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NAVSHIPS 91047 **RESTRICTED**

INSTRUCTION BOOK

for

RF AND AF SIGNAL DISTRIBUTION UNIT

AIRPLANE & MARINE INSTRUMENTS, INC.
CLEARFIELD, PA.

BUREAU OF SHIPS **NAVY DEPARTMENT**

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Contract: NObsr - 30,000 *Approved by BuShips: 2 JAN. 1948*

LIST OF EFFECTIVE PAGES

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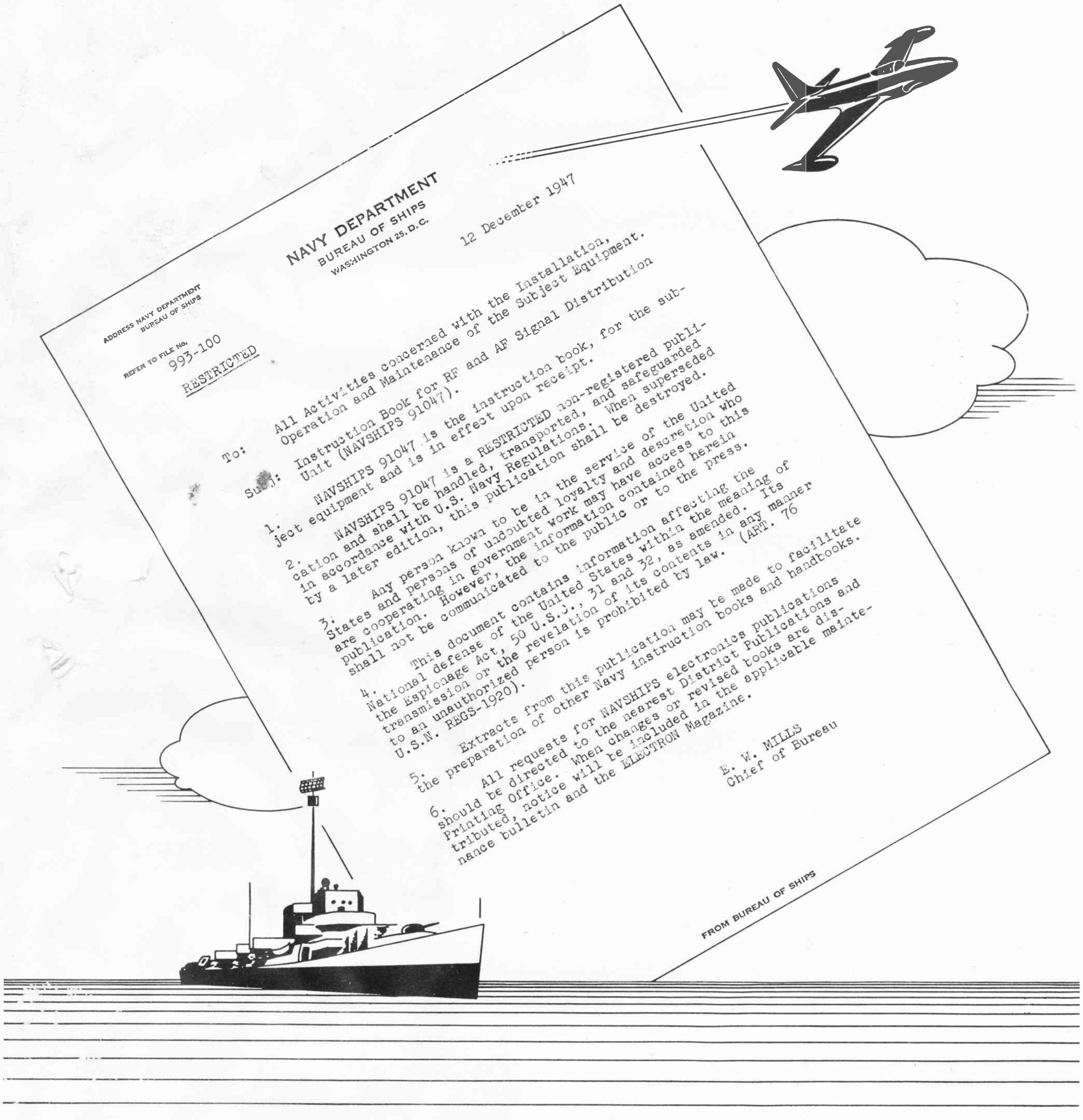

NAVY DEPARTMENT
BUREAU OF SHIPS
WASHINGTON 25, D.C.

ADDRESS NAVY DEPARTMENT
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REFER TO FILE No.
993-100

RESTRICTED

12 December 1947

To: All Activities concerned with the Installation, Operation and Maintenance of the Subject Equipment.

Subj: Instruction Book for RF and AF Signal Distribution Unit (NAVSHIPS 91047).

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E. W. MILLS
Chief of Bureau

FROM BUREAU OF SHIPS

RECORD OF CORRECTIONS MADE

CHANGE NO.	DATE	SIGNATURE OF OFFICER MAKING CORRECTION

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GUARANTEE

The Contractor guarantees that at the time of delivery thereof the articles provided for under this contract will be free from any defects in material or workmanship and will conform to the requirements of this contract. Notice of any such defect or non-conformance shall be given by the Government to the contractor within one year of the delivery of the defective or nonconforming article, unless a different period of Guarantee is specified in the schedule. If required by the Government within a reasonable time after such notice, the Contractor shall with all possible speed correct or replace the defective or noncomforming article or part thereof. When such correction or replacement requires transportation of the article or part thereof, shipping costs, not exceeding usual charges, from the delivery point to the Contractor's plant and return, shall be borne by the Contractor; the Government shall bear all other shipping costs. This Guarantee shall then continue as to corrected or replacing articles or, if only parts of such articles are corrected or replaced, to such corrected or replacing parts, until one year after the date of redelivery, unless a different period of Guarantee is specified in the schedule. If the Government does not require correction or replacement of a defective or non-conforming article, the Contractor, if required by the contracting officer within a reasonable time after the notice of defect or non-conformance, shall repay such portion of the contract price of the article as is equitable in the circumstances.

INSTALLATION RECORD

Contract Number NObsr-30,000 Date of Contract, 23 April 1946

Serial Number of equipment..

Date of acceptance by the Navy..

Date of delivery to contract destination..

Date of completion of installation..

Date placed in service..

Blank spaces on this page shall be filled in at time of installation. Operating personnel shall also mark the "date placed in service" on the date of acceptance plate located below the model nameplate on the equipment, using suitable methods and care to avoid damaging the equipment.

REPORT OF FAILURE

Report of failure of any part of this equipment, during its entire service life, shall be made to the Bureau of Ships in accordance with current regulations using form NAVSHIPS NBS 383 (revised) except for Marine Corps equipment, in which case the "Signal Equipment Failure Report" form shall be used and distributed in accordance with instructions pertaining thereto. The report shall cover all details of the failure and give the date of installation of the equipment. For procedure in reporting failures see Chapter 67 of the *Bureau of Ships Manual* or superseding instructions.

ORDERING PARTS

All requests or requisitions for replacement material should include the following data:

1. Federal stock number or, when ordering from a Marine Corps or Signal Corps supply depot, the Signal Corps stock number.
2. Name and short description of part.

If the appropriate stock number is not available the following shall be specified:

1. Equipment model or type designation, circuit symbol, and item number.
2. Name of part and complete description.
3. Manufacturer's designation.
4. Contractor's drawing and part number.
5. JAN or Navy type number.

DESTRUCTION OF ABANDONED MATERIAL IN THE COMBAT ZONE

In case it should become necessary to prevent the capture of this equipment, and when ordered to do so, DESTROY IT SO THAT NO PART OF IT CAN BE SALVAGED, RECOGNIZED, OR USED BY THE ENEMY. BURN ALL PAPERS AND BOOKS.

Means:

1. Explosives, when provided.
2. Hammers, axes, sledges, machetes, or whatever heavy object is readily available.
3. Burning by means of incendiaries such as gasoline, oil, paper or wood.
4. Grenades and shots from available firearms.
5. Burying all debris, where possible and when time permits.
6. Throwing overboard or disposing of in streams or other bodies of water.

Procedure:

1. Obliterate all identifying marks. Destroy nameplates and circuit labels.
2. Demolish all panels, castings, switch and instrument boards.
3. Destroy all controls, switches, relays, connections and meters.
4. Rip out all wiring and cut interconnections of electrical equipment Smash gas, oil, and water cooling systems in gas engine generators, etc.
5. Smash every electrical or mechanical part, whether rotating, moving or fixed
6. Break up all operating instruments such as keys, phones, microphones, etc.
7. Destroy all classes of carrying cases, straps, containers, etc.
8. Bury or scatter all debris.

DESTROY EVERYTHING!

SAFETY NOTICE

The attention of officers and operating personnel is directed to Chapter 67 of the BUREAU OF SHIPS MANUAL or superseding instructions on the subject of radio-safety precautions to be observed.

This equipment employs voltages (1200 volts) which are dangerous and may be fatal if contacted by operating personnel. Extreme caution should be exercised when working with the equipment.

While every practicable safety precaution has been incorporated in this equipment, the following rules must be strictly observed:

KEEP AWAY FROM LIVE CIRCUITS:

Operating personnel must at all time observe all safety regulations. Do not change tubes or make adjustments inside equipment with high voltage supply on. Under certain conditions dangerous potentials may exist in circuits with power controls in the off position due to charges retained by capacitors. To avoid casualties always remove power and discharge and ground circuits prior to touching them.

DON'T SERVICE OR ADJUST ALONE:

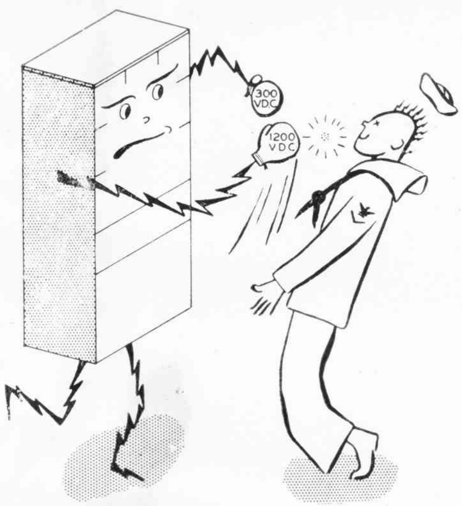
Under no circumstances should any person reach within or enter the enclosure for the purpose of servicing or adjusting the equipment without the immediate presence or assistance of another person capable of rendering aid.

DON'T TAMPER WITH INTERLOCKS:

Do not depend upon door switches or interlocks for protection but always shut down motor generators or other power equipment. Under no circumstances should any access gate, door, or safety interlock switch be removed, short-circuited, or tampered with in any way, by other than authorized maintenance personnel, nor should reliance be placed upon the interlock switches for removing voltages from the equipment.

RESUSCITATION

AN APPROVED POSTER ILLUSTRATING THE RULES FOR RESUSCITATION BY THE PRONE PRESSURE METHOD SHALL BE PROMINENTLY DISPLAYED IN EACH RADIO, RADAR, OR SONAR ENCLOSURE. POSTERS MAY BE OBTAINED UPON REQUEST TO THE BUREAU OF MEDICINE AND SURGERY.

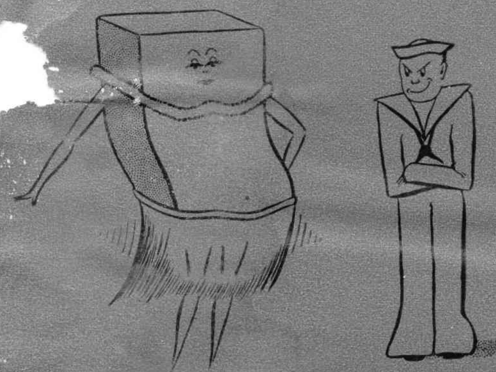


WARNING:

NEVER MEASURE POTENTIALS IN EXCESS OF 1000 VOLTS BY MEANS OF FLEXIBLE TEST LEADS OR PROBES.

Navships 91047

General Description
Section 1



Signal Distribution System
(AF and RF)

Restricted

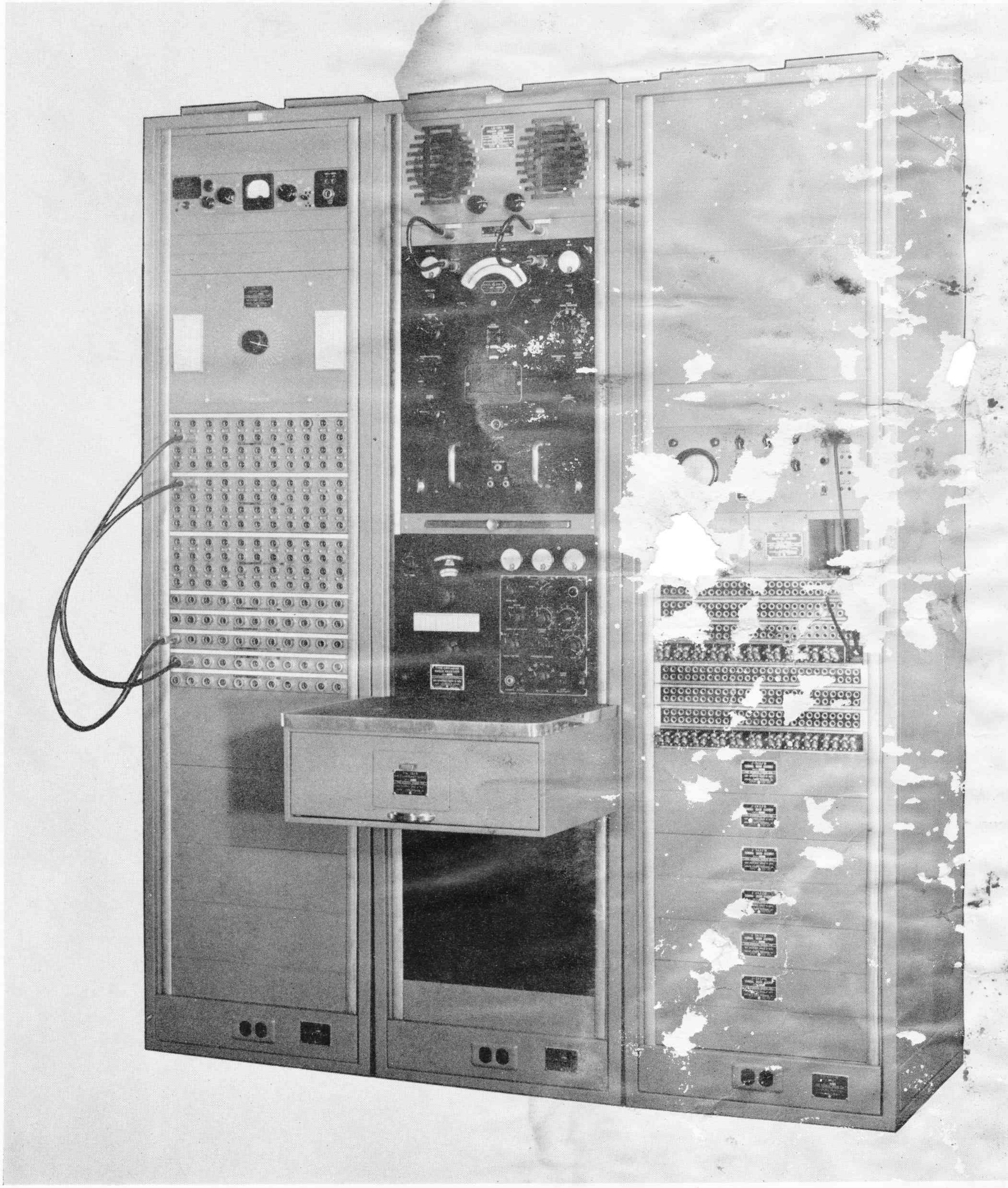


Figure 1-1. Signal Distribution Unit Type A Assembled For Operation

SECTION 1
GENERAL DESCRIPTION

1. GENERAL DESCRIPTION.

a. PURPOSE.—The Navy Signal Distribution Unit is a standardized RF and AF manually operated switching and monitoring equipment for use in Naval shore communication centers.

The equipment permits standardization of components, methods of installation and wiring of AF and RF signal circuits, and provides maximum operational flexibility when installed.

b. DESIGN.—To meet the requirements of paragraph 1, *a*, standardized components are available from Navy stock which have been designed to mount in standard 19" relay rack cabinets in any desired order. Blank panel space is provided to permit expansion as additional components are required. The necessary Government furnished components may be obtained from Navy supply sources upon proper authorization.

The Type A Signal Distribution Unit, which consists of three cabinets, is described in this section. Types B and C are similar in construction but consist of two and one cabinet respectively. Basic operating procedures and components are the same for all three types, but the number, arrangement, and mounting of components are altered to fit the space available.

c. OVERALL FUNCTION.—The Signal Distribution Unit consists of two sections, the Radio Frequency (RF) and the Audio Frequency (AF). Suitable monitoring equipment is included.

The RF section provides connection facilities for all antennae of the station network. The internal wiring is such that "normal through" circuits from antennae to station receivers and/or multicouplers are used. However, suitable panels and patchcords permit the operation of any receiver or multicoupler from any station antenna. In addition, the normal signal source to a receiver may be interrupted, and the signal obtained from a different source which may be either a multicoupler or an antenna. A rotary antenna selector switch is provided which permits rapid comparison of antennae to determine the best input response for a particular signal by comparison of reception on various antennae of the network. The antenna selector switch may also be used to determine roughly the bearing of a given signal or intense noise source, provided the antenna network coverage is sufficiently large and the transmission lines have approximately the same attenuation characteristics.

The AF section provides connection facilities for the audio outputs of the station receivers. Direct "normal through" circuits connect the receiver outputs to their normal loads. An arrangement of jack panels and suitable AF patchcords permits the normal load circuits to be switched so that any receiver can be connected to any load with minimum interruption. Or, if so desired, the normal load circuit of a receiver may be connected to another load in parallel for monitoring without interrupting communications. The interconnecting terminal boards, in series between receiver output terminal boards and connected load terminal boards, furnish a means for making temporary or permanent circuit connections to eliminate the use of patchcords in permanent or semi-permanent circuits. An audio frequency selector switch with parallel connections from the receiver output terminal boards is used to monitor or measure any receiver output circuit without interrupting connections.

Patchcord switching enables the operator to set up circuits other than the "normal through" circuits as desired. However, since the needs of individual stations differ, the system must be adapted to the specific case.

d. FEATURES.—In each type of the Signal Distribution Unit, provision is made for mounting Government furnished equipments which may be used to measure frequency, insulation resistance, volume level, voltage, and current, and provide visual and aural monitoring. The Signal Distribution Units are wired for a 115 volt AC power source. Switch Panel AN Type SA-134/G mounts in the rear of each cabinet to serve as a fused primary power line control. Each cabinet contains convenience outlets on the front and rear, a strip outlet with a common ON-OFF Switch for electrically operated components, and a trouble light. A writing shelf and a dual utility speaker panel are included for use by the operator.

The Type A Unit provides space for a Navy Model RBC Radio Receiver with Power Supply Unit Navy Type CRV-20130 for 110/115/120 VAC operation.

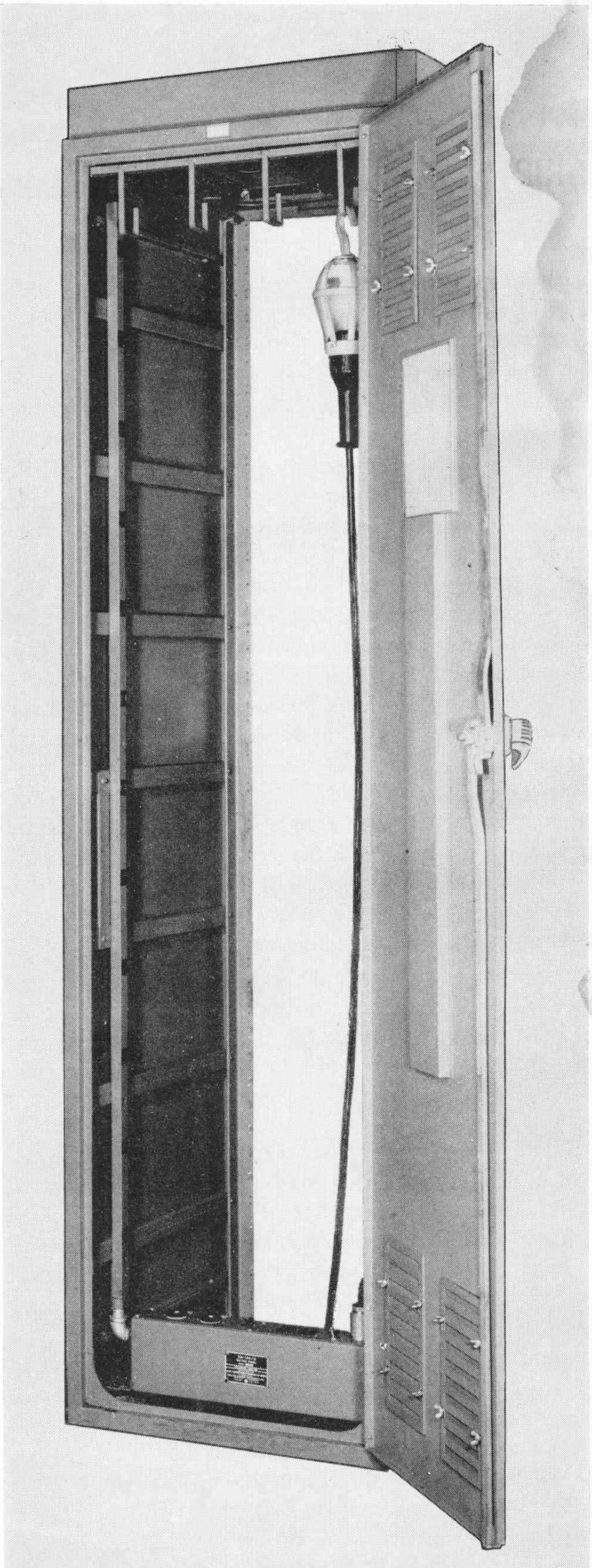


Figure 1-2. Cabinet, AN Type CY-597/G, Rear View

This receiver is intended primarily for monitoring purposes.

2. MAJOR TYPE UNITS AND ASSOCIATED EQUIPMENT.

a. The Signal Distribution Unit is furnished in three types to suit the needs of different size stations. The components mounted in each type unit are interchangeable with the components in the other two types. The units are designated as Types A, B, and C. Types may be readily converted to the larger or smaller size by rearrangement and addition of components.

(1) TYPE A UNIT.—The type A Signal Distribution Unit, used singly or in multiple, is designed to meet the needs of the largest shore communication centers. Provision is made for connecting thirty-two antennae and thirty-two receivers. The Type A Unit, consisting of three cabinets, is approximately 67 1/8 inches wide, 26 inches deep, and 87 9/16 inches high when completely assembled. A typical Type A installation includes the components listed in Table 1-1 and Table 1-4. See figure 2-31 for the arrangement of components.

(2) TYPE B UNIT.—The Type B Signal Distribution Unit is designed to meet the needs of a medium size shore communication center. Provision is made for connecting twenty-two antennae and twenty-two receivers. The Type B Unit, consisting of two cabinets, is approximately 44 3/4 inches wide, 26 inches deep, and 87 9/16 inches high. Should the needs of a medium sized station expand so that twenty-two circuits are insufficient, the Type B Unit can easily be converted to a Type A Unit merely by the addition of one cabinet and the necessary components and rearrangement of the components within the three cabinets. The cabinets are identical with those used in the Type A Unit. A typical Type B installation contains, when completely assembled, the components listed in Table 1-2 and Table 1-5. See figure 2-32 for the arrangement of the components.

(3) TYPE C UNIT.—The Type C Signal Distribution Unit is designed to meet the needs of the smaller shore communication centers. Provision is made for connecting eleven antennae and eleven receivers. The Type C Unit consists of one cabinet. Its overall dimensions are approximately 22 3/8 inches wide, 26 inches deep, and 87 9/16 inches high. Should the needs of a small station expand so that eleven circuits are insufficient, the Type C Unit can easily be expanded to become a Type B or Type A Unit by the addition of cabinets and components and rearrangement of components. A typical Type C installation contains, when completely assembled, components

lis... in Table 1-3 and Table 1-6. See figure 2-33 for the arrangement of the components.

3. COMPONENTS OF THE SIGNAL DISTRIBUTION UNITS.

a. STANDARD COMPONENTS.—The Signal Distribution Unit was designed to include certain Government and contractor furnished components. A brief description of the appearance and function of each component is included below. It is anticipated, however, that new components will be designed or adapted to become part of the Signal Distribution System. All mounting panels are spot-faced around the holes for the mounting screws to ground the chassis of the component to the cabinet.

(1) CABINET AN TYPE CY-597/G *(Figure 1-2)*.—Cabinet AN Type CY-597/G is of steel construction and strengthened throughout by an arrangement of supporting cross members and corner angle gussets. The cabinet is designed to accommodate components which are fitted with 19″ front mounting panels. The panel mounting angles, which provide 77″ of mounting space vertically, are drilled and tapped alternately on 1 1/4″ and 1/2″ centers for #10-32 screws and are movable in 1/2″ steps from front to rear of the cabinet. Sufficient blank panels are provided to cover all front panel space not taken up by mounted components. An additional set of panel mounting angles is provided for mounting 19″ panels within the cabinets. The vertical panel mounting angles are secured to cross members which are drilled and tapped for #10-32 screws every 1/2″ from front to rear of the cabinet are mounted to provide 10 1/2″ vertical spacing between these rows of holes.

The sides of the cabinet is closed by removable side panels. Small filler panels are included at the top and bottom which may be removed to provide cable entrances. The rear of the cabinet is fitted with a steel door to allow access to the rear of the mounted

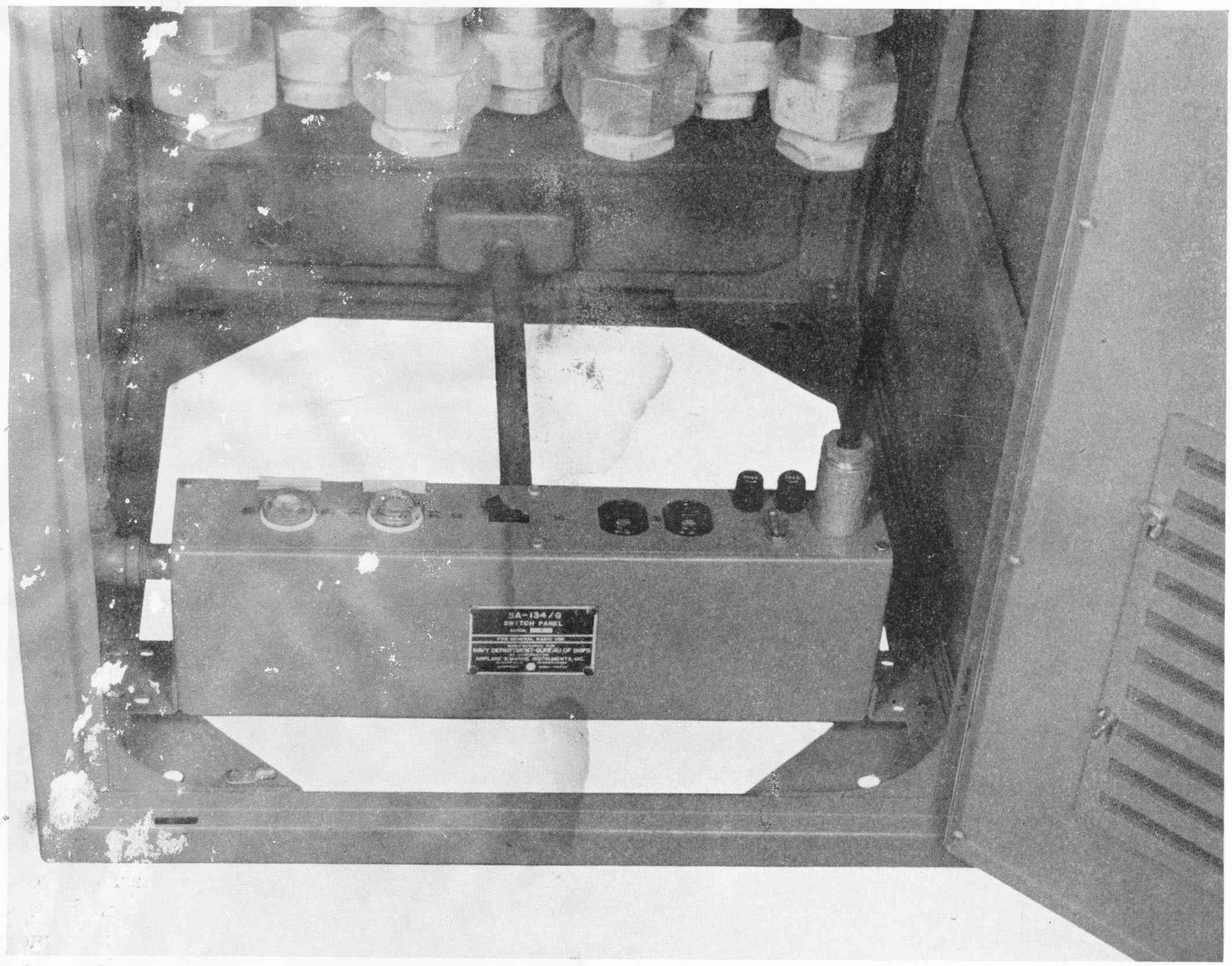


Figure 1-3. Switch Panel AN Type SA-134/G, Installed in Cabinet AN Type CY-597/G

components. The door and the top of the cabinet are fitted with adjustable louvers which provide controlled ventilation. A conduit box with removable fittings for interconnecting cable runs and cable hangers are included. The Switch Panel AN Type SA-134/G is mounted in the bottom rear of the cabinet to provide a 115 VAC control for operation of components mounted within the cabinet.

(a) BLANK PANELS.—Blank panels, which conform with the standard sizes found throughout the service, are provided by the contractor for filling front panel space not taken up by mounted components. Their designations and vertical dimensions are as follows: Size A - 1 23/32″; B - 3 15/32″; C - 5 7/32″; D - 6 31/32″; E - 8 23/32″; F - 10 15/32″; G - 12 7/32″; and H - 13 31/32″.

(2) SWITCH PANEL AN TYPE SA-134/G *(Figure 1-3)*.—Switch Panel AN Type SA-134/G controls the primary power input to each cabinet and is mounted in the bottom rear of the cabinet. The Switch Panel is wired and fused for 115 volts AC 15 amperes. If desired, it may be connected to 230 volts AC, but the 15 amp fuses must be replaced with 5 amp fuses. A trouble light is included which is fused separately with two one ampere cartridge fuses. It is controlled by a "bat" handle double pole single throw switch. The main power double pole single throw switch disconnects all circuits except the two double convenience outlets and trouble lamp.

Knockouts in one side of the Switch Panel permit the installation of up to four receptacles for drying lamps. These bulbs, if installed, are wired to the main fuses. The power input cable enters the Switch Panel through a knockout in the bottom for 1/2 or 3/4 inch conduit.

(3) JACK PANEL AN TYPE J-243/G *(Figure 1-4)*.—Jack Panel AN Type J-243/G mounts internally in the cabinet between the horizontal cabinet members on the vertical movable mounting channels. It consists of eleven Connector-Adapters Navy Type CIA-491652 mounted on a steel channel 7″ x 20 1/2″ fitted with mounting brackets. Eleven 1 17/32″ holes are provided for mounting the Connector-Adapters. Since the Jack Panel mounts internally, the front panel space may be utilized for other components which do not project too far inside the cabinet, or is filled with blank panels. The Connector-Adapters are secured in the panel by suitable mounting nuts.

(a) CONNECTOR-ADAPTER, NAVY TYPE CIA-491652 *(Figure 1-4)*.—The Connector-Adapter

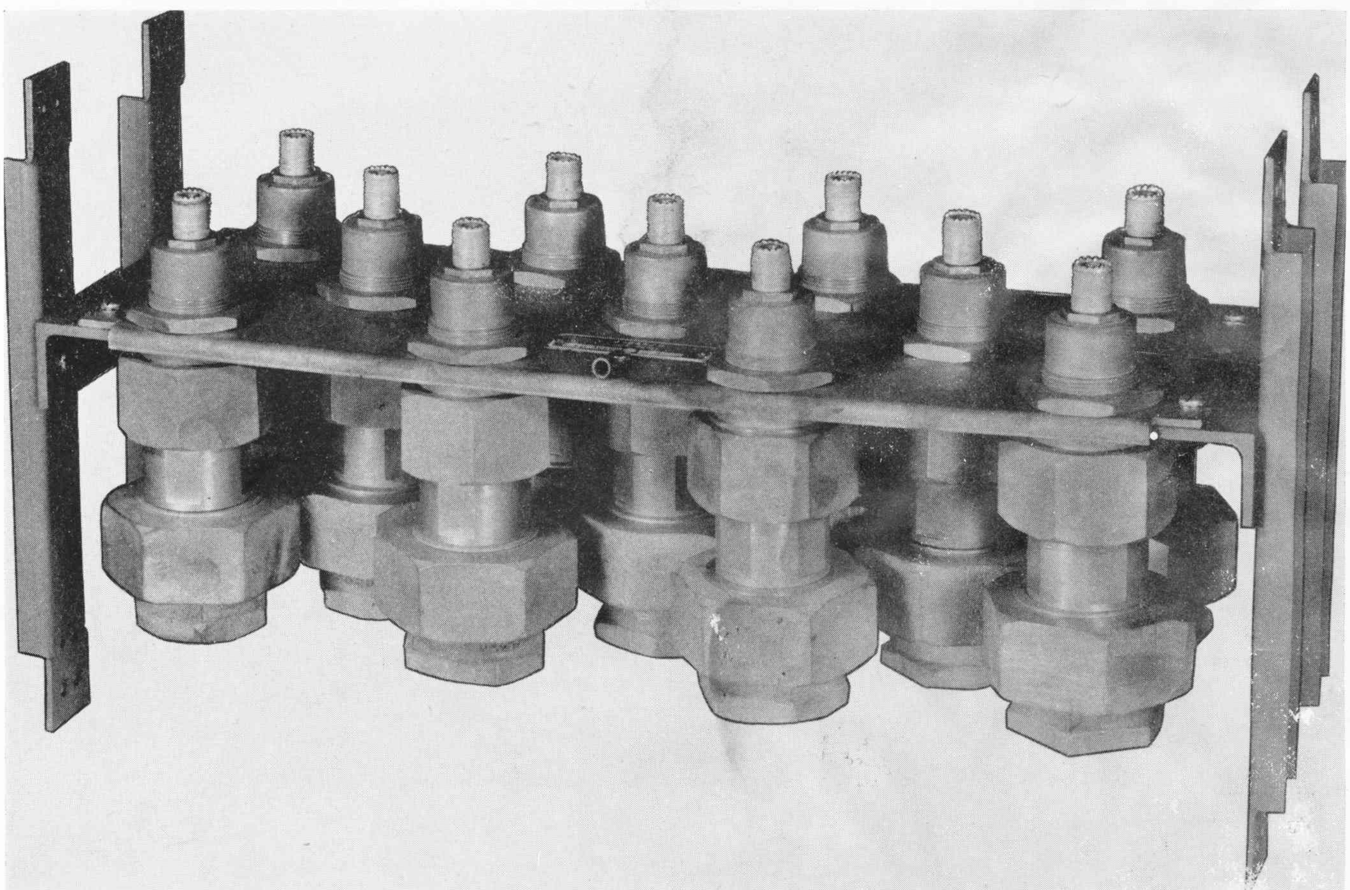


Figure 1-4. Jack Panel AN Type J-243/G With Connector-Adapters Navy Type CIA-491652 in Place.

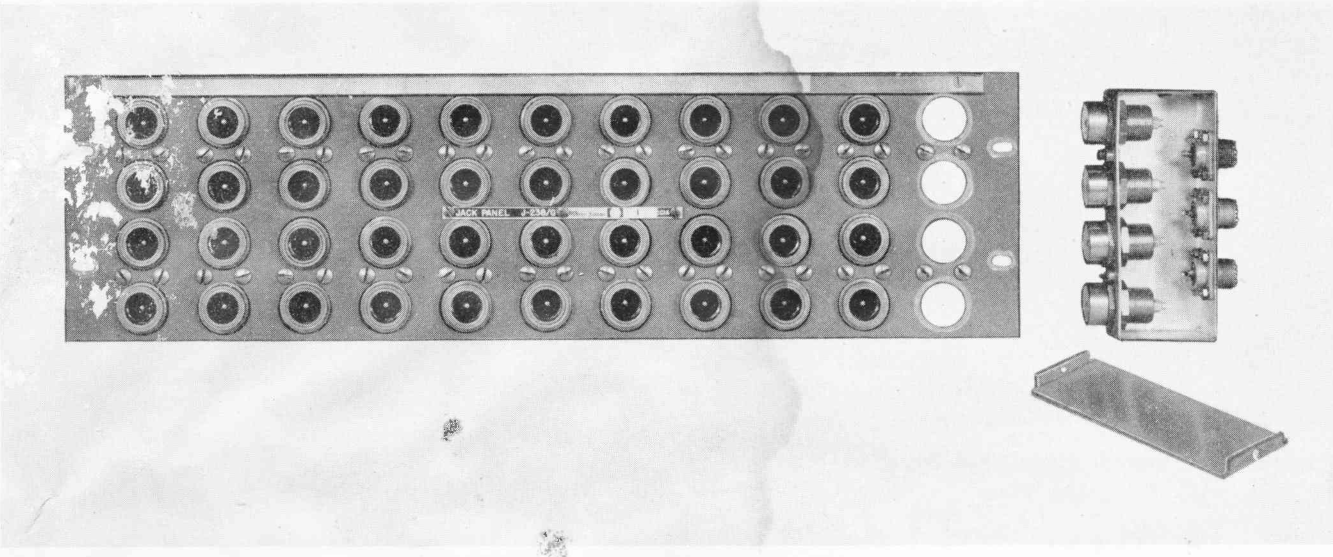


Figure 1-5. Jack Panel AN Type J-238/G, Front View With One Jack Box Navy Type -491729 Removed

is an RF coaxial type fitting which provides coupling between the incoming RG-85/U antenna coaxial cable and the internal cabinet wiring (RG-12/U cable). All metal parts are cadmium plated brass. Gaskets are provided to keep the cables water tight at the fitting. Navy Type -49190 Connectors are used to connect the RG-12/U internal cables to the Navy Type -49191 receptacles on the output end of the Connector-Adapters. See figure 2-3 for an exploded view of the Connector-Adapter.

(4) JACK PANEL AN TYPE J-238/G *(Figure 1-5)*.—Jack Panel AN Type J-238/G is a size C panel which mounts on the front of the cabinet. It contains eleven jack boxes, Navy Type CIA-291729, in each of which a cable from one Connector-Adapter Navy Type CIA-491652 terminates.

(a) JACK BOX NAVY TYPE CIA-491729 *(Figure 1-6)*.—The front, or panel end of the jack box contains four receptacles Navy Type -49120 which mate with Navy Type -49121A patchcord plugs. The rear end contains three receptacles Navy Type -49194 which mate with Navy Type -49190 connectors. All receptacles are connected in parallel internally (see figure 1-6). The incoming antenna signal is applied to the lower receptacle on the rear of each jack box; the center receptacle distributes this signal to Jack Panel AN Type J-239/G; and the upper rear receptacle connects to the RF Antenna Selector Switch on Switch Panel AN Type SA-137/G. The four receptacles Navy Type -49120 on the front of each Jack Box provide points for making parallel connections by means of RF patchcords.

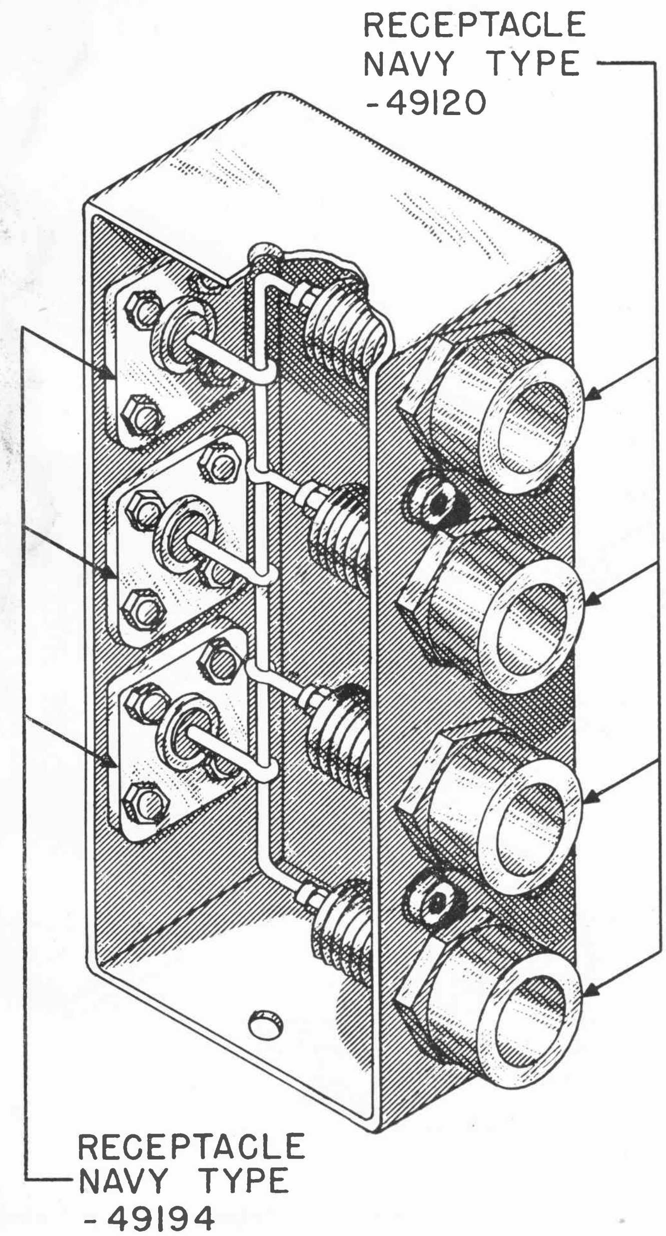


Figure 1-6. Jack Box Navy Type CIA-491729, Part of J-238/G Isometric View With Cover Removed

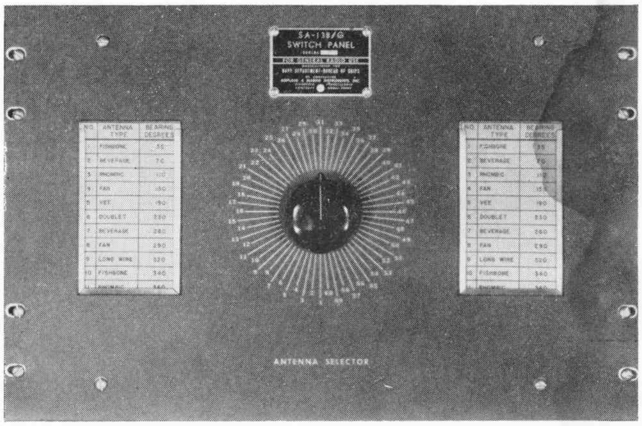


Figure 1-7. Switch Panel AN Type SA-138/G, Front View.

(5) SWITCH PANEL AN TYPES SA-136/G, SA-137/G, and SA-138/G.—The Switch Panel consists of an Antenna Selector Switch mounted on a size G panel. It has appropriate control markings on the face of the panel to indicate the switch positions. It includes two card holders for tabulating the necessary information concerning the antenna array. It comes in three types as follows:

SA-136/G.—This type includes the 20 position switch AN Type SA-139/U.

SA-137/G.—This type includes the 40 position switch AN Type SA-140/U.

SA-138/G.—This type includes the 60 position switch AN Type SA-141/U.

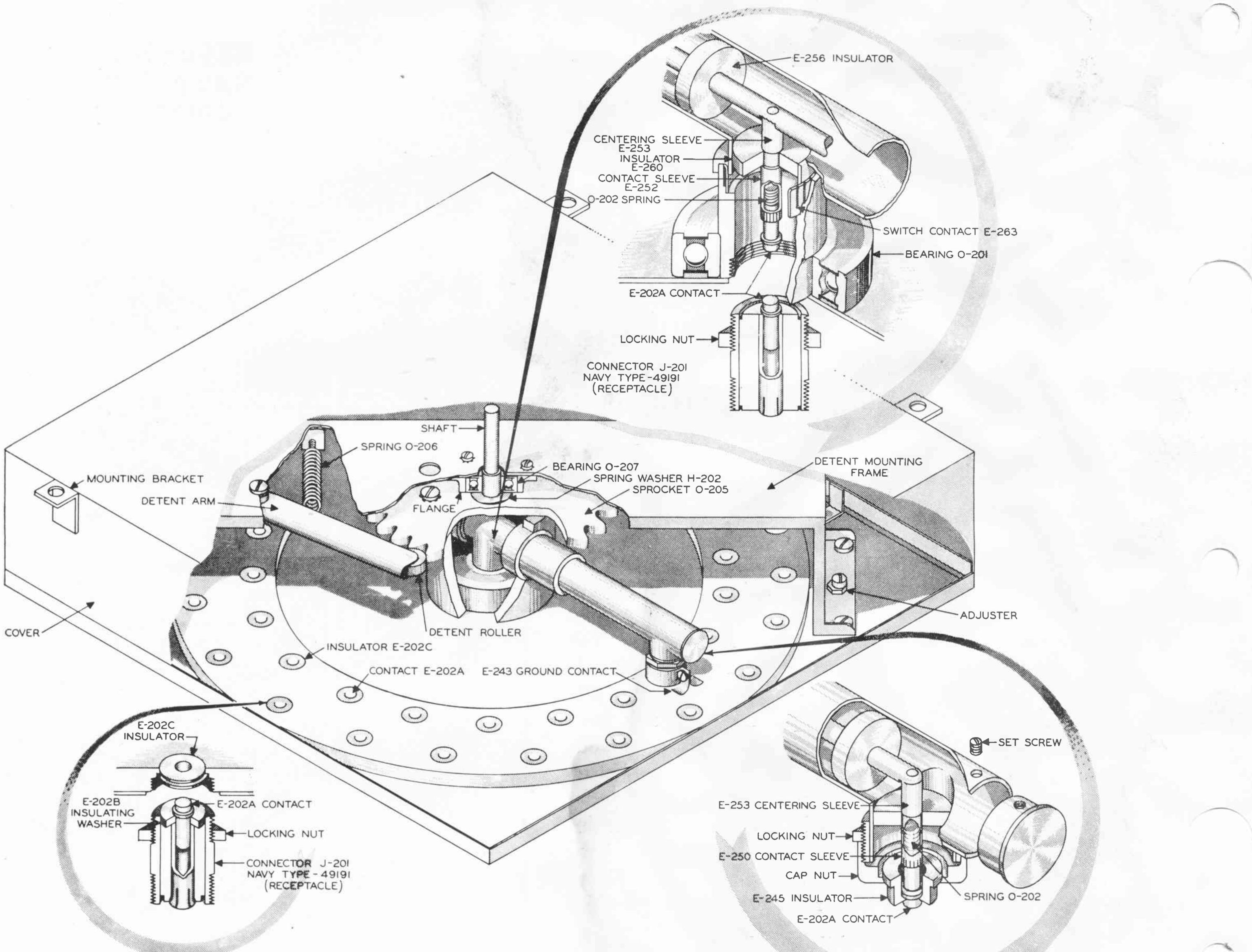


Figure 1-8. Antenna Selector Switch, AN Type SA-140/U, Cutaway View.

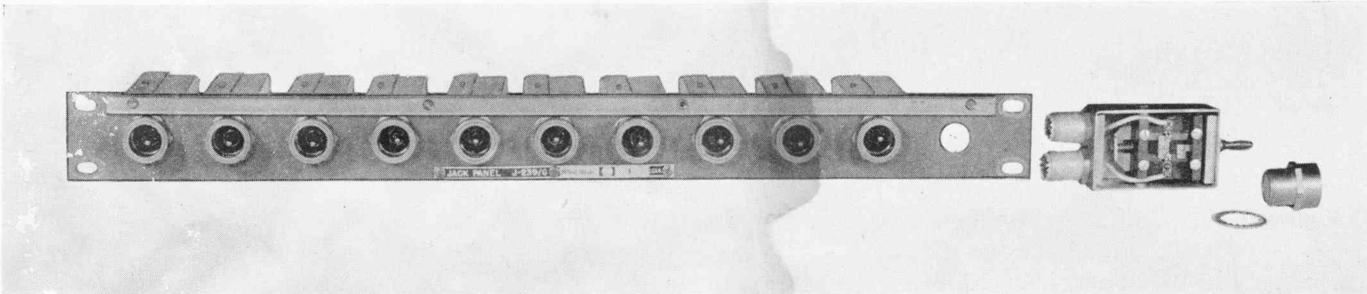


Figure 1-9. Jack Panel AN Type J-239/G, Front View With One RF Jack Switch Navy Type CIA-491388 Removed

(a) ANTENNA SELECTOR SWITCH AN TYPES, SA-139/U, SA-140/U, and SA-141/U.—The Antenna Selector Switch comes in three sizes: 20 position designated as AN Type SA-139/U, 40 position designated as AN Type SA-140/U, and 60 position designated as AN Type SA-141/U. The construction of all three types is similar, the difference being in the number of contacts provided.

The 40 and 60 position switches consist of a silver plated brass contact ring in which specially constructed coaxial silver plated contacts are arranged in two concentric circles, each circle containing half the total number (see figure 1-8). Each contact is surrounded by a polystyrene insulator which is fitted into an appropriate hole in the contact ring. A Connector Navy Type -49191 screws into the bottom of the contact ring to mate with the silver contacts. The contacts protrude slightly above the plane of the contact ring. The rotor of the switch consists of an arm fitted with specially designed RF spring loaded coaxial fittings on each end which make contact with the contacts in the contact ring. The arms are of different lengths so that one makes contact with the inner circle of contacts and the other makes contact with the outer circle. The contacts in the contact ring are staggered so that one arm is making contact while the other is between the contacts. A suitable detent mechanism is included which insures positive positioning of the rotor at the point of proper contact. The coaxial fittings on the ends of the rotor arms are connected in parallel to a coaxial fitting at the exact center of rotation which serves as the output connection for the switch. The arm is grounded to the contact ring by sliding brass contacts on either end. The rotor is mounted on ball bearings which allow it to turn freely. The whole switch is enclosed in a cadmium plated steel box of welded construction.

The 20 position switch is similar in construction except that the rotor has only one arm and the contacts are spaced in one circle on the contact ring.

(6) JACK PANEL AN TYPE J-239/G *(Figure 1-9)*.—Jack Panel AN Type J-239/G mounts on the front of the cabinet and contains eleven Jack Switches Navy Type CIA-491388. It is normally used to distribute RF signals from Jack Panel AN Type J-238/G to the station receivers and/or multi-couplers and auxiliary equipment. It is a size A panel.

(a) RF JACK SWITCH NAVY TYPE CIA-491388 *(Figure 1-10)*.—The rear of each RF Jack Switch is equipped with two coaxial cable connectors, Navy Type -49191. The design of the Jack Switch is such that when no patchcord plug is inserted into the front receptacle (Navy Type -49120) the two rear connectors in the Jack Switch are bridged together with a sliding silver alloy contact. The received signal is therefore applied to a receiver or multicoupler. When a Navy Type -49121A patchcord plug is inserted in the front receptacle, the upper rear connector (antenna input) is disconnected from the circuit and the lower rear connector (receiver input) is connected with the inserted plug. This enables the operator to disconnect the receiver from the normal antenna and by patchcord connect another antenna to receiver.

(7) JACK PANEL AN TYPE J-237/G *(Figure 1-11)*.—Jack Panel AN Type J-237/G is a size A panel,

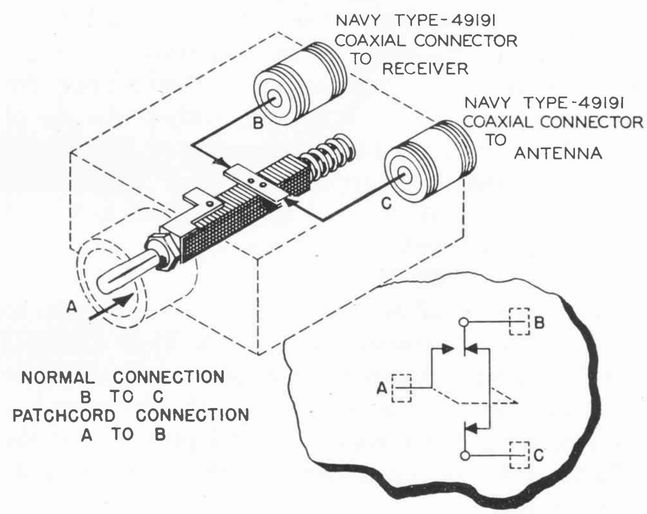


Figure 1-10. RF Jack Switch Navy Type CIA-491388, Functional Diagram

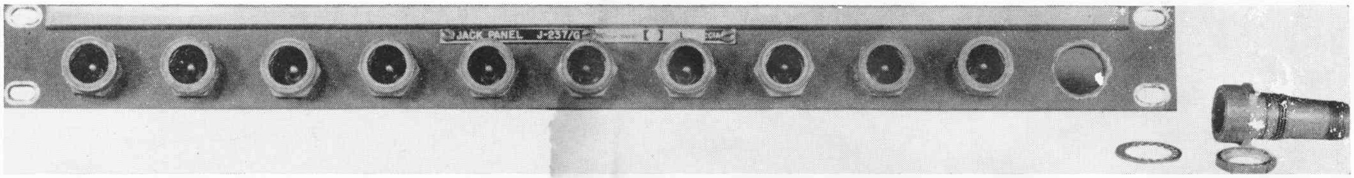


Figure 1-11. Jack Panel AN Type J-237/G, Front View With One Connector AN Type UG-294/U Removed

which mounts on the front of the cabinet, containing eleven RF Connectors AN Type UG-294/U. The front or panel ends mate with Navy Type -49121A patchcord plugs and are used to patch multicoupler or miscellaneous sources to the input lines of the station receivers through Jack Panel AN Type J-239/G. The rear ends mate with Navy Type -49190 connectors and external cable from multicoupler outputs or miscellaneous sources.

(8) CONTROL AN TYPE C-443/G *(Figure 1-12)*.—Control AN Type C-443/G is the connecting link between the Signal Distribution Unit and the AF output from two radio receivers at each operator's position within the station, or any remote position included in the Distribution System. This component which is designed for mounting under the front edge of a Standard Navy Operator's Table (see figure 2-34) consists essentially of a three position rotary selector switch used for selection of either or both receiver outputs to the operator's phones, a set of toggle switches for connecting the receiver audio circuits to the Distribution Unit, and four pairs of phone jacks for the operator's headset connections. The operator's headset is normally connected to the set of jacks designated "SEL" which permits either or both receiver outputs to be impressed on the phones by the action of the three position rotary selector switch. The set of jacks designated "U" may be connected from a utility line to the operator's position. The jacks marked Receiver "A" and Receiver "B" are connected in parallel with the receiver outputs and are used to connect the operator's headset to each receiver without the use of the selector switch. The construction of all jacks is such that headsets equipped with Navy Type -49109 single plugs are inserted in the left hand jack, and those equipped with Navy Type -491242 twin plugs are inserted in both jacks.

The toggle switches connect the receiver outputs to the audio lines between Control AN Type C-443/G and the Receiver Output Terminal Boards AN Type J-242/G. With the switches open, the operator has the receiver outputs available at his phones, and the selector switch permits either or both receiver outputs to be heard.

(9) TERMINAL BOARD ASSEMBLY AN TYPE J-242/G *(Figure 1-13)*.—Terminal Board Assembly AN Type J-242/G consists of a size B panel on the rear of which four barrier type terminal boards mount. Each is equipped with thirteen double screw type terminals. The terminal boards are offset from the panel by brackets to allow space for the connecting internal AF cables, which are fabricated from modified TTRS series cable. Terminal designation strips are numbered consecutively in pairs from 1-13 inclusive on the two top terminal boards and 14-26 inclusive on the two bottom terminal boards. For a description of the wiring, refer to paragraph 1, *h* (3) of section 2.

(10) JACK MOUNTING STRIP, NAVY TYPE -491394 *(Figure 1-14)*.—The Jack Mounting Strip Navy Type -491394 is a size A panel which includes mounting for 52 Telephone Jacks, Navy Type -491395, arranged in two rows of 26 jacks each. Wiring, which is installed by the installation activity, is so connected that horizontally adjacent pairs connect to the two sides of a single circuit. Only the tips of the twin plug patchcords make connection. The vertically adjacent jacks are connected in parallel in such a fashion that when a patchcord is inserted into the top pair, the normal circuit to the load is broken and a new connection substituted; but when a patchcord plug is inserted into the bottom jacks, the normal circuit is unaltered and the patchcord is then in parallel. Thus, a total of 13 circuits may be connected into any one Jack Mounting Strip.

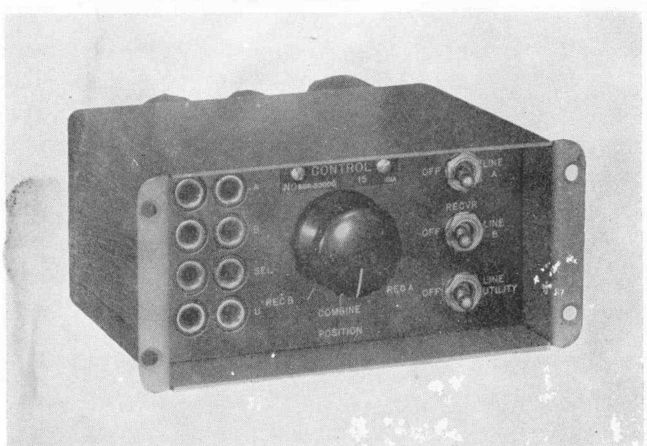


Figure 1-12. Control AN Type C-443/G, Front View

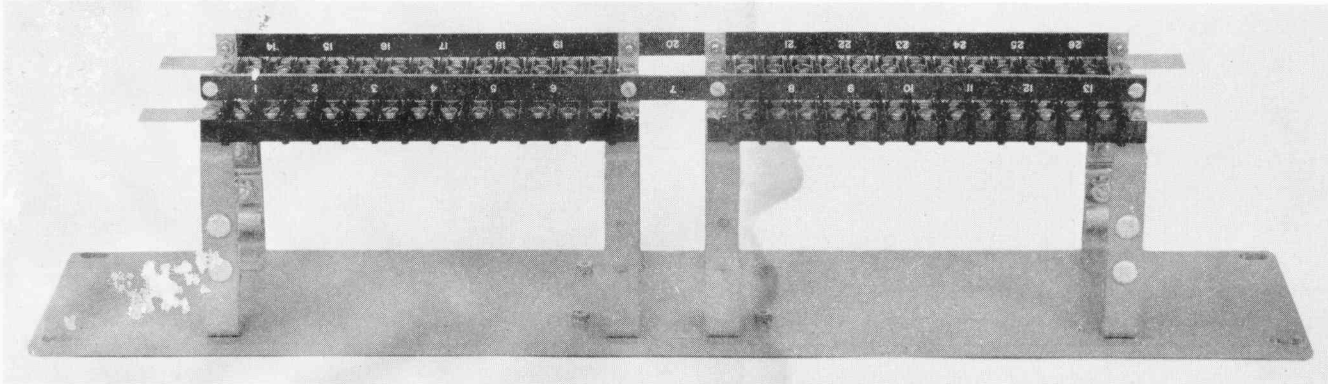


Figure 1-13. Terminal Board Assembly AN Type J-242/G, Rear View.

The Jack Mounting Strip, Navy Type -491394 has two uses in the Signal Distribution System as follows (see figure 2-24):

(a) RECEIVER OUTPUT PANEL.—The outputs of the receivers connect to the Receiver Output Panel which has a "normal through" circuit to the receiver loads. These connections can be altered by plugging into the upper row of jacks or can be paralled by plugging into the lower row of jacks.

(b) MISCELLANEOUS APPARATUS PANEL.—The Miscellaneous Apparatus Panel is connected in series between the Receiver Output Panel and the load circuits. Plugging into the upper row of jacks breaks the normal AF input to a certain load and substitutes another input in its place. Plugging into the bottom row of jacks sets up a parallel circuit.

(11) RETAINER-PULLEY ASSEMBLY AN TYPE MX-813/G *(Figure 1-15)*.—The Retainer-Pulley Assembly AN Type MX-813/G consists of eleven spring loaded retainers mounted on a steel bracket. The bracket is secured at each end by two vertical channels mounted between adjacent cross members in the sides of the AF cabinet. The purpose of the Retainer-Pulley Assembly is to furnish a method by which patchcords can be stowed in an orderly manner when not in use. It also eliminates slack cables across the front of the cabinet when patchcords are used. When a patchcord is removed from a connection to the AF Jack Panels, it will return to the Patchcord Storage Panel AN Type MX-814/G automatically.

Each patchcord retainer is constructed in the form of a spring loaded barrel with a textile tape wound on

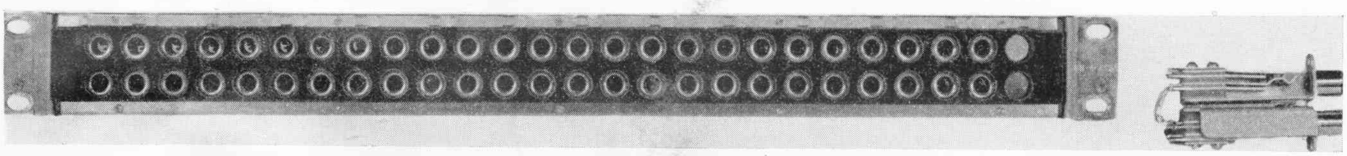


Figure 1-14. Jack Mounting Strip Navy Type -491394, Front View With One Jack Navy Type -491395 Removed

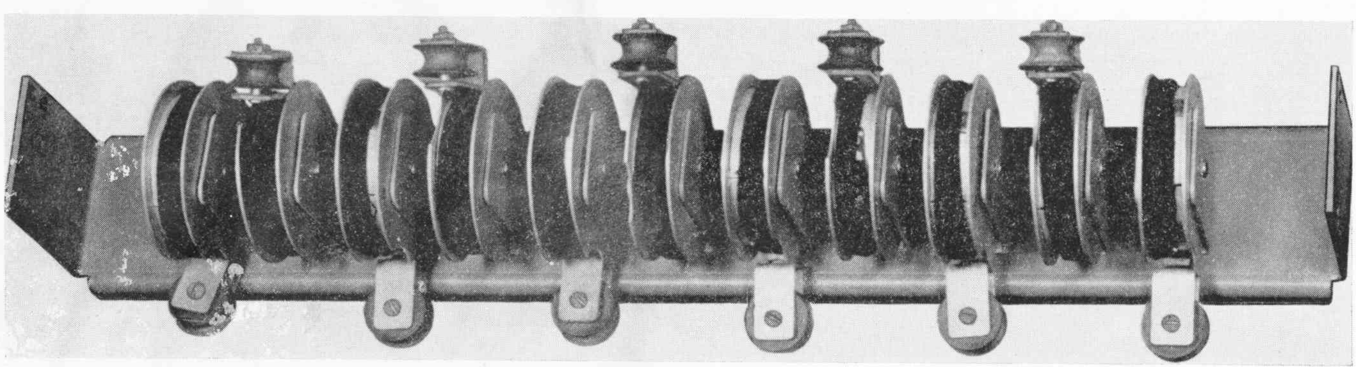


Figure 1-15. Retainer-Pulley Assembly, AN Type MX-813/G

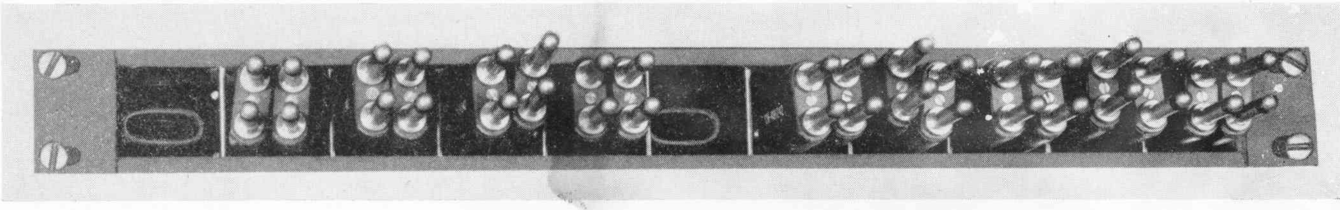


Figure 1-16. Patchcord Storage Panel, AN Type MX-814/G, Front View

the circumference with one end anchored to a lug. The free end of the tape is connected to a clip on a small pulley through which the patchcord is passed. This provides spring tension on the patchcord loop at all times and insures positive return of the patchcords to the Patchcord Storage Panel AN Type MX-814/G.

(12) PATCHCORD STORAGE PANEL AN TYPE MX-814/G.—The Patchcord Storage Panel AN Type MX-814/G is a size A panel which provides partially recessed storage compartments for eleven individual patchcords. The Panel Assembly consists of two stainless steel frames (top and bottom) between which is secured a phenolic retainer strip. The retainer strip contains guide slots for each patchcord. An angle fitting permits the panel to be mounted on the panel mounting angles of the cabinet. Patchcords are retained in the panel when not in use by the action of the Retainer-Pulley Assembly AN Type MX-814/G. The assembly contains eleven AF twin plug patchcords Navy Type -491397 which have notches on one side of the plug to indicate polarity.

(13) SWITCH PANEL AN TYPE SA-135/G *(Figure 1-17)*.—Switch Panel AN Type SA-135/G consists of a size C panel on which is mounted a 60 position rotary type audio channel selector switch, Navy Type CSM-241259, a toggle switch, and a key compartment.

(a) KEY COMPARTMENT *(Figure 1-18)*.—A key compartment 4″ x 4″ x 7″ is mounted on Switch Panel AN Type SA-135/G behind a 4″ x 4″ panel opening. A terminal board is mounted on the rear surface of the key compartment for making connections and mounting key click filter components. Electrical connections are made to the Key Compartment through a terminal tube in the rear. A removable

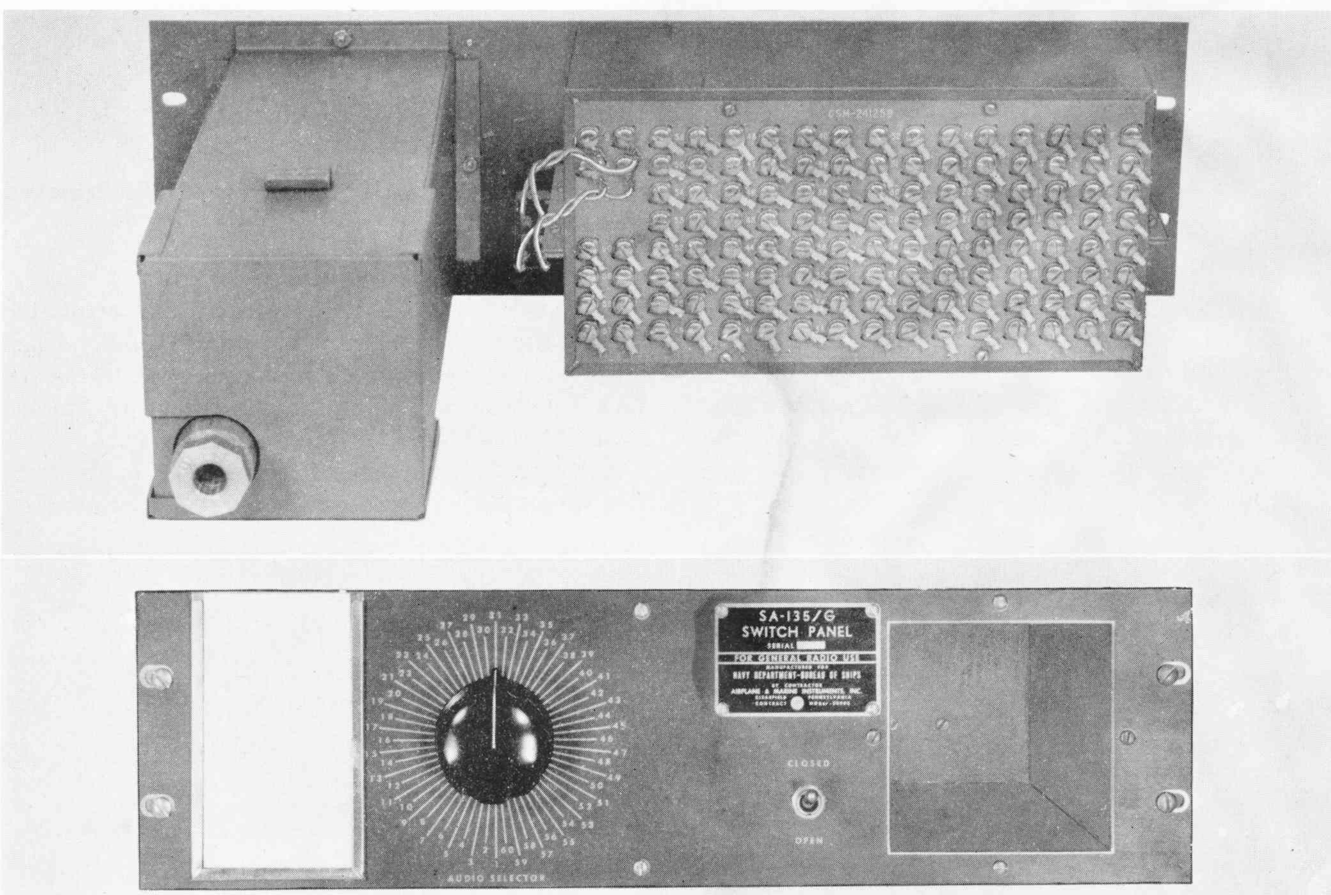


Figure 1-17. Switch Panel AN Type SA-135/G, Front and Rear Views

shield cover, secured by spring clips, fits over the terminal board of the Key Compartment.

(b) AF CHANNEL SELECTOR SWITCH, NAVY TYPE CSM-241259 *(Figure 1-19)*.—The AF Channel Selector Switch is of non-shorting, non-grounding construction and contains two sections, one for each side of the circuit. It consists of two synthane wafers with silver plated contacts. It is continuously rotatable to any of the 60 positions by the knob control. Connections to the stationary contacts of the switch are made from the Audio Selector Terminal Board, which contains 60 numbered pairs of terminals and two pairs of terminals marked A and B. The common or rotor terminals of the switch are connected to the A terminals. The B terminals are provided for connecting the DPST toggle switch (S-1002) in series with the common switch lead. The terminals on the Audio Selector Terminal Board are intended for connection in parallel with the load circuits at the Receiver Output Terminal Board. The AF Selector Switch permits rapid selection of channels for monitoring, testing, etc, without extensive patching and without serious interruption of communications.

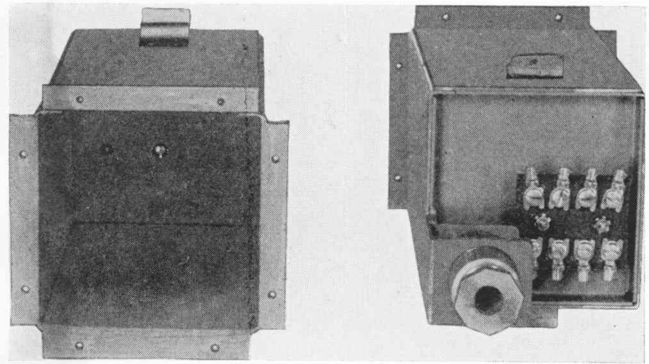


Figure 1-18. Key Compartment, Part of Switch Panel AN Type SA-135/G

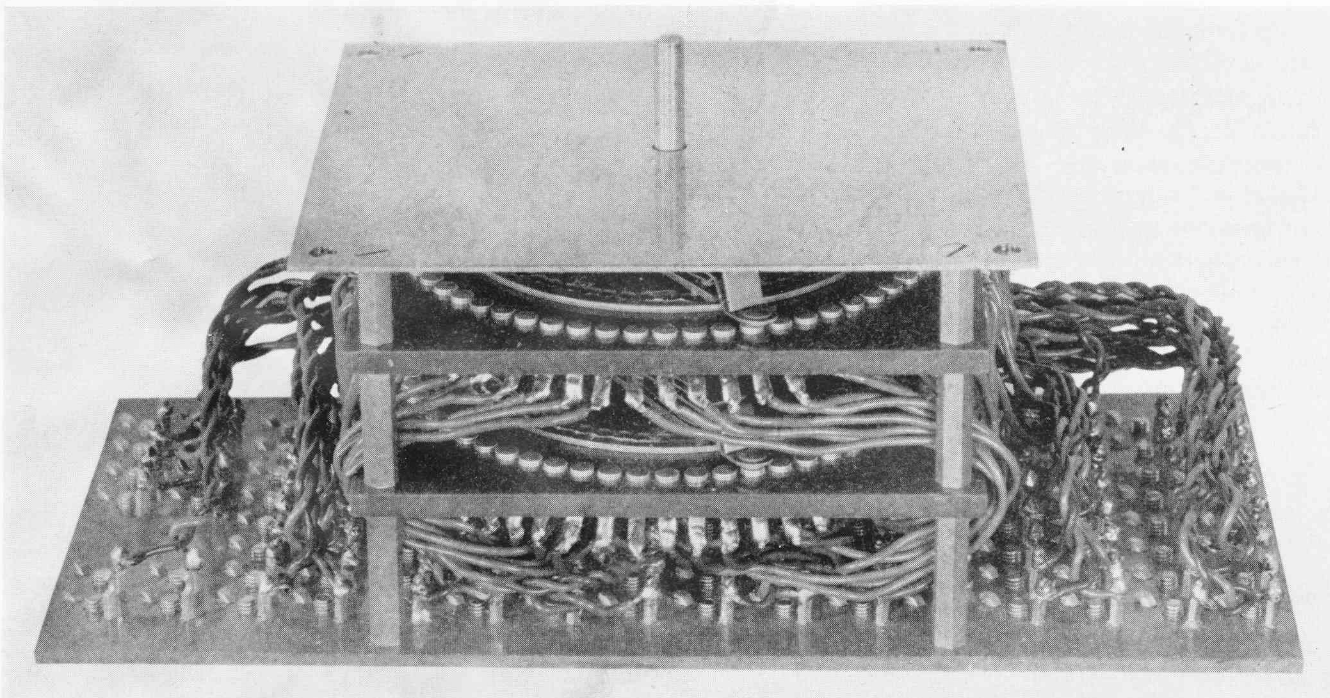


Figure 1-19. AF Channel Selector Switch, Navy Type CSM-241259

(14) SPEAKER ASSEMBLY AN TYPE LS-139/G *(Figure 1-20)*.—Speaker Assembly AN Type LS-139/G is a size E panel on which are mounted two Navy Type CPS-491814 permanent magnet speakers with an attenuator for each. Output transformers are mounted on the speaker frames for impedance match-

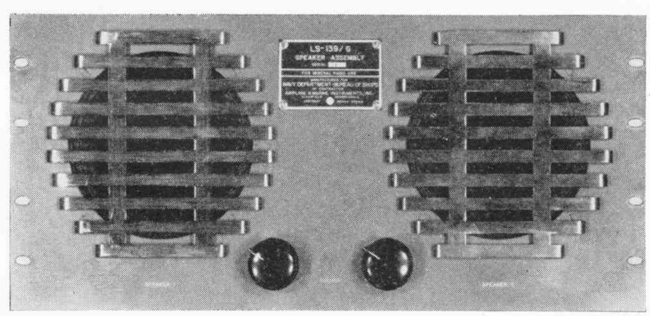


Figure 1-20. Speaker Assembly AN Type LS-139/G, Front View

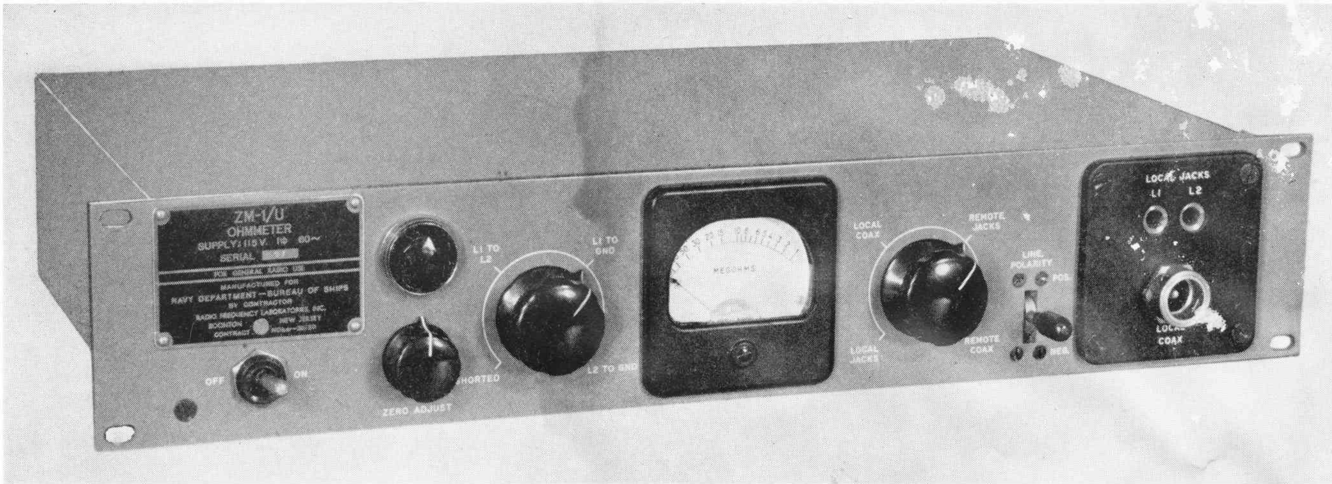


Figure 1-21. Ohmmeter Navy Model ZM-1/U, Front View

ing. A terminal board containing two screw connectors is provided for each speaker.

(15) OHMMETER NAVY MODEL ZM-1/U *(Figure 1-21)*.—The Ohmmeter Navy Model ZM-1/U measures resistance between .5 and 200 megohms and is designed specifically to measure the leakage of balanced and unbalanced communication lines. The equipment consists of a 500 volt regulated power supply, a precision 10 megohm resistor, a D. C. microammeter, and various control switches. It operates from a 95-130 volt 50-60 cycle source. For more complete information refer to NavShips 900,948. This component is Government furnished, and is not included in the contractor's shipment of equipment.

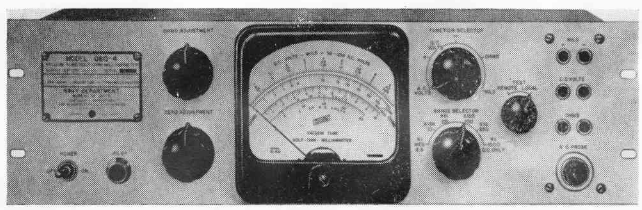


Figure 1-22. Volt-Ohm-Milliammeter Navy Model OBQ-4

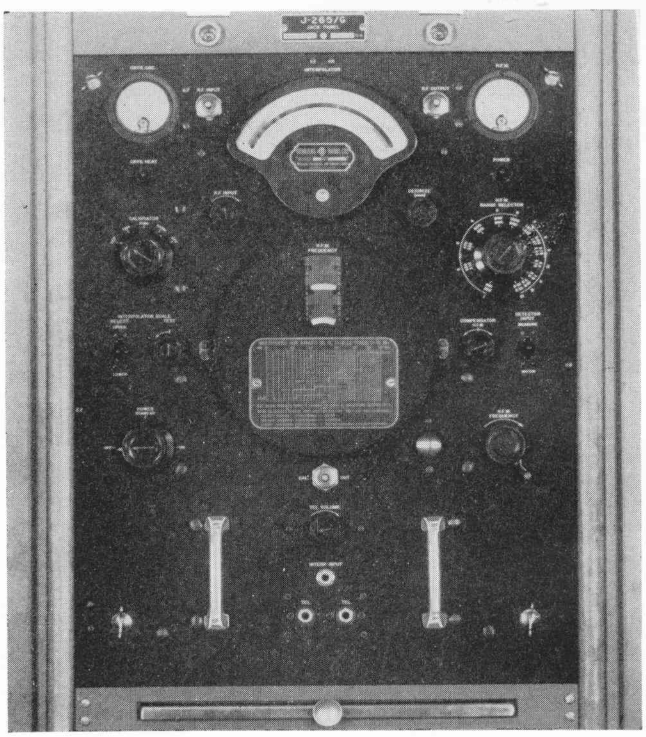


Figure 1-23. Frequency Meter Navy Model LR-1 Mounted in Signal Distribution Unit

(16) VOLT - OHM - MILLIAMMETER NAVY MODEL OBQ-4 *(Figure 1-22)*.—Vacuum-Tube Volt-Ohm-Milliammeter Navy Model OBQ-4 is a combination electronic A-C and D-C volt meter, ohmmeter, and milliammeter which can be used wherever it is necessary to make voltage, resistance, and current measurement. For more complete information refer to NavShips 900,988. This component is Government furnished, and is not included in the contractor's shipment of equipment.

(17) FREQUENCY METER NAVY MODEL LR-1 *(Figure 1-23)*.—The Frequency Meter Navy Model LR-1 is intended to measure frequencies from 160 - 30,000 KCS. It consists of a single unit containing the power supply, heterodyne frequency meter, crystal calibrator, detector - audio amplifier, and electronic frequency meter. It operates from a 110-120 volt 60 cycle power source. It requires 160 watts for operation. For more complete information refer to the instruction book entitled "Combined Heterodyne Frequency Meter and Crystal Controlled Calibrator Equipment, Model LR-1." This component is Government furnished, and is not included in the contractor's shipment of equipment. Mounting AN Type

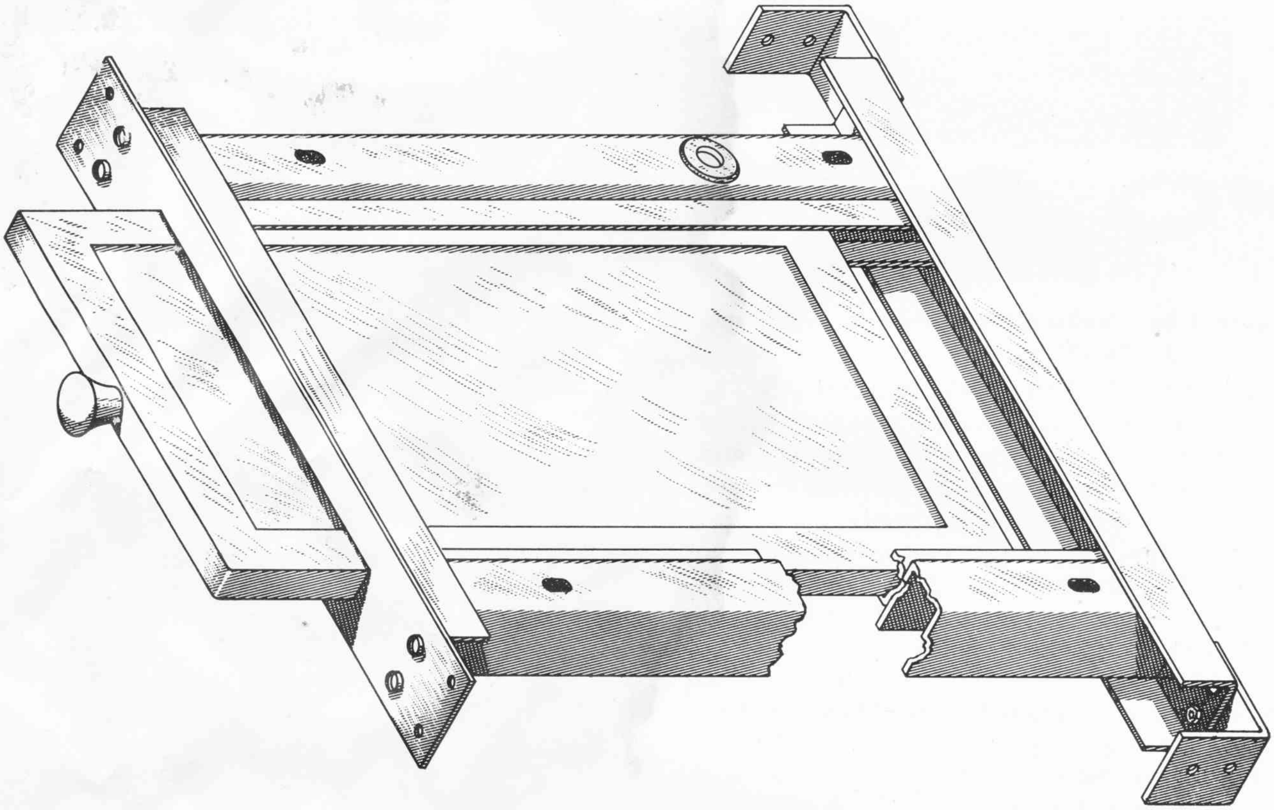


Figure 1-24. Mounting AN Type MT-571/G, Isometric View

MT-571/G and Jack Panel AN Type J-265/G are required for installation of the Model LR-1 in the Cabinet AN Type CY-597/G.

(*a*) MOUNTING AN TYPE MT-571/G (*Figure 1-24*).—Mounting AN Type MT-571/G is a rack constructed of steel channels with a size A panel which mounts on the front of the cabinet. The rear of the rack is secured between two suitably placed movable vertical mounting channels with steel angle brackets. The rack supports the Navy Model LR-1 Frequency Meter. A stainless steel writing panel located between the two side channels of the rack directly below the front of the LR-1 equipment is included which pulls out from the front of the cabinet. This component is furnished by the contractor.

(*b*) JACK PANEL AN TYPE J-265/G (*Figure 1-25*).—Jack Panel AN Type J-265/G is a size A panel which mounts on the front of the cabinet. It contains two RF Adapters AN Type UG-294/U, which mate with Navy Type -49121A patchcord plugs used to connect to the RF input and output jacks of the Navy Model LR-1 Frequency Meter Calibrator Equipment. The rear ends mate with Navy Type -49190 connectors carrying the r-f signal from Jack Panel AN Type J-237/G to allow convenient measurement of all RF circuits. This provides a convenient point for patching connections into any RF circuit for frequency measurement. This component is furnished by the contractor.

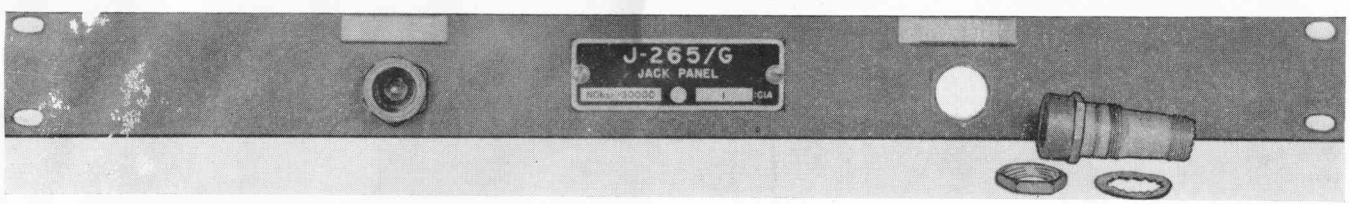


Figure 1-25. Jack Panel AN Type J-265/G, Front View With One Adapter AN Type UG-294/U Removed

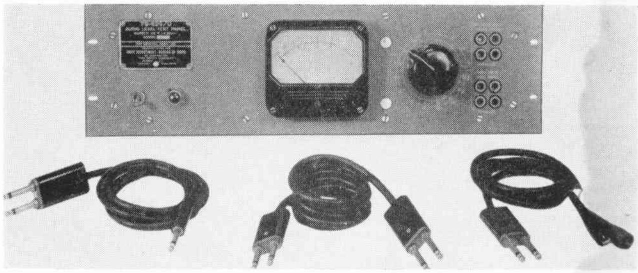


Figure 1-26. Volume Level Indicator, AN Type TS-629/U, Front View

(18) VOLUME LEVEL INDICATOR AN TYPE TS-629/U *(Figure 1-26)*.—This equipment is intended to measure the relative volume of audio signals. For a complete description of the physical properties and operation of this equipment, refer to the applicable instruction book. This component is Government furnished, and is not included in the contractor's shipment of equipment.

(19) FREQUENCY METER NAVY MODEL LM-15a *(Figure 1-27)*.—Frequency Meter Navy Model LM-15a is substituted for the Model LR-1 Frequency Meter in the Type C Signal Distribution Unit. The Frequency Meter Navy Model LM-15 is crystal calibrated to measure frequencies from 125 - 20,000 KCS. It consists of a single unit containing a heterodyne frequency meter, a rectifier power unit, and the necessary mechanical parts. It operates from a 100 - 130 V, 50-60 cycle power source and requires 28 watts for operation. In order to mount the meter in the relay rack, it is fitted with a modification Kit Navy Type RL-10624. For more complete information, refer to NavShips 900,274. This component is Government furnished, and is not included in the contractor's shipment of equipment.

(20) CATHODE RAY OSCILLOSCOPE NAVY MODEL OBL-3 *(Figure 1-28)*.—The Navy Model Model OBL-3 Oscilloscope is an instantaneous indicating device for making electrical measurements. It can be used to visualize both recurrent and transient electrical phenomena such as analysis of audio frequency distortion, amplifier gain or overload, phase shift, etc. It consists of one major unit which operates from a 105 - 125 volt 50 - 70 cycle power source. The power required for operation is 40 watts. It provides sweep repetition rates of 7 to 30,000 cycles. In order to fit in the relay rack, it must be fitted with a modification kit Navy Type RL-10625 which converts it from a Model OBL-3 to OBL-3a. For more complete information, refer to NavShips 900,224. This component is Government furnished, and is not included in the contractor's shipment of equipment.

Figure 1-27. Frequency Meter Navy Model LM-15a, Front View

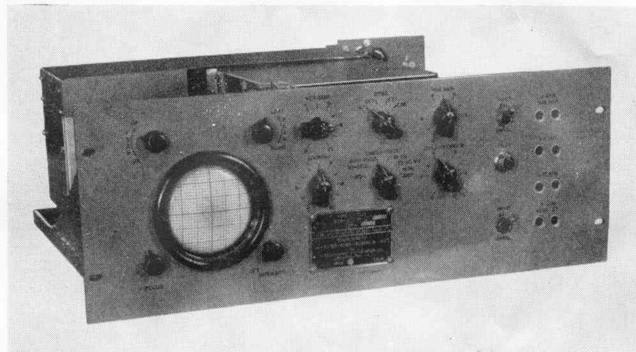


Figure 1-28. Cathode Ray Oscilloscope, Navy Model OBL-3a, Front View

(21) NAVY MODEL RBC RECEIVER *(Figure 1-29)*.—The Navy Model RBC series Radio Receiver is primarily designed for operation on all types of Naval vessels or in Naval radio shore stations, and is suitable for operation of a number of receivers on a single antenna, operation with narrow frequency separation when the receiver antenna is adjacent to transmitting antennae, and operation under continuous sub-

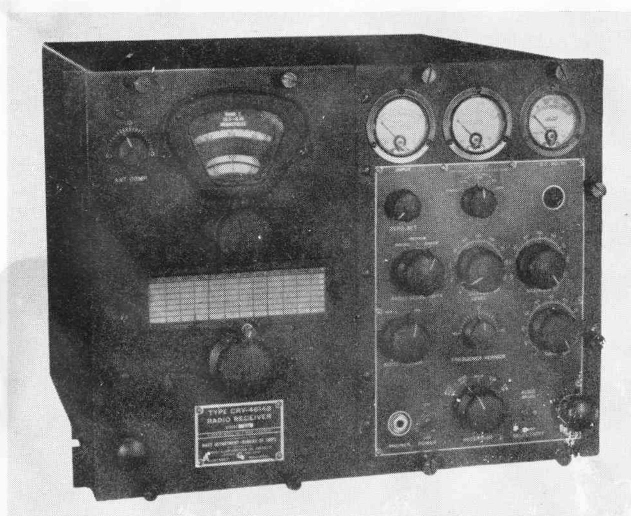


Figure 1-29. Radio Receiver Navy Model RBC-2, Mounted in Rack Mounting Cabinet Navy Type 10350

jection to high temperatures and high relative humidity. It has a frequency of 4.0 to 27.0 megacycles. For more complete information refer to NavShips 900,477. A Cabinet Navy Type 10350 is required for mounting this receiver in Cabinet CV-597/G. The RBC Series Receiver and Cabinet Type 10350 are Government furnished, and are not included in the contractor's shipment of equipment.

(a) POWER SUPPLY NAVY TYPE CRV-20130 FOR RBC RECEIVER *(Figure 1-28)*.—The Navy Type CRV-20130 Rectifier Power Unit is designed to operate primarily with a single receiver of the Navy RBB/RBC Receiver equipment, although satisfactory operation of two receivers is possible in an emergency. The circuit includes all necessary provisions for a stable and reliable power supply for the RBB/RBC radio receivers. The Rectifier Power Unit is completely shielded in a metal cabinet and includes filtering for the reduction of A. C. hum and for minimizing interference from local transmitters. The power required for operation of one receiver is 100 watts. Operating voltages are 110/115/120 VAC 55-65 cycles. For more complete information refer to NavShips 900,477. A Rectifier Mounting Shelf Navy Type 10348 is required for mounting this power supply in Cabinet CY-597/G. These items are Government furnished and are not included in the contractor's shipment of equipment.

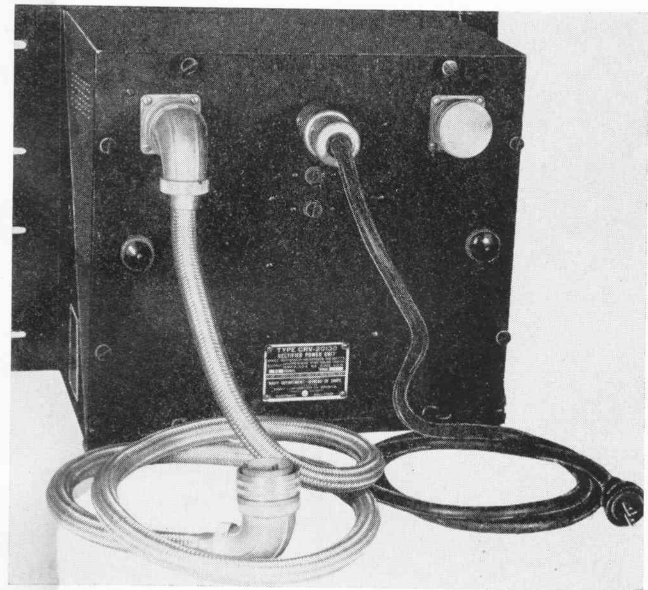


Figure 1-30. Power Supply Navy Type CRU-20130, Part of Navy Model RBB/RBC Radio Receiver, Mounted in Rack Mounting Shelf Navy Type 10348

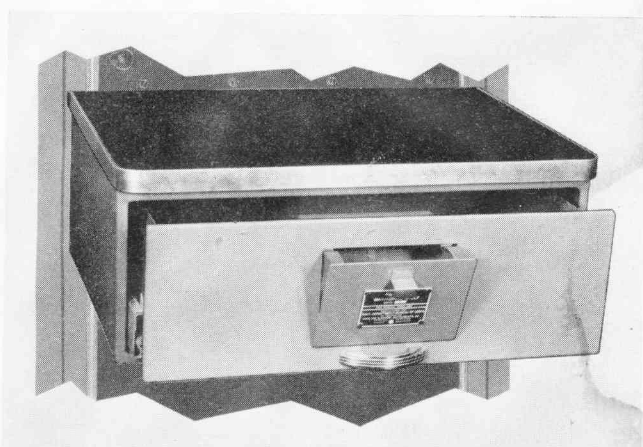


Figure 1-31. Switchboard Shelf AN Type FN-28/G Mounted on Front of Cabinet

(24) SWITCHBOARD SHELF AN TYPE FN-28/G *(Figure 1-31)*.—Switchboard Shelf AN Type FN-28/G is a desk panel located at the operator's position of the Signal Distribution Unit. The Shelf is of sheet metal construction and is secured to the front panel mounting angles of the cabinet. It occupies panel space equal to a Navy standard Size E panel. The shelf consists of a masonite writing top and sliding steel drawer with a removable ashtray built into the front.

4. REFERENCE DATA:

a. NOMENCLATURE.—Signal Distribution System (AF and RF).

b. CONTRACT.—NObsr—30,000, dated 23 April 1946.

c. CONTRACTOR.—Airplane and Marine Instruments, Inc., Clearfield, Pa.

d. COGNIZANT NAVAL INSPECTOR.—Inspector of Naval Material, 23 Federal Courthouse Building, Erie, Pa.

e. NUMBER OF PACKAGES PER COMPLETE SHIPMENT.

	Type A	Type B	Type C
Equipment*	4	3	2
Equipment Spares	1	1	1
Stock Spares	8	—	—

f. TOTAL CUBIC CONTENTS UNCRATED. (cubic feet):

	Type A	Type B	Type C
Equipment	88.5	59.0	29.5
Equipment Spares	3.8	3.1	2.5

g. TOTAL CUBIC CONTENTS CRATED (cubic feet).

	Type A	Type B	Type C
Equipment	148	100	51
Equipment Spares	7.2	6.0	4.9
Stock Spares	62.9	—	—

h. TOTAL WEIGHT EQUIPMENT (pounds).

	Type A	Type B	Type C
Crated*	1951	1377	664
Uncrated**	1692	1169	578

i. TOTAL WEIGHT EQUIPMENT SPARES (pounds).

	Type A	Type B	Type C
Crated	181	146	110
Uncrated	125	100	69

j. IMPEDANCE OF RF COMPONENTS.—70 ohms (nominal)

k. IMPEDANCE OF RF LOADS.—600 ohms (nominal)

l. ANTENNA CHARACTERISTICS.—Dependent upon characteristics of connected equipment.

m. PRIMARY POWER INPUT.—115 VAC ± 10% 58 to 60 cycle. Unit fused for 15 amps. 230 VAC ± 10% 58 to 60 cycle may be substituted if all internally mounted components served are capable of operation on 230 v and 5 amps fuses are substituted for the 15 amps fuses.

*Does not include Connector-Adapters Navy Type -491652 which are supplied to stock and must be requisitioned separately.

**Included Government furnished equipment required for operation of the system and Connector-Adapters Navy Type -491652.

TABLE 1-1. EQUIPMENT SUPPLIED, TYPE A UNIT

QUAN. PER EQUIP.	NAME OF COMPONENT	AN-NAVY TYPE DESIG.	OVERALL DIMENSIONS HEIGHT IN.	WIDTH IN.	DEPTH IN.	VOLUME CU. FT.	UNIT WEIGHT LBS.
3	Cabinet each including:	CY-597/G	87 1/2	22 3/8	26	29.5	276
2	Moulding strips and appropriate mounting clips						
1	Switch Panel	SA-134/G	6 31/32	20 5/8	2 7/8	0.24	10
1	Conduit end cover						
1	Switch Panel	SA-135/G	5 7/32	19	11 3/4	0.68	10.3
1	Switch Panel	SA-137/G	12 7/32	19	12	1.62	25
16	Control	C-443/G	5 7/32	7	7 3/4	0.17	5
2	Jack Panel	J-237/G	1 23/32	19	2 1/8	0.04	2.3
3	Jack Panel	J-238/G	5 7/32	19	3	0.17	10.2
**3	Jack Panel	J-239/G	1 23/32	19	4 1/4	0.08	4.9
3	Jack Panel	J-243/G	8 23/32	19	7	0.62	70.3
1	Jack Panel	J-265/G	1 23/32	19	2 1/8	0.04	14
6	Terminal Board Assembly	J-242/G	3 15/32	19	4	0.15	2.9
1	Speaker Assembly Panel	LS-139/G	8 23/32	19	6 1/4	0.60	8.9
1	Switch Board Shelf	FN-28/G	8 23/32	22 1/2	16 3/4	1.91	45.5
1	Mounting	MT-571/G	1 23/32	19	16 7/8	0.33	12.1
6	Jack Mounting Strip	-491394	1 23/32	19	3 3/8	0.07	5.8
2	Patchcord Storage Panel	MX-814/G	1 23/32	19	1 1/4	0.02	2
2	Retainer-Pulley Assembly	MX-813/G	2 3/4	20 1/4	3 3/4	0.12	8.5
5	Blank Panels Size "A"		1 23/32	19	3/16		0.6
5	Blank Panels Size "B"		3 15/32	19	3/16		1.3
2	Blank Panels Size "C"		5 7/32	19	3/16		1.9
3	Blank Panels Size 'D'		6 31/32	19	3/16		2.5
1	Blank Panels Size "E"		8 23/32	19	3/16		3.1
1	Blank Panels Size "F"		10 15/32	19	3/16		3.7
1	Blank Panels Size "G"		12 7/32	19	3/16		4.4
1	Blank Panels Size "H"		13 31/32	19	3/16		5
263	Connectors	-49190					0.05
20	Panel Screws #10/32 x 1/2 B H.						
2	Code Marker Sets						
			LENGTH				
22	AF Patchcords installed in MX-814/G	-491397A	3 ft.				0.5
	Total Type A Unit Completely Assembled		87 1/2	67 1/8	26	88.5	*1419
1	Spool #6 lacing twine						
12	Cabinet holding-down bolts (1/2" x 3" lag bolts)						
			LENGTH				
36	Clamp bars each complete with 3 #10/32 x 1" roundhead screws		11 3/4"				
1	Equipment Spare Parts box		12	36	15	3.8	125

* Weight does not include GFE Components.

** Connector-Adapters NT-491652 furnished to Navy Stock. Requisition required number.

TABLE 1-2. EQUIPMENT SUPPLIED, TYPE B UNIT

QUANTITY PER EQUIP.	NAME OF COMPONENT	AN-NAVY TYPE DESIG.	OVERALL DIMENSIONS HEIGHT IN.	OVERALL DIMENSIONS WIDTH IN.	OVERALL DIMENSIONS DEPTH IN.	VOLUME CU. FT.	UNIT WEIGHT LBS.
2	Cabinet each including:	CY-597/G	87 1/2	22 3/8	26	9.5	276
2	Moulding strips and appropriate mounting clips						
1	Switch Panel	SA-134/G	6 31/32	20 5/8	2 7/8	0.24	10
1	Conduit end cover						
1	Switch Panel	SA-135/G	5 7/32	19	11 3/4	0.68	10.3
1	Switch Panel	SA-137/G	12 7/32	19	12	1.62	25
11	Control	C-443/G	5 7/32	7	7 3/4	0.17	5
1	Jack Panel	J-237/G	1 23/32	19	2 1/8	0.04	2.3
2	Jack Panel	J-238/G	5 7/32	19	3	0.17	10.2
2	Jack Panel	J-239/G	1 23/32	19	4 1/4	0.08	4.9
**2	Jack Panel	J-243/G	8 23/32	19	7	0.62	70.3
1	Jack Panel	J-265/G	1 23/32	19	2 1/8	0.04	14
5	Terminal Board Assembly	J-242/G	3 13/32	19	4	0.15	2.9
1	Speaker Assembly Panel	LS-139/G	8 23/32	19	6 1/4	0.60	8.9
1	Switch Board Shelf	FN-28/G	8 23/32	22 1/2	[illegible] 3/4	1.91	45.5
1	Mounting	MT-571/G	1 23/32	19	16 7/8	0.33	12.1
5	Jack Mounting Strip	-491394	1 23/32	19	3	0.07	5.8
2	Patchcord Storage Panel	MX-814/G	1 23/32	19	1 1/4	0.02	2
2	Retainer-Pulley Assembly	MX-813/G	2 3/4	20 1/4	3 3/4	0.12	8.5
6	Blank Panels Size "A"		1 23/32	19	3/16		0.6
3	Blank Panels Size "B"		3 15/32	19	3/16		1.3
2	Blank Panels Size "C"		5 7/32	19	3/16		1.9
2	Blank Panels Size "D"		6 31/32	19	3/16		2.5
1	Blank Panels Size "E"		8 23/32	19	3/16		3.1
1	Blank Panels Size "F"		10 15/32	19	3/16		3.7
186	Connectors	-49190					0.05
15	Panel Screws #10/32 x 1/2 B. H.						
2	Code Marker Sets						
			LENGTH				
22	AF Patchcords installed in MX-514/G	-41397A	3 ft.				0.5
	Total Type B Unit Completely Assembled		87 1/2	44 3/4	26	59	*1004
1	Spool #6 lacing twine						
8	Cabinet holding-down bolts (1/2" x 3" lag bolts)						
			LENGTH				
24	Clamp bars each complete with 3 #10/32 x 1" roundhead screws		11 3/4"				
1	Equipment Spare Parts box		15	24	15	3.1	100

* Weight does not include GFE Components.

** Connector-Adapters NT-491652 furnished to Navy Stock. Requisition required number.

TABLE 1-3. EQUIPMENT SUPPLIED, TYPE C UNIT

QUANTITY PER EQUIP.	NAME OF COMPONENT	AN-NAVY TYPE DESIG.	OVERALL DIMENSIONS			VOLUME CU. FT.	UNIT WEIGHT LBS.
			HEIGHT IN.	WIDTH IN.	DEPTH IN.		
1	Cabinet including:	CY-597/G	87 1/2	22 3/8	26	29.5	276
2	Moulding strips and appropriate mounting clips						
1	Switch Panel	SA-134/G	6 31/32	20 5/8	2 7/8	0.24	10
2	Conduit end covers						
1	Jack Panel	J-237/G	1 23/32	19	2 1/8	0.04	2.3
1	Jack Panel	J-238/G	5 7/32	19	3	0.17	10.2
1	Jack Panel	J-239/G	1 23/32	19	4 1/4	0.08	4.9
**1	Jack Panel	J-243/G	8 23/32	19	7	0.62	70.3
2	Terminal Board Assembly	J-242/G	3 15/32	19	4	0.15	2.9
1	Speaker Assembly Panel	LS-189/G	8 23/32	19	6 1/4	0.60	8.9
1	Switchboard Shelf	FN-28/G	8 23/32	22 1/2	16 3/4	1.91	45.5
2	Jack Mounting Strip	-491394	1 23/32	19	3 3/8	0.07	5.8
1	Patchcord Storage Panel	MX-814/G	1 23/32	19	1 1/4	0.02	2
1	Retainer-Pulley Assembly	MX-813/G	2 3/4	20 1/4	3 3/4	0.12	8.5
3	Blank Panels Size "A"		1 23/32	19	3/16		0.6
2	Blank Panels Size "B"		3 15/32	19	3/16		1.3
1	Blank Panels Size "C"		5 7/32	19	3/16		1.9
1	Blank Panels Size "D"		6 31/32	19	3/16		2.5
1	Blank Panels Size "E"		8 23/32	19	3/16		3.1
1	Blank Panels Size "G"		12 7/32	19	3/16		4.4
77	Connectors	-49190					0.05
10	Panel Screws #10/32 x 1/2 B. H.						
2	Code Marker Sets						
			LENGTH				
11	AF Patchcords installed in MX-814/G		3 ft.				0.5
	Total Type C Unit Completely Assembled		87 1/2	44 3/4	26	29.5	*472
1	Spool #6 lacing twine						
4	Cabinet holding-down bolts (1/2" x 3" lag bolts)		LENGTH				
12	Clamp bars each complete with 3 #10/32 x 1" roundhead screws		11 3/4"				
1	Equipment Spare Parts box		12	24	16	2.5	69

* Weight does not include GFE Components.

** Connector-Adapters NT-491652 furnished to Navy Stock. Requisition required number.

TABLE 1-4. EQUIPMENT AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED TYPE A UNIT

QUANTITY PER EQUIP.	NAME OF COMPONENT	AN-NAVY TYPE DESIG.	OVERALL DIMENSIONS			VOLUME CU. FT.	UNIT WEIGHT LBS.
			HEIGHT IN.	WIDTH IN.	DEPTH IN.		
1	Ohmmeter	ZM-1/U	3 15/32	19	11	0.4[illegible]	1.9
1	Volt-Ohm-Milliammeter	OBQ-4	5 7/32	19	**		*20
1	Combined Heterodyne Frequency Meter and Crystal Controlled Calibrator Equipment	LR-1	22 3/4	19	17 1/2	4.38	15[illegible]
1	Receiver with Rack Mounting Cabinet Navy Type -10350	RBC Series	14 3/4	19	20 1/8	3.29	82
1	Power Supply with Rectifier Mounting Shelf Navy Type -10348	CRV-20130	14	19	10	1.54	5[illegible]
1	Volume Level Indicator	TS-629/U	3 15/32	19	**		*20
1	Oscilloscope, with Mounting Adapter Kit Navy Type RL-10625	OBL-3a	6 31/32	19	15 1/2	1.18	26.7
7	Total GFE Components						367.6
1	I. B. for Ohmmeter Model ZM-1/U — NavShips 900,948						
1	I. B. for Volt-Ohm-Milliammeter Model OBQ-4 — NavShips 900,988						
1	I. B. for Combined Heterodyne Frequency Meter and Crystal Controlled Calibrator Equipment Model LR-1 (Unnumbered)						
1	I. B. for Receiver Model RBC — NavShips 900,477						
1	I. B. for Volume Level Indicator Model TS-629/U						
1	I. B. for Oscilloscope Model OBL-3 — NavShips 900,224						
1	Qt. fungacide varnish for printing internal AF wiring						
1	Box (1,000) Thomas and Betts Grounding Ferrules #200-30006						
60	Ft. 1/4" grounding braid						
1500	Ft. shielded twisted pair cable similar to TTRS		LENGTH				
***	RF Patchcords, 70 ohm	49122-B 49123-B 49150-B	18" 36" 48"				
300	Ferrules	-10670					
60	Ft. #9 radio grade spaghetti						
6	Ft. #1 radio grade spaghetti						
	Tools listed in Table 2-1						

* Approximate   ** Information not available   *** Determined by station allowance.

TABLE 1-5. EQUIPMENT AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED TYPE B UNIT

QUANTITY PER EQUIP.	NAME OF COMPONENT	AN-NAVY TYPE DESIG.	OVERALL DIMENSIONS			VOLUME CU. FT.	UNIT WEIGHT LBS.
			HEIGHT IN.	WIDTH IN.	DEPTH IN.		
1	Ohmmeter	ZM-1/U	3 15/32	19	11	0.42	11.9
1	Volt-Ohm-Milliammeter	OBQ-4	5 7/32	19	**		*20
1	Combined Heterodyne Frequency Meter and Crystal Controlled Calibrator Equipment	LR-1	22 3/4	19	17 1/2	4.38	155
1	Volume Level Indicator	TS-629/U	3 15/32	19	**		*20
1	Oscilloscope, (with Mounting Adapter Kit, Navy Type RL-10625)	OBL-3a	6 31/32	19	15 1/2	1.18	26.7
5	Total GFE Components						233.6
1	I. B. for Ohmmeter Model ZM-1/U — NavShips 900,948						
1	I. B. for Volt-Ohm-Milliammeter Model OBQ-4 — NavShips 900,988						
1	I. B. for Combined Heterodyne Frequency Meter and Crystal Controlled Calibrator Equipment, Model LR-1 (Unnumbered)						
1	I. B. for Volume Level Indicator Model TS-629/U						
1	I. B. Oscilloscope Model OBL-3 — NavShips 900,224						
1	Quart fungicide varnish for painting internal RF wiring						
1	Box (1,000) Thomas and Betts Grounding Ferrules #200-30006						
55	Ft. 1/4" grounding braid						
1200	Ft. shielded twisted pair cable similar to TTRS		LENGTH				
***	RF Patchcords 70 Ohms	49122-B 49123-B 49150-B	18" 36" 48"				
200	Ferrules	-10670					
55	Ft. #9 Radio Grade Spaghetti						
6	Ft. #1 Radio Grade Spaghetti						
	Tools listed in Table 2-1						

* Approximate. ** Information not available. *** Determined by station allowance.

TABLE 1-6. EQUIPMENT AND PUBLICATIONS REQUIRED BUT NOT SUPPLIED TYPE C UNIT

QUANTITY PER EQUIP.	NAME OF COMPONENT	AN-NAVY TYPE DESIG.	OVERALL DIMENSIONS			VOLUME CU. FT.	UNIT WEIGHT LBS.
			HEIGHT IN.	WIDTH IN.	DEPTH IN.		
1	Ohmmeter	ZM-1/U	33 15/32	19	11	0.42	11.9
				19	**		*20
1	Volt-Ohm-Milliammeter	OBQ-4	5 7/32	19	**		*20
1	Volume Level Indicator	TS-629/U	3 15/32	19	16	1.54	44.5
1	Frequency Meter with Mounting Adapter Kit, Navy Type RL-10625	LM-15a	8 23/32	19	15 1/2	1.18	26.7
1	Oscilloscope, With Mounting Adapter Kit, Navy Type RL-10625	OBL-3a	6 31/32				123.1
5	Total GFE Components						
1	I. B. for Ohmmeter Model ZM-1/U — NavShips 900,948						
1	I. B. for Volt-Ohm-Milliammeter Model OBQ-4 — Navships 900,988						
1	I. B. for Volume Level Indicator Model TS 629/U						
1	I. B. for Frequency Meter Model LM-15 — NavShips 900,274						
1	I. B. for Oscilloscope Model OBL-3 — NavShips 900,224						
1	Quart funcicide varnish for painting internal AF wiring						
1/2	Box (500) Thomas and Betts Grounding Ferrules #200-30006						
15	Ft. 1/4" grounding braid						
400	Ft. Shielded, twisted pair cable similar to TTRS		LENGTH				
***	RF Patchcords, 70 Ohms	49122-B 49123-B 49150-B	18" 36" 48"				
125	Ferrules	-10670					
18	Ft. #9 radio grade spaghetti						
6	Ft. #1 radio grade spaghetti						
	Tools listed in Table 2-1						

* Approximate. ** Information not available. *** Determined by station allowance.

TABLE 1-7. SHIPPING DATA

QUANTITY IN BOX	CONTENTS		OVERALL DIMENSIONS			VOLUME (CU FT)	WEIGHT (LBS.)
	NAME	DESIGNATION	HEIGHT	WIDTH	DEPTH		
	TYPE A						
	BOX 1		25	32	93	45	576
1	Cabinet	CY-597/G					
1	Switch Panel	SA-137/G					
3	Jack Panel	J-238/G					
3	Jack Panel	J-239/G					
2	Jack Panel	J-237/G					
2*	Jack Panel	J-243/G					
2	Blank Panel	Size B					
2	Blank Panel	Size C					
2	Blank Panel	Size D					
	BOX 2		25	32	93	45	518
1	Cabinet	CY-597/G					
1*	Jack Panel	J-243/G					
1	Jack Panel	J-265/G					
1	Mounting	MX-571/G					
1	Blank Panel	Size A					
1	Blank Panel	Size B					
	BOX 3		25	32	93	45	583
1	Cabinet	CY-597/G					
3	Jack Mounting Strip	-491394					
2	Patchcord Storage Panel	MX-814/G					
2	Retainer-Pulley Assembly	MX-813/G					
6	Terminal Board Assembly	J-242/G					
1	Blank Panel	Size B					
1	Blank Panel	Size G					
1	Blank Panel	Size F					
	BOX 4		19	42	27	13	274
2	Equipment Instruction Book	NavShips 91047					
1	Box of Miscellaneous Hardware, Connectors, Lacing Twine, etc.						
1	Speaker Assembly	LS-139/G					
1	AF Switch Panel	SA-135/G					
16	Control	C-443/G					
1	Switchboard Shelf	FN-28/G					
	TYPE B						
	BOX 1		25	32	93	45	578
1	Cabinet	CY-597/G					
1	Jack Panel	J-265/G					
1	Mounting	MT-571/G					
1	Switch Panel	SA-137/G					
2	Jack Panel	J-238/G					
2	Jack Panel	J-239/G					
1	Jack Panel	J-237/G					
2*	Jack Panel	J-243/G					
1	Blank Panel	Size B					
1	Blank Panel	Size C					
	BOX 2		25	32	93	45	570
1	Cabinet	CY-597/G					
5	Jack Mounting Strip	-491394					
2	Patchcord Storage Panel	MX-814/G					
[illegible]	Retainer-Pulley Assembly	MX-813/G					
5	Terminal Board	J-242/G					
2	Blank Panel	Size A					
[illegible]	Blank Panel	Size F					
	BOX 3		16	41	26	10	229
2	Equipment Instruction Book	NavShips 91047					
1	Box of Miscellaneous Hardware, Connectors, Lacing Twine, etc.						
1	Speaker Assembly	LS-139/G					
1	AF Switch Panel	SA-135/G					
11	Control	C-443/G					
1	Switchboard Shelf	FN-28/G					

* Connector-Adapters Navy Type -49165 not included.

TABLE 1-7. SHIPPING DATA

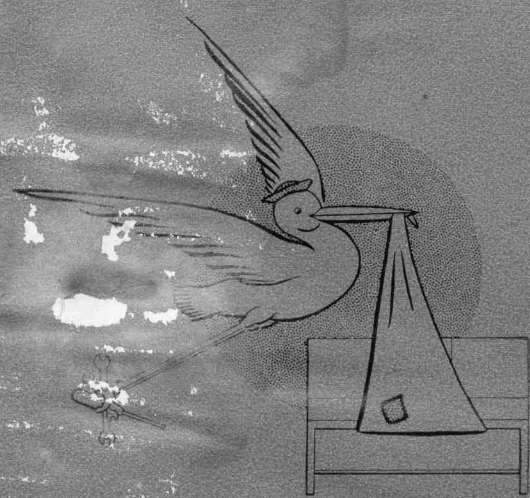
QUANTITY IN BOX	CONTENTS		OVERALL DIMENSIONS			VOLUME (CU FT)	WEIGHT (LBS.)
	NAME	DESIGNATION	HEIGHT	WIDTH	DEPTH		
	TYPE C BOX 1		25	32	93	45	539
1	Cabinet	CY-597/G					
1	Jack Panel	J-237/G					
1	Jack Panel	J-238/G					
1	Jack Panel	J-239/G					
1*	Jack Panel	J-243/G					
2	Jack Mounting Strip	-491394					
1	Patchcord Storage Panel	MX-814/G					
1	Retainer-Pulley Assembly	MX813/G					
2	Terminal Board Assembly	J-242/G					
1	Blank Panel	Size A					
1	Blank Panel	Size E					
	BOX 2		19	27	20	6	125
2	Equipment Instruction Book	NavShips 91047					
1	Box of Miscellaneous Hardware, Connectors, Lacing Twine, etc.						
1	Speaker Assembly	LS-139/G					
1	Switchboard Shelf	FN-28/G					

* Connector-Adapters Navy Type -49165 not included.

Navships 91047

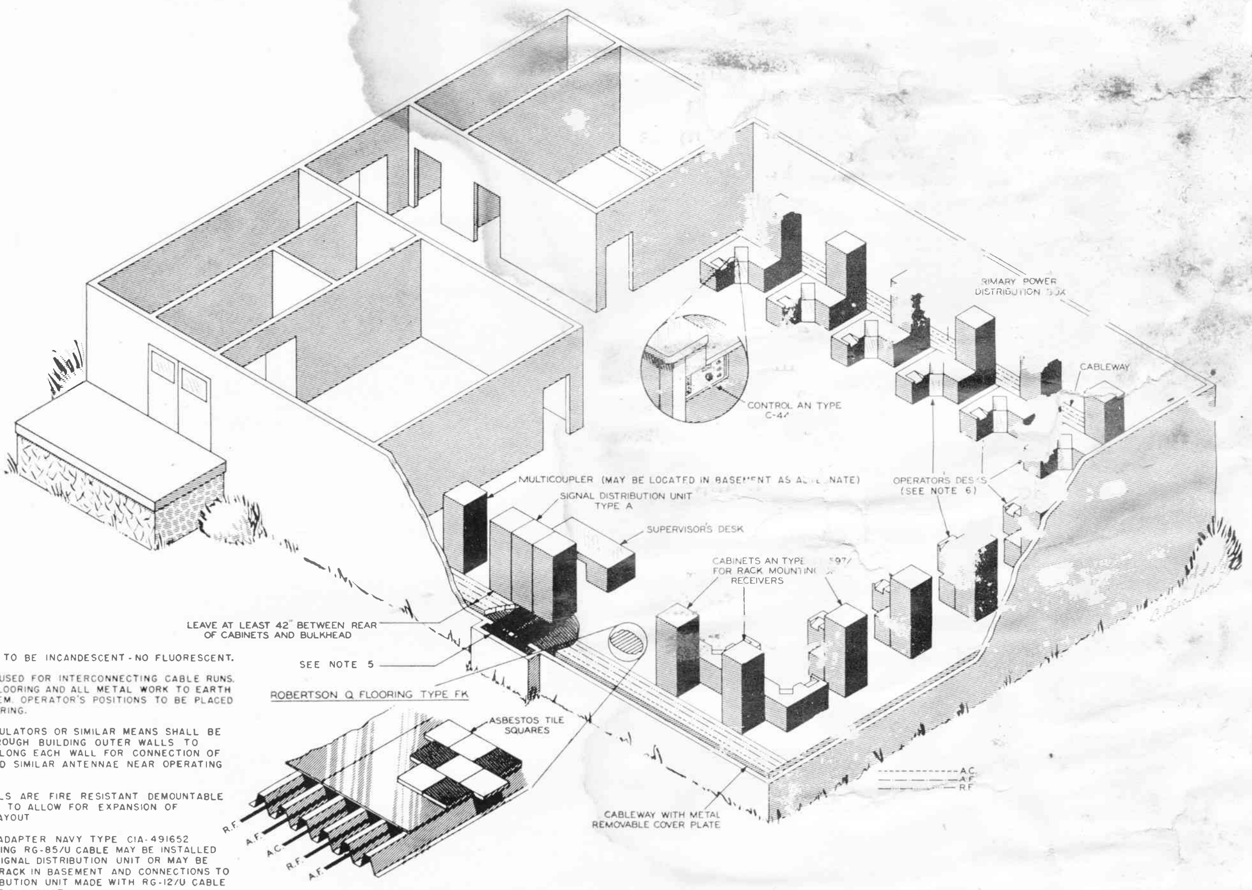
Installation and Operation

Section 2



Signal Distribution System (AF and RF)

Restricted



1. ALL LIGHTING TO BE INCANDESCENT - NO FLUORESCENT.
2. "Q" FLOORING USED FOR INTERCONNECTING CABLE RUNS. GROUND "Q" FLOORING AND ALL METAL WORK TO EARTH GROUND SYSTEM. OPERATOR'S POSITIONS TO BE PLACED OVER "Q" FLOORING.
3. ENTERING INSULATORS OR SIMILAR MEANS SHALL BE PROVIDED THROUGH BUILDING OUTER WALLS TO CABLEWAYS ALONG EACH WALL FOR CONNECTION OF DOUBLETS AND SIMILAR ANTENNAE NEAR OPERATING BUILDING.
4. INTERIOR WALLS ARE FIRE RESISTANT DEMOUNTABLE CONSTRUCTION TO ALLOW FOR EXPANSION OF EQUIPMENT LAYOUT
5. CONNECTOR - ADAPTER NAVY TYPE CIA-491652 FOR TERMINATING RG-85/U CABLE MAY BE INSTALLED DIRECTLY IN SIGNAL DISTRIBUTION UNIT OR MAY BE INSTALLED IN RACK IN BASEMENT AND CONNECTIONS TO SIGNAL DISTRIBUTION UNIT MADE WITH RG-12/U CABLE THROUGH VERTICAL DUCT
6. STANDARD OPERATING DESKS FOR USE WITH RACK MOUNTED RECEIVERS ARE BEING DESIGNED BY BUSHIPS FOR ISSUE TO THE SERVICE.

Figure 2-1. Typical Station Floor Plan Showing Location of Signal Distribution Unit.

SECTION 2
INSTALLATION AND OPERATION

1. INSTALLATION.

a. GENERAL.—This section includes instructions relative to installation of Types A, B, and C Units of the Signal Distribution System. Since this equipment is quite flexible and may be varied in its application, the instructions are based on a typical installation only. The installing activity will find it necessary to depart from the procedures outlined herein in almost all cases. It is, however, desirable to maintain standardization throughout all Naval installations in so far as practical in order that installations at all stations will be similar except for actual quantities of RF and AF components. All external wiring of the Signal Distribution Unit is to be fabricated by the installing activity as shown in figures 2-7 and 2-10. The installing activity is not to depart from the standard arrangement of components shown in figures 2-31, 2-32, and 2-33 except upon specific authorization from BuShips.

b. LOCATION OF SIGNAL DISTRIBUTION UNITS.—In selecting the location for the Signal Distribution Unit within a station, several factors must be considered. **In general, it should be centrally placed so as to be readily accessible to the supervisor of the watch and in such a position that he will have unobstructed view of the operators from his normal position in front of the Unit.** All installations must be indoors and protected from moisture as the Units are not drip-proof. At least 36′ but preferably 42″ must be allowed to the rear of the cabinets to permit maintenance personnel to work with the rear doors open. Wherever possible, sufficient space should be allowed to convert the Unit to the next larger size with minimum interruption of service. Figure 2-1 illustrates a typical station floor plan showing the relative position of the Signal Distribution Unit and the associated operating positions and receivers. Note the "Q" flooring which standardizes the method of running the interconnecting cables. Refer to the outline dimension drawings figures 2-31, 2-32, and 2-33 to determine the space requirements.

c. UNPACKING AND HANDLING OF COMPONENTS.—In order to facilitate installation, all components which are provided by the contractor except those which because of some reason such as size or weight cannot be shipped in place, are mounted in the cabinets. The boxes in which components are packed separately are clearly marked with identification data to facilitate assembly of the units in the field.

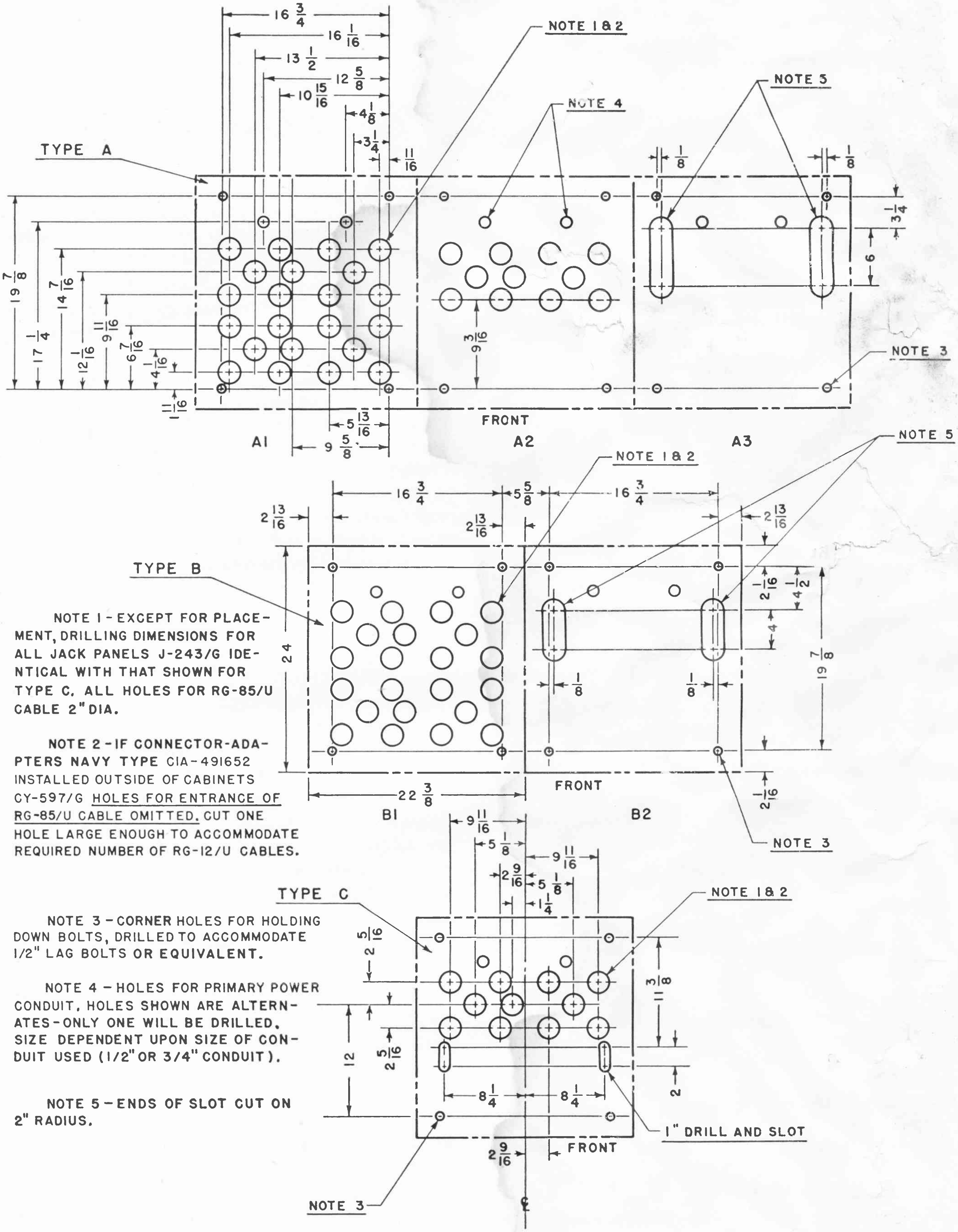
Electronic components and other delicate devices are specially packed to prevent damage in shipping. Unpacking requires particular attention. The use of heavy hammers or pry bars must be avoided in opening the cases, or considerable damage to equipment may result. Remove at least three sides with a nail puller to insure that the equipment is not damaged while being removed from the box. The contents should be checked against the packing list, and any shortage of or damage to equipment reported in writing to the proper authority. See tables 1-1 through 1-6 for components supplied and those required for installation but not supplied by the contractor.

Equipment which is not to be immediately installed should not be unpacked, but should be stored in a clean, dry place.

d. PREPARATION OF MOUNTING SURFACE.—Since the cabinets butt together, it is necessary that the mounting surface be true and level or gaps will appear between the cabinets when they are set in place. Since these equipments are quite heavy, it is necessary for the installing activity to determine that sufficient supporting members are included to safely support the weight (see tables 1-1 through 1-6 to determine the actual weight of each type). Certain drilling and cutting is required, but care must be taken in placing the units that no structural members of the flooring are cut. Installation of additional stanchions below units may be found necessary in certain cases.

In paragraph 1, *e* below, two methods of installing the antenna lead-ins are described. The installation activity will receive specific instructions from BuShips as to the particular method to use. If the Connector-Adapters Navy Type CIA-491652 are to be installed inside the cabinets as described in method 1, they should be installed on the ends of the RG-85/U cable before the cabinets are set in place.

A drilling template should be made from the plan shown in figure 2-2, and the holes drilled before the cabinets are set in place. It will be necessary to stuff around the cables after they are installed to prevent



NOTE 1 - EXCEPT FOR PLACEMENT, DRILLING DIMENSIONS FOR ALL JACK PANELS J-243/G IDENTICAL WITH THAT SHOWN FOR TYPE C. ALL HOLES FOR RG-85/U CABLE 2" DIA.

NOTE 2 - IF CONNECTOR-ADAPTERS NAVY TYPE CIA-491652 INSTALLED OUTSIDE OF CABINETS CY-597/G HOLES FOR ENTRANCE OF RG-85/U CABLE OMITTED. CUT ONE HOLE LARGE ENOUGH TO ACCOMMODATE REQUIRED NUMBER OF RG-12/U CABLES.

NOTE 3 - CORNER HOLES FOR HOLDING DOWN BOLTS, DRILLED TO ACCOMMODATE 1/2" LAG BOLTS OR EQUIVALENT.

NOTE 4 - HOLES FOR PRIMARY POWER CONDUIT. HOLES SHOWN ARE ALTERNATES-ONLY ONE WILL BE DRILLED. SIZE DEPENDENT UPON SIZE OF CONDUIT USED (1/2" OR 3/4" CONDUIT).

NOTE 5 - ENDS OF SLOT CUT ON 2" RADIUS.

Figure 2-2. Drilling and Cutting Plan for Preparation of Mounting Surface for Signal Distribution Unit

moisture from entering the cabinets, so the holes should be kept down to the sizes indicated in figure 2-2.

e. INSTALLATION OF ANTENNA LEAD-INS.—The Cabinets as shipped include Jack Panel J-243/G without the Connector - Adapters Navy Type CIA 491652. The required number of Connector-Adapters must be requisitioned from BuShips, preferably far enough in advance of installation to allow them to be installed on the ends of the RG-85/U cable before the Cabinets arrive. Two methods of terminating the RG-85/U cable are provided as described below.

(1) METHOD 1, INSTALLATION OF CONNECTOR-ADAPTERS NAVY TYPE CIA-491652 WITHIN THE CABINETS AN TYPE CY-597/G.—The mounting surface must be prepared as shown in figure 2-2 and the RG-85/U cables pulled through so that they protrude about three feet above the surface of the floor. THIS METHOD IS NOT RECOMMENDED WHERE A LARGE NUMBER OF CABLES ARE TO BE EMPLOYED.

(*a*) INSTALLATION OF CONNECTOR-ADAPTERS NAVY TYPE CIA-491652.—The Connector-Adapters obtained from Navy stock should be installed on the RG-85/U cable before the cabinets are set in place as the actual installation requires considerable cutting and soldering which would be almost impossible inside the restricted space of the cabinet. Remove Jack Panel J-243/G from the cabinet. Determine from the outline dimension drawings (figures 2-31, 2-32, and 2-33) the correct height of the Connector-Adapters above the floor and assemble one on each cable as shown in figure 2-3. Be sure that they are installed at exactly the same height so that they will fit into the Jack Panel AN Type J-243/G.

(2) METHOD 2, INSTALLATION OF CONNECTOR-ADAPTERS NAVY TYPE CIA-491652 OUTSIDE THE CABINETS AN TYPE CY-597/G.—Since the interior of the cabinets is already crowded without the RG-85/U cable, the Connector-Adapters may be installed outside the cabinets in particular installations when specified by BuShips. They may then be located in one of the two places as specified by the Bureau. In stations having a satisfactory basement, the RG-85/U cable will be brought into the special cable support illustrated in figure 2-4. This cable support is located in the most convenient position in the basement and RG-12/U cable brought from the Connector on the top of the Connector-Adapter into the Cabinet AN Type CY-597/G rather than bringing in the RG-85/U cable which is bulky and unwieldy to handle. The only cut-out required in this case under the Cabinet AN Type CY-597/G is a hole large enough to accommodate the required number of RG-12/U cables.

If no basement is available, the Bureau will specify a cable vault similar to the one illustrated in figure 2-5 for terminating the RG-85/U cables. This vault is placed near the main receiving building in which the Signal Distribution Unit is installed and the RG-12/U cable brought in through a cableway or through the regular vertical duct as shown in figure 2-1.

In either case, the Connector-Adapters, Navy Type CIA-491652 are installed in the same manner as described in figure 2-4. It will be noted, that in this case, the cable itself is clamped into the cable support and the regular mounting nut on the Connector-Adapter is not used.

f. INSTALLATION OF THE CABINETS AN TYPE CY-597/G.—After the mounting surface is prepared and the antenna lead-ins completed, if the Connector-Adapters are to be installed within the Cabinets, the Cabinets AN Type CY-597/G are slipped over the prepared mounting surface and the holding-down bolts, which are provided by the contractor, installed. The cableways across the top of the cabinets overlap and bolts are provided for securing them together. The small side filler panels at the top and bottom of adjacent cabinets must be removed **before** the cabinets are set in place to allow cable runs between the cabinets. The cabinets must fit snugly together with no gaps between. If the mounting surface is not true, the cabinets must be leveled with suitable shims. Blanking covers are provided for closing the ends of the cableway on the top of the cabinets if it is not used for an external cable entrance.

(1) ANTENNA LEAD-INS.—If the RG-85/U antenna lead-ins are brought into the cabinets, the conduit to the convenience outlet must fit between the cables. As shown in figure 2-2, the center cable is offset to allow this. The cable must then be bent so that it will fit into the proper hole on Jack Panel AN Type J-243/G. Now fit J-243/G over the Connector-Adapters and secure the Connector- Adapters in the panel with the mounting nuts.

If the Connector-Adapters are to be installed external to the Signal Distribution Unit, the cabinets are to be completely installed and all wiring completed prior to bringing in the RG-12/U interconnecting cables.

g. MOUNTING OF COMPONENTS.—The arrangement and mounting of components in the Cabinets for a standard installation is indicated on the outline dimension drawings (figures 2-31 through 2-33). The number of AF and RF Jack Panels may be altered to suit the needs of the individual station; but re-location should be made only by authority of BuShips in each case. The recommended arrangement is considered by BuShips to be the most practical after consideration of all factors involved. All components for

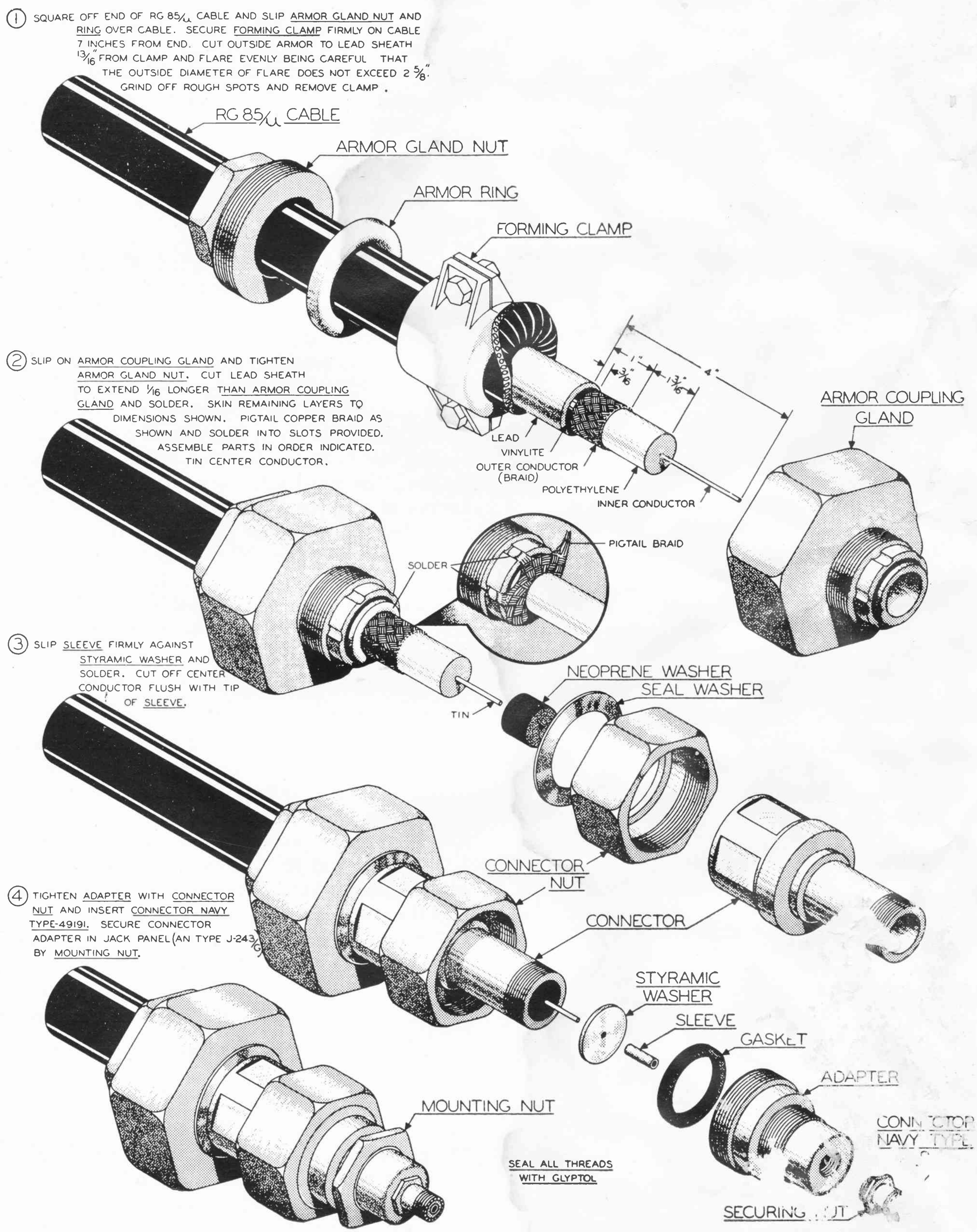


Figure 2-3. Installation of Connector-Adapter Navy Type CIA-491652 on Cable AN Type RG-35/U

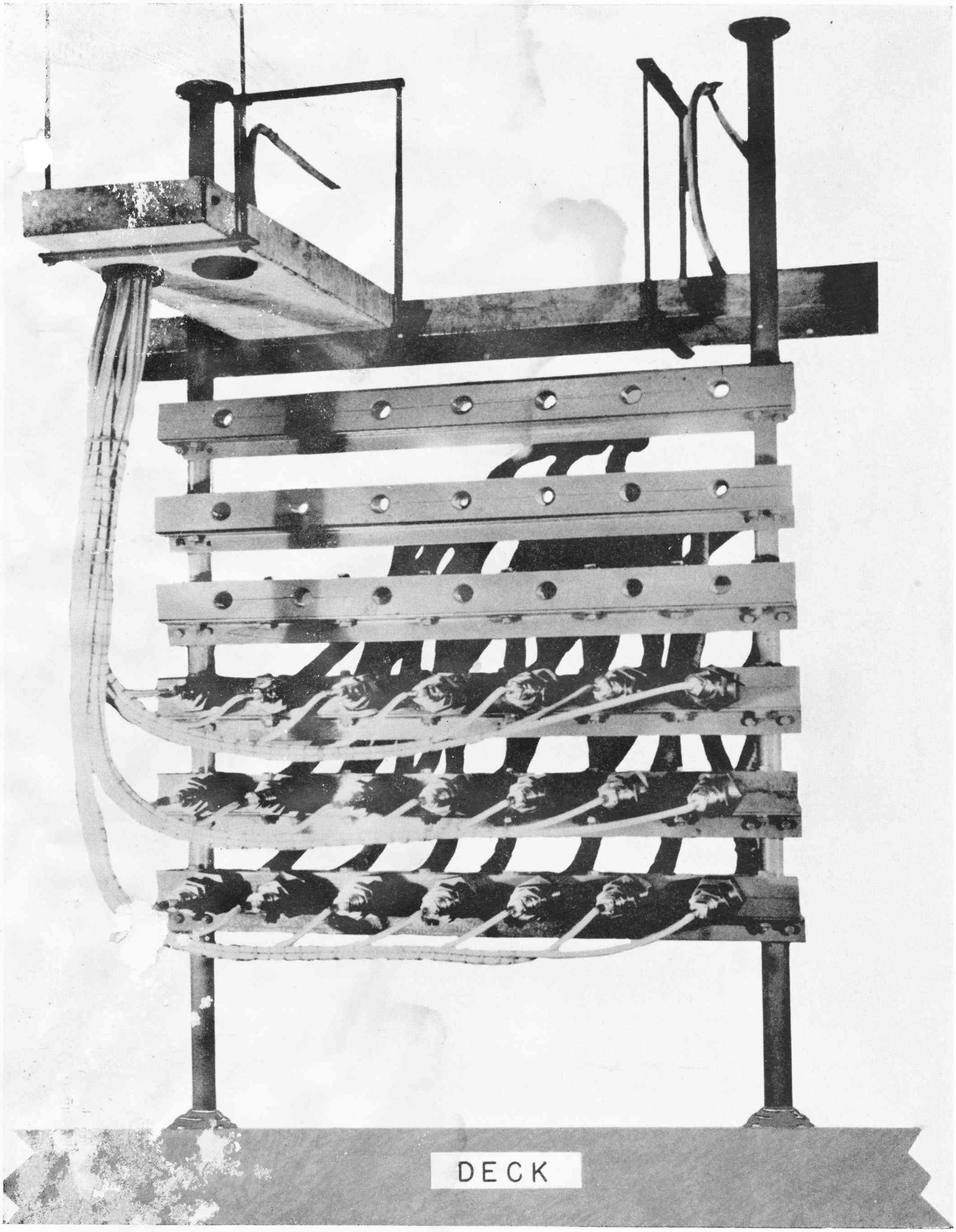


Figure 2-4. Cable Support for RG-85/U Cable Fabricated According to BuShips Drawing RW6F366D

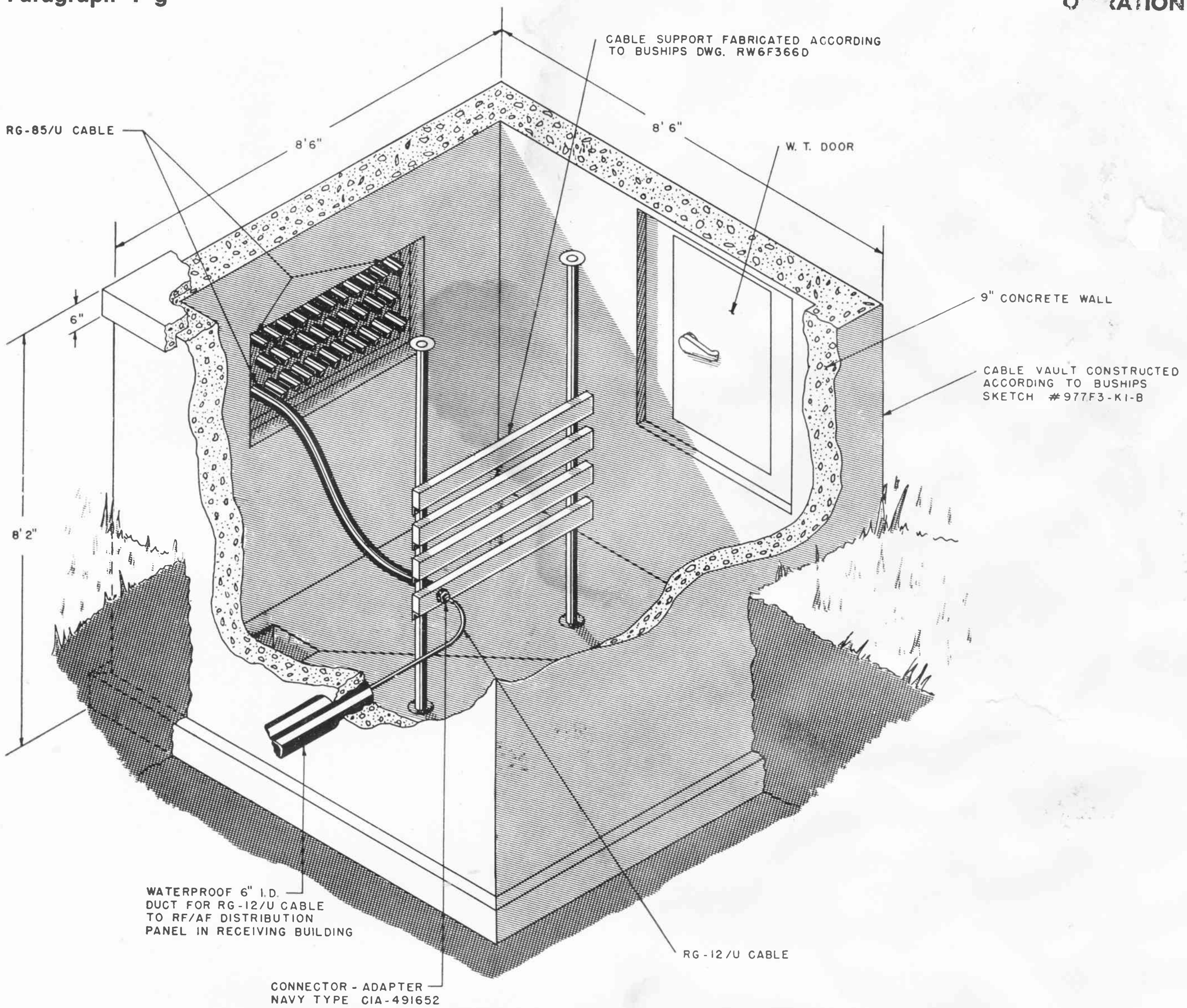


Figure 2-5. Cable Vault Fabricated According to BuShips Sketch #977F3-K1-B Dated 15 August 1947

use with the Signal Distribution unit are either designed or suitably modified to fit into the standard mounting space provided, either the 19″ front panel mounting space or the internal mounting space. Components mount by means of 1/2″ #10-32 binder head screws. Sufficient 19″ blank panels are provided to fill in all unused space on the front of the Cabinets. The front panel mounting angles are drilled and tapped alternately on 1 3/4″ and 1/2″ centers for universal mounting of any standard Navy or commercial relay rack panel. Two additional panel mounting angles are provided for recessed mounting of panels when required. These may be moved in 1/2″ steps from the front to the rear of the Cabinet.

Components mounted internally are provided with vertical channels which fit between adjacent horizontal channels in each side of the Cabinet. The vertical channels may be moved to any point from front to rear of the Cabinet in 1/2″ steps along the horizontal channels. The vertical channels are drilled and tapped for #10-32 screws every 1/2″. The horizontal channels are mounted to provide 10 1/2″ vertical spacing between these rows of holes. Internally mounted components which require 20 1/2″ mounting space include the following:

(1) Primary Power Switch Panel AN Type SA-134/G.

(2) Jack Panel AN Type J-243/G (optional location).

(3) Retainer-Pulley Assembly AN Type MX-813/G.

(4) Mounting AN Type MT-571/G for LR-1 Frequency Meter.

Their locations are indicated on the outline dimension drawings (figures 2-31, 2-32, 2-33).

h. INTERNAL WIRING.—After the cabinets have

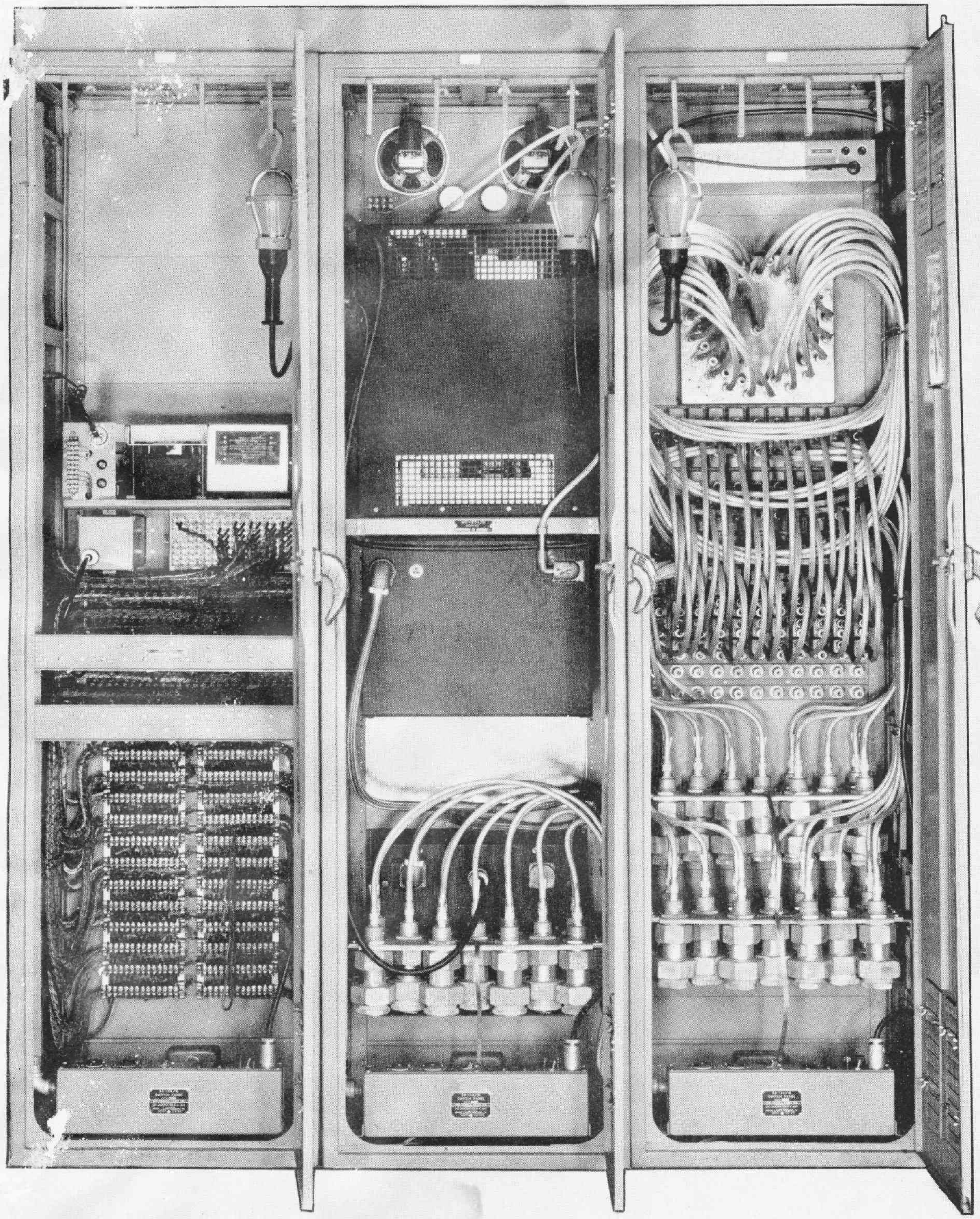


Figure 2-6. Signal Distribution Unit Type A Showing Internal Wiring

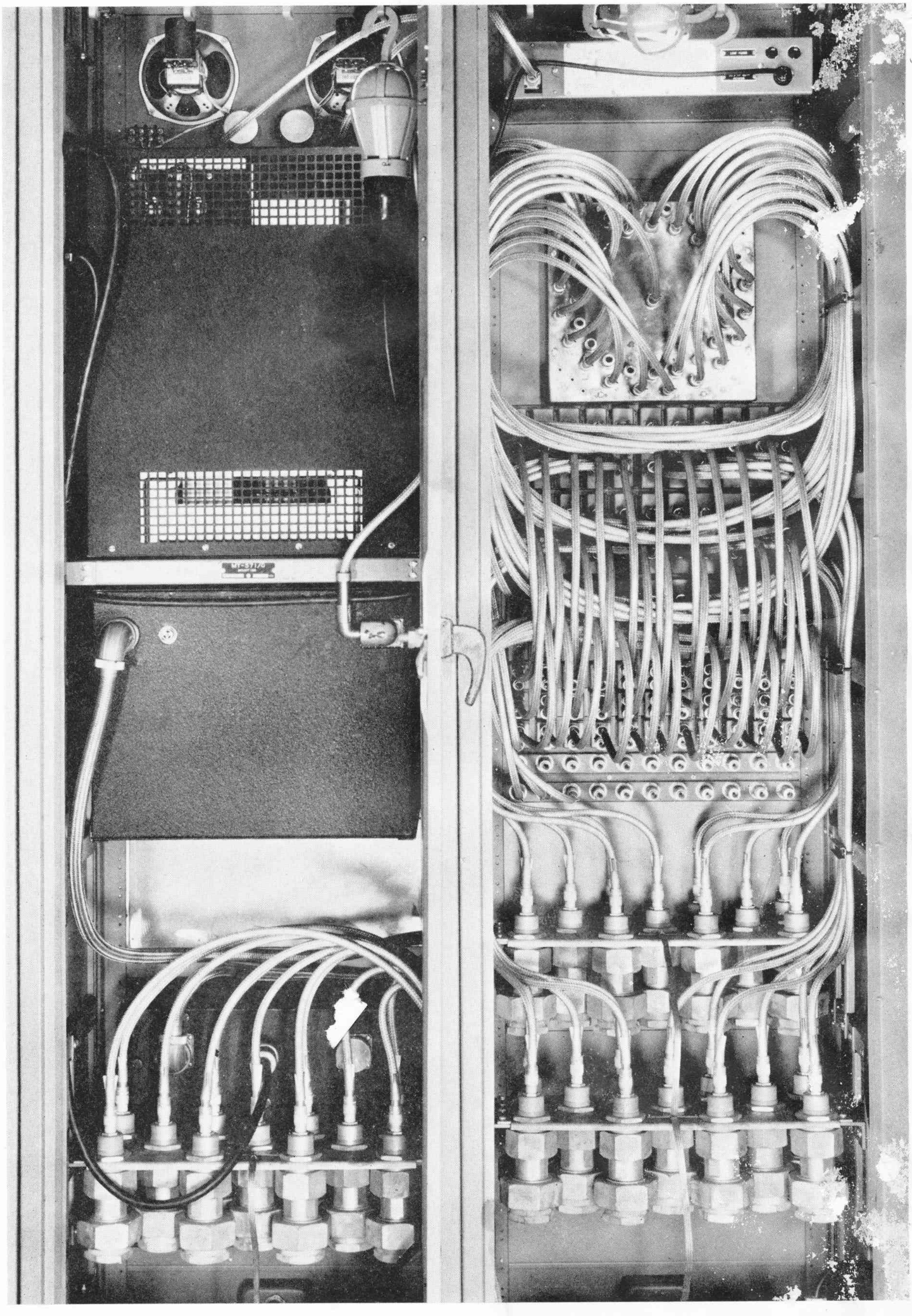


Figure 2-7. Signal Distribution Unit Type A, Rear View Showing Connector-Adapters Navy Type CIA 491652 Installed in the Cabinets

been secured to the deck and all components installed in the mounting racks as explained above, the installing activity must fabricate and install the internal cabinet wiring (see figure 2-40 and 2-41). Sufficient clamp bars, which come in 11 3/4″ lengths, are provided for holding the internal wiring in place (see figures 2-9, 2-10, and 2-11). One inch machine screws are provided to secure the clamp bars to horizontal channels of the cabinet.

(1) ANTENNA LEAD-INS.—See paragraph 1, *e* above for the method of leading in the RG-85/U antenna cables.

(2) RF WIRING.—All RF cables are made from AN Type RG-12/U which is supplied by the installing activity. All connectors used are Navy Type -49190 which are supplied by the contractor as part of the original shipment. In wiring the RF section, it is advisable to refer to *Installation and Maintenance of Transmission Lines Waveguides and Fittings*, (NavShips 900,081, Chapter IV. RG-12/U cable is an armored, solid dielectric, coaxial cable; and certain precautions must be taken to prevent damage.

(a) Do not heat the cable above 180° F or the dielectric will be damaged.

(b) Be sure that the bend radius is at least ten times the diameter of the cable. If too sharp a bend is used, the physical configuration of the components of the cable will be upset, and the impedance of the line will be altered.

(c) Make sure that all connectors are properly installed as shown in figure 2-8.

Figure 2-9 is a view of the completed RF wiring of an A unit based on thirty-two antennae and thirty-two receivers. Figure 2-30 gives the routing and lengths of all cables in a typical A unit without multicouplers. No photographs or table of lengths is given for a B or C unit, but the method of wiring is similar, and the lengths can be easily computed. Cables must be clamped in place as shown in figure 2-9.

The spacing of the RF cables is critical since RG-12/U cable must not be bent on too small a radius as explained above. The most convenient order for installing the cables is to wire first the antenna cables, second the RF Selector Switch, and last install the

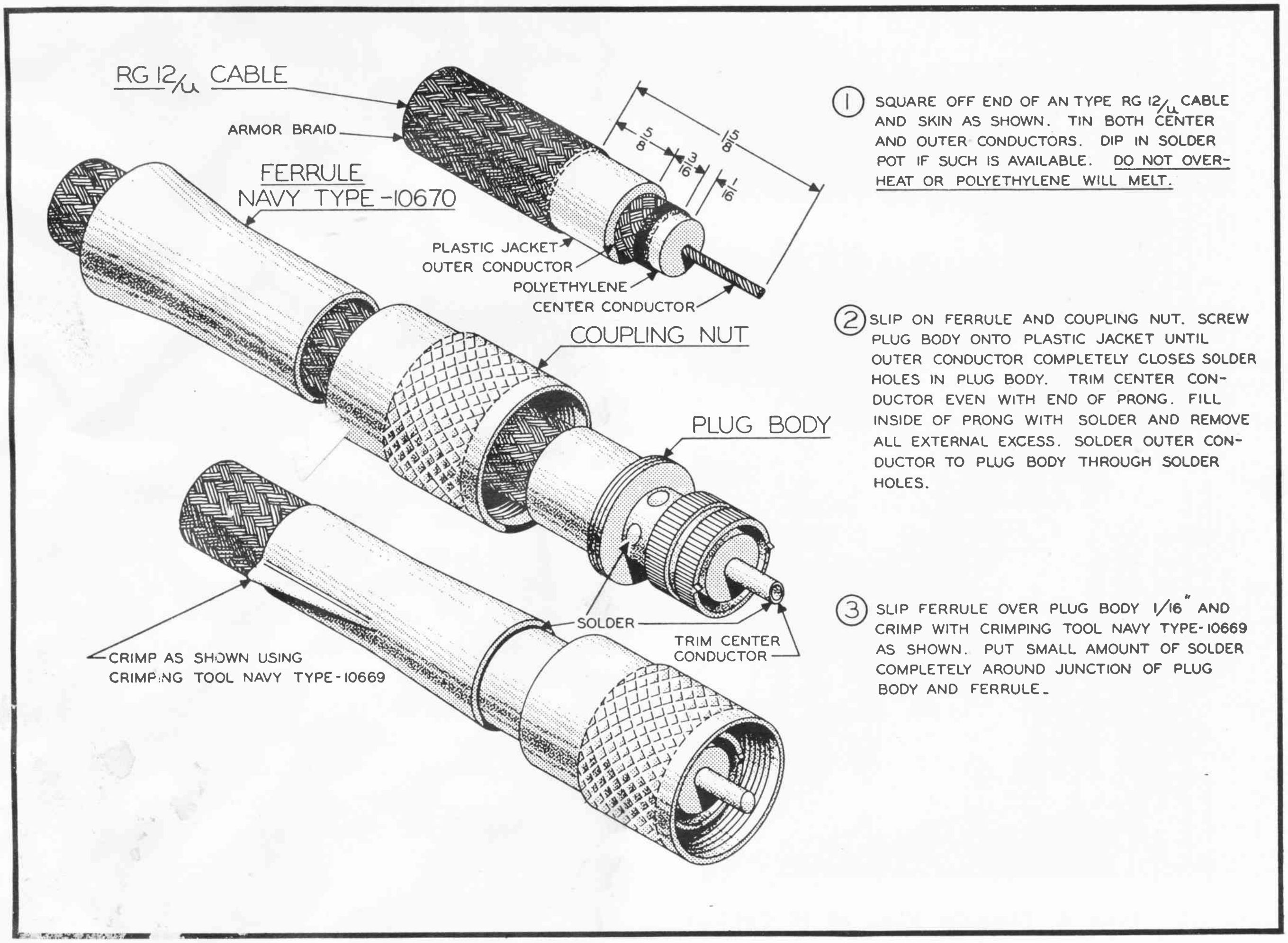


Figure 2-8. Installation of Connectors Navy Type -49190 on RG-12/U Cable

jumpers. All cables should be fabricated on the bench as shown in figure 2-8 before installation in the Cabinet. Ferrules Navy Type -10670, which are not supplied by the contractor, are required for fabrication of the RF cables to bond the outer braid and minimize interference.

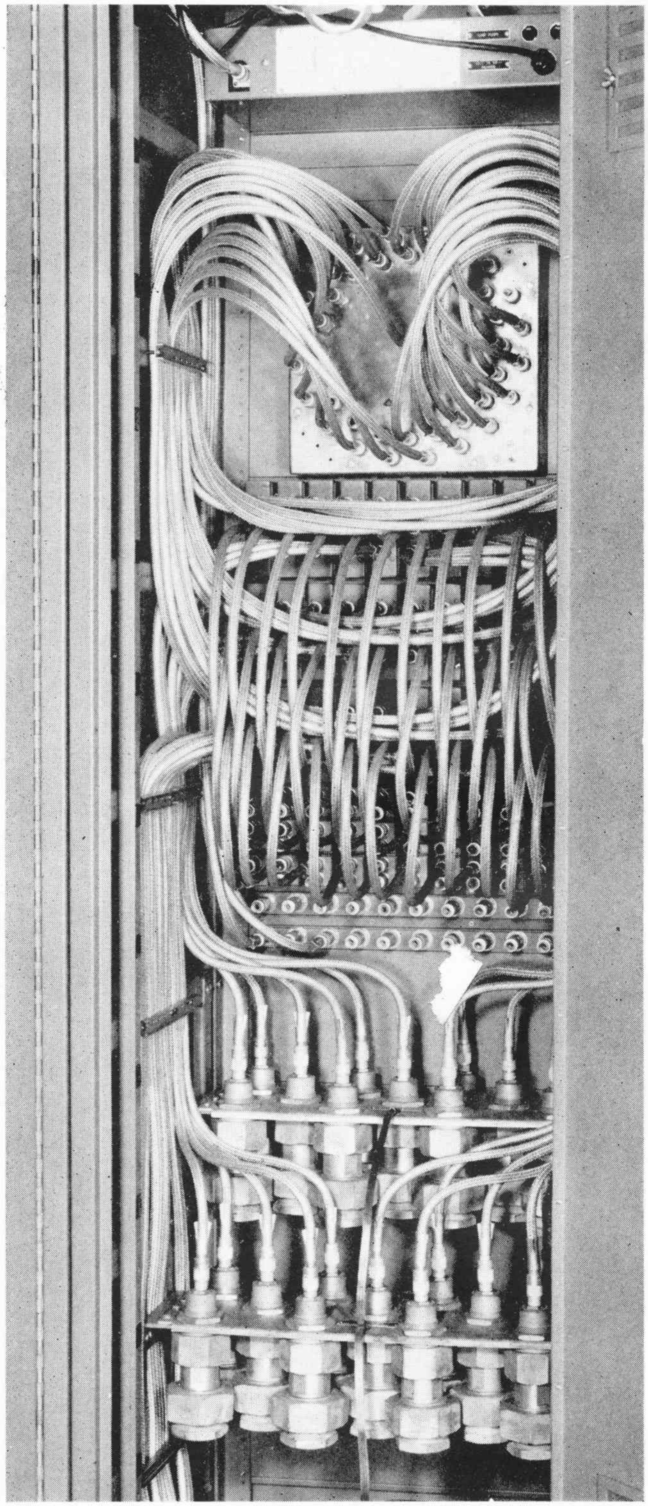


Figure 2-9. Type A, Close-Up View of RF Cabinet Wiring With Connector-Adapters Navy Type CIA-491652 Installed in Cabinet

In connecting the RG-12/U cable to the Connector-Adapters Navy Type CIA-491652 connect them so that the circuits will run in some logical order. For example, if the antennae of the station are numbered, the #1 antenna should connect to the left hand Jack Box (when viewed from the front) and the #1 position of the Antenna Selector Switch.

(3) AF WIRING.—All AF wiring is fabricated from twisted, shielded pairs obtained by stripping the outer plastic from TTRS series cable or similar twisted, shielded pairs. Wiring when completed will look like that shown in figure 2-10. Connections are similar to that shown on the connection diagram figure 2-40.

When making up the required internal AF wiring, bear in mind that **sufficient slack** must be left in the wiring to allow the panels to be pulled out through the front without disturbing the wiring. Note the "U" shape of the laced cable in figure 2-10 which is for this purpose. This requirement must be kept in mind when placing the clamps. The entire cable is painted with fungacide varnish as stated in paragraph 2, *b* (8) of section three. The installing activity must furnish the necessary fungacide varnish.

(a) AF JACK PANELS.—As shown on the wiring convention (figure 2-21) the upper and lower pairs of jacks on the Jack Strip are wired in parallel and in such a fashion that plugging horizontally into the top pair breaks the normal circuit; while plugging horizontally into the bottom pair establishes a parallel connection.

To accomplish this connection, a piece of #20 AWG bus wire is soldered from the tip connection of the top bank to the tip connection of the lower bank as shown in figure 2-13. In the Signal Distribution Unit, only the tip connection of the patchcord is utilized, but the body is connected and can be used if required. Each pair splits between two horizontally adjacent jacks. The ends of the twisted pairs are fitted with Thomas and Betts Grounding Ferrules #200-30006 as shown in figure 2-15 to prevent fraying of the braid. The shield is not grounded on the jack strip end, but it is grounded on the terminal board end. Thus, the grounding braid and the spade lugs illustrated in figure 2-15 are omitted in wiring the Jack strips. Skin off the plastic coating on the conductors for about 1/4″ and slip a piece of #9 radio grade spaghetti about 1″ long on each of the conductors. Insert the bare conductors through the appropriate holes, double back, and solder in place. Establish some sort of color code to make it easier to visually trace a particular cable. If TTRS-4 cable is used, the right hand pair of jacks should be black, the second pair white, the third pair red, and the fourth pair green. It is advis-

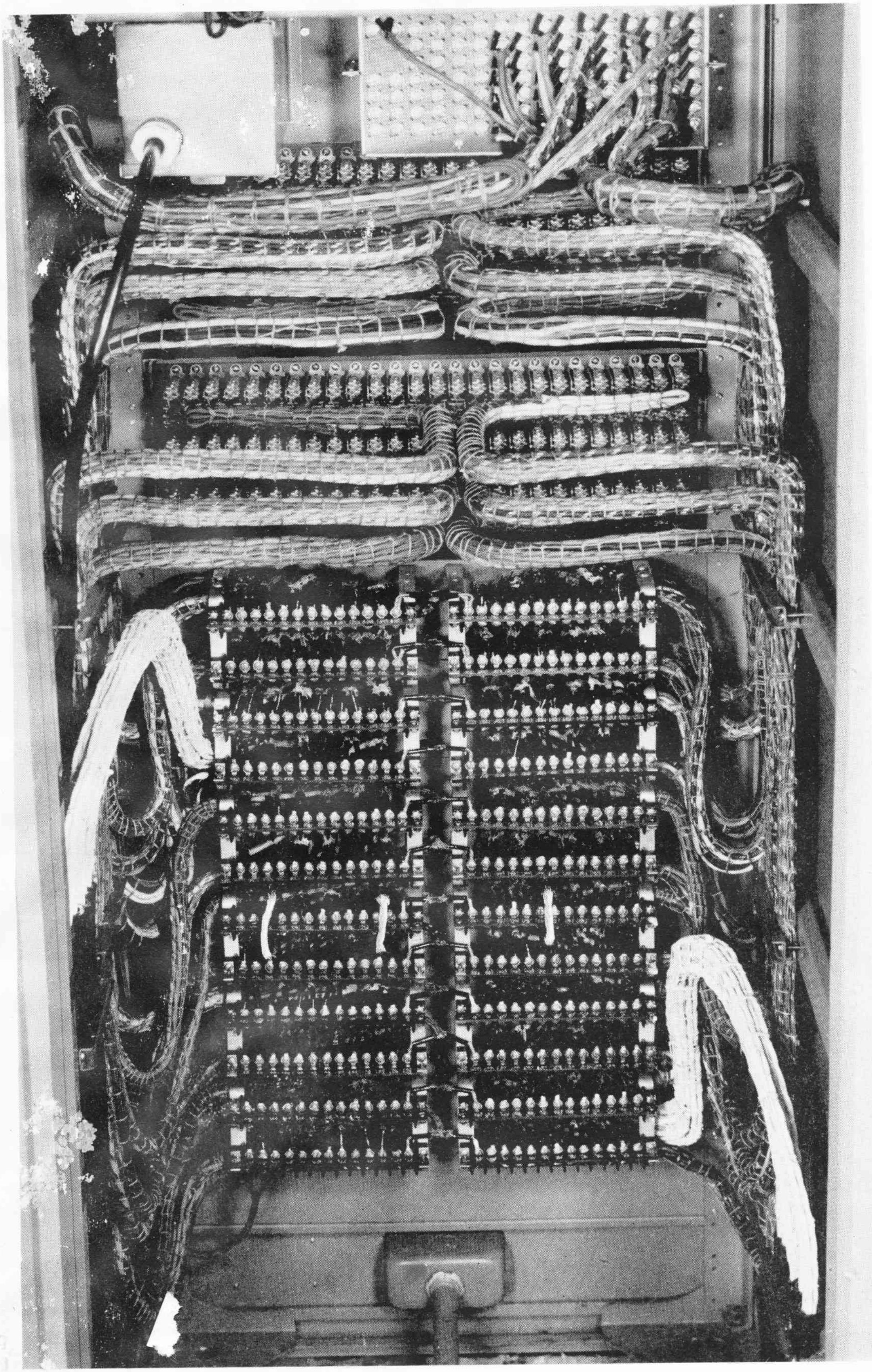


Figure 2-10. Type A, Close-Up View of AF Cabinet Wiring

able to leave every fourth lead, in this case the green lead, as a spare. It should be cut to such a length that it will reach from the farthest jack to the farthest terminal in a particular run and then doubled back and laced into the cable.

(b) TERMINAL BOARDS.—There are two methods of mounting the terminal boards as illustrated in figures 2-10 and 2-14. Wiring is as illustrated.

1. FRONT PANEL MOUNTING *(Figure 2-10)*.—The terminal boards on the equipment as shipped are mounted on special size B panels AN Type J-242/G, which fit into regular rack mounting space. If the front panel space is not required for some other equipment, this is the most convenient method. Wiring is as shown in figure 2-10. In clamping the wiring, be sure to place the clamps in such a position that the boards may be pulled out through the front with the wiring connected.

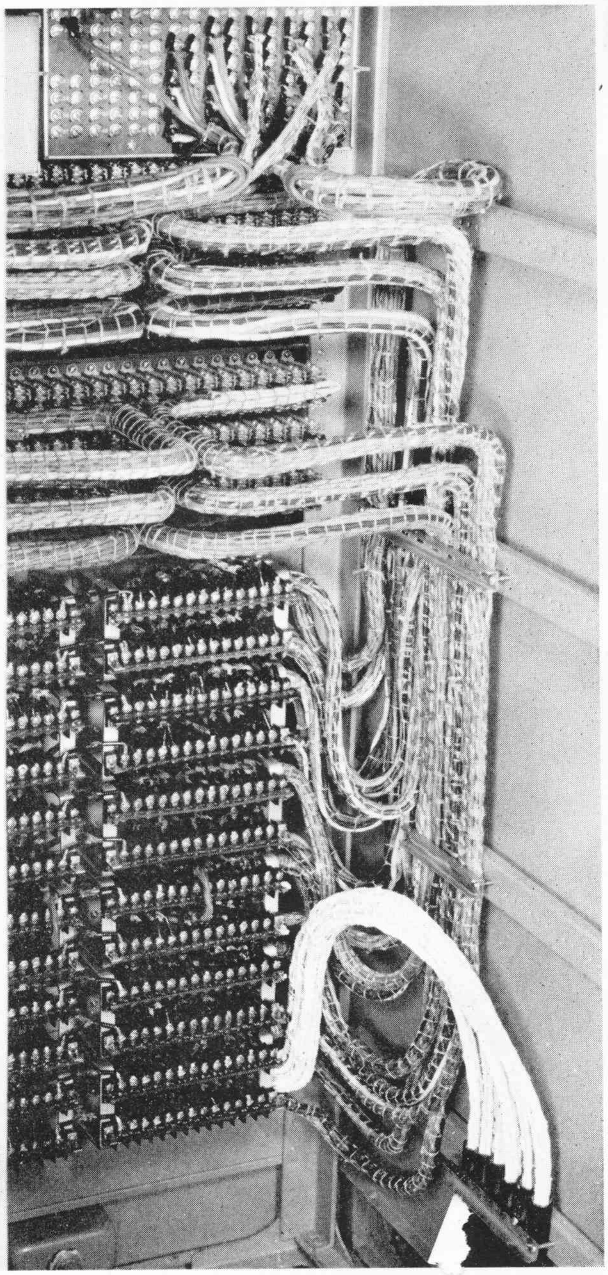


Figure 2-11. Type A, Close-Up View of AF Cabinet Wiring Showing Method of Lacing and Clamping

2. SIDE PANEL MOUNTING *(Figure 2-14)*.—Should additional front panel mounting space be required, the terminal strips may be mounted on the side of the Cabinet opposite from the side which carries the convenience outlet strip (right hand looking from the rear). The mounting is accomplished by drilling and tapping appropriate holes in the rear vertical corner angle of the Cabinet. One of the movable vertical channels is installed in such a position that it may be drilled and tapped to support the opposite end of the panel. This type of mounting is possible only if the components mounted on the front panels do not protrude more than 4 1/2 inches beyond the rear of the front panel.

3. WIRING THE TERMINAL BOARDS.—The terminals on the boards are numbered in pairs. These numbers correspond with the pairs of similarly numbered jacks on the jack strips. Figure 2-40 is a typical connection diagram. The actual connections will of necessity be determined by the needs of the individual station.

In making the connections on the terminal strip end of the internal wiring, Thomas and Betts Grounding Ferrules #200-30006 or the equivalent are used in all cases. These ferrules are installed as illustrated in figure 2-15. After the spade lugs are installed on the ends of the conductors, ring out all circuits and clip the spade lug which connects to the right hand jack of a particular pair, thus making it possible to maintain polarity. The terminal board illustrated in figure 2-16 is wired using this method. Solder on a piece of #14 AWG tinned bus wire as shown in figure 2-16 and solder the grounding braids to it. It is not necessary to ground the panel itself as the paint has been omitted around the mounting screws to make it self grounding. **Remember to leave enough cable to allow the terminal boards to be pulled out for servicing with the wiring connected.**

(c) AF SELECTOR SWITCH WIRING.—Referring to figure 1-17, it can be seen that the spacing between the terminals is very close. The ends are made up using the Thomas and Betts Grounding Ferrules #200-30006 or equivalent as shown in figure 2-15. The shield is not grounded on this end. A piece of #1 radio grade spaghetti 1/2" long is slipped over the grounding ferrule to prevent it from making electrical contact with the terminals, thus causing a short circuit. A piece of #9 radio grade spaghetti 1" long is then slipped over each conductor and the spade lugs which come secured to the terminals are fixed on each

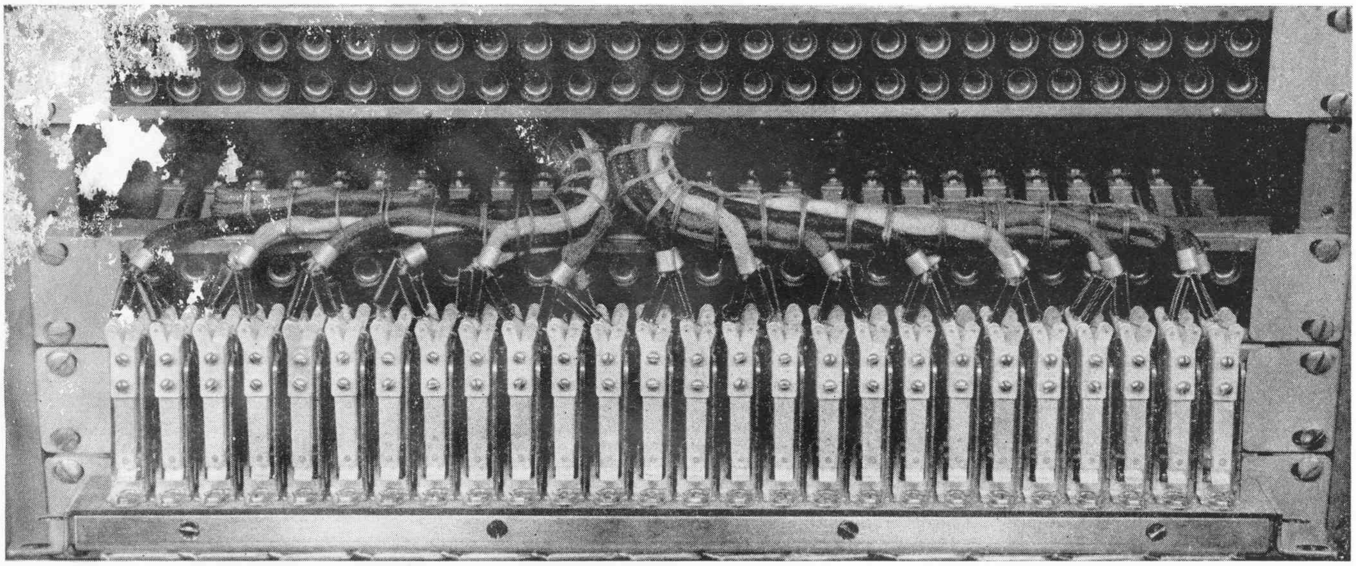


Figure 2-12. AF Jack Panel Wired Using Thomas and Betts Grounding Ferrules #200-30006

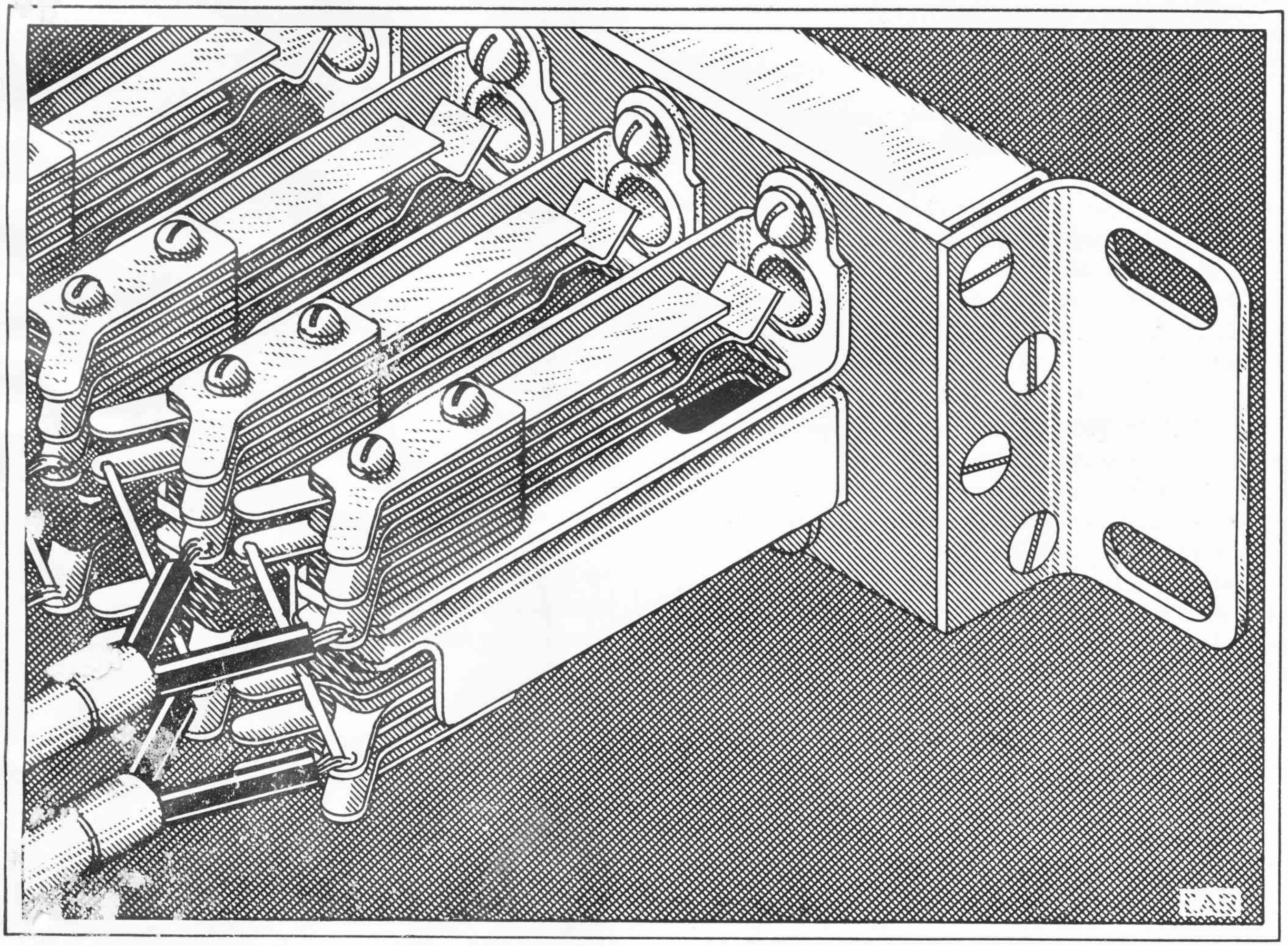


Figure 2-13. Close-Up Showing Method of Wiring Telephone Jacks on Rear of Jack Mounting Strips Navy Type -491394

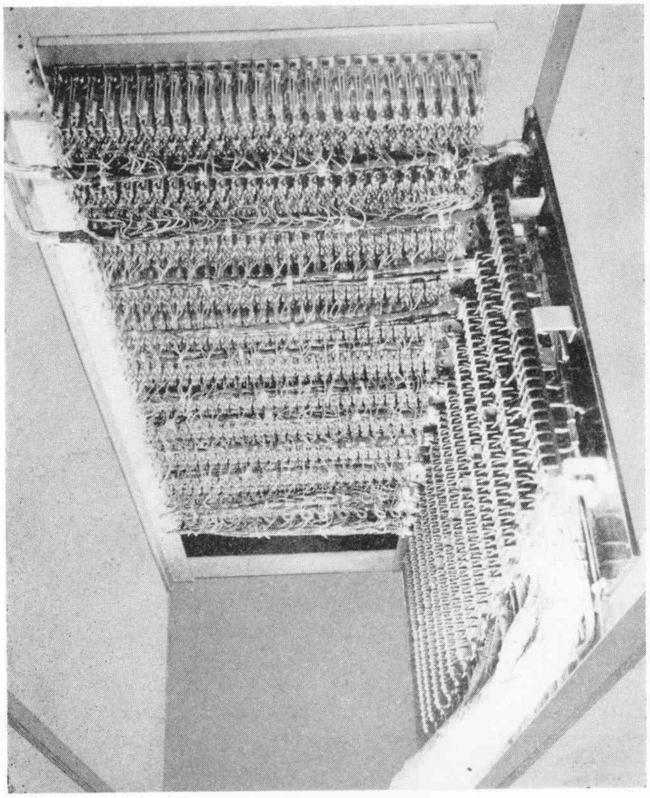


Figure 2-14. Top View Showing Alternate Method of Mounting Terminal Boards

conductor. These spades are then bent out to about 45° to further lessen the danger of short circuits. The individual pairs are then laced together into convenient size cables and painted with fungicide varnish.

i. EXTERNAL INTERCONNECTING CABLES.—It is advisable to complete the internal cabinet wiring before installing the external wiring.

(1) RF WIRING.—The receiver input and miscellaneous apparatus jacks have been left blank in figure 2-9 as these connections vary with individual installations. Connections to the antenna input of the receivers are made with RG-12/U cable, and the connectors are installed in the Signal Distribution Unit end of cables as shown in figure 2-8. See the applicable instruction book for the receiving equipment for the type of plug to be installed on the other end of these cables. The cables are led through the regular RF cableways in the "Q" flooring or equivalent of the station to the proper receiving equipment (see figure 2-1 for a description of the "Q" flooring). The cables must be clamped with the clamps provided inside the Signal Distribution Unit in the same manner as the internal cables illustrated in figure 2-9. Keep in mind that the bending radius of the RG-12/U cable must be not less than ten times the diameter of the cables. Refer to figures 2-37, 2-38, and 2-39 for the external connections to be made in a typical installation.

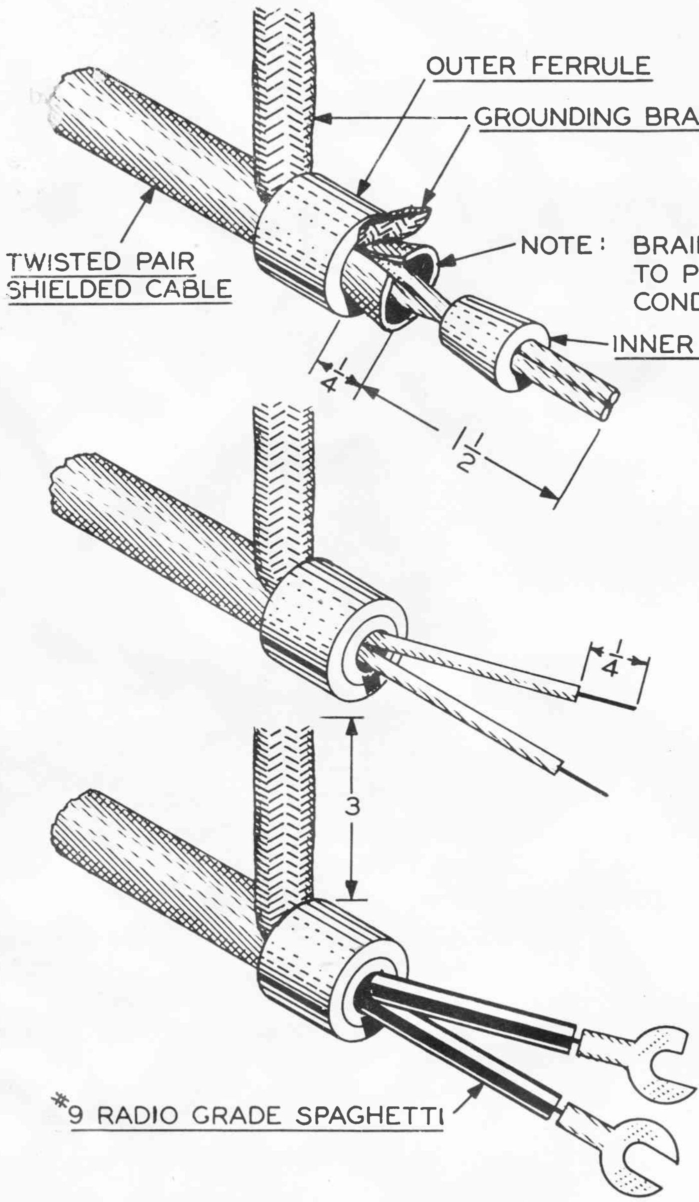
(2) OPERATOR'S POSITION.—The standard operator's position consists of two receivers mounted so that they may be conveniently controlled by one operator. A Control AN Type C-443/G is provided for headphone outputs as part of the Signal Distribution Unit to enable the operator to guard either receiver or, by operation of a knob, to guard both at once. The function of this control is covered more fully in paragraph 2, *e* of this section. The installing activity must mount this control on the operator's table. Alternate methods of mounting the control are shown on figures 2-31 through 2-36. The installing activity must design and fabricate suitable mounting brackets for this purpose as none are provided by the contractor. Wiring of the control is shown on the interconnecting diagrams figures 2-37, 2-38, and 2-39; and the schematic figure 2-29.

(3) EXTERNAL AF WIRING.—As explained above, two receiver output cables go into each Control AN Type C-443/G, while only one cable (TTRS-4) goes out. Thus there are approximately half as many receiver output cables which go into the AF cabinet as there are receivers. An undetermined number of AF cables go to the loads, the number being dependent upon the number of speakers, recorders, teletypes, etc. which are in the station allowance. The receiver output cables come in on the left hand side of the AF cabinet of the Signal Distribution Unit and the load cables go out the right hand side looking from the rear. Cut-outs for these cables are shown in figure 2-2. Remember that the AF cables are run in the AF cableways of the "Q" flooring or equivalent cable ducts.

The receiver output cables come up the left hand side of the cabinet as explained above. There is not enough space for a single layer of cables, so they must be clamped in two banks. Arrange the layers so that the cables which connect to the highest terminal strips in the Cabinet are on the bottom layer. One set of clamps hold both layers of cables.

The load cables go out of the right hand side of the AF cabinet as explained above. They are stacked in layers and clamped in exactly the same manner as the receiver output cables.

Both the receiver output and the load cables are TTRS-4 cable. As shown in figures 2-10 and 2-11, the complete cable is brought in through the cut-out in the floor and clamped. The outer plastic covering is cut off at about the level of the terminal board to which the conductors are to connect. The twisted pairs are then laced together and formed into a loop as shown in figure 2-11 which leads into the rear of the terminal boards. Connections are then made to the appropriate terminals with spade lugs and Thomas and Betts Grounding Ferrules #200-30006, as shown in figure 2-15. The grounding braid is soldered to the common

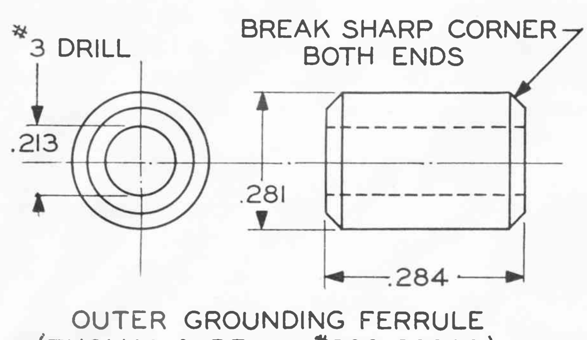


1. SLIP BACK METAL SHIELD ABOUT 1 1/2 INCHES. SLIP PIECE OF 1/4 INCH METAL BRAID THROUGH THOMAS & BETTS OUTER FERRULE #200-30006 AND SLIP FERRULE OVER BRAID OF TWISTED PAIR. SLIP INNER FERRULE OVER CONDUCTORS.

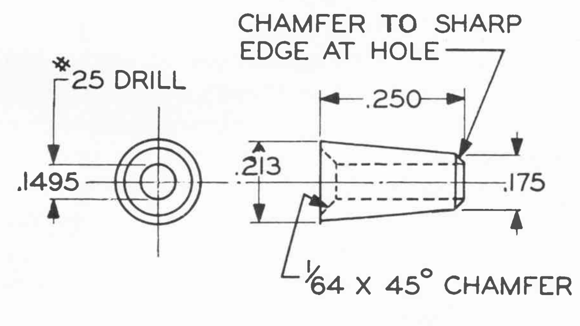
NOTE: BRAID ON TTRS SHIELDED PAIRS MUST BE SPLIT TO PERMIT INNER FERRULE TO SLIP BETWEEN CONDUCTORS AND SHIELD.

2. PRESS INNER FERRULE INTO OUTER FERRULE USING THOMAS & BETTS WEDGE-ON PLIERS #21000 OR EQUIVALENT. THE BRAID WILL AUTOMATICALLY TRIM. SKIN CONDUCTORS AS SHOWN.

3. SLIP #9 RADIO GRADE SPAGHETTI 1 INCH LONG OVER EACH CONDUCTOR AND CRIMP AND SOLDER ON SUITABLE SPADE LUG. CLIP SPADE LUG ON EACH END OF ONE CONDUCTOR TO INDICATE POLARITY. CUT GROUNDING BRAID TO 3 INCHES AND SOLDER TO GROUND BUS.



OUTER GROUNDING FERRULE
(THOMAS & BETTS #200-30006)



INNER GROUNDING FERRULE
(THOMAS & BETTS #200-30006)

Figure 2-15. Fabrication of Internal AF Wiring Using Thomas and Betts Grounding Ferrules #200-30006

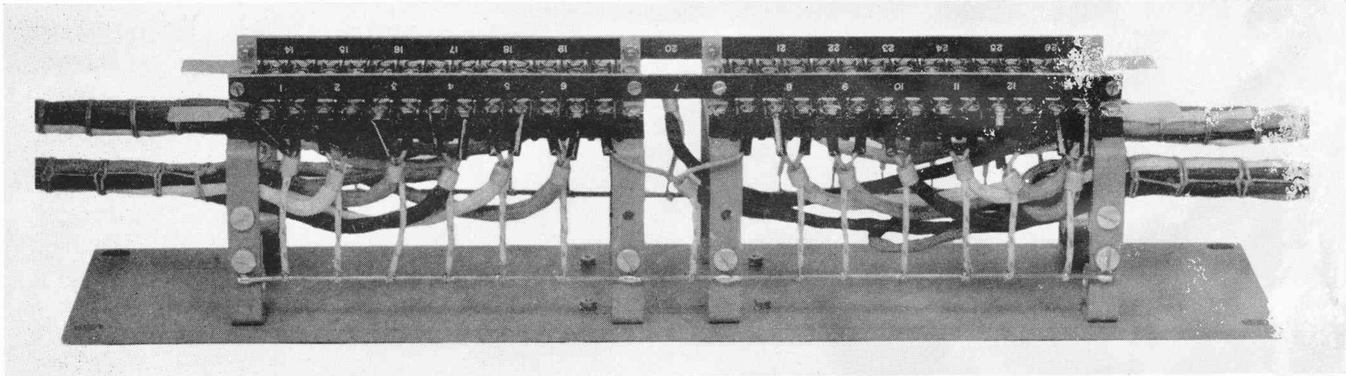


Figure 2-16. Terminal Board Wired Using Modified TTRS Cable and Thomas and Betts Grounding Ferrules #200-30006

ground buss on the terminal board (see figure 2-16). Be sure that the loop is made big enough to allow the terminal board to be pulled through the front for servicing with the wires connected. Whenever polarity must be maintained, ring out the circuits and clip the lug on the conductor which connects to the same terminal as the clipped lug in the internal cabinet wiring.

j. PRIMARY POWER CONNECTIONS *(Figure 2-17)*.—The primary power input cable to the cabinets connects into Switch Panel AN Type SA-134/G through a knockout in the bottom for 1/2 or 3/4 inch conduit (conduit not furnished). The normal primary power input is 115 volts AC, 60 cycles. Fuses required are 15 ampere for convenience and strip outlet and one ampere capacity for the trouble light circuit. Supply of 230 v 60 cycles may be used if equipment served within Cabinets is **so rated** and if 5 amp fuses are used.

k. INSTALLATION TESTS.

(1) CONTINUITY TESTS.—When the cabinet wiring is completed and all interconnections made, each unit should be given a final check before being put in service. This is to insure that the components have been correctly installed and that all wiring connections are complete. A continuity check should be made on each unit with the volt-ohm-milliammeter or a portable device for ringing or lighting out circuits.

To check continuity through a particular wire, refer to the applicable connection diagram figures 2-37 through 2-41 and proceed as follows:

(a) Select some starting point on the diagram, preferably an input.

(b) Mark this point on the diagram and locate the corresponding point in the equipment.

(c) Trace the circuit from this point to the next point where contact can be made such as a terminal board, switch terminal, etc., and test the continuity. Mark the test points and check wires on the diagram to insure that all wires are checked thoroughly.

(d) Proceed in this manner, marking each point until all wires are completely checked as indicated between test points on the diagram.

(e) Draw up a corrected connection diagram for the particular installation showing actual circuit markings as installed for use of maintenance men to permit rapid diagnosis of trouble in the future.

(2) INSULATION TESTS.—After continuity has been established in all circuits, test insulation resistance with test equipment provided by BuShips as part of the system. The resistance of the RF cables to ground must be approximately 50 megohms or more. In the AF section, the resistance between conductors and between the conductors and ground must be at least five megohms. Replace or repair defective components as necessary. Record all values in a suitable manner and turn them over to the officer-in-charge for subsequent use by maintenance personnel.

l. AF JUMPER CABLES.—Connections between the Interconnecting Terminal Boards of the AF section (see figures 2-22 and 2-23) are made by flexible jumpers fitted with spade lugs so that the connections may be readily altered to minimize use of patchcords on front panels. The installing activity should fabricate enough of these jumpers to connect all circuits in the equipment. The jumpers are made of suitable twisted pairs fitted with Thomas and Betts Grounding Ferrules #200-30006 and spade lugs on each end installed in the manner shown in figure 2-15. The jumper should be made long enough to reach between the most remote terminals of the Interconnecting Terminal Boards. Clip the spade lugs on both ends of one of the conductors in each jumper to make it possible to maintain polarity.

m. MARKING.—Designation strips and card holders are provided on the panels for insertion of circuit

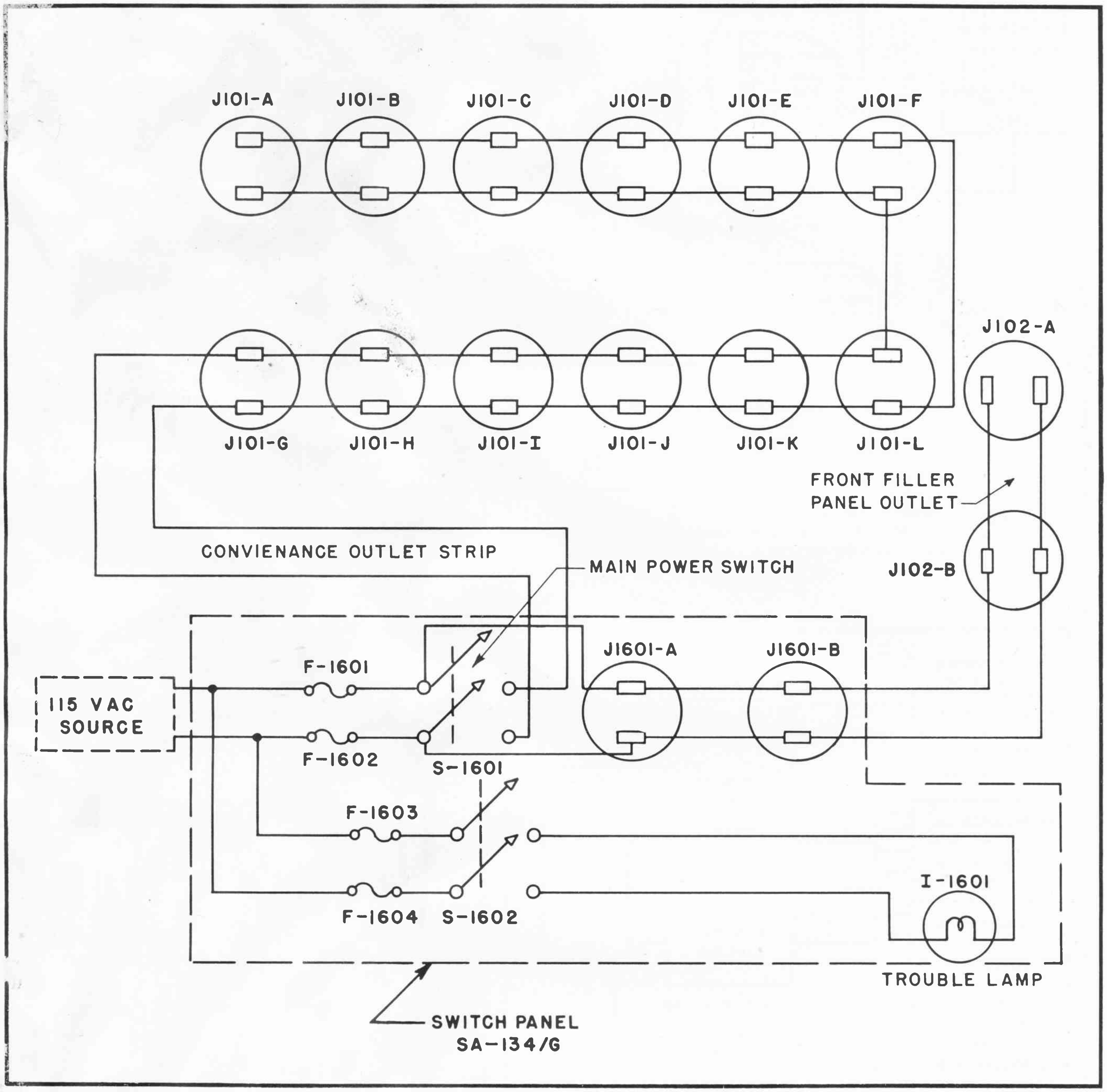


Figure 2-17. Primary Power Distribution

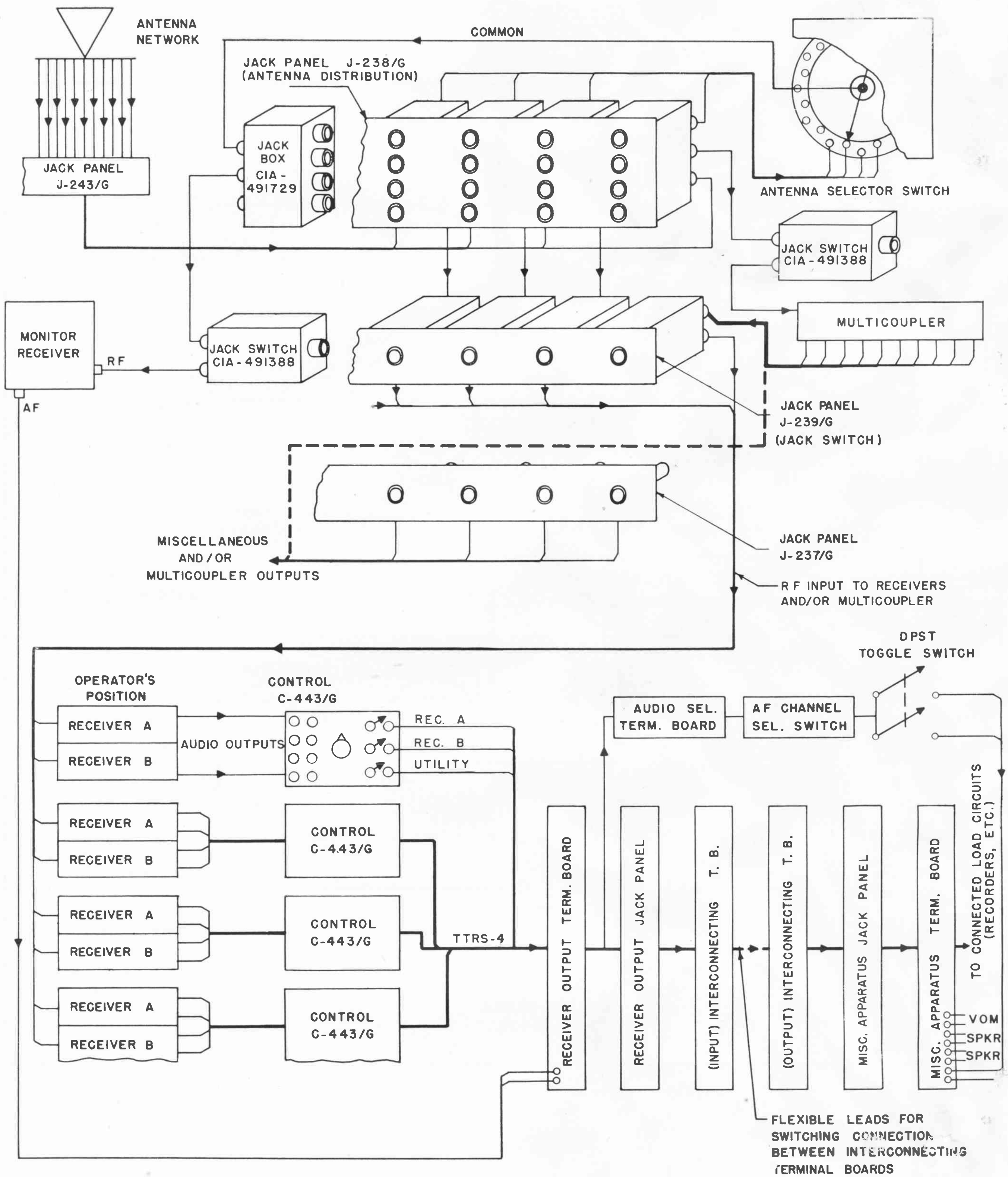


Figure 2-18. Overall Functional Block Diagram (AF and RF)

identification markers. The installing activity should carefully mark all circuits in a suitable manner and make appropriate diagrams for use by maintenance and operating personnel. Cardholders (8½" x 11") are included on the inside of the doors for tabulating this information.

(1) RF CIRCUITS.—In most stations, antennae are identified by symbol number, type, and direction of reception. The circuits on the RF Jack and Switch Panels must be marked on designation strips. Two plexiglass covered cardholders are included on the front panel of the Antenna Selector Switch for identification. Antennae should be tabulated on cards showing the number of the antenna, its type, and the true azimuth bearing. If the antennae are fixed for reception from some particular location, for example, Hawaii, it may be desirable to use the geographical position or station call in addition to the bearing in degrees. EZ cable markers for marking all internal RF cables in cabinets are provided.

(2) AF CIRCUITS.—The receivers or operating positions in a station are generally numbered in some manner. The AF output circuits from these receivers should be clearly identified throughout. Cardholders are provided on the front panel of the AF Selector Switch for identification of the receiver output (AF) circuits. Obviously, receiver 1 should connect to position 1 of the AF Selector Switch, etc. Tabs must be made up for insertion in the designation strips for identification of the circuits and/or receivers.

NOTE

> In marking the jacks on the AF Jack Panels, make sure markings identify a **pair of jacks clearly** so that operating personnel will not split a twin plug patchcord between adjacent circuits. Marking tabs of contrasting colors may be used on adjacent pairs to clearly differentiate between adjacent circuits (see figure 2-25).

n. MOISTURE PROOFING AROUND CUT-OUTS.—As is often the case, the space over which the Signal Distribution Unit is installed may be damp or unheated. For this reason, the cut-outs shown in figure 2-2 are as small as practical. After the interconnecting cables have been completely installed and tested, the openings should be stuffed with jute, oakinite, or equivalent to make the floor reasonably moisture proof.

In extreme, moist climates it may be desirable to install from one to four 50 watt lamps in Switch Panel AN Type SA-134/G. Knockouts are provided in this Switch Panel on the side toward the front of the Cabinet for installation of lamp sockets (see figures 1-3 and 2-17).

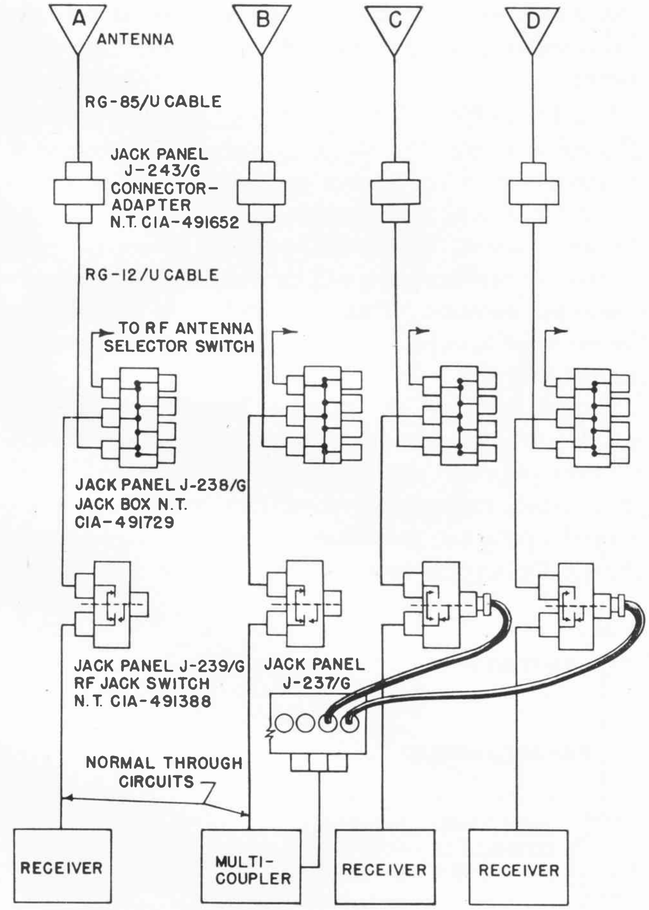


Figure 2-19. RF Circuits Showing "Normal Through" and Multicoupler Operation

2. OPERATION

a. GENERAL.—The Signal Distribution Unit furnishes a centralized control point for the selection, distribution, switching, and monitoring of RF and AF circuits within a communication center.

The design of the Signal Distribution Units is not complex, but supervisors must be thoroughly familiar with the construction and operation of the units, including associated equipment, to understand its capabilities and limitations. Since Navy communication procedure requires rapid and accurate manipulation of radio signals to prevent interruptions or delay, it is essential that supervisors be well trained to carry out assigned duties at the Distribution Units with speed and accuracy.

Inasmuch as the outstanding feature of the Signal Distribution Unit is its flexibility, and since no two stations operate under the same conditions, standard operating procedure for each individual station should be established by the officer-in-charge to meet the requirements of the station concerned.

A general operating procedure applicable to all types of Signal Distribution Units is given in this section which may be used as reference in establishing the standard operating procedures for the individual station.

b. OPERATING PROCEDURE, RF SECTION.—The RF section of the Signal Distribution System is so designed and wired that a certain receiver or multicoupler connects to a certain antenna by a "normal through" circuit. In normal operating procedure, each receiver or multicoupler will be used with its normally connected antenna. Thus, no patching is required for the operator to copy a given signal on a predetermined normal antenna.

Should, however, the operator have difficulty copying due to some abnormal cause such as a defective receiver, improper directive antenna for desired signal, or unusual atmospheric conditions which upset the normal operating procedure, it may be desirable to change the normal connections. Also, it is necessary to monitor and test the various circuits with as little interruption as possible. The methods of accomplishing these functions is described below.

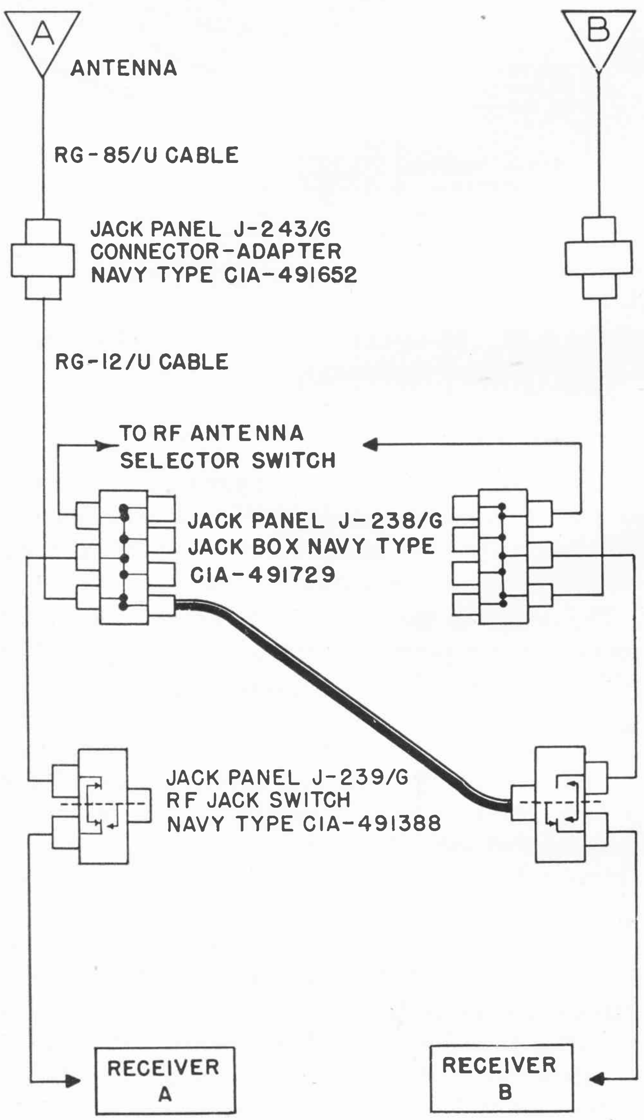


Figure 2-20. RF Circuits Showing Parallel Operation of Two Receivers From One Antenna

(1) "NORMAL THROUGH" OPERATION.—"Normal Through" operating is defined as operation of a specific receiver or multicoupler from a specific antenna without the use of patching. Every antenna is connected to a "normal through" circuit which should be used in normal operation and in particular point to point circuits wherever possible. A "normal through" circuit is obtained by connecting the signal source to the top connector on the rear of the Type -491388 Jack Switch on J-239/G and connecting the receiver to the bottom connector on the rear of this Jack Switch. Patching should be used only when satisfactory operation cannot be obtained in the normal manner. No special instructions are required for this type of operation. Patching is to be avoided wherever possible as it increases the possibility of loose connections and grounds in addition to making the equipment unsightly and complicated. "Normal through" circuits can be changed by changing the jumper cables which connect between Jack Panels J-238/G and J-239/G within the cabinet (see figure 2-9). This is to be done only by authorized maintenance personnel. Applicable station drawings must be altered accordingly. The receiver in circuit "A" (figure 2-19) is operating from a "normal through" circuit.

(2) PARALLEL CONNECTIONS.—It is often desirable to connect test and/or monitoring equipment into a circuit with minimum interruption of communications on that circuit or to operate two receivers from one antenna. This is to be avoided wherever possible, as the impedance of the antenna is matched to its terminating equipment and a mismatch will occur when parallel connections are made. But, since a certain amount of mismatch is allowable before serious interference with communication occurs, the use of two receivers or one receiver and one piece of test equipment is possible.

To connect a parallel circuit, plug an RF patchcord into any of the four jacks on the front of the appropriate Jack Box Navy Type CIA-491729 on Jack Panel AN Type J-239/G. All four of the jacks on the front and three jacks on the rear of the Jack Box, Navy Type CIA-491729 (see figure 1-6) are connected in parallel. The other end of the patchcord may be connected into whichever equipment requires this RF input. Where it becomes essential to parallel up to four receivers with minimum loss on the antenna for extended periods of time without use of multicouplers, Antenna Jack Panel AN Type J-238/G can be modified as shown in BuShips drawing RE 109 F 100. Authority for such modification must be obtained from BuShips. The RF patchcords are not included in the contractor's shipment of equipment and must be requisitioned from Naval stock.

(3) SWITCHING RECEIVER INPUTS.—It is often necessary to interrupt the "normal through" circuit and substitute a patching circuit in its place. For example, an operator may have difficulty in copying a particular schedule with a particular antenna connected to the receiver in use. By means of the Antenna Selector Switch described in paragraph (5) below, the supervisor by use of the monitor receiver in the unit may test all of his antennae and determine that a particular antenna is pulling in a stronger signal than the one presently in use. He may then switch the receiver on which the operator is copying over to a better antenna with almost no interruption of communication. Or, if a receiver should fail in the middle of a schedule, the supervisor may patch the same antenna into a stand-by receiver so that the operator may resume operation with a minimum of interruption. Also, it may be desirable to disconnect a particular "normal through" circuit for monitoring, or to connect a multicoupler as described in paragraph (4) below.

To clear a "normal through" circuit and substitute a patching circuit, plug an RF patchcord into the appropriate Jack Switch Navy Type CIA-491388 on Jack Panel AN Type J-239/G. This will break the circuit between the antenna and its normally connected receiver (or other equipment as applicable). The end of the patchcord is then inserted into the Jack Box, Navy Type CIA-491729 of the desired antenna circuit. This will, of course, produce a parallel connection on the selected antenna, as plugging into the Jack Box on Jack Panel J-238/G does not interrupt the "normal through" circuit. Should it be found that reception is poor, the supervisor may plug an RF patchcord or dummy plug into the RF Jack Switch on the Jack Panel AN Type J-239/G of the Antenna which has been patched to disconnect the normal antenna connection. When an RF patchcord is removed from an RF Jack Switch Navy Type CIA-491388, the "normal through" connection is automatically restored. See figure 1-10 for the construction and function of this Jack Switch.

Referring to figure 2-20, suppose for example that it is desired to operate receiver "B" from antenna "A". A patchcord is connected from Jack Box "A" to Jack Switch "B". This disconnects antenna "B" from receiver "B" and substitutes antenna "A"; but it does not disconnect receiver "A" from antenna "A". If the effects are objectionable, insert a dummy plug or an RF patchcord into Jack Switch "A" to break the "normal through" circuit. Or, it may also be desirable to operate receiver "A" from antenna "B". An RF patchcord may be connected from Jack Box "B" to Jack Switch "A".

(4) USE OF THE MULTICOUPLER WITH THE SIGNAL DISTRIBUTION UNIT.—One or more Multicouplers may be installed for use in connection with the Signal Distribution Unit (see figure 2-18). A multicoupler is an electronic device which facilitates the operation of up to ten Navy communication receivers on one antenna without interaction between receivers. It presents a constant impedance to the antenna regardless of the number of receivers connected to it, so no mismatch will result from operation of receivers in parallel from the same antenna. Certain antenna of the array may be connected by "normal through" circuits to the Multicoupler rather than to a receiver, or the Multicoupler input jack may be connected to one of the jacks on the Miscellaneous Apparatus Jack Panel AN Type J-237/G, and the desired antenna patched to the Multicoupler. In either case, the outputs of the Multicoupler are suitably connected to jacks on Jack Panel AN Type J-237/G and/or J-239/G. The RF Multicoupler outputs may then be patched from J-237/G to the Jack Switches Navy Type CIA-491388 on Jack Panel AN Type J-239/G of the desired receivers and/or test equipment. For more information on the description and use of the Multicoupler, refer to NavShips 900,213. In figure 2-19 receivers C and D are operating from antenna B through Multicoupler B.

(5) USE OF THE ANTENNA SELECTOR SWITCH.—The RF section of the Signal Distribution System includes an Antenna Selector Switch which may have 20, 40, or 60 positions depending upon the needs of the station, The contacts of this selector switch are connected in parallel with the "normal through" circuits of the antenna array (see figure 2-18). The center contact of this switch should be connected to one of the jack boxes on J-238/G and may also be connected through J-239/G by a "normal through" circuit to the Monitor Receiver included in the Signal Distribution System. Any receiver may thus be connected to the Antenna Selector Switch by patching into the proper jack box on panel J-238/G. The supervisor may tune the Monitor Receiver to the desired frequency and rotate the Antenna Selector Switch and compare the signal strengths of the various antennae for the particular signal which is desired. He may thus determine which antenna should be used to copy a particular schedule. If the Antenna Selector Switch has been properly calibrated, it is possible to obtain the **approximate** bearing of a signal source by comparison of the signal strength of the various antennae. The Antennae Selector Switch is shown in figure 1-8.

(6) MONITOR RECEIVER.—The use of the Monitor Receiver, which is a standard Navy Model RBC receiver, in connection with the Antenna Selector Switch is described in paragraph (5) above. At certain times in a station it may be necessary for the

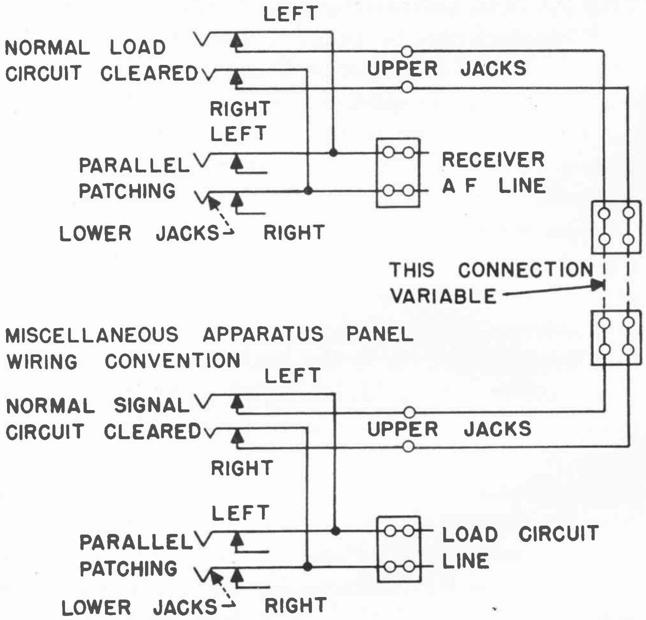


Figure 2-21. Wiring Convention, AF Section

supervisor to analyze a signal on the monitor receiver with the test equipment provided.

(7) FREQUENCY METER.—All sizes of the Signal Distribution Unit include frequency meters which are furnished by BuShips. The frequency meter may be used to measure the frequency of a certain specific signal which is being received on one of the station antennae or any other RF Signal which is within its frequency range.

In the Types A and B Units of the Signal Distribution System, a Frequency Meter Navy Model LR-1 is included (mounting rack AN Type MT-571/G only furnished by contractor). Jack Panel AN Type J-265/G, which is included for connection to the Frequency Meter, has two jacks which connect by short patchcords to similar jacks on the Frequency Meter marked RF OUTPUT. These jacks, in turn, are connected to jacks on Jack Panel J-237/G. To calibrate a receiver, connect an RF patchcord from the appropriate Jack Switch on Jack Panel AN Type J-239/G to the jack on Jack Panel AN Type J-237/G which connects with the RF OUTPUT on the Frequency Meter. For more complete information on the use of the LR-1, refer to LR-1 Instruction Book (unnumbered).

In the Type C Unit of the Signal Distribution System, a Frequency Meter Navy Model LM-15a (modified for rack mounting) is substituted to save space. Jack Panel J-265/G is omitted as the Frequency Meter is close enough to the regular RF jack panels to be patched in directly. On the LM-15a, there is only one jack marked RF COUPLING rather than two jacks. For measuring an incoming frequency, connect an RF patchcord from the RF COUPLING on the LM-15a to the appropriate jack on Jack Panel AN Type J-238/G. To calibrate a receiver, connect an RF patchcord from the RF COUPLING on the LM-15a to the appropriate Jack Switch on Jack Panel AN Type J-239/G.

c. OPERATING PROCEDURE AF SECTION.—The audio section of the Signal Distribution Unit consists of terminal boards and Jack Panels similar to a telephone switchboard connecting the receiver outputs to the desired loads. Provision is made for testing and monitoring.

(1) "NORMAL THROUGH" OPERATION.—As in the RF section, "normal through" circuits are provided so that a receiver may be operated from its normally connected load without patching. The AF section differs in that the "normal through" circuits may be readily altered by flexible leads between the Interconnecting Terminal Boards. "Normal through" operation should be used wherever possible, but it will probably be necessary to depart from normal procedure more often than in the RF section.

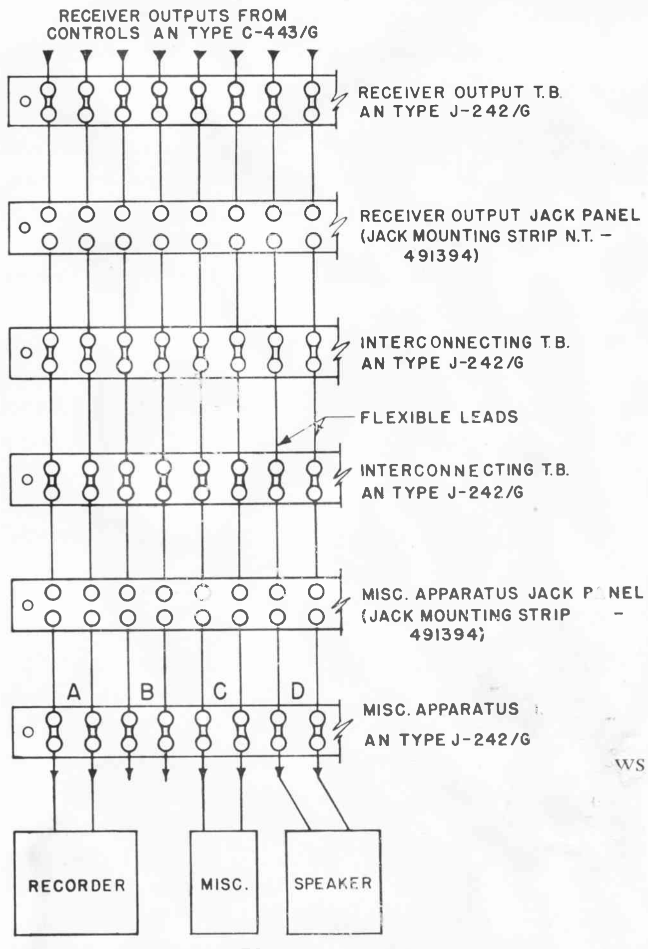


Figure 2-22. "Normal Through" Operation, AF Section

As explained above, "normal through" circuits may be readily altered by maintenance men by moving the flexible leads inside the cabinet between the Interconnecting Terminal Boards AN Type J-242/G. Whenever a circuit is to be in use for any length of time, a "normal through" circuit should be set up and the use of patchcords eliminated as patchcords are susceptible to loose connections and unnecessarily clutter the front of the equipment. The flexible leads consist of twisted pairs fitted with spade lugs on both ends. Connection is made by merely connecting the spade lugs to the screw terminals on the terminal boards.

NOTE

> If the flexible leads have been properly fabricated by the installing activity, one of the spade lugs is clipped on the opposite ends of the lead to indicate polarity. Connect to corresponding terminals so that polarity will not be reversed.

(a) NORMAL THROUGH CIRCUIT ALTERATIONS.—Figure 2-22 shows the ideal "normal through" circuit in which the flexible leads are connected straight through. This is desirable, but if it is found that some other connection will be used for some time, it is desirable for maintenance men to change the "normal through" circuit rather than relying upon patching. For example, as shown in figure 2-23, suppose that it is desirable to exchange the loads of circuits "A" and "C". This exchange may be readily made by maintenance men by exchanging the connection of the flexible leads as shown in figure 2-23.

(2) PATCHING OPERATION.—Figure 2-21 shows the wiring convention for the Receiver Output and Miscellaneous Apparatus Jack Panels. Figure 2-24 shows the operation of the jacks in the Receiver Output and Miscellaneous Apparatus Jack Panels as installed and wired. It can be seen that insertion of a patchcord plug into the bottom jack establishes a parallel connection, while insertion into the top jack interrupts the "normal through" circuit and substitutes another circuit in its place.

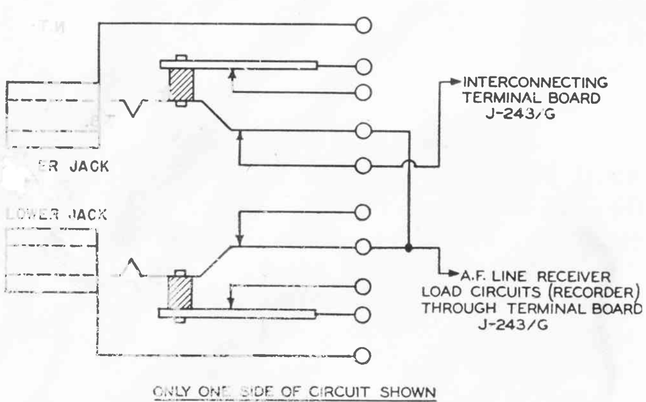


Figure 2-24. Wiring Convention For AF Jack Panels

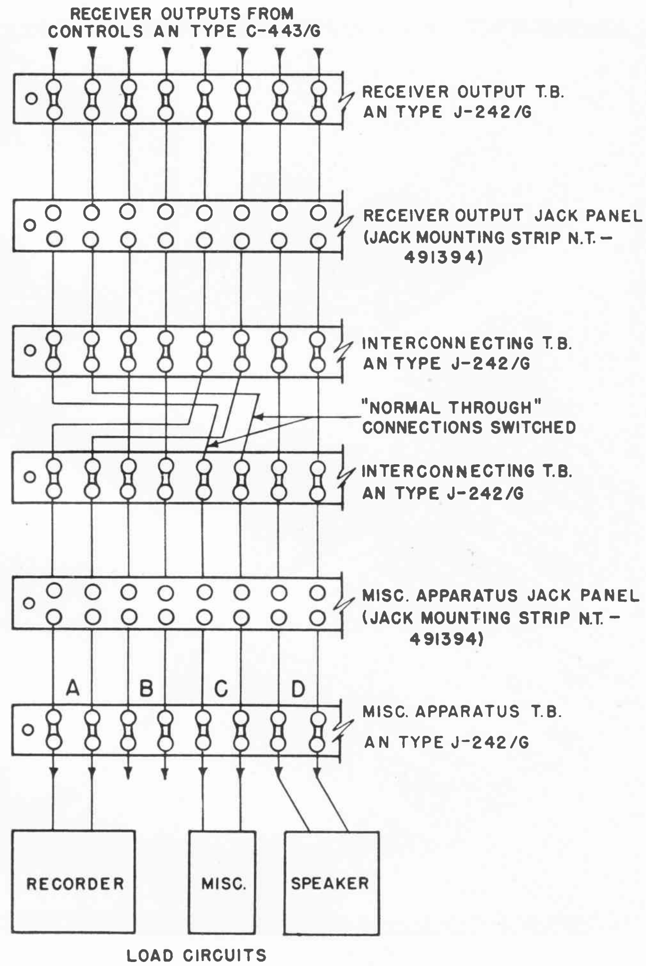


Figure 2-23. Changing "Normal Through" Circuits by Altering Flexible Connections

The audio section is wired so that in all cases the top row of jacks substitutes a new circuit for a "normal through" circuit while the bottom row parallels a circuit to the "normal through" circuit. The twin pronged patchcord is always inserted so that the plane of the prongs **is horizontal** as shown in figure 2-25.

When inserting a patchcord plug, make sure that it is inserted into the proper pair for that circuit and does not split between adjacent pairs. The patchcord plugs have notches cut into them on one side to indicate polarity. Always insert the patchcord so that the notches are to the right.

AF Patchcords Navy Type -491397A which are mounted in special storage panels are provided for normal patching operations. These cords are 3 feet long. Additional patchcords are provided in spares for patching where this length will not reach or if the number provided is insufficient. These are as follows:

Type	Length
-491397	24″
-491397B	48″
-491397C	72″

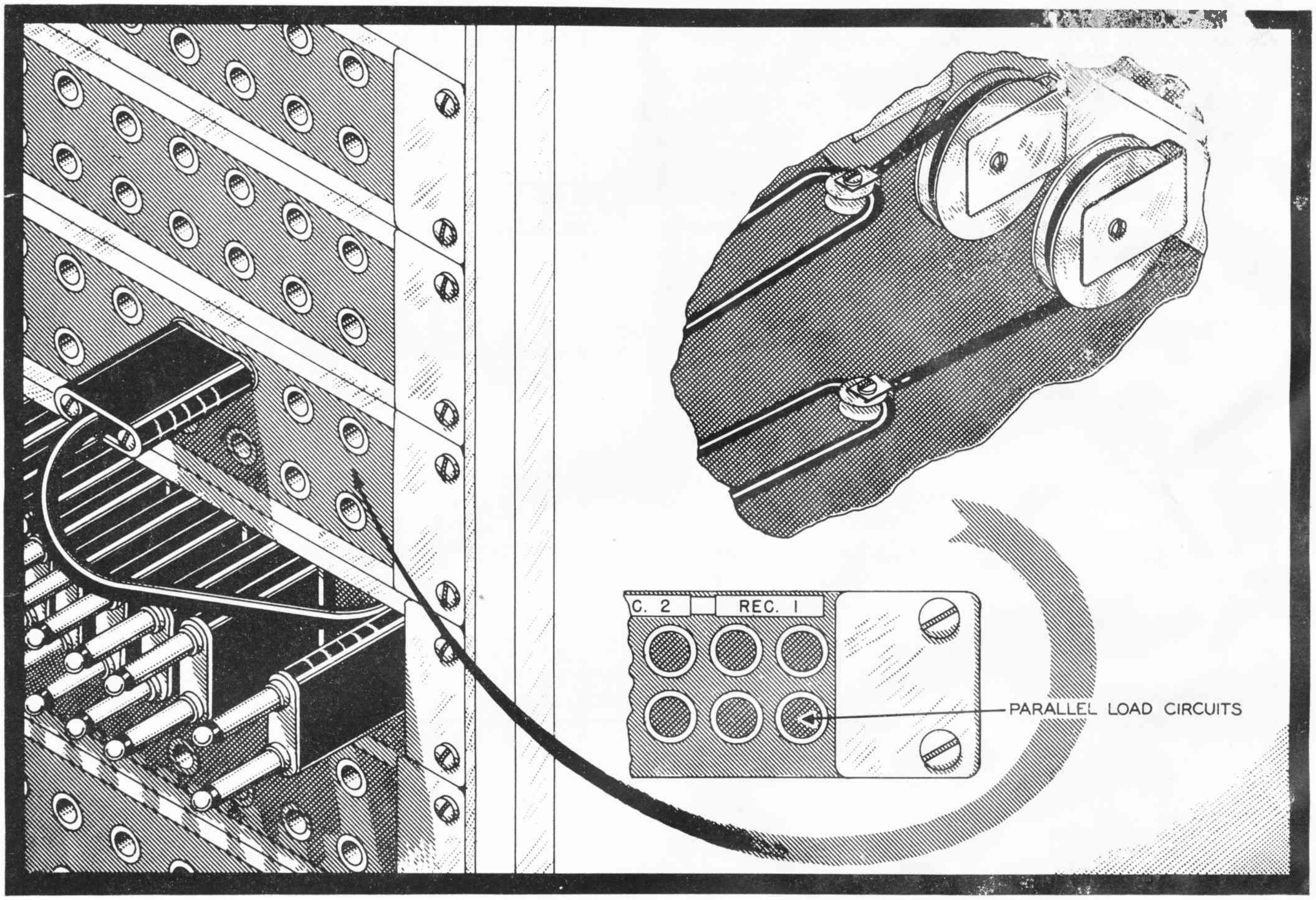


Figure 2-25. Operation of AF Patchcords

(a) PARALLEL PATCHING.—Parallel patching is permissible as the standard Navy receivers are designed to operate with from one to twenty 600 ohm loads with maximum undistorted power of 15 milliwatts. To make a parallel connection from a "normal through" circuit, plug into the bottom row of jacks on the jack panel. A parallel connection may be made from either the Receiver Output Panel or the Miscellaneous Apparatus Panel. If two parallel circuits are desired, a connection may be made from each panel.

(b) LOAD EXCHANGE PATCHING.—The AF section of the Signal Distribution System contains in all cases Jack Mounting Strips Navy Type -491394 half of which are known as Receiver Output Panels and the other half known as Miscellaneous Apparatus Panels. The Panels are identical, but their function differs slightly as shown in the wiring convention (figure 2-21). A few specific cases are explained below. Since the system is very flexible, the operator is able to adapt the components to meet the situation with which he is confronted.

1. SUBSTITUTION OF LOADS.—It is possible to substitute one load for another, at the same time breaking the "normal through" connection in both circuits. If desired, parallel connections may still be made to loads from the lower jacks on both the Miscellaneous Apparatus and the Receiver Output Panels. For example, as shown in figure 2-26, the AF input of circuit "A" is connected into the load of circuit "C". Both normal circuits are broken.

2. TWO AUDIO INPUTS TO ONE LOAD. It may sometimes be desirable to connect two audio inputs into one load as for example when one operator is required to guard two circuits which are normally silent (such as the distress channel). This system is superior to the split headphone.

3. COMBINATION LOAD EXCHANGE AND PARALLEL PATCHING.—Figure 2-27 shows the patchcords used to obtain more than one parallel circuit in addition to the "normal through" circuits. The patchcord is inserted into the bottom jack of circuit "A" on the Receiver Output Panel so that the AF input still connects to its normal load. Plugging into the upper jack on the Miscellaneous Apparatus Panel breaks the "normal through" circuit "D" and substitutes the input of "A" to the speaker. If it is desired

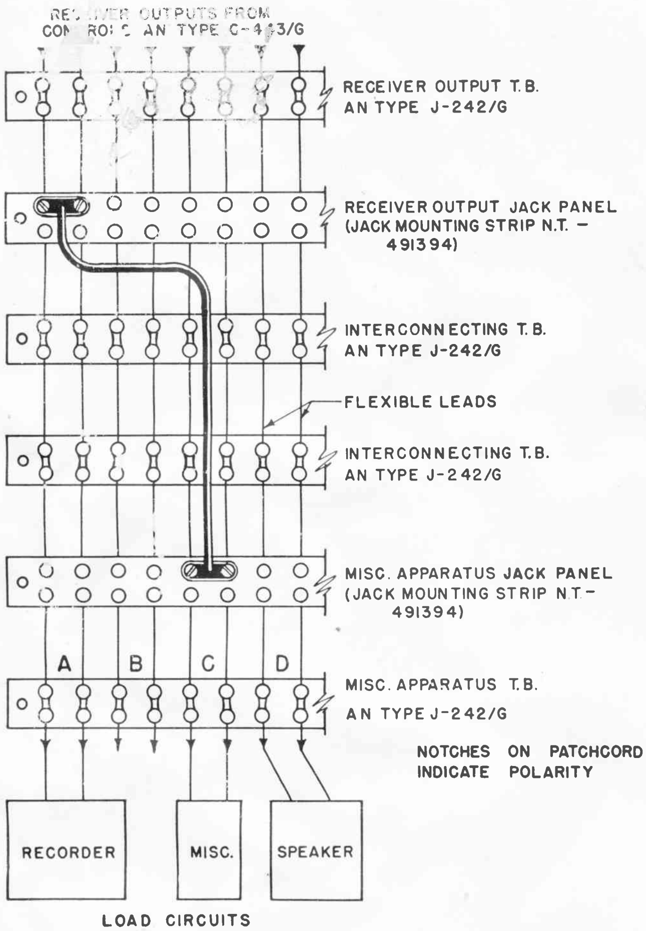


Figure 2-26. Substitution of Load Circuit C to AF Circuit A

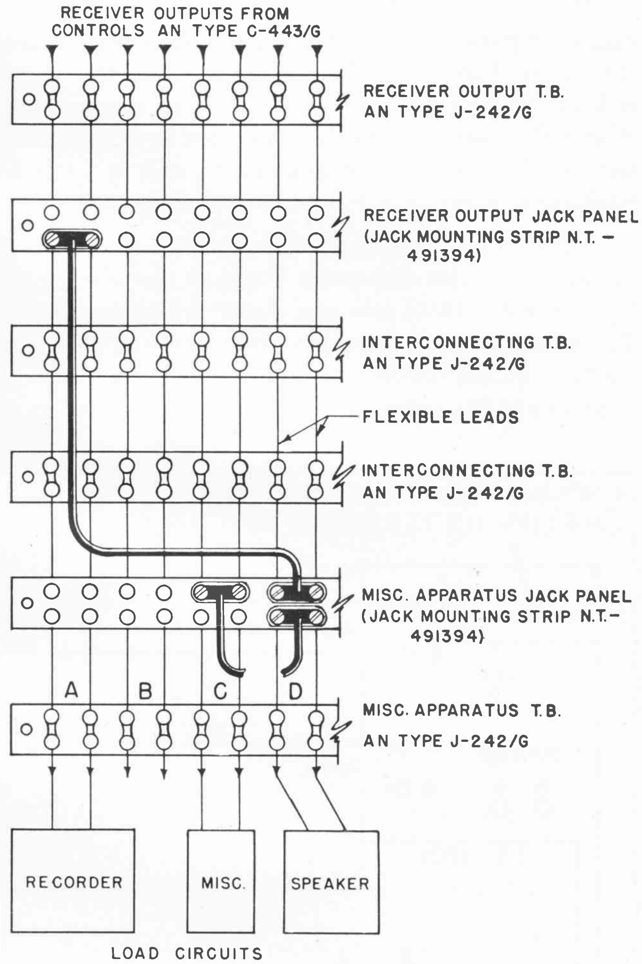
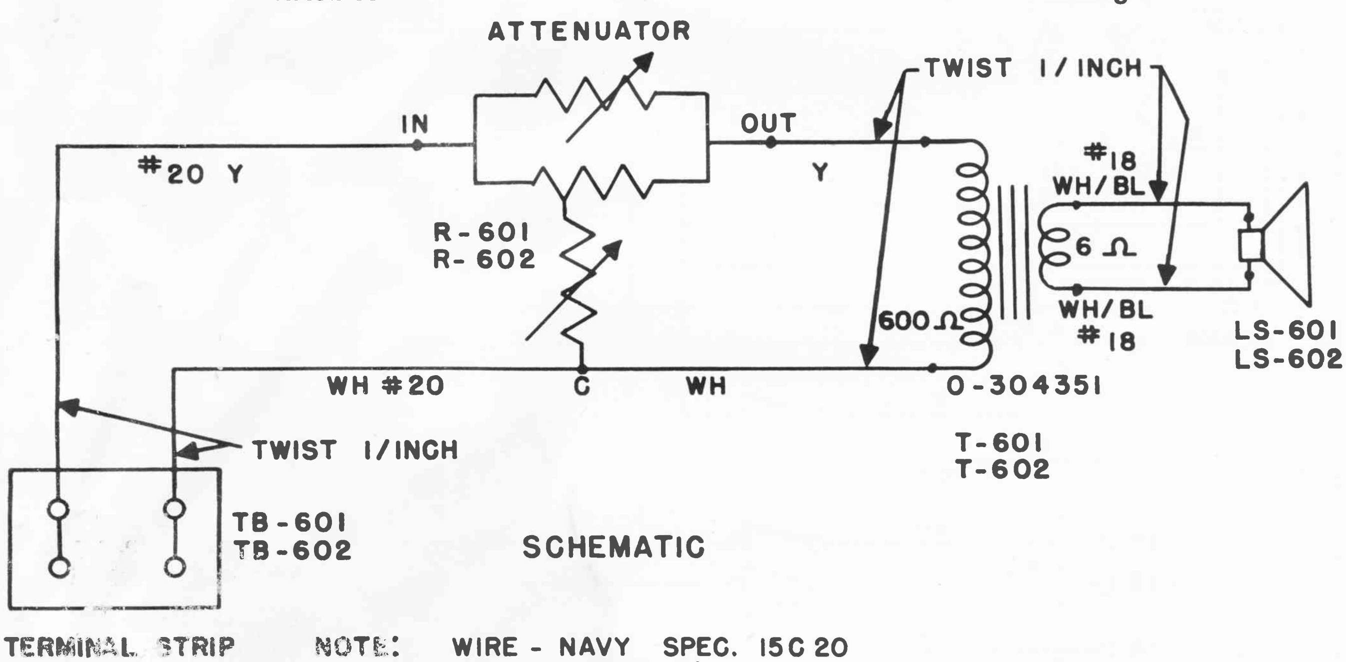


Figure 2-27. Combination Load Exchange and Parallel Patching



NOTE: WIRE - NAVY SPEC. 15C20
TYPE SRIR - 3/5 (7) 20 - 4 #20 AWG. STR. - Y
TYPE SRIR - 3/5 (7) 20 - 6 #20 AWG. STR. - B
TYPE SRIR - 3/5 (7) 20 - 9 #20 AWG. STR. - W

Figure 2-28. Speaker Assembly AN Type LS-139/G, Schematic further to parallel the load of circuit "C" with "A" and "D", a patchcord may be connected from the lower jack of "D" to the upper jack of "C" as shown. Another patchcord may also be connected from the lower jack of "C" to the upper jack of "B", and so forth, to establish as many parallel circuits as are desired.

d. SPEAKER PANEL.—The speakers are wired to the Miscellaneous Apparatus Panel so that the operator may patch them into any circuit which he desires. The speakers will be used most commonly as the audio output load for the monitor receiver. It may also be used on a utility circuit such as intercommunication or broadcast. Figure 2-28 is the schematic for the speaker circuit.

e. CONTROL AN TYPE C-443/G.—The Control AN Type C-443/G mounts on the operator's desk as explained in paragraph 1, *b* [illegible] of this section. A front view of the control is shown in figure 1-1[illegible].

The chief use of the control is to provide a point from which an operator may guard either of two receivers or both at once. The bat handle switches allow the operator to disconnect the receivers from a remote load circuit. The following lists a few cases which will illustrate its use.

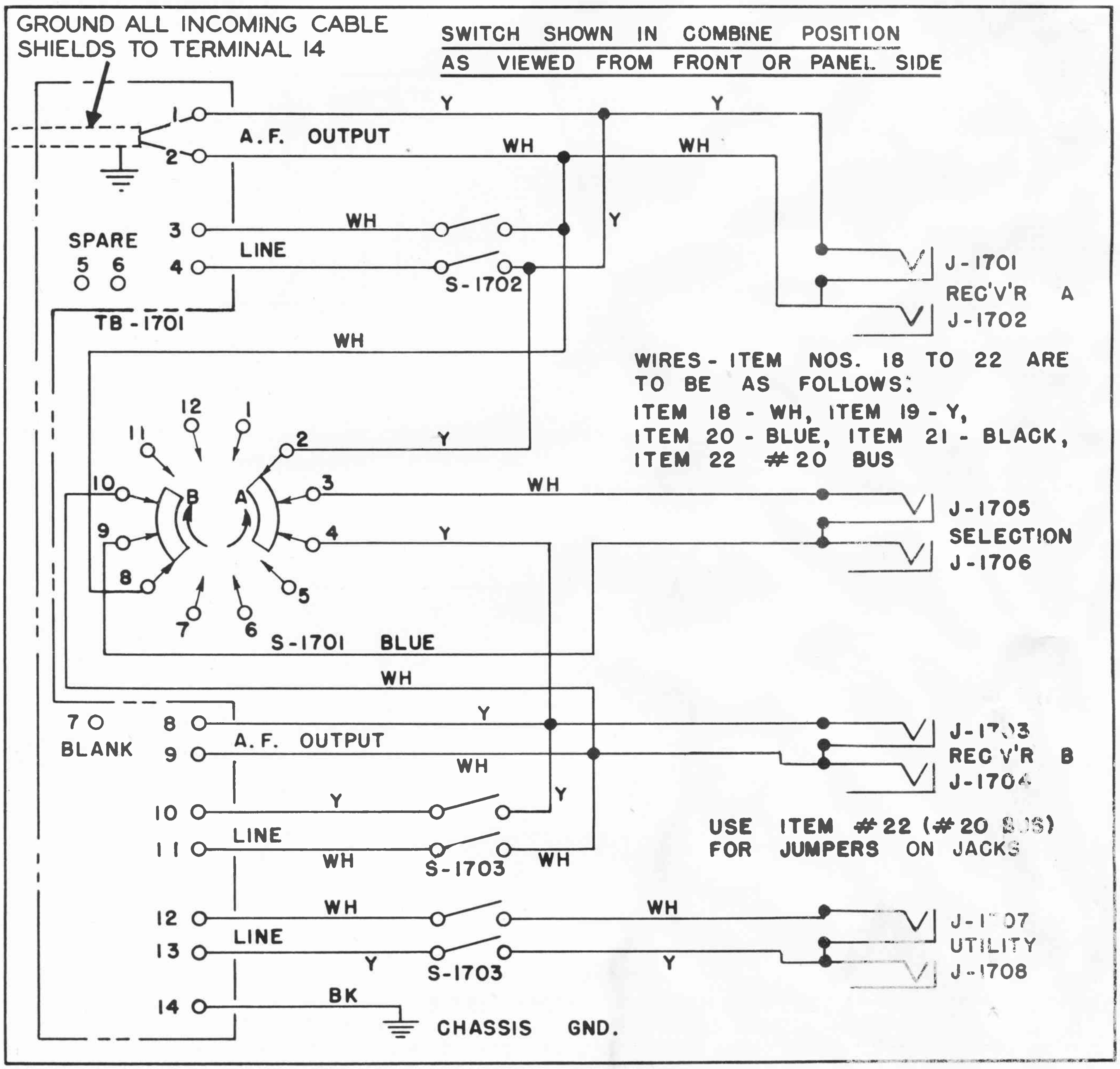


Figure 2-29. Control AN Type C-443/G, Schematic

(1) OPERATOR DESIRES TO GUARD ONE RECEIVER.—Plug a pair of 600 ohm phones into the appropriate jack (A or B). This connects the phones in parallel with the "normal through" connection. If desired, throw the appropriate toggle switch to off to break the "normal through" connection to the receiver load. The selector switch must not be on COMBINE or interaction will occur.

(2) OPERATOR DESIRES TO GUARD BOTH RECEIVERS.—Plug a 600 ohm phone into the jack marked SEL and throw the selector to COMBINE.

NOTE

When the switch is on COMBINE interaction between the receivers will occur. Both receiver outputs will be impressed upon both normal loads as well as the headphones.

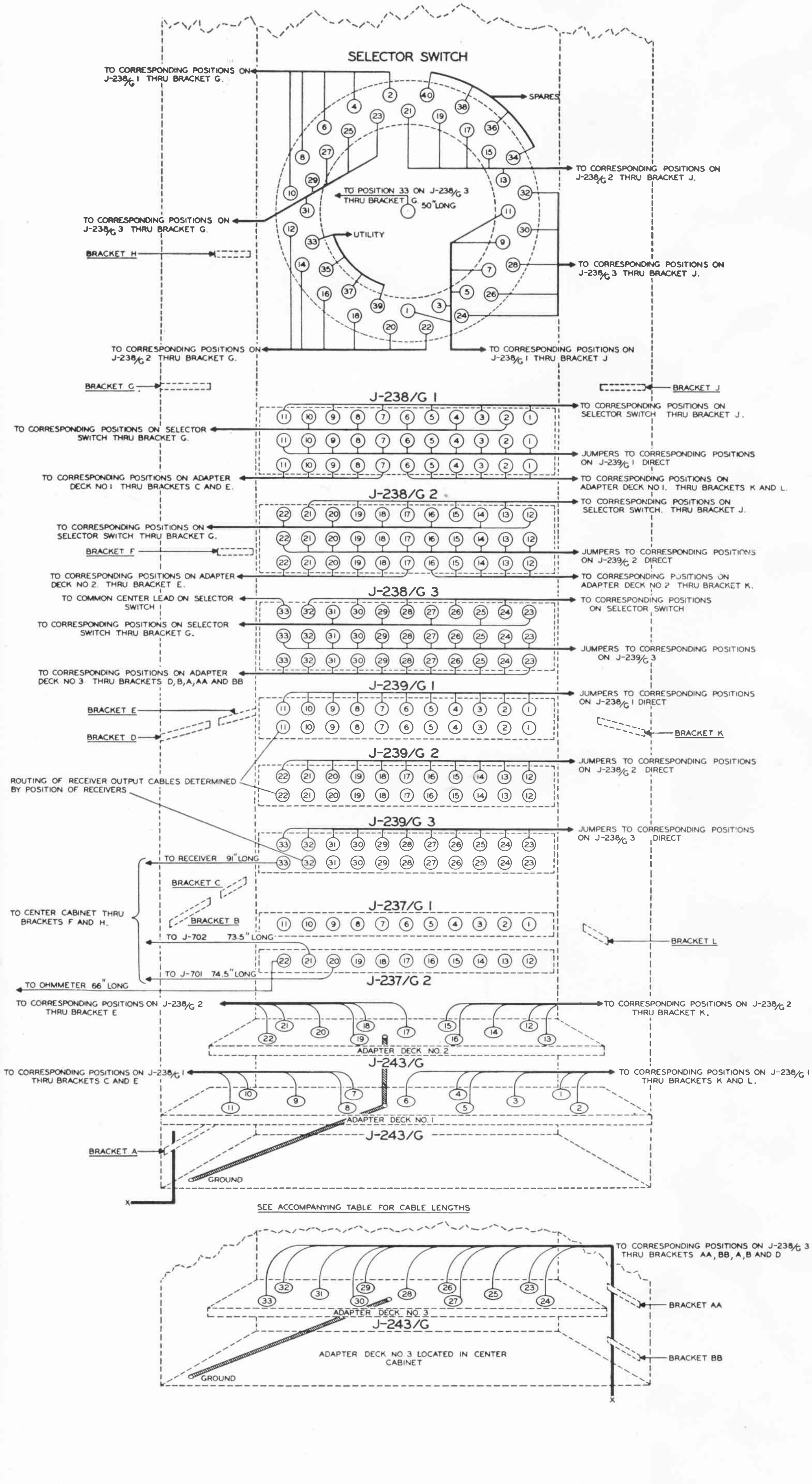
With the phones plugged into the SEL jack, the operator may select receiver A, receiver B, or both together. This eliminates the split headphone formerly used for this purpose. This allows the operator to guard two circuits at once or to select the particular circuit on which he wishes to copy.

(3) UTILITY.—The utility line is effectively a complete spare circuit included to meet the needs of individual stations. It is provided for use with recorders and other similar equipment that may be employed at a receiving position requiring an AF line.

f. TEST EQUIPMENT.—Electronic components are included in the equipment for testing and maintenance. Their use is explained in the applicable instruction books listed in Tables 1-4, 1-5, and 1-6.

TABLE 2-1. TOOLS REQUIRED FOR INSTALLATION

NUMBER	NAME	MFG. OR NAVY TYPE	DESCRIPTION	USE
1	"Wedge-on" Pliers	Thomas & Betts #21000	Special Type	Installation of Thomas & Betts Grounding Ferrules #200-30006
1	Crimping Tool	Navy Type #10669	Consists of two halves machined with appropriate slots for crimping	Crimping Ferrule #10670 to RG-12/U cable
1	Vise		Any which will open more than 3″	Required for operation of crimping tool #10669
1	Soldering Iron		Right angle, 100 watt	Required for fabrication of cables
1	Soldering Iron		Straight, 500 watt	
3	Screwdrivers		Assorted sizes	
1	Long-nose pliers			
1	Diagonal pliers			
1	Drill		Hand or electric taking up to 2″ bit	Drilling mounting and entrance holes
1	Set assorted bits		0.15″ to 2.0″	Drilling mounting and entrance holes
1	Drill, tap		#21 (0.1590″)	Tapping holes for #10/32 screws
1	Tap		#10/32 thread	
1	Wrench		Open end or Stilson for 3″ nut.	Tightening Connector-Adapter on RG-85/U cable
1	Wrench		Open end or Stilson for 2 3/8″ nut.	
1	Pair armor bending clamps	See item H-148 of parts list	Clamp halves	For assembly of Connector-Adapter Navy Type -491652 to RG-85/U cable
1	Hacksaw			Assembly of RF cables



SELECTOR SWITCH CABLES	
CABLE NO.	LENGTH IN INCHES*
1	39
2	53
3	41
4	50
5	45
6	46
7	49
8	43
9	52
10	40
11	54
12	60
13	46
14	57
15	48
16	54
17	52
18	50
19	56
20	47
21	59
22	44
23	65
24	51
25	62
26	54
27	58
28	57
29	55
30	61
31	52
32	64

JUMPER CABLES ARE 32″

Figure 2-30. RF Ca

'OR SWITCH BLES
LENGTH IN INCHES*
39
53
41
50
45
46
49
43
52
40
54
60
46
57
48
54
52
50
56
47
59
44
65
51
62
54
58
57
55
61
52
64

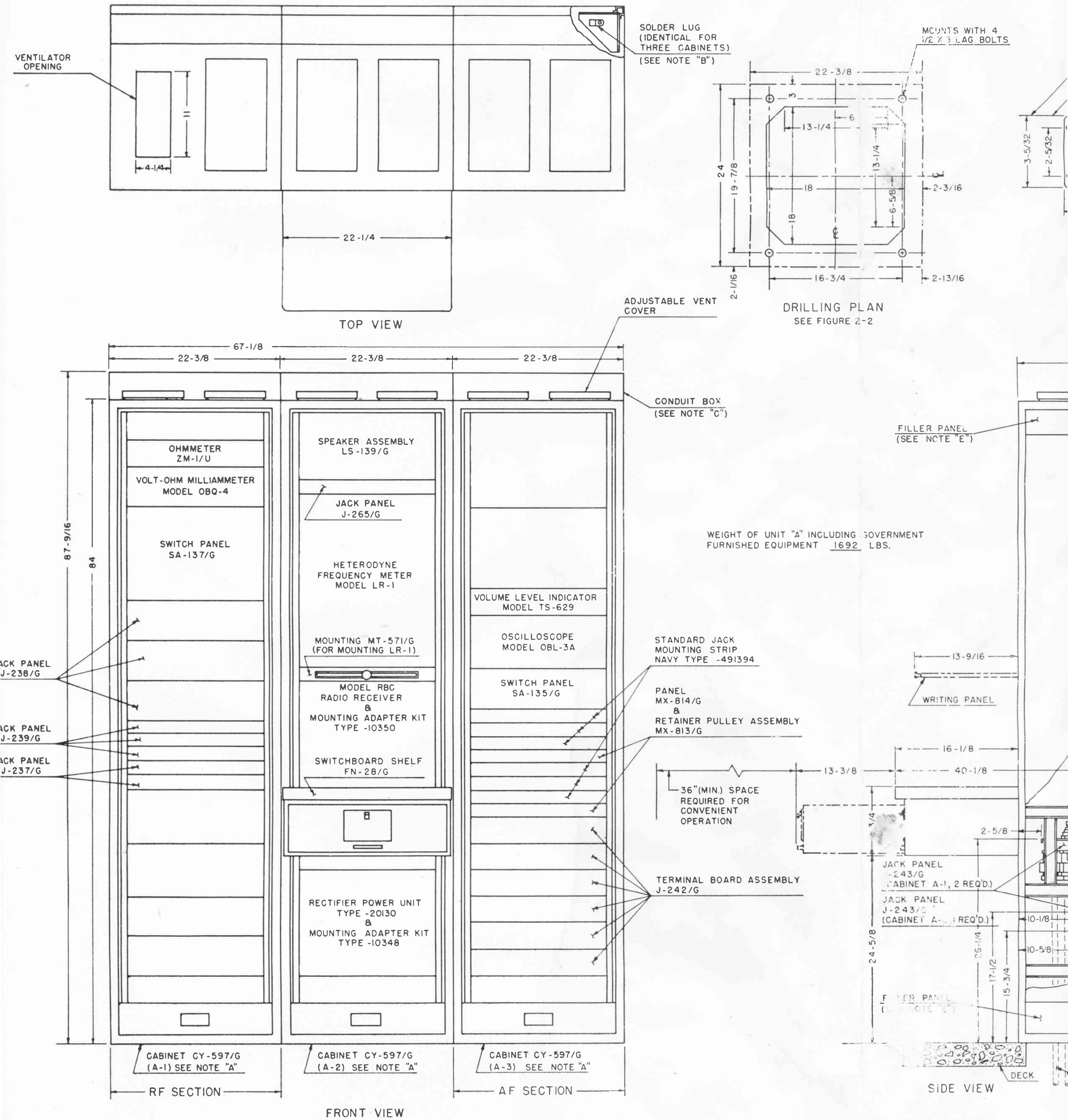
ADAPTER CABLES	
CABLE NO.	LENGTH IN INCHES*
1	43
2	46
3	48
4	50
5	54
6	55
7	51
8	53
9	48
10	43
11	46
12	29
13	30
14	33
15	37
16	39
17	43
18	39
19	38
20	33
21	29
22	29
23	94
24	94
25	93
26	96
27	96
28	96
29	96
30	97
31	98
32	98
33	101

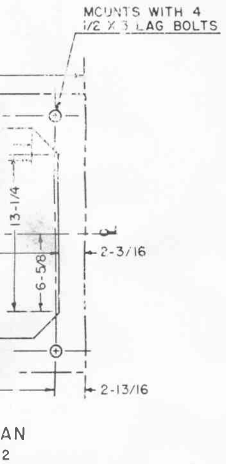
DISREGARD THIS TABLE WHEN CONNECTOR-ADAPTERS NAVY TYPE CIA-491652 ARE INSTALLED OUTSIDE THE CABINET.

*LENGTH GIVEN INCLUDES 4" ALLOWANCE FOR FABRICATION

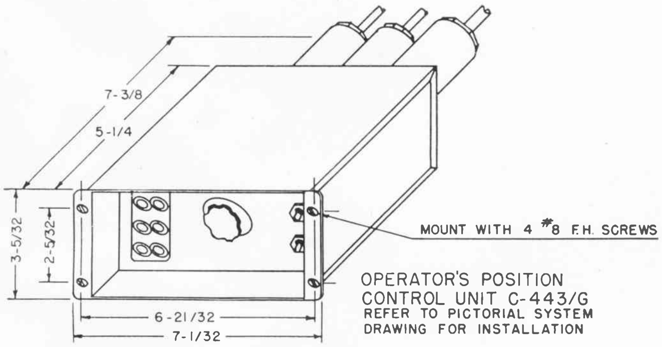
MPER CABLES ARE 32" LONG EACH

Figure 2-30. RF Cabinets, Internal Wiring Diagram, Type A


VENTILATOR OPENING
SOLDER LUG (IDENTICAL FOR THREE CABINETS) (SEE NOTE "B")
11
4-1/4
22-1/4
TOP VIEW
MOUNTS WITH 4 1/2 X 3 LAG BOLTS
22-3/8
24
19-7/8
13-1/4
6
3
18
6-5/8
2-3/16
16-3/4
2-13/16
2-1/16
DRILLING PLAN
SEE FIGURE 2-2
ADJUSTABLE VENT COVER
67-1/8
22-3/8
22-3/8
22-3/8
CONDUIT BOX (SEE NOTE "C")
87-9/16
84
OHMMETER ZM-1/U
VOLT-OHM MILLIAMMETER MODEL OBQ-4
SWITCH PANEL SA-137/G
SPEAKER ASSEMBLY LS-139/G
JACK PANEL J-265/G
HETERODYNE FREQUENCY METER MODEL LR-1
MOUNTING MT-571/G (FOR MOUNTING LR-1)
MODEL RBC RADIO RECEIVER & MOUNTING ADAPTER KIT TYPE -10350
SWITCHBOARD SHELF FN-28/G
RECTIFIER POWER UNIT TYPE -20130 & MOUNTING ADAPTER KIT TYPE -10348
VOLUME LEVEL INDICATOR MODEL TS-629
OSCILLOSCOPE MODEL OBL-3A
SWITCH PANEL SA-135/G
JACK PANEL J-238/G
JACK PANEL J-239/G
JACK PANEL J-237/G
WEIGHT OF UNIT "A" INCLUDING GOVERNMENT FURNISHED EQUIPMENT 1692 LBS.
STANDARD JACK MOUNTING STRIP NAVY TYPE -491394
PANEL MX-814/G & RETAINER PULLEY ASSEMBLY MX-813/G
TERMINAL BOARD ASSEMBLY J-242/G
36"(MIN.) SPACE REQUIRED FOR CONVENIENT OPERATION
13-3/8
16-1/8
40-1/8
13-9/16
WRITING PANEL
FILLER PANEL (SEE NOTE "E")
2-5/8
JACK PANEL J-243/G (CABINET A-1, 2 REQ'D.)
10-1/8
10-5/8
24-5/8
26-1/4
17-1/2
15-3/4
DECK
SIDE VIEW
CABINET CY-597/G (A-1) SEE NOTE "A"
CABINET CY-597/G (A-2) SEE NOTE "A"
CABINET CY-597/G (A-3) SEE NOTE "A"
RF SECTION
AF SECTION
FRONT VIEW



AN
2



WEIGHT * CRATED	WEIGHT * UNCRATED	CABINET	CUBIC CONTENTS CRATED
576#	362#	A-1	45 CU FT
518#	304#	A-2	45 CU FT
583#	370#	A-3	45 CU FT
274#	MISC. BOX		13 CU FT

* SEE NOTE "G"

NOTE "A" A-1, A-2, A-3 USED ONLY TO IDENTIFY INDIVIDUAL CABINETS

NOTE "B" PROVIDED ON BOTTOM CORNER GUSSET FOR GROUNDING CABINET. INSTALLATION ACTIVITY TO MAKE SUITABLE CONNECTION TO EARTH GROUND

NOTE "C" PROVIDED FOR ENTRANCE OF CABLE INTO UNIT FROM TOP OF CABINETS WHEN REQUIRED

NOTE "D" PROVIDED FOR GROUNDING JACK PANEL. INSTALLATION ACTIVITY TO MAKE SUITABLE CONNECTION.

NOTE "E" REMOVABLE FOR ALTERNATE CABLE ENTRANCE. FILLER PANELS BETWEEN INDIVIDUAL CABINETS CAN BE REMOVED FOR ACCESSIBILITY.

NOTE "F" JACK PANEL J-243/G MAY BE INSTALLED EXTERNAL TO THE CABINETS AT SOME ACTIVITIES BY SPECIAL BUSHIPS AUTHORITY

NOTE "G" WEIGHTS OF CABINETS A-1, A-2, & A-3 DO NOT INCLUDE JACK PANELS J-243/G & ITEMS IN THE MISCELLANEOUS BOX

GOVERNMENT
LBS.

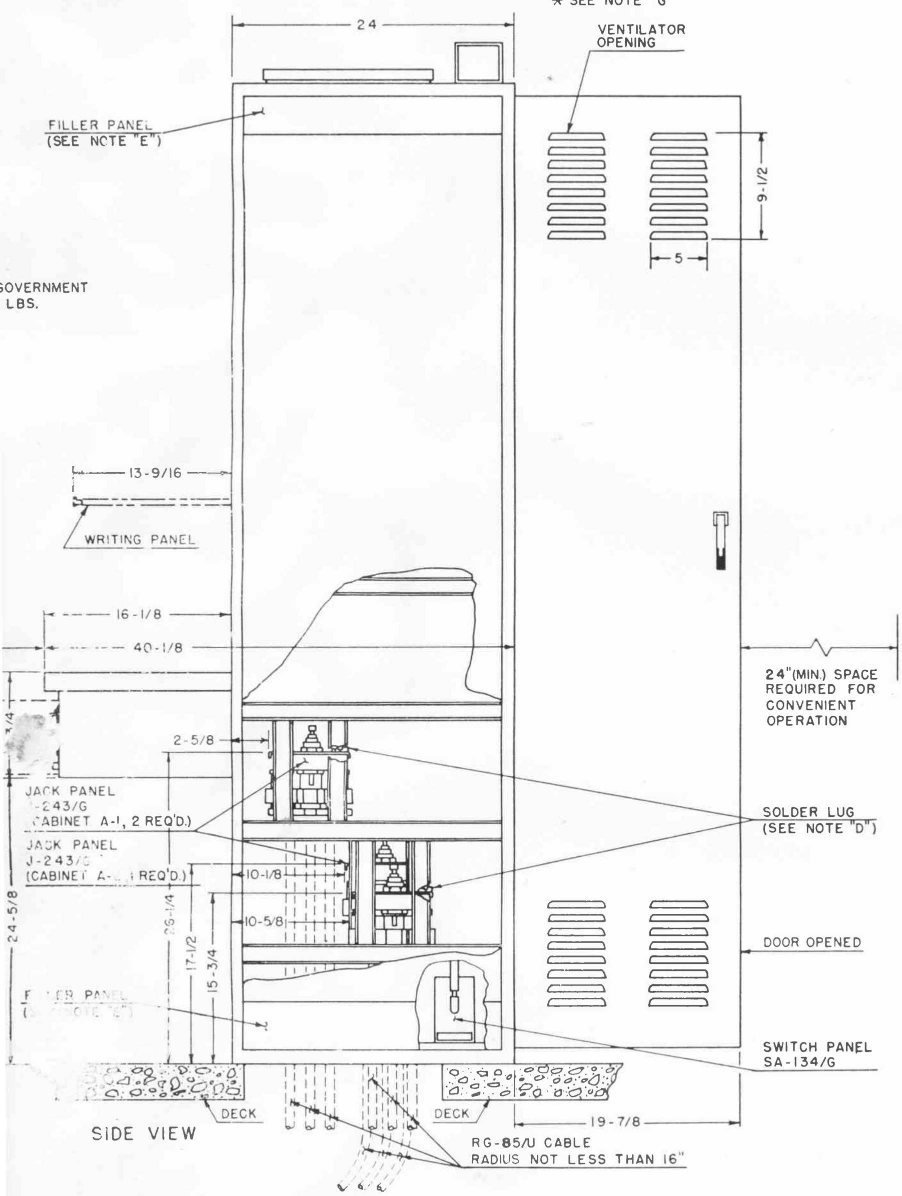
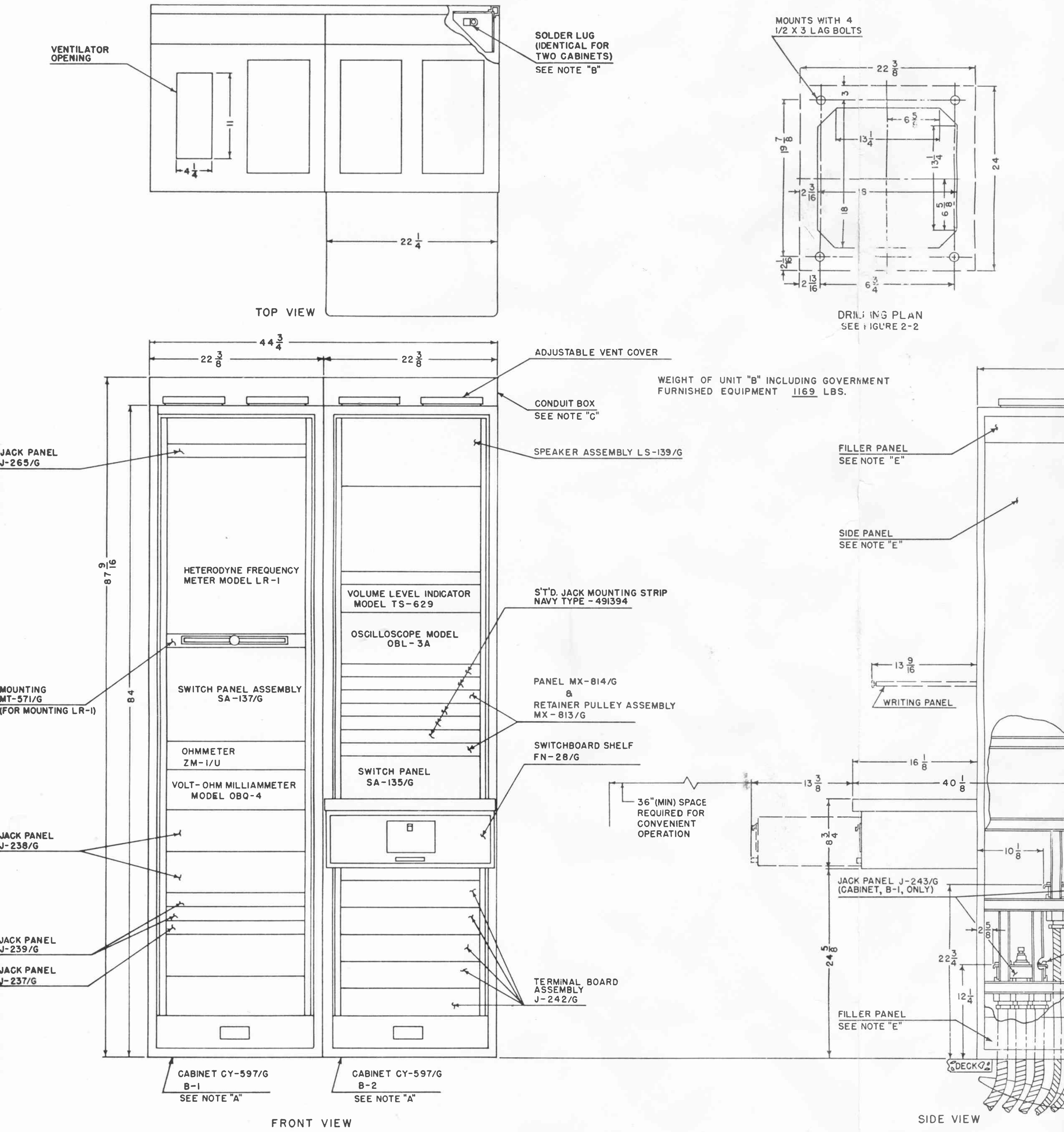
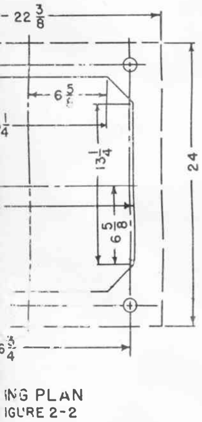
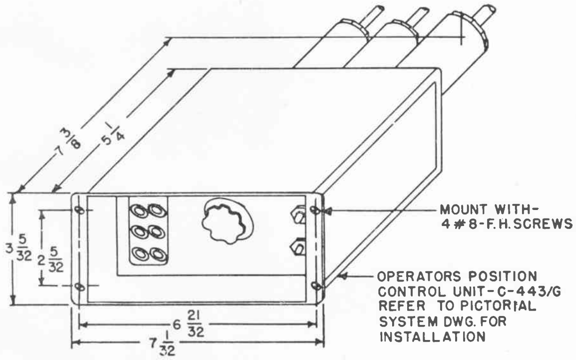


Figure 2-31. Type A, Outline Dimensions


VENTILATOR OPENING
SOLDER LUG (IDENTICAL FOR TWO CABINETS)
SEE NOTE "B"
11
4 1/4
22 1/4
TOP VIEW
MOUNTS WITH 4 1/2 X 3 LAG BOLTS
22 3/8
3
6 5/8
13 1/4
19 7/8
13 1/4
24
2 3/16
18
18
6 5/8
2 1/16
2 13/16
6 3/4
DRILLING PLAN
SEE FIGURE 2-2
44 3/4
22 3/8
22 3/8
ADJUSTABLE VENT COVER
WEIGHT OF UNIT "B" INCLUDING GOVERNMENT FURNISHED EQUIPMENT 1169 LBS.
CONDUIT BOX
SEE NOTE "C"
JACK PANEL J-265/G
SPEAKER ASSEMBLY LS-139/G
FILLER PANEL
SEE NOTE "E"
SIDE PANEL
SEE NOTE "E"
87 9/16
HETERODYNE FREQUENCY METER MODEL LR-1
VOLUME LEVEL INDICATOR MODEL TS-629
S'T'D. JACK MOUNTING STRIP NAVY TYPE - 491394
OSCILLOSCOPE MODEL OBL-3A
13 9/16
MOUNTING MT-571/G (FOR MOUNTING LR-1)
84
SWITCH PANEL ASSEMBLY SA-137/G
PANEL MX-814/G & RETAINER PULLEY ASSEMBLY MX-813/G
WRITING PANEL
OHMMETER ZM-1/U
SWITCHBOARD SHELF FN-28/G
16 1/8
VOLT-OHM MILLIAMMETER MODEL OBQ-4
SWITCH PANEL SA-135/G
13 3/8
40 1/8
36"(MIN) SPACE REQUIRED FOR CONVENIENT OPERATION
8 3/4
10 1/8
JACK PANEL J-238/G
JACK PANEL J-243/G (CABINET, B-1, ONLY)
2 5/8
JACK PANEL J-239/G
24 5/8
22 3/4
JACK PANEL J-237/G
TERMINAL BOARD ASSEMBLY J-242/G
12 1/4
FILLER PANEL
SEE NOTE "E"
DECK
CABINET CY-597/G
B-1
SEE NOTE "A"
CABINET CY-597/G
B-2
SEE NOTE "A"
FRONT VIEW
SIDE VIEW





WEIGHT *		CABINET	CUBIC CONTENTS CRATED
CRATED	UNCRATED		
365#	578#	B-1	45 CU. FT.
356#	570#	B-2	45 CU. FT.
229#	MISC. BOX		10 CU. FT.

* SEE NOTE "G"

NOTE "A" - B-1 & B-2 USED ONLY TO IDENTIFY INDIVIDUAL CABINET.

NOTE "B" - PROVIDED ON BOTTOM CORNER GUSSET FOR GROUNDING CABINET. INSTALLATION ACTIVITY TO MAKE SUITABLE CONNECTION.

NOTE "C" - PROVIDED FOR ENTRANCE OF CABLE INTO UNIT.

NOTE "D" - PROVIDED FOR GROUNDING JACK PANEL. INSTALLATION ACTIVITY TO MAKE SUITABLE CONNECTION.

NOTE "E" - REMOVABLE FOR ALTERNATE CABLE ENTRANCE. SIDE PANEL & FILLER PANEL BETWEEN INDIVIDUAL CABINETS CAN BE REMOVED FOR ACCESSIBILITY.

NOTE "F" - JACK PANEL J-243/G MAY BE INSTALLED EXTERNAL TO THE CABINETS AT SOME ACTIVITIES BY SPECIAL BUSHIPS AUTHORITY.

NOTE "G" - WEIGHTS OF CABINETS B-1 & B-2 DO NOT INCLUDE JACK PANELS J-243/G & ITEMS IN THE MISCELLANEOUS BOX.

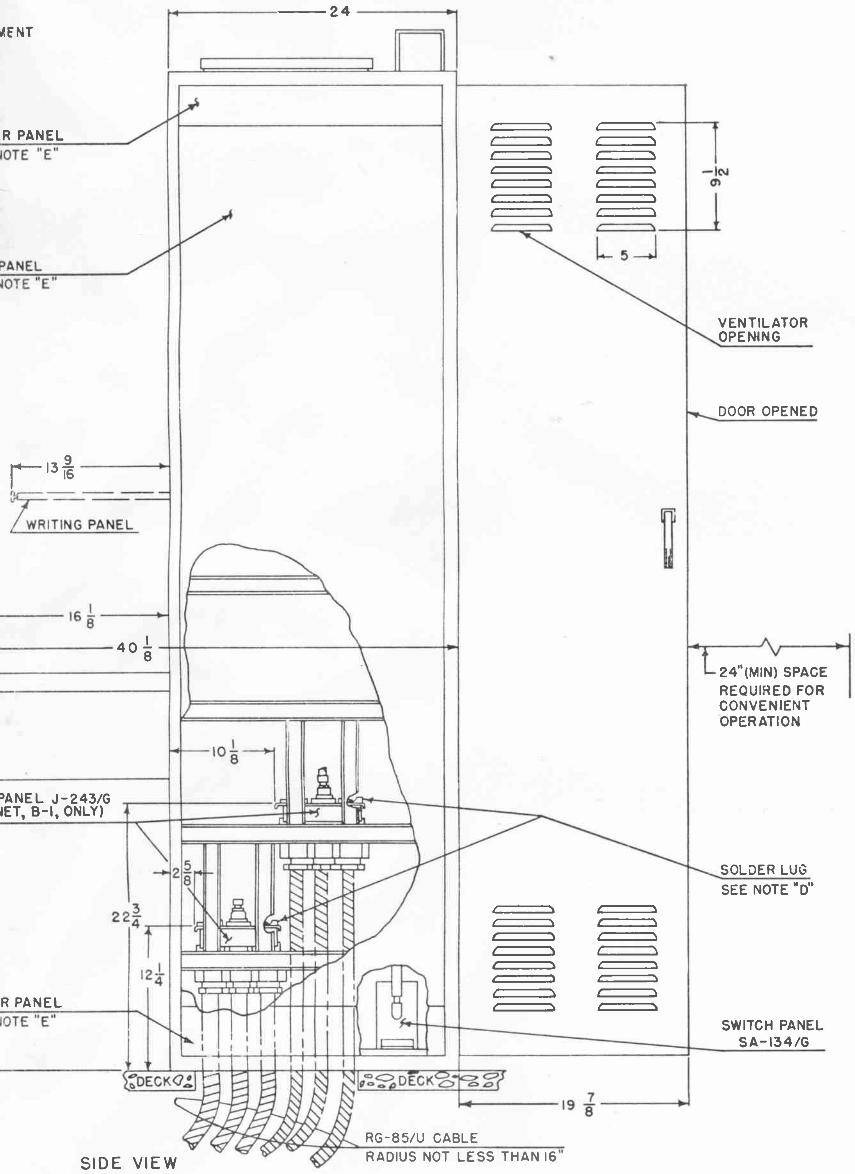
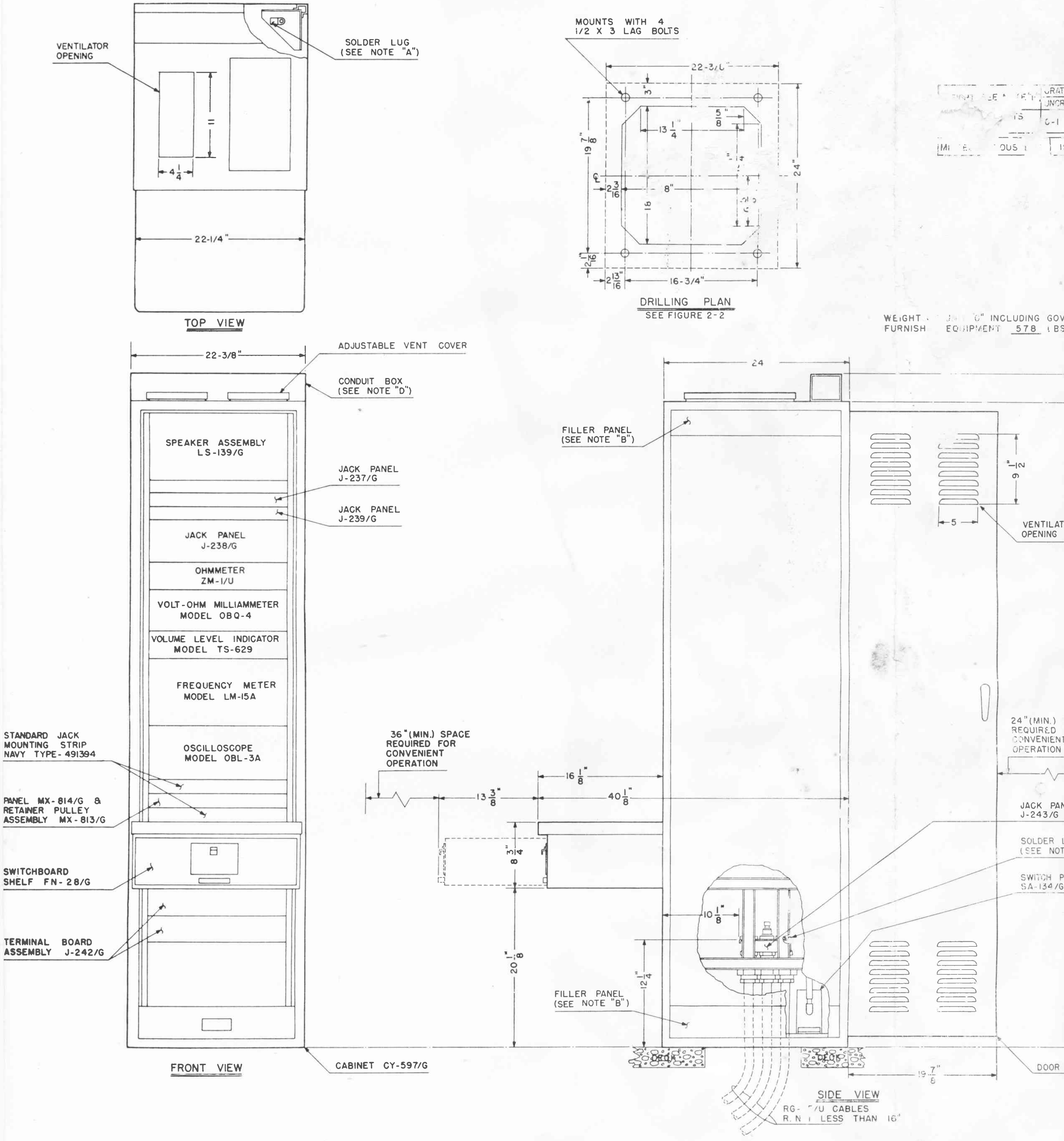
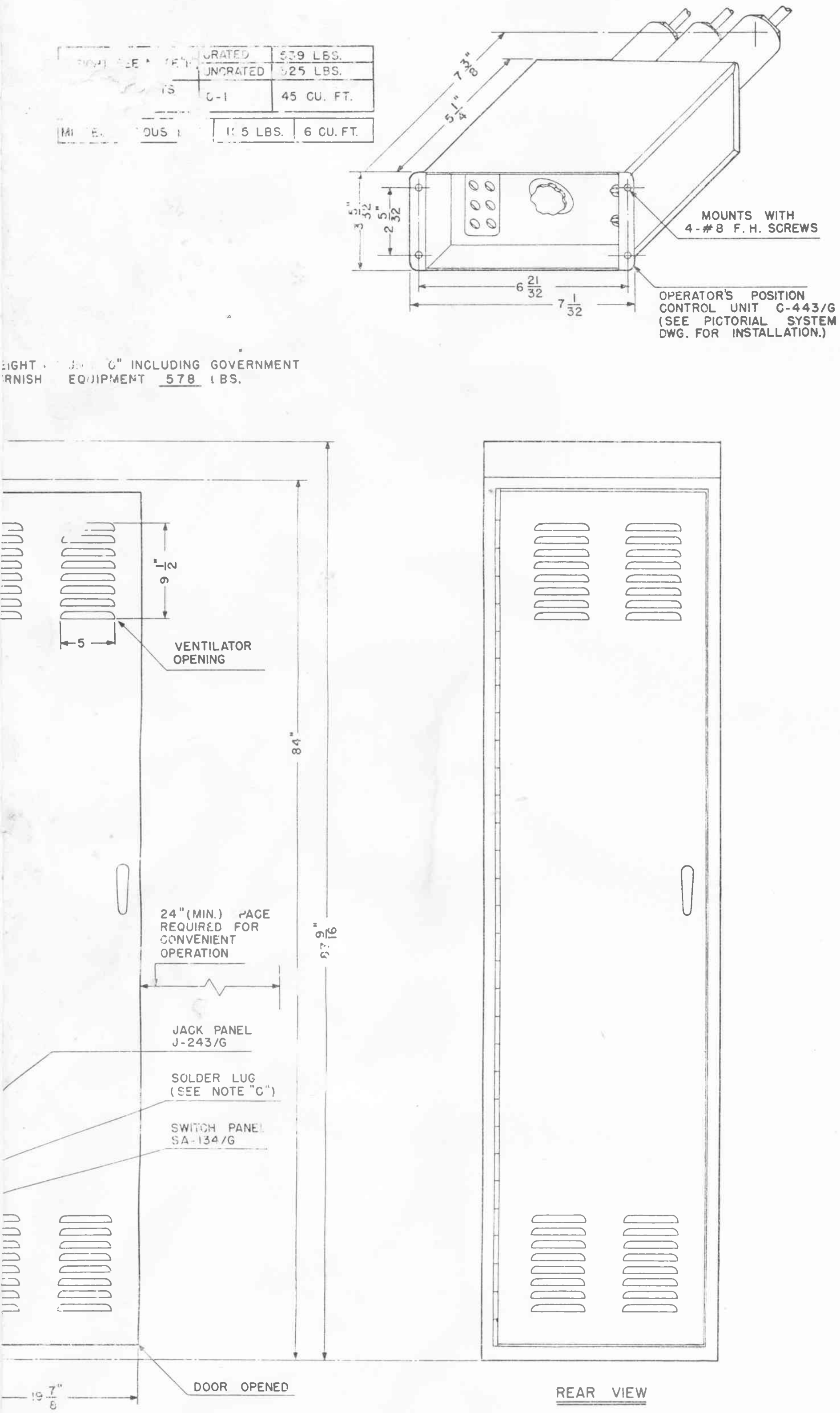


Figure 2-32. Type B, Outline Dimensions


VENTILATOR OPENING
SOLDER LUG (SEE NOTE "A")
11
4 1/4
22-1/4"
TOP VIEW
MOUNTS WITH 4 1/2 X 3 LAG BOLTS
22-3/8"
3"
5/8"
13 1/4
19 7/8
24"
2 3/16
8"
18
2 1/16
2 13/16
16-3/4"
DRILLING PLAN
SEE FIGURE 2-2
22-3/8"
ADJUSTABLE VENT COVER
CONDUIT BOX (SEE NOTE "D")
SPEAKER ASSEMBLY LS-139/G
JACK PANEL J-237/G
JACK PANEL J-239/G
JACK PANEL J-238/G
OHMMETER ZM-1/U
VOLT-OHM MILLIAMMETER MODEL OBQ-4
VOLUME LEVEL INDICATOR MODEL TS-629
FREQUENCY METER MODEL LM-15A
OSCILLOSCOPE MODEL OBL-3A
STANDARD JACK MOUNTING STRIP NAVY TYPE-491394
PANEL MX-814/G & RETAINER PULLEY ASSEMBLY MX-813/G
SWITCHBOARD SHELF FN-28/G
TERMINAL BOARD ASSEMBLY J-242/G
FRONT VIEW
CABINET CY-597/G
36"(MIN.) SPACE REQUIRED FOR CONVENIENT OPERATION
13 3/8"
16 1/8"
40 1/8"
8 3/4"
10 1/8"
20 1/8"
12 1/4"
24
FILLER PANEL (SEE NOTE "B")
FILLER PANEL (SEE NOTE "B")
9 1/2"
5
VENTILAT OPENING
24"(MIN.) REQUIRED CONVENIENT OPERATION
JACK PAN J-243/G
SOLDER L (SEE NOT
SWITCH P SA-134/G
DECK
DECK
19 7/8"
DOOR
SIDE VIEW
RG- /U CABLES R. N LESS THAN 16"
WEIGHT INCLUDING GOV FURNISH EQUIPMENT 578 LBS



NOTE "A"- PROVIDED FOR GROUNDING CABINET INSTALLATION ACTIVITY TO MAKE SUITABLE CONNECTION.

NOTE "B"- FILLER PANELS CAN BE REMOVED FOR ALTERNATE CABLE ENTRANCE.

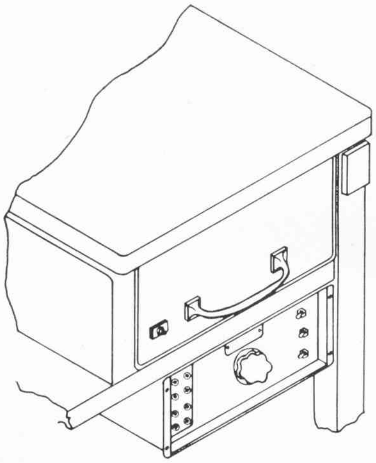
NOTE "C"- PROVIDED FOR GROUNDING JACK PANEL. INSTALLATION ACTIVITY TO MAKE SUITABLE CONNECTION.

NOTE "D"- PROVIDED FOR ENTRANCE OF CABLES INTO UNIT.

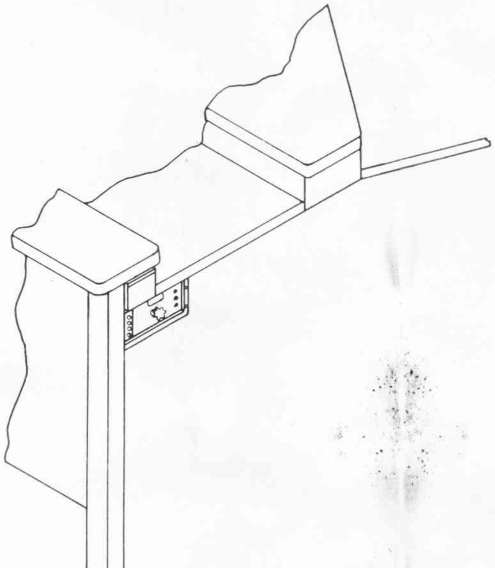
NOTE "E"- JACK PANEL J-243/G MAY BE INSTALLED EXTERNAL TO CABINET AT SOME ACTIVITIES BY SPECIAL BUSHIPS AUTHORITY.

NOTE "F"- WEIGHT OF CABINET C-I DOES NOT INCLUDE JACK PANEL J-243/G & ITEMS IN THE MISCELLANEOUS BOX.

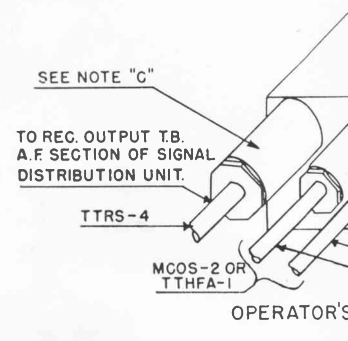
Figure 2-33. Type C, Outline Dimensions

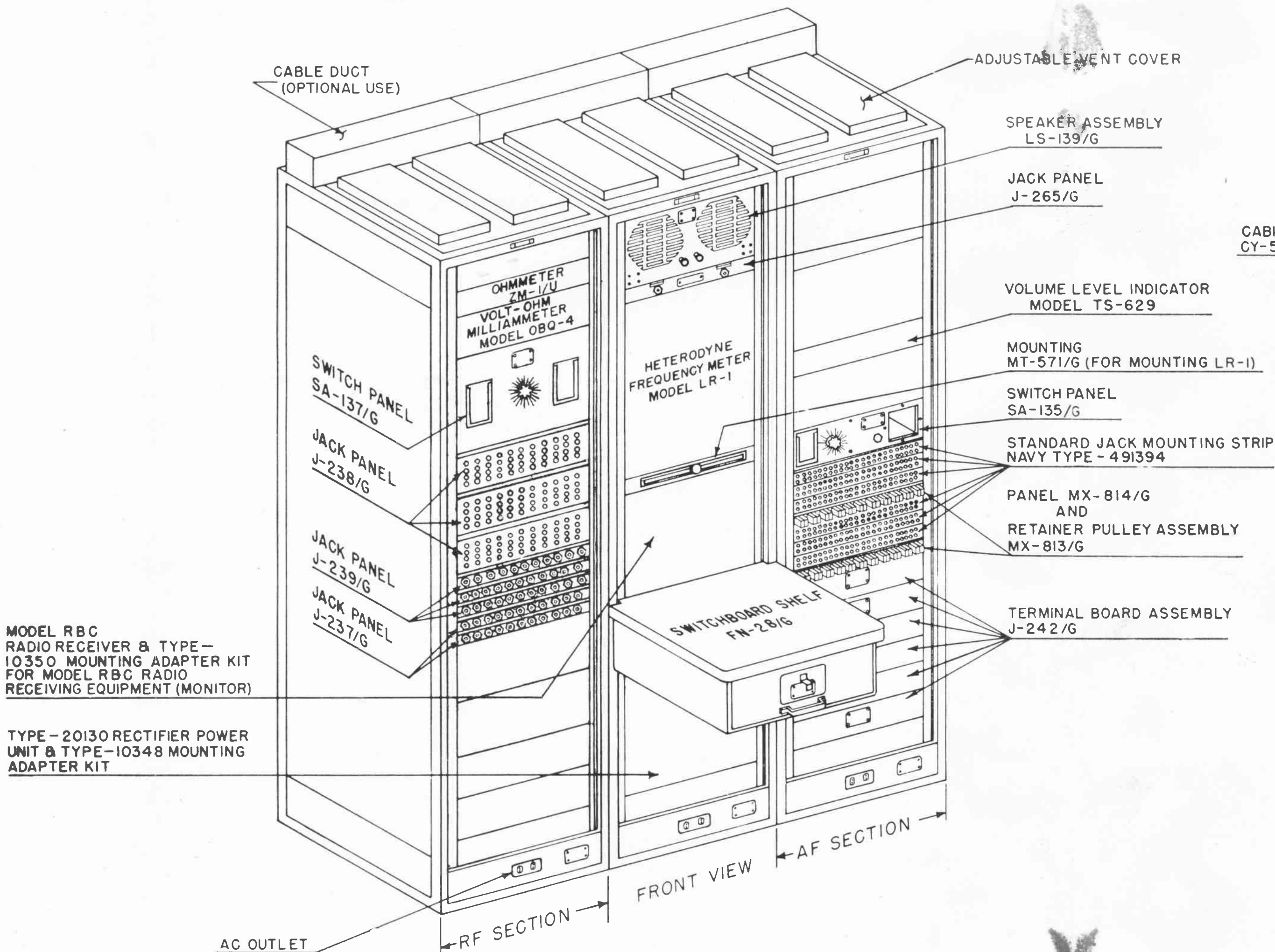


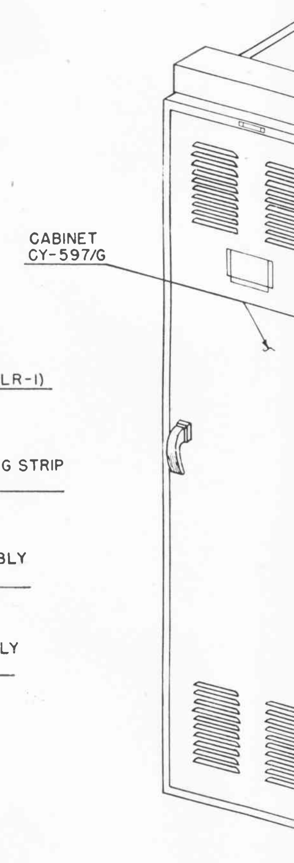
OPERATOR'S POSITION CONTROL UNIT-TYPE C-443/G SHOWN INSTALLED IN GENERAL TYPE PLAN RADIO OPERATING DESK NAVY DEPT. DWG. BU. NO S6700-635345 ALL MOUNTING ACCESSORIES WILL BE FURNISHED BY THE INSTALLING AGENCY

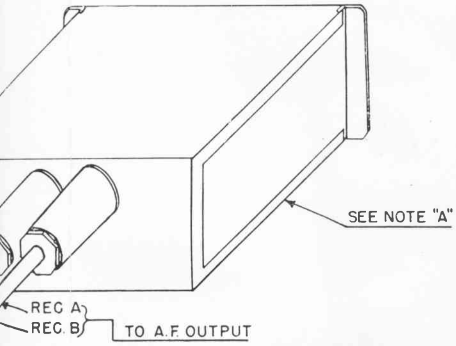


OPERATOR'S POSITION CONTROL UNIT - TYPE C-443/G SHOWN INSTALLED IN SPECIAL RADIOMAN'S DESK AS USED IN CONJUNCTION WITH RACK MOUNTED RECEIVERS – ALL MOUNTING ACCESSORIES WILL BE FURNISHED BY THE INSTALLING AGENCY (REFER TO DWG. NO. SUB'M 6629 DATED 8-14-45)









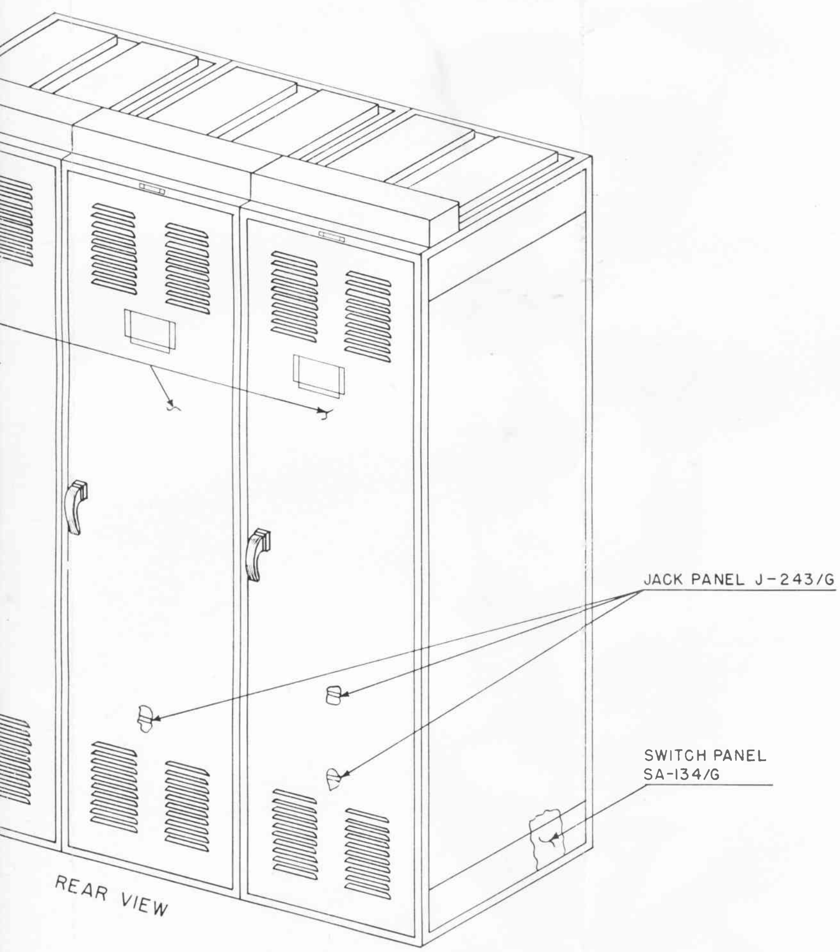
R'S POSITION CONTROL UNIT C-443/G
REAR VIEW

SPARE PARTS BOXES			
SPARES	WEIGHT	CONTENTS CU. FT.	DIMENSIONS
EQUIPMENT SPARES BOX	181 LBS	7.2	41.5 LONG 19.5 WIDE 15.5 HIGH
STOCK SPARES BOX #1	142 LBS.	6.6	32 LONG 21.5 WIDE 16.5 HIGH
STOCK SPARES BOXES #2,3,4,5	236 LBS (EACH)	8.8	42.5 LONG 22.75 WIDE 15.75 HIGH
STOCK SPARES BOX #6	220 LBS	9.1	51.5 LONG 20.75 WIDE 14.75 HIGH
STOCK SPARES BOX #7	166 LBS	6.9	37.5 LONG 21.75 WIDE 14.75 HIGH
STOCK SPARES BOX #8	130 LBS	5.1	48.5 LONG 14.5 WIDE 12.5 HIGH

NOTE "A" PROVIDED FOR CONTROL OF RECEIVERS AT OPERATOR'S POSITION.

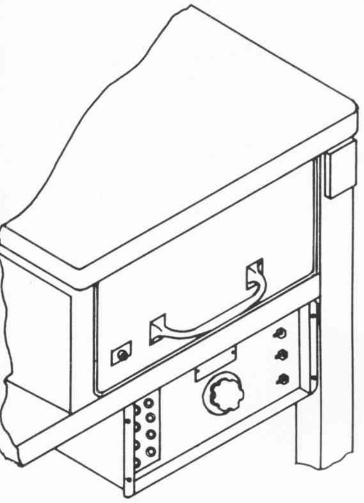
NOTE "B" JACK PANEL J-243/G MAY BE INSTALLED EXTERNAL TO THE CABINETS AT SOME ACTIVITIES BY SPECIAL BUSHIPS AUTHORITY

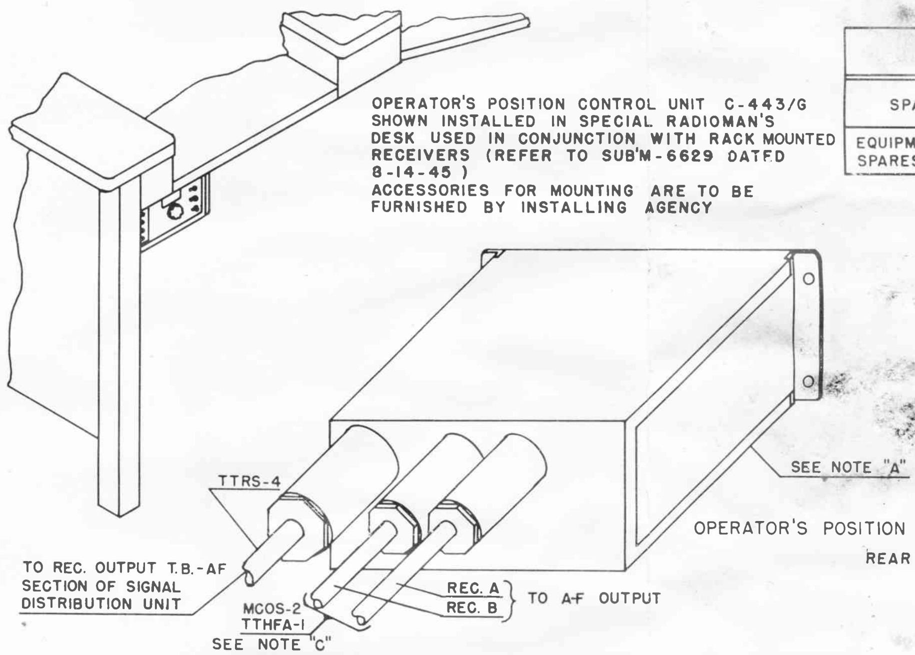
NOTE "C" GROUND SHIELDS OF INDIVIDUAL PAIRS INTERNALLY TO TERMINAL NO. 14.

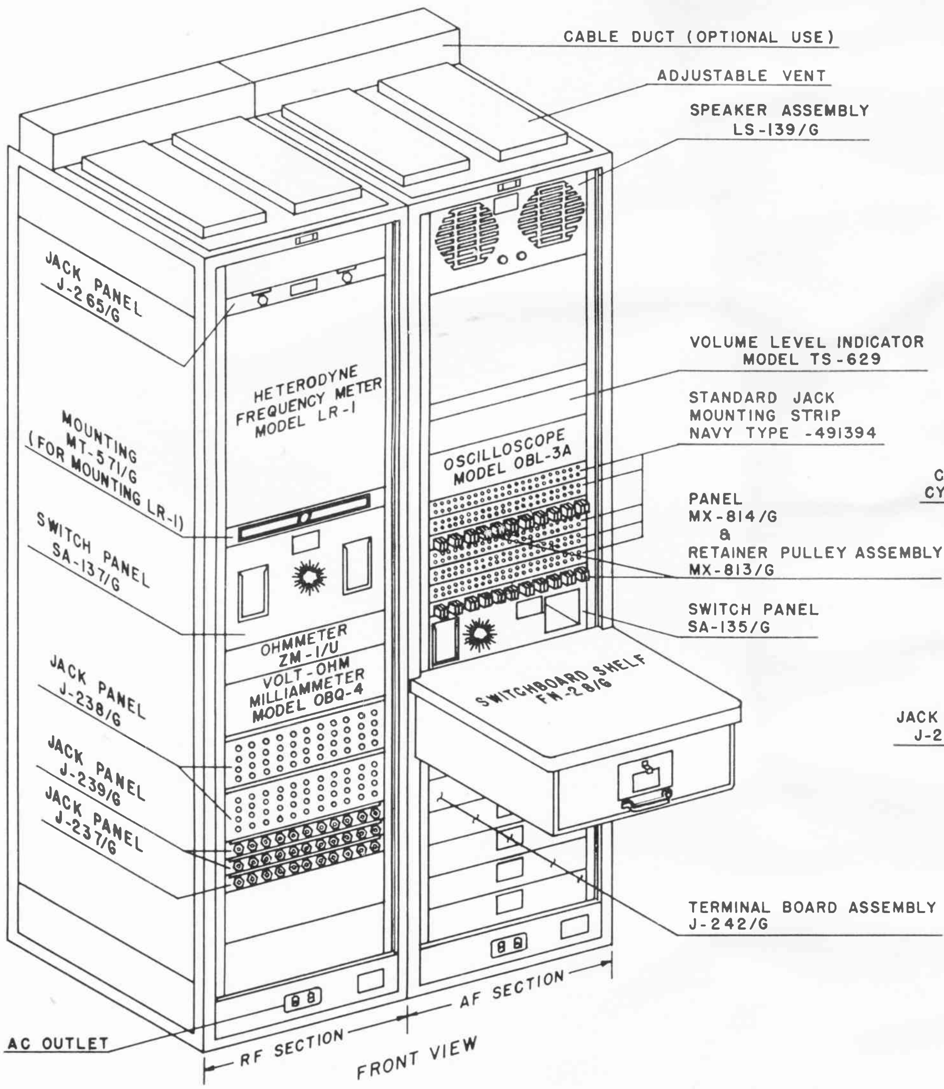


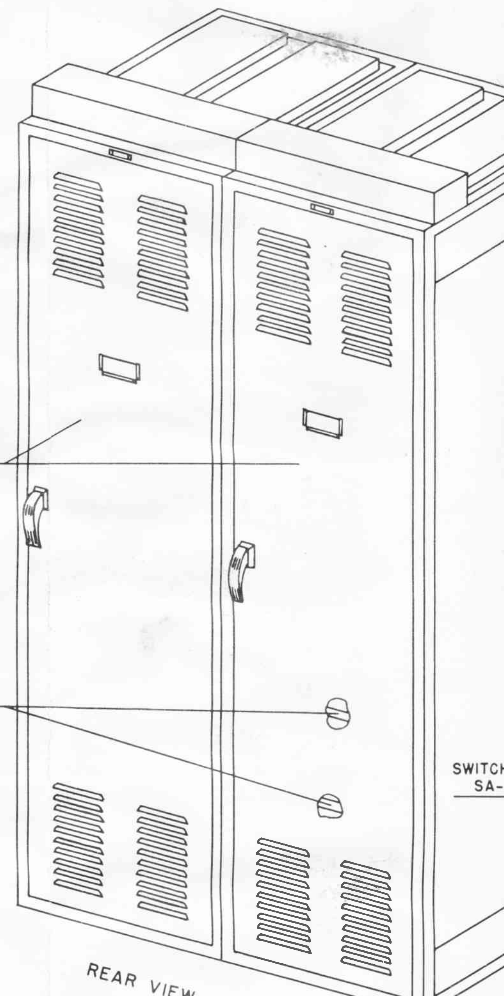
Type 2-34. Type A, Pictorial

SPARE PARTS	
SPARES	WEIGHT
EQUIPMENT SPARES BOX #	146 LBS







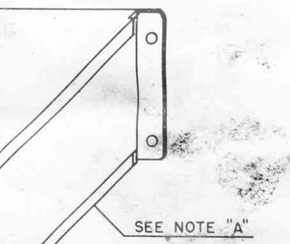


Type 2-35. Ty

SPARE PARTS BOXES			
SPARES	WEIGHT	CONTENTS CU. FT.	DIMENSIONS
EQUIPMENT SPARES BOX #	146 LBS	6	30" LONG 19.5" WIDE 18" HIGH

L UNIT C-443/G
RADIOMAN'S
WITH RACK MOUNTED
-6629 DATED

ARE TO BE
GENCY



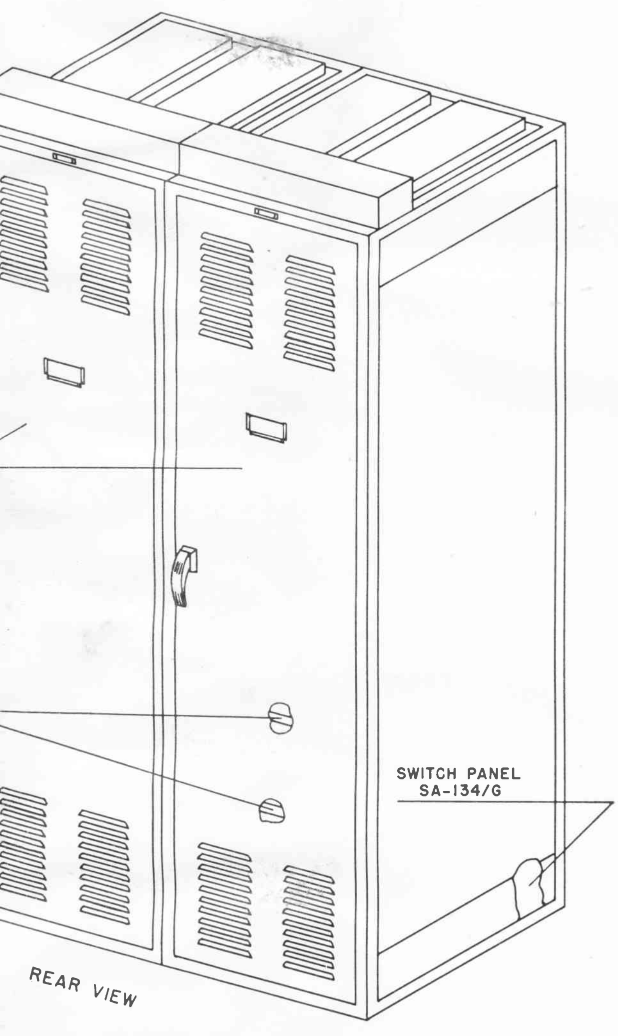
OPERATOR'S POSITION CONTROL UNIT C-443/G
REAR VIEW

NOTE "A" PROVIDED FOR CONTROL OF RECEIVERS AT OPERATOR'S POSITION

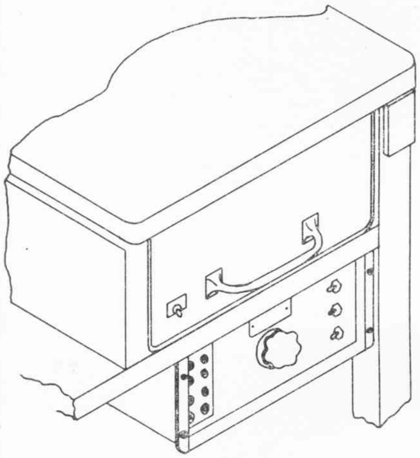
NOTE "B" JACK PANEL J-243/G MAY BE INSTALLED EXTERNAL TO THE CABINETS AT SOME ACTIVITIES BY SPECIAL BUSHIPS AUTHORITY

NOTE "C" GROUND SHIELD OF INDIVIDUAL PAIRS INTERNALLY TO TERMINAL #14

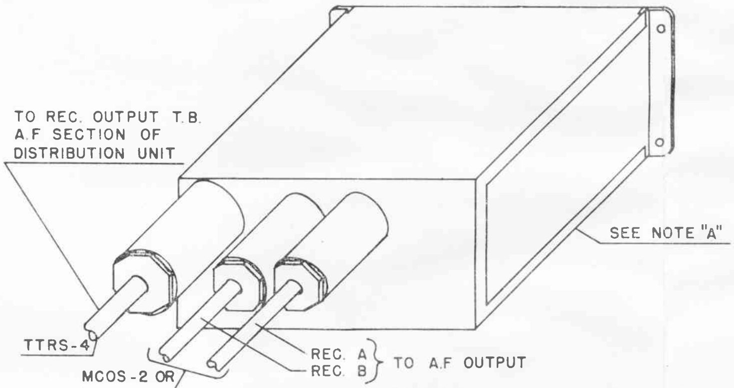
T



Type 2-35. Type B, Pictorial

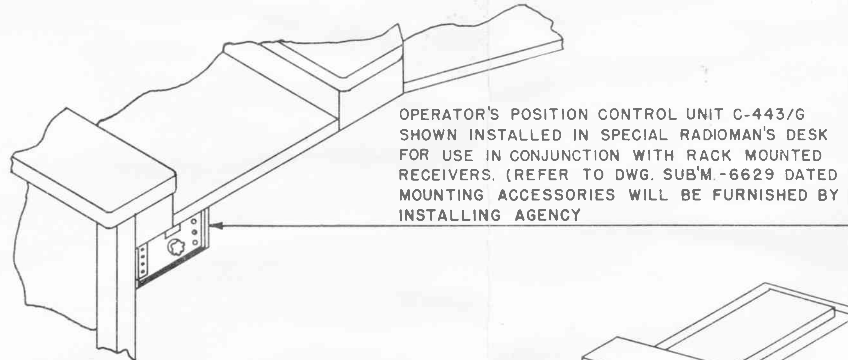


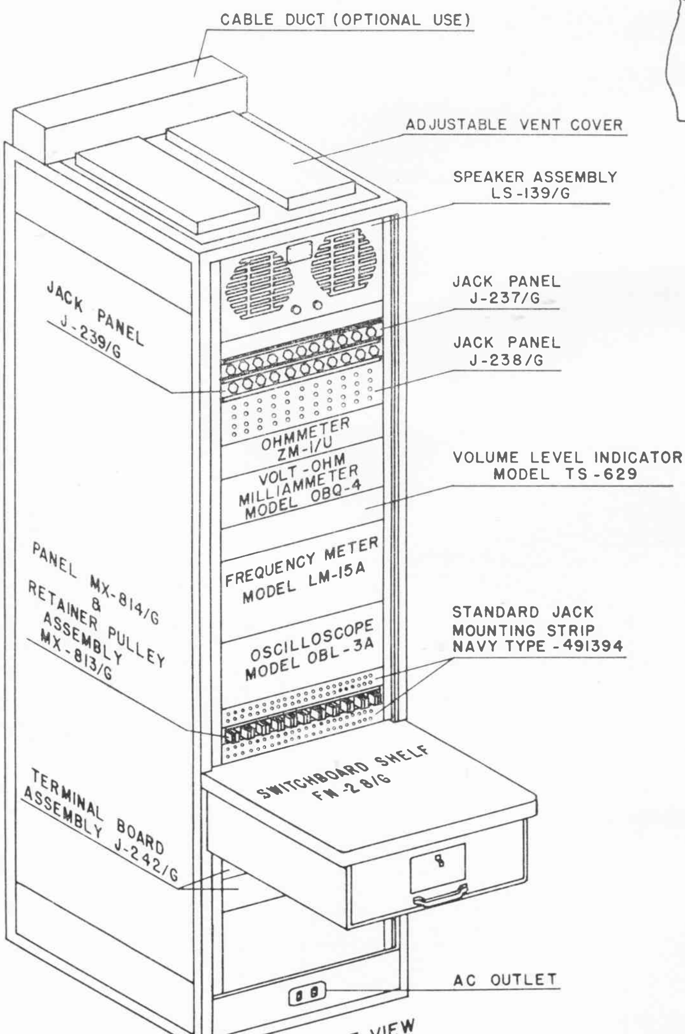
OPERATOR'S POSITION CONTROL UNIT C-443/G SHOWN INSTALLED IN GENERAL TYPE RADIO OPERATING DESK (NAVY DWG. BU. NO S6700-635345) MOUNTING ACCESSORIES WILL BE FURNISHED BY INSTALLING AGENCY



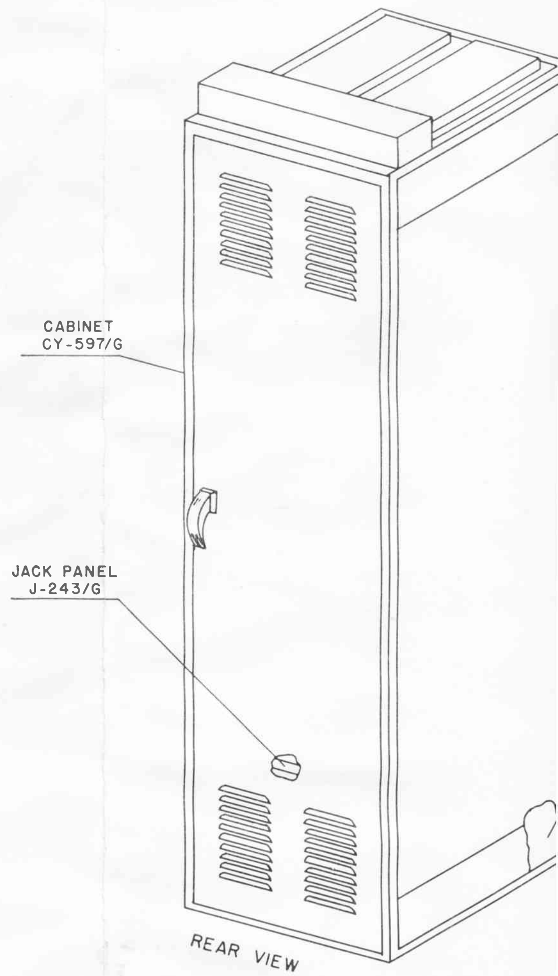
OPERATOR'S POSITION CONTROL UNIT C-443/G
REAR VIEW

SPARE PARTS BOXES		
SPARES	WEIGHT	CONTEN CU. FT
EQUIPMENT SPARE BOX #	110 LBS.	4.9





FRONT VIEW



REAR VIEW

Figure 2-36. Typ

SPARE PARTS BOXES			
SPARES	WEIGHT	CONTENTS CU. FT.	DIMENSIONS
EQUIPMENT SPARE BOX #	110 LBS.	4.9	30" LONG 19.5" WIDE 14.5" HIGH

TE "A"

/G

S POSITION CONTROL UNIT C-443/G
TALLED IN SPECIAL RADIOMAN'S DESK
N CONJUNCTION WITH RACK MOUNTED
(REFER TO DWG. SUB'M.-6629 DATED 8/14/45)
ACCESSORIES WILL BE FURNISHED BY
S AGENCY

NOTE "A" PROVIDED FOR CONTROL OF RECEIVERS AT OPERATOR'S POSITION

NOTE "B" JACK PANEL J-243/G MAY BE INSTALLED EXTERNAL TO THE CABINETS AT SOME ACTIVITIES BY SPECIAL BUSHIPS AUTHORITY

NOTE "C" GROUND SHIELD OF INDIVIDUAL PAIRS INTERNALLY TO TERMINAL #14

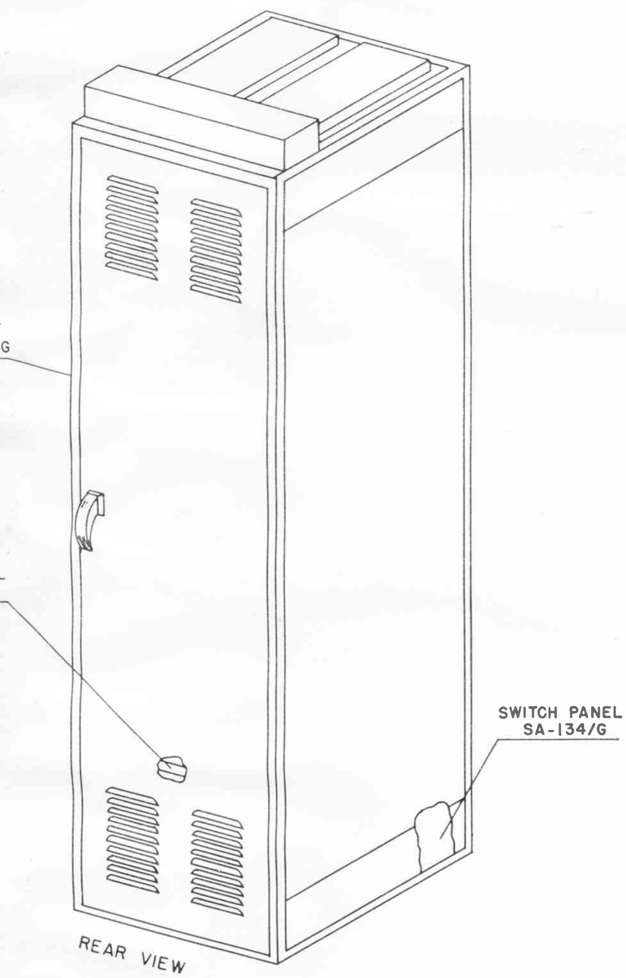
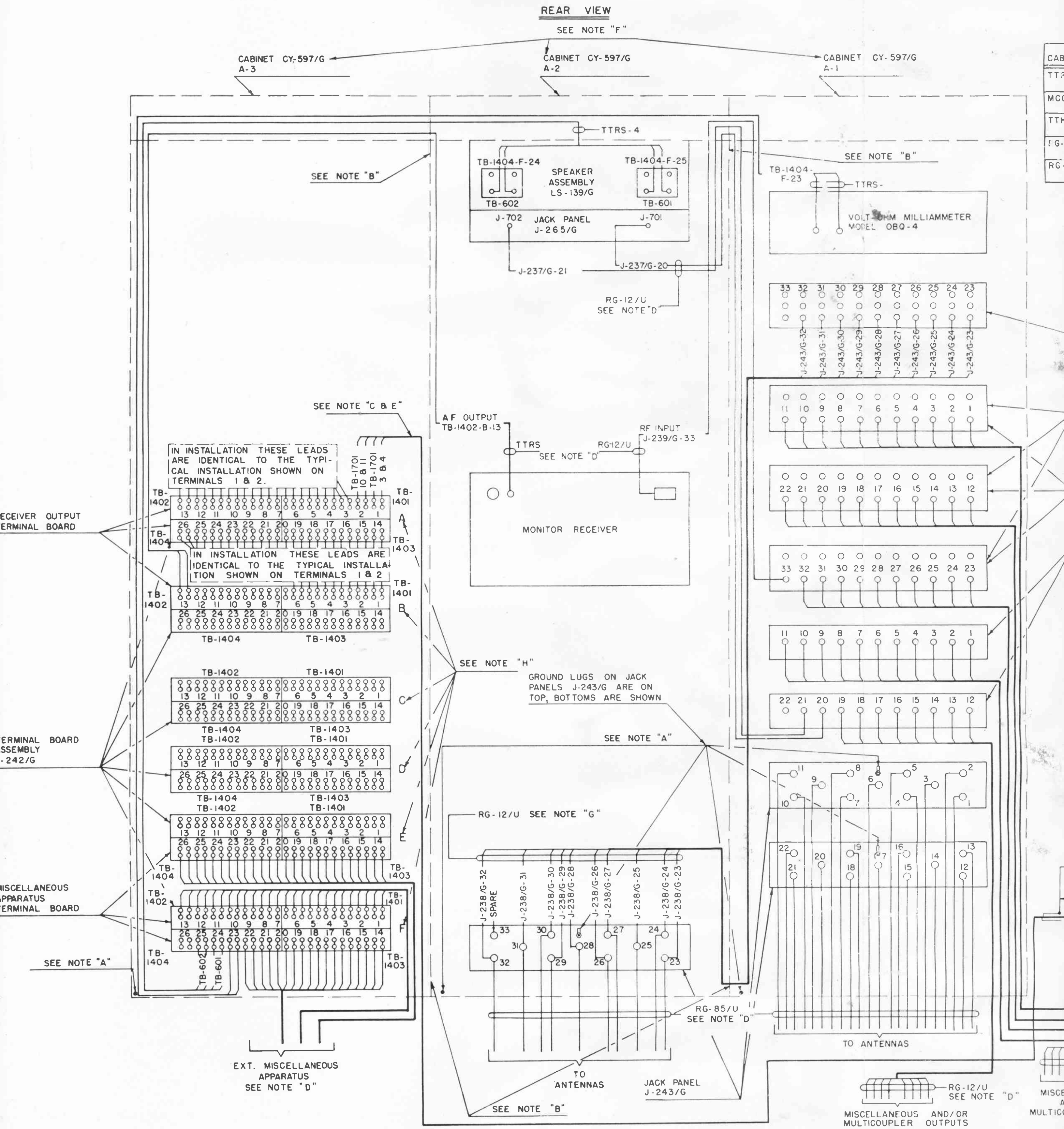
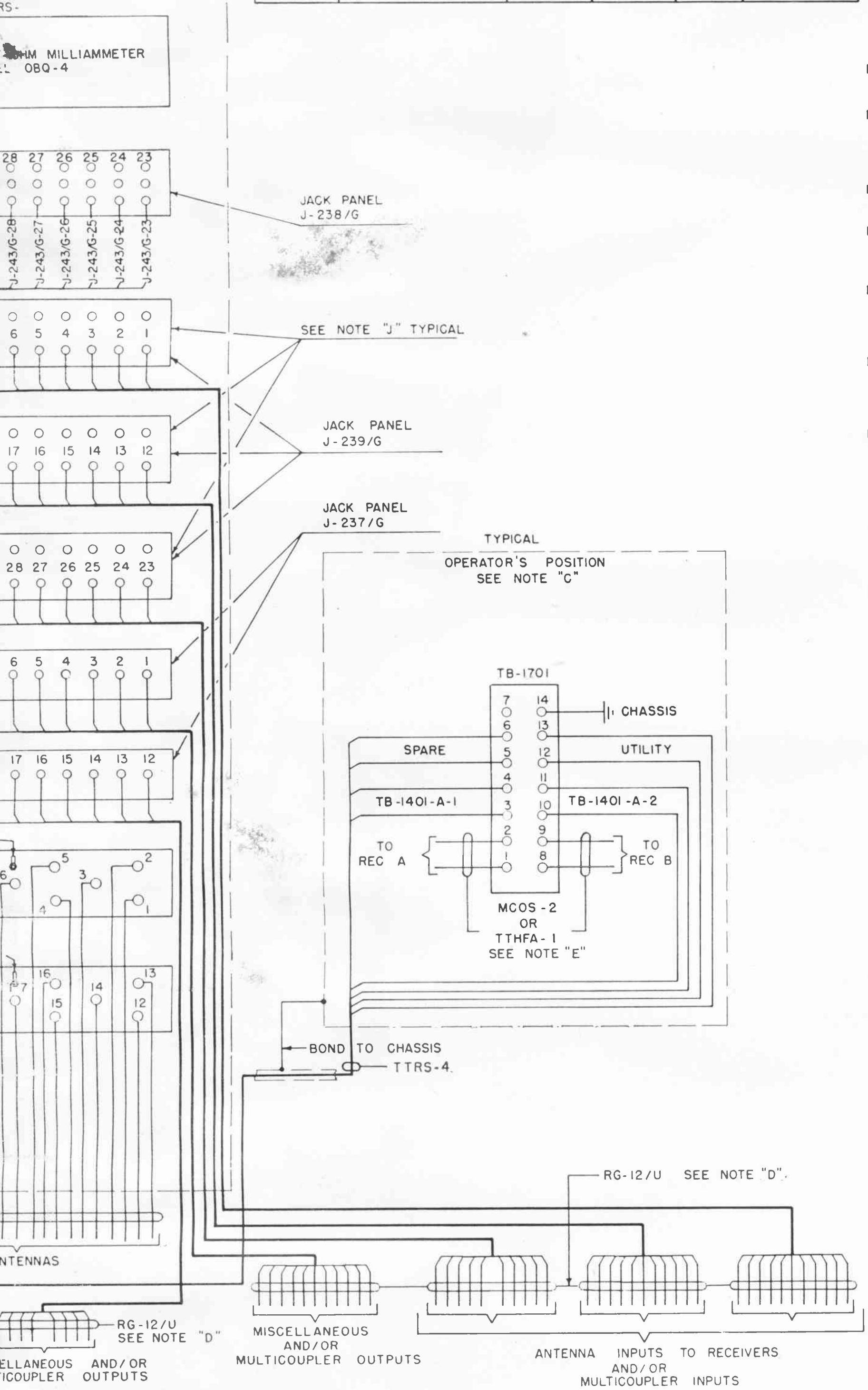


Figure 2-36. Type C, Pictorial


REAR VIEW
SEE NOTE "F"
CABINET CY-597/G A-3
CABINET CY-597/G A-2
CABINET CY-597/G A-1
TTRS-4
SEE NOTE "B"
TB-1404-F-24
TB-1404-F-25
SPEAKER ASSEMBLY LS-139/G
TB-602
TB-601
J-702
JACK PANEL J-265/G
J-701
J-237/G-21
J-237/G-20
RG-12/U SEE NOTE "D"
TB-1404-F-23
TTRS-
VOLT-OHM MILLIAMMETER MODEL OBQ-4
SEE NOTE "C & E"
AF OUTPUT TB-1402-B-13
TTRS
SEE NOTE "D"
RG-12/U
RF INPUT J-239/G-33
IN INSTALLATION THESE LEADS ARE IDENTICAL TO THE TYPICAL INSTALLATION SHOWN ON TERMINALS 1 & 2.
TB-1701 10 & 11
TB-1701 3 & 4
MONITOR RECEIVER
RECEIVER OUTPUT TERMINAL BOARD
IN INSTALLATION THESE LEADS ARE IDENTICAL TO THE TYPICAL INSTALLATION SHOWN ON TERMINALS 1 & 2
TB-1402
TB-1401
TB-1404
TB-1403
SEE NOTE "H"
GROUND LUGS ON JACK PANELS J-243/G ARE ON TOP, BOTTOMS ARE SHOWN
TERMINAL BOARD ASSEMBLY J-242/G
SEE NOTE "A"
RG-12/U SEE NOTE "G"
MISCELLANEOUS APPARATUS TERMINAL BOARD
J-238/G-32 SPARE
J-238/G-31
J-238/G-30
J-238/G-29
J-238/G-28
J-238/G-26
J-238/G-27
J-238/G-25
J-238/G-24
J-238/G-23
RG-85/U SEE NOTE "D"
TO ANTENNAS
EXT. MISCELLANEOUS APPARATUS SEE NOTE "D"
JACK PANEL J-243/G
RG-12/U SEE NOTE "D"
MISCELLANEOUS AND/OR MULTICOUPLER OUTPUTS

CABLE	ARRANGEMENTS	PHYSICAL SIZE	CONDUCTOR	SIZE A W G	IMPEDANCE Ω
TTRS-4	4 INDIVIDUALLY SHIELDED PAIRS	.720 O.D.	7 STRANDS # 28	# 20	76 Ω
MCOS-4	1 SHIELDED PAIR	.460 O.D.	16 STRANDS # 30	# 18	
TTHFA-1	1 SHIELDED PAIR	.462 O.D.	1 STRAND	# 22	
RG-12/U	ARMORED COAXIAL CABLE	.475 O.D.	7 STRANDS # 26	# 19	75 Ω
RG-85/U	ARMORED COAXIAL CABLE	1.56 O.D.	1 STRAND	# 9	72 Ω



NOTE "A" PROVIDED FOR GROUNDING EQUIPMENT. INSTALLATION ACTIVITY TO MAKE SUITABLE CONNECTION.

NOTE "B" BEFORE SETTING CABINETS IN PLACE REMOVE TOP AND BOTTOM FILLER PANELS BETWEEN ADJACENT CABINETS FOR CABLE RUNS BETWEEN CABINETS.

NOTE "C" TYPICAL INSTALLATION OF CONTROL C-443/G TO TERMINAL BOARD ASSEMBLY J-242/G.

NOTE "D" ALL RF CABLES USED EXTERNAL TO UNITS SHALL BE RG-12/U OR RG-85/U CABLE USED FOR AF DISTRIBUTION EXTERNAL TO UNITS TO BE TTRS.

NOTE "E" ALL CABLE FROM RECEIVERS TO CONTROL C-443/G TO BE MCOS-2; SECOND CHOICE TTRS-4 FROM CONTROL C-443/G TO DISTRIBUTION UNIT TO BE TTRS-4.

NOTE "F" A-1, A-2, & A-3 USED ONLY TO IDENTIFY INDIVIDUAL CABINETS.
- A-1 RF CABINET
- A-2 MONITORING CABINET
- A-3 AF CABINET

NOTE "G" IN CABINET A-2 THESE CABLES (RG-12/U) ARE CONNECTED TO RECEPTACLES NAVY TYPE 49191 PART OF CONNECTOR-ADAPTOR NAVY TYPE CIA-491652 LOCATED ON JACK PANEL J-243/G.

NOTE "H" LETTERS A, B, C, D, E, & F USED ONLY TO IDENTIFY INDIVIDUAL TERMINAL BOARDS ON SEPARATE BUT IDENTICAL TERMINAL BOARD ASSEMBLIES J-242/G.

NOTE "J" MARKER NUMBERS TO BE ADDED AROUND CABLES BY INSTALLATION ACTIVITY, TO CORRESPOND WITH NUMBERS SHOWN ON DRAWING. E Z CODE MARKERS OR EQUIVALENT ARE FURNISHED FOR THE PURPOSE.

Figure 2-37. Type A, Interconnecting Diagram

CABLE	ARRANGEM
TTRS-4	4 INDIVIDU SHIELDED
MCOS-2	I SHIELDED
TTHFA-I	I SHIELDED
RG-12/U	ARMORED CABLE
RG-85/U	ARMORED CABLE

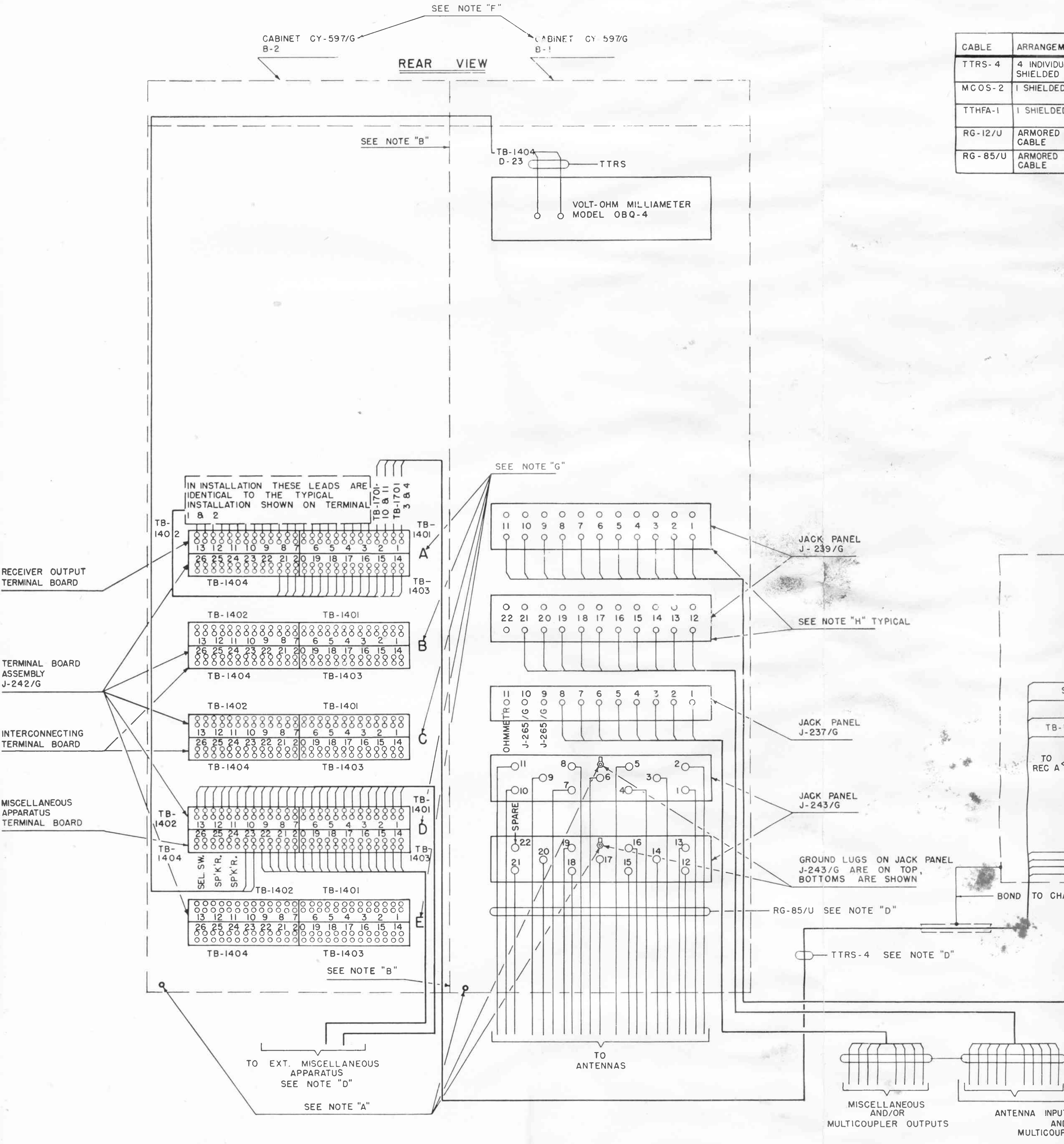


Figure 2-3

CABLE	ARRANGEMENT	PHYSICAL SIZE	CONDUCTOR	SIZE AWG	IMPEDANCE Ω
TTRS-4	4 INDIVIDUALLY SHIELDED PAIRS	.720 O.D.	7 STRANDS # 28	# 20	76 Ω
MCOS-2	1 SHIELDED PAIR	.460 O.D.	16 STRANDS # 30	# 18	
TTHFA-1	1 SHIELDED PAIR	.462 O.D.	1 STRAND	# 22	
RG-12/U	ARMORED COAXIAL CABLE	.475 O.D.	7 STRANDS # 26	# 19	75 Ω
RG-85/U	ARMORED COAXIAL CABLE	1.56 O.D.	1 STRAND	# 9	72 Ω

NOTE "A" PROVIDED FOR GROUNDING EQUIPMENT. INSTALLATION ACTIVITY TO MAKE SUITABLE CONNECTION.

NOTE "B" BEFORE SETTING CABINETS IN PLACE REMOVE TOP & BOTTOM FILLER PANELS BETWEEN ADJACENT CABINETS FOR CABLE RUNS BETWEEN CABINETS.

NOTE "C" TYPICAL INSTALLATION OF CONTROL C-443/G TO TERMINAL BOARD ASSEMBLY J-242/G.

NOTE "D" ALL RF CABLES USED EXTERNAL TO UNITS SHALL BE RG-12/U OR RG-85/U CABLE. ALL CABLE USED FOR AF DISTRIBUTION EXTERNAL TO UNITS TO BE TTRS.

NOTE "E" ALL CABLE FROM RECEIVERS TO CONTROL C-443/G TO BE MCOS-2 SECOND CHOICE TTRS-4. FROM CONTROL C-443/G TO DISTRIBUTION UNIT TO BE TTRS-4.

NOTE "F" B-1, & B-2 USED ONLY TO IDENTIFY INDIVIDUAL CABINETS.
B-1 RF CABINET
B-2 AF CABINET

NOTE "G" LETTERS A, B, C, D, & E USED ONLY TO IDENTIFY INDIVIDUAL TERMINAL BOARDS. ON SEPERATE BUT IDENTICAL TERMINAL BOARD ASSEMBLIES J-242/G.

NOTE "H" MARKER NUMBERS TO BE ADDED AROUND CABLES BY INSTALLATION ACTIVITY, TO CORRESPOND WITH NUMBERS SHOWN ON DRAWINGS. E Z CODE MARKERS OR EQUIVALENT ARE FURNISHED FOR THE PURPOSE.

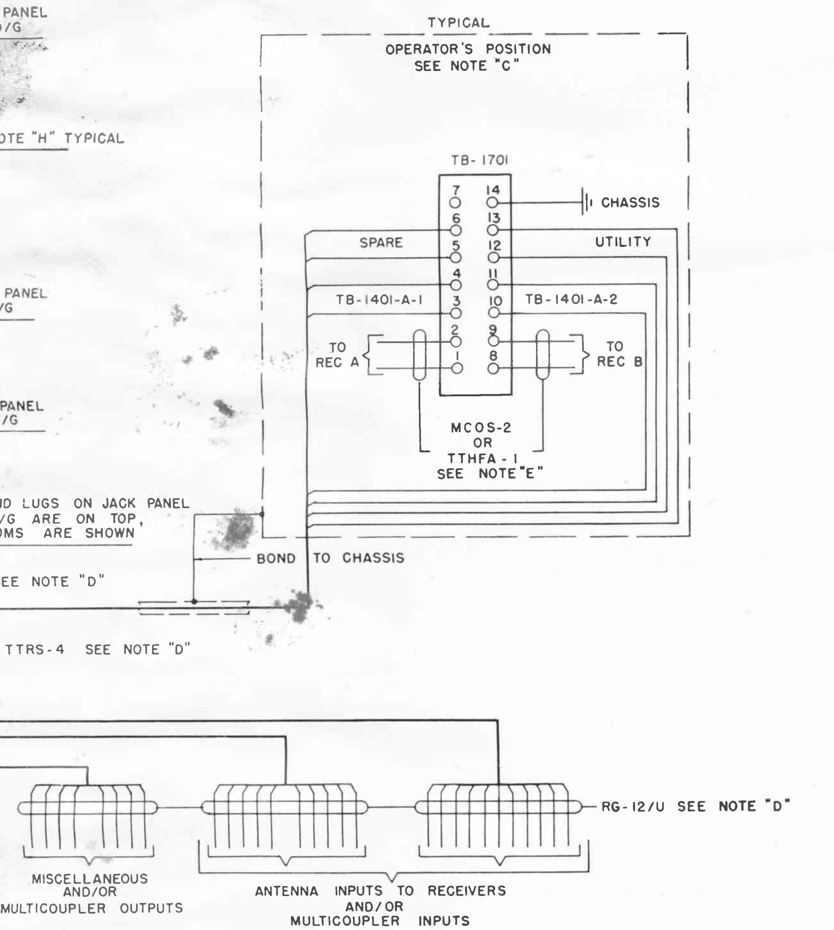
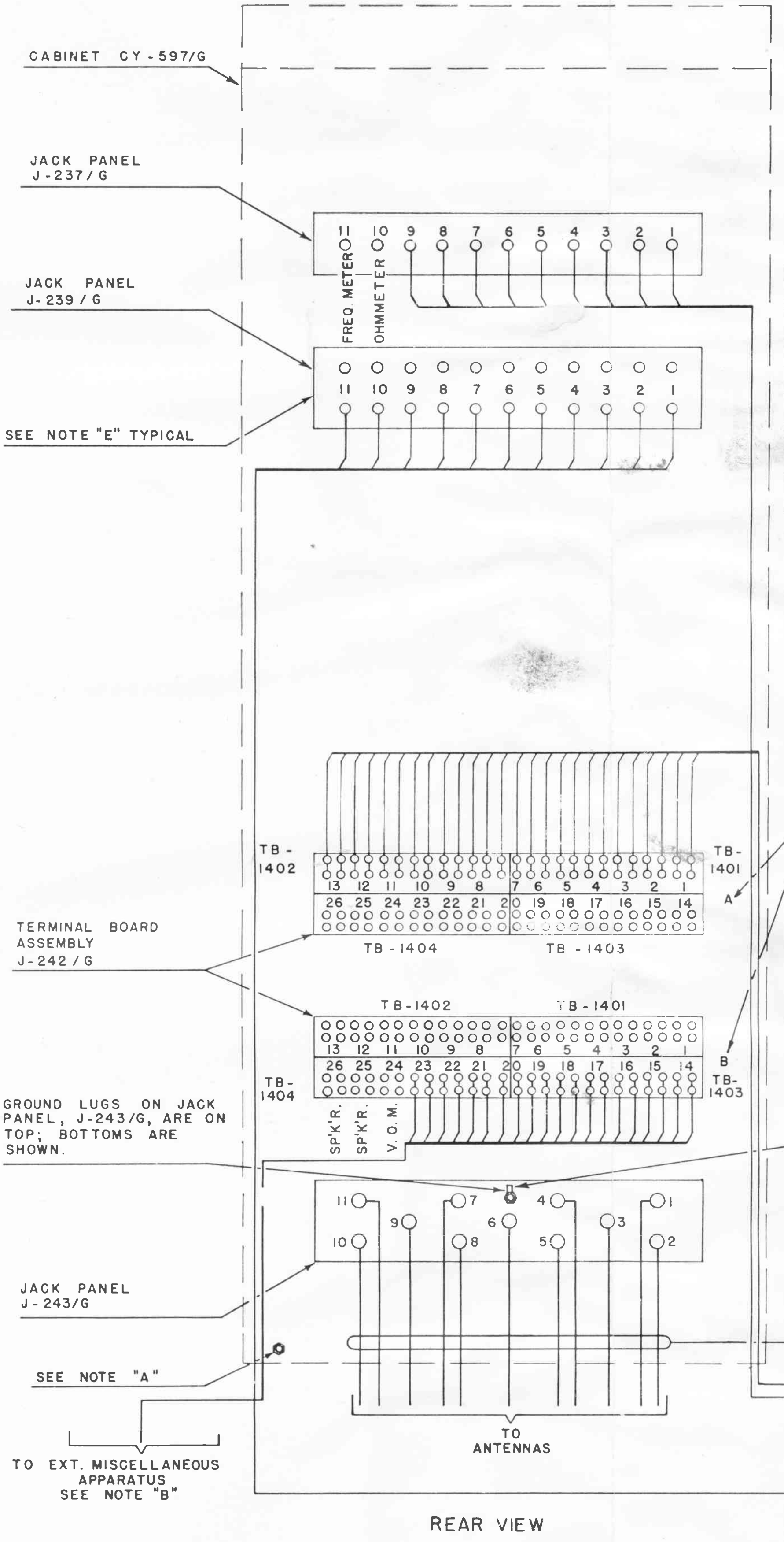


Figure 2-38. Type B, Interconnecting Diagram



CABLE	ARRANGEMENT	PHYSICAL SIZE	CONDUCT
TTRS - 4	4 INDIVIDUALLY SHIELDED PAIRS	.720 O.D.	7 STRAN # 28
MCOS - 2	I SHIELDED PAIR	.460 O.D.	16 STRAN # 30
TTHFA - I	I SHIELDED PAIR	.462 O.D.	I STRAN
RG-12/U	ARMORED COAXIAL CABLE	.475 O.D.	7 STRAN # 26
RG-85/U	ARMORED COAXIAL CABLE	1.56 O.D.	I STRAN

NOTE "A" PROVIDED FOR G
INSTALLATION AC
SUITABLE CONN

NOTE "B" ALL R-F CABLES
UNITS SHALL BE
CABLE. ALL CAB
DISTRIBUTION EX
BE TTRS.

NOTE "C" ALL WIRE FROM
BUTION UNIT TO

NOTE "D" LETTERS A & B U
INDIVIDUAL TER
SEPARATE BUT I
ASSEMBLIES J-

NOTE "E" MARKER NUMBER
CABLES BY INST
CORRESPOND W
ON DRAWING. EZ
EQUIVALENT AR
PURPOSE.

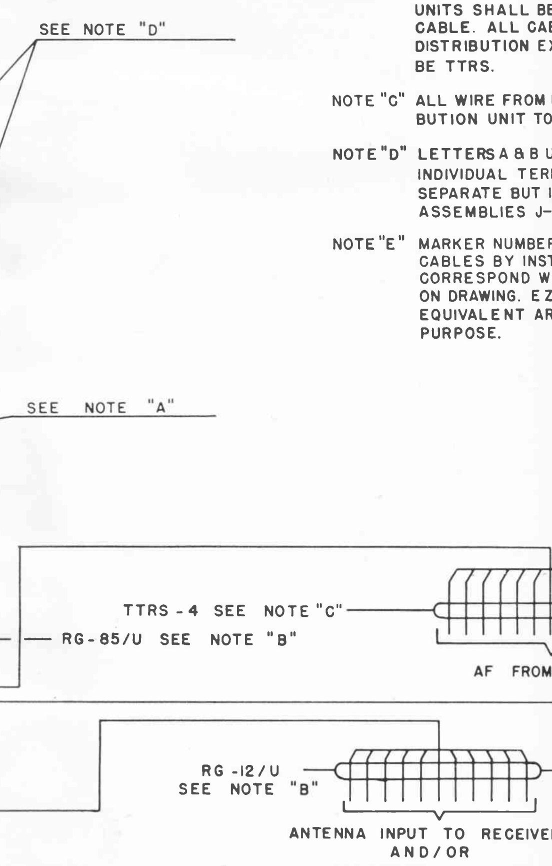


Figure 2-39. Type C, Interconnecting Diagram

CABLE	ARRANGEMENT	PHYSICAL SIZE	CONDUCTOR	SIZE AWG	IMPEDANCE Ω
TTRS - 4	4 INDIVIDUALLY SHIELDED PAIRS	.720 O. D.	7 STRANDS # 28	# 20	76 Ω
MCOS - 2	I SHIELDED PAIR	.460 O. D.	16 STRANDS # 30	# I 8	
TTHFA - I	I SHIELDED PAIR	.462 O. D.	I STRAND	# 22	
RG - I2/U	ARMORED COAXIAL CABLE	.475 O. D.	7 STRANDS # 26	# I9	75 Ω
RG-85/U	ARMORED COAXIAL CABLE	I.56 O. D.	I STRAND	# 9	72 Ω

NOTE "A" PROVIDED FOR GROUNDING EQUIPMENT. INSTALLATION ACTIVITY TO MAKE SUITABLE CONNECTION.

NOTE "B" ALL R-F CABLES USED EXTERNAL TO UNITS SHALL BE RG-I2/U OR RG-85/U CABLE. ALL CABLE USED FOR A-F DISTRIBUTION EXTERNAL TO UNITS TO BE TTRS.

NOTE "C" ALL WIRE FROM RECEIVERS TO DISTRIBUTION UNIT TO BE TTRS-4.

NOTE "D" LETTERS A & B USED ONLY TO IDENTIFY INDIVIDUAL TERMINAL BOARDS ON SEPARATE BUT IDENTICAL BOARD ASSEMBLIES J-242/G.

NOTE "E" MARKER NUMBERS TO BE ADDED AROUND CABLES BY INSTALLATION ACTIVITY, TO CORRESPOND WITH NUMBERS SHOWN ON DRAWING. E Z CODE MARKERS OR EQUIVALENT ARE FURNISHED FOR THE PURPOSE.

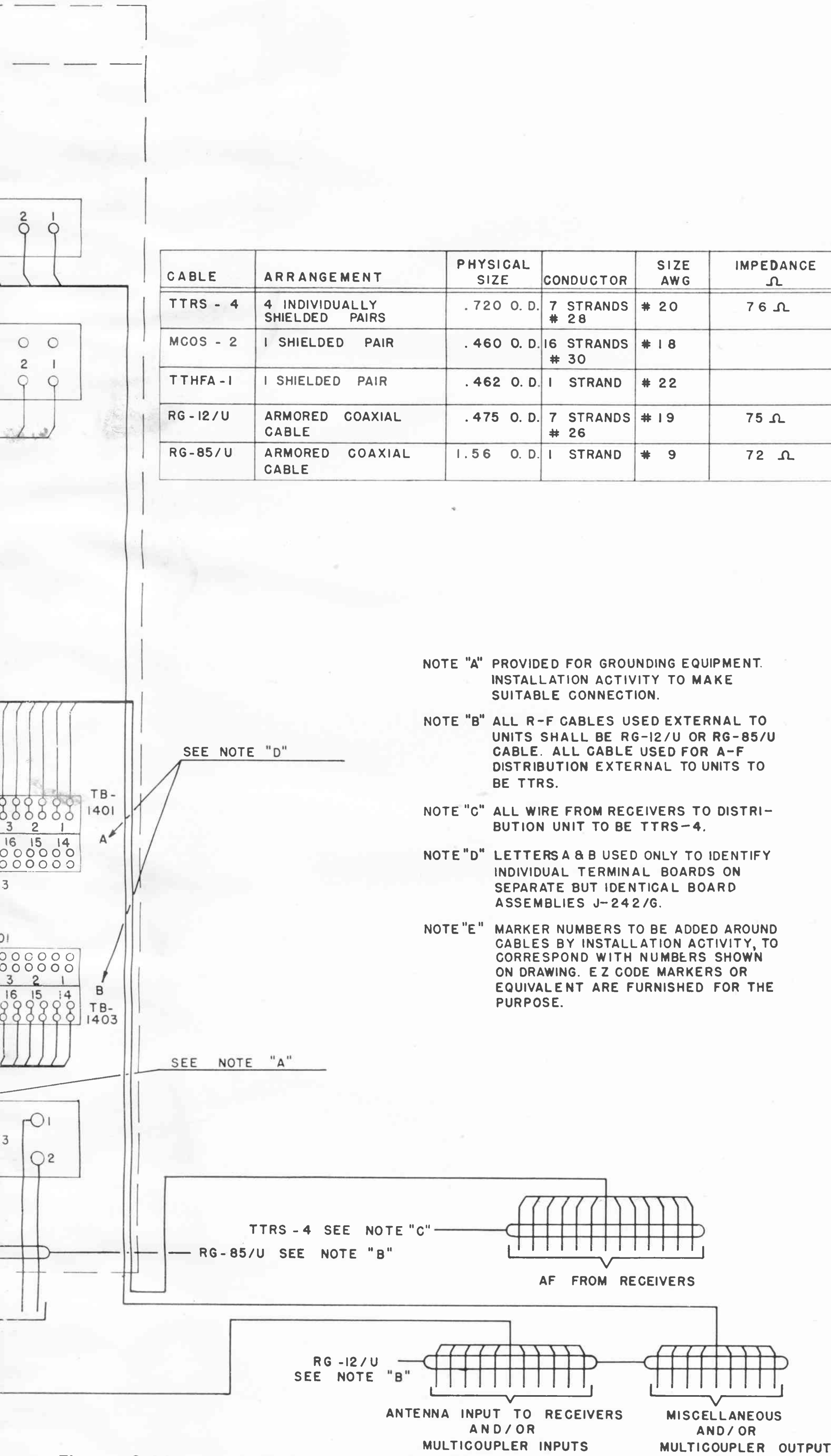
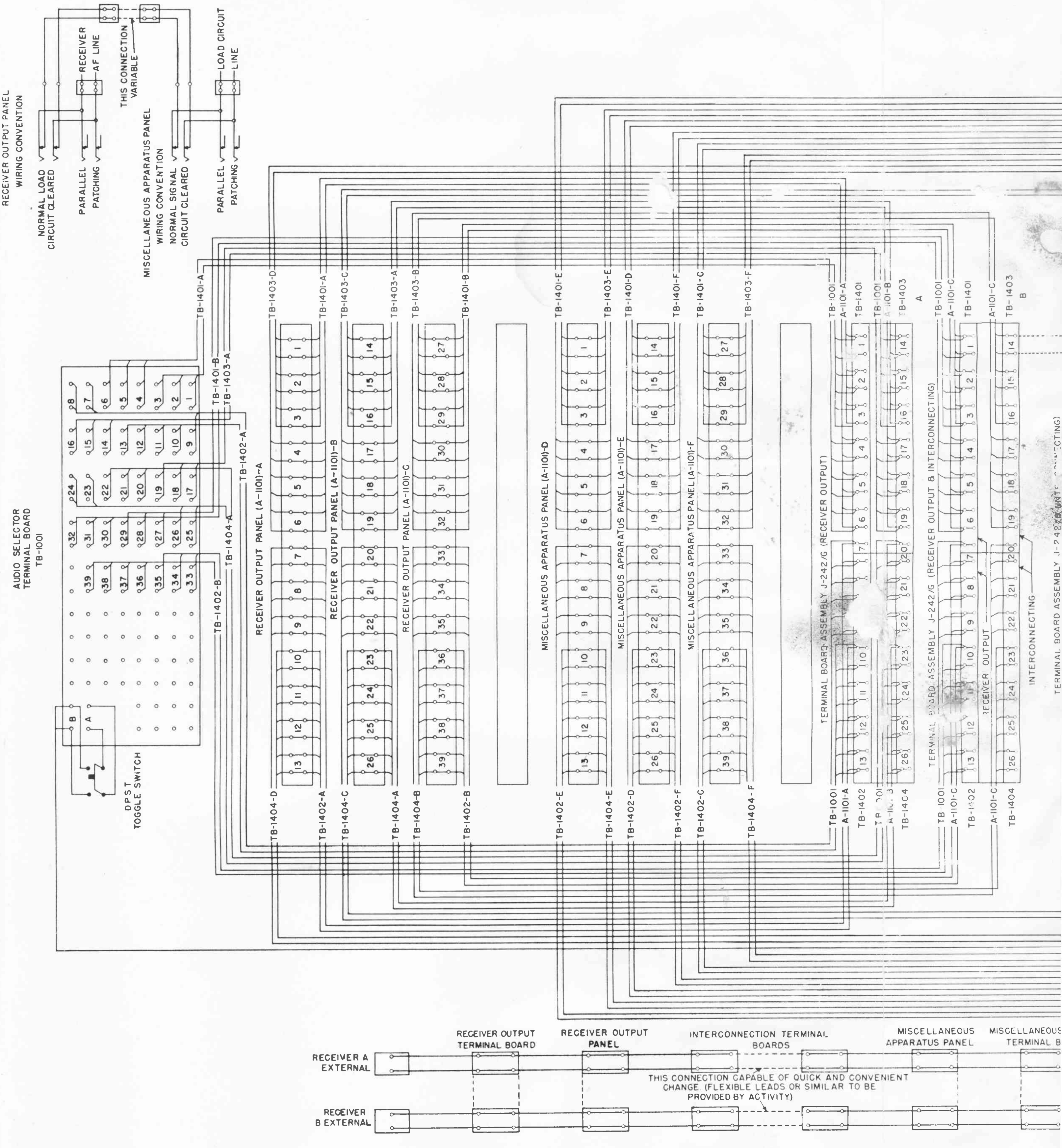
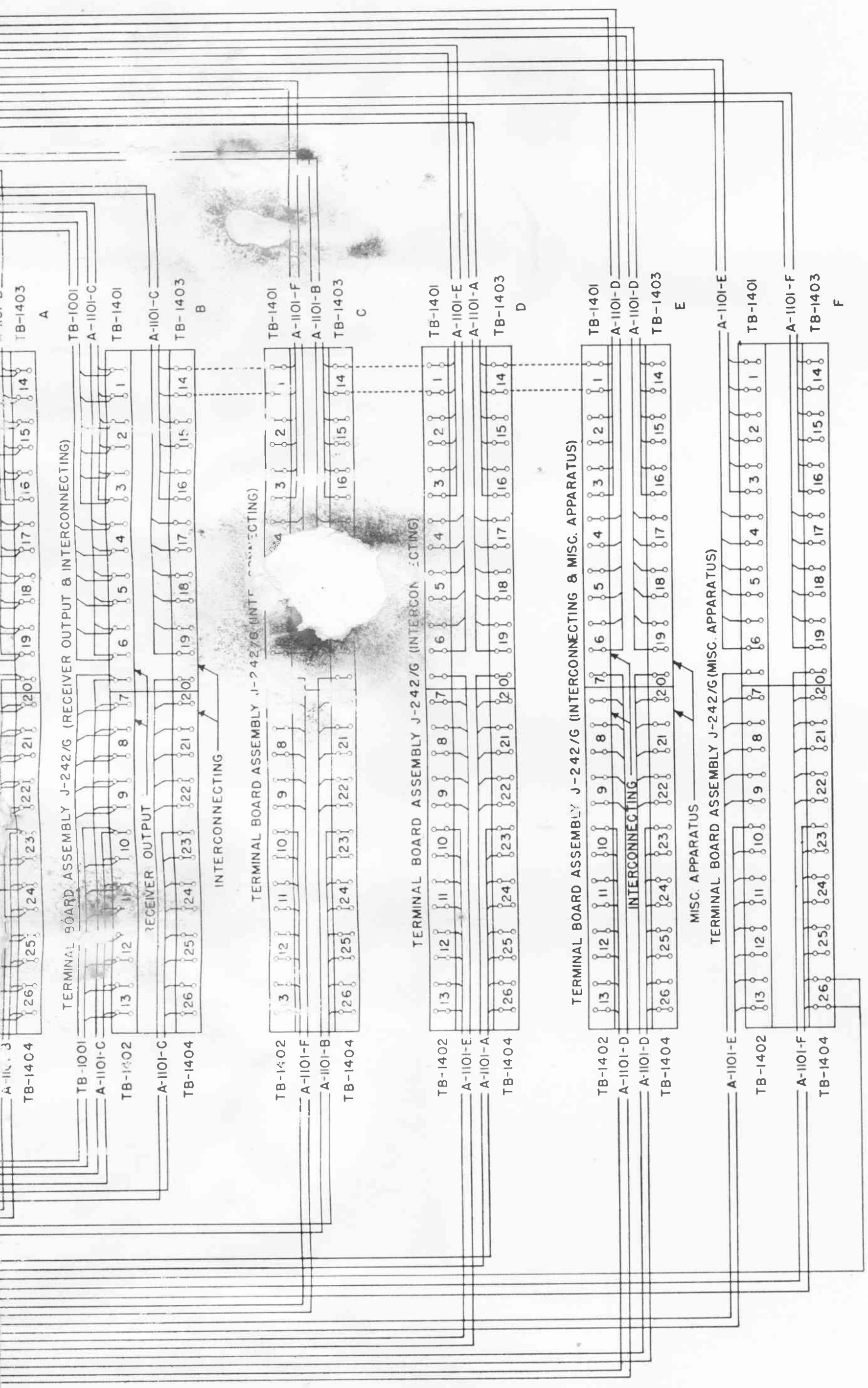


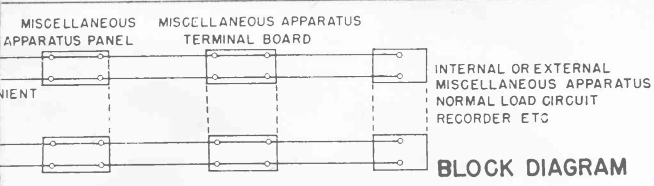
Figure 2-39. Type C, Interconnecting Diagram


RECEIVER OUTPUT PANEL
WIRING CONVENTION
NORMAL LOAD
CIRCUIT CLEARED
PARALLEL
PATCHING
RECEIVER
AF LINE
THIS CONNECTION
VARIABLE
MISCELLANEOUS APPARATUS PANEL
WIRING CONVENTION
NORMAL SIGNAL
CIRCUIT CLEARED
LOAD CIRCUIT
LINE
AUDIO SELECTOR
TERMINAL BOARD
TB-1001
DPST
TOGGLE SWITCH
RECEIVER OUTPUT PANEL (A-1101)-A
RECEIVER OUTPUT PANEL (A-1101)-B
RECEIVER OUTPUT PANEL (A-1101)-C
MISCELLANEOUS APPARATUS PANEL (A-1101)-D
MISCELLANEOUS APPARATUS PANEL (A-1101)-E
MISCELLANEOUS APPARATUS PANEL (A-1101)-F
TERMINAL BOARD ASSEMBLY J-242/G (RECEIVER OUTPUT)
TERMINAL BOARD ASSEMBLY J-242/G (RECEIVER OUTPUT & INTERCONNECTING)
RECEIVER OUTPUT
INTERCONNECTING
RECEIVER A
EXTERNAL
RECEIVER
B EXTERNAL
RECEIVER OUTPUT
TERMINAL BOARD
RECEIVER OUTPUT
PANEL
INTERCONNECTION TERMINAL
BOARDS
MISCELLANEOUS
APPARATUS PANEL
THIS CONNECTION CAPABLE OF QUICK AND CONVENIENT
CHANGE (FLEXIBLE LEADS OR SIMILAR TO BE
PROVIDED BY ACTIVITY)



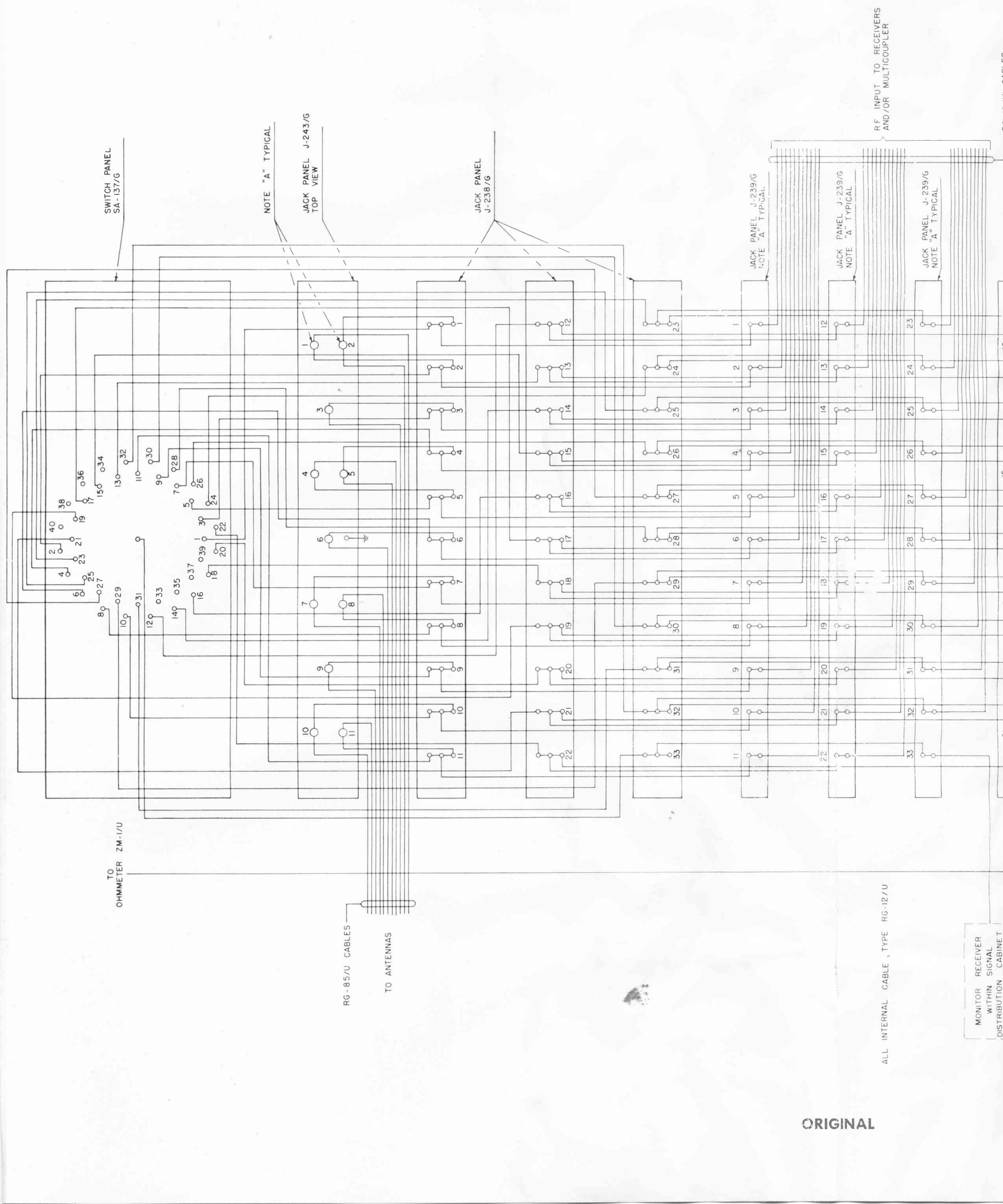
NOTE "A" THE LETTERS (A THROUGH F) WHICH FOLLOW THE SYMBOL DESIGNATIONS OF COMPONETS ARE USED ONLY TO IDENTIFY SIMILAR COMPONENTS WHEN USED IN MORE THAN ONE PLACE.

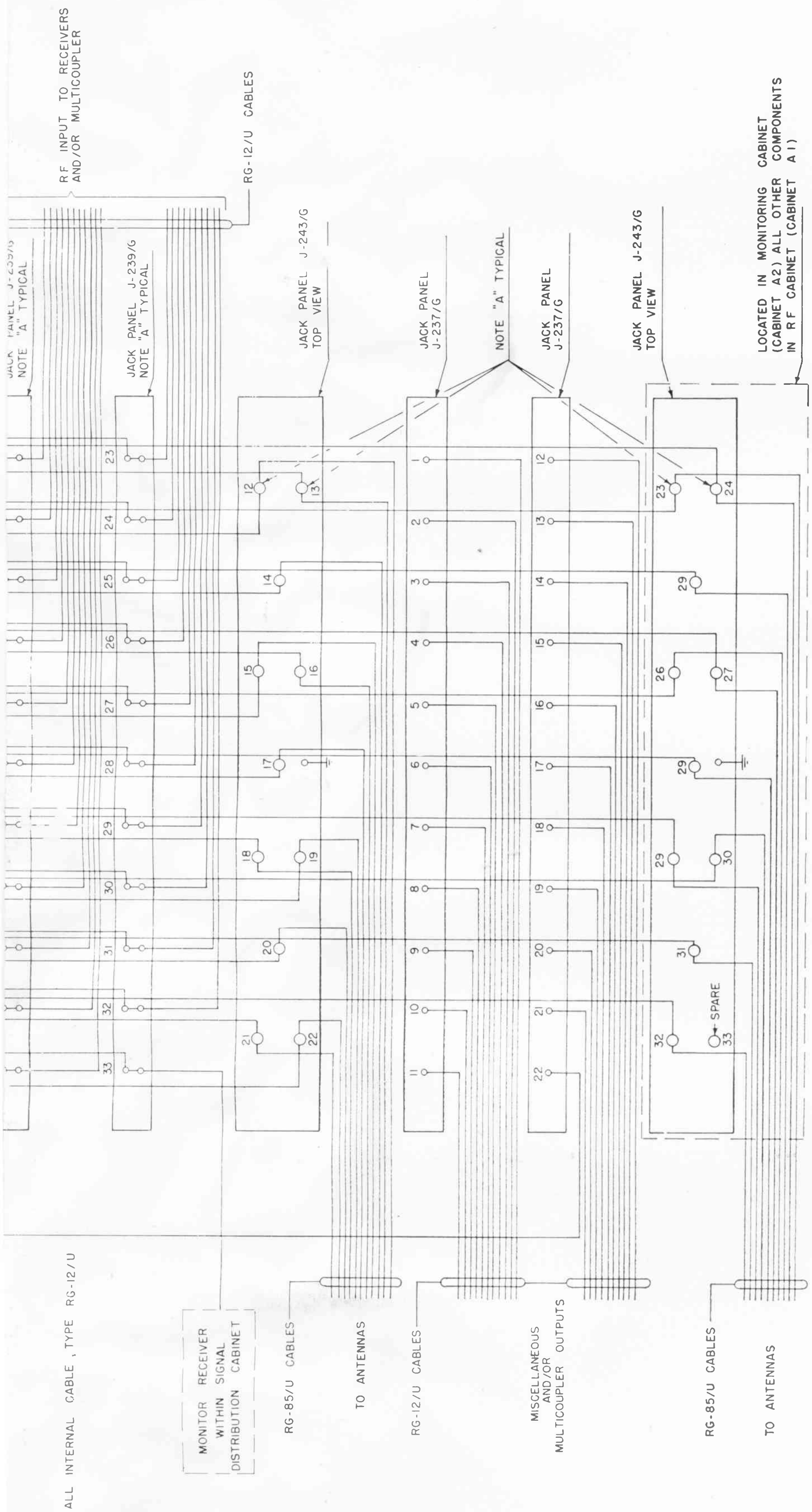
NOTE "B" SINCE TYPES "A", "B" AND "C" UNITS ARE IDENTICAL EXCEPT IN THE NUMBER OF CIRCUITS, THIS DRAWING SERVES FOR ALL TYPES.



BLOCK DIAGRAM

Type 2-40. Typical Connection Diagram, AF Section


SWITCH PANEL
SA-137/G
NOTE "A" TYPICAL
JACK PANEL J-243/G
TOP VIEW
JACK PANEL
J-238/G
JACK PANEL J-239/G
NOTE "A" TYPICAL
JACK PANEL J-239/G
NOTE "A" TYPICAL
JACK PANEL J-239/G
NOTE "A" TYPICAL
RF INPUT TO RECEIVERS
AND/OR MULTICOUPLER
TO
OHMMETER ZM-1/U
RG-85/U CABLES
TO ANTENNAS
ALL INTERNAL CABLE, TYPE RG-12/U
MONITOR RECEIVER
WITHIN SIGNAL
DISTRIBUTION CABINET



NOTE "A" MARKER NUMBERS TO BE ADDED AROUND CABLES BY INSTALLATION ACTIVITY, TO CORRESPOND WITH NUMBERS SHOWN ON DRAWING, E Z CODE MARKERS OR EQUIVALENT

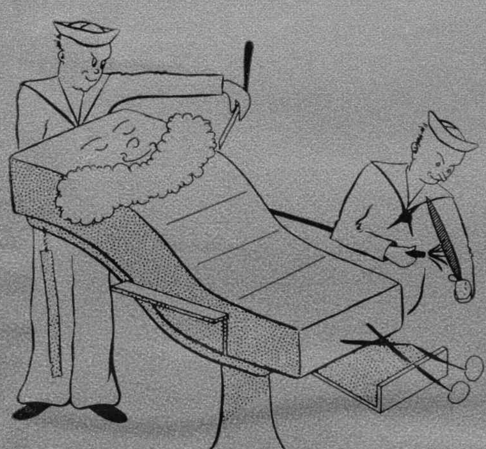
NOTE "B" SINCE TYPES A, B AND C UNITS ARE IDENTICAL EXCEPT IN THE NUMBER OF CIRCUITS, THIS DRAWING SERVES FOR ALL TYPES.

Figure 2-41. Typical Connection Diagram, RF Section

Navships 91047

Maintenance

Section 3



Signal Distribution System
(AF and RF)

Restricted

FAILURE REPORTS

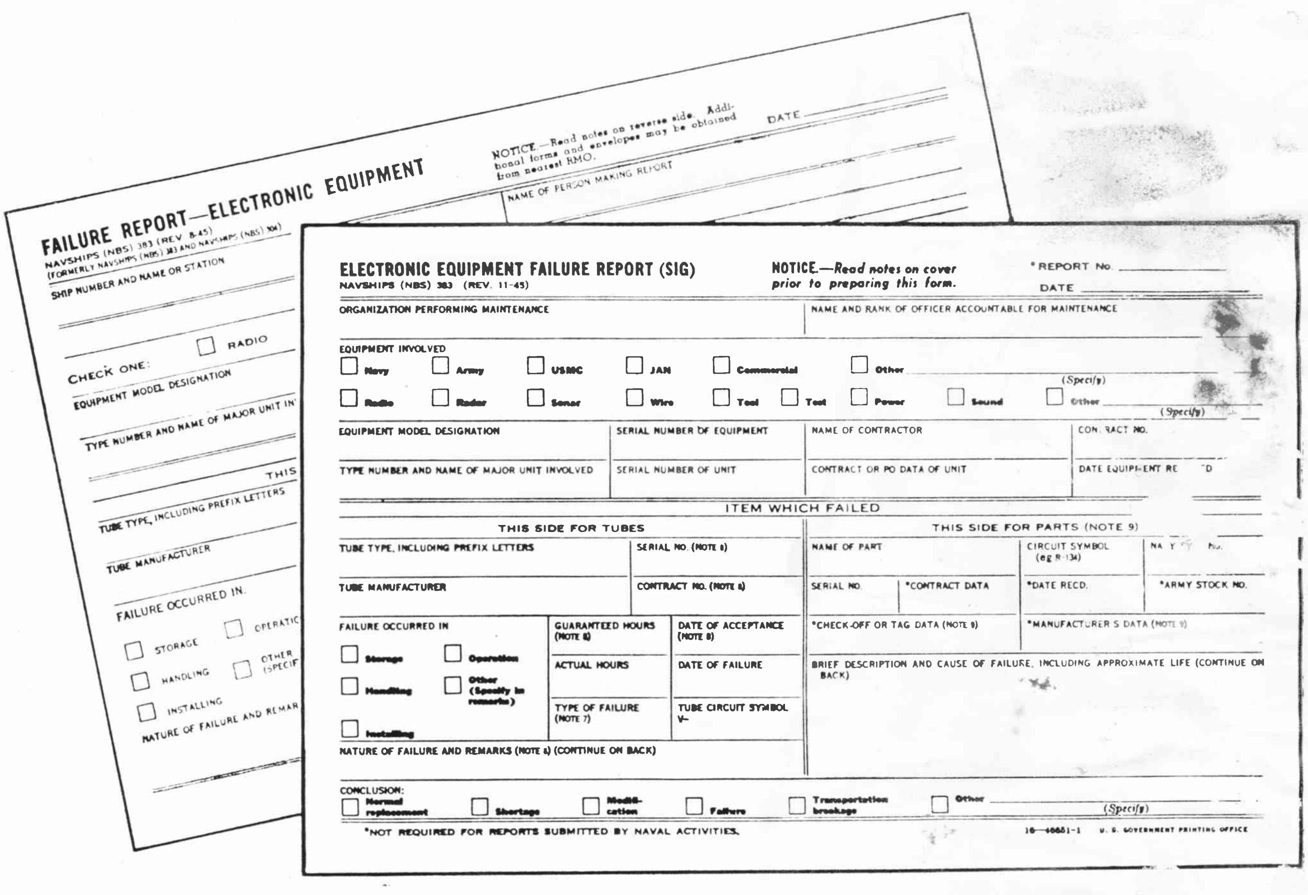
A FAILURE REPORT must be filled out for the failure of any part of the equipment whether caused by defective or worn parts, improper operation, or external influences. It should be made on Failure Report form NBS-383, which has been designed to simplify this requirement. The card must be filled out and forwarded to BUSHIPS in the franked envelope which is provided. Full instructions are to be found on each card.

Use great care in filling the card out to make certain it carries adequate information. For example, under "Circuit Symbol" use the schematic drawings, such as T-803, in the case of a transformer, or R-207, for a resistor. Do not substitute brevity for clarity. Use the back of the card to completely describe the cause of failure and attach an extra piece of paper if necessary.

The purpose of this report is to inform BUSHIPS of the type and rate of failure. The information is used by the Bureau in the design of future equipment and in the maintenance of adequate supplies to keep the present equipment going. The cards you send in, together with those from hundreds of other ships, furnish a store of information permitting the Bureau to keep in touch with the performance of the equipment of your ship and all other ships of the Navy.

This report is not a requisition. You must request the replacement of parts through your Officer-in-Charge in the usual manner.

Make certain you have a supply of Failure Report cards and envelopes on board. They may be obtained from any Electronics Officer.



Failure Report, Sample Form

SECTION 3
MAINTENANCE

WARNING

Voltages sufficient to cause injury or death are present in the equipment. Make sure that all power is secured before working inside the cabinets.

1. OPERATOR'S MANTENANCE.

NOTICE TO OPERATORS

Operators shall not perform emergency maintenance procedures except upon specific authorization from proper authority.

a. CLEANING.—The operator is responsible that the Signal Distribution Unit is kept shipshape. The exterior should be dusted off daily and any damaged paint touched up with grey paint Navy Specification #52E4. Use a dry cloth or foxtail, but do not use a damp cloth unless all circuits are secured. DON'T MAKE YOURSELF A GROUNDING LUG! If the equipment is secured for sufficiently long periods, clean out the interior with a vacuum device or foxtail. Brush out particularly the rear of jack panels, terminal boards and the ventilation screens in the top and door. Check all terminal screws and connectors for tightness. Inspect for loose spades, damaged insulation, or disconnected grounding leads. But if the power cannot be secured keep completely outside of the cabinet. The dust may be blown out with compressed air if due care is exercised that contact with conductors is avoided.

b. FUSES.—The operator must replace fuses when the occasion arises. The only fuses in the equipment, except those in the electronic components which are Government furnished, are in the primary power distribution panel SA-134/G (see figure 3-1). If a fuse blows the most probable cause is excessive starting current caused by several electronic components being started at once. Turn off all components connected to the convenience strip and outlets and install a new fuse. Turn on the components one by one. If the fuse blows again, it will be easy to tell which component is causing the overload.

WARNING

Never replace a fuse with one of higher rating unless continued operation of the equipment is more important than probable damage. If a fuse burns out immediately after replacement, do not replace it a second time until the cause has been corrected.

c. VENTILATION.—The cabinets are equipped with adjustable louvers on the top and the rear door which regulate the circulation of air. In cold climates, the openings should be decreased to prevent slow warm-up of the electronic components. In warm climates, the louvers should be opened to prevent overheating. The airscreens over the louvers must be kept free from dust which would restrict circulation of air.

2. PREVENTIVE MAINTENANCE.

Preventive maintenance is a systematic series of operations performed at regular intervals on equipment to eliminate unnecessary interruptions in service, and to keep the equipment operating at top efficiency. The function of preventive maintenance is to locate and repair minor malfunctions, thereby eliminating extensive repairs which might interrupt communication at some vital time. The entire system of radio communication demands that each receiver be operating efficiently when needed. Since the Signal Distribution Unit is a vital part of the communication system, the importance of preventive maintenance cannot be over-emphasized.

NOTE

THE ATTENTION OF MAINTENANCE PERSONNEL IS INVITED TO THE REQUIREMENTS OF CHAPTER 67 OF THE BUREAU OF SHIPS MANUAL, OF THE LATEST ISSUE.

a. INSPECTION.—Inspection is the most important operation in the preventive maintenance program. Inspection consists of carefully observing all parts of the equipment noticing color, placement, state of cleanliness, etc. Inspect for the following conditions:

WARNING

Be sure that the primary power switch (see figure 3-1) is turned off to prevent injury or death before conducting the following maintenance procedures. Since the AF and RF conductors carry only very small currents, it is safe to work inside the cabinets without securing operations completely.

(1) OVERHEATING.—Indicated by discoloration, blistering or bulging of the parts, leaking of insulating compounds, and oxidation of metal contact surfaces. Replace as necessary all parts found defective.

(2) PLACEMENT.—Observe that all leads and cables are in their correct position, laced, and secured properly. Replace and secure as necessary.

(3) CLEANLINESS.—Carefully clean all recesses in the cabinets, especially between connecting terminals on terminal boards. Parts, connections, and joints should be free of dust, corrosion, and other foreign matter. In tropical and high humidity locations, look for fungus growth and mildew. Retropicalize wherever growth is found as described in paragraph 2, b (9) of this section.

(4) TIGHTNESS.—Test all connections and mountings for looseness. Tighten all loose terminals and redress or resolder all defective lugs and connectors.

CAUTION

Screws, bolts, nuts, and cable connectors should not be tightened carelessly. Fittings tightened beyond the pressure for which they are designed may be damaged or broken.

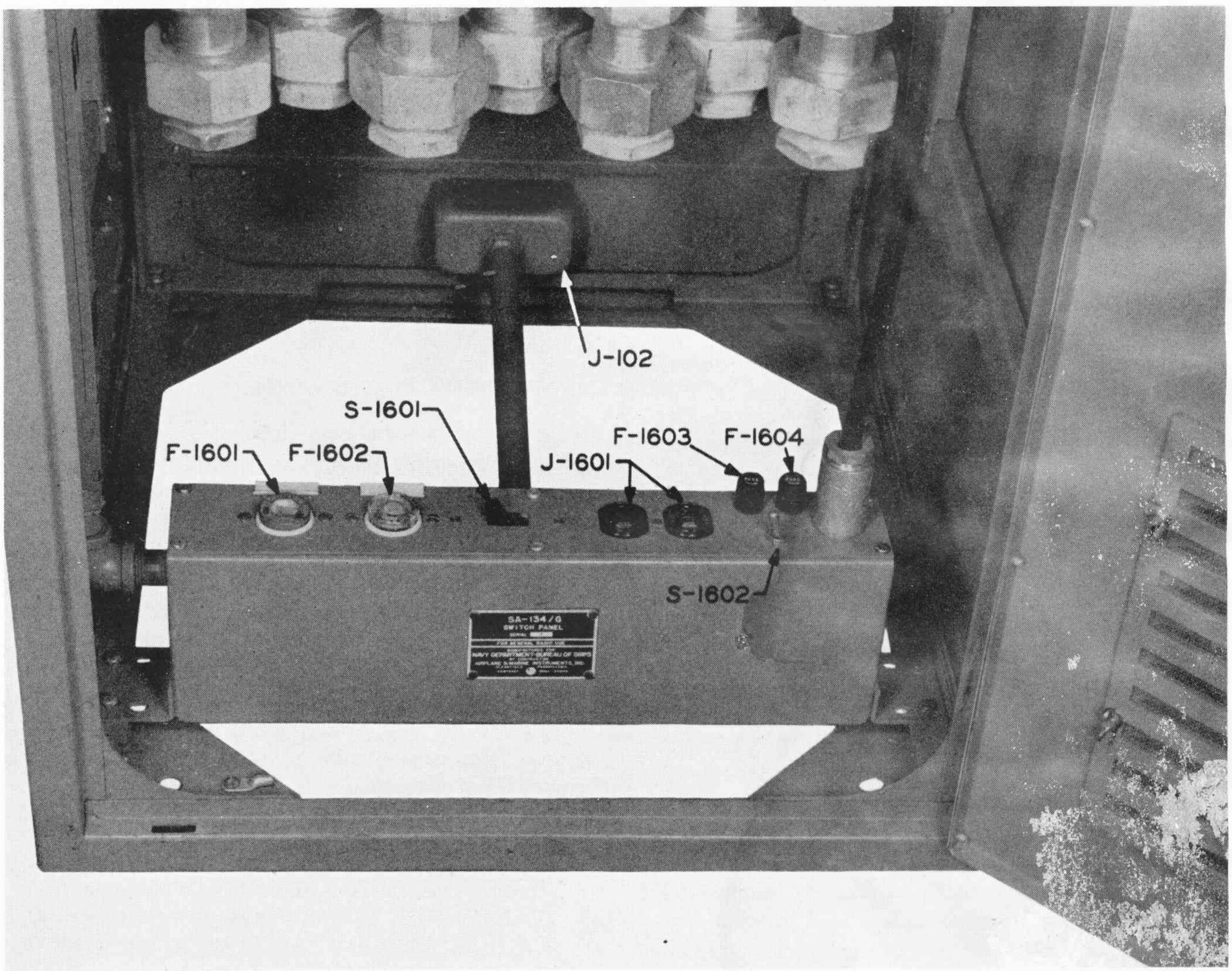


Figure 3-1. Fuse Locations in Primary Power Distribution Panel SA-134/G

b. ROUTINE TESTS AND CHECKS.—In order to reduce maintenance cost and time to a minimum, and to insure continuous, uninterrupted service, certain tests and procedures are of great value in determining the condition of components. This makes possible the correction of defects before they become serious enough to necessitate major repairs and interruption of communications.

(1) INSULATION TESTS.—Make regular periodic insulation tests of all circuits and record the results for future reference.

(2) GROUND TESTS.—Make regular periodic ground tests of all circuits and record results for future reference.

(3) VENTILATOR SCREENS.—In order to insure proper air circulation within the cabinets, keep the ventilator screens clean and free of dust.

(4) GROUND CONNECTIONS.—Inspect ground connections at frequent intervals and insure that connections are tight and properly made.

(5) ELECTRONIC COMPONENTS.—The care and testing of electronic components is covered fully in the manufacturer's instruction books. Perform all test procedures as required.

(6) AF PATCHCORDS.—The AF patchcords are susceptible to loose connections and shorts if not properly maintained. They should be inspected and tested monthly as follows:

(a) Inspect contact tips to insure that they provide a good contact surface. Polish with chamois if corrosion is noted.

(b) Tighten screw terminals and inspect for broken parts or frayed insulation.

(c) Make ground and insulation tests.

(7) GROUNDING OF SHIELDS.—If shielding around conductors is not grounded, "cross-talk" may occur. Connect one probe of the ohmmeter to the common ground and check all shields with the other probe. All should be grounded.

(8) TROPICALIZATION.—All components and parts of the Signal Distribution Unit which would be damaged by fungus growth are treated with a moisture and fungus resistant varnish. This treatment is intended to accomplish the following:

(a) To render the surfaces moisture resistant.

(b) To envelop terminals and connections with a low moisture absorbing film, thereby minimizing surface electrical leakage and arc-overs.

(c) To retard the absorption of moisture.

(d) To aid in retarding corrosion.

(e) To prevent the growth of fungi.

(9) RE-TROPICALIZATION.—This equipment is treated in accordance with proposed joint Army-Navy specification JAN-T-132, "General Process for Replacement and Fungus Resistant Treatment of Communications, Electronic and Associated Electrical Equipment." When making replacement, the component part or parts and soldering must be treated with a coating (brushed or sprayed) of fungus-resistant varnish or lacquer in accordance with JAN-T-152. A good example of a suitable fungicide varnish is "Tuf-On" #74 FM which is used in the the tropicalization of this equipment. The following quotations from JAN-T-152 are the essential points that apply:

"C-1. MATERIAL.—The coating materials used shall meet the requirements of Signal Corps Tentative Specifications 72-84—Navy Department Specification 52C35 (Proposed JAN-C-173) . . . "

"D-1a. COVERAGE.—The coating material shall be applied thoroughly and completely over all surfaces, circuit elements (resistors, capacitors, coils, etc.), all surfaces supporting circuit elements, interconnecting wiring and connections unless such applications will interfere with the operation and performance of the equipment . . . "

"D-1b. MASKING.—The coating material shall not be applied to any surface or parts where such application will interfere with the operation or performance of the equipment. The following are examples of surfaces which are not to be treated by the method specified herein:

(1) Contact portion of . . . connectors, fuses, jacks, . . . plugs, . . . sockets, switches . . . .

(2) Surfaces which rub together for electrical or magnetic contact such as those in . . . shields . . .

(3) Mechanical parts such as . . . glass (meter) . . .

(4) Components, parts and materials such as . . . painted, lacquered or varnished exterior surfaces . . . plugs, plug-connectors, tube sockets, etc., (pins, mating surfaces and threads) . . . "

"D-1c. The following need not be coated; however, if the operation and performance of the equipment is not undesirably affected, no precaution need be taken to prevent coverage, except that dripping thereon shall be prevented:

Cable, wire, braids, and jackets whose outside surface is of rubber or vinylite type composition, (not flexed in normal operation) . . . painted, lacquered, or varnished interior surfaces . . . parts made of, or plated with . . . nickel . . . electron tubes (avoid direct application to envelopes) . . . "

"D-2. PREPARATION FOR TREATMENT.—The parts, circuit elements, etc., shall be exposed so that the coating shall be applied effectively and completely over all surfaces to be treated . . . "

"D-2a. Cleaning.—All surfaces of parts to be coated shall be sufficiently clean so that they are free from dirt, oil, grease or other foreign matter which could interfere with the adherence or proper functioning of the material. All readily visable deposits of the rosin shall be cleaned off as much as practicable by scrapping, chipping, etc. Joints with no readily visable deposits of rosin need not be cleaned. The use of solvents such as alcohol or acetone is not advisable as it tends to spread a thin coat of rosin over a large area."

"D-2b. DRYING OF EQUIPMENT.—The coating material shall be applied only on dry surfaces. In no case shall the coating materials be applied on wet or damp materials with moisture on their surfaces . . . "

WARNING

The Anti-fungus agent is poisonous. Do not inhale fumes and avoid contact with the skin until the material is dry.

c. CORRECTIVE MAINTENANCE.—Corrective Maintenance includes location, isolation, and repair of failures of the equipment which affect its operating characteristics. This section contains information to aid personnel in locating and correcting trouble. Proper maintenance of equipment will do much to prevent and minimize failures of the equipment. To assist personnel in Corrective Maintenance, the Signal Distribution Units are equipped with electronic components which will readily detect failures or abnormal conditions. The instruments include the Navy Model ZM-1/U Ohmmeter, the Navy Model OBQ-4 Volt-Ohm-Milliammeter, Navy Model OBL-3a Oscilloscope, etc. The operation and use of these instruments is fully covered in the applicable instruction books listed in Tables 1-4 to 1-6 inclusive.

A trouble light for use when working in the cabinets, and convenience outlets for soldering irons, electric drills, etc., are included in each cabinet.

(1) WIRING.—In the Signal Distribution Units one of the more probable sources of trouble is the internal wiring. The most common troubles in the wiring are as follows:

(a) GROUNDED OR PARTIALLY GROUNDED CIRCUITS.—A circuit which is grounded is a circuit in which one or both sides of the circuit make contact with the ground, i. e., the electrical ground. A ground on one side of a circuit does not necessarily make the circuit inoperative, but should another ground develop on the opposite side of the line, the circuit will fail. It is therefore essential that grounds be cleared as soon as possible after they are detected.

Grounded cables are readily detected by the use of an ohmmeter. The ohmmeter is more suitable than a bell or light testing apparatus, as it will detect partial grounds; whereas the other devices will show, at best, a dead ground, i. e., zero resistance to ground. To detect a ground, put one ohmmeter test lead in contact with the cabinet frame, which is ground. Test each conductor individually with the other test lead noting the deflection of the ohmmeter pointer indicating the relative leakage to ground. Sections of AF cables showing a resistance of less than 5 megohms to ground should be repaired or replaced as necessary.

NOTE

AF lines must be disconnected from receivers and other apparatus in order to make this test.

The Signal Distribution System includes an Ohmmeter Navy Model ZM-1/U and a Volt-Ohm-Milliammeter Navy Model OBQ-4 which aid the technician in maintaining the equipment. They are fitted with suitable adapters so that they may be patched into both the AF and RF circuits for testing. The operation of these components is described in instruction books listed in tables 1-4, 1-5, and 1-6.

(b) GROUNDS IN THE AF SECTION.—A ground in the AF section may develop as a result of insulation breakdown between the conductors in the cable and the shield which is grounded. Another possibility is grounding of a conductor to the cabinet frame as a result of some mechanical derangement. Test with Navy Model ZM-1/U ohmmeter or OBQ-4 Volt-Ohm-Milliammeter. See note at end of paragraph 2*c* (1) (*a*) of this section.

(c) GROUNDS IN THE RF SECTION.—A ground or short to ground in the RF section will probably develop as a result of failure of the dielectric in the coaxial cable or failure of the insert in a coaxial fitting. RF cables or fittings showing a resistance of less than 50 megohms to ground should be replaced as necessary to clear fault. The coaxial jacks on the Navy Model ZM-1/U ohmmeter permit the use of patchcords in the testing of RF cable.

(d) SHORTED OR CROSSED CIRCUITS.—A short circuit condition exists when two sides of a circuit at a potential difference are brought directly into electrical contact. In the AF section of the Signal Distribution Units a short circuit will most likely cause loss of power to the load circuits from the input source. To detect a short in a cable, apply an ohmmeter between the two insulated conductors. A low resistance reading indicates a short circuit. In most cases shorted cables must be replaced with new cables

rather than repaired. See note at end of paragraph 2, c (1) (a) of this section.

In the Primary Power Distribution System a short circuit will blow the line fuses. Corrective measures consist of location and correction of the fault and re-fusing of the circuit before operation is resumed.

(e) OPEN CIRCUITS.—An open circuit exists when continuity through a conductor is broken. Most open circuits are caused by the conductor actually breaking and thereby interrupting the electrical path. Open circuits are detected by use of an ohmmeter applied to the opposite ends of the same conductor in a cable. An open circuit will show up as infinite resistance through the conductor. Open circuits are evidenced by loss of output power in a connected circuit.

(f) IMPROPERLY GROUNDED SHIELD IN AF SECTION.—If the metal braid shielding is not tied to the common ground, interaction between receiviers may occur. This condition is usually the cause of "cross-talk" between adjacent circuits. Locate ungrounded shields with an ohmmeter and correct by proper grounding.

(g) IMPROPERLY GROUNDED SHIELD IN RF SECTION.—If the shields in the RF section are not properly grounded, the effects are not as noticeable as in the AF section. Voltages may be set up in the shields, however, which may effect the attenuation characteristics of the line and cause high noise level. Check frequently and reground as necessary.

(2) ANTENNA SELECTOR SWITCH, TROUBLE SHOOTING.—The Antenna Selector Switch is the most complicated component of the Signal Distribution Unit and consequently is the most susceptible to trouble. It should be tested monthly for mechanical action, continuity, and grounds.

(a) ONE POSITION FAULTY.—This indicates that one of the stationary contacts is faulty.

(b) EVERY SECOND POSITION FAULTY. This will occur only on the 40 and 60 position sizes. This usually indicates that the contact on one end of the rotor arm is defective.

(c) ALL POSITIONS FAULTY.—Center (common) contact is usually defective. Since the 20 position switch has only one rotor contact, it may also cause the whole switch to be inoperative.

(d) ONE WHOLE SEGMENT INOPERATIVE.—If several adjacent contact positions are faulty, suspect that the axis of the rotor is not perpendicular to the plane of the contact ring.

(e) OPERATION INTERMITTENT ON ALL POSITIONS.—This indicates that the detent mechanism is not holding the rotor in the contact position. Rotate the knob to see that the detent action is positive and that the shaft is not sticky, thus preventing it from returning to its proper position. See if continuity can be restored by moving the knob.

(f) HIGH NOISE LEVEL IN A PARTICULAR CIRCUIT.—This usually indicates that the ground contacts are faulty.

(3) ANTENNA SELECTOR SWITCH, CORRECTIVE ACTION.

(a) If only one contact position is defective, it may usually be repaired without removing the switch from the Signal Distribution Unit. The most likely cause is insufficient interference between the stationary contact and the spring loaded contact on the Rotor.

Loosen the locking nut (see figure 3-3) and tighten the Connector Navy Type -49191 until it is handtight. DO NOT USE A WRENCH OR THE INSULATING WASHER WILL BE DAMAGED. Tighten the Locking Nut with a wrench and check the continuity. If this does not correct the trouble, remove the Connector from the equipment. The Contact and Insulating Washer should come out with it. Inspect for corrosion and damage. Clean with chamois and replace parts as necessary. Insure that there is good contact between contact E-202A and the contact sleeve of the Connector. Replace the Insulator E-202C if it is cracked or deformed. Screw Connector securely into the rear of the Contact Ring and re-check. This should correct the trouble.

(b) If all contact positions are inoperative, suspect the center contacts. Loosen the Locking Nut on the center Connector J-201 and screw the Connector in until it is handtight. Tighten the Locking Nut. If this does not correct the discontinuity, remove the Connector and inspect contact. Clean with chamois or replace as necessary. Insert a pair of long-nose pliers through the hole left by the removal of the center Connector and carefully pull out the contact E-202A. Clean or replace as necessary. If spring O-202 has become weak, remove it in the same manner and replace. Replace the contact E-202A and press it in with the index finger to see that the spring O-202 is loading it sufficiently to insure positive contact. Reassemble and test again. If this does not correct the trouble, the whole switch must be removed and disassembled for repairs.

(c) All other troubles require that the switch be removed from the equipment. Proceed as follows:

1. Tag all cables and disconnect them.

2. Remove the Control Knob.

3. Remove the eight screws on the rear Connector Plate which hold the switch in the Switch Cover

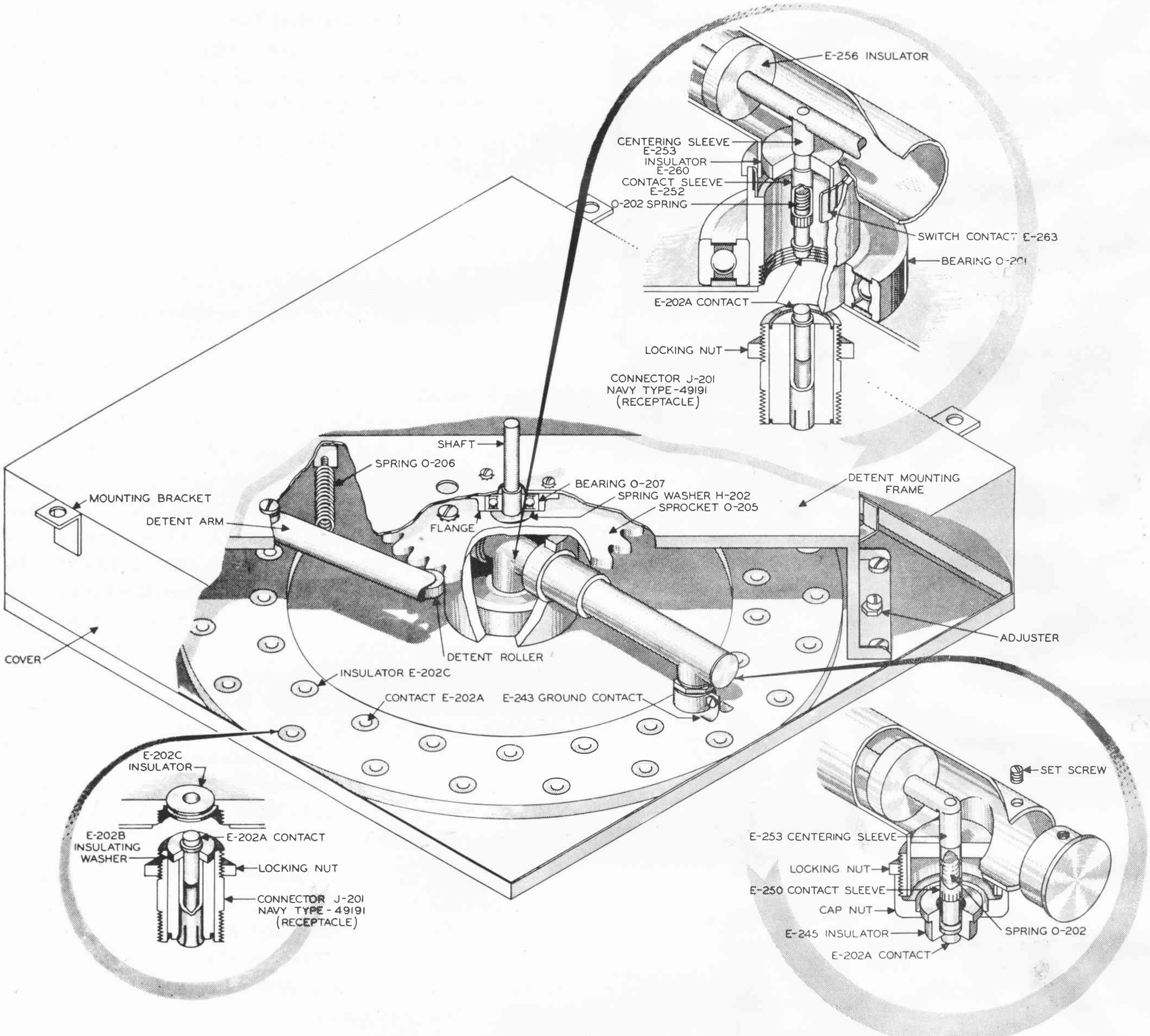


Figure 3-2. Antenna Selector Switch AN Type SA-140/U, Cutaway

Box and pull out the whole switch. The front panel may be left in place if desired. Do not remove Switch Cover Box from panel.

(d) If every second switch position is faulty, one of the end rotor contacts is defective. Rotate the switch slowly noting whether both contacts are making with the stationary contacts. There should be at least 0.010″ interference between the stationery rotor and the contacts to insure positive contact. Check with a feeler gauge to see that the rotor contacts have a clearance of at least 0.020″ from the Contact Ring when they are between the stationary contacts or they will ground the circuit. Adjust by loosening the Locking Nut on the Rotor Contact Arm (see figure 3-4) and rotate the Cap Nut to give the proper clearance. Inspect the Insulator for damage or dirt which might cause an RF ground. Insure that the grounding contact is applying a positive pressure against the Contact Ring.

(e) If the rotor contact or insulator require replacement, the Detent Mounting Frame must be removed to allow removal of the cap nut. Remove the three screws on each end of the Detent Mounting Frame and lift off the Detent Mounting Frame. The Rotor is now free and may be also lifted out. The end rotor contacts are now acccessible. Reassemble in the same manner, making sure that the center contact does not drop out of the contact sleeve during reassembly. Adjust the position of the Detent Mounting Frame as described in paragraph 2, *c* (3) *(f)* below.

(*f*) If several adjacent contacts fail to make connection while the rest make properly, the axis of rotation of the Rotor is not perpendicular to the plane of the Contact Ring. This slight misalignment may be corrected by loosening the Adjuster and Detent Frame Mounting screws and rotating the Adjuster Nuts (see figure 3-2). Loosen screws on both ends of the Detent Mounting Frame when making adjustments to either end. The Adjuster Nut is merely an insert with an off center hole which may be rotated to move the Detent Mounting Frame slightly. Use a cut and try procedure until the arms make contact all the way around. Tighten all three screws on both ends of the Detent Mounting Frame, being careful not to upset the adjustment.

(*g*) If the switch will not establish proper continuity with the Detent in its normal position but will establish continuity if the Control Knob is held at some other position, the Detent mechanism is not stopping the Rotor at the correct contact position. If the action is positive and pressure must be applied to hold the rotor arm in any other position, loosen the two screws which secure the Sprocket O-205 in place and move the Contact Arm in relation to the Sprocket until proper contact is made. Tighten the screws to lock the arm in relation to the Sprocket. If the Rotor may be made to stop at any position other than the point of positive detent action, check to see that the shaft is not binding. If the bearing is sticky, replace it with a bearing from spare parts. If the shaft is free but the detent action is not positive, adjust the Detent Spring O-206 to apply greater pressure and insure that the detent roller turns freely and that the sprocket teeth are free from corrosion. If necessary apply one drop of Navy Type 2075 oil to the Detent Arm pivot and the axle of the Detent Roller.

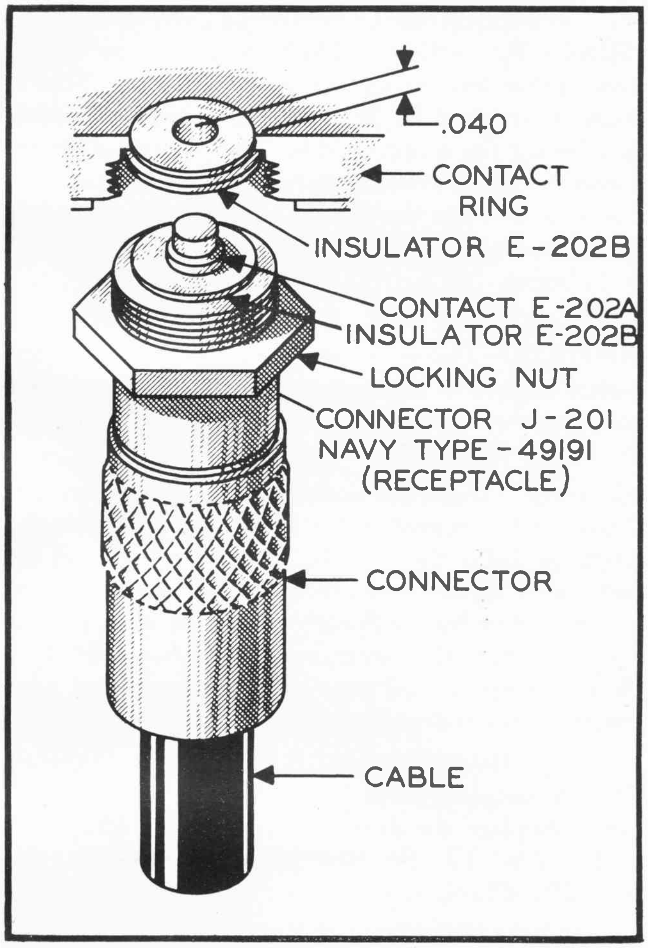


Figure 3-3. Stationary Contact Partially Removed From Contact Ring

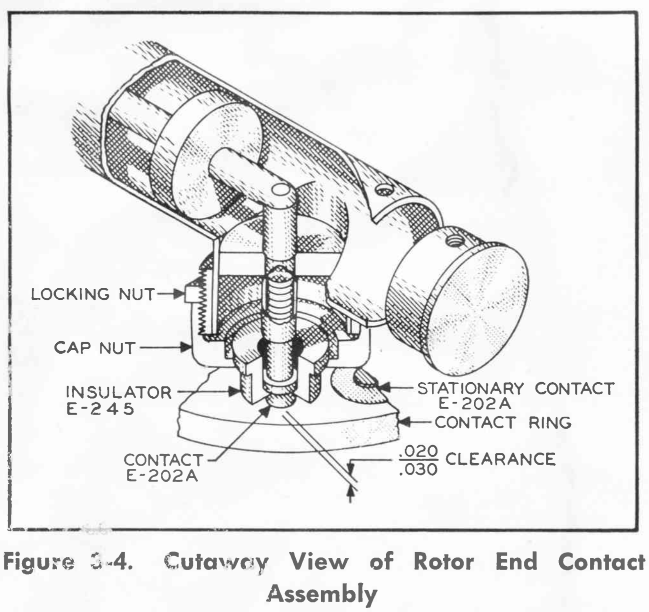


Figure 3-4. Cutaway View of Rotor End Contact Assembly

(4) AF SELECTOR SWITCH NAVY TYPE CSM-241259, TROUBLE SHOOTING.—The following troubles may develop in the AF selector switch during extended operation of the equipment (see figure 1-19).

(*a*) SHORT CIRCUITS.—The most likely cause of short circuits is contact between adjacent connection screws on the rear of the switch. The screws are necessarily spaced rather closely due to the small space available so the spade lugs may touch each other. This trouble may usually be located visually. Shorts are not likely to develop in the actual switch wiring unless the wiring is burned up by excessive currents or mechanically damaged.

(*b*) HIGH CONTACT RESISTANCE.—This may be caused by burned or dirty contacts. The sliding inner contact surface is particularly susceptable to grease which may be wiped inside from the detent mechanism. Clean contacts with carbon tetrachloride or chamois as required.

(c) LACK OF CONTINUITY ON ALL POSITIONS.—This will most likely be caused by insufficient spring tension on the rotor contacts. This is easily determined by lifting up on the rotor contact thus feeling the spring tension. If there is insufficient tension to cause contact, remove the spring and bend it so as to increase the tension and replace. This may also be caused by improper detent action as described in (5) below.

(d) LACK OF CONTINUITY ON ONE POSITION.—This is caused by a broken lead. The easiest method of repair is to utilize one of the spare positions.

(e) IMPROPER DETENT ACTION.—This may cause intermittent continuity through the switch. If moving the control knob slightly restores continuity, this is probably the trouble. Wash the ball and detents with carbon tetrachloride and apply a small quantity of Ordnance Specification 1350 grease to the detent. Rotate the switch several times to distribute the grease evenly and wipe off all grease except what remains in the indentations.

(f) WAFERS MECHANICALLY DAMAGED.—A complete wafer (S-1001A) is provided in spare parts. Replace the damaged wafer and solder in all leads. TAG LEADS BEFORE REMOVING OLD WAFER. Check continuity!

(5) RF JACK SWITCH NAVY TYPE CIA-491388. The most likely trouble in the RF Jack Switch Navy Type CIA-491388, which mounts in Jack Panel AN Type J-239/G, is faulty contacts. The only other likely trouble is that the movable portion may not return to its original position when the RF patchcord is removed. If an RF Jack Switch is defective, remove it from the Jack Mounting Strip AN Type J-239/G by disconnecting the two cables on the rear and unscrewing the RF fitting which secures it in place (see figure 1-9). Take off the cover and inspect. Clean and adjust the contacts as necessary. If the contacts are damaged so that they require replacement parts, install a new Jack Switch and turn the defective unit into a depot for repairs. If the movable position does not return to its normal position to re-establish the "normal through" circuit, see whether the spring is applying sufficient tension. Inspect to see if foreign matter has accumulated in the movable parts. Disassemble and clean parts with carbon tearachloride and reassemble. If the parts are damaged, replace the whole Jack Switch.

(6) CONNECTOR-ADAPTERS NAVY TYPE CIA-491652.—RG-85/U cable has a tendency to "breath" thus sucking in moist air which will eventually cause the cable to fail. The Connector-Adapters Navy Type CIA-491652 is designed to be airtight if properly fabricated and thus seal the end of the RG-85/U cable. New gaskets are provided in spare parts. See figure 2-1 for an exploded view of the Connector-Adapter.

Navships 91047

Parts List

Section 4

Signal Distribution System (AF and RF)

Restricted

TABLE 4-1. WEIGHTS AND DIMENSIONS OF SPARE PARTS BOX

EQUIPMENT SPARES (One Box For Each Type Unit)											STOCK SPARES (No Metal Box Used)					
	UNCRATED					CRATED										
EQUIPMENT TYPE	OVERALL DIMENSIONS			VOLUME (Cu Ft)	WEIGHT (lbs)	OVERALL DIMENSIONS			VOLUME (Cu Ft)	WEIGHT (lbs)	SPARE PARTS BOX	OVERALL DIMENSIONS			VOLUME (Cu Ft)	WEIGHT (lbs)
	HEIGHT (In)	WIDTH (In)	DEPTH (In)			HEIGHT (In)	WIDTH (In)	DEPTH (In)				HEIGHT (In)	WIDTH (In)	DEPTH (In)		
A	12	36	15	3.8	125	15.5	41.5	19.5	7.2	181	1	16.5	32	21.5	6.6	142
B	15	24	15	3.1	100	18	30	19.5	6.0	146	2	16	42.5	23	8.8	236
C	12	24	16	2.5	69	14.5	30	19.5	4.9	110	3	16	42.5	23	8.8	236
											4	16	42.5	23	8.8	236
											5	16	42.5	23	8.8	236
											6	15	51.5	21	9.1	220
											7	15	37.5	22	6.9	166
											8	12.5	48.5	14.5	5.1	130

TABLE 4-2. LIST OF MAJOR UNITS

SYMBOL GROUP	QUANTITY PER UNIT: UNIT "A" BY CABINET NOS. 1, 2 & 3 #1	UNIT "A" #2	UNIT "A" #3	UNIT "B" BY CABINET NOS. 1 & 2 #1	UNIT "B" #2	UNIT "C" BY CAB. #1	MISCELLANEOUS "M"*	NAME OF MAJOR UNIT	AN OR NAVY TYPE DESIG.
								NAVY SIGNAL DISTRIBUTION UNIT, RF AND AF UNITS "A", "B" AND "C" CONSISTING OF:	
101 - 199	1	1	1	1	1	1	X	CABINET	CY-597/G
201 - 299	1			1			X	SWITCH PANEL	SA-137/G
301 - 399	3			2		1	X	JACK PANEL	J-238/G
401 - 499	3			2		1	X	JACK PANEL	J-239/G
501 - 599	2			1		1	X	JACK PANEL	J-237/G
601 - 699		1			1	1	X	SPEAKER ASSEMBLY	LS-139/G
701 - 799		1		1			X	JACK PANEL	J-265/G
801 - 899		1		1			X	MOUNTING	MT-571/G
901 - 999		1			1	1	X	SWITCH BOARD SHELF	FN-28/G
1001 - 1099			1		1		X	SWITCH PANEL	SA-135/G
1101 - 1199			6		5	2	X	JACK MOUNTING STRIP	-491394
1201 - 1299			2		2	1	X	PATCHCORD STORAGE PANEL	MX-814/G
1301 - 1399			2		2	1	X	RETAINER-PULLEY ASSEMBLY	MX-813/G
1401 - 1499			6		5	2		TERMINAL BOARD ASSEMBLY	J-242/G
1501 - 1599	3			2		1	X	JACK PANEL	J-243/G
1601 - 1699	1	1	1	1	1	1	X	SWITCH PANEL	SA-134/G
1701 - 1799	16			11			X	CONTROL	C-443/G
1801 - 1899							X	SWITCH PANEL	SA-136/G
1901 - 1999							X	SWITCH PANEL	SA-138/G

* Items marked X in this column supplied to Naval Stock for issue by BuShips.

TABLE 4-3. COMBINED PARTS AND SPARE PARTS LIST

PARTS											SPARE PARTS			
							TOTAL PER EQUIP.				EQUIP.		STOCK	
							UNIT							
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	MFGR. AND MFGR'S DESIG-NATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	A	B	C	M	BOX	QUAN.	BOX	QUAN.
A-101	PANEL: blank; aluminum, gray enamel finish; rectangular, 19" lg x 1 3/4" wd x 3/16" thk overall; four 1/4" wd x 29/64" lg slots for mtg located on 18 1/4" x 1 1/4" mtg/c.	Blank Panel, Unit "A", Cabinet #2		CIA	B-6867, Gr. 1	A-101, A-102, A-103, A-104, A-105*, A-106*, A-107*, A-108*, A-109*, A-110*, A-111*, A-112*, A-113*, A-114*	5	6	3	X		0 0 0 0		0 0 0 0
A-102	PANEL: Same as A-101.	Blank Panel, Unit "B", Cabinet #2												
A-103	PANEL: Same as A-101.	Blank Panel, Unit "B", Cabinet #2												
A-104	PANEL: Same as A-101.	Blank Panel, Unit "C", Cabinet #1												
A-105*	PANEL: Same as A-101.	General Purpose Panel Unit "A"												
A-106*	PANEL: Same as A-101.	General Purpose Panel Unit "A"												
A-107*	PANEL: Same as A-101.	General Purpose Panel Unit "A"												
A-108*	PANEL: Same as A-101.	General Purpose Panel Unit "A"												
A-109*	PANEL: Same as A-101.	General Purpose Panel Unit "B"												
A-110*	PANEL: Same as A-101.	General Purpose Panel Unit "B"												
A-111*	PANEL: Same as A-101.	General Purpose Panel Unit "B"												
A-112*	PANEL: Same as A-101.	General Purpose Panel Unit "B"												
A-113*	PANEL: Same as A-101.	General Purpose Panel Unit "C"												
A-114*	PANEL: Same as A-101.	General Purpose Panel Unit "C"												
A-115	PANEL: blank; aluminum, gray enamel finish; rectangular, 19" lg x 3 1/2" wd x 3/16" thk overall; four 1/4" wd x 29/64" lg slots for mtg located on 18 1/4" x 3" mtg/c.	Blank Panel, Unit "A", Cabinet #1		CIA	B-6867, Gr. 2	A-115, A-116, A-117, A-118, A-119, A-120*, A-121*, A-122*, A-123*, A-124*	5	3	2	X		0 0 0 0		0 0 0 0
A-116	PANEL: Same as A-115.	Blank Panel, Unit "A", Cabinet #1												
A-117	PANEL: Same as A-115.	Blank Panel, Unit "A", Cabinet #2												
A-118	PANEL: Same as A-115.	Blank Panel, Unit "A", Cabinet #3												
A-119	PANEL: Same as A-115.	Blank Panel, Unit "B", Cabinet #1												

*Supplied as Accessory

A-120*	PANEL: Same as A-115.	General Purpose Panel for Unit "A"												
A-121*	PANEL: Same as A-115.	General Purpose Panel for Unit "B"												
A-122*	PANEL: Same as A-115.	General Purpose Panel for Unit "B"												
A-123*	PANEL: Same as A-115.	General Purpose Panel for Unit "C"												
A-124*	PANEL: Same as A-115.	General Purpose Panel for Unit "C"												
A-125	PANEL: blank; aluminum, gray enamel finish; rectangular, 19" lg x 5 1/4" wd x 3/16" thk overall; four 1/4" wd x 29/64" lg slots for mtg located on 18 1/4" x 2 1/4" mtg/c.	Blank Panel, Unit "A", Cabinet #1		CIA	B-6867, Gr. 3	A-125, A-126, A-127, A-128, A-129*	2	2	1	X		0 0 0 0		0 0 0 0
A-126	PANEL: Same as A-125.	Blank Panel, Unit "A", Cabinet #1												
A-127	PANEL: Same as A-125.	Blank Panel, Unit "B", Cabinet #1												
A-128	PANEL: Same as A-125.	Blank Panel, Unit "B", Cabinet #1												
A-129*	PANEL: Same as A-125.	General Purpose Panel for Unit "C"												
A-130	PANEL: blank; aluminum, gray enamel finish; rectangular, 19" lg x 7" wd x 3/16" thk overall; four 1/4" wd x 29/64" lg slots for mtg, located on 18 1/4" x 4" mtg/c.	Blank Panel, Unit "A", Cabinet #1		CIA	B-6867, Gr. 4	A-130, A-131, A-132*, A-133*, A-134*, A-135*	3	2	1	X		0 0 0 0		0 0 0 0
A-131	PANEL: Same as A-130.	Blank Panel, Unit "A", Cabinet #1												
A-132*	PANEL: Same as A-130.	General Purpose Panel for Unit "A"												
A-133*	PANEL: Same as A-130.	General Purpose Panel for Unit "B"												
A-134*	PANEL: Same as A-130.	General Purpose Panel for Unit "B"												
A-135*	PANEL: Same as A-130.	General Purpose Panel for Unit "C"												
A-136	PANEL: blank; aluminum, gray enamel finish; rectangular, 19" lg x 8 3/4" wd x 3/16" thk overall; eight 1/4" wd x 29/64" lg slots for mtg, located on 1 3/4", 2 1/4", 1 3/4" x 18 1/4" mtg/c.	Blank Panel, Unit "C", Cabinet #1		CIA	B-6867, Gr. 5	A-136, A-137*, A-138*	1	1	1	X		0 0 0 0		0 0 0 0
A-137*	PANEL: Same as A-136.	General Purpose Panel for Unit "A"												
A-138*	PANEL: Same as A-136.	General Purpose Panel for Unit "B"												
A-139	PANEL: blank; aluminum, gray enamel finish; rectangular, 19" lg x 10 1/2" wd x 3/16" thk overall; eight 1/4" wd x 29/64" lg slots for mtg located on 2 1/4", 3", 2 1/4" x 18 1/4" mtg/c.	Blank Panel, Unit "A", Cabinet #3		CIA	B-6867, Gr. 6	A-139, A-140	1	1	0	X		0 0 0 0		0 0 0 0
A-140	PANEL: Same as A-139.	Blank Panel, Unit "B", Cabinet #2												

*Supplied as Accessory

TABLE 4-3. COMBINED PARTS AND SPARE PARTS LIST

PARTS											SPARE PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	MFGR. AND MFGR'S DESIG-NATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL PER EQUIP. UNIT A	B	C	M	EQUIP. BOX	EQUIP. QUAN.	STOCK BOX	STOCK QUAN.
A-141	PANEL: blank; aluminum, gray enamel finish; rectangular, 19" lg x 12 1/4" wd x 3/16" thk overall; eight 1/4" x 29/64" lg slots for mtg located on 1 3/4", 5 3/4", 1 3/4" x 18 1/4" mtg/c.	Blank Panel, Unit "A", Cabinet #3		CIA	A-6867, Gr. 7	A-141, A-142*	1	0	1	X		0 0 0 0		0 0 0 0
A-142*	PANEL: Same as A-141.	General Purpose Panel for Unit "C"												
A-143*	PANEL: blank; aluminum, gray enamel finish; rectangular, 19" lg x 14" wd x 3/16" thk overall; eight 1/4" wd x 29/64" lg slots for mtg located on 3 1/2", 4", 3 1/2" x 18 1/4" mtg/c.	General Purpose Panel for Unit "A"		CIA	A-6867, Gr. 8	A-143*	1	0	0	X		0 0 0 0		0 0 0 0
A-144	CASE: spare parts type; steel, gray enamel finish; 36" lg x 15" wd x 12" h; 2 folding type handles located on ends; hasp and staple for padlock; 2 snap type trunk latches for additional cover support.	Spare Parts Box for Unit "A"		Donnelly Electric Mfg. Co.		A-144	0	0	0	0		1 0 0 0	1	0 0 0 0
A-145	CASE: spare parts type; steel, gray enamel finish; 24" lg x 15" h; 2 folding type handles located on ends; hasp and staple for padlock; 2 snap type trunk latches for additional cover support.	Spare Parts Box for Unit "B"		Donnelly Electric Mfg. Co.		A-145	0	0	0	0		0 1 0 0	1	0 0 0 0
A-146	CASE: spare parts type; steel, gray enamel finish; 24" lg x 15" wd x 12" h; 2 folding type handles located on ends; hasp and staple for padlock; 2 snap type trunk latches for additional cover support.	Spare Parts Box for Unit "C"		Donnelly Electric Mfg. Co.		A-146	0	0	0	0		0 0 1 0	1	0 0 0 0
E-201	KNOB: round; black bakelite; for 1/4" shaft; double #8/32 set screws set at 120°; pointer type; 2" diam x 1 1/4" lg overall; brass insert; shaft hole 5/8" d; counterbored; Type "C", RE10F479B.	Switch Knob		CMI	C955A1036-7	E-201, E-1001, E-1801, E-1901	2	2	0	0		0 0 0 0		0 0 0 0
E-202A to E-241A	CONTACT, switch: tap switch point type; single "fasaloy" tipped contact (brass or copper backed), oval shaped contact, 0.187" diam x 0.021" thk; cylindrical, 0.218" diam x 0.500" lg overall; no mtg means provided.	Stator C[illegible]ntact for S-201		CIA	A-6783	E-202A to E-241A, E-242, E-247, E-248, E-249, E-1801A to E-1821A, E-1822, E-1825, E-1826, E-1901A to E-1961A, E-1962, E-1967, E-1968, E-1969	44	44	0	0	1A1 1J1	20 20 0 0	8R1	250 0 0 0
E-202B to E-241B	WASHER, flat: polystyrene; round 7/16" OD, 0.161" ID, 0.064" thk.	Insulating Washers for E-202A to E-241A		CIA	A-7199	E-202B to E-241B, E-1802B to E-1821B, E-1902B to E-1961B	40	40		0	1A7 1J6	21 21 0 0	8R2	100 0 0 0
E-202C to E-241C	WASHER, flat: polystyrene; round 1/2" OD, 0.191" ID, 1/16" thk, undercut for shoulder 0.031" d, [illegible].4625" diam.	Insulator for E-202A to E-241A		CIA	A-7237	E-202C to E-241C, E-1802C to E-1821C, E-1902C to E-1961C	40	40		0	1A8 1J7	21 21 0 0	8L1	100 0 0 0

E-242	CONTACT, switch: Same as E-202A.	Stator Contact for S-201												
E-243	CONTACT, switch: wiping ground contact type; 2 contacts, beryllium copper silver plated, curved wiping arm shape, wiper 0.010" thk x 5/16" wd x 1 1/8" lg; single 0.136" diam mtg hole provided.	Ground Contact Wiper for Switch (S-201) Arm		CIA	A-7208A	E-243, E-244, E-1823, E-1963, E-1964	2	2	0	0	1A2 1J2	4 4 0 0	8S1	15 0 0 0
E-244	CONTACT, switch: Same as E-243.	Ground Contact Wiper for Switch (S-201) Arm												
E-245	INSULATOR, bushing: cylindrical shape; polystyrene, grade 12; 9/16" OD, 0.191" ID, 0.236" thk; undercut for shoulder 0.158" d, 0.465" diam; counterbored 0.176" d, 15/64" diam.	Insulator for E-247		CIA	A-7200	E-245, E-246, E-1824, E-1965, E-1966	2	2	0	0	1A9 1J8	4 4 0 0	8K1	30 0 0 0
E-246	INSULATOR, bushing: Same as E-245.	Insulator for E-248												
E-247	CONTACT, switch: Same as E-202A.	Rotor Contact for S-201												
E-248	CONTACT, switch: Same as E-202A.	Rotor Contact for S-201												
E-249	CONTACT, switch: Same as E-202A.	Rotor Contact for S-201												
E-250	SLEEVE, contact: contact holder sleeve; beryllium copper silver plated; cylindrical shape, 0.178" diam x 1 3/32" lg overall; 0.159" diam x 17/32" lg hole to accommodate contact; threaded externally one end #4/40 x 1/4" lg for mtg.	Contact Sleeve for E-247		CIA	A-7209, Gr. 1	E-250, E-251, E-1827, E-1970, E-1971	2	2	0	0	1A4 1J4	4 4 0 0	8M1	30 0 0 0
E-251	SLEEVE, contact: Same as E-250.	Contact Sleeve for E-248												
E-252	SLEEVE, contact: contact holder sleeve; beryllium copper silver plated; cylindrical shape, 0.178" diam x 1 3/32" lg overall; 0.159" diam x 17/32" lg hole to accommodate contact; threaded externally one end #4/40 x 1/4" lg for mtg.	Contact Sleeve for E-249		CIA	A-7209, Gr. 2	E-252, E-1828, E-1972	1	1	0	0	1A5 1J5	2 2 0 0	8L2	15 0 0 0
E-253	SLEEVE, centering: contact centering type; brass silver plated; cylindrical shape, 0.178" diam x 0.2835" lg overall; 0.113" diam hole.	Contact Sleeve for E-247		CIA	A-7210, Gr. 1	E-253, E-254, E-255, E-1829, E-1830, E-1973, E-1974, E-1975	3	3	0	0	° °°	6 6 0 0	°°°	45 0 0 0
E-254	SLEEVE, centering: Same as E-253.	Contact Sleeve for E-248												
E-255	SLEEVE, centering: Same as E-253.	Contact sleeve for E-249												
E-256	WASHER, flat: polystyrene; round 0.570" diam x 0.125" thk; 0.177" diam hole.	Insulator for Rotor Arm		CIA	A-7213, Gr. 1	E-256, E-257, E-258, E-259, E-1831, E-1832, E-1976, E-1977, E-1978, E-1979	4	4	0	0		0 0 0 0		0 0 0 0
E-257	WASHER, flat: Same as E-256.	Insulator for Rotor Arm												
E-258	WASHER, flat: Same as E-256.	Insulator for Rotor Arm												
E-259	WASHER, flat: Same as E-256.	Insulator for Rotor Arm												

TABLE 4-3. COMBINED PARTS AND SPARE PARTS LIST

PARTS											SPARE PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	MFGR. AND MFGR'S DESIG-NATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL PER EQUIP. UNIT				EQUIP.		STOCK	
							A	B	C	M	BOX	QUAN.	BOX	QUAN.
E-260	WASHER, flat: polystyrene; round 0.570" diam x 0.125" thk; 0.158" diam hole.	Insulator for contact E-247		CIA	A-7213, Gr. 3	E-260, E-261, E-262, E-1833, E-1834, E-1980, E-1981, E-1982	3	3	0	0	° °°	6 6 0 0	°°°	45 0 0 0
E-261	WASHER, flat: Same as E-260.	Insulator for contact E-248												
E-262	WASHER, flat: Same as E-260.	Insulator for contact E-249												
E-263	CONTACT, switch: wiping contact; 16 wiping contact fingers, beryllium copper silver plated; fingers 0.008" thk x 1/8" lg x 1/16" wd; cylindrical shape overall, 0.722" diam x 3/8" overall, 0.6425" ID; no mtg means provided.	Contact for S-201		CIA	A-7094	E-263, E-1835, E-1983	1	1	0	0	1A3 1J3	2 2 0 0	8K2	15 0 0 0
E-401 to E-411	CONTACT, connector: brass nickel plated; banana type; 5/16" diam x 3/4" lg; contact 3/16" diam x 9/16" lg; mtg stud projects 3/8" from end of contact threaded #6/32.	Contact for J-401A		CAG #274-P	C955A1020-20	E-401 to E-411	33	22	11	0		0 0 0 0		0 0 0 0
E-412 to E-433	CONTACT, switch: rotary switch type; 2 contacts, beryllium copper silver plated, contact fingers wipe both sides of moving contact; 3/4" lg x 3/16" wd x 1/8" thk overall; solder lug term; two #2/56 screw clearance holes spaced 5/32" apart provided for mtg.	Contact for J-401 to J-441		COC #5151	C955A1020-21	E-412 to E-433	66	44	22	0		0 0 0 0		0 0 0 0
E-601	KNOB: round; black bakelite, for 1/4" shaft; double #8/32 set screws set at 120°; pointer type; 1 7/16" diam x 7/8" lg overall; brass insert; shaft hole 9/16" d; counterbored; Type "B", RE10F-479B.	Knob for R-601		CMI	D955A1006-10	E-601, E-602, E-1701	18	13	2	0		0 0 0 0		0 0 0 0
E-602	KNOB: Same as E-601.	Knob for R-602												
E-1001	KNOB: Same as E-201.	Switch Knob			D955A1010-9									
E-1501 to E-1511	SLEEVE: contact type; brass silver plated; 0.160" OD x 0.116" ID x 1/2" lg overall; 45° out in one end.	Contact Sleeve for J-1501 to J-1511		CIA	A-6648	E-1501 to E-1511	33	22	11	0	1A6 1B1 1A1	33 22 11 0		0 0 0 0
E-1512 to E-1522	WASHER, flat: styramic; 1.044" diam x 1/8" thk; 0.116" diam hole in center.	Insulating Washer for J-1501 to J-1511		CIA	A-6647	E-1512 to E-1522	33	22	11	0	1A10 1J9 1A2	33 22 11 0	8K3	66 0 0 0
E-1701	KNOB: Same as E-601.	Control Knob			C955A1016-8									
E-1702 to E-1709	SLEEVE, centering: Jack centering type; synthane tubing, black; cylindrical shape; 0.5125" OD x 0.4515 ID x 0.2275" lg overall.	Jack Sleeves for J-1701 to J-1708		CIA	A-6959	E-1702 to E-1709	128	[illegible]	[illegible]	0	1A[illegible] 1J10	64 44 0 0	8S2	256 0 0 0

E-1801	KNOB: Same as E-201.	Switch Knob			C955A1035-7									
E-1802A to E-1821A	CONTACT, switch: Same as E-202A.	Stator Contact for S-1801												
E-1802B to E-1821B	WASHER, flat: Same as E-202B.	Insulating Washers for E-1802A to E-1821A												
E-1802C to E-1821C	WASHER, flat: Same as E-202C.	Insulator for E-1802A to E-1821A												
E-1822	CONTACT, switch: Same as E-202A.	Stator Contact for S-1801												
E-1823	CONTACT, switch: Same as E-243.	Ground Contact Wiper for Switch (S-1801) Arm												
E-1824	INSULATOR, bushing: Same as E-245.	Insulator for E-1825												
E-1825	CONTACT, switch: Same as E-202A.	Rotor Contact for S-1801												
E-1826	CONTACT, switch: Same as E-202A.	Rotor Contact for S-1801												
E-1827	SLEEVE, contact: Same as E-250.	Contact Sleeve for E-1825												
E-1828	SLEEVE, contact: Same as E-252.	Contact Sleeve for E-1826												
E-1829	SLEEVE, centering: Same as E-253.	Contact Sleeve for E-1825												
E-1830	SLEEVE, centering: Same as E-253.	Contact Sleeve for E-1826												
E-1831	WASHER, flat: Same as E-256.	Insulator for Rotor Arm												
E-1832	WASHER, flat: Same as E-256.	Insulator for Rotor Arm												
E-1833	WASHER, flat: Same as E-260.	Insulator for Contact E-1825												
E-1834	WASHER, flat: Same as E-260.	Insulator for Contact E-1826												
E-1835	CONTACT, switch: Same as E-263.	Contact for S-1801												
E-1901	KNOB: Same as E-201.	Switch Knob			C955A1037-7									
E-1902A to E-1961A	CONTACT, switch: Same as E-202A.	Stator Contact for S-1901												
E-1902B to E-1961B	WASHER, flat: Same as E-202B.	Insulating Washers for E-1902A to E-1961A												
E-1902C to E-1961C	WASHER, flat: Same as E-202C.	Insulator for E-1902A to E-1961A												
E-1962	CONTACT, switch: Same as E-202A.	Stator Contact for S-1901												
E-1963	CONTACT, switch: Same as E-243.	Ground Contact Wiper for Switch (S-1901) Arm												
E-1964	CONTACT, switch: Same as E-243.	Ground Contact Wiper for Switch (S-1901) Arm												
E-1965	INSULATOR, bushing: Same as E-245.	Insulator for E-1967												
E-1966	INSULATOR, bushing: Same as E-245.	Insulator for E-1968												
E-1967	CONTACT, switch: Same as E-202A.	Rotor Contact for S-1901												

*4 in box 1A4, 2 in box 1A5. **4 in box 1J4, 2 in box 1J5. ***30 in box 8M1, 15 in box 8L2.

TABLE 4-3. COMBINED PARTS AND SPARE PARTS LIST

PARTS											SPARE PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	MFGR. AND MFGR'S DESIG-NATION	CONTRACTOR & PART & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL PER EQUIP. UNIT				EQUIP.		STOCK	
							A	B	C	M	BOX	QUAN.	BOX	QUAN.
E-1968	CONTACT, switch: Same as E-202A.	Rotor Contact for S-1901												
E-1969	CONTACT, switch: Same as E-202A.	Rotor Contact for S-1901												
E-1970	SLEEVE, contact: Same as E-250.	Contact Sleeve for E-1967												
E-1971	SLEEVE, contact: Same as E-250.	Contact Sleeve for E-1968												
E-1972	SLEEVE, contact: Same as E-252.	Contact Sleeve for E-1969												
E-1973	SLEEVE, centering: Same as E-253.	Contact Sleeve for E-1967												
E-1974	SLEEVE, centering: Same as E-253.	Contact Sleeve for E-1968												
E-1975	SLEEVE, centering: Same as E-253.	Contact Sleeve for E-1969												
E-1976	WASHER, flat: Same as E-256.	Insulator for Rotor Arm												
E-1977	WASHER, flat: Same as E-256.	Insulator for Rotor Arm												
E-1978	WASHER, flat: Same as E-256.	Insulator for Rotor Arm												
E-1979	WASHER, flat: Same as E-256.	Insulator for Rotor Arm												
E-1980	WASHER, flat: Same as E-260.	Insulator for Contact E-1967												
E-1981	WASHER, flat: Same as E-260.	Insulator for Contact E-1968												
E-1982	WASHER, flat: Same as E-260.	Insulator for Contact E-1969												
E-1983	CONTACT, switch: Same as E-263.	Contact for S-1901												
F-1601	FUSE, plug: 15 amp; 125 v; one-time; NEC standard screw base; instantaneous action; indicating type; 1 1/4" diam x 1 7/32" lg overall.	Line Fuse	-28102-15	CAXV "Clearsite"	A-7266	F-1601, F-1602	6	4	2	0	1F1 1H1 1E1	8 4 4 0		0 0 0 0
F-1602	FUSE, plug: Same as F-1601.	Line Fuse												
F-1603	FUSE, cartridge: 1 amp; opens in 1 hr. at 135% load, rated continuous at 110% load; 250 v; one time; glass body; ferrule terminals; 1/4" diam x 1 1/4" lg overall; vibration factor of 500; opens at 200% load.	Trouble Light Fuse	-28032-1	CFA Type 3AG, 1 amp	D955A1017-15	F-1603, F-1604	6	4	2	0	1C6 1A 1A3	12 6 6 0		0 0 0 0
F-1604	FUSE, cartridge: Same as F-1603.	Trouble Light Fuse												
H-101	FITTING, pipe: 90° elbow type; cast iron with galvanized finish; std wt; 1/2" x 1/2" female.	Pipe Elbow for Plug-in-Strip		CIA	D955A1029-3	H-101	3	2	1	0		0 0 0 0		0 0 0 0

H-102	PIPE: steel, galvanized; 1/2" size; ends outside threaded; American std pipe thd; 1 1/2" straight length (short).	Pipe Nipple for Plug-in-Strip	CIA	D955A1029-4	H-102	3	2		0	0000	0000
H-103	FITTING, conduit; locknut; steel, galvanized; internally threaded for 1/2" conduit.	Locknut for Plug-in-Strip	CIA	D955A1029-5	H-103, H-104, H-105, H-113, H-114, H-115	21	14	8	0	0000	0000
H-104	FITTING, conduit: Same as H-103.	Locknut for Plug-in-Strip									
H-105	FITTING, conduit: Same as H-103.	Locknut for Plug-in-Strip									
H-106	BOX, junction: steel, gray enamel finish; straight end junction box for std plug-in-strip; 1/2" conduit knockouts on end and rear for connection of any type wiring; 5 1/2" overall, fits end of plug-in-strip J-102.	Junction Box for Plug-in-Strip	CBHW #CF2-617L (Less term block)	D955A1029-7	H-106	3	2	1	0	0000	0000
H-107	COVER: steel, gray enamel finish; rectangular joiner coupling for adjoining std plug-in-strips; 5" overall.	Joiner Cover for J-101 and J-102 Junction	CBHW #CF2-644	D955A1029-8	H-107	3	2	1	0	0000	0000
H-108	COVER: steel, gray enamel finish; rectangular end fitting for std plug-in-strip; 2 1/2" lg overall; supplied with two wire nuts for insulating conductor ends.	End Cover for J-101	CBHW #CF2-680	D955A1029-9	H-108	3	2	1	0	0000	0000
H-109	HINGE: continuous; stainless steel; 80 5/8" lg x 1 1/4" wd x 0.040" thk; non-removable pin; requires twenty-two #10/32 self-tapping machine screws for mtg, eleven holes each flap.	Door Hinge	CIA	A-6919	H-109	3	2	1	0	0000	0000
H-110	HANDLE: door type; cast bronze, bright nickel plated; 5 7/32" lg x 1 3/16" wd x 2" h overall; 1 1/16" wd x 3 5/8" lg grip; mounts with two #8/32 screws spaced on 1 3/8" mtg/c.	Door Handle	CIA	D955A1032-18, A-6918	H-110	3	2	1	0	0000	0000
H-111	FITTING, conduit: bushing type; magnesium alloy; rolled edge; threaded internally for 1/2" conduit; American std pipe thread.	Conduit Bushing for Front Filler Panel Assembly	CIA	C955A1033-6	H-111, H-112, H-135, H-136	12	8	4	0	0000	0000
H-112	FITTING, conduit: Same as H-111.	Conduit Bushing for Front Filler Panel Assembly									
H-113	FITTING, conduit: Same as H-103.	Locknut for Front Filler Panel Assembly		C955A1033-7							
H-114	FITTING, conduit: Same as H-103.	Locknut for Front Filler Panel Assembly		C955A1033-7							
H-115	FITTING, conduit: Same as H-103.	Locknut for Front Filler Panel Assembly		C955A1033-7							
H-116	PIPE: steel, galvanized; 1/2" size; ends outside threaded; American std pipe thd; 16 1/2" straight length (long).	Pipe Nipple for Front Filler Panel Assembly	CIA	C955A1033-9	H-116	3	2	1	0	0000	0000
H-117	JUNCTION BOX: for 1/2" conduit; sherardized steel; less cover; rectangular, 4 1/8" lg x 2 1/8" wd x 1 7/8" d overall; mounts with two #6/32 screws with holes located on 3 9/32" mtg/c; knockouts, bottom—3, sides—3, ends 1 all for 1/2" conduit.	Flush Receptacle Box for Front Filler Panel Assembly	CBHW #2020	C955A1033-10	H-117	3	2	1	0	0000	0000

TABLE 4-3. COMBINED PARTS AND SPARE PARTS LIST

PARTS											SPARE PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	MFGR. AND MFGR'S DESIG-NATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL PER EQUIP. UNIT				EQUIP.		STOCK	
							A	B	C	M	BOX	QUAN.	BOX	QUAN.
H-118	COVER: flush receptacle type; sheradized steel; 4 1/4" lg x 2 1/4" wd x 1/16" thk overall; outputs for std dual outlet receptacle; two mtg holes provided for #6/32 oval head screws spaced on 3 9/32" mtg/c.	Receptacle Cover for Front Filler Panel Assembly		CBHW #20-C	C955A1033-11	H-118	3	2	1	0		0 0 0 0		0 0 0 0
H-119	STUD: brass nickel plated; 9/16" lg x 23/64" diam overall; shoulder 0.250" diam; one end threaded #10/32 x 15/32" lg.	Stud for Door Assembly		CIA	A-6874, Gr. 1	H-119, H-120, H-121, H-122, H-123, H-124, H-125, H-126, H-127, H-128, H-129, H-130, H-131, H-132, H-133, H-134	48	32	16	0	1B1 1C1 1C1	2 2 1 0		0 0 0 0
H-120	STUD: Same as H-119.	Stud for Door Assembly												
H-121	STUD: Same as H-119.	Stud for Door Assembly												
H-122	STUD: Same as H-119.	Stud for Door Assembly												
H-123	STUD: Same as H-119.	Stud for Door Assembly												
H-124	STUD: Same as H-119.	Stud for Door Assembly												
H-125	STUD: Same as H-119.	Stud for Door Assembly												
H-126	STUD: Same as H-119.	Stud for Door Assembly												
H-127	STUD: Same as H-119.	Stud for Door Assembly												
H-128	STUD: Same as H-119.	Stud for Door Assembly												
H-129	STUD: Same as H-119.	Stud for Door Assembly												
H-130	STUD: Same as H-119.	Stud for Door Assembly												
H-131	STUD: Same as H-119.	Stud for Door Assembly												
H-132	STUD: Same as H-119.	Stud for Door Assembly												
H-133	STUD: Same as H-119.	Stud for Door Assembly												
H-134	STUD: Same as H-119.	Stud for Door Assembly												
H-135	FITTING, conduit: Same as H-111.	Conduit Bushing for Plug-in-Strip Assembly			D955A1029-6									
H-136	FITTING, conduit: Same as H-111.	Conduit Bushing for Plug-in-Strip Assembly			D955A1029-6									
H-137	CLIP: ornamental strip type; steel, bonderized; 23/32" lg x 1/2" wd x 5/32" thk overall; opening between sides 1/2" normal; one 0.196" diam hole centrally located for mtg.	Conduit Bushing for Cabinet		CIA	A-6962	H-137, H-138, H-139, H-140, H-141, H-142, H-143, H-144, H-145, H-146	30	20	10	0	1B10 1C10 1C6	6 4 2 0		0 0 0 0
H-138	CLIP: Same as H-137.	Ornamental Strip Holding Cabinet												
H-139	CLIP: Same as H-13[illegible].	Ornamental Strip Holding Cabinet												
H-140	CLIP: Same as H-137.	Ornamental Strip Holding Cabinet												

H-141	CLIP: Same as H-137.	Ornamental Strip Holding for Cabinet													
H-142	CLIP: Same as H-137.	Ornamental Strip Holding for Cabinet													
H-143	CLIP: Same as H-137.	Ornamental Strip Holding for Cabinet													
H-144	CLIP: Same as H-137.	Ornamental Strip Holding for Cabinet													
H-145	CLIP: Same as H-137.	Ornamental Strip Holding for Cabinet													
H-146	CLIP: Same as H-137.	Ornamental Strip Holding for Cabinet													
H-147	WRENCH: steel, bonderized; for hex socket screw; 5/64" across flats.	Turns #8 Allen Head Set Screw		Active Screw	955C-2	H-147	*	*	*	*	1B11 1C11 1C7	1 1 1 0			0 0 0 0
H-148	CLAMP: armor bending type; bronze, cadmium plated; 4 3/8" lg x 2 5/8" wd x 3" h overall; center hole 1.4" diam; upper edge rounded to 5/16" radius; two 25/64" diam holes provided for mtg located on 3 5/8" mtg/c.	Accessory for use in Assembling RG-85/U Cable to NT-491652 Adapter		CIA	B-7002	H-148	*	*	*	*	1Q 1L 1G	1 1 1 0			0 0 0 0
H-201	SCREW, machine: Bind H (without screwdriver slot); stainless steel; #10/32 thd; overall length 9/16"; threaded 1/4" lg; 7/16" diam x 1/16" thk head; shank portion under head knurled for locking.	Secures S-201 to Panel		CIA	A-6942, Gr. 2	H-201, H-203, H-204, H-205, H-1801, H-1802, H-1803, H-1804, H-1901, H-1902, H-1903, H-1904	4	4	0	0	1B2 1C2 1C2	4 4 1 0			0 0 0 0
H-202	WASHER, spring: beryllium copper, round 1" OD, 0.402" ID, 0.015" thk; bent on 1 5/64" radius making washer bend to 1/8" thk.	Detent Assembly Spring Washer		CIA	A-7226	H-202, H-1805, H-1905	1	1	0	0	1B6 1C6	2 2 0 0			0 0 0 0
H-203	SCREW, machine: Same as H-201.	Secures S-201 to Panel													
H-204	SCREW, machine: Same as H-201.	Secures S-201 to Panel													
H-205	SCREW, machine: Same as H-201.	Secures S-201 to Panel													
H-206	SCREW, set: Allen drive; headless; steel, bonderized; #8/32; 1/4" lg; cup point.	Secures Switch Knob		Active Screw	955C-1	H-206, H-207, H-609, H-610, H-611, H-612, H-1008, H-1009, H-1701, H-1702	40	30	4	0	1B3 1C3 1C3	2 2 1 0			0 0 0 0
H-207	SCREW, set: Same as H-206.	Secures Switch Knob													
H-601 to H-608	STUD: brass nickel plated; 3/4" lg x 0.385" diam overall; shoulder 0.250" diam; one end threaded #8/32 x 35/64" lg.	Stud for LS-139/G		CIA	A-6874, Gr. 4	H-601 to H-608	8	8	8	0	1B4 1C4 1C4	2 2 1 0			0 0 0 0
H-609 to H-612	SCREW, set: Same as H-206.	Secures Knobs to Controls													
H-801	HANDLE: knob type; drawer type; brass nickel plated; 3/4" diam x 1/2" lg overall; tapped internally #10/32 for mtg; supplied with mtg screw.	Knob for Writing Panel		National Brass #625	D955A1018-12	H-801	1	1	0	0		0 0 0 0			0 0 0 0
H-802	GROMMET: rubber; fits 1 1/16" diam hole; 3/4" hole diam; 1/16" wd groove, 7/16" wd x 1 3/8" diam overall.	Grommet for MT-571/G		Continental #12-17, Mold #7882	D955A1018-11	H-802	1	1	0	0		0 0 0 0			0 0 0 0
H-901	HANDLE: drawer type; brass chrome plated; 4" lg x 5/8" wd x 7/8" h overall; one piece construction, grip 2" lg, 1/8" x 5/8"	Drawer Handle for FN-28/G		American Cabinet Hardware #295	D955A1008-25	H-901	1	1	1	0		0 0 0 0			0 0 0 0

*Supplied in Equipment Spares Only

TABLE 4-3. COMBINED PARTS AND SPARE PARTS LIST

PARTS											SPARE PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	MFGR. AND MFGR'S DESIGNATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL PER EQUIP. UNIT				EQUIP.		STOCK	
							A	B	C	M	BOX	QUAN.	BOX	QUAN.
	cross section; two #6/32 tapped holes provided for mtg spaced on 2 3/4" mtg/c.													
H-1001	GROMMET: rubber; fits 3/8" diam hole; 9/32" hole diam, 1/16" wd groove, 1/4" wd x 9/16" diam overall.	Grommet for Key Compartment of SA-135/G		Atlantic India-Rubber Works #763	C955A1055-9	H-1001	1	1	0	0		0 0 0 0		0 0 0 0
H-1002	SCREW, machine: Bind H (without screwdriver slot); stainless steel; #6/32 thd; overall length 9/16"; threaded 1/4" lg; 7/16" diam x 1/16" thk head; shank portion under head knurled for locking.	Secures S-1001 to Panel		CIA	A-6920, Gr. 1	H-1002, H-1003, H-1004, H-1005, H-1006, H-1007	6	6	0	0	1B5 1C5 1C5	2 2 1 0		0 0 0 0
H-1003	SCREW, machine: Same as H-1002.	Secures S-1001 to Panel												
H-1004	SCREW, machine: Same as H-1002.	Secures S-1001 to Panel												
H-1005	SCREW, machine: Same as H-1002.	Secures S-1001 to Panel												
H-1006	SCREW, machine: Same as H-1002.	Secures S-1001 to Panel												
H-1007	SCREW, machine: Same as H-1002.	Secures S-1001 to Panel												
H-1008	SCREW, set: Same as H-206.	Secures Knob to Switch												
H-1009	SCREW, set: Same as H-206.	Secures Knob to Switch												
H-1301 to H-1311	BUSHING: pulley spacing; brass, cadmium plated; female; 3/16" OD x 0.1435" ID x 9/16" overall.	Spacer for Pulleys O-1334 to O-1344		CIA	A-6943	H-1301 to H-1311	22	22	11	0	1B14 1C14 1C12	6 6 3 0		0 0 0 0
H-1601	BUSHING: rubber; 7/8" OD x 15/32" ID x 5/8" lg overall.	Rubber Bushing for Trouble Light Cable		CIA	D955A1017-23	H-1601	3	2	1	0	1B12 1C12 1C8	3 2 1 0		0 0 0 0
H-1701	SCREW, set: Same as H-206.	Secures Knob to Switch												
H-1702	SCREW, set: Same as H-206.	Secures Knob to Switch												
H-1801	SCREW, machine: Same as H-201.	Secures S-1801 to Panel												
H-1802	SCREW, machine: Same as H-201.	Secures S-1801 to Panel												
H-1803	SCREW, machine: Same as H-201.	Secures S-1801 to Panel												
H-1804	SCREW, machine: Same as H-201.	Secures S-1801 to Panel												
H-1805	WASHER, spring: Same as H-202.	Detent Assembly Spring Washer												
H-1901	SCREW, machine: Same as H-201.	Secures S-1901 to Panel												
H-1902	SCREW, machine: Same as H-201.	Secures S-1901 to Panel												
H-1903	SCREW, machine: Same as H-201.	Secures S-1901 to Panel												
H-1904	SCREW, machine: Same as H-201.	Secures S-1901 to Panel												

H-1905	WASHER, spring: Same as H-202.	Detent Assembly Spring Washer												
I-1601	LAMP, incandescent: household type light bulb; 40 watts, 115 v AC; standard NEC screw type base.	Trouble Light		CG Mazda, 40W	D955A1017-21	I-1601	3	2	1	0		0 0 0 0		0 0 0 0
J-101	CONNECTOR ASSEMBLY, female contact: plug-in-strip type; 33" lg x 15/16" wd x 25/32" d overall; strip consists of 5 outet receptacles for std convenience outlets; 15 amp, 115 v AC; supplied with terminal connector.	Convenience Outlet for Cabinet	-491729	CBHW #CF2-603-6 (CF2-2)	C-7272	J-101, J-102	6	4	2	0		0 0 0 0		9 0 0 0
J-102	CONNECTOR ASSEMBLY, female contact: Same as J-101.	Convenience Outlet for Cabinet												
J-103	CONNECTOR, female contact: duplex convenience outlet; each section comprising 2 rectangular parallel contacts; straight; 4" lg x 1 1/2" wd x 1 3/32" h overall; mtg holes consist of one #6/32 tapped hole centrally located; two 3/16" x 5/16" slots spaced on 3 1/4" mtg/c and four 3/16" diam holes located on 3 5/8" x 15/16" mtg/c.	Convenience Outlet for Front Filler for Assembly	-491669	CHU #9595	A-7271	J-103, J-1601	6	4	2	0	1J4 1F1 1E2	3 2 1 0		0 0 0 0
J-201 to J-241	ADAPTER, connector: double ended female; single round contact at each end; straight; threaded externally 5/8"-24 at each end; 5/8" diam x 1 1/8" lg overall; brass silver plated; self supporting on cont.	Jacks for S-201	-49191	CPH #83-1J	D955A1067, Gr. 1-7	J-201, to J-241, J-401B to J-411B, J-401C to J-411C, J-1512 to J-1522, J-1801 to J-1821, J-1901 to J-1961	140	107	33	0	1C1 1B2 1A4	12 8 4 0		0 0 0 0
J-301 to J-311	JACK BOX: aluminum, gray enamel finish; with cover; rectangular, 4 15/16" lg x 1 3/8" wd x 2" d overall excluding connector extensions; four NT 49120 connectors 1 1/4" - 1 1/8" - 1 1/4" mtg/c on front of box; three NT 49194 connectors spaced on 1 3/16" mtg/c on rear of box.	Interconnects RF Circuits	-491729	CIA	C955A1002	J-301 to J-311	33	22	11	0		0 0 0 0		0 0 0 0
J-301A to J-311A	CONNECTOR, male contact: round male contact; straight body; body, 7/8" diam x 1 5/16" lg (excluding length of term); cylindrical brass nickel plated body; styramic or equiv insert; rear of body threaded externally 3/4"-20 for mtg nut; fits in 3/4" diam hole; connector contact located in connector center; supplied with mtg nut.	Part of J-301 to J-311	-49120	CN	C955A1002-5	J-301A to J-311A, J-301B to J-311B, J-301C to J-311C, J-301D to J-311D	132	88	44	0	1C2 1A2 1A5	12 8 4 0		0 0 0 0
J-301B to J-311B	CONNECTOR, male contact: Same as J-301A.	Part of J-301 to J-311												
J-301C to J-311C	CONNECTOR, male contact: Same as J-301A.	Part of J-301 to J-311												
J-301D to J-311D	CONNECTOR, male contact: Same as J-301A.	Part of J-301 to J-311												
J-301E to J-311E	CONNECTOR, female contact: single round female contact; straight; body, 5/8" diam x 27/32" lg (excluding length of solder lug type contacts); cylindrical die cast zinc body, silver plated finish; low-loss mica filled bakelite insert; mtg flange molded around body 1" lg x 1" wd x 0.170"	Part of J-301 to J-311	-49194	CPH 83-1R	C955A1002-6	J-301E to J-311E, J-301F to J-311F, J-301G to J-311G	99	66	33	0	1C3 1A3 1A6	12 8 4 0		0 0 0 0

*Box Nos. 8A to 8J

TABLE 4-3. COMBINED PARTS AND SPARE PARTS LIST

PARTS											SPARE PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	MFGR. AND MFGR'S DESIG-NATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	PER PER EQUIP. UNIT A	B	C	M	EQUIP. BOX	EQUIP. QUAN.	STOCK BOX	STOCK QUAN.
	thk, 4 mtg holes 0.125" diam on 23/32" x 23/32" mtg/c; connector threaded 5/8"-24 for mating connector; connector contactor located in connector center.													
J-301F to J-311F	CONNECTOR, female contact: Same as J-301E.	Part of J-301 to J-311												
J-301G to J-311G	CONNECTOR, female contact: Same as J-301E.	Part of J-301 to J-311												
J-401 to J-411	JACK SWITCH: RF type; fitted with jack (NT 49120 modified) one end; fitted with two NT 49191 connectors other end; switch portion, when J-401A is not in use provides continuous path between J-401B and J-401C; switch portion, when J-401A is in use, provides path from J-401A to J-401B and disconnects J-401C; 4 7/32" lg x 1 45/64" wd x 1 7/32" h overall; case aluminum with gray enamel finish; mounts by means of connector J-401A in 3/4" diam mtg hole.	RF Circuit Switching on J-239/G	-491388	CIA	C955A1020	J-401 to J-411	33	22	11	0	1K1 1K1 1C9	9 6 3 0	1D1	33 0 0 0
J-401A to J-411A	CONNECTOR, male contact: housing for E-401 to E-411; contact not included; 7/8" diam x 1" lg overall; brass nickel plated; one end threaded externally 3/4"-20 for mtg.	Part of J-401 to J-411		CIA	A-6714	J-401A to J-411A	33	22	11	0		0 0 0 0		0 0 0 0
J-401B to J-411B	ADAPTER: Same as J-201.	Part of J-401 to J-411												
J-401C to J-411C	ADAPTER: Same as J-201.	Part of J-401 to J-411												
J-501 to J-511	ADAPTER, connector: male one end, female other end; single contact, round; straight; adapts NT Plug 40121 to NT Plug 49195; 7/8" diam x 2 3/32" lg overall; cylindrical shape; brass silver plated body; styramic insert; portion of body threaded externally 3/4"-20 x 9/16" lg for mtg into 3/4" diam hole; one end threaded 5/8"-24 externally for mating connector; contacts located centrally in each end; BuShips dwg #RE499F410B.	Adapter for J-237/G	UG-294/U	CN	B955A1005-5	J-501 to J-511, J-701, J-702	44	13	11	0	1C4 1A4 1A7	12 7 6 0		0 0 0 0
J-701	ADAPTFR, connector: Same as J-501.	Adapter for J-265/G			B955A1021-4									
J-702	ADAPTER, connector: Same as J-501.	Adapter for J-265/G			B955A1021-4									
J-1101 to J-1152	JACK, telephone: for two conductor plug 0.25" diam; 3 15/32" lg x 0.450" wd x 13/16" h overall; contact arrangement J4-1B; 5/32"	Jacks for NT -491394 Mounting Strips	-491395	CN	955-10 (less mtg strip)	J-1101 to J-1152	312	260	104	0	1 1A 1E	50 25 25 0		5896 0 0 0

	diam hole provided for mtg; body fits into 0.450" diam hole for mtg.													
J-1501 to J-1511	ADAPTER, connector: female both ends; single contact; straight; adapts type RG-85/U to type RG-12/U cable; 3" max diam x 7 31/32" min lg; brass cadmium plated body; one end fitted with J-1512 to J-1522.	Cable Adapter for J-243/G	-491652	CIA	B955A1001	J-1501 to J-1511	33	22	11	0		0 0 0 0		0 0 0 0
J-1512 to J-1522	ADAPTER, connector: Same as J-201.	Part of J-1501 to J-1511												
J-1601	CONNECTOR, female contact: Same as J-103.	Convenience Outlet for Switch Panel												
J-1701 to J-1708	JACK, telephone: for two conductor plug 0.25"; 3 15/32" lg x 0.450" wd x 13/16" h overall; contact arrangement J1; 5/32" diam hole provided for mtg; body fits into 0.450" diam hole for mtg.	Audio Jacks for C-443/G	-491224	CN	A-955A1065-3	J-1701 to J-1708	128	88	0	0	1H1 1F2	64 44 0 0	1A1	256 0 0 0
J-1801 to J-1821	ADAPTER, connector: Same as J-201.	Jacks for S-1801			D955A1067, Gr. 2-7									
J-1901 to J-1961	ADAPTER, connector: Same as J-201.	Jacks for S-1901			D955A1067, Gr. 3-7									
LS-601	SPEAKER, dynamic: 6" diam cone; PM field; 5.0 watts normal output; voice coil impedance 3.2 ohms nominal; 6 3/32" lg x 6 3/32" wd x 3 9/64" d overall; four 13/64" x 19/64" slots provided for mtg at 90° to each other on 3 3/32" rad from center.	Speaker for LS-139/G	-491814	CJS #P6-T	B-7240	LS-601, LS-602	2	2	2	0		0 0 0 0		0 0 0 0
LS-602	SPEAKER, dynamic: Same as LS-601.	Speaker for LS-139/G												
N-101	HOLDER, card: steel, bonderized; 2 1/4" lg x 13/16" wd x 1/16" thk overall; pressed from 0.030" material; holds card size 1 11/16" x 5/8"; provided with 0.020" thk pyralin face strip.	Card Holder for Frame Assembly		CIA	A-6921 & A-6920, Gr. 4	N-101, N-102	6	4	2	0		0 0 0 0		0 0 0 0
N-102	HOLDER, card: Same as N-101.	Card Holder for Frame Assembly												
N-103	HOLDER, card: steel, bonderized; 10 3/32" lg x 8 3/16" wd x 3/16" thk overall; pressed from 0.030" material; holds card size 9 11/16" x 7 13/32"; provided with 0.020" thk pyralin face strip.	Card Holder for Door Assembly		CIA	A-6909 & A-6920, Gr. 2	N-103	3	2	1	0		0 0 0 0		0 0 0 0
N-104	HOLDER, card: steel, bonderized; 4 3/16" lg x 2 1/4" wd x 3/16" thk overall; pressed from 0.030" material; holds card size 3 19/32" x 1 7/8"; mounts by two #10/32 screws spaced on 3 3/4" mgt/c; provided with 0.020" thk pyralin face strip.	Card Holder for Door Assembly		CIA	A-6910 & A-6920, Gr. 3	N-104	3	2	1	0		0 0 0 0		0 0 0 0
N-105	PLATE, identification: aluminum; 3" lg x 2" wd x 0.032" thk; inscribed; "CY-597/G, Cabinet, Serial (blank)"; Navy Department, Bureau of Ships, contractor's identification and contract number; reverse etched, anodized with black enamel background; four 1/8" diam mtg holes on 2 3/4" x 1 3/4" mtg/c; for general radio use.	Unit Nameplate		CIA	A-6862	N-105	3	2	1	0		0 0 0 0		0 0 0 0

*Box Nos. 2A to 2E, 3A to 3E, 4A to 4E, 5A to 5E

TABLE 4-3. COMBINED PARTS AND SPARE PARTS LIST

PARTS												SPARE PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	MFGR. AND MFGR'S DESIG-NATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL PER EQUIP. UNIT					EQUIP.		STOCK	
							A	B	C	M		BOX	QUAN.	BOX	QUAN.
N-106	BOOK, instruction: instruction book for Signal Distribution System AF & RF, NavShips 91047; 11" lg x 8 1/2" wd x 1/2" thk.	Equipment Instruction		CIA		N-106	2	2	2	X			0 0 0 0		0 0 0 0
N-107	LIST, combined parts and spare parts: Table 4-3 of Instruction Book N-106.	Parts & Spare Parts List		CIA		N-107	0	0	0	0		1U 1P 1J	1 1 1 0	1F	1 0 0 0
N-201	HOLDER, card: brass nickel plated; 5 5/64" lg x 3 5/64" wd x 7/64" thk overall; pressed from 0.020" material; holds card size 5" x 3"; provided with 0.020" thk pyralin face strip.	Card Holder for SA-137/G		CIA	A-6939 A-6920, Gr. 1	N-201, N-202, N-1001, N-1801, N-1802, N-1901, N-1902	3	3	0	0			0 0 0 0		0 0 0 0
N-202	HOLDER, card: Same as N-201.	Card Holder for SA-137/G													
N-203	PLATE, identification: aluminum; 3" lg x 2" wd x 0.032" thk; inscribed: "SA-137/G, Switch Panel, Serial (blank)"; Navy Department, Bureau of Ships, contractor's identification and contract number; reverse etched, anodized with black enamel background; four 1/8" diam mtg holes on 2 3/4" x 1 3/4" mtg/c; for general radio use.	Unit Nameplate		CIA	A-6968	N-203	1	1	0	0			0 0 0 0		0 0 0 0
N-301	HOLDER, card: steel, nickel plated; 17 1/2" lg x 7/16" wd x 1/8" thk overall; pressed from 0.030" material; holds card size 17 1/2" x 3/8"; provided with 0.010" thk pyralin face strip; 4 mtg holes provided 0.096" diam csk for #2 flat head screw spaced on 5 3/4" - 5" - 5 3/4" mtg/c.	Card Holder for J-238/G		CIA	A-6820, C955A1003-9	N-301, N-401, N-501	8	5	3	0			0 0 0 0		0 0 0 0
N-302	PLATE, identification: aluminum; 4 3/4" lg x 1/4" wd x 0.032" thk; inscribed: "Jack Panel J-238/G"; reverse etched, anodized with black enamel background; three 1/8" diam mtg holes spaced on 2 1/4" mtg/c.	Unit Nameplate		CIA	A-6995	N-302	3	2	1	0			0 0 0 0		0 0 0 0
N-401	HOLDER, card: Same as N-301.	Card Holder for J-239/G													
N-402	PLATE, identification: aluminum; 4 3/4" lg x 1/4" wd x 0.032" thk; inscribed: "Jack Panel J-239/G"; reverse etched, anodized with black enamel background; three 1/8" diam mtg holes spaced on 2 1/4" mtg/c.	Unit Nameplate		CIA	A-6996	N-402	3	2	1	0			0 0 0 0		0 0 0 0
N-501	HOLDER, card: Same as N-301.	Card Holder for J-237/G													
N-502	PLATE, idesntification: aluminum; 4 3/4" lg x 1/4" wd x 0.032" thk; inscribed: "Jack Panel	Unit Nameplate		CIA	A-6994	N-502	2	1	1				0 0 0		0 0 0

	J-237/G"; reverse etched, anodized with black enamel background; three 1/8" diam mtg holes spaced on 2 1/4" mtg/c.									0		0		0
N-601	PLATE, identification: aluminum; 3" lg x 2" wd x 0.032" thk; inscribed: "LS-139/G, Speaker Assembly, Serial (blank)"; Navy Department, Bureau of Ships, contractor's identification and contract number; reverse etched, anodized with black enamel background; four 1/8" diam mtg holes on 2 3/4" x 1 3/4" mtg/c; for general radio use.	Unit Nameplate		CIA	A-6964	N-601	1	1	1	0		0 0 0 0		0 0 0 0
N-701	HOLDER, card: steel, nickel plated; 1 1/2" x 3/8" x 1/8" thk overall; pressed from 0.030" material; holds cards size 1 1/2" x 3/8"; provided with 0.010" pyralin face strip; two mtg holes provided 0.096" diam csk for #2 flat head screw spaced on 7/8" mtg/c.	Card Holder for J-265/G		CIA	A-6810, B955A1021-5	N-701, N-702, N-1061, N-1602	8	6	2	0		0 0 0 0		0 0 0 0
N-702	HOLDER, card: Same as N-701.	Card Holder for J-265/G												
N-703	PLATE, identification: aluminum; 3" lg x 1" wd x 0.032" thk; inscribed: "J-265/G, Jack Panel, NObsr-30,000, (blank), CIA"; reverse etched, anodized with black enamel background; two 1/8" diam holes provided for mtg spaced on 2 3/4" mtg/c.	Unit Nameplate		CIA	A-6971	N-703	1	1	0	0		0 0 0 0		0 0 0 0
N-801	PLATE, identification: aluminum; 3" lg x 1" wd x 0.032" thk overall; inscribed: "MT-571/G, Mounting, NObsr-30000 (blank), CIA"; reverse etched, anodized with black enamel background; two 1/8" diam mtg holes spaced on 2 3/4" mtg/c.	Unit Nameplate		CIA	A-6970	N-801	1	1	0	0		0 0 0 0		0 0 0 0
N-901	PLATE, identification: aluminum; 3" lg x 2" wd x 0.032" thk overall, inscribed: "FN-28/G, Switchboard Shelf, Serial (blank)"; Navy Department, Bureau of Ships, contractor's identification and contract number; reverse etched, anodized with black enamel background; four 1/8" diam mtg holes on 2 3/4" x 1 3/4" mtg/c; for general radio use.	Unit Nameplate		CIA	A-6965	N-901	1	1	1	0		0 0 0 0		0 0 0 0
N-1001	HOLDER, card: Same as N-201.	Card Holder for SA-135/G												
N-1002	PLATE, identification: aluminum; 3" lg x 2" wd x 0.032" thk overall; inscribed: "SA-135/G, Switch Panel, Serial (blank)"; Navy Department, Bureau of Ships, contractor's identification and contract number; reverse etched, anodized with black enamel background; four 1/8" diam mtg holes on 2 3/4" x 1 3/4" mtg/c; for general radio use.	Unit Nameplate		CIA	A-6966	N-1002	1	1	0	0		0 0 0 0		0 0 0 0
N-1201	PLATE, identification: aluminum; 3" lg x 1" wd x 0.032" thk overall; inscribed: "MX-814/G, Panel, NObsr-30000, (blank), CIA"; reverse etched, anodized with black	Unit Nameplate		CIA	A-6993	N-1201	2	2	1	0		0 0 0 0		0 0 0 0

TABLE 4-3. COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	MFGR. AND MFGR'S DESIG-NATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL PER EQUIP. UNIT A	B	C	M	SPARE PARTS EQUIP. BOX	EQUIP. QUAN.	STOCK BOX	STOCK QUAN.
	enamel background; two 1/8" diam mtg holes spaced on 2 3/4" mtg/c.													
N-1301	PLATE, identification: aluminum; 2" lg x 5/8" wd x 0.032" thk overall; inscribed: "MX-813/G, Retainer-Pulley Assembly, (blank), CIA"; reverse etched, anodized with black enamel background; two 0.120" diam mtg holes spaced on 1.83" mtg/c.	Unit Nameplate		CIA	A-6992	N-1301	2	2	1	0		0 0 0 0		0 0 0 0
N-1401	PLATE, identification: lamicoid; 13 7/8" lg x 3/8" wd x 3/32" thk; inscribed both top and bottom with numbers 1 through 13 inclusive; four 0.128" diam mtg holes provided spaced 6 1/8" - 1 5/16" - 6 1/8".	Identification Strip for TB-1401 and TB-1402		CIA	B-6753, Gr. 1	N-1401	6	5	2	0		0 0 0 0		0 0 0 0
N-1402	PLATE, identification: lamicoid; 13 7/8" lg x 3/8" wd x 3/32" thk; inscribed both top and bottom with numbers 14 through 26 inclusive; four 0.128" diam mtg holes provided spaced 6 1/8" - 1 5/16" - 6 1/8".	Identification Strip for TB-1403 and TB-1404		CIA	B-6753, Gr. 2	N-1402	6	5	2	0		0 0 0 0		0 0 0 0
N-1403	PLATE, identification: aluminum; 3" lg x 2" wd x 0.032" thk; inscribed: "J-242/G, Terminal Board Assembly, Serial (blank)"; Navy Department, Bureau of Ships, contractor's identification and contract number; reverse etched, anodized with black enamel background; four 1/8" diam mtg holes on 2 3/4" x 1 3/4" mtg/c; for general radio use.	Unit Nameplate		CIA	A-6974	N-1403	6	5	2	0		0 0 0 0		0 0 0 0
N-1501	PLATE, identification: aluminum; 2" lg x 5/8" wd x 0.032" thk; inscribed: "J-243/G, Jack Panel, (blank), CIA"; reverse etched, anodized with black enamel background; two 0.120" diam mtg holes spaced on 1.83" mtg/c.	Unit Nameplate		CIA	A-6991	N-1501	3	2	1	0		0 0 0 0		0 0 0 0
N-1601	HOLDER, card: Same as N-701.	Card Holder for SA-134/G												
N-1602	HOLDER, card: Same as N-701.	Card Holder for SA-134/G												
N-1603	PLATE, identification: aluminum; 3" lg x 2" wd x 0.032" thk overall; inscribed: "SA-134/G, Switch Panel, Serial, (blank)"; Navy Department, Bureau of Ships, contractor's identification and contract number; reverse etched, anodized with black enamel background; four 1/8" diam mtg holes	Unit Nameplate		CIA	A-6861	N-1603	3	2	1	0		0 0 0 0		0 0 0 0

	spaced on 2 3/4" x 1 3/4" mtg/c; for general radio use.													
N-1801	HOLDER, card: Same as N-201.	Card Holder for SA-136/G												
N-1802	HOLDER, card: Same as N-201.	Card Holder for SA-136/G												
N-1803	PLATE, identification: aluminum; 3" lg x 2" wd x 0.032" thk; inscribed: "SA-136/G, Switch Panel, Serial (blank)"; Navy Department, Bureau of Ships, contractor's identification and contract number; reverse etched, anodized with black enamel background; four 1/8" diam mtg holes on 2 3/4" x 1 3/4" mtg/c; for general radio use.	Unit Nameplate		CIA	A-6967	N-1803	0	0	0	*		0 0 0 0		0 0 0 0
N-1901	HOLDER, card: Same as N-201.	Card Holder for SA-138/G												
N-1902	HOLDER, card: Same as N-201.	Card Holder for SA-138/G												
N-1903	PLATE, identification: aluminum; 3" lg x 2" wd x 0.032" thk; inscribed: "SA-138/G, Switch Panel, Serial (blank)"; Navy Department, Bureau of Ships, contractor's identification and contract number; reverse etched, anodized with black enamel background; four 1/8" diam mtg holes on 2 3/4" x 1 3/4" mtg/c; for general radio use.	Unit Nameplate		CIA	A-6969	N-1903	0	0	0	**		0 0 0 0		0 0 0 0
O-101 to O-108	SPRING: helical compression type; 0.050" diam steel spring wire, copper flash and cadmium plated; 9/32" ID x 1 1/2" lg (free length); 5 turns; rounded ends.	Ventilator Cover Spring		CIA	A-6777	O-101 to O-108	24	16	8	0	1B7 1C7 1C10	12 8 4 0	8Q1	120 0 0 0
O-201	BEARING, ball: single row radial; double shield; light duty; 0.7874" bore, 1.8504" OD, 0.5512" wd; 8 balls; packed with grease similar to Navy Type O. S.-1350; std fit; ABEC-3 tol.	S-201 Bearing		New Departure #77504	D955A1067, Gr. 1-10	O-201, O-1801, O-1901	1	1	0	0		0 0 0 0		0 0 0 0
O-202	SPRING: helical compression type; for contract pressure; 0.019" beryllium copper wire; 0.145" OD x 5/16" lg (free lg); 6 turns; flattened ends.	Spring for E-247		CIA	A-7211	O-202, O-203, O-204, O-1802, O-1803, O-1902, O-1903, O-1904	3	3	0	0	*** ****	6 6 0 0	*****	45 0 0 0
O-203	SPRING: Same as O-202.	Spring for E-248												
O-204	SPRING: Same as O-202.	Spring for E-249												
O-205	SPROCKET, chain: steel, cadmium plated; straight teeth; 40 teeth; 4.78" pitch diam; 4.98" OD, 0.500" bore, 3/16" thk; straight face; hub extends 1/16" beyond face of sprocket 1.7125" diam one side, extends 3/32" beyond face of sprocket 1 1/2" diam other side; two 0.1495" diam drill and slotted holes through face of gear spaced on 2 1/8" diam at 180° apart.	Sprocket for Detent		CIA	B-7221, Gr. 1	O-205	1	1	0	0		0 0 0 0		0 0 0 0
O-206	SPRING: helical tension type; for detent assembly; #18 AWG (0.040") stainless steel spring temper wire; 5/16" OD x 1/2"	Spring for Detent		CIA	A-7224	O-206, O-1805, O-1906	1	1	0	0	1B8 1C8	2 2 0 0		0 0 0 0

* Part of Switch Panel SA-136/G
** Part of Switch Panel SA-138/G
*** 4 in box 1A4, 2 in box 1A5
**** 4 in box 1J4, 2 in box 1J5
***** 30 in box 8M1, 15 in box 8L2

TABLE 4-3. COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	MFGR. AND MFGR'S DESIG-NATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL PER EQUIP. UNIT A	B	C	M	SPARE PARTS EQUIP. BOX	EQUIP. QUAN.	STOCK BOX	STOCK QUAN.
	lg (free lg); 14 turns close wound; ends twisted into hooks; overall lg over hooks 1 13/16" (free lg); tension at normal operating lg 9 1/2# to 10#; max operating lg 3".													
O-207	BEARING, ball: single row radial; double shield light duty; 0.3937" bore, 1.1811" OD, 0.3543" wd; 7 balls; packed with grease similar to Navy Type O.S.-1350; std fit; ABEC-3 tol.	Detent Bearing		New Departure #77500	C955A1070, Gr. 1-13	O-207, O-1806, O-1907	1	1	0	0		0 0 0 0		0 0 0 0
O-401 to O-411	SPRING: helical compression type; for jack switch; 0.020" diam spring steel wire; 5/32" diam x 15/16" lg (free lg); 12-14 turns; squared ends.	Spring for J-401 to J-411		CIA	A-6716	O-401 to O-411	33	22	11	0		0 0 0 0		0 0 0 0
O-1001	SPRING: catch type; for key compartment holding; bent from 0.025" thk stainless steel sheet; 1 47/64" lg x 1" wd x 11/32" thk after bending.	Key Compartment Catch Spring		CIA	A-6925	O-1001, O-1002	2	2	0	0	1B9 1C9	2 2 0 0		0 0 0 0
O-1002	SPRING: Same as O-1001.	Key Compartment Catch Spring												
O-1301 to O-1311	SPRING: barrel type spring assembly; for internal spring information see O-1323; barrel 2 13/16" diam x 5/8" wd; catch on outer perifery for O-1312; two #6/32 tapped holes one on either side of barrel center for mtg.	Spring and Barrel Assembly for MX-813/G		CIA	A955A1061	O-1301 to O-1311	22	22	11	0		0 0 0 0		0 0 0 0
O-1312 to O-1322	TAPE: patchcord positioning type; 1/4" wd fabric tape; black fastener fitted to each end for securing to patchcord puley and spring-barrel assembly; 22" lg x 11/32" wd x 0.020" thk overall; 1/4" x 5/32" slot provided in each fastener for mtg.	Positions and holds tension on AF Patchcords		CIA	B955A1066	O-1312 to O-1322	22	22	11	0	1B13 1C13 1C11	11 11 6 0		0 0 0 0
O-1323 to O-1333	SPRING: clock-spring type; 1/2" wd x 0.020" thk spring steel; wound for torsion action; 8 day clock spring.	Part [illegible] O-1301 to O-[illegible]11		CIA	A-7236	O-1323 to O-[illegible]	22	22	11	0	1F2 1H2 1E3	22 22 11 0	8P1	110 0 0 0
O-1334 to O-1344	PULLEY: patchcord holding; grooved type; synthane; 1" diam x 7/16" lg; single groove, 3/16" d, 3/16" radius; 0.191" diam hole in center of puley for affixing to shaft.	Patchcord Holding		CIA	A-6944	O-1334 to O-1344	22	22	11	0	1B14 1C14 1C12	6 6 3 0		0 0 0 0
O-1501 to O-1[illegible]	GASKET: insulating type; neoprene; 1 1/2" OD x 1.115" ID x 3/16" thk overall.	Gasket for J-1501 to J-1511		CIA	A-6652	O-1501 to O-1511	33	22	11	0	1I1 1G1 1E4	33 22 11 0	8N1	132 0 0 0
O-1512 to O-1522	WASHER, flat: sealing type; copper cadmium plated; 2 1/8" OD x 1 37/64" ID x 1/16" thk overall.	Seal Washer for J-1501 to J-1511		CIA	A-6649	O-1512 to O-1522	33	[illegible]			1J2 1C2	33 22	8N2	132 0

									11		1E5	11 6		0 0
O-1523	GASKET: insulating type; neoprene; 0.690" OD x 0.100" ID x 1/2" lg overall.	Gasket for J-1501 to J-1511		CIA	A-6645	O-1523 to O-1533	33	22	11		1E3 1G3 1E6	33 22 11 0	8N3	152 0 0 0
O-1801	BEARING, ball: Same as O-201.	S-1801 Bearing			D955A1067, Gr. 10									
O-1802	SPRING: Same as O-202.	Spring for E-1825												
O-1803	SPRING: Same as O-202.	Spring for E-1826												
O-1804	SPROCKET, chain: steel; cadmium plated; straight teeth; 20 teeth; 3.20" pitch diam; 3.51" OD; 0.500 bore; 1/8" thk; straight face; hub extends 1/16" beyond face of sprocket 1.7125" diam; two 0.1495" diam drill and slotted holes through face of gear spaced on 2 1/8" diam at 180° apart.	Sprocket for Detent		CIA	B-7221, Gr. 2	O-1804	0	0	0	*		0 0 0 0		0 0 0 0
O-1805	SPRING: Same as O-206.	Spring for Detent												
O-1806	BEARING, ball: Same as O-207.	Detent Bearing			C955A1070, Gr. 2-13									
O-1901	BEARING, ball: Same as O-201.	S-1901 Bearing			D955A1067, Gr. 3-10									
O-1902	SPRING: Same as O-202.	Spring for E-1967												
O-1903	SPRING: Same as O-202.	Spring for E-1968												
O-1904	SPRING: Same as O-202.	Spring for E-1969												
O-1905	SPROCKET, chain: steel; cadmium plated; straight teeth; 60 teeth; 7.17" pitch diam; 7.37" OD; 0.625" bore; 3/16" thk; straight face; hub extends 1/16" beyond face of sprocket 1.7125" diam; one side, extends 3/32" beyond face of sprocket 1 1/2" diam other side; two 0.1495" diam drill and slotted holes through face of gear spaced on 2 1/8" diam at 180° apart.	Sprocket for Detent		CIA	B-7221, Gr. 3	O-1905	0	0	0	**		0 0 0 0		0 0 0 0
O-1906	SPRING: Same as O-206.	Spring for Detent												
O-1907	BEARING, ball: Same as O-207.	Detent Bearing			C955A1070, Gr. 3-13									
P-201 to P-241	CONNECTOR, male contact: 1 round male contact; straight; body, 11/16" diam x 1 1/2" lg overall; cylindrical brass shell; silver plated; mica-filled bakelite insert; tropicalized finish overall; ferrule type mtg ring threaded internally 5/8"-24 for mating connector; connector located in connector center.	Plug for J-201 to J-241	-49190	CPH 83-1SP	D955C-46	P-201 to P-241, P-301E to P-311E, P-301F to P-311F, P-301G to P-311G, P-401B to P-411B, P-401C to P-411C, P-501 to P-511, P-701, P-702, P-1512 to P-1522, P-1801 to P-1821, P-1901 to P-1961	263	186	77	0	1D1 1B3 1B2	50 25 25 0		0 0 0 0
P-301E to P-311E	CONNECTOR, male contact: Same as P-201.	Plug for J-301 to J-311E												
P-301F to P-311F	CONNECTOR, male contact: Same as P-201.	Plug for J-301F to J-311F												
P-301G to P-311G	CONNECTOR, male contact: Same as P-201.	Plug for J-301G to J-311G												

* Part of Switch Panel SA-136/G
** Part of Switch Panel SA-138/G

TABLE 4-3. COMBINED PARTS AND SPARE PARTS LIST

PARTS											SPARE PARTS			
SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY TYPE) NO.	MFGR. AND MFGR'S DESIG-NATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL PER EQUIP. UNIT				EQUIP.		STOCK	
							A	B	C	M	BOX	QUAN.	BOX	QUAN.
P-401B to P-411B	CONNECTOR, male contact: Same as P-201.	Plug for J-401B to J-411B												
P-401C to P-411C	CONNECTOR, male contact: Same as P-201.	Plug for J-401C to J-411C												
P-501 to P-511	CONNECTOR, male contact: Same as P-201.	Plug for J-501 to J-511												
P-701	CONNECTOR, male contact: Same as P-201.	Plug for J-701												
P-702	CONNECTOR, male contact: Same as P-201.	Plug for J-702												
P-1201A, B to P-1244A, B	PLUG, telephone: 4 cond; twin shank; round black bakelite shell; shell; shank, 0.249" diam x 1.209" lg; shell, 2 1/4" lg x 1 3/16" wd x 9/16" thk; for lug type cable terminations; NT number stamped on shell.	Part of Patchcords W-1201 to W-1244	-491242	CN	955C-4	P-1201A, B to P-1244A, B	236	140	70	0	1J5 1B4 1A8	6 4 2 0	1B1	200 0 0 0
P-1245A, B to P-1255A, B	PLUG, telephone: 2 cond; single shank; round black bakelite shell; shank, 0.250" diam x 1 7/32" lg; shell, 1.62" lg x 1/2" diam; for lug type cable terminations; NT number stamped on shell.	Part of Patchcords W-1245 to W-1255	-49109	CN	955C-3	P-1245A, B to P-1255A, B	32	16	8	0	1C5 1B5 1A9	3 2 2 0		0 0 0 0
P-1512 to P-1522	CONNECTOR, male contact: Same as P-201.	Plug for J-1512 to J-1522												
P-1801 to P-1821	CONNECTOR, male contact: Same as P-201.	Plug for J-1801 to J-1821												
P-1901 to P-1961	CONNECTOR, male contact: Same as P-201.	Plug for J-1901 to J-1961												
R-601	ATTENUATOR, variable: bridged "T" type; wire-wound; 600/600 ohm ± 5%; 40 w; aluminum case, 2 1/8" diam x 2 1/8" lg overall excluding bushing and shaft; 1/4" diam shaft extends 15/16" from body; 3/8"-32 bushing extending 13/32" beyond case; linear attenuation; 10 step attenuation at 4 db per step, total 40 db; three solder lug type term; panel mounted with 3/8"-32 bushing; supplied with mtg nut and lockwasher; dog tag for indexing placed on 13/32" rad from center of control.	Attenuator for LS-139/G	-636286	CSM #410-4B1	A-7239	R-601, R-602	2	2	2	0	1P 1M 1F	1 1 1 0	8Q2	10 0 0 0
R-602	ATTENUATOR, variable: Same as R-601.	Attenuator for LS-139/G												
S-201	SWITCH, rotary: single pole, 40 position; steel case, cadmium plated 12 13/64" wd x 12 13/64" h x 5 1/16" d overall; terminals consist of 41 jacks, NT	40 Position RF Switch	SA-140/U	CIA	D955A1039	S-201	1	1	0	0		0 0 0 0		0 0 0 0

	49191; mounts by mtg holes on 10" mtg/c for #10/32 screws; mounts on size "G" panel; equipped with detent mechanism for positive positioning.													
S-1001	SWITCH, rotary: 2 pole, 60 position; 2 section (1 pole, 60 position/section); silver plated brass contacts; synthane body; 5" lg x 5" wd x 3 9/16" d (excluding shaft); solder lug term wired to terminal board consisting of 124 screw type term; bushing 3/8"-32 x 3/8" lg; shaft 1/4" diam x 1/2" lg flatted one side 3/8" lg; four 7/32" diam mtg holes spaced 5 1/4" x 4 1/2" mtg/c.	Audio Switching for SA-135/G	-241259	CSM	C955A1041	S-1001	1	1	0	0		0 0 0 0		0 0 0 0
S-1001A	SWITCH SECTION, rotary: wafer section of S-1001; synthane stator and rotor sections; 1 pole, 60 positions; silver plated brass contacts; 5" lg x 5" wd x 3/16" thk (excluding solder lug term); four 0.144" diam mtg holes provided for mounting to S-1001 spaced on 4 1/2" x 4 1/2" mtg/c.	Switch Section for S-1001		CIA	B955A1042	S-1001A, S-1001B	2	2	0	0	1R 1G4	1 1 0 0	1C1	20 0 0 0
S-1001B	SWITCH SECTION, rotary: Same as S-1001A.	Switch Section for S-1001												
S-1002	SWITCH, toggle: DPST; 25 amp, 125 v AC; phenolic body; 1 21/64" lg x 49/64" wd x 1 1/16" d max overall; 11/16" lg bat type handle; up position—on, center position—none, down position—off; screw type term; single hole mtg bushing 15/32"-32, 15/32" lg; with two mtg nuts; furnished in conformance with JAN spec JAN-S-23.	Switches S-1001 in and out of Circuit	ST52K	CAE #8823K	D955A1010-11	S-1002, S-1602, S-1702, S-1703, S-1704	52	36	1	0	1B15 1C15 1A12	13 9 1 0		0 0 0 0
S-1601	SWITCH, toggle: DPST; rated 250 v AC, 20 amp; ceramic body; body 2 7/8" lg x 1 5/8" wd x 1 1/4" h overall; non shorting type contacts; actuating handle 9/16" lg with 5/16" x 5/16" cross-section; screw type term; two #6/32 tap holes provided for mtg spaced on 2 3/8" mtg/c.	Power Switch	-241300	CIA	A-7238	S-1601	3	2	1	0	1S 1G5 1E7	1 1 1 0		0 0 0 0
S-1602	SWITCH, toggle: Same as S-1002.	Trouble Light Switch												
S-1701	SWITCH, rotary: 2 pole, 3 position; single section; silver alloy contacts; ceramic body; 1 7/8" max diam x 27/32" lg overall (excluding bushing and shaft); shorting type contacts; solder lug type term; panel mtg type; bushing 3/8"-32 x 1/4" lg; shaft 1/4" diam x 1/2" lg, flatted one side.	Operator's Position Switch		COC Type HC	A-6680	S-1701	16	11	0	0	1N1 1C16	4 3 0 0	1C2	16 0 0 0
S-1702	SWITCH, toggle: Same as S-1002.	Position Switch			C955A1016-7									
S-1703	SWITCH, toggle: Same as S-1002.	Position Switch			C955A1016-7									
S-1704	SWITCH, toggle: Same as S-1002.	Position Switch			C955A1016-7									
S-1801	SWITCH, rotary: single pole, 20 position; steel case, cadmium plated; 12 13/64" wd x 12-13/64" h x 5 1/16" d overall; terminals consist of 21 jacks, NT 49191; mounts by mtg holes on 10" mtg/c for #10/32 screws; mounts on size "G" panel; equip-	20 Position RF Switch	SA-139/U	CIA	C955A1038	S-1801	0	0	0	X		0 0 0 0		0 0 0 0

TABLE 4-3. COMBINED PARTS AND SPARE PARTS LIST

SYMBOL DESIG.	NAME OF PART AND DESCRIPTION	FUNCTION	JAN AND (NAVY SYMBOL TYPE) NO.	MFGR. AND MFGR'S DESIG-NATION	CONTRACTOR DRAWING & PART NO.	ALL SYMBOL DESIG. INVOLVED	TOTAL PER EQUIP. UNIT A	B	C	M	SPARE PARTS EQUIP. BOX	EQUIP. QUAN.	STOCK BOX	STOCK QUAN.
	ped with detent mechanism for positive positioning.													
S-1901	SWITCH, rotary: single pole, 60 position; steel case, cadmium plated; 12 13/64" wd x 12-13/64" h x 5 1/16" d overall; terminals consist of 61 jacks, NT 49191; mounts by mtg holes on 10" mtg/c for #10/32 screws; mounts on size "G" panel; equipped with detent mechanism for positive positioning.	60 Position RF Switch	SA-141/U	CIA	C955A1040	S-1901	0	0	0	X		0 0 0 0		0 0 0 0
T-601	TRANSFORMER, AF: line type; primary 600 ohms impedance, secondary 6 ohms impedance; steel, hermetically sealed case; 1 13/16" lg x 1 13/16" wd x 2 1/2" h (excluding length of term); 5 watts; four solder lug type term located in base; four 5/32" diam mtg holes spaced on 1 1/2" x 1 1/2" mtg/c; furnished in accordance with Navy Specification 16T30 (INT), Grade I, Class I.	Speaker LS-601 Transformer	-304351	CUT B-3616	A-6835	T-601, T-602	2	2	2	0	1N2 1K2 1C13	2 2 2 0	1D2	6 0 0 0
T-602	TRANSFORMER, AF: Same as T-601.	Speaker LS-602 Transformer												
TB-601	BOARD, terminal: general purpose; 2 brass nickel plated screw term (two screws per term, 4 screws total); term 9/16" between centers; with barriers molded into board; molded phenolic board; 2 2/32" lg x 1 5/16" wd x 5/8" h overall; four 0.209" diam mtg holes spaced on 1 11/16" x 1/2" mtg/c.	General Purpose Terminal Board		CJC #2-142	D955A1006-9	TB-601, TB-602	2	2	2	0		0 0 0 0		0 0 0 0
TB-602	BOARD, terminal: Same as TB-601.	General Purpose Terminal Board												
TB-1001	BOARD, terminal: general purpose; 124 brass cadmium plated screw type term; terminals spaced in rectangular fashion of sixteen terminals in a row and a total of eight rows; rows five and six have two terminals each missing; all terminals spaced 5/8" apart and each row spaced 5/8" apart; four 0.149" diam holes provided for mtg to switch S-1001 spaced on 4 1/2" x 4 1/2" mtg/c.	Te[illegible] board for [illegible]31		CIA	B955A1044	TB-1001	1	1	0	0		0 0 0 0		0 0 0 0
TB-1002	BOARD, terminal: general purpose; 8 brass cadmium plated screw type term; terminals spaced in two rows, 4 terminals per row; terminals spaced 1/2" apart, rows spaced 1" apart; two 9/64" diam	Terminal Board for Key Compartment		CIA	A955A1058	TB-1002	1	1	0	0		0 0 0 0		0 0 0 0

	mtg holes provided spaced on 1 1/8" mtg/c.													
TB-1401 to TB-1404	BOARD, terminal: general purpose; 13 brass nickel plated screw term (two screws per term, 26 screws total); term 7/16" between centers; with barriers molded into board; molded phenolic board; 6 7/16" lg x 1 1/8" wd x 1/2" h overall; four 0.175" diam mtg holes spaced on 6 1/8" x 27/64" mtg/c.	General Purpose Terminal Board		CJC #13-141	D955A1009-11	TB-1401 to TB-1404	24	20	8	0	1N3 1G6 1E8	3 2 1 0	8M2	10 0 0 0
TB-701	BOARD, terminal: general purpose; 14 brass nickel plated screw type term; terminals in two rows of 7 terminals each, terminals spaced 1/2" apart, rows spaced 1" apart; two 0.169" diam holes spaced on 3 3/4" mtg/c for mtg.	General Purpose Terminal Board		CIA	A955A1064	TB-1701	16	11	0	0		0 0 0		0 0 0 0
W-1201 to W-1211	CABLE ASSEMBLY, special purpose: four conductor cable, Navy Type FT-4, BuShips spec 15C9 (INT); 36" lg; fitted each end with Navy Type -491242 twin plugs, Navy dwg. RE49F411.	AF Patchcords for Panel MX-814/G	-491397-A	CN	B955A1049-10	W-1201 to W-1211	22	22	11	X	1M1 1E1 1D1	22 22 11 0	*	250 0 0 0
W-1212 to W-1222	CABLE ASSEMBLY, special purpose: four conductor cable, Navy Type FT-4, BuShips spec 15C9 (INT); 24" lg; fitted each end with Navy Type -491242 twin plugs, Navy dwg. RE49F411.	Alternate Patchcords for MX-814/G	-491397	CN	D955A-31	W-1212 to W-1222	0	0	0	X	1L1 1D1 1D2	15 10 5 0	**	110 0 0 0
W-1223 to W-1233	CABLE ASSEMBLY, special purpose: four conductor cable, Navy Type FT-4, BuShips spec 15C9 (INT); 72" lg; fitted each end with Navy Type -491242 twin plugs, Navy dwg. RE49F411.	Alternate Patchcords for MX-814/G	-491397C	CN	D955A-33	W-1223 to W-1233	0	0	0	X	1G1 1D2 1D3	8 4 2 0	1E1	16 0 0 0
W-1234 to W-1244	CABLE ASSEMBLY, special purpose: four conductor cable, Navy Type FT-2, BuShips spec 15C9 (INT); 48" lg; fitted each end with Navy Type -49109 plugs, Navy dwg RE49AA422.	Alternate Patchcords for MX-814/G	-491396B	CN	D955A-34	W-1234 to W-1244	0	0	0	X	1L2 1D3 1D4	16 8 4 0	***	299 0 0 0
XF-1601	LAMPHOLDER: for holding fuse with NEC standard screw base; ceramic body; 250 v, 660 w; 2 5/16" lg x 1 5/8" wd x 1 9/16" h overall; mounts in 1 3/8" diam hole; two #8/32 tapped bushings spaced on 1 13/16" mtg/c provided for mtg.	Fuseholder for F-1601		CYD #4063	A-7277	XF-1601, XF-1602	6	4	2	0	1N4 1C17 1A10	2 1 1 0		0 0 0 0
XF-1602	LAMPHOLDER: Same as XF-1601.	Fuseholder for F-1602												
XF-1603	HOLDER, fuse: extractor post type; for single 3AG cartridge fuse; cylindrical black bakelite body with tinned brass or copper contacts and lugs: 30 amp, 250 v max; 11/18" OD x 2 3/8" lg overall: 1/2" diam threaded body for panel hole mounting; flatted 1/32"; 2 solder lug term; with lockwasher and mtg nut; test prod hole provided in cap.	Fuseholder for F-1603		CFA, Type HKM-HR	D955A1017-14	XF-1603, XF-1604	6	4	2	0	1C7 1A6 1A11	3 2 1 0		0 0 0 0
XF-1604	HOLDER, fuse: Same as XF-1603.	Fuseholder for F-1604												
XI-1601	LIGHT, extension: trouble light NEC type SJ cordage; cable 9' lg, total length including handle and guard is 10'; 25-40 watt size fibre strap guard; molded rubber handle; guard is 3 3/4" diam.	Trouble Light for Cabinet		Woodhead #120 (Protex)	D955A1017-19	XI-1601	3	2	1	0	1T 1N 1H	1 1 1 0		0 0 0 0

* Box Nos. 7A1 to 7E1 ** Box Nos. 6A1 to 6B1 *** Box Nos. 6C1 to 6G1

TABLE 4-4. CROSS REFERENCE PARTS LIST

JAN (or AWS) DESIGNATION	KEY SYMBOL
ST52K	S-1002
NAVY TYPE	
-28032-1	F-1603
-28102-15	F-1601
-49109	P-1245A
-49120	J-301A
-49190	P-201
-49191	J-201
-49194	J-301E
-241259	S-1001
-241300	S-1601
-304351	T-601
-491224	J-1701
-491242	P-1201A
-491388	J-401
-491652	J-1501
-491669	J-103
-491729	J-301
-491814	LS-601
-491820	J-101
-491395	J-1101
-491396-B	W-1234
-491397	W-1212
-491397-A	W-1201
-491397-C	W-1223
-636286	R-601
ARMY-NAVY TYPE	
SA-139/U	S-1801
SA-140/U	S-201
SA-141/U	S-1901
UG-294/U	J-501

TABLE 4-5. LIST OF MANUFACTURERS

PREFIX	NAME	ADDRESS
CAE	CUTLER-HAMMER, INC.	1333 W. ST. PAUL AVE., MILWAUKEE, WISC.
CAG	GENERAL RADIO CO.	30 STATE STREET, CAMBRIDGE, MASS.
CAXV	ECONOMY FUSE & MFG. CO.	GREENVIEW AVE., AT DIVERSEY PARKWAY, CHICAGO, ILL.
CBHW	NATIONAL ELECTRIC PRODUCTS CORP.	PITTSBURGH, PA.
CFA	BUSSMAN MFG. CO.	2538 W. UNIVERSITY ST., ST. LOUIS, MISSOURI
CG	GENERAL ELECTRIC CO.	SCHENECTADY, N. Y.
CHU	HUBBELL, HARVEY, INC.	447 CONCORD AVE., BRIDGEPORT, CONN.
CIA	AIRPLANE AND MARINE INSTRUMENTS, INC.	CLEARFIELD, PA.
CJC	JONES, HOWARD B. CO.	2300 W. WABANSIA AVE., CHICAGO, ILL.
CJS	JENSEN RADIO MFG. CO.	6601 S. LARAMIE AVE., CHICAGO, ILL.
CMI	MOLDED INSULATION CO., INC.	3246 LUDLOW ST., PHILADELPHIA, PA.
CN	NATIONAL ELECTRIC MACHINE SHOPS, INC.	1935 5TH ST., N. E., WASHINGTON, D. C.
COC	OAK MFG. CO.	1200 N. CLYBOURNE AVE., CHICAGO, ILL.
CPH	AMERICAN PHENOLIC CORP.	1250 W. VAN BUREN ST., CHICAGO, ILL.
CSM	SHALLCROSS MFG. CO.	PUSEY & JACKSON AVENUES, COLLINGDALE, PA.
CUT	UNITED TRANSFORMER CO.	148 [illegible]ICK ST., NEW YORK, N. Y.
CYD	BRYANT ELECTRIC CO.	1421 STA[illegible] ST., BRIDGEPORT, CONN.
*	AMERICAN CABINET HARDWAR[illegible]	ROCKFORD, ILL.
*	ATLANTIC INDIA RUBBER W[illegible]	571 W. PAL[illegible] ST., CHICAGO 7, ILL.
*	CONTINENTAL RUBBER WOR[illegible]	1932 LIBERTY BLVD., ERIE, PA.
*	DONNELLY ELECTRIC & MFG. CO.	3050 WASHINGTON ST., BOSTON, MASS.
*	NEW DEPARTURE DIVISION OF G. M.	7-122 GENERAL MOTORS BLDG., DETROIT 2, MICHIGAN
*	NATIONAL BRASS COMPANY	1601 MADISON AVE., S. E., GRAND RAPIDS, MICHIGAN
*	WOODHEAD, DANIEL CO.	15 N. JEFFERSON ST., CHICAGO 6, ILL.

* No Prefix Available.