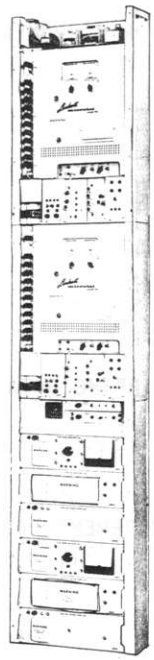
17 August 1967 MICROWAVE SYSTEM CBBY-74B

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Lenkurt Electric Co. Inc., (83744).



MICROWAVE SYSTEM CBBY-74B

FUNCTIONAL DESCRIPTION:

Microwave System Type CBBY-74B provides high-capacity, point-to-point communications for carrier-on-radio applications. The system operates within the 7125 to 8400 mc Government Band, and is available for either frequency or space-diversity operation. The system is particularly suited to the transmission of voice, teleprinter, high-speed numerical data, or graphic services. Up to 300 single-sideband, suppressed-carrier voice channels can be transmitted with excellent quality - 61 db signal-to-noise ratio per hop when loaded for 300 channels according to CCIR recommendations. 480 channels can be transmitted where performance requirements are less stringent. Many useful features are included as standard equipment to provide better and easier maintenance, and peak performance. The features include automatic frequency control on both the transmitter and receiver, RF power monitoring circuitry, pilot program circuitry, and a diversity combiner. Each transmitter-receiver is equipped with built-in meters for test and maintenance. Power supplies are similarly metered.

No field changes in effect at time of preparation (26 April 1967).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

POWER REQUIREMENTS:
AC OPERATION: 115 v ac ± 10%, 47 to 100 cyc, 6 amps.
BATTERY OPERATION: 24 v dc, 26 amp; or 48 v dc, 13 amp.
SYSTEM DATA
RADIO FREQUENCY RANGE: 7125 to 8400 mc.
FREQUENCY STABILITY: ± 0.02% or better.
PEAK FREQUENCY DEVIATION: ± 2 mc approx.
RF POWER OUTPUT: 1 W nom (+ 29 dbm ± 2 db).
ABSOLUTE OR NOISE THRESHOLD SENSITIVITY: − 91 dbm (− 121 dbw).
PRACTICAL THRESHOLD: − 81 dbm.
TOTAL NOISE PER SECTION: 21 dba.
H-F-BASEBAND DATA
FREQ RESPONSE FOR 300 CHANNELS (40 KC REF): 12-40 kc, + 0.2 − 0.5 db 40-1300 kc, ± 0.25 db.
INPUT LEVEL: − 6 to − 37 dbm.
OUTPUT LEVEL: − 15 dbm.
INPUT AND OUTPUT IMPEDANCE: 75 ohms, unbalanced.
SUPERVISORY DATA
FREQUENCY RANGE: 0.3 to 8 kc.
FREQUENCY RESPONSE: ± 1.0 db.
INPUT LEVEL (CHANNEL TEST TONE): + 10 to − 24.5 dbm.
OUTPUT LEVEL (CHANNEL TEST TONE): − 4 dbm, ± 1.5 db.
SUPERVISORY TONE LEVEL: 16 db below test tone level.
INPUT AND OUTPUT IMPEDANCE: 600 ohms balanced.
TRANSMITTER TRANSFER TIME DATA
MANUAL TRANSFER: Less than 1-1/2 ms.
LOSS OF PILOT OR RF OUTPUT: Less than 1-1/2 ms (for non-catastrophic-failure).

797

MAJOR COMPONENTS

QTY	ITEM	OVER-ALL DIMENSIONS (INCHES)	WEIGHT LBS
1	Microwave System CBBY-74B		

REFERENCE DATA AND LITERATURE:

LENKURT ELECTRONIC CO.: Catalog for Microtel Type 7BB 7125-8400 Megacycle Microwave for the Government Band.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: USN
SPEC &/OR DWG:

DESIGN COG: USN, NavShips

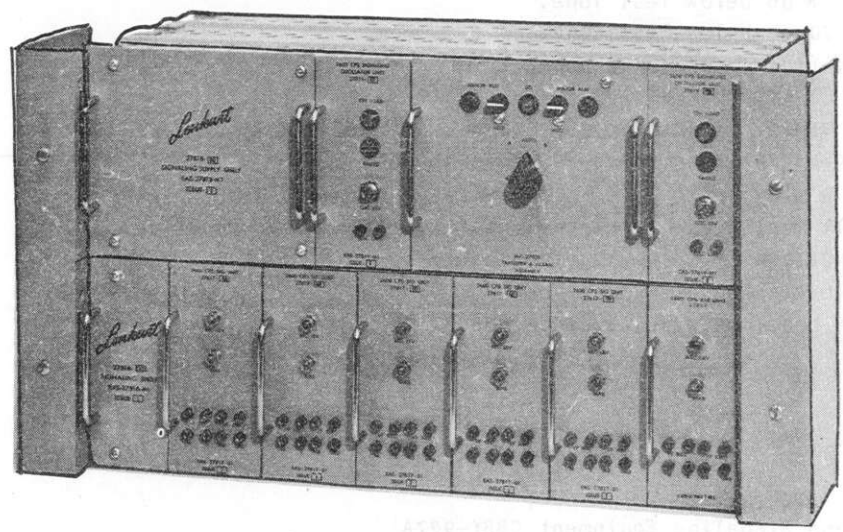
CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Lenkurt Electric Co. Inc.	San Carlos, Calif.	N600-59940	

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Lenkurt Electric CO., (83744).



IN-BAND SIGNALING EQUIPMENT CBBY-927A

799

FUNCTIONAL DESCRIPTION:

In-Band Signaling Equipment CBBY-927A provides fully transistorized equipment to convert d-c pulses to tone pulses and vice versa. It can be used with carrier systems where 2600-cyle E and M signaling is desired, and will operate end-to-end with W.E. 2600 cps signaling units adaptable to 4 wire lines. The equipment may be adapted to ac ringdown circuits by use of external converters, which are optionally available. The complete signaling equipment contains a signaling supply shelf and an appropriate number of signaling shelves. The supply shelf is equipped with a transfer and alarm subassembly, distribution facilities, and two plug-in oscillators. The signaling shelf provides mounting and wiring facilities for six plug-in signaling units. Each signal supply shelf will provide signal tone for as many as 144 channels. Strap-option resistive hybrids provide termination for application to either 600 ohm or 900 ohm 2 wire drops. The hybrids may be strapped out for application to 600 ohm 4-wire drop circuits or for use with external 4-wire terminating sets.

No field changes in effect at time of preparation (3 May 1967).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

POWER REQUIREMENTS: -48 vdc; 43 ma ea signaling unit; 500 ma signaling supply shelf.
IMPEDANCES(NOM): Drop (2-wire) -600 ohms or 900 ohms; Drop (4-wire) -600 ohms; Line (4-wire) -600 ohms.
LONGITUDINAL BALANCE: Greater than 35 db (500-2500 cps).
DROP LEVELS (TEST TONE): 2-wire transmit -0 dbm; 4-wire transmit, -16 dbm or -13 dbm 2-wire receive-adjustable; 4-wire receive, +7 dbm or +4 dbm (adjustable).
LINE LEVELS (TEST TONE): Transmit, -16 dbm or -13 dbm; Receive +7 dbm or +4 dbm (adjustable).
SIGNALING TONE LEVELS (TRANSMIT OR RECEIVE)
HIGH LEVEL: 8 db below Test Tone.
LOW LEVEL: 20 db below Test Tone.
BIAS DISTORTION (for 8 pps to 12 pps)
OVER SPECIFIED ENVIRONMENTAL TEMP RANGE: Less than 8%.
AT CONSTANT TEMP: Less than 2%.
V-F FREQ RESPONSE: Flat ±0.25 db (250 cps to 3500 cps).
RETURN LOSS OF RESISTANCE
HYBRID: Will meet present return-loss requirements for class 5 offices.
SIGNAL LEAD CONDITION
ON HOOK: M Lead Ground, E Lead-Open.
OFF HOOK: M Lead, -48 vdc, E Lead-Ground.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	In-Band Signaling Equipment CBBY-927A		

REFERENCE DATA AND LITERATURE:

Lenkurt Electric Co. Catalog Sheets for Type 927A In-Band Signaling Equipment.
NAVSHIPS 0967-0213-0010: Instruction Manual for 927A-40001-1 In-Band Signaling Equipment.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

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

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Lenkurt Electric Co.	San Carlos, Calif.	N600-61082 N600-59940 N600-63243 N600-63529 N600-65558	

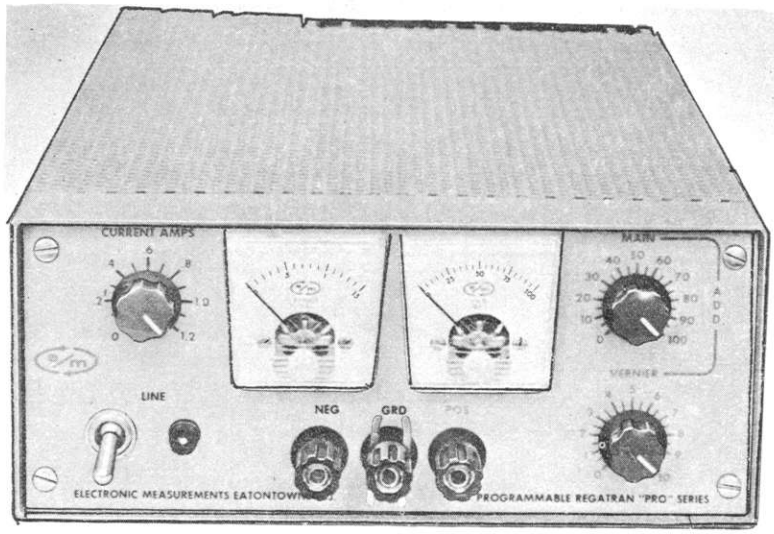
801

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Electronic Measurements Co. Inc. (89022)



POWER SUPPLY CBIK-PRO-100-1

FUNCTIONAL DESCRIPTION:

Power Supply CBIK-PRO-100-1 is a completely transistorized, highly regulated dc source with a continuously variable output. The use of semiconductor circuitry throughout insures instant start-up and exceptional efficiency in a lightweight, compact unit. A current limiting control provides continuously variable current through a wide range. The output current will not exceed the current limiter setting with an overload or short circuit. The power supply can be programmed (remotely controlled). A resistance connected between the REM and (+) terminals at the rear develops an output voltage at a constant programming ratio of 100 ohms per volt with an optional extra of 1000 ohms per volt. Rated operation is maintained during programmed operation.

No field changes in effect at time of preparation (27 April 1967).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

POWER REQUIREMENTS: 105 to 125 v ac, or 198 to 242 v ac, 1 ph, 50 to 60 cps.
DC OUTPUT: 0 to 100 v, 0 to 1 amp.
OUTPUT CONTROLS: Main -0 to 100 v; Fine -0 to 10 v; current limiter -0 to 1.2 amp.
REGULATION: 0.04% or 3 mv, line or load.
RIPPLE: 500 uv max rms value, either pos or neg grds.
TRANSIENT RESPONSE OUTPUT: Recovers to 50 mc; recovers in 100 usec.
WATTS INPUT: 165 W.
STABILITY: ±0.1% of 15 mv, whichever is greater, for 8 hrs after warmup, under fixed line, load, and temp.
TEMPERATURE COEFFICIENT: 0.1% per deg C.
OUTPUT IMPEDANCE: 0.03 ohm at 1 kc; 0.1 ohm at 50 kc.
PROGRAMMING CONSTANT: 100 ohms per v std; 1000 ohms per v optional.
OVERLOAD PROTECTION: Current limiting. Fused ac input and dc output.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Power Supply CBIK-PRO-100-1	3-1/2 x 9-1/2 x 12	20

803

REFERENCE DATA AND LITERATURE:

Electronic Measurements Co., Inc. Instruction Manual for Reggtran Semiconductor Power Supply Model PRO 100-1.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

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

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Electronic Measurements Co. Inc.	Eatontown, N.J.		

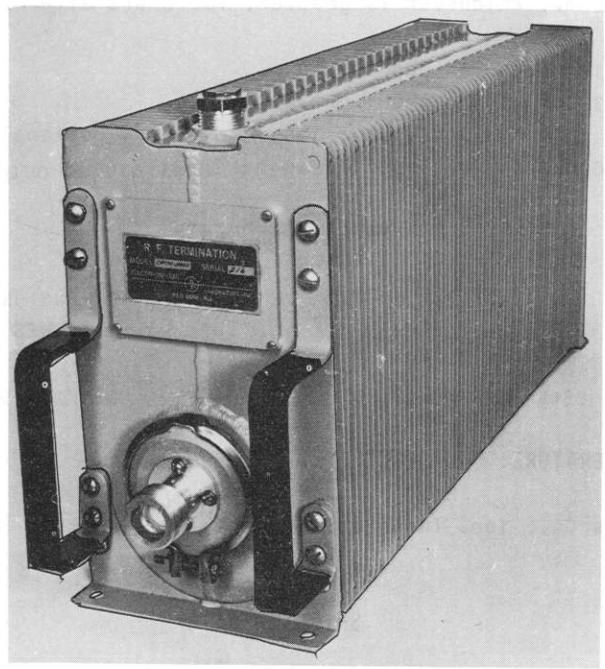
21 August 1967 R.F. TERMINATION CBRP-CPTN-3000

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Electro Impulse Laboratory Inc., (91161).



R.F. TERMINATION CBRP-CPTN-3000

FUNCTIONAL DESCRIPTION:

The R.F. Termination CBRP-CPTN-3000 is designed as a low-reflection and non-radiating termination for coaxial R.F. Termination lines to assist in tuning and trouble-shooting of transmitting equipment within its rating. It may be used in a fixed position or in portable applications on both ship and shore installations.

The R.F. Termination CPTN-3000 is a self contained equipment. No additional equipment or outside power source is needed. The load unit is rectangular in shape with transverse cooling fins spaced evenly along the entire length. Reinforced fins at front and rear are bent outward 90 degrees at the bottom to form mounting flanges. The R.F. Termination CPTN-3000 is useful for the following purposes: (A) As a substitute Antenna: (1) For tuning Transmitters-under Non-Radiating Conditions, (2) For making routine tests and adjustments; (B) As a substitute for any circuit loading element; (C) To measure, with a suitable indicating device, the power output of coaxially transmitted power within its rating.

No field changes in effect at time of preparation (6 March 1967).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

INPUT IMPEDANCE: 50 ohms nominal.
POWER INPUT: 2500 watts average, 5 kilowatt peak.
FREQUENCY RANGE: DC to 1000 mc.
VSW RATIO: 1.15 to 1.0 maximum.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	R.F. Termination CBRP-CPTN-3000	6-3/8 x 11-1/8 x 25	35

REFERENCE DATA AND LITERATURE:

NAVSHIPS 0969-101-5010: Technical Manual for R.F. Termination CBRP-CPTN-3000.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

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

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Electro Impulse Laboratory Inc.	Red Bank, New Jersey	N00600-67C-0632	

805

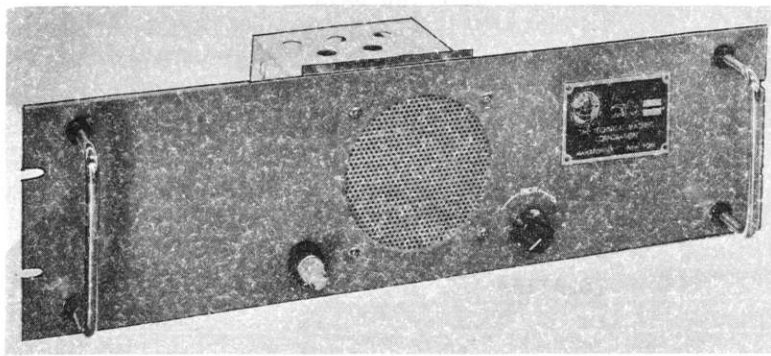
17 August 1967 BRIDGING SPEAKER PANEL CCLX-BSP-1D

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: The Technical Material Corporation, (82679).



BRIDGING SPEAKER PANEL CCLX-BSP-1D

FUNCTIONAL DESCRIPTION:

The Bridging Speaker Panel CCLX-BSP-1D is a loudspeaker panel designed to provide monitor capability for communication facilities with a wide selection of speakers available. Most of the speakers in this series are mounted on panels with one, two, or three speakers per panel. Some of the speaker panels in this series include transistorized bridging amplifiers with high impedance input for dynamic monitoring of audio circuits.

No field changes in effect at time of preparation (12 May 1966).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

AMPLIFIER POWER GAIN: Amplifier power gain is 36 dbm; Amplifier will provide 1 watt of output at input level of 6 dbm.
AMPLIFIER INPUT IMPEDANCE: 10,000 ohms, ungrounded.
AMPLIFIER DISTORTION: 2% at 1 watt at 400 cps.
AVERAGE AMPLIFIER FREQUENCY RESPONSE: 200 to 7000 cps at 3 db points.
HUM LEVEL: − 40 dbm at 1 watt output.
AMPLIFIER CONSTRUCTION: Solid state.
AMPLIFIER POWER REQUIREMENTS: 115 v ac, 50 to 60 cycles per second, approximately 8 watts per amplifier.
ENVIRONMENTAL CONDITIONS: Designed to operate in any ambient temperature between 0 deg and 50 deg C, and any value of humidity up to 95%.
COMPONENTS AND CONSTRUCTION: All equipment manufactured in accordance with JAN/MIL specifications wherever practicable.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Bridging Speaker Panel CCLX-BSP-1D	5-1/4 x 6-1/2 x 19	5

REFERENCE DATA AND LITERATURE:

THE TECHNICAL MATERIAL CORPORATION: Technical Manual for Bridging Speaker Panel Model BSP-1D.

807

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	2.7	15

PROCUREMENT DATA

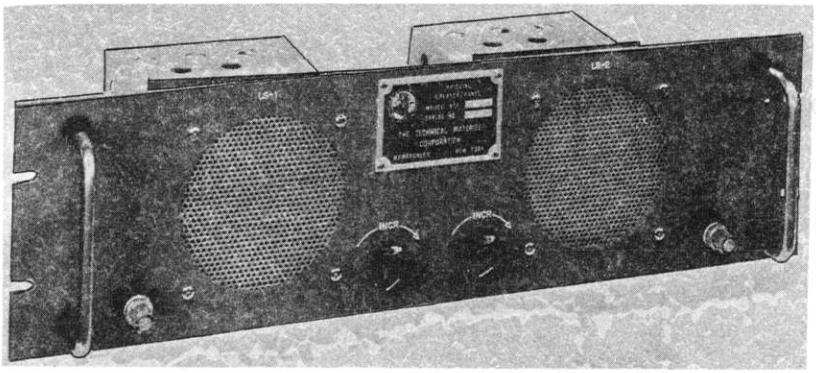
PROCURING SERVICE: USN
DESIGN COG: USN, NavShips
SPEC &/OR DWG:

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO	APPROX. UNIT COST
The Technical Material Corp. Model BSP-1D Bulletin No. 9008A	Mamaroneck, New York	N600(63133)65095	

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: The Technical Material Corporation, (82679).



BRIDGING SPEAKER PANEL CCLX-BSP-2D

808

FUNCTIONAL DESCRIPTION:

The Bridging Speaker Panel CCLX-BSP-2D provides monitor capability for communication facilities with a wide selection of speakers available. Most of the speakers in this series are mounted on panels with one, two, or three speakers per panel. Some of the speaker panels in this series include transistorized bridging amplifiers with high impedance input for dynamic monitoring of audio circuits.

The equipment includes two speakers.

No field changes in effect at time of preparation (13 May 1966).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

AMPLIFIER POWER GAIN: Amplifier power gain is 36 dbm. Amplifier will provide 1 watt of output at input level of − 6 dbm.
AMPLIFIER INPUT IMPEDANCE: 10,000 ohms, ungrounded.
AMPLIFIER DISTORTION: 2% at 1 watt at 400 cps.
AVERAGE AMPLIFIER FREQUENCY RESPONSE: 200 to 7000 cps at 3 db points.
HUM LEVEL: − 40 dbm at 1 watt output.
AMPLIFIER CONSTRUCTION: Solid State.
AMPLIFIER POWER REQUIREMENTS: 115 v ac, 50 to 60 cps, approximately 8 watts per amplifier.
ENVIRONMENTAL CONDITIONS: Designed to operate in any ambient temperature between 0 deg and 50 deg C, and any value of humidity up to 95%.
COMPONENTS AND CONSTRUCTION: All equipment manufactured in accordance with JAN/MIL specifications wherever practicable.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Bridging Speaker Panel CCLX-BSP-2D	5-1/4 x 6-1/2 x 19	7-1/2

REFERENCE DATA AND LITERATURE:

THE TECHNICAL MATERIAL CORPORATION: Technical Manual for Bridging Speaker Panel CCLX-BSP-2D.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	2.7	17

PROCUREMENT DATA

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

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
The Technical Material Corporation Model BSP-2D, TMC Bulletin No. 9008A	Mamaroneck, New York	N600(63133)65095	$270.00

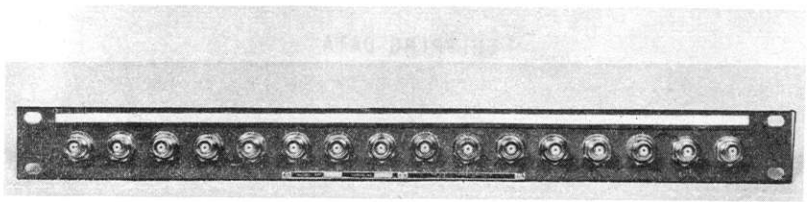
14 July 1967 RF PATCH PANEL CCLX-QDP-4A3X16

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Technical Material Corporation,(82679).



RF PATCH PANEL CCLX-QDP-4A3X16

FUNCTIONAL DESCRIPTION:

The RF Patch Panel CCLX-QDP-4A3X16 utilizes the unique, quick disconnect type coaxial connector for use in transmitting and patching schemes. The panel has a row of 16 QDM (Quick Disconnect Miniature) connectors on a 1 - 3/4 in. panel height increasing patching density area an additional 70% over existing panels. The QDM series has a rating of 500 volts and can be used with cables such as RG-58/U, RG-59/U, RG-223/6.

No field changes in effect at time of preparation (11 May 1966).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

VOLTAGE RATING: 500 volts.
CONSTRUCTION: 16 QDM connector front, 16BNC Connector rear.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	RF Patch Panel CCLX-QDP-4A3X16	1-3/4 x 6-1/2 x 19	4

REFERENCE DATA AND LITERATURE:

THE TECHNICAL MATERIAL CORPORATION: Technical Manual for RF Patch Panels QDP-4A3X16.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	5.0	6

PROCUREMENT DATA

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

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
The Technical Material Corp.	Mamaroneck, New York	N600(63133)65095	$160.00

Data Sheet-IMC No. IN-7000

811

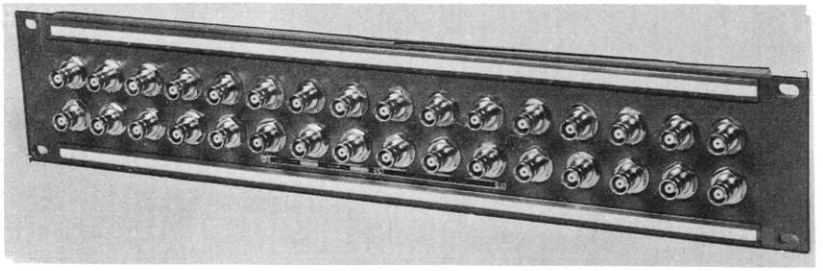
19 July 1967
Cog Service: USN **FSN:**

SWITCHING PATCH PANELS CCLX-SPP-40416
Functional Class:

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: The Technical Material Corporation (82679).



SWITCHING PATCH PANELS CCLX-SPP-40416

FUNCTIONAL DESCRIPTION:

The Switching Patch Panels CCLX-SPP-40416 is an improved switching panel for use in RF signal distribution systems where a "normalizing" patching scheme is indicated.

This panel is a major advance of patching techniques for antennas, receivers, T.V., video devices and many other equipments. The switch mechanism in this device is of a new coaxial design providing a positive action locking arrangement for the mating plug. The patch panel is to be used with mating cable assembly CA-480 series.

No field changes in effect at time of preparation (12 May 1966).

RELATION TO OTHER EQUIPMENT:

The CCLX-SPP-40416 replaced various AN type jack panels and their associated rear jumper connections.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None

812

TECHNICAL CHARACTERISTICS:

VSWR: The VSWR via normal or "switched" path does not exceed 1.02/1 over the frequency range of 2 to 32 megacycles.

ISOLATION: The isolation from jack to jack with "normals" terminated is 55 db at 8 megacycles, 42 db at 30 megacycles.

CONNECTOR TYPE: Dual QDM to dual selective (UHF, BNC "N" or "C".)

CONNECTOR QUANTITY: Front 32, Rear 32, 16 switches.

CONSTRUCTION: The switchihg device is completely sealed, and the assembly is of Rhodium-Teflon, Gold construction throughout. These units have exceeded shock and vibration tests of MIL-S-901 and MIL-STD-167.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Switching Patch Panels, Model CCLX-SPP-40416	3-1/4 x 3-1/2 x 19	7

REFERENCE DATA AND LITERATURE:

THE TECHNICAL MATERIAL CORPORATION: Technical Manual for Switching Patch Panels SPP-40416.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	5.0	9

PROCUREMENT DATA

PROCURING SERVICE: USN DESIGN COG: USN, NavShips

SPEC &/OR DWG:

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
The Technical Material Corporation	Mamaroneck, New York	N600(63133) 65095	$566.00

813

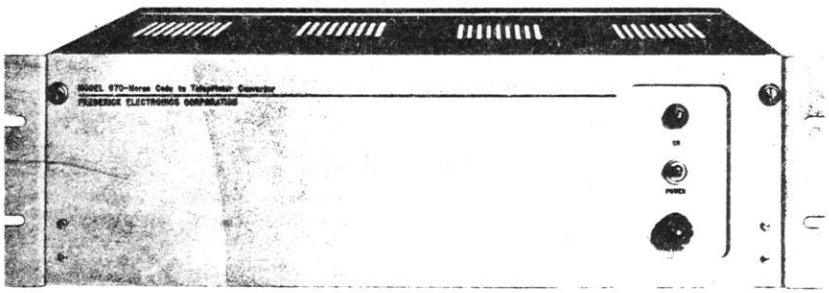
21 October 1966 MORSE CODE TO TELEPRINTER CONVERTER CDR-670

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Frederick Electronics Corporation, (15230).



MORSE CODE TO TELEPRINTER CONVERTER CDCR-670

FUNCTIONAL DESCRIPTION:

The Morse Code to Teleprinter Converter CDCR-670 is designed and developed to provide direct conversion of International Morse Code signals to standard 5 level or Baudot teleprinter code. The Morse signal supplied as an input to the CDCR-670 may vary widely in element length or speed depending on its origin. It may be machine generated or hand-keyed by an operator. This wide latitude of input signal characteristics poses a complex problem to the converter, since the device may be required to copy stations of considerably different word per minute rates, in unpredictable order, or even track the "fist" of human operators' whose style and technique are highly individualized. To solve this problem, the CDCR-670 continuously computes the input rate and automatically adjusts itself to variations that may occur.

No field changes in effect at time of preparation (5 August 1966).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

INPUT SIGNAL: International Morse Code.
INPUT RATE: 10 to 50 words per minute.
ALLOWABLE-INPUT SPEED VARIATIONS: The Model-670 will compensate for instantaneous variation of input rate of approximately 30% of the average rate
INPUT CIRCUIT: All electronic and isolated. Will accept standard 60 ma neutral telegraph loop. Other input configurations available on special order.
INPUT IMPEDANCE: Less than 100 ohms.
CONVERSION FORMAT: Normally supplied to convert International Morse to five level code conforming to CCIT-2 keyboard. Other conversions could be supplied on special order.
OUTPUT SIGNAL: 5 level, start-stop, teleprinter code 7.0 units or longer in length.
OUTPUT CIRCUIT: All electronic, suitable for driving standard 60 ma neutral telegraph loop. Other configurations could be supplied on special order.
OUTPUT RATE: 45.45, 50.0, 56.9 or 74.2 baud, as selected by strap connection or rear panel terminal strip.
POWER REQUIREMENTS: 100 to 130 v ac, 47 to 63 cycles, 15 W.
PHYSICAL CONSTRUCTION: All solid state, modular construction. Mounts in 5-1/4 inch of 19 inch rack space..

815

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Morse Code To Teleprinter Converter, CDCR-670		

REFERENCE DATA AND LITERATURE:

Frederick Electronics Corporation: Technical Description for Morse Code To Teleprinter Converter Model-670.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

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

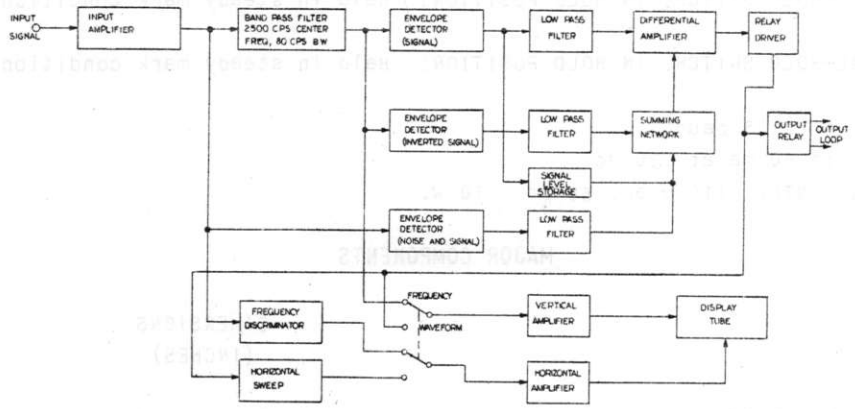
CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Frederick Electronics Corp.	Frederick, Maryland	N600(63133)64427	

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Frederick Electronics Corporation, (15230).



TONE DETECTOR CDCR-MODEL-1201

817

FUNCTIONAL DESCRIPTION:

The Tone Detector CDCR-1201 is designed to serve as an interface between a conventional communications receiver and the Frederick Electronics Corporation Morse to Teleprinter Converter, Model-670. The CDCR-1201 accepts, from the receiver, Morse Code signals up to 75 baud in the form of a keyed 2500 cycle audio tone. A system of detection and filtering is provided to permit solid copy over a wide variation in signal to noise ratio and in the presence of rapid fading. After detection and filtering, the Morse information is conditioned to provide signals suitable for keying the 60 ma neutral input loop of the Model-670. The design includes a display module which may be utilized as a visual aid for receiver tuning or to observe the quality of the Morse signals at the output of the detector.

No field changes in effect at time of preparation (5 August 1966).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Morse to Teleprinter Converter, Model-670.

TECHNICAL CHARACTERISTICS:

INPUT
CIRCUIT: Single-ended.
IMPEDANCE: 5,000 ohms, nominal.
SIGNAL
2,500 cps audio tone at 0 dbm or greater from a communications receiver. Detector will not operate when input signal drops to − 20 db level.
BAUD RATE: Up to 75 baud.
OUTPUT
CIRCUIT: "Contacts" of an electronic relay.
SIGNAL:
(a) NORMAL-HOLD SWITCH, IN HOLD POSITION: Held in steady mark condition for all inputs.
(b) NORMAL-HOLD SWITCH, IN HOLD POSITION: Held in steady mark condition for all inputs.
BAUD RATE: Up to 75 baud.
CURRENT: Up to 60 ma at 130 dc.
POWER REQUIREMENTS: 115 v ac, 60 cps, 10 W.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Tone Detector CDCR-1201	5-1/4 x 18 x 19	30

REFERENCE DATA AND LITERATURE:

Frederick Electronics Corporation: Technical Description for Tone Detector, Model-1201.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

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

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Frederick Electronics Corp., Model-1201	Frederick, Maryland	N600(63133)64427	

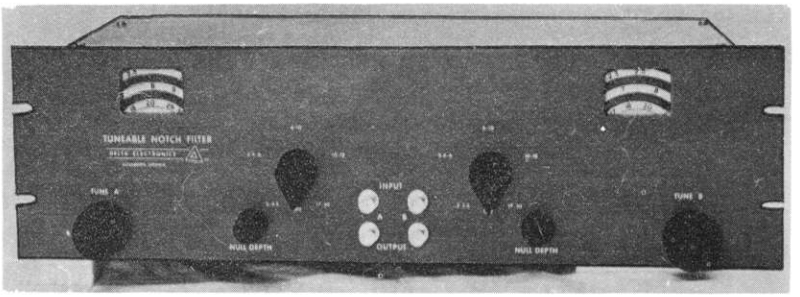
819

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Delta Electronics Incorporated, (19482).



FILTER, BAND SUPPRESSION CDDB-TNF-2

FUNCTIONAL DESCRIPTION:

Filter, Band Suppression CDDB-TNF-2, is a rack-mounted dual tunable notch filter, providing rejection of undesired frequencies at the input of communications receivers operating in the 2 to 30 megacycle frequency range. Two identical filters mounted on a common chassis may be connected in series for notching out two frequencies for one receiver or may be operated independently to provide filtering for two separate receivers. The filters are capable of rejecting relatively high level signals for preventing receiver overload from locally transmitted signals.

No field changes in effect at time of preparation (21 March 1967).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

TUNABLE FREQUENCY RANGE: 2 to 30 mc in 5 bands.

NOMINAL IMPEDANCE: 70 ohms.
RESIDUAL INSERTION LOSS: (off rejected frequency); 1.5 db (2 to 30 mc); greater than 60 db below 1.5 mc w/high-pass filter.
RESIDUAL VSWR (OFF REJECTED FREQUENCY): 1.5 to 1 (3 to 30 mc); 2.0 to 1 (2 to 3 mc w/high pass filter).
NULL DEPTH: Variable to 50 db.
CONTROLS: Band switch; variable frequency dial, null depth.
BAND SWITCH POSITIONS: (1) Filter out of circuit.
BAND 1: 2 to 3.5 mc.
BAND 2: 3.4 to 6 mc.
BAND 3: 5.9 to 10.2 mc.
BAND 4: 10 to 18 mc.
BAND 5: 17 to 30 mc.
MAXIMUM RECOMMENDED INPUT RF VOLTAGE: 50 v rms (open circuit).
NOTCH WIDTH: ± 12% max for 3 db points.
TERMINALS: Type BNC.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Filter, Band Suppression CDDB-TNF-2		

REFERENCE DATA AND LITERATURE:

D93-38A: Delta Electronics, Inc. Technical Manual for Tunable Notch Filter, Model TNF-2.

821

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	0.87	15

PROCUREMENT DATA

PROCURING SERIVCE: USN
DESIGN COG: USN, NavAir
SPEC &/OR DWG:

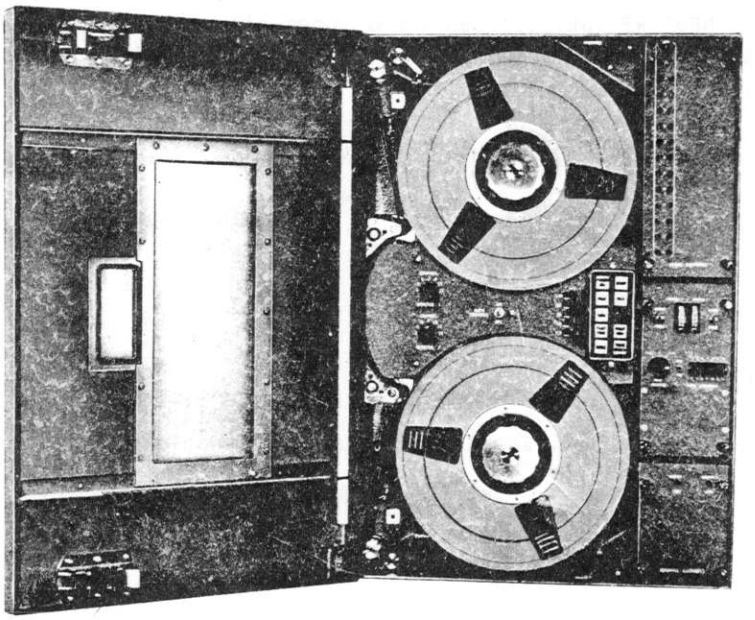
CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Delta Electronics Inc.	Alexandria, Va.	N00-67-C-0489	

Cog Service: USN FSN: Functional Class:

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Winston Research Corporation, (17774).



WIDE-BAND TAPE RECORDER/REPRODUCER CFJ-P-5114B

FUNCTIONAL DESCRIPTION:

Wide-Band Tape Recorder/Reproducer CFJ-P-5114B, is a portable wide-band instrumentation tape recorder/reproducer. The instrument provides analog signal record/reproduce capability in selected bandwidths from 800 cps to 2.0 mc. The P-5114B features direct recording of 2, 4 or 14 tracks per pass and direct reproducing of any selected 2 tracks.

No field changes in effect at time of preparation (14 September 1966).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

HEADS: Track dimensions and track spacing conform to IRIG specifications. Gap Azimuth: Record heads held within ± 1 minute perpendicular to the head base plate. Reproduce heads adjustable within a range of ± 1 degree of nominal azimuth. Gap Scatter: Trailing edges held within ± 50 micro-inches.

HEAD REPLACEMENT: Each individual head stack can be separately replaced in the field without any special tools or optical aligning equipment.

2.0 MC DIRECT RECORD/REPRODUCE SYSTEM:

FREQUENCY RESPONSE: 800 cps to 2 mc ± 3 db at 120 ips.
800 cps to 1 mc ± 3 db at 60 ips.
800 cps to 500 kc ± 3 db at 30 ips.
400 cps to 200 kc ± 3 db at 15 ips.
400 cps to 100 kc ± 3 db at 7-1/2 ips.

SIGNAL-TO-NOISE RATIO: 17 db rms signal-to-rms noise over the specified passband.

HARMONIC DISTORTION: Less than 1.5% third harmonic distortion of a 10,000 cps signal recorded at 60 ips.

INPUT IMPEDANCE: 1,000 ohms unbalanced to ground.

SIGNAL SOURCE IMPEDANCE: 91 ohms.

INPUT LEVEL: Nominal input level of 1.0 volt rms. Input sensitivity 0.25 to 10 volts rms.

OUTPUT: 1.0 volt rms into 91 ohms.

TAPE TRANSPORT:

TAPE SPEEDS: 7-1/2, 15, 30, 60 and 120 ips. All tape speeds are front panel selectable.

AVERAGE TAPE ± 0.3% of nominal selected tape.

SPEED ACCURACY: Speed.

WOW AND FLUTTER: Tape,

Speed (ips)	Flutter (% P/P)	Bandwidth (cps)
120	0.3	0.1 to 10,000
60	0.3	0.1 to 10,000
30	0.5	0.1 to 5,000
15	0.6	0.1 to 2,500
7-1/2	0.8	0.1 to 1,250

REEL AND TAPE: Standard 10-1/2 inch NAB REELS.

SIZES: 1-inch wide tape.

RECORDING TIME: Twelve minutes at 60 ips.

REWIND TIME: Less than four minutes for 3,600 feet of tape.

NUMBER OF TRACKS: 14, IRIG configuration.

END-OF-TAPE SENSING: In record or reproduce mode, the transport automatically stops before the end of the tape supply is reached, leaving the tape threaded to the reels. In any mode, the transport automatically stops in the event of tape breakage.

AUTOMATIC TRANSFER(OPTIONAL): Utilizing two complete systems, operations are automatically transferred, alternately, from one machine to the other without the loss of signal data.

MONITOR FACILITY

PEAK READING METERS: Two peak reading meters, with suitable selector switches for monitoring inputs or outputs of any 2 of the 14 channels, are contained within the basic system dimensions.

SIGNAL CONNECTORS: All input and output signal connections are made via BNC connectors.

AC POWER SUPPLY: 115 ± 10%, single phase, 50 to 400 cps;
(INTERNAL) or 230 ± 10%, single phase, 50 to 400 cps ac.

POWER INPUT: 400 W, approximately.
OPERATING TEMPERATURE: 0 deg C to + 55 deg C with direct electronics.
OPERATION POSITION: The P-5114B will operate in any position; Per MIL-I-16910 C.
RFI
REMOTE CONTROL
(OPTIONAL)
CONTROLS: All tape transport controls except power ON/OFF, are available on the remote Control Unit.
INDICATORS: All tape transport indicators, including the tape speed indicators, are available on the remote control unit.
SIGNAL
GENERATOR: A built-in control track generator can be used to provide 100 kc at 60 ips
(OPTIONAL) or a multiple there-of, proportional to tape speed.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Wide-Band Tape Recorder/Reproducer CFJ-P-5114B	11 x 17-5/8 x 24-1/2	150

REFERENCE DATA AND LITERATURE:

Operation and Maintenance Manual for Portable Magnetic Tape Recorder/Reproducer System Model P-5114B.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	32	238

PROCUREMENT DATA

PROCURING SERVICE: USN
DESIGN COG: USN, NavShips
SPEC &/OR DWG: MIL-I-16910C

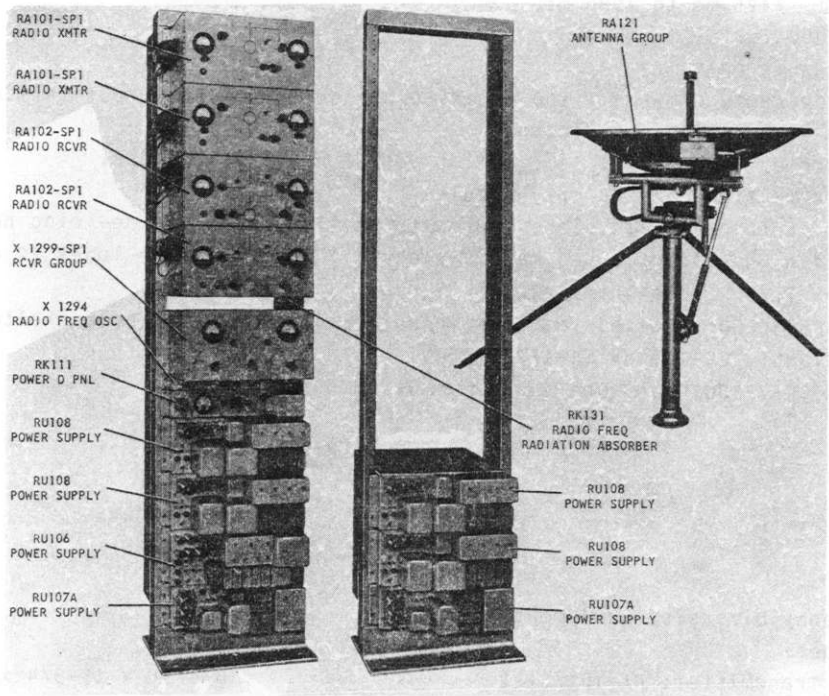
CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Winston Research Corp., Part no. P-5114B Dwg no. A-60110-01	Los Angeles, Calif.	N600(63133-126)65487	$31,000

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Motorola Inc., (80211).



RF FREQUENCY DIVERSITY EQUIPMENT CGG/MRR-4

FUNCTIONAL DESCRIPTION:

The RF Frequency Diversity Equipment is designed to provide point-to-point communication by means of two frequency modulated radio carriers, each of which bears the same modulation intelligence. In this manner, Frequency Diversity Equipment offers protection against communications interruption due to selective fading. The equipment operates in the microwave band from 7125 mc to 7985 mc.

No field changes in effect at time of preparation (18 July 1966).

RELATION TO OTHER EQUIPMENT:

The components of the equipment are similar to those of MCR-2 equipment, a fixed commercial version of a frequency diversity system. The rack layout is different between the two equipments.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

For the equipment to fulfill its purpose, FM or single sideband multiplex units such as Motorola MC-20 or MC-50 equipment is needed.

TECHNICAL CHARACTERISTICS:

TYPE OF RECEPTION AND TRANSMISSION: Frequency Diversity FM modulated Microwave Carriers.
FREQUENCY RANGE: 7125 mc to 7985 mc.
POWER OUTPUT: 100 mw.
OUTPUT SIGNAL CHARACTERISTICS
FOR VISUAL AND/OR AUDIO OUTPUTS: 100 mv at 60 cps to 1 mc with output terminated in 75 ohms.
RANGES AS RATED: Line-of-sight distance.
ACCURACIES: Carrier frequency ± 3 mc, Pilot tone frequency ± 75 cps.
POWER REQUIREMENT: 115 v ac, 60 cps, single ph.
ANTENNA SYSTEM: 6 ft parabolic dish; thermostatically controlled de-icing heaters; center-fed; beam width, H plane 1.5 deg max, E plane 1.7 deg max, side lobes 22 db down min; gain 40 db min; VSWR less than 1.20.
WHERE AND HOW INSTALLED: Bolted to floor in building or transportable shelter.
MOUNTING DIMENSIONS: 20-1/2 by 15-1/2 inches.
NUMBER OF OPERATORS REQUIRED: One technician at each terminal.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	RF Frequency Diversity Equipment CGG/MRR-4 includes:		
4	Radio Transmitter: RA-101/SP-1	8-5/16 x 11-3/4 x 19	20
4	Radio Receiver: RA-102/SP-1	8-5/16 x 11-3/4 x 19	20
2	Antenna Group: RA-121	37 x 73-13/16 x 93	153
2	Power Distribution Panel: RK-111	3-1/2 x 8 x 19	8
2	Power Supply: RU-106	7 x 8 x 19	29
4	Power Supply: RU-107A	5-1/4 x 7 x 19	16
8	Power Supply: RU-108	7 x 8-3/8 x 19	30
2	Radio Frequency Oscillator: X-1294	1-3/4 x 7-1/2 x 19	3
2	Receiver Group: X-1299/SP-1	8-3/4 x 11-1/2 x 19	31
2	Electrical Equipment Rack: RK-105	15-1/2 x 20-1/2 x 83-1/8	160
2	Radio Frequency Radiation Absorber: RK-131	1-1/16 x 1-1/2 x 2-1/4	3/4
2	Waveguide Monitor Coupler: RK-162	4 x 4 x 5-1/2	5
*			

Note 1.
* Estimated. For this installation the Kit contains an 18 in. flexible Waveguide section and a 6 in. rigid Waveguide section.

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94138: Instruction Manual for RF Frequency Diversity Equipment 700S-75331-0.

826

SHIPPING DATA

PKG	VOLUME (CU FT)	WEIGHT (LBS)
1	29	375
1	9	160
1	6	100
1	72	250
1	36	250
1	29	375
1	9	160
1	6	100
1	72	250
1	36	250

PROCUREMENT DATA

PROCURING SERVICE: USN
DESIGN COG: USN NavShips
SPEC &/OR DWG: MIL-E-17362A

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Motorola Inc.	Chicago, Illinois	NObsr-75054	

827

23 November 1965 COMPARATOR, SIGNAL CM-167/U
Cog Service: USN FSN: 2F6625-776-5941 Functional Class:

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Freedman and Freedman & Co. Inc., (01486).

COMPARATOR, SIGNAL CM-167/U

FUNCTIONAL DESCRIPTION:

Comparator, Signal CM-167/U mixes two frequencies and delivers an output proportionate to the difference of the two inputs.

This equipment when used with a strip chart recorder, such as the RD-49A/U, will compare two almost equal frequency standards whose frequency are either 100 kc or 1 megacycle.

The difference and the relationship will be recorded as a sine wave whose frequency is the exact difference between the two standards.

No field changes in effect at time of preparation (27 May 1964).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

A recorder, such as the RD-49A/U is required for the operation of Signal Comparator CM-167/U.

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 100 kc to 1 mc.
INPUT LEVEL: 1 v rms to either input
INPUT IMPEDANCE: 50 to 5000 ohms
INPUT TERMINALS: BNC.
OUTPUT LEVEL: 0.5 ma peak to peak.
OUTPUT IMPEDANCE: 1300 ohms of type RD-49A/U Recorder

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Comparator, Signal CM-167/U	2F6625-776-5941	3-1/2 x 3-5/8 x 6-5/8	1.25

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94111: Technical Manual for Signal Comparator CM-167/U.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: Not required.

CRYSTALS: Not required.

SEMI-CONDUCTORS: (4) 1N281

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	0.21	3

PROCUREMENT DATA

PROCURING SERVICE: USN DESIGN COG: USN, BuShips
SPEC &/OR DWG: MIL-C-21624(SHIPS)

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Freedman And Freedman & Co. Inc.	Brooklyn, N. Y.	NObsr 75907 22 Jun 1959	$45.00

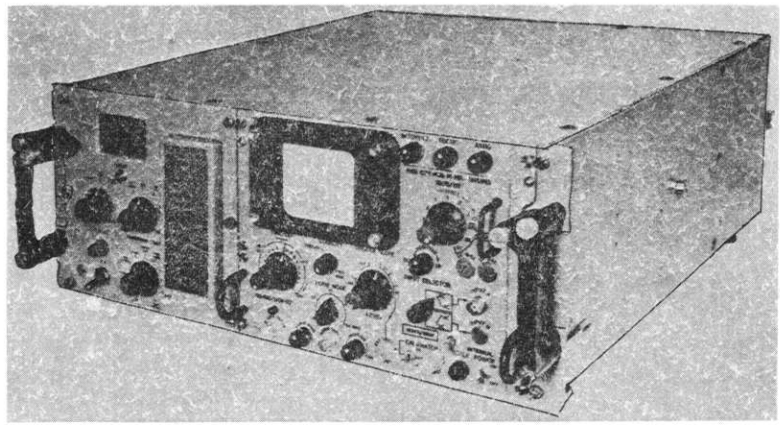
16 January 1967 COMPARATOR DIGITAL DATA CM-296/SRC-17

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Manson Laboratories Division, The Hallicrafters Company, (93279).



COMPARATOR DIGITAL DATA CM-296/SRC-17

FUNCTIONAL DESCRIPTION:

The Comparator Digital Data CM-296/SRC-17, compares pulse data supplied to the transmitter of UHF transmitting and receiving sets with leakage data received at the antenna at operating frequencies ranging from 225 to 400 megacycles. In addition to its data monitoring function, the comparator has a test signal generating circuit that can simulate synchronizing pulse signals, data pulse signals, or control pulse signals. These simulated signals are useful for checking operation of the radio set with which the comparator is used. These same signals can also be used for self-checking the comparator comparison circuits for operational confidence without the use of computer input data.

No field changes in effect at time of preparation (26 May 1966).

RELATION TO OTHER EQUIPMENT:

The Comparator Digital Data, CM-296/SRC-17 is a modified version of Visual Data Monitor, IP-598(XN-1)SRC-17, except parts differ.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Mounting (Anti-Vibration fixture) MT; (4) Mounting Brackets (Outer Chassis) 100-067-024, 100-067-025; (1) Technical Manual NAVSHIPS 900,000; (1) Handbook of Electronic Circuits: NAVSHIPS 900,000.102; (1) Technical Manual NAVSHIPS 94344(A); (1) Electronic Multimeter (vtvm) ME-26/U; (1) Instruction Book T.O. 33A1-12-171; (1) Transistor, Test Set TS-1100A/U; (1) Technical Manual NAVSHIPS 93277.

TECHNICAL CHARACTERISTICS:

BINARY INPUTS: Control Message, Radio Sync, Carrier Relay Message.
(1) LEVEL: Binary Zero, − 3 to − 4.5 v; Binary one, 0 to − 0.5 v.
(2) IMPEDANCE: 200 ohms (25,000 for reply message).
SINE WAVE INPUT: 100 kc reference.
(1) LEVEL: 1 vrms.
(2) INPUT IMPEDANCE: 300 ohms.
ERROR READOUT CAPACITY: 99 maximum.
DATA RATE: 5000 bits per second.
PULSE AND SIGNAL FALL AND RISE TIMES: 1 usec maximum.
TEST OUTPUTS
(1) LEVEL: Binary zero, 3 to 4.5 v; binary one, 0 to 0.5 v.
(2) IMPEDANCE: 20 ohms maximum.
RADIO ERROR OUTPUT: 6 v ± 1 v.
POWER REQUIREMENTS: 115 v ac ± 10%, 50 to 400 cycles, single phase at 530 milliamperes.
MOUNTING: Bench or Relay Rack.

831

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Comparator Digital Data CM-296/SRC-17 includes:	7-1/2 x 17-1/2 x 20-1/2	66
2	Technical Manual NAVSHIPS 95870	3/4 x 8-1/2 x 11	
1	Maintenance Standards Book for Digital Data Comparator CM-296/SRC-17	1/2 x 9 x 11-1/2	
1	Power Cable W-1	6 ft. length	
1	Oscilloscope Accessory Kit KT		

REFERENCE DATA AND LITERATURE:

NAVSHIPS 95870: Technical Manual for Digital Data Comparator CM-296/SRC-17.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: USN
SPEC &/OR DWG:

DESIGN COG: USN, NavShips

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Manson Laboratories Div.	Wilton, Conn.	NObsr 87289	
The Hallicrafters Co.		NObsr 87560	

Cog Service: USAF FSN: Functional Class:

USA USN USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Douglas Microwave Co., Inc., (00341).

ATTENUATOR CN-29/UP

FUNCTIONAL DESCRIPTION:

Attenuator CN-29/UP attenuates power by a factor of 20 db nominal or 100x. It is used with power measuring equipment and signal generators between a power source and measuring equipment.

No field changes in effect at time of preparation (13 July 1965).

RELATION TO OTHER EQUIPMENT:

Similar to CN-42/UP and CN-43/UP Attenuators except for attenuation value.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 2.5 to 3.33 kmc.

ATTENUATOR CN-29/UP

POWER: 1 W average; 1 kw peak.
CALIBRATION ACCURACY: 20 db ± 1 db at 25° C at 2.7 kmc.
FREQUENCY SENSITIVITY: Variation in attenuation 1.4 db over freq range.
VSWR: 1.25 to 1 over freq range.
INSTALLATION DATA: Unit installed into type N transmission line. A male type N connector is installed at the input end and female type N connector is installed on the output end.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Attenuator CN-29/UP		

REFERENCE DATA AND LITERATURE:

Advance Data Sheets for Attenuator CN-29/UP.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: Not required.

CRYSTALS: Not required.

SEMI-CONDUCTORS: Not required.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: USAF DESIGN COG: USAF
SPEC &/OR DWG: MIL-A-4637(USAF)

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Douglas Microwave Co., Inc.	Mount Vernon, N.Y.	NObsr-85443	

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Loral Electronics Corporation, (81413).

COMPUTER AIR NAVIGATION CP-336/ASA-24

FUNCTIONAL DESCRIPTION:

Computer Air Navigation CP-336/ASA-24 uses time, automatically inserted heading, and manually inserted wind speed and wind direction to generate the following data as voltage outputs: (a) North - south and east - west components of wind; (b) Range from an initial fix; (c) Wind direction.

In addition, the heading input is routed through the computer and supplied to associated equipment. A dial on the computer indicates wind direction. Counters indicate time and wind speed.

No field changes in effect at time of preparation (25 March 1965).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

AIR SPEED: 100 to 400 knots.
WIND SPEED: 0 to 120 knots.
AC POWER: 0.1 va, 11 v, 380 to 420 cps, single ph, 26 v, 380 to 420 cps, single ph.
DC POWER: 1.5 amps max at 25 to 29 v; 5 ma at 250 v.
TEMPERATURE: - 55 to + 55° C (- 67 to + 131° F).

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Computer Air Navigation CP-336/ASA-24			

REFERENCE DATA AND LITERATURE:

NAVWEPS 16-35CP336-1: Handbook of Overhaul Instructions for Air Navigation Computer CP-336/ASA-24.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: Not required.

CRYSTALS: Not required.

SEMI-CONDUCTORS: Not required.

836

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

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

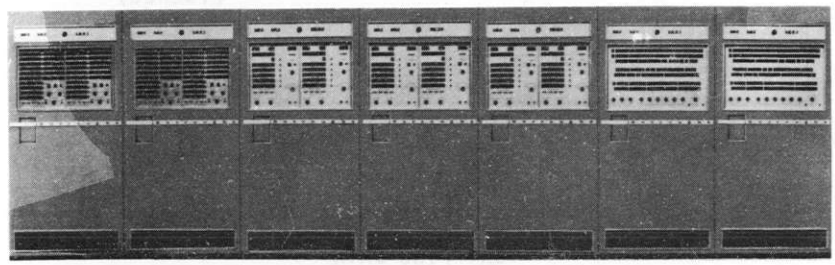
CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Loral Electronics Corporation	New York, New York	N383-72175A	

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Burroughs Corp., Defense and Space Group, (15416).



COMPUTER DIGITAL DATA CP-719A/GYK-4

837

FUNCTIONAL DESCRIPTION:

Computer Digital Data CP-719A/GYK-4 is a three megacycle synchronous general purpose computer which processes data and performs arithmetic operations. The computer consists of the following functional areas: arithmetic unit; control unit; and the thin film memory unit. The arithmetic unit contains the registers and adder circuitry necessary to perform all arithmetic and logical operations. The control unit contains the gates which generate the sub-commands and timing necessary for executing the instructions entered into the computer. The thin Film Memory unit contains an operand stack and the control registers which are used by the computer logic. The computer also has a self-contained power supply, control, and a real time clock.

No field changes in effect at time of preparation (26 May 1966).

RELATION TO OTHER EQUIPMENT:

The CP-719A/GYK-4 is one way interchangeable with CP-719/GYK-4.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Core Memory Unit MU-468A/GYK-4; (1) Controller Comparator C-4634A/GYK-4.

TECHNICAL CHARACTERISTICS:

POWER REQUIREMENTS
- VOLTAGE: 102 to 208 v ± 10%.
- FREQUENCY: 60 cps.
- PHASE: 3.
- POWER: 2.22 kva.
- POWER FACTOR: 0.903.

HEAT DISSIPATION: 7030 BTU per hr.
AMBIENT TEMPERATURE: 32 to 104° F.
RELATIVE HUMIDITY: 95%.
AMBIENT LIGHTING: 50 foot candles max.
THIN FILM STORAGE CAPACITY: 64-12 bit syllable and 64-16 bit syllable.
THIN FILM READ-WRITE CYCLE TIME: 333 usec per 12 bit or 16 bit data group.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
2	Digital Data Computer CP-719A/GYK-4	28 x 39 x 80	1655

REFERENCE DATA AND LITERATURE:

NAVSHIPS 96051: Technical Manual for Computer, Digital Data CP-719A/GYK-4.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	93	2105

PROCUREMENT DATA

PROCURING SERVICE: USN
DESIGN COG: USN, NavShips
SPEC &/OR DWG: SHIPS-D-4542

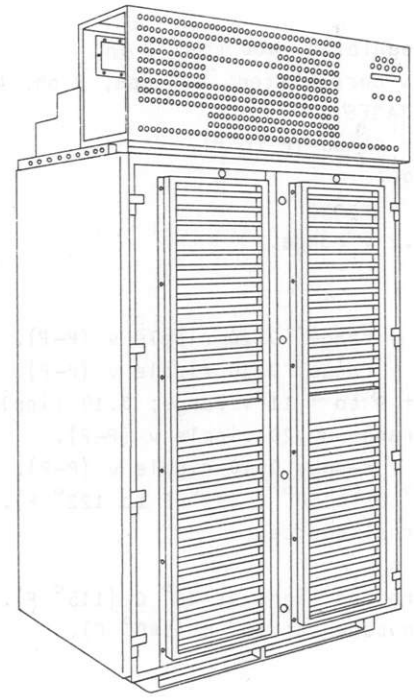
CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Burroughs Corporation Defense and Space Group	Paoli, Penn.	NObsr 91181	

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Univac Div. of Sperry Rand Corporation, (90536).



COMPUTER, DIGITAL DATA CP-808/TYK

FUNCTIONAL DESCRIPTION:

839

Computer, Digital Data CP-808/TYK is a general purpose, stored program, real time digital computer capable of processing a large quantity of complex data where heavy input/output communication is required.

The computer is suitable for such real-time applications as missile guidance, range safety, process monitoring, and tactical control and display. It may be connected simultaneously to a variety of UNIVAC military-qualified or commercial peripheral equipments, such as: Teletypewriter units, Magnetic tape units, High-speed printer units, Card read/punch units, Display and display interface equipment, Radar and radar adaption interfaces, Paper tape units and Manual entry devices. The computer is also capable of communicating with a wide variety of other manufacturer's a synchronous external devices in real time applications. In addition to the peripheral equipment listed, other compatible peripheral equipment includes; video processors, various types of displays, digital-to-analog converters, analog-to-digital converters, X-Y plotters, and high-speed radio transmission links.

No field changes in effect at time of preparation (28 June 1965).

RELATION TO OTHER EQUIPMENT:

The CP-808/TYK consists of a UNIVAC CP-642B Computer modified for use inside portable shelters.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

POWER REQUIREMENTS
- INPUT, INTERLOCK: 120 v unregulated, 400 cps, 1 ph.
- INPUT, COMPUTER LOGIC: 208 v unregulated, 400 cps, 3 ph, 4 wire.

CONSOLE POWER SUPPLY OUTPUT VOLTAGES
- − 90.5 V DC: − 80 to − 100 v range (P to P).
- − 54 V DC: − 48 to 60 v range.
- − 15 V DC: − 13.5 to − 16.5 v range.
- − 26.5 V DC: − 23.8 to − 29.2 v range.
- 12 V AC: 10 to 14 v range.

REGULATED POWER OUTPUT VOLTAGES
- − 15 V DC: − 13.5 to − 16.5 v range; 0.20 ripple v (P-P).
- + 15 V DC: + 13.5 to + 16.5 v range; 0.10 ripple v (P-P).
- + 10 V DC: Adjustable from + 9 to + 11 v range; 0.10 ripple v (P-P).
- − 4.5 V DC: − 4.5 to 5.0 v range; 0.20 ripple v (P-P).
- + 18 V DC: + 16.2 to + 19.8 v range; 0.10 ripple v (P-P).

OPERATING TEMPERATURE RANGE: 0° C to 50° C (32° F to 122° F).

COOLING: Cooling air from external source.

OVER-TEMPERATURE FEATURES
- OVER-TEMP WARNING: Alarm horn and light at 46° C (115° F).
- OVER-TEMP SHUTDOWN: Equip shutdown at 60° C (140° F).

SIGNAL VOLTAGE LEVELS
- INTERNAL
  - LOGICAL "1": − 4.5 v dc.
  - LOGICAL "0": − 0.0 v dc.
- I/O LINES
  - LOGICAL "1"
    - LOW SPEED INTERFACE: 0.0 v dc.
    - HIGH SPEED INTERFACE: 0.0 v dc.
  - LOGICAL "0"
    - LOW SPEED INTERFACE: − 13.5 v dc.
    - HIGH SPEED INTERFACE: − 3.0 v dc.
- I/O CHANNELS
  - 0 TO 3
    - CHASSIS: A4.
    - TYPE: II
    - INTERFACE CAPABILITY: High speed.
  - 4 TO 7
    - CHASSIS: A3.
    - TYPE: II
    - INTERFACE CAPABILITY: High speed.

8 TO 11
CHASSIS: A2.
TYPE: 11
INTERFACE CAPABILITY: Low speed.
12 TO 15 (NOT FURNISHED)
CHASSIS: A1.

INTERNAL FEATURES
MAIN MEMORY: Ferrite cores.
CAPACITY: 32,768 thirty-bit words.
CYCLE TIME: 4 usec.
CONTROL MEMORY: Thin film devices.
CAPACITY: 64 thirty-bit words.
CYCLE TIME: 667 nanosec.
BOOTH STRAP MEMORY: Unifluxor devices.
CAPACITY: 64 thirty-bit words.
CYCLE TIME: 667 nanosec.
INSTRUCTION REPERTOIRE: 64 function codes (2 of which are invalid).

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Computer, Digital Data CP-808/TYK		31-1/8 x 37-1/4 x 70-5/32	1655

841

REFERENCE DATA AND LITERATURE:

UNIVAC PX3290: Tech Manual General Information Data Sheets for UNIVAC Digital Data Computer CP-642B.
UNIVAC PX3294: Supplement to Technical Manual for CP-642B Digital Data Computer.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: Not available.

CRYSTALS: Not available.

SEMI-CONDUCTORS: Not available.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

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

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
UNIVAC Div. of Sperry Rand Corporation	St. Paul, Minnesota	NObsr 91163	

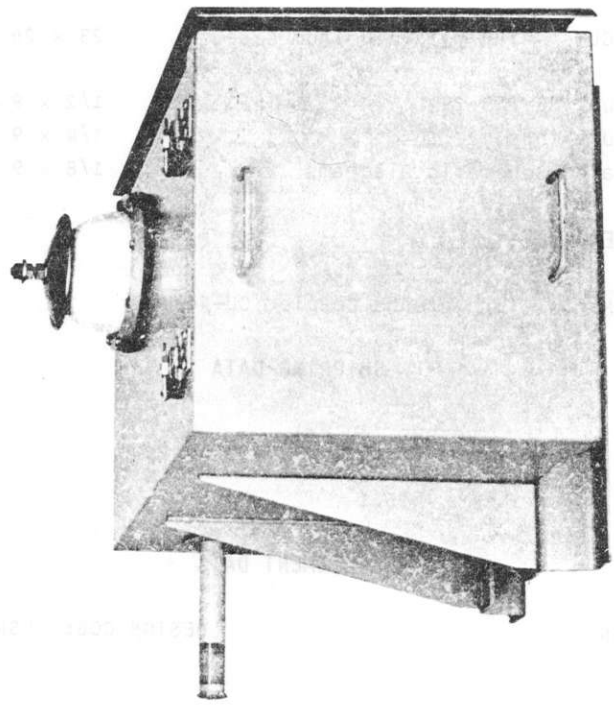
23 November 1966 COUPLER ANTENNA CU-464A/UR

Cog Service: USN FSN: Functional Class:

USA USN USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Scope Inc. (09430).



COUPLER ANTENNA CU-464A/UR

FUNCTIONAL DESCRIPTION:

The Coupler Antenna CU-464A/UR, provides a means of coupling the Loran Receiving Antenna to a 52 ohm coaxial line.

No field changes in effect at time of preparation (22 March 1966).

RELATION TO OTHER EQUIPMENT:

The CU-464A/UR is mechanically and electrically one-way interchangeable with, and is a direct replacement, for, CU-464/UR except for improved design, and parts differences, and ground strap added.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

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

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Coupler Antenna CU-464A/UR with Aluminum Case, includes:	23 x 26 x 29	53
2	Technical Manual CG-273-29	1/2 x 9 x 11-1/2	0.8
2	Installation Drawings	1/4 x 9 x 11-1/2	0.2
2	Plastic Laminated Schematic Diagrams	1/8 x 9 x 11-1/2	0.1

REFERENCE DATA AND LITERATURE:

CG-273-29: Technical Manual for Antenna Coupler CU-464/UR.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	15.1	140

PROCUREMENT DATA

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

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Scope Inc.	Falls Church, Va.	TCG-41675(CG-51, 393A)	

844

22 July 1964 COUPLER, ANTENNA CU-631/ARC

Cog Service: USN FSN: Functional Class:

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Munston Electronics Manufacturing Corporation, (74096).

COUPLER, ANTENNA CU-631/ARC

FUNCTIONAL DESCRIPTION:

Coupler, Antenna CU-631/ARC is a tandem cavity, automatically-tuned, selective filter. It is intended for use with Radio Set AN/ARC-27 or AN/ARC-52. The high selectivity provided by this filter reduces intermodulation and cross-modulation interference, spurious responses, and attenuates transmitter harmonic radiation.

No field changes in effect at time of preparation (1 July 1964).

RELATION TO OTHER EQUIPMENT:

CU-631/ARC COUPLER, ANTENNA

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Radio Receiver-Transmitter RT-178/ARC-27; (1) Radio Set Control C-626/ARC-27; (1) Radio Receiver-Transmitter RT-332/ARC-52; (1) Radio Set Control C-1607/ARC-52; (1) Antenna AT-141/ARC-27; (2) RF Cable RG-8/U; (4) Cable Assy; (13) Connector Plug.

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 225.0 to 400.0 mc.
CHANNELS: 1750, in 0.1 mc increments.
CHANNEL SELECTION TIME: 10.0 sec.
INPUT IMPEDANCE: 50 ohms.
OUTPUT IMPEDANCE: 50 ohms.
RADIO FREQUENCY INPUT POWER: 20 W avg.
STANDING WAVE RATIO: 2.0 to 1.0 max.
RESONANT SELECTION
10 DB TOTAL ATTENUATION: 1.0 mc max total bandwidth.
20 DB TOTAL ATTENUATION: 1.6 mc max total bandwidth.
40 DB TOTAL ATTENUATION: 6.0 mc max total bandwidth.
60 DB TOTAL ATTENUATION: 16.0 mc max total bandwidth.
INSERTION LOSS: At resonance 2.0 db, max.
TUNING: Automatic, servo controlled.
COUPLING: Loop (input and output); aperture (between tandem filter cavities).
POWER REQUIREMENTS: 108 to 121 v, 380 to 420 cyc, single ph, 40 va; 25 to 29 v dc, 130 W.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Coupler, Antenna CU-631/ARC includes:	R5821-833-6082	7 x 13 x 22-3/4	27.0
1	Mounting MT-1938/ARC	R5821-830-4676	2-1/2 x 13-3/4 x 22-3/4	3.0

REFERENCE DATA AND LITERATURE:

NAVWEPS 16-35CU631-1: Handbook of Operation and Service Instructions for Antenna Coupler CU-631/ARC.
NAVWEPS 16-35CU631-2: Handbook of Overhaul Instructions for Antenna Coupler CU-631/ARC.
NAVWEPS 16-35CU631-3: Illustrated Parts Breakdown for Antenna Coupler CU-631/ARC.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: None used.

CRYSTALS: None used.

SEMI-CONDUCTORS: (2) 1N76A (5) 1N457 (2) 2N43A (2) 2N174 (1) 2N539

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1		

PROCUREMENT DATA

PROCURING SERVICE: USN
SPEC &/OR DWG: MIL-C-21964

DESIGN COG: USN, BuWeps

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Munston Electronics Mfg Corp.	Islip, New York	NOw 60-0266-A NOw 61-0903-c	

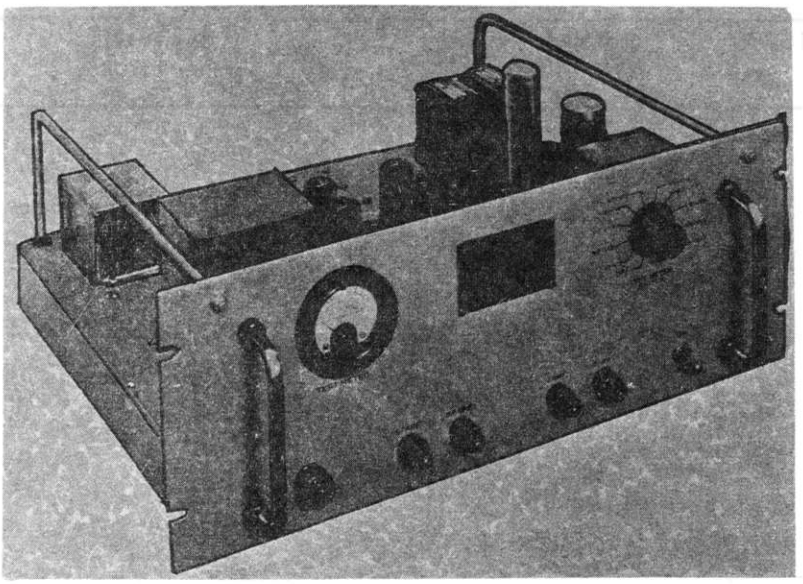
7 October 1966 COUPLER ANTENNA CU-656A/U

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Voron Electronics Corporation, (94518).



COUPLER ANTENNA CU-656A/U

FUNCTIONAL DESCRIPTION:

The Coupler Antenna CU-656A/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 mc through 32 mc), a high attenuation of out of band frequencies, a minimum noise figure, minimum intermodulation, a high degree of isolation between individual outputs, on overall power gain and high reliability.

No field changes in effect at time of preparation (20 May 1966).

RELATION TO OTHER EQUIPMENT:

The CU-656A and the CU-656/U, CU-873/U, 874/U are electrically similar. Antenna Coupler CU-656A, CU-656/U and CU-873/U have a 70 ohm input. However, Antenna Coupler CU-874/U has a 150 ohm balanced input. The units are physically similar except that Antenna Coupler CU-656A/U and CU-656/U utilizer type-C input connectors and output connectors while Antenna

Coupler CU-873/U and CU-874/U utilize type-N input connectors and output connectors.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

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

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 2.0 mc to 32 mc.
INPUT IMPEDANCE: 70 ohms, a single type "C" connector located at the rear of the unit provides for the antenna input connection.
OUTPUT IMPEDANCE: 70 ohms, eight type "C" connectors located at the rear of the unit provide for output connections.
NUMBER OF OUTPUTS: Eight outputs are provided for at the rear of the unit.
INTERMODULATION: The intermodulation products of two 0.25 volt signals applied at the input are down 60 db.
ISOLATION OF OUTPUTS: Minimum isolation between any two outputs is 40 db.
GAIN: 0 to 3 db, to each output.
ANTENNA CHARACTERISTICS: The antenna (GFM) should have a VSWR of less than 3 to 1 over the band of 2.0 to 32 mc for best performance.
AMBIENT TEMPERATURE LIMITATIONS: − 40 deg C (− 40 deg F) to + 50 deg C (+ 122 deg F).
POWER REQUIREMENT: 115 to 230 v, 50 to 60 cycles ac single, ph 125 watts approx.
NOISE FIGURE: 6 db or better.
CASCADE OPERATION: Additional antenna connections may be obtained by connecting the antenna couplers in cascade with a resultant increase in signal gain of 0 to 3 db. The effective noise figure of two cascaded antenna couplers will be 7.7 db or better.

849

MAJOR COMPONENTS

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

REFERENCE DATA AND LITERATURE:

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

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	2.3	40

COUPLER ANTENNA CU-656A/U

PROCUREMENT DATA

PROCURING SERVICE: USN
SPEC &/OR DWG: SHIPS-C-3913

DESIGN COG: USN, NavShips

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Voron Electronics Corp.	Philadelphia, Pa.	NObsr-87369	

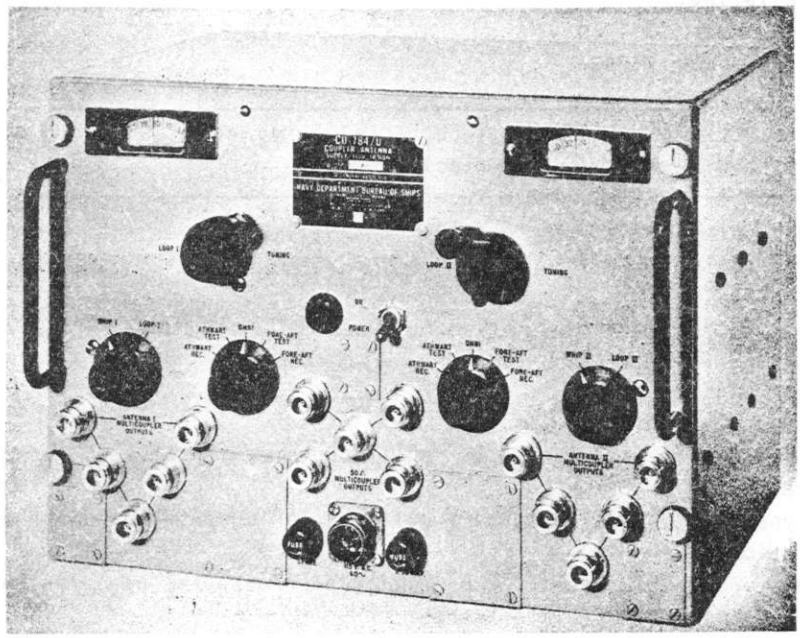
22 November 1965 COUPLER, ANTENNA CU-784/U

Cog Service: USN **FSN:** 2F5985-897-6883 **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Westrex Div. of Litton Industries Inc., (00335).



COUPLER, ANTENNA CU-784/U

FUNCTIONAL DESCRIPTION:

Coupler, Antenna CU-784/U is designed to couple five very low frequency antennas to fifteen very low frequency receivers. The antennas are available for use three at a time with the receivers grouped in banks of five per antenna. One, a 50 ohm untuned, omnidirectional antenna provides fixed coupling to five receivers. The four other antennas are in two pairs; a loop 1 and whip 1 antenna; a loop 2 and whip 2 antenna. Only one antenna from each pair is used at a given time. The whip antennas are untuned and omnidirectional. The loop antennas are tuned by the antenna coupler. In addition the multicoupler also provides means for operating the loop antennas in any one of the following five modes: (1) omnidirectional, (2) fore and aft directional, (3) athwart directional, (4) fore and aft directional test, (5) and athwart directional test.

No field changes in effect at time of preparation (30 April 1964).

RELATION TO OTHER EQUIPMENT:

The CU-784/U and CU-784A/U are alike electronically and mechanically except the multicoupler antenna outputs are arranged differently and the CU-784/U utilizes a whip 2 Antenna Input connection and the CU-784A/U utilizes a trailing wire connection.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(15) R-958(XN-2)/U VLF Receiver; (2) Whip Antenna; (1) 50 Ohm Antenna; (2) Loop Antenna AT-317/BRR, AT-317A/BRR, or AT-317B/BRR.

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 WHIP 2: 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 Whip 2 operation.
- THREE: Five N-type receptacles (50-ohm multicoupler outputs) used for 50 Ohm antenna.

FREQUENCY RANGE: 14.6 to 38 kc, all antennas.

POWER REQUIREMENTS: 117 v, 60 cps, single ph, 0.25 amp.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Antenna Coupler CU-784/U	2F5985-897-6883	10 x 11-11/16 x 14-1/8	31.75
	includes:			
1	Resistor Test Decade Unit			
1	Power Cord			
1	Technical Manual NAVSHIPS 94184			

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94184: Technical Manual for Antenna Multicouplers CU-784/U and CU-784A/U.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (5) 12AT7WB

CRYSTALS: Not required.

SEMI-CONDUCTORS: (4) 1N547

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

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

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Westrex Div. of Litton, Industries Inc.	New York, N. Y.	NObsr 77516	

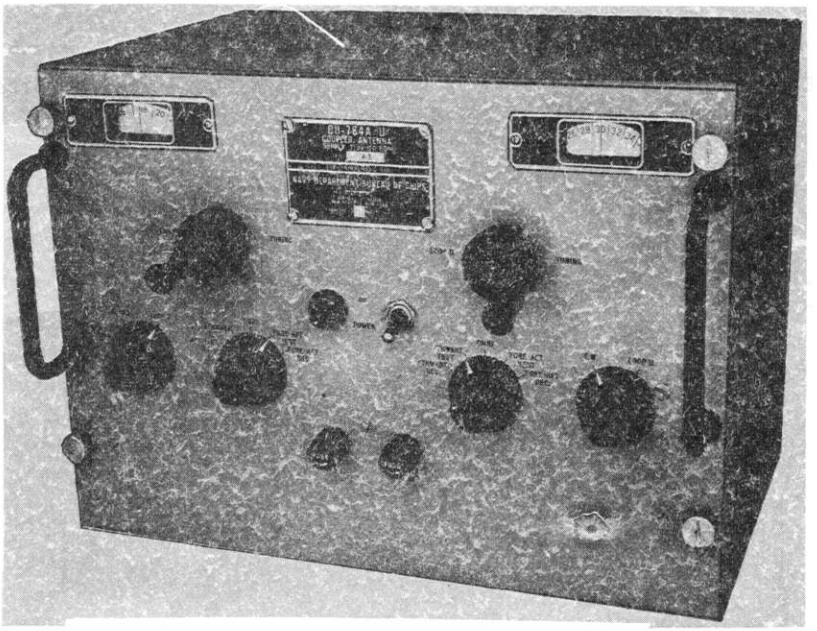
22 July 1964 COUPLER, ANTENNA CU-784A/U

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS:

MANUFACTURER'S NAME/CODE NUMBER: Westrex Div. of Litton Industries Inc., (00335).



COUPLER, ANTENNA CU-784A/U

FUNCTIONAL DESCRIPTION:

Coupler, Antenna CU-784A/U is designed to couple five very low frequency antennas to fifteen very low frequency receivers. The antennas are available for use three at a time with the receivers grouped in banks of five per antenna. One, a 50 ohm untuned, omnidirectional antenna provides fixed coupling to five receivers. The four other antennas are in two pairs; a loop 1 and whip 1 antenna; a loop 2 and trailing wire antenna. Only one antenna from each pair is used at a given time. The whip and trailing wire antennas are untuned and omnidirectional. The loop antennas are tuned by the Antenna Coupler. In addition the Antenna Coupler also provides means for operating the loop antennas in any one of the following five modes: (1) omnidirectional; (2) fore and aft directional; (3) athwart directional; (4) fore and aft directional test, and (5) athwart directional test.

No field changes in effect at time of preparation (30 April 1964).

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

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.

855

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Antenna Coupler CU-784A/U	10 x 11-11/16 x 14-1/8	31-3/4

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94184: Technical Manual for Antenna Coupler CU-784A/U.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

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

ANTENNA COUPLER CU-784A/U

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST.
Westrex Co., Division of Litton Systems Inc. DWG no. D-51,097	New York, New York	NObsr-81458, 20 June 1960	$1,203.50

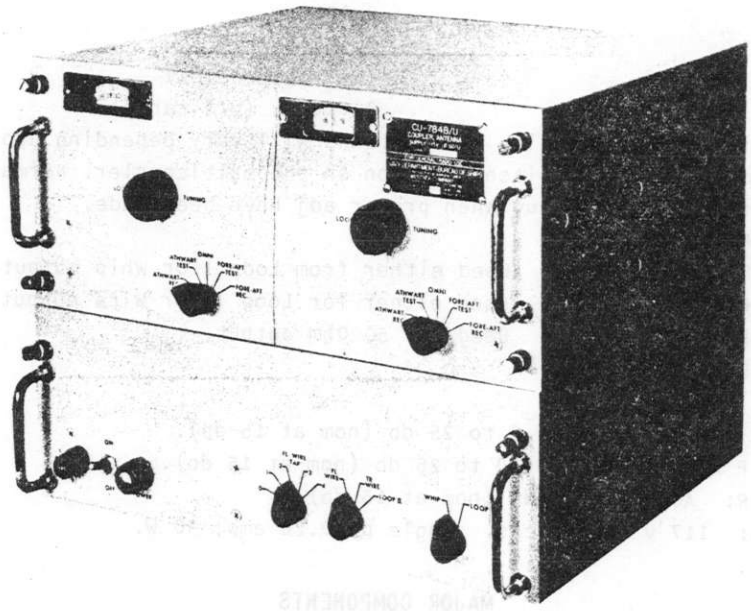
23 November 1965 MULTICOUPLER, ANTENNA CU-784B/U

Cog Service: USN **FSN:** 2F5985-973-0315 **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Westrex Co., (00335).



MULTICOUPLER, ANTENNA CU-784B/U

FUNCTIONAL DESCRIPTION:

Multicoupler, Antenna CU-784B/U provides between six antennas and 18 receivers with a maximum of six receivers per antenna. Connections are provided for six antenna inputs, three of which can be used at one time. Switches select the antennas desired, except for the 50 ohm antenna which is connected permanently.

No field changes in effect at time of preparation (24 June 1964).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

As required. VLF receivers having a 50 ohm antenna input impedance such as the AN/BRR-3, AN/SRR-11 and R-958/U receivers, and the following antennas: Whip, Trailing Wire, Floating Wire, 50 ohm, and two AT-317B/BRR Loops.

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE
- LOOP I ANTENNA: 14 to 30 kc.
- LOOP II ANTENNA: 14 to 30 kc.
- WHIP ANTENNA: 14 to 100 kc.
- WIRE ANTENNA: 14 to 130 kc.
- 50 OHM ANTENNA: 14 to 130 kc.

ANTENNA INPUTS

ANTENNA	SENSITIVITY (APPROX)
LOOP I (AT317B/BRR):	0.005 uv
LOOP II (AT317B/BRR):	0.005 uv
WHIP:	0.050 uv
TRAILING WIRE:	0.004 uv
FLOATING WIRE:	(See note below)
50 OHM:	0.010 uv (v/f range)

NOTE: Sensitivity of the floating wire antenna will vary depending upon amount of wire extended, and the FL Wire switch position on the multicoupler. Normally the sensitivity should be better than 0.006 uv when proper adj have been made.

OUTPUTS TO RECEIVERS
- SIX N-TYPE RECEPTACLES (AMP 1): Used either from Loop I or Whip output.
- SIX N-TYPE RECEPTACLES (AMP 2): Used either for Loop II or Wire output.
- SIX N-TYPE RECEPTACLES (AMP 3): Used for 50 Ohm output.
- OUTPUT IMPEDANCE: 50 Ohms ea.

GAIN
- LOOP I AND WHIP AMPLIFIER: Adj 0 to 25 db (nom at 15 db).
- LOOP II AND WHIP AMPLIFIER: Adj 0 to 25 db (nom at 15 db).
- 50 OHM AMPLIFIER: Adj 0 to 25 db (nom at 15 db).

POWER REQUIREMENTS: 117 v ac, 60 cps, single ph 0.26 amp, 30 W.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Multicoupler Antenna CU-784B/U	2F5985-973-0315	12 x 12 x 16	
	includes:			
1	Resistor Test Decade Unit			
2	Instruction Manual			

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94612: Technical Manual for Antenna Multicoupler CU-784B/U.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (6) 12AT7WA

CRYSTALS: Not required.

SEMI-CONDUCTORS: (2) 1N547 (1) 1N2846B

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT(LBS)
1	1.33	58

PROCUREMENT DATA

PROCURING SERVICE: USN
SPEC &/OR DWG:

DESIGN COG: USN, BuShips

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Westrex Co.	New York, N. Y.	NObsr 87430	

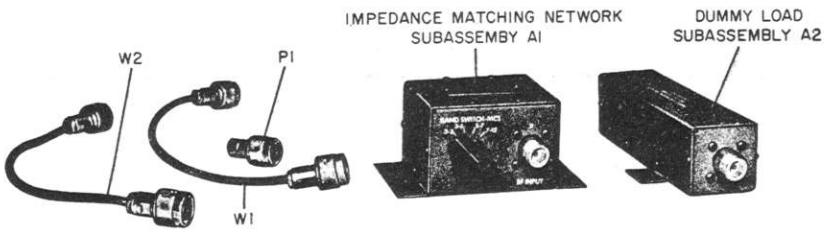
22 July 1964 NETWORK, IMPEDANCE MATCHING CU-837/URC

Cog Service: USN **FSN:** 2F5915-789-2193 **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Piqua Engineering, Incorporated, (81380).



NETWORK, IMPEDANCE MATCHING CU-837/URC

FUNCTIONAL DESCRIPTION:

Network Impedance Matching CU-837/URC adapts the output of a TCS transmitter (or similar equipments) to the 50 ohm coaxial input of Antenna Coupler Group AN/SRA-22, equivalent antenna couplers, or antenna multicouplers. This unit was procured primarily for use with AN/SRA-22 and TCS transmitter. The dummy load provides a 50 ohm noninductive termination for tuning of the transmitter prior to tuning of the antenna coupler.

No field changes in effect at time of preparation (28 May 1964).

RELATION TO OTHER EQUIPMENT:

The CU-837/U is to be used with the AN/SRA-22 and TCS transmitter.

CU-837/URC NETWORK, IMPEDANCE MATCHING

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 2 to 12 mc.
FREQUENCY BANDS: 2 to 3, 3 to 5, 5 to 7, and 7 to 12 mc.
CONTROLS: Manual bandswitch.
RF POWER INPUT: 100 W into network.
DUTY CYCLE (50 OHM LOAD)
1 MINUTE: 100 W.
5 MINUTES: 50 W.
CONTINUOUS: 25 W.
IMPEDANCE: Will introduce an impedance so that the TCS or similar transmitter output will match the 50 ohm input of Antenna Coupler Group AN/SRA-22.
AMBIENT TEMPERATURE: -28° C to $+65^{\circ}$ C.
AMBIENT HUMIDITY: 0 to 95%.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Network Impedance Matching CU-837/URC includes:	2F5915-789-2193	2-1/8 x 3-7/8 x 4-5/8	0.5
1	Dummy Load		1-1/8 x 3-1/8 x 6-3/4	0.5
2	RF Cable with connector ea end		11-1/2 lg	
1	RF Connector			
1	Technical Manual NAVSHIPS 93645(A)			

REFERENCE DATA AND LITERATURE:

NAVSHIPS 93645(A): Technical Manual for Impedance Matching Network CU-837/URC.
NAVSHIPS 93286: Technical Manual for Antenna Coupler Group AN/SRA-22.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: Not required.

CRYSTALS: Not required.

SEMI-CONDUCTORS: Not required.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1.2 CU-837/URC: 2		

PROCUREMENT DATA

PROCURING SERVICE: USN
SPEC &/OR DWG:

DESIGN COG: USN, BuShips

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Piqua Engineering, Inc.	Piqua, Ohio	NObsr 87008, 31 July 1961	
Collins Radio Company	Cedar Rapids, Iowa	NObsr 81220, 6 April 1960	$62.00

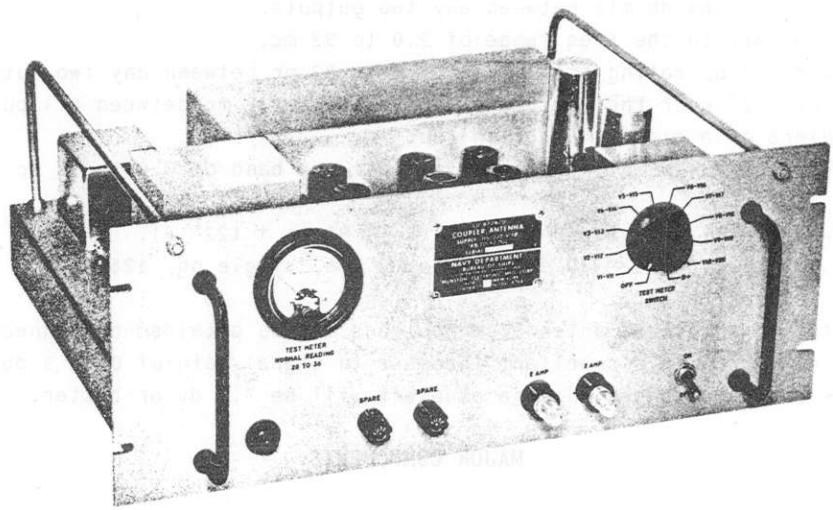
22 November 1965 COUPLER, ANTENNA CU-872A/U

Cog Service: USN FSN: 2F5820-020-2738 Functional Class:

USA USN USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Munston Electronic Manufacturing Corporation, (74096).



COUPLER, ANTENNA CU-872A/U

FUNCTIONAL DESCRIPTION:

Coupler, Antenna CU-872A/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 mc through 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 (23 June 1964).

RELATION TO OTHER EQUIPMENT:

Coupler, Antenna CU-872A/U is electrically similar to Coupler, Antenna CU-656/U, CU-873/U and CU-874/U.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Adapter UG-107B/U; (1) High Frequency Signal Generator and Instruction Manual Hewlett Packard 606A; (1) Multimeter and Technical Manual AN/USM-34 Series NAVSHIPS 92197; (1) Radio Test Set and Technical Manual AN/PRM-1 Series NAVSHIPS 91255; (1) Radio Interference Measuring Set AN/URM-47 Series NAVSHIPS 92147; (1) Phase Meter (vectorlizer) Advanced Electronics Lab Inc. Type 202; (1) Antenna, and up to (8) Radio Receivers.

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 2.0 to 32 mc.

IMPEDANCE

INPUT: 70 ohm (is obtained through one Type N connector).

OUTPUT: 70 ohm (is provided through eight Type N connectors).

INTERMODULATION: Products of two 0.25 v signals applied at the input are down 60 db.

ISOLATION OF OUTPUTS: 40 db min between any two outputs.

GAIN: 0 to + 3 db within the freq range of 2.0 to 32 mc.

PHASE: ± 2° over the operating freq range of 2 to 32 mc between any two outputs of one antenna coupler; ± 2° over the operating range of 2 to 32 mc between all outputs of all antenna couplers of a given production run.

ANTENNA: Should have a VSWR of less than 3:1 over the band of 2.0 to 32 mc for best performance.

AMBIENT TEMPERATURE LIMITATIONS: 0 to + 50° C (+ 32 to + 122° F).

POWER SUPPLY: 115 ± 11.5 v or 230 ± v, 48 to 62 cps, single ph, 125 W.

NOISE FIGURE: 6 db or better.

CASCADE OPERATION: Additional antenna connections may be obtained by connecting the antenna couplers in cascade with a resultant increase in signal gain of 0 to 3 db. The effective noise figure of two cascaded antenna couplers will be 7.7 db or better.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Coupler Antenna CU-872A/U includes:	2F5820-020-2738	7 x 16-1/2 x 19	33
9	Connectors UG-1185/U		13/16 x 13/16 x 1-7/16	0.123
1	Connector AN3106A-14S-7S		1-1/8 x 1-1/8 x 1-7/16	

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94490: Technical Manual for Antenna Coupler CU-872A/U.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (20) 6922 (1) 0B2WA

CRYSTALS: Not required.

SEMI-CONDUCTORS: (4) 1N540

COUPLER, ANTENNA CU-872A/U

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	2.3	40

PROCUREMENT DATA

PROCURING SERVICE: USN
SPEC &/OR DWG:

DESIGN COG: USN, BuShips

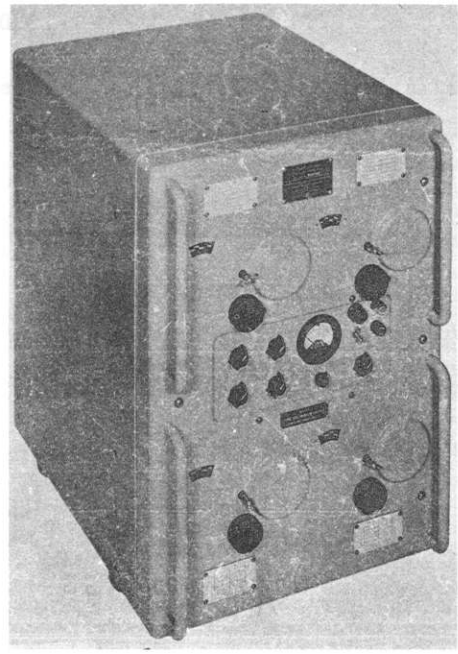
CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Munston Electronic Manufacturing Corporation	Islip, New York	NObsr 87247	

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Collins Radio Company, (13499).



ANTENNA COUPLER CU-916(XN-1)U

FUNCTIONAL DESCRIPTION:

The Antenna Coupler CU-916(XN-1)U provides isolation between four transmitter and/or receiver combinations operating simultaneously into a common antenna. Isolation is achieved with four highly selective tandem filters and a combining network. The high selectivity reduces intermodulation interference, cross modulation interference, and spurious responses. Harmonic radiation from the transmitters is also attenuated. The unit is table mounted or in a standard 19 inch rack.

No field changes in effect at time of preparation (28 January 1966).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

INPUT IMPEDANCE: 50 ohms.
NUMBER OF INPUTS: 4 (type C connector).
OUTPUT IMPEDANCE: 50 ohms (nominal).
NUMBER OF OUTPUTS: 1 (type HN connector).
POWER LEVEL: 0 to 200 watts or 0 to 300 watts (note meter scale determine).
FREQUENCY RANGE OF TANDEM FILTERS: 225 to 400 mc.
MAXIMUM STANDING WAVE RATIO: 2.0 to 1.
OFF CHANNEL REJECTION: 1 mc- 20 db, 3 mc- 40 db, 10 mc- 60 db.
DECOUPLING: 5 mc channel separation, 50 db minimum; 10 mc channel separation, 60 db minimum.
INSERTION LOSS: 2.0 db maximum.
MONITOR METER SCALE: Power (watts), 0 to 200 or 0 to 300 SWR, unity to infinity.
MONITOR SWITCH POSITIONS
ONE SET FOR EACH INPUT: Power, SWR CAL, SWR.
MONITOR ACCURACY
POWER: ± 15%.
SWR:

ACTUAL	INDICATED
1.0 to 1	1.0 to 1 to 1.5 to 1
2.0 to 1	1.5 to 1 to 2.6 to 1
3.0 to 1	2.3 to 1 to 4.1 to 1
4.0 to 1	2.9 to 1 to 6.0 to 1
5.0 to 1	3.6 to 1 to 8.0 to 1

TYPE OF TUNING: Manual or automatic (local or remote)to 1 of preset frequencies within range.
TUNING SCALES: Megacycles.
CALIBRATION: For approximate frequency setting only.
RESETABILITY: ± 0.1 mc.

867

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Antenna Coupler CU-916(XN-1)U includes:		17-1/4 x 24-27/64 x 24-7/16	150
6	Shockmounts		1-1/2 x 3 x 3	
4	Rack-Mounting Brackets		7/8 x 1 x 11-1/3	
1	Channel Mount		1-3/16 x 3-3/8 x 16-11/64	

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94168: Technical Manual for Antenna Coupler CU-916(XN-1)U.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT(LBS)
1	15.4	247

PROCUREMENT DATA

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

CONTRACTOR	LOCATION	CONTRACTOR ORDER NO.	APPROX. UNIT COST
Collins Radio Co.	Cedar Rapids, Iowa	NObsr 81264	

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Manson Laboratories Division The Hallicrafters Co.,(93279).

DUPLEXER CU-950/SRC-17

FUNCTIONAL DESCRIPTION:

The Duplexer CU-950/SRC-17 is a completely solid-state device that functions to couple power from an antenna to a receiver or from a transmitter to the same antenna. The duplexer covers a frequency range of from 225 to 400 mc, and since it is completely solid-state, does not require tuning or pulsing, thereby eliminating the need for "Keep-alive" or sweep voltage power supplies. The duplexer consists of two 3-db hybird networks joined with TR elements in each arm at the junction. Low insertion losses and a low firing level ensure maximum efficiency in coupling the transmitter power to the antenna. Receiver protection is ensured by additional limiters in the receiver arm. The duplexer is designed to be installed within, or on top of, a 19-inch rack or mounted on a bench or bulkhead.

No field changes in effect at time of preparation (9 June 1966).

RELATION TO OTHER EQUIPMENT:

The Duplexer CU-950/SRC-17 is a modified version of duplexer CU-950(XN-1)/SRC-17. The major similarities and differences between the two duplexers are in firing and recovery time, Bandwidth, Rack mounting capability using slide assembly Minimum firing level, Power Supply, Weight and Solid-State construction.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Multimeter: AN/PSM-4; (1) Mounting; (1) Duplexer Load;
(1) Dummy Load: CU-242/U; (1) Vacuum Tube Voltmeter: AN/USM-143;
(1) Signal Generator: AN/USM-44; (2) Wattmeter: AN/USM-177;
(1) Handbook for Electronic Circuits: NAVSHIPS 900,000.102;
(1) Maintenance Standard Book for Radio Set AN/SCR-17; NAVSHIPS 95947.42;
(8) Instruction Books for CU-242/U, AN/PSM-4, AN/USM-143, AN/USM-44;
(1) Electronic Installation and Maintenance Book NAVSHIPS 900,000.

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 225 to 400 mc.
TRANSMIT
(1) POWER: 10 to 1250 watts (cw or peak).
(2) IMPEDANCE: 50 ohms.
(3) TRANSMITTER ANTENNA LOSS: 0.3 db maximum.
RECEIVE
(1) IMPEDANCE: 50 ohms.
(2) ANTENNA-RECEIVER LOSS: 1 db maximum.
ANTENNA IMPEDANCE: 50 ohms.
LOAD
(1) RATING: 15 watts.
(2) IMPEDANCE: 50 ohms.
(3) ATTENUATION: 10 db.
VSWR (all ports): 1.5 to 1 maximum (with other ports terminated).
FIRING AND RECOVERY TIME: 10 microseconds maximum.
NOISE FIGURE: 1 db maximum.
AMBIENT ENVIRONMENT
(1) TEMPERATURE: -0 deg C to +50 deg C (+32 deg F to +122 deg F).
(2) HUMIDITY: 0 to 95 percent RH.
MOUNTING: Relay Rack or Bench.
CURRENT DRAIN: 32 ma.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Duplexer: CU-950/SRC-17 includes:	3 x 17-1/2 x 24-1/8	38
2	Technical Manual NAVSHIPS 95813	1/2 x 8-1/2 x 11	

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
*4	Relay Rack Mounting Brackets and Attaching Hardware (2) MP1-B100-067-017 (2) MP2-B100-067-016		

* In most instances this item is not supplied.

REFERENCE DATA AND LITERATURE:

NAVSHIPS 95813: Technical Manual for Duplexer CU-950/SRC-17.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT(LBS)

PROCUREMENT DATA

PROCURING SERVICE: USN
SPEC &/OR DWG: SPEC: U-4001

DESIGN COG: USN, NavShips

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Manson Laboratories Div., The Hallicrafters Co.	Wilton, Conn.	NObsr-87289	

871

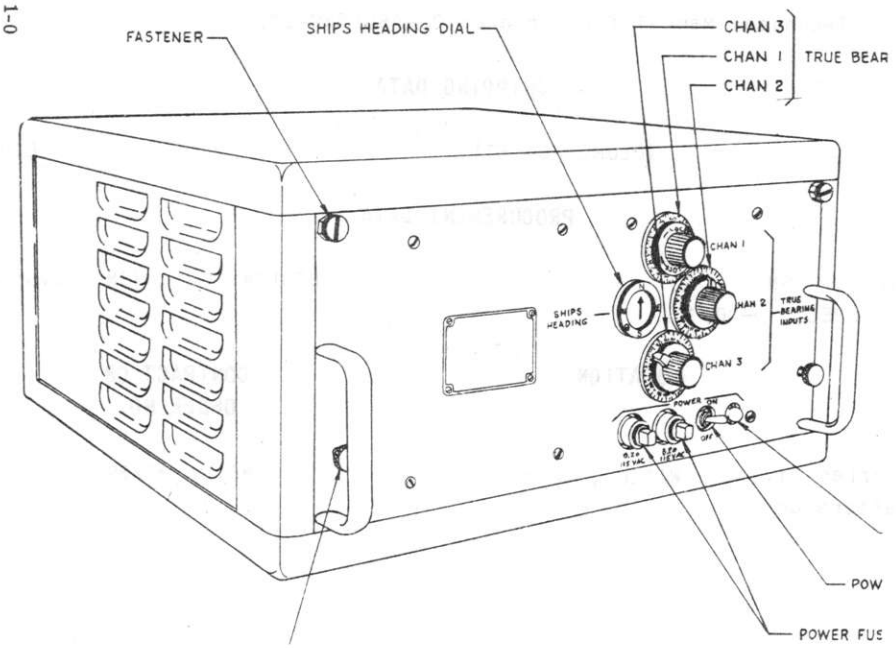
5 May 1966 COUPLER, ANTENNA CU-951(XN-1)/UR

Cog Service: USN **FSN:** **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: ITT Federal Laboratories, Div. of International Telephone and Telegraph Corp., (90348).



COUPLER, ANTENNA CU-951(XN-1)/UR

FUNCTIONAL DESCRIPTION:

Coupler, Antenna CU-951(XN-1)/UR provides a means of utilizing a small, streamlined loop antenna in conjunction with the Type II Omega Navigational System. The antenna coupler receives the inputs from a pair of fixed crossed loops, amplifies them, and produces two simultaneous outputs; an omnidirectional pattern, and a directional pattern (figure-eight). Normally, the onmidirectional pattern is used only during the synchronization of the commutator in the receiver; the directional pattern is used to supply accurate relative-phase navigational data to the receiver.

The directional pattern is capable of being switched rapidly, by a gating network, to three selected azimuths as required by the Omega Navigational System. The three azimuths to which the directional pattern should be switched are the locations (with respect to true north) of the master and slave transmitting stations of the Omega Navigational System. These azimuths are manually set on three resolvers. Since the ship is constantly changing direction, the loop antenna coupler automatically compensates for any deviation from true north in the ship's heading. It does this by feeding ships-heading information, through a servo system,

to all three resolvers controlling the azimuths of the directional (figure-eight) patterns.
No field changes in effect at time of preparation (28 September 1965).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

BANDWIDTH: 8.2 to 15.2 kc nom.
INPUTS
(1) 8.2 to 15.2 kc variable amplitude signal from loop antenna.
(2) Ships heading info from existing 5 wire synchro system aboard ship.
(3) Three resolver gating waveforms (− 3 v dc to − 11 v dc) from the receiver indicator.
(4) 115 v, 60 cps, 1 ph from primary power aboard ship.
OUTPUTS: Omni and switched resolver.
ANTENNA: AT-317/BRR, AT-317A/BRR, or AT-317B/BRR.
ACCURACY: Differential phase error within 1°.
AMBIENT TEMPERATURE LIMITATIONS: 0° C to + 50° C.
POWER REQUIREMENTS: 115 v, 60 cps, 1 ph, 1.5 amp.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Coupler, Antenna CU-951(XN-1)/UR		10 x 20 x 23	100
	includes:			
1	Technical Manual NAVSHIPS 94421			

873

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94421: Technical Manual for Loop Antenna Coupler CU-951(XN-1)/UR.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (1) 0A2WA (1) 6C4WA (4) 12AT7WA (3) 5814A (2) 6005 (2) 6922

CRYSTALS: Not required.

SEMI-CONDUCTORS: (2) 1N1130

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	6.5	140

PROCUREMENT DATA

PROCURING SERVICE: USN
SPEC &/OR DWG:

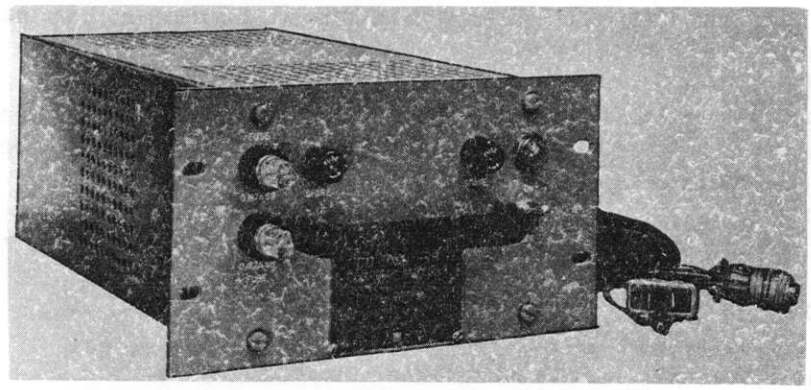
DESIGN COG: USN, BuShips

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
ITT Federal Laboratories, Div. of International Telephone and Telegraph Corporation	Nutley, New Jersey	NObsr 81592	

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Trak Electronics Company, (88769).



COUPLER, ANTENNA CU-1099/FRR

FUNCTIONAL DESCRIPTION:

Coupler, Antenna CU-1099/FRR is a broadband transistor rf amplifier which permits up to eight 70-ohm outputs to operate simultaneously from a common antenna. The unit operates over the frequency range of 2 to 32 megacycles with an input of 70 ohms. An internal rf filter suppresses signals at frequencies outside of this range. It is used in installations requiring a single antenna to provide input signals to a group of receivers operating on different bands.

No field changes in effect at time of preparation (28 April 1965).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Multimeter w/instruction manual AN/PSM-4C or Simpson Model 260; (1) Oscilloscope w/instruction manual Hewlett Packard Model 130A; (1) Signal Generator w/instruction manual Hewlett Packard Model 606A; (1) RF Attenuator w/instruction manual Daven Co. Model 650-70; (1) RF Attenuator w/instruction manual Daven Co. Model 561; (2) Impedance Transformer 50 ohms (female BNC) to 70 ohms (male BNC) Applied Research Corp.; (1) Low Pass Filter, cut off 30 db at 3 mc Track Electronics Co. Pt no. A8657; (1) RF Voltmeter w/instruction manual Boonton Model 91-C; (1) Hybrid Trak Electronics Co. Pt no. A8656; (1) Detector Trak Electronics Co. Pt no. A8655; (1) Transistor Set TS-1100A/U.

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 2 to 32 mc.
NUMBER OF OUTPUTS: 8.
INPUT AND OUTPUT IMPEDANCE: 70 ohm unbalanced coaxial lines.
BANDPASS INPUT FILTER
  ATTENUATION RF: 40 db min between 14 kc and 150 mc.
PRIMARY POWER: 105, 115 or 125 v ± 6%, 15 W, 48 to 62 cyc, single ph ac.
RF INPUT FILTER
  INSERTION LOSS: 2 to 32 mc 0.5 db max.
  ATTENUATION OF SIGNALS OUTSIDE OF FREQUENCY RANGE: At least 30 db down 14 kc to 1.5 mc and from 54 to 150 mc.
VOLTAGE GAIN
  INPUT TO ANY OUTPUT: Within the limits of + 1 to + 2 db at all frequencies in range. Variations with line voltage change up to 10% from nom value, do not exceed 1 db. Unused outputs may be short or open circuited.
  UNIFORMITY AMONG COUPLERS: Same within 0.5 db at any frequency from 2 to 32 mc when comparing any outputs of any two multicouplers fabricated on the same contract or purchase order.
NOISE FIGURE: 10 db max.
INPUT AND OUTPUT VSWR: 2:1 max.
CROSSTALK ISOLATION: Greater than 40 db between outputs.
RADIATION (BACK SIGNAL REJECTION): Greater than 50 db from any output connector to input.
INTERMODULATION (SPURIOUS RESPONSES)
  SECOND ORDER PRODUCTS: 60 db down.
  THIRD ORDER PRODUCTS: 60 db down.
OVERLOAD CAPABILITIES: Less than 3 db reduction of gain to any 100 uv signal in the 2-32 band by a 1.5 v signal of any other frequency.
PHASE CHARACTERISTICS
  PHASE DIFFERENCE BETWEEN ANY TWO OUTPUTS ON SAME UNIT: ± 2° max.
  PHASE DIFFERENCE BETWEEN ANY TWO OUTPUTS ON ANY TWO UNITS: ± 2° max.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Antenna Coupler CU-1099/FRR includes:	5-7/32 x 16-11/32 x 16-11/32	11.5

COUPLER, ANTENNA CU-1099/FRR

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
*1	Adapter Plate		3/32 x 2 x 5	
**	Technical Manual NAVSHIPS 94933		1/2 x 8-1/2 x 11	

* One adapter plate supplied w/ea two units.
** Manuals supplied in bulk qty only.

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94933: Technical Manual for Antenna Coupler CU-1099/FRR.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: Not required.

CRYSTALS: Not required.

SEMI-CONDUCTORS: (5) 1N538 (2) 1N754A (1) 1N755A (1) 2N1039-1 (1) 2N256
(8) TRAK202512 (16) TRAK202513

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

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

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Trak Electronics Company	Wilton, Connecticut	N600(24)60147 N600(24)61880	

877

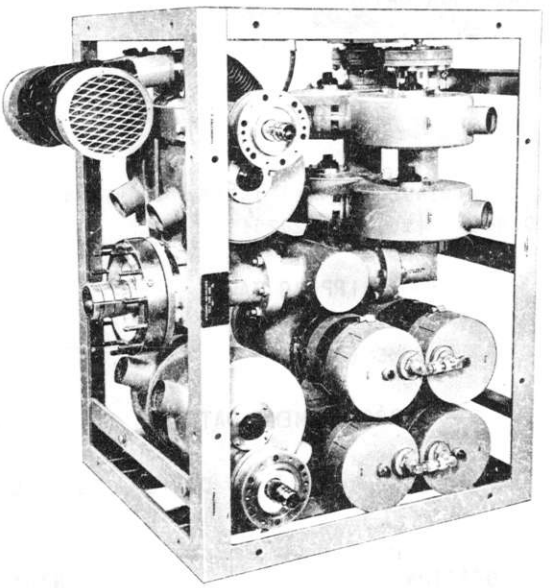
6 July 1965
Cog Service: USN FSN:

ANTENNA DUPLEXER-MULTIPLEXER CU-1299/URC
Functional Class:

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Dielectric Products Engineering Company, Inc., (08441).



ANTENNA DUPLEXER-MULTIPLEXER CU-1299/URC

878

FUNCTIONAL DESCRIPTION:

Antenna Duplexer-Multiplexer CU-1299/URC is a coaxial five-terminal passive network which provides the simultaneous use of a single antenna for high-power transmission at two frequencies, and for reception at two frequencies. All four frequencies must be different and must be separated from one another by minimum increments.

No field changes in effect at time of preparation (3 May 1965).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Sweep Signal Generator (04423)HD1A; (1) Signal Generator (28480)608C; (1) Oscilloscope (28480)130B; (1) Frequency Meter (88869)FM3; (1) Impedance Plotter (08441)600 PK; (1) Capacitive Coupler (08441)P20CC; (1) Low Pass Filter (24655)874-F500; (1) Receiver AN/APR-4

W/TN-18/APR-4; (1) Bolometer Amplifier (28480)415B; (1) Bolometer (28480)447B; (1) Crystal (Video) Detector (00929)XP1040; (2) Attenuator Fixed 6 db (00929)AB-06N; (1) Attenuator Fixed 3 db (00929)AB-039; (1) Set Precision Attenuators AS-1; (1) Reducer 6-1/8 to 3-1/8 EIA (08441)C8242; (3) Reducer 3-1/8 EIA to Type N (08441)370-62; (2) Reducer 7/8 EIA to Type N (08441)170-62 50 ohm Cables and Adapters as required.

TECHNICAL CHARACTERISTICS:

TRANSMITTER TERMINALS (FOR A SINGLE CHANNEL BANDWIDTH OF ± 750 KC/S)
- RF POWER INPUT: Continuous wave, 10 kw nom, 12 kw max.
- FREQUENCY: 345 to 400 mc/s.
- FREQUENCY SEPARATION: 3% min between transmitted frequencies, 6% min from received frequencies.
- INPUT IMPEDANCE: 50 ohm nom VSWR 1.2:1 max with antenna terminal terminated in a 1.05:1 or better load.
- INSERTION LOSS: $\leq$ 0.3 db nom, 0.5 db max between antenna and either transmitter terminal except that 0.1 db more may be observed near the ± 750 kc/s band edges.
- ISOLATION: $\geq$ 30 db between transmitter terminals, $\geq$ 90 db between either transmitter terminal and either receiver terminal, when antenna terminal is terminated in a load having a VSWR of 1.5:1 at any phase angle.
- HARMONIC REJECTION: > 10 db at all transmitter harmonics.

RECEIVER TERMINALS (FOR A SINGLE CHANNEL BANDWIDTH OF ± 750 KC/S)
- FREQUENCY: 345 to 400 mc/s.
- FREQUENCY SEPARATION: 3% min between received frequencies, 6% min from transmitter frequencies.
- SOURCE IMPEDANCE: 50 ohm nom VSWR 1.3:1 max with antenna terminal terminated in a 1.05:1 or better load.
- INSERTION LOSS: $\leq$ 0.7 db.
- ISOLATION: $\geq$ 40 db between receiver terminal. $\geq$ 90 db between either receiver terminal and either transmitter terminal, when antenna terminal is terminated in a load having a VSWR of 1.5:1 at any phase angle.

879

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Antenna Duplexer-Multiplexer CU-1299/URC includes:		24 x 27 x 37	265
2	Filter			
2	VSWR Trimmer			
1	Directional Coupler			
1	Wattmeter			

REFERENCE DATA AND LITERATURE:

NAVSHIPS 94728: Book X Instruction Manual and Parts List for CU-1299/URC Antenna Duplexer-Multiplexer.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: Not required.

CRYSTALS: Not required.

SEMI-CONDUCTORS: Not required.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: USN
SPEC &/OR DWG:

DESIGN COG: USN, BuShips

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Dielectric Products Engineering Company Inc.	Raymond, Maine	NObsr-87659	

880

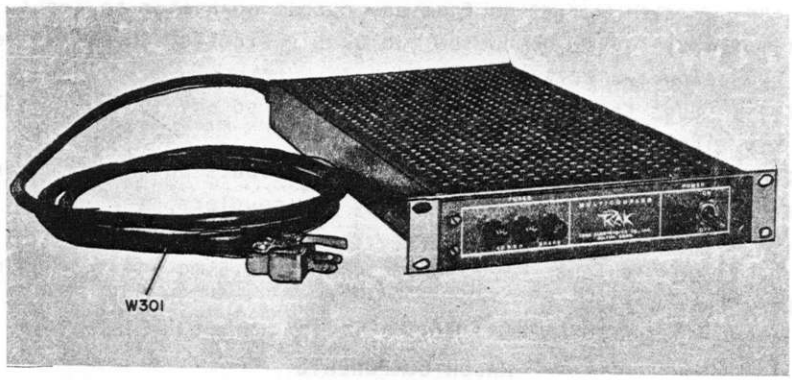
20 September 1967 COUPLER, ANTENNA CU-1382/FRR

Cog Service: USN FSN: Functional Class:

USA USN USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Trak Electronics Co., Inc., (88769).



COUPLER, ANTENNA CU-1382/FRR

881

FUNCTIONAL DESCRIPTION:

Coupler, Antenna CU-1382/FRR is a broad-band, solid-state radio-frequency amplifier which permits up to eight outputs to operate simultaneously from a common antenna over the frequency range of 2 to 32 megacycles. Coupling from the radio receivers to the antenna is accomplished without mutual interference or loss of antenna efficiency. This compact transistorized coupler, incorporating advanced techniques in circuit and mechanical design, offers electrical performance combined with high reliability suitable to meet the requirements of the latest communications and direction finding systems. An internal RF filter suppresses signals at frequencies outside of the 2-32 mc range. The modulator design of the unit facilitates its removal or replacement for maintenance purposes.

No field changes in effect at time of preparation (6 April 1967).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

POWER REQUIREMENTS: 115 v ac, ± 10%, 48-62 cps, 25 W.
FREQUENCY RANGE: 2 to 32 mc.
NUMBER OF OUTPUTS: 8.
INPUT AND OUTPUT IMPEDANCE: Match 50/75 ohm unbalanced coaxial lines.
INPUT FILTER
INSERTION LOSS (2 to 32 MC): Less than 1/2 db.
ATTENUATION BETWEEN 14 KC AND 1.5 MC: At least 30 db.
ATTENUATION BETWEEN 54 MC AND 100 MC: At least 30 db.
MAJOR ELECTRICAL UNITS: (1) Input Filter; (2) RF Pre-amplifier; (3) Isolator Network; (4) Power Supply.
VOLTAGE GAIN: Within limits of 1 to 3 db at all freq in range. Variations w/line-voltage changes up to 10% from nom value do not exceed 1 db.
NOISE FIGURE: Max 7 db.
INPUT AND OUTPUT VSWRS: Max 1.5 to 1.
ISOLATION: Greater than 40 db between outputs.
BACK-SIGNAL REJECTION: Greater than 50 db from any output connector to input.
INTERMODULATION DISTORTION: 70 db nom below two 0.25 v signals; 60 db nom below two 0.46 v signals; 50 db nom below two 0.75 v signals.
OVERLOAD CAPABILITIES: Less than 3 db reduction of gain to any 100 uv signal in the 2-32 mc band by 92.5 v signal of any other freq.
PHASE CHARACTERISTICS: Ph difference between any two outputs on the same coupler - ± 2° max; ph difference between any 2 outputs of any two couplers, ± 2° max.
INPUT FILTER
ATTENUATION OF SIGNALS: At least 30 db from 14 kc to 1.5 mc and from 54 mc to 150 mc.
INSERTION LOSS: Less than 0.5 db.

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Coupler, Antenna CU-1382/FRR	1-23/32 x 9-7/16 x 16-7/16	6.5

882

REFERENCE DATA AND LITERATURE:

TRAK ELECTRONICS CO., INC.: Handbook of Operating and Maintenance Instructions Model 308 Multicoupler.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

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

COUPLER, ANTENNA CU-1382/FRR

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Trak Electronics Co., Inc.	Wilton, Conn.	N600-64039	

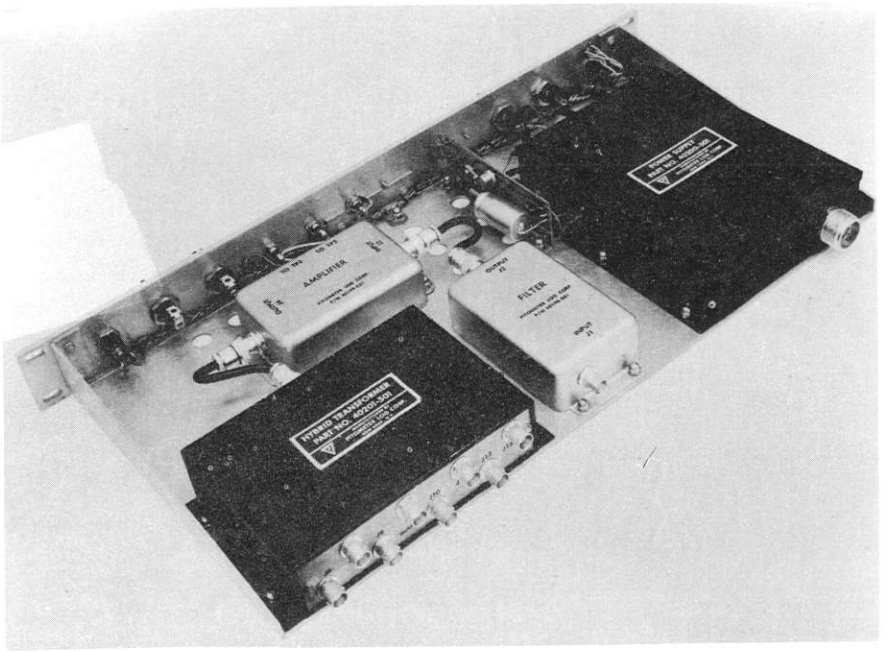
31 August 1967 COUPLER, ANTENNA CU-1382A/FRR

Cog Service: USN FSN: Functional Class:

USA USN USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Pitometer Log Corp., (47496).



COUPLER, ANTENNA CU-1382A/FRR

FUNCTIONAL DESCRIPTION:

Coupler, Antenna CU-1382A/FRR is a solid state, wide band amplifier designed to operate over the 2 to 32 megacycle frequency range. It provides optimum coupling between a single 50 ohm antenna and as many as eight 50 ohm receivers. The unique circuit design provides a minimum noise figure, minimum intermodulation distortion products, low input and output, VSWR, a high degree of isolation between outputs, and a degree of isolation between outputs and input. Electronic voltage regulation is incorporated to insure operational stability. An RF interference filter is used in the input to the power supply to provide bi-directional attenuation to all RF signals.

No field changes in effect at time of preparation (6 April 1967).

RELATION TO OTHER EQUIPMENT:

CU-1382A/FRR is similar to and two way interchangeable w/CU-1382/FRR except for maintenance parts.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 2 to 32 mc.
IMPEDANCE: 50 ohms, input and output.
VSWR: less than 1.5:1.
OUTPUTS: 8.
GAIN: Between 1.0 db. and 3.0 db.
NOISE FIGURE: 6.0 db nom, 7.4 db max at 2 mc.
INTERMODULATION DISTORTION: 70db below two 0.25vrms signals; 60db below two 0.46vrms signals; 50db below two 0.75vrms signals.
CROSS MODULATION: Less than 30% of small signal (100uv) w/a large signal of 4vrms at 80% modulation.
OUTPUT TO INPUT ISOLATION: greater than or equal to 50db.
INTERCHANNEL ISOLATION: 40db min.
INTERCHANNEL GAIN DIFFERENCE: Less than or equal to ±0.5db between all outputs of any coupler.
FILTERS:
POWER LINE FILTER: 40db rejection 14kc to 150 mc.
INPUT BAND PASS FILTER: 30db down at 1.5 mc and 54 mc.
DESENSITATION: 2.5vrms will reduce a low level signal by no more than 3db; Unwanted signal not to exceed 2.25 v at 8 mc.
OVERLOAD: 10vrms continuous or 50vrms for 5 sec intervals will not cause damage to circuit components.
POWER REQUIREMENTS: 115 v ac, 48 to 63 cps, single ph, 12 w.
RELIABILITY: MTBF 20,000 hr.

885

MAJOR COMPONENTS

QTY	ITEM	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Coupler, Antenna, CU-1382A/FRR	1-3/4 x 10 x 19	10

REFERENCE DATA AND LITERATURE:

Pitometer Log Corp. Operating and Maintenance Instruction Manual for Model 124A, CU1382A/FRR Antenna Coupler.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

COUPLER, ANTENNA CU-1382A/FRR

PROCUREMENT DATA

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

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Pitometer Log Corp.	New York, N.Y.	N600(63133)64255	

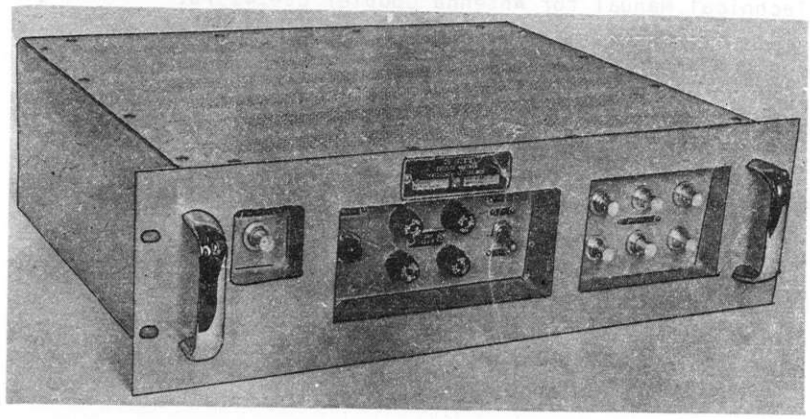
26 April 1965

Cog Service: USN **FSN:** ANTENNA COUPLER CU-1423/U **Functional Class:**

USA	USN	USAF

TYPE CLASS: Used by

MANUFACTURER'S NAME/CODE NUMBER: Applied Research Inc., (70314).



ANTENNA COUPLER CU-1423/U

FUNCTIONAL DESCRIPTION:

Antenna Coupler CU-1423/U consists of a rack mounted panel which contains seven assemblies. An eight stage amplifier supplies gain, and a multicoupler supplies six outputs from the amplifier signal input. A line operated power supply furnishes tube heater and anode power.

No field changes in effect at time of preparation (10 March 1965).

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

TECHNICAL CHARACTERISTICS:

FREQUENCY RANGE: 30 to 300 mc.

NUMBER OF OUTLETS: 6.
GAIN PER OUTLET: 18 db.
VSWR
INPUT: 1.5 v.
OUTPUT: 1.75 v.
IMPEDANCE: (Input and Output) 50 ohms.
POWER REQUIREMENTS: 11 v, 60 cps, 85 W.
CONNECTORS
RF: Type BNC.
POWER SUPPLY: MS3102E-10SL-3P.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Antenna Coupler CU-1423/U		5-1/4 x 13-1/2 x 19	32-1/2

REFERENCE DATA AND LITERATURE:

NAVSHIPS 96144: Technical Manual for Antenna Coupler CU-1423/U.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (7) 5842/417A (1) 7768

CRYSTALS: Not required.

SEMI-CONDUCTORS: (1) A100 (4) A300 (1) RS-6 (1) 1N751 (1) 2N1073B (3) 2N1374

888

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

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

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Applied Research Inc.	Port Washington, New York		