June 1961

Radio-Auxiliary

MONITORING SET, NOISE AN/WSQ-3

FUNCTIONAL DESCRIPTION

The AN/WSQ-3 is designed to monitor the normal noise produced by the primary coolant pumps of a pressurized water nuclear reactor plant. These pumps are canned-motor driven, centrifugal pumps. Since they are not accessible during operation of the reactor plant, remote indication is provided by this equipment to detect excessive vibration indicating incipient failure of the pump. It will monitor up to six pumps.

No field changes in effect at time of preparation (12 December 1960).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

OPERATING FREQUENCY RANGE: 30 to 15,000 cps.
FREQUENCY RESPONSE: Porm 3 db.
OPERATING POWER RQMT: 115 v ac, 60 cps, single ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

Dyna-Empire Inc., Garden City, Long Island, New York.
Model No. D-876.

Contract NObsr-75948.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) 6111
Total Tubes: (1)

SEMI-CONDUCTORS
(1) 1N430 (8) 1N645
Total Semi-Conductors: (9)

TRANSISTORS
(5) 2N335 (3) 2N341
Total Transistors: (8)

No Crystals used.

REFERENCE DATA AND LITERATURE

NAVSHIPS 93400: Preliminary Data Form for Monitoring Set, Noise AN/WSQ-3.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE NAVY BUSHIPS
PROCUREMENT COGNIZANCE SHIPS-P-3389
STOCK NO.
R.D.B. IDENT. NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Monitoring Set, Noise AN/WSQ-3 consists of:		
1	Control-Monitor C-3192/WSQ-3	10 x 11-5/32 x 11-3/4	
1	Pickup TR-168/WSQ-3	2 x 2 x 5-3/32	

AN/WXA-1(XN-1) ILLUMINATING GROUP, TELEVISION

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Control-Ballast			
As Rq'd	Cabling			

REFERENCE DATA AND LITERATURE:

NAVSHIPS 92772: Technical Manual for Television Illuminating Group AN/WXA-1(XN-1).

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: None used.

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: DESIGN COG: Navy, BuShips
SPEC &/OR DWG:

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Hanovia Chemical & Mfg. Co. Model no. Z-1016	Newark, N.J.	NObsr-64790, 4 June 1956	

AQ-2(1) SOUND MOTION PICTURE PROJECTION EQUIPMENT

VOLUME CONTROL: 20 db reserve gain at 8 W at 400 cps.

TONE CONTROL DATA

HIGH RANGE

ACCENTUATION: 6 ±2 db at 3500 cps.

ATTENUATION: 10 ±2 db at 5000 cps.

LOW RANGE

ATTENUATION: 12 ±2 db at 100 cps.

LOUDSPEAKER DATA

TYPE: Permanent magnet, 5-inch, 10 W.

IMPEDANCE: 8 ohms.

No Crystals used.

MANUFACTURER'S OR CONTRACTOR'S DATA

Federal Manufacturing and Engineering Corp, Garden City, N.Y.
Contract AF33(600)-20834.

TUBE AND/OR CRYSTAL COMPLEMENT

(2) 12AX7 (2) 6X4WA (3) 6005/6AQ5W
Total Tubes: (7)

REFERENCE DATA AND LITERATURE

NAVSHIPS 385-0226: Technical Manual for 16MM Sound Motion Picture Projection Equipment Single Case Projectors Types AQ-2(1) and AQ-3(1).

TYPE CLASSIFICATION

DESIGN COGNIZANCE USAF

PROCUREMENT COGNIZANCE

STOCK NO

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Projector AQ-2(1)	12-1/8 X 14-1/2 X 16-1/4	48
1	Protective Slipover Cover		
1	Power Cable Assembly	180 lg	
1	Reel, 1600 Feet		
1	Set of Equipment Spares		
2	Technical Manual NAVSHIPS 385-0226	1 X 9 X 11	

Radio-Auxiliary

January 1958

AS-51/MRQ-2, AS-93/MRQ-2 ANTENNA ASSEMBLY AND AUXILIARY ANTENNA ASSEMBLY

FUNCTIONAL DESCRIPTION

The Antenna Assembly AS-51/MRQ-2 and Auxiliary Antenna Assembly AS-93/MRQ-2 consists of a group of components for the installation of either of two powerful radio beam antennas and a general purpose, lance-pole supported antenna. For purposes of identification the radio beam antennas are designated as antenna "A" and "B" while the lance-pole supported antenna is designated as antenna "D".

Antenna "A" is a vertically polarized, half-rhombic antenna for transmitting or receiving radio signals between 0.95 and 8.0 mc while antenna "B" is of similar design except for frequency which ranges from 3 to 18 mc. These antennas are either Kite supported or hydrogen filled balloon supported. The above antennas are composed of components of the AS-51/MRQ-2.

The AS-93/MRQ-2 or Antenna "C" is a single wire antenna and counterpoise combination, the antenna proper, being supported 30 feet from the ground by four lance poles and suitable guyed by ropes. It is used in place of antennas "A" or "B" when tactical considerations or terrain dictate.

No field changes in effect at time of preparation (10 April 1957).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 0.95 to 8 mc and 3 to 18 mc.

TYPE
- AS-51/MRQ-2: Half-rhombic.
- AS-93/MRQ-2: Single wire.

POLARIZATION
- AS-51/MRQ-2: Vertical.
- AS-93/MRQ-2: Horizontal.

GAIN
- AS-51/MRQ-2: 29 or 24 db.
- AS-93/MRQ-2: 13 db.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes.

REFERENCE DATA AND LITERATURE

TM-11-2610, Technical Manual for Antenna Assembly AS-51/MRQ-2 and Auxiliary Antenna Assembly AS-93/MRQ-2.

TYPE CLASSIFICATION
DESIGN COGNIZANCE TASSA
PROCUREMENT COGNIZANCE
STOCK NO.

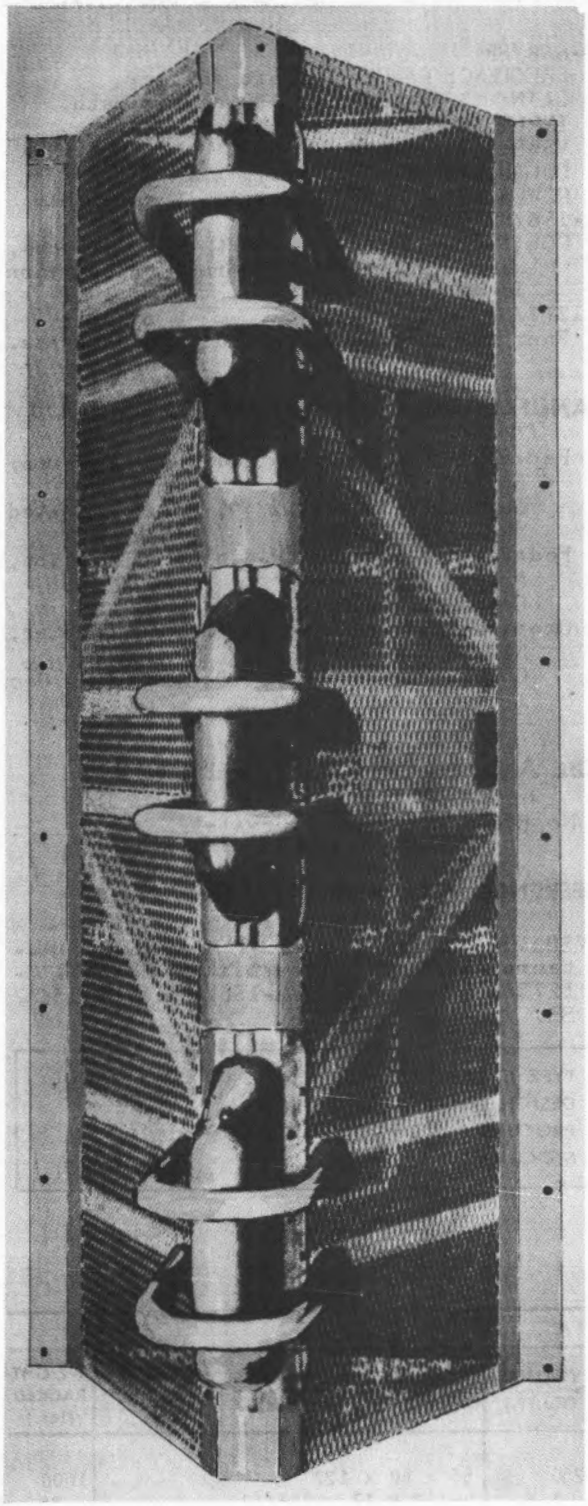
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
	AS-51/MRQ-2		
3	Bag CW-20/MRQ-2 containing		
	(1) Balloon MX-93/MRQ-2	2 X 1.5 X 1.5	30
	(1) Bridle Bag CW-19/MRQ-2		
3	Case CY-62/MRQ-2 containing		
	(8) Balloon Stabilizers	0.5 X 5 X 7	35
1	Case CY-72/MRQ-2 containing	0.7 X 1 X 1.2	20
	(1) Hose Assembly MX-136/MRQ-2		
	(1) Steel Wrench		
	(2) Brass Shackles		
	(1) Repair Kit MK-15/MRQ-2		

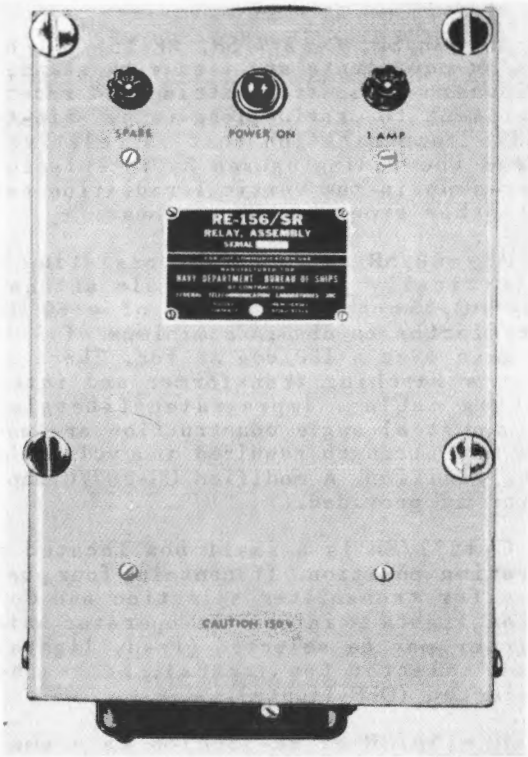
April 1958

Radio-Auxiliary

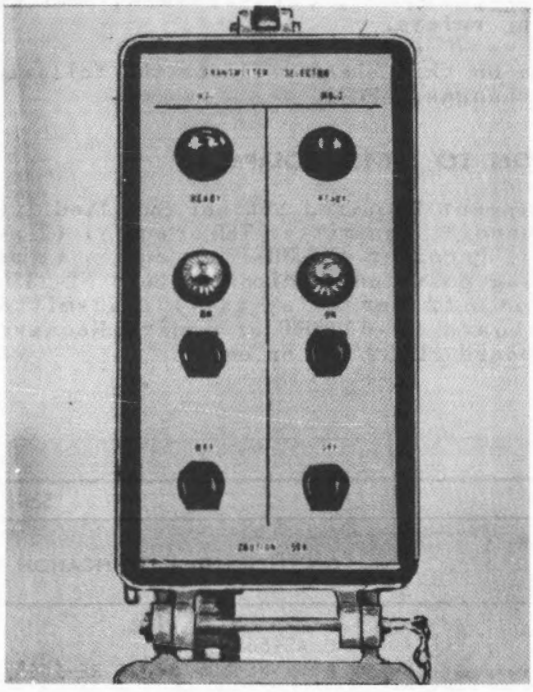
ANTENNA, TRANSMITTER CONTROL, AS-668/SR, C1277/SR, RELAY ASSEMBLY RE-156/SR, RE-156A/SR



Antenna AS-668/SR



Relay Assembly RE-156/SR



Transmitter Control C-1277/SR

April 1958

ANTENNA, TRANSMITTER CONTROL, AS-668/SR, C1277/SR, RELAY ASSEMBLY RE-156/SR, RE-156A/SR

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	(2 per channel)		
	Antenna AS-668/SR	52 x 54 x 122	950
	(1 per operating point)		
	Transmitter Control C-1277/SR	4-3/4 x 5-1/4 x 10-5/8	5
	(1 per channel)		
	Relay Assy RE-156/SR or RE-156A/SR	5-1/4 x 8-1/4 x 13	16
	(1 per channel)		
	Plug with Clamp 3106A-14S-7S, 3057-6		
2	Technical Manual		

August 1960

Radio-Auxiliary

ANTENNA AS-933/SR

FUNCTIONAL DESCRIPTION

Antenna AS-933/SR is a UHF Directional Antenna designed for surface vessels other than aircraft carriers.

No field changes in effect at time of preparation (27 April 1960).

RELATION TO OTHER EQUIPMENT

This equipment is a lightweight version of Antenna AS-668/SR, but is not interchangeable.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 225 to 400 mc.
INPUT IMPEDANCE: 50 ohms.

MANUFACTURER'S OR CONTRACTOR'S DATA

Philadelphia Naval Shipyard.
Dwg No. RE66F2117A.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes or Crystals used.

REFERENCE DATA AND LITERATURE

Nomenclature Card for ANTENNA AS-933/SR.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE USN, BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.
R.D.B. IDENT. NO.

EQUIPMENT SUPPLIED DATA

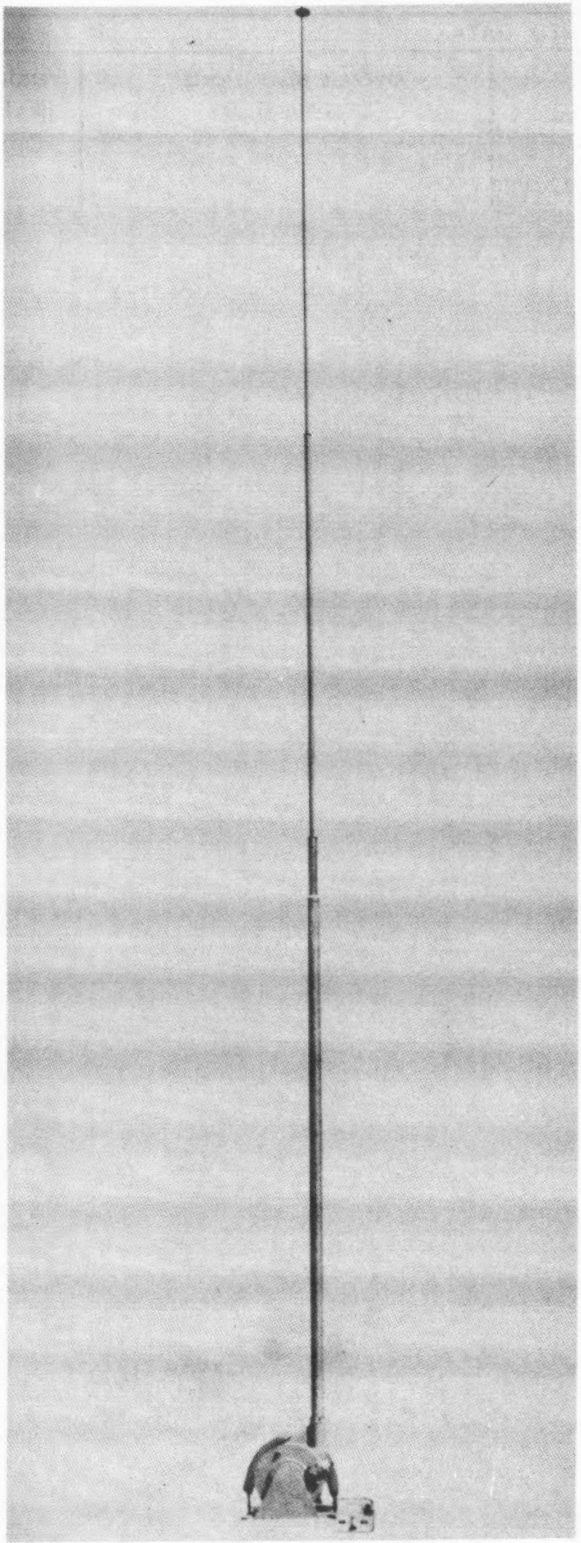
QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna AS-933/SR		

January 1958

AUTOMATIC RETRACTABLE ANTENNA

Radio-Auxiliary

AT-343(XN-1)/URC



Automatic Retractable Antenna AT-343(XN-1)/URC

FUNCTIONAL DESCRIPTION

The AT-343(XN-1)/URC consists of three parts; (1) A telescoping Antenna Mechanism which is externally mounted (desk or hydraulic mast), (2) a Control Box which is installed in radio shack or similar location), (3) a Hull Fitting Assembly. The Antenna Mechanism consists of four telescoping plastic tubes.

No field changes in effect at time of preparation (12 April 1957).

MANUFACTURER'S OR CONTRACTOR'S DATA

Bergen Engineering and Development Corp., Paramus, New Jersey.
Contract NObsr-43103.
Approximate Cost: $5,000.00 with equipment spares.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes.

REFERENCE DATA AND LITERATURE

NAVSHIPS-91494, Technical Manual for Automatic Retractable Antenna AT-343(XN-1)/URC.

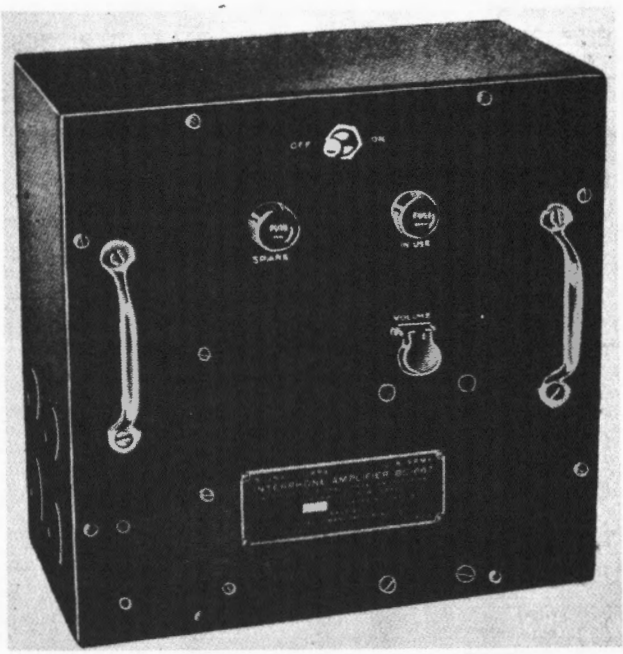
TYPE CLASSIFICATION	
DESIGN COGNIZANCE	BUSHIPS
PROCUREMENT COGNIZANCE	
STOCK NO.	

October 1957

Radio-Auxiliary

INTERPHONE AMPLIFIERS

BC-367, BC-667



Interphone Amplifiers BC-367,BC-667

FUNCTIONAL DESCRIPTION

The BC-367 and BC-667 are transformer-coupled amplifiers which contain an oscillator and amplifier circuit. The oscillator generates a 600 cycle signal. The amplifier has a rated output of 2 W.

These equipments are used in Interphone Equipment RC-99, a multistation interphone equipment which allows communication among the crew members of medium tank M3. They also permit the radio operator and tank commander to retain partial control of the tank radio for voice communication with station outside of the tank.

The oscillator generates an audio signal which the driver of the tank may use to indicate that he wishes to speak to someone on the radio side of the system.

The BC-367 is the same as the BC-667 except that the BC-367 dynamotor has a 12 volt input while the BC-667 dynamotor has a 24 volt input.

No field changes in effect at time of preparation (11 February 1957).

RELATION TO OTHER EQUIPMENT

Used with Interphone Equipment RC-99.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY OF OSCILLATOR FREQUENCY: 600 cps.
AMPLIFIER OUTPUT: 2 Watts.
POWER SOURCE REQUIRED.
BC-367: 12 V DC.
BC-667: 24 V DC.

TUBE AND/OR CRYSTAL COMPLEMENT

(2) 6V6

Total Tubes: (2)

REFERENCE DATA AND LITERATURE

TM11-4059: Technical Manual for Interphone Amplifiers BC-367 and BC-667 Repair Instructions.

TYPE CLASSIFICATION
DESIGN COGNIZANCE TASSA
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

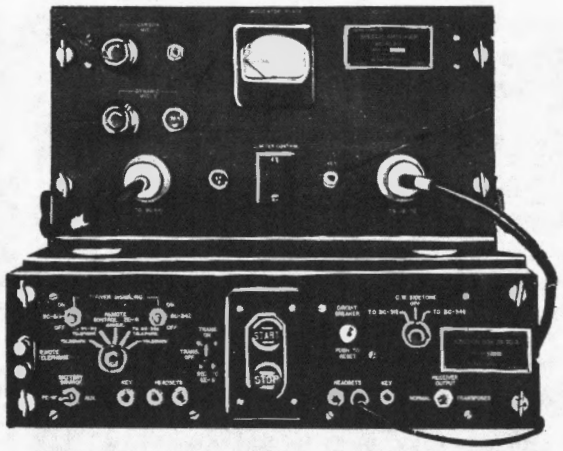
QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Interphone Amplifier BC-367		
1	Interphone Amplifier BC-667		

June 1961

Radio-Auxiliary

SPEECH AMPLIFIER

BC-614-E



Speech Amplifier BC-614-E

FUNCTIONAL DESCRIPTION

The BC-614-E is used to amplify the output of a microphone to the desired level, prior to being fed to the voice-modulation circuit of a transmitter.

The BC-614-E is part of Radio Transmitter BC-610, which in turn is part of Radio Set SCR-299, SCR-399 and SCR-499.

These equipments differ in the layout of operating controls, minor design changes, number of tubes used, and methods of connection and operation.

No field changes in effect at time of preparation (6 September 1960).

RELATION TO OTHER EQUIPMENT

The BC-614-E is functionally similar, but not interchangeable to the BC-614-A, B, C, D and F due to differences in layout, mounting methods, component part changes and method of operation.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

OPERATING POWER RQMT: 117 v ac, 50 to 70 cps, single ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

The Hallicrafters Co., Chicago, Illinois. Approximate Cost $382.00 with equipment spares.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) 6SQ7 (1) 80 (3) 6SN7WGTA
(1) 6SR7 (2) 6J5

Total Tubes: (8)

No Crystals used.

REFERENCE DATA AND LITERATURE

TM11-4043: Technical Manual for Speech Amplifiers BC-614-A, -B, -C, -D, -E, and -F.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE TASSA
PROCUREMENT COGNIZANCE
STOCK NO.
R.D.B. IDENT. NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Speech Amplifier BC-614-E		

Radio-Auxiliary

BC-686-A AMPLIFIER

April 1958

REFERENCE DATA AND LITERATURE

AN16-40BC686-2: Technical Manual for Amplifier BC-686-A.

TYPE CLASSIFICATION
DESIGN COGNIZANCE TASSA
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

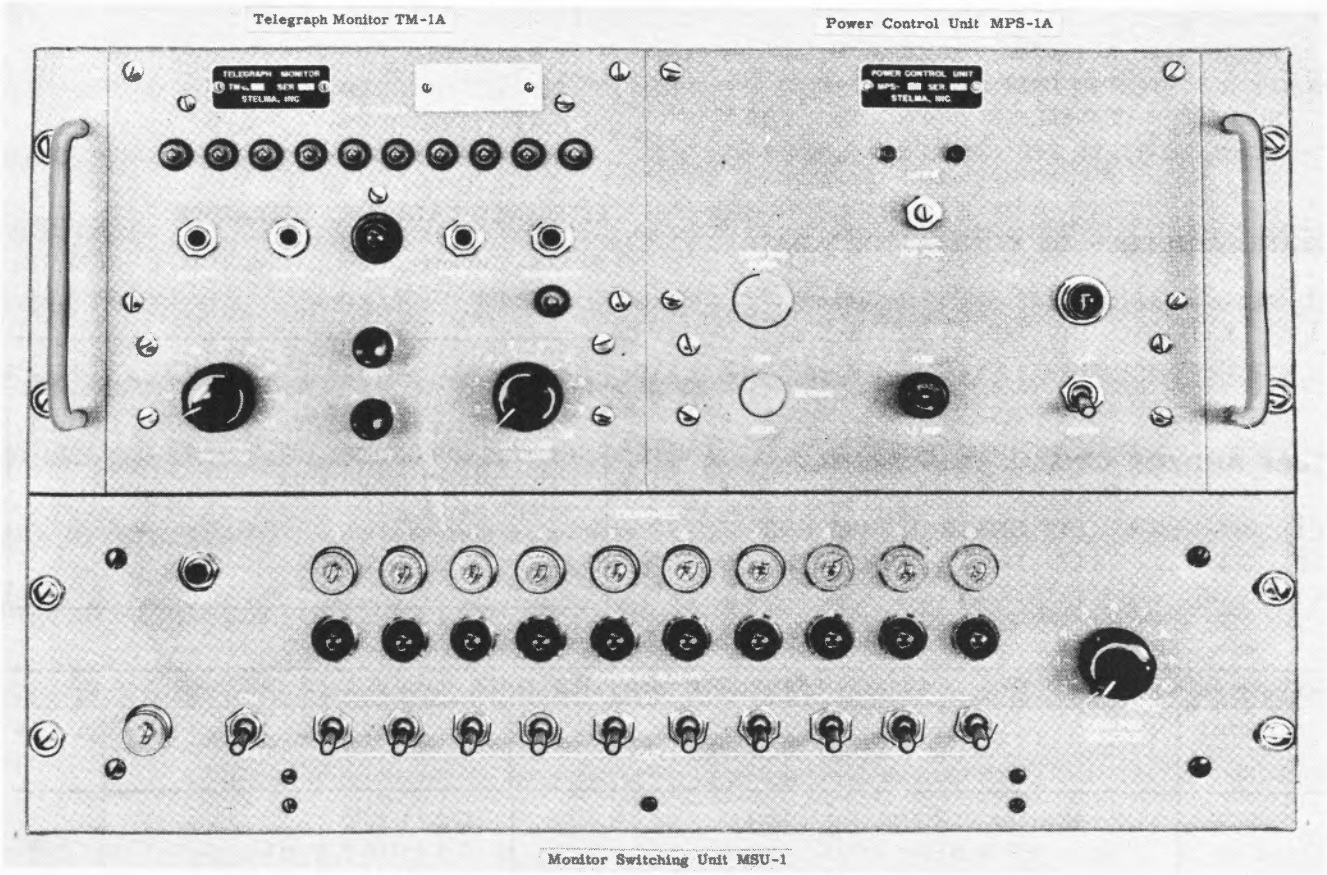
QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Amplifier BC-686-A	10-15/32 x 10-1/2 x 19	36

August 1960

Radio-Auxiliary

ALARM-MONITOR

BZ-58/UG



Alarm Monitor BZ-58/UG

FUNCTIONAL DESCRIPTION

Alarm-Monitor BZ-58/UG is a self-contained, ten channel monitoring system that automatically furnishes a warning alarm and alerts operations personnel when circuit conditions or equipment are deteriorating to a degree that requires attention. Up to ten telegraph circuits can be monitored in automatic sequence in any combination or order desired.

No field changes in effect at time of preparation (18 February 1960).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TELEGRAPH MONITOR TM-1A

INPUT SIGNALS: 20 ma or 60 ma neutral.
30 ma polar.
60, 75, 100 wpm start-stop telegraph signals, keyboard or tape.
53, 66 wpm teletypesetter signals.

INPUT RESISTANCE: 80 ohms for 60 ma neutral.
240 ohms for 20 ma neutral or 30 ma polar.

DISTORTION DETECTION: 5 to 45%, 5% steps.

ACCURACY: ±2% distortion.

POWER CONTROL UNIT MPS-1A

INPUT POWER: 115 or 230 v, 50 to 60 cy, single ph, 120 W.

OUTPUT

-B+ (REGULATED): 150 v, 40 ma.

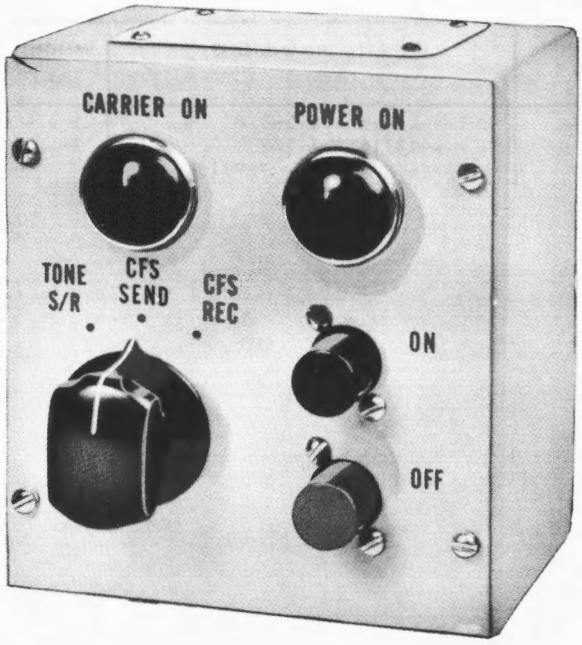
NEGATIVE BIAS (REGULATED): -150 v, 4.0 ma.

RELAY SUPPLY: 48 v, 150 ma.

FILAMENT (REGULATED): 25.2 v ac, 150

April 1958

TRANSMITTER-TELETYPEWRITER C-1004/SG,C-1004A/SG, CONTROL C-1004B/SG



Transmitter-Teletypewriter Control C-1004A/SG

FUNCTIONAL DESCRIPTION

The C-1004/SG, C-1004A/SG, and C-1004B/SG are intended for general shipboard installation. It is used in connection with teletypewriter sending and receiving loop circuits. The control unit, when properly connected, is intended to transfer a teletypewriter from a radio sending to a radio receiving circuit and vice versa, to turn power on or off for an associated transmitter and provide visual indication and to control the transmitter carrier and provide visual indication.

Data on this sheet reflects the following field changes: FC No. 1 (C-1004A/SG).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

POWER SOURCE REQUIRED: 110-220 v, 60 cps, single ph, 10 W.

MANUFACTURER'S OR CONTRACTOR'S DATA

Electronic Engineering and Service Co.
Contract: NObsr-52229, dated 12 Jan 1951 (C-1004/SG).
Maspeth Telephone and Radio Corp.
Contract: NObsr-63443, dated 18 May 1953 (C-1004A/SG).
Tabet Mfg Co Inc, Norfolk, Va.
Contract: N126s-83782 (C-1004B/SG).

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes or Crystals used.

REFERENCE DATA AND LITERATURE

NAVSHIPS 91542: Technical Manual for Transmitter-Teletypewriter Control C-1004/SG.
NAVSHIPS 92279: Technical Manual for Transmitter-Teletypewriter Control C-1004A/SG.
Nomenclature Card for Transmitter-Teletypewriter Control C-1004B/SG.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

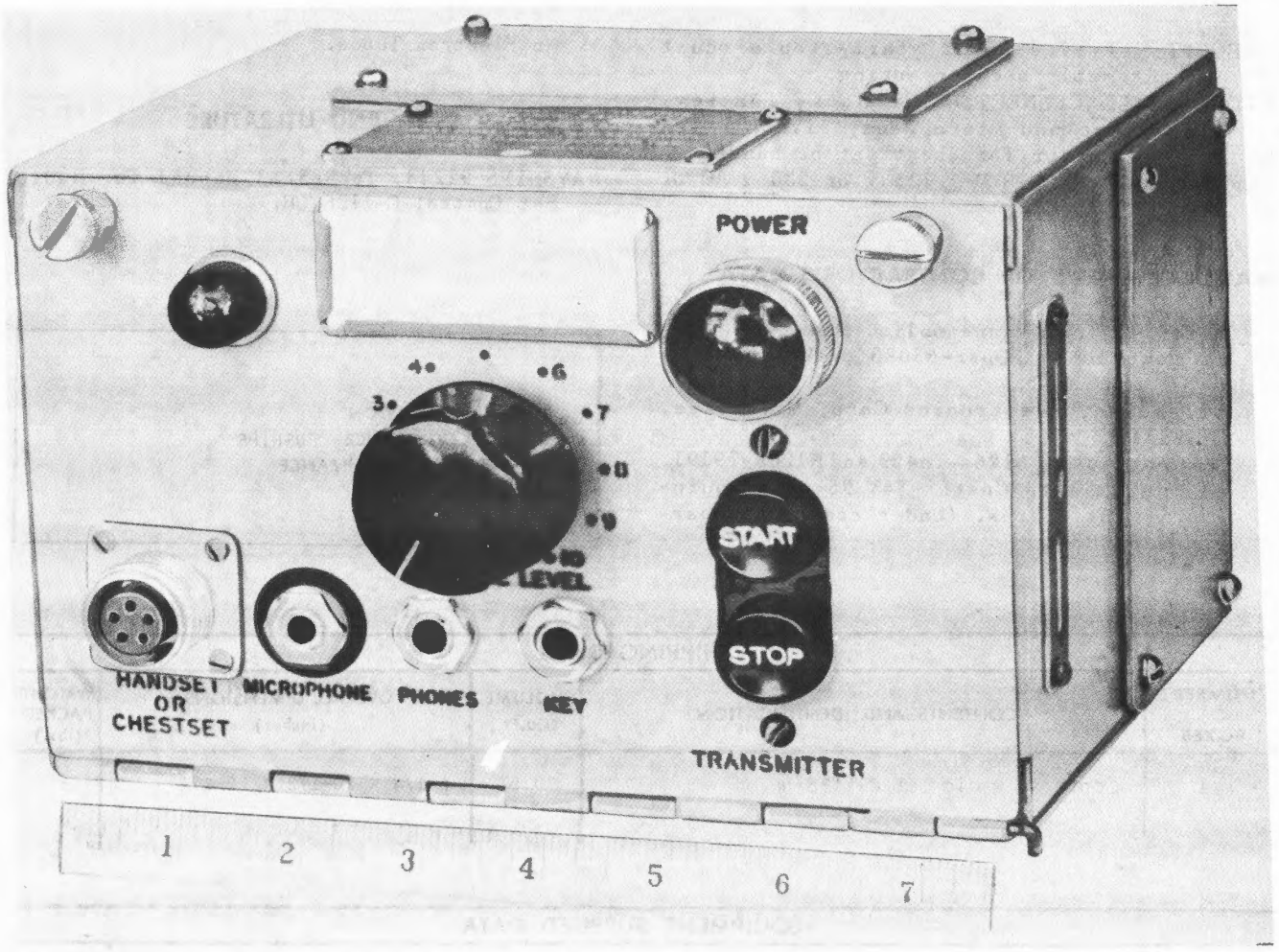
SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Transmitter-Teletypewriter Control C-1004/SG	0.1932	5-5/8 x 6-1/2 x 9-1/8	3-1/4
1	Transmitter-Teletypewriter Control C-1004A/SG	0.148	4-7/8 x 5 x 7-11/16	2-3/4
1	Transmitter-Teletypewriter Control C-1004B/SG			

April 1958

RADIO SET CONTROL

Radio-Auxiliary
C-1138/UR



Radio Set Control C-1138/UR

FUNCTIONAL DESCRIPTION

The C-1138/UR provides the necessary facilities to remotely control certain radiophone transmitter functions and the output of a radio receiver. Incorporated into the circuitry is the means for turning on or off any standard Navy shipboard transmitter, the means to voice modulate (or Key when CW operation is desired) any standard Navy shipboard transmitter and the means to monitor and control the output of any standard Navy radio receiver. The unit incorporates POWER and CARRIER ON indicators to provide the remote control operator with this information. Under standard operating conditions, as many as four C-1138/UR or similar units may be parallel connected to a single equipment group (transmitter and receiver) to provide various remote operating positions. An attenuator is available for headset level control. An adjustable speaker muting feature is provided to automatically reduce the input to an external speaker amplifier during periods of transmission.

No field changes in effect at time of preparation (10 February 1958).

RELATION TO OTHER EQUIPMENT

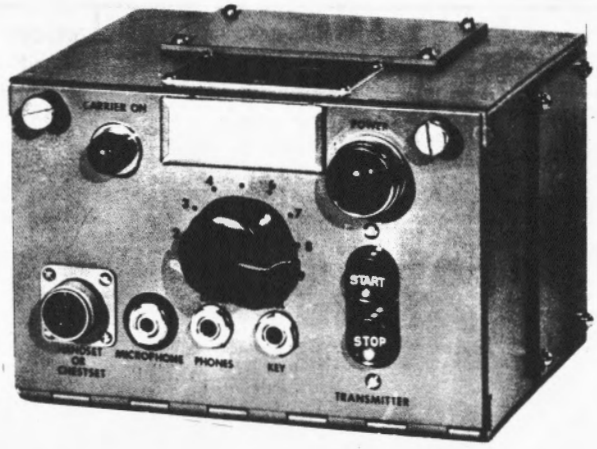
Similar to NT-23500 radiophone unit but of smaller size.

Equipment Required but not Supplied: (1) Microphone, (1) Headphone, (1) Chest set and (1) Hand Key.

June 1961

Radio-Auxiliary

RADIO SET CONTROL C-1138A/UR



Radio Set Control, C-1138A/UR

FUNCTIONAL DESCRIPTION

Radio Set Control C-1138A/UR is designed to provide necessary facilities to remotely control certain radio-phone transmitter functions and the output of a radio receiver. Incorporated into the circuitry is the means for turning on or off any standard Navy shipboard transmitter, the means to voice modulate (or key when CW operation is desired) any standard Navy shipboard transmitter and the means to monitor and control the output of any standard Navy radio receiver. The unit incorporates POWER and CARRIER ON indicators to provide the remote control operator with this information. Under standard operation conditions, as many as four C-1138A/UR Radio Set Controls or similar units may be parallel connected to a single equipment group (transmitter and receiver) to provide various remote operating positions.

No field changes in effect at time of preparation (3 January 1961).

RELATION TO OTHER EQUIPMENT

This equipment is electrically and mechanically interchangeable with C-1138/UR, except that maintenance parts differ.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TYPE OF CONTROL: Manual.

MANUFACTURER'S OR CONTRACTOR'S DATA

Tabet Mfg Co. Inc., Norfolk, Va.
Contract N126s-83888.
Model Engineering and Mfg Inc., Huntington, Ind.
Contract N126s-85774.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes or Crystals used.

REFERENCE DATA AND LITERATURE

NAVSHIPS 93152: Technical Manual for RADIO SET CONTROL C-1138A/UR and C-1138B/UR.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE USN, BUSHIPS
PROCUREMENT COGNIZANCE SPEC: MIL-C-17151C
STOCK NO. (SHIPS)
R.D.B. IDENT. NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Radio Set Control C-1138A/UR			

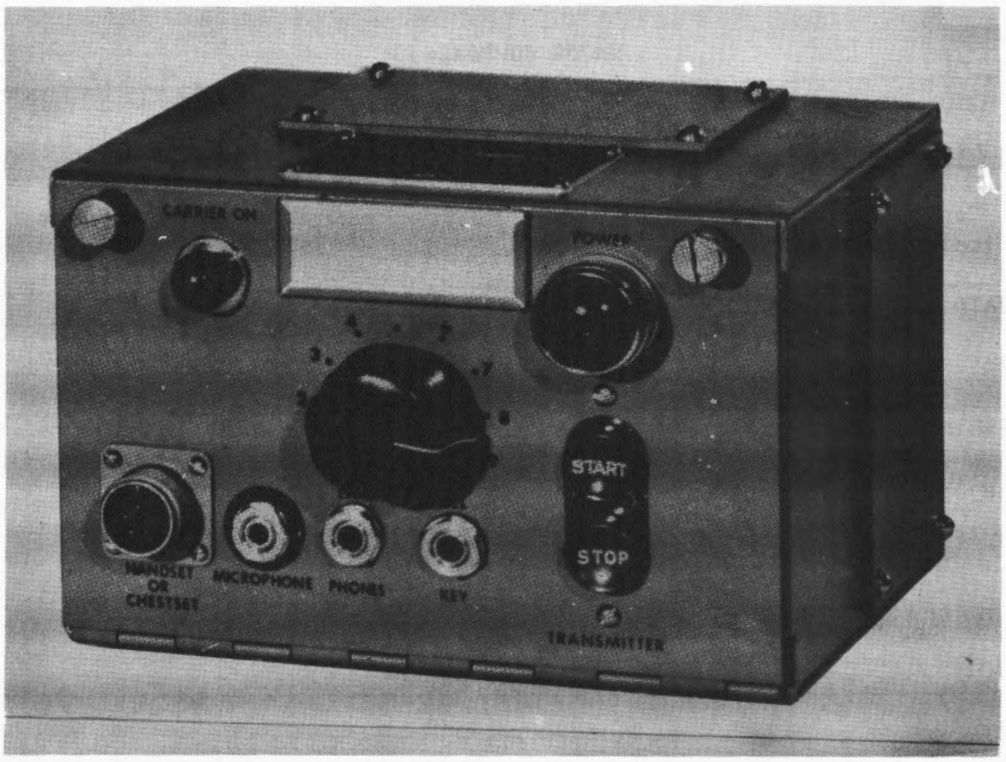
13 July 1962 RADIO CONTROL SET C-1138B/UR

Cog Service: USN FSN: N5820-681-8038 Functional Class:

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Kings Electronics Company, Incorporated, (91836).



Radio Control Set C-1138B/UR

FUNCTIONAL DESCRIPTION:

The Radio Control Set C-1138B/UR is designed to provide the necessary facilities to remotely control certain radiophone transmitter functions and the output of a radio receiver. Incorporated into the circuitry is the means for turning on or off any standard Navy shipboard transmitter, the means to voice modulate (or key when cw operation is desired) any standard shipboard transmitter; and the means to monitor and control the output of any standard Navy radio receiver. The unit incorporates Power and Carrier on Indicators to provide the remote control operator with this information.

No field changes in effect at time of preparation (12 December 1961).

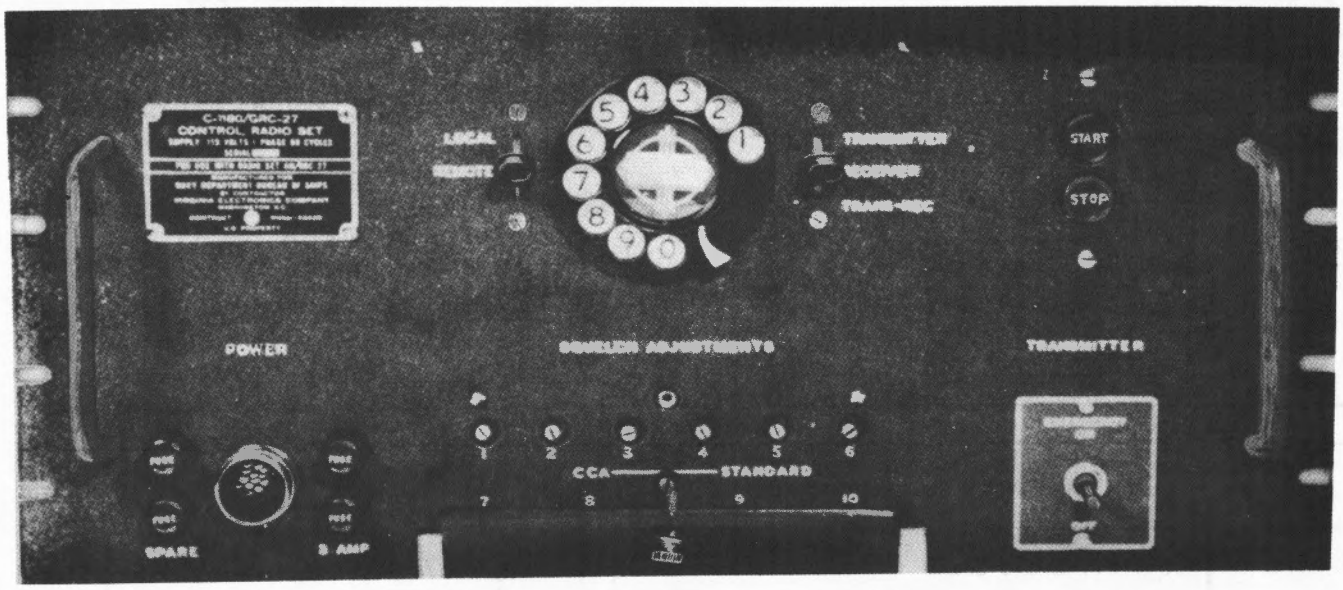
TECHNICAL CHARACTERISTICS:

TYPE OF CONTROL: Manual.

April 1958

RADIO SET CONTROL

Radio-Auxiliary
C-1180/GRC-27



Radio Set Control C-1180/GRC-27

FUNCTIONAL DESCRIPTION

The C-1180/GRC-27 is designed to permit operation of Radio Set AN/GRC-27 with the Navy standard shipboard remote control system. The control provides all facilities necessary for remote control operation of the AN/GRC-27 and associated Antenna Couplers CU-255/UR (where required):

(1) By means of Remote Control-Indicator Units Type 23496.

(2) By means of Channel Selector Units Type 23445 in conjunction with Radiophone Units Navy Type 23127, 23211, 23500, C-1138/UR, C-1207/UR or similar radiophone units.

(3) Or combinations of the above.

The design of the C-1180/GRC-27 additionally provides for limited control of the AN/GRC-27 from Console OA-365/SIC-1.

The C-1180/GRC-27 has been designed to perform the following functions:

Individual (duplex) and simultaneous (simplex) selection of preset frequency channels of the transmitter and receiver and any associated antenna couplers by local and remote control.

Remote indication of channels to which the transmitter and receiver and their antenna couplers are tuned.

Emergency control of primary power for the complete system.

Local indication that primary power is connected (emergency switch on).

Local and remote start-stop operation of the transmitter units of the AN/GRC-27.

Remote indication that primary power has been applied to the transmitter units.

Remote push-to-talk operation of the transmitter.

Remote indication that the transmitter is on the air (simulated carrier-on-indication).

Automatic selection of present receiver silencer threshold levels simultaneous with receiver channel selection.

Provides terminations for cables of the AN/GRC-27 assembly.

Connection and switching necessary for operation of the AN/GRC-27 from the CCA Console.

Data on this sheet reflects the following field changes: FC No. 3.

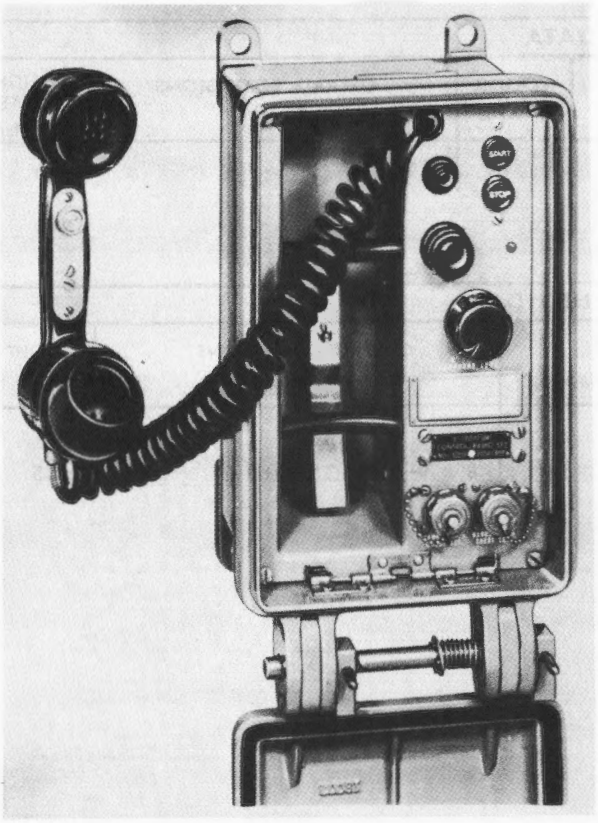
ELECTRICAL AND MECHANICAL CHARACTERISTICS

POWER SOURCE REQUIRED: 115 v, 60 cps, single ph.

April 1958

RADIO SET CONTROL

Radio-Auxiliary
C-1207/UR



Radio Set Control C-1207/UR

FUNCTIONAL DESCRIPTION

The C-1207/UR remotely controls the following functions of a Navy standard receiving set and Navy standard shipboard transmitter: (1) energizes and de-energizes the transmitter, (2) voice modulates the transmitter input, and (3) monitors and controls the output of the receiving set. In addition the Radio Set Control contains indicator lights that inform the operator whether the transmitter power and carrier-on circuits are energized or de-energized. In standard shipboard control systems, these circuits may be controlled from as many as four Model C-1207/UR or similar radio set controls connected in parallel.

Data on this sheet reflects the following field changes. FC No. 1 (dated 5 February 1958).

RELATION TO OTHER EQUIPMENT

Equipment Required but not Supplied: Stuffing tubes as required.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

CONTROL CIRCUITS: Start-stop, transmitter input voice modulation, receiving set audio monitoring and earphone level attenuator circuit.

INDICATING CIRCUITS: Power on, speaker muting and carrier on.

POWER SOURCE REQUIRED: 115 or 230 v, 60 cps, single ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

American Measuring Instruments Corp, Long Island, N.Y.
Contract: NObsr-63156, dated 18 December 1952.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes or Crystals.

REFERENCE DATA AND LITERATURE

NAVSHIPS 92198, Technical Manual for Radio Set Control C-1207/UR.

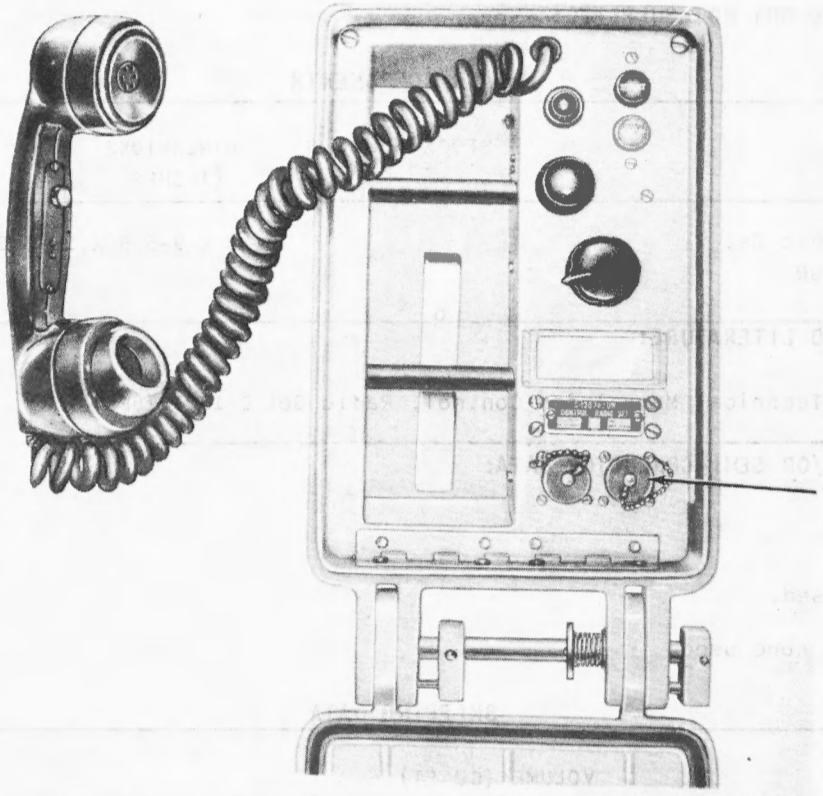
TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE MIL-C-17308
STOCK NO. (Ships)
R.D.B. IDENT. NO.

Cog Service: FSN: Functional Class:

USA USN USAF

TYPE CLASS:

MANUFACTURER'S NAME/CODE NUMBER: Polytronic Research Incorporated.



Control, Radio Set C-1207A/UR

FUNCTIONAL DESCRIPTION:

The Control, Radio Set C-1207A/UR is for general-purpose use, to remotely energize and de-energize the standard Navy transmitter, voice modulate the transmitter, and control the output of the receiver.

No field changes in effect at time of preparation (1 May 1961).

TECHNICAL CHARACTERISTICS:

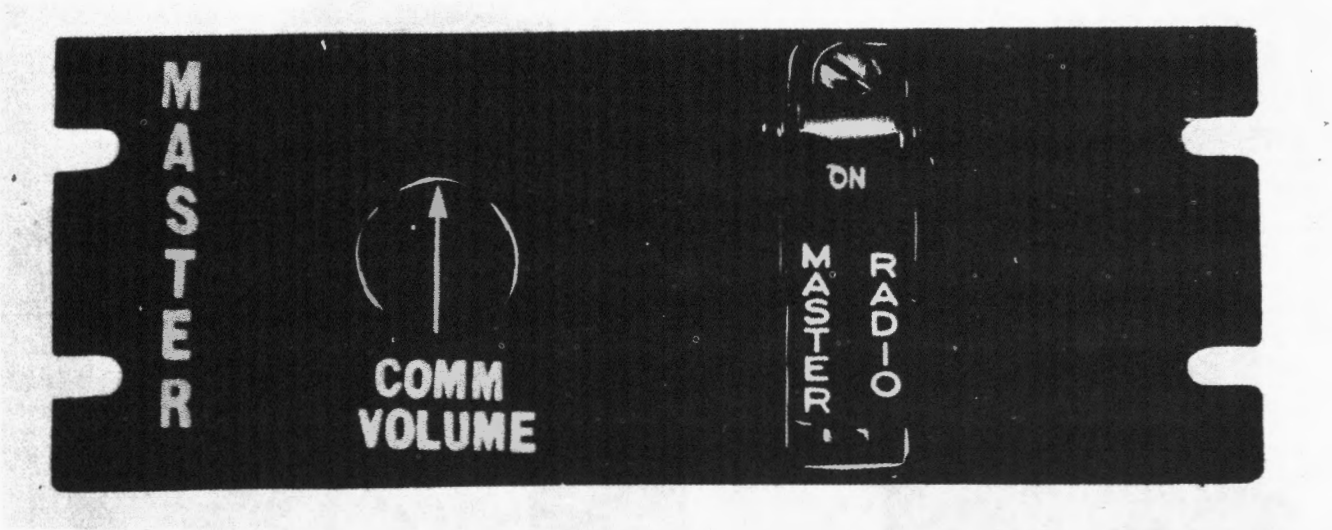
TYPE OF MOUNTING: Bulkhead mounted.
TYPE OF CONTROL: Manual.
TYPE OF FUNCTION PERFORMED
ONE: Energizes and de-energizes the transmitter.
TWO: Voice modulates the transmitter input.
THREE: Monitors and controls the output of the receiving set.
OPERATING POWER RQMT: 115 v or 230 v ac or dc and 12 v dc.

October 1957

Radio-Auxiliary

MASTER PANEL

C-127A/ARC



Master Panel C-127A/ARC

FUNCTIONAL DESCRIPTION

The C-127A/ARC is designed to be mounted in the pilot's cockpit of naval carrier based aircraft. The unit is intended to serve as a master power switch for Radio Communication and Navigation transmitters and receivers, but not including IFF and radar equipment, and as a master volume control for the associated VHF and HF communications receivers.

No field changes in effect at time of preparation (5 April 1957).

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes.

REFERENCE DATA AND LITERATURE

NAVAER 16-35C127-501: Technical Manual for Master Panel C-127A/ARC.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUAER
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Master Panel C-127A/ARC	2-1/4 x 6 x 6-5/16	

Radio-Auxiliary

C-1281/U CONTROL, ANTENNA

April 1958

MANUFACTURER'S OR CONTRACTOR'S DATA

Mercury Manufacturing Corp, Buffalo, New York.
Contract: NObsr-57139.

REFERENCE DATA AND LITERATURE

NAVSHIPS 92042, Technical Manual for Navy Type C-1281/U Control, Antenna.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes or Crystals used.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Control, Antenna C-1281/U	5 X 8 X 13-1/2	15
1	Relay and Vacuum Switch Assy	4-3/4 X 6 X 7	2.625
3	Connectors UG-946/U	2 X 6 X 8	3.125
3	Connectors UG-218/U	1 X 2 X 2-1/2	1.375
1	Interconnection Harness and Accessories	4-1/2 X 6 X 9	5.5
2	Technical Manuals		
2	Field Change Bulletin No. 3 NavShips 98387		
1	Equipments Maintenance Parts	6 X 9 X 12	12

Radio-Auxiliary

C-1360/SRT CONTROL-MONITOR

REFERENCE DATA AND LITERATURE

NAVSHIPS 92589: Technical Manual for Fairwater Antenna Tuning System.
Nomenclature Card for Control-Monitor C-1360/SRT.

TYPE CLASSIFICATION	(NAVY)
DESIGN COGNIZANCE	NAVY BUSHIPS
PROCUREMENT COGNIZANCE	OA SHIPS-A-1392
STOCK NO.	
R.D.B. IDENT. NO.	

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Control-Monitor C-1360/SRT	11 X 17 X 19	65

C-1360A/SRT CONTROL-MONITOR

INPUT SIGNALS RECEIVED
ONE: Unmodulated radio frequency, 300 kc to 30 mc.
TWO: Amplitude modulated radio frequency, 300 kc to 30 mc.
OPERATING POWER RQMT: 110 to 115 v ac, 50 to 60 cps, single ph, 350 W.

RELATION TO OTHER EQUIPMENT:

The C-1360A/SRT is electrically and mechanically interchangeable with C-1360/SRT except for maintenance parts and more ruggedized shock mounts.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Control-Monitor C-1360A/SRT		11-3/8 x 17-5/8 x 18-11/16	74

REFERENCE DATA AND LITERATURE:

NAVSHIPS 93160: Technical Manual for Antenna Tuning Group AN/BRA-3, AN/BRA-5 of which the C-1360A/SRT is used with.
Nomenclature Card for Control-Monitor C-1360A/SRT.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (1) 0B2WA (2) 12AT7WA (1) 5726 (1) 5727 (1) 5760

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	4.2	125

PROCUREMENT DATA

PROCURING SERVICE: DESIGN COG: USN, BuShips
SPEC &/OR DWG: SHIPS-A-1885

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Granite State Machine Co., Incorporated Part no. 33-0-1 Rev C	Manchester, N. H.	NObsr-64802	

August 1960

Radio-Auxiliary

CONTROL INDICATOR C-1600/SPA

FUNCTIONAL DESCRIPTION

The C-1600/SPA selects manual or automatic range delay, selects information from one of four Plan Position Indicators (PPI), switches power to Correlator, Indicator SN-148/SPA.

No field changes in effect at time of preparation (6 May 1960).

RELATION TO OTHER EQUIPMENT

The C-1600/SPA is designed to be used with but not part of VL-1, VK and AN/SPA-8A.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TYPE OF CONTROL: Manual and automatic control.

OPERATING POWER RQMT: 115 v AC, 60 cps, single ph, 100 W.

MANUFACTURER'S OR CONTRACTOR'S DATA

Emerson Electric Mfg Co., St. Louis, Mo.
Part No. 512580.

Contract NObsr-64026, dated 21 August 1953.

TUBE AND/OR CRYSTAL COMPLEMENT

Electron Tube and/or Crystal data not available.

REFERENCE DATA AND LITERATURE

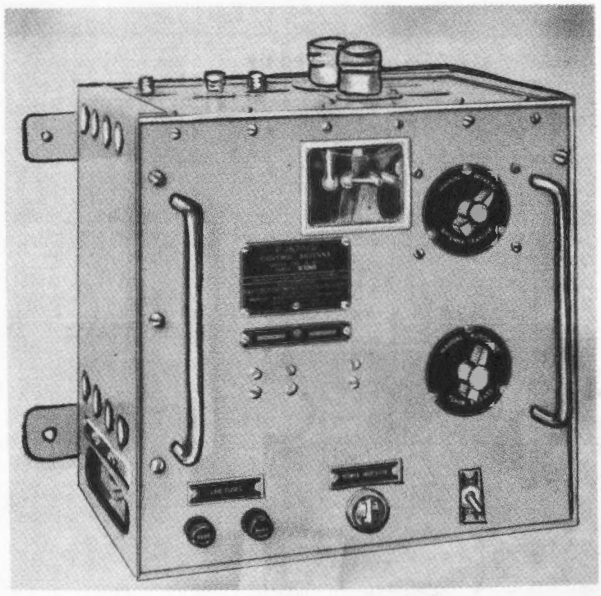
Nomenclature Card for Control Indicator C-1600/SPA.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE NAVY BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Control Indicator C-1600/SPA	4-5/16 X 8-27/32 X 12	

CONTROL, ANTENNA C-1670/U



Control, Antenna C-1670/U

FUNCTIONAL DESCRIPTION

The C-1670/U provides facilities for controlling transmitter keying and antenna switching from receive to transmit position. This equipment provides an automatic antenna transfer system for break-in operation. The unit is interconnected with the keying circuit of the associated transmitter in such a manner that the antenna transfer contacts are never required to break the antenna current. Provision is made for bulkhead mounting of the unit. It is used with the AN/SRT-14, 15, 16 and the TBL series.

No field changes in effect at time of preparation (9 July 1956).

RELATION TO OTHER EQUIPMENT

Similar to function and operation to the CU-1281/U.

Equipment Required but not Supplied: Interconnecting cables.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

OPERATING FREQUENCY RANGE: 2 to 20 mc.
KEYING SPEED: 60 words per minute.
CIRCUIT CLOSING DELAY: Adjustable; 0 to 1 sec.
POWER SOURCE: 115 v, 60 cps, single ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

Mercury Manufacturing Corp., Buffalo, New York,
Contract NObsr 57139, dated 28 December 1951.
Approximate Cost: $1500.00 with equipment spares.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes.

REFERENCE DATA AND LITERATURE

NAVSHIPS 92566: Technical Manual for Navy Type C-1670/U, Control, Antenna.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE MIL-A-16318A
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Control, Antenna-C-1670/U	9-1/2 x 13-1/2 x 15-1/4	39
1	Set Accessories	2 x 4-1/2 x 4-3/4	3-5/16
2	Technical Manuals	1 x 9 x 12	1-5/8
1	Spare Parts Box	6 x 9 x 12	12

C-1827/ARC-55 CONTROL, RADIO SET

RELATION TO OTHER EQUIPMENT:

The C-1827/ARC-55 is designed as part of Radio Set AN/ARC-55 or AN/ARC-27.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Control, Radio Set C-1827/ARC-55		3 x 4-1/4 x 5-3/4	1-3/4

REFERENCE DATA AND LITERATURE:

NAVWEPS 16-30ARC27-501, T016-30ARC27-4: Technical Manual for Radio Set AN/ARC-27. AN/ARC-27A, AN/ARC-55 and AN/ARC-55B of which Control, Radio Set C-1827/ARC-55 is a part of.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: None used.

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: BuWeps DESIGN COG: BuWeps
SPEC &/OR DWG:

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Collins Radio Company Dwg no. 540 6412 003	Cedar Rapids, Iowa	NOas 55-833	

October 1957

Radio-Auxiliary

RADIO SET CONTROL C-1897/GRC-27A

FUNCTIONAL DESCRIPTION

The C-1897/GRC-27A is designed to permit operation of Radio Set AN/GRC-27 with the Navy Standard shipboard remote control system. The control provides all facilities necessary for remote control operation of the AN/GRC-27 and associated Antenna Coupler CU-355/UR by means of Remote Control Indicator Units NT-23496, by means of Channel Selector Units NT-23445 in conjunction with radiophone units NT-23127, -23211, -23500, C-1138/UR, C-1207/UR or similar radiophone units or combinations of the above. The design of C-1897/GRC-27A additionally provides for limited control of the AN/GRC-27 from CCA Intercommunication Set OA-365/SIC-1.

The C-1897/GRC-27A has been designed to perform the following functions:

a. Individual (duplex) and simultaneous (simplex) selection of preset frequency channels of the transmitter and receiver and any associated antenna couplers by local and remote control.

b. Remote indication of channels to which the transmitter and receiver and their antenna couplers are tuned.

c. Emergency local control of primary power for the complete system.

d. Local indication that primary power is connected (emergency switch on).

e. Local and remote start-stop operation of the transmitter units of the AN/GRC-27.

f. Remote indication that primary power has been applied to the transmitter units.

g. Remote push-to-talk operation of the transmitter.

h. Remote indication that the transmitter is on the air (simulated carrier-on indication).

i. Automatic selection of present receiver silencer threshold levels simultaneous with receiver channel selection.

j. Provide terminations for cables of the AN/GRC-27 assembly.

k. Connection and switching necessary for operation of the AN/GRC-27 from the CCA console.

No field changes in effect at time of preparation (11 April 1957).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

POWER SOURCE REQUIRED: 115 v, 60 cps, single ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

Virginia Electronics Co., Washington, D. C. Contract NObsr-63439 dated 6 May 1953, NObsr-64661 dated 8 March 1955.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes.

REFERENCE DATA AND LITERATURE

NAVSHIPS 92175, Technical Manual for Radio Set Control C-1180/GRC-27 and C-1897/GRC-27A.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

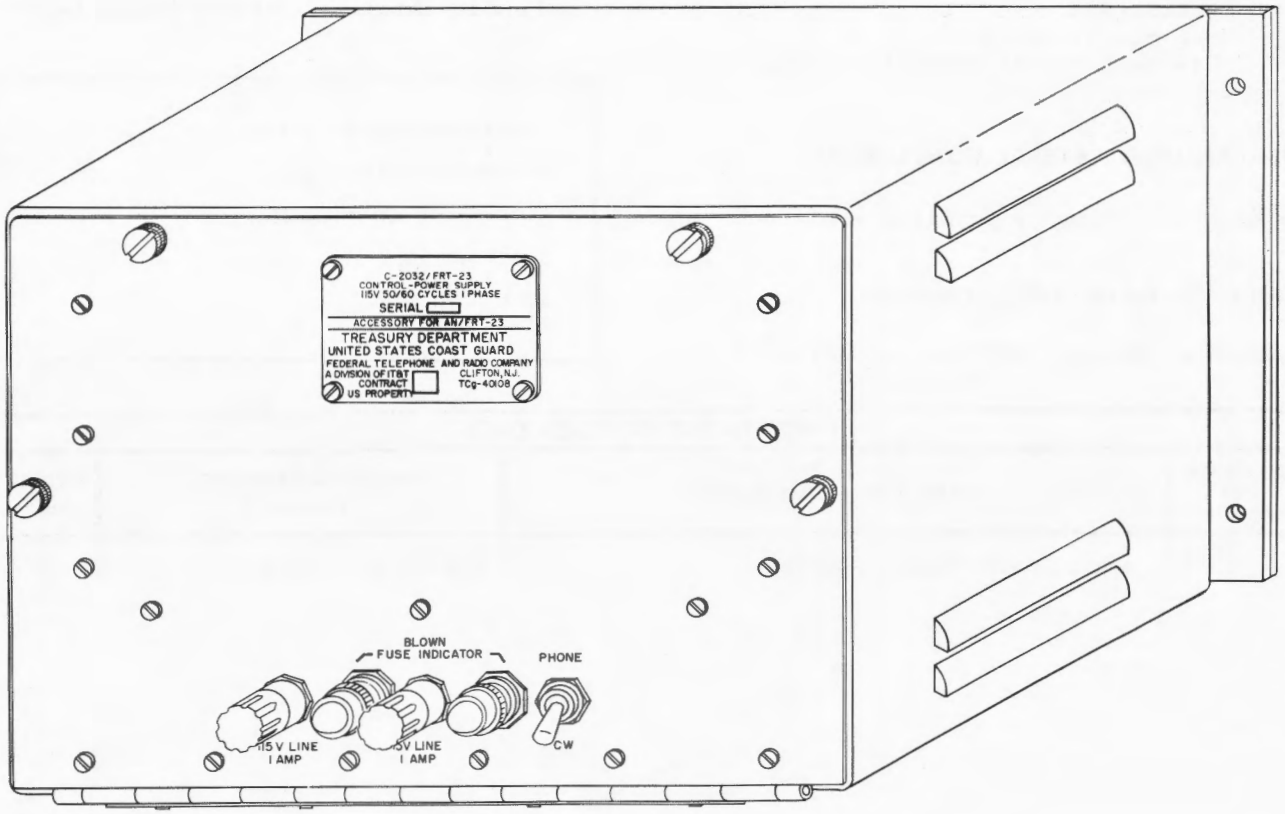
SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Control, Radio Set (packed) includes	2.1	11-1/4 X 13-1/4 X 24-1/4	36
	Control Radio Set (Packaged) (Includes Installation Kit and 2 Instruction Books)	1.6	10-1/2 X 13 X 20	32
	Maintenance Parts Kit	0.25	3-1/2 X 9-1/2 X 12-1/4	2-1/2

September 1960

Radio-Auxiliary

CONTROL POWER SUPPLY C-2032/FRT-23



Control-Power Supply C-2032/FRT-23

FUNCTIONAL DESCRIPTION

The C-2032/FRT-23 is designed to provide remote operation of Radio Transmitting Set AN/FRT-23 for voice and radio telegraph communications from CIC, bridge, or other remote locations on ships or shore installations.

The C-2032/FRT-23 is designed to provide remote operation and control of the AN/FRT-23 from a NT-23500 Radiophone Unit. The modification unit supplies a source of twelve (12) volts direct current (dc) to the radiophone unit for microphone current, and to operate the "carrier on" relay during handset operation. It also controls the transmitter plate supply voltage and, when phone operation is used, it causes the transmitter to be set up for audio modulation. Relay contacts are provided which may be used to disable the receiver during voice transmissions.

No field changes in effect at time of preparation (13 January 1960).

RELATION TO OTHER EQUIPMENT

The C-2032/FRT-23 is designed as part of the Radio Transmitting Set AN/FRT-23.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TYPE OF CONTROL: Automatic type.
TYPE OF POWER SUPPLY: Metallic disk power supply.
OPERATING POWER RQMT: 115 v, 50 to 60 cps, single ph.

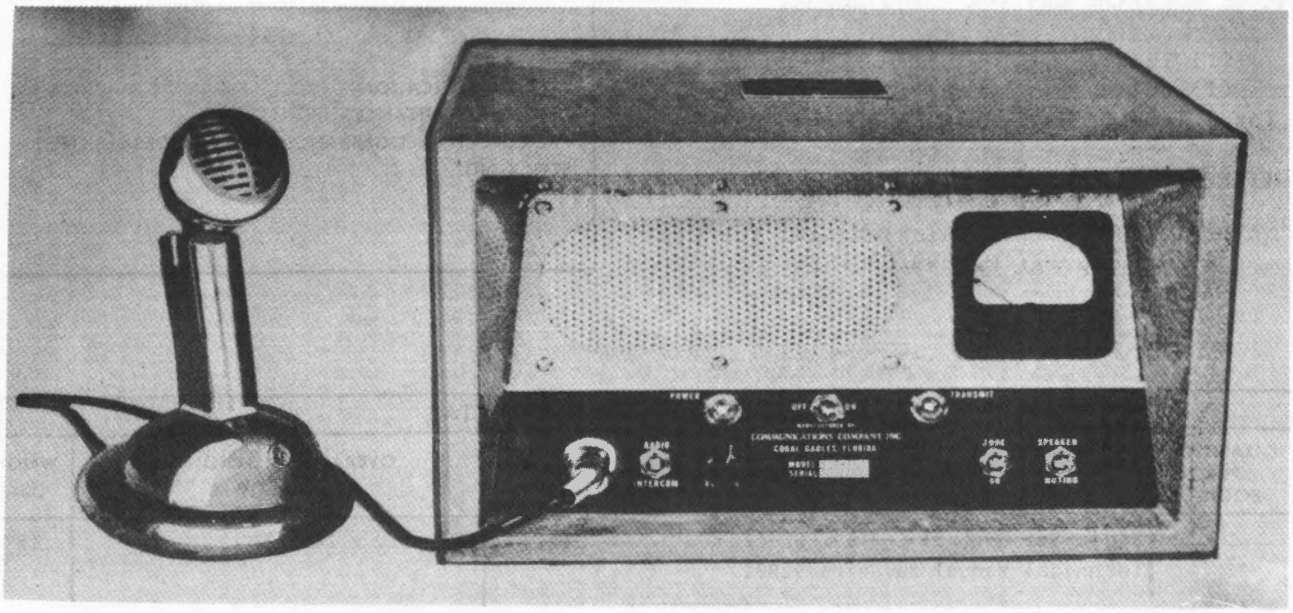
MANUFACTURER'S OR CONTRACTOR'S DATA

Federal Telephone and Radio Co., Clifton,

January 1958

Radio-Auxiliary

CONTROL RADIO SET C-2099/FRC-52



Control Radio Set C-2099/FRC-52

FUNCTIONAL DESCRIPTION

The C-2099/FRC-52 is designed for the remote controlling of a radio telephone transmitter and receiver using a single pair, metallic, telephone-line and a earth ground. It is primarily intended for the remote control of AN/FRC-52, but it is equally intended for controlling any similar two-way radio telephone station using AM or FM emission having a single transmitter and receiver located at a remote location. It furnishes voltage for push-to talk operation of the remote transmitter.

No field changes in effect at time of preparation (11 February 1957).

RELATION TO OTHER EQUIPMENT

The C-2099/FRC-52 is the Communications Company, Inc Model Number 297-4H.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

SPEAKER AMPLIFIER DATA

INPUT IMPEDANCE: 500 to 600 ohms balanced to ground.

INPUT: -10 db min for 1 W speaker level over a 500 to 600 ohm telephone line.

OUTPUT IMPEDANCE: 4 and 500 ohms unbalanced.

SPEAKER OUTPUT: 1 W (less than 10% distortion).

MICROPHONE AMPLIFIER DATA

INPUT: For high impedance dynamic, reluctance or crystal microphone; or carbon microphone or handset (unbalanced to input).

OUTPUT: 500 to 600 ohms balanced to ground.

OUTPUT LEVEL: 0 to +6 db into 500 to 600 ohm telephone line.

POWER REQUIREMENTS: 110 to 120 v, 50 to 60 cps, single ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

Communications Company, Inc., Coral Gables, Fla.

Contract NObsr-71359, dated 22 June 1956.

Approximate Cost: $130.00 with equipment spares.

Radio-Auxiliary

CONTROL, RADIO SET C-2099A/FRC-52

Control, Radio Set C-2099A/FRC-52

FUNCTIONAL DESCRIPTION

Radio Set Control C-2099A/FRC-52 is a desk mount control unit, designed for the remote control of a radio telephone receiver and transmitter. Remote control is accomplished over a single pair, metallic, telephone line and an earth ground. More specifically, a standard two-wire 600 ohm telephone line having a total loop resistance of not over 1500 ohms, nor more than 20 db loss.

While designed primarily for the remote control of Navy models AN/FRC-52( ) and AN/FRC-70( ) equipments and various COMCO commercial models of VHF-FM systems and VHF-AM aeronautical ground equipments, it is equally applicable for controlling similar two-way radio telephone stations using A-3(AM) or F-3(FM or PM) emission having a single receiver and transmitter operating simplex located at a remote location.

It is designed primarily for voice communication. The C-2099A/FRC-52 furnishes voltage for Push-to-Talk operation of the remote transmitter. It meets F.C.C. requirements for remote transmitter control.

No field changes in effect at time of preparation (28 April 1961).

RELATION TO OTHER EQUIPMENT

This equipment is similar in performance and physical/electrical design, to the C-2099/FRC-52. The differences being the addition of compression amplifier circuits (one each for transmit and receive). The C-2099A/FRC-52 and C-2099/FRC-52 are interchangeable, (except for compression amplifiers) and may be used in parallel with each other.

EQUIPMENT REQUIRED BUT NOT SUPPLIED

A single pair, metallic, telephone line with an earth ground return.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

COMPRESSION AMPLIFIER: This remote radio set control incorporates compression amplifiers having the capability with respect to a variation of 25 db (or more) in the audio level, of limiting the audio output level to less than 3 db variation. This capability is effective in both the transmit and receive conditions.

TRANSMIT CONDITIONS

INPUT: Controlled Reluctance, Transistorized Pre-Amplifier, microphone, or an audio tone oscillator within a frequency range of 800 to 1000 cycles.

OUTPUT: 500/600 ohms audio (balanced to ground).

OUTPUT LEVEL: Into a 600 ohm telephone line, up to 50 mw, normal max. level 18 mw with less than 5% distortion.

AUDIO RESPONSE: Porm 3 db from 300 to 3000 cyc (controlled by the compression amplifier).

HUM AND NOISE LEVEL: At least 40 db or more below the rated output level.

RECEIVER CONDITION

INPUT IMPEDANCE: 500/600 ohms audio (balanced to ground).

MINIMUM INPUT: Required over a 600 ohm telephone line for 1 W of speaker level, M10 db (or lower).

OUTPUT IMPEDANCE: 3.5 and 500 ohms (unbalanced).

SPEAKER OUTPUT: At least 2.0 W with less than 5% distortion.

AUDIO RESPONSE: Porm 3 db from 300 to 3000 cycles (controlled by the compression amplifier).

HUM AND NOISE LEVEL: At least 45 db or more below the rated output level of 2.0 W.

POWER SUPPLY

INPUT: 110 to 120 v, 50 to 60 cyc, single ph.

OUTPUT VOLTAGES

B PLUS VOLTAGE: 250 v dc.

FILAMENT VOLTAGE: 6.3 v ac.

RELAY VOLTAGE

TONE RELAY: 6.3 v ac.

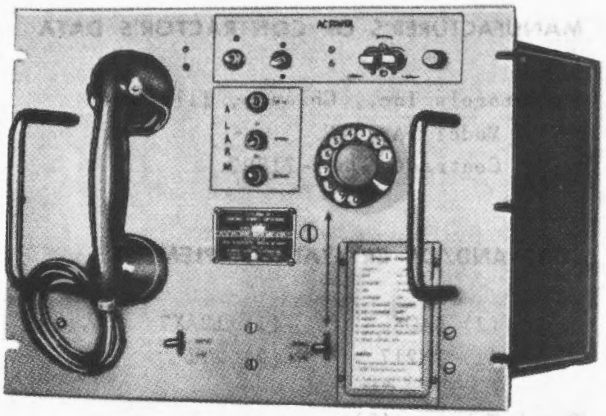
PUSH-TO-TALK: M48 v dc (key down) to M55 v dc (key up).

PUSH-TO-TALK: P24 v dc to P60 v dc.

September 1960

Radio-Auxiliary

REMOTE SWITCHING CONTROL C-2234/GRA-34



Remote Switching Control C-2234/GRA-34

FUNCTIONAL DESCRIPTION

The C-2234/GRA-34 is designed to enable an operator to remotely control the "OFF", "ON", "STAND-BY" conditions of two (2) transmitters. It also provides voice communications between Local and Remote sites.

No field changes in effect at time of preparations(27 January 1960).

RELATION TO OTHER EQUIPMENT

The C-2234/GRA-34 is designed to be used with but not part of the AN/GRA-34 and AN/URN-3.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

OPERATING POWER RQMT: 117 v AC, 60 cps, single phase.

MANUFACTURER'S OR CONTRACTOR'S DATA

Olympic Radio and Television Co., Long Island City, New York.
Part No. AS16063.
Contract NObsr-71539.

TUBE AND/OR CRYSTAL COMPLEMENT

(3) 5670 (1) 6AU6WA

Total Tubes: (4)

No Crystals used.

REFERENCE DATA AND LITERATURE

NAVSHIPS 93121(A): Technical Manual for Control Monitor Group AN/GRA-34 and Remote Switching Group C-2234/GRA-34.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE USN, BUSHIPS
PROCUREMENT COGNIZANCE SPEC: MIL-E-16400B, Class 1
STOCK NO.
R.D.B. IDENT. NO. 12.12

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Remote Switching Control C-2234/GRA-34	4.1	17 X 18 X 23	40

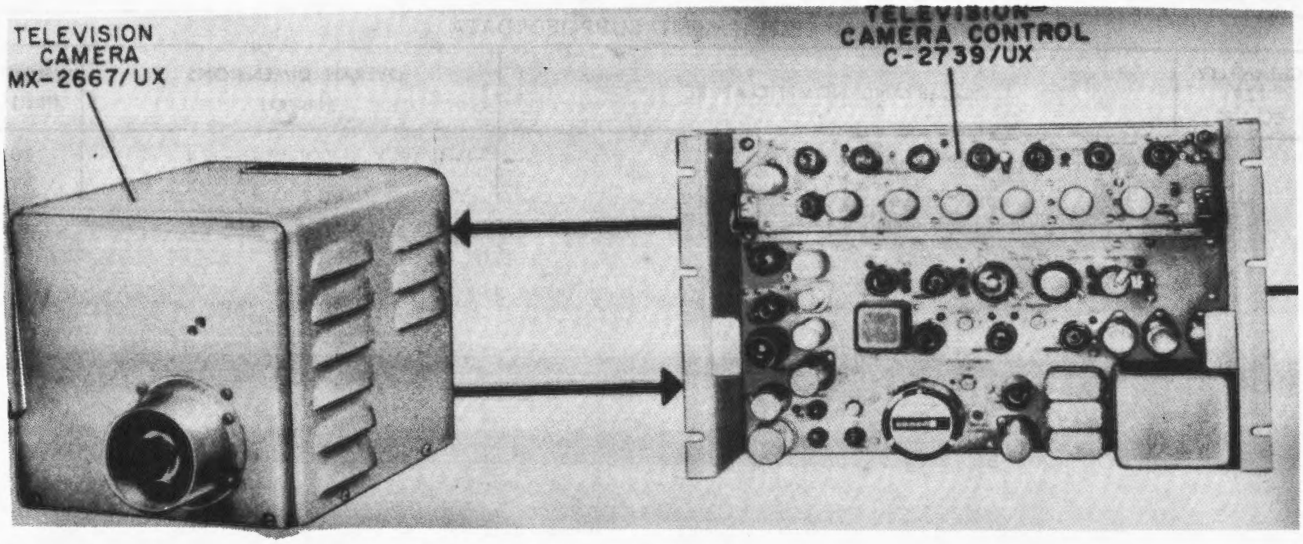
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Remote Switching Control C-2234/GRA-34	13 X 14 X 19	

February 1960

Radio: Auxiliary

TELEVISION CAMERA CONTROL C-2739/UX
TELEVISION CAMERA MX-2667/UX



FUNCTIONAL DESCRIPTION

Television Camera MX-2667/UX is a high resolution single lens television camera employing a vidicon type camera tube designed for use aboard ship or shore.

Television Camera Control C-2739/UX provides amplification and processing function and vertical sweep and certain current and voltages for the control of the television camera and the turrent television camera.

No field changes in effect at time of preparation (10 December 1959).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

C-2739/UX

TYPE OF CONTROL: Manual.
POWER REQUIREMENTS: 115 v, 60 cy, 1 ph; 300 v DC.

MX-2667/UX

IMAGE PICK-UP TUBE: RCA type 6198A.
LENS: F1.5, 63/64 in. focal length.
POWER REQUIREMENTS: 115 v, 60 cy, 1 ph; 300 v DC.

MANUFACTURER'S OR CONTRACTOR'S DATA

General Precision Laboratory, Inc., Pleasantville, New York.
Part No. 5359-1(C-2739/UX), 5358-2 (MX-2667/UX).
Contract NObsr-75369.

TUBE AND/OR CRYSTAL COMPLEMENT

C-2739/UX

(5) E180F/6688	(4) E88CC/6922	(1) 6BL7
(4) 12AV7	(1) 12AT7WA	(1) 6CL6
(2) OD3	(1) 5726/6AL5W	(1) VXR900
(1) C74008	(3) 1N38A	(1) T8G
(1) S9G		

Total Tubes: 25

MX-2667/UX

(1) E180F/6688	(1) E88CC/6922	(2) 12AV7
(1) 12AT7WA	(2) 6CL6	(5) 1N38A
(1) 417A/5842	(1) C74008	(1) 1N485

Total Tubes: 15

No crystals used.

REFERENCE DATA AND LITERATURE

NAVSHIPS 93377(A): Technical Manual for TELEVISION CAMERA MX-2667/UX.

TYPE CLASSIFICATION (Navy)
DESIGN COGNIZANCE USN, BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.
R.D.B. IDENT. NO.

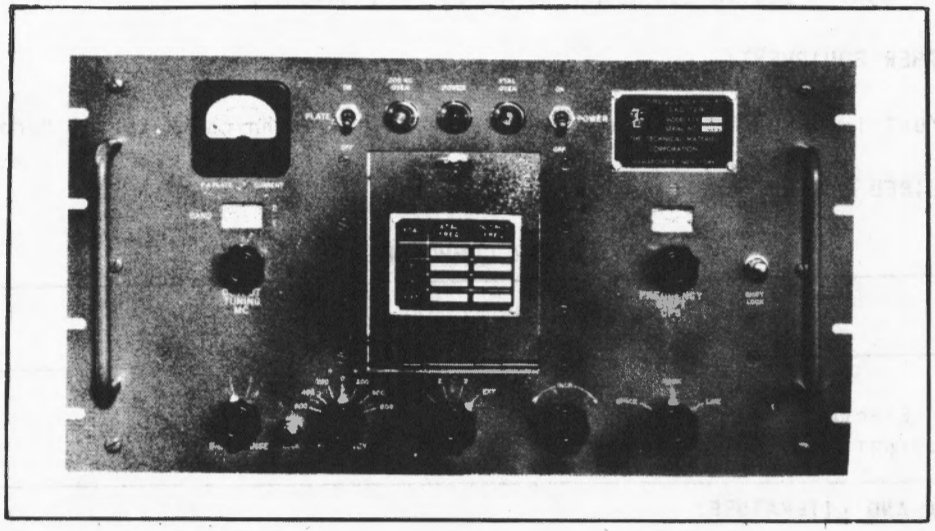
5 September 1962 | CONTROL, ELECTRICAL FREQUENCY C-2749/URT

Cog Service: | FSN: | Functional Class:

USA | USN | USAF

TYPE CLASS:

MANUFACTURER'S NAME/CODE NUMBER: The Technical Materiel Corporation.



Control, Electrical Frequency C-2749/URT

FUNCTIONAL DESCRIPTION:

The Control, Electrical Frequency C-2749/URT is a general-purpose, extremely stable frequency-shift exciter that is used with, but is not a part of AN/FRT-39. The frequency-shift from the center frequency is limited to 1000 cycles. The keying speed is 1000 words per minute. The keying bias is not greater than 10 percent at 1000 words per minute.

No field changes in effect at time of preparation (1 May 1961).

TECHNICAL CHARACTERISTICS:

TYPE OF INSTALLATION: Single unit, self-contained, fixed station.
TYPE OF FREQUENCY CONTROL: High frequency crystal oscillator 0.8 to 6.7 mc high stability 200 kc oscillator.
KEYING BIAS: No greater than 10% at 1,000 wpm.
MONITORING: 100 millivolts across 70 ohms coaxial connector.

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
The Technical Materiel Corp. Model XFK	Mamaroneck, N. Y.	NObsr-75685, 18 Jan 1959 NObsr-71790 NObsr-75916	$695.00

Radio-Auxiliary

October 1957

C-292,-292A,-292B/TRA-7 CONTROL UNIT

C-292B/TRA-7

(1) OD3
(1) 5R4WGY
(3) 6SJ7Y
(2) 6V6GTY
(4) 6Y6G
(1) 0C3
(1) 6H6
(2) 6SL7GT
(2) 6X5GT

Total Tubes: (17)

Units C-292/TRA-7, C-292A/TRA-7 and C-292B/TRA-7.

TYPE CLASSIFICATION
DESIGN COGNIZANCE TASSA
PROCUREMENT COGNIZANCE
STOCK NO.

REFERENCE DATA AND LITERATURE

TM11 - 262: Technical Manual for Control

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Control Unit C-292/TRA-7, C-292A/TRA-7, or C-292B/TRA-7	12-1/4 X 16-7/8 X 21-1/2	

C-3007/UG CONTROL, TELETYPEWRITER

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

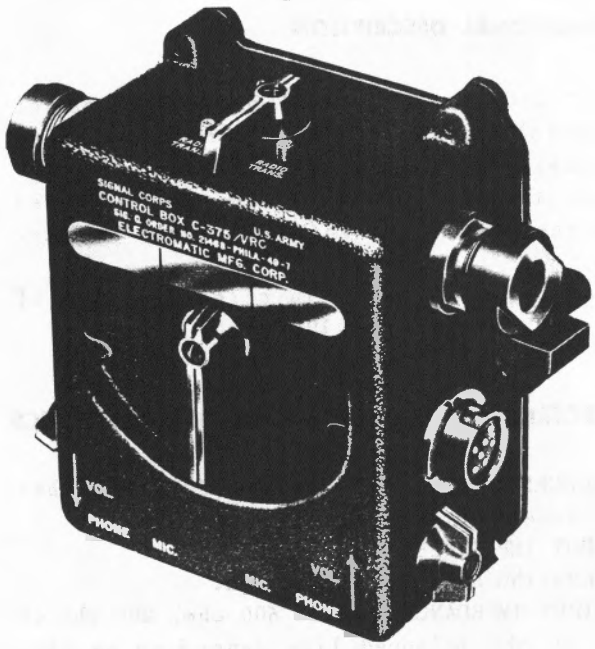
PROCURING SERVICE: DESIGN COG: USN, BuShips
SPEC &/OR DWG:

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
U.S. Naval Security Engineering Facility Dwg no. FSC-02227-67D	Washington, D. C.	NSEF-Task-Ma-59-25	

June 1961

Radio-Auxiliary

CONTROL BOX C-375/VRC



Control Box C-375/VRC

FUNCTIONAL DESCRIPTION

The C-375/VRC is designed to control interphone and two radio sets push-to-talk. Monitors either of two radio sets plus interphone, or both radio sets plus interphone.

No Field changes in effect at time of preparation (10 May 1960).

RELATION TO OTHER EQUIPMENT

The C-375/VRC is designed to be used with but not part of the AN/GRC-3( ) thru 8( ), AN/VRQ-1( ), AN/VRQ-2( ), and AN/VRQ-3.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

OPERATING POWER RQMT: 12 or 24 v dc storage battery.

MANUFACTURER'S OR CONTRACTOR'S DATA

Electromatic Mfg Co., New York, New York.
Sig C Order 21468-Phila-49-7.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes and/or Crystals used.

REFERENCE DATA AND LITERATURE

TM11-284
TO16-30GRC-3-6: Technical Manual for Radio Sets AN/GRC-3,-4,-5,-6,-7 and -8.
Nomenclature Card for Control Box C-375/VRC.

TYPE CLASSIFICATION	(NAVY)
DESIGN COGNIZANCE	TASSA
PROCUREMENT COGNIZANCE	271-3327 (ARMY)
STOCK NO.	
R.D.B. IDENT. NO.	

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Control Box C-375/VRC	0.1	4 x 7 x 7	3

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Control Box C-375/VRC	3-1/4 x 6-13/16 x 7	

C-388/CRC CONTROL UNIT

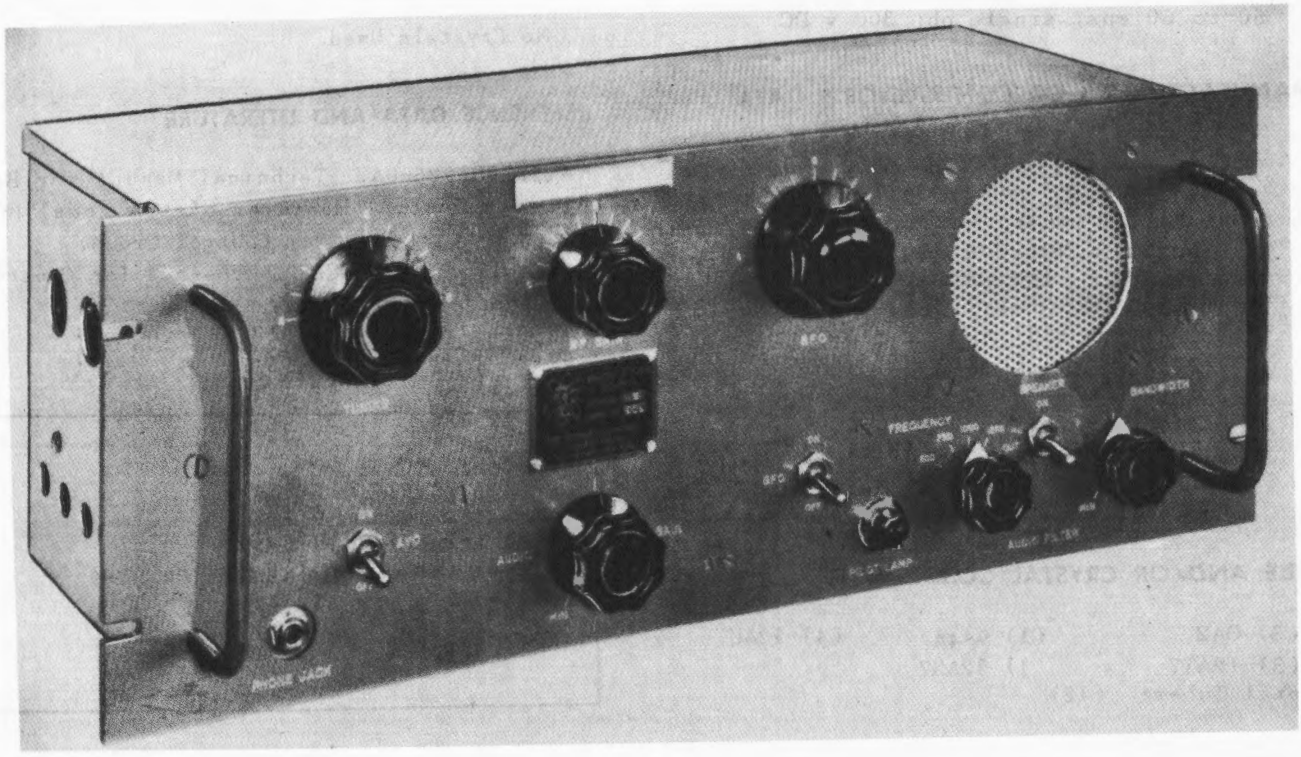
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Control Unit C-388/CRC	6 X 9 X 28	

Radio-Auxiliary

CONTROL RECEIVER

C-5028/FRA-501



Control Remote C-5028/FRA-501

FUNCTIONAL DESCRIPTION

The C-5028/FRA-501 is the equipment wherein the control tones are generated and controlled, and where the returning audio intelligence is amplified and monitored for operating purposes.

The control tones are generated within the C-5028/FRA-501 and center around a specified frequency. These tones are determined by highly stable frequency determining networks. Each tone is varied by a front panel control, marked for the function which it provides. Each of the three tones may be monitored for checking purposes by means of rear panel jacks. Toggle switches are provided on the front panel of this equipment to turn the BFO on/off; and the AVC on/off. In addition to the remoting features, a system of monitoring the returning audio intelligence is provided in the form of an audio gain potentiometer, and a selective filter network, the center frequency and bandwidth of which is controllable by the operator. A switch also enables the operator to cut out the loudspeaker, yet still permitting phone monitoring. A pilot lamp is provided on the front panel to insure the operator that the separate power supply (which may be separately located) is delivering power to the unit.

No field changes in effect at time of preparation (6 March 1959).

RELATION TO OTHER EQUIPMENT

The C-5028/FRA-501 is part of the AN/FRA-501. The C-5028/FRA-501 is designed to be used with but not part of AN/FRR-502. The C-5028/FRA-501 is similar to the C-5029/FRA-501, C-5030/FRA-501 and C-5031/FRA-501 except that it differs in the Control Frequencies.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

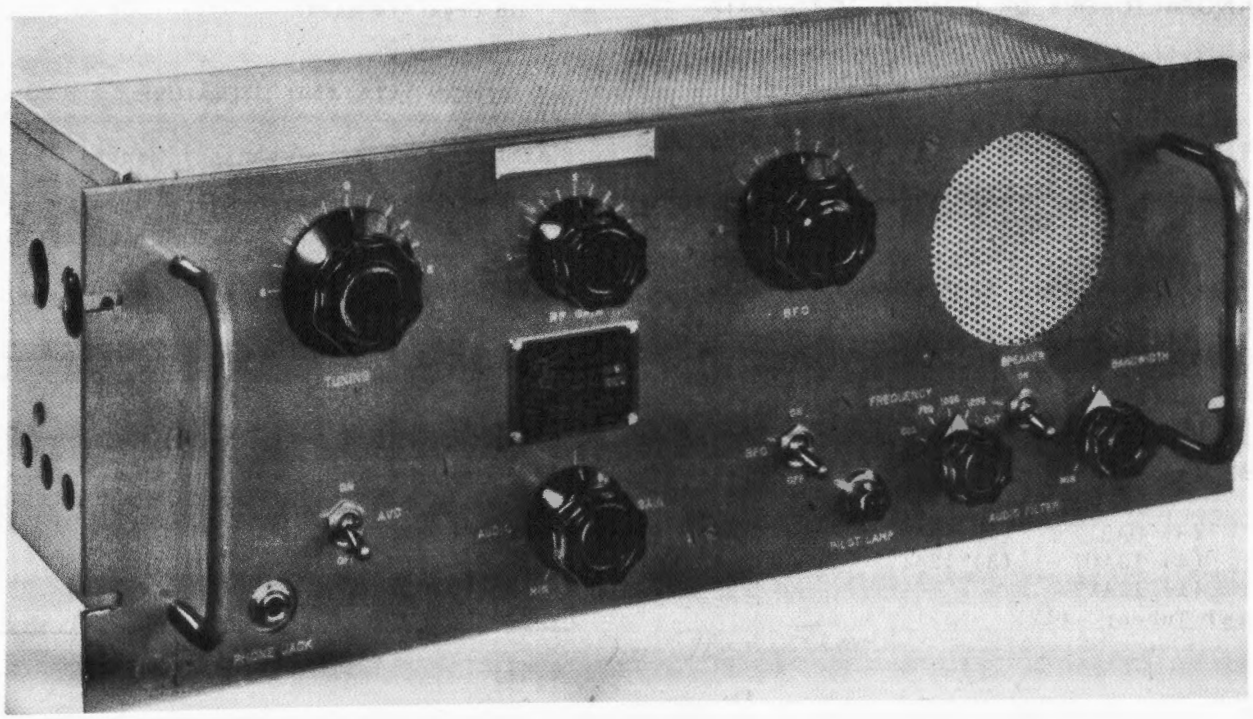
NUMBER OF AUDIO TONES: 3 tones.
TYPE OF CONTROL: Automatic.
CONTROL FREQUENCIES: 595, 1445, 2295 cps.
OPERATING POWER REQUIREMENT: 6.3 v AC, CT

April 1959

Radio-Auxiliary

CONTROL RECEIVER

C-5029/FRA-501



Control, Remote C-5029/FRA-501

FUNCTIONAL DESCRIPTION

The C-5029/FRA-501 is the equipment wherein the control tones are generated and controlled and where the returning audio intelligence is amplified and monitored for operating purposes.

The control tones are generated within the C-5029/FRA-501 and center around a specific frequency. These tones are determined by highly stable frequency determining networks. Each tone is varied by a front panel control marked for the function which it provides. Each of the three tones may be monitored for checking purposes by means of rear panel jacks. Toggle switches are provided on the front panel of this equipment to turn the BFO on/off, and the AVC on/off. In addition to the remoting features, a system of monitoring the returning audio intelligence is provided in the form of an audio gain potentiometer, and a selective filter network, the center frequency and bandwidth of which is controllable by the operator. A switch also enables the operator to cut-out the loudspeaker, yet still permitting phone monitoring. A pilot lamp is provided on the front panel to insure the operator that the separate power supply (which may be separately located) is delivering power to the unit.

No Field changes in effect at time of preparation (6 March 1959).

RELATION TO OTHER EQUIPMENT

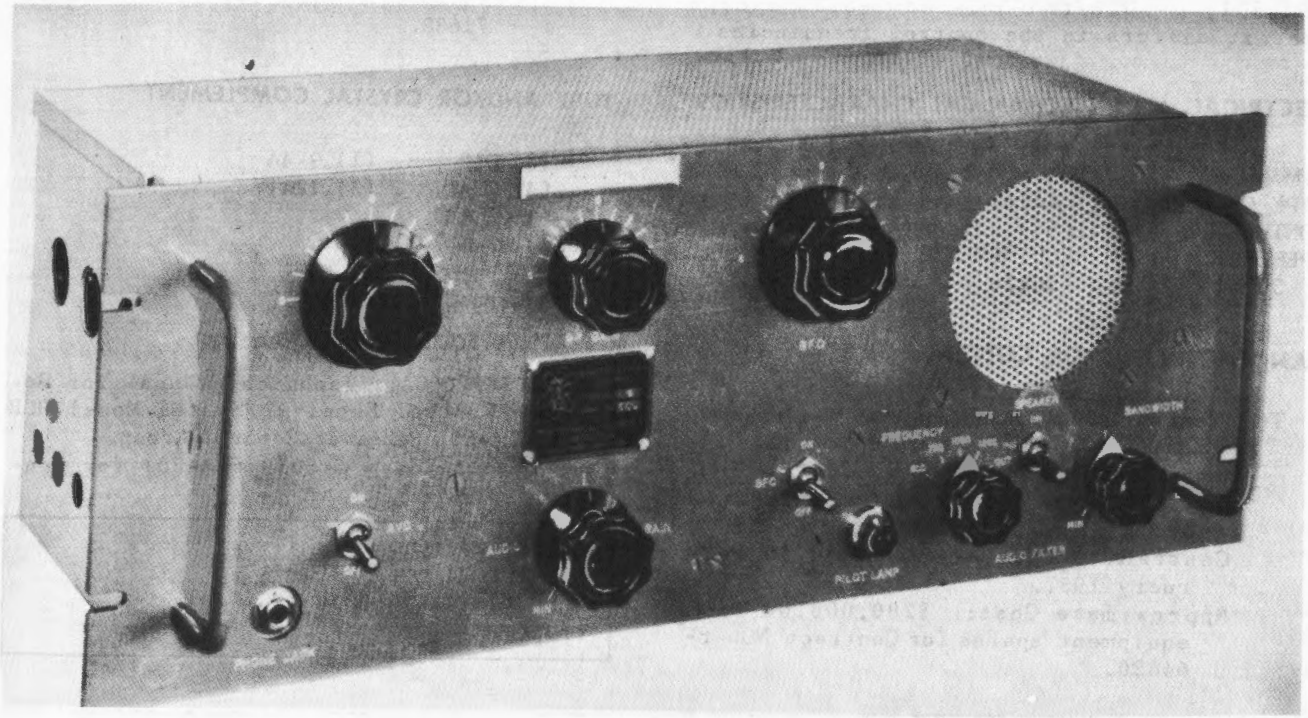
The C-5029/FRA-501 is part of AN/FRA-501. The C-5029/FRA-501 is designed to be used with but not part of the AN/FRR-502. The CV-5029/FRA-501 is similar to the CV-5028/FRA-501, CV-5030/FRA-501 and CV-5031/FRA-501 except that it differs in control frequencies.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

NUMBER OF AUDIO TONES: 3 audio tones.
TYPE OF CONTROL: Automatic control.
CONTROL FREQUENCIES: 765, 1615, 2465 cps.
OPERATING POWER REQUIREMENT: 6.3 v AC C.T., 50 to 60 cps, single ph; 300 v DC.

Radio-Auxiliary

CONTROL RECEIVER C-5030/FRA-501



Control, Remote C-5030/FRA-501

FUNCTIONAL DESCRIPTION

The C-5030/FRA-501 is the equipment wherein the control tones are generated and controlled, and where the returning audio intelligence is amplified and monitored for operating purposes.

The control tones are generated within the C-5030/FRA-501 and center around a specific frequency. These tones are determined by highly stable frequency determining networks. Each tone is varied by a front panel control, marked for the function which it provides. Each of the three tones may be monitored for checking purposes by means of rear panel jacks. Toggle switches are provided on the front panel of this equipment to turn the BFO on/off, and the AVC on/off. In addition to the remoting features, a system of monitoring the returning audio intelligence is provided in the form of an audio gain potentiometer, and a selective filter network, the center frequency and bandwidth of which is controllable by the operator. A switch also enables the operator to cut out the loudspeaker, yet still permitting phone monitoring. A pilot lamp is provided on the front panel to insure the operator that the separate power supply (which may be separately located) is delivering power to the unit.

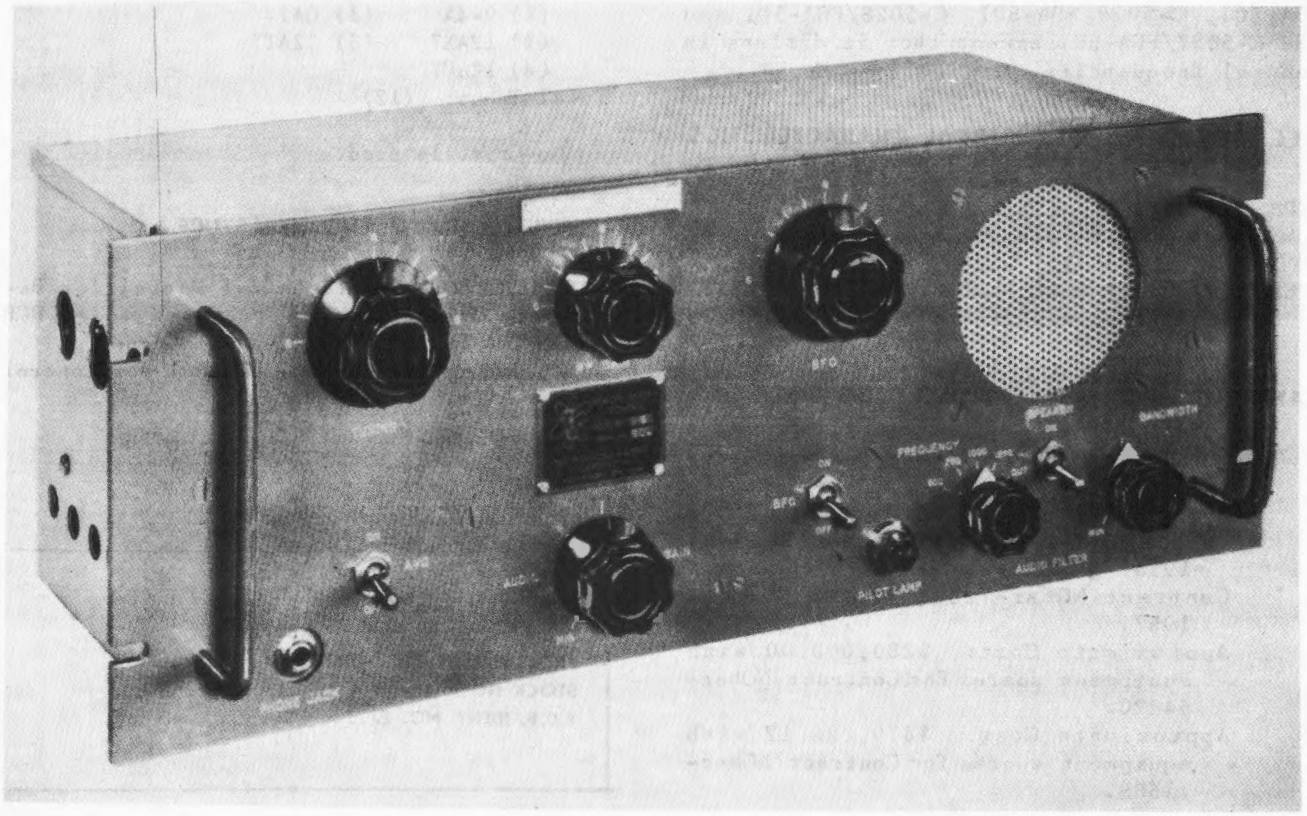
No field changes in effect at time of preparation (6 March 1959).

RELATION TO OTHER EQUIPMENT

The C-5030/FRA-501 is part of the AN/FRA-501. The C-5030/FRA-501 is designed to be used with but not part of the AN/FRR-502. The

Radio-Auxiliary

CONTROL RECEIVER C-5031/FRA-501



Control, Remote C-5031/FRA-501

FUNCTIONAL DESCRIPTION

The C-5031/FRA-501 is the equipment wherein the control tones are generated and controlled, and where the returning audio intelligence is amplified and monitored for operating purposes.

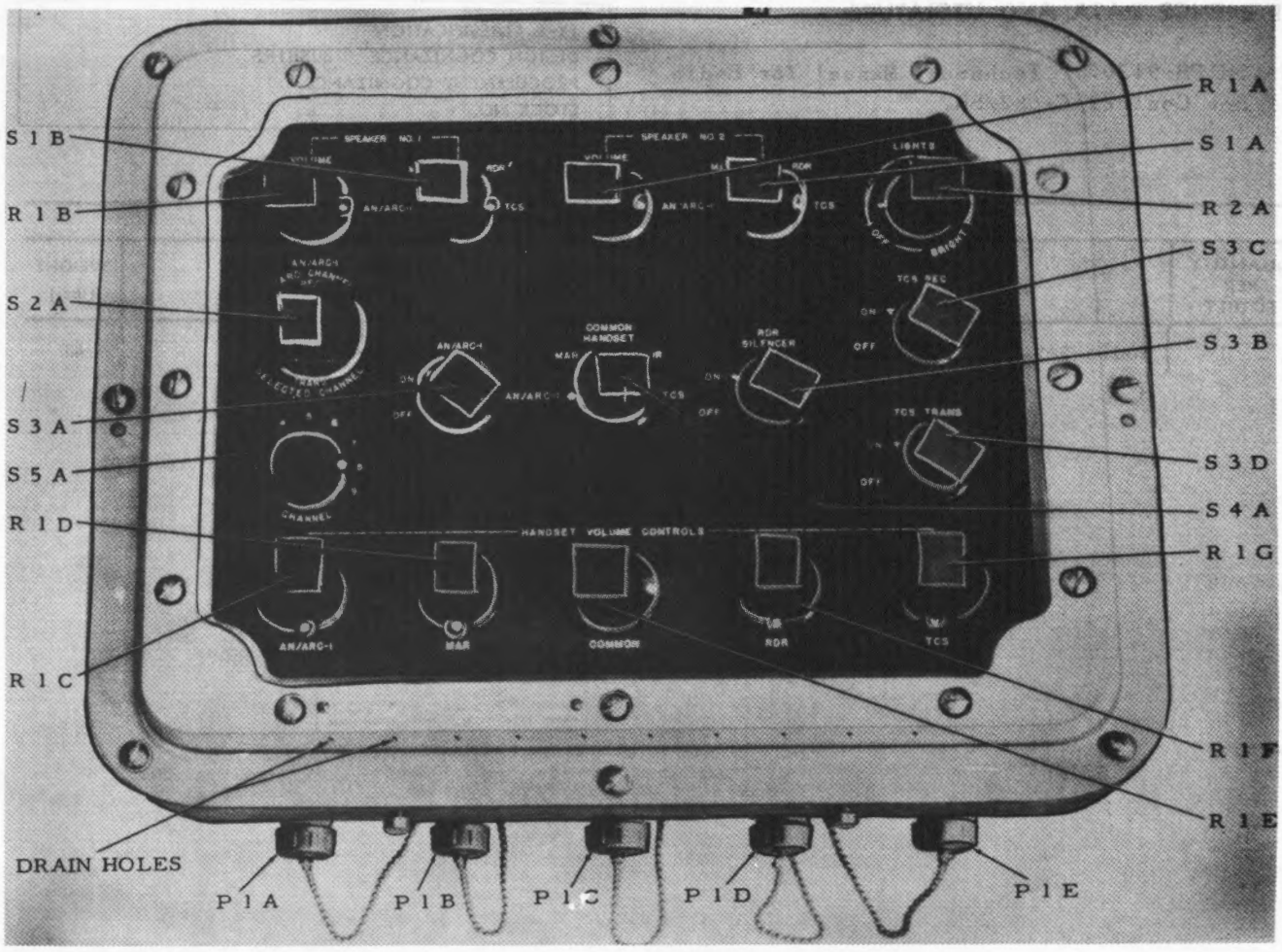
The control tones are generated within the C-5031/FRA-501 and center around a specific frequency. These tones are determined by highly stable frequency determining networks. Each tone is varied by a front panel control, marked for the function which it provides. Each of the three tones may be monitored for checking purposes by means of rear panel jacks. Toggle switches are provided on the front panel of this equipment to turn the BFO on/off, and the AVC on/off. In addition to the remoting features, a system of monitoring the returning audio intelligence is provided in the form of an audio gain potentiometer, and a selective filter network, the center frequency and bandwidth of which is controllable by the operator. A switch also enables the operator to cut out the loudspeaker, yet still permitting phone monitoring. A pilot lamp is provided on the front panel to insure the operator that the separate power supply (which may be separately located) is delivering power to the unit.

No field changes in effect at time of preparation (9 March 1959).

RELATION TO OTHER EQUIPMENT

The C-5031/FRA-501 is part of the AN/FRA-501. The C-5031/FRA-501 is designed to be

RADIO SET CONTROL C-682/SR



Radio Set Control C-682/SR

FUNCTIONAL DESCRIPTION

The C-682/SR is a panel, designed for centralized control of Radio Sets AN/ARC-1, MAR, RDR and TCS and loudspeakers and handsets. The audio output circuits of four Radio Sets, AN/ARC-1, MAR, RDR and TCS are permanently connected to the radio set control. Selector switches are provided on the front panel so that the output of any one of the four radio sets may be connected to either one or both of the two loudspeakers. Individual volume controls are provided for each loudspeaker. To provide for two way communication, where applicable, the audio circuits of the four radio sets may be connected to handsets. The handsets are not permanently connected to the panel but may be plugged into any one of the five connectors mounted on the housing of the panel. Four of these connectors are permanently connected to each of the four radio sets and the fifth connector is common to any one of the four radio sets by means of a switch.

No field changes in effect at time of preparation (31 October 1956).

MANUFACTURER'S OR CONTRACTOR'S DATA

Bendix Aviation Corporation, Friez Instrument Division, Baltimore, Maryland.
Contract NObs 47842, dated 18 May 1949.

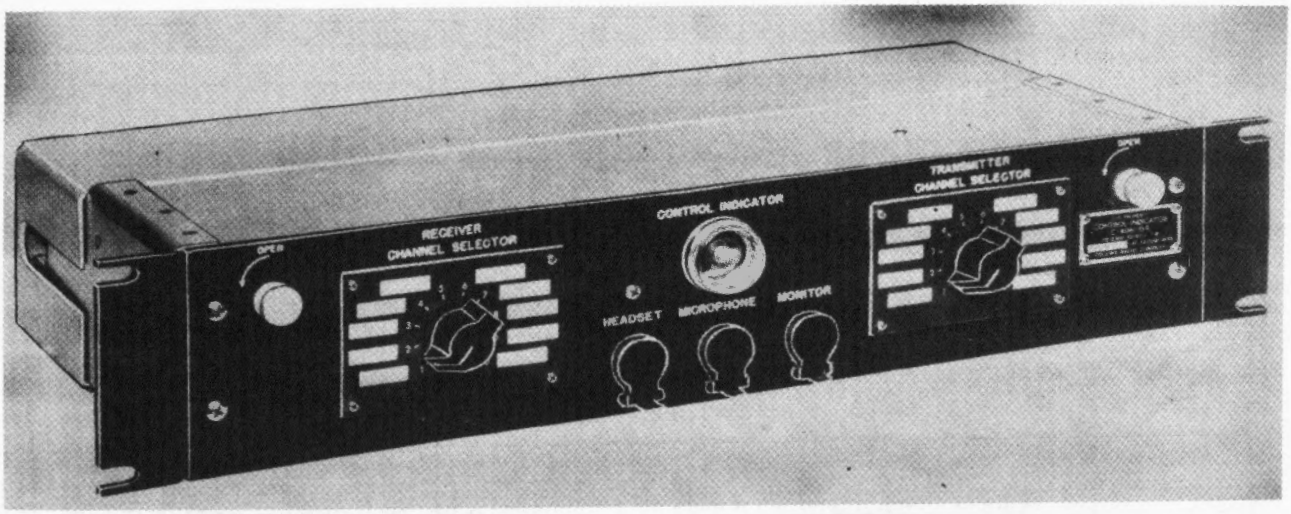
TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes.

December 1956

CONTROL INDICATOR

C-806/GR



Control-Indicator C-806/GR

FUNCTIONAL DESCRIPTION

The C-806/GR selects any one of ten preset channels from one Radio Receiver R-278/GR and one Radio Transmitter T-217/GR and indicates when any of a number of transmitters are being modulated. Emergency modulation of a single receiver and reception from a single transmitter are available from jacks. These functions are available over 5 miles of field wire or commercial telephone lines.

No field changes in effect at time of preparation (9 July 1956).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

POWER SOURCE: 115 or 230 v, 50 to 60 cps single ph.
QUANTITY OF CONTROLLED CHANNELS: 10.

MANUFACTURER'S OR CONTRACTOR'S DATA

Collins Radio Co., Cedar Rapids, Iowa.
Contract AF-33(038)-6135 Undated.
Approximate Cost: $230.00 with equipment spares.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) 12AU7	(1) 6X4-W
(1) 6AL5W	(1) 991

Total Tubes: (4)

REFERENCE DATA AND LITERATURE

T.O. No. 16-35C806-4: Illustrated Parts Breakdown-Control Indicator C-806/GR; Nomenclature Card for C-806/GR and ( ).

TYPE CLASSIFICATION
DESIGN COGNIZANCE USAF
PROCUREMENT COGNIZANCE EXHIBIT WLENG-234-A
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Control Indicator-C-806/GR	3-15/32 X 8 X 19	12

Radio-Auxiliary

C-975/URR RECEIVER CONTROL

TUBE AND/OR CRYSTAL COMPLEMENT

(6) 6BJ6
(9) 6BH6
(6) 12AU7
(2) 6AK5W
(2) 6C4
(1) 12AX7
(2) 2D21W
(1) 3A4
(1) 6J4
(2) 5651
(2) 26Z5W
(1) 6082

Total Tubes: (35)

REFERENCE DATA AND LITERATURE

TM11-5080: Technical Manual for Receiver Control C-975/URR.

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	TASSA
PROCUREMENT COGNIZANCE	
STOCK NO.	

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Receiver Control C-975/URR	12.4	21 x 32 x 32	120

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Receiver Control C-975/URR	8-3/4 x 16-1/2 x 19	48
1	Power Cable Assembly CX-1358/U	96	
2	Cord CG-409C/U	53	
2	Electrical Special Purpose Cable Assembly CX-2753/U		
2	Manuals		
1	Set of Running Spares		

CA-1402 CARRIER MODULATOR DRIVER

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Carrier Modulator Driver Type CA-1402	2	10-5/8 x 14-1/2 x 22-5/16	47

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Carrier Modulator Driver Type CA-1402	8-23/32 x 9-7/8 x 19	29.5

June 1961

Radio-Auxiliary

STROBOSCOPE

CAG-1531-A

Stroboscope Type CAG-1531-A

FUNCTIONAL DESCRIPTION

The CAG-1531-A is a small, compact, short flash, high accuracy electrical tachometer. It has a white light with a flashing range from 60 to 25,000 revolutions per minute (rpm).

No field changes in effect at time of preparation (10 November 1960).

RELATIONS TO OTHER EQUIPMENT

The Stroboscope 1531-A is designed to replace General Radio's Model 631-BL Stroboscope.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FLASH DURATION: 10 to 40 microseconds.
PEAK LIGHT: 0.02 to 0.03 megacandle power.

ACCURACY: Porm 1% of scale reading.
RANGE: 60 to 25,000 rpm.
POWER INPUT: 35 W max.
OPERATING POWER RQMT: 105 to 125 v ac, 60 cps, single ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

General Radio Company, Cambridge, Mass.
Type 1531-A.
Approximate cost $170.00 with equipment spares.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) 631-P1
(1) 6N7GT/G
(1) 6X5GT/G

Total Tubes: (3)

No Crystals used.

REFERENCE DATA AND LITERATURE

No. 03704-F: General Radio Co. Catalog "P" for Stroboscope Type CAG-1531-A.

NAVSHIPS 93400: Preliminary Data Form for Stroboscope Type CAG-1531-A.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE NAVY BUSHIPS
PROCUREMENT COGNIZANCE COMMERCIAL
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Stroboscope Type CAG-1531-A	7-5/8 x 9 x 10	9-1/2

CAOV-23A 1 KW AMPLIFIER

POWER OUTPUT: 1000 W nom carrier, plus 320 W sideband during modulation.
DRIVING POWER REQUIRED: 100 W.
INPUT FREQUENCY RANGE: 225 to 400 mc.
IMPEDANCE
DRIVING INPUT: 52 ohms.
RF OUTPUT: 52 ohms.
SPURIOUS SIGNAL RADIATION: At least 60 db below nom modulated carrier power level.
AUDIO DISTORTION: Not more than 3% of modulated power output.
FIDELITY (MODULATED OUTPUT): Flat to within 1.5 db of 1000 cps reference level from 200 to 20000 cps.
AUDIO INPUT DATA
SIGNAL REQUIRED: 5 v rms for 80% modulation.
CIRCUIT IMPEDANCE: 500 ohms.
POWER REQUIREMENTS: 208 v, 60 cps, 3 ph, 4-wire system, 8.3 kva at 95% pf.

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

(1) RF Excitation Source; (1) Audio Source; (1) Suitable Antenna with Transmission Lines.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	1 KW Amplifier CAOV-23A		42-3/4 x 46 x 4-1/2	1400
	includes:			
2	Technical Manual NAVSHIPS 93066(A)			

REFERENCE DATA AND LITERATURE:

NAVSHIPS 93066(A): Technical Manual for 1 KW Amplifier Model 23A.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (1) 0A2 (10) 3B28 (3) 5U4G (1) 6AL5 (2) 6AU6 (1) 12AU7 (2) 4-1000A (1) GL-6182

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1		1600

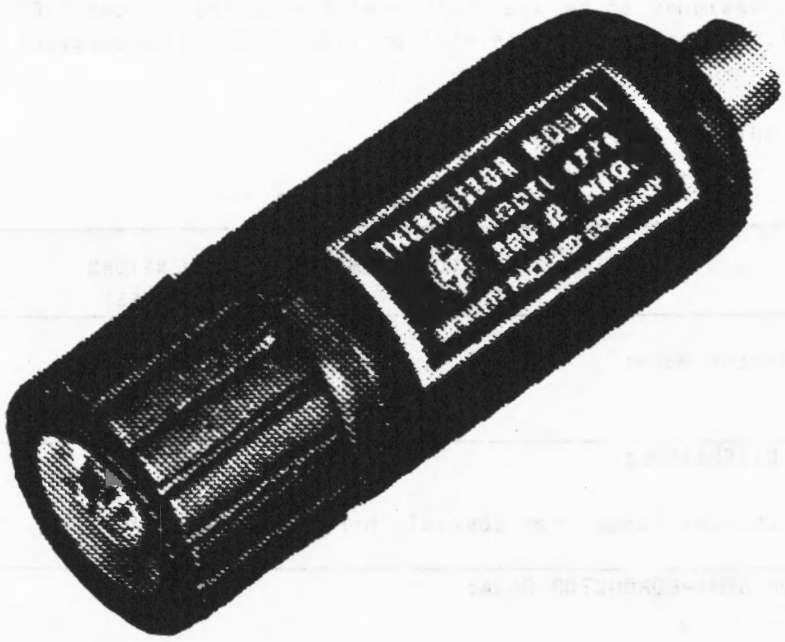
23 August 1962 COAXIAL THERMISTOR MOUNT CAQI-477B

Cog Service: FSN: Functional Class:

USA USN USAF

TYPE CLASS:

MANUFACTURER'S NAME/CODE NUMBER: Hewlett-Packard Company.



Coaxial Thermistor Mount CAQI-477B

FUNCTIONAL DESCRIPTION:

The Coaxial Thermistor CAQI-477B is designed to provide accurate, efficient power measurements over the three (3)-decade frequency range from 10 megacycle (MC) to 10 kilomegacycle (KMC). It is fixed tuned, requiring no adjustments during use. The long time-constants of its thermistor elements make possible accurate power measurements even for low duty cycle pulses. The instrument is not susceptible to burn-out even at power levels.

No field changes in effect at time of preparation (26 May 1961).

TECHNICAL CHARACTERISTICS:

TYPE OF TUNING: Fixed-tuned.
FREQUENCY RANGE: 10 mc to 10 kmc.
SWR: Less than 1.5 full frequency range (Less than 1.3 M50 mc to 5 kmc).
POWER RANGE: 0.01 to 10 mw.

COAXIAL THERMISTOR MOUNT CAQI-477B

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Hewlett-Packard Company Model no. 477B	Palo Alto, California	NObsr-85049, 31 August 1960	$75.00
		NObsr-71626, 21 September 1956	$75.00

CAXE-1030-2 POWER SUPPLY

RELATION TO OTHER EQUIPMENT:

The Power Supply CAXE-1030-2 is designed to be used with, but not part of, Radar Set AN/SPA-13.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
*	Power Supply CAXE-1030-2		13 x 14 x 19	70

REFERENCE DATA AND LITERATURE:

Beta Electric Corporation Catalog ES0 Copy #04171-F for Power Supply Model CAXE-1030-2.
NAVSHIPS 93400: Preliminary Data Form for Power Supply CAXE-1030-2.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: Data not available.

CRYSTALS: Data not available.

SEMI-CONDUCTORS: Data not available.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: DESIGN COG: Navy, BuShips
SPEC &/OR DWG: Commercial

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Beta Electric, Div., Sorenson and Co., Inc. Model no. 1030-2	South Norwalk, Conn.		

CBD-RD-2321-00 OSCILLOGRAPH

FREQUENCY RESPONSE: DC to 100 cps.
MAXIMUM AMPLITUDE: 40 lines to 40 cps, 20 lines to 70 cps, 10 lines to 100 cps.
CHART SPEEDS: 5, 25, and 125 mm/sec.
TRACE WIDTH
INK MEDIUM LINE: 0.015 inch nominal.
INK FINE LINE: 0.010 inch nominal.
DC RESISTANCE OF PENMOTOR: 1400 ohms.
CHART PAPER DRIFT: Less that 1/3 mm.
CHART SPEED REGULATION: Synchronous motor direct drive.
CHART PAPER WIDTH: 3.5 inches.
OPERATING POWER RQMT: 105 to 125 v ac, 60 cps, single ph, 40 W.

RELATION TO OTHER EQUIPMENT:

The Oscillograph CBD-RD-2321-00 is designed to be used with Brush Chart Paper and Brush RD series amplifiers.
Oscillograph CBD-RD-2321-00 supersedes Brush Model BL-202.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Oscillograph CBD-RD-2321-00		6-1/2 x 6-7/8 x 14-7/8	25

REFERENCE DATA AND LITERATURE:

NAVSHIPS 93400: Preliminary Data Form for Oscillograph CBD-RD-2321-00.
Brush Electronics Company Catalog ES0 Copy no. 1458-F for Oscillograph Model RD-2321-00.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (1) 5Y3WGTB

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	0.3	30

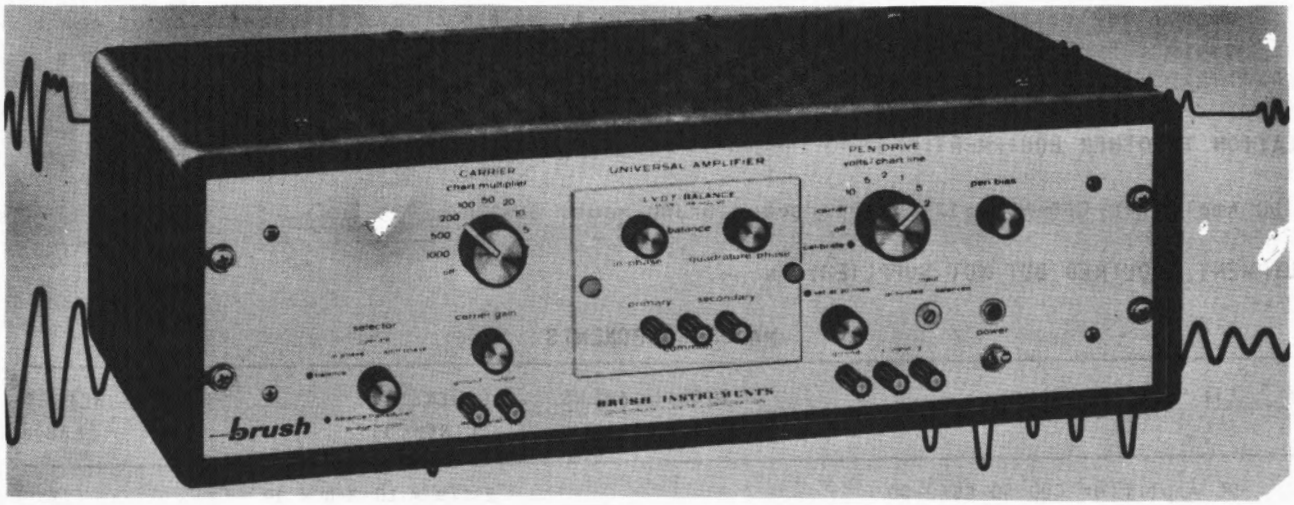
PROCUREMENT DATA

PROCURING SERVICE:
SPEC &/OR DWG: Commercial
DESIGN COGNIZANCE: USN, BuShips

Cog Service:	FSN:		Functional Class:
	USA	USN	USAF

TYPE CLASS:

MANUFACTURER'S NAME/CODE NUMBER: Brush Electronics Co., Division of Clevite Corp.



DC Amplifier CBD-RD-5612-00

FUNCTIONAL DESCRIPTION:

DC Amplifier CBD-RD-5612-00 is designed for strain recording applications using resistance gauges. May be used as medium gain amplifier.

No field changes in effect at time of preparation (26 June 1961).

TECHNICAL CHARACTERISTICS:

TYPE OF INSTALLATION: Portable.
NUMBER OF CHANNELS: 2 channels.
CARRIER AMPLIFIER SENSITIVITY
WITH BRUSH OSCILLOGRAPH: 1 micro inch/inch = 1 chart line (MM) pen deflection.
FREQUENCY RESPONSE: DC to 100 cps.
BRIDGE EXCITER FREQUENCY: 2000 cps.
BRIDGE EXCITER VOLTAGE: 3 v max (120 ohm load).
CHART MULTIPLIER STEP: 1 to 1000 in 1, 2, 5, 10 series.

PROCUREMENT DATA

PROCURING SERVICE: DESIGN COG: Navy, BuShips
SPEC &/OR DWG: Commercial

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Brush Electronics Co., Division of Clevite Corp. Model RD-5612-00	Arlington, Va.		

CCAP-RT-8 STANDARD RATIO TRANSFORMER

TERMINAL LINEARITY: 0.001%.
MAXIMUM EFFECTIVE IMPEDANCE
RS: 3 ohms.
LS: 350 uh.
INDUCTANCE: 500 henries.
MAX INPUT VOLTAGE (ERMS): 2.5 f (f in cps) max 350 v above 140 cps.

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Standard Ratio Transformer Model RT-8		8 x 9-1/4 x 17	40

REFERENCE DATA AND LITERATURE:

Gertsch Products Incorporated Catalog no. 6 ESO Copy no. 10534-F for Standard Ratio Transformer Model CCAP-RT-8.
NAVSHIPS 93400: Preliminary Data Form for Standard Ratio Transformer CCAP-RT-8.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: None used.

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: DESIGN COG: Navy BuShips
SPEC &/OR DWG: Commercial

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Gertsch Products Inc. Model no. RT-8	Los Angeles, California		

CCAP-ST-100 BRIDGE TRANSFORMER

LOW SIDE: 120 ohms.
HIGH SIDE: 3000 ohms.
INSULATION: 500 v test.
FREQUENCY RANGE: 20 to 5,000 cps.
OPERATING POWER RQMT: 115 v ac, 60 cps, single ph.

RELATION TO OTHER EQUIPMENT:

The CCAP-ST-100 is designed to be used with, but not part of, the Gertsch Standard Ratio Transformers.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Bridge Transformer ST-100		3-11/16 x 4-5/16 x 4-7/8	

REFERENCE DATA AND LITERATURE:

Gertsch Products Incorporated Catalog #6. ESO's Copy no. 10534-F for Bridge Transformer CCAP-ST-100.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: None used.

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE:
SPEC &/OR DWG: Commercial
DESIGN COG: Navy BuShips

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Gertsch Products, Inc. Model ST-100	Los Angeles, California		

CCAQ-32-0 ATTENUATOR

ACCURACY OF ATTENUATION: Within 0.1 db/db to 500 mc, better accuracy at lower frequency.
TYPE OF CONNECTORS: Type BNC-UG-185/U.

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Attenuator Model 32-0		2-1/8 x 2-1/4 x 11-1/2	4

REFERENCE DATA AND LITERATURE:

Commercial Catalog of Kay Electric Company for Attenuator Model 32-0.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: None used.

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: DESIGN COG: Commercial
SPEC &/OR DWG:

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Kay Electric Company Model no. 32-0	Pine Brook, New Jersey		$95.00

CDN-H693 ATTENUATOR

TYPE OF WINDING: Mica Card type, non-inductive.
IMPEDANCE: 600 ohms.
OPERATING FREQUENCY RANGE: 0 to 50 kc.

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Attenuator H693 *Impedance Matching Plug-in-Pads Note: *Input and output impedance matching devices for matching base impedance of network to impedances of source and load.		5 x 6 x 11-1/2	

REFERENCE DATA AND LITERATURE:

The Daven Company Commercial Catalog for Attenuator Model H693.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: None used.

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: DESIGN COG: Commercial
SPEC &/OR DWG:

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
The Daven Company Model H693	Newark, N. J.		

CDN-T-690-A ATTENUATOR

ATTENUATION: 0 to 110 db in 1 db step.
IMPEDANCE: 500 ohms.
OPERATING FREQUENCY: 0 to 50 kc.

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Attenuator T-690-A		5 x 5 x 10	4
*1	Impedance Matching Plug-IN-Pads			

Note: *Input and output impedance matching devices for matching base impedance of network to impedance of source and load.

REFERENCE DATA AND LITERATURE:

The Daven Company Catalog for Attenuators Model T-690-A.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: None used.

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE:
SPEC &/OR DWG:

DESIGN COG: Commercial

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
The Daven Company Model no. CDN-T-690-A	Newark, N. J.		

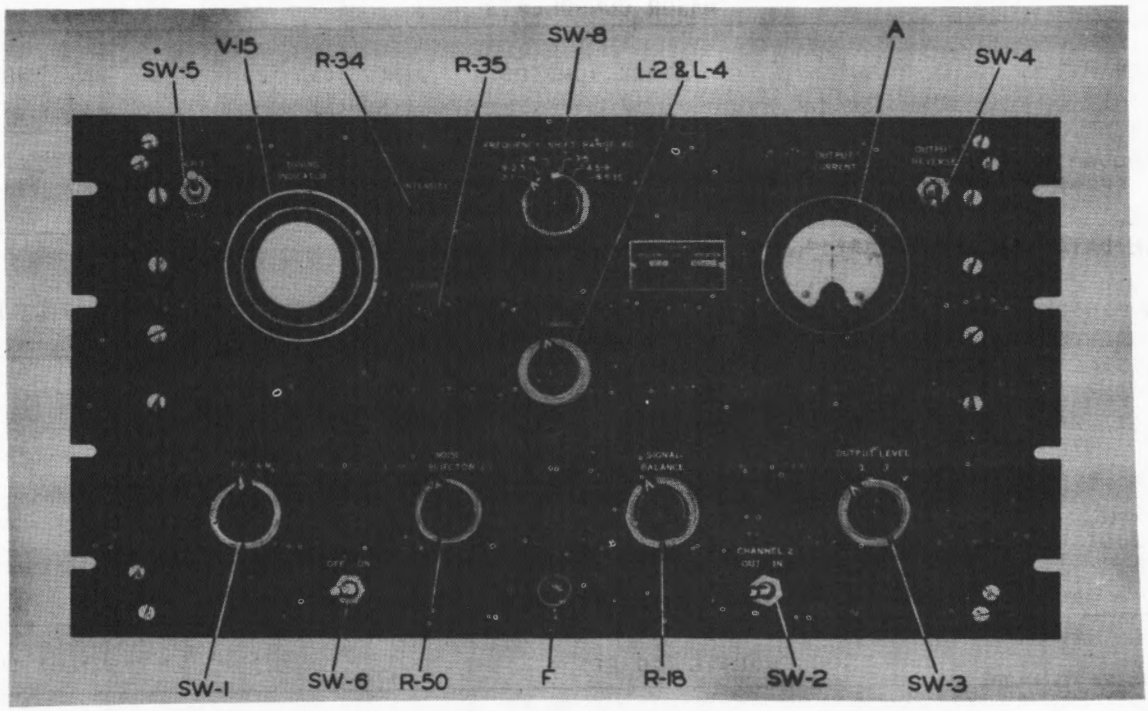
13 July 1962 FREQUENCY SHIFT CONVERTER CHO-5-C, SERIES B

Cog Service: USN FSN: Functional Class:

USA USN USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: H. O. Boehm Incorporated, (07835).



Frequency Shift Converter CHO-5-C, Series B

FUNCTIONAL DESCRIPTION:

Frequency Shift Converter CHO-5-C, Series B is designed to combine and convert the output of two diversity receivers into polar or neutral keyed dc. The input may be either frequency shift or make-break signals. The output can be used either directly or through relays to drive teletypewriters, ink recorders, or transmitters.

No field changes in effect at time of preparation (6 March 1962).

TECHNICAL CHARACTERISTICS:

POWER REQUIREMENTS: 150 W approx, 115 v porm 10%, 60 cyc, single ph.

INPUT IMPEDANCE: 500 or 5,000 ohms.

INPUT SIGNAL LEVEL: M15 db to P20 db (0 db being 6 mw).

INPUT FREQUENCIES: 500 to 5,000 cyc on make-break keying, 200 to 15,000 cyc spread on frequency shift keying.

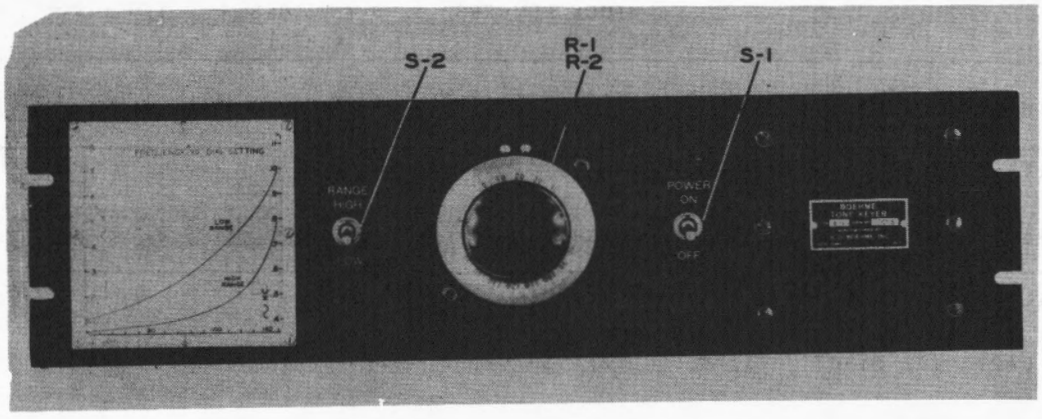
13 July 1962 TONE KEYER CHO-6-E, SERIES B

Cog Service: USN FSN: 5820-646-4796 W/S Functional Class:

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: H.O. Boehme Incorporated, (07835).



Tone Keyer CHO-6-E, Series B

FUNCTIONAL DESCRIPTION:

Tone Keyer CHO-6-E, Series B is a device which accepts polar or neutral square wave dc pulses at its input terminals and produces similar pulses of keyed tone suitable for long line transmission. It is designed primarily for use with any Boehme signal converter but is readily adaptable for use with many other control sources.

No field changes in effect at time of preparation (7 March 1962).

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 500 to 5,000 cyc.
HARMONIC CONTENT: Approx. 4% total.
OUTPUT LEVEL: P4 db, 6 mw reference.
FREQUENCY STABILITY: Porm 0.1% as line voltage varies porm 10%.
AMPLITUDE STABILITY: Porm 0.2 db as line voltage varies porm 10%.

28 August 1962 COMPARATOR, SIGNAL CM-167/U

Cog Service: FSN: 5820-776-5941 Functional Class:

USA USN USAF

TYPE CLASS:

MANUFACTURER'S NAME/CODE NUMBER: Freedman & Freedman.

(No Illustration Available)

FUNCTIONAL DESCRIPTION:

The Comparator, Signal CM-167/U is an instrument which when used with a RD-49A/U recorder will continuously record the frequency difference between two (2) frequency standards.

No field changes in effect at time of preparation (3 May 1961).

TECHNICAL CHARACTERISTICS:

TYPE OF INDICATOR: RD-49A/U.
LEVEL OF CONTROL: Two level controls to adjust levels of the two signals being compared.
PHASE SHIFT DATA
ONE: 1 push-button to shift phase 100 kc.
TWO: 1 push-button to shift phase 1 mc.
IMPEDANCE: 5000 ohms max input.
FREQUENCY RANGE: 100 kc to 1 mc.
OPERATING POWER RQMT: None required.

RELATION TO OTHER EQUIPMENT:

The CM-167/U is designed to be used with, but not part of, RD-49A/U Recorder-Milliammeter.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Comparator, Signal CM-167/U		3-1/2 x 3-5/8 x 6-5/8	

REFERENCE DATA AND LITERATURE:

Nomenclature Card for Comparator, Signal CM-167/U.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: Data not available.

CRYSTALS: Data not available.

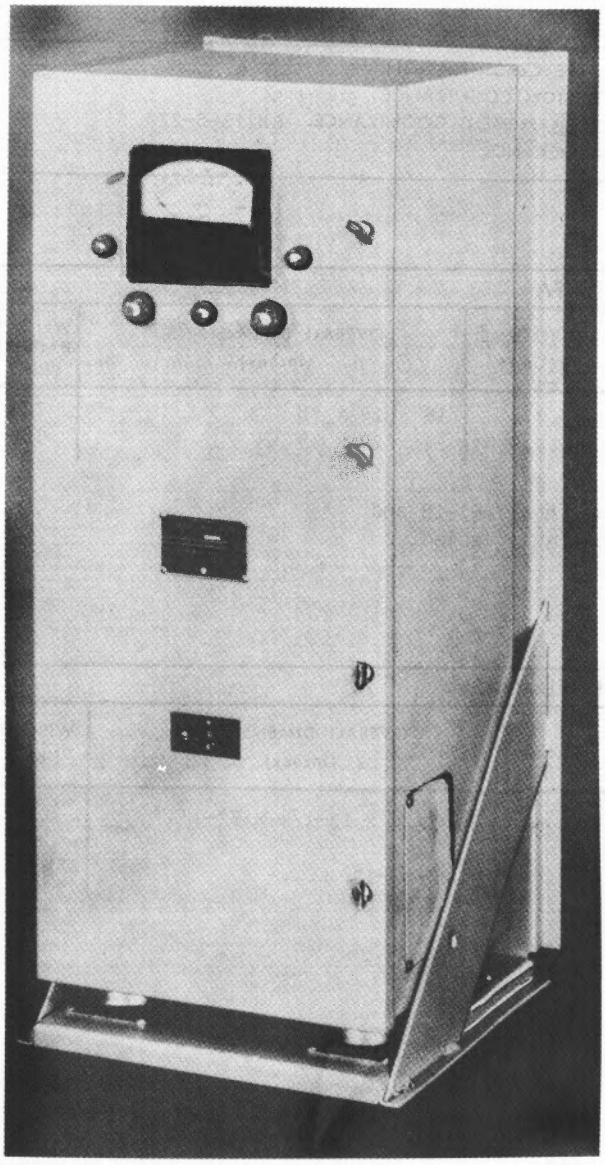
SEMI-CONDUCTORS: Data not available.

December 1956

VOLTAGE REGULATOR

Radio-Auxiliary

CN-154/U



Voltage Regulator CN-154/U

FUNCTIONAL DESCRIPTION

The CN-154/U is a general purpose electro-mechanical unit designed to answer the need for a highly efficient method of automatically regulating fluctuating AC lines to maintain a constant output voltage regardless of line or load changes. It provides a constant output of 117 v AC single phase at 4 kva with inputs ranging from 100 to 135 v at any frequency from 45 to 65 cps.

Data on this sheet reflects the following field changes, 1 thru 4 (10 July 1956).

RELATION TO OTHER EQUIPMENT

Similar to CN-154A/U except that in the CN-154A/U an aluminum cabinet is used instead of steel and no mounting plate is included with the CN-154A/U.

Equipment Required but not Supplied: Connecting Cables as required.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

POWER SOURCE REQUIRED: 100 to 135 vy 60 cps single ph, 40 amp max at full load.
OUTPUT RANGE: 110 to 120 v, ±1%, 60 cps, single ph, 4 kva max.
HEAT DISSIPATION
1/4 LOAD: 23.5 W.
1/2 LOAD: 25 W.
FULL LOAD: 25 W.

MANUFACTURER'S OR CONTRACTOR'S DATA

Sangamo Electric Co., Springfield, Illinois
Contract NObsr 43419, dated 22 June 1949.
Contract NObsr 52043, dated 19 October 1950.
Contract NObsr 52018, dated 2 October 1950.
Contract NObsr 52339, dated 22 March 1951.
Contract NObsr 52186, dated 26 December 1950.
Contract NObsr 64056, dated 20 October 1953.
Contract NObsr 52509, dated 8 June 1951.
Approximate Cost: $570.00 with equip-spares.

TUBE AND/OR CRYSTAL COMPLEMENT

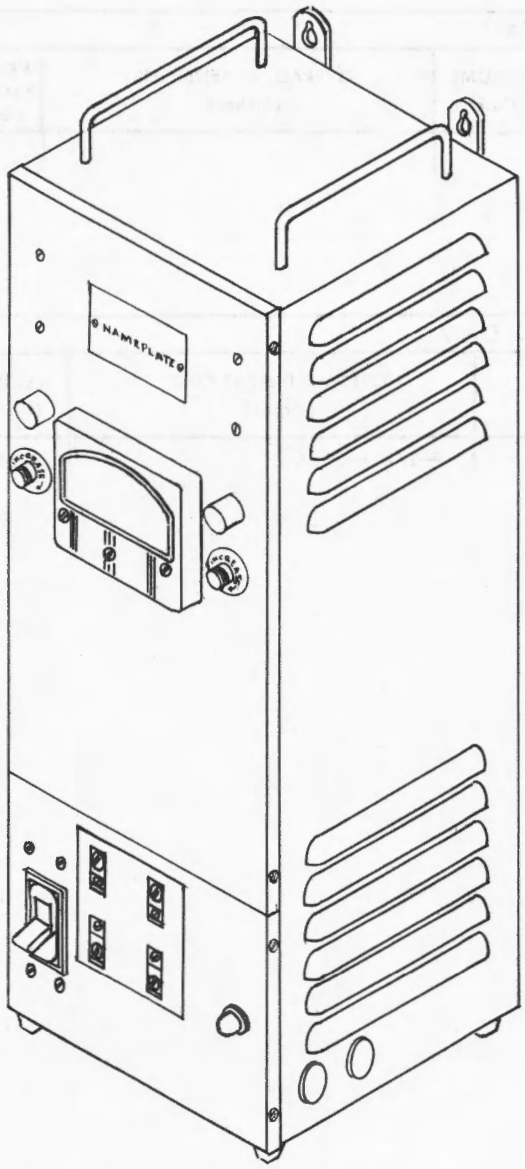
(2) 2D21
Total Tubes: (2)

(2) IN34
Total Crystals: (2)

September 1960

Radio-Auxiliary

VOLTAGE REGULATOR CN-186/U



Voltage Regulator CN-186/U

FUNCTIONAL DESCRIPTION

Voltage Regulator CN-186/U is an AC line voltage regulator designed to maintain an output voltage of 115 v rms ±1% over an input voltage range of 95-135 v, 50 or 60 cy at a maximum output line current of 52 amp.

No field changes in effect at time of preparation (5 February 1960).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

INPUT VOLTAGE: 95 to 135 v, 50 to 60 cy, single ph, 52 amp (max).
ADJUSTABLE OUTPUT VOLTAGE: 110 to 120 v.
MAXIMUM CAPACITY: 6 kva.
EFFICIENCY: 98%.

MANUFACTURER'S OR CONTRACTOR'S DATA

The Superior Electric Co., Bristol, Conn.
Type No. EM-4106.
Contract NObsr-71517.

TUBE AND/OR CRYSTAL COMPLEMENT

(2) 2050
Total Tubes: (2)
No Crystals used.

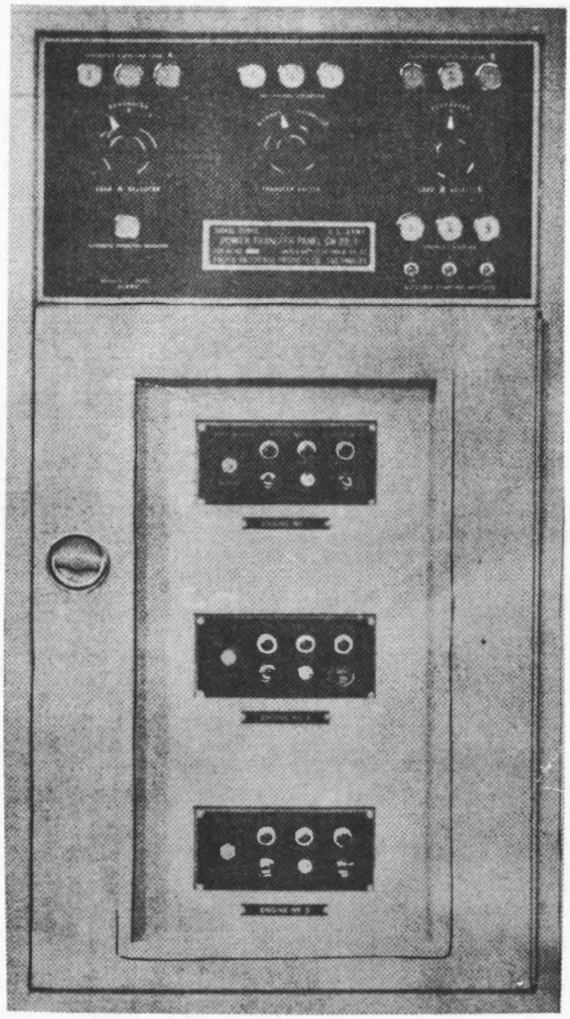
REFERENCE DATA AND LITERATURE

NAVSHIPS 93014: Technical Manual for VOLTAGE REGULATOR CN-186/U.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE USN, BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.
R.D.B. IDENT. NO.

Radio–Auxiliary

POWER TRANSFER PANEL CN-22/F



Power Transfer Panel CN-22/F

FUNCTIONAL DESCRIPTION

The CN-22/F is a portable, automatic switching device designed for use in the power systems to supply uninterrupted 115 v, 60 cycle current to two communications loads. The transfer panel is designed to work with and control automatically three gasoline-engine-driven AC generating sets, or with a 115 v, 60 cycle commercial power supply and two generating sets. To obtain fully automatic operation, the engines in the generating sets must be equipped with electric starters and remote control starting equipment.

No field changes in effect at time of preparation (11 December 1956).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

OPERATING POWER: 115 v, 60 cps, single ph.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes.

REFERENCE DATA AND LITERATURE

TM11-967: Technical Manual for Power Transfer Panel CN-22/F.

TYPE CLASSIFICATION
DESIGN COGNIZANCE TASSA
PROCUREMENT COGNIZANCE
STOCK NO.

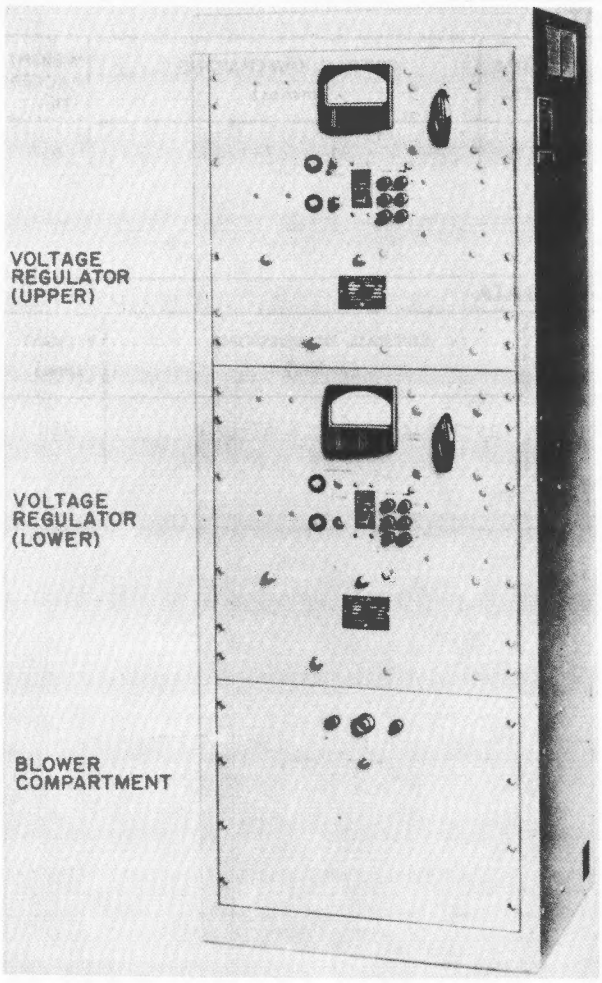
SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Power Transfer Panel CN-22/F	18.8	21 x 26 x 61	420

February 1960

Radio-Auxiliary

VOLTAGE REGULATOR ASSEMBLY CN-239/FPN



Voltage Regulator Assembly CN-239/FPN

FUNCTIONAL DESCRIPTION

Voltage Regulator Assembly CN-239/FPN consists of two identical voltage regulators mounted in one cabinet. The voltage regulators operate independently of one another. These voltage regulators are general purpose electro-mechanical units designed to automatically regulate fluctuating ac line voltage. The output voltage of the regulator is a distortionless reproduction of the applied waveform. The over-all efficiency of the regulator at full load is approx. 97%.

No field changes in effect at time of preparation (8 July 1959).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

POWER REQUIREMENTS: 6.5 kva per regulator.
INPUT VOLTAGE: 195 to 225 v ac.
OUTPUT VOLTAGE: 220 to 240 v ac.
HEAT DISSIPATION: 120 W with both regulators operating.

MANUFACTURER'S OR CONTRACTOR'S DATA

Federal Telephone and Radio Co., Clifton, New Jersey.
Contract Tcg-39108(CG-24,984-A), dated 10 October 1953.

TUBE AND/OR CRYSTAL COMPLEMENT

(4) 2D21W

Total Tubes: (4)

No Crystals used.

REFERENCE DATA AND LITERATURE

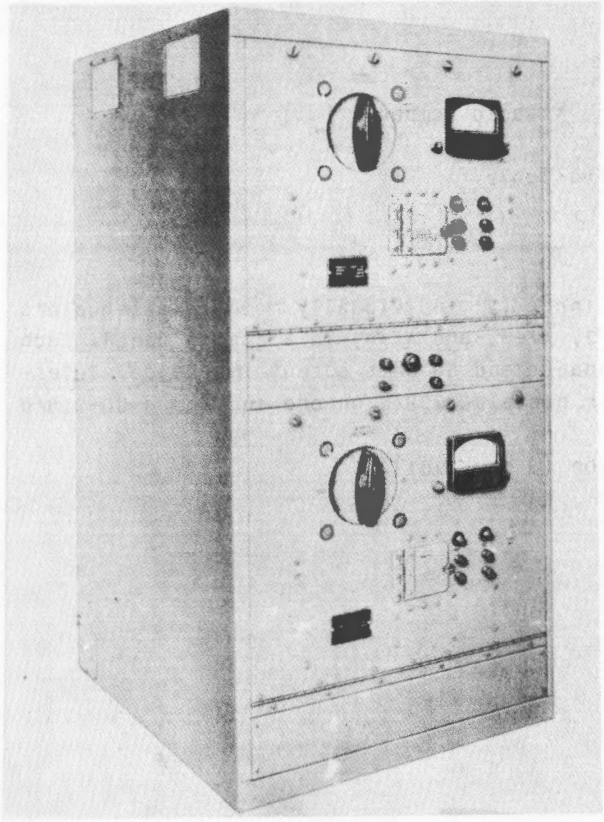
CG-273-17: Technical Manual for VOLTAGE REGULATOR ASSEMBLY CN-239/FPN.

TYPE CLASSIFICATION
DESIGN COGNIZANCE U.S.C.G.
PROCUREMENT COGNIZANCE
STOCK NO.
R.D.B. IDENT. NO.

February 1960

Radio-Auxiliary

VOLTAGE REGULATOR ASSEMBLY CN-324/FPN



Voltage Regulator Assembly CN-324/FPN

FUNCTIONAL DESCRIPTION

Voltage Regulator Assembly CN-324/FPN consists of two identical voltage regulators mounted in one cabinet. They operate indepently of one another. These voltage regulators are general purpose electromechanical units designed to automatically regulate fluctuating ac line voltage. The output voltage of the regulator is a distortion less reproduction of the applied waveform. The over-all efficiency of the regulator at full load is approx 99%.

No field changes in effect at time of preparation (8 July 1959).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

POWER REQUIREMENTS: 24 kva per regulator.
INPUT VOLTAGE: 195 to 255 v ac.
OUTPUT VOLTAGE: 220 to 240 v ac.
HEAT DISSIPATION: 500 W with both regulators operating.

MANUFACTURER'S OR CONTRACTOR'S DATA

Federal Telephone and Radio Co., Clifton, New Jersey.
Contract Tcg-39108(CG-24,984-A), dated 30 September 1952.

TUBE AND/OR CRYSTAL COMPLEMENT

(2) 2D21W
Total Tubes: (2)
No Crystals used.

REFERENCE DATA AND LITERATURE

CG-273-25: Technical Manual for Voltage Regulator Assembly CN-324/FPN.

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	U.S.C.G.
PROCUREMENT COGNIZANCE	
STOCK NO.	
R.D.B. IDENT. NO.	

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Voltage Regulator CN-324/FPN	53.3	35-5/8 X 40-1/4 X 64-3/8	1,495

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Voltage Regulator Assembly CN-324/FPN	26-1/8 X 32-1/8 X 52-11/32	1,035
2	Technical Manuals		

CN-400/FRC ATTENUATOR ASSEMBLY

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: DESIGN COG: USN, BuShips
SPEC &/OR DWG:

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Federal Telephone & Radio Company Dwg no. C1046554	Clifton, New Jersey	NObsr-52473	

COL-156H-3A COUPLER-FILTER

NUMBER OF BANDS: 4 bands.
BAND FREQUENCY
BAND ONE: 2.000 to 3.700 mc.
BAND TWO: 3.700 to 7.700 mc.
BAND THREE: 7.700 to 15.700 mc.
BAND FOUR: 15.700 to 31.700 mc.
OPERATING POWER RQMT: 115 v ac, 60 cps, single ph, 0.75 amps.

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Vacuum-Tube-Voltmeter Hewlett-Packard Model 410B; (1) Signal Generator Measurement Corporation Model 65B.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Coupler-Filter COL-156H-3A		7 x 12-1/4 x 19	34

REFERENCE DATA AND LITERATURE:

NAVSHIPS 93529: Technical Manual for Coupler-Filter COL-156H-3A.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (2) 5687 (1) 6012 (1) SV905

CRYSTALS: None used.

SEMI-CONDUCTORS: (1) 1N198 (1) 1N538 (2) 1N1491 (1) 2N158

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: DESIGN COG: USN, BuShips
SPEC &/OR DWG: Commercial

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Collins Radio Company Model no. 156-H-3A	Cedar Rapids, Iowa	NObsr-75834, 5 May 1959	$4159.00

Radio-Auxiliary

CU-168/FRR ANTENNA COUPLER

MANUFACTURER'S OR CONTRACTOR'S DATA

Collins Radio Co., Cedar Rapids, Iowa.
Contract NObsr-49175, dated 2 June 1950.
Contract NObsr-52727, dated 29 June 1951.
Contract NObsr-64175.

Hugh H. Eby Co., Philadelphia, Pa.
Contract NObsr-64811, dated 20 April 1955.
Contract NObsr-71393.

Electronics of Clearfield, Clearfield, Pa.
Contract NObsr-71854, dated 8 March 1957.

Galbraith-Pilot Marine Corp, Brooklyn, New York.
Contract NObsr-75908.

Telectro Industries Corp, Long Island City, New York.
Contract NObsr-75293, dated 15 October 1958.

Decitron Electronics Co., Brooklyn, New York.
Contract NObsr-81160, dated 22 September 1959.

TUBE AND/OR CRYSTAL COMPLEMENT

(20) 12AU7 (1) 5U4G
Total Tubes: (21)
No Crystals used.

REFERENCE DATA AND LITERATURE

NAVSHIPS 91697(A): Technical Manual for ANTENNA COUPLER CV-168/FRR.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE USN, BUSHIPS
PROCUREMENT COGNIZANCE SPEC: MIL-C-15744D
STOCK NO.
R.D.B. IDENT. NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Antenna Coupler CU-168/FRR	2.6	12 x 16 x 23	52

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-168/FRR including:	8-3/4 x 12 x 19	41
1	Connector AN3106-14S-7S	1-1/8 dia x 1-7/16	0.055
1	Adapter AN3057-6	15/16 dia x 1-5/64	0.029
6	Connector UG-21B/U	25/32 dia x 1-13/16	0.123
2	Technical Manual NAVSHIPS 91697(A)	1/4 x 8-1/2 x 11	

Radio-Auxiliary

CU-255/UR ANTENNA COUPLER

April 1958

OPERATING POWER REQUIREMENTS: 115 v AC, 4 amps max during cycle and 48 v DC pulses to indicate tuning cycle. Power supplied by TDZ Transmitter in a TDZ-RDZ system or by Selector Control Unit NT-23497 in an RDZ receiver system.

MANUFACTURER'S OR CONTRACTOR'S DATA

Hoffman Laboratories Inc, Los Angeles, Calif.
Contract NObsr-52220, dated 17 January 1951.
Contract NObsr-57073, dated 14 November 1951.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes.
(1) 1N21B
Total Crystals: (1)

REFERENCE DATA AND LITERATURE

NAVSHIPS 91745(A), Technical Manual for Antenna Coupler CU-255/UR and Antenna Coupler CU-332A/UR.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Antenna Coupler CU-255/UR	6.7	10-3/16 x 13-7/8 x 83-3/8	175

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-255/UR incl (2) Bracket, Mounting (2) Bar, Mounting (1) Connector AN3108B-22-14S (1) Connector AN3108B-22-14P (1) Connector UG-941A/U (4) Screw (4) Washer, Split Lock (2) Clamp, Cable AN3057A-12A (2) Technical Manuals NAVSHIPS 91745(A)	5-1/4 x 7-7/8 x 69-1/4	97

Radio-Auxiliary

CU-274/UR ANTENNA COUPLER

April 1958

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQ RANGE: 225 to 400 mc.
QUANTITY OF PRE-SET FREQ: 10 per signal channel or cavity. Ea cavity individually tuned and capable of independent simultaneous operation.
QUANTITY OF CHANNELS: 4.
INPUT AND OUTPUT IMPEDANCES: 50 ohms.
POWER SOURCE REQUIRED: 115 v, 50 to 60 cps, single ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

Harvey-Wells Electronics, Inc, Southbridge, Mass.
Contract: NObsr-52597 dated 27 June 1950.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes used.
(1) 1N34
Total Crystals: (1)

REFERENCE DATA AND LITERATURE

NAVSHIPS 91860, Technical Manual for Antenna Coupler CU-274/UR.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Ant Coupler CU-274/UR c/o (2) Mtg Bracket (4) Selector Control C-1219/UR (1) Junction Box J-493/UR Mating Connectors and Hardware	6.12	20.5 X 21.5 X 24	92

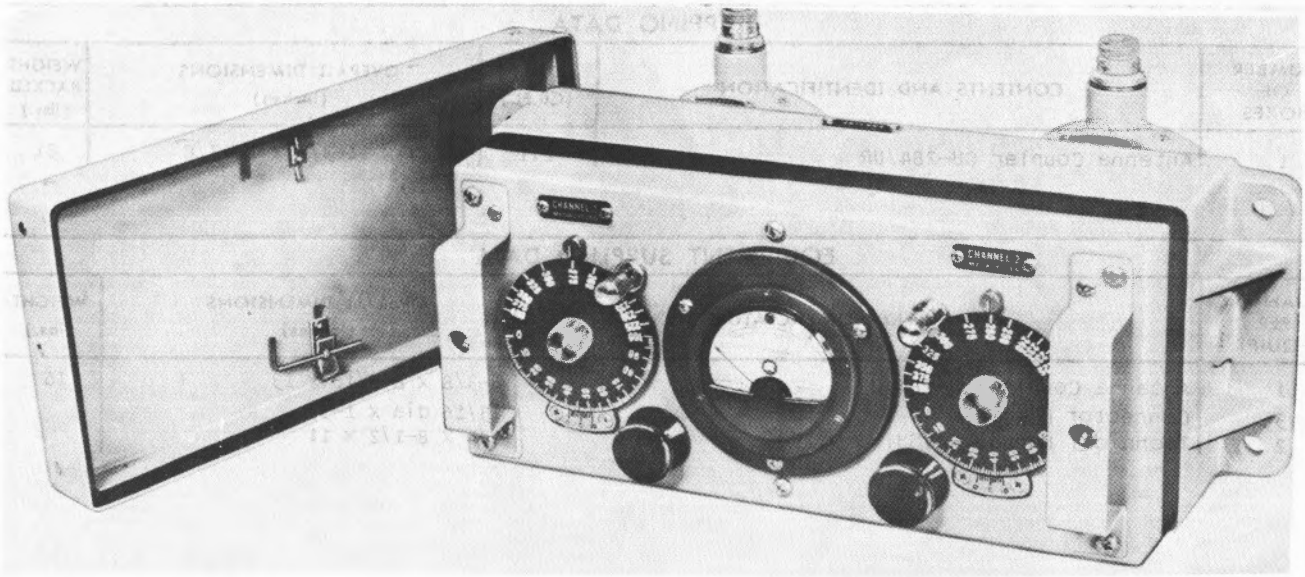
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Ant Coupler CU-274/UR	11.875 X 14.4375 X 15.125	57
2	Mtg Bracket	2.5 X 12.5 X 16.75	7
4	Selector Control C-1219/UR	3.172 X 5.125 X 5.812	5
1	Junction Box J-493/UR	2.625 X 10.25 X 11.0	5-1/4
	Mating Connectors and associated Hardware		

Radio-Auxiliary

April 1958

ANTENNA COUPLER CU-284/UR



Antenna Coupler CU-284/UR

FUNCTIONAL DESCRIPTION

The CU-284/UR is designed to be used aboard ship to make possible the simultaneous operation of two radio transmitters or receivers from a single antenna with about the same efficiency as if the equipments were operated into individual, isolated antennas. This efficiency is necessary due to the few locations on a vessel from which antenna radiation patterns are undistorted and where sufficient isolation is afforded between antennas.

It consists of two parallel-connected, capacitively tuned, resonant cavities with separate manually operated tuning controls, which permit tuning of each cavity to any one of corresponding frequencies of the attached receivers or transmitters.

It is intended for use with Receivers AN/URR-13 or Navy Model RDZ, Transmitters Navy Models TED or TDZ, and Antennas AT-150/SRC, AS-390/SCR, and AS-468/B and similar UHF radio transmitting and receiving equipments.

No field changes in effect at time of preparation (18 October 1957).

RELATION TO OTHER EQUIPMENT

Equipment Required but not Supplied: Cable RG-8/U, RG-9/U, or RG-10/U as Required.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 225 to 400 mc.

OUTPUT IMPEDANCE: 50 ohms.

POWER TRANSFER: Each cavity can transfer 100 W of transmitted power.

MANUFACTURER'S OR CONTRACTOR'S DATA

Harvey-Wells Electronics, Inc., Southbridge, Mass.
Contract NObsr-52597, dated 27 June 1951.

Barlow Electrical Manufacturing Co., New York, N.Y.
Contract NObsr-63380, dated 30 March 1953.
Approximate Cost: $195.00.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) IN34A

Total Crystals: (1)

REFERENCE DATA AND LITERATURE

NAVSHIPS 91790: Technical Manual for Antenna Coupler CU-284/UR.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE MIL-A-16306B(SHIPS)
STOCK NO.

September 1956

ANTENNA COUPLERS ELECTRICAL DUMMY LOADS

Radio-Auxiliary

CU-291,292,293/GRD DA-57,58/GRD

FUNCTIONAL DESCRIPTION

The CU-291/GRD, CU-292/GRD, CU-293/GRD are designed to cover three bands for use with Navy Model DAL, DAM, and DAN Direction Finder Equipment, respectively, providing coupling between the monopoles of the Adcock array and the receiver.

The DA-57/GRD and DA-58/GRD are networks provided to connect corresponding antenna couplers to a signal generator when being tested and simulate the average monopole characteristics.

The DA-57/GRD is used with the CU-291/GRD and CU-292/GRD, and the DA-58 is used with the CU-293/GRD.

No field changes in effect at time of preparation (12 June 1956).

RELATION TO OTHER EQUIPMENT

The Antenna Couplers are designed to replace a cathode follower type of coupler which was found to insert spurious signals in the system.

Equipment Required but not Supplied: (1) Signal Generator.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

BANDS
CU-291/GRD: 1.5 to 3.75 mc.
CU-292/GRD: 3.75 to 7.5 mc.
CU-293/GRD: 7.5 to 15.0 mc.
DA-57/GRD: 1.5 to 7.5 mc.
DA-58/GRD: 7.5 to 15.0 mc.
INPUT IMPEDANCE: To match antenna impedance of Navy Model DAJ Direction Finder System.
OUTPUT IMPEDANCE: 140 ohms, balanced.

MANUFACTURER'S OR CONTRACTOR'S DATA

Tech-Tron Corporation, Kansas City, Mo.
Contract NObsr-57279
Approximate Cost: $1,190.00 including equipment spares.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes.

REFERENCE DATA AND LITERATURE

Manuscript of Technical Manual for CU-291, 2, 3/GRD Antenna Couplers, DA-57, 8/GRD Electrical Dummy Load.

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	BUSHIPS
PROCUREMENT COGNIZANCE	SHIPS-A-556
STOCK NO.	

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Antenna Coupler CU-291/GRD (6) Dummy Antenna DA-57/GRD (2)	1.3	9-3/4 X 14-3/4 X 15-3/4	14
1	Antenna Coupler CU-292/GRD (6) Dummy Antenna DA-57/GRD (2)	1.3	9-3/4 X 14-3/4 X 15-3/4	14
1	Antenna Coupler CU-293/GRD (6) Dummy Antenna DA-58/GRD (2)	1.3	9-3/4 X 14-3/4 X 15-3/4	14

EQUIPMENT SUPPLIED DATA

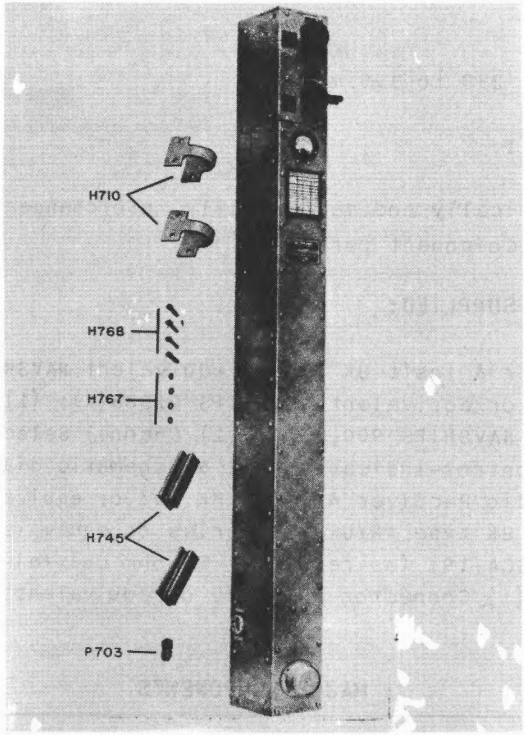
QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
6	Antenna Coupler CU-291/GRD	4 X 4 X 5-1/2	0.6
2	Dummy Antenna DA-57/GRD	2 X 2-1/2 X 4	0.2
6	Antenna Coupler CU-292/GRD	4 X 4 X 5-1/2	0.6
2	Dummy Antenna DA-57/GRD	2 X 2-1/2 X 4	0.2
6	Antenna Coupler CU-293/GRD	4 X 4 X 5-1/2	0.6
2	Dummy Antenna DA-58/GRD	2 X 2-1/2 X 4	0.2
1	Technical Manual CU-291, 2, 3/GRD	1/8 X 8-1/2 X 11	0.1

14 September 1962 — ANTENNA, COUPLER CU-332A/UR

Cog Service:	FSN: 5985-372-3131	Functional Class:
USA	USN	USAF

TYPE CLASS:

MANUFACTURER'S NAME/CODE NUMBER: Hoffman Laboratories Incorporated.



Antenna, Coupler CU-332A/UR

FUNCTIONAL DESCRIPTION:

The Antenna, Coupler CU-332A/UR when arranged in a group of from two (2) to six (6) units provides a system whereby from two to six radio transmitters, receivers, or transmitter-receiver systems can be operated simultaneously on a single antenna. The coupler is not intended for use in a single transmitter or receiver installation. It can be used with any communications transmitter or receiver operating within the frequency range from 230 to 390 megacycles. They are intended for use aboard ship or at shore stations.

The primary purpose in the use of the CU-332A/UR is twofold: (1) to effect a reduction in the number of UHF communication antennas required aboard ship; (2) to increase the communication range through improved radiation patterns by installing the few antennas required in unobstructed locations. It provides an efficient power-coupling, impedance matching, and filtering system.

No field changes in effect at time of preparation (3 May 1961).

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: None used.

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	6.3	155

PROCUREMENT DATA

PROCURING SERVICE: DESIGN COG: USN, BuShips
SPEC &/OR DWG: SHIPS-A-488

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Hoffman Laboratories Inc.	Los Angeles, California	NObsr-57073, 14 November 1951	

Radio-Auxiliary

CU-352/BRR COUPLER, ANTENNA

February 1960

TUBE AND/OR CRYSTAL COMPLEMENT

Nc Electron Tubes or Crystals used.

REFERENCE DATA AND LITERATURE

NAVSHIPS 92182: Technical Manual for LOOP ANTENNA SYSTEM AT-317/BRR.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE USN, BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.
R.D.B. IDENT. NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-352/BRR	7-3/16 X 8-3/4 X 10-5/8	11.5

CU-352A/BRR COUPLER, ANTENNA

RELATION TO OTHER EQUIPMENT:

The CU-352A/BRR is designed to be used with, but not part of Navy Radio Receiving Equipment Model RBA or RAK.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Antenna Coupler CU-352A/BRR		7-3/16 x 8-11/16 x 10-5/8	11-1/2

REFERENCE DATA AND LITERATURE:

NAVSHIPS 92182: Technical Manual for Navy Model AT-317/BRR, AT-317A/BRR and AT-317B/BRR VLP Loop Antenna System of which Coupler Antenna CU-352A/BRR is a part of.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: None used.

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

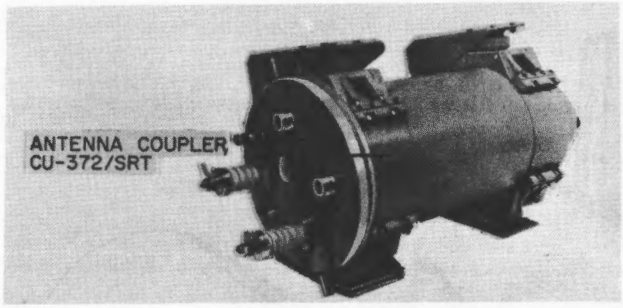
PROCUREMENT DATA

PROCURING SERVICE: USN
DESIGN COG: USN, BuShips
SPEC &/OR DWG: MIL-A-15900

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Amphenol Borg Electronics Corp. part no. 142-011	Chicago, Illinois	NObsr-75555(FBM), 18 September 1958	

Radio-Auxiliary

ANTENNA COUPLER CU-372/SRT



Antenna Coupler CU-372/SRT

FUNCTIONAL DESCRIPTION

The CU-372/SRT is designed to provide fixed inductances and capacitances which are used to extend the range of impedance that can be matched by the Radio Frequency Tuner.

No field changes in effect at time of preparation (10 May 1960).

RELATION TO OTHER EQUIPMENT

The CU-372/SRT is designed as part of the AN/SRA-18 Antenna Tuning Group.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

OPERATING POWER RQMT: 110 v ac, 60 cps, single ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

Federal Telecommunications Laboratory,
Nutley, New Jersey.
FTL Model NUS-2623.
Contract NObsr-52021.
Contract NObsr-52621.
Contract NObsr-52622.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes and/or Crystals used.

REFERENCE DATA AND LITERATURE

NAVSHIPS 92540(A): Technical Manual for Antenna Tuning Group AN/SRA-18.
Nomenclature Card for Antenna Coupler CU-372/SRT.

TYPE CLASSIFICATION	(NAVY)
DESIGN COGNIZANCE	NAVY BUSHIPS
PROCUREMENT COGNIZANCE	SHIPS-A-1392
STOCK NO.	
R.D.B. IDENT. NO.	

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Antenna Coupler CU-372/SRT	11.36	20-3/8 x 23-1/2 x 41	170

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-372/SRT	12-5/8 dia x 34-5/8	66

Radio-Auxiliary

ANTENNA COUPLER

March 1957

CU-377/UR

RELATION TO OTHER EQUIPMENT

NAVSHIPS 92187: Technical Manual for Antenna Coupler CU-377/UR.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE SHIPS-C-1120
STOCK NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Antenna Coupler-CU-377/UR (3) Mating Connector UG-21B/U (2) Technical Manuals NAVSHIPS-92187	1.1	9-1/4 X 11-3/4 X 17-3/8	24.5

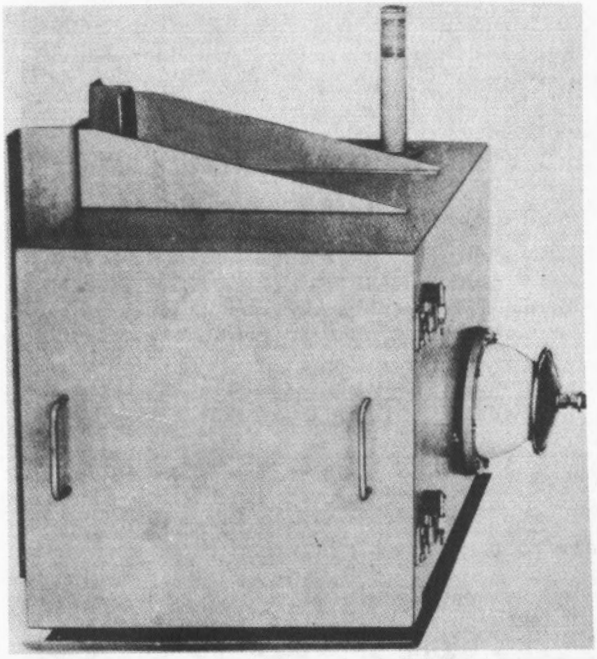
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-377/UR	5-1/4 X 7-5/32 X 11	9.5
3	Mating Connectors-UG-21B/U		
2	Technical Manuals NAVSHIPS-92187		

April 1959

Radio-Auxiliary

ANTENNA COUPLER CU-464/UR



Antenna Coupler CU-464/UR

FUNCTIONAL DESCRIPTION

Antenna Coupler CU-464/UR is designed for use at Loran transmitting stations.

No field changes in effect at time of preparation (12 May 1959).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 1.7 to 2.0 mc.
TRANSMISSION LINE TYPE: RG-148/U.
IMPEDANCE: 8 to 25 ohms.

MANUFACTURER'S OR CONTRACTOR'S DATA

Palmer Service Co Inc, East Orange, N.J.
Contract TCG39,220(CG-26-246A), 13 January 1953.

No Electron Tubes or Crystals used.

REFERENCE DATA AND LITERATURE

CG-273-29: Technical Manual for ANTENNA COUPLER CU-464/UR.

TYPE CLASSIFICATION
DESIGN COGNIZANCE U.S.C.G
PROCUREMENT COGNIZANCE USCG SPEC LRACS-389
STOCK NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Antenna Coupler CU-464/UR	15.1	27 X 29 X 34	140

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-464/UR Including:	23 X 26 X 29	53
2	Technical Manual CG-273-29	1/2 X 9 X 11-1/2	.8
2	Installation Dwg	1/4 X 9 X 11-1/2	.2
2	Plastic Laminated Schematic Diagrams	1/8 X 9 X 11-1/2	.1

Radio-Auxiliary

CU-480(XN-1)/U ANTENNA COUPLER

FUNCTIONAL DESCRIPTION

Antenna Coupler CU-480(XN-1)/U is an accessory unit that can accommodate or match the radio frequency output from up to three 3 kw, 100% modulated radio transmitters into a single broadband antenna presenting 75 ohms with 3:1 or less impedance variation.

No field changes in effect at time of preparation (28 September 1960).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 2 to 6 mc.
INPUT POWER LEVEL: 3 kw AM carrier, 100% modulated.
INPUT IMPEDANCE: 75 ohms.
OUTPUT IMPEDANCE: 75 ohms.
TRANSMISSION EFFICIENCY: 80% nominal.
CHANNEL ISOLATION: 3 db nominal at 10% frequency separation.
POWER REQUIREMENTS: 108 W, 115 v, 60 cyc, single ph.
TEMPERATURE RANGE: 0 deg C to P50 deg C (P32 deg F to P122 deg F).

MANUFACTURER'S OR CONTRACTOR'S DATA

Electronic Communications Inc., St. Petersburg, Florida.
Contract NObsr-75367.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes or Crystals used.

SEMI-CONDUCTORS

(1) 1N540 (6) 1N21B

Total Semi-Conductors: (7)

REFERENCE DATA AND LITERATURE

NAVSHIPS 00000: Technical Manual for ANTENNA COUPLER CU-480(XN-1)/U.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE USN, BUSHIPS
PROCUREMENT COGNIZANCE SPEC: SHIPS-A-2900
STOCK NO.
R.D.B. IDENT. NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
3	Tuner Unit	14	21-5/8 x 22-7/8 x 49-1/4	190
1	Capacitors	18	26-1/2 x 27 x 43-1/2	118
1	Antenna Coupler CU-480(XN-1)/U	64	40 x 41-1/4 x 67-1/4	568

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-480(XN-1)/U	36-3/16 x 39-1/2 x 62-1/2	
2	Technical Manual NAVSHIPS		

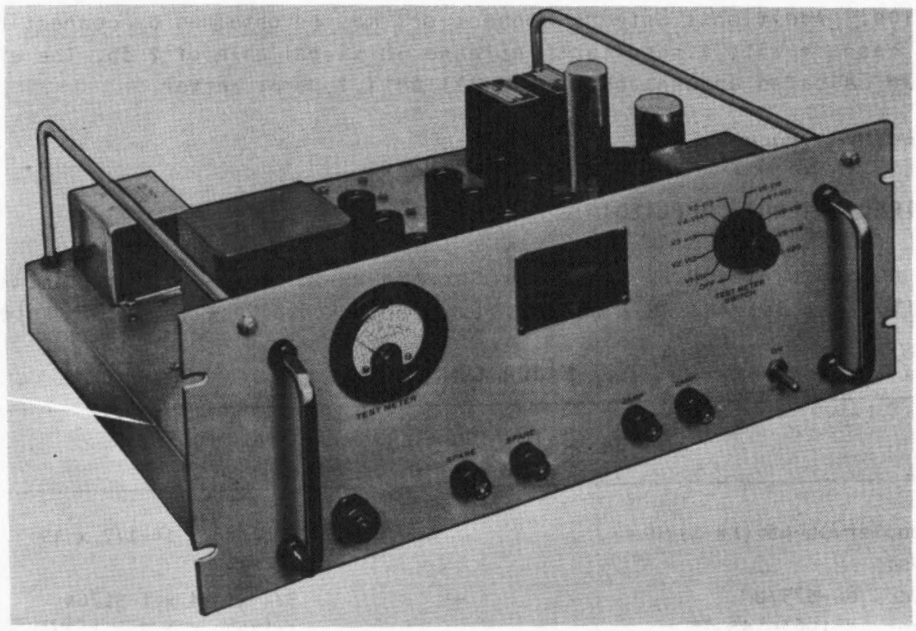
16 July 1962 ANTENNA COUPLER CU-656(XN-1)/U

Cog Service: USN FSN: Functional Class:

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Westinghouse Electric Corp.



Antenna Coupler CU-656(XN-1)/U

FUNCTIONAL DESCRIPTION:

Antenna Coupler CU-656(XN-1)/U provides optimum coupling between a single antenna and as many as eight receivers. Design considerations include selection of circuits and choice of components providing a low voltage standing wave ratio, a wide frequency range (2.0 to 32 mc) a high attenuation of out of band frequencies, a minimum noise figure, minimum intermodulation, a high degree of isolation between individual outputs, an overall power gain and high reliability.

No field changes in effect at time of preparation (14 April 1961).

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 2.0 to 32 mc.
IMPEDANCE: 70 ohms (input); 70 ohms (output).
NUMBER OF OUTPUTS: 8 outputs at rear of unit.

PROCUREMENT DATA

PROCURING SERVICE: USN
DESIGN COG: USN, BuShips
SPEC &/OR DWG: SHIPS-A-2389, Amend 1

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Westinghouse Electric Corp. Dwg no. 476D353H01	Baltimore, Md.	NObsr-72624	$2, 300.00

GAIN: 0 to 3 db.
NOISE FIGURE: 6 db or better.
VOLTAGE STANDING WAVE RATIO: 3:1.
INTERMODULATION: 60 db.
AMBIENT TEMPERATURE RANGE: M40 deg C (M40 deg F) to P50 deg C (P122 deg F).
OPERATING FREQUENCY RANGE: 2.0 to 32 mc.
OPERATING POWER RQMT: 115 or 230 v ac, 48 to 62 cps, single ph, 125 W.

RELATION TO OTHER EQUIPMENT:

Antenna Couplers CU-656/U, CU-873/U, and CU-874/U are electrically similar. Antenna Couplers CU-656/U & CU-873/U both have a 70 ohm input; CU-874/U has a 150 ohm balanced input. The units are physically similar except the CU-656/U utilizes type C input and output connectors while CU-873/U & CU-874/U utilizes type N input and output connectors.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Radio Interference Measuring Set AN/URM-47 series and Technical Manual NAVSHIPS 92147; (1) to (8) Radio Receivers; (1) Antenna; (1) Adapter UG-566/U; (1) Adapter UG-107B/U; (1) R.F. Signal Generator AN/URM-25 series & Technical Manual NAVSHIPS 91283; (1) Multimeter AN/USM-116 series or AN/USM-34.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Antenna Coupler CU-656/U or CU-873/U or CU-874/U consists of:		6-31/32 x 16-1/2 x 19	33
9	Connectors Type UG-573/U		3/4 x 3/4 x 1-31/64	
1	Connector Type AN3106A-145S-7S		1-1/8 x 1-1/8 x 1-7/16	
1	Technical Manual NAVSHIPS 93804(A)		1/4 x 9 x 11-1/2	

REFERENCE DATA AND LITERATURE:

NAVSHIPS 93804(A): Technical Manual for Antenna Coupler's CU-656/U, CU-873/U, CU-874/U.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (20) 6922 (1) 0B2WA

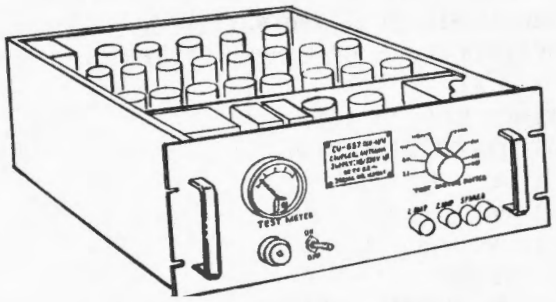
CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

February 1960

Radio-Auxiliary

ANTENNA COUPLER CU-657(XN-1)/U



Antenna Coupler CU-657(XN-1)/U

FUNCTIONAL DESCRIPTION

Antenna Coupler CU-657(XN-1)/U is designed to provide optimum coupling between a single antenna and as many as ten receivers in communications systems employing amplitude-modulation emission. Design considerations include selection of circuits to provide a low vswr, wide frequency range (15 kc to 2.0 mc), high attenuation of out-of-band frequencies, minimum noise figure, high degree of isolation between individual outputs, an over-all power gain, and high stability.

No field changes in effect at time of preparation (12 August 1959).

EQUIPMENT REQUIRED BUT NOT SUPPLIED

(1) R.F. Signal Generator Set AN/URM-25 series, (1) Multimeter AN/USM-34 series, (1) Radio Test Set AN/PRM-1 series, (1) Antenna, (UP to 10) Radio Receiver RBA, (UP to 10) Radio Receiver RBB, (2 to 11) Coaxial Cable RG-11A/U, (1) Cable TSGA-3.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE:. 15 kc to 2.0 mc.

IMPEDANCE: 70 ohms (input); 70 ohms (output).
NUMBER OF OUTPUTS: 10.
INTERMODULATION: Two 0.25 v signals applied at the input is 60 db down.
GAIN: +3 db within the frequency range.
ANTENNA CHARACTERISTICS (GFM)
IMPEDANCE: 70 ohms.
VSWR: No greater than 2:1 over frequency range.
AMBIENT TEMPERATURE: −40° C to +50° C (−40° F to +122° F).
POWER REQUIREMENTS: 145 W, 115 ±11.5 v or 230 ±23 v, 48 to 62 cy, 1 ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

Westinghouse Electric Corp, Baltimore, Maryland.
Contract NObsr-72624.

TUBE AND/OR CRYSTAL COMPLEMENT

(21) 6922
Total Tubes: (21)
No Crystals used.

REFERENCE DATA AND LITERATURE

NAVSHIPS 93304: Technical Manual for ANTENNA COUPLER CU-657(XN-1)/U,

TYPE CLASSIFICATION (Navy)
DESIGN COGNIZANCE USN, BUSHIPS
PROCUREMENT COGNIZANCE SPEC: SHIPS-A-2389
STOCK NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Antenna Coupler CU-657(XN-1)/U	2.3	10 X 19 X 21	40

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-657(XN-1)/U including:	6-31/32 X 16-1/2 X 19	33
11	Connector UG-573/U	3/4 X 3/4 X 1-31/64	1.1
1	Connector AN3106A-14S-7S	1-1/8 X 1-1/8 X 1-7/16	0.055
2	Technical Manual NAVSHIPS 93304	9 X 11-1/2	

CU-691/U ANTENNA COUPLER

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Antenna Coupler CU-691/U			

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-691/U Including:	17-1/4 X 22-7/16 X 24-27/64	90
6	Shock Mounts	1-1/2 X 3 X 3	
4	Rack-Mounting Brackets	7/8 X 1 X 11-1/4	
1	Channel Mount	1-3/16 X 3-3/8 X 16-11/64	

CU-692/U ANTENNA COUPLER

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-692/U Including:	13-29/32 X 17-1/4 X 22-7/16	55
4	Shockmounts	1-1/2 X 3 X 3	
2	Rack-Mounting Brackets	7/8 X 1 X 13	

CU-723/URC-7 COUPLER, ANTENNA

REFERENCE DATA AND LITERATURE:

Nomenclature Card for Antenna Coupler CU-723/URC-7.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: None used.

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: DESIGN COG: USCG
SPEC &/OR DWG:

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Monitor Electronics Company Dwg no. 21B100 Dwg no. RE43C2034	Montclair, New Jersey	Tcg-40194	

Radio-Auxiliary
CU-726/URT

ANTENNA COUPLER

February 1960

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Antenna Coupler	4		40

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-726/URT Including:	8-23/32 X 19 X 19-1/2	30
1	Allen Wrench (hexago.. 3/32 in.)		
3	Coaxial Connectors UG-352/U		

Radio-Auxiliary
CU-727/URT

ANTENNA COUPLER

February 1960

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Antenna Coupler CU-727/URT	4		39.5

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-727/URT Including:	8-23/32 X 19 X 19-1/2	29.5
1	Allen Wrench (hexagon 3/32 in.)		
3	Coaxial Connectors UG-352/U		

Radio-Auxiliary
CU-728/URT

ANTENNA COUPLER

February 1960

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Antenna Coupler CU-728/URT	4		37.3

EQUIPMENT SUPPLIED DATA

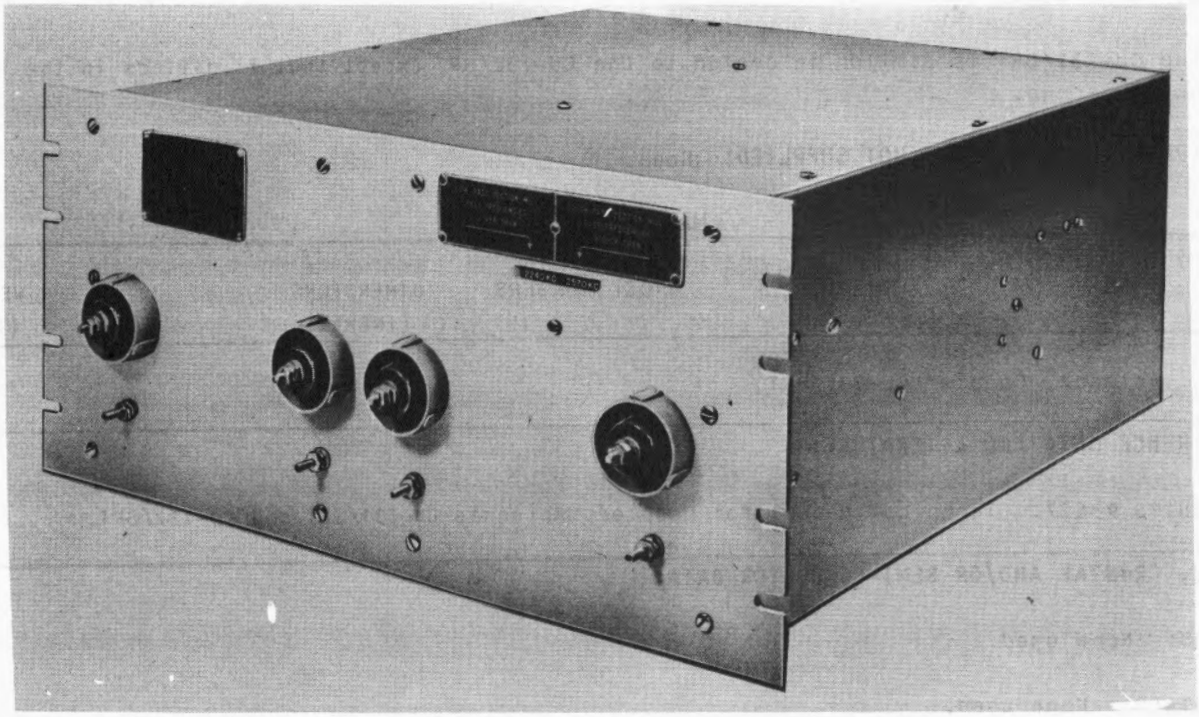
QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-728/URT Including:	8-23/32 X 19 X 19-1/2	27.3
1	Allen Wrench (hexagon 3/32 in)		
3	Coaxial Connectors UG-352/U		

Cog Service: USN FSN: 5985-725-8171 Functional Class:

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Columbus Electronics Corp., (81751).



Coupler, Antenna CU-731/SRT

FUNCTIONAL DESCRIPTION:

The Antenna, Coupler CU-731/SRT is designed as a complete filter equipment which can be used alone or combined with other complementary filters to provide a means for simultaneous operation of two (2) or more transmitters using a common antenna but operating on different frequencies.

No field changes in effect at time of preparation (19 July 1962).

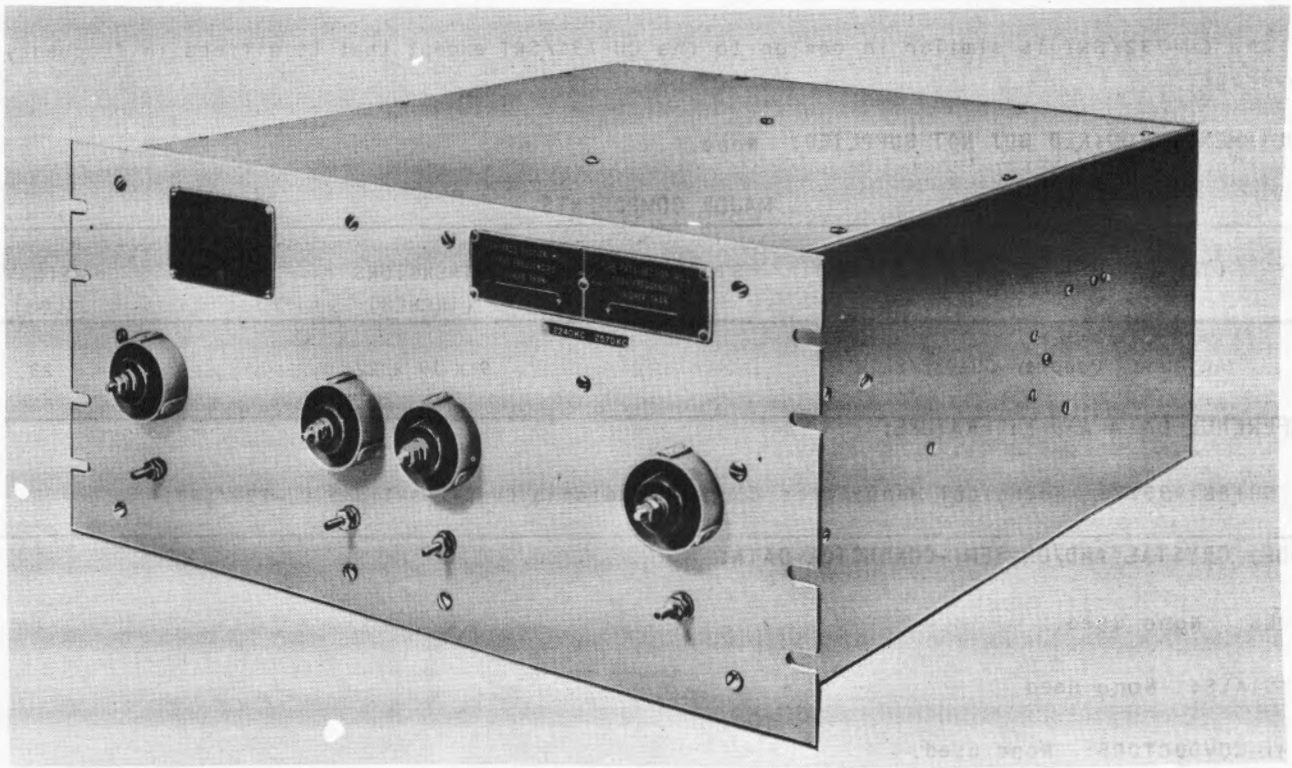
TECHNICAL CHARACTERISTICS:

TYPE OF MOUNTING: Standard relay rack mounting.
METHOD OF COUPLING: Inductive-capacitive.
FREQUENCY SPECTRUM: 175 kc to 27 mc.
CROSS-OVER FREQUENCY: At 2400 kc or 2750 kc.
FREQUENCY SWITCHING: Changing the filter cross-over frequency requires changing manually

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Columbus Electronics Corp., (81751).



Coupler, Antenna CU-732/SRT

FUNCTIONAL DESCRIPTION:

The Antenna, Coupler CU-732/SRT is designed as a complete filter equipment which can be used alone or in combination with other complementary filters to provide a means of simultaneous operation of two (2) or more transmitters using a common antenna but operating on different frequencies.

No field changes in effect at time of preparation (19 July 1962).

TECHNICAL CHARACTERISTICS:

TYPE OF MOUNTING: Standard relay rack mounting.
METHOD OF COUPLING: Inductive-capacitive.
FREQUENCY SPECTRUM: 175 kc to 27 mc.
CROSS-OVER FREQUENCY: At 3300 kc or 3800 kc.
FREQUENCY SWITCHING: Changing the filter cross-over frequency changing manually each of the

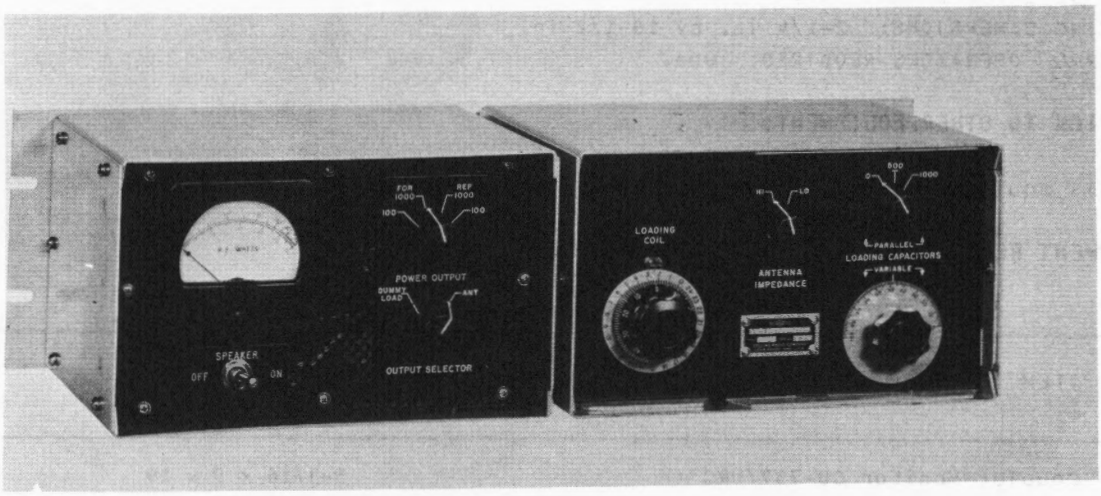
11 September 1962 COUPLER-MONITOR CU-737/URC

Cog Service: FSN: 5985-678-4053 Functional Class:

USA USN USAF

TYPE CLASS:

MANUFACTURER'S NAME/CODE NUMBER: Collins Radio Company.



Coupler-Monitor CU-737/URC

FUNCTIONAL DESCRIPTION:

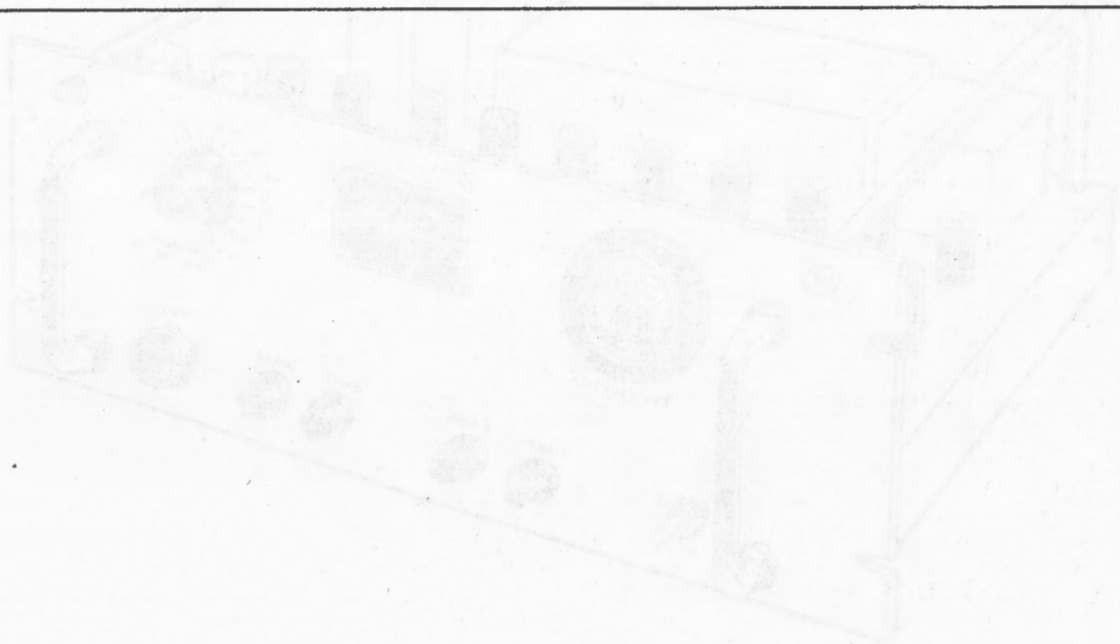
Coupler-Monitor CU-737/URC matches a 50 ohm output from rf amplifier to a 50 ohm transmission line having a standing-wave ratio up to 2:1. The operating frequency range of the unit is 2 to 30 mc. Antenna Network 180U-2 contains an antenna transfer relay, a directional coupler with an rf wattmeter, and a reversible L-network for impedance matching. A 4 ohm loudspeaker is also provided as well as a terminating load which is switched to the audio input when the loudspeaker is not in use.

No field changes in effect at time of preparation (15 June 1961).

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 2 to 30 mc.
POWER HANDLING CAPABILITIES
RF: 1000 W max.

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Collins Radio Company Part no. 522-1398-00	Cedar Rapids, Iowa	NObsr-81220	



Radio-Auxiliary

February 1960

CU-744(XN-1)/U ANTENNA COUPLER

TUBE AND/OR CRYSTAL COMPLEMENT

(20) 6688
Total Tubes: (20)

No Crystals used.

REFERENCE DATA AND LITERATURE

Technical Manual for ANTENNA COUPLER CU-744 (XN-1)/U.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE USN, BUSHIPS
PROCUREMENT COGNIZANCE SPEC: SHIPS-A-2389
STOCK NO.
R.D.B. IDENT. NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Antenna Coupler CU-744(XN-1)/U	2.3	10 X 19 X 21	40

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-744(XN-1)/U includes:	6-31/32 X 16-1/2 X 19	33
9	Connectors UG-573/U	3-4 X 3/4 X 1-31/64	
1	Connector AN3106A-14S-7S	1-1/8 X 1-1/8 X 1-7/16	
1	Technical Manual	9 X 11-1/2	

Cog Service: USN FSN: Functional Class:

USA	USN	USAF

TYPE CLASS: Used by Used by

MANUFACTURER'S NAME/CODE NUMBER: Westrex Company, Division of Litton Systems Inc., (00335).

(No Illustration Available)

FUNCTIONAL DESCRIPTION:

The Antenna Coupler CU-784A/U is designed to provide between five (5) Very Low Frequency (VLF) antennas and fifteen (15) receivers with a maximum of five (5) receivers to any one (1) antenna.

No field changes in effect at time of preparation (7 June 1962).

TECHNICAL CHARACTERISTICS:

ANTENNA INPUTS
- BROADBAND WHIP (WHIP 1): N-type receptacle.
- TUNABLE LOOP (LOOP 1): 5-pin female receptacle.
- BROADBAND TRAILING WIRE: N-type receptacle.
- TUNABLE LOOP (LOOP 2): 5-pin female receptacle.
- BROADBAND 50 OHM ANTENNA: N-type receptacle.

TYPE OF TUNING: variable.

GAIN
- LOOP 1 AND WHIP 1: 4 db min.
- LOOP 2 AND T.W.: 18 db min.
- 50 OHM ANTENNA: 4 db min.

OUTPUTS TO RECEIVERS
- ONE: Five N-type receptacles (Antenna 1 Multicoupler outputs) used for either Loop 1 or Whip 1 operation.
- TWO: Five N-type receptacles (Antenna 2 Multicoupler outputs) used for either Loop 2 or T.W. operation.
- THREE: Five N-type receptacles (50-ohm Multicoupler outputs) used for 50-ohm antenna.

OPERATING POWER RQMT: 117 v ac, 60 cps, single ph, 0.25 amps.

RELATION TO OTHER EQUIPMENT:

The CU-784A/U is one way interchangeable with CU-784/U.

The CU-784A/U is designed to be used with, but not part of Radio, Receiver R-958/U.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

June 1961

Radio-Auxiliary

NETWORK, IMPEDANCE MATCHING CU-837/URC

FUNCTIONAL DESCRIPTION

Network, Impedance Matching CU-837/URC adapts the output impedance of Radio Transmitting and Receiving Equipment TCS to match the 50 ohm input of Antenna Coupler Group AN/SRA-22.

No field changes in effect at time of preparation (17 January 1961).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 2 to 12 mc, 4 bands.
POWER OUTPUT: 100 W.
OUTPUT IMPEDANCE: 50 ohms.

MANUFACTURER'S OR CONTRACTOR'S DATA

Collins Radio Co., Cedar Rapids, Iowa.

Type 399L-1; Dwg 522 1947 00.
Contract NObsr-81220.
Approximate unit cost $62.00.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes or Crystals used.

REFERENCE DATA AND LITERATURE

NAVSHIPS 93400: Preliminary Data Sheet for Network, Impedance Matching CU-837/URC.

TYPE CLASSIFICATION	(NAVY)
DESIGN COGNIZANCE	USN, BUSHIPS
PROCUREMENT COGNIZANCE	
STOCK NO.	
R.D.B. IDENT. NO.	

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Network, Impedance Matching CU-837/URC	4 x 4	

Radio-Auxiliary

June 1961

CU-872/U ANTENNA COUPLER

GAIN: 2 db porm 0 to 3 db within the frequency range.
PHASE: Less than porm 2 deg over frequency range.
ANTENNA (GFM)
IMPEDANCE: 70 ohms.
VSWR: Less than 3:1 over frequency range.
AMBIENT TEMPERATURE: 0 to P50 deg C (P32 deg to P122 deg F).
POWER REQUIREMENTS: 125 W, 115 porm 11.5 v or 230 porm 23 v, 48 to 62 cyc, single ph.
NOISE FIGURE: 6 db or better.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

Westinghouse Electric Corp., Baltimore, Maryland.
Dwg no. 485D894.
Contract NObsr-81489, dated 28 June 1960.
Approximate unit cost $1,164.16.

TUBE AND/OR CRYSTAL COMPLEMENT

(20) 6922 (1) OB2WA
Total Tubes (21)
No Crystals used.

REFERENCE DATA AND LITERATURE

NAVSHIPS 93803(A): Technical Manual for Antenna Coupler CU-872/U.

TYPE CLASSIFICATION (NAVY)
PROCUREMENT COGNIZANCE SPEC: SHIPS-C-3638, Amend 1
DESIGN COGNIZANCE USN, BUSHIPS
STOCK NO.
R.O.B. IDENT. NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu. Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Antenna Coupler CU-872/U	2.3	10 x 19 x 21	40

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Coupler CU-872/U	7 x 16-1/2 x 19	33
9	Connectors UG-21B/U	13/16 x 13/16 x 1-7/8	0.123
1	Connector AN3106A-14S-7S	1-1/8 x 1-1/8 x 1-7/16	
1	Technical Manual NAVSHIPS 93803(A)	1/2 x 9 x 11-1/2	

CUT-LS-33 MATCHING TRANSFORMER

RELATION TO OTHER EQUIPMENT:

The CUT-LS-33 is designed to be mounted in United Transformer Corporation's Case Model LS-2.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Matching Transformer LS-33		3-1/2 x 4-3/16 x 4-7/16	7-1/2

REFERENCE DATA AND LITERATURE:

United Transformer Corporation's Commercial Catalog for Matching Transformer CUT-LS-33.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: None used.

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: DESIGN COG: USN, BuShips
SPEC &/OR DWG: Commercial

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
United Transformer Corp. Model LS-33	New York, N.Y.		

Radio-Auxiliary

CV-172 /U FREQUENCY SHIFT CONVERTER

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Frequency Shift Converter CV-172/U			

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Frequency Shift Converter CV-172/U	6-1/2 x 16-1/2 x 19	