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NAVSHIPS 92121(A)

INSTRUCTION BOOK

for

RADIO TRANSMITTING SETS

**AN/SRT-14, AN/SRT-14A, AN/SRT-15,
AN/SRT-15A, AN/SRT-16 AND AN/SRT-16A**

FEDERAL TELEPHONE AND RADIO COMPANY

A division of INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

CLIFTON, NEW JERSEY

DEPARTMENT OF THE NAVY

BUREAU OF SHIPS

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*Contract: NObsr-52021
NObsr-52622*

Approved by BuShips: 26 October 1955

LIST OF EFFECTIVE PAGES

PAGE NUMBERS	CHANGE IN EFFECT	PAGE NUMBERS	CHANGE IN EFFECT
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DEPARTMENT OF THE NAVY
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WASHINGTON 25, D. C.IN REPLY REFER TO
Code 993-100
26 October 1955

From: Chief, Bureau of Ships
To: All Activities Concerned with the
Installation, Operation and Main-
tenance of the Subject Equipment

Subj: Instruction Book for Radio Trans-
mitting Sets AN/SRT-14, AN/SRT-14A,
AN/SRT-15, AN/SRT-15A, AN/SRT-16
and AN/SRT-16A

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A. G. MUMMA
Chief of Bureau

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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 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 times 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.

WHERE 1000 VOLTS OR MORE, TAKE NOTE:

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

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.

NAVSHIPS 92121(A)

INSTRUCTION BOOK

for

RADIO TRANSMITTING SETS

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

SECTION 1

GENERAL DESCRIPTION

FEDERAL TELEPHONE AND RADIO COMPANY

A division of INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

CLIFTON, NEW JERSEY

DEPARTMENT OF THE NAVY

BUREAU OF SHIPS

Contract: NObsr-52021
NObsr-52622

Approved by BuShips: 26 October 1955

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SECTION 1 GENERAL DESCRIPTION

1. INTRODUCTION.

This instruction book describes the procedure for the installation, operation, and maintenance of Radio Transmitting Sets AN/SRT-14, AN/SRT-15 and AN/SRT-16. Primary attention is given to the installation, operation, and maintenance of these sets on shipboard. Other locations should consider the information, particularly that on installation, in the light of their individual conditions or requirements.

Note

The AN/SRT-14A, 15A and 16A are non-magnetic versions of the AN/SRT-14, 15 and 16 respectively. As the nonmagnetic versions vary from the standard types only in the material used for cabinet panels, all other information on the general description of the AN/SRT-14, 15 and 16, as set forth in the following section, applies equally as well for the AN/SRT-14A, 15A and 16A.

Note

Where, throughout this section, reference is made to either low level radio modulator or high level radio modulator, it should not be interpreted as meaning the technique of modulation known as grid modulation or low level modulation, but rather as referring to the operating *power* level.

2. BASIC FEATURES.

a. PURPOSE.—The purpose of Radio Transmitting Sets AN/SRT-14, 15 and 16 is to provide radio-frequency energy at any frequency from 0.3 to 26 mc for the transmission of voice, facsimile, and also c-w telegraph communication. All three sets are capable of covering the frequency range in steps of 10 cycles with nominal 100-watt output level. The AN/SRT-15 and AN/SRT-16 sets can also operate at a nominal 500-watt carrier level in the frequency range 2 to 26 mc.

b. MODES OF TRANSMISSION.—The AN/SRT-14 and AN/SRT-15 sets are single transmitters. The AN/SRT-14 is limited to a single 100-watt output while the AN/SRT-15 may transmit an r-f carrier at either a 100-watt or a 500-watt nominal level. The AN/SRT-16 set is a dual transmitter capable of transmitting two carriers simultaneously, one of which is limited to a 100-watt output while the other may be transmitted at the 500-watt level or at the 100-watt level. Although the carrier levels are referred to as 100 and 500 watts, the outputs vary over the frequency range according to the form of communication. Each r-f carrier may be used for any one of several forms of communication:

Facsimile	—	amplitude modulation (A3)
Telegraphy	—	{ amplitude modulation (A1)— c-w hand key, c-w machine key frequency shift (F1)— FS machine key
Radiophone	—	frequency modulation (F4)

Over the entire frequency range, the unmodulated carrier level for radiophone communication may vary from 55 to 100 watts at the lower level and from 265 to 400 watts at the higher level, while over the same frequency range the carrier level for telegraph and facsimile transmission may vary from 80 to 150 watts for the lower output level and from 400 to 600 watts at the higher level.

c. FREQUENCY SELECTION.—Frequency selection is manually accomplished in the AN/SRT-14, 15 and 16. A set of nine frequency selection control knobs, located on the radio frequency oscillator, allow an operator to choose, in 10-cps steps, any frequency between 0.3-26 mc.

d. TUNING PROCEDURES.—The AN/SRT-14, 15 and 16 are manually tuned to any desired frequency within the 0.3-26-mc range. Tuning is accomplished in three stages in the radio-frequency amplifier unit. Meters are provided to assist in the tuning operation. The antenna tuning equipment also contains several stages of manual tuning, with the controls and indicators located in the transmitter.

e. REMOTE OPERATION.—Each of the transmitting sets may be arranged for remote operation. Start-stop control, keying, and radiophone may be performed from a remote location. Standard Navy six-wire radio transmitter control circuits are used for all remote control operations.

f. PRIMARY POWER SUPPLY.—For 100-watt operation, only 110-volt, single-phase, 60-cps power is required. For 500-watt operation an additional source of 220- or 440-volt, three-phase, 60-cps power is required.

3. DESCRIPTION OF SETS.

a. GENERAL.—Radio Transmitting Sets AN/SRT-14, AN/SRT-15 and AN/SRT-16 are formed from a number of major components that are used like building blocks to assemble a set with desired features. Although the necessary differences exist in the interconnecting wiring of the transmitters, the major components forming each set are identical and interchangeable. Figures 1-1, 1-2, and 1-3 show the major components of the sets.

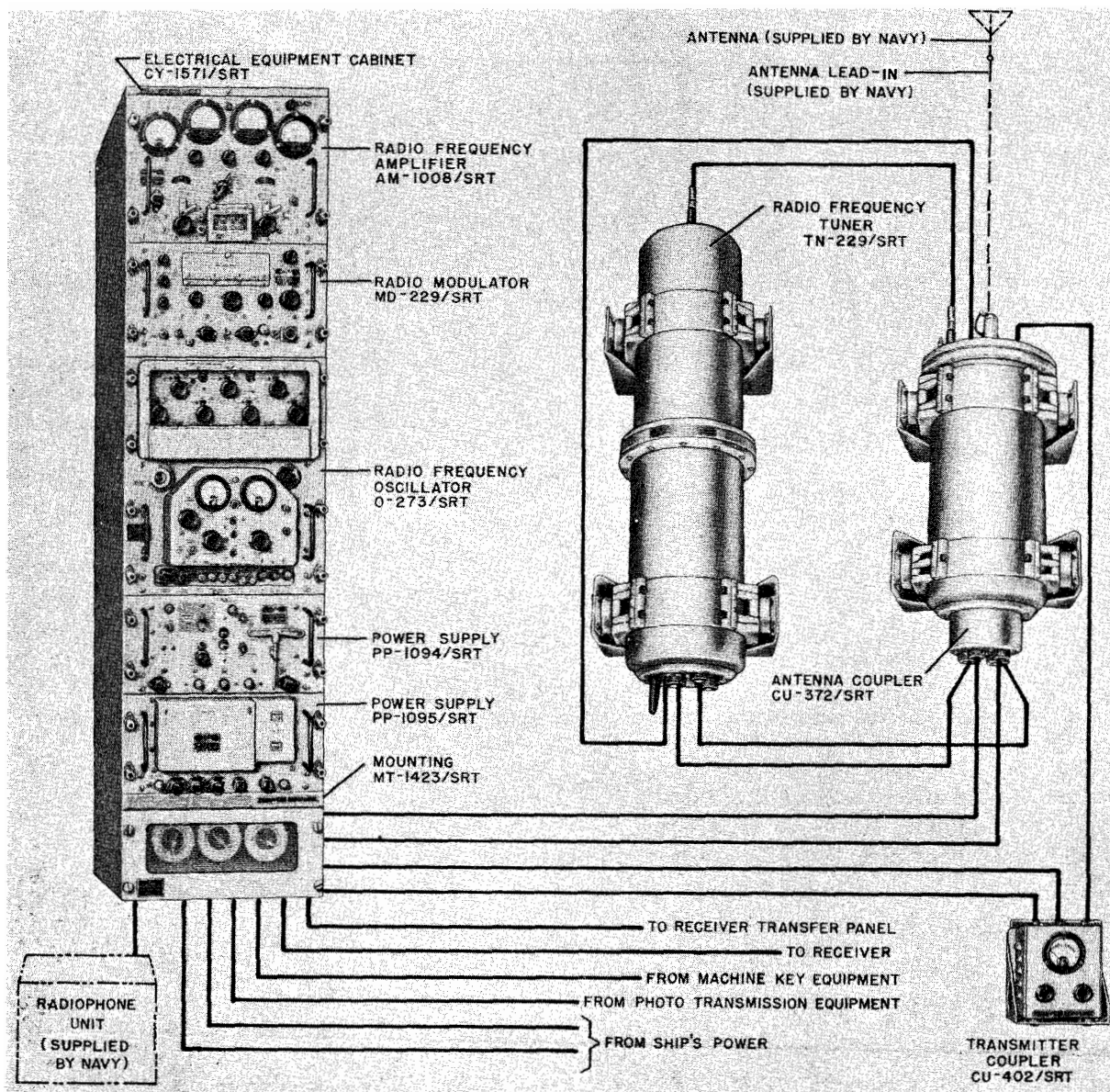


Figure 1-1. Radio Transmitting Set AN/SRT-14, Relationship of Units

b. AN/SRT-14. (See figure 1-1.)—Radio Transmitting Set AN/SRT-14 consists of a 100-watt transmitter bay, antenna tuning equipment, together with spare parts. A radiophone unit and an antenna are required but are not furnished as parts of the set.

c. AN/SRT-15. (See figure 1-2.)—Radio Transmitting Set AN/SRT-15 consists of a 100-watt transmitter bay and booster, antenna tuning equipment, together with spare parts. A radiophone unit and an antenna are required but are not furnished as parts of the set.

d. AN/SRT-16. (See figure 1-3.)—Radio Transmitting Set AN/SRT-16 consists of two 100-watt transmitter bays and two antenna tuning equipments, together

with spare parts. Two radiophone units and two antennas are required but are not furnished as parts of the set.

e. TRANSMITTER BAY.—Each AN/SRT-14, 15 and 16 set has a basic transmitter bay having identical and interchangeable units to accomplish 100-watt operation. The AN/SRT-15 and AN/SRT-16 transmitter bays have, in addition, identical and interchangeable modulator power units to accomplish 500-watt operation. The AN/SRT-14 transmitter bay consists of a transmitter group, a transmitter coupler, and a mounting (figure 1-1). The AN/SRT-15 transmitter bay consists of a transmitter group, a transmitter coupler,

two mountings, and a radio modulator-power supply (booster) (figure 1-2). The AN/SRT-16 transmitter bay is made up of two transmitter groups, two transmitter couplers, two mountings, and a radio modulator-power supply (booster) (figure 1-3).

TABLE 1-1. MAJOR UNITS

NAME OF UNIT	AN/SRT-14	AN/SRT-15	AN/SRT-16
Transmitter Group OA-684/SRT	1	1	2
Radio Modulator-Power Supply OA-685/SRT (Booster)	0	1	1
Mounting MT-1423/SRT	1	2	2
Antenna Coupler CU-372/SRT	1	1	2
Radio Frequency Tuner TN-229/SRT	1	1	2
Test Cable ¹	1	1	1
Installation Material (including Cover CW-341/SRT in AN/SRT-15)	1 ²	1 ²	1 ²
Spare Parts	1 ²	1 ²	1 ²
Radiophone Unit, Navy Type 23500 ³	1	1	2
Antenna (as required) ³	1	1	2

- ¹ Material (less wires) supplied loose.
- ² Items supplied vary with type of set.
- ³ Supplied by Navy.

f. ANTENNA TUNING EQUIPMENT.—The term "antenna tuning equipment" covers the Antenna Coupler CU-372/SRT and the Radio Frequency Tuner TN-229/SRT. One of each of these units is required for an AN/SRT-14 or 15, while two are required for an AN/SRT-16.

g. COMPARISON OF SETS.—Table 1-1 shows, for each transmitter set, the major units included, their nomenclature, and the quantity supplied.

4. DESCRIPTION OF UNITS.

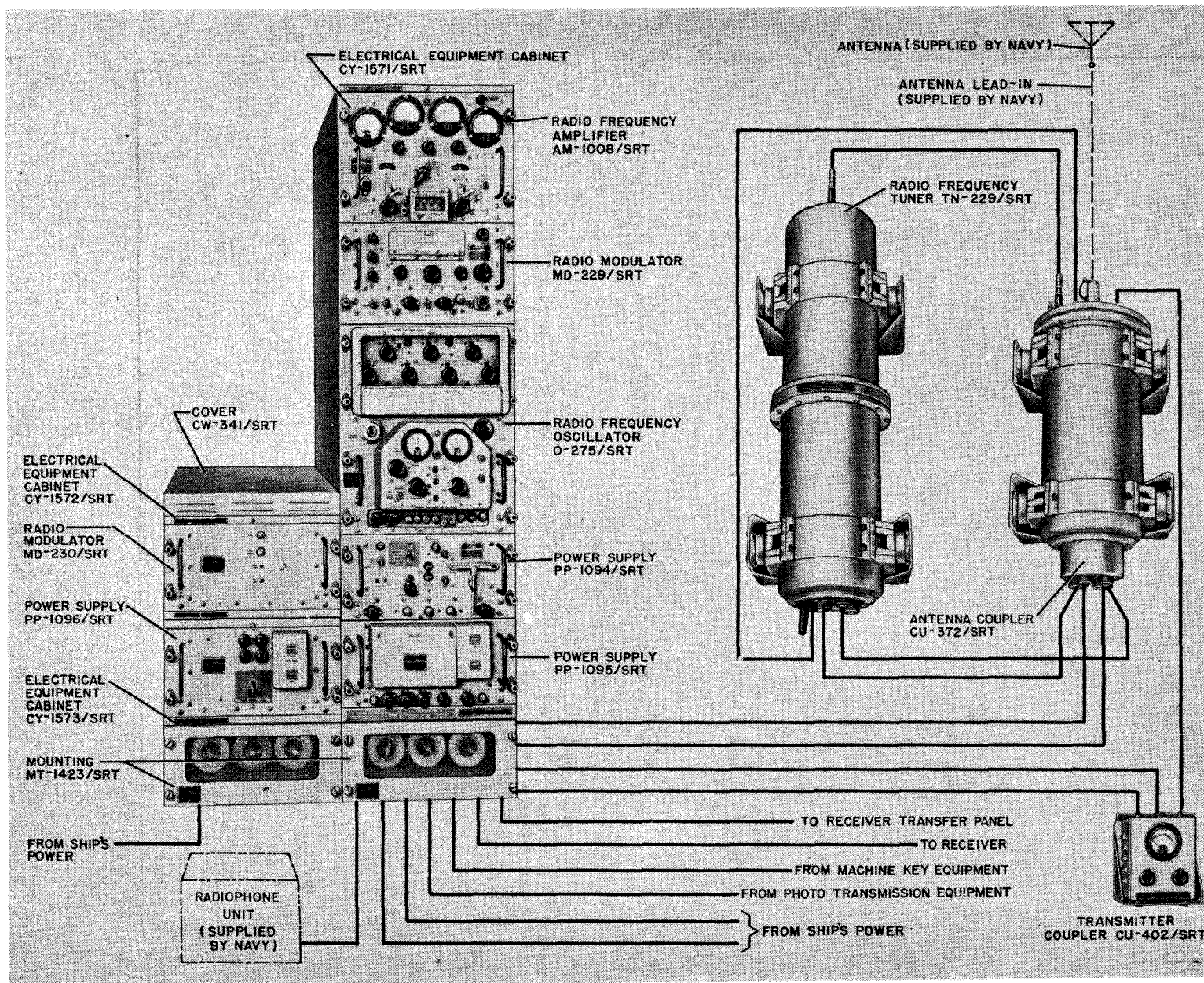
a. NOMENCLATURE.—Table 1-2 shows the official nomenclature, common name, abbreviation, and reference symbol group for every major component in the AN/SRT-14, 15 and 16.

b. TRANSMITTER GROUP OA-684/SRT.—The 100-watt transmitter group contains all circuits for generating the desired radio frequency, amplifying it to the 100-watt carrier level, and provides it either in amplitude- or frequency-modulation communication. Modulated r-f carrier output is delivered to a 50-ohm coaxial cable terminated in an "N" connector. The r-f carrier is then connected to an adjustable impedance transformer for matching to the output impedance of the antenna tuning system. All necessary power supplies are included to convert the primary power to the voltages

TABLE 1-2. GENERAL NOMENCLATURE

OFFICIAL NOMENCLATURE	COMMON NAME	ABBREVIATION	REFERENCE SYMBOL GROUP
Transmitter Group OA-684/SRT ¹	Transmitter Group		501-699, 1001-1399, 2001-3099, 3201-3299
Electrical Equipment Cabinet CY-1571/SRT ¹	Transmitter Group Cabinet		601-699
Radio Frequency Amplifier AM-1008/SRT	Radio Frequency Amplifier	RFA	1301-1399
Radio Modulator MD-229/SRT	Low Level Radio Modulator	LLRM	1001-1299
Radio Frequency Oscillator O-275/SRT	Radio Frequency Oscillator	RFO	2001-2999
Power Supply PP-1094/SRT	Low Voltage Power Supply	LVPS	3001-3099
Power Supply PP-1095/SRT	Medium Voltage Power Supply	MVPS	501-599
Transmitter Coupler CU-402/SRT	Load Adjusting Unit	LAU	3201-3299
Radio Modulator-Power Supply OA-685/SRT ¹	Booster		1401-1699
Electrical Equipment Cabinet CY-1572/SRT ¹	High Level Radio Modulator Cabinet	HLRM Cabinet	1401-1499
Electrical Equipment Cabinet CY-1573/SRT ¹	High Voltage Power Supply Cabinet	HVPS Cabinet	1401-1499
Radio Modulator MD-230/SRT	High Level Radio Modulator	HLRM	1601-1699
Power Supply PP-1096/SRT	High Voltage Power Supply	HVPS	1501-1599
Cover ¹ CW-341/SRT ²	Booster Cover		—
Mounting MT-1423/SRT	Mounting		701-799
Antenna Coupler CU-372/SRT	Antenna Coupler		3501-3599
Radio Frequency Tuner TN-229/SRT	R-F Tuner		301-399
Control-Indicator C-1352/SRT	Control-Indicator		401-499
Installation Kit MK-230/SRT-14	Installation Material, AN/SRT-14		3301-3399
Installation Kit MK-231/SRT-14A	Installation Material, AN/SRT-14A		3301-3399
Installation Kit MK-232/SRT-15	Installation Material, AN/SRT-15		3301-3399
Installation Kit MK-233/SRT-15A	Installation Material, AN/SRT-15A		3301-3399
Installation Kit MK-234/SRT-16	Installation Material, AN/SRT-16		3301-3399
Installation Kit MK-235/SRT-16A	Installation Material, AN/SRT-16A		3301-3399

- ¹ Indicates available in nonmagnetic version with nomenclature modified to show suffix "A"—e.g., OA-684A/SRT and CY-1572A/SRT for nonmagnetic versions.
- ² Cover CW-341/SRT part of Installation Kit MK-232/SRT-15 (CW-341A/SRT part of MK-233/SRT-15A).



NAVSHIPS 92121(A)
AN/SRT-14, 14A, 15, 15A, 16, 16A

GENERAL
DESCRIPTION

Figure 1-2. Radio Transmitting Set AN/SRT-15, Relationship of Units

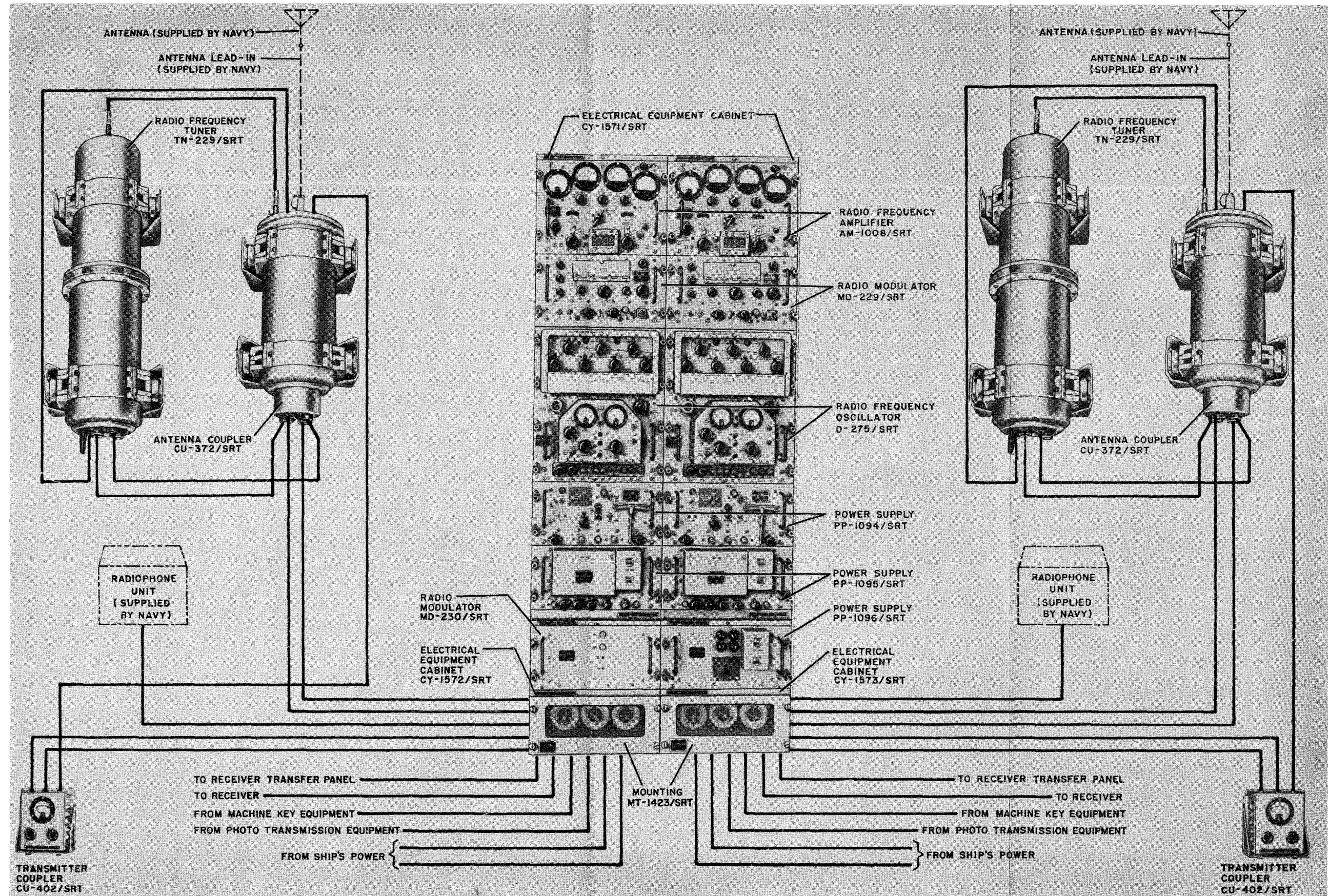


Figure 1-3. Radio Transmitting Set AN/SRT-16, Relationship of Units

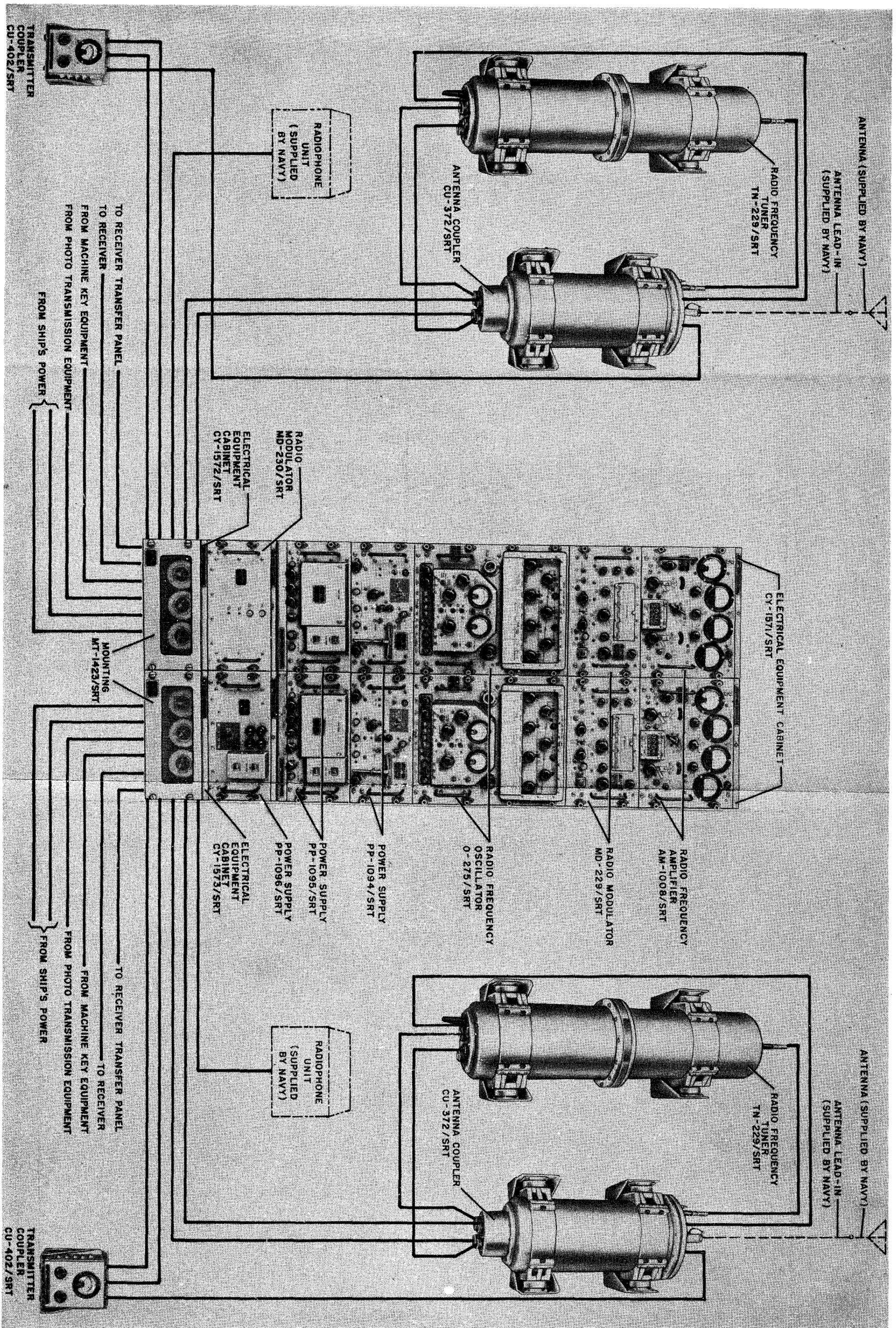


Figure 1-3. Radio Transmitting Set AN/SRT-16, Relationship of Units

required in the various circuits. However, the transmitter group must be associated with Mounting MT-1423/SRT so that the necessary forced-air ventilation and suitable mounting arrangements may be obtained.

The transmitter group consists of Electrical Equipment Cabinet CY-1571/SRT holding five pull-out drawer-type chassis and the Transmitter Coupler CU-402/SRT, commonly known as load adjusting unit, which contains the impedance matching transformer and the standing-wave monitor.

From top to bottom the major components located in Electrical Equipment Cabinet CY-1571/SRT are:

- (1) Radio Frequency Amplifier AM-1008/SRT (Radio Frequency Amplifier, RFA)
- (2) Radio Modulator MD-229/SRT (Low Level Radio Modulator, LLRM)
- (3) Radio Frequency Oscillator O-275/SRT (Radio Frequency Oscillator, RFO)
- (4) Power Supply PP-1094/SRT (Low Voltage Power Supply, LVPS)
- (5) Power Supply PP-1095/SRT (Medium Voltage Power Supply, MVPS)

For power, control, and r-f circuit connections, each drawer is equipped with connectors at the rear that mate with receptacles in the cabinet wiring. The front panel of each drawer is equipped with hex socket-head captive screws that secure the drawer to the cabinet. Releasing these screws with the hex key (provided on the front panel of the low voltage power supply) permits the drawers to be withdrawn on a slide and rail arrangement all the way out of the cabinet. At this point the drawer slides engage a positive stop that must be released (by removing two retaining screws and depressing two slide latches) before complete withdrawal of the drawer can be accomplished. The retractable cabinet wiring is disconnected from the drawer at this point and the retractable cable is latched in its extended position to a special latch provided for this purpose for each drawer. Two handles are provided on the front of each drawer for convenience in handling. To reinsert a drawer, the slides are engaged with the cabinet rails, and the cabinet wiring is reconnected; then, with the slide latches depressed, the drawer is run in until the slides hit the spring-loaded buttons. Depressing these buttons allows the drawer to be completely returned into the cabinet.

While maximum side and rear access is convenient during installation, it is not essential for maintenance of this equipment. Since the drawers are removable, only sufficient access space is required to permit removal of the individual drawers. Preparation of the special test cable allows operation of individual drawers when completely removed from the cabinet.

(1) RADIO FREQUENCY AMPLIFIER AM-1008/SRT (RADIO FREQUENCY AMPLIFIER, RFA). (See figure 1-4.)—The basic function of the radio fre-

quency amplifier (RFA) is to amplify the r-f signal received from the radio frequency oscillator to either the 100-watt or 500-watt nominal level.

The RFA consists of three stages of amplification: namely, the buffer, intermediate power amplifier (IPA), and power amplifier (PA). The output of the radio frequency oscillator drives the tuned buffer stage. This stage also receives keying signals from the low level radio modulator to key the output of the RFA on and off during hand-key, machine-key, and phone operation. The tuned intermediate power amplifier stage follows using a 5933 beam tetrode. The final stage is the power amplifier employing a 4-400A tetrode with forced air cooling. In phone operation an audio modulating signal is received from either the low level radio modulator or the high level radio modulator, the latter in an AN/SRT-15 or 16 only, to amplitude-modulate the output of the RFA.

The RFA is manually tuned by the adjusting of three front panel controls. Each of these stages of amplification has a tuned plate tank circuit. The first of the tuning controls is a six-position switch that connects a tank circuit to each of the three stages, in accordance with the band of frequencies in which the selected transmission frequency lies. The second control tunes the buffer and IPA stage tank circuits and the third control tunes the PA stage.

In addition to the tuning controls, there is a control for regulating the input level of the signal from the radio frequency oscillator. The RFA front panel contains four meters used for tuning indicators and as test meters for various operating voltages and currents. A set of indicator lamps is provided to indicate overload conditions and operating conditions of the carrier. For test purposes, the front panel also contains a receptacle and switch, which allows an external source of r-f energy other than the component radio frequency oscillator to energize the buffer stage. A push-button switch, which is used to place a transmitter group in the nominal 550-

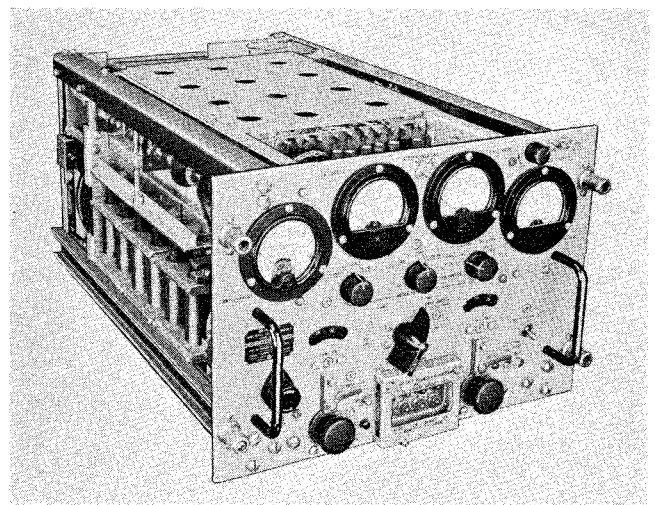


Figure 1-4. Radio Frequency Amplifier AM-1008/SRT, Front Oblique View

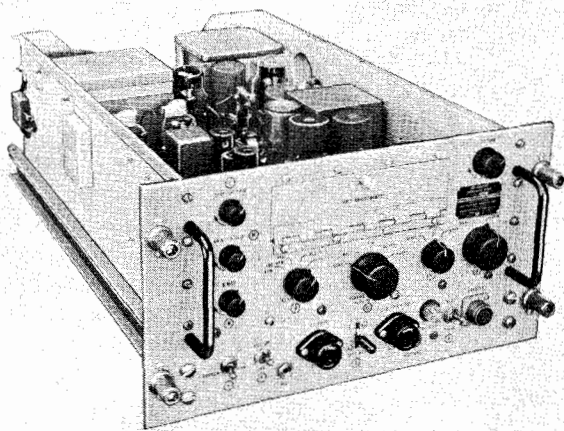


Figure 1-5. Radio Modulator MD-229/SRT, Front Oblique View

watt level of output (in SRT-15 and 16 only), is mounted on the RFA front panel. A second push button is used to restore a transmitter group to the 100-watt level.

(2) RADIO MODULATOR MD-229/SRT (LOW LEVEL RADIO MODULATOR, LLRM). (See figure 1-5.)—This unit is commonly called the low level radio modulator (LLRM) to distinguish it from the high level radio modulator that is used in AN/SRT-15 and AN/SRT-16 sets. The low level radio modulator accepts voice, telegraphy (hand or machine key), or facsimile signals. It contains audio amplifying and modulating circuits for amplitude modulation of the r-f carrier at the 100-watt level. For 500-watt carrier operation in the AN/SRT-15 and 16, the low level radio modulator feeds a high level radio modulator that boosts the audio signal to the required level. Peak limiting and noise suppression (squell) features are provided in the audio circuits. Either carbon or dynamic microphones may be used.

An electronic keyer circuit provides the keying voltage to control the radio frequency amplifier during amplitude modulation (cw) telegraphy and the radio frequency oscillator in frequency-shift telegraphy. A wave-shaping circuit provides optimum keying waveshape for the keying speed in use. The keying circuits are suitable for speeds from hand keying to 600 words per minute. Facsimile set signals are connected through the low level radio modulator to the frequency-shift circuits in the radio frequency oscillator drawer. A 200-cps oscillator is included to phase shift modulate the transmitter signal to overcome selective fading in frequency-shift transmission; in c-w telegraphy the audio oscillator has a 1,000-cps output used for aural monitoring of the keying signals. A regulated +250-volt power supply and a -12-volt power supply are provided to supply the requirements of the low level radio modulator and other circuits of the transmitter group.

The front panel of the low level radio modulator has controls for selecting a mode of transmission, receptacles for a local carbon or dynamic microphone, gain controls, and a squell circuit control. A test key is provided for carrier control.

(3) RADIO FREQUENCY OSCILLATOR O-275/SRT (RADIO FREQUENCY OSCILLATOR, RFO). (See figures 1-6 and 1-7.)—The radio frequency oscillator (RFO) is the source of the r-f carrier signal. The 100-kc crystal oscillator, the interpolation oscillator, multipliers, frequency converters, and filters provide frequencies between 0.3 and 26 mc in steps of 10 cycles. A frequency-shift oscillator provides carrier frequency shift for telegraphy in accordance with keying signals received from the low level radio modulator. The radio frequency oscillator delivers a minimum output of two volts rms to the first stage of the radio frequency amplifier.

The radio frequency oscillator consists of 15 sections: 14 easily removable units holding vacuum tube circuits, and a mounting to which these units are attached. The 15 sections have official standard item name and symbol designations but are usually referred to by their common name or unit number. The output stage of the radio frequency oscillator is divided into three separate units (11a, 11b, 11c), each of which covers a portion of the total frequency range of the radio transmitter. Table 1-3 gives the official standard item name, reference symbol, common name, subunit number, and reference symbol for RFO units.

Units 1 through 12 are equipped with multiple pin-type connectors that mate with receptacles on unit 14. Radio-frequency connections are made through BNC connectors and jumper cables. On each subchassis, test

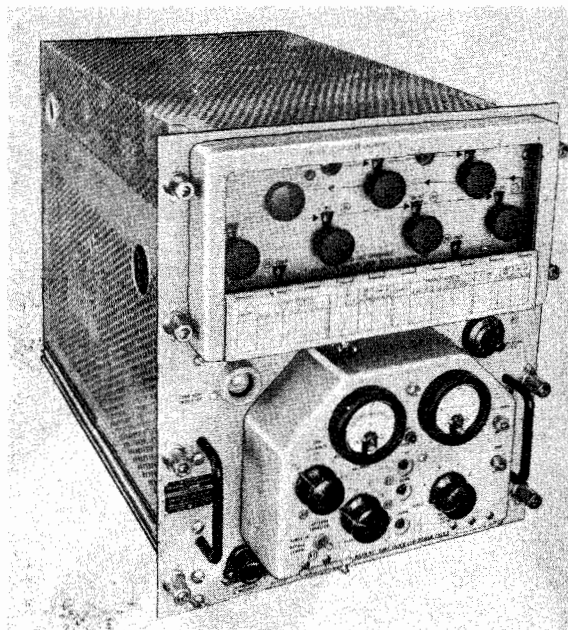


Figure 1-6. Radio Frequency Oscillator O-275/SRT, Front Oblique View, Covers On

TABLE 1-3. SUBUNITS OF RADIO FREQUENCY OSCILLATOR O-275/SRT

STANDARD ITEM NAME	REF SYMBOL	COMMON NAME	SUBUNIT	SYMBOL GROUP
Radio Frequency Oscillator	Z-2001	Crystal Oscillator	Unit 1	2001-2030
Frequency Multiplier	Z-2034	Frequency Multiplier	Unit 2	2031-2050
Radio Frequency Oscillator	Z-2053	Interpolation Oscillator	Unit 3	2051-2099
Frequency Multiplier	Z-2103	Frequency Multiplier	Unit 4	2101-2125
Electronic Frequency Converter	Z-2158	Frequency Converter	Unit 5	2151-2199
Electronic Frequency Converter	Z-2204	10 Kc Step Generator	Unit 6	2201-2299
Frequency Multiplier	Z-2305	Frequency Multiplier	Unit 7	2301-2325
Electronic Frequency Converter	Z-2330	100 Kc Step Generator	Unit 8	2336-2425
Electronic Frequency Converter	Z-2426	Frequency Converter	Unit 9	2426-2525
Frequency Multiplier	Z-2526	1 Mc Step Generator	Unit 10	2526-2600
Electronic Frequency Converter	Z-2626	Frequency Converter	Unit 11A	2626-2650
Electronic Frequency Converter	Z-2651	Frequency Converter	Unit 11B	2651-2800
Electronic Frequency Converter	Z-2801	Frequency Converter	Unit 11C	2801-2915
Radio Frequency Oscillator	Z-2127	Frequency Shift Oscillator	Unit 12	2126-2150
Electrical Equipment Rack	Z-2901	Mounting	Unit 14	2001-2999

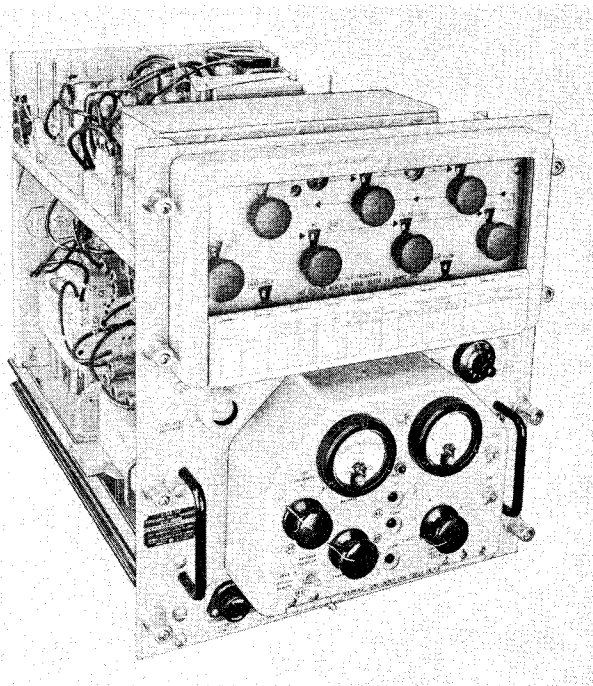


Figure 1-7. Radio Frequency Oscillator O-275/SRT, Front Oblique View, Covers Off

points are provided at radio-frequency input or output points. Each subchassis is fastened to the frame with quick-acting fasteners. Locating pins are provided to insure precise positioning and to minimize the probability of damage to electrical and mechanical connections. The separable construction is a great convenience in maintenance operations. By using a test cable, any subunit can be examined in detail, with each part readily accessible. The front panel may be detached by removing several machine screws. All the units in the RFO are shielded.

There are three individual oscillators in the radio frequency oscillator. Unit 1 is the crystal oscillator. It generates the basic frequency of 100 kc with an accuracy

of 1.5 parts per million over the temperature range $-20^{\circ}\text{C.} (-4^{\circ}\text{F.}) +50^{\circ}\text{C.} (+122^{\circ}\text{F.})$. Unit 3 is the interpolation oscillator used to obtain the 10-cps steps. The accuracy of this oscillator is ± 20 cycles over the temperature range of $-20^{\circ}\text{C.} (-4^{\circ}\text{F.})$ to $+50^{\circ}\text{C.} (+122^{\circ}\text{F.})$. Unit 12 is the frequency-shift oscillator. The 100-kc carrier frequency of this oscillator is capable of being shifted from $+2,000$ cycles to -500 cycles about the 100-kc value within 5 percent linearity. The frequency shift oscillator is used in the mixing sequence only when SERVICE SELECTOR control (U) on the low level radio modulator is set in one of the frequency-shift positions (FSK or FAX).

The 100-kc signal from the crystal oscillator controls several frequency multipliers that generate a high order of frequencies for the mixing stages. Locked to the crystal oscillator are 10-kc, 100-kc, and 1-mc step generators, each of which provides 10 frequency increments used in the mixing sequence. The independent interpolation oscillator is used to obtain 10-, 100-, and 1,000-cps steps. This interpolation oscillator can be checked readily against the crystal oscillator and may be adjusted to maintain its accuracy. Several frequency converters mix the signals from the crystal oscillator, interpolation oscillator, and the several step generators to provide an r-f signal in steps of 10 cycles over the frequency range 0.3 to 26 mc.

The front panel of the radio frequency oscillator has all the controls for setting up any frequency within the frequency range. Nine knobs are provided for manually setting a frequency.

An electron ray tube is provided for checking the frequency-shift oscillator or the interpolation oscillator against the standard crystal oscillator. A set of test receptacles are provided on the front panel; these bring out important signals in the RFO for monitoring with a standard test oscilloscope.

Mounted to the face of the radio frequency oscillator front panel and considered as a component of the Radio Frequency Oscillator O-275/SRT is the Control-Indica-

tor C-1352/SRT. This unit has all the controls and indicators required to accomplish the manual tuning of the two antenna tuning equipment components (antenna coupler and r-f tuner). A set of three push-button switches control the up and down movement of the shorting ring on the main tuning coil in the r-f tuner. One toggle switch is used to control the action of the bypass switch in the antenna coupler, enabling the antenna tuning equipment to be placed in the antenna line or be completely bypassed. One rotary switch controls the loading switches in the antenna coupler, selecting various values of capacitive or inductive reactance loading in conjunction with the main tuning coil. Another rotary switch controls the action of a switch in the r-f tuner, which switches an impedance transformer in or out of the transmission line. An indicator is provided to show the standing-wave ratio on the transmission line. This indicator has an associated switch which is used to set the range of the indicator. A second indicator shows the position of the shorting ring on the main tuning coil in the r-f tuner.

(4) POWER SUPPLY PP-1094/SRT (LOW VOLTAGE POWER SUPPLY, LVPS). (See figure 1-8.)—This unit is commonly called the low voltage power supply (LVPS) to distinguish it from other power supplies.

It consists of three conventional full-wave high-vacuum rectifiers and filter circuits providing +300 volts, +250 volts, and -220 volts for the transmitter group circuits. A full-wave metallic rectifier provides a separate -24-volt supply for control circuit functions. One plate-filament transformer supplies all voltages for the rectifier circuits. Primary a-c input is 110 volts, 60 cps, single phase.

The two controls for turning power on and off in the 100-watt transmitter group are found on the front panel of this unit. A CABINET HEATER switch controls heaters provided to raise the equipment temperature under some conditions. The STANDBY-OPERATE switch may be used to put the equipment in a "ready"

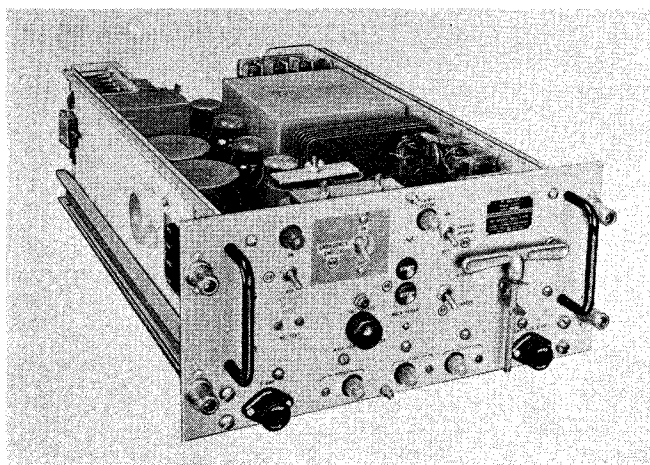


Figure 1-8. Power Supply PP-1094/SRT,
Front Oblique View

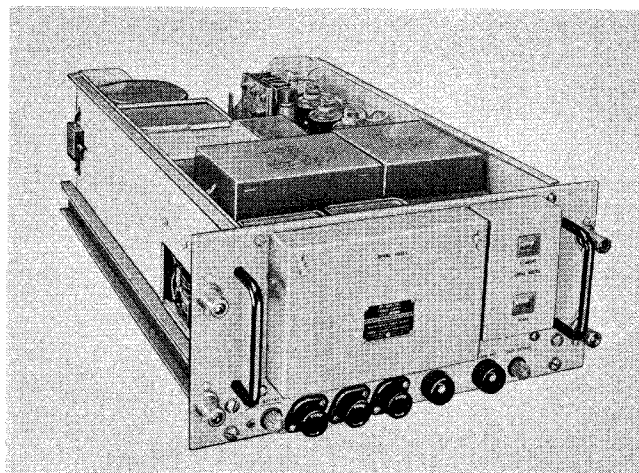


Figure 1-9. Power Supply PP-1095/SRT,
Front Oblique View

or "stand-by" condition. The front panel indicator lights show the proper operation of controls and circuits of this unit.

(5) POWER SUPPLY PP-1095/SRT (MEDIUM VOLTAGE POWER SUPPLY, MVPS). (See figure 1-9.)—This unit is commonly called the medium voltage power supply (MVPS) to distinguish it from other power supplies. It contains the necessary power transformers, rectifier tubes, filter components, and miscellaneous parts to provide outputs of +500 and +1,050/1,300 volts for the IPA and PA tubes of the radio frequency amplifier and portions of the low level radio modulator. This unit is energized by the controls on the low voltage power supply front panel. The +500-volt supply is used when the equipment is operating at the 100-watt and the 500-watt levels, but the +1,050/1,300-volt supply is used only at the 100-watt level. The +1,050 volts is used with phone service only, whereas the +1,300 volts is used with all other modes of transmission. The elapsed-time meters on the front panel are provided for logging transmitter group tube hours (filament and plate).

(6) ELECTRICAL EQUIPMENT CABINET CY-1571/SRT (TRANSMITTER GROUP CABINET). (See figure 1-10.)—The transmitter group cabinet houses the five drawer-type chassis described above. It consists of a rigid welded steel frame with thin side, rear, and top panels. Struts are provided to stiffen the structure. The bottom is arranged to bolt to Mounting MT-1423/SRT or to one of the booster cabinets. Provisions for lifting eyes are incorporated in the top. Each drawer chassis slides into the cabinet on a slide and track arrangement, which permits easy insertion and removal. Ducts in the sides of the cabinet distribute the filtered forced air from the mounting to ventilate the transmitter chassis. Provision is made at the top rear of the cabinet for attaching two side sway mounts. Seven terminal boards are provided on the bottom of the cabinet and one on the lower left rear of the cabinet to which all transmitter group external connections are made. R-f

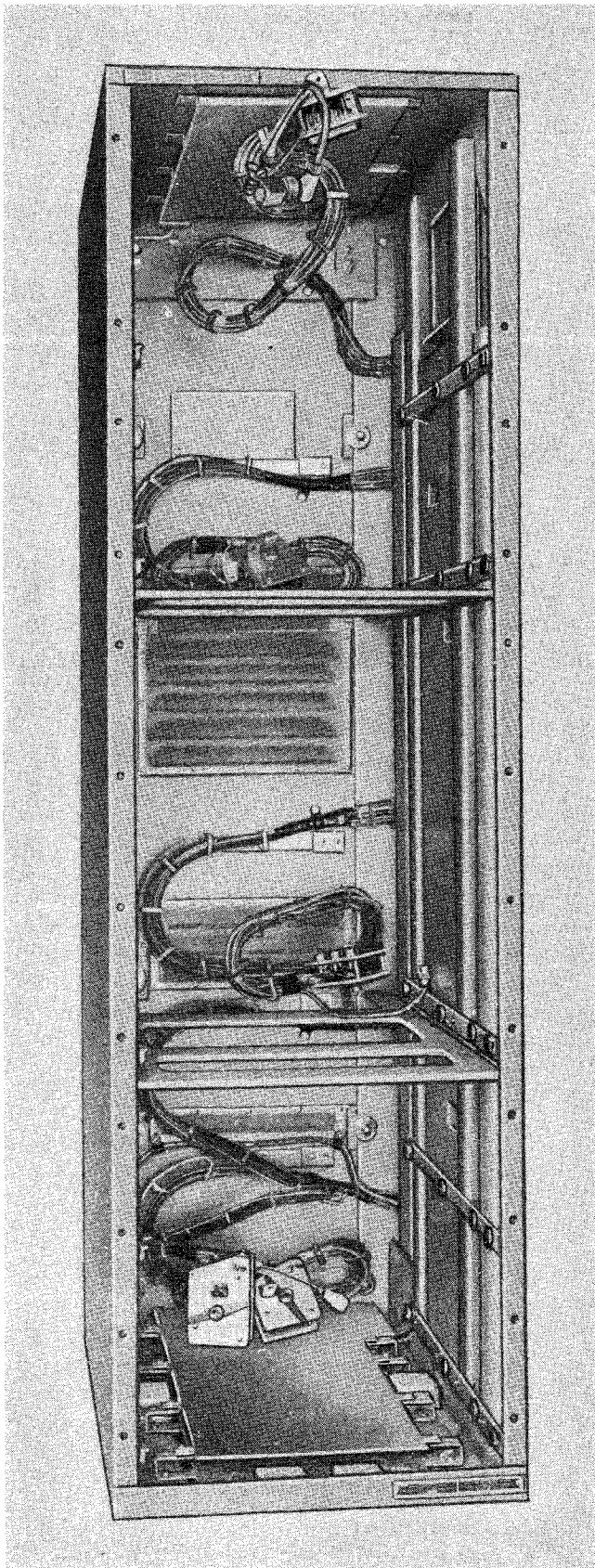


Figure 1-10. Electrical Equipment Cabinet
CY-1571/SRT, Front Oblique View

output is supplied on a 50-ohm coaxial cable terminated in an "N" type connector. Receptacles at the rear of the drawer chassis mate with corresponding receptacles, which, in turn, are connected to the retractable cabinet wiring. The retractable cabinet wiring allows a chassis to be pulled out from the cabinet to the limits of the front rail stop without disconnecting the chassis from the cabinet wiring.

(7) TRANSMITTER COUPLER CU-402/SRT (LOAD ADJUSTING UNIT, LAU). (See figure 1-11.)

—The load adjusting unit (LAU) has a mounting bracket as an integral part to permit independent mounting of this unit. It consists of an autotransformer with four taps and a standing-wave ratio monitor circuit. An input switch and an output switch, each with four positions that are connected to the four taps of the autotransformer, are also components of this unit.

The r-f output of the radio frequency amplifier is connected by interconnecting cabling to the standing-wave ratio monitor and then to the input switch and one of the taps of the autotransformer, which acts as an impedance matching device. The output from the autotransformer from the tap selected by the output switches is fed to Antenna Coupler CU-372/U. The standing-wave ratio monitor circuit detects the standing-wave ratio on the r-f transmission line at this point and sends the indicating voltages to the control indicator. The r-f output is then interconnected from the standing-wave ratio monitor circuit to the antenna coupler.

c. MOUNTING MT-1423/SRT (MOUNTING). (See figure 1-12.)—The mounting supports the transmitter stack, provides forced ventilation, and is the cable entrance point for the transmitter bay.

The mounting contains the blower assembly that provides filtered forced-air ventilation through ducts on either side of the transmitter cabinet shells. There are two blowers in each unit. One rotates clockwise and the

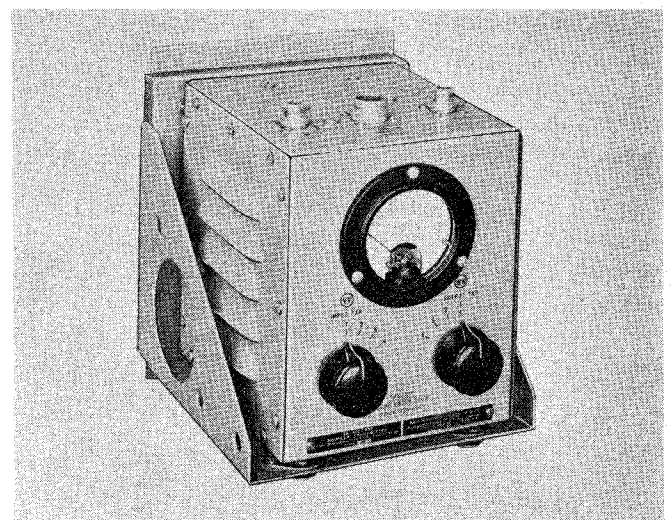


Figure 1-11. Transmitter Coupler CU-402/SRT,
Front Oblique View

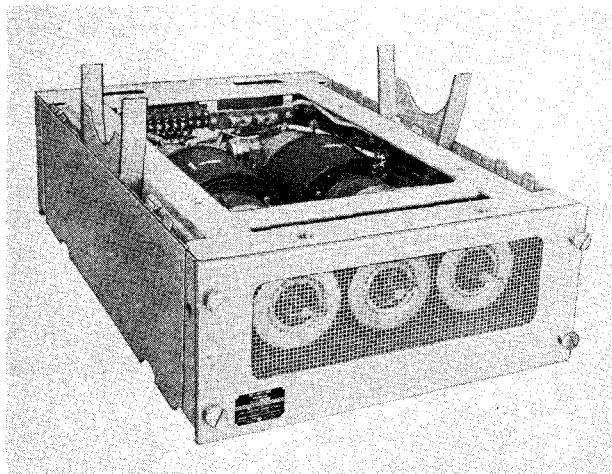


Figure 1-12. Mounting MT-1423/SRT,
Front Oblique View

other counterclockwise. Three cleanable oiled wire-mesh filters remove dust from the incoming air. Each mounting contains four heater strips whose function is to convection heat the Electrical Equipment Cabinet CY-1571/SRT air when the transmitter bay is operated under low ambient temperature conditions. Operation of the heaters is controlled by the CABINET HEATER switch on the low voltage power supply.

The transmitter group cabinet or one of the booster cabinets may be bolted to the top of the mounting. Shock mounts of suitable load rating must be attached to the bottom of the mounting. The shock mounts tend to isolate the equipment stack from severe mechanical shocks.

Provisions for interconnecting cable entrance are at the rear and also on the bottom of the rear. For transmitter bay interstack cable passageway, a hole is provided on the side of the mounting. Two ground straps are provided at diagonally opposite points for transmitter bay grounding.

d. RADIO MODULATOR-POWER SUPPLY OA-685/SRT (BOOSTER).—The radio modulator-power supply (usually called the "booster") provides additional audio and plate power to increase the r-f carrier output of the Transmitter Group OA-684/SRT to 500 watts. Limitations within the transmitter and antenna tuning equipment make it impractical to obtain 500-watt carrier on the lower frequencies, 0.3 to 2 mc. With this exception, all features of the 100-watt transmitter are retained when high power operation is used. Transmitter and antenna tuning is performed at the 100-watt level; high power is applied only when tuning has been completed.

The booster consists of the following units:

- (1) Radio Modulator MD-230/SRT
(High Level Radio Modulator, HLRM)
- (2) Power Supply PP-1096/SRT
(High Voltage Power Supply, HVPS)

- (3) Electrical Equipment Cabinet CY-1572/SRT
(High Level Radio Modulator (HLRM)
Cabinet)
- (4) Electrical Equipment Cabinet CY-1573/SRT
(High Voltage Power Supply (HVPS)
Cabinet)

The mechanical construction of the booster components is similar to that used in the transmitter group. The high level radio modulator (HLRM) and the high voltage power supply (HVPS) are of the pull-out-drawer design and are housed in individual cabinets equipped with slide and rail arrangement. All features of the transmitter group drawers are also incorporated in the booster drawers. For reasons of ventilation and mounting, the booster components must be associated with Mounting MT-1423/SRT. The booster cabinets may be combined in various ways with a transmitter group and mounting to form a transmitter bay suitable for local conditions. The transmitter bay assembly variations are discussed in Section 3 of this instruction book.

(1) RADIO MODULATOR MD-230/SRT (HIGH LEVEL RADIO MODULATOR, HLRM). (See figure 1-13.)—This unit is commonly called the high level radio modulator (HLRM) to distinguish it from the radio modulator in the 100-watt transmitter group. It modulates the radio frequency amplifier during phone service at the nominal 500-watt power level. A push-pull high level audio amplifier consisting of two 4D21 tetrodes operating in class AB₂ provides plate modulation for the final radio frequency amplifier stage. Six watts of audio power to drive the high level radio modulator are supplied from the low level radio modulator.

The control that energizes the action of the HLRM is located on the RFA front panel.

In an AN/SRT-16 the output of the HLRM is connected to one transmitter group only. The choice of which transmitter group will be able to operate at the 500-watt level is made at installation time when the output of the HLRM is permanently interconnected with one transmitter group.

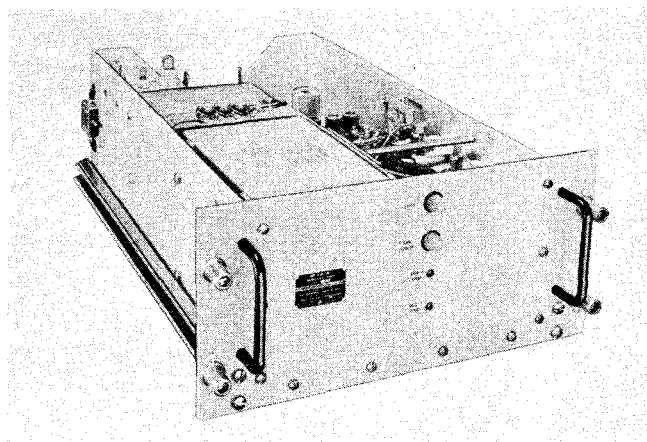


Figure 1-13. Radio Modulator MD-230/SRT,
Front Oblique View

**GENERAL
DESCRIPTION**

**NAVSHIPS 92121(A)
AN/SRT-14, 14A, 15, 15A, 16, 16A**

**Section 1
Paragraph 4 d (1)**

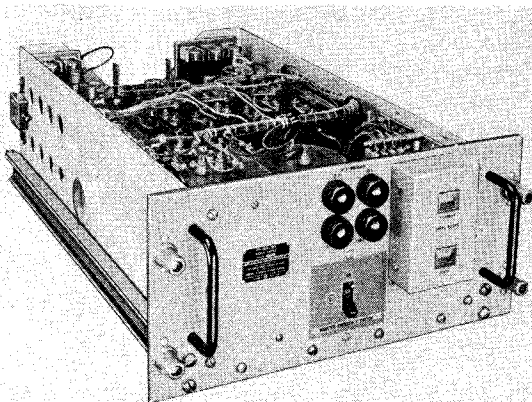
The HLRM has self-contained +50-volt d-c and regulated +350-volt d-c power supplied as local bias and screen supplies.

(2) **POWER SUPPLY PP-1096/SRT (HIGH VOLTAGE POWER SUPPLY, HVPS).** (See figure 1-14.)— This unit is called the high voltage power supply (HVPS) to distinguish it from the power supplies in the 100-watt transmitter group.

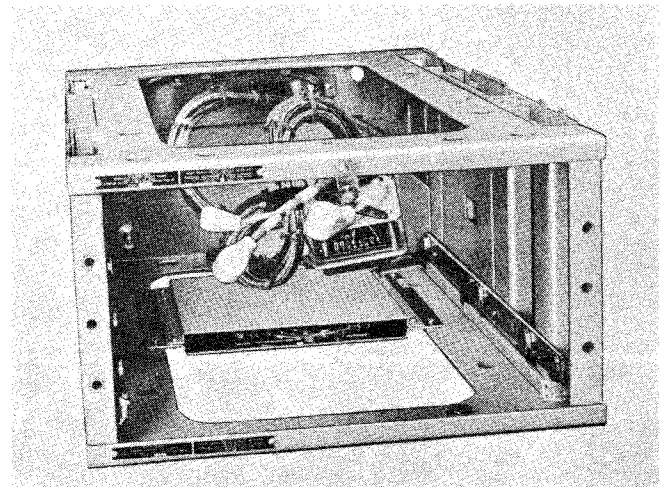
The high voltage power supply consists of six 3B28 hot cathode gas rectifier tubes in a three-phase, full-wave rectifier circuit with a choke input filter. It provides an output of either +2,400-volt or +3,000-volt d-c power as required for the plate of the 4-400A tetrode in the radio frequency amplifier. The +2,400 volts is used for phone service only, whereas the +3,000 volts is used with all other modes of transmission. By means of links, the input connections may be changed to accommodate either 220- or 440-volt, three-phase, 60-cps primary power.

An emergency switch on the front panel controls the three-phase input power. Filament power is applied to the high voltage power supply (and the high level radio modulator) whenever the **BOOSTER EMERGENCY SWITCH** is ON. Application of plate power is controlled by a time delay element and the push-button switch on the RFA of the transmitter group. Indicator lamps are provided to show power on and time delay status.

(3) **ELECTRICAL EQUIPMENT CABINET CY-1572/SRT (HIGH LEVEL RADIO MODULATOR (HLRM) CABINET).** (See figure 1-15.)— This unit provides facilities for mounting the high level radio modulator (HLRM) chassis and for booster external connections. It consists of a rigid welded frame with sheet metal side and rear panels. A slide and rail arrangement allows easy insertion and removal of the high level radio modulator drawer. Ducts in the sides of the cabinet distribute the filtered forced air from the mounting to ventilate the HLRM chassis. Receptacles connected to the retractable cabinet wiring mate with the high level radio modulator chassis connectors. At the



**Figure 1-14. Power Supply PP-1096/SRT,
Front Oblique View**

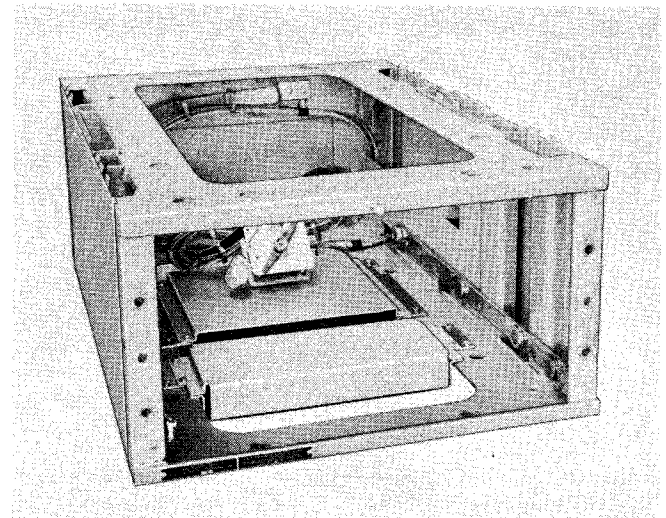


**Figure 1-15. Electrical Equipment Cabinet
CY-1572/SRT, Front Oblique View**

bottom two terminal boards are provided and one at the left rear to which all incoming connections to the high level radio modulator are made.

(4) **ELECTRICAL EQUIPMENT CABINET CY-1573/SRT (HIGH VOLTAGE POWER SUPPLY (HVPS) CABINET).** (See figure 1-16.)— This unit provides facilities for mounting the high voltage power supply (HVPS) and for external power and control connections. Mechanically the cabinet is similar to the high level radio modulator cabinet described above. Three terminal boards at the bottom and one at the left rear are provided for connecting cables to the high voltage power supply cabinet.

e. **COVER CW-341/SRT.** (See figure 1-2.)— The booster cover is used to close the top of one of the two booster cabinets for reasons of safety and appearance. Louvers permit adequate air flow for cooling. The cover is associated only with the AN/SRT-15 booster.



**Figure 1-16. Electrical Equipment Cabinet
CY-1573/SRT, Front Oblique View**

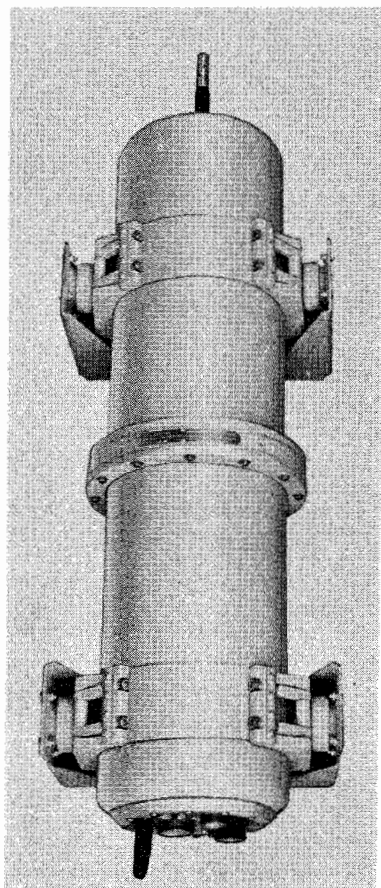


Figure 1-17. Radio Frequency Tuner TN-229/SRT, Side View, Cover On

f. REMOTE CONTROL UNIT.—To operate the AN/SRT-14, 15 and 16 sets from a remote location requires some form of power control and microphone or keying input arrangement at the remote location. The AN/SRT-14, 15 and 16 are designed to work with a standard Navy six-wire transmitter control circuit in accordance with Specification MIL-G-946 of September 15, 1949.

A typical remote unit is Radiophone Unit Navy Type 23500. This unit is a nonwatertight cabinet equipment to control transmitter operation. It is provided with a transmitter START-STOP push button, receptacles for a Navy head set or chest set, a jack for a hand key, and a gain control to adjust the receiver signal level. Indicator lamps are provided for TRANSMITTER ON and CARRIER ON indications.

This unit is not supplied with the AN/SRT-14, 15 or 16 but it, or an equivalent, must be supplied by the installing activity if remote operation is desired.

g. RADIO FREQUENCY TUNER TN-229/SRT (R-F TUNER). (See figures 1-17 and 1-18.)—The function of the antenna tuning equipment is to match the characteristic 50-ohm impedance of the r-f transmission lines to the impedance presented by the antenna over the

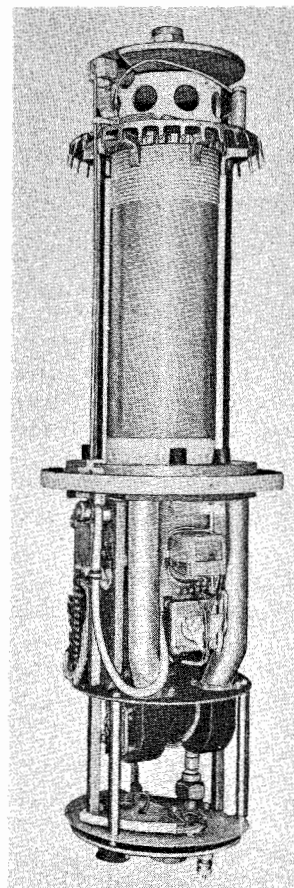


Figure 1-18. Radio Frequency Tuner TN-229/SRT, Side View, Cover Off

entire frequency range. The principal tuning component to accomplish this is the main tuning coil found in the r-f tuner. This coil is a helically wound length of transmission line whose length can be varied by the position of a concentric sliding short. Concentric with the main coil and mounted on the sliding short is a single coupling coil. The sliding short is positioned by a drive motor and associated gear train; the drive motor is controlled from the control-indicator in the transmitter bay. Also located in the r-f tuner is an impedance transformer that can be inserted or removed from the transmission line by a motor-driven switch that, in turn, is controlled at the control-indicator. This impedance transformer is a step-up transformer required to be used at the low frequencies to bring the antenna impedance up to the 50-ohm level.

A blower for heat dissipation is provided. A thermostatic switch, which is normally closed and a blower centrifugal switch, which is closed only when the blower is rotating, are provided as safety devices when the equipment is operated at the 500-watt level. If either or both of these switches are open, the transmitter can function at the 100-watt level only.

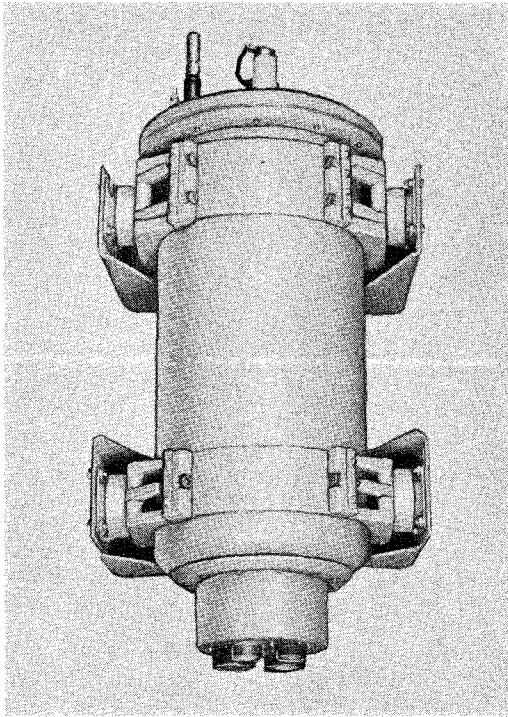


Figure 1-19. Antenna Coupler CU-372/SRT, Side View, Cover On

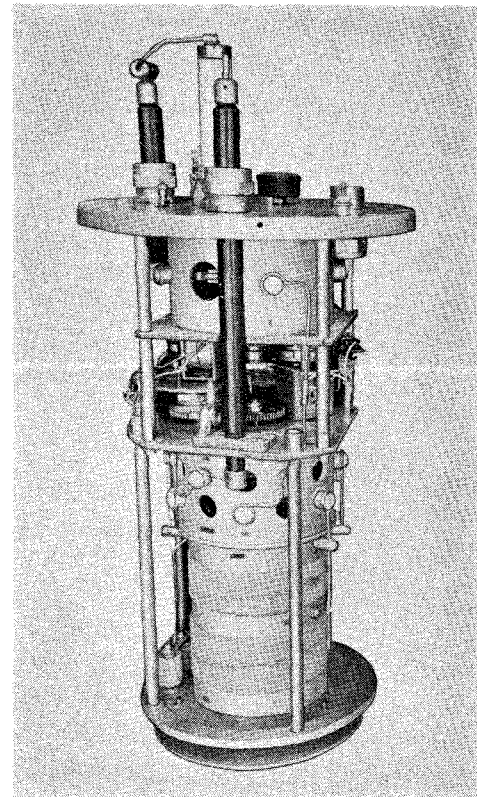


Figure 1-20. Antenna Coupler CU-372/SRT, Side View, Cover Off

The r-f tuner is a sealed, moistureproof unit, equipped with valves and a pressure gauge to permit pressurizing the unit to a pressure of 20 psi with dry nitrogen gas.

b. ANTENNA COUPLER CU-372/SRT (ANTENNA COUPLER). (See figures 1-19 and 1-20.)—The antenna coupler has two basic functions: (1) to switch various inductive or capacitive reactance components into the transmission line to extend the range of tuning of the main tuning coil, and (2) to provide a switch that permits the antenna to be connected through the tuning components to the transmitter r-f output or connects the antenna directly to the transmitter r-f output.

For the purpose of extending the tuning range of the main coil in the r-f tuner, there are three capacitors and two coils in the antenna coupler that can be inserted in various combinations, in series or in shunt, with the main tuning coil. A motor-driven switch selects the component desired; the switch is controlled from the control-indicator in the transmitter bay. This switch also has a position in which no loading components are added, leaving the main tuning coil in the r-f tuner as the only tuning component in use.

The switch to either bypass the tuning components or insert them on the transmission line also is a motor-driven switch, with two positions, that is manually controlled at the control-indicator.

Like the r-f tuner, the antenna coupler is a sealed unit with the same provisions for charging with dry nitrogen gas.

TABLE 1-4. STANDARD TEST EQUIPMENT
REQUIRED FOR AN/SRT-14, 15 AND 16

NOMENCLATURE	CHARACTERISTICS
Multimeter ME-25A/U	0 to 1,000 volts ac/dc in 7 ranges; 0 to 1,000 ma in 6 ranges; 0 to 1,000 megohms in 6 ranges.
Oscilloscope OS-8A/U	Sensitivity, 0.1 v (RMS)/in.; response, ± 3 db from 30 cps to 2 mc.
Frequency Meter AN/USM-29 or AN/FRM-3	15 kc to 26 mc in 10-cps steps; accurate to within 0.0001%, ± 4 cps; (± 1 cps in one megacycle, ± 4 cps).
Receiver Navy type RBA	Frequency coverage: 15 kc to 500 kc.
Receiver Navy type RBB	Frequency coverage: 500 kc to 4.0 mc.
Receiver Navy type RBC	Frequency coverage: 4.0 kc to 27.0 mc.
Audio Oscillator TS-382A/U	20 to 20,000 cps, $\pm 2\%$; output, 0 to 100 mw.
Dummy Load DA-91/U	50 ohms, 600 watts; air cooled.
Signal Generator, RF, AN/URM-25	10 kc to 50 mc; output, 2 v maximum.
Ammeter, DC, Navy type 60107	0 to 1,000 ua, in 5 ranges; accuracy, $\pm 2\%$.
Resistance Bridge ZM-4/U	1-10 megohms; accuracy, $\pm 0.15\%$.
Radio Frequency Bridge Navy type 60094	Range 400 kc to 60 mc; resistance 0-1,000 ohms, $\pm 1\%$; reactance, 0-5,000 ohms at 1 mc, $\pm 2\%$.

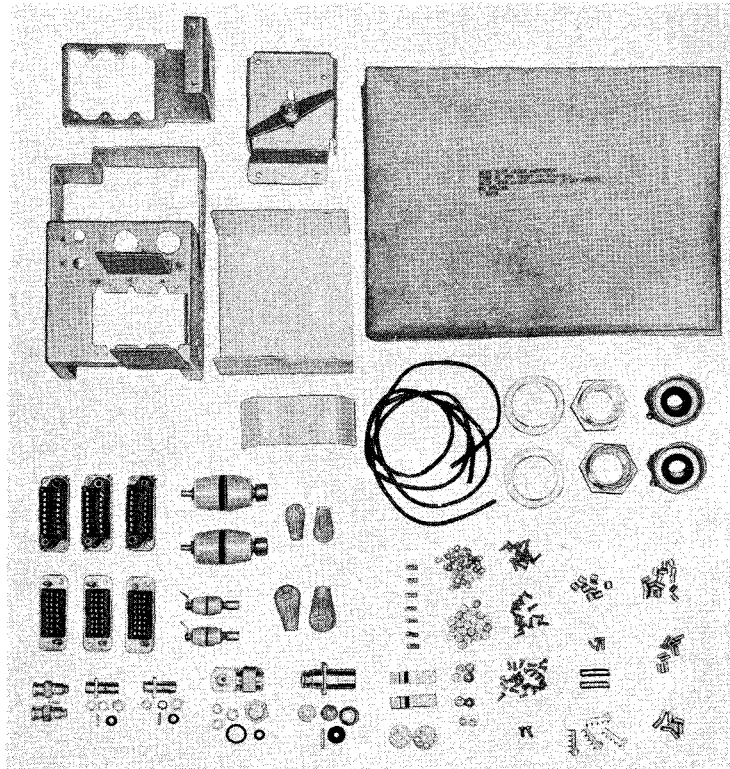


Figure 1-21. Main Test Cable Assembly, AN/SRT-14, 15 and 16

i. ANTENNAS.—Radio Transmitting Sets AN/SRT-14, 15 and 16 are designed to work into a 35-foot whip antenna, Navy type C-66047, or into a 60-130-foot long single wire with a 40-foot down lead. Suitable antennas must be furnished by the installing activity.

j. STANDARD TEST EQUIPMENT.—For the purposes of corrective and preventive maintenance and making the initial trial operation and adjustments, various pieces of Navy standard test equipment are required as outlined in table 1-4.

k. SPECIAL TEST EQUIPMENT.—In corrective maintenance, certain conditions may warrant the removal of a unit from its cabinet to be worked on at a bench. To permit the energizing of the unit while on a bench, a patch test cable that will match the connectors of the unit at one end and match the corresponding cabinet connectors at the other end will be needed. This test cable is supplied unassembled and less the wires (figure 1-21). At the time of installation, the installing activity is to supply the wires and assemble the cable. Instructions for the assembly of this test cable are found in Section 3, paragraph 6, of this instruction book.

In performing maintenance on any of the plug-in subunits of the radio frequency oscillator, it may be necessary to remove the subunit from the main radio frequency oscillator chassis. In such a case a set of test cables will be required to patch between the subunit and the main chassis. Required for this purpose are six r-f

cables and two power cables. The r-f cables each consists of a three-foot length of RG-58A/U coaxial cable terminated at one end in a UG-88/U connector and terminated at the other end with a UG-89/U connector. The make-up of the two power cables is shown in table 1-5. Connections should be made wire for wire between corresponding terminals (i.e., pin A to pin A). These power cables also should be three feet in length.

Note

The RFO subunit test cables are not supplied with the AN/SRT-14, 15 and 16.

l. SPECIAL TOOLS.—A set of suitable hex wrenches mounted in spring clips for the hex socket head set-screws are provided mounted on the radio frequency amplifier chassis, a second set being mounted on the rack (unit 14) of the radio frequency oscillator. A hex key for securing the drawer front panel screws is located on the front of the low voltage power supply of the transmitter bay. A special screwdriver for tuning components in the radio frequency oscillator is also provided. Included with each antenna coupler and r-f tuner is a special wrench for disassembling the spring-loaded switch contacts.

The following additional tools are recommended equipment:

Relay contact burnisher.

"Tru-arc" standard pliers (external) Nos. 0012; 0015; 0018; #2; #4; #6.

TABLE 1-5. RFO SUBUNIT TEST CABLES
(POWER)

CONNECTORS REQUIRED	CONNECTOR TERMINAL	WIRE GAUGE	TYPICAL COLOR CODE
Winchester Electronics part Nos. MRE14PG and MRE14SG; also two hoods part No. MRE14H; (Cable #1)	A	—	—
	B	22	Red
	C	—	—
	D	20	Grn
	E	22	Bl
	F	20(sh)*	Or
	H	20(sh)*	Gray
	J	22	Yel
	K	20	Brn
	L	20	Tan
	M	22	Lt Grn
	N	22	Clr
	P	22	Wh
	R	22	Mar
	Grd Post	20	Blk
Winchester Electronics part Nos. MRE21PG and MRE21SG; also two hoods part No. MRE21H; (Cable #2)	A	—	—
	B	22	Bl
	C	22	Or
	D	—	—
	E	—	—
	F	20(sh)*	Brn
	H	20(sh)*	Wh
	J	22	Grn
	K	22	Gray
	L	22	Lt Grn
	M	22	Tan
	N	22	Mar
	P	—	—
	R	—	—
	S	—	—
	T	22	Bl
	U	22(sh)*	Or
	V	—	—
	W	—	—
	X	22(sh)*	Wh
Y	22(sh)*	Clr	
Grd Post	20	Blk	
Grd Post	20	Blk	

* Shields to be grounded on ground posts.

Tweezers—150 mm long, straight tips.

Tweezers—150 mm long, bent tips.

Closed socket wrench set detachable socket 3/8 and 1/2 in. drive, SNSN G41-W-2997.

Hex key wrench and screwdriver set ratchet handle SNSN G41-H-1395-615.

Pencil-type soldering iron.

m. INSTALLATION MATERIALS.—Furnished with each AN/SRT-14, 15 and 16 is a set of installation material. Included are all the hardware items, shock mounts, connectors, etc., required to mechanically install and electrically interconnect each type of equipment. The installation material is packaged separately together with the main test cable assembly.

n. SPARE PARTS.—Equipment spare parts are furnished and packed on a major unit basis as per table 1-8. The spare parts are shipped in consolidating cartons

that should be opened on receipt at the using ship so that these spare parts may be added to the ship's integrated electronic spare parts supply. The spare parts furnished are those parts peculiar to the AN/SRT-14, 15 and 16 that are considered most likely to require replacement in normal usage. Common electronic parts are furnished through other channels. Other replaceable parts peculiar not included in the equipment spare parts must be obtained, through authorized channels, from the nearest Navy shore supply activity.

5. REFERENCE DATA.

a. GENERAL.

- (1) Nomenclature: Radio Transmitting Sets AN/SRT-14, 14A, 15, 15A, 16 and 16A.
- (2) Contract data: NObsr-52021, dated 1 September 1950.
NObsr-52622, dated 14 May 1951.
- (3) Contractor: Federal Telephone and Radio Company, Clifton, N.J.
- (4) Cognizant Naval Inspector: Inspector of Naval Material, Newark, N.J.
- (5) Number of packages involved per complete shipment of equipment:

	AN/ SRT-14	AN/ SRT-15	AN/ SRT-16
	7	10	14
- (6) Number of packages involved in equipment spares:

	4	7	10
--	---	---	----
- (7) Total cubical contents (including spares):

crated	76.5	105.9	173.5
uncrated	33.6	44.9	74.2
- (8) Total weight (including spares):

crated	1,842	2,649	4,274
uncrated	1,315	1,990	3,124

b. ELECTRICAL INFORMATION.

- (1) Frequency range: 0.3 to 26 mc.
- (2) Tuning bands:

(a) 0.3 to 0.8 mc	(d) 5 to 11 mc
(b) 0.8 to 2 mc	(e) 11 to 19 mc
(c) 2 to 5 mc	(f) 19 to 26 mc
- (3) Nominal carrier output for each type of emission:

	AN/ SRT-14	AN/ SRT-15	AN/ SRT-16
A1, F1 and F4	100 watts	100/500 watts	two 100 watts or one 500 and one 100
A3	67 watts	67/333 watts	two 67 watts or one 333 and one 67

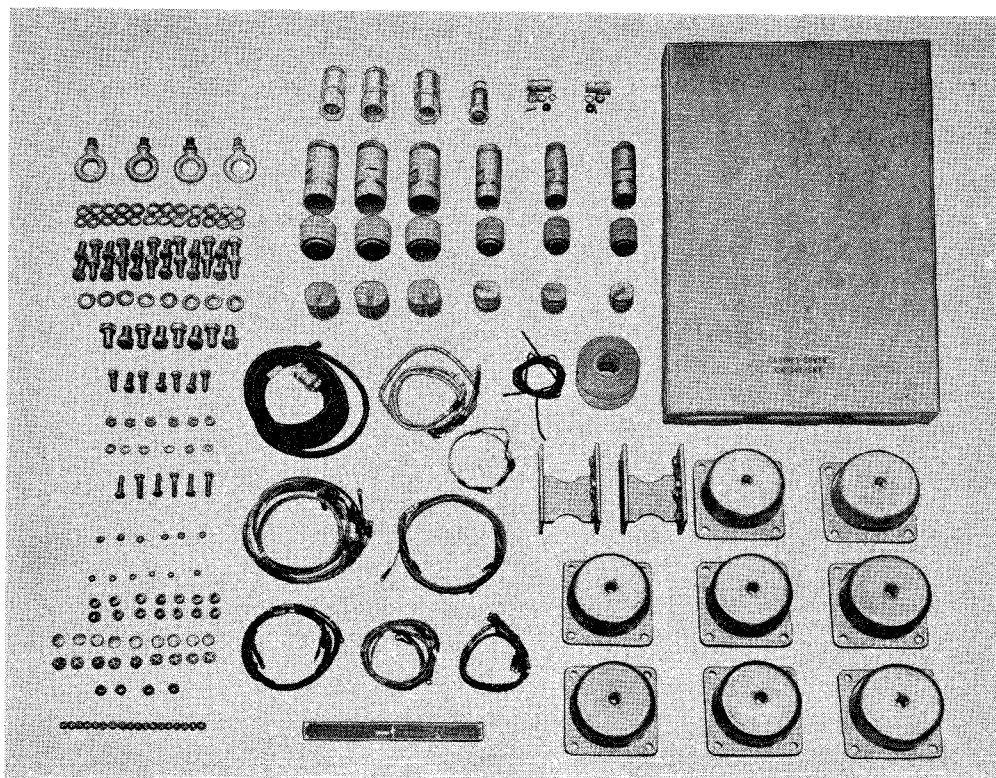


Figure 1-22. Installation Material, AN/SRT-15

Nominal carrier (See figure 1-23.)
output over fre-
quency range:

(4) Frequency control:

Crystal Oscillator: A 100-kc GT cut crystal with an accuracy of 1.5 parts per million over the temperature range -20°C . (-4°F .) to $+50^{\circ}\text{C}$. ($+122^{\circ}\text{F}$.) set in an oven regulated by a thermostat at 70°C . (158°F .)

Frequency Shift Oscillator: A 100-kc oscillator capable of being shifted from $+2,000$ cycles to -500 cycles about the 100-kc value with 5 percent linearity, with its component parts set in an oven regulated by a thermostat at 70°C . (158°F .)

(5) Types of emission and modulation capability:

A1, 100 percent, A3, 100 percent, F1 ± 500 cps shift about carrier, F4, from 0 to $+2,000$ cps shift.

(6) Squelch circuit characteristics: A conventional circuit that cuts off the audio amplifier when the microphone is not receiving voice signals.

(7) Harmonic attenuation in the amplifier:

40 db below the carrier level from 0.3 to 2 mc.
50 db below the carrier level from 2 to 5 mc.
60 db below the carrier level above 5 mc.

(8) Electrical characteristics of recommended antennas:

The antenna tuning equipment is capable of tuning an antenna system consisting of a standard 35-

foot whip antenna (Navy type 66047) or a single wire antenna between 60- and 130-feet long with 40-foot height.

(9) Power supply characteristics:

AN/SRT-14

Primary Power

(a) Voltages: 110 volts ± 10 percent, 60 cps ± 5 percent, single phase, ac.

(b) Current and power factor: Start, 15 amps at 0.92 power factor; stand-by, 7.9 amps at 0.92 power factor; operate (A1), 13.4 amps at 0.90 power factor; operate (A3), 13.6 amps at 0.92 power factor.

Oven Heater Power

(a) Voltages: 110 volts ± 10 percent, 60 cps ± 5 percent, single-phase, ac.

(b) Current and power factor: 0.8 amp at 1.0 power factor.

AN/SRT-15

Primary Power

(a) Voltages: 110 volts ± 10 percent, 60 cps ± 5 percent single phase, ac.

(b) Current and power factor: Start, 15 amps at 0.92 power factor; stand-by, 7.9 amps at 0.92 power factor; operate (A1), 13.4 amps at 0.90 power factor; operate (A3), 13.6 amps at 0.92 power factor.

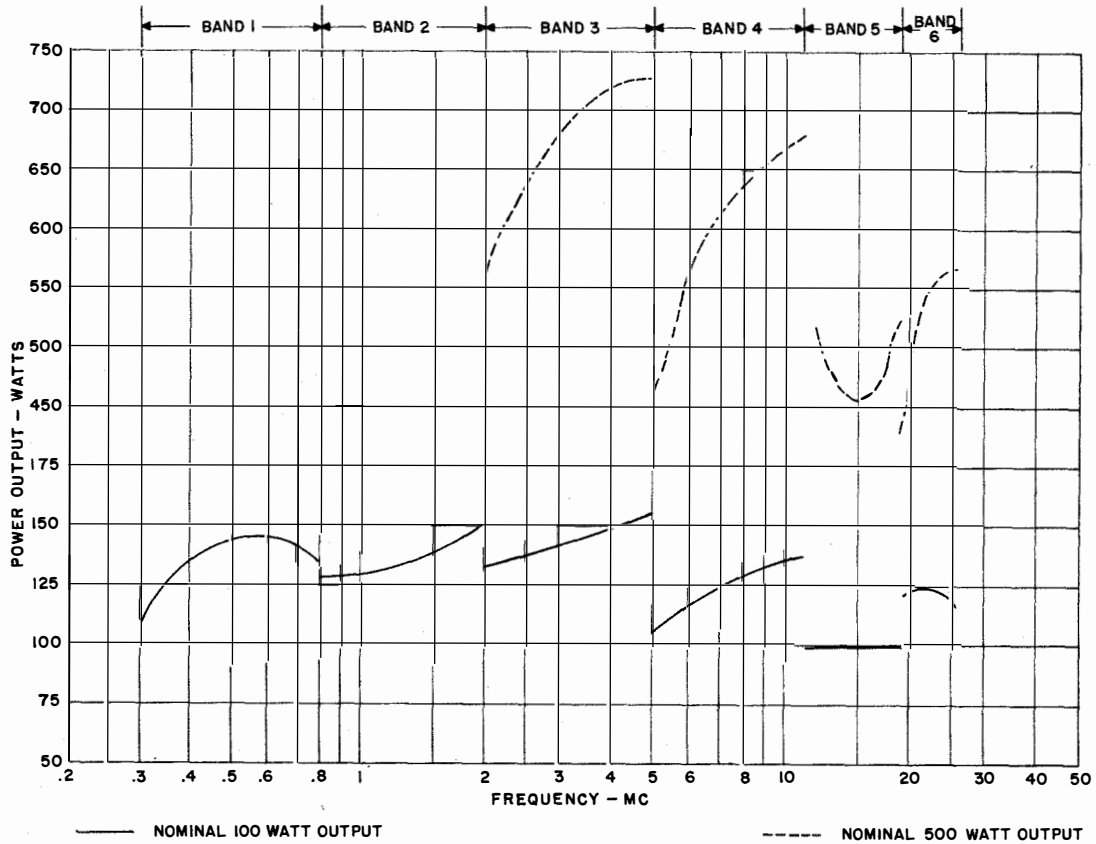


Figure 1-23. 50-Ohm Load, Typical Output Curves

Oven Heater Power

(a) Voltages: 110 volts ± 10 percent, 60 cps ± 5 percent, single phase, ac.

(b) Current and power factor: 0.8 amp at 1.0 power factor.

Booster Power

(a) Voltages: 110 volts ± 10 percent, 60 cps ± 5 percent, three-phase ac, or 440 volts ± 10 percent, 60 cps ± 5 percent, three-phase, ac.

(b) Current and power factor (220 v input): Start, 14.5 amps at 0.82 power factor; stand-by, 0.8 amp at 0.98 power factor; operate (A1), 14.7 amps at 0.82 power factor; operate (A3), 15.1 amps at 0.77 power factor.

(c) Current and power (440 v input): Start, 7.2 amps at 0.82 power factor; stand-by, 0.4 amp at 0.98 power factor; operate (A1), 7.4 amps at 0.82 power factor; operate (A3), 7.6 amps at 0.77 power factor.

AN/SRT-16

Primary Power

(a) Voltages: 110 volts ± 10 percent, 60 cps ± 5 percent, single phase, ac.

(b) Current and power factor: Start, 30 amps at 0.92 power factor; stand-by, 15.8 amps at 0.92 power factor; operate (A1), 26.8 amps at 0.90 power factor; operate (A3), 27.2 amps at 0.92 power factor.

Oven Heater Power

(a) Voltages: 110 volts ± 10 percent, 60 cps ± 5 percent, single phase, ac.

(b) Current and power factor: 16 amperes at 1.0 power factor.

Booster Power

(a) Voltages: 110 volts ± 10 percent, 60 cps ± 5 percent, three-phase, ac, or 440 volts ± 10 percent, 60 cps ± 5 percent, three-phase, ac.

(b) Current and power factor (220 v input): Start, 14.5 amps at 0.82 power factor; stand-by, 0.8 amp at 0.98 power factor; operate (A1), 14.7 amps at 0.82 power factor; operate (A3), 15.1 amps at 0.77 power factor.

(c) Current and power factor (440 v input): Start, 7.2 amps at 0.82 power factor; stand-by, 0.4 amp at 0.98 power factor; operate (A1), 7.4 amps at 0.82 power factor; operate (A3), 7.6 amps at 0.77 power factor.

(10) Heat Dissipation.

100-watt transmitter group and mounting	1,600 watts max.
Radio Modulator-Power Supply (Booster)	1,900 watts max.

TABLE 1-6. EQUIPMENT SUPPLIED

QUANTITY PER SET			NAME OF UNIT	NAVY TYPE DESIGNATION	OVER-ALL DIMENSIONS ¹			VOLUME ¹	WEIGHT ¹
AN/SRT-14	AN/SRT-15	AN/SRT-16			HEIGHT	WIDTH	DEPTH		
1	1	2	Transmitter Group consisting of one each: Radio Frequency Amplifier Radio Modulator Radio Frequency Oscillator Power Supply Power Supply Electrical Equipment Cabinet Transmitter Coupler	OA-684/SRT AM-1008/SRT MD-229/SRT O-275/SRT PP-1094/SRT PP-1095/SRT CY-1571/SRT CU-402/SRT	55 3/8 ²	16 ²	26 ²	13.3 ²	765 ²
1	2	2	Mounting	MT-1423/SRT	9 7/16	7 11/16	9 1/4	0.4	11
0	1	1	Radio Modulator-Power Supply consisting of one each: Radio Modulator Power Supply Electrical Equipment Cabinet Electrical Equipment Cabinet	OA-685/SRT MD-230/SRT PP-1096/SRT CY-1572/SRT CY-1573/SRT	7	16	24	1.5	100
1	1	2	Radio Frequency Tuner	TN-229/SRT	18 1/4	16	26	4.4	350
1	1	2	Antenna Coupler	CU-372/SRT	13 3/8	16 1/2	50	6.4	135
2	2	2	Instruction Books	—	13 3/8	16 1/2	34 5/8	4.4	100
1			Installation Kit	MK-230/SRT-14	—	—	—	0.1	6
	1		Installation Kit	MK-232/SRT-15	—	—	—	1.0	53
		1	Installation Kit	MK-234/SRT-16	—	—	—	2.8	100
1 set	1 set	2 sets	Equipment Spares for Transmitter Group OA-684/SRT	—	—	—	—	1.8	90
1 set	2 sets	2 sets	Equipment Spares for Mounting MT-1423/SRT	—	—	—	—	5.0	105
1 set	1 set	2 sets	Equipment Spares for Antenna Coupler CU-372/SRT	—	—	—	—	0.5	7
1 set	1 set	2 sets	Equipment Spares for Radio Frequency Tuner TN-229/SRT	—	—	—	—	0.1	2
—	1 set	1 set	Equipment Spares for Radio Modulator-Power Supply OA-685/SRT (less Transformer)	—	—	—	—	0.9	20
—	1	1	Equipment Spare Transformer (T-1502)	—	—	—	—	2.0	90
					—	—	—	1.0	80

¹ Unless otherwise stated, dimensions are inches, volume cubic feet, and weight pounds.

² Excluding Transmitter Coupler CU-402/SRT.

TABLE 1-7. EQUIPMENT REQUIRED BUT NOT SUPPLIED

QUANTITY PER EQUIPMENT			NAME OF UNIT	NAVY TYPE DESIGNATION	REQUIRED USE	REQUIRED CHARACTERISTICS
AN/SRT-14	AN/SRT-15	AN/SRT-16				
To suit ship's requirements			Remote Radiophone Unit Antenna	23500 or equivalent	Remote control and operation R-f radiation	Twelve-wire control system Typical Navy whip antenna or a 60- to 130-foot long single wire with a 40-foot down lead
1	1	2				
1	1	2	Handset, Carbon	H-51/U	Voice transmission	See paragraph 4k
1	1	2	Handset, Dynamic	H-52/U	Voice transmission	
1	1	2	Hand Key	26012	Telegraphy transmission	
6	6	6	R-f Test Cable	—	RFO corrective maintenance	
2	2	2	Power Test Cable	—	RFO corrective maintenance	

TABLE 1-8. SHIPPING DATA

SHIPPING BOX NO.	CONTENTS		OVER-ALL DIMENSIONS ¹			VOLUME ¹	WEIGHT ¹
	NAME	DESIGNATION	HEIGHT	WIDTH	DEPTH		
A	Transmitter Group (less Transmitter Coupler CU-402/SRT, Control-Indicator C-1352/SRT and Electron Tube 4-400A)	OA-684/SRT	34	29	67	38.2	1,086
B	Transmitter Coupler Control-Indicator Electron Tube	CU-402/SRT C-1352/SRT 4-400A	13	17	20	2.5	20
C	Mounting	MT-1423/SRT	17	21	19	5.9	137
D	Antenna Coupler	CU-372/SRT	16	20	36	6.7	160
E	Radio Frequency Tuner	TN-229/SRT	16	20	55	10.1	201
F	Radio Modulator-Power Supply (less two Electron Tubes 4-125A)	OA-685/SRT	26	24	34	12.3	407
G	Electron Tube (2)	4-125A	13	17	20	2.5	12
H	Installation Kit (lot 1), Instruction Books (2)	MK-230/SRT-14 (partial)	11	16	20	2.0	60
I	Installation Kit (lot 2)	MK-230/SRT-14 (partial)	11	12	13	1.0	12
J	Installation Kit (lot 1)	MK-232/SRT-15 (partial)	10	18	27	2.8	68
K	Installation Kit (lot 2), Instruction Books (2)	MK-232/SRT-15 (partial)	13	15	25	2.8	52
L	Installation Kit (lot1)	MK-234/SRT-16 (partial)	11	16	20	2.0	65
M	Installation Kit (lot 2), Instruction Books (2)	MK-234/SRT-16 (partial)	11	16	20	2.0	45

¹ Unless otherwise stated, dimensions are inches, volume cubic feet, and weight pounds.

ORIGINAL

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GENERAL DESCRIPTION

NAVSHIPS 92121(A)
AN/SRT-14, 14A, 15, 15A, 16, 16A

Section 1

TABLE 1-8. SHIPPING DATA (Continued)

SHIPPING BOX NO.	CONTENTS		OVER-ALL DIMENSIONS ¹			VOLUME ¹	WEIGHT ¹
	NAME	DESIGNATION	HEIGHT	WIDTH	DEPTH		
N	Equipment Spares for Transmitter Group OA-684/SRT	—	20	23	29	7.7	130
O	Equipment Spares for Mounting MT-1423/SRT	—	11	11	13	0.9	9
P	Equipment Spares for Antenna Coupler CU-372/SRT	—	7	7	8	0.2	2.5
Q	Equipment Spares for Radio Frequency Tuner TN-229/SRT	—	11	12	17	1.3	24
R	Equipment Spares for Radio Modulator-Power Supply OA-685/ SRT (less spare transformer T-1502)	—	13	18	22	2.9	106
S	Equipment Spares Transformer (T-1502)	—	14	15	19	2.3	88

¹ Unless otherwise stated, dimensions are inches, volume cubic feet, and weight pounds.

TABLE 1-9. ELECTRON TUBE COMPLEMENT

UNIT	NUMBER OF TUBES OF TYPE INDICATED																				TOTAL	
	0A2	0B2	3B2B	4-400A	4D21	5R4W/GB	6AG5	6AG7	6AK6	6A57G	6E5	12AU7	5651	5654	5687	5725	5726	5751	5814	5933		6201
TRANSMITTER GROUP	1	2	4	1	—	4	2	1	8	1	1	1	1	29	1	14	4	3	7	3	6	94
Radio Freq Osc							2		8		1	1		29	1	13			4		1	60
Unit 1														1					2			3
Unit 2														2					2			4
Unit 3									1													1
Unit 4														2								2
Unit 5														1		3						4
Unit 6									1			1		4		3						9
Unit 7														4								4
Unit 8									2					3		3					1	9
Unit 9									1					2		1						4
Unit 10														4								4
Unit 11A														2	1	1						4
Unit 11B									1					2		1						4

TABLE 1-9. ELECTRON TUBE COMPLEMENT (Continued)

Unit 11C									1					2		1						4	
Unit 12							2		1													3	
Unit 14											1											1	
Radio Freq Amp		1			1				1											1		4	
Low Level Radio Modulator			2				1			1			1			1	4	3	3	2	5	23	
Low Voltage Power Supply							3															3	
Medium Voltage Power Supply				4																		4	
RADIO MODULATOR-POWER SUPPLY (BOOSTER)		1	2	6		2																11	
High Level Radio Modulator		1	2			2																5	
High Voltage Power Supply				6																		6	
SET TOTALS	AN/SRT-14	1	2	4	1	0	4	2	1	8	1	1	1	1	29	1	14	4	3	7	3	6	94
	AN/SRT-15	2	4	10	1	2	4	2	1	8	1	1	1	1	29	1	14	4	3	7	3	6	105
	AN/SRT-16	3	6	14	2	2	8	4	2	16	2	2	2	2	58	2	28	8	6	14	6	12	199

NOTES