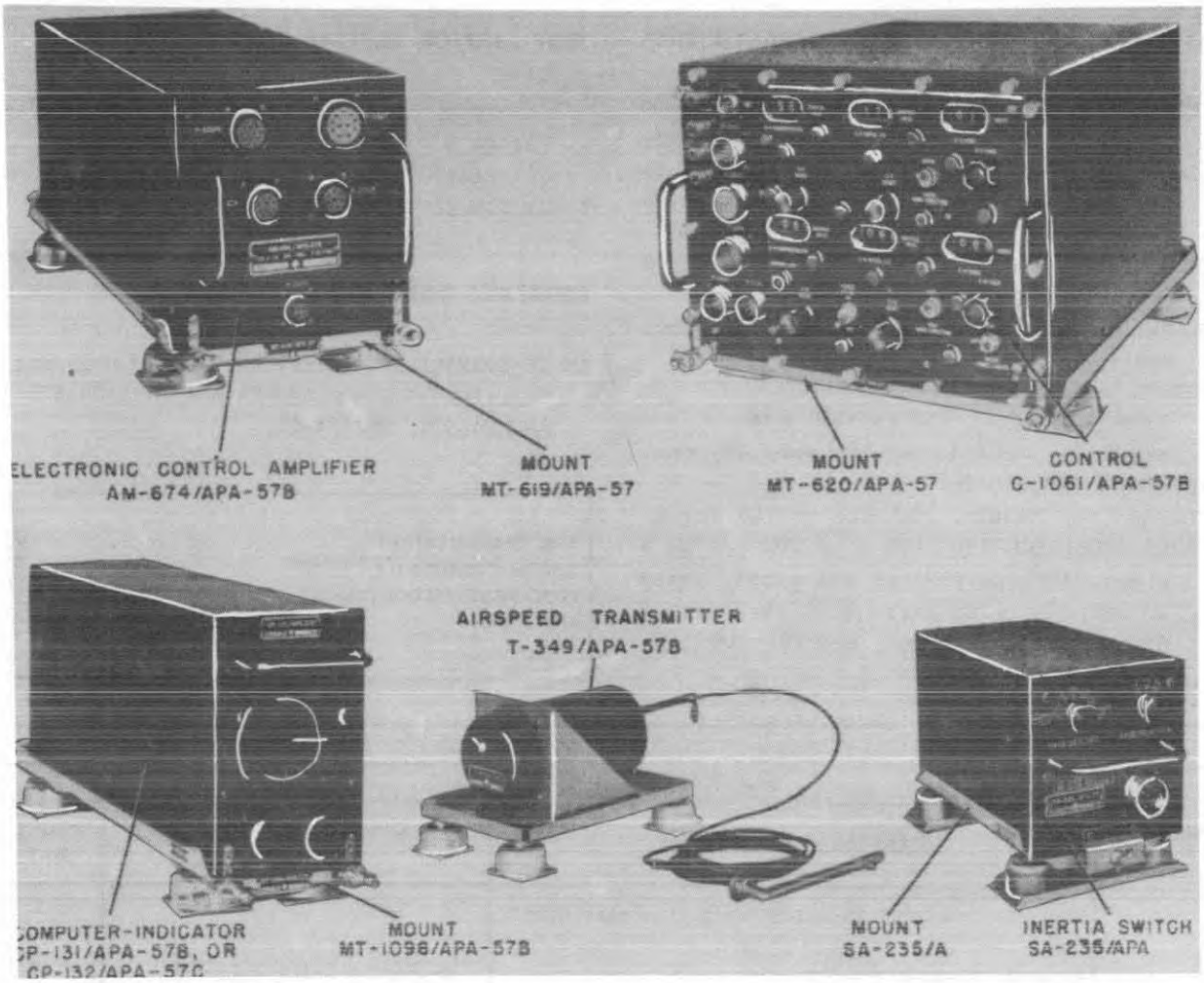
GROUND POSITION INDICATOR AN/APA-57B,C



Ground Position Indicator AN/APA-57B, C

FUNCTIONAL DESCRIPTION

The AN/APA-57B and C are airborne equipment used to indicate the displacement in nautical miles of the aircraft from an initial ground position, in terms of N-S and E-W coordinates. It provides direct indication of the relative position of the aircraft from an initial ground reference, derived from true airspeed, heading, and wind information supplied to the various units of the equipment. The resultant N-S and E-W coordinates, converted into corresponding variable DC voltages, are used to ground stabilize the PPI presentation of radar indicating systems, including Indicator Assy AN/APA-56, or Indicator Group AN/APA-81.

No field changes in effect at time of preparation (2 November 1956).

RELATION TO OTHER EQUIPMENT

Similar to AN/APA-57 and AN/APA-57A.

Equipment Required but not Supplied: (1) G-2 Compass System, (1) Adapter, (1) Set Interconnecting Cables.

AN/APA-57B,C GROUND POSITION INDICATOR

ELECTRICAL AND MECHANICAL CHARACTERISTICS

HEADING SIGNAL: 0 to 3 v, single phase, 400 cps; or 0 to 9 v, single phase, 400 cps.
AIRSPEED SIGNAL: 0 to 65 v, 3 phase, 40 to 160 cps; or 0 to 12 v, single phase, 400 cps.
WIND SIGNAL: 0 to 1.5 v, single phase, 400 cps.
OUTPUT HEADING SIGNAL: 0 to 12 v, 3 phase, 400 cps.
OUTPUT GROUND POSITION COORDINATES
POTENTIOMETER: −150 to +150 v DC.
SYNCHRO: 0 to 12 v, 3 phase, 400 cps.
ALTITUDE: 30,000 ft.
TEMPERATURE RANGE: −55 deg to +55 deg C.
POWER REQUIREMENTS: 115 v or 208 v ±5%, 3 phase, 400 cps ±5% and 115 v ±5%, phase A, 400 cps, ±5%; phase A 70 va, phase B 62 va, phase C 78 va, and 28 v DC ±5%, lamp.

TUBE AND/OR CRYSTAL COMPLEMENT

(8) 12AU7	(3) 12AT7
(2) 6AQ5	(3) 6X4W
(1) 6AX5	(1) 6J6W

Total Tubes: (18)

REFERENCE DATA AND LITERATURE

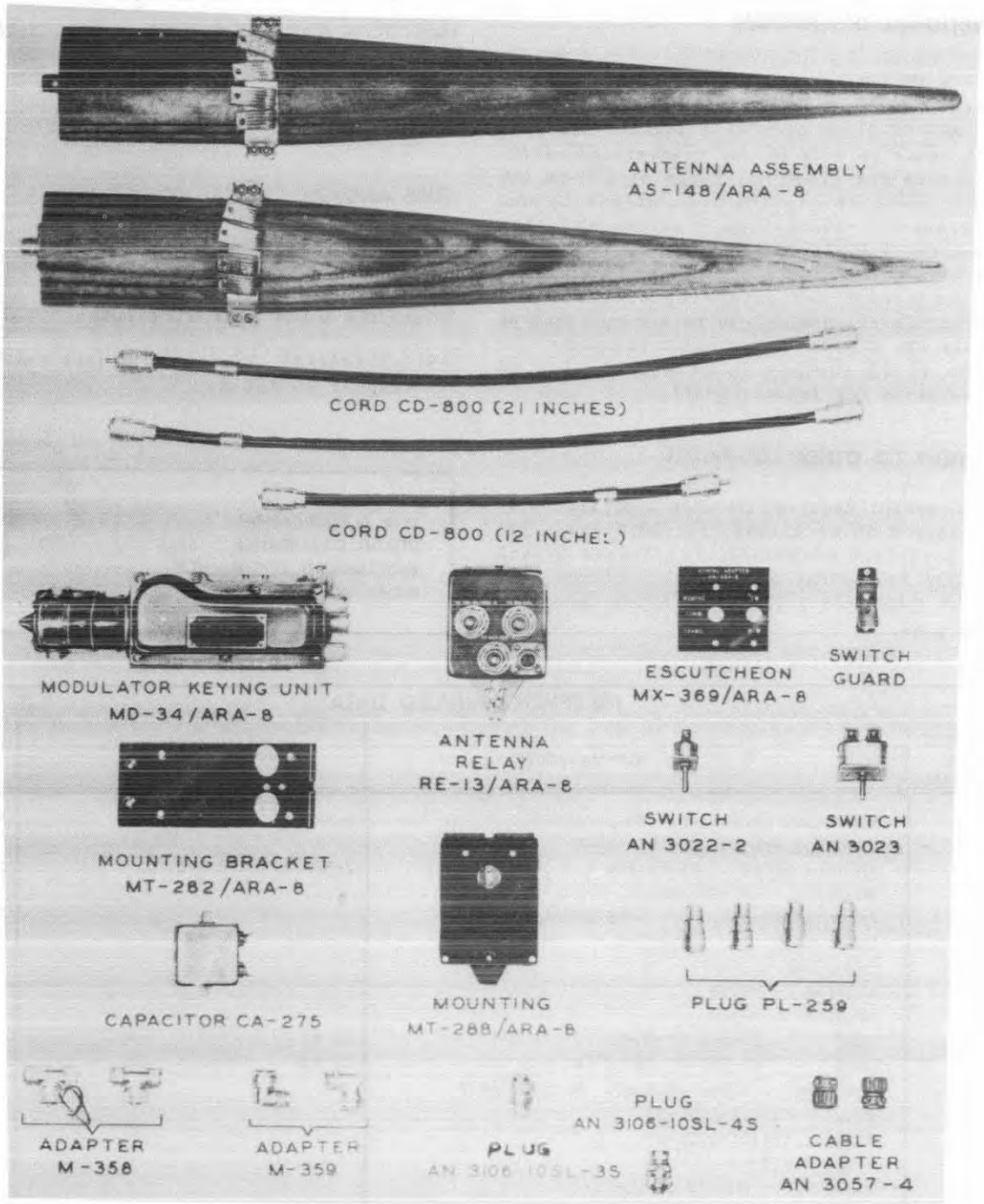
AN 16-30APA57-3: Technical Manual for Ground Position Indicator AN/APA-57A, AN/APA-57B, AN/APA-57C, AN/APA-57.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUAER
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Computer-Indicator CP-131/APA-57B or CP-132/APA-57C	5 X 7-5/8 X 21-1/2	18.5
1	Mounting MT-1098/APA-57B	2-17/32 X 5-3/4 X 23-3/8	1.5
1	Electronic Control Amplifier AM-674/APA-57B	7-5/8 X 7-5/8 X 21-1/2	34
1	Mounting MT-617/APA-57	2-17/32 X 8-1/2 X 23-3/8	2.5
1	Control C-1061/APA-57B	10-5/8 X 15-3/8 X 17-1/2	51
1	Mounting MT-620/APA-57	2-17/32 X 10-3/8 X 16-3/8	2.5
1	Airspeed Transmitter T-349/APA-57B	3-1/4 X 3-1/4 X 7-3/16	2.25
1	Mounting	5-1/4 X 5-5/8 X 9-1/4	0.875
1	Inertia Switch SA-235/APA-57	5-5/16 X 5-5/16 X 10-1/4	5
1	Mounting MT-935/A	1-29/32 X 6-1/16 X 11-5/8	1
1	Set Accessories		

HOMING ADAPTER AN/ARA-8



Homing Adapter AN/ARA-8

AN/ARA-8 HOMING ADAPTER

FUNCTIONAL DESCRIPTION

The AN/ARA-8 is to be used with a VHF receiver, such as Radio Set SCR-522 or Radio Set AN/ARC-3, to provide a fighter aircraft with means to home on any transmitted carrier within the frequency range of 120 to 140 megacycles. It enables lost pilots to home on ground communication stations and thus reach the vicinity of the landing field, and can be used for air-to-air homing for purposes of rendezvous and gathering of scattered combat planes. Homing can be accomplished on either CW, MCW, or audio pulse signals.

No field changes in effect at time of preparation (31 January 1957).

RELATION TO OTHER EQUIPMENT

Equipment Required But Not Supplied: (1) Ohmmeter I-56 or IS-189, (1) 28 V lamp, (1) Toggle Switch AN-3023-1, (1) Toggle Switch AN-3022-2, (1) Set Antenna Mtg. Clamps, (1) Signal Generator I-130-A, (1) Noise Generator TS-274/AR.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 120 to 140 mc.
RECEPTION: CW, MCW, audio pulses.
POWER REQUIREMENTS: 28 v DC, 1 amp.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes.

REFERENCE DATA AND LITERATURE

AN16-30ARA8-3: Technical Manual for Homing Adapter AN/ARA-8.

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	USAF
PROCUREMENT COGNIZANCE	
STOCK NO.	

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Modulator Keying Unit MD-34/ARA-8	3-5/8 X 4-1/2 X 10	4-7/8
1	Mounting Bracket MT-282/ARA-8		1/4
1	Antenna Relay RE-13/ARA-8	2-3/4 X 3-1/8 X 5	1
1	Mounting MT-288/ARA-8		3/16
2	Antenna Assembly AS-148/ARA-8		2-3/5
2	Cable Adapter AN3057-4		
1	Capacitor CA275		3/8
2	Adapter M-358		
*	Adapter M-359		
2	Cord CD-800 or CG-107/U	21 lg	
1	Cord CD-800 or CG-107/U	12 lg	
1	Escutcheon, w/Switch Guard MX-369/ARA-8		
1	Plug AN3106-10SL-3S		
1	Plug AN3106-10SL-4S		
4	Plug PL-259		
**	Cable R.F. RG-8/U or RG-31/U		

NOTES: * Qty 2 to 7 depending on type of aircraft in which equipment is installed.
** Length depends on type of aircraft in which equipment is installed.

MARKER BEACON RECEIVING SET AN/ARN-12

Marker Beacon Receiving Set AN/ARN-12

FUNCTIONAL DESCRIPTION

The AN/ARN-12 is an airborne radio navigation aid designed to receive signals transmitted by a ground beacon transmitter and deliver an aural and visual indication of the received signal to the pilot of the aircraft in which the receiver is located. From these indications the pilot can accurately determine his position.

No field changes in effect at time of preparation (4 February 1957).

RELATION TO OTHER EQUIPMENT

Equipment Required but not Supplied: (1) Antenna Assembly AS-215/ARN, RF Cable RG-8/U as Required, (1) Adapter M-359, (1) Cable Adapter AN-3057-10, (2) Plug PL-259-A, (1) Lamp and Switch Assembly AN-3157-4, (1) Phone Plug PJ-055, (1) Power Switch, (1) Connector AN-3108-18-9S.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY: 75 mc.
TYPE RECEPTION: Signals AM at 400, 1300, or 3000 cps signals.
TYPE RECEIVER: Superheterodyne.
SENSITIVITY: 500 and 1500 uv.
SELECTIVITY: Bandwith 125 kc min at 6 db down from resonance, 600 kc max at 60 db down from resonance, when carrier is 30% modulated by a 400 cps signals.
OUTPUT
AUDIO: 180 mv at 150 ohm load
VISUAL: Relay controlled by a current proportional to the audio modulation signal amplitude.
IMPEDANCE (RECEIVER)
INPUT: 52 ohms.
OUTPUT: 150 ohms.
OPERATING LIMITS
TEMPERATURE: -55 to + 71 deg C (-67 to +160 deg F).
HUMIDITY: 100% relative.
POWER REQUIREMENTS: 24 to 29 v DC, 39.8 W at 26.5 v.
ANTENNA CHARACTERISTICS: 52 ohms impedance with antenna cut for 75 mc.

MANUFACTURER'S OR CONTRACTOR'S DATA

Trad Television Corp, Asbury Park, N.J.
Contract AF33(600)-13961.

TUBE AND/OR CRYSTAL COMPLEMENT

(5) 6AJ5 (2) 28D7 (2) 5726/6AL5W
Total Tubes: (9)
(1) CR-24/U
Total Crystals: (1)

REFERENCE DATA AND LITERATURE

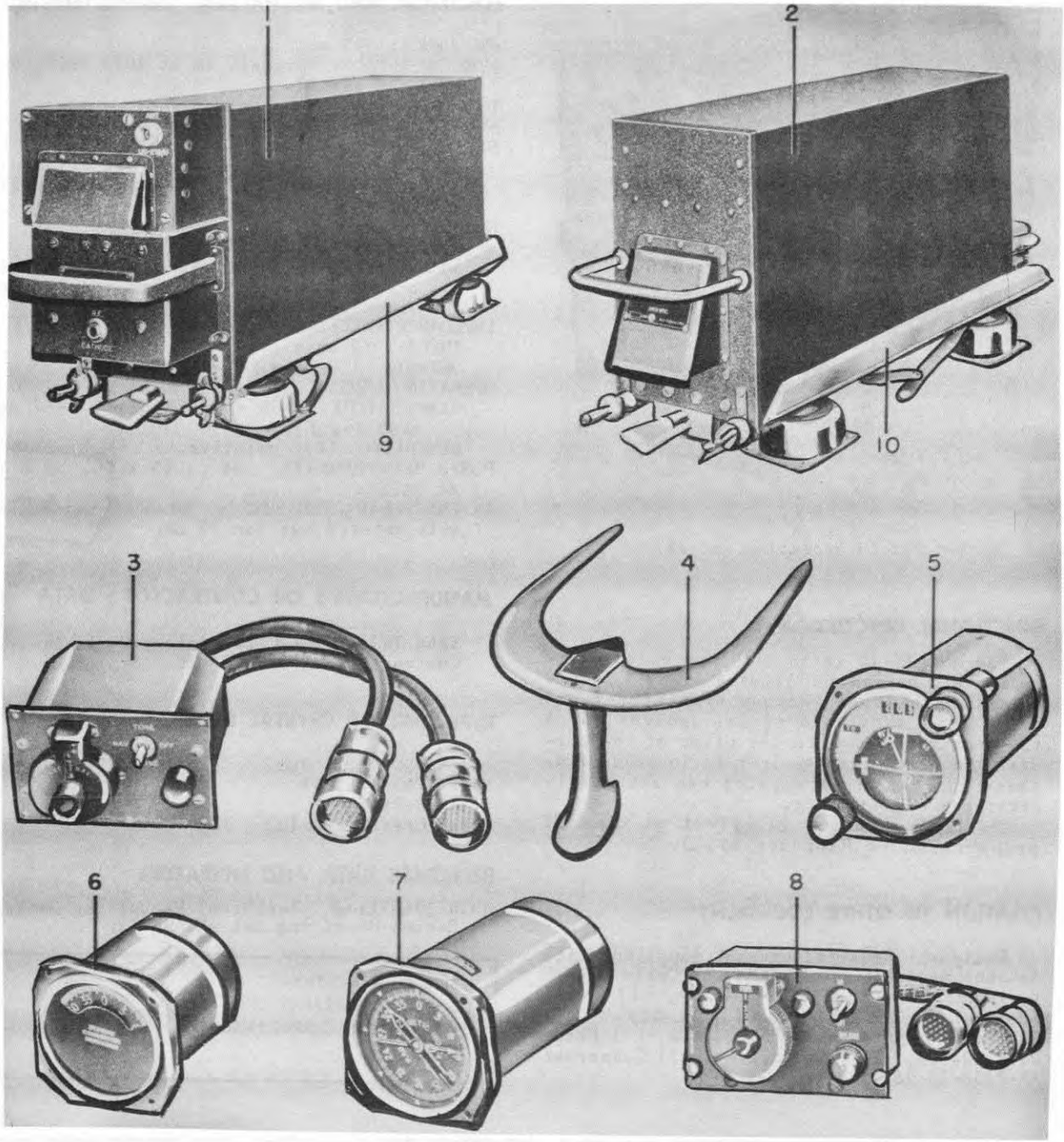
AN16-30ARN12-6: Technical Manual for Marker Beacon Receiving Set AN/ARN-12.

TYPE CLASSIFICATION
DESIGN COGNIZANCE USAF
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Receiver R-122/ARN-12	5-1/8 x 6 x 10	8.0
1	Mounting MT-589/ARN-12	1-7/16 x 5-15/16 x 10-1/8	1.3

RADIO RECEIVING SET AN/ARN-14



Radio Receiving Set AN/ARN-14

AN/ARN-14 RADIO RECEIVING SET

FUNCTIONAL DESCRIPTION

The AN/ARN-14 is an airborne equipment designed to provide the pilot or other members of an air crew with all the radio aids to navigation now available in the very high frequency range of 108.0 to 135.9 megacycles, inclusive. The reception range includes both military and commercial AM communication channels, Omnidirectional Range Channels, Tone (90 or 150 cycle) and Phase Comparison Localizer Channels, and Two-Course VHF Visual Range Navigational Channels are available when the Radio Receiving Set has as a part of its system, Radio Receiver R-252/ARN-14 and Control Box C-512/ARN-14. The Radio Receiving Set which uses Radio Receiver R-252B/ARN-14 does not provide Phase Comparison Localizer Channel facilities. In any receiving system which utilizes Control Panel C-760A/A, Phase Comparison Localizer Channels are not available.

No field changes in effect at time of preparation (8 November 1956).

RELATION TO OTHER EQUIPMENT

Equipment Required but not Supplied: (1) Flight Path Deviation Indicator ID-48A, (1) Antenna Changeover Relay, (1) Gyro Flux Gate Compass Transmitter and Amplifier Unit or other remote indicating magnetic compass, (1) Antenna Coaxial Connector UG-21B/U, Antenna Coaxial Cable RG-8/U, Headsets, Cords, Interphone Jack Boxes, Interconnecting wires as Required, Test Equipment as Required.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 108.0 to 135.9 mc.
CHANNEL DATA
- NUMBER: 280.
- SPACING: 100 kc.
- CONTROL: Crystal.

SERVICE FREQUENCY RANGES
- TONE TYPE RUNWAY LOCALIZER: 108.0 to 111.9 mc.
- PHASE TYPE RUNWAY LOCALIZER: 108.0 to 111.9 mc.
- OMNIDIRECTIONAL RANGE: 112.0 to 117.9 mc.
- VHF TWO-COURSE RANGE: 108.3 to 110.3 mc.
- WEATHER BROADCAST RECEPTION: 111.0 to 112.0 mc.
- TOWER RECEPTION: 118.0 to 121.9 mc.
- GENERAL COMMUNICATION RECEPTION: 122.0 to 135.9 mc.

FREQUENCY STABILITY: ±0.007%.
AUDIO POWER OUTPUT: 300 mw into 500 ohm load.
AUDIO OUTPUT IMPEDANCE: 500 ohms.
ANTENNA INPUT IMPEDANCE: 52 ohms with less than 2: 1 SWR.
AUTOMATIC GAIN CONTROL: Maintains audio output within 3 db for variation of RF input from 5 to 100000 uv.
TEMPERATURE RANGE: −55 to +71 deg C (−67 to +160 deg F).
HUMIDITY: Up to 95% at +50 deg C (+122 deg F).
PRESSURE: Altitude up to 50000 ft.
RANGE: 4 mi at 10 ft altitude to 300 mi at 50000 ft altitude.
POWER REQUIREMENTS: 26.5 v DC, 7 amps normal, 20 amps starting and channel selection; 26 v, 400 cps, 0.43 amps for automatic indicators.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) 6627/OB2WA	(9) 5654/6AK5W
(11) 5670	(4) 5726/6AL5W
(4) 5749/6BA6W	(1) 5750/6BE6W
(3) 5751	

Total Tubes: (33)

(2) 1N34A	(34) Hc-6/U

Total Crystals: (36)

REFERENCE DATA AND LITERATURE

T.O. 12R5-2ARN 14-2: Technical Manual for Radio Receiving Set AN/ARN-14.

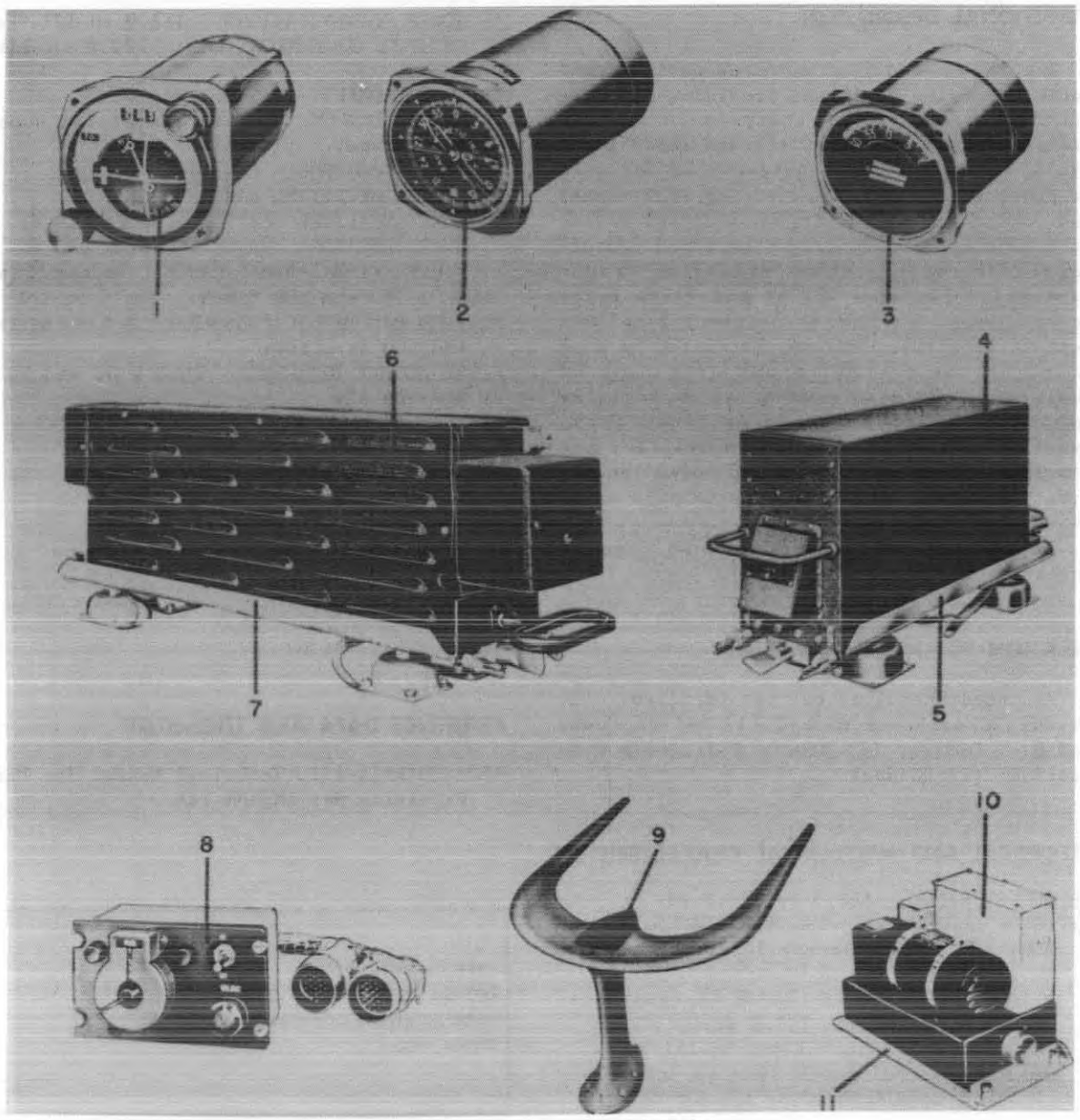
TYPE CLASSIFICATION
DESIGN COGNIZANCE USAF
PROCUREMENT COGNIZANCE
STOCK NO.

RADIO RECEIVING SET

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Receiver R-252/ARN-14 or R-252B/ARN-14 including: RF Head IF and Audio Chassis Navigation Chassis Monitor Chassis	5 X 7.62 X 25.41	33.5
1	Control Panel C-512/ARN-14 or: Control Panel C-760A/A	3.375 X 5 X 5.37 3.375 X 4.5 X 5.75	2.37 2.8
1	Dynamotor Unit DY-66/ARN-14	5 X 7.75 X 14.74	16.04
1	Mounting, Dynamotor MT-627/ARN-14	5.87 X 5.93 X 24.75	3.18
1	Course Indicator ID-249/ARN or ID-249A/ARN	3.25 dia X 6.21	3.25
1	Course Indicator ID-250/ARN	3.25 dia X 6.25	2.5
1	Radio-Indicator Control ID-251/ARN	3.25 dia X 4.36	1.86
1	Antenna AT-172/ARN-14	12.125 X 17.25 X 26.5	5.75

RADIO RECEIVING SET AN/ARN-14A



Radio Receiving Set AN/ARN-14A

1 Course Indicator ID-249A/ARN
2 Course Indicator ID-250/ARN
3 Radio Indicator-Control ID-251/ARN
4 Dynamotor DY-66/ARN-14
5 Mounting MT-628/ARN-14
6 Radio Receiver R-252C/ARN-14
7 Mounting MT-627A/ARN-14
8 Control Panel C-760A/A
9 Antenna AT-172/ARN-14
10 Dynamotor DY-84/ARN-14A
11 Mounting MT-962/ARN-14A

AN/ARN-14A RADIO RECEIVING SET

FUNCTIONAL DESCRIPTION

The AN/ARN-14A is an airborne navigational radio receiving equipment providing 280 communication-navigation channels covering a frequency range of 108-0 through 135.9 megacycles. Primarily the equipment is designed to provide the pilot and air crew with visual indications of the lateral positional deviation of the aircraft from a selected omnidirectional range station radial or from a particular leg of a VHF visual-aural range on an airway, or from the correct localizer path to an airport runway. Provision is also made for the reception and detection of amplitude modulated communication signals. including weather and tower broadcasts, general communications on the military and commercial frequency bands and coded identification letter groups associated with navigational signals.

No field changes in effect at time of preparation (10 December 1956).

RELATION TO OTHER EQUIPMENT

Equipment Required but not Supplied: (1) Antenna Changeover Relay, (1) Set of Power and R.F. Cables, (1) Remote Indicating Compass and (1) Headset.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 108.0 to 135.9 mc.
TYPES OF SERVICE AND FREQUENCY BANDS.
TONE LOCALIZER (Runway location): 108.8 to 111.9
V.H.F. VISUAL-AURAL-RANGE (Airway location): 108.3 to 110.3 mc.
WEATHER BROADCASTS: 111.0 to 111.9 mc.
OMNIDIRECTIONAL RANGE (Radial location): 112.0 to 117.9 mc.
TOWER COMMUNICATIONS: 118.0 to 121.9 mc.
GENERAL COMMUNICATIONS: 122.0 to 135.9 mc.
FREQUENCY DRIFT: 0.01%.
RECEIVER SYSTEM: Triple conversion superheterodyne.
FREQUENCY CONTROL: Crystal.
EFFECTIVE RECEIVING RANGE
TONE LOCALIZER SERVICE: Approx 20 mi.
OMNIDIRECTIONAL RANGE: Approx 175 mi.
V.H.F. VISUAL-AURAL-RANGE: Approx 159 mi.
AMBIENT TEMPERATURE RANGE: -55° C to $+71^{\circ}$ C.
MINIMUM BAROMETRIC PRESSURE: 3.4 in. mercury (50,000 ft altitude).
POWER SOURCE REQUIRED: 26.5 V DC and 26 V, 400 cps AC.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) OB2WA	(1) 5627
(7) 6AK5W	(4) 6BA6W
(4) 5670	(2) 6BE6W
(1) 6AS6W	(7) 5751

Total Tubes: (30)

REFERENCE DATA AND LITERATURE

AN16-30ARN14-11: Technical Manual for Radio Receiving Set AN/ARN-14A.

TYPE CLASSIFICATION
DESIGN COGNIZANCE USAF
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Receiver R-252C/ARN-14		
1	Control Panel C-760A/A		
1	Dynamotor CY-84/ARN-14A or CY-66/ARN-14		

RADIO RECEIVING SET AN/ARN-14A

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Mounting MT-962/ARN-14A or MT-628/ARN-14		
1	Mounting MT-627A/ARN-14		
1	Course Indicator ID-249A/ARN		
1	Course Indicator ID-250/ARN		
1	Radio Indicator Control ID-251/ARN		
1	Antenna AT-172/ARN-14		

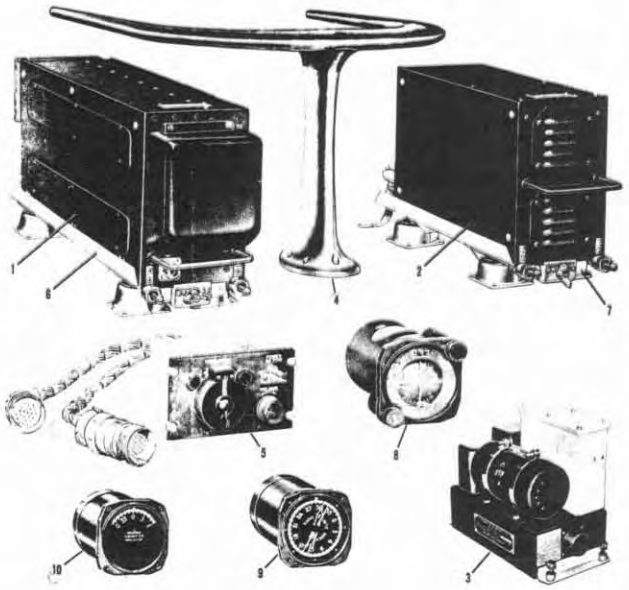
10 August 1962 RADIO RECEIVING SET AN/ARN-14C

Cog Service: BuWeps FSN: Functional Class:

USA	USN	USAF

TYPE CLASS: Used by Used by

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



Radio Receiving Set AN/ARN-14C

FUNCTIONAL DESCRIPTION:

The Radio Receiving Set AN/ARN-14C is an airborne navigational radio receiving equipment providing 280 communication-navigation channels covering a frequency range of 108.0 to 135.9 megacycles (MC).

No field changes in effect at time of preparation (5 March 1962).

TECHNICAL CHARACTERISTICS:

TYPE OF INSTALLATION: Airborne.
TYPE OF INDICATATION: Visual.
TYPE OF RECEPTION: A9 type.
TYPE OF RECEIVER: Superheterodyne.
TYPE OF FREQUENCY CONTROL: Crystal.
EQUIPMENT PURPOSE: Navigation.

FREQUENCY RANGE: 108.0 to 135.9 mc.
NUMBER OF CHANNELS: 280.
CHANNEL SPACING: 100 kc.
OPERATING POWER RQMT: 115 v ac, 400 cps, single ph, 25 W; 26.5 v dc, 159 W.

AN/ARN-14C RADIO RECEIVING SET

RELATION TO OTHER EQUIPMENT:

The AN/ARN-14C is functionally the same as Radio Receiving Set AN/ARN-14 except the tone localizer functions are deleted from the even tenth megacycles positions in the range 108 to 119.9 mc and VOR functions are substituted on these frequencies.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Stabilized Magnetic Compass; (1) Headset (Match 500-ohm output impedance); (1) Primary Power Source (26 v, 400 cps for indicator circuits); (1) Primary Power Source (26.5 v dc for dynamotor); (2) Antenna Coaxial Connector Type UG-21B/U; (1) Antenna Coaxial Cable Type RG-8/U (52-ohm impedance); (1) Mounting MT-962/ARN-14A (mounting to support DY-84/ARN-14A, if supplied).

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Radio Receiving Set AN/ARN-14C consists of:			
1	Radio Receiver R-540/ARN-14C		5 x 8 x 21	
1	Dynamotor DY-66A/ARN-14		4-7/8 x 7-5/8 x 14	
1	Antenna AT-172/ARN-14		10 x 15 x 25	
1	Control Panel C-760/A		3-3/8 x 5-1/2 x 5-3/4	
1	Mounting MT-627A/ARN-14		2 x 5 x 20	
1	Mounting MT-628/ARN-14		2 x 5 x 12	
1	Course Indicator ID-249A/ARN		3-1/8 dia x 6-1/4 lg	5
1	Course Indicator ID-250/ARN		3-1/8 x 3-1/8 x 6	2
1	Radio Indicator Control ID-251		3-1/8 x 3-1/8 x 4	2

REFERENCE DATA AND LITERATURE:

(USAF) TO 12R5-2ARN14-11 and (Navy) AN16-30ARN14-6: Technical Manual for Radio Receiving Sets AN/ARN-14B and AN/ARN-14C.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (1) 6AL5W (9) 6AK5W (1) 12AT7 (10) 5814 (3) 5751 (1) 5687 (1) 0A2

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: BuWeps
SPEC &/OR DWG: MCREE-329-B

DESIGN COG: BuWeps

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Collins Radio Co.	Cedar Rapids, Iowa	AF33(038)-20917 AF33(038)-30015	

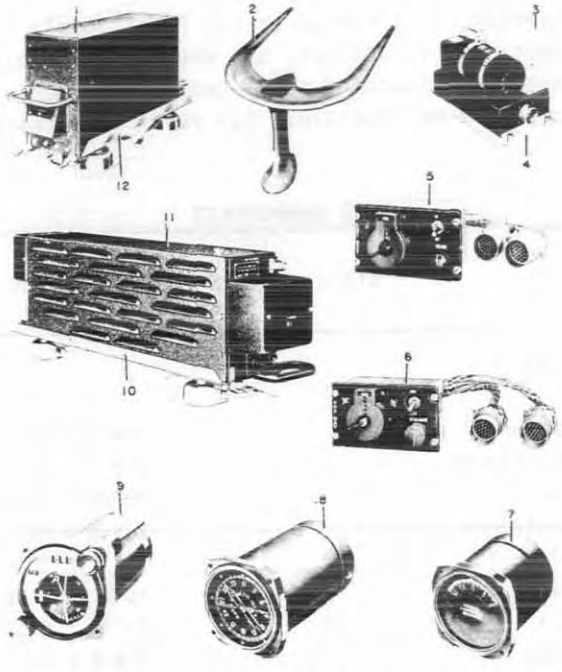
14 August 1962 RADIO RECEIVING SET AN/ARN-14D

Cog Service: BuWeps FSN: Functional Class:

USA	USN	USAF

TYPE CLASS: Used by Used by

MANUFACTURER'S NAME/CODE NUMBER: Bendix Aviation Corp., Bendix Radio Division, (06845).



1 Dynamotor DY-66/ARN-14
2 Antenna AT-172/ARN-14
3 Dynamotor DY-84/ARN-14A
4 Mounting Base MT-962/ARN-14A
5 Control Panel C-760A/A
or
6 Receiver Control C-996/A
7 Radio Indicator-Control ID-251/ARN (not supplied)
8 Course Indicator ID-250/ARN (not supplied)
9 Course Indicator ID-249A/ARN (not supplied)
10 Mounting Base MT-627A/ARN-14 (or MT-1161/ARN)
11 Radio Receiver R-541/ARN-14D
12 Mounting Base MT-628/ARN-14

Radio Receiving Set AN/ARN-14D

FUNCTIONAL DESCRIPTION:

The Radio Receiving Set AN/ARN-14D is an airborne navigational radio receiving equipment providing 280 communication-naviation channels covering a frequency range of 108.0 to 135.9 megacycles (MC).

No field changes in effect at time of preparation (2 March 1962).

TECHNICAL CHARACTERISTICS:

TYPE OF INSTALLATION: Airborne.
TYPE OF INDICATION: Visual.
TYPE OF RECEPTION: A9 type.
EQUIPMENT PURPOSE: Navigation.
FREQUENCY RANGE: 108.0 to 135.9 mc.
NUMBER OF CHANNELS: 280 channels.
CHANNEL SPACING: 100 kc.
OPERATING POWER RQMT: 115 v ac, 400 cps, single ph, 25 W; 26.5 v dc.

AN/ARN-14D RADIO RECEIVING SET

RELATION TO OTHER EQUIPMENT:

The AN/ARN-14D is functionally the same as Radio Receiving Set AN/ARN-14A except the tone localizer functions are deleted from the even tenth megacycles position in the range 108 megacycles to 119.9 megacycles and VOR function substituted on these frequencies.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Power Supply for Dynamotor DY-66/ARN-14 or (1) Power Supply for Dynamotor DY-84/ARN-14A; (1) Power Supply for Indicators (26 v, 400 cps, 0.5 amps); (1) Remote Indicating Magnetic Compass NT 12013; (1) Headset; (3) Antenna Coaxial Cables RG-8/U; (6) Antenna Coaxial Connector (to match W/UG-58/U Receptacle or UG-21B/U); (1) Vertical Antenna Type AN-104B or equivalent.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Radio Receiving Set AN/ARN-14D consists of:			
1	Radio Receiver R-541/ARN-14D		5 x 8 x 21	
1	Receiver Control C-512/ARN-14		2 x 3 x 5	
1	Dynamotor DY-66/ARN-14		4-7/8 x 7-5/8 x 14	
1	Mounting Base MT-627A/ARN-14		2 x 5 x 20	
1	Mounting Base MT-628/ARN-14		2 x 5 x 12	
1	Antenna AT-172/ARN-14		10 x 15 x 25	
1	Control Panel C-760A/A		3-3/8 x 5-1/2 x 5-3/4	
1	Dynamotor DY-84/ARN-14A		5 x 8 x 10	
1	Mounting Base MT-962/ARN-14A			

REFERENCE DATA AND LITERATURE:

AN16-35R541-1: Technical Manual for Radio Receiving Set AN/ARN-14D.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (7) 5654 (5) 5670 (4) 5749 (1) 5750 (4) 5726 (5) 5751 (1) 0B2

CRYSTALS: None used.

SEMI-CNODUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: BuWeps DESIGN COG: BuWeps
SPEC &/OR DWG: MCREE-329-B

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Bendix Aviation Corp., Bendix Radio Division	Baltimore, Maryland		

21 August 1962 RADIO RECEIVING SET AN/ARN-14E

Cog Service: USAF FSN: Functional Class:

USA USN USAF

TYPE CLASS: Used by

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

(No Illustration Available)

FUNCTIONAL DESCRIPTION:

The Radio Receiving Set AN/ARN-14E is an airborne navigational radio receiving equipment providing 280 communication-navigation channels covering a frequency range of 108.0 through 135.9 megacycles (MC).

The AN/ARN-14E is primarily designed to provide the pilot and air crew with visual indications of the lateral positional deviation of the aircraft from a selected omnidirectional range station radial, or from a particular leg of a Very High Frequency (VHF) visual-aural range on an airway, or from the correct localizer path to an airport runway. Provision is also made for the reception and detection of amplitude modulated communication signals, including tower broadcasts, general communications on the military and commerical frequency bands, and coded identification letter groups associated with navigational signals.

No field changes in effect at time of preparation (3 January 1962).

TECHNICAL CHARACTERISTICS:

TYPE OF INSTALLATION: Aircraft installed.
TYPE OF RECEIVER: Double superheterodyne.
TYPE OF FREQUENCY CONTROL: Crystal.
CHANNEL DATA
- NUMBER OF CHANNELS: 280.
- CHANNEL SPACING: 100 kc.
- TYPE OF CONTROL: Crystal.

SERVICE FREQUENCY RANGES
- TONE TYPE RUNWAY LOCALIZER: 108 to 111.9 mc.
- PHASE TYPE RUNWAY LOCALIZER: 108 to 111.9 mc.
- OMNIDIRECTIONAL RANGE: 112.0 to 117.9 mc.
- VHF TWO-CORSE RANGE: 108.3 to 110.3 mc.
- WEATHER BROADCAST RECEPTION: 110.0 to 112.0 mc.
- TOWER RECEPTION: 118.0 to 121.9 mc.
- GENERAL COMMUNICATION RECEPTION: 122.0 to 135.9 mc.

TYPE OF RECEPTION: A9 type.
OPERATING FREQUENCY RANGE: 108 to 135.9 mc.
OPERATING POWER RQMT: 26.5 dc, 2.5 amps; 250 v dc, 150 ma.

RELATION TO OTHER EQUIPMENT:

The AN/ARN-14E is similar to but not the same as AN/ARN-14,-14A,-14B,-14C and AN/ARN-14D.

AN/ARN-14E RADIO RECEIVING SET

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Radio Receiving Set AN/ARN-14E consists of:			
1	Radio Receiver R-540/ARN-14C		5 x 8 x 21	
1	Mounting MT-627A/ARN-14			
1	Dynamotor DY-84/ARN-14A		5 x 8 x 10	9
1	Mounting MT-962/ARN-14A			

REFERENCE DATA AND LITERATURE:

AN16-35R541-1: Technical Manual for Radio Receiving Set AN/ARN-14,-14A,-14B,-14C,-14D and AN/ARN-14E.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (1) 0A2WA (10) 6AK5W (1) 5687WA (1) 6AL5W (3) 5751 (10) 5814A

CRYSTALS: (34) HC-6/U

SEMI-CONDUCTORS: (2) 1N34A

SHIPPING DATA

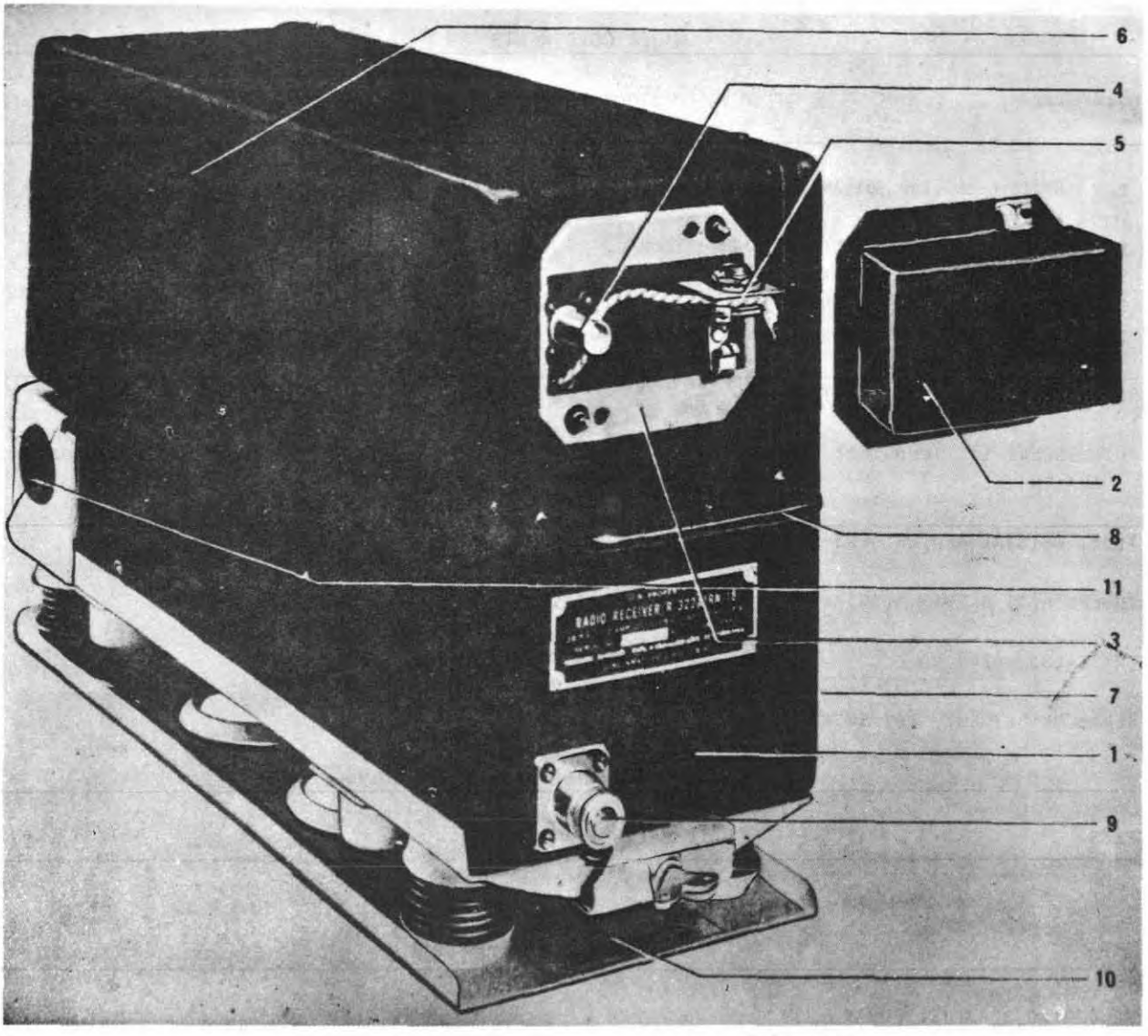
PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: USAF, USN DESIGN COG: USAF
SPEC &/OR DWG: MCREE-329B(USAF)

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Collins Radio Company	Cedar Rapids, Iowa	MIPR2776-53	

RADIO RECEIVING SET AN/ARN-18



Radio Receiving Set AN/ARN-18

FUNCTIONAL DESCRIPTION

The AN/ARN-18 is a part of the instrument landing system which provides for both vertical and lateral guidance when landing an aircraft. Lateral guidance is supplied by a separate receiver. The signals received by the guide slope receiver are radiated by an ultra high frequency glide slope transmitter located in proximity to the touchdown point on the airfield landing strip or runway. These signals are used to operate the horizontal pointer of one to three cross-pointer instruments to provide a continuous visual indication of the position of the aircraft with respect to the established glide slope.

No field changes in effect at time of preparation (6 March 1957).

RELATION TO OTHER EQUIPMENT

Equipment Required but not Supplied: (1) Antenna, (as required) Transmission Line, (1) Power Cable (26.5 V DC) (1) Power Cable (115 V AC) (1) Set Interconnecting Wire, (1) Control Panel C-760/A or C-996/A, (1 to 3) Indicator ID-48/ARN or ID-249/ARN or ID-249A/

AN/ARN-18 RADIO RECEIVING SET

ARN, (1) Radio Receiving Set AN/ARN-14.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 329.3 to 335.0 MC.
TYPE RECEIVER: Fixed tuned superhetrodyne.
NUMBER CHANNELS: 20 channels, spaced 0.3 mc apart.
INTERMEDIATE FREQUENCY: 18.9 mc.
IF BANDWIDTH: 135 KC min. at 6 db attenuation; 52 475 KC max. at 60 db attenuation.
RF INPUT: 52 ohms coaxial.
POWER SUPPLY
FILAMENT: 26.5 V DC, 1.25 amp.
PLATE SUPPLY: 115 V, 320 to 1700 cps, 0.3 amp.
RECEIVER STABILITY: ±66 KC max.
UNDESIRED REJECTIONS
ADJACENT CHANNEL: 70 db.
IMAGE: 75 db.
IF: 90 db.
OTHERS: 70 db.
HARMONIC DISTORTION: Less than 5%.
INTERMODULATION: Less than 10%.

TUBE AND/OR CRYSTAL COMPLEMENT

(10) 6AK5W/5654	(1) 6AL5W/5726	(1) 5751
(1) 5670WA	(2) 6X4W	(1) OA2

Total Tubes: (16)

(20) CR-18/U

Total Crystals: (20)

REFERENCE DATA AND LITERATURE

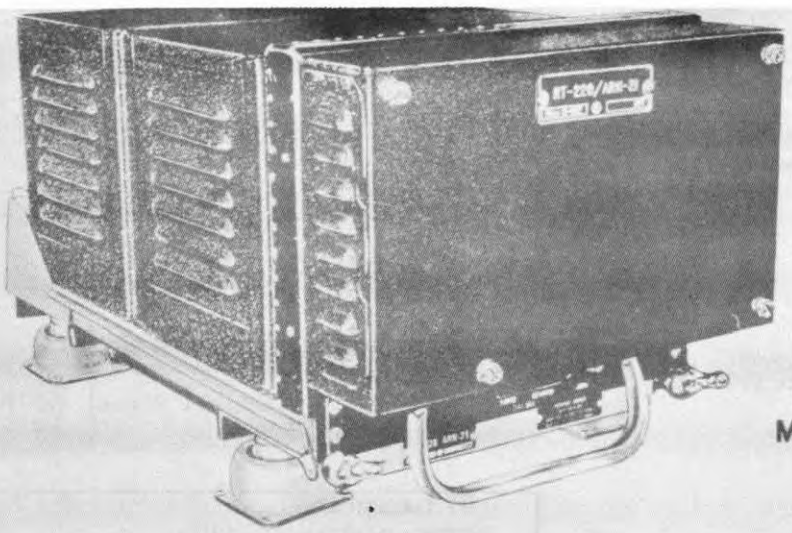
AN16-30ARN18-1: Technical Manual for Radio Receiving Set AN/ARN-18.

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	BUAER
PROCUREMENT COGNIZANCE	
STOCK NO.	

EQUIPMENT SUPPLIED DATA

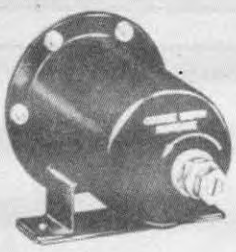
QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Mounting MT-691/ARN-18	3-3/4 X 5-3/16 X 13-7/8	1.9
1	Radio Receiver R-322A/ARN-18	4-7/8 X 7-5/8 X 14-1/8	13

RADIO SET AN/ARN-21



RADIO
RECEIVER-TRANSMITTER
RT-220/ARN-21

MOUNTING
MT-928/ARN-21



PHASE DETECTING NETWORK
CV-279/ARN

AZIMUTH INDICATOR
ID-307/ARN

RANGE INDICATOR
ID-310/ARN

RADIO SET CONTROL
C-866/ARN-21

Radio Set AN/ARN-21

AN/ARN-21 RADIO SET

FUNCTIONAL DESCRIPTION

The AN/ARN-21 is an airborne navigation interrogator-responsor designed to operate in conjunction with a surface navigation beacon such as Radio Set AN/URN-3. The airborne and surface equipments form a radio navigation system which enables an equipped aircraft to obtain continuous indications of its distance and bearing from any selected surface beacon located within a line-of-sight distance from the aircraft up to 195 nautical miles. The bearing information and distance information are displayed on two separate indicators.

No field changes in effect at time of preparation (6 November 1956).

RELATION TO OTHER EQUIPMENT

Equipment Required but not Supplied: (1) Antenna AS-572/ARN-21 or AS-133/APX or AT-234/APX, (1) Cable, Antenna RG-8/U, Plugs and Cable Clamps as required, Test Equipment as required. (1) Course Indicator ID-249(A)/ARN, (1) Course Indicator ID-250/ARN, (1) Fluxgate Compass G-2, and Plugs and Cable Clamps are Accessory Equipment as required.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

RECEIVER DATA
- FREQUENCY RANGE
  - LOW BAND: 962 to 1024 mc in 1 mc steps.
  - HIGH BAND: 1151 to 1213 mc in 1 mc steps.
- INTERMEDIATE FREQUENCY: 63 mc.
- NOISE FIGURE: 13 db.
- IMAGE RATIO: 60 db min.

TRANSMITTER DATA
- FREQUENCY RANGE: 1025 to 1150 mc in 1 mc steps.
- PEAK PULSE POWER OUTPUT: 1 kw min.
- PULSE PAIR TRANSMISSION RATE: 150 and 30 pps.

SIGNAL DATA
- TRANSMITTED
  - PULSE PAIR SPACING: 12 usec.
  - RISE TIME: 2.5 usec (10 to 90% amplitude).
  - DURATION: 3.5 usec (50% amplitude).
  - DECAY TIME: 1 usec max (90 to 10% amplitude).
- RECEIVED
  - PULSE PAIR SPACING: 12 usec.
  - RISE TIME: 2.5 usec (10 to 90% amplitude).
  - DURATION: 3.5 usec (50% amplitude).
  - DECAY TIME: 2.5 usec (90 to 10% amplitude).
  - PULSE MODULATION: Amplitude modulated at 15 and 135 pps. Depth of modulation is 15 to 30% for each frequency.
  - 15 CYCLE REFERENCE BEARING SIGNAL: 15 pulse groups per second, each group consisting of 12 pulse pairs spaced 30 usec apart.
  - 135 CYCLE REFERENCE BEARING SIGNAL: 135 pulse groups per second, each group consisting of 6 pulse pairs spaced 24 usec apart.

POWER REQUIREMENTS: 115 v, 380 to 420 cps, single phase, 80 va; 115 v, 320 to 1000 cps, single phase, 400 va; 28 v DC, 0.7 amps.

MANUFACTURER'S OR CONTRACTOR'S DATA

Hoffman Laboratories, Inc., Los Angeles, California.
Contract NOas 52-445, dated 6 December 1951.

Stromberg Carlson Company, Rochester, N.Y.
Contract NOas 52-446, dated 21 November 1951.

Collins Radio Company, Cedar Rapids, Iowa.
Contract NOas 51-1155-i, dated 30 June 1951.

International Telephone and Telegraph Corp (Federal Telephone and Radio Company Div), Clifton, New Jersey.
Contract NOas 51-1227, dated 19 June 1951.
Approximate Cost: $9500.00 with equipment spares.

TUBE AND/OR CRYSTAL COMPLEMENT

(17) 6021	(4) 5784WA
(3) 5719	(6) 5829WA
(4) 5702WA	(2) 5636
(5) 5696	(2) 5687
(2) 5639	(4) 2D21W
(1) 6Y3A	(5) 2C39A
(2) 5726	(1) 6X4W
(1) 5787WA	(1) 6AS7G

RADIO SET AN/ARN-21

(1) OA2 (2) 5670
(6) 5654 (3) 5656
(1) 3D21A (2) 5517
Total Tubes: (75)

(43) CR-23/U (1) 1N23B
(1) 1N34A (1) 1N35

Total Crystals: (46)

REFERENCE DATA AND LITERATURE

AN16-30ARN21-3: Technical Manual for Radio Set AN/ARN-21.

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	BUSHIPS
PROCUREMENT COGNIZANCE	
STOCK NO.	

EQUIPMENT SUPPLIED DATA

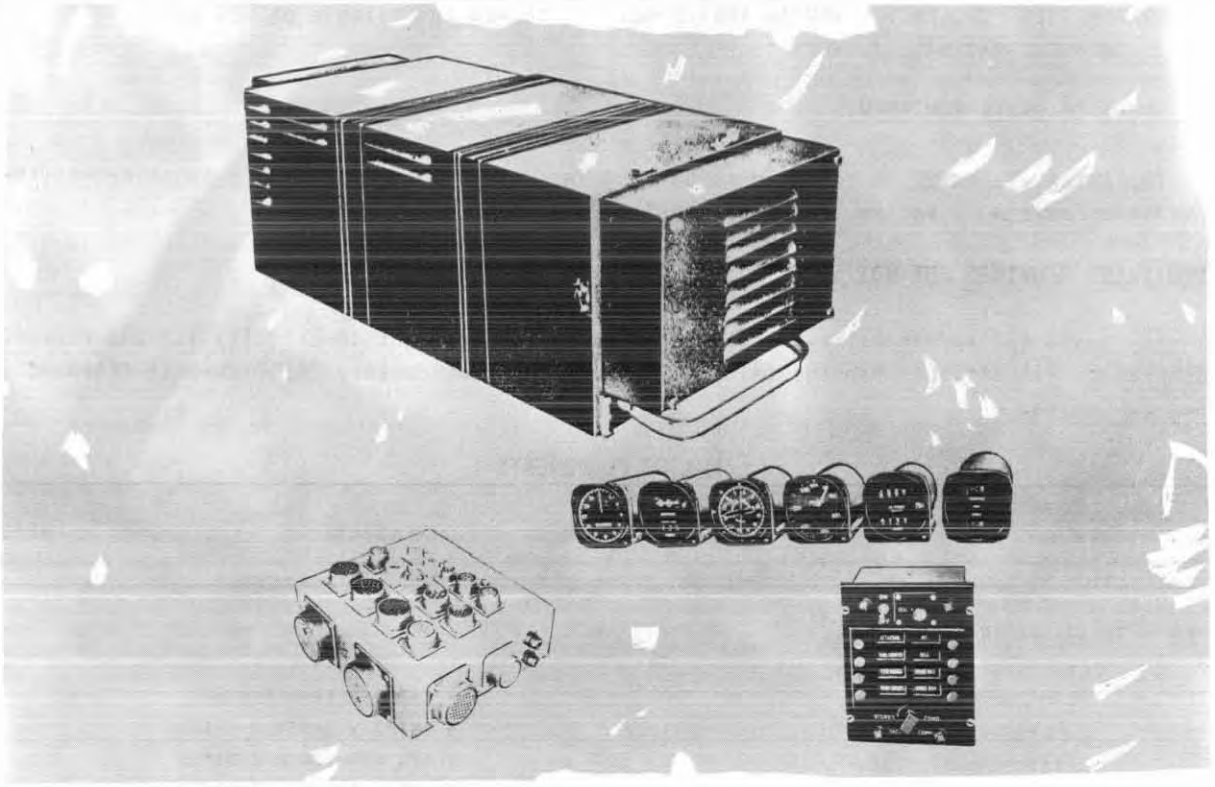
QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Receiver-Transmitter RT-220/ARN-21	8-5/16 X 11-1/8 X 18-3/4	60
1	Mounting MT-928/ARN-21		
1	Azimuth Indicator ID-307/ARN	3-1/8 dia X 6-5/8	3
1	Range Indicator ID-310/ARN	3-1/8 dia X 7-1/4	2.5
1	Radio Set Control C-866/ARN-21	2-1/4 X 4-3/4 X 5-3/4	1.5
1	Phase Detecting Network CY-279/ARN	2-23/32 X 3 X 4-7/8	

13 August 1962 **RADIO SET AN/ARN-26(XN-2)**

Cog Service: USN FSN: Functional Class:

	USA	USN	USAF
TYPE CLASS:	Used by	Used by	

MANUFACTURER'S NAME/CODE NUMBER: ITT Laboratories, (90348).



Radio Set AN/ARN-26(XN-2)

FUNCTIONAL DESCRIPTION:

The Radio Set AN/ARN-26(XN-2) is designed as a radio receiving set operating between 90 kilocycles and 110 kilocycles on seventy-five (75) preset channels, automatically obtains a bearing and a course to fly to the Navaglobe Station selected, up to a distance of 1500 nautical miles.

The AN/ARN-26(XN-2) is an airborne data link equipment operated in conjunction with airborne Radio Set AN/ARN-21(XN-3) to perform the following functions: (1) It displays actual bearing, heading, air speed and altitude information; (2) It encodes and feeds to Radio Set AN/ARN-21(XN-3) for transmission to the surface activity the above flight data, acknowledgements of received orders, any one of 31 discrete messages, and any one of six modes of operation; (3) It decodes and displays ordered instructions received from the surface activity in the same categories.

No field changes in effect at time of preparation (1 March 1962).

AN/ARN-26(XN-2) RADIO SET

TECHNICAL CHARACTERISTICS:

TYPE OF INSTALLATION: Airborne.
TYPE OF EQUIPMENT: Radio.
EQUIPMENT PURPOSE: Navigation.
EFFECTIVE RANGE: Up to 1500 nautical miles.
FREQUENCY RANGE
TRANSMITTER FREQUENCY: 960 to 1087.5 mc.
CHANNEL SPACING: 2.5 mc.
RECEIVER FREQUENCY: 1087.5 to 1215 mc.
CHANNEL SPACING: 2.5 mc.
NUMBER OF PRESET CHANNELS: 75.
OPERATING POWER RQMT: 28 v dc, 2 amps; 110 v ac, 320 to 1760 cps, 400 va; 115 v ac, 380 to 420 cps, single ph, 30 va.

RELATION TO OTHER EQUIPMENT:

The AN/ARN-26(XN-2) is designed to be used in conjunction with Radio Sets AN/ARN-21(XN-3), AN/URN-3; AN/GRN-9, 9A, 9B, 9C or AN/SRN-6.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Radio Set AN/ARN-21(XN-3); (1) Cross Pointer Instrument ID-249; (1) ILS and Marker Generator; (1) Altitude Sensing Cell; (1) Throttle Potentiometer; (1) Flux-Gate Compass; (1) Set of Cables.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBER	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Radio Set AN/ARN-26(XN-2) consists of:			
1	Data Coding Unit		9-13/16 x 11-1/8 x 24	
1	Control Panel		5-13/32 x 5-3/4 x 7-1/8	
1	Airspeed Indicator		3-1/4 x 3-1/4 x 8-11/16	
1	Altitude Indicator		3-1/4 x 3-1/4 x 7-31/32	
1	Radio Magnetic (Heading) Indicator		3-1/4 x 3-1/4 x 7-13/16	
1	Bearing Indicator		3-1/4 x 3-1/4 x 8-7/32	
1	Distance Indicator		3-1/4 x 3-1/4 x 8-21/32	
1	Discrete Data Indicator		3-1/4 x 3-1/4 x 10-5/8	
1	Junction Box		4-17/64 x 10-9/16 x 12-1/2	
1	Set of Connectors			

REFERENCE DATA AND LITERATURE:

NAVSHIPS 93501: Technical Manual for Radio Set AN/ARN-26(XN-2).

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (11) 5636A (1) 5639A (14) 5643 (2) 5644A (1) 5718A (1) 5719A (4) 5840A (6) 5902A (6) 5987 (32) 6021A (3) 6080WA (4) 6110 (16) 6111A (10) 6112A (2) 6336

CRYSTALS: None used.

SEMI-CONDUCTORS: (168) 1N274 (119) 1N278 (6) 1N343 (6) 1N344 (15) 1N352 (1) 1N429

SHIPPING DATA

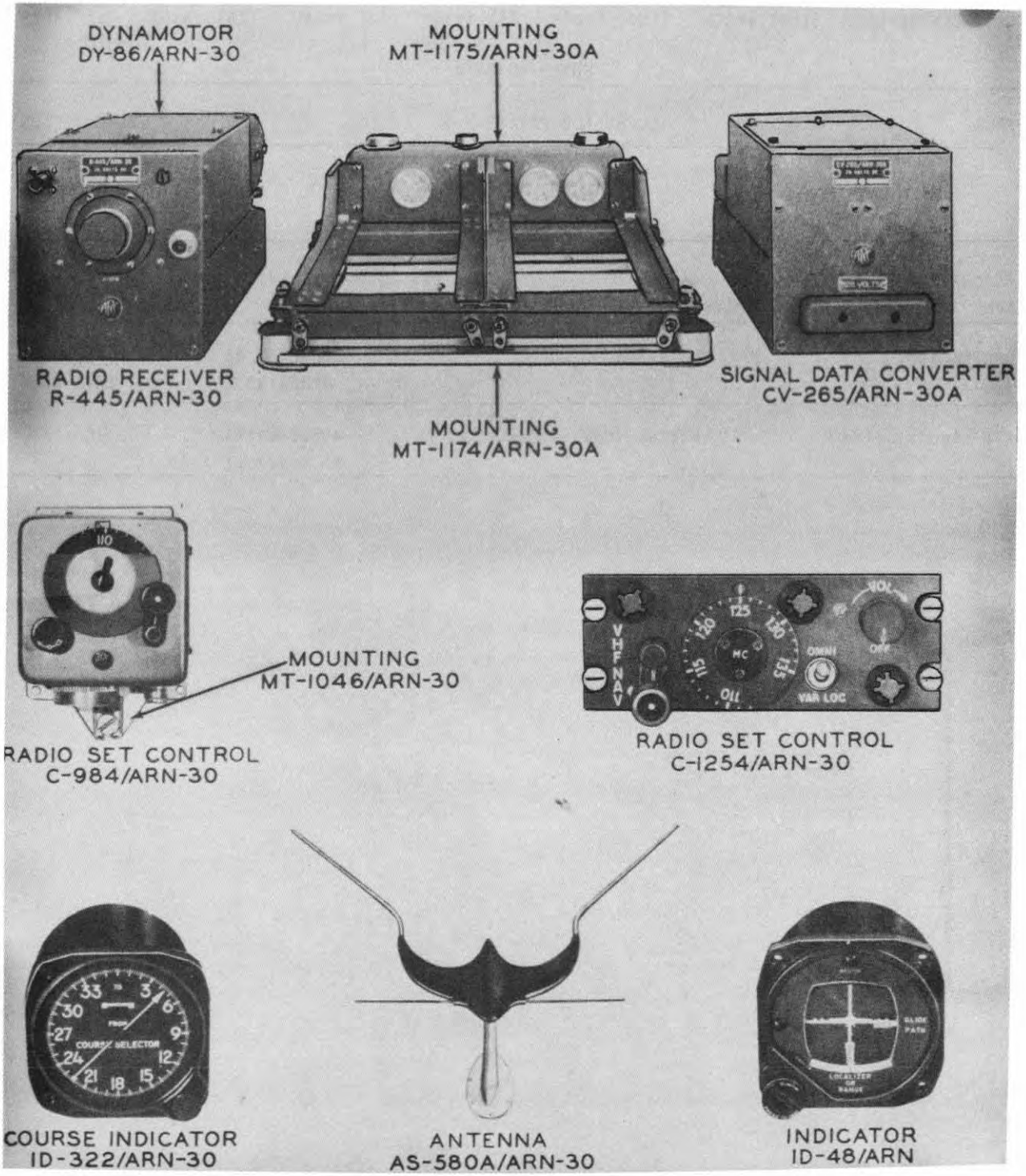
PKGS	VOLUME (CU FT)	WEIGHT (LBS)

PROCUREMENT DATA

PROCURING SERVICE: USN
DESIGN COG: USN, BuAer
SPEC &/OR DWG: BuAer XEL-148

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
ITT Laboratories	Nutley, New Jersey	NObsr-64655, 30 November 1959	

RADIO RECEIVING SET AN/ARN-30,30A



Radio Receiving Set AN/ARN-30, 30A

Radio-Navigational Aids

June 1957

AN/ARN-30,30A RADIO RECEIVING SET

FUNCTIONAL DESCRIPTION

The AN/ARN-30 and AN/ARN-30A are airborne navigation-communication receiving systems designed for use in the frequency range of 108 to 135 megacycles for use in aircraft equipped with a 28 volt direct-current power source.

They provide for VHF omnidirectional radio range (VOR), visual-aural range (VAR), 90 to 150 cps runway tone localizers (AMP LOC), and voice reception on all frequencies covered by the receiver, simultaneously with the navigation facilities, if desired.

The approximate distance range of the equipment is dependent on height and surrouning terrain.

The AN/ARN-30 and AN/ARN-30A are functionally interchangeable, but differ slightly in the major components provided.

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

RELATION TO OTHER EQUIPMENT

The AN/ARN-30 is Aircraft Radio Corporation VHF Navigational Receiving Equipment Type 15C, while the AN/ARN-30A is Aircraft Radio Corporation Type 15D.

Equipment Required but not Supplied: Cable as Required, Test Equipment as Required.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 108 to 135 mc.
TUNING: Continuous.
FREQUENCY STABILITY: 0.04% max.
TYPE RECEIVER: Superheterodyne.
AUDIO OUTPUT: 170 mw at AVC knee (at approx 6 uv input), 360 mw at 100,000 uv input with 30% modulation at 400 cps, into a 300 ohm load.
SENSITIVITY: 2 uv or better throughout frequency range (for 10 mw with 30% modulation at 400 cps, into a 300 ohm load).
SELECTIVITY: Total bandwidth 100 kc for 6 db, 350 kc for 60 db.
INTERMEDIATE FREQUENCY: 15 mc.
TUNING ACCURACY: Better than 0.2%.
POWER REQUIREMENTS: 28 v DC.
ANTENNA TYPE: Ramshorn type comprising two broad-band antennas.

MANUFACTURER'S OR CONTRACTOR'S DATA

Aircraft Radio Corporation, Boonton, New Jersey.
Approximate Cost: $846.00 with equipment spares.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) 12A6	(3) 12AT7WA
(1) 12AX7	(1) 14F7
(2) 14R7	(1) 6189
(1) 9002	(3) 9003
	(1) 14A7/12B7

Total Tubes: (14) (AN/ARN-30, 30A)

AN/ARN-30	AN/ARN-30A
(8) 1N34A	(8) 1N34A
	(2) 15910

Total Crystals: (8) AN/ARN-30, (10) 30A

REFERENCE DATA AND LITERATURE

AN 16-45-132: Technical Manual for Radio Receiving Set AN/ARN-30.
AN 16-30ARN30-1: Technical Manual for Radio Receiving Set AN/ARN-30A.

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	BUAER
PROCUREMENT COGNIZANCE	COMMERCIAL
STOCK NO.	
R.D.B. IDENT. NO.	

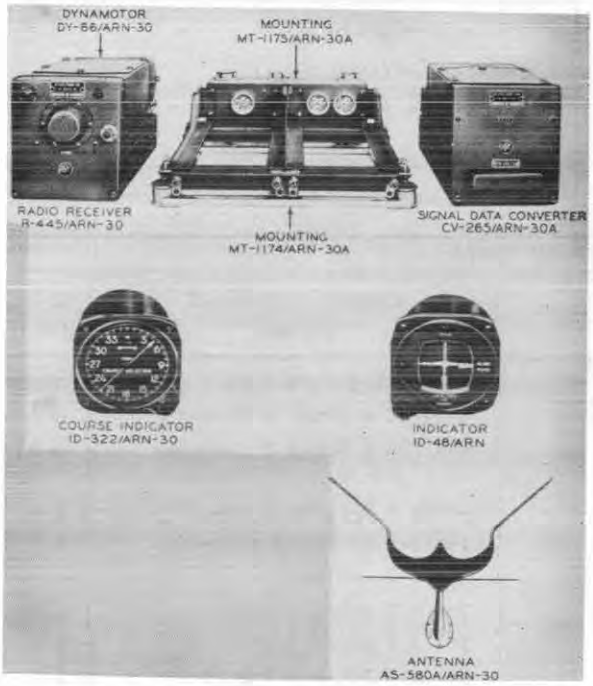
RADIO RECEIVING SET AN/ARN-30,30A

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
	AN/ARN-30		
1	Radio Receiver R-445/ARN-30	4-13/16 X 5-1/2 X 11-1/2	8.6
1	Signal Data Converter CV-217/ARN-30	4-13/16 X 5-1/2 X 11-1/2	4.5
1	Filter-Amplifier AM-609/ARN-30	4-13/16 X 5-1/2 X 6-13/16	4
1	Mounting MT-1047/ARN-30	3-5/8 X 11 X 13-1/16	2.8
1	Dynamotor DY-86/ARN-30	2-3/4 dia X 4-27/32	2.8
1	Radio Set Control C-984/ARN-30	2-15/16 X 3-1/8 X 4-9/16	0.62
1	Antenna AS-580A/ARN-30	10-1/4 X 21-1/4 X 28	3.6
1	Indicator ID-48/ARN	3-1/4 X 3-1/4 X 4-13/16	1.9
1	Course Indicator ID-322/ARN-30	3-1/4 X 3-1/4 X 5-5/16	1.5
1	Mounting MT-1044/ARN-30	1-5/8 X 10-23/32 X 11-5/8	0.75
1	Mounting MT-1045/ARN-30	1-5/16 X 4-15/16 X 6-11/16	0.35
1	Mounting MT-1046/ARN-30	5/16 X 3-1/8 X 4-19/32	0.08
1	Set of Accessories		
	AN/ARN-30A		
1	Antenna AS-580A/ARN-30	10-1/4 X 21-1/4 X 28	3.6
1	Radio Receiver R-445/ARN-30	4-27/32 X 5-5/8 X 11-1/2	8.6*
1	Signal Data Converter CV-265/ARN-30A	4-27/32 X 5-5/8 X 11-1/2	5.8
1	Mounting MT-1175/ARN-30A	3-7/8 X 9-11/16 X 12-1/2	2.3
1	Mounting MT-1174/ARN-30A	1-1/2 X 10-23/32 X 11-5/8	0.7
1	Dynamotor DY-86/ARN-30	2-3/4 dia X 4-27/32	
1	Radio Set Control C-984/ARN-30 including:	2-15/16 X 3-1/8 X 4-9/16	0.7+
	(1) Mounting MT-1046/ARN-30 or	5/16 X 3-1/8 X 4-19/32	
	Radio Set Control C-1254/ARN-30	2-9/32 X 3-5/16 X 5-3/4	0.8
1	Indicator ID-48/ARN	3-1/4 X 3-1/4 X 4-13/16	1.8
1	Course Indicator ID-322/ARN-30	3-1/4 X 3-1/4 X 5-5/16	1.5
1	Set of Accessories		

* - Includes Dynamotor DY-86/ARN-30
\+ - Includes Mounting MT-1046/ARN-30

RADIO RECEIVING SET AN/ARN-30B



Radio Receiving Set AN/ARN-30B
Radio Set Control C-1254/ARN-30 Omitted

FUNCTIONAL DESCRIPTION

The AN/ARN-30B is an airborne navigation-communication receiving system designed for use in the frequency range of 108 to 135 megacycles on the following very high frequency (vhf) facilities:

Very high frequency (vhf) omnidirectional range (VOR)

Visual-aural range (VAR)

90 to 150 cycles per second runway tone localizer (AMP LOC)

Voice reception on the complete band of frequencies covered by the equipment's receiver; simultaneously with the navigation facilities, if desired.

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

RELATION TO OTHER EQUIPMENT

Interchangeable with AN/ARN-30A electrically, mechanically, and functionally. Differs in that Radio Set Control C-984/ARN-30A in the AN/ARN-30A equipment is replaced in AN/ARN-30B by Radio Set Control C-1254/ARN-30.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 108 to 135 mc.

FREQUENCY STABILITY: 0.04% max for temperature changes from -55° C (-67° F) to +55° C (+131° F).

AUDIO OUTPUT: 170 mw with approximately 6 uv input, 360 mw at 100,000 uv input with 30% modulation at 400 cps, into a 300 ohm load.

SENSITIVITY: 2 uv or better throughout the frequency range for 10 mw with 30% modulation at 400 cps, into a 300 ohm load.

SELECTIVITY: Total bandwidth 100 kc for 6 db, 350 kc for 60 db.

INTERMEDIATE FREQUENCY: 15 mc.

INPUT VOLTAGE: 28 v dc.

FILAMENT CURRENT REQUIREMENT: 600 ma.

TUNING ACCURACY: Better than 0.02%.

DYNAMOTOR DY-86/ARN-30 CHARACTERISTICS.

RATED INPUT VOLTAGE: 25 v dc.
RATED INPUT CURRENT: 1.7 amp.
RATED OUTPUT VOLTAGE: 250 v dc.
RATED OUTPUT CURRENT: 85 ma.
AMBIENT TEMPERATURE: -55° C (-67° F) to +71° C (+159.8°F).
TEMPERATURE RISE: 55° C (67° F).
RATED SPEED: 7000 rpm.
ALTITUDE RATING: 40,000 ft max.

DISTANCE RANGE: $D = 1.2\sqrt{h}$ where D=distance in miles and h=height in feet.

MANUFACTURER'S OR CONTRACTOR'S DATA

Aircraft Radio Corporation, Boonton, N.J.
Contract 21312-PHILA-56-55(31).

TUBE AND/OR CRYSTAL COMPLEMENT

(3) 12AT7WA	(1) 12AU7
(1) 12AX7	(1) 12A6
(1) 14A712B7	(1) 14F7
(2) 14R7	(2) 15910
(1) 9002	(3) 9003

Total Tubes: (16)

(2) 1N34A
Total Crystals: (2)

Radio-Navigational Aids

AN/ARN-30B RADIO RECEIVING SET

REFERENCE DATA AND LITERATURE

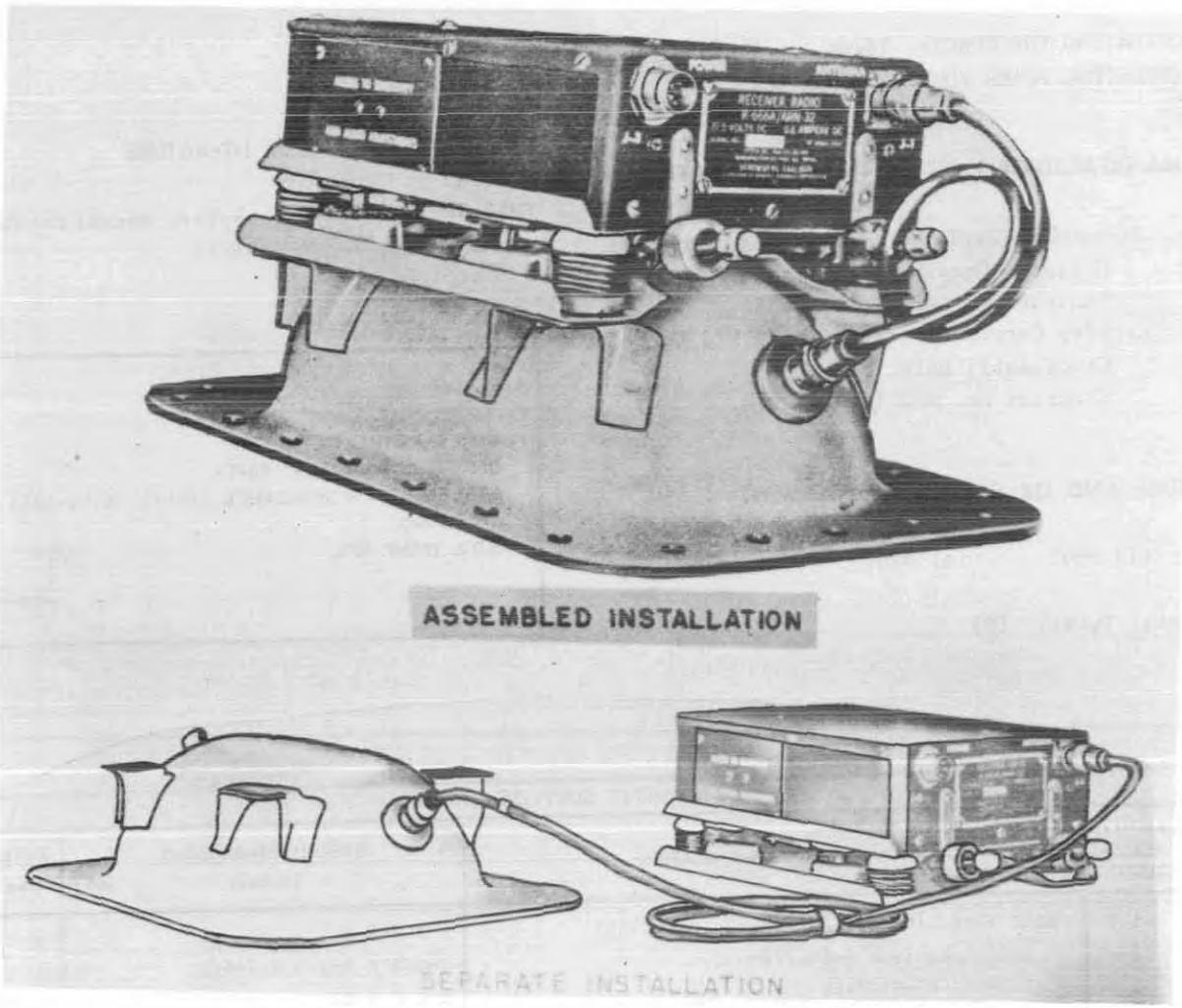
Nomenclature Card for Radio Receiving Set AN/ARN-30B.
Technical Manual for Radio Receiving Set AN/ARN-30A.

TYPE CLASSIFICATION
DESIGN COGNIZANCE TASSA
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna AS-580A/ARN-30	10-1/4 X 21-1/4 X 28	3.6
1	Radio Receiver R-445/ARN-30	4-27/32 X 5-5/8 X 11-1/2	8.6
1	Signal Data Converter CV-265/ARN-30A	4-27/32 X 5-5/8 X 11-1/2	5.8
1	Mounting MT-1175/ARN-30A	3-7/8 X 9-11/16 X 12-1/2	2.3
1	Mounting MT-1174/ARN-30A	1-1/2 X 10-23/32 X 11-5/8	0.7
1	Dynamotor DY-86/ARN-30	2-3/4 X 4-27/32	
1	Radio Set Control C-1254/ARN-30	2-1/4 X 4-1/2 X 5-3/4	0.7
1	Indicator ID-48/ARN	3-1/4 X 3-1/4 X 4-13/16	1.8
1	Course Indicator ID-322/ARN-30	3-1/4 X 3-1/4 X 5-5/16	1.5
1	Clamp AN3057-10	1-1/8 X 1-3/16	0.05
1	Connector AN3106A-18-1S	1-5/16 X 2	0.1
2	Connector ARC-14050	1-1/4 X 1-5/16	0.07
1	Connector ARC-14321	1-1/32 X 1-1/16	0.04
1	Connector ARC-15911	1-1/4 X 1-5/16	0.07
1	Connector ARC-15912	1-1/4 X 1-5/16	0.07
2	Connector UG-88/U	27/64 X 31/32	0.02
1	Cable RG-58/U		
1	Shafting ARC-1174		
2	Nut ARC-1167 or ARC-11035		
1	Casing ARC-3406 or ARC-8601		
2	Sleeve ARC-6585 or ARC-1103		
2	Spline ARC-6788		

RADIO RECEIVING SET AN/ARN-32



Radio Receiving Set AN/ARN-32

FUNCTIONAL DESCRIPTION

The AN/ARN-32 is designed as an airborne marker beacon receiving equipment. It receives and indicates the reception of 75-megacycle (MC) Amplitude Modulated (AM) signals from marker beacon transmitters for the purpose of determining the position of an aircraft. It also gives the pilot a visual and aural indication denoting distance to runway when aircraft is approaching under instrument guidance.

No field changes in effect at time of preparation (23 April 1959).

EQUIPMENT REQUIRED BUT NOT SUPPLIED

(1) Audio Output Meter General Radio Co type 583A, (1) Signal Generator AN/USM-44 or Hewlett-Packard type 608D, (1) Test Oscillator BC-376, (1) Electronic Tube Tester TV-77/U or Hickok 540 or 570, (1) Vacuum Tube Voltmeter (RCA Voltohmyst or equivalent), (1) VHF impedance and phase measurement bridge Hewlett-Packard type 803, (1) VHF Detector Hewlett-Packard type 417A.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TYPE OF RECEPTION: AM type.

Radio-Navigational Aids

April 1959

AN/ARN-32 RADIO RECEIVING SET

OPERATING FREQUENCY: 75 mc.
OPERATING POWER RQMT: 27.5 v DC.

No Crystals used.

MANUFACTURER'S OR CONTRACTOR'S DATA

Stromberg-Carlson, Division of General Dynamics Corp., Rochester, N. Y.
Contract No. AF33(600)-31550.
Crosley Corp., Division of Avco Mfg Corp., Cincinnati, Ohio.
Contract No. AF33(600)-22078.

REFERENCE DATA AND LITERATURE

TM11-5826-205-50: Technical Manual for Radio Receiving Set AN/ARN-32.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) 5903 (4) 5907 (4) 5908

Total Tubes: (9)

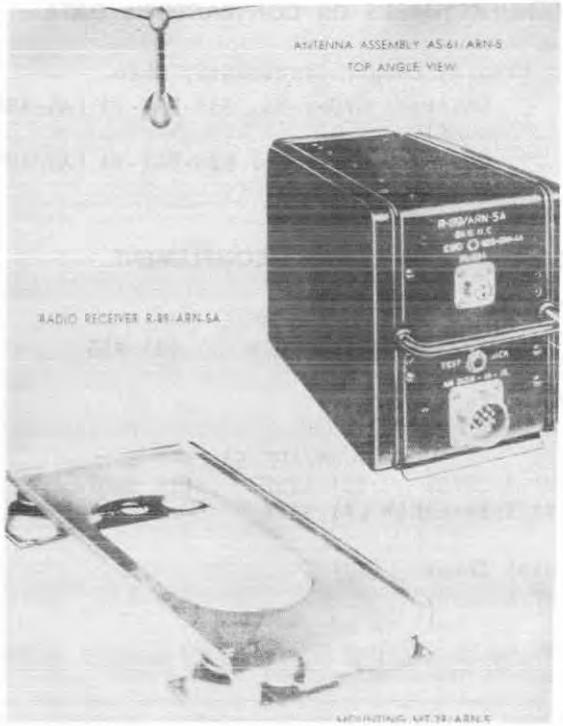
TYPE CLASSIFICATION
DESIGN COGNIZANCE BUAER
PROCUREMENT COGNIZANCE EXHIBIT WCIN-1014
STOCK NO.
R.D.B. IDENT. NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Receiving Set AN/ARN-32 Including:	6 X 7 X 8	6-1/2
1	Radio Receiver R-666/ARN-32	2-1/8 X 5-1/4 X 7-5/8	
1	Antenna AT-536/ARN	4 X 8 X 12	
1	Mounting MT-1546/ARN-32	1-1/2 X 7 X 8	1-1/4
1	Angle Bracket MT-1547/ARN-32		

RADIO RECEIVING SET AN/ARN-5 and AN/ARN-5A

Radio Receiving Equipment AN/ARN-5



Radio Receiving Equipment AN/ARN-5(A)

FUNCTIONAL DESCRIPTION

The AN/ARN-5 and AN/ARN-5A is airborne equipments designed to give vertical guidance to a pilot during aircraft landing operations. This equipment is part of an instrument approach system which provides both lateral and vertical guidance, lateral guidance being supplied by Radio Receiving Equipment RC-103A.

The AN/ARN-5 and AN/ARN-5A are similar in operation, but differ in equipment supplied.

No field changes in effect at time of preparation (14 April 1959).

RELATION TO OTHER EQUIPMENT

The AN/ARN-5 uses Radio Receiver R-57/ARN-5 whereas AN/ARN-5A uses Radio Receiver R-89/ARN-5A.

EQUIPMENT REQUIRED BUT NOT SUPPLIED

(2) Plug type PL-P257 or PL-190, (1 or 2) Cable, Aircraft Low Tension per Spec AN-J-C-48 as required, (1) Connector Panel, (1) Mounting Plate FT-292-A, (1) Radio Control Box BC-732-A, (1) Headset W/Plug PL-55.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

RADIO RECEIVER CHARACTERISTICS

TYPE RECEIVER: Super-regenerative, glide-path receiver.

NUMBER OF CHANNELS: 1 channel.

OPERATING FREQUENCY RANGES: 332.6, 333.8 or 335.0 mc.

OPERATING POWER RQMT: 24 v DC.

Radio-Navigational Aids

April 1959

AN/ARN-5 and AN/ARN-5A RADIO RECEIVING SET

MANUFACTURER'S OR CONTRACTOR'S DATA

Crosley Corp., Cincinnati, Ohio.
Contract Order No. 613-DAY-44 (AN/ARN-5).
Contract Order No. 825-DAY-44 (AN/ARN-5A).

TUBE AND/OR CRYSTAL COMPLEMENT

AN/ARN-5

(2) 12AH7GT (2) 28D7W (1) 955

Total Tubes: (5)

AN/ARN-5A

(2) 12SN7GT (1) 12SR7 (1) 28D7W
(7) 5654-6AK5W (7) 6AJ5

Total Tubes: (18)

No Crystals Used.

REFERENCE DATA AND LITERATURE

AN16-30ARN5-3: Technical Manual for Radio Receiving Equipments AN/ARN-5 and AN/ARN-5A.

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	USAF
PROCUREMENT COGNIZANCE	
STOCK NO.	
R.D.B. IDENT. NO.	

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT		NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
AN/ARN-5	5A			
1	1	Antenna Ass'y AS-61/ARN-5 or	6-1/2 X 10 X 20	2.5
	*	Antenna System AS-27/ARN-5	10 X 20 X 23	3.5
1	1 +	Resistor RS-125		
1	1	Adapter AN3057-10	15/16 dia X 1-5/64	0.03
1	1	Mounting MT-28/ARN-5	1-1/2 X 6 X 11	1.3
1	1	Capacitor Dwg No. SC-D-2246		
1	1 ‡	Plug Type PL-275		
2	2 **	Plug Type PL-284		
	1	Plug Type AN3108-18-1S or Plug Type AN3106-18-1S		
1	1	Radio Frequency Cable Type RG-22/U (10 ft) or Cable WC-551-B		
1	1	Adapter Type PL-293		
1		Radio Receiver R-57/ARN-5 Including: 3 Crystal Holders FT-243, tubes and	5-1/4 X 6-1/2 X 12-1/8	11.0
	X	Adapter U-19/ARN M1		
	1	Radio Receiver R-89/ARN-5A or R-89A/ARN-5A or R-89B/ARN-5A	5-1/2 X 6-1/2 X 14	12.5

NOTE: *Antenna Ass'y AS-27/ARN-5 is issued only when the installation plan of the aircraft that Radio Receiving Equipment AN/ARN-5 or AN/ARN-5A and RC-103-A use the same antenna.

†When two indicators (Indicator I-101-C or I-101-D) are used, omit Resistor RS-125.

**Used only in pressurized-Cabin installations, or special installations, Radio Frequency Cable RG-22/U or Cable WC-55-B may have to be cut and interconnected through Plug type PL-275. In such installations, two additional plugs type PL-284 must be used.

‡Used only in pressurized-Cabin installation.

XSince most Aircraft will have installation that includes a 10-Prong Plug for connection to the receiver, Radio Receiver R-57/ARN-5 is equipped with Adapter U-19/ARN M1.

RADIO RECEIVING SET AN/ARN-5B

Radio Receiving Equipment AN/ARN-5B

FUNCTIONAL DESCRIPTION

The AN/ARN-5B is designed to provide a pilot with visual indication of the position of the aircraft with respect to a glide-path transmitting equipment. Output of the receiver is fed into a cross pointer meter position of the horizontal pointer of the meter with respect to center of meter face gives a pilot an indication of whether to fly up or down, to remain on a predetermined descent path to ground. It may be operated at 332.6, 333.8 or 335.0 megacycles (MC) with crystal changes controlled from the pilots compartment.

No field changes in effect at time of preparation (14 April 1959).

RELATION TO OTHER EQUIPMENT

The AN/ARN-5B is similar in operation to that of the AN/ARN-5 and 5A except that the indicators and receiver used are different.

EQUIPMENT REQUIRED BUT NOT SUPPLIED

(1 or 2) Indicator ID-48/ARN, (1) Control C-512/ARN-14 or C-760A/A or C-996/A, (1 or 2) Aircraft Cable Low Tension MIL-W-5086.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

RADIO RECEIVER CHARACTERISTICS

TYPE RECEIVER: Super-regenerative, glide-path receiver.

NUMBER OF CHANNELS: 1 channel.

OPERATING FREQUENCY RANGE: 332.6, 333.8 or 335.0 mc.

OPERATING POWER RQMT: 24 v DC.

MANUFACTURER'S OR CONTRACTOR'S DATA

The Crosley Corp., Cincinnati, Ohio

TUBE AND/OR CRYSTAL COMPLEMENT

(7) 6AJ5 (1) 12SR7

(2) 12SN7 (1) 28D7

Total Tubes: (11)

No Crystals used.

REFERENCE DATA AND LITERATURE

T.O. 12R5-2ARN5-2: Technical Manual for Radio Receiving Equipment AN/ARN-5( ).

TYPE CLASSIFICATION
DESIGN COGNIZANCE USAF
PROCUREMENT COGNIZANCE
STOCK NO.
R.D.B. IDENT. NO.

Radio-Navigational Aids

AN/ARN-5B RADIO RECEIVING SET

EQUIPMENT SUPPLIED DATA

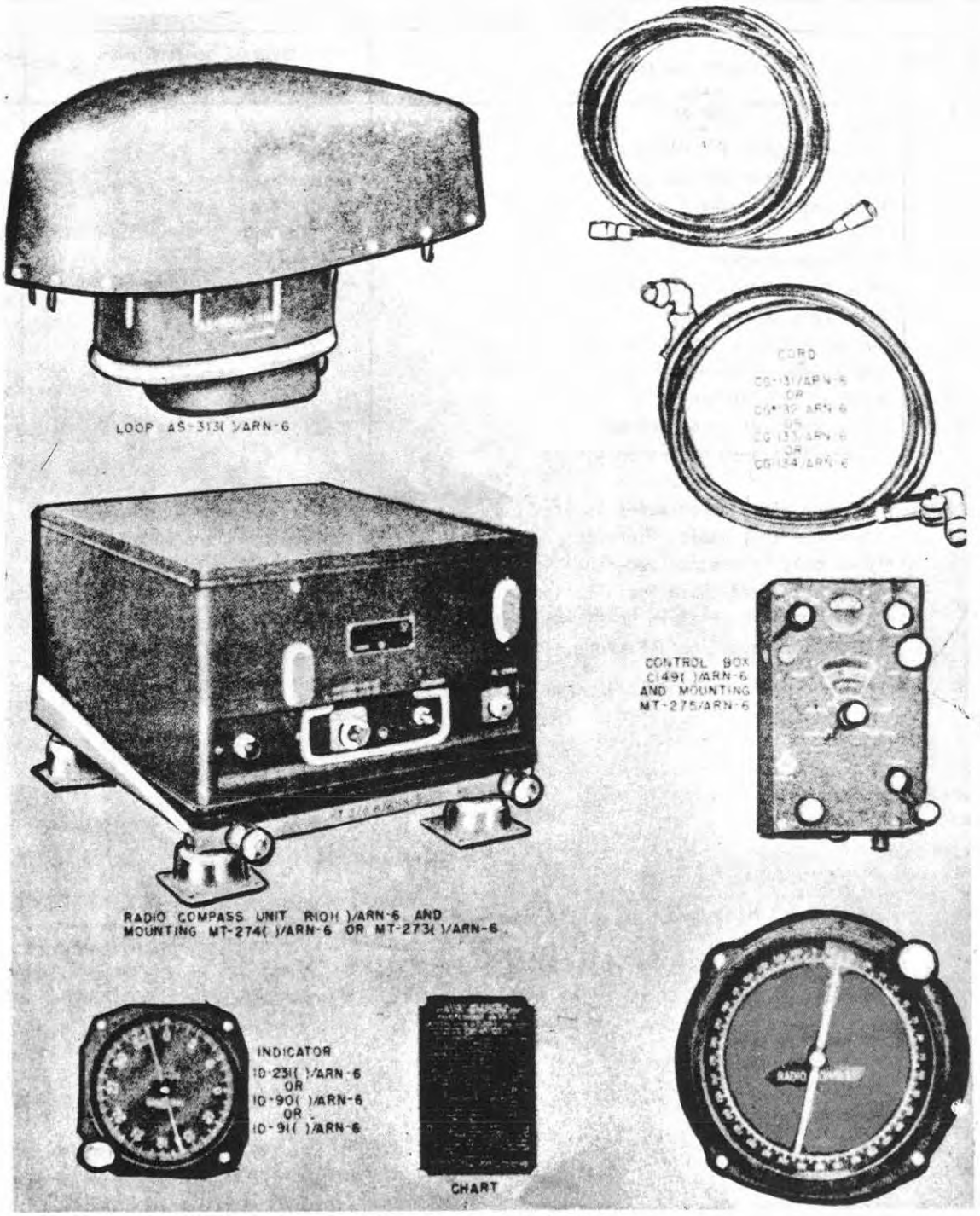
QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna Ass'y AS-61/ARN-5 or	6-1/2 X 10 X 20	2.5
*	Antenna System AS-27-ARN-5	10 X 20 X 23	3.5
1	Antenna System AN/ARN-5B	4-1/8 X 8-1/4 X 8-1/4	
1	Mounting MT-28/ARN-5	1-1/2 X 6 X 11	1.3
1 ***	Plug Type PL-275		
2****	Plug Type PL-284		
1	Plug Type AN3108-18-1S or Plug Type AN3106-18-1S		
1	Radio Frequency Cable RG-22/U (10 ft) or Cable Type WC-551-B		
1	Adapter Type PL-293		
1	Radio Receiver R-268/ARN-5B R-268A/ARN-5B or R-268B/ARN-5B	5-1/2 X 6-1/2 X 14	12.5

NOTE: *Antenna Ass'y AS-27/ARN-5 is used only when the installation plan of the aircraft requires that Radio Receiving Equipment AN/ARN-5A and RC-103-A use same antenna.

***Used only in pressurized-cabin installations.

****In pressurized-cabin installations, or other special installations, Radio Frequency Cable RG-22/U or Cable WC-551-B may have to be cut and interconnected through Plug PL-275. In such installations, two additional plugs, Plug PL-284, must be use.

RADIO COMPASS AN/ARN-6



Radio Compass AN/ARN-6

Radio-Navigational Aids

AN/ARN-6 RADIO COMPASS

FUNCTIONAL DESCRIPTION

The AN/ARN-6 is an airborne navigational instrument designed to cover the frequency range of 100 to 1750 kilocycles and is capable of providing automatic visual bearing indication of the direction of arrival of RF energy and simultaneous aural reception of modulated RF energy, aural reception of modulated RF energy using a non-directional or a loop antenna, and aural-null directional indications of the arrival of modulated RF energy using a loop antenna.

It has been designed smaller and lighter than other automatic radio compass equipment for the purpose of using it in small aircraft.

No field changes in effect at time of preparation (22 April 1957).

RELATION TO OTHER EQUIPMENT

Equipment Required but not Supplied:

Qty Per Installation		
Single	Dual	
1	2	Headset HS-33 or HS-38 or HS-18 or HS-23
1	1	Coupling Unit CU-65/ARN-6
1	1	Loop AS-313/ARN-6 or AS-313A/ARN-6 or AS-313B/ARN-6
1	1	Antenna, Non-directional
1	3	Tuning Shaft MC-124
0	1	Coupling MC-203A
1	1	Plug AN-3106-16S-1S
1	2	Plug AN-3106-14S-2S
1	2	Cable Clamp AN-3057-6
1	1	Cable Clamp AN-3057-8
*	*	Receptacle MRE-34S-G
*	*	Tuning Meter EA-112

NOTE: *-Indicates quantities as required for installation.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 100 to 1750 kc.
OUTPUT: 50 mw into 300 ohm load.
OUTPUT IMPEDANCE: 300 ohms.
SIGNAL-TO-NOISE RATIO: 4:1 in power, 2:1 in voltage. Noise output is 12.5 mw when combined noise and modulation output is 50 mw.
NORMAL PERFORMANCE CHARACTERISTICS
COMPASS DATA
ACCURACY: ±1 deg at all frequencies and field strengths from 25 uv per meter up.
SENSITIVITY: 25 uv per meter or better.
BEARINGS SPEED: 4 to 7 sec for 175 deg.
HUNTING: 0 deg to ±1 deg.
POWER REQUIREMENTS: 26.5 v DC, 4 amps.

MANUFACTURER'S OR CONTRACTOR'S DATA

Approximate Cost: $2400.00 with equipment spares.

TUBE AND/OR CRYSTAL COMPLEMENT

(6) 12SK7	(1) 12SW7
(4) 12SX7GT	(2) 26A7GT
(1) 12SY7	(2) 2050

Total Tubes: (16)

REFERENCE DATA AND LITERATURE

TM11-5125: Technical Manual for Radio Compass AN/ARN-6.

TYPE CLASSIFICATION
DESIGN COGNIZANCE USAF
PROCUREMENT COGNIZANCE
STOCK NO.

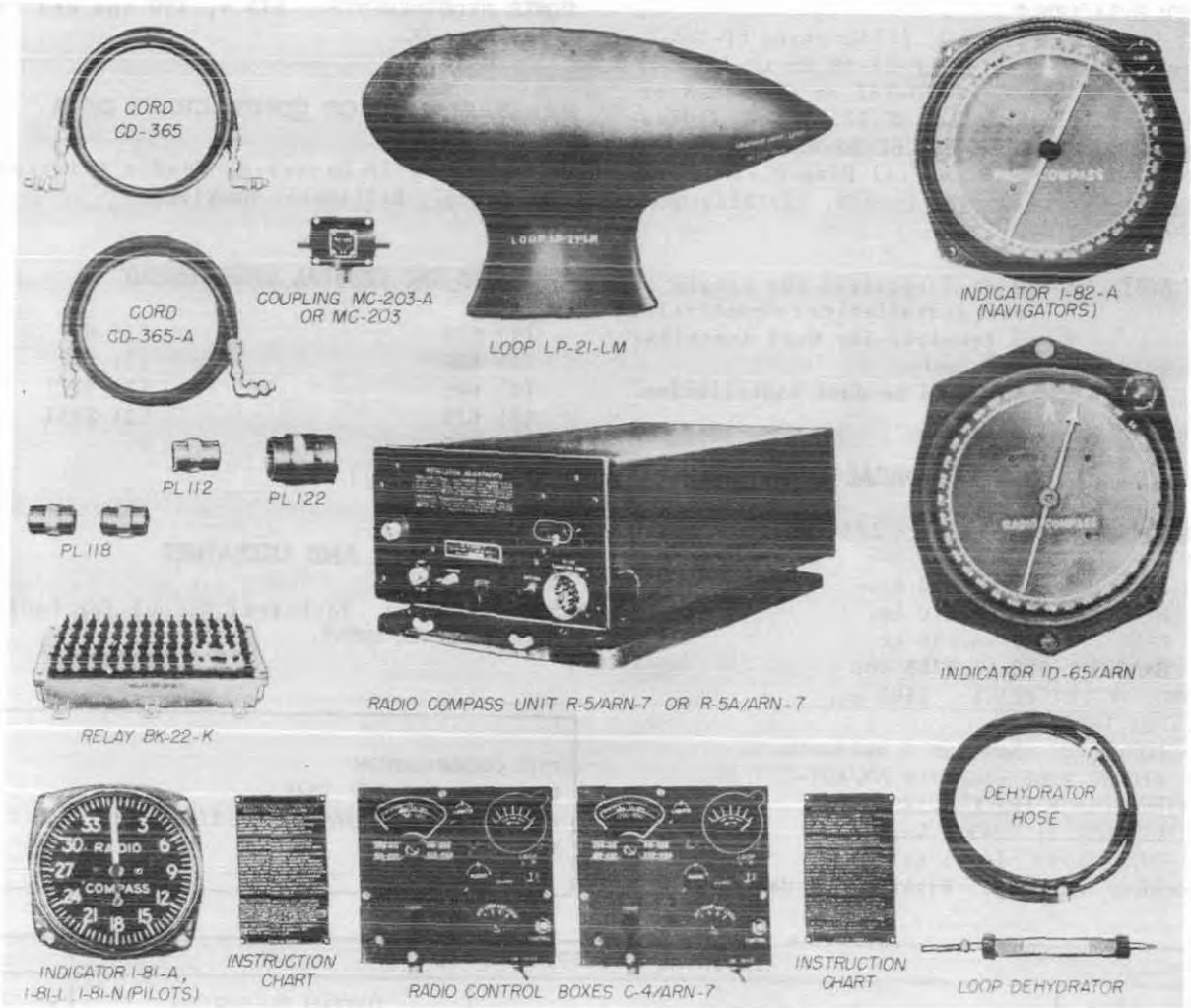
RADIO COMPASS AN/ARN-6

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT		NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
S	D			
1	1	Radio Compass Unit R-101/ARN-6 or R-101A/ARN-6 or R-101B/ARN-6	7-5/16 x 11-3/8 x 15-1/4	34.75
0	1	Mounting MT-273A/ARN-6 or MT-273B/ARN-6 or MT-273D/ARN-6 or MT-273E/ARN-6	4 x 11-9/16 x 17-1/8	6.25
1	0	Mounting MT-274/ARN-6 or MT-274A/ARN-6 or MT-274B/ARN-6 or MT-274C/ARN-6	4 x 11-9/16 x 17-1/8	5.19
*	*	Control Box C-149/ARN-6 or C-149A/ARN-6	2-3/8 x 5 x 9	3.25
*	*	Control Panel C-403A or C-403A/A	3-1/4 x 5 x 9	3.12
*	*	Control Panel C-758/A	5-3/4 x 6-5/16 x 9-1/8	4.2
*	*	Control Panel C-1514/A	4-1/4 x 5-1/4 x 7	2.49
1	2	Mounting MT-275/ARN-6	1-1/2 x 4-7/8 x 8-3/8	0.43
*	*	Indicator, Pilots ID-90/ARN-6 or ID-90A/ARN-6	3-1/4 x 3-1/4 x 5-55/64	2.1
		or		
		Indicator, Pilots or Night Fighter ID-91/ARN-6 or ID-91A/ARN-6 or ID-91B/ARN-6	3-1/4 x 3-1/4 x 5-55/64	2.1
		or		
		Indicator, 90 Deg Mtg of Loop ID-231/ARN-6 or ID-231A/ARN-6 or ID-231D/ARN-6 or ID-231E/ARN-6	3-1/4 x 3-1/4 x 5-55/64	2.1
		or		
		Indicator, Navigator ID-92/ARN-6 or	5-1/2 x 5-1/2 x 5-29/32	3.06
		ID-92A/ARN-6	4-19/64 x 5-1/8 x 5-1/8	2.8
1†	1†	Coupling Unit, Antenna CU-65/ARN-6	2-1/4 x 2-1/2 x 5	0.5
1†	1†	Coupling Unit Antenna CU-65A/ARN-6	2-1/2 x 2-3/4 x 5-1/4	0.5
1	1	Cord, One Right Angle Connector CG-131/ARN-6	72 lg	1.31
		or		
		Cord, Two Right Angle Connectors CG-132/ARN-6	72 lg	1.31
		or		
		Cord, One Right Angle Connector CG-133/ARN-6	180 lg	2.5
		or		
		Cord, Two Right Angle Connectors CG-134/ARN-6	180 lg	2.5
1	1	Cord, Antenna CG-405/ARN-6 or	72 lg	0.62
		CG-320/ARN-6	180 lg	1.38
1†	1†	Loop (incl Cover CW-141/ARN-6) AS-313/ARN-6 or AS-313A/ARN-6 or AS-313B/ARN-6	5-1/2 x 10-57/64 x 16-13/16	15.0

NOTE: *-Indicates quantities as required for installation.
†-Indicates required but not supplied in some installations.
① S-Single Installation.
D-Dual Installation.

RADIO COMPASS AN/ARN-7



Radio Compass AN/ARN-7

FUNCTIONAL DESCRIPTION

The AN/ARN-7 is designed primarily to be used as an airborne navigational instrument and is capable of providing automatic visual bearing indication of the direction of arrival of radio-frequency energy snd simultaneous aural reception of modulated radio-frequency energy using a non-directional antenna or a loop antenna. In addition, it provides aural-null directional indications of the arrival of modulated radio-frequency energy using a loop antenna.

It is operated from a single control box, but two controls permit operation from either of two separate positions on the aircraft.

No field changes in effect at time of preparation (4 October 1957).

RELATION TO OTHER EQUIPMENT

The AN/ARN-7 was formerly known as Radio Compass SCR-269-A thru G.

Equipment Required but not Supplied:
WITH R-5/ARN-7
(1) Non-Directional Antenna, (1) Tuning Shaft, (1) *Rectifier Unit RA-59-A, Wiring as Required.

NOTE: *-For use only when 12 to 14 v DC power supply is used.

AN/ARN-7 RADIO COMPASS

WITH R-5A/ARN-7
(1) Mounting FT-213-A, (*) Mounting FT-224-A, (+) Loop LP-21-A or LP-21-AM or LP-31-A or LP-31-AM, (1) Cord CD-365 or CD-365-A or CD-365-B, (1) Coupling MC-203-A, (1) Indicator I-82-A, (1) Relay BK-22-K, (1) °Relay SW-172-A or SW-182-A, (1) Plug PL-112, (*) Plug PL-118, (1) Plug PL-122, (1) Alignment Tool TL-138-B.

NOTE: * - 1 or 2 required for single or dual installation respectively.
+ - 1 required for dual installation only.
° - Not used in dual installation.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 100 to 1750 kc.
BAND FREQUENCIES
BAND 1: 100 to 200 kc.
BAND 2: 200 to 410 kc.
BAND 3: 410 to 850 kc.
BAND 4: 850 to 1750 kc.
POWER OUTPUT(PEAK): 1500 mw.
OUTPUT IMPEDANCE
LOW: 300 ohms for 4 headsets.
HIGH: 4000 ohms for AN/ARN-7.
INTERMEDIATE FREQUENCIES
CHANNEL 1: 243.5 kc.
CHANNEL 2: 142.5 kc.
BEARING ACCURACY: Within ±2.5 deg.

POWER REQUIREMENTS: 115 v, 400 cps and 14 or 28 v DC.

MANUFACTURER'S OR CONTRACTOR'S DATA

Bendix Radio Division, Bendix Aviation Corp., Baltimore, Maryland.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) 5Z4
(2) 6B8
(2) 6F6
(1) 6J5
(4) 6K7
(1) 6L7
(1) 6N7
(1) 6SC7
(2) 2051
Total Tubes: (15)

REFERENCE DATA AND LITERATURE

AN16-30ARN7-3: Technical Manual for Radio Compass AN/ARN-7.

TYPE CLASSIFICATION
DESIGN COGNIZANCE USAF
PROCUREMENT COGNIZANCE 71-1719
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT		NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
INSTALLATION				
SINGLE	DUAL			
1	1	Radio Compass Unit R-5/ARN-7 or	7-7/8 X 12 X 19-13/16	48.13
		R-5A/ARN-7 including:	7-7/8 X 12 X 19-13/16	52.25
		Mounting FT-213-A		
1	2	Radio Control Box C-4/ARN-7 including:	3-15/16 X 7-1/2 X 7-11/16	4.12
		Mounting FT-224-A		
0	1*	Loop LP-21-A or	9 X 15-1/4 X 25-3/8	10.37
		LP-21-AM or	9 X 15-1/4 X 25-3/8	10.37
		LP-21-LM or	9 X 15-1/4 X 25-3/8	10.37
		LP-31-A or	6-3/32 X 11-5/16 X 14-23/32	6.8
		LP-31-AM	6-3/32 X 11-15/16 X 14-23/32	6.8
0	1*	Loop Dehydrator	1-5/8 X 1-13/16 X 12-1/16	1.25
0	1*	Cord CD-365 or	1/2 dia X 72	1.62
		CD-365-A or		
		CD-365-B		
0	1*	Coupling MC-203-A	1-19/64 X 2-7/16 X 3-3/4	0.34

RADIO COMPASS AN/ARN-7

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT		NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
INSTALLATION				
SINGLE	DUAL			
1	1	Pilots Indicator I-81-A or I-81-L or I-81-N	3/4 X 3-1/4 X 3-11/16	0.75
1	1	Navigator's Indicator ID-65/ARN	3-5/8 X 5-3/16 X 5-3/10	1.51
1	1	Navigator's Indicator I-82-A	4-3/32 X 5-1/8 X 5-1/8	1.19
0	1*	Relay BK-22-K including: Autotransformer	3 X 7 X 11-3/4	5.25
1*	0	Relay SW-172-A, C, or F or SW-182-A, C, or F	1-3/8 X 1-7/8 X 2-3/4	0.31
1*	1*	Plug PL-112	15/32 X 1-3/32 dia	0.06
2*	2*	Plug PL-118	1-3/32 dia X 1-15/32	0.06
1*	1*	Plug PL-122	1-23/32 dia X 2-1/8	0.2
1	2	Chart for Radio Compass AN/ARN-7	1/32 X 4-1/2 X 7-1/8	0.06

NOTE: *-Not supplied by contractor with Radio Compass Unit R-5A/ARN-7.

RADIO BEACON TRAINING SET AN/ARN-T1

FUNCTIONAL DESCRIPTION

The AN/ARN-T1 is used to simulate on Link Trainer radio direction finding of signals and homing beacon signals of Radio Receiving Equipment AN/ARR-1 (Navy Model ZB-2 series) and AN/ARR-2 (Navy Model ZBX series) for training purposes.

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

RELATION TO OTHER EQUIPMENT

Used with Standard Link Trainer.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

POWER SOURCE REQUIRED: 120 v, 60 cps.

MANUFACTURER'S OR CONTRACTOR'S DATA

DeVry Corp.
Contract NOas-176.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes.

REFERENCE DATA AND LITERATURE

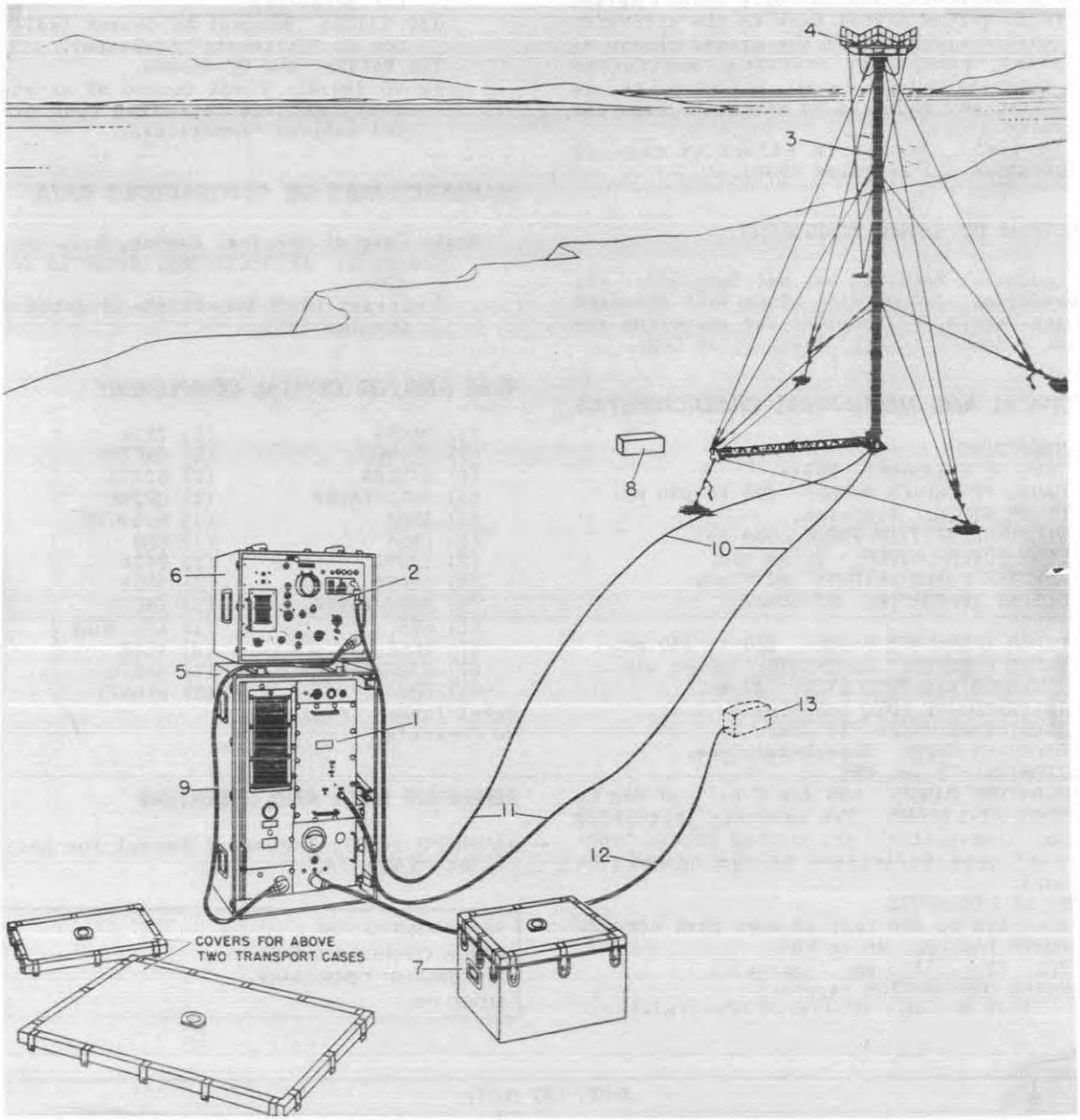
Nomenclature Card for Radio Beacon Training Set AN/ARN-T1 Amended 8 September 1945.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUAER
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Photo-Cell Assembly CY-4/ARN-T1		
1	Direction Finder Simulator CY-5/ARN-T1		
1	Radio Beacon Simulator CY-6/ARN-T1		
1	Mounting Frame MT-142/ARN-T1		
1	Loop Drive Assembly MX-45/ARN-T1		
1	Transmitter-Receiver RT-33/ARN-T1		

RADIO SET AN/CPN-2A



Radio Set AN/CPN-2A

FUNCTIONAL DESCRIPTION

The AN/CPN-2A is a ground station in the Shoran (Short Range Navigation) system of radio navigation. The Shoran system enables aircraft equipped with Radio Set AN/APN-3A precision Shoran airborne equipment, to determine its position and navigate without taking observations on the stars or the surface of the earth. The airborne equipment indicates, on individual counters, the distance of the aircraft from two Shoran ground stations of known locations and thereby fixes the aircraft position. The Shoran system may also be used for aerial mapping and reconnaisance by photography.

The AN/CPN-2A is interrogated by a pulsed radio frequency signal from the airborne

Shoran equipment, and in reply sends a pulsed radio frequency signal back to the aircraft. The entire operation of the ground Shoran equipment, except for starting, monitoring the receiver output level, and stopping, is automatic and requires no attention from the operator.

No field changes in effect at time of preparation (21 February 1958).

RELATION TO OTHER EQUIPMENT

Equipment Required but not Supplied: (1) Screwdriver, 1/4 in. wide blade with standard length handle, (1) compass for orienting antenna assembly and (1) Power Plant C-25.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TRANSMITTING
- TYPE OF EMISSION: Pulse.
- RADIO FREQUENCY RANGE: 290 to 330 mc.
- PULSE WIDTH: 0.8 usec.
- PULSE REPETITION FREQ: 930 cps.
- PEAK POWER OUTPUT: 25 kw min.
- AVERAGE POWER OUTPUT: 60 W min.
- OUTPUT IMPEDANCE: 52 ohms.

RECEIVING
- RADIO FREQUENCY RANGE: 210 to 330 mc.
- RADIO FREQUENCY BANDWIDTH: 10 mc min.
- INTERMEDIATE FREQUENCY: 30 mc.
- INTERMEDIATE FREQ BANDWIDTH: 7 mc.
- INPUT IMPEDANCE: 52 ohms.
- RECEIVER TYPE: Superheterodyne.

MONITORING: 3 in. CRT.

TEMPERATURE RANGE: -55 deg C to + 50 deg C.

ANTENNA AT-176/AP: Two antennas (receiving and transmitting) are mounted within "corner" type reflectors at the top of the mast.

POWER REQUIREMENTS
- AC: 115 v, 400 cps, 12 amps peak approx.
- POWER FACTOR: 90 to 95%.
- DC: 27 v, 11.5 amp (approx).
- POWER CONSUMPTION (approx)
  - 1020 W: Max AC demand (Control-Monitor Selector).
  - 850 WATTS: Nominal AC demand (selector in "Calibrate" position).
  - 310 WATTS: Max DC demand.
  - 70 TO 280 W: Power demand of crystal oven, wattage depending upon oven and ambient temperature.

MANUFACTURER'S OR CONTRACTOR'S DATA

Radio Corp of America, Camden, N.J.
- Contract: AF33(635)926, dated 15 June 1953.
- Contract MIPR 800-29289-52 dated 31 October 1951.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) OA2WA	(1) 2X2A
(3) 5R4WGB	(2) 6AC7WA
(4) 6AU6WA	(2) 6J4WA
(3) 6005/6AQ5W	(1) OB2WA
(1) 3BP1	(1) 5Y3WGTB
(6) 6AG5	(1) 6D4
(3) 6J6WA	(2) 705A
(4) 12AU7	(5) 3E29
(9) 5654/6AK5W	(5) 6AG7Y
(1) 6E5	(1) 6SN7WGTA
(7) 2C51	(2) 4C28
(7) 5726/6AL5W	(1) 6AS7G
(1) 6H6	(2) 6V6GTY

Total Tubes: (76)

No Crystals.

REFERENCE DATA AND LITERATURE

NAVSHIPS 91999, Technical Manual for Radio Set AN/CPN-2A.

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	BUSHIPS
PROCUREMENT COGNIZANCE	
STOCK NO.	

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Transmitter (in carrying case CY-134A/CPN-2)		20-1/4 X 24-3/4*X 38-1/2	230
1	Control-Monitor (in carrying case CY-135A/CPN-2)		20-1/2* X 22-1/8* X 24*	120
1	Set of Accessories (in carrying case CY-136A/CPN-2)		16-1/2 X 20-3/4 X 24-3/4*	100
1	Mast Bundle No. 1 (4 mast section)		10 X 18 X 123	90

NOTE: *Add four inches on both sides to permit free use of handles.

RADIO SET AN/CPN-2A

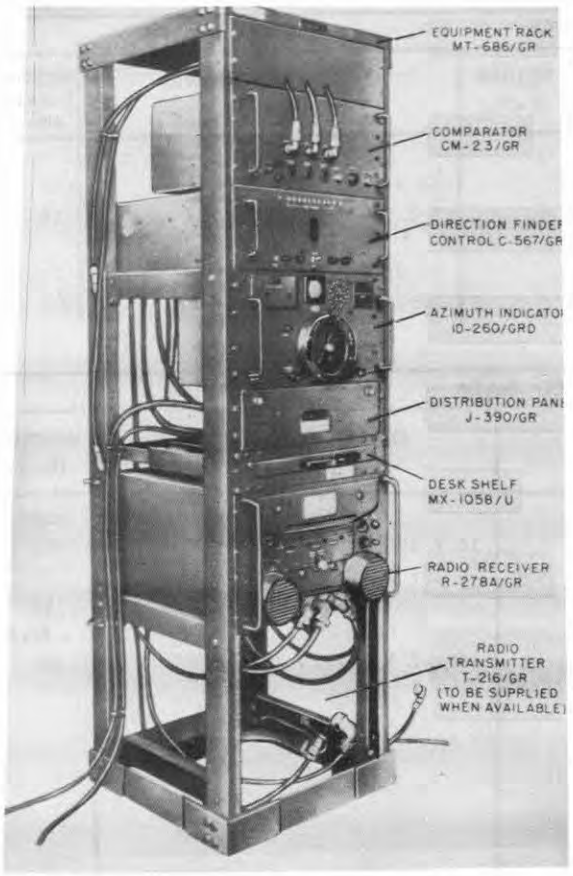
SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Mast Bundle No. 2 (3 mast sections and accessories)		16 X 18 X 123	110
1	Mast Bundle No. 3 (antenna reflectors)		6 X 32 X 52	16
1	Mast Bundle No. 4 (antenna base assembly and struts)		11 X 20 X 132	27-1/2
1	Mast Accessories in Transport Chest		14-1/2 X 16 X 46	200

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Mast AB-168/CPN-2A c/o		445
	(1) Mast and Boom incl Transit components	16 X 18 X 120	200
	(1) Set of Mast Accessories incl Transport Case	14-1/2 X 16 X 46	200
	(1) Set of 2 reflectors		16
	(1) Base Assembly incl 2 strut Assy		27.5
1	Transport Case CY-136A/CPN-2 incl	16-1/2 X 20-3/4 X 24-3/4	100
	(1) Set of Accessories		
	(2) Antenna AT-176/AP		
	(1) Set of Spare Tubes		
	(1) Set of RF Cable, Power Cable and Test Cable		
	(1) Visor M387		
	(2) Adapters UG-559/U		
	(1) Cable Trimmer MX-103/U		
1	Control-Monitor IP-68/CPN-2A incl	20-1/2 X 22-1/8 X 24	120
	(1) Transport Case CY-135A/CPN-2	20-1/2 X 22-1/8 X 24	49
1	Radar Transmitter T-230/CPN-2A incl	20-1/4 X 24-3/4 X 38-1/2	230
	(1) Transport Case CY-134A/CPN-2	20-1/4 X 24-3/4 X 38-1/2	63

RADIO DIRECTION FINDER AN/CRD-6



Radio Direction Finder AN/CRD-6

FUNCTIONAL DESCRIPTION

The AN/CRD-6 is a ground radio direction finder for determining azimuth of aircraft transmitting on a UHF channel such as Radio Set AN/ARC-27 or Radio Set AN/ARC-33 in aircraft. Operates on any of 1751 channels, 100 kc spacing, ten of which may be present. Employs a diversity type reception using 2 coaxial type dipole antennas with rotating reflectors. Employ a phase meter type bearing indicator to give automatic indication of azimuth of received signals. Includes one remote control point. For each additional remote control point; an additional C-568/GRC and ID-260/GRD will be required. Provision is made up to four (4) remote points.

No field changes in effect at time of preparation (20 June 1958).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TYPE OF INDICATION: Visual CRT.
TYPE OF RECEPTION: AM and CW.
NUMBER OF CHANNELS: 1751.
SPACING PER CHANNEL: 100 kc apart.
TYPE OF CONTROL: Crystal.
OPERATING FREQUENCY RANGE: 225 to 400 mc.
OPERATING POWER RQMT: 110 v, 50 to 60 cps, single ph.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) OA2	(1) 2BP1
(1) 2D21	(4) 5Y3GT
(12) 6AK6	(1) 6AL5W
(2) 6AU6	(2) 12AU7
(10) 12AX7	(5) 6SN7GT

Total Tubes: (39)

No Crystals Used.

REFERENCE DATA AND LITERATURE

Nomenclature Card AN/CRD-6 for Radio Direction Finder.
T.O. 31R4-2CRD6-4 Technical Manual and Parts Breakdown for AN/CRD-6 Radio Direction Finder.

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	USAF
PROCUREMENT COGNIZANCE	ENG-211C
STOCK NO.	
R.D.B. IDENT. NO.	

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Direction Finder AN/CRD-6 Including: (1) Radio Receiver R-278C/GR (2) Azimuth Indicator ID-260/GRD (1) Radio Transmitter T-216/GR		

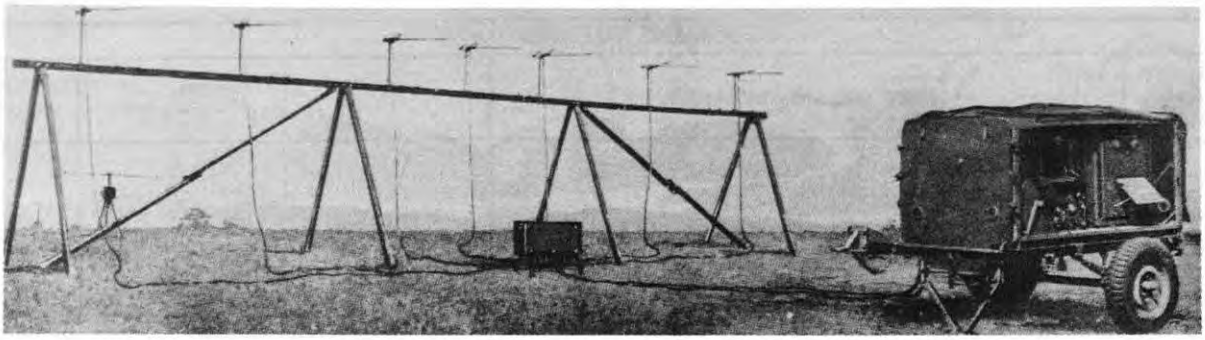
AN/CRD-6 RADIO DIRECTION FINDER

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
	(1) Direction Finder Control C-568/GRD		
	(1) Rack Mount 686/GR		
	(1) Direction Finder Control C-567/GRD		
	(1) Shelter S-57/GR		
	(1) Comparator CM-23/GR		
	(1) Power Distribution Panel SB-349/CRD-6		
	(1) Antenna AT-368/CRD-6		
	(1) Mast AB-277/CRD-6		
	(1) Junction Box J-476/CRD-6		
	(1) Case CY-722/GR		
	(1) Case CY-894/GR		
	(2) Antenna Case CY-1178/CRD-6		
	(2) Control Case CY-1175/CRD-6		
	(2) Case Indicator CY-1177/CRD-6		
	(1) Case Signal Comparator CY-1174/CRD-6		
	(1) Aircraft Clock (8 day) AN5743-2		
	(1) Desk Shelf MX-1058/U		
	(1) Headset CW-49507		
	(1) Obstruction Light and Cable NL-69787-1b		
	(2) Ground Rod, Hubbard 9426		
	(2) Telephone EE-8-A		
	(1) Transit MX-409/U		
	(1) Power Unit PE-75		

September 1956

RADIO SET AN/CRN-10



Radio Set AN/CRN-10

FUNCTIONAL DESCRIPTION

The AN/CRN-10 is designed to Radiate two modulated overlapping field patterns. The intersection of these field patterns provides a region of characteristic sound which can be received by aircraft radio equipment and used as the localizer beam for an airport runway.

No field changes in effect at time of preparation (14 June 1956).

RELATION TO OTHER EQUIPMENT

Equipment Required but not Supplied: (1) Power Unit PU-25/CRN, (1) Converter Unit PU-15/CRN-2, (1) Weston Multi-meter 665, (1) RCA Oscilloscope 152.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 108.3 to 110.3 mc.
RANGE OF EQUIPMENT
40 MILES: 2500 ft.
60 MILES: 6000 ft.
75 MILES: 10000 ft.
POWER SOURCE: 110 to 120 v, 60 cps, single phase.
TRANSMITTER OUTPUT: 110 W.
POWER FACTOR: 93%
MODULATION: Mechanical and electronically controlled.
ANTENNA
TYPE: Broad band dipole.
BEAM PATTERN: Cardioid type.
IMPEDANCE: 55 ohms.

TUBE AND/OR CRYSTAL COMPLEMENT

(5) 807	(4) 836	(3) 4E27
(1) 5U4G	(2) 6H6	(1) 9002
(1) 2051	(1) 2050	(1) 6K6GT
(1) 6X5GT	(1) 957	(1) 1R5
(2) 1LN5	(1) 1S5	(1) 3S4

Total Tubes: (26)

(6) DC-17-A
Total Crystals: (6)

REFERENCE DATA AND LITERATURE

AN 16-30CRN10-3: Technical Manual for Radio Set AN/CRN-10.

TYPE CLASSIFICATION
DESIGN COGNIZANCE
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna System AS-156/CRN-10 consisting of:	10-7/16 X 84-3/4 X 108 X 41'	
1	Antenna Tuning Unit TN-71/CRN-10	11-1/8 X 17-1/4 X 32-15/16	39
7	Masts	1-9/16 X 3-5/8 X 10-7/8 X 12	11.4
8	Antenna Assembly AS-155/CRN-10	2-1/4 X 30 X 37	5
1	Mounting Frame MT-280/CRN-10	84-3/4 X 118-7/16 X 41'	
1	Cord CG-153/CRN-10	73-13/16 lg	

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Cord CG-154/CRN-10	47' 9" lg.	12
1	Cord CG-154/CRN-10	47' 11" lg.	7.5
2	Cord CG-152/CRN-10	28' 3" lg.	0.5
2	Cord CG-152/CRN-10	19' 9" lg.	
2	Cord CG-152/CRN-10	34' 2" lg.	0.5
1	Cord CG-152/CRN-10	24' 7" lg.	3
12	Anchors	3-5/8 X 18	
1	Course Detector TS-179/CRN-10 consisting of:	8-7/8 X 11-1/4 X 31	26.25
1	Leg LG-16-B	1-3/16 X 1-3/16 X 72	5
1	Mounting MT-229/CRN-10	1-1/2 X 7-5/8 X 10	2.6
1	Course Monitor TS-180/CRN-10 consisting of:	9-3/8 X 10-7/8 X 19-15/16	17
1	Cord CX-244/CRN-10	225 lg	22.3
1	Mounting MT-226/CRN-10	1-1/2 X 8-5/8 X 12	2.6
1	Tripod LG-27-B	4-1/8 X 9-1/2 X 24	6.3
1	Radio Transmitter T-66/CRN-10 consisting of:	25-3/4 X 26 X 31	411.5
1	Cord (junction box to indicator)	31 lg	0.3
1	Cord (junction box to obstacle lights)	12' 6" lg	1.05
1	Cord (12 volts DC to junction box)	20' 1" lg	3.4
1	Cord (115 volts A-C to junction box)	20' 2" lg	3.25
1	Cord (junction box to transmitter)	33-1/2 lg	1
1	Cord (transmitter to Modulator)	85 lg	1.4
1	Crystal Unit (6016.66kc) DC-17-A		
1	Crystal Unit (6038.88kc) DC-17-A		
1	Crystal Unit (6061.11kc) DC-17-A		
1	Crystal Unit (6083.33kc) DC-17-A		
1	Crystal Unit (6105.55kc) DC-17-A		
1	Crystal Unit (6127.77kc) DC-17-A		
1	Modulator and Bridge MD-24/CRN-10 consisting of:	20-5/8 X 23-1/2 X 43-3/8	153
1	Cord CX-345/CRN-10	10' 2-1/2" lg	
1	Cord CX-346/CRN-10	10' 2-1/2" lg	
1	Chest CY-242/CRN-10	7 X 11-1/4 X 24-1/2	9.5
1	Indicator Box ID-70/CRN-10	1-3/8 X 1-13/16 X 18-9/16	77
1	Voltmeter IS-176-B	4-1/4 X 4-3/4 X 16	2.25
1	Trailer V-6/CRN-10 consisting of:	62 X 63 X 79	
1	Chest CY-184/CRN-10	8 X 12 X 15-3/4	
1	Cable Case CY-241/CRN-10	5 X 22-3/4 X 54-7/8	87.9
1	Reel Assembly RL-107/CRN-10	8-9/16 X 12-3/4 X 16-3/4	9
1	Obstacle Light MX-217/CRN-10	6 X 14 X 93	7.9
2	Obstacle Light Combat Hoods		
1	Set of tools consisting of:		
1	*Pliers	6 lg	
1	Electrician's Tool Kit		
1	Voltmeter IS-189		
1	*Screw Driver	7 lg	

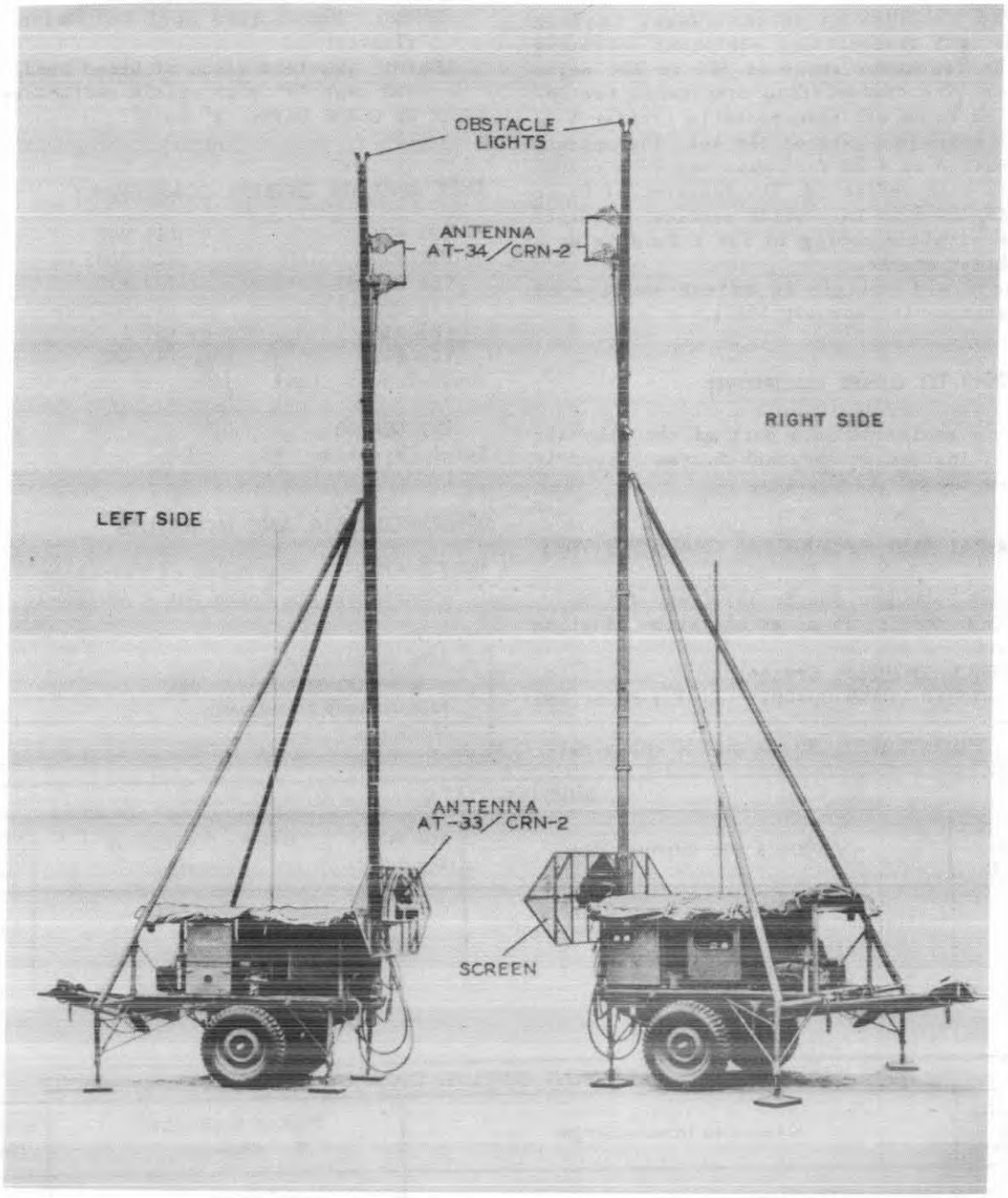
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	*Screw Driver	5-1/2 lg	
1	Soldering Iron		
1	Roll Rasin Core Solder		
1	Roll Black Friction Tape		
1	Electrician's Knife		
1	Metal Tape	100	
1	Hammer HM-1		
1	**Shovel LC-19		
1	**Mattock		
1	Fire Extinguisher		
1	**Ground Rod		
1	Metal Tape		
1	Radio Set SCR-610-()	1 X 11-5/8 X 16-1/2	57
1	Chart (Operating Instructions)	1/32 X 4-1/2 X 8-7/16	0.15
1	Right Side Antenna Stowage Rack		
	(loaded)	14-1/2 X 16-1/2 X 91-1/4	228
	(unloaded)	18-1/2 X 19-1/2 X 84-1/4	48
1	Left Side Antenna Stowage Rack		
	(Loaded)	14-1/2 X 16 X 104	174
	(unloaded)	17 X 18-1/2 X 84-1/4	48

*Items mounted in the transmitter cabinet.

**Items mounted external on trailer.

RADIO SET AN/CRN-2



Radio Set AN/CRN-2

AN/CRN-2 RADIO SET

FUNCTIONAL DESCRIPTION

The AN/CRN-2 is an instrument landing glide path transmitting equipment operating in the frequency range of 329 to 335 megacycles. The transmitting components are installed in an air transportable trailer V-1/CRN-2 which is a part of the set. The antenna is mounted on a 30 foot mast and is a folded dipole with reflector. The function of Radio Set AN/CRN-2 is to provide vertical guidance to an airplane coming in for a landing on a localizer course.

No field changes in effect at time of preparation (6 February 1957).

RELATION TO OTHER EQUIPMENT

This equipment is a part of the Army Air Forces Instrument Approach System (formerly called the SCS-51 System).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 332.6, 333.8 and 335 MC.
DISTANCE RANGE: 15 mi at elevation of glide path.
FREQUENCY CONTROL: Crystal
TRANSMITTER POWER OUTPUT: 20 W max at 335 mc.
AUDIO FREQUENCIES: 90 cps and 150 cps simultaneously by means of a divided output.
ANTENNA:
UPPER: broad band half loop with reflector.
LOWER: two-fold stack of broad band, end fed type "V" with dipole reflectors.
ANGLE OF GLIDE PATH: 2° to 5°.

TUBE AND/OR CRYSTAL COMPLEMENT

(2) 6SJ7	(1) 832
(1) 829B	(1) 9002
(3) 6SN7GT	(1) 6J5
(1) OD3/VR150	(1) OB3/VR-90
(2) 83L	(3) 5
(4) 8025	(1) 957

Total Tubes: (21)

(2) DC-17B
Total Crystals: (2)

REFERENCE DATA AND LITERATURE

AN08-30CRN2-3: Handbook of Maintenance Instructions for Radio Set - AN/CRN-2.

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	USAF
PROCUREMENT COGNIZANCE	
STOCK NO.	

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Trailer holds complete equipment - AN/CRN-2			2190
	With hitch		60 X 62 X 123	
	Without hitch		60 X 62 X 78	

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Transmitter T-3/CRN-2	24 X 25 X 39	227
1	Rectifier Power Unit PP-29/CRN-2	22-3/8 X 24-3/8 X 26-3/8	254
1	Antenna System AS-2/CRN-2 including		
	(1) Antenna-AT-33/CRN-2	9 X 11 X 20	6
	with Antenna Cover CW-100/CRN-2	3/16 X 11-1/2 X 23	7

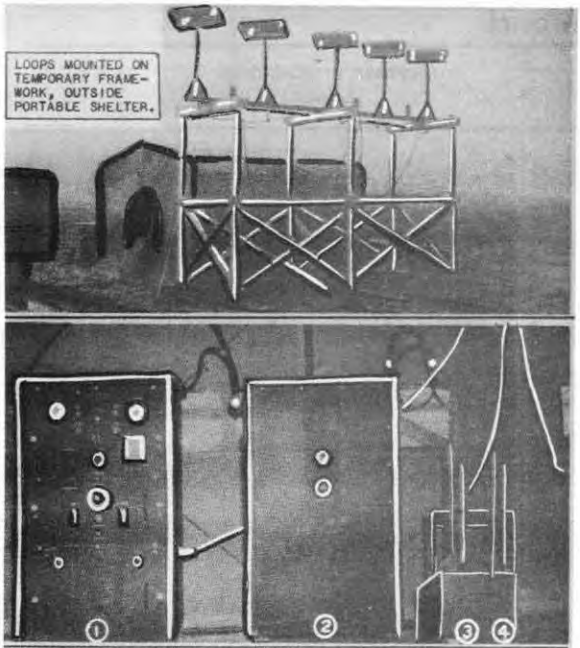
RADIO SET AN/CRN-2

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
	(1) Antenna - AT-34/CRN-2	16 X 21-1/2 X 22-1/2	36
	with Antenna Cover - CW-101/CRN-2	3/16 X 3 X 4	
	Antenna Cover - CW-103/CRN-2	3/16 X 3 X 6	
	(1) Antenna Reflector - AT-35/CRN-2	11 X 31 X 99	36
1	Cord CG-22/CRN-2	312	11-1/4
1	Cord CG-21/CRN-2	90	4-1/2
1	Cord CG-19/CRN-2	309	3
1	Cord CG-20/CRN-2	76	1
2	Guy Section AB-101/CRN-2	2-1/2 X 102	12
2	Guy Section AB-11/CRN-2	4 X 103-1/2	15
1	Mast Assembly - including:		
	(1) Mast Section AB-12/CRN-2	4 X 103-1/2	14
	(1) Mast Section AB-13/CRN-2	1/3 X 111	21
	(1) Mast Section AB-14/CRN-2	3-1/2 X 4-1/2 X 117	20
1	Light Unit MX-42/CRN-2	4 X 6 X 10	5-1/4
	With Cord	312	1-3/4
1	Power Unit PU-1/CRN-2	16 X 21-3/4 X 32	226
2	Battery BB-57	7 X 9-1/2 X 16	62
*1	Motor Generator PU-15/CRN-2		
1	Auto Transformer MX-95/CRN-2	7-1/2 X 8 X 10	48
1	Radio Set SCR-610A	13 X 13 X 17	70
1	Voltmeter TS-40/CRN-2	4 X 5 X 12	2-3/4
1	Chest CY-63/CRN-2	15 X 16 X 17	Full - 77 Empty - 36
1	Trailer V-1/CRN-2 - With hitch	60 X 62 X 123	1033
	Without hitch	60 X 62 X 78	
1	Tarpaulin	1/8 X 98 X 137	18
1	Compass (Air Corp Type) B-16	3-1/2 X 4-1/2 X 4-1/2	1-1/2
1	Fire Extinguisher A-2	3 X 13-1/2	6
1	Shovel LC-19	3 X 4 X 9	4
1	Kerosene Lantern	6 X 14-1/2	7
**1	Test Set I-77 ()	2 X 3 X 5-1/4	1-3/4
1	Battery BA-42		

NOTES: * Supplied only with 50 cycle power
** Any production is applicable

RADIO SET AN/CRN-3



Radio Set AN/CRN-3

FUNCTIONAL DESCRIPTION

The AN/CRN-3 is designed for temporary field installation for use as a ground localizer transmitter to provide azimuth guidance of aircraft for blind approach or instrument landing over a range of 75 miles. It replaces in part the Army A-1 Instrument Landing System.

No field changes in effect at time of preparation (20 June 1956).

RELATION TO OTHER EQUIPMENT

Similar to the AN/MRN-1 except for installation.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 108.3 to 110.3 mc.
PRESET FREQUENCIES: 108.3, 108.7, 109.1, 109.5, 109.9, 110.3.
ANTENNA: 5 Alford Loops in same horizontal plane.
TYPE OF SIGNAL: CW, MCW, VOICE.
RANGE: 75 mi.
TUNING: (MO or xtal) xtal.
POWER SOURCE: Power Unit PE-141 or 110 v 60 cps
POWER OUTPUT: 25 W.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) 6SN7GT	(2) VR-150-30	(1) 957
(1) 5V4G	(4) 836	(2) 1LN5
(1) 6F6	(1) 6SF5	(1) 3S4
(2) 6H6	(1) 6K6GT	(2) 6SC7
(3) HK257	(1) 6X5GT	(3) 1S5
(4) 807W	(1) 1R5	(1) 9002

Total Tubes: (32)

REFERENCE DATA AND LITERATURE

TM-11-227 War Department Technical Manual for Signal Communication Equipment Directory of Radio Communication Equipment.

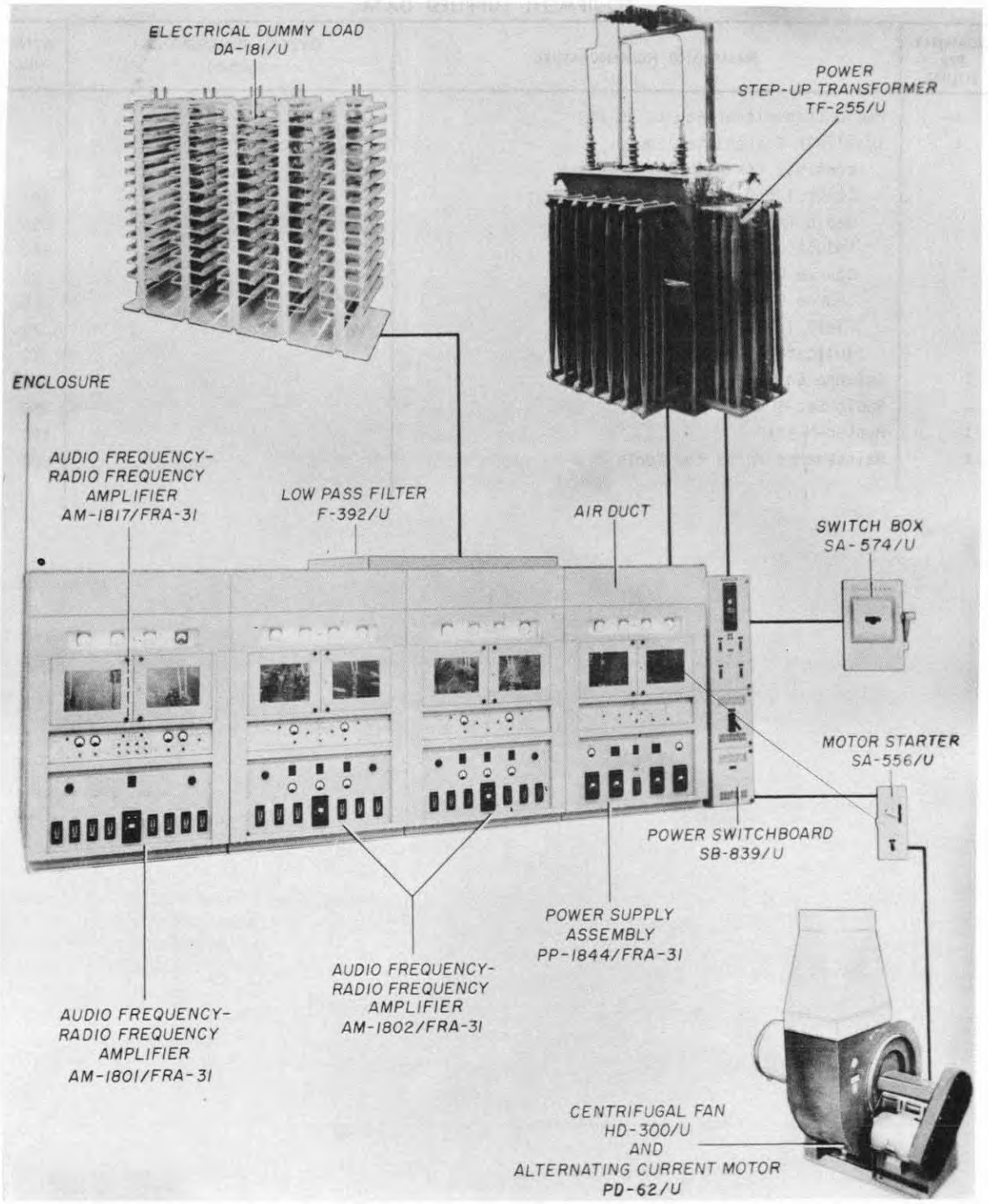
TYPE CLASSIFICATION
DESIGN COGNIZANCE USAF
PROCUREMENT COGNIZANCE WCEG-P399(USAF)
STOCK NO.

AN/CRN-3 RADIO SET

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Transmitter Equip. RC-107		
1	Localizer Transmitter Equip.		
	consists of :		
	Control Box-BC-915		800
	Radio Transmitter-BC-751		550
	Modulator and Bridges-BC-752		300
	Course Detector-BC-753 (Fixed)		80
	Course Detector-BC-754 (Portable)		25
	Field Intensity Meter-BC-755		25
	Indicator-BC-777 (Alarm)		70
1	Antenna Equip.-RC-109		450
1	Radio Set-SCR-610		135
1	Heater-M-321		100
1	Maintenance Parts and Tools		500

TRANSMITTER GROUP AN/FRA-31



Transmitter Group AN/FRA-31

AN/FRA-31 TRANSMITTER GROUP

FUNCTIONAL DESCRIPTION

The AN/FRA-31 is a very low frequency, high power radio transmitter designed for use in a long range navigation system under widely varying climatic conditions. It is capable of receiving signals from an external source in the 9 to 40 kilocycle frequency range and emitting continuous-wave signals between the frequency ranges of 9 to 14 kilocycles and 34 to 40 kilocycles at the maximum outputs of 20 kilowatts and 100 kilowatts respectively. It is housed in aluminum subassemblies and bolted together in the final assembly.

No field changes in effect at time of preparation (7 July 1958).

EQUIPMENT REQUIRED BUT NOT SUPPLIED

(1) Antenna, (1) Antenna Tuner, (1) Antenna Coupler, (1) Circuit Breaker, Test Equipment as Required.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 9 to 40 kc.
POWER OUTPUT (NOMINAL)
9 TO 14 KC: 10, 15, and 20 kw.
34 TO 40 KC: 50, 75, and 100 kw.
EMISSION: CW.
INPUT AND OUTPUT DATA
AM-1801/FRA-31
INPUT: 2 v across 70 ohms from external signal generators.
OUTPUT: 2200 W across 500 ohms to AM-1802/FRA-31.
AM-1802/FRA-31
INPUT: 1100 v for 100 kw output from AM-1801/FRA-31.
OUTPUT: 100 kw across 300 ohms to RF Transformer.
AMBIENT TEMPERATURE RANGE: 0 to 50 deg C.
POWER REQUIREMENTS
LIGHT BUS: 120 v, 5 amps per line, 0.6 kva, 97% pf.
POWER BUS: 480 v, 320 amps per line, 266 kva, 85% pf.

MANUFACTURER'S OR CONTRACTOR'S DATA

Westinghouse Electric Corp, Washington, D.C.
Contract NObsr-72581, dated 21 August 1956.

TUBE AND/OR CRYSTAL COMPLEMENT

(4) 5933WA (2) ML6425 (6) ML6697
(7) 857B
Total Tubes: (19)
(2) 1N38A
Total Crystals: (2)

REFERENCE DATA AND LITERATURE

NAVSHIPS 93077: Manuscript Copy of Technical Manual for Transmitter Group AN/FRA-31.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE SHIPS-N-2252
STOCK NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	AF-RF Amplifier AM-1801/FRA-31.	176.0	46 X 72 X 92	1650
1	Miscellaneous Parts for AM-1801/FRA-31	8.3	20 X 20 X 36	200
2	AF-RF Amplifier AM-1802/FRA-31	176.0	46 X 72 X 92	1727
2	Miscellaneous Parts for AM-1802/FRA-31	10.0	20 X 24 X 36	400
1	Power Supply Assembly PP-1844/FRA-31	176.0	46 X 72 X 92	1600
1	Power Switchboard SB-839/U	89.6	26 X 62 X 96	1900
1	Switch Box SA-574/U	6.8	14 X 24 X 35	200
1	AF-RF Transformer TF-265/U	18.4	27 X 28 X 42	440

TRANSMITTER GROUP AN/FRA-31

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
3	Power Distribution Transformer TF-257/U	4.0	18 X 19 X 20	285
1	Power Distribution Transformer TF-256/U	1.8	12 X 14 X 18	105
1	Power Step-Up Transformer TF-255/FRA-31	208.3	50 X 80 X 90	5600
1	Centrifugal Fan HD-300/U including: AC Motor PD-62/U	133.0	58 X 60 X 66	885
1	Reactor MX-2294/U	12.5	20 X 24 X 45	570
1	Line Capacitors (3)	10.0	24 X 24 X 30	330
1	Capacitor Rack	10.3	19 X 24 X 39	40
1	Motor Starter SA-556/U	1.7	10 X 12 X 24	53
	Electrical Dummy Load DA-181/U consisting of:			
5		46.0	23 X 40 X 86	250
5		0.7	6 X 10 X 20	40
5		5.0	12 X 18 X 40	75
	Direct Current Power Filter F-371/U consisting of:			
2		25.0	24 X 30 X 30	1600
1		1.4	10 X 12 X 20	40
1		1.3	10 X 15 X 15	80
1		0.7	8 X 12 X 12	50
1		64.0	23 X 65 X 74	200
	Low-Pass Filter and Enclosure F-392/U consisting of:			
3		144.0	24 X 48 X 72	600
2		70.0	38 X 40 X 40	400
2		44.0	25 X 38 X 40	300
3		198.0	24 X 44 X 108	2700
	Enclosure consisting of:			
1		45.0	30 X 36 X 72	560
1		50.0	30 X 36 X 80	630
1		67.7	24 X 65 X 75	800

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Power Supply Assembly PP-1844/FRA-31	41-1/2 X 66 X 84	1200
1	Centrifugal Fan HD-300/U including: AC Motor PD-62/U	52 X 53-9/16 X 54-1/2	665
1	Motor Starter SA-556/U	7-1/8 X 8-15/16 X 22-5/16	35
1	Power Switchboard SB-839/U	20 X 50-5/8 X 90-3/8	1300
1	Power Distribution Transformer TF-256/U	9-1/2 X 10-3/16 X 14-7/16	75.5
1	Power Step-Up Transformer TF-255/FRA-31	44 X 73-3/4 X 77	5000
1	AF-RF Transformer TF-265/U	23 X 24 X 35	350
1	Low-Pass Filter and Enclosure F-392/U	98 X 99 X 108	3095

AN/FRA-31 TRANSMITTER GROUP

EQUIPMENT SUPPLIED DATA

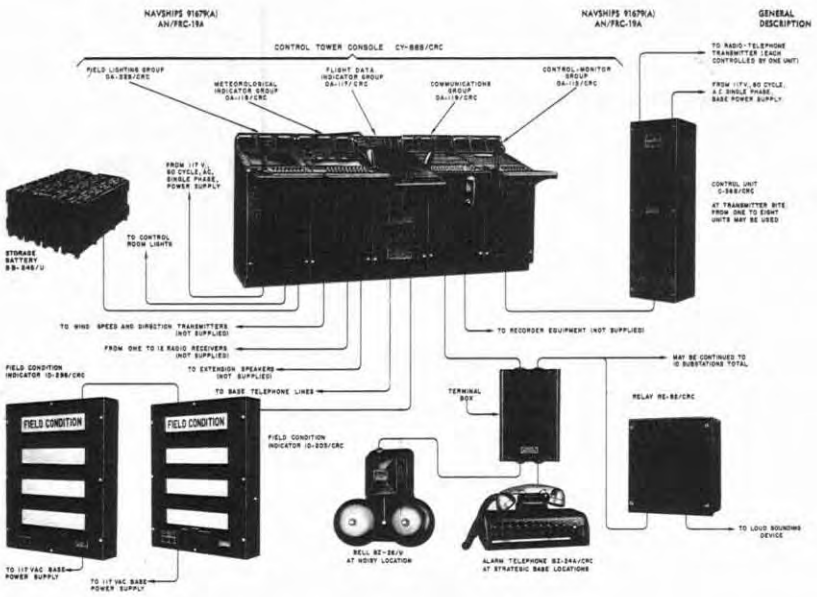
QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
5	Electrical Dummy Load DA-181/U	19 X 36-1/4 X 87-13/16	275
1	Reactor MX-2294/U	16-5/8 X 19 X 37-1/4	490
1	DC Power Filter F-371/U	19 X 66 X 78	1540
3	Power Distribution Transformer TF-257/U	14-3/4 X 15-3/4 X 22-1/8	239
1	AF-RF Amplifier AM-1817/FRA-31	12 X 13-3/4 X 25-3/4	40
1	AF-RF Amplifier AM-1801/FRA-31	48-1/4 X 66 X 84	1290
2	AF-RF Amplifier AM-1802/FRA-31	49-1/4 X 66 X 84	1327
2	Technical Manual NAVSHIPS 93077		
1	Filament Contactor	7 X 11 X 18-1/2	
1	Enclosure	68 X 76 X 264	1700
1	Switch Box SA-574/U	13 X 24 X 31	160

13 August 1962 AIRPORT CONTROL TOWER CONSOLE AN/FRC-19A

Cog Service: USN **FSN:** 5895-665-1980 W/S **Functional Class:**

	USA	USN	USAF
TYPE CLASS:	Used by	Used by	Used by

MANUFACTURER'S NAME/CODE NUMBER: Wickes Engineering & Construction Co., (74451).



Airport Control Tower Console AN/FRC-19A

FUNCTIONAL DESCRIPTION:

The Airport Control Tower Console AN/FRC-19A is an airport traffic control system designed to provide unified control of aircraft traffic from an airfield control tower. Facilities incorporated in the equipment provide for complete coordination of visual aid operation, radio telephone transmission, radio telephone reception, message recording, crash-alarm emergency, and intercommunication. Operating personnel can quickly obtain information such as flight progress, weather and field conditions, wind direction and speed, altimeter readings, and time. Two operating positions, "A" and "B", are provided for controlling the radio telephone transmitting system. The controls and indicators for other console facilities are within easy reach of either operator.

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

TECHNICAL CHARACTERISTICS:

RADIO TELEPHONE RECEIVING SYSTEM
- INPUT SIGNAL LEVEL: P14 dbm.
- OUTPUT TO EXTENSION: P8 dbm P14 dbm input signal level.

INDICATOR CONTROL C-791/CRC
- SIGNAL LEVEL NECESSARY TO ENERGIZE LAMPS: P14 dbm porm 1 db.
- SIGNAL LEVEL WHEN LAMPS ARE DE-ENERGIZED: P10.5 dbm porm 1 db.
- SENSITIVITY: 200 cps to 5000 cps.

CONTROL PANEL C-792/CRC
- CROSS-TALK AT 1000 CPS WITH P14 DBM INPUT SIGNAL LEVEL: At least M30 dbm on all other lines.

RECORDER SYSTEM
- INPUT TO RECORDER: M29 dbm porm 2 db to P14 dbm.
- OUTPUT TO RECORDER: M29 dbm porm 2 db to P20 dbm.

INTERPHONE
- CROSS-TALK AT 1000 CYCLES WITH P10 DBM: At least M30 dbm on all other lines.

TRANSMITTING SYSTEM
- AUDIO LEVEL: P10 dbm porm 2 db.
- CROSS-TALK AT 1000 CYCLES WITH P20 DBM SIGNAL: At least M30 dbm on all other lines.

AF AMPLIFIER AM-365/CRC
- INPUT SIGNAL LEVEL: M30 to zero dbm.
- OUTPUT SIGNAL LEVEL: P8 to P28 dbm.
- LIMITING ACTION: Porm 1.5 db of any present output level between P8 to P28 dbm.
- FREQUENCY RESPONSE: Flat within porm 1.5 db between 200 to 5000 cps.
- HUM LEVEL AT FULL OUTPUT: M50 db below 28 dbm.
- MAXIMUM GAIN: 60 dbm.

INPUT AND OUTPUT IMPEDANCES
- AF AMPLIFIER AM-365/CRC
  - INPUT IMPEDANCE: 600 ohms.
  - OUTPUT IMPEDANCE: 600 ohms.
- CONTROL UNIT C-388/CRC
  - INPUT IMPEDANCE: 600 ohms.
  - OUTPUT IMPEDANCE: 600/200/50 ohms, balanced line.

EQUIPMENT AC POWER CONSUMPTION
- CONTROL TOWER CONSOLE CY-888/CRC: 500 W.
- CONTROL UNIT C-388/CRC: 30 W.
- FIELD CONDITION INDICATOR ID-203/CRC: 30 W.
- FIELD CONDITION INDICATOR ID-298/CRC: 15 W.

OPERATING POWER RQMT: 117/234 v ac, 50 to 60 cps, three-wire single ph or 117 v ac, 50 to 60 cps, two-wire, single ph.

RELATION TO OTHER EQUIPMENT:

The AN/FRC-19A is similar to and interchangeable with Airport Control Tower Console AN/FRC-19.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Tube Tester TV-2/U; (1) Multimeter TX-297/U; (1) Multitester TS-352/U; (1) Audio Oscillator TS-382A/U; (1) Output Meter TS-585/U; (1) Distortion Meter GE Model no. 1932A.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Control Tower Console CY-888/CRC		36 x 40 x 94	929
1	Field Lighting Control Group OA-228/CRC consists of:		19-1/4 x 36 x 40	215
1	Cabinet CY-889/CRC		19-1/4 x 36 x 40	142
1	Control Panel C-796/CRC		7 x 8-3/4 x 18	17
1	Power Supply PP-523/CRC		8-3/4 x 11 x 18	47
3	Dynamic Speaker LS-173/CRC		3-5/8 x 5 dia	3
1	Meteorological Indicator Group OA-118/CRC consists of:		19-1/4 x 36 x 40	200
1	Cabinet CY-884/CRC		19-1/4 x 36 x 40	116
1	Aerological Indicator ID-296/CRC		6 x 7 x 19	13
1	Control Panel C-792/CRC		5-1/4 x 17 x 17-1/2	18
1	Indicator Control C-791/CRC		3-1/4 x 17-1/2 x 20	40
1	Panel Light MX-1133/CRC		3-1/2 x 5 x 19	4
3	Dynamic Speaker LS-173/CRC		3-5/8 x 5 dia	3
1	Flight Data Indicator Group OA-117/CRC consists of:		17 x 38 x 40	90
1	Cabinet CY-885/CRC		17 x 36 x 40	67
1	Flight Data Board PT-102/U		2 x 17 x 35	23
1	Communications Group OA-119/CRC consists of:		19-1/4 x 36 x 40	184
1	Cabinet CY-887/CRC		19-1/4 x 36 x 40	117
1	Interphone Control C-794/CRC		5-1/4 x 17-1/2 x 20	44
1	AF Amplifier AM-365/CRC		5-1/4 x 8-1/4 x 18	14
3	Dynamic Speaker LS-173/CRC		3-5/8 x 5 dia	3
1	Control-Monitor Group OA-115/CRC consists of:		19-1/4 x 36 x 40	210
1	Cabinet CY-886/CRC		19-1/4 x 36 x 40	187
1	AF Monitor ID-297/CRC		4 x 5-1/4 x 19	6
2	AF Amplifier AM-365/CRC		5-1/4 x 8-1/4 x 18	14
1	Transmitter Control C-793/CRC		5-1/4 x 17-1/2 x 18	32
3	Dynamic Speakers LS-173/CRC		3-5/8 x 5 dia	3
1	Storage Battery BB-245/U		12 x 21-1/2 x 26-1/2	312
10	Alarm Telephone BZ-24A/CRC		6-7/16 x 7-5/16 x 12-3/4	13
2	Bell BZ-26/U		4-1/4 x 12-1/4 x 13	8
8	Control Unit C-388/CRC		6-1/2 x 9 x 28	22
1	Field Condition Indicator ID-203/CRC		5 x 20 x 24	21
1	Field Condition Indicator		4-1/4 x 20 x 24	22

AN/FRC-19A AIRPORT CONTROL TOWER CONSOLE

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
	ID-298/CRC			
2	Relay RE-82/CRC		4-1/4 x 8-3/16 x 8-3/16	3
1	Alternate Wind Panel			
1	Storage Battery Maintenance Kit			
1	Wind Panel Installation Kit			
2	Maintenance Parts Kit			
1	Set of Interconnecting Cables			30
	consists of:			
1	Power Cable Ass'y CX-1311/U		77 lg	
1	Power Cable Ass'y CX-1311/U		107 lg	
1	Power Cable Ass'y CX-1311/U		113 lg	
1	Power Cable Ass'y CX-1311/U		165 lg	
1	Special Purpose Cable Ass'y CX-1310/U		147 lg	
1	Special Purpose Cable Ass'y CX-1309/U		144 lg	
1	Special Purpose Cable Ass'y CX-1308/U		149 lg	
1	Special Purpose Cable Ass'y CX-1307/U		70 lg	
1	Special Purpose Cable Ass'y CX-1306/U		73 lg	
1	Special Purpose Cable Ass'y CX-1305/U		108 lg	
1	Special Purpose Cable Ass'y CX-1304/U		73 lg	
1	Special Purpose Cable Ass'y CX-1303/U		126 lg	
1	Special Purpose Cable Ass'y CX-1302/U		71 lg	

REFERENCE DATA AND LITERATURE

NAVSHIPS 91679(A): Technical Manual for Airport Control Tower Console AN/FRC-19A.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (5) 5Y3GT (3) 6H6 (15) 6SJ7 (3) 6SK7 (3) 6V6GT (15) 991

CRYSTAL: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	24.4	365
1	24.4	335

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	24.4	263
1	27.1	335
1	24.4	350
1	1.3	31
1	3.4	54
1	11.8	361
1	0.6	21
1	10.2	188
1	10.2	188
1	4.6	75
1	4.6	77
1	12.0	180
1	8.3	135
1	3.3	125
1	2.2	100

PROCUREMENT DATA

PROCURING SERVICE: USN, USAF
DESIGN COG: USN, BuShips
SPEC &/OR DWG: USAF Exhibit WLENG-144A

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Wickes Engineering & Construction Co. Dwg no. 4500024	Camden, New Jersey	AF33(038)-25926, 10 May 1951	

August 1957

Radio-Navigational Aids

DIRECTION FINDER SET AN/FRD-5

FUNCTIONAL DESCRIPTION

The AN/FRD-5 is a ground UHF equipment for ground communications and aircraft control. It is used for determining azimuth of aircraft transmitting on a uhf channel such as Radio Set AN/ARC-27 or Radio Set AN/ARC-33 in aircraft. It employs a phasemeter type bearing indicator to give automatic indication of azimuth of received signals.

No field changes in effect at time of preparation (17 December 1956).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 225 to 400 mc
CHANNELS: 1751, spaced 100 kc apart
CONTROL: Crystal
POWER REQUIREMENTS: 110 v, 50 or 60 cps, single ph.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes.

REFERENCE DATA AND LITERATURE

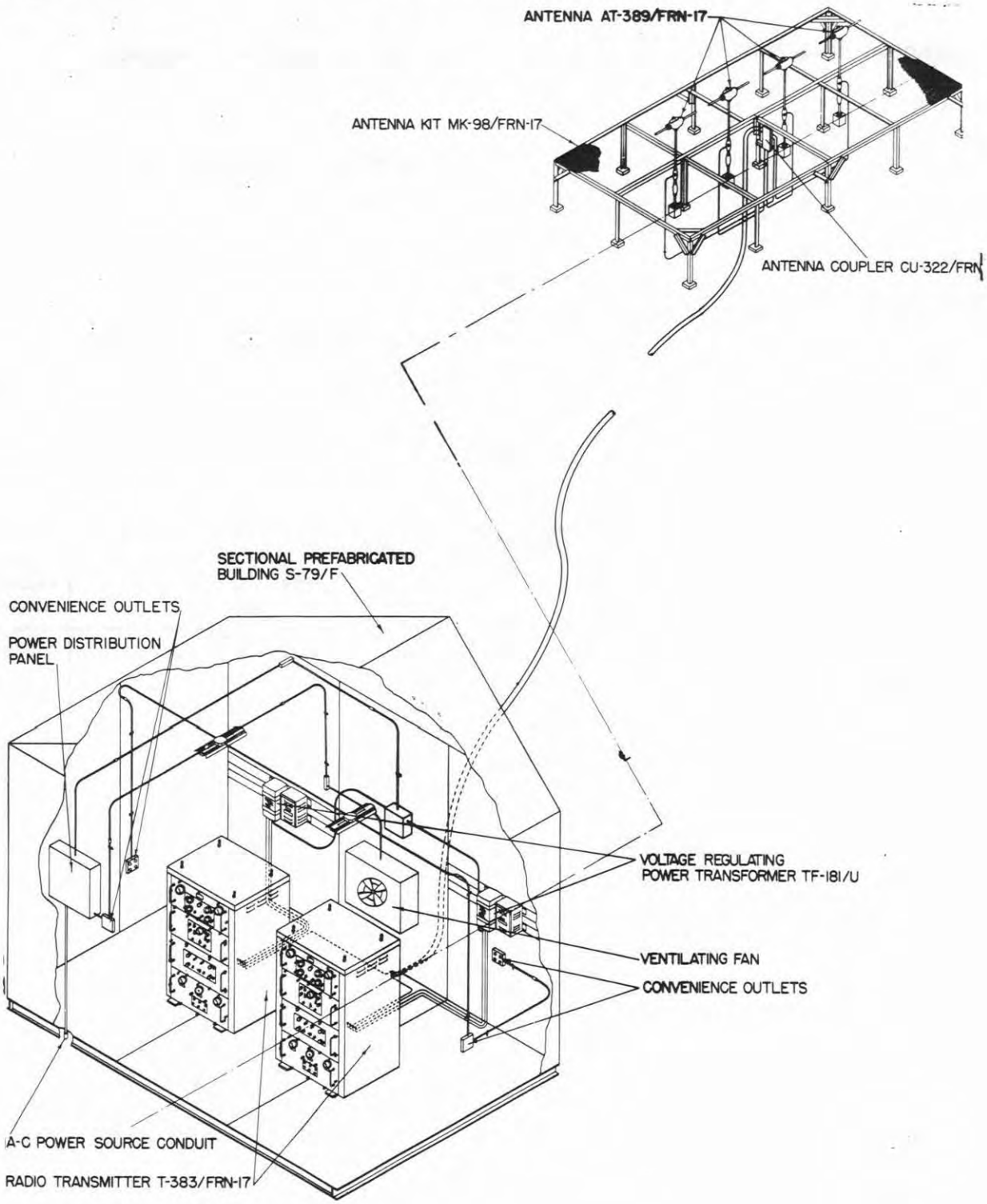
Nomenclature Card for Direction Finder Set AN/FRD-5

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	
PROCUREMENT COGNIZANCE	
STOCK NO.	

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna AS-449A/GRD		
1	Azimuth Indicator ID-260A/GRD		
1	Radio Radio Receiver R-278/GR		
1	Mast AB-157/GR		
1	Panel, Power Distribution		
1	Headset NT-49507		
1	Obstruction Light and Cable		
1	Transmit MX-409/U		
1	Cabinet, Electrical Equipment		
1	Channel Selection Control Panel		
1	Interconnecting Cables, Receiver – Junction Box		

RADIO BEACON AN/FRN-17



Radio Beacon AN/FRN-17

FUNCTIONAL DESCRIPTION

The AN/FRN-17 is used as an air-navigational aid. It performs the function of providing a positive indication of position at a point along an airway by radiating an identification signal which is broad in a perpendicular to the airway and narrow in a plane along the airway.

The radiated signal may be either voice modulated or modulated by a 3000 cps identification tone.

Data on this sheet reflects the following; Field Change No. 1 (14 June 1956).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY: 75 mc.
FREQUENCY CONTROL: Crystal.
TYPE OF EMISSION: A2, A3.
CARRIER OUTPUT: 100W into a balanced 70 ohm load
FREQUENCY STABILITY: 0.01%.
OUTPUT IMPEDANCE: 70 ohms, balanced.
MICROPHONE INPUT IMPEDANCE: 500 ohms.
POWER INPUT: 115v, single ph, 50 to 60 cps.
INPUT POWER FACTOR: 0.945.
HEAT DISSIPATION: 940W.

MANUFACTURER'S OR CONTRACTOR'S DATA

Maryland Electronic Mfg. Corp., College Park, Maryland
Contract NObsr-52631, dated 30 June 1956
Cost $22960.00

TUBE AND/OR CRYSTAL COMPLEMENT

(3) OA2	(3) 6AU6WA	(2) 5687
(3) OB2	(1) 6E5	(1) 5727
(2) 3B28	(1) 6X4W	(2) 5751
(4) 4-65A	(1) 12AT7WA	(2) 5763
(1) 5R4WGB	(1) 807W/5933	(3) 5814

Total Tubes: (30)
(1) CR-18/U
Total Crystals: (1)

REFERENCE DATA AND LITERATURE

NAVSHIPS 92334(A): Technical Manual Radio Beacon AN/FRN-17

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	BUSHIPS
PROCUREMENT COGNIZANCE	
STOCK NO.	

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Antenna Assembly AE-1386 (4)	67.4	25 X 44 X 106	708
1	Set Antenna Accessories	9.5	18 X 24 X 38	167
1	Set Antenna Accessories	9.5	18 X 24 X 38	298
1	Set Antenna Accessories and Counterpoise hardware	4.6	13 X 18 X 34	93
1	Set Counterpoise Angles	11.4	11 X 14 X 128	605
1	Set Counterpoise Angles	9.2	8 X 8 X 249	501
1	Set Counterpoise Angles	1.9	8 X 8 X 52	132
1	Wire Mesh 42ft. lg. X 5ft. h. (4 rolls)	30.5	28 X 29 X 65	352
1	Building, Prefabricated, Sectional S-79F	148.8		4063
1	Transmitter Cabinet, including: interconnecting cables, tubes, resistors and tubeshields	40.6	30 X 39 X 60	495
2	Monitor and Control Unit	7.5	14-1/4 X 27 X 34-1/4	165
2	Modulator and RF Unit	9.0	17-1/4 X 27 X 34-1/4	175
2	Identification Reproducer and Keyer Unit	13.7	20-3/4 X 30-1/2 X 37-1/2	224
2	High Voltage power supply unit	9.6	18-1/4 X 27 X 34-1/4	241
1	Transmitter Cabinet	40.6	30 X 39 X 60	458
2	Transformer, Power, Voltage Regulating TF-181/U	3.6	13 X 19 X 25	170
1	Equipment Spares for AN/FRN-17	2.2	12 X 15 X 21-1/4	57
1	Equipment Spares for AN/FRN-17	2.8	15 X 15-1/4 X 21-3/4	152

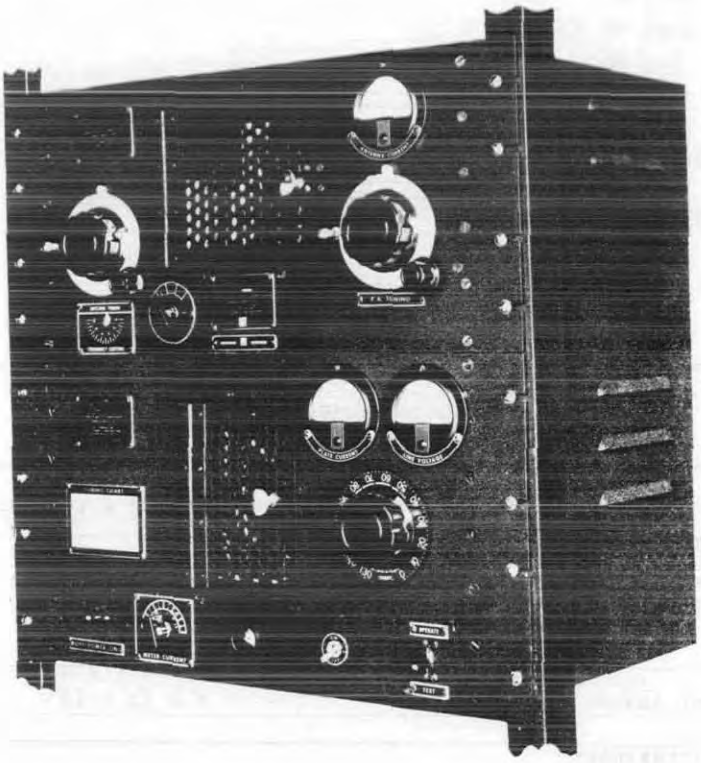
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
2	Radio Transmitter T-383/FRN-17 consists of: Modulator and RF Monitor and Control Unit Identification Reproducer and Keyer High Voltage Power Supply	25-15/16 X 30-3/16 X 54-3/8	648
2	Transformer, Power, Voltage Regulating TF-181/U	8-1/2 X 15-1/8 X 21	149
1	Antenna Kit MK-98/FRN-17 consisting of: Antenna AT-389/FRN-17 Antenna Coupler CU-322/FRN-17 Counterpoise	145-3/4 X 241-1/8 X 477-5/8	1965
1	Building, Prefabricated, Sectional S-79/F	130 X 135 X 163	3397

Cog Service:	FSN:	Functional Class:
	USA USN USAF	

TYPE CLASS:

MANUFACTURER'S NAME/CODE NUMBER: Erco Radio Laboratories Incorporated.



Radio Beacon Transmitter AN/FRN-18

FUNCTIONAL DESCRIPTION:

The Radio Beacon Transmitter AN/FRN-18 is a rack mounted radio beacon transmitter for the propagation of signals for Marine radio direction finder service. It is primarily designed for use on ships and other stations of the U. S. Coast Guard as a radio aid to navigation.

No field changes in effect at time of preparation (24 May 1961).

TECHNICAL CHARACTERISTICS:

TYPE OF INSTALLATION: Ship or shore station.
TYPE OF EMISSION: A1 & A2 type.
TYPE OF FREQUENCY CONTROL: Crystal and master oscillator.
FREQUENCY STABILITY: 0.008%.
ANTENNA CHARACTERISTICS: 10 ohm 0.001 mfds to 35 ohm 0.0004 mfds.
NUMBER OF BANDS: 1 band.

AN/FRN-18 RADIO BEACON TRANSMITTER

FREQUENCY RANGE: 275 to 325 kc.
POWER OUTPUT OF EACH EMISSION
A1 TYPE OF EMISSION: 25 W.
A2 TYPE OF EMISSION: 25 W.
POWER SUPPLY CHARACTERISTICS
TYPE: MD-162/FRN-18.
INPUT POWER: 115 v ac, 60 cps, single ph.
CURRENT AND POWER FACTOR
STAND-BY: 1.2 amps at 95% pf.
KEY LOCKED CW: 1.8 amps at 92% pf.
KEY LOCKED MCW: 2.6 amps at 90% pf.

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(2) Quartz Crystal Unit CG Type T-4 (285-410KC).

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
2	Amp-Oscillator Unit AM-629/FRN-18		10-1/2 x 15 x 24	41
2	Mod-Power Supply Unit MD-162/FRN-18		12-1/4 x 15 x 24	122
2	Dust Cover		15-5/16 x 21 x 22-1/2	13
4	Set of Tubes		3 x 6-1/2 x 17-1/4	2.5
1	Set of Equipment Spares		6 x 12 x 12	20

REFERENCE DATA AND LITERATURE:

U. S. Coast Guard Technical Manual for Radio Beacon Transmitter AN/FRN-18.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (2) 5Z3 (5) 807

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	11.7	265
1		
1	1.38	40

PROCUREMENT DATA

PROCURING SERVICE: DESIGN COG: U. S. Coast Guard

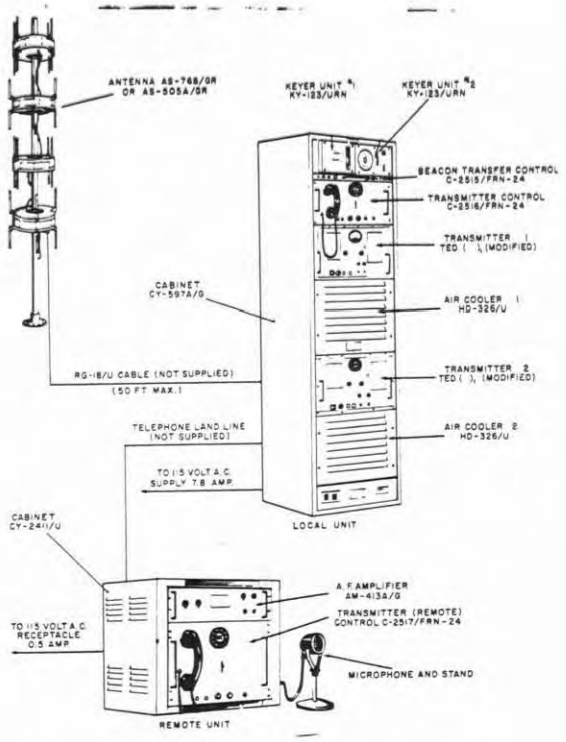
SPEC &/OR DWG: U. S. C. G. TRB-362

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Erco Radio Laboratories Incorporated Model TB-107	Garden City, New York, N. Y.	Tcg-38262, 3 October 1950	

Cog Service:	FSN:	Functional Class:
	USA USN USAF	

TYPE CLASS:

MANUFACTURER'S NAME/CODE NUMBER: RCA Service Company, Systems Engineering Facility.



Radio Beacon Set AN/FRN-24

FUNCTIONAL DESCRIPTION:

The Radio Beacon Set AN/FRN-24 is intended for installation at naval air stations. It provides for the radiation of an identified Modulated Continuous Wave (MCW) signal for air station location and voice modulation for ground to aircraft communication. It also provides remote control and standby unattended Ultra-High-Frequency (UHF) Radio Beacon and Radio Telephone communications (one-way) to high altitude aircraft for navigational purposes.

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

TECHNICAL CHARACTERISTICS:

TRANSMITTER DATA MODEL TED SERIES

FREQUENCY RANGE: 225 to 400 mc.

TYPE OF FREQUENCY CONTROL: Crystal.

TYPE OF EMISSION: A2 (MCW); A3 (phone).

NOMINAL CARRIER OUPUT: 22 to 25 watts.
FREQUENCY STABILITY: Porm 0.007% under any conditions or combination of conditions.
IMPEDANCE
INPUT: 600 ohms.
OUTPUT: 50 ohms.
AUDIO INPUT VOLTAGE: M25 db to P5 db from a 0.006 W reference level (0.1 to 3.4 volts).
AUDIO FREQUENCY RESPONSE CHARACTERISTICS: Flat within plus or minus 3 db from 1,000 cps response level, from 300 to 3,500 cps.
HEAT DISSIPATION: 725 W.
POWER SUPPLY: 115 v ac, 50 to 60 cps, single ph, 900 W.

AUDIO AMPLIFIER AM-413 A/G
FREQUENCY RESPONSE: Porm 1 db from 200 to 5000 cps.
INPUT IMPEDANCE: 600 ohms porm 10%.
INPUT LEVEL: 0.0001 to 6 milliwatts.
OUTPUT: 6 mw, 600 ohms balanced.
COMPRESSION RANGE: 0.001 to 6 mw.
DISTORTION: 7% max.
POWER SUPPLY: 115 v ac, 50 to 60 cps, single ph, 50 W.

ANTENNA TYPE AS-768/GR or AS-505A (NOT SUPPLIED)
FREQUENCY RANGE: 225 to 400 mc.
PATTERN: Omni-directional.
IMPEDANCE: 50 ohms.
MAXIMUM STANDING WAVE RATIO: 2 to 1.
TYPE OF ANTENNA: 4-bay vertically stacked array.
GAIN: 4 db at 225 mc; 5 db at 400 mc.
HORIZONTAL BEAM WIDTH: Omni-directional.
VERTICAL BEAM WIDTH: 20 deg at 225 mc, 12 deg at 400 mc.
FRONT TO BACK RATIO: Omni-directional.
MAXIMUM POWER TRANSMITTED: 1 kW.
POLARIZATION: Vertical.

RELATION TO OTHER EQUIPMENT:

The AN/FRN-24 is similar to, but not interchangeable with AN/URN-12.
The AN/FRN-24 is designed to be used with, but not part of AN/ARA-25 and AN/ARC-27 (Receiver Portion).

EQUIPMENT REQUIRED BUT NOT SUPPLIED:

(1) Antenna AS-768/GR or AS-505A/GR; (2) Technical Manual NAVSHIPS 93137A for Antenna AS-768/GR (or AS-505A/GR); (2) Crystal Unit CR-24/U.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
	Local Control Unit consisting of:			
1	Cabinet CY-597A/G		23-3/8 x 26 x 87-1/2	
2	Radio Transmitting Set TED-(Mod) CCAD-52373-( )		12-7/32 x 15 x 19	

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
2	Keyer Unit KY-123/URN		6 x 6-3/4 x 11-1/2	8
2	Electronic Equipment Air Cooler HD-326/U		16 x 19 x 22	
1	Transmitter Control Unit C-2516/FRN-24		12-1/4 x 19 x 20-1/4	
1	Beacon Transfer Control Unit C-2515/FRN-24		8-3/4 x 13-3/4 x 19	14
2	Technical Manual for Radio Transmitting Set TED-(Mod)			
2	Technical Manual for Keyer KY-123/URN NAVSHIPS 92003			
	Remote Control Unit consisting of:			
1	Cabinet CY-2411/U		14-3/4 x 19-1/2 x 22	
1	Transmitter (Remote) Control Unit C-2517/FRN-24			
1	Audio Frequency Amplifier AM-413A/G		5-1/4 x 8-3/4 x 19	15-1/2
2	Technical Manual for A. F. Amplifier AM-413A/G NAVSHIPS 91905			
2	Technical Manual for Radio Beacon Set AN/FRN-24 NAVSHIPS 93291		1/4 x 8-1/2 x 11-1/2	

REFERENCE DATA AND LITERATURE:

NAVSHIPS 93291: Technical Manual for Radio Beacon Set AN/FRN-24.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (4) 3B28 (6) 4X150A (2) 5Y3WGTB (2) 6AT6 (1) 6J6 (11) 12AT7WA (1) 12AX7
(1) 6005 (4) 807 (4) 5726/6AL5W (2) 5749/6BA6W (8) 5814/12AU7

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	29.5	276
1	2.0	144
1	0.27	8
1	3.8	

AN/FRN-24 RADIO BEACON SET

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	2.7	
1	1.3	14
1	3.7	
1		
1	0.5	15-1/2

PROCUREMENT DATA

PROCURING SERVICE:

DESIGN COG: USN, BuShips

SPEC &/OR DWG:

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
RCA Service Company Systems Engineering Facility	Alexandria, Virginia	Nobsr-81015, 11 December 1959	

RADIO SET AN/FRR-51

FUNCTIONAL DESCRIPTION

The AN/FRR-51 is a receiving set which provides for dual diversity reception of frequency shift radio teletype signals in frequency range 0.5 to 32 mc. This equipment employs a 10 channel auto-turn system.

No field changes in effect at time of preparation (3 May 1957).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

RECEPTION: A0, A1, A2, A3, A9.
FREQUENCY RANGE: 0.5 to 32 mc.
NUMBER OF CHANNELS: 10.
PRESENTATION: Audio.
POWER SOURCE REQUIRED: 115 v, or 230 v, 48 to 62 cps, single ph.

TUBE AND/OR CRYSTAL COMPLEMENT

Tubes and Crystals: Not Available.

REFERENCE DATA AND LITERATURE

Nomenclature Card for Receiving Set, Radio AN/FRR-51 dated 21 September 1956.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
2	Radio Receiver R-792/URR		
1	Antenna Coupler CU-560/URR		
1	Receiver Control C-2087/URR		
1	Remote Switching Control C-2086/URR		
1	Frequency Shift Converter CV-116/URR		
1	Electrical Equipment Cabinet CY-1119/U		
1	Signal Data Converter CV-395/U		

October 1957

Radio-Navigational Aid

AIR CONTROL CENTRAL AN/GRN-10

FUNCTIONAL DESCRIPTION

The AN/GRN-10 is used in monitoring, instructing, supervising and advising student traffic at Air Training Command bases concerning their take-offs, approaches, and landings. May be mounted on and operated from a 1-1/2 ton 4 x 2 combination stake and platform truck.

No field changes in effect at time of preparation (6 June 1957).

RELATION TO OTHER EQUIPMENT

Formerly nomenclatured as Trainer, Air Traffic Control Central AN/MRN-T1.

TUBE AND/OR CRYSTAL COMPLEMENT

Tubes and Crystals: Not Available.

REFERENCE DATA AND LITERATURE

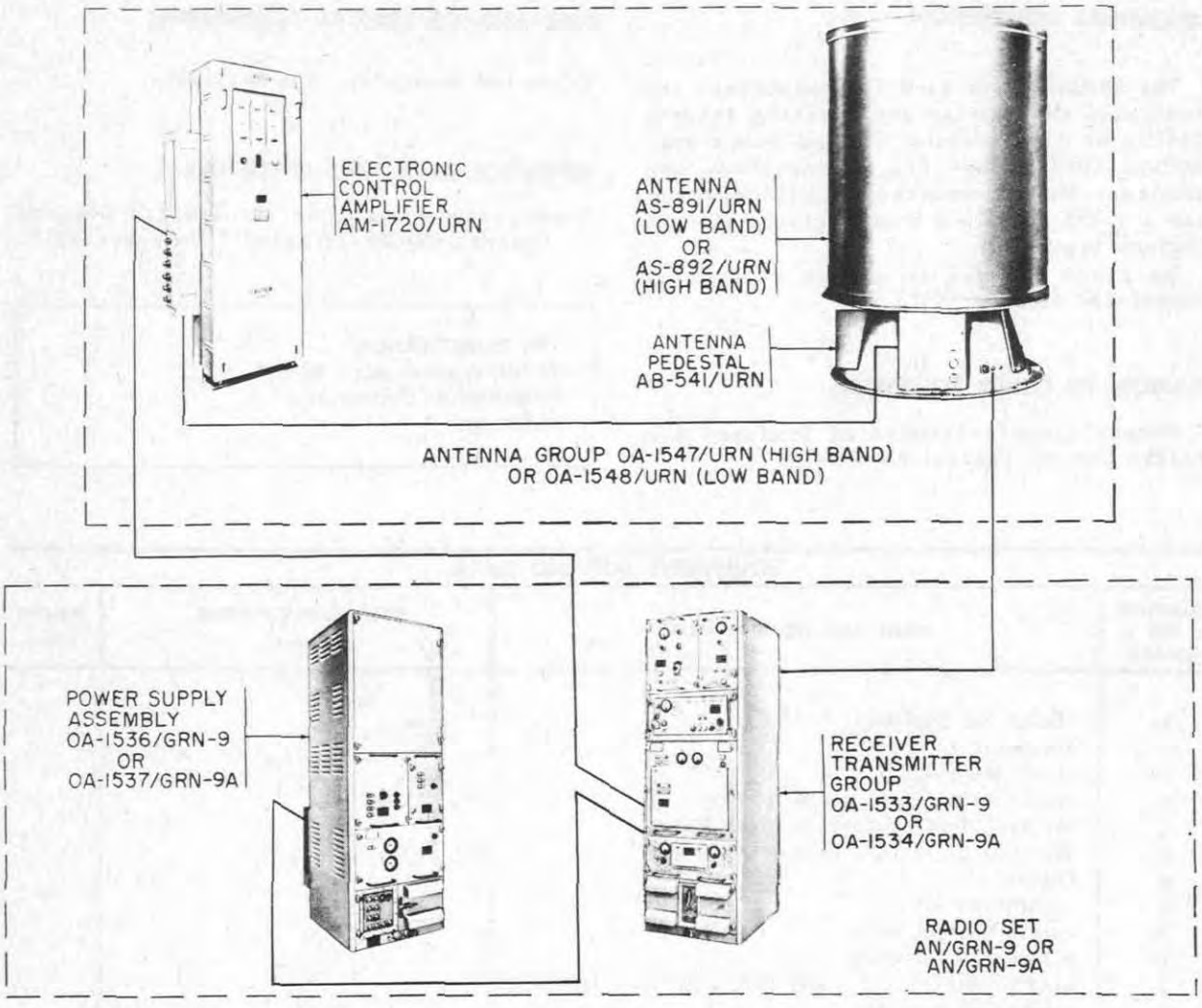
Nomenclature Card for Air Traffic Control Central AN/GRN-10 dated 7 December 1957.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUAER
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Electrical Equipment Shelter		
1	Altimeter Type 12C		
1	Clock AN5743-1A		
2	Pyrotechnic Pistol AN-M8		
1	Air type Traffic Control Light B-2		
1	Air Conditioner and Heater		
4	Chairs		
1	Control Panel		
1	Remote Control Unit		
1	Multimeter AN/PSM-6		
1	Wind Direction and Speed Indicator ID-373/GMQ-11		
2	Microphone M-15/UR		
4	Loudspeaker LS-11		
4	Headset HS-33-A		
2	Ground Rod GP-26		
1	Wind Direction and Speed Transmitter T-420/GMQ-11		
2	Binocular 7 x 50		

RADIO SET AN/GRN-9



Radio Beacon (Shore-based), using Radio Set AN/GRN-9

FUNCTIONAL DESCRIPTION

Radio Set AN/GRN-9, its associated antenna groups and accessories, and Radio Set AN/ARN-21 make up an air navigation system through which an aircraft (equipped with Radio Set AN/ARN-21) can accurately determine its position. As many as one hundred aircraft may simultaneously obtain navigational information in conjunction with a single installation of Radio Set AN/GRN-9.

Radio Set AN/GRN-9 is capable of receiving on any one of 126 frequencies in the range of 1025 to 1150 megacycles. This set can transmit on any one of 126 frequencies in the ranges of 962 to 1024 megacycles and 1151 to 1213 megacycles. Two types of antennas are available for use. Each antenna can operate on 63 channels, either in a low band of frequencies or in a high band of frequencies. Low band installations transmit at frequencies between 962 and 1024 megacycles and receive at frequencies between 1025 and 1087 megacycles. High band installations transmit at frequencies between 1151 and 1213 megacycles and receive at frequencies between 1088 and 1150 megacycles. Two frequencies are used in each channel, one for receiving and one for transmitting. In low band installations, the frequency used for receiving is 63 megacycles

AN/GRN-9 RADIO SET

above the frequency used for transmitting in the same channel. In high band installations, the receiving frequency is 63 megacycles below the transmitting frequency.

No field changes in effect at time of preparation (26 Janaury 1960).

RELATION TO OTHER EQUIPMENT

This equipment is similar to Radio Set AN/URN-3 except modified for improved performance, ease in maintenance and change in power requirements.

EQUIPMENT REQUIRED BUT NOT SUPPLIED

(1) Power Meter-Pulse Counter TS-891/URN-3; (1) Switch-Test Adapter SA-420/URN-3 (Technical Manual NAVSHIPS 92809); (1) Oscilloscope OS-54/URN-3 (Technical Manual NAVSHIPS 92778); (1) Pulse Analyzer-Signal Generator TS-890/URN-3 (Technical Manual NAVSHIPS 92819); (1) Pulse Sweep Generator SG-121A/URN-3 (Technical Manual NAVSHIPS 92745).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE
- RECEIVING: 1025 to 1150 mc.
- TRANSMITTING: 962 to 1024 mc, and 1151 to 1213 mc.

FREQUENCY STABILITY
- TRANSMITTER: ±2.5 kc.
- RECEIVER: ±50 kc.

RECEIVER DATA
- SELECTIVITY: Rejects properly coded interrogations on adjacent channels 80 db.
- TRIGGERING LEVEL: 125 db below 1 W (no load); 124 db below 1 W (full load).
- BANDWIDTH: Trigger level does not deteriorate by more than 3 db.
- RECOVERY TIME: 20 to 65 usec.
- INTERMEDIATE FREQUENCY: 63 mc.

RESPONSE DELAY: 50 ±0.25 usec.

INTERROGATION PULSE REPETITION FREQUENCY: 24 cps from each 95 interrogating sources and 150 cps from each of 5 other sources

TRAFFIC CAPACITY: 100 aircraft.

HORIZONTAL ANTENNA PATTERN: Scalloped cardioid.

PULSE TYPE TRANSMISSION
- RATE: 3,600 pulse-pairs per sec.
- PULSE-PAIR SPACING: 12 usec.
- PULSE SHAPE
  - DURATION: 3.5 usec.
  - RISE TIME: 2.5 usec.
  - DECAY TIME: 2.5 usec.

POWER OUTPUT: 120 W (avg); 5 kw (peak).

ANTENNA IMPEDANCE: 50 ohms.

POWER REQUIREMENTS: 208 v, 60 cy, 3 ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

Federal Telephone and Radio Co, Div of International Telephone and Telegraph Corp, Clifton, New Jersey.
Part/Dwg No. NLS959.
Contract NObsr-71385, dated 1 July 1956.

TUBE AND/OR CRYSTAL COMPLEMENT

(2) 1N21C	(5) 5R4WGB	(1) SAL-39A
(2) 1N25	(1) 6AH6	(2) 5725/6AS6W
(7) 5687WA	(1) 371B	(8) 1N69
(3) 6AR6	(8) 829B	(3) 5726/6AL5W
(5) 1N126	(3) 6J4WA	(2) 836
(1) 5814A	(2) 6X4W	(2) 5651WA
(1) 4-1000A	(1) 6V3A	(2) 6005/6AQ5W
(2) 6080WA	(1) 5D22	(10) 5654/6AK5W
(4) 6293	(13) 12AT7WA	(10) 5670
(6) 2C39A	(6) 8020	(3) 6627/OB2WA
(5) 6626/OA2WA		

Total Tubes: (122).

126) CR-32/U

Total Crystals: (126).

REFERENCE DATA AND LITERATURE

NAVSHIPS 92986(A): Technical Manual for RADIO SETS AN/GRN-9, AN/GRN-9A, AN/SRN-6.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE USN, BUSHIPS
PROCUREMENT COGNIZANCE SPEC: MIL-R-19390 (SHIPS)
STOCK NO.
R.D.B. IDENT. NO.

RADIO SET AN/GRN-9

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Receiver-Transmitter Group OA-1533/GRN-9	105	44 X 46 X 90	1935
1	Power Supply Assembly OA-1536/GRN-9	105	44 X 46 X 90	1655
1	Tube, Klystron SAL-39A	7.0	20 X 20 X 30	78
1	Electronic Control Amplifier AM-1720/URN	48.0	22 X 45 X 86	784
1*	Low-Band Antenna C/O Antenna AS-891/URN Antenna Pedestal AB-541/URN	133	54 X 54 X 87	850
1*	High-Band Antenna C/O Antenna AS-892/URN Antenna Pedestal AB-541/URN	120	54 X 54 X 71	846
1	Equipment Spares			

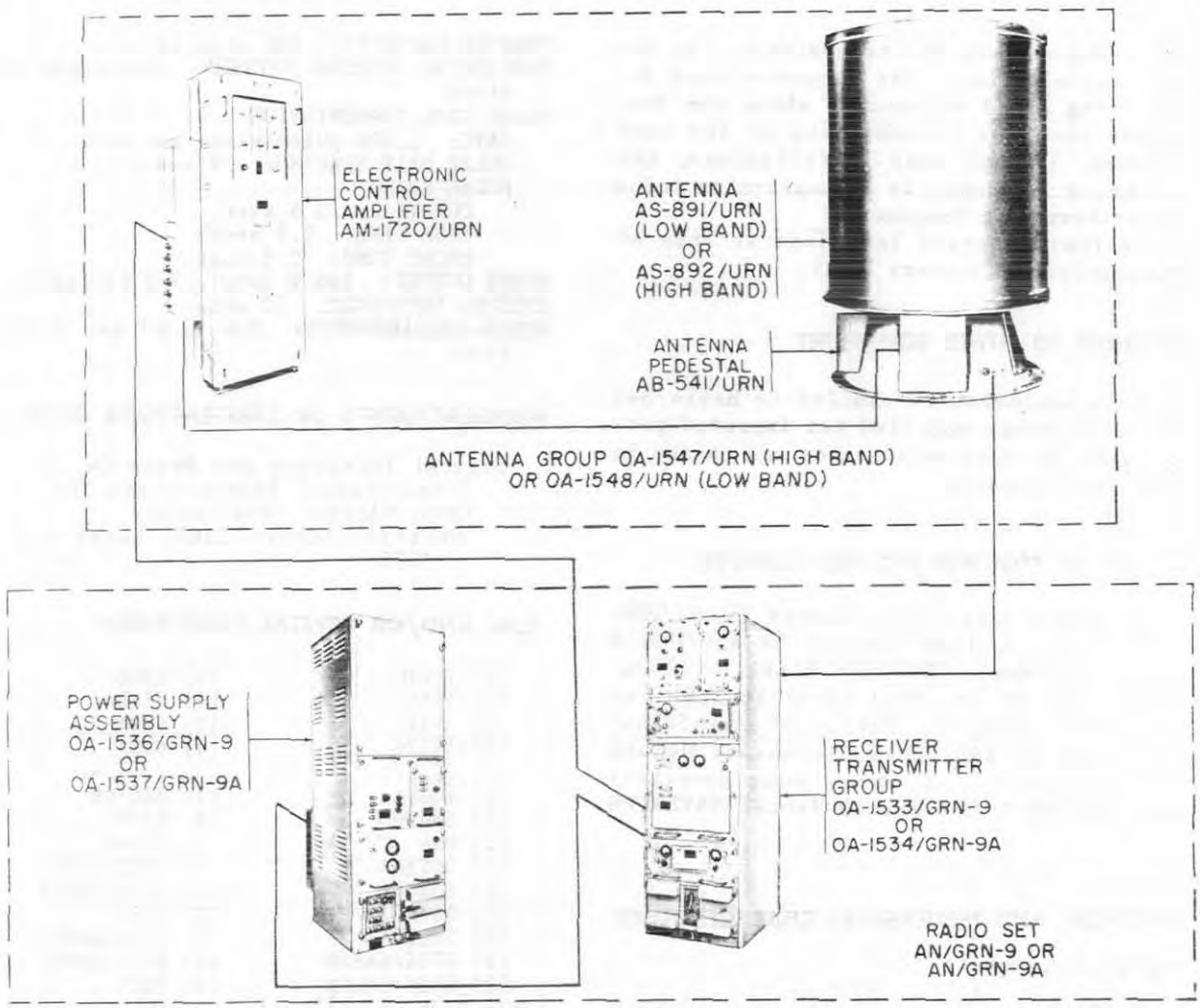
* Either low-band or high-band antenna is shipped.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Set AN/GRN-9 includes:		
1	Receiver-Transmitter Group OA-1533/GRN-9 C/O	25 X 34-1/8 X 72	1126
1	Coder-Indicator KY-235/URN		
1	Radio Receiver R-824/URN		
1	Control-Duplexer C-2226/GRN-9		
1	Amplifier-Modulator AM-1702/GRN-9		
1	Frequency-Multiplier-Oscillator CV-590/GRN-9		
1	Electrical Equipment Cabinet CY-2185/GRN-9		
1	Power Supply Assembly OA-1536/GRN-9 C/O	25 X 34-1/8 X 72	986
1	Power Supply PP-1764/URN		
1	Power Supply PP-1765/URN		
1	Power Supply PP-1766/URN		
1	Electrical Equipment Cabinet CY-2188/GRN-9		
1*	Antenna Group (Low-Band) OA-1547/URN C/O		
1	Antenna AS-891/URN Antenna Pedestal AB-541/URN	43-1/2 dia X 65-5/8	450
1	Electronic Control Amplifier AM-1720/URN	12-1/2 X 30-7/8 X 70	475
1*	Antenna Group (High-Band) OA-1548/URN-C/O		
1	Antenna AS-892/URN	43-1/2 dia X 59-1/4	420
1	Antenna Pedestal AB-541/URN		
1	Electronic Control Amplifier AM-1720/URN	12-1/2 X 30-7/8 X 70	475
2	Technical Manual NAVSHIPS 92986(A)	8-1/2 X 11	
1	Performance Standards Book NAVSHIPS 92986.31	8-1/2 X 11	
1	Maintenance Check-Off Book NAVSHIPS 92986.41	8-1/2 X 11	

* Either the low-band or the high-band group is supplied.

RADIO SET AN/GRN-9A



Radio Beacon (Shore-based), using Radio Set AN/GRN-9A

FUNCTIONAL DESCRIPTION

Radio Set AN/GRN-9A, its associated antenna groups and accessories, and Radio Set AN/ARN-21 make up an air navigation system through which an aircraft (equipped with Radio Set AN/ARN-21) can accurately determine its position. As many as one hundred aircraft may simultaneously obtain navigational information in conjunction with a single installation of Radio Set AN/GRN-9A.

Radio Set AN/GRN-9A is capable of receiving on any one of 126 frequencies in the range of 1025 to 1150 megacycles. This set can transmit on any one of 126 frequencies in the ranges of 962 to 1024 megacycles and 1151 to 1213 megacycles. Two types of antennas are available for use. Each antenna can operate on 63 channels, either in a low band of frequencies or in a high band of frequencies. Low band installations transmit at frequencies between 962 and 1024 megacycles and receive at frequencies between 1025 and 1087 megacycles. High band installations transmit at frequencies between 1151 and 1213 megacycles and receive at frequencies between 1088 and 1150 megacycles. Two frequencies are used in each channel, one for

receiving and one for transmitting. In low band installations, the frequency used for receiving is 63 megacycles above the frequency used for transmitting in the same channel. In high band installations, the receiving frequency is 63 megacycles below the transmitting frequency.

No field changes in effect at time of preparation (26 January 1960).

RELATION TO OTHER EQUIPMENT

This equipment is similar to Radio Set AN/URN-3 except modified for improved performance, ease in maintenance and change in power requirements.

EQUIPMENT REQUIRED BUT NOT SUPPLIED

(1) Power Meter-Pulse Counter TS-891/URN-3; (1) Switch-Test Adapter SA-420/URN-3 (Technical Manual NAVSHIPS 92809); (1) Oscilloscope OS-54/URN-3 (Technical Manual NAVSHIPS 92778); (1) Pulse Analyzer-Signal Generator TS-890/URN-3 (Technical Manual NAVSHIPS 92819); (1) Pulse Sweep Generator SG-121A/URN-3 (Technical Manual NAVSHIPS 92745).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE
- RECEIVING: 1025 to 1150 mc.
- TRANSMITTING: 962 to 1024 mc and 1151 to 1213 mc.

FREQUENCY STABILITY
- TRANSMITTER: ±25 kc.
- RECEIVER: ±50 kc.

RECEIVER DATA
- SELECTIVITY: Rejects properly coded interrogations on adjacent channels 80 db.
- TRIGGERING LEVEL: 125 db below 1 W (no load); 124 db below 1 W (full load).
- BANDWIDTH: Trigger level does not deteriorate by more than 3 db.
- RECOVERY TIME: 20 to 65 usec.
- INTERMEDIATE FREQUENCY: 63 mc.

RESPONSE DELAY: 50 ±0.25 usec.

INTERROGATION PULSE REPETITION FREQUENCY: 24 cps from each of 95 interrogating sources, and 150 cps from each of 5 other sources.

TRAFFIC CAPACITY: 100 aircraft.

HORIZONTAL ANTENNA PATTERN: Scalloped cardioid.

PULSE TYPE TRANSMISSION
- RATE: 3,600 pulse-pairs per sec.
- PULSE PAIR SPACING: 12 usec.
- PULSE SHAPE
  - DURATION: 3.5 usec.
  - RISE TIME: 2.5 usec.
  - DECAY TIME: 2.5 usec.

POWER OUTPUT: 180 W (avg), 7.5 kw (peak).

ANTENNA IMPEDANCE: 50 ohms.

POWER REQUIREMENTS: 208 v, 60 cy, 3 ph, 4 wire.

MANUFACTURER'S OR CONTRACTOR'S DATA

Federal Telephone and Radio Co, Div of International Telephone and Telegraph Corp, Clifton, New Jersey.
Contract NObsr-71385, dated 1 July 1956.

TUBE AND/OR CRYSTAL COMPLEMENT

(2) 1N21C	(1) 6AH6
(2) 1N25	(3) 6J4WA
(8) 1N69	(2) 6X4W
(5) 1N126	(1) 6V3A
(2) 1N256	(13) 12AT7WA
(6) 2C39A	(1) SAL-89
(5) 5R4WGB	(8) 829B
(2) 836	(1) 5814A
(3) 5651WA	(1) 6005/6AQ5W
(2) 6080WA	(11) 5654/6AK5W
(10) 5670	(5) 6293
(8) 5687WA	(5) 6626/OA2WA
(2) 5725/6AS6W	(3) 6627/OB2WA
(3) 5726/6AL5W	(6) 8020

Total Tubes: (121)
(126) CR-32/U
Total Crystals: (126)

REFERENCE DATA AND LITERATURE

NAVSHIPS 92986(A): Technical Manual for Radio Sets AN/GRN-9, AN/GRN-9A, AN/SRN-6.

TYPE CLASSIFICATION	(NAVY)
DESIGN COGNIZANCE	USN, BUSHIPS
	SPEC: MIL-R-19390(SHIPS)
PROCUREMENT COGNIZANCE	
STOCK NO.	
R.D.B. IDENT. NO.	

RADIO SET AN/GRN-9A

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Receiver-Transmitter Group OA-1537/GRN-9A	105	44 X 46 X 90	1935
1	Power Supply Assembly OA-1534/GRN-9A	105	44 X 46 X 90	1655
1	Tube, Klystron SAL-89	7.0	20 X 20 X 30	78
1	Electronic Control Amplifier	48.0	22 X 45 X 86	784
1*	Low-Band Antenna c/o	133	54 X 54 X 87	850
	Antenna AS-891/URN			
	Antenna Pedestal AB-541/URN			
1*	High-Band Antenna c/o	120	54 X 54 X 71	846
	Antenna AS-892/URN			
	Antenna Pedestal AB-541/URN			
	Equipment Spares			

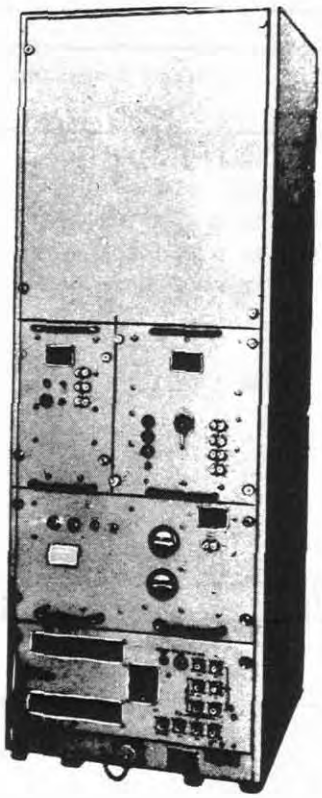
EQUIPMENT SUPPLIED DATA

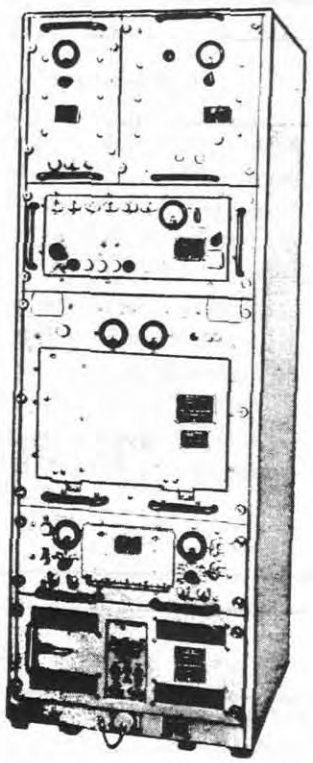
QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Set AN/GRN-9A includes:		
1	Receiver-Transmitter Group OA-1534/GRN-9A c/o	25 X 34-1/8 X 72	1126
1	Coder-Indicator KV-235/URN		
1	Radio Receiver R-824/URN		
1	Control-Duplexer C-2226/GRN-9		
1	Amplifier Modulator AM-1701/URN		
1	Frequency Multiplier-Oscillator CV-589/URN		
1	Electrical Equipment Cabinet CY-2186/GRN-9A		
1	Power Supply Assembly OA-1537/GRN-9A c/o	25 X 34-1/8 X 72	986
1	Power Supply PP-1763/URN		
1	Power Supply PP-1765/URN		
1	Power Supply PP-1766/URN		
1	Electrical Equipment Cabinet CY-2189/GRN-9A		
1*	Antenna Group (Low-Band) OA-1547/URN c/o		
1	Antenna AS-891/URN	43-1/2 X 65-5/8	450
1	Antenna Pedestal AB-541/URN		
1	Electronic Control Amplifier AM-1720/URN	12-1/2 X 30-7/8 X 70	475
1*	Antenna Group (High-Band) OA-1548/URN c/o		
1	Antenna AS-892/URN	43-1/2 dia X 59-1/4	420
1	Antenna Pedestal AB-541/URN		
1	Electronic Control Amplifier AM-1720/URN	12-1/2 X 30-7/8 X 70	475
2	Technical Manual NAVSHIPS 92986(A)	8-1/2 X 11	
1	Performance Standards Book NAVSHIPS 92986.31	8-1/2 X 11	
1	Maintenance Check-Off Book NAVSHIPS 92986.41	8-1/2 X 11	

*Either the low-band or the high-band group is supplied.

Navigational Aid

RADIO SET AN/GRN-9B





Radio Set AN/GRN-9B

FUNCTIONAL DESCRIPTION

Radio Set AN/GRN-9B, its associated antenna groups and accessories, and Radio Set AN/ARN-21 make up an air navigation system through which an aircraft (equipped with Radio Set AN/ARN-21) can accurately determine its position. As many as one hundred aircraft may simultaneously obtain navigational information in conjunction with a single installation of Radio Set AN/GRN-9B.

Radio Set AN/GRN-9B is capable of receiving on any one of 126 frequencies in the range of 1025 to 1150 megacycles. The set can transmit on any one of 126 frequencies in the range of 962 to 1024 megacycles and 1151 to 1213 megacycles. Two types of antenna are available for use. Each antenna can operate on 63 channels, either in a lowband of frequencies or in a high band of frequencies. Low band installations transmit at frequencies between 962 and 1024 megacycles and receive at frequencies between 1025 and 1087 megacycles. High band installations transmit at frequencies between 1151 and 1213 megacycles and receive at frequencies between 1088 and 1150 megacycles. Two frequencies are used in each channel, one for receiving and one for transmitting. In low band installations, the frequency used for receiving is 63 megacycles above the frequency used for transmitting in the same channel. In high band installations, the receiving frequency is 63 megacycles below the transmitting frequency.

No field changes in effect at time of preparation (26 January 1960).

RELATION TO OTHER EQUIPMENT

This equipment is similar to Radio Set AN/URN-3 except it is improved in performance, has more ease of maintenance, and has a different power requirements.

Radio-Navigational Aid

AN/GRN-9B RADIO SET

EQUIPMENT REQUIRED BUT NOT SUPPLIED

(1) Antenna Group (Low Band) OA-1547/GRN-9; (1) Antenna Group (High Band) OA-1548/GRN-9; (1) Power Meter-Pulse Counter TS-891/URN-3; (1) Switch-Test Adapter SA-420/URN-3; (2) Technical Manual NAVSHIPS 92809; (1) Oscillator OS-54/URN-3; (2) Technical Manual NAVSHIPS 92778; (1) Pulse Analyzer Signal Generator TS-890/URN-3; (2) Technical Manual NAVSHIPS 92819; (1) Pulse Sweep Generator SG-121A/URN-3; (2) Technical Manual NAVSHIPS 92745; (1) Control Monitor Group AN/GRA-34; (1) Remote Switching Control C-2234/GRA-34; (2) Technical Manual NAVSHIPS 93121(A).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TYPE OF RECEPTION AND TRANSMISSION: Coded pulses.

FREQUENCY RANGE

LOW BAND: 962 mc to 1024 mc for transmitting.
1025 mc to 1087 mc for receiving.

HIGH BAND: 1151 mc to 1213 for transmitting.
1088 mc to 1150 mc for receiving.

POWER OUTPUT: 187.5 W (avg); 7.0 kw (peak).

FREQUENCY STABILITY

TRANSMITTER: ±25 kc.

RECEIVER: ±50 kc.

RECEIVER DATA

SELECTIVITY: Rejects properly coded interrogations on adjacent channels 80 db.

TRIGGERING LEVEL: 125 db below 1 W (no load); 124 db below 1 W (full load).

BANDWIDTH: Trigger level does not deteriorate more than 3 db.

ECHO SUPPRESSION: Properly spaced pulse-pairs do not trigger the transmitter more than 20% of the time for any signal.

INTERMEDIATE FREQUENCY: 63 mc.

RESPONSE DELAY: 50 ±0.025 usec measured at a standard signal strength of 50 db.

INTERROGATION PULSE REPETITION FREQUENCY: 24 cps from each 95 source and 150 cps from each of 5 other sources.

PULSE DATA (TRANSMITTING)

RATE: 3600 pulse-pairs per sec.

PULSE-PAIR SPACING: 12 usec.

PULSE SHAPE

DURATION: 3.5 usec.

RISE TIME: 2.5 usec.

DECAY TIME: 2.5 usec.

INSTALLATION: Shore.

POWER REQUIREMENTS: 208 v, 60 cy, 3 ph, four wire, 10 KVA, 0.95 pf, 30 amp per phase.

MANUFACTURER'S OR CONTRACTOR'S DATA

Stromberg-Carlson, Div of General Dynamics Corp, Rochester, N. Y.
Contract NObsr-71717.

TUBE AND/OR CRYSTAL COMPLEMENT

(2) 1N21C	(2) 1N25	(8) 1N69
(5) 1N126	(2) 1N256	(6) 2C39A
(5) 5R4WGB	(1) 6AH6	(3) 6J4WA
(2) 6X4W	(1) 6V3A	(13) 12AT7WA
(1) SAL-89	(8) 829B	(2) 836
(3) 5651WA	(11) 5670	(8) 5687WA
(10) 5654/6AK5W	(2) 5725/6AS6W	(3) 5726/6AL5W
(1) 5814A	(1) 6005/6AQ5W	(2) 6080WA
(5) 6293	(5) 6626/OA2WA	(6) 8020
(3) 6627/OB2WA		

Total Tubes: (121)

(126) CR-32/U

Total Crystals: (126)

REFERENCE DATA AND LITERATURE

NAVSHIPS 93177(A): Technical Manual for RADIO SETS AN/GRN-9B and AN/SRN-6A.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE USN, BUSHIPS
PROCUREMENT COGNIZANCE SPEC: MIL-R-19390(SHIPS)
STOCK NO.
R.D.B. IDENT. NO.

RADIO SET AN/GRN-9B

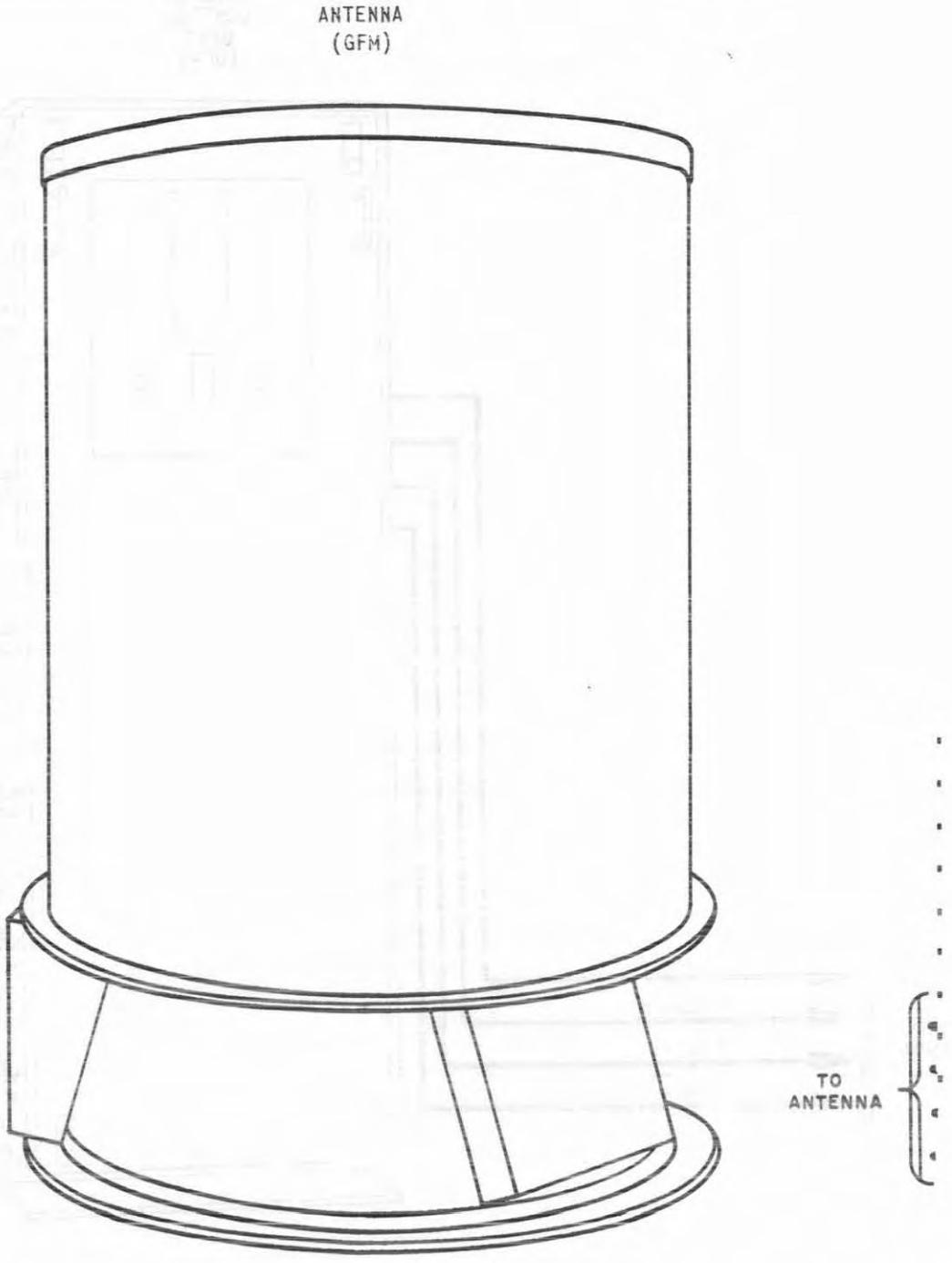
SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Receiver-Transmitter Group OA-1803/GRN-9B	105	43 X 44 X 90	1850
1	Power Supply Assembly OA-1804/GRN-9B	105	43 X 44 X 90	1720
	Tube, Klystron SAL-89			

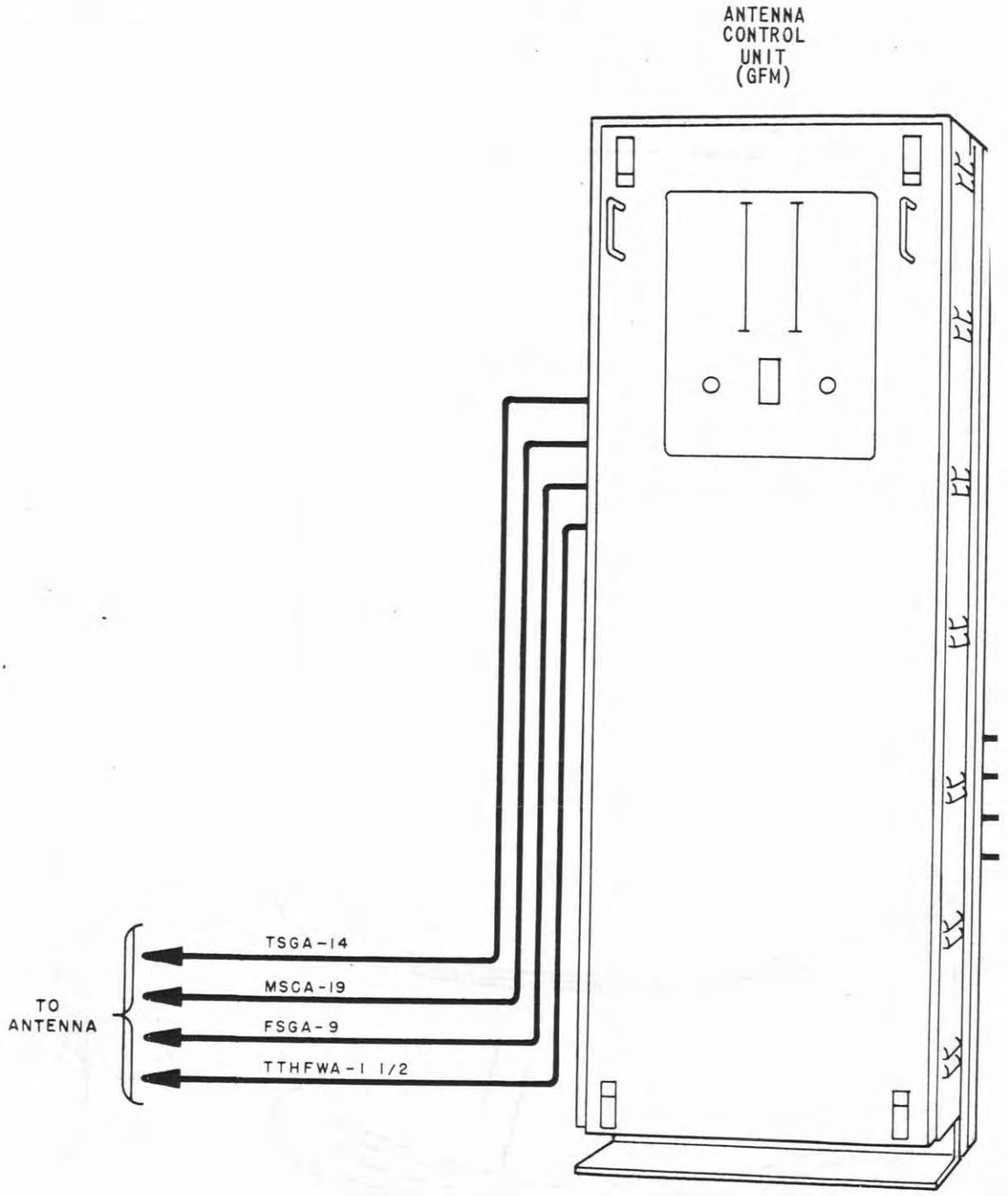
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Set AN/GRN-9B includes:		
1	Receiver-Transmitter Group OA-1803/GRN-9B c/o	25 X 34-1/8 X 72	1173
	Coder-Indicator KY-248/GRN-9B		
	Radio Receiver R-865/GRN-9B		
	Control-Duplexer C-2412/GRN-9B		
	Amplifier-Modulator AM-1872/GRN-9B		
	Frequency Multiplier-Oscillator CV-650/GRN-9B		
	Electrical Equipment Cabinet CY-2373/GRN-9B		
1	Power Supply Assembly OA-1804/GRN-9B c/o	25 X 34-1/8 X 72	1051
	Power Supply PP-1927/GRN-9B		
	Power Supply PP-1928/GRN-9B		
	Power Supply PP-1929/GRN-9B		
	Electrical Equipment Cabinet CY-2374/GRN-9B		
2	Technical Manual NAVSHIPS 93177	8-1/2 X 11	
2	Maintenance Standards Book NAVSHIPS 93177.42		
1	Operating Instructions Chart NAVSHIPS 93177.32		

RADIO SET AN/GRN-9C

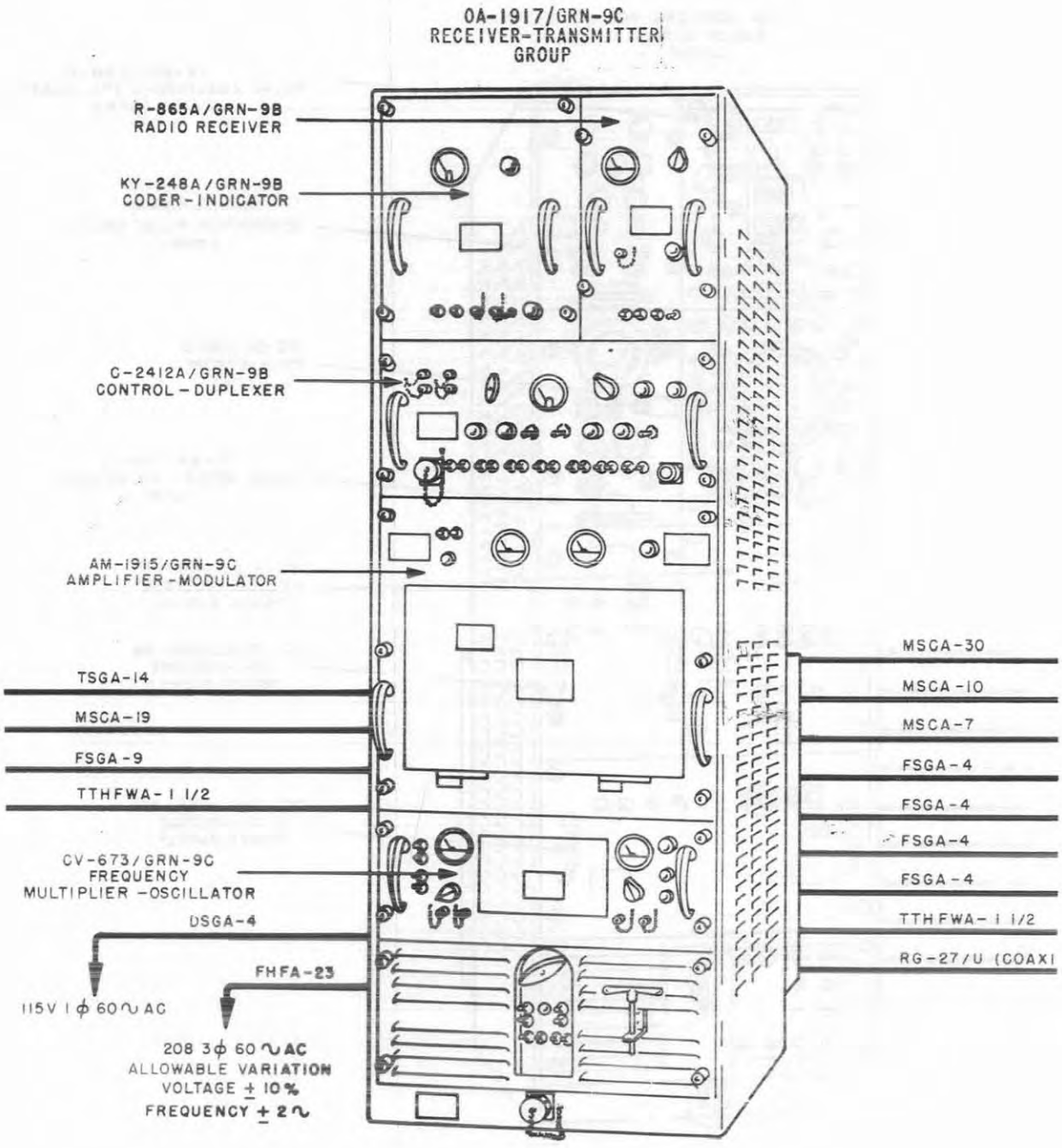


Radio Set AN/GRN-9C, 1 of 4



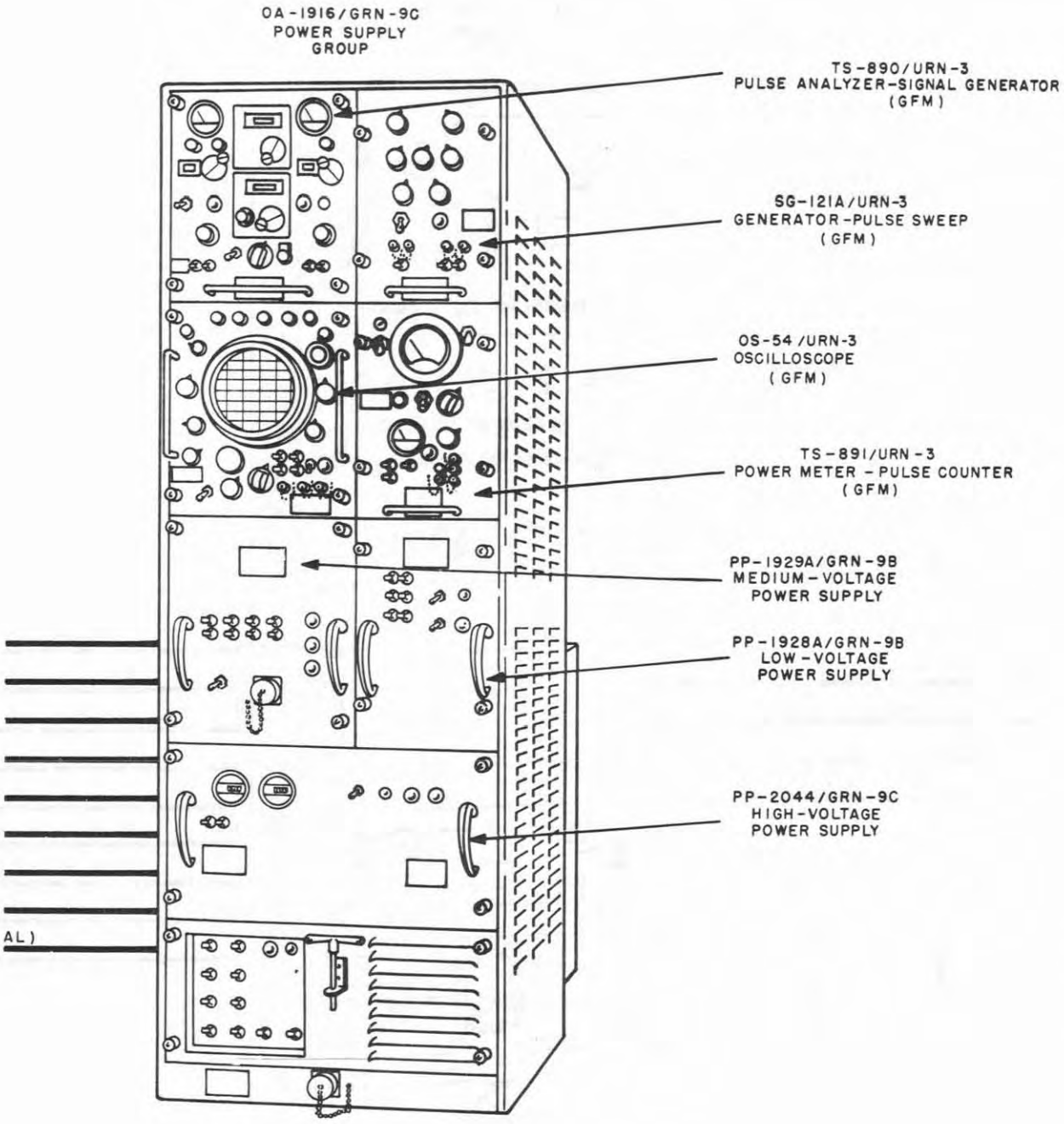
Radio Set AN/GRN-9C, 2 of 4

RADIO SET AN/GRN-9C



Radio Set AN/GRN-9C, 3 of 4

AN/GRN-9C RADIO SET



Radio Set AN/GRN-9C, 4 of 4

RADIO SET AN/GRN-9C

FUNCTIONAL DESCRIPTION

Radio Set AN/GRN-9C is a tactical air navigation system known as TACAN. The system provides radio navigation information (bearing, identification, and distance) by means of rf energy radiated from an antenna to as many as 95 aircraft simultaneously.

An important feature of the AN/GRN-9C is the use of a SAL-89 klystron in the transmitter output stage.

No field changes in effect at time of preparation (2 September 1959).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE
- RECEIVING: 1025 to 1150 mc.
- TRANSMITTING: 962 to 1024 mc and 1151 to 1213 mc.

FREQUENCY STABILITY
- RECEIVER: ±50 kc.
- TRANSMITTER: ±25 kc (0.002% of the channel frequency).

RECEIVER SELECTIVITY: 80 db.

RECEIVER BANDWIDTH: 3 db when its total frequency drift is ±70 kc.

RECEIVER IF: 63 mc.

RESPONSE DELAY: 50 ±0.25 usec.

TRAFFIC CAPACITY: 100 aircraft (max).

TRANSMITTER PULSE COUNT: Within ±2.5% of its nominal value.

PULSE TYPE TRANSMISSION: 3600 pulse-pairs per sec.

TRANSMITTER POWER OUTPUT: 7.0 kw peak, using SAL-89 klystron.

DUTY CYCLE: 3600 pulse-pairs per sec ±2.5%.

POWER REQUIREMENT: 208 v, four-wire, 3 ph, 60 cy; 10 kva, 0.95 pf, 30 amp per phase.

MANUFACTURER'S OR CONTRACTOR'S DATA

Raytheon Mfg. Co., Waltham, Massachusetts. Contract NObsr-71769.

TUBE AND/OR CRYSTAL COMPLEMENT

(6) 2C39A	(5) 5R4WGB
(3) 6J4WA	(2) 6X4WA
(14) 12AT7WA	(1) 5AL89
(8) 829B	(2) 836
(3) 5651WA	(12) 5654/6AK5W
(10) 5670	(11) 5687WA
(2) 5725/6AS6W	(4) 5726/6AL5W
(1) 6005/6AQ5W	(2) 6080WA
(3) 6293	(5) 6626/OA2WA
(2) 6627/OBW2A	(6) 8020

Total Tubes: (102)

(2) 1N21C	(3) 1N25	(5) 1N126
(2) 1N256	(11) 1N457	

Total Crystals: (23)

REFERENCE DATA AND LITERATURE

NAVSHIPS 93208(A): Technical Manual for RADIO SET AN/GRN-9C.

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

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Receiver-Transmitter Group OA-1917/GRN-9C C/O: (1) Amplifier-Modulator AM-1915/GRN-9C (1) Cabinet, Electrical Equipment CY-2373A/GRN-9B (1) Coder-Indicator KY-248A/GRN-9B (1) Control-Duplexer C-2412A/GRN-9B (less 2 connector) (1) Frequency Multiplier-Oscillator CV-673/GRN-9C	67.8	34 X 42 X 82	1003

AN/GRN-9C RADIO SET

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
	(1) Radio Receiver R-865A/GRN-9B (less tube 5R4 packed in box #4) (2) Technical Manual NAVSHIPS 93208(A) (1) Performance Standards Book NAVSHIPS 93208.31 (1) Maintenance Checkoff Book NAVSHIPS 93208.41 (1) Operator's Instruction Chart NAVSHIPS 93208.21			
1	(1) Extra Cavity Assy 6003-5009G1 or G2	7.0	21 X 23 X 25	61
1 (drum)	(1) Tube (Klystron) SAL-89	7.0	20 X 20 X 30	78
1	Power Supply Group OA-1916/GRN-9C C/O: (1) Cabinet, Electrical Equipment CY-2374A/GRN-9B (1) Power Supply PP-1928A/GRN-9B (less 2 tubes 836) (1) Power Supply PP-1929A/GRN-9B (less 3 tubes 5R4) (1) Power Supply PP-2044/GRN-9C (less 6 tubes 8020)	67.8	34 X 42 X 82	968
*1	Wiring Harness CX-3958/URN-3	8.6	8 X 22 X 84	110
**1 (carton)	1 Set Equipment Maintenance Parts		16 X 16 X 20	21
**1 (carton)			12 X 14 X 20	8
**1 (drum)			20 X 20 X 30	78

*Furnished to BuAer
**Furnished to USAF

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Set AN/GRN-9C Including:		
1	Receiver-Transmitter Group OA-1917/GRN-9C C/O:	25 X 34-1/8 X 72	725
1	Coder-Indicator KY-248A/GRN-9B		
1	Radio Receiver R-865A/GRN-9B		
1	Control-Duplexer C-2412A/GRN-9B		
1	Amplifier-Modulator AM-1915/GRN-9C		
1	Frequency Multiplier-Oscillator CV-673/GRN-9C		
1	Cabinet, Electrical Equipment CY-2373A/GRN-9B		
1	Power Supply Group OA-1916/GRN-9C C/O:	25 X 34-1/8 X 72	725
1	Power Supply PP-1929A/GRN-9B		
1	Power Supply PP-1928A/GRN-9B		
1	Power Supply PP-2044/GRN-9C		
1	Cabinet, Electrical Equipment CY-2374A/GRN-9B		

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1*	Power Meter-Pulse Counter TS-891/URN-3	9-1/2 X 14-13/32 X 26-3/4	31.5
1*	Oscilloscope OS-54/URN-3	13-1/2 X 14-13/32 X 26-1/2	87
1*	Pulse Analyzer Signal Generator TS-890/URN-3	13-1/2 X 14-5/8 X 24	95
1*	Pulse Sweep Generator SG-121A/URN-3	9-1/2 X 14-19/32 X 26-25/32	45
2	Technical Manual NAVSHIPS 93208(A)		
1	Approved Manuscript Performance Standards Book NAVSHIPS 93208.31		
1	Approved Manuscript Maintenance Checkoff Book NAVSHIPS 93208.41		
1	Operator's Instruction Chart NAVSHIPS 93208.21		

*Government-furnished equipment

AIR TRAFFIC CONTROL CENTRAL AN/GSN-7

FUNCTIONAL DESCRIPTION

The AN/GSN-7 has two uses (1) as a substitute for the AN/GSN-3 when less precise control is permissable and (2) as an input acquisition unit for the AN/GSN-3 at ranges in excess of the 60 mi range of the AN/GSN-3. The equipment features analog tracking radial velocity, time of arrival computation, PPI and time of arrival displays. Facilities are provided for automatically tracking a target, computing its velocity and time of arrival and displaying position and time of arrival. These functions are necessary for course air traffic control. This equipment has operational utility independent of its use with the AN/GSN-3. Maximum useful range is 200 miles.

No field changes in effect at time of preparation (19 June 1957).

RELATION TO OTHER EQUIPMENT

Part of AN/GSN-3.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

LINEAR RANGE: 200 mi.

TUBE AND/OR CRYSTAL COMPLEMENT

Tubes and Crystals: Not Available.

REFERENCE DATA AND LITERATURE

Nomenclature Card for Air Traffic Control Central AN/GSN-7 dated 1 Nov 1956.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUAER
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
20	Polar Coordinate Tracking Channel		
20	Time of Arrival Computer Channel		
1	Range Reference Saw-Tooth Generator		
1	Azimuth Reference Voltage Generator		
1	Range Mark Generator		
1	Video Mixer		
1	Target Acquisition Device Power Supplies		
1	Self Contained Test Facility		
1	Control Console w/PPI		
1	Set of Interconnecting		

June 1961

Radio-Navigational Aids

DIRECTION FINDER SET AN/MRD-15

FUNCTIONAL DESCRIPTION

The Direction Finder Set AN/MRD-15 is a mobile installation mounted in a Cargo Truck Model M-35. It is a ground equipment used for ground communications, aircraft control and for determining azimuth of aircraft.

No field changes in effect at time of preparation (11 April 1961).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TYPE OF INSTALLATION: Ground, mobile, truck-mounted.
TYPE OF PRESENTATION: Visual (cathode ray tube).
TYPE OF EMISSION: A1, A2, A3, A4, B, F0, F1, F2, F3 and F4 types.
NUMBER OF BANDS: 4 bands.
OPERATING FREQUENCY RANGE: 0.54 to 30 mc.
OPERATING POWER RQMT: 110 v ac, 60 cps, single ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

Servo-Corporation of America, New Hyde Park, L. I., New York.

TUBE AND/OR CRYSTAL COMPLEMENT

Electron Tube, Crystal and/or Semi-Conductor Device data not available.

REFERENCE DATA AND LITERATURE

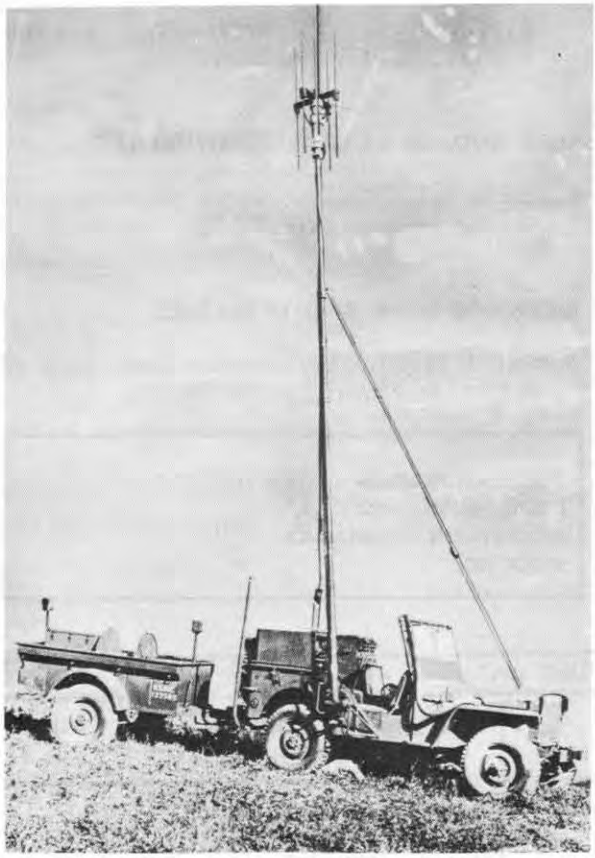
NAVSHIPS 93400: Preliminary Data Form for Direction Finder Set AN/MRD-15.

TYPE CLASSIFICATION	(NAVY)
DESIGN COGNIZANCE	TASSA
PROCUREMENT COGNIZANCE	MIL-R-10637 (SIG C)
STOCK NO.	

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (Inches)	WEIGHT (lbs.)
	Direction Finder Set AN/MRD-15 including:		
1	Truck M-35	2-1/2 ton (6 x6)	
1	Shelter Electrical Equipment S-56( )/G	75 x 76-1/2 x 138	
5	Antenna Ass'y AS-533( )/UR		
3	Radio Receiver R-390( )/URR	10-1/2 x 14-1/2 x 19	
1	Indicator, Azimuth IP-137( )/URD	10-1/2 x 17 x 19	
2	Goniometer, Electrical GO-5( )/GRD	5-1/2 x 5 x 7-1/4	
1	Goniometer, Electrical GO-6( )/GRD	5 x 5-1/2 x 7-1/4	
1	Goniometer, Drive MX-1170( )/URD	10-1/2 x 12 x 19	
1	Amplifier, Radio Frequency AM-496( )/TRD-4	6-1/2 x 6-1/2 x 33-1/2	
2	Power Unit PU-58( )/U		2079
1	Transmitter, Radio T-279( )/UR	7-3/16 x 9-1/2 x 16	

RADIO SET AN/MRD-8



Radio Set AN/MRD-8

FUNCTIONAL DESCRIPTION

The AN/MRD-8 consists of a portable Radio Direction Finding Equipment DAZ, Portable Radio Transmitting and Receiving Equipment MAX, Generator and all necessary spare parts and accessories mounted in a truck and trailer.

The DAZ operates in the frequency range of 100 to 156 mc to provide when used with the associated equipment, instantaneous indication of the direction of arrival of received radio waves and panoramic indication of any radio waves in the range of 1.5 mc on each side of the received signal frequency.

The MAX is designed to provide reliable, long range, two way, amplitude modulated radio telephone communication between aircraft and ground station as well as other ground stations. The equipment operates in the frequency range of 100 to 156 mc on any of its nine fixed, crystal-controlled channels and one crystal-controlled guard channel which is fixed and within a restricted band. When operating on one of the other channels, the equipment can be monitored on the guard channel of the receiver.

No field changes in effect at time of preparation (29 October 1956).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

RADIO DIRECTION FINDER DAZ
- FREQUENCY RANGE: 100 to 156 mc, 1 band.
- TYPE INDICATOR: CR tube.
- TYPE RECEIVER: Superheterodyne.
- TYPE RECEPTION: Unmodulated, frequency. modulated, phase modulated, or amplitude modulated.
- INPUT POWER: 24 v DC, 14 amp.
- RECEIVER OUTPUT: 200 mw to phones.

RADIO SET MAX
- FREQUENCY RANGE: 100 to 156 mc, 10 crystal controlled operating frequencies.
- FREQUENCY STABILITY: 0.025%,
- POWER SOURCE REQUIRED: 28 v, 18 amp, 504 W.
- TRANSMITTER
- POWPOWER INPUT: 28 v, 10 amp.
- POWER OUTPUT: 8 W.
- PLATE MODULATION: Up to 100%.
- OUTPUT IMPEDANCE: 50 ohms.
- SELECTIVITY: 25 db down at 100 kc from resonance.
- RECEIVER
- POWER INPUT: 28 v, 7 amp.
- POWER OUTPUT: 400 mw into 300 or 4000 ohm load.
- SENSITIVITY: 3 to 5 uv upon DC v supply.

OPERATING POWER: 24 v DC, 25 amp furnished by generator.

MANUFACTURER'S OR CONTRACTOR'S DATA

Bendix Radio Division, Bendix Aviation Corporation, Baltimore, Maryland.
Contract NXsr 86345, dated 30 August 1945.
Approximate Cost: $8000.00 with equipment spares.

AN/MRD-8 RADIO SET

TUBE AND/OR CRYSTAL COMPLEMENT

(22) 6AK5	(6) 6AG5
(2) 6AL5	(1) 6BA6
(4) 6C4	(1) 6SN7W
(2) 6SL7GT	(2) 6N7
(1) 2D21	(1) 5CP1
(1) 5T4	(1) 8016
(1) 9002	(2) 9003
(1) VR150-30	(1) 958A
(1) 1A5GT/G	(2) 832A
(2) 6V6GT/G	(2) 6J6
(1) 12SL7GT	(1) 12A6

Total Tubes: (60)

REFERENCE DATA AND LITERATURE

NAVSHIPS 900,939(A): Technical Manual for Radio Set AN/MRD-8.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

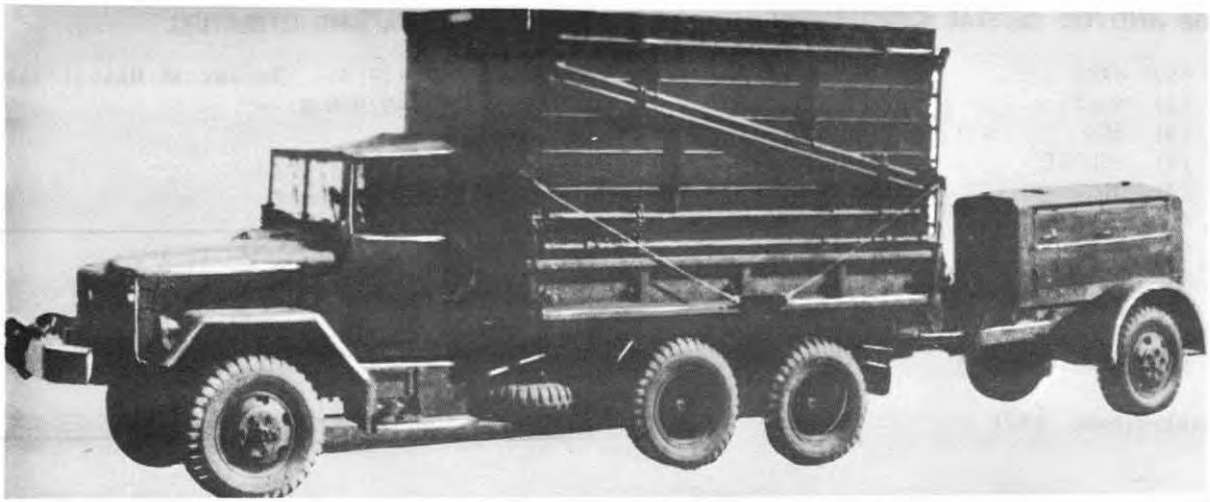
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Truck NT-10466		5000
1	Trailer V-25/MRD-8		5000
1	Radio Direction Finding Equipment DAZ consists of:		
1	Radio Receiver Indicator NT-46291	9-5/8 X 16-13/32 X 24-1/2	55
1	Converter PU-118/U	5-3/4 X 9-3/4 X 13-1/2	36
1	Antenna Assembly NT-66148-A	16 X 16 X 26	25
1	Radio Transmitter NT-52358-A	6-5/8 X 8-7/8 X 9-1/8	13
1	Compass NT-10666	1-15/16 X 5-1/8 X 5-11/16	2
1	Tripod NT-10610-A	4 dia X 60	8
1	Carrying Case NT-10587-A	11 X 13 X 17	16
1	Case CY-564/MRD-8	16-1/4 X 19 X 32	20
1	Carrying Case NT-10588	19 X 19-1/2 X 28	50
1	Case CY-571/MRD-8	23-1/4 X 23-1/4 X 26	60
1	Mast-Antenna Support AB-132/MRD-8	6 X 6 X 240	75
1	VHF Radio Transmitting and Receiving Equipment MAX consists of:		
1	Radio Transmitter Receiver RT-18/ARC-1	9-1/32 X 10-5/8 X 24-3/16	47
1	Mounting Base MT-100/ARC-1		4
1	Antenna AS-359/MRD-8		
1	Technical Manual AN08-30ARC-1-3	5/8 X 8-1/2 X 11	2
1	Jack Box NT-62123	2-3/4 X 2-3/4 X 3-1/2	
2	Roll Field Wire	1/8 dia X 1200	
2	Microphone, Face Harness NT-51071	2 X 1-3/4 X 3	
2	Headset Assembly NT-49507	4 X 6 X 7	
2	Cord, Microphone NT-49561	5/8 dia X 63	
2	Cord, Headset Extension NT-49534	5/8 dia X 69	
1	Test Meter TS-80/H	2-1/4 X 2-3/4 X 4-1/8	
1	Phantom Antenna, Transmitter TS-78/U	1-3/4 X 2-1/4	
1	Phantom Antenna, Receiver TS-79/U	5/8 X 1 X 2-7/8	
1	Tool Kit H733	3 dia X 10	1
1	Case CY-568/MRD-8	18 X 20 X 30	55
1	Case CY-570/MRD-8	7-3/4 X 19 X 19-1/2	25
1	Generator NT-211410		
1	Reel DR-7		
12	Cable		

February 1960

Radio-Navigational Aid

RADIO SET AN/MRN-16



Radio Set AN/MRN-16

FUNCTIONAL DESCRIPTION

Radio Set AN/MRN-16 is a ground based navigational aid which supplies information to an aircraft equipped with Radio Set AN/ARN-21 as to the azimuth and distance to go to the subject equipment.

No field changes in effect at time of preparation (2 October 1959).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

POWER REQUIREMENTS: 208 v, 60 cy, 3 ph.
FREQUENCY RANGE: 962 to 1024 mc.
TYPE OF EMISSION: P9d.
POWER OUTPUT: 5 kw.

MANUFACTURER'S OR CONTRACTOR'S DATA

Philadelphia Naval Shipyard, Philadelphia, Pennsylvania.

TUBE AND/OR CRYSTAL COMPLEMENT

Electron Tube and Crystal Data not Available.

REFERENCE DATA AND LITERATURE

NAVSHIPS 92707: Technical Manual for RADIO SET AN/MRN-16.

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

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Set AN/MRN-16 Including:		
1	Antenna Group OA-592/URN-3	44 X 44 X 78	410
1	Antenna Control C-1349/URN-3	12-1/2 X 30-7/8 X 70	
1	Power Supply-Test Group OA-500/URN-3	, X 72	1,051

AN/MRN-16 RADIO SET

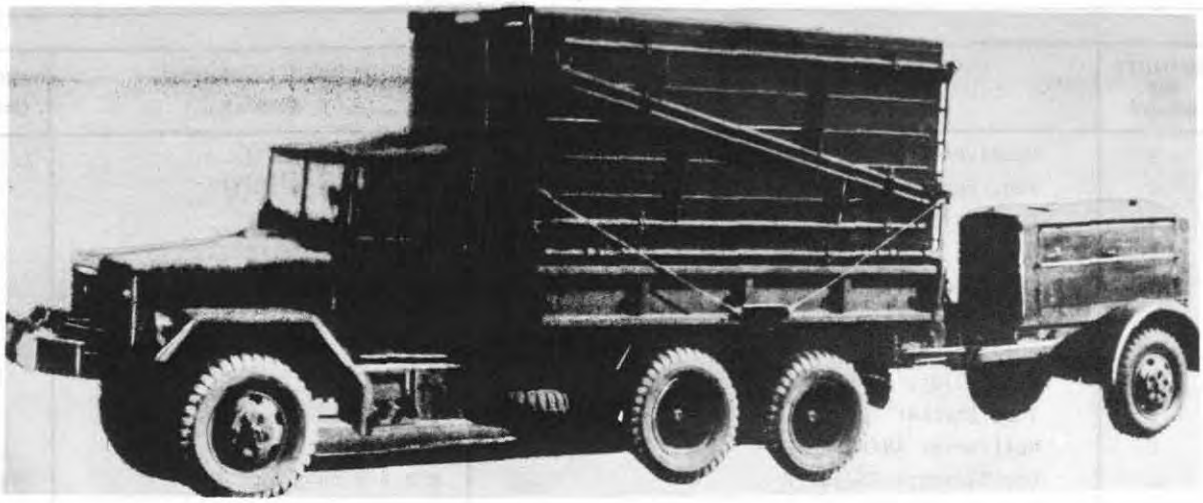
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Receiver-Transmitter Group OA-499/URN-3	25 X 34-1/8 X 72	1,173
1	Fan, Ventilating, Propeller HD-245/U	22-3/4 dia X 16-1/2	
1	Dehumidifier		
1	Heater, Electric		
1	Contactor, Heater		
1	Panel, Power Distribution		
1	Hoisting Mechanism, Antenna E-25/MRN-16	76-1/2 X 84	
1	Controller, Hoist		
1	Tube Checker TV-3C/U	6-7/8 X 10-7/8 X 16-3/4	19
1	Multimeter AN/USM-34	6-5/8 X 8-7/8 X 9-3/4	13
1	Oscilloscope TS-34A/P	8 X 9 X 20-3/4	29
1	Tool Set AN/USM-15	7-1/2 X 8-7/8 X 14-1/8	20
1	Dummy Load RG-21/U		
1	Shelter, Electrical Equipment S-122/MRN-16	83-3/4 X 95-1/4 X 154-1/4	
1	Generator Diesel Engine PU-239B/G	80 X 88-1/2 X 164	5,108
1	2-1/2 Ton Truck M-35	88 X 107 X 274-3/4	11,775
1	Cable Assy, Dehumidifier Power		
1	Case 1, Mag. Ampfr. Components/Misc. Capacitors	12 X 23-1/2 X 31-1/2	308
1	Case 2, Mag. Ampfr.	11 X 13 X 23-1/2	66
1	Case 3, Chain Hoist, Sling	11-1/2 X 14 X 30-1/2	
1	Case 4, Vent Motor, Hoist Motor	11-1/2 X 14 X 30-1/2	
1	Case 5, Transformer	11 X 13 X 22	
1	Case 6, Transformer	13 X 23-1/2 X 30	
1	Case 7, Vacuum Tubes	13 X 23-1/2 X 30	
1	Case 8, Capacitor and Resistors	13 X 22 X 22	
1	Case 9, Two V-1302 Tubes	13 X 22 X 22	
1	Case 10, Coil, Relays, Misc. Parts	13 X 15 X 22	
1	Case 11, Switches, Connectors, Misc. Parts	11 X 15 X 30	
4	Chain Hoists, One Tone	3-1/4 X 10-7/8 X 13-3/8	32-1/2
1	Two Pulleys w/Sling, Wire Rope		
4	"A" Frame	2-1/2 X 43	78
2	"A" Frame Cross Member	6-1/2 X 3 X 136	54
1	Fire Extinguisher CO_2 Type	5-1/2 X 16	20
1	Grease Gun		
1	Wrench Lug, Antenna		
1	Gallon, Paint Radome		
1	Astro Compass		
1	Tripod and Sextant		

February 1960

Radio-Navigational Aid

RADIO SET AN/MRN-16A



Radio Set AN/MRN-16A

FUNCTIONAL DESCRIPTION

Radio Set AN/MRN-16A is a ground based navigational aid which supplies information to an aircraft equipped with Radio Set AN/ARN-21 as to the azimuth and distance to go to the subject equipment.

No field changes in effect at time of preparation (2 October 1959).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

POWER REQUIREMENTS: 120/208 v, 60 cy, 3 ph, 12 kw.
FREQUENCY RANGE: 962 to 1024 mc.
TYPE OF EMISSION: P9d.
POWER OUTPUT: 5 kw.

MANUFACTURER'S OR CONTRACTOR'S DATA

Philadelphia Naval Shipyard, Philadelphia, Philadelphia

TUBE AND/OR CRYSTAL COMPLEMENT

Electron Tube and Crystal Data not Available.

REFERENCE DATA AND LITERATURE

NAVSHIPS 92707: Technical Manual for RADIO SET AN/MRN-16.
NAVSHIPS 93400: Preliminary Data Sheet for RADIO SET AN/MRN-16A.

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

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Set AN/MRN-16A including:		
1	Antenna Group OA-592/URN-3	44 X 44 X 78	410
1	Antenna Control C-1349/URN-3	12-1/2 X 30-7/8 X 70	
1	Power Supply Assy OA-1536/GRN-9	22 X 34-1/8 X 72	1,050

AN/MRN-16A RADIO SET

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Receiver-Transmitter Group OA-1533/GRN-9	22 X 34-1/8 X 72	1,173
1	Fan, Ventilating, Propeller HD-245/U	22-3/4 dia X 16-1/2	
1	Monitor, RF MX-1627/URN-3	15-1/2 X 19-1/2 X 24-5/8	
1	Dehumidifier		
1	Heater, Electric		
1	Contactor, Heater		
1	Panel, Power Distribution		
1	Hoisting Mechanism, Antenna E-25/MRN-16	76-1/2 X 84	
1	Controller, Hoist		
1	Tube Checker TV-3C/U	6-7/8 X 10-7/8 X 16-3/4	19
1	Multimeter AN/USM-34	6-5/8 X 8-7/8 X 9-3/4	13
1	Oscilloscope TS-34A/P	8 X 9 X 20-3/4	29
1	Tool Set AN/USM-15	7-1/2 X 8-7/8 X 14-1/8	20
1	Dummy Load RG-21/U		
1	Shelter, Electrical Equipment S-122/MRN-16	83-3/4 X 95-1/4 X 154-1/4	
1	Generator, Diesel Engine PU-239B/G	80 X 88-1/2 X 164	5,108
1	2-1/2 Ton Truck M-35	88 X 107 X 274-3/4	11,775
1	Cable Assy, Dehumidifier Power		
1	Case 1, Mag. Amplfr. Components/Misc. Capacitors	12 X 23-1/2 X 31-1/2	308
1	Case 2, Mag. Ampfr.	11 X 13 X 23-1/2	66
1	Case 3, Chain Hoist, Sling	11-1/2 X 14 X 30-1/2	
1	Case 4, Vent Motor, Hoist Motor	11-1/2 X 14 X 30-1/2	
1	Case 5, Transformer	11 X 13 X 22	
1	Case 6, Transformer	13 X 23-1/2 X 30	
1	Case 7, Vacuum Tubes	13 X 23-1/2 X 30	
1	Case 8, Capacitors and Resistors	13 X 22 X 22	
1	Case 9, Two V-1302 tube	13 X 22 X 22	
1	Case 10, Coil, Relays, Misc. Parts	13 X 15 X 22	
1	Case 11, Switches, Connectors, Misc. Parts	11 X 15 X 30	
4	Chain Hoist, One Tone	3-1/4 X 10-7/8 X 13-3/8	32-1/2
1	Two Pulleys w/Sling, Wire Rope		
4	"A" Frame	2-1/2 X 43	78
2	"A" Frame Cross Member	3 X 6-1/2 X 136	54
1	Fire Extinguisher CO_2 Type	5-1/2 X 16	20
1	Grease Gun		
1	Wrench Lug, Antenna		
1	Gallon, Paint Radome		
1	Astro Compass		
1	Tripod and Sextant		

Radio-Navigational Aids

RADIO SET AN/MRN-18

FUNCTIONAL DESCRIPTION

The AN/MRN-18 is a mobile tactical air navigation aid consisting of a modified K-78 trailer in which are mounted two Radio Set AN/URN-3, Antenna (either HI or Low Band) with an automatic transfer panel (only one AN/URN-3 issued, the other is standby) one or two KW engine generators with automatic change over facilities, trailer mounted.

No field changes in effect at time of preparation (14 December 1956).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 962 to 1024 mc.
TYPE EMISSION: P9d.
POWER OUTPUT: 5 kw.

OPERATING POWER: 115 or 208, 60 cps, 3 ph.

TUBE AND/OR CRYSTAL COMPLEMENT

No Electron Tubes.

REFERENCE DATA AND LITERATURE

Nomenclature Card for Radio Set AN/MRN-18.

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	BUSHIPS
PROCUREMENT COGNIZANCE	
STOCK NO.	

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Receiver-Transmitter Group OA-449/URN-3 consist of:	22 x 34-1/8 x 72	1173
	Coder - Indicator KY-101/URN-3		
	Radio Receiver R-549/URN-3		
	Control - Duplexer C-1236/URN-3		
	Amplifier - Modulator AM-487/URN-3		
	Frequency Multiplier-Oscillator CU-273/URN-3		
	Electrical Equipment Cabinet CY-1372/URN-3		
1	Power Supply - Test Set Group OA-500/URN-3		
	Consists of:	22 x 34-1/8 x 72	1051
	Power Supply PP-954/URN-3		
	Power Supply PP-955/URN-3		
	Power Supply PP-956/URN-3		
1	Antenna Group consists of:		
	Antenna AS-685/URN-3 or AS-686/URN-3		
	Antenna AB-361	61-5/8 h	
	Antenna Control C-1349/URN-3	12-1/2 x 24-7/8 x 70	

October 1957

Radio-Navigational Aids

AIR TRAFFIC CONTROL SET AN/MRN-20

FUNCTIONAL DESCRIPTION

The AN/MRN-20 provides mobile control tower facilities, performing all functions of a fixed control tower, and monitoring at forward areas when fixed control towers are nonexistant or out of operation. It provides direction finder facilities when telephone facilities are maintained with other similar units. It is designed for all weather operations, and is transportable in C-47 aircraft.

No field changes in effect at time of preparation (2 May 1957).

MANUFACTURER'S OR CONTRACTOR'S DATA

Craig Systems, Danvers, Mass.
Contract AF30(635)-7052.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

No Electron Tubes.

REFERENCE DATA AND LITERATURE

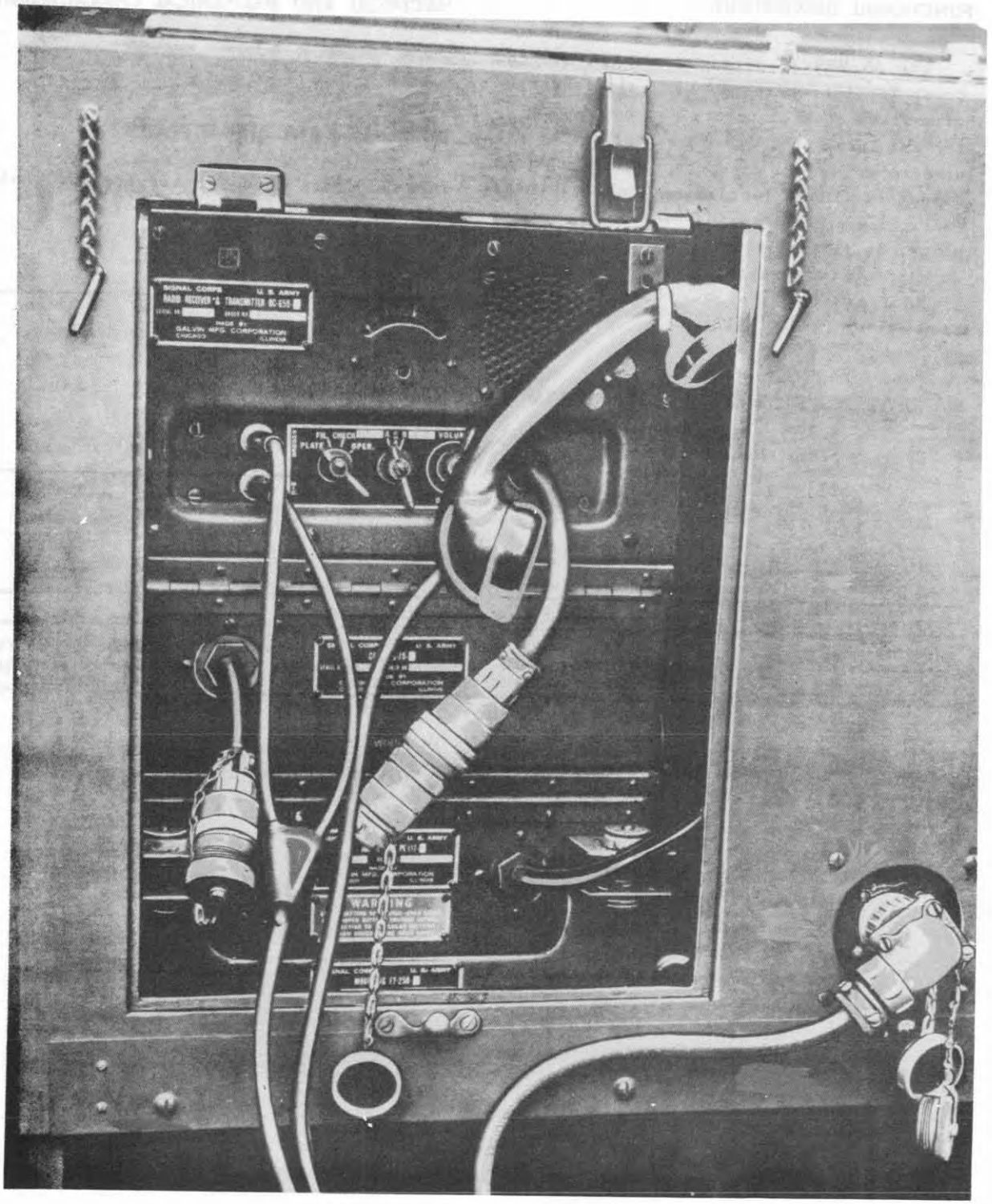
Nomenclature Card for Air Traffic Control Set AN/MRN-20.

TYPE CLASSIFICATION
DESIGN COGNIZANCE USAF
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Shelter, Electrical Equipment including: (1) Trailer, Chassis		
3	Receiving Set, Radio AN/URR-35		
1	Receiving Set, Radio AN/URR-27		
1	Transmitting Set, Radio AN/URT-7A		
3	Transmitting Set Model TED-6		
1	Receiver, Radio BC-342		
1	Radio Beacon Monitor Type RIW		
1	Wind Equipment AN/GMQ-11		
1	Air Traffic Control Light		
1	Set of Altimeters, Microphones, Loudspeakers, Antennas, Masts, Flares		

MARKER BEACON SET AN/MRN-3



Marker Beacon Set AN/MRN-3

AN/MRN-3 MARKER BEACON SET

FUNCTIONAL DESCRIPTION

The AN/MRN-3 is a mobile ground-transmitting equipment which transmits vertically either a keyed or continuous tone-modulated signal in a fan-shaped pattern. This signal, when received by a 75 mc beacon receiver installed in an aircraft, provides the pilot with visual indication of his horizontal position along a preset line of flight with respect to the landing field.

Three complete sets of Marker Beacon Set AN/MRN-3 are used to aid in the landing of aircraft. On set is used a "boundary" marker, one as a "middle" marker, and one as an "outer" marker. Inter-communication is provided between these marker beacon sets and a central control point.

No field changes in effect at time of preparation (8 November 1956).

RELATION TO OTHER EQUIPMENT

Similar to Marker Beacon Set AN/MRN-3A.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

RADIO TRANSMITTER
- FREQUENCY: 75 mc.
- MODULATION: 400, 1300 or 3000 cps.
- OPERATING POWER: 105 to 135 v, 50 to 70 cps.

RADIO SET
- FREQUENCY RANGE: 27.0 to 38.9 mc.
- OPERATING POWER: 6 or 12 v DC.

POWER UNIT
- OPERATING POWER: 12 v at 100 amp.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) 7E6	(4) 1299
(2) 7F7	(5) 1LN5
(1) 7N7	(1) 1LC6
(5) 7C5	(1) 1294
(2) OD3/VR150	(1) 1LH4
(1) 5Z4	(1) 1005
(2) 1291	(1) 10T1
	(1) OB3/VR90

Total Tubes: (29)

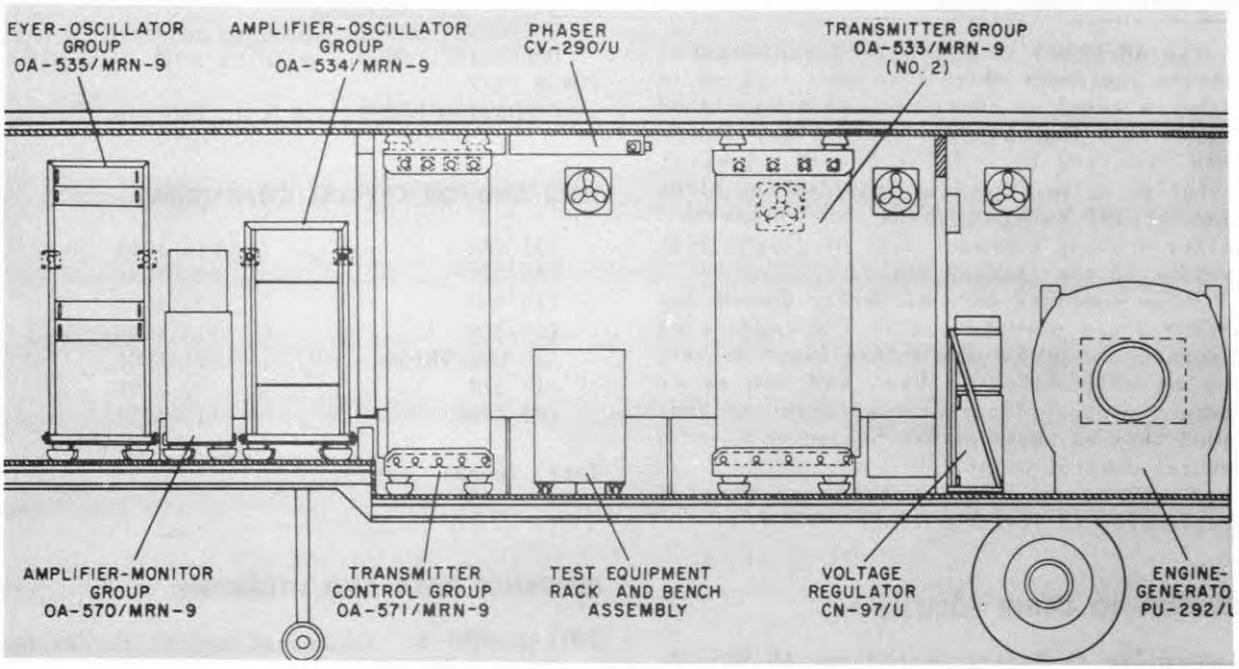
REFERENCE DATA AND LITERATURE

TM16-30MRN3-6: Technical Manual for Marker Beacon Set AN/MRN-3, 3A.

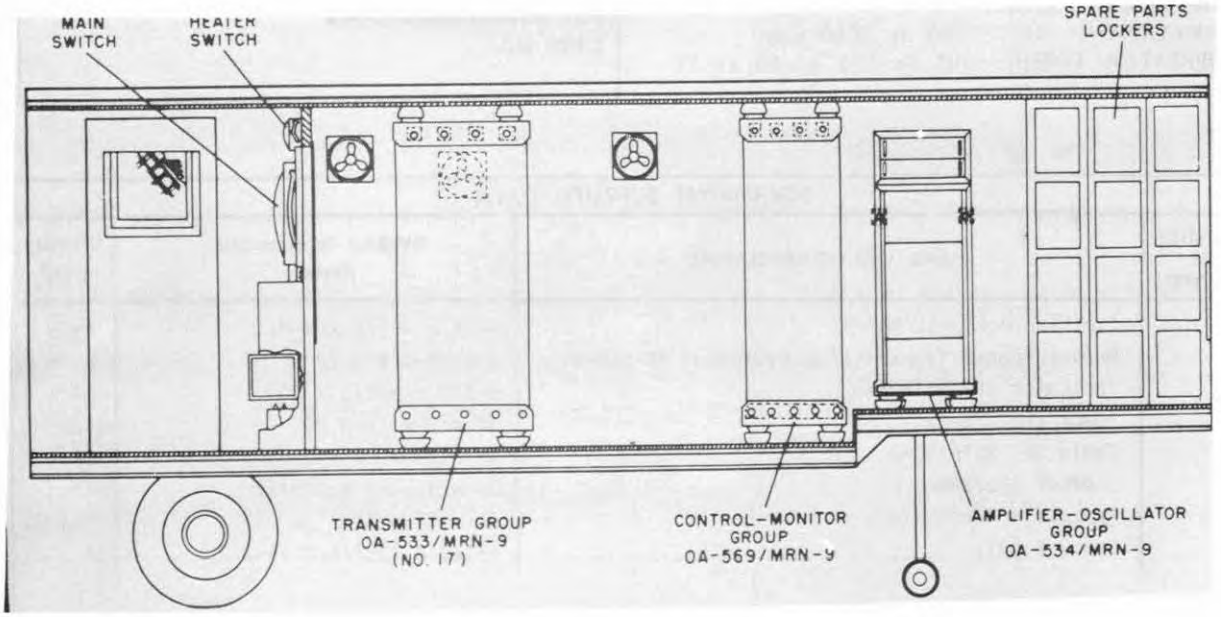
TYPE CLASSIFICATION
DESIGN COGNIZANCE USAF
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Junction Box J-11/MRN-3	2-1/4 x 4-3/4 x 4-3/4	3.5
1	Marker Beacon Transmitting Equipment RC-115-A	18 x 21-1/4 x 22	55
1	Indicator ID-101/MRN-3	5-1/2 x 5-1/2 x 10	8
1	Power Unit PE-88	17-1/2 x 18 x 20	84.5
1	Radio Set SCR-610-A	13 x 13 x 17	137
1	Shelter S-2/MRN-3	23 x 31-1/2 x 57-1/2	60
1	Truck 1/4 Ton 4 x 4	66 x 70 x 129	3025
1	Drum, 5 gal.	6-1/2 x 13-3/4 x 18-1/2	10



Equipment Arrangeme t. Starboard Side of Trailer



Equipment Arrangement, Port Side of Trailer

Radio-Navigational Aids

AN/MRN-9 RADIO TRANSMITTING SET

April 1958

FUNCTIONAL DESCRIPTION

The AN/MRN-9 is an unattended, remotely controlled ground station designed to provide aircraft with indication of bearing with reference to the station and track guidance between the station and any point within the line of sight without limitation as to azimuth. Transmitting on an assigned carrier in the 112 to 118 mc band, the AN/MRN-9 radiates two fields. One field, rotating 30 times per sec., develops in the receiver a 30 cycle signal with a phase that varies directly with azimuthal position around the station. The other field carriers a 30 cycle reference signal which is received in the same phase at all points in azimuth. The difference in phase between the received signals indicates the position of the aircraft in azimuth. Course orientation is under control of the pilot, a theoretically infinite number of radial visual courses being open to him.

A 1020 cps code identification and a voice identification signal modulate the carrier continuously except when emergency or other information is being broadcast over the station.

To permit periodic inspection and maintenance while maintaining continuous year-round service, duplicate transmitting equipment is provided for alternate operation. A monitoring system checks the station output continuously and automatically. In the event of transmitter trouble it actuates warning alarms at the remote control location. Remote control is accomplished by means of a telephone-type dial via a single pair control line from a position up to 30 miles from the range. Two-way communication is also afforded over the control line by means of sound powered hand sets.

No field changes in effect at time of preparation (24 February 1958).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 112.1 to 117.9 mc.
TYPE FREQUENCY CONTROL: Quartz crystal.
MODULATION CAPABILITY
- AMPLITUDE MODULATION: 85%.
- FM DEVIATION RATIO: 16:1 for 9960/30 cps audio signal only.

MODULATION FREQUENCIES
- AM (SIDEBAND): 30 cps.
- AM (SUBCARRIER): 9960 cps.
- FM (SUBCARRIER): 30 cps.

NOMINAL CARRIER OUTPUT: 200 W.
ANTENNA
- TYPE: Undergrounded, balanced, four slot.
- NUMBER SECTIONS: 4.
- IMPEDANCE: 52 ohms.

POWER SUPPLY CHARACTERISTICS
- TYPE: Engine-Generator PU-292/U (furnished) or alternate power source of single ph, 3-wire, 230 v, 60 cps.
- CURRENT AND POWER FACTOR
  - MAX STARTING: 28 amp, 90% pf.
  - STANDING: 6 amp, 90% pf.
  - ONE TRANSMITTER ON, OTHER AT STANDBY: 20 amp, 90% pf.
  - VOICE TRANSMISSION: 29 amp, 90% pf for 85% modulation.
  - POWER OFF: 2.7 amp, 90% pf.

HEAT DISSIPATION
- TRAILER, ONE TRANSMITTER ON: 12,520 BTU per hr.
- TRANSMITTER GROUP OA-533/MRN-9: 7300 BTU per hr.
- AMPLIFIER-OSCILLATOR GROUP OA-534/MRN-9: 2440 BTU per hr.
- KEYER-OSCILLATOR GROUP OA-535/MRN-9: 1025 BTU per hr.
- CONTROL-MONITOR GROUP OA-569/MRN-9: 1385 BTU per hr.
- TRANSMITTER CONTROL GROUP OA-571/MRN-9: 360 BTU per hr.
- AMPLIFIER-MONITOR GROUP OA-571/MRN-9: 360 BTU per hr.
- ENGINE-GENERATOR PU-292/U: 200,000 BTU per hr.

MANUFACTURER'S OR CONTRACTOR'S DATA

Lavoie Laboratories, Morganville, N.J.
Contract: NObsr-52692, dated 26 June 1951.

TUBE AND/OR CRYSTAL COMPLEMENT

(4) ML-322	(2) OA2	(1) OA3
(2) OB2	(8) OC3	(12) OD3
(2) 1P40	(2) 2E26	(4) 3B25
(12) 3B28	(12) 4D21	(11) 5R4GY
(2) 5U4G	(5) 5Y3	(12) 6AG5
(6) 6AL5	(2) 6AQ5	(3) 6AS7G
(1) 6BA6	(2) 6BF6	(2) 6J6
(4) 6SJ7	(2) 6SL7	(12) 6SN7
(4) 6V6	(3) 6X4	(4) 6Y6G
(15) 12AU7	(14) 12AX7	(4) 805

(2) 815 (4) 5763
Total Tubes: (175)

(1) CR-19/U
Total Crystals: (1)

TYPE CLASSIFICATION
DESIGN COGNIZANCE
PROCUREMENT COGNIZANCE
STOCK NO.

REFERENCE DATA AND LITERATURE

NAVSHIPS 92411(A): Technical Manual for Radio Transmitting Set AN/MRN-9.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Truck Tractor V-46/G	98 X 108 X 266	
1	Trailer consist of:	95 X 137 X 288	14500
1	Antenna AS-664/MRN-9	23 dia X 95	136
1	Counterpoise	300 dia X 24	360
1	Engine-Generator PU-292/U	39 X 48 X 74	2300
1	Voltage Regulator CN-97/U	20 X 23 X 43-1/2	746
2	Transmitter Group OA-533/MRN-9 consists of:	32 X 32-3/8 X 76	1045
1	Cabinet, Electrical CY-1493/MRN-9	32 X 32-3/8 X 76	262
1	RF Amplifier AM-323/FRN-12	16 X 23 X 26	95
1	RF Amplifier-Oscillator O-98/FRN-12	6 X 6-1/2 X 15-1/2	15
1	Transmitter-Control C-611/FRN-12	2-5/8 X 7 X 8-1/2	5
1	Radio Modulator MD-112/FRN-12	14 X 25 X 26	198
1	Power Supply PP-470/FRN-12	25 X 26 X 26	470
2	Amplifier-Oscillator Group OA-534/MRN-9 c/o:	23-1/2 X 27 X 52	433
1	Cabinet, Electrical Equipment CY-1461/MRN-9	23-1/2 X 27 X 52	150
1	Amplifier-Oscillator AM-909/MRN-9	14-1/2 X 19 X 23	256
1	Modulator Eliminator Bridge MX-1175/FRN-12A	13-1/2 X 14 X 19	27
1	Keyer-Oscillator Group OA-535/MRN-9 c/o:	23-1/2 X 24 X 66	310
1	Cabinet, Electrical Equipment CY-1462/MRN-9	23-1/2 X 24 X 66	140
2	Keyer-Sound Reproducer KY-113/MRN-9	11 X 19 X 25	62
2	Audio Oscillator O-211/MRN-9	5-1/2 X 10 X 19	18
1	Transmitter Control Group OA-571/MRN-9 c/o:	23-1/4 X 24 X 76	415
1	Cabinet, Electrical Equipment CY-1494/MRN-9	23-1/4 X 24 X 76	208
1	Transmitter Control C-579/FRN-12	11 X 17-1/2 X 27	56
1	Power Supply PP-471/FRN-12	10-1/2 X 17 X 17-1/2	84
1	Goniometer Group OA-120/FRN-12	15 X 17-1/2 X 28-1/2	67
1	Control-Monitor Group OA-569/MRN-9 c/o:	23-1/4 X 24 X 76	440
1	Cabinet, Electrical Equipment CY-1495/MRN-9	23-1/4 X 24 X 76	180
1	Monitor Receiver R-282/FRN-12	10-5/8 X 17 X 27	120
1	AF Amplifier AM-322/FRN-12	6-5/16 X 10-5/8 X 17	38
1	AF Amplifier AM-324/FRN-12	6-5/16 X 10-5/8 X 17	27
1	Goniometer Group OA-120/FRN-12	15 X 17-1/2 X 28-1/2	67
1	Line Loss Equalizer CN-107/FRN-12	2-3/4 X 5 X 11-1/2	8
1	Amplifier-Monitor Group OA-570/MRN-9 c/o:	18 X 22 X 30	251
1	Cabinet, Electrical Equipment CY-1496/MRN-9	18 X 22 X 30	154
1	Monitor Panel SB-342/MRN-9	3 X 7-3/4 X 17	8
1	AF Amplifier AM-325/FRN-12	8-1/2 X 10-5/8 X 17	38
1	Power Supply PP-529/FRN-12	4-1/4 X 7-3/8 X 17	15
1	Dial Switch SA-360/MRN-9	5 X 5 X 19	9
1	AF Amplifier AM-324/FRN-12	6-5/16 X 10-5/8 X 17	27
1	Phaser CV-290/U		
1	Handset H-54/U	3 X 3 X 10	1
2	Antenna-Detector AT-460/MRN-9	9 X 9 X 58	15
2	Tripod (For Antenna-detector)	4 X 4 X 39-1/2	14
2	Case (For Antenna-detector)	10 X 10-1/2 X 58	47

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
2	Stepladder	5 X 24 X 96	21
8	Guy, Nylon Rope	7/16 dia X 240 lg	1.5
8	Stake, Guy Anchor	2 X 2 X 36	8
1	Ground Rod	3/4 dia X 60	8
1	Mast, Fixed	1-1/2 dia X 96	4
12	Mast, Adjustable	1-1/2 dia X 96	16
2	Jack Plate, Steel	4 X 24 X 24	39
2	Footers, Landing Gear, Steel	4 X 16 X 16	21
2	Cable Reel (For Antenna-detector)	22 dia X 13	27.5
1	Carriage (For Antenna stowage)	12 X 24 X 100	20
1	Locker	18-1/2 X 45-1/2 X 74	196
2	Air Heater HD-60/U	16 X 16 X 16	40
1	Set, Cable Assy		
1	Tube Tester Hickok Model 600A	7-1/2 X 11-3/4 X 16-3/4	15
1	Multimeter ME-48/U		
1	Multimeter ME-25/U		
1	Radio Receiving Set AN/FRR-27		
1	Signal Generator TS-382/U	10 X 12-3/4 X 18-3/4	40
1	Test-Tool Set AN/USM-15		
1	Oscilloscope TS-239/U	13-1/2 X 16-1/2 X 21-1/2	90
2	Directional Coupler		
1	Test Equipment Bench and Rack Assy	31-1/4 X 36-1/2 X 47-1/2	318
1	Technical Manual NAVSHIPS 91898 (Antenna AS-664/MRN-9)	1/2 X 8-1/2 X 11	
1	Technical Manual T.O. 16-350A120-3 (Goniometer Group OA-120/FRN-12)	1/4 X 8-1/2 X 11	
1	Technical Manual (Engine-Generator PU-292/U)	1/2 X 8-1/2 X 11	

October 1957

Radio-Navigational Aids

RADIO BEACON RECEIVER AN/PRN-1

FUNCTIONAL DESCRIPTION

The AN/PRN-1 is a man-pack radio receiver weighing not more than 15 lbs. with self-contained batteries. It is used with Radio Beacon Transmitter AN/TRN-1.

No field changes in effect at time of preparation (27 March 1957).

RELATION TO OTHER EQUIPMENT

Used with Radio Beacon Transmitter AN/TRN-1.

TUBE AND/OR CRYSTAL COMPLEMENT

Tubes and Crystals: Not Available.

REFERENCE DATA AND LITERATURE

Nomenclature Card for Radio Beacon Receiver AN/PRN-1.

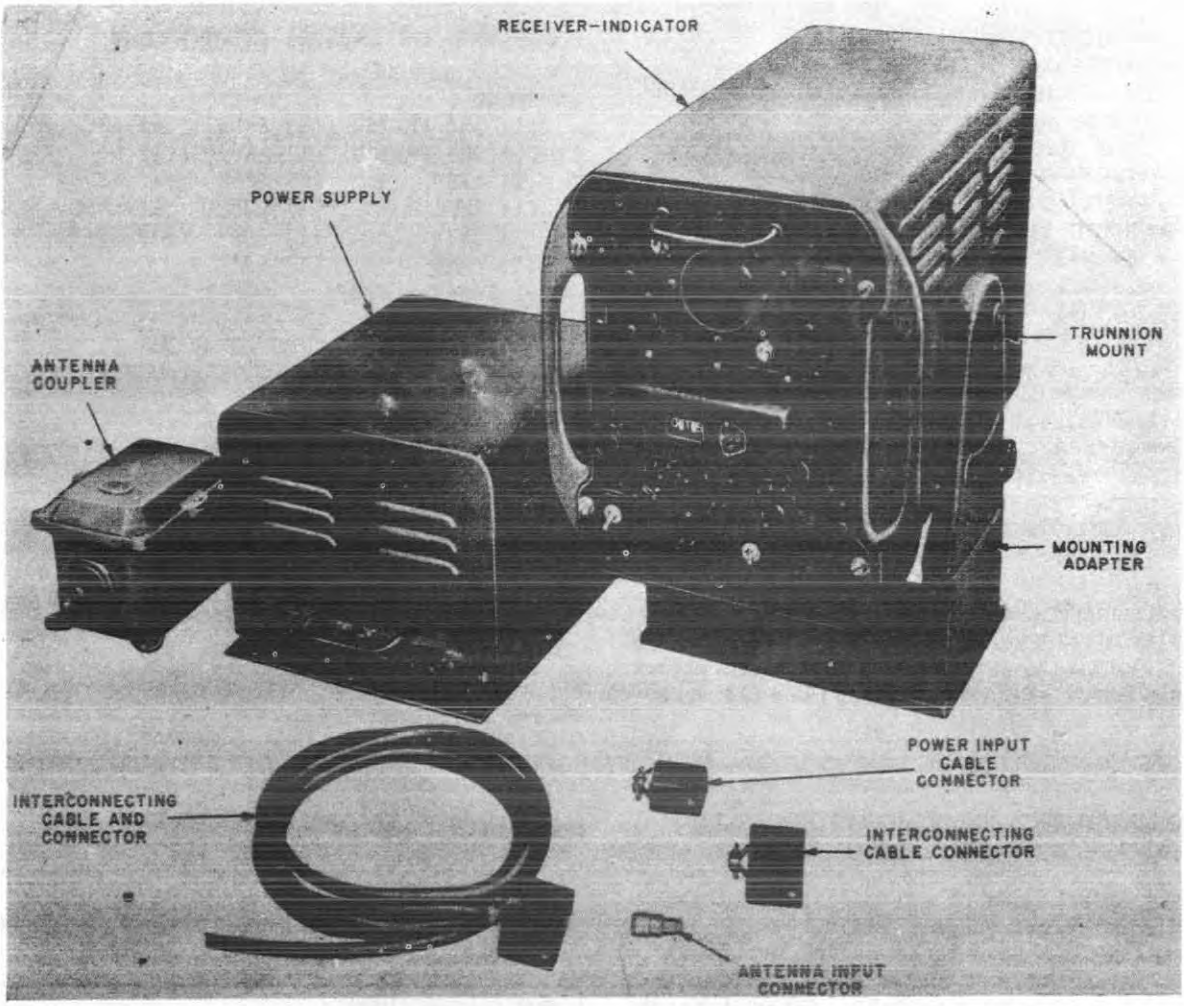
TYPE CLASSIFICATION	
DESIGN COGNIZANCE	TASSA
PROCUREMENT COGNIZANCE	
STOCK NO.	

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Beacon Receiver AN/PRN-1		

RADAR RECEIVING SET

AN/SPN-7,7A



Radar Receiving Set AN/SPN-7A

FUNCTIONAL DESCRIPTION

The AN/SPN-7, or AN/SPN-7A is a shipborne Loran Receiver used to receive and indicate loran signals to determine a position at sea under all conditions of weather. The receiver may be used to obtain either a single loran line of position (LOP) or a fix, A fix may be obtained by crossing a loran line of position with other loran lines, sun lines, sounding lines, star lines, radar range circles, or beacon bearings. The two sets are similar except for a few minor electrical and mechanical changes.

No field changes in effect at time of preparation (21 June 1956).

RELATION TO OTHER EQUIPMENT

Equipment Required but not Supplied
Installation material as required.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 1750 to 1950 kc.
CRYSTAL-CONTROLLED FREQUENCY: 4 channels.
- CHANNEL 1: 1950 kc.
- CHANNEL 2: 1850 kc.
- CHANNEL 3: 1900 kc.
- CHANNEL 4: 1750 kc.

FREQUENCY DRIFT: ±5 kc.
RECEIVER TYPE: Superheterodyne.

AN/SPN-7,7A RADAR RECEIVING SET

December 1956

TYPE OF SIGNALS RECEIVED: Pulsed.
PULSE RECURRANCE RATES
BASIC RECURRANCE RATES (selected by BASIC P.R.R. switch).
POSITION S: 20 pps.
POSITION L: 25 pps.
POSITION H: 33-1/3 pps.
SPECIFIC RECURRANCE RATES (selected by SPECIFIC P.R.R. switch):
8 different specific rates for each basic rate.
TOTAL DIFFERENT PULSE RECURRANCE RATES: 24.
RANGE: 600 to 90 miles by day, and 1400 miles at night.
ANTENNA
TYPE: Vertical wire.
LENGTH: 35 to 100 ft.
RESISTIVE COMPONENT: 75 to 1000 ohms at 1850 kc.
TYPES OF INDICATORS
PULSE MATCHING: 3 inc. CR tube.
TIME DIFFERENCE MEASUREMENT: Read directly in number on TIME DIFFERENCE indicator.
POWER SOURCE REQUIRED: 105, 115 or 125 v, 50 to 60 cps, single ph, 250 W.

TUBE AND/OR CRYSTAL COMPLEMENT

AN/SPN-7

(1) OA3/VR-75	(4) 6AL5	(9) 6J6
(1) OC3/VR-105	(1) 6AS6	(1) 6SH7
(1) 1Z2	(3) 6BA6	(1) 6X5GT
(1) 3KP1	(1) 6BE6	(1) 6Y6G
(1) 5V46	(5) 6D4	(14) 12AW7
(2) 6AK5	(1) 6J5	

Total Tubes: (48)

(1) VC-5K (4) NT 40125
Total Crystals: (5)

AN/SPN-7A

(1) OA3/VR-75	(1) 6AL5	(1) 6SH7
(1) OC3/VR-105	(1) 6AS6	(1) 6X5GT
(1) 1Z2	(3) 6BA6	(1) 6Y6G
(1) 2KP1	(1) 6BE6	(2) 12AT7
(1) 5V4G	(1) 6J5	(21) 12AU7
(2) 6AK5	(6) 6J6	

Total Tubes: (46)

(1) VC-5K (4) NT 40125
Total Crystals: (5)

MANUFACTURER'S OR CONTRACTOR'S DATA

(AN/SPN-7) none
Approximate Cost: $4350.00.
(AN/SPM-7A) Sperry Gyroscope Co., Great Neck, N.Y.
Contract NObsr-57171, dated 4 March 1952.
Approximate Cost: $4000.00.

REFERENCE DATA AND LITERATURE

TM11-1502: Technical Manual for Radar Receiving Set AN/SPN-7.
NAVSHIPS 91862: Technical Manual for Radar Receiving Set AN/SPN-7A.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Radar Receiving Set AN/SPN-7			
1	Indicator-Receiver IP-61/SPN-7	11.3	23 X 23 X 37	185
1	Power Supply PP-442/SPN-7 consisting of: Antenna Coupler CU-180/SPN-7 Interconnecting Cable and Plug Plug PL-259 Input Power Plug Interconnecting Cable Plug	8.6	16 X 28 X 16	130
1	Set Running Spare Parts	7.5	21 X 22 X 28	150
1	Radar Receiving Set AN/SPN-7A			

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Indicator-Receiver IP-61A/SPN-7	15.2 13	25-1/2 X 26 X 39-1/2 24 X 24 X 39	225* 191
1	Power Supply PP-442A/SPN-7 consisting of: Antenna Coupler CU-180/SPN-7 Accessories	13.6 11.8	23-1/2 X 29 X 34-1/2 20 X 25 X 41	190* 154
1	Spare Parts	3.73 0.94	12-1/2 X 21-1/2 X 24 9-1/4 X 9-1/4 X 19	42* 22

*Processed equipment has been especially packed in moisture free moisture-proof containers to permit long storage periods without deterioration of the equipment.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radar Receiving Set AN/SPN-7 consists of:		
1	Indicator-Receiver IP-61/SPN-7	14 X 22 X 22	82
1	Power Supply PP-442/SPN-7	11 X 15 X 16	55
1	Antenna Coupler CU-180/SPN-7	6 X 6 X 12	6
1	Set Running Spare Parts	18 X 18 X 24	130
1	Interconnecting Cable and Plug	15 ft. (lg)	4
1	Plug PL-259	3/8 X 3/8 X 1-3/4	1/8
1	Input Power Plug	1 X 1-1/2 X 2	1/4
1	Interconnecting Cable Plug	1 X 2 X 3	1/2
1	Equipment Preformance Checklist Card	1/32 X 8 X 8	1/8
1	Radar Receiving Set AN/SPN-7A consists of:		
1	Indicator-Receiver IP-61A/SPN-7	15 X 15-1/2 X 24-3/8	82
1	Power Supply PP-442A/SPN-7	10-1/4 X 13-5/8 X 17-3/4	55
1	Antenna Coupler CU-180/SPN-7	6-1/16 X 7-1/8 X 12-1/8	6
1	Control Panel Dust Cover	2-7/8 X 14-5/8 X 15-1/2	2
1	Interconnecting Cable and Socket	15 ft. (lg).	4
1	Coaxial Connector	3/4 X 3/4 X 1-1/2	1/8
1	Alignment Chart (Plastic)	1/32 X 8-1/8 X 8-1/8	1/8
1	Alignment Adjustment Record	8-1/2 X 11	
1	Set Equipment Spares Parts	9 X 9 X 18	25

DIRECTION FINDER SET AN/SRD-12

FUNCTIONAL DESCRIPTION

The AN/SRD-12 is designed as a twenty-one tube superheterodyne radio receiver, used as a navigational aid in fixing positions; checking wind, current, and tide drift at sea; and making landfalls on the coast in all kinds of weather. The AN/SRD-12 operates in the low frequency (275 kc to 510 kc) radio beacon band. Accurate radio bearing determination can be made up to more than one hundred (100) miles from a radio-beacon station.

No field changes in effect at time of preparation (15 July 1958).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TYPE OF RECEPTION: A0, A1, A2 and A3.
TYPE OF INDICATION: Visual.
NUMBER OF BANDS: 2 bands.
AZIMUTH SCALE CALIBRATION: 0° to 360°.
TYPE OF PRESENTATION: Dial and pointer.
FREQUENCY RANGE: 275 to 510 kc, 2 to 3.5 mc.
OPERATING POWER REQUIREMENTS: 110 v AC, 60 cps, 1 ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

Raytheon Mfg Co., Waltham, Mass.

Contract Tcg-39798.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) 0B2WA
(1) 5R4WGB
(1) 5750-6BE6W
(1) 6005-6AQ5W
(4) 12AT7WA
(1) 5654-6AK5W
(6) 6BJ6

Total Tubes: (15)

(6) 1N67

Total Crystals: (6)

REFERENCE DATA AND LITERATURE

Nomenclature Card AN/SRD-12 for the Direction Finder Set.

TYPE CLASSIFICATION
DESIGN COGNIZANCE U.S. Coast Guard
PROCUREMENT COGNIZANCE RDF-319
STOCK NO.
R.D.B. IDENT. NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna AT-628/SRD-12		
1	Antenna AT-627/SRD-12		
1	Radio Receiver R-715/SRD-12		

June 1961

DIRECTION FINDER SET AN/SRD-13

FUNCTIONAL DESCRIPTION

The AN/SRD-13 is a navigational aid to obtain relative bearings on distant radio transmitters quickly and automatically. Manual operation is provided when interference prevents automatic operation. To obtain the position of the vessel on which the direction finder is installed, two or more bearings are taken on shore station transmitters at widely separated points. This set determines the relative bearing of another ship and the position of a ship at sea by direction finder bearings from two or more widely separated shore direction finder installations.

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

RELATION TO OTHER EQUIPMENT

The AN/SRD-13 is similar to and a replacement for Direction Finder Set AN/SRD-12.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TYPE OF EMISSION: AO, A1, A2, A3 types of emission.
TYPE OF PRESENTATION: Audio and electric meter type presentations.
TYPE OF ANTENNA: Loop antenna.
NUMBER OF BANDS: 2 bands.
OPERATING FREQUENCY RANGE: 275 to 510 kc, and 2 to 3.5 mc frequency range.
OPERATING POWER RQMT: 115 v ac, 60 cps, single ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

Control Electronics Co., Inc., Huntington, New York.
Contract Tog-40709(CG-42, 102-A), dated 10 October 1958.

TUBE AND/OR CRYSTAL COMPLEMENT

Electron Tube and/or Crystal data not available.

REFERENCE DATA AND LITERATURE

NAVSHIPS 93400: Preliminary Data Form for Direction Finder Set AN/SRD-13.

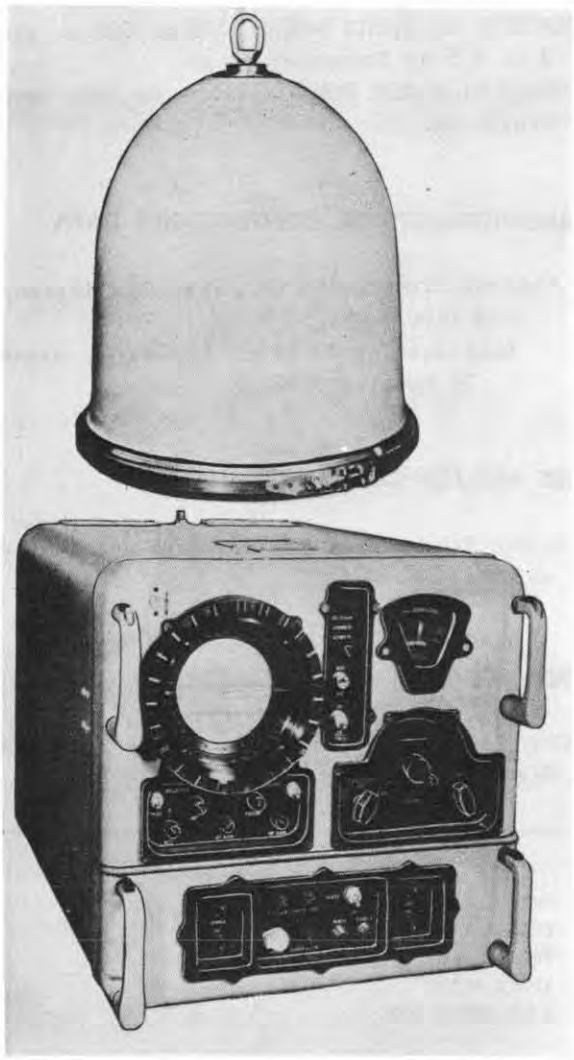
TYPE CLASSIFICATION	(NAVY)
DESIGN COGNIZANCE	TASSA
PROCUREMENT COGNIZANCE	
STOCK NO.	
R.D.B. IDENT. NO.	

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Direction Finder Set AN/SRD-13 consists of:		
1	Loop Antenna		
1	Receiver-Indicator		
1	Sense Antenna		

April 1958

DIRECTION FINDER SET AN/SRD-7



Direction Finder Set AN/SRD-7

FUNCTIONAL DESCRIPTION

The AN/SRD-7 is a general purpose shipboard direction finding equipment covering the frequency range of 250 kc to 32.0 mc. This range is divided into seven bands. Direction finding information is displayed on the screen of a five inch cathode-ray tube and the associated bearing is readable from concentric azimuth rings. In addition, panoramic type (frequency scanning) operation, not simultaneous with the Direction Finding function, enables the operator to visually monitor a band of frequencies. This band, 100 kc wide, is centered on the frequency to which the receiver tuning dial is set, and the radio activity within the limits of 50 kc above and 50 kc below this frequency is displayed on the face of the five inch cathode-ray tube.

Data on this sheet reflects the following field changes: FC No. 1 (18 March 1958).

RELATION TO OTHER EQUIPMENT

The AN/SRD was developed as a replacement equipment for the DAK and DAU sets. It provides greater flexibility in antenna setting, simpler operation and improved performance.

Equipment Required but not Supplied: (1) Headset, (1) Flange or mtg plate in accordance w/installing Activity Plans, (8) Antenna Mtg Bolts, interconnecting cable and associated hardware.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQ RANGE: 250 kc to 32 mc in 7 bands.

TYPE OF RECEPTION: AO, A1, A2 and A3.

SENSITIVITY: For 20 db signal plus noise to noise; min approx 3 uv; max better than one uv.

OUTPUT: Demodulated (audio) signals available at front panel headset connector. Radio bearing, true or relative readable from azimuth dials located around the face of the cathode-ray tube.

TYPE OF RECEIVER: Superheterodyne.

INTERMEDIATE FREQ: 175 kc for the lower frequency bands (250 kc to 4.0 mc) and double conversion; 175 kc/2.0 mc for the higher frequency bands (4.0 mc to 32.0 mc).

POWER SOURCE REQUIRED: 115 v, 50 cps, single ph, 250 W approx.

MOUNTING: Normally, table or pedestal mounted in locations where the developed information may have tactical or navigational utility. Mounting requires pedestal or table space 22 inches wide and 27-5/8 inches deep, with additional clearance of 3 inches min to rear bulkhead and 22 inches in front of receiver for drawer extension.

ANTENNA

TYPE: Self-contained, continuously-rotating loop.

MOUNTING: Preferred location indicates a masthead mounting above and clear of all ships structures. Unit is secured to a special masthead mounting flange by eight 3/4-16 bolts.

Radio-Navigational Aids

AN/SRD-7 DIRECTION FINDER SET

April 1958

MANUFACTURER'S OR CONTRACTOR'S DATA

Stewart-Warner Electronics, Division of Stewart Warner Corp, Chicago, Ill.
Part No. G-165000.
Contract NObsr-52218, dated 18 January 1951.
Contract Nobsr-63065, dated 30 September 1952.
Approximate Cost: $14,817.32 with equipment spares.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) OB2WA
(3) 5750/6BE6W
(2) 5725/6AS6W
(7) 5654/6AK5W
(1) 5696
(1) 5CP1A
(11) 5751
(5) 5726/6AL5W
(3) 6AK6
(9) 5749/6BA6W
(3) 5670

Total Tubes: (46)

No Crystals Used.

REFERENCE DATA AND LITERATURE

NAVSHIPS 92349(A): Technical Manual for Direction Finder Set AN/SRD-7.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

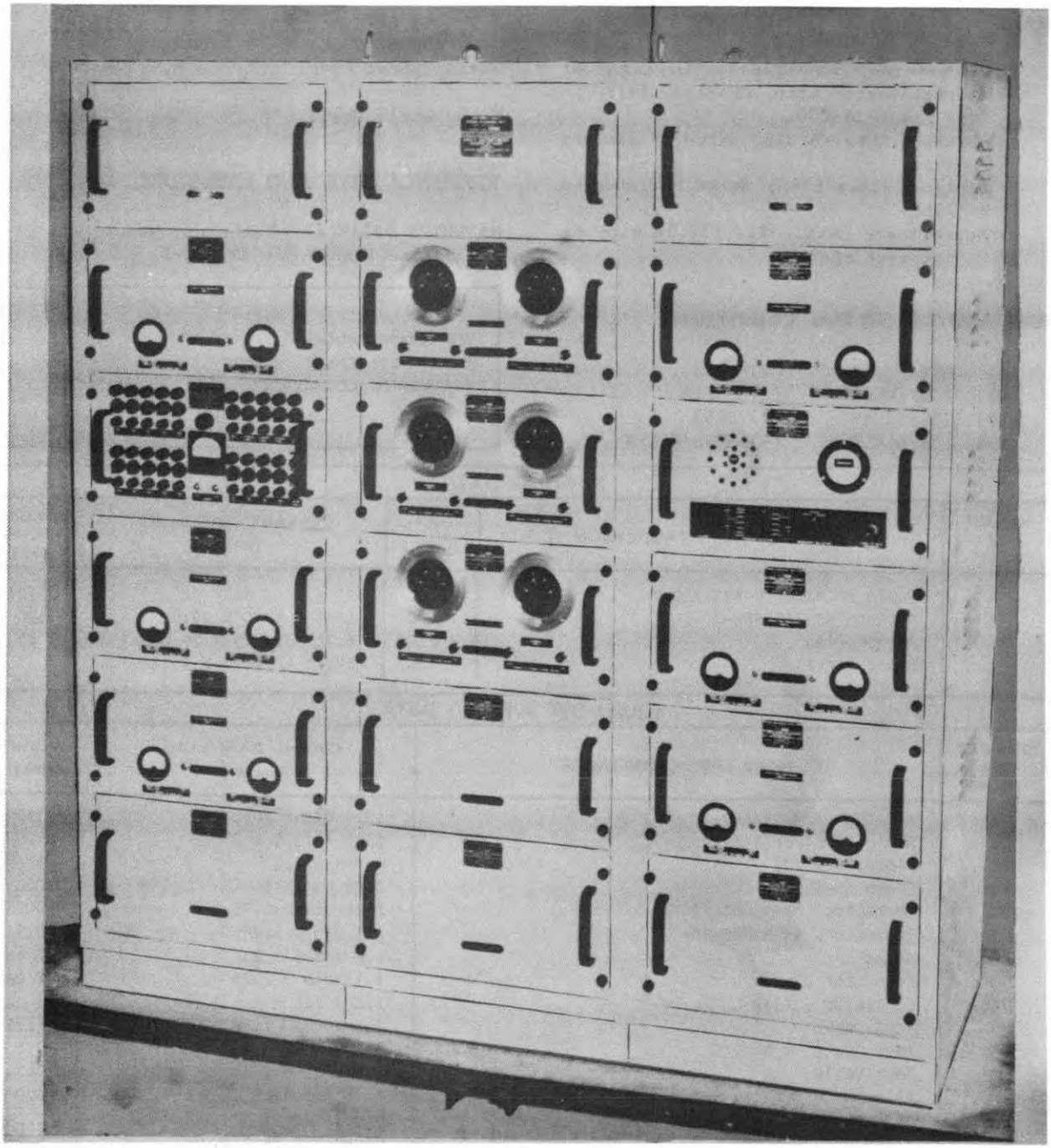
SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Radio Receiver R-623/SRD-7	16.0	27 X 28 X 36	220
1	Antenna AS-714/SRD-7	9.0	22.5 X 24.0 X 29.0	100
1	Accessories	0.77	6.75 X 13.75 X 14.5	15
1	Spare Parts	1.8	14.25 X 14.25 X 15.25	25

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna, AS-714/SRD-7	19.0 dia X 20.0	75.0
1	Radio Receiver R-623/SRD-7	19.5 X 22.0 X 27.15	195.0
1	Clamp (H-1527)	2 dia X 2.25	0.25
1	Clamp (H-1528)	2.25 dia X 3	0.25
1	Connector, AN-3106C-32-8S	2.25 dia X 2.75	0.25
1	Connector, AN-3106C-36-15P	2.5 dia X 1.75	0.5
2	Clamp	1.5 X 1.5 X 3	0.2 ea
2	Connector UG-421/U	1.75 dia X 2.75	0.2 ea
3	Connector UG-21B/U	1.5 X 1.5 X 3	0.25 ea
6	Test Cable	0.8 X 3.75 X 48	1.25
2	Test Cable	0.8 X 2.25 X 48	0.5
2	Test Cable	0.8 X 2.25 X 18	0.5
1	Allen Head Wrench	0.05 X 0.72 X 1.89	0.02
1	Allen Head Wrench	0.067 X 0.72 X 1.90	0.03
1	Allen Head Wrench	0.084 X 0.84 X 2.05	0.05
1	Allen Head Wrench	0.11 X 0.84 X 2.19	0.1
1	Allen Head Wrench	0.15 X 1.09 X 2.75	0.5
1	Alignment Tool	8.0 X 0.16 dia	0.4
1	Alignment Tool	0.19 dia X 12.0	0.5
2	Technical Manual NAVSHIPS 92349(A)	1.5 ea X 8.75 X 11.5	6.0 ea
2	Technical Manual NAVSHIPS 92349	0.2 ea X 8.5 X 11.0	0.375 e
3	Technical Manual NAVSHIPS 92349	0.75 ea X 8.5 X 11.0	3.0 ea

RADIO RANGING SET AN/SRN-1(XN-1)



Radio Ranging Set AN/SRN-1(XN-1)

Radio-Navigational Aids

AN/SRN-1(XN-1) RADIO RANGING SET

April 1958

FUNCTIONAL DESCRIPTION

The AN/SRN-1(XN-1) is a shipboard radio equipment designed for use as the center station in a precision automatic radio ranging system. It is used in conjunction with two Radio Ranging Sets AN/URN-4(XN-1) for obtaining continuous range-only information by means of phase comparison.

The complete system is installed on three naval vessels, two employing the AN/URN-4 (XN-1) with all phase information either originating at, or being relayed to, the vessel containing the AN/SRN-1(XN-1). The synchros of the center station equipment give continuous range information concerning each ship with respect to the other two ships. The information may be stored by photographically recording the synchro dials, and/or by using a multichannel recorder.

No field changes in effect at time of preparation (3 December 1957).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

DUAL LF-CW TRANSMITTER
- FREQ RANGE: 2.0 to 5.0 mc.
- OPERATING FREQ: 2130 to 2170 kc.
- FREQ CONTROL: Crystal.
- EMISSION: A1.
- POWER OUTPUT: 25 W.

DUAL HF-AM RECEIVER (2)
- FREQ RANGE: 36 to 42 mc.
- OPERATING FREQ
  - RECVR NO 1: 36.510 and 36.490 mc.
  - RECVR NO 2: 38.470 and 38.450 mc.
- TYPE: Double superheterodyne.

DUAL LF-AM RECEIVER
- FREQ RANGE: 2.0 to 5.0 mc.
- OPERATING FREQ: 2.130 and 2.170 mc.
- TYPE: Double superheterodyne.

RECORDER: Hot-stylus, strip-chart type w/ six channels and a timer.

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

ANTENNA
- LF: 35 ft whip.
- HF: Broadband folded dipole.

MTG DATA: Fifteen units are mounted in a master station and four units are deck or relay-rack mounted.

MANUFACTURER'S OR CONTRACTOR'S DATA

Hastings Instrument Co, Inc, Hampton, Virginia.
Contract NObsr-49020, dated 13 January 1950.

TUBE AND/OR CRYSTAL COMPLEMENT

(10) 5U4G	(24) 6H6	(1) 6K6
(6) VR150	(10) 6AL5	(2) OB2
(2) 6J4	(6) 6AU6	(9) 6BE6
(6) 6X5	(1) 6V6	(8) OA2
(22) 6BA6	(6) VR105	(2) 12AU7
(2) 807W	(42) 6SN7	(3) 5Y3
(2) 6AQ5	(2) 5U4G	(7) 6SL7
(24) 6N7	(6) 12AX7	(4) 6AG7
(2) 6C4		

Total Tubes: (209)

No Crystals:

REFERENCE DATA AND LITERATURE

NAVSHIPS 91671: Technical Manual for Radio Ranging Sets AN/SRN-1(XN-1) and AN/URN-4 (XN-1).

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

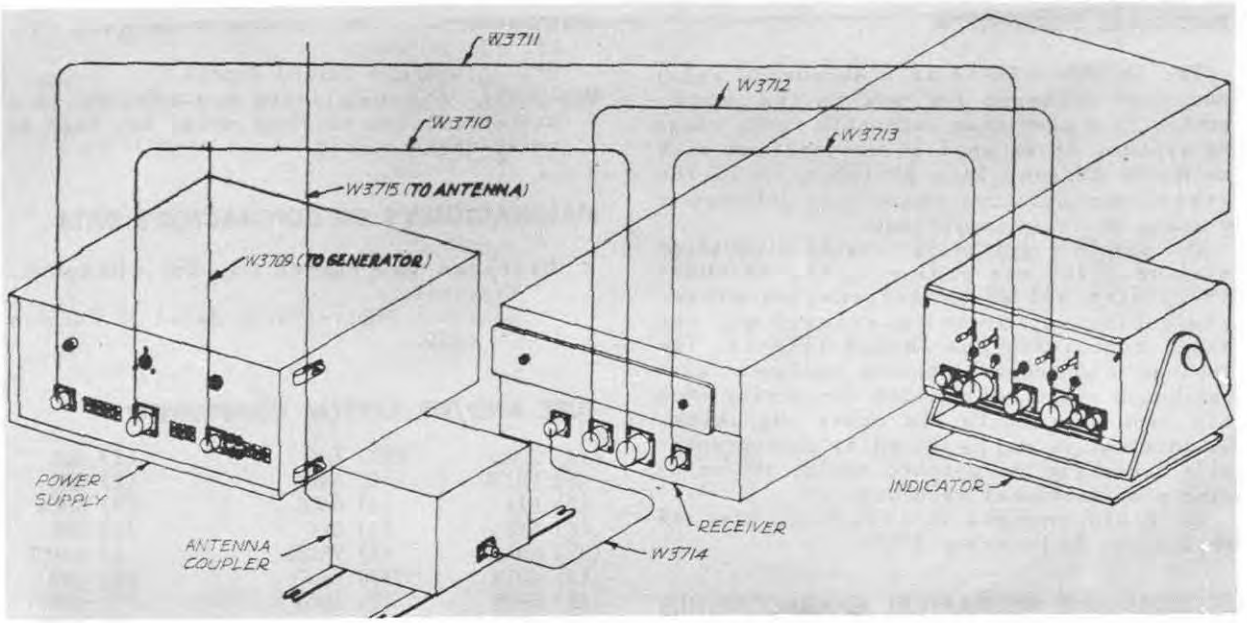
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Dual Channel CW Transmitter	12-1/8 x 17-3/8 x 24-1/4	132
3*	Antenna Loading Coil Unit	12 x 12 x 18	34.0
1	Master Station	13-15/16 x 65-1/2 x 69-3/8	1800
1	Six Channel Strip Recorder	7 x 8 x 15	20.0
3	Antennas and Base Insulators NT-66047	3/4 dia x 78	120
1	HF Folded Unipole Antenna w/4 Attachments		

NOTES: *One (1) furnished as a spare

April 1958

RADIO RECEIVING SET AN/SRN-2(XN-1) and AN/SRN-2



Radio Receiving Set AN/SRN-2(XN-1)

FUNCTIONAL DESCRIPTION

The AN/SRN-2(XN-1) and AN/SRN-2 are medium-frequency shipboard receivers designed for use as the receiving equipment in a LORAC (Long Range Accuracy) hyperbolic phase-comparison navigation system. It receives signals from fixed-station LORAC transmitters and provides highly accurate position information in the form of dial readings which are related to the hyperbolic coordinate system.

No field changes in effect at time of preparation (4 December 1957).

RELATION TO OTHER EQUIPMENT

The AN/SRN-2(XN-1) is designed to be used in conjunction with one Radio Transmitting Set AN/TRN-2(XN-1) and two Radio Sets AN/TRN-3(XN-1).

Equipment Required but not Supplied: For AN/SRN-2(XN-1); Vacuum Tube voltmeter, AF Signal Generator, RF Signal Generator and an inverter for primary power source.

For AN/SRN-2; (1) Audio Oscillator TS-382A/U, (1) Multimeter ME-25A/U, (1) RF Signal Generator AN/URM-25, (1) Tube Tester TV-3A/U.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 1.7 to 2.5 mc.
FREQUENCY CONTROL: Xtal.
IF
  AN/SRN-2(XN-1): 262 kc.
  AN/SRN-2: 455 kc.
TYPE RECEIVER: Superheterodyne.
TYPE RECEPTION: A2, AO.
RECEIVER INPUT IMPEDANCE (AN/SRN-2): 52 ohms.
FILTERS: 135 and 315 cycle filters.
NOISE LIMITING: Automatic in each detector-amplifier channel.
PRESENTATION
  AN/SRN-2: 2 dial type meters.
  AN/SRN-2(XN-1): 4 dial type meters.
TEMPERATURE RANGE
  AN/SRN-2(XN-1): -20 deg to +50 deg C.
  AN/SRN-2: 0 to 50 deg C.

Radio-Navigational Aids

AN/SRN-2(XN-1) and AN/SRN-2 RADIO RECEIVING SET

April 1958

POWER SOURCE REQUIRED: 115 v, 60 to 400 cps, single ph 300 W.
ANTENNA: 15 to 100 ft vert whip type.

MANUFACTURER'S OR CONTRACTOR'S DATA

Seismograph Service Corp, Tulsa, Oklahoma.
Contract NObsr-52614, dated 15 September, 1951 [AN/SRN-2(XN-1)].
Contract NObsr-64651, dated 1 March 1956 (AN/SRN-2).

TUBE AND/OR CRYSTAL COMPLEMENT

AN/SRN-2

(2) 12AT7WA	(1) 6626/OA2WA	(2) 6627/OB2WA
(2) 5750/6BE6W	(4) 5814A	(8) 5749/6BA6W
(1) 6080WA	(4) 5726/6AL5W	(3) 6072
(1) 5R4WGB	(1) 6X4WA	

Total Tubes: (29)

(2) 1N38A
Total Crystals: (2)

AN/SRN-2(XN-1)

(5) OB2	(2) 5R4WGY	(17) 5749
(3) 6BA7	(50) 5814	(15) 5726
(1) 6X4W	(2) 6AS7G	(2) 6AU6

Total Tubes: (97)

No Crystals.

REFERENCE DATA AND LITERATURE

NAVSHIPS 91775(A), Technical Manual for Radio Receiving Set AN/SRN-2(XN-1).
NAVSHIPS 92804, Technical Manual for Radio Receiving Set AN/SRN-2.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
	AN/SRN-2			
1	Radio Receiver R-736/SRN-2	9.6	21 x 25 x 25	230
1	Indicator ID-540/SRN-2	3.3	12 x 19 x 25	85
1	Antenna Coupler CU-498/SRN-2	0.7	9 x 11 x 12	9

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
	AN/SRN-2(XN-1)		
1	Receiver Unit	12 x 20-1/2 x 46-1/2	158.00
1	Power Supply Unit	9-1/2 x 21-1/2 x 22-1/2	153.00
1	Indicator Unit	10-3/4 x 12-1/2 x 24-1/4	52.00
1	Antenna Coupler	6 x 7-5/8 x 7-13/16	10.25
	AN/SRN-2		
1	Antenna Coupler CU-498/SRN-2	5-3/8 x 6-7/8 x 8	5
1	Indicator ID-540/SRN-2	7-3/16 x 15-3/16 x 20-5/8	50
1	Radio Receiver R-736/SRN-2	16-3/8 x 20-5/8 x 21-3/4	150

April 1958

Radio-Navigational Aid

SEXTANT, ELECTRONIC AN/SRN-5

FUNCTIONAL DESCRIPTION

The AN/SRN-5 is a high precision tracker for radio stars; to be used as navigational aid in conjunction with shipboard inertial navigation system.

No field changes in effect at time of preparation (6 June 1958).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TYPE OF RECEPTION: AO type of reception.
NUMBER OF BANDS: 1 band.
NUMBER CHANNELS: 1 channel.
OPERATING FREQUENCY: 7.5 to 18 kmc.
OPERATING POWER RQMT: 115 v, 400 cps, 3 ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

Detroit Controls Corp, Norwood, Mass.
Contract NObsr-72556, dated 30 March 1956.

TUBE AND/OR CRYSTAL COMPLEMENT

Electron Tubes and Crystal data not available.

REFERENCE DATA AND LITERATURE

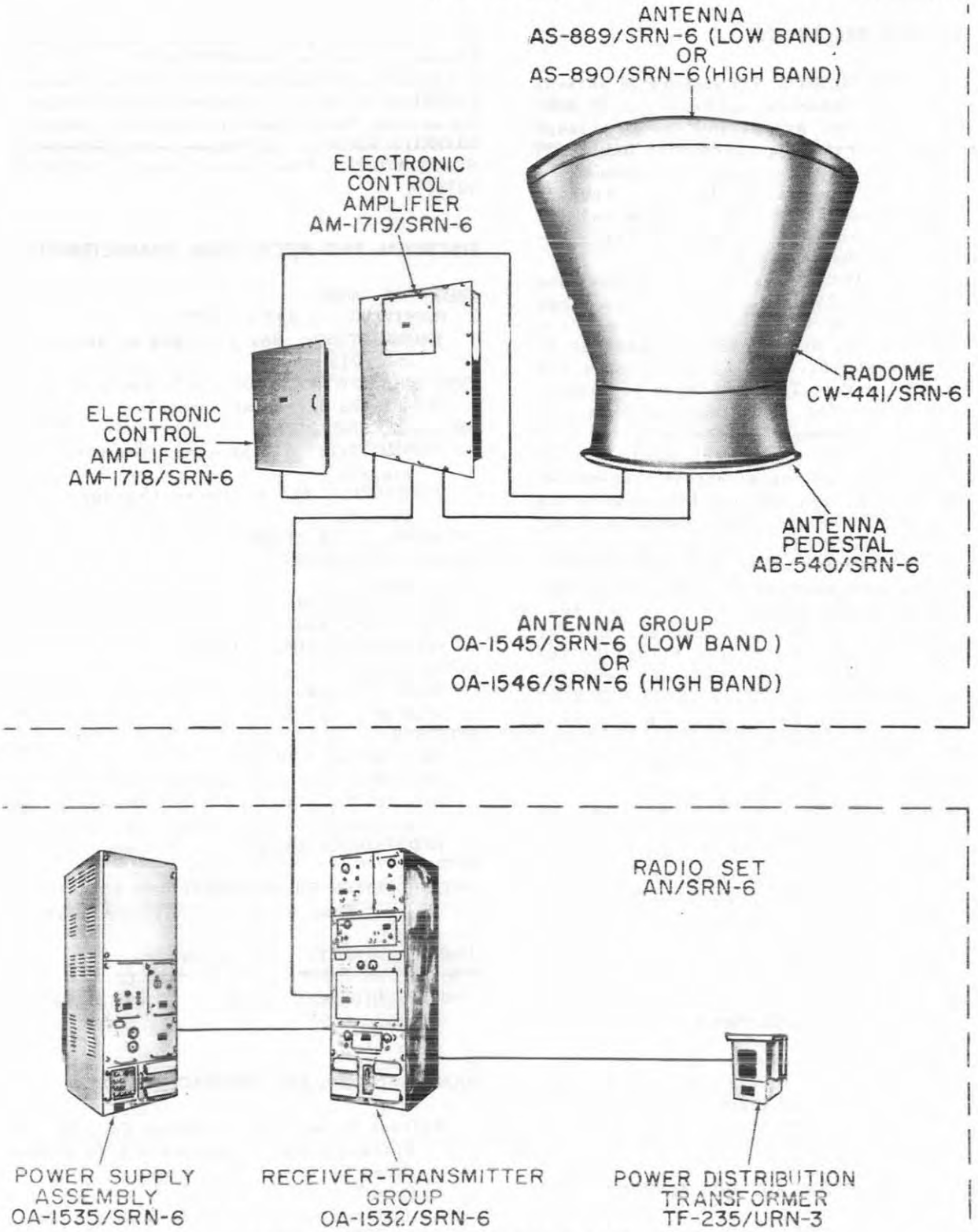
NAVSHIPS 4457 (Rev. 11-56) Preliminary Data form for AN/SRN-5 Sextant, Electronic.
Nomenclature Card for AN/SRN-5 for Sextant, Electronic.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE SHIPS-2325
STOCK NO.
R.D.B. IDENT. NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Sextant, Electronic AN/SRN-5		
1	Antenna Console Power Supply		

RADIO SET AN/SRN-6



Radio Beacon (Shipboard), using Radio Set AN/SRN-6

Radio-Navigational Aids

AN/SRN-6 RADIO SET

FUNCTIONAL DESCRIPTION

Radio Set AN/SRN-6, its associated antenna groups and accessories, and Radio Set AN/ARN-21 make up an air navigation system through which an aircraft (equipped with RADIO SET AN/ARN-21) can accurately determine its position. As many as one hundred aircraft may simultaneously obtain navigational information in conjunction with a single installation of Radio Set AN/SRN-6.

Radio Set AN/SRN-6 is capable of receiving on any one of 126 frequencies in the range of 1025 to 1150 megacycles. The set can transmit on any one of 126 frequencies in the ranges of 962 to 1024 megacycles and 1151 to 1213 megacycles. Two types of antenna are available for use. Each antenna can operate on 63 channels, either in a low band of frequencies or in a high band of frequencies. Low band installations transmit at frequencies between 962 and 1024 megacycles and receive at frequencies between 1025 and 1087 megacycles. High band installations, transmit at frequencies between 1151 and 1213 megacycles and receive at frequencies between 1088 and 1150 megacycles. Two frequencies are used in each channel, one for receiving and one for transmitting. In low band installations, the frequency used for receiving is 63 megacycles above the frequency used for transmitting in the same channel. In high band installations, the receiving frequency is 63 megacycles below the transmitting frequency.

This set employs a SAL-89 Klystron in the transmitter output stage, but is designed for shipboard installation. The antenna group used includes facilities required to compensate on shipboard, for roll, pitch and bearing variations.

No field changes in effect at time of preparation (26 January 1960).

RELATION TO OTHER EQUIPMENT

This equipment is similar to Radio Set AN/URN-3 except it is improved in performance, has more ease of maintenance, and has a different power requirement.

EQUIPMENT REQUIRED BUT NOT SUPPLIED

(1) Power Meter-Pulse Counter TS-891/URN-3; (1) Switch-Test Adapters SA-420/URN-3 (Technical Manual NAVSHIPS 92809); (1) Oscilloscope OS-54/URN-3 (Technical Manual NAVSHIPS 92778); (1) Pulse Analyzer-Signal Generator TS-890/URN-3 (Technical Manual NAVSHIPS 92819); (1) Pulse Sweep Generator SG-121A/URN-3 (Technical Manual NAVSHIPS 92745).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE
- RECEIVING: 1,025 to 1150 mc.
- TRANSMITTING: 962 to 1,024 mc and 1,151 to 1,213 mc.

FREQUENCY CONTROL: Directly controlled by one of 126 different crystals.

FREQUENCY STABILITY
- TRANSMITTER: ±25 kc (over the operating range).
- RECEIVER: ±50 kc (over the operating range).

EMISSION: 3600 ±2.5% pulse-pairs per sec.

PULSE-PAIR SPACING: 12 usec.

PULSE SHAPE
- PULSE DURATION: 3.5 usec.
- PULSE RISE TIME: 2.5 usec.
- PULSE DECAY TIME: 2.5 usec.

POWER OUTPUT
- PEAK: 7.5 kw.
- AVERAGE: 180 W.

RECEIVER
- SELECTIVITY: 80 db.
- TRIGGER LEVEL: 125 db below 1 W.
- BANDWIDTH: Trigger level does not deteriorate by more than 3 db.
- INTERMEDIATE FREQUENCY: 9.3 mc.

RESPONSE DELAY: 50 ±0.25 usec.

INTERROGATION PULSE REPETITION FREQUENCY: 24 cps from each of 95 interrogating sources.

TRAFFIC CAPACITY: 100 aircraft.

TEMPERATURE RANGE: -55 to +75° C.

POWER REQUIREMENTS: 440 v, 60 cy, three ph, 9.5 KVA, 0.95 pf, 20 amp per phase.

MANUFACTURER'S OR CONTRACTOR'S DATA

Federal Telephone and Radio Co., Div of International Telephone and Telegraph Corp, Clifton, New Jersey.
Part/Dwg No. NLS958.
Contract NObsr-71385, dated 1 July 1956.

RADIO SET AN/SRN-6

TUBE AND/OR CRYSTAL COMPLEMENT

(2) 1N21C	(2) 1N25	(1) 6005/6AQ5W
(8) 1N69	(1) 6V3A	(2) 5725/6AS6W
(5) 1N126	(2) 1N256	(3) 5726/6AL5W
(6) 2C39A	(5) 5R4WGB	(11) 5654/6AK5W
(1) 6AH6	(3) 6J4WA	(5) 6626/OA2WA
(2) 6X4W	(1) SAL-89	(3) 6627/OB2WA
(8) 829B	(13) 12AT7WA	(2) 836
(3) 5651WA	(10) 5670	(8) 5687WA
(1) 5814A	(2) 6080WA	(5) 6293
(6) 8020		

Total Tubes: (121)

(126) CR-32/U

Total Crystals: (126)

REFERENCE DATA AND LITERATURE

NAVSHIPS 92986(A): Technical Manual for Radio Sets AN/GRN-9, AN/GRN-9A, AN/SRN-6.

TYPE CLASSIFICATION (NAVY)

DESIGN COGNIZANCE USN, BUSHIPS

PROCUREMENT COGNIZANCE

STOCK NO.

R.D.B. IDENT. NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Receiver Transmitter Group OA-1532/SRN-6	105	43 X 44 X 90	1935
1	Power Supply Assembly OA-1535/SRN-6	105	43 X 44 X 90	1655
1	Operating Tubes and Misc. Materials	3.4	16 X 18 X 24	29
1	Tube, Klystron SAL-89	4.0	20 X 20 X 30	78
1	Transmission Line Filter Assembly Z1156 or Z1157	8.0	20 X 23 X 30	90
1	Equipment Spares	1.6	10 X 15 X 19	28
1	Equipment Spares	1.6	10 X 15 X 19	45
1	Equipment Spares	1.6	10 X 15 X 19	55
2	Equipment Spares	1.6	10 X 15 X 19	61
1	Low-Band Antenna AS-889/SRN-6 Antenna Pedestal AB-540/SRN-6	180	58 X 62 X 86	1150
1	Electronic Control Amplifier AM-1719/SRN-6	51	25 X 52 X 67	1110
1	Electronic Control Amplifier AM-1718/SRN-6	28	22 X 38 X 59	653
1	Radome CW-441/SRN-6	539	94 X 97 X 99	520
1	Equipment Spares	1.6	10 X 15 X 19	28
1	Equipment Spares	3.5	15 X 20 X 20	74
1	Equipment Spares	3.5	12 X 15 X 32	46
1	Equipment Spares	3.5	15 X 20 X 20	46
1	Equipment Spares	13.0	17 X 32 X 42	339
1	Power Distribution Transformer TF-235/URN-3	3.5	16 X 17 X 22	152

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Set AN/SRN-6 includes:		
1	Receiver-Transmitter Group OA-1532/SRN-6 c/o	25 X 34-1/8 X 72	1126
1	Coder-Indicator KY-235/URN		
1	Radio Receiver R-824/URN		
1	Control Duplexer C-2225/SRN-6		
1	Amplifier-Modulator AM-1701/URN		
1	Frequency Multiplier-Oscillator CV-589/URN		

AN/SRN-6 RADIO SET

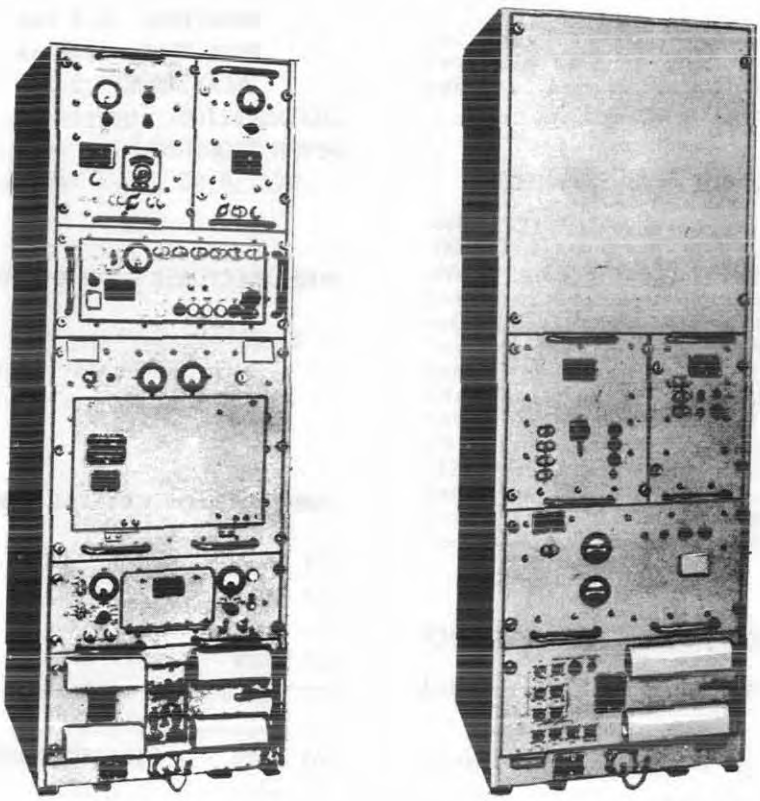
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Electrical Equipment Cabinet CY-2184/SRN-6		
1	Power Supply Assembly OA-1535/SRN-6 c/o	25 X 34-1/8 X 72	986
1	Power Supply PP-1763/URN		
1	Power Supply PP-1765/URN		
1	Power Supply PP-1766/URN		
1	Electrical Equipment Cabinet CY-2187/SRN-6		
1*	Antenna Group (Low-Band) OA-1545/SRN-6 c/o		
1	Antenna AS-889/SRN-6	43-1/2 dia X 76-7/8	750
1	Antenna Pedestal AB-540/SRN-6		
1	Electronic Control Amplifier AM-1718/SRN-6	11-13/16 X 29-1/4 X 49-1/2	450
1	Electronic Control Amplifier AM-1719/SRN-6	15-1/2 X 38-1/4 X 56-1/2	733
1	Radome CW-441/SRN-6	89-1/2 dia X 80-1/2	200
1*	Antenna Group (High-Band) OA-1546/SRN-6 c/o		
1	Antenna AS-890/SRN-6		
1	Antenna Pedestal AB-540/SRN-6		
1	Electronic Control Amplifier AM-1718/SRN-6	11-13/16 X 29-1/4 X 49-1/2	450
1	Electronic Control Amplifier AM-1719/SRN-6	15-1/2 X 38-1/4 X 56-1/2	733
1	Radome CW-441/SRN-6	89-1/2 dia X 80-1/2	200
1	Power Distribution Transformer TF-235/URN-3	10-7/8 X 11-7/16 X 14-3/8	110
2	Technical Manual NAVSHIPS 92986(A)	8-1/2 X 11	
1	Performance Standards Book NAVSHIPS 92986.31	8-1/2 X 11	
1	Maintenance Check-Off Book NAVSHIPS 92986.41	8-1/2 X 11	

* Either the low band or the high band group is supplied.

Radio-Navigational Aid

RADIO SET AN/SRN-6A



Radio Set AN/SRN-6A

FUNCTIONAL DESCRIPTION

Radio Set AN/SRN-6A, its associated antenna groups and accessories and Radio Set AN/ARN-21 make up an air navigation system through which an aircraft (equipped with Radio Set AN/ARN-21) can accurately determine its position. As many as one hundred aircraft may simultaneously obtain navigational information in conjunction with a single installation of Radio Set AN/SRN-6A.

Radio Set AN/SRN-6A is capable of receiving on any one of 126 frequencies in the range of 1025 to 1150 megacycles. The set can transmit on any one of 126 frequencies in the ranges of 962 to 1024 megacycles and 1151 to 1213 megacycles. Two types of antenna are available for use. Each antenna can operate on 63 channels, either in a lowband of frequencies or in a high band of frequencies. Lowband installations transmit at frequencies between 962 and 1024 megacycles and receive at frequencies between 1025 and 1087 megacycles. High band installations transmit at frequencies between 1151 and 1213 megacycles and receive at frequencies between 1088 and 1150 megacycles. Two frequencies are used in each channel, one for receiving and one for transmitting. In low band installations, the frequency used for receiving is 63 megacycles above the frequency used for transmitting in the same channel. In high band installations, the receiving frequency is 63 megacycles below the transmitting frequency.

This set employs a SAL-89 Klystron in the transmitter output stage, but is designed for shipboard installations. The antenna group used includes facilities required to compensate on shipboard, for roll, pitch and bearing variations.

No field changes in effect at time of preparation (26 January 1969).

Radio-Navigational Aid

AN/SRN-6A RADIO SET

RELATION TO OTHER EQUIPMENT

This equipment is similar to Radio Set AN/URN-3 except it is improved in performance, has more ease of maintenance, and has a different power requirements.

EQUIPMENT REQUIRED BUT NOT SUPPLIED

(1) Antenna Group (Low-Band) OA-1545/SRN-6; (1) Antenna Group (High-Band) OA-1546/SRN-6; (1) Power Meter Pulse Counter TS-891/URN-3; (1) Switch-Test Adapters SA-420/URN-3 (Technical Manual NAVSHIPS 92809); (1) Oscillator OS-54/URN-3 (Technical Manual NAVSHIPS 92778); (1) Pulse Analyzer Signal Generator TS-890/URN-3 (Technical Manual NAVSHIPS 92819); (1) Pulse Sweep Generator SG-121A/URN-3 (Technical Manual NAVSHIPS 92745); (1) Radio Frequency Monitor MX-1627/URN-3; (1) Antenna AT-592/URN-3 (Technical Manual NAVSHIPS 92975(A)); (1) Electrical Dummy Load DA-177/U (Instruction Sheet NAVSHIPS 93065).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TYPE OF RECEPTION AND TRANSMISSION: Coded pulses.
FREQUENCY RANGE
LOW BAND: 962 mc to 1024 mc for transmitting.
1025 to 1087 mc for receiving
HIGH BAND: 1151 mc to 1213 mc for transmitting
1088 mc to 1150 mc for receiving
POWER OUTPUT: 187.5 W (avg); 7.0 kw (peak).
FREQUENCY STABILITY
TRANSMITTER: ±25 kc.
RECEIVER: ±50 kc.
RECEIVER DATA
SELECTIVITY: Rejects properly coded interrogations on adjacent channels 80 db.
TRIGGERING LEVEL: 125 db below 1 W (no load); 124 db below 1 W (full load).
BANDWIDTH: Trigger level does not deteriorate more than 3 db.
ECHO SUPPRESSION: Properly spaced pulse-pairs do not trigger the transmitter more than 20% of the time for any signal.
INTERMEDIATE FREQUENCY: 63 mc.
RESPONSE DELAY: 50 ±0.25 usec measured at a standard signal strength of 50 db.
INTERROGATION PULSE REPETITION FREQUENCY: 24 cps from each 95 source and 150 cps from each of 5 other sources.
PULSE DATA (TRANSMITTING)
RATE: 3600 pulse-pairs per sec.
PULSE-PAIR SPACING: 12 usec.
PULSE SHAPE
DURATION: 3.5 usec.
RISE TIME: 2.5 usec.
DECAY TIME: 2.5 usec.
INSTALLATION: Shipboard.
POWER REQUIREMENTS: 440 v, 60 cy, 3 ph, 9.5 KVA 0.95 power factor, 20 amp per phase.

MANUFACTURER'S OR CONTRACTOR'S DATA

Stromberg-Carlson, Div of General Dynamics Corp, Rochester, New York.
Contract NObsr-71717.

TUBE AND/OR CRYSTAL COMPLEMENT

(2) 1N21C	(2) 1N25	(8) 1N69
(5) 1N126	(2) 1N256	(6) 2C39A
(5) 5R4WGB	(1) 6AH6	(3) 6J4WA
(2) 6X4W	(1) 6V3A	(13) 12AT7WA
(1) SAL-89	(8) 829B	(2) 5725/6AS6W
(3) 5651WA	(11) 5670	(8) 5687WA
(6) 8020	(10) 5654/6AK5W	(5) 6626/OA2WA
(2) 836	(1) 5814A	(3) 6627/OB2WA
(2) 6080WA	(5) 6293	(1) 6005/6AQ5W
(3) 5726/6AL5W		

Total Tubes: (121)

(126) CR-32/U

Total Crystals: (126)

REFERENCE DATA AND LITERATURE

NAVSHIPS 93177(A): Technical Manual for RADIO SETS AN/GRN-9B and AN/SRN-6A.

TYPE CLASSIFICATION	(NAVY)
DESIGN COGNIZANCE	USN, BUSHIPS
PROCUREMENT COGNIZANCE SPEC:	MIL-R-19390 (SHIPS)
STOCK NO.	
R.D.B. IDENT. NO.	

RADIO SET AN/SRN-6A

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Receiver-Transmitter Group OA-1532A/SRN-6	105	43 X 44 X 90	1850
1	Power Supply Assembly	105	43 X 44 X 90	1720

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Set AN/SRN-6A includes:		
1	Receiver-Transmitter Group OA-1532A/SRN-6 C/O:	25 X 34-1/8 X 72	1173
1	Coder-Indicator KY-235/URN		
1	Radio Receiver R-824/URN		
1	Control-Duplexer C-2225A/SRN-6		
1	Amplifier-Modulator AM-1701/URN		
1	Frequency Multiplier-Oscillator CV-589A/URN		
1	Electrical Equipment Cabinet CY-2184/SRN-6		
1	Power Supply Assembly OA-1535/SRN-6 C/O:	25 X 34-1/8 X 72	1051
1	Power Supply PP-1763/URN		
1	Power Supply PP-1765/URN		
1	Power Supply PP-1766/URN		
1	Electrical Equipment Cabinet CY-2187/URN		
3	Power Distribution Transformer TF-235/URN-3	10-7/8 X 11-7/16 X 14-3/8	110
2	Technical Manual NAVSHIPS 93177	8-1/2 X 11	
2	Maintenance Standards Book NAVSHIPS 93177.42		
1	Operating Instructions Charts NAVSHIPS 93177.32		

TARGET CONTROL SYSTEM AN/SRW-4

FUNCTIONAL DESCRIPTION

The AN/SRW-4 is designed to provide remote control of aircraft targets when installed aboard a ship or at shore installations. It provides for two remote control stations; CIC for out-of-sight control and ADS for in-sight control. 100% backup equipment is provided with manual switching system designed for installation on TERRIER and TARTAR Guided Missile Ships.

No field changes in effect at time of preparation (31 August 1960).

ELECTRICAL AND MECHANICAL CHARACTERISTICS

OUTPUT: F9; 100 W or more.
TYPE OF FREQUENCY CONTROL: Crystal and master oscillator.
POWER: 1400 W max, 700 W stand-by; 9 power factor.
FREQUENCY RANGE: 406 to 549 mc; 1 band.
OPERATING POWER RQMT: 102 to 106 v ac, 55 to 65 cps, single ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

Babcock Radio Engineering Inc., Costa Mesa, California.
Contract NOas 59-8018r.

TUBE AND/OR CRYSTAL COMPLEMENT

Electron Tube and/or Crystal data not available.

REFERENCE DATA AND LITERATURE

Nomenclature Card for Target Control System AN/SRW-4.

TYPE CLASSIFICATION	(NAVY)
DESIGN COGNIZANCE	NAVY BUAER
PROCUREMENT COGNIZANCE	MIL-T-21010
STOCK NO.	
R.D.B. IDENT. NO.	

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Target Control System AN/SRW-4 Incl:		
2	Control Transmitter C-2803/SRW-4	3 x 8 x 8-7/8	
2	Control Transmitter C-2802/SRW-4	3-7/16 x 8-11/16 x 9-3/8	
1	Control Transmitter C-2801/SRW-4	5-7/8 x 6-1/2 x 8-3/4	
1	Control Transmitter C-2804/SRW-4	3-1/2 x 7-5/8 x 9-1/4	
1	Interconnecting Box J-1039/SRW-4	4 x 10-3/8 x 11	
1	Interconnecting Box J-1038/SRW-4	5-1/4 x 10-3/4 x 11-3/8	
1	Relay Assy RE-434/SRW-4	7-9/16 x 24-5/8 x 33-3/16	
1	Power Supply PP-2288/SRW-4	12-5/8 x 15-5/8 x 27-1/8	
2	Transmitter Set, Radio AN/URW-14		
1	Interconnecting Box J-1052/SRW-4	5-1/4 x 10-3/4 x 11-3/8	
1	Test Harness Transmitting Set AN/URM-111	13-9/32 x 22-5/16 x 25-3/4	
2	R.F. Transmission Line Switch SA-631/SRW-4	10 x 10 x 24	
2	Antenna Ass'y AT-781A/U	25-1/2 dia x 80 lg	91

DIRECTION FINDER SET AN/TRD-12

FUNCTIONAL DESCRIPTION

The Direction Finder Set AN/TRD-12 is designed to provide instantaneous visual direction finding information from radio frequency signals in the frequency range from 225.0 megacycles to 399.9 megacycles (MC).

No field changes in effect at time of preparation (18 April 1961).

RELATIONS TO OTHER EQUIPMENT

The AN/TRD-12 is a Direction Finder Set AN/URD-4 modified into a transit-case housed equipment that can be readily transported, erected and disassembled.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TYPE OF RECEPTION: AM, FM, (A9, F9).
TYPE OF FREQUENCY CONTROL: Crystal.
TYPE OF RECEIVER: Superheterodyne.
SENSITIVITY: 10 microvolts for 10 db signal to noise ratio.
BANDWIDTH: 50 kc minimum for 6 db attenuation.
NUMBER OF TUNING BANDS: 1 band.
NUMBER OF PRESET FREQUENCIES: 20.
INTERMEDIATE FREQUENCIES: 15.325 mc & 2.8072 mc.
RECEIVER AUDIO OUTPUT: 100 mw into 600 ohm impedance headphones.
IMPEDANCE
ANTENNA: 52 ohms.
R.F. INPUT: 52 ohms.
HEADPHONES: 600 ohms.
NUMBER OF CHANNELS: 1750.
CHANNEL SPACING: 0.1 mc apart.
TYPE OF INDICATION: Visual (5 inch CRT).
OPERATING FREQUENCY RANGE: 225.0 to 399.9 mc.
OPERATING POWER RQMT: 115 v ac, 55 to 65 cps, single ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

U. S. M. C. Supply Forwarding Annex, San Francisco, California.

TUBE AND/OR CRYSTAL COMPLEMENT

(2) 1Z2	(1) 5CP12
(2) 5R4WGB	(1) 5651WA
(5) 5654-6AK5W	(19) 5670
(1) 5686	(17) 5725-6AS6W
(5) 5726-6AL5W	(3) 6F4
(1) 6L6WGB	(1) 6X4WA
(2) 6080WA	

Total Tubes: (64)

(1) CR-18/U (1) CR-28/U (17) CR-27/U

Total Crystals: (19)

No Semi-Conductor Devices used.

REFERENCE DATA AND LITERATURE

Nomenclature Card for Direction Finder Set AN/TRD-12.
NAVSHIPS 93400: Preliminary Data Form for Direction Finder Set AN/TRD-12.
NAVSHIPS 91912(A): Technical Manual for Direction Finder Set AN/URD-4.

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

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
	Direction Finder Set AN/TRD-12 consists of:		
1	Receiver Radio R-353/URD-4		
1	Indicator, Azimuth IP-93/URD-4		
1	Power Supply PP-556/URD-4	10.41 x 20.5 x 21.0	

AN/TRD-12 DIRECTION FINDER SET

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna AS-514/URD-4	18-3/4 dia x 73-1/8 lg	
1	Junction Box J-306/GR	2 x 5 x 10	
1	Cabinet, Electrical Equipment CY-1881/TRD-12	21-1/2 x 23-3/4 x 26-1/6	
1	USMC Case, Receiver Dwg No. SFA, SF (Elect) 1014		
1	Cabinet, Electrical Equipment CY-1882/TRD-12	13-3/4 x 21 x 28-1/8	
1	USMC Case, Indicator Dwg No. SFA, SF (Elect) 1015		
1	Chest type BC-5		
2	USMC Reel, Cable Dwg No. SFA, SF (Elect) 1016		
1	Mast AB-440/GR		
1	Support, Antenna AB-441/GR	9-1/4 dia x 58 lg	
1	Test Set, Radio TS-777/URD-4	3-1/2 x 6-1/2 x 8	4
1	USMC Headset Type No. MHS-7		
1	USMC Cable Ass'y, Power, Electrical Dwg No. SFA, SF (Elect) 1021		
1	USMC Cable Ass'y, Power, Electrical Dwg No.		
4	SFA, SF (Elect) 1021 Sheet 5 item 13		
2	Cable Ass'y, R.F. CG-1068/U	0.206 dia x 18 lg	
2	Cable Ass'y, R.F. CG-1068/U	0.206 dia x 36 lg	
1	Cable Ass'y, Special Purpose, Electrical CX-2356/U		
1	Cable Ass'y, Special Purpose, Electrical CX-2357/U		
1	Cable Ass'y Special Purpose, Electrical CX-2358/U		

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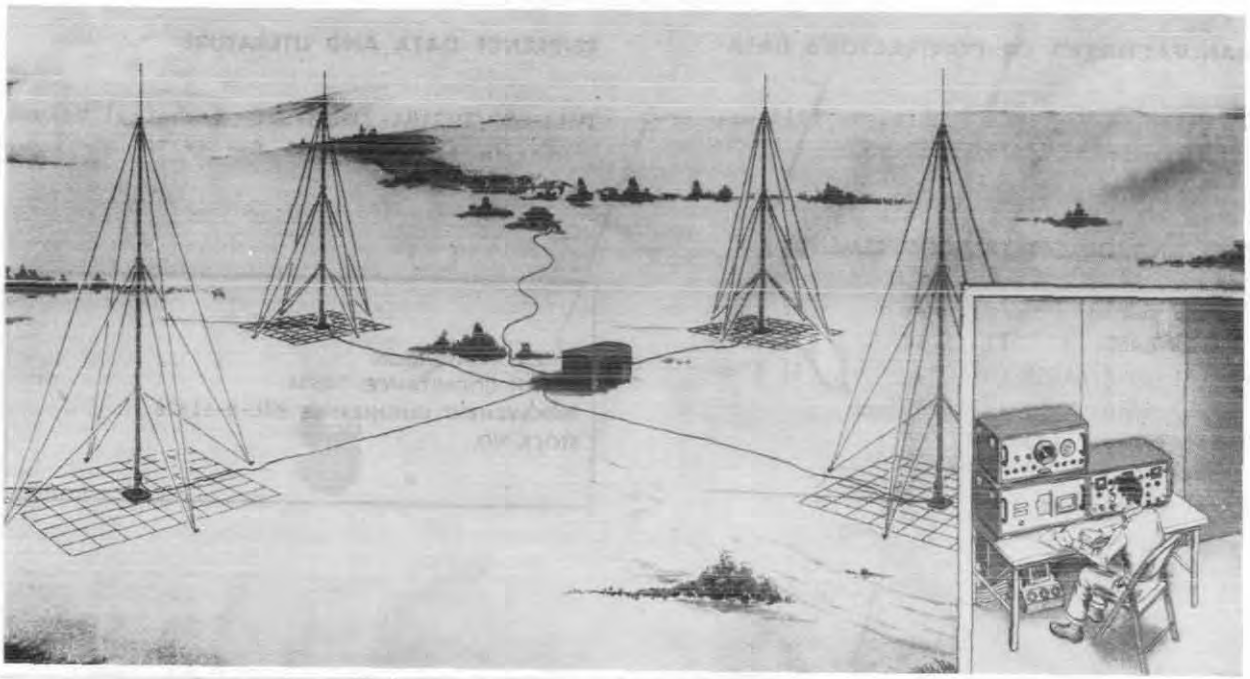
Radio-Navigational Aids

DIRECTION FINDER SET AN/TRD-3



Direction Finder Set AN/TRD-3

FUNCTIONAL DESCRIPTION

The AN/TRD-3 consists of an assembly of equipments for use in the detection, identification, frequency measurement, and determination of bearing (azimuth) of radio frequency (RF) transmissions from fixed, mobile, or portable radio sets operating in the frequency range of 100 to 1500 kilocycles (KC). The direction finder set will give bearings on signals from continuous wave (CW), amplitude modulated (AM), radioteletype, facsimile, or other types of radio frequency transmission. (Azimuth bearings of static and jamming signals can also be determined). When used in conjunction with other direction finder sets, positions of stations, called fixes, can be determined by triangulation.

The AN/TRD-3 is designed as a semifixed installation with an easily erected and disassembled antenna system, which will permit a change of site with a minimum of delay. Accessory items furnished with the direction finder set aid in the proper orientation of the antenna system. Two (2) methods of obtaining bearings are the visual method and the aural-null method.

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

ELECTRICAL AND MECHANICAL CHARACTERISTICS

ANTENNA SYSTEM
- ANTENNA TYPE: Crossed Adcock array of vertical monopoles.
- ANTENNA MONOPOLE HEIGHT: 64 ft.
- ARRAY DIAGONAL DISTANCE: 180 ft.

TYPE OF SIGNALS: CW, AM, radioteletype, and facsimile.

BEARING PRESENTATION
- AURAL-NULL: Null on headset or loudspeaker, bearing read from graduated scale.
- VISUAL: Display on cathode-ray tube screen; bearing read from graduated scale around screen.

VISUAL PRESENTATION
- NORMAL RECEPTION WITHOUT SENSE APPLIED: Propeller-shaped pattern.
- NORMAL SENSE INDICATION: Arrowhead-shaped pattern.

INSTRUMENTAL ACCURACY: $\pm 2^{\circ}$.

POWER CONSUMPTION: 400 watts.

FREQUENCY RANGE
- DIRECTION FINDING SYSTEM: 100 to 1,500 kc.
- RADIO RECEIVER: 15 to 1,500 kc.
- TARGET TRANSMITTER: 100 to 2,000 kc.

OPERATING POWER RQMT: 115 v or 230 v AC, 50 to 60 cps line frequency.

Radio-Navigational Aids

April 1959

AN/TRD-3 DIRECTION FINDER SET

MANUFACTURER'S OR CONTRACTOR'S DATA

Raytheon Mfg., Co., Chicago, Illinois
Contract 11674-PH-52-93.

REFERENCE DATA AND LITERATURE

TM11-629/T031R4-2TRD3-21: Technical Manual for Direction Finder Set AN/TRD-3.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) 5CP1B	(1) 5R4WGY	(1) 1Z3
(1) 6AS7	(1) 5750	(1) 5693
(1) 6005/6AQ5W	(1) OB2	(1) 5749
(2) 6AK6	(1) 5Y3GT	

Total Tubes: (13)

(4) 1N69

Total Crystals: (4)

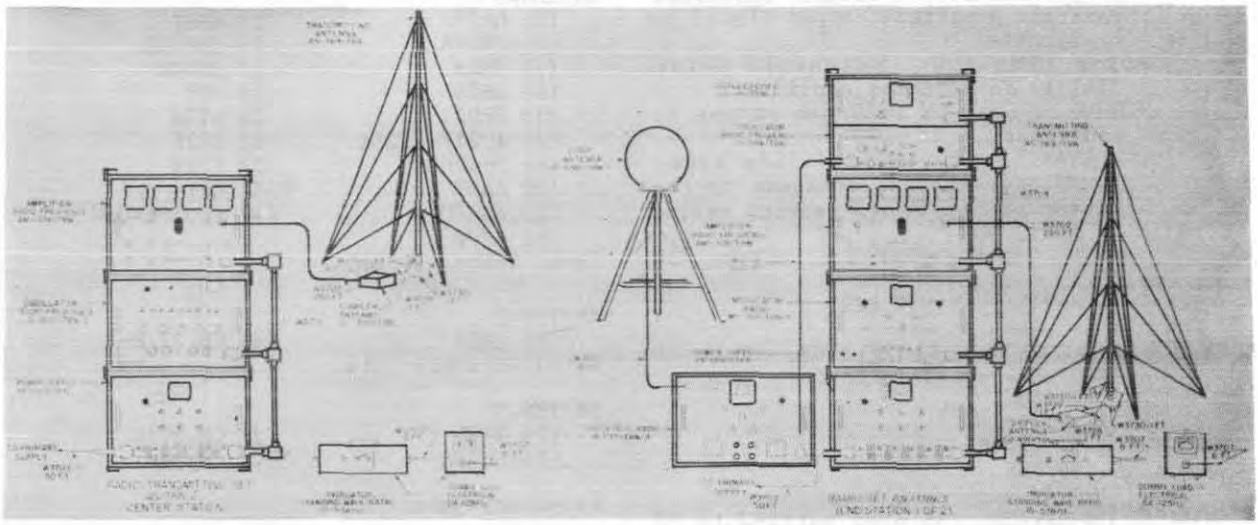
TYPE CLASSIFICATION
DESIGN COGNIZANCE TASSA
PROCUREMENT COGNIZANCE MIL-R-11378
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
5	Antenna AS-595( )/GR		
1	Azimuth Indicator IP-137( )/GRD	10-1/2 X 17 X 19	
1	Generator Set Gasoline Engine PU-236( )/G		
1	Radio Transmitter T-339( )/TRD-3	14-1/4 X 14-3/4 X 16-1/2	
1	Shelter S-44( )G		
1	Goniometer Electrical GO-9( )/TRD-3	5 X 5-1/2 X 7-1/4	
1	Goniometer Electrical GO-5( )/GRD	5 X 5-1/2 X 7-1/4	
1	Radio Receiver R-389( )/URR		

RADIO TRANSMITTING SET AND RADIO SET

AN/TRN-2,3



Radio Transmitting Set and Radio Set AN/TRN-2, AN/TRN-3

FUNCTIONAL DESCRIPTION

The AN/TRN-2 and AN/TRN-3 is a LORAC method of radionavigation of the LORAC type "A" system, comprised of one Radio Transmitting Set AN/TRN-2 and two Radio Sets AN/TRN-3, each consisting of a receiver and a transmitter. The equipment is transportable but it is operated at fixed sites.

The radio frequency energy radiated from the fixed stations establishes a radiowave interference pattern, hyperbolic in nature, from the vicinity of the stations outward, covering an area of thousands of square miles of the earth's surface. Any ship or vehicle in this area equipped with a receiver employing phase-measuring equipment, such as Radio Receiving Set AN/SRN-2, can navigate with a high degree of accuracy under conditions unfavorable to other means of navigation.

No field changes in effect at time of preparation (15 November 1956).

RELATION TO OTHER EQUIPMENT

Similar to AN/TRN-2, 3, 4, 5 (XN-1's).

Equipment Required but not Supplied: (3) Antenna AS-769/TRN, (1) Audio Oscillator TS-382A/U, (1) Frequency Meter and Calibrator Equipment Model LR, (1) Multimeter ME-25A/U, (2) Oscilloscope OS-8/U, (3) Radio Set, Communications, (1) Radio Test Set AN/PRM-1, (1) RF Signal Generator AN/URM-25, (1) Tube Tester TV-3A/U.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY DATA
- RANGE: 1.7 to 2.5 mc.
- CHANNELS: 2 separated by 20 kc min.
- BANDWIDTH: 1.5 kc max for any channel.

FREQUENCY CONTROL DATA
- TYPE: Crystal (enclosed in crystal oven).
- FREQUENCY VARIATION: Less than 1 cps per mc per deg C at 75 ±1 deg C.

EMISSION DATA
- AN/TRN-2: A0, A1, A3.
- AN/TRN-3: A0, A1, A3, A9.

MODULATION (AN/TRN-3)
- A9: Capable of at least 90% modulation, with less than 10% hormonic distortion.

INPUT POWER (DC PLATE): 500 W at each RF amplifier.

INPUT IMPEDANCE
- MODULATOR: 600 ohms.
- RF AMPLIFIER: 50 ohms microphone input at speech amplifier.

REFERENCE RECEIVER DATA
- TYPE: Superheterodyne.
- TYPE RECEPTION: Heterodyne (2 or more CW signals).
- FREQUENCY BAND: 1.7 to 2.5 mc, semi-fixed tunable.

INTERMEDIATE FREQUENCY: 455 kc.

FREQUENCY CONTROL: Crystal controls electron coupled local oscillator.
- BANDWIDTH: 3000 cps at 3 db points.
- SENSITIVITY: 5 uv.
- AVC DATA
  - RF-IF LEVEL: Delayed AVC voltage developed by signal at audio amplifier controls gain of RF and IF amplifiers.

AN/TRN-2,3 RADIO TRANSMITTING SET AND RADIO SET

AF LEVEL: Audio AVC circuit maintains constant-amplitude output signal to transmitter.
NOISE LIMITING: Automatic noise limiter in detector amplifier.
OUTPUT IMPEDANCE: 600 ohm output to modulator.
ANTENNA: 3 ft shielded loop type, quadripod mounted, connects to receiver through 52 ohm coaxial cable.

OPERATING CONDITIONS
TEMPERATURE RANGE (AMBIENT): -20 to +50 deg C.
RELATIVE HUMIDITY: 95% max.
ELEVATION: 5000 ft max.

POWER REQUIREMENTS: 115 v ±10%, 50 to 60 cps or 400 cps, single phase.

POWER CONSUMPTION
AN/TRN-2: 1100 W.
AN/TRN-3: 2000 W.

ANTENNA AS-769/TRN.
TYPE: 100 ft sectional tower.
INPUT IMPEDANCE: 35 ohms matched to 52 ohm transmission line by antenna coupler.

MANUFACTURER'S OR CONTRACTOR'S DATA

Seismograph Service Corporation, Tulsa, Oklahoma,
Contract NObsr 64651, dated 25 February 1955

TUBE AND/OR CRYSTAL COMPLEMENT

AN/TRN-2

(1) 0B2WA	(2) 6BQ6GT
(2) 3B28	(1) 6X4WA
(2) 4D21/4-125A	(1) 807
(2) 5R4WGB	(2) 5726
(2) 6AG7	(3) 5814
(1) 6AS7G	(1) 6005/6AQ5W
(5) 6AU6	

Total Tubes: (25)

AN/TRN-3

(2) 0A2WA	(1) 6BA7
(4) 0B2WA	(2) 6BQ6GT
(1) 2X2A	(1) 6X4WA
(4) 3B28	(1) 807
(1) 3RP1	(2) 811A
(2) 4D21/4-125A	(4) 5726
(4) 5R4WGB	(3) 5749
(2) 6AG7	(16) 5814
(2) 6AS7G	(4) 6005/6AQ5W
(6) 6AU6	

Total Tubes: (62)

AN/TRN-2

(2) 1N35	(4) CR-27/U

Total Crystals: (6)

AN/TRN-3

(2) 1N35	(2) CR-27/U
(4) 1N54A	(2) CR/180

Total Crystals: (10)

REFERENCE DATA AND LITERATURE

NAVSHIPS 92643(A): Technical Manual for Radio Transmitting Set AN/TRN-2 and Radio Set AN/TRN-3.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE SHIPS-T-1867,
STOCK NO. SHIPS-R-1858

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
3	Power Supply PP-1440/TRN	6.3	17 X 25 X 26	240
2	Radio Modulator MD-267/TRN-3	6.3	17 X 25 X 26	310
3	Radio Frequency Amplifier AM-1378/TRN	6.3	17 X 25 X 26	150
2	Oscilloscope OS-60/TRN-3 including: Radio Frequency Oscillator O-398/TRN	6.3	17 X 25 X 26	200
3	Antenna Coupler CU-490/TRN	8.5	21 X 26 X 28	109
2	Radio Receiver R-733/TRN-3	6.3	17 X 25 X 26	150
2	Antenna AT-648/TRN-3 (Loop Only)	8.8	9 X 41 X 41	77
2	Stand, Antenna	9.6	14 X 15 X 80	160
3	Standing Wave Ratio Indicator ID-538/U	0.8	7.5 X 9.5 X 19	24

RADIO TRANSMITTING SET AND RADIO SET

AN/TRN-2,3

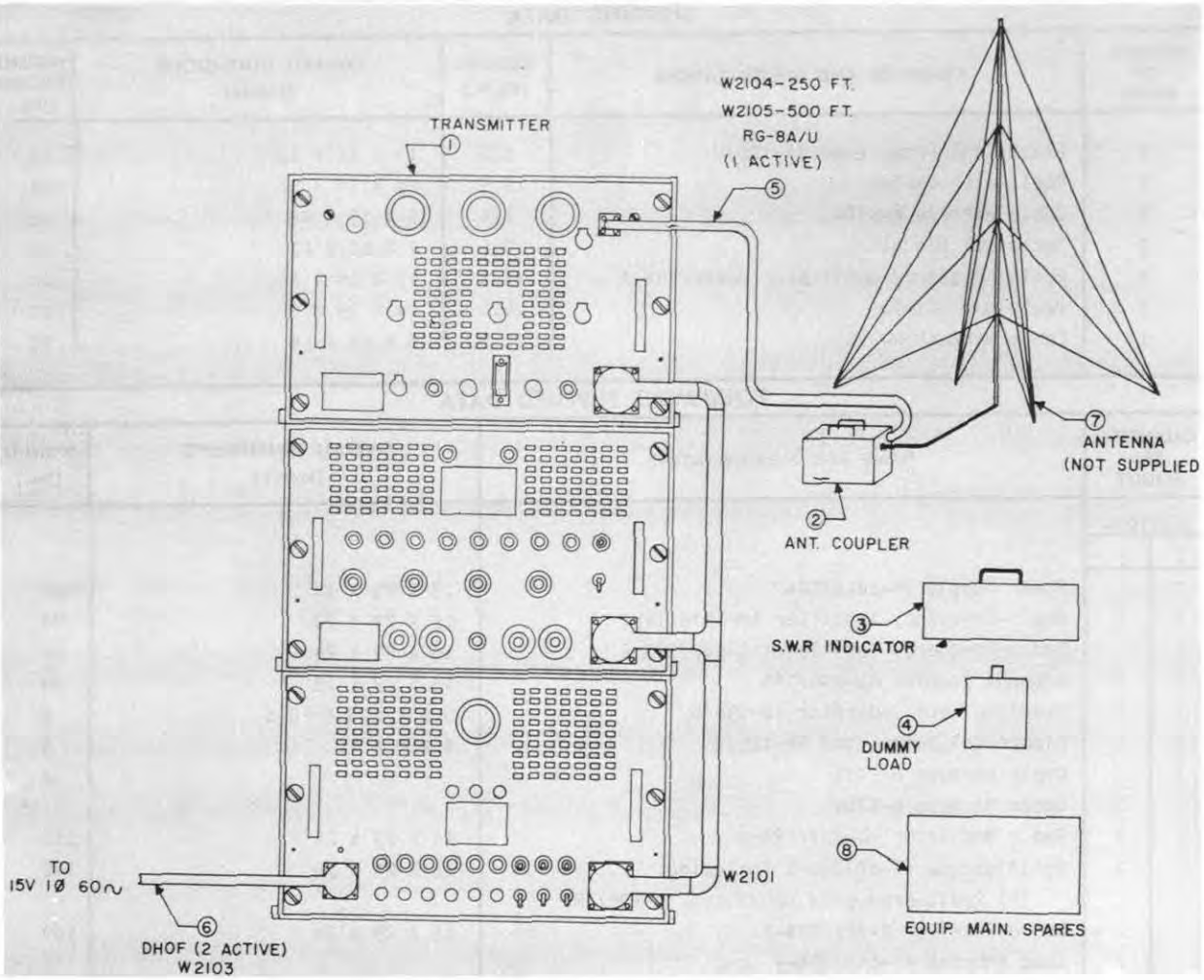
SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
3	Electrical Dummy Load DA-125/U	1.2	10 X 12 X 18	26
2	Reel, with Cables	13.5	24 X 30 X 32	505
2	Cable Harness W-3704	1.6	5 X 13 X 45	45
3	Technical Manuals	0.6	7 X 10 X 12	14
1	Radio Frequency Oscillator O-402/TRN-2	6.3	17 X 25 X 26	140
1	Reel, with Cable	4.1	14 X 23 X 23	87
1	Cable Harness W-3701	1.3	5 X 13 X 34	20

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT		NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
AN/TRN-				
2	3			
1	1	Power Supply PP-1440/TRN	15 X 23 X 24	180
1	1	Radio-Frequency Amplifier AM-1378/TRN	15 X 23 X 24	90
1		Radio-Frequency Oscillator O-402/TRN-2	15 X 23 X 24	80
1	1	Antenna Coupler CU-490/TRN	15 X 23 X 23	49
1	1	Standing Wave Indicator ID-538/U	5.5 X 6.5 X 15.5	8
1	1	Electrical Dummy Load DA-125/U	6 X 9 X 11	5
1		Cable Harness W-3701		5
	1	Cable Harness W-3704		7.5
	1	Radio Modulator MD-267/TRN-3	15 X 23 X 24	250
	1	Oscilloscope OS-60/TRN-3 including: (1) Radio-Frequency Oscillator O-398/TRN	15 X 23 X 24	140
	1	Radio Receiver R-733/TRN-3	15 X 23 X 24	100
	1	Loop Antenna AT-648/TRN-3		125

RADIO TRANSMITTING SET AN/TRN-2X,AN/TRN-3X



Radio Transmitting Set AN/TRN-2X,3X

FUNCTIONAL DESCRIPTION

The AN/TRN-2X and AN/TRN-3X is a LORAC method of radionavigation of the LORAC type "A" system, comprised of one Radio Transmitting Set AN/TRN-2X and two Radio Sets AN/TRN-3X. The Radio frequency energy radiated by these transmitters cover a large area at the earth's surface. The radiation pattern may be plotted on a geographical map as a grid composed of interesting hyperbolic lines.

Any ship, or other carrier, using phase-measuring equipment such as Radio Receiving Set AN/SRN-7 can navigate with a high degree of accuracy within an area covered by the LORAC grid. Fixing a position at the receiving set consists only in reading two position indicator dials and in locating these readings as map coordinates. Each indicator dial shows a lane number and the position within that lane.

No field changes in effect at time of preparation (15 May 1958).

RELATION TO OTHER EQUIPMENT

The AN/TRN-2X is directly interchangeable with the Radio Transmitting Set AN/TRN-2. However, the individual units which make up the AN/TRN-2X are not directly interchangeable with the units which make up the AN/TRN-2.

The AN/TRN-3X is directly interchangeable with Radio Set AN/TRN-3. However, the individual units which make up the AN/TRN-3X are not directly interchangeable with the units which make up the AN/TRN-3.

Radio-Navigational Aids

April 1958

AN/TRN-2X,AN/TRN-3X RADIO TRANSMITTING SET

Equipment Required but not Supplied: Antenna AS-769/TRN, Audio Oscillator TS-382/U, Combined Heterodyne Frequency Meter and Crystal Controlled Calibrator Equipment LR, Multimeter ME-25A/U, Oscilloscope OS-8/U, RF Signal Generator AN/URM-25, Tube Tester TV-3A/U, Radio Test Set AN/PRM-1, and Radio Set.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

RADIO TRANSMITTING SET AN/TRN-2X

FREQUENCY DATA

RANGE: 1.7 to 2.5 mc.

CHANNELS: 2 separated by 20 kc min.

BANDWIDTH: 1.5 kc max for any channel.

FREQUENCY CONTROL DATA

TYPE: Crystal (Enclosed in crystal oven).

FREQUENCY VARIATION: Less than 1 cps per mc per deg C at 75 ±deg C.

TYPE OF EMISSION: AO.

POWER INPUT TO FINAL AMPLIFIER: 500 W.

POWER REQUIRED: 115 v ±10%, 50 to 60 cps, 1 ph.

POWER CONSUMPTION: 1100 W.

POWER OUTPUT: 300 W across 52 ohm load.

RADIO SET AN/TRN-3X

FREQUENCY DATA

RANGE: 1.7 to 2.5 mc.

CHANNELS: 2 separated by 20 kc min.

BANDWIDTH: 1.5 kc max for any channel.

FREQUENCY CONTROL DATA

TYPE: Crystal (Enclosed in crystal oven).

FREQUENCY VARIATION: Less than 1 cps per mc per deg C at 75 ±deg C.

TYPE OF EMISSION: AO, A9.

POWER INPUT TO FINAL AMPLIFIER: 500 W.

POWER REQUIRED: 115 v ±10%, 50 to 60 cps, 1 ph.

POWER CONSUMPTION: 2000 W.

POWER OUTPUT: 300 W across 52 ohm load.

RADIO RECEIVER

TYPE RECEIVER: Superheterodyne.

FREQUENCY RANGE: 1.7 to 2.5 mc.

INTERMEDIATE FREQUENCY: 455 kc.

FREQUENCY CONTROL: AT-cut crystals, controls electron-coupled local oscillator.

BANDWIDTH: 300 cps at 6 db voltage points, 8000 cps at 60 db voltage points.

SENSITIVITY: 5 mv.

RF-IF LEVEL: AVC voltage developed by signal at detector controls gain on R-F and I-F amplifiers.

AF LEVEL: Audio AGC circuit maintains constant amplitude output signal to modulator.

OUTPUT IMPEDANCE: 600 ohm output to modulator.

ANTENNA: Three foot diameter shielded loop, quadripod mounted. Connects to receiver through a 52 ohm coaxial cable.

MANUFACTURER'S OR CONTRACTOR'S DATA

Seismograph Service Corp; Tulsa, Oklahoma. Contract NObsr-71572 dated 8 October 1957.

TUBE AND/OR CRYSTAL COMPLEMENT

AN/TRN-2X

(1) OA2WA	(2) 3B28
(2) 4D21	(2) 5R4WGB
(3) 6AG7	(4) 6AU6WA
(2) 5726	(1) 5751
(1) 5814A	(2) 5933WA
(1) 6336	

Total Tubes: (21)

AN/TRN-3X

(4) OA2WA	(1) OB2WA
(1) 2X2A	(4) 3B28
(1) 3RP1	(2) 4D21
(4) 5R4WGB	(2) 6AG7
(3) 6AU6WA	(2) 811A
(6) 5726	(4) 5749
(1) 5750	(3) 5751
(13) 5814A	(2) 5933WA
(3) 6005	(2) 6336

Total Tubes: (58)

Crystal data not available.

REFERENCE DATA AND LITERATURE

NAVSHIPS 93068: Technical Manual for Transmitting Set AN/TRN-2X and AN/TRN-3X.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.
R.D.B. IDENT. NO.

RADIO TRANSMITTING SET AN/TRN-2X,AN/TRN-3X

SHIPPING DATA

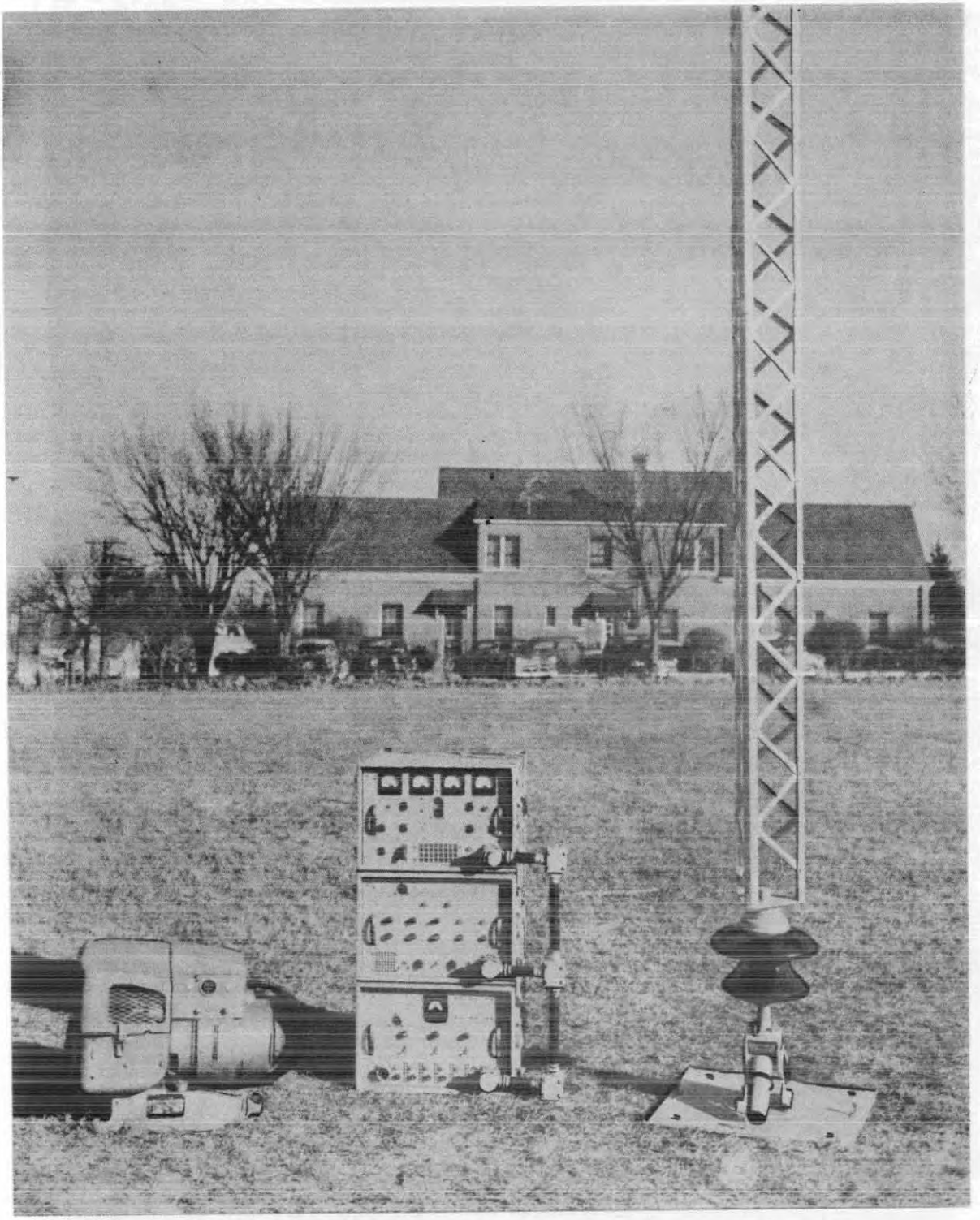
NUMBER OF BOXES		CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
AN/TRN-2X	AN/TRN-3X				
1	1	Power Supply PP-1827/TRN	9.2	19 X 26 X 32	300
	1	Modulator-Power Supply MD-314/TRN-3X	9.2	19 X 26 X 32	330
1	1	Radio Frequency Amplifier AM-1761/TRN	9.2	19 X 26 X 32	196
	1	Oscilloscope OS-80/TRN-3X	9.2	19 X 26 X 32	256
	1	Radio Frequency Oscillator O-510/TRN-3X		Included with Oscilloscope	
1	1	Antenna Coupler CU-490A/TRN	6.7	18 X 26 X 27	119
	1	Radio Receiver R-838/TRN-3X	9.2	19 X 26 X 32	209
	1	Antenna (Loop) AT-648A/TRN-3	8.8	9 X 41 X 41	112
	1	Antenna (Stand)	9.6	14 X 15 X 80	214
1	1	Standing Wave Ratio Indicator ID-538A/U	0.62	8 X 8 X 15	18
1	1	Electrical Dummy Load DA-125A/U	0.85	8 X 12 X 13	15
	1	Interconnecting Cables		On reels and boxed as required	550
1		Complete Equipment AN/TRN-2X	35.77		958
	1	Complete Equipment AN/TRN-3X	72.57		2319

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT		NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
AN/TRN-2X	AN/TRN-3X			
1	1	Radio Frequency Amplifier AM-1761/TRN	15 X 22 X 28	75
1		Radio Frequency Oscillator O-509/TRN-2X	Included with Oscelloscope	
	1	Radio Frequency Oscillator O-510/TRN-3X	Included with Oscilloscope	
1	1	Power Supply PP-1827/TRN	15 X 22 X 28	178
	1	Modulator-Power Supply MD-314/TRN-3X	15 X 22 X 28	208
	1	Oscilloscope OS-80/TRN-3X	15 X 22 X 28	134
	1	Radio Receiver R-838/TRN-3X	15 X 22 X 28	87
	1	Loop Antenna AT-648A/TRN-3		99
1	1	Antenna Coupler CU-490A/TRN	15 X 22 X 23	49
1	1	Electrical Dummy Load DA-125A/U	5-1/4 X 9-1/16 X 10-3/4	9
1	1	Standing Wave Ratio Indicator ID-538A/U	4-1/4 X 5-1/4 X 12-1/4	13
1		Cable Harness W2101		4
	1	Cable Harness W2102		4

April 1958

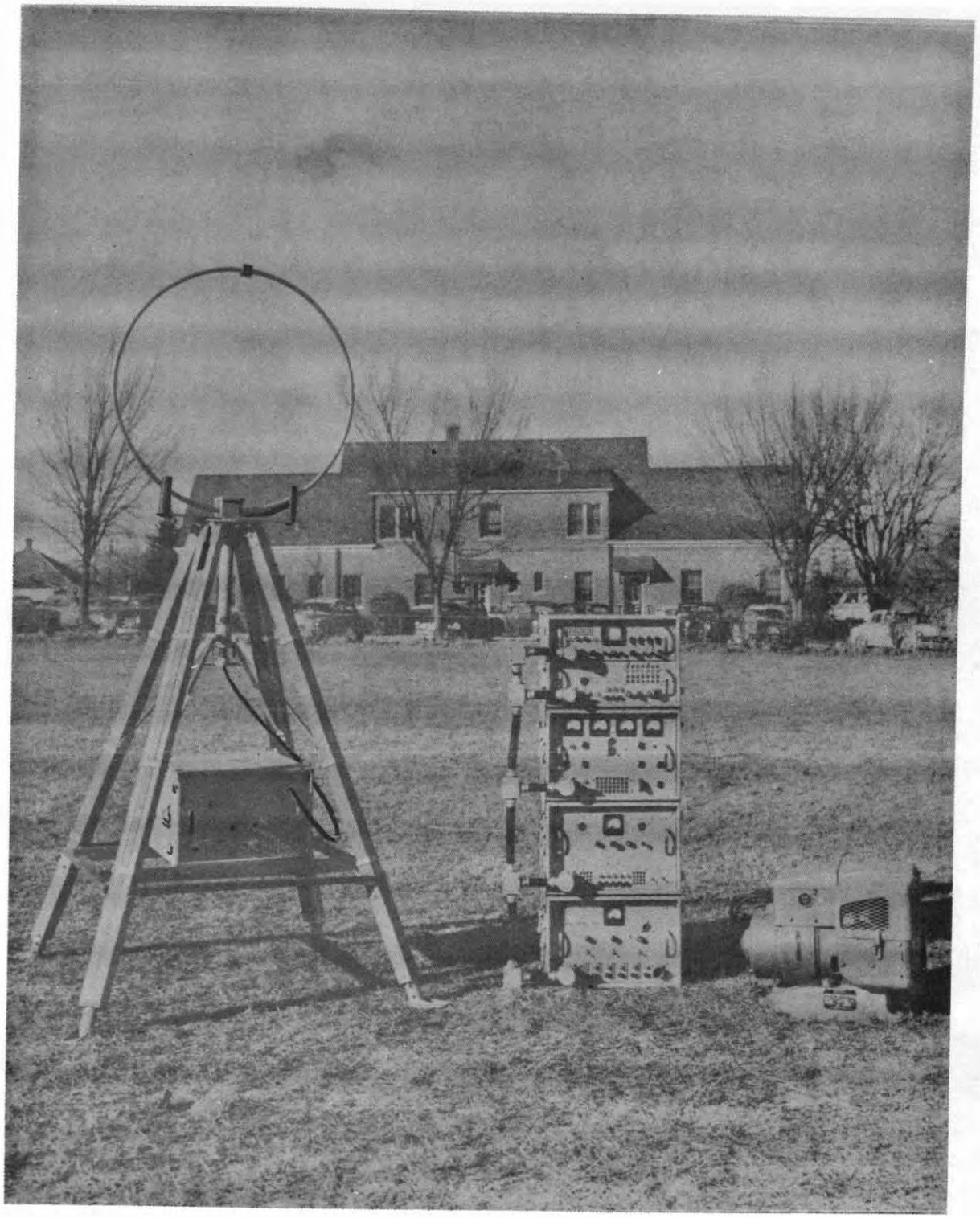
RADIO SET
RADIO TRANSMITTING SET



Radio Transmitting Set AN/TRN-2(XN-1)

AN/TRN-3(XN-1)
AN/TRN-2(XN-1)
RADIO SET
RADIO TRANSMITTING SET

April 1958



Radio Set AN/TRN-3(XN-1)

April 1958

RADIO SET AN/TRN-3(XN-1)
RADIO TRANSMITTING SET AN/TRN-2(XN-1)

FUNCTIONAL DESCRIPTION

The AN/TRN-2(XN-1) is a medium-frequency, transportable, fixed site transmitter designed to be used as the center station of three transmitter stations in a LORAC, or hyperbolic phase comparison navigation system. It includes a transmitter, antenna coupler, and transmitting antenna.

The AN/TRN-3(XN-1) is a medium-frequency, transportable, fixed site transmitter designed to be used as an end station of three transmitter stations in a LORAC, or hyperbolic phase comparison navigation system. It is comprised of the transmitter, antenna coupler, transmitting antenna, reference receiver, and loop antenna.

When used as part of a LORAC system the AN/TRN-2(XN-1) and AN/TRN-3(XN-1) are each instrumental in establishing a radio-wave interference pattern of hyperbolic nature in the vicinity of the stations, and outward, covering an area of thousands of square miles at the earth's surface. Any ship or vehicle in this area equipped with a suitable receiver and phase-measuring equipment can navigate with a high degree of precision under conditions unfavorable to other means of navigation.

Telephone communication is possible between the three transmitter sites.

No field changes in effect at time of preparation (17 December 1957).

RELATION TO OTHER EQUIPMENT

The receiving equipment designed for use in this system is the Radio Receiving Set AN/SRN-2(XN-1).

Equipment Required but not Supplied: Vacuum-tube voltmeter, AF Signal Generator, RF Signal Generator and gasoline engine generator.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

GENERAL
- OPERATING CONDITIONS
- AMBIENT TEMP RANGE: −20 to +50 deg C.
- RELATIVE HUMIDITY: 95% max.
- ELEVATION: 5000 ft max.
- POWER SOURCE REQUIRED: 115 v ±10%, 50 to 400 cps, single ph (blowers must be changed for other than 50 to 60 cps operation).
- RECOMMENDED POWER EQUIP: Power Unit PE-75.
- ANT
  - AN/TRN-2(XN-1): 100 ft sectional tower.
  - AN/TRN-3(XN-1): 3 ft dia shielded loop, quadrapod mounted, feeds thru 52 ohm, coax.

TRANSMITTER
- FREQ
  - AN/TRN-2(XN-1): 1722.0 and 1797.4 kc.
  - AN/TRN-3(XN-1): 1771.685 or 1797.265 kc.
- FREQ CONTROL: AT cut xtal.
- FREQ VARIATION: Less than 1 cycle/mc/deg C at 50 deg C ±1 deg C.
- POWER OUTPUT: 500 W approx.
- INPUT IMPEDANCE: 50 ohm microphone input.
- OUTPUT IMPEDANCE: 52 ohm at RF amplifier.
- EMISSION: CW type AO and AM type A2 automatically switched by received carrier.

RECEIVER [AN/TRN-3(XN-1)]
- TYPE: Superheterodyne.
- RECEPTION: AM types AO, A2.
- FREQ BAND: 1.7 to 2.5 mc semifixed tunable.
- RF INPUT TUNING: 1797.265 kc and 1771.685 kc.
- FREQ CONTROL: AT cut xtals.
- IF: 262 kc.
- OUTPUT IMPEDANCE: 600 ohm output to modulator.

MANUFACTURER'S OR CONTRACTOR'S DATA

Seismograph Service Corp, Tulsa, Oklahoma. Contract NObsr-52614 dated 15 September 1951.

TUBE AND/OR CRYSTAL COMPLEMENT

(AN/TRN-2(XN-1)

(2) 5R4WGY	(2) 4D21
(5) 6AU6	(1) 6005/6AQ5W
(2) 3B28	(1) 807
(1) 2X2A	(1) OB2
(1) 6AS7G	(4) 5814
(2) 6BQ6GT	(2) 6AG7
(2) 5726	

Total Tubes: (26)

Transmitter AN/TRN-3(XN-1)

(2) OA2	(1) 3RP1
(1) 6AS7G	(2) 811A
(1) OB2	(2) 4D21
(4) 6AU6	(3) 5726
(1) 2X2A	(3) 5R4WGY
(2) 6BQ6GT	(9) 5814
(4) 3B28	(2) 6AG7
(1) 807	(3) 6005/6AQ5W

Total Tubes: (41)

Receiver

(3) OB2	(1) 6BA7
(7) 5814	(1) 5R4WGY
(1) 6X4W	(1) 6005/6AQ5W
(1) 6AS7G	(1) 5726
(2) 6AU6	(3) 5749

Total Tubes: (21)

Radio-Navigational Aids

AN/TRN-3(XN-1)
AN/TRN-2(XN-1)

RADIO SET
RADIO TRANSMITTING SET

April 1958

No Crystals.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

REFERENCE DATA AND LITERATURE

NAVSHIPS 91774(A): Technical Manual for Radio Transmitting Set AN/TRN-2(XN-1) Radio Set AN/TRN-3(XN-1), Radio Transmitting Set AN/TRN-4(XN-1), Radio Set AN/TRN-5(XN-1).

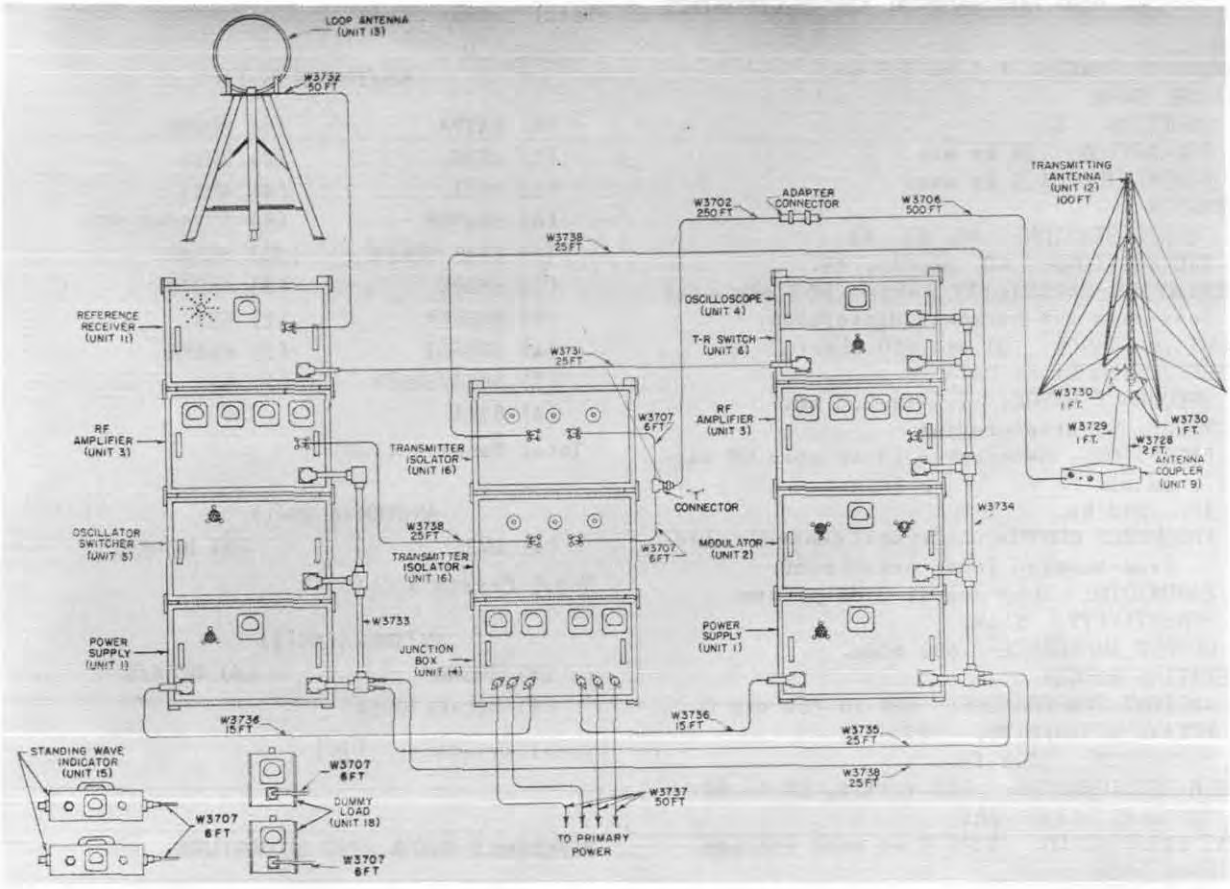
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Transmitter incl	20 X 21-1/2 X 41-1/8	
	(1) Power Supply	13-3/4 X 20 X 21-1/2	208
	(1) Oscillator-Switcher	13-3/4 X 20 X 21-1/2	117
	(1) RF Amplifier	13-3/4 X 20 X 21-1/2	110
1	Standing Wave Indicator	4-1/8 X 5-1/4 X 14-1/4	7.75
1	Ant Coupler	9-1/8 X 12-1/4 X 13	18.5
1	Ant		
1	Reference Receiver incl*	13-3/4 X 20 X 21-1/2	
	(1) Detector-Amplifier		
	(1) Power Supply		
	(1) AVC subchassis		
	(1) Filter subchassis		
	(1) Output Amplifier		
	(1) Audio Monitor		
	(1) Loop Antenna		

NOTES: *Supplied w/AN/TRN-3(XN-1) only.

RADIO TRANSMITTING SET AND RADIO SET

AN/TRN-4(XN-1), AN/TRN-5(XN-1)



Radio Set AN/TRN-5(XN-1)

FUNCTIONAL DESCRIPTION

One AN/TRN-4(XN-1) and two AN/TRN-5(XN-1) comprise a LORAC type "D" radionavigation system that is transportable and used at fixed shore stations. The type "D" LORAC system operates with the navigational receiver, Radio Receiving Set AN/SRN-2(XN-1) to form a high-accuracy, multiuser system featuring lane identification.

The radio frequency energy radiated from the fixed stations establishes a radio-wave interference pattern, hyperbolic in nature, from the vicinity of the stations outward, covering an area of thousands of square miles at the earth's surface. Any ship or vehicle in this area equipped with a receiver employing phase-measuring equipment, such as the AN/SRN-2(XN-1), can navigate with a high degree of accuracy under conditions unfavorable to other means of navigation.

No field changes in effect at time of preparation (12 June 1958).

RELATION TO OTHER EQUIPMENT

The AN/TRN-4(XN-1) and AN/TRN-5(XN-1) type "D" LORAC system is similar to the AN/TRN-2(XN-1) and AN/TRN-3(XN-1) type "A" LORAC system except that the type "D" system features lane identification while the type "A" system locates a position relative to two intersecting hyperbolic lines, but does not identify the exact lanes to which the readings are related.

EQUIPMENT REQUIRED BUT NOT SUPPLIED

(3) Communication Radio Set, Test Equipnt as Required.

AN/TRN-4(XN-1), AN/TRN-5(XN-1) RADIO TRANSMITTING SET AND RADIO SET

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 1.7 to 2.5 mc.
CHANNEL DATA
  QUANTITY: 3.
  SEPARATION: 20 kc min.
  BANDWIDTH: 1.5 kc max.
EMISSION
  CENTER STATION: AO, A1, A3.
  END STATIONS: AO, A1, A3, A9.
MODULATION CAPABILITY (A9): 90% min with less than 10% harmonic distortion.
INPUT IMPEDANCE: 50 and 600 ohms.
REFERENCE RECEIVER DATA
  FREQUENCY RANGE: 1.7 to 2.5 mc.
  TYPE: Superheterodyne.
  RECEPTION: Heterodyne (2 or more CW signals).
  IF: 262 kc.
  FREQUENCY CONTROL: Crystal controls electron-coupled local oscillator.
  BANDWIDTH: 3000 cps at 3 db points.
  SENSITIVITY: 5 uv.
  OUTPUT IMPEDANCE: 600 ohms.
OPERATING RANGES
  AMBIENT TEMPERATURE: -20 to +50 deg C.
  RELATIVE HUMIDITY: 95% max.
  ELEVATION: 5000 ft.
POWER REQUIREMENTS: 115 v ±10%, 50 to 60 or 400 cps, single ph.
HEAT DISSIPATION: 3200 W at each station.
ANTENNA DATA
  TRANSMITTER
    TYPE: 100 ft sectional tower.
    INPUT IMPEDANCE: 35 ohms matched to 52 ohm transmission line.
  RECEIVER
    TYPE: 3 ft dia shielded loop.

MANUFACTURER'S OR CONTRACTOR'S DATA

Seismograph Service Corp, Tulsa, Okla.
Contract NObsr-64651, dated 25 February 1955.

TUBE AND/OR CRYSTAL COMPLEMENT

AN/TRN-4(XN-1)

(2) OB2WA	(6) 3B28
(6) 4D21	(5) 5R4WGB
(6) 5726/6AL5W	(10) 5814A
(4) 6AG7Y	(2) 6AS7G
(10) 6AU6WA	(6) 6BQ6GT
(3) 6005/6AQ5W	(3) 807

Total Tubes: (63)

AN/TRN-5(XN-1)

(3) OA2WA	(5) OB2WA
(1) 2X2A	(8) 3B28
(1) 3RP1	(4) 4D21
(6) 5R4WGB	(9) 5726/6AL5W
(6) 5749/6BA6W	(32) 5814A
(3) 6AG7Y	(3) 6AS7G
(9) 6AU6WA	(2) 6BA7
(4) 6BQ6GT	(1) 6X4WA
(7) 6005/6AQ5W	(2) 807
(4) 811A	

Total Tubes: (110)

AN/TRN-4(XN-1)

(2) 1N35	(3) HC-6/U

Total Crystals: (5)

AN/TRN-5(XN-1)

(8) 1N54A	(4) HC-6/U
(4) MIL-C-3098A	

Total Crystals: (16)

REFERENCE DATA AND LITERATURE

NAVSHIPS 91774(A): Technical Manual for Radio Transmitting Set AN/TRN-2(XN-1), Radio Set AN/TRN-3(XN-1), Radio Transmitting Set AN/TRN-4(XN-1), Radio Set AN/TRN-5(XN-1).

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE SHIPS-T-1867,
STOCK NO. SHIPS-R-1858

RADIO TRANSMITTING SET AND RADIO SET AN/TRN-4(XN-1), AN/TRN-5(XN-1)

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
	TYPE "D" SYSTEM			
3	Technical Manuals NAVSHIPS 91774(A)	3.8	14 X 16 X 29	75
3	Antenna Base Plate including: Accessories	5.9	14 X 26 X 28	180
3	Antenna Tower Sections	45.0	22 X 47 X 76	318
3	Guy-Wire Reel including: Guys Ground Wire	14.8	16 X 39 X 41	314
3	Guy and Ground Stakes including: Sledge Hammer Gin Pole Stakes	3.1	5 X 20 X 53	183
3	Gin Pole	5.7	9 X 9 X 123	130
3	Antenna Base Insulator	4.0	19 X 19 X 19	88
1	Power Supply	7.2	17 X 26 X 28	267
4	Power Supply	6.1	17 X 24 X 26	267
1	Oscillator-Switcher	7.2	17 X 26 X 28	175
2	Oscillator-Switcher	7.2	17 X 26 X 28	180
5	RF Amplifier	6.1	17 X 24 X 26	170
2	Transmitter Isolator	6.1	17 X 24 X 26	160
1	Transmitter Isolator	6.4	17 X 25 X 26	159
5	Transmitter Isolator	6.1	17 X 24 X 26	173
1	Transmitter Isolator	7.1	17 X 26 X 28	170
3	Junction Box	6.4	17 X 25 X 26	157
1	Dummy Load including: Standing-Wave Indicator Antenna Coupler	5.6	19 X 22 X 23	117
5	Dummy Load including: Standing-Wave Indicator Antenna Coupler	5.6	19 X 22 X 23	100
5	Cable Harness	1.7	6 X 14 X 34	30
2	Cable Harness	1.6	6 X 14 X 33	25
1	Cable Harness	2.7	6 X 14 X 55	22
1	Cable Harness	1.7	6 X 14 X 34	27
1	Cable Harness	6.4	17 X 25 X 26	25
1	Interconnecting Cables	7.6	18 X 27 X 27	146
3	Interconnecting Cables including: Patch Cables	7.2	17 X 26 X 28	193
1	Crystals including: Microphones	7.2	17 X 26 X 28	193
4	Loop Antenna Stand	12.0	13 X 20 X 80	205
4	Loop Antenna	8.5	9 X 40 X 41	89
3	Power Supply	6.1	17 X 24 X 26	261
2	Oscillator-Switcher	6.1	17 X 24 X 26	175
1	Oscillator-Switcher	7.2	17 X 26 X 28	181
1	RF Amplifier	7.2	17 X 26 X 28	170
2	RF Amplifier	6.1	17 X 24 X 26	172
2	Modulator	6.1	17 X 24 X 26	333
1	Modulator	6.4	17 X 25 X 26	239
2	Oscilloscope including: Gated T-R Switch	6.1	17 X 24 X 26	237
2	Radio Receiver	6.4	17 X 25 X 26	160

AN/TRN-4(XN-1), AN/TRN-5(XN-1) RADIO TRANSMITTING SET AND RADIO SET

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Radio Receiver	6.1	17 X 24 X 26	175
2	Junction Box	6.1	17 X 24 X 26	165
2	Cable Harness	2.7	6 X 14 X 55	45
2	Interconnecting Cables	8.4	20 X 27 X 27	197
2	Interconnecting Cables	6.8	21 X 23 X 24	197
2	Crystals including: Microphones	3.5	14 X 15 X 29	50
1	Power Supply	6.1	17 X 24 X 26	270
1	Power Supply	6.1	17 X 24 X 26	265
1	Oscillator-Switcher	6.1	17 X 24 X 26	170
1	RF Amplifier	6.1	17 X 24 X 26	173
1	RF Amplifier	6.1	17 X 24 X 26	189
1	Modulator	7.1	17 X 26 X 28	333
1	Oscilloscope including: Gated T-R Switch	6.1	17 X 24 X 26	235
1	Oscilloscope including: Gated T-R Switch	7.1	17 X 26 X 28	240
1	Radio Receiver	7.1	17 X 26 X 28	175
1	Transmitter Isolator	6.4	17 X 25 X 26	160
1	Transmitter Isolator	6.4	17 X 25 X 26	161
1	Junction Box	6.1	17 X 24 X 26	160
2	Cable Harness	2.1	6 X 14 X 55	47

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
	AN/TRN-4(XN-1)		
1	Transmitting Set AN/TRN-4(XN-1) Consisting of:	22 X 55 X 60	
	(4) Power Supply	14 X 20 X 22	210.0
	(4) RF Amplifier	14 X 20 X 22	110.0
	(3) Oscillator-Switcher	14 X 20 X 22	220.0
	(5) Transmitter Oscillator	14 X 20 X 22	
2	Antenna Coupler	13 X 15 X 18	
4	Standing Wave Indicator	5.7 X 6.1 X 15	7.8
3	Dummy Load	5.3 X 6.9 X 9.6	5.0
2	Transmitting Antenna AN/TRN-5(XN-1)*		470.0
1	Transmitting Set AN/TRN-5(XN-1) consisting of:	22 X 55 X 60	
	(3) Power Supply	14 X 20 X 22	210.0
	(2) Modulator	14 X 20 X 22	270.0
	(3) RF Amplifier	14 X 20 X 22	110.0
	(2) Oscillator-Switcher	14 X 20 X 22	220.0
	(2) Oscilloscope	6.5 X 20 X 22	
	(2) T-R Switch	6.5 X 20 X 22	
	(3) Transmitter Isolator	6.5 X 20 X 22	

RADIO TRANSMITTING SET AND RADIO SET

AN/TRN-4(XN-1), AN/TRN-5(XN-1)

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
2	Antenna Coupler	13 X 15 X 18	
3	Standing Wave Indicator	5.7 X 6.1 X 15	7.8
3	Dummy Load	5.3 X 6.9 X 9.6	5.0
2	Reference Receiver	14 X 20 X 22	
2	Loop Antenna		125.0
2	Transmitting Antenna		470.0

NOTE: *-Indicates two(2) Radio Sets Supplied per "D" system.
Quantities of all components include one (1) spare Supplied

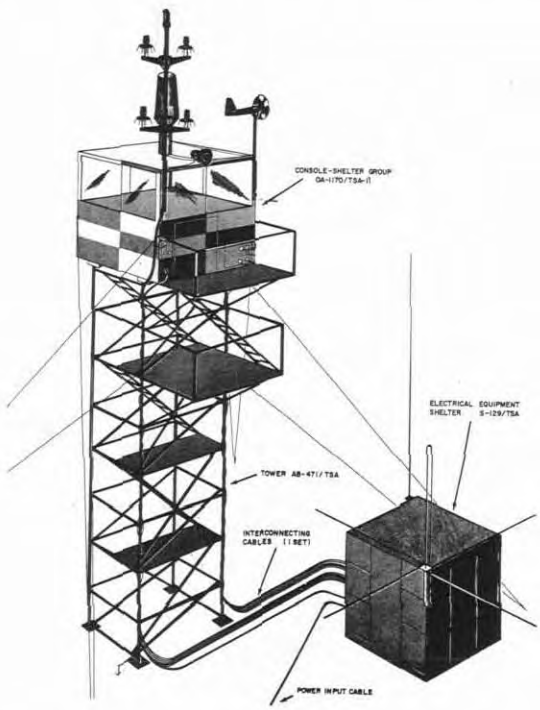
12 July 1962
Cog Service: USN FSN: 5840-503-3100 W/S

AIR TRAFFIC CONTROL GROUP AN/TSA-11
Functional Class:

USA	USN	USAF

TYPE CLASS: Used by Used by

MANUFACTURER'S NAME/CODE NUMBER: Wickes Engineering & Construction Co., (74451).



Air Traffic Control Group AN/TSA-11

FUNCTIONAL DESCRIPTION:

The Air Traffic Control Group AN/TSA-11 is a complete airport control system, designed to provide unified control of aircraft traffic. It provides complete coordination of visual aid operation, radio-telephone transmission, radio-telephone reception, and telephone intercommunications. Operating personnel can quickly obtain information such as direction finding data, wind direction, and wind velocity. Two (2) operating positions are provided for controlling the radio-telephone transmitting and receiving systems and the telephone system. Each operator has access to a UHF radio set for emergency radio-telephone communications. Message recording facilities are also provided.

No field changes in effect at time of preparation (13 December 1961).

TECHNICAL CHARACTERISTICS:

TYPE OF INSTALLATION: Ground transportable.

AN/TSA-11 AIR TRAFFIC CONTROL GROUP

EQUIPMENT PURPOSE: Complete air traffic control tower system.

INPUT AND OUTPUT IMPEDANCE

A.F. AMPLIFIER ALA-5

INPUT: 50/600 ohms.

OUTPUT: 600 ohms.

TRANSMITTER LINE TERMINAL UNIT TMU-4

NUMBER OF OUTPUTS: 10; 600/200/50 ohms each.

RECEIVER LINE TERMINAL UNIT TMU-5

NUMBER OF INPUTS: 10; 600 ohms each.

DYNAMIC MICROPHONE IMPEDANCE: 30 ohms.

POWER SUPPLY CHARACTERISTICS

AC POWER SOURCE: 120/208 v, 60 cps, four-wire, 3 ph; power consumption approx 16 kw.

DC POWER SOURCE

28 V DC POWER SUPPLY: 95-130 v, 60 cycle, single ph ac input at 20 amps max. DC output 24-32 volts at 30 amps max.

24 V DC POWER SUPPLY: 100-130 v 50/60 cycles, single ph ac input. DC output 24 v at 4 amps max.

RELATION TO OTHER EQUIPMENT: None.

EQUIPMENT REQUIRED BUT NOT SUPPLIED: None.

MAJOR COMPONENTS

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Air Traffic Control Group AN/TSA-11 consists of:			8911
1	Console-Shelter Group OA-1170/TSA-11 consists of:		75-3/8 x 75-3/8 x 82	2420
1	Mobile Shelter, Wickes Type MS-15		75-3/8 x 75-3/8 x 82	
4	Transit Cover, Wickes no. 8750081-501		3/4 x 38-5/8 x 75	21-3/4
1	Ladder Assy, Wickes no. 8750069-501		5 x 15-1/4 x 96	14
1	Hoisting Rig, Wickes no. 8750071-501			100
1	Stowage Rack, Wickes no. 8700086-001		12 x 34 x 34	21-1/2
1	Helicopter Lifting Sling			
1	Davit Support Assy, Wickes no. 8750101-501			17-3/4
1	Airport Control Console, Wickes Type ACC-10B consists of:		20 x 35 x 60	
2	Equipment Rack, Wickes Type ER-1		19 x 20 x 35	

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Equipment Rack, Wickes Type ER-2		20 x 22 x 30	
2	Writing Shelf, Wickes no. 8750040-501		5 x 12 x 19	9-1/4
2	Light Panel			3
2	Speaker-Telephone Control Panel, Wickes Type STC-1		5 x 5-7/32 x 19	
2	Control Panel, Wickes Type TRC-3		5 x 5-7/32 x 19	
2	Control Input Unit, Wickes Type ICU-1		3-15/32 x 8-5/8 x 19	6-1/2
2	Line Relay Unit, Wickes Type LRU-6		3-15/32 x 8-5/8 x 19	9
5	A.F. Amplifier, Wickes Type ALA-5		3-15/32 x 8-5/8 x 19	13
1	Line Relay Unit, Wickes Type LRU-7		5-7/32 x 8-5/8 x 19	9
1	Mating Relay Unit, Wickes Type MRU-3		3-15/32 x 8-5/8 x 19	7
1	Line Terminal Unit, Wickes Type TMU-4		5-7/32 x 8-5/8 x 19	27-1/2
1	Line Terminal Unit, Wickes Type TMU-5		5-7/32 x 8-5/8 x 19	21-1/2
1	Indicator Amplifier Assy, Wickes Type ASA-3		3-15/32 x 8-5/8 x 19	
1	24 v dc Power Supply, Sola Electric Co. Pt no. 28177		5-7/32 x 10 x 19	
2	Telephone Handset, W.E. Co. pt no. F1AW-20		2-1/2 x 3-1/4 x 8-3/4	
2	Handset Mtg, W.E. Co. Pt no. G1		2-7/8 x 5 x 5-5/8	
3	Dynamic Microphone, Wickes Pt no. 8500210-501		5 dia x 8-1/4	
1	Accessories consists of:			
1	Meteorological Panel, Wickes Type MP-4 consists of:		5-3/16 x 13-3/4 x 22	13-3/4
1	Windial, Bendix-Friez Model no. 4766			7
1	Altimeter, Kollsman Ins. Pt no. 671CPX-4-038			
1	Clock, Chelsea Co. Type A, Pt no. P-642			2
1	Ringing Generator, Lorain Products Corp. Pt no. BC-30X		4-1/8 x 4-3/4 x 6-1/2	5-1/4

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	28 v dc Power Supply, Perkin Engineering Corp. Model no. 28-30 WXM		15 x 19 x 21	160
1	Air Traffic Signal Light, Crouse-Hinds Co. Type B-2		9 x 14-1/2 x 14-13/16	6-1/2
1	Siren, Sperti-Faraday Co. Pt no. 150		10-3/8 dia x 12-15/16	12
1	Mounting Bracket, Wickes Pt no. 7750056-501		5-1/2 x 5-1/2 x 22	5-1/2
2	Mounting Bracket, Wickes Pt no. 7750056-502		5-1/2 x 5-1/2 x 22	5-1/2
4	Guard Rail, Wickes Type no. 7700077-501		1 x 6 x 48	
1	Antenna Mast, Wickes Type no. 5750073-502		1-1/4 dia x 54	4-3/4
1	Windial Mast, Wickes Type no. 4700101-501		1.66 dia x 54	3-1/2
1	Antenna Mast Assy consists of:			
1	Bottom Mast Section Wickes Pt no. 7750057-006		1-1/4 dia x 55-3/4	4-1/2
1	Center Mast Section, Wickes no. 8750064-501		2-1/4 x 2-1/4 x 44-3/4	7-1/4
1	Top Section w/lights, Wickes no. 7750057-501			4
6	Mast Extensions, Wickes no. 8700074-501		1-3/16 x 6 x 18	3
6	Antenna Adapter, Wickes no. 4750015-501		1 dia x 8	1/4
1	Wind Transmitter, p/o Bendix-Friez Model no. 476-6		15-1/2 x 22 x 32	7-1/2
1	Wind Transmitter Tripod, p/o Bendix-Friez Model 476-6			15
1	Antenna Adapter, Wickes no. 4750015-501		1 dia x 8	1/4
1	Headset, N.T. 49507, 600 ohms			
1	Ground Rod		1/2 dia x 60	
1	Ground Wire, Wickes no. 5790006-001		420 lg	
2	Connector Plug, Crouse-Hinds Pt no. WP721			
1	Connect Plug, Crouse-Hinds Pt no. APJ-3273			
1	Set of Cables Includes:			

QTY	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	R.F. Cable Assy, Wickes no. 7790015-502		192 lg	
1	Special Purpose Cable, Wickes no. 8930131-501		432 lg	
1	Special Purpose Cable, Wickes no. 8930131-502		432 lg	
1	Electrical Equipment Shelter S-129/TSA consisting of:		75-3/8 x 75-3/8 x 82	3820
1	Mobile Shelter, Wickes Type MS-16		75-3/8 x 75-3/8 x 82	
1	Mounting Bracket, Wickes no. 7750069-502		2 x 6-1/2 x 7	1/2
1	Antenna Support, Wickes no. 7750081-501		2-3/4 x 3-7/16 x 24	3
1	H.F. Whip Antenna (3-Sections)		180 lg	2-1/4
1	R.F. Cable Assy, Wickes no. 7790015-501		864 lg	
1	Set of Interconnecting Cables includes:			
6	R.F. Cable Assy, Wickes no. 7790015-504		1020 lg	
1	R.F. Cable Assy, Wickes no. 7790015-501		1020 lg	
1	Special Purpose Cable Assy, Wickes no. 8930131-505		1020 lg	
1	R.F. Cable Assy, Wickes no. 7790015-503		1020 lg	
1	Power Cable Assy, Wickes no. 4790008-502		1200 lg	
1	Special Purpose Cable, Wickes no. 8930131-503		900 lg	
1	Special Purpose Cable, Wickes no. 8930131-504		900 lg	
1	Special Purpose Cable, Wickes no. 8930131-506		900 lg	
1	Power Cable Assy, Wickes no. 479008-501		600 lg	
1	Tower AB-471/TSA consists of:		48 x 72 x 288	
4	Base Plate, Wickes no. 4500294-008 (AB-206/U)		4-1/2 x 12 x 12	7
1	Base Tower Section AB-208/U		48 x 72 x 72	119
3	Upper Tower Section AB-207/U		48 x 72 x 72	119

156	ITEM	STOCK NUMBERS	DIMENSIONS (INCHES)	WEIGHT (LBS)
1	Outboard Platform, Wickes no. 4500294-003			
1	Outboard Platform, Wickes no. 8750065-501 (MOD)			
1	Platform Mtg Assy, Wickes no. 7750073-501		12 x 13-1/2 x 84	
1	Platform Mtg Assy, Wickes no. 7750073-502		12 x 13-1/2 x 84	
1	Stairway w/locking Hooks, Wickes no. 4500294-602			
1	Hoist Line Assy, Wickes no. 4500294-012		900 lg	
1	Davit Assy, Wickes no. 4500294-011 (MX-1215/U)		2-1/2 x 4 x 166	35
4	Tag Line, Wickes no. 4500294-013		600 lg	
2	Guard Rail, Wickes no. 7750051-501			
1	Set of Hardware			
1	Guy Accessory Kit consisting of:			
4	Guy Anchor, Wickes no. 4200495-001		10 dia x 66	30-1/4
1	Tensiometer, Wickes no. 4500294-001			
8	Guy Winch, Wickes no. 4500294-005		4-3/4 x 7-1/2 x 11-1/2	
8	Guy, Nylon Covered, Wickes no. 4500294-004		804 lg	
8	Insulator Clevio, Wickes no. 4500294-006		7/8 x 2-7/8 x 4-1/2	
4	Guy, Winch Spacer, Wickes no. 4500294-007			
1	GFM Equipment includes:			
7	Antenna Assy AS-390/SRC			
1	Direction Finder Set AN/URD-4		14 x 14 x 34-1/2	148
1	Radio Set AN/FRC-42 includes:		11 x 14-1/2 x 14-1/2	34
1	Antenna Assy AS-759/FRC-36		5-3/4 x 5-3/4 x 105-1/4	40
1	Radio Set AN/ARC-27			
6	Radio Receiving Set AN/URR-35			
6	Radio Transmitting Set TED			
1	Radio Telephone & Telegraph Transmitting Receiving Equipment TCS-12			
2	Sound Recorder-Reproducer RD-115(A)/UN			

REFERENCE DATA AND LITERATURE:

NAVSHIPS 92943: Technical Manual for Air Traffic Control Group AN/TSA-11.

TUBE, CRYSTAL AND/OR SEMI-CONDUCTOR DATA:

TUBES: (10) 5670 (5) 6SK7W (5) 6SJ7 (5) 6H6 (5) 5Y3GT (5) 6V6GT

CRYSTALS: None used.

SEMI-CONDUCTORS: None used.

SHIPPING DATA

PKGS	VOLUME (CU FT)	WEIGHT (LBS)
1	4.2	100
1	2.3	14
1	20.7	124
1	20.7	112
1	20.7	112
1	20.7	112
1	22.1	107
1	22.1	98
1	11	124
1	6.2	130
1	21	415
1	50.7	466
1	4.8	148
1	2	40
1	1.1	34
1	5.7	138
1	2.9	86
1	1.5	45
1	1.5	45
1	1.5	45
1	1.5	45
1	1.5	45
1	1.5	45
1	3.2	53
1	5.3	114

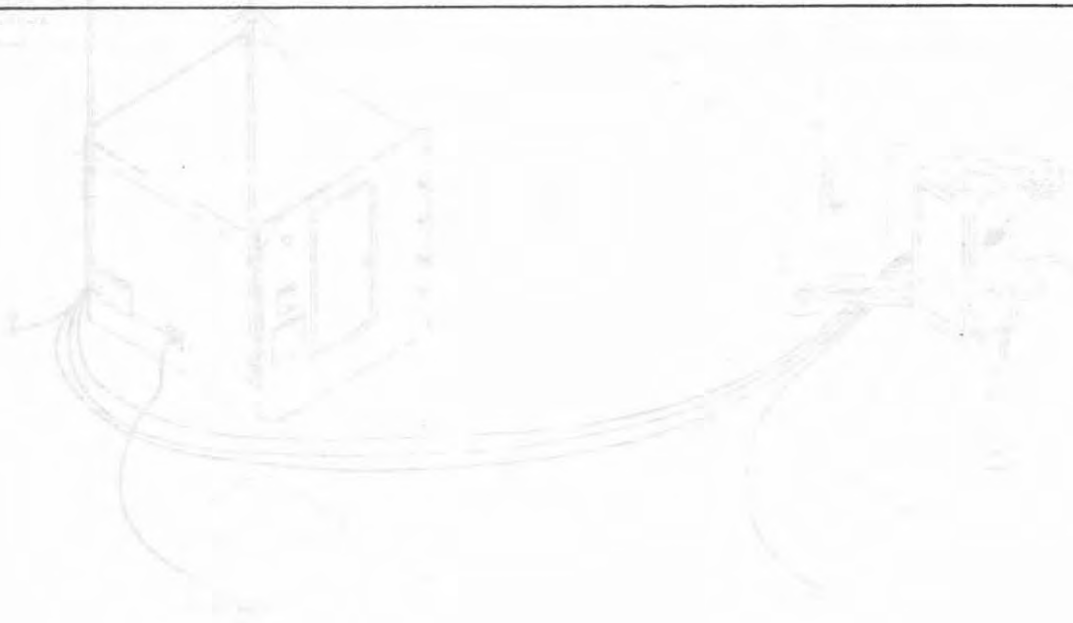
PROCUREMENT DATA

PROCURING SERVICE: USN

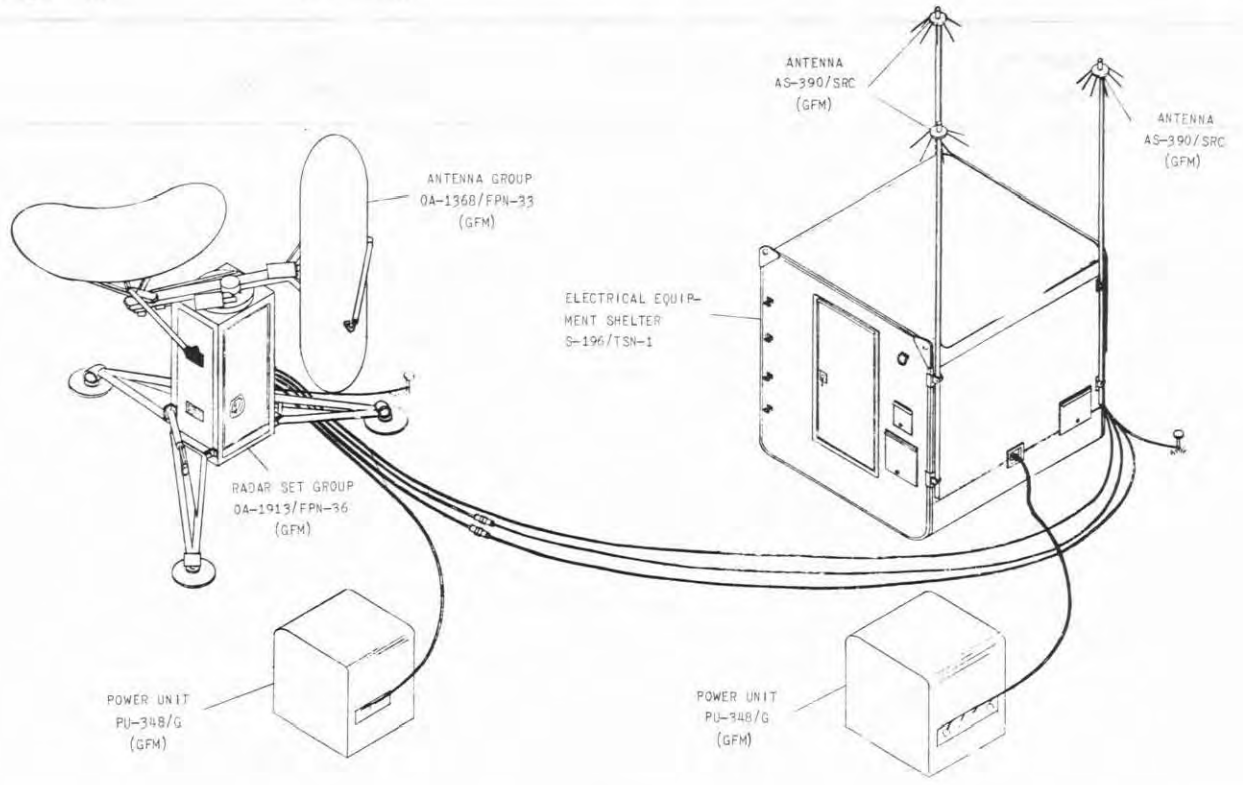
DESIGN COG: USN, BuShips

SPEC &/OR DWG:

CONTRACTOR	LOCATION	CONTRACT OR ORDER NO.	APPROX. UNIT COST
Wickes Engineering & Construction Co.	Camden, New Jersey	NObsr-71088, 28 November 1955	



LANDING CONTROL CENTER AN/TSN-1



Landing Control Central AN/TSN-1

FUNCTIONAL DESCRIPTION

The AN/TSN-1 is comprised of two (2) sets of remotely located, integrated electronic equipments designed of search, presentation of aircraft approach data, and transmission and reception of voice communications for the guidance of aircraft during landings. Facilities are also provided for recording the voice communications and for interphone communications between each area.

The AN/TSN-1 can be used in any area where ground control approach facilities must be quickly set up and operated. The equipment is easily transportable and can be moved to another location in the event that an emergency arises.

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

EQUIPMENT REQUIRED BUT NOT SUPPLIED

(1) Control-Indicator Group OA-1313/FPN-35, (1) Video Amplifier AM-1578/FPN-33, (1) Power Supply PP-1633/FPN-33, (1) Radar Set Group OA-1913/FPN-36, (1) Antenna Group OA-1368/FPN-33, (2) Power Supply PU-348/G.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

OPERATING POWER REQUIREMENTS: 208 v ac, 3 ph, 60 cps.

MANUFACTURER'S OR CONTRACTOR'S DATA

Wickes Engineering & Construction Company,
Camden, New Jersey.
Dwg. No. SK-6280.
Contract NObsr-75291.

TUBE AND/OR CRYSTAL COMPLEMENT

Electron Tube and/or Crystal data not available.

AN/TSN-1 LANDING CONTROL CENTER

REFERENCE DATA AND LITERATURE

NAVSHIPS 93641: Technical Manual for Landing Control Central AN/TSN-1.

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

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Electrical Equipment Shelter S-196/TSN-1	350	84-5/8 x 87-5/16 x 88-1/16	2486

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Landing Control Central AN/TSN-1		
1	Electrical Equipment Shelter S-196/TSN-1 consists of:		
1	Shelter Wickes Type EES-14	84-5/8 x 87-5/16 x 88-1/16	1192
2	Tape Recorder RD-217/UNH	6-1/4 x 11-7/8 x 18-1/8	52
6	Magnetic Tape Soundscriber Type ST-124	2-1/4 lg x 3-3/4 dia	
1	Demagnetizer Soundscriber Model BE-24	8-1/2 x 9-1/4 x 11-1/4	30
1	Air Conditioner F.W. Lang Model Y9M22	22 x 24 x 48-3/4	195
1	Power Supply Wickes Type PS-9	14 x 19 x 20-1/2	225
1	Fan I.L.G. Type "L.Q." 103-008-A009	6-3/4 lg x 10-1/2 dia	10
1	Jack Box	3 x 4 x 4-5/8	5
1	Radio-Interphone Control Wickes Type RIC-3	5 x 6-1/2 x 10	10
1	Radio-Interphone Control Wickes Type RIC-3A	5 x 6-1/2 x 10	10
1	Power Distribution Panel	4-1/2 x 16 x 19	15
4	Leveling Jacks	6 x 6 x 20	44
1	Helicopter Sling (4-ropes)	3/4 dia x 12-1/2 lg	17
1	Operators Chair	15-1/4 x 21 x 28	15
1	Folding Chair	15 x 16-1/2 x 17	12
6	Antenna Mast	1-1/2 dia x 66 lg	48
2	Lamp Swivelier Model M-721	4-5/8 dia x 8-1/2 lg	1/2
1	Cable Ass'y Wickes Type No. 4790026-501	180 lg	5-3/4
1	Cable Ass'y Wickes Type No. 4790026-502	132 lg	4
1	Cable Ass'y Wickes Type No. 5790037-501	36 lg	1/4
1	Cable Ass'y Wickes Type No. 5790038-501	36 lg	1/4
1	Cable Ass'y Wickes Type No. 5790037-502	60 lg	1/4
1	Cable Ass'y Wickes Type No. 5790038-503	78 lg	1/4
1	Cable Ass'y Wickes Type No. 5790039-501	84 lg	1/4
1	Cable Ass'y Wickes Type No. 5790040-501	42 lg	1/2
1	Cable Ass'y Wickes Type No. 5790040-502	24 lg	
1	Cable Ass'y Wickes Type No. 7790090-501	216 lg	1-3/4
1	Cable Ass'y Wickes Type No. 7790089-501	276 lg	3-1/2
1	Cable Ass'y Wickes Type No. 7790088-501	276 lg	2
1	Cable Ass'y Wickes Type No. 7790090-502	216 lg	1-1/2

LANDING CONTROL CENTER AN/TSN-1

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Cable Ass'y Wickes Type No. 7790089-502	216 lg	2-1/2
1	Cable Ass'y Wickes Type No. 7790088-502	216 lg	1-3/4
1	Cable Ass'y Wickes Type No. 7790090-503	276 lg	1-1/4
1	Cable Ass'y Wickes Type No. 7790009-503	216 lg	2-1/2
1	Cable Ass'y Wickes Type No. 7790088-503	216 lg	2
11	Cable Reels Wickes Type No. 7750136-501	15-3/8 x 24 dia	125
10	Cable Reels Wickes Type No. 7750136-502	6-3/8 x 24 dia	80
3	Cable Reels Wickes Type No. 5790021-501	300 lg	3
10	Cable Ass'y Wickes Type No. 7780077-501	6000 lg	80
2	Cable Ass'y Wickes Type No. 7790077-502	1800 lg	18
10	Cable Ass'y Wickes Type No. 7790075-501	6000 lg	125
1	Cable Ass'y Wickes Type No. 7790075-502	1800 lg	30
2	Cable Ass'y Wickes Type No. 5790027-501	1200 lg	123
2	Cable Ass'y Wickes Type No. 5790034-501	192 lg	1/2
2	Cable Ass'y Wickes Type No. 5790034-502	258 lg	1/2
1	Cable Ass'y Wickes Type No. 5790036	180 lg	3-1/4
3	Receiver-Transmitter RT-178/ARC-27	11-1/4 x 12-3/8 x 27-7/8	70.5
3	Mounting MT-822/ARC-27	2-3/8 x 11-1/8 x 19-3/4	4
3	Control Box C-626/ARC-27	5-1/2 x 6-3/8 x 9-9/16	30.9
3	Antenna AS-390/SRC	8 x 22 x 22	25.5
3	Technical Manual NavAer AN/ARC-27		
3	Technical Manual NAVSHIPS 91338		
3	Mounting MT-821/ARC-27	3/8 x 3/4 x 9-1/16	0.6
1	X-Band Echo Box IS-488A/U	9 x 11-1/2 x 17-3/4	25-1/4
1	Multimeter AN/PSM-4A	4-7/8 x 6-3/4 x 7-5/8	5-3/4
1	Oscilloscope AN/USM-38	10-3/8 x 14-1/2 x 17-1/2	40
1	Tube Tester TV-10/U	7-1/4 x 11 x 18-3/8	22
1	Vacuum Tube Voltmeter AN/USM-34	5-1/2 x 9-3/8 x 11-7/8	11
1	X-Band Test Set TS-147/UP	12 x 12-7/8 x 19-1/2	42-1/2

October 1957

Radio-Navigational Aids

AIR TRAFFIC CONTROL SET AN/TSW-1

FUNCTIONAL DESCRIPTION

The AN/TSW-1 is used for controlling aircraft traffic in and around an airport and provides complete control tower facilities. It is readily transportable by 2-1/2 ton cargo truck, cargo type helicopter, and cargo type aircraft.

No field changes in effect at time of preparation (2 May 1957).

REFERENCE DATA AND LITERATURE

Nomenclature Card for Air Traffic Control Set AN/TSW-1.

TYPE CLASSIFICATION
DESIGN COGNIZANCE
PROCUREMENT COGNIZANCE
STOCK NO.

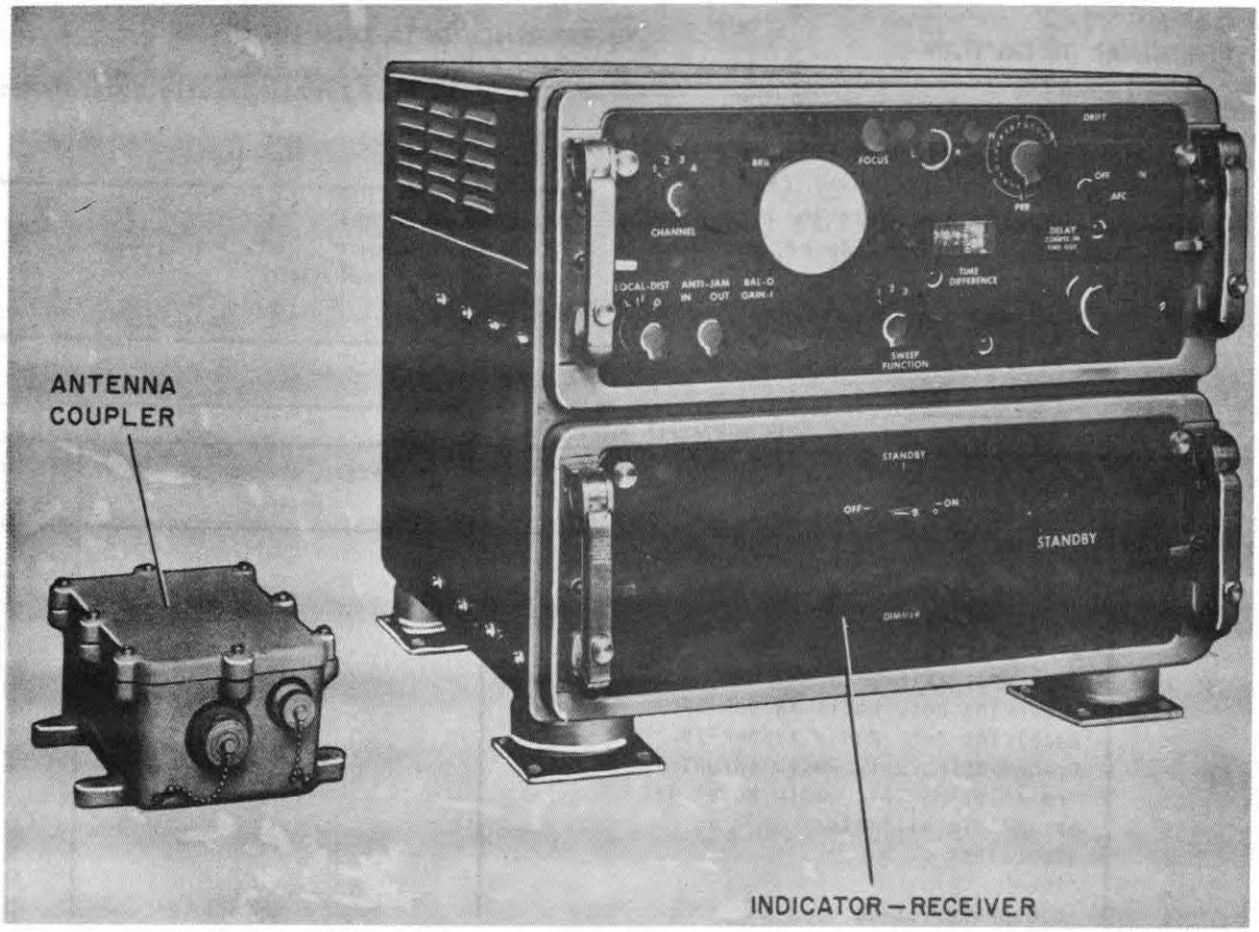
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Shelter, Electrical Equipment S-116/TSW		
1	Console, Airport Control Tower		
1	Signal Light		
1	Wind Measuring Set AN/GMQ-11		
2	Radio Set AN/FRC-15		
2	Receiving Set, Radio AN/URR-27		
3	Receiving Set, Radio AN/URR-35		
2	Transmitting Set, Radio AN/URT-7		
3	Transmitting Set, Radio Model TED		
3	Barometric Altimeter		
1	Binoculars		
2	Clock		
6	Loudspeaker LS-11		

June 1957

Radio-Navigation

LORAN RECEIVING SET AN/UPN-12(XN-1)



Loran Receiving Set AN/UPN-12(XN-1)

FUNCTIONAL DESCRIPTION

The AN/UPN-12 (XN-1) is a navigational aid which gives a direct reading, in microseconds, of the time difference in arrival of signal pulses from the master and slave transmitters of a Loran transmitting group.

The receiving set is basically an instrument for measuring the very small periods of time that elapse between the arrival of signals from the two stations of a Loran Transmitting pair. To accomplish this, a variable, timed interval is generated within the receiving set and displayed on the screen of a CR tube. When the received signals are positioned at the beginning and end of the timed-period, the time difference between arrival of the signals at the location of the receiving set may be read from a revolution type counter and with a second reading obtained in the same manner from a different transmitting pair used to determine geographical location from Loran charts and tables.

Data on this sheet reflects the following field changes, FC-1 (26 October 1956).

RELATION TO OTHER EQUIPMENT

Equipment Required but not Supplied: (1) Cable, Power DSGA-3, (1) Interconnecting Cable RG-10/U, (1) Terminal Tube.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 1700 to 2000 kc.
NUMBER PRESET FREQUENCIES: 4 channels.
TYPE CONTROL: Crystal.
TYPE RECEIVER: Superheterodyne.
INTERMEDIATE FREQUENCY: 1100 kc.
TYPE RECEPTION: Pulse.
FREQUENCY STABILITY
  HETERODYNE OSCILLATOR: ±300 cps.
  RECEIVER OVERALL: ±3 kc.
OPERATING POWER: 105, 115, or 125 v, 60 c 400 cps, single phase, 335 W.

Radio-Navigation

AN/UPN-12(XN-1) LORAN RECEIVING SET

MANUFACTURER'S OR CONTRACTOR'S DATA

RCA Victor Division Radio Corporation of America, Camden, New Jersey.
Contract NObsr 57556, dated 18 June 1952.
Approximate Cost: $12000.00 with equipment spares.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) OB2WA	(2) 1Z2	(1) 3JP1
(1) 5R4WGYA	(1) 5Y3WGT	(4) 6AU6WA
(1) 6X4W	(43) 5670	(2) 5696
(3) 5725	(3) 5726	(3) 5749
(1) 5750	(1) 5814	(1) 6072
(2) 6080WA		

Total Tubes: (70)

(4) CR-18/U (1) CR-15/U

Total Crystals: (5)

REFERENCE DATA AND LITERATURE

NAVSHIPS 91964: Technical Manual for Loran Receiving Set AN/UPN-12 (XN-1).

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	BUSHIPS
PROCUREMENT COGNIZANCE	
STOCK NO.	

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Loran Receiving Set AN/UPN-12 (XN-1)	8.2	20 X 22 X 32	170
1	Maintenance Spare Parts	2.8	9 X 18 X 30	

EQUIPMENT SUPPLIED DATA

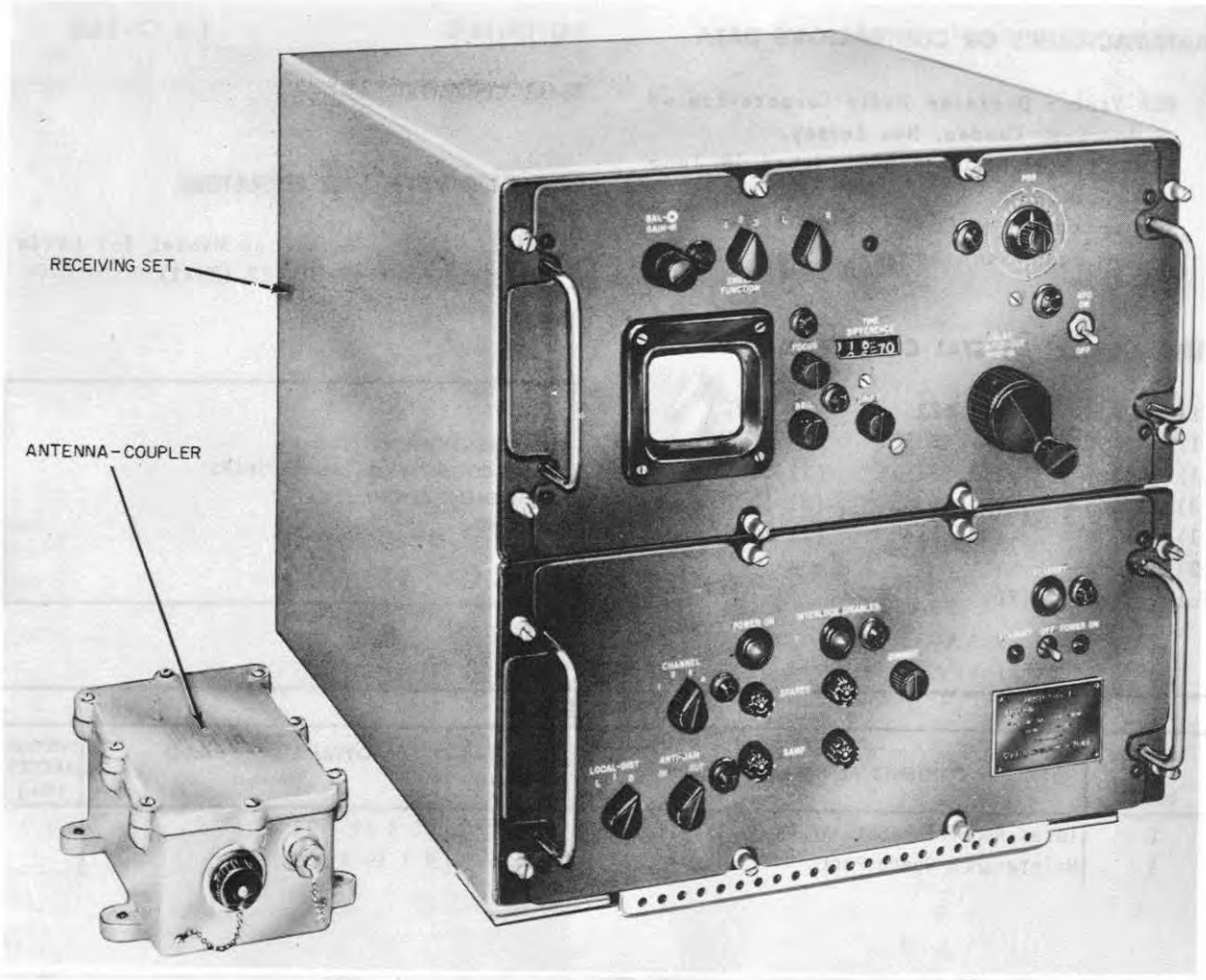
QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Indicator-Receiver Unit consists of:	15-5/8 X 17-21/32 X 20-1/64	133
1	Loran Receiver Unit 1		
1	Power Supply Unit 2		
1	Complete Tube Complement		
1	Complete Crystal Complement		
1	Antenna Coupler Unit 3	3-1/2 X 6-1/6 X 10-3/4	4.5
2	Technical Manuals NAVSHIPS 91964		

April 1958

LORAN RECEIVING SET

Radio-Navigational Aid

AN/UPN-12



Loran Receiving Set AN/UPN-12

FUNCTIONAL DESCRIPTION

The AN/UPN-12 is a navigational aid which permits the navigator to determine the ship's position when weather conditions or extreme distance from shore prevent the use of standard methods such as celestal navigation or radio direction finding.

The receiving set is basically an instrument for measuring the very small periods of time that elapse between the arrival of signals from the two stations of a Loran transmitting pair. To accomplish this, a variable time interval is generated within the receiving set and is displayed on the screen of a CR tube. When the received signals are positioned at the beginning and end of the time period, the time difference may be read from a revolution type counter and with a second reading obtained from a different transmitting pair, the geographical location can be determined by the use of the Loran charts and tables.

No field changes in effect at time of preparation (6 March 1958).

RELATION TO OTHER EQUIPMENT

Equipment Required but not Supplied: (1) Power Cable DSGA-3, (1) Interconnecting Cable RG-10/U.

Radio-Navigational Aid

AN/UPN-12 LORAN RECEIVING SET

April 1958

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 1700 to 2000 kc.
NUMBER PRESET FREQUENCIES: Four channels (1750, 1850, 1900 and 1950 kc).
TYPE FREQUENCY CONTROL: Crystal.
TYPE RECEIVER: Superheterodyne.
INTERMEDIATE FREQUENCY: 1100 kc.
TYPE OF RECEPTION: Pulse (Loran Signals).
CRYSTALS
CR-15/U: 80 kc.
CR-18/U: 2850, 2950, 3000 and 3050 kc.
FREQUENCY STABILITY
RECEIVER OSCILLATOR: ±300 cps.
RECEIVER OVERALL: ±3 kc.
TIMER CIRCUITS: ±1 part per million during 4 min. operating period.
ANTENNA COUPLER: Accommodate antennas within range of 25-j75 to 2j1000 ohms.
SENSITIVITY: 4 uv peak pulse input for 1 in. deflection on indicator tube, at 3:1 signal plus noise to internally generated noise ratio.
POWER SOURCE REQUIRED: 105, 115, or 125 v ± 10%, 60 or 400 cps ±5%, single ph.
CURRENT (at 115 v):
STARTING: 3.85 amp max.
STANDBY: 1.95 amp.
OPERATING: 3.0 amp.

MANUFACTURER'S OR CONTRACTOR'S DATA

Polaroid Electronics Corp, Long Island City, N.Y.
Contract NObsr-71148.
Approximate Cost: $12,000.00 with equipment spares.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) OB2WA	(24) 1N69
(2) 1Z2	(1) 3JP1
(1) 5R4WGB	(2) 6AU6WA
(1) 6X4W	(38) 5670
(2) 5696	(3) 5725
(3) 5726	(3) 5739/6BA6WA
(1) 5750/6BE6W	(3) 5751
(1) 5814A	(1) 6005/6AQ5W
(1) 6072	(1) 6080WA
(1) 6098/6AR6WA	

Total Tubes: (90)
(4) CR-18/U (1) CR-15/U
Total Crystals: (5)

REFERENCE DATA AND LITERATURE

NAVSHIPS 92988: Technical Manual for Loran Receiving Set *AN/UPN-12*.

TYPE CLASSIFICATION	
DESIGN COGNIZANCE	BUSHIPS
PROCUREMENT COGNIZANCE	
STOCK NO.	

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Loran Receiving Set AN/UPN-12	9.4	22 X 24-3/4 X 29-3/4	193
1	Antenna Coupler CU-532/UPN-12	0.1	5 X 5 X 7	9
1	Maintenance Spare Parts	3.4	18 X 18 X 18	25

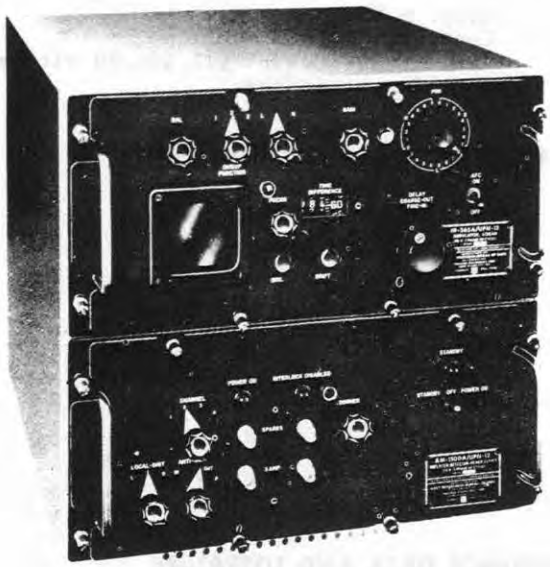
EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Loran Receiving Set AN/UPN-12 consists of:	17-1/2 X 18-1/4 X 22-9/16	180
1	Amplifier-Detector-Power Supply AM-1500/UPN-12	7-3/4 X 18-1/8 X 20-1/4	47
1	Indicator, Loran IP-365/UPN-12	8-1/2 X 18-1/8 X 20-1/4	28
1	Cabinet, Loran Receiving Set CY-1989/UPN-12	17-1/2 X 18-1/4 X 22-9/16	33
1	Coupler, Antenna CU-532/UPN-12	3-11/16 X 6-1/16 X 11	5
2	Connector, Plug, Electrical (RF) UG-21D/U		
1	Connector, Plug, Electrical (Power) AN3106A-10SL-3S		
1	Clamp, Electrical AN3057-4B		

June 1961

Radio-Navigational Aids

RECEIVING SET, LORAN AN/UPN-12B



Loran Receiving Set AN/UPN-12B

FUNCTIONAL DESCRIPTION

The AN/UPN-12B is a general purpose, seaborne installation, designed for surface and sub-surface vessels. Time difference is obtained from rotating counter presentation. One reading is required to obtain the time difference.

No field changes in effect at time of preparation (17 October 1960).

RELATION TO OTHER EQUIPMENT

The AN/UPN-12B is electrically, mechanically and functionally interchangeable with the AN/UPN-12A and AN/UPN-12 except for different manufacturer and parts changes.

EQUIPMENT REQUIRED BUT NOT SUPPLIED

(1) Power Cable type DSGA-3, (1) Interconnecting Cable RG-10/U.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

TYPE OF INSTALLATION: Seaborne installation.

TYPE OF PRESENTATION: Rotating Counter presentation.

NUMBER OF REPETITION RATES: 24 selected repetition rates.

TYPE OF EMISSION: Continuous Wave (CW).

NUMBER OF CHANNELS: 4 channels.

OPERATING FREQUENCY RANGE: 1700 to 2000 kc.

OPERATING POWER RQMT: 115 v ac, 600 cps, single ph.

MANUFACTURER'S OR CONTRACTOR'S DATA

Waterman Products Co., Philadelphia, Pa. Contract NObsr-75357, dated 17 June 1958.

TUBE AND/OR CRYSTAL COMPLEMENT

(1) OB2WA	(2) 1Z2
(1) 3JP1	(1) 5R4WGB
(1) 5Y3WGTB	(43) 5670
(2) 5696	(3) 5725-6AS6W
(3) 5726-6AL5W	(3) 5749-6BA6W
(1) 5750-6BE6W	(1) 5814A
(4) 6AU6WA	(1) 6X4WA
(1) 6072	(2) 6080WA

Total Tubes: (70)

No Crystals used.

REFERENCE DATA AND LITERATURE

NAVSHIPS 92988: Technical Manual for Loran Receiving Set AN/UPN-12, -12A.

NAVSHIPS 93400: Preliminary Data Form for Loran Receiving Set AN/UPN-12B.

TYPE CLASSIFICATION (NAVY)
DESIGN COGNIZANCE NAVY BUSHIPS
PROCUREMENT COGNIZANCE MIL-R-19977(SHIPS)
STOCK NO.
R.D.B. IDENT. NO.

AN/UPN-12B RECEIVING SET, LORAN

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Receiving Set, Loran AN/UPN-12B (less Antenna Coupler)	9.4	22 x 24-3/4 x 29-3/4	193
1	Antenna Coupler CU-532/UPN-12	0.1	5 x 5 x 7	9
1	Set of Equipment Spares	3.4	18 x 18 x 18	25

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Receiving Set, Loran AN/UPN-12B consists of:	17-1/2 x 18-1/4 x 22-9/16	108
1	Amplifier-Detector-Power Supply AM-2427/UPN-12B	7-3/4 x 18-1/8 x 20-1/4	47
1	Cabinet, Loran Receiving Set CY-2752/UPN-12B	17-1/2 x 18-1/4 x 22-9/16	33
1	Indicator, Loran IP-365B/UPN-12	8-1/2 x 18-1/8 x 20-1/4	28
1	Coupler, Antenna CU-532/UPN-12	3-11/16 x 6-1/16 x 11	5
2	Connector, Plug, Electrical UG-21D/U		
1	Connector, Plug, Electrical AN-3106A-10SL-3S		
1	Clamp, Electrical AN-3057-4B		

RADIO SET AN/URD-1

FUNCTIONAL DESCRIPTION

The AN/URD-1 is a radio direction finder for marine or land station use. It is designed for the reception of amplitude modulated radio frequency signals over the frequency range from 255 to 550 kilocycles. It is supplied with a loop antenna, a battery box, a six volt storage battery, a battery charger and a gyro repeater. The equipment uses but does not include a 45 v dry battery. It is designed for suspension mounting from coiling by pedestal shaft.

No field changes in effect at time of preparation (13 March 1957).

RELATION TO OTHER EQUIPMENT

Equipment Required But Not Supplied: 45 volt dry battery.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 255 to 550 kc.
SIGNAL RECEIVED: AM.
SENSITIVITY: 0.25 uv.
POWER OUTPUT: 6 miliwatt.
POWER SOURCE REQUIRED: 6 v DC at 3.8 amp and 45 v DC at 18 ma.
MOUNTING: suspension mounting from coiling by pedestal shaft.

MANUFACTURER'S OR CONTRACTOR'S DATA

Federal Telephone And Radio Corp.

TUBE AND/OR CRYSTAL COMPLEMENT

(4) 6J5 (4) 6SK7WA
Total Tubes: (8)

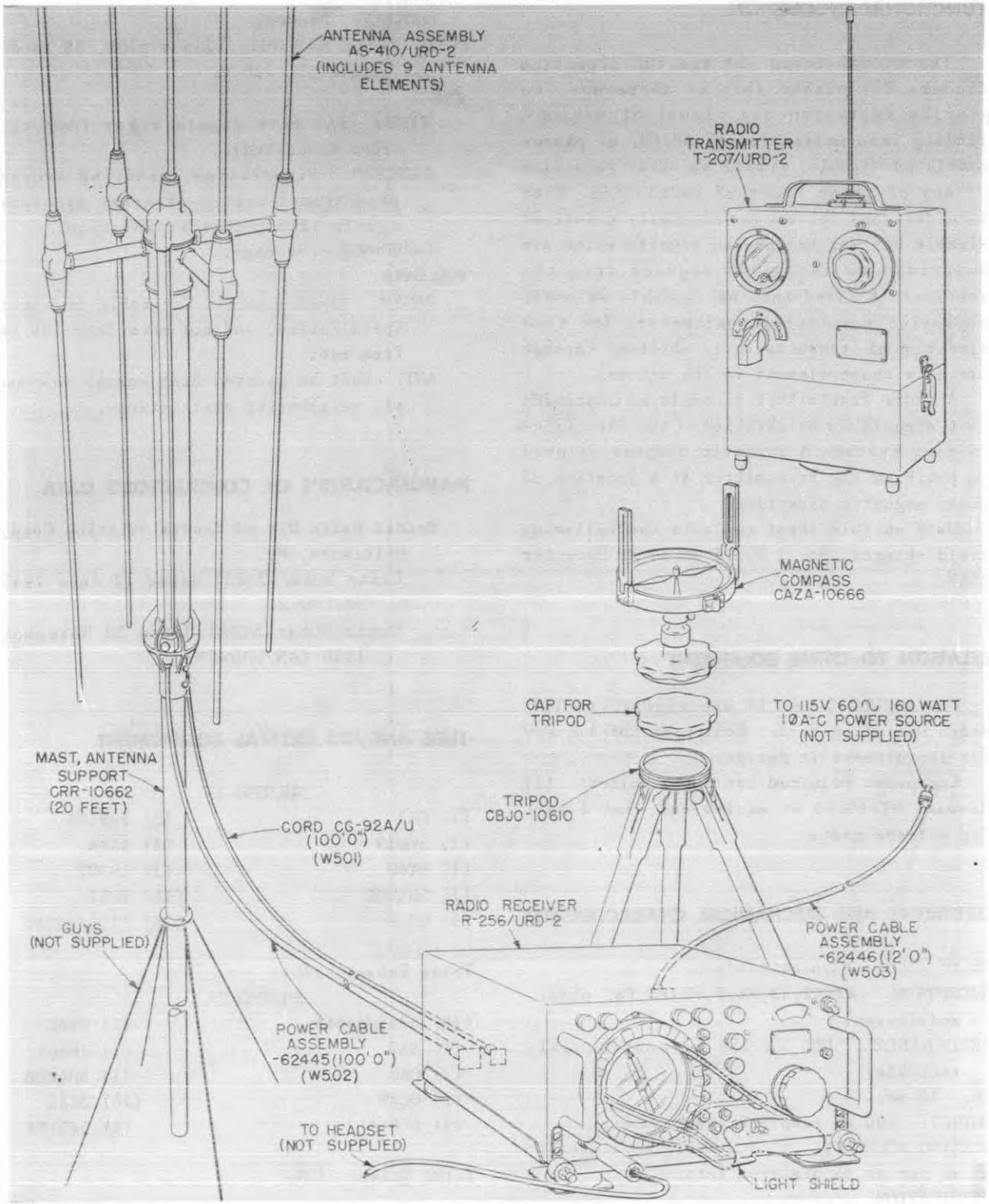
REFERENCE DATA AND LITERATURE

Nomenclature Card for Radio Set AN/URD-1 dated 21 May 1946.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Set AN/URD-1 c/o (1) Battery Box (1) 6 volt Storage Battery (1) Headset (1) Battery Charger (1) Gyro Repeater		



Direction Finder Set AN/URD-2, -2A

Radio-Navigational Aids

AN/URD-2,-2A DIRECTION FINDER SET

April 1958

FUNCTIONAL DESCRIPTION

The AN/URD-2 and -2A are VHF direction finders for either ship or shore use, to provide instantaneous visual direction-finding information for A1,AM,FM, or phase-modulated signals, as well as aural reception of any of these types of modulation. They were designed for use on vertically polarized signals but may be used on signals which are polarized as far as 45 degrees from the vertical. A fixed antenna assembly is used. employing a rotating goniometer. The true direction of transmission is obtained through use of a sense element in the antenna.

A radio Transmitter is employed to provide test signals for calibration of the direction-finding system. A magnetic compass is used to position the transmitter at a location of known magnetic direction.

Data on this sheet reflects the following field changes. No. 1,2,3,4 dated 18 December 1957.

RELATION TO OTHER EQUIPMENT

The AN/URD-2 and 2A are similar to VHF Radio Direction Finder Equipment DBF-1 except for improvement in design.

Equipment Required but not Supplied: (1) Headset NT-49016 or equivalent, and 4 guys for antenna mast.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

RECVR TYPE: Superheterodyne.
RECEPTION: A1,A2,A3,A4,F,F2,F3,F4, phase modulation.
FREQ RANGE: 100 to 156 mc continuously variable.
IF: 12 mc.
OUTPUT: 200 mv into 600 ohm headset.
BEARING ACCURACY: ±5 deg on sig polarized to as far as 45 deg from vert.
INDICATION
  VISUAL: 5 in. CRT.
  AUDIBLE: Phones.
POWER SOURCE REQUIRED: 115 v ±10%, 55 to 65 cps single ph, 126 W.
ANT
  TYPE: 1/2 wave dipole array (Adcock, cross connected).
  PATTERN: Figure-eight rotating around geometrical center of array synchronously with goiometer rotation.
  IMPEDANCE: 50 ohms.
MTG DATA
  RECVR: Shock-mounted for table or shelf installation, and not more than 100 ft from ant.
  ANT: Must be mounted high enough to clear all neighboring obstructions.

MANUFACTURER'S OR CONTRACTOR'S DATA

Bendix Radio Div of Bendix Aviation Corp, Baltimore, Md.
Contr NObsr-39237 dated 12 June 1947 (AN/URD-2).
Contr NObsr-52081 dated 28 November 1950 (AN/URD-2A).

TUBE AND/OR CRYSTAL COMPLEMENT

AN/URD-2

(1) OA3	(2) 5651WA
(1) 5CP1A	(2) 958A
(1) 6Y6G	(1) 1B3GT
(1) 5R4WGB	(10) 2C51
(1) OD3W	(10) 5725/6AS6W

Total Tubes: (30)

AN/URD-2A

(10) 5725/6AS6W	(1) 6Y6G
(1) 3A5	(1) 1B3GT
(1) OA3	(1) 5R4WGB
(1) OC3W	(10) 2C51
(1) 5CP1A	(2) 5651WA

Total Tubes: (29)

No Crystals.

April 1958

DIRECTION FINDER SET AN/URD-2,-2A

REFERENCE DATA AND LITERATURE

NAVSHIPS 91198, Technical Manual for Direction Finder Set AN/URD-2.
NAVSHIPS 91521, Technical Manual for Direction Finder Set AN/URD-2A.

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

SHIPPING DATA

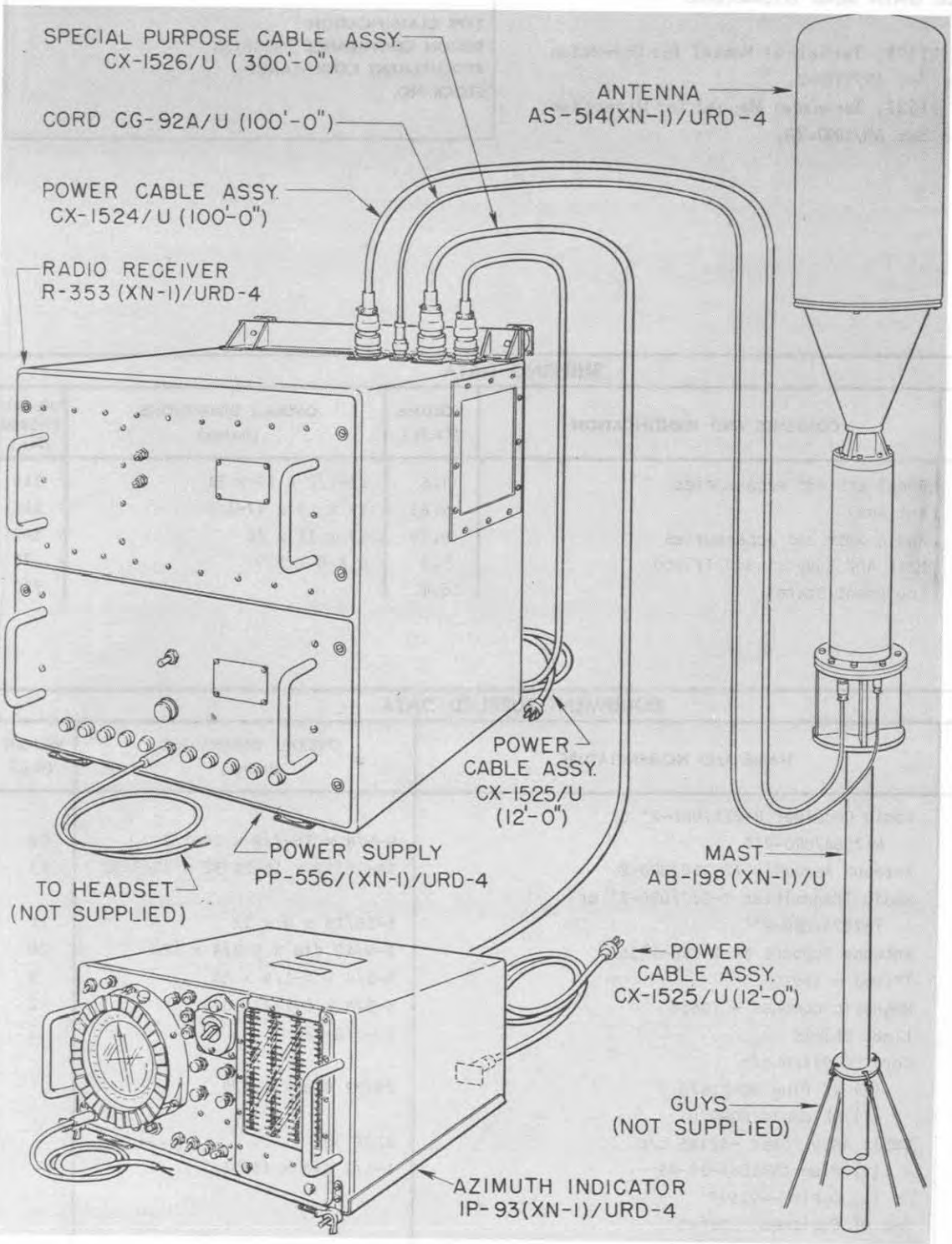
NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
1	Receivers and Accessories	4.6	13-1/2 x 19 x 31	116
1	Ant Assy	9.83	19 x 19 x 47-1/2	115
1	Radio Xmtr and Accessories	5.79	19 x 21 x 25	102
1	Mast Ant Support and Tripod	3.5	6 X 8 X 129	70
3	Equipment Spares	16.4		320

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Radio Receiver R-256/URD-2* or R-256A/URD-2**	9-5/8 x 16-7/8 x 24-1/2	55
1	Antenna Assembly AS-410/URD-2	14-25/32 x 14-25/32 x 40-3/32	33
1	Radio Transmitter T-207/URD-2* or T-207A/URD-2**	6-15/16 x 9 x 12	11
1	Antenna Support Mast CRR-10662	1-9/10 dia x 3-3/4 x 120	20
1	Tripod - 10610	4-1/4 x 4-1/4 x 60	8
1	Magnetic Compass - 10666	5-3/8 x 5-11/16 dia	2
1	Light Shield	10-7/8 dia	5
1	Cord CG-92A/U c/o		
	(2) RF Plug UG-21B/U	25/32 dia x 1-3/4	
	(1) RF Cable RG-9/U		
1	Cable Assy Power -62445 c/o	1200 lg	
	(2) Plug AN3106A-22-4S	1-1/2 dia x 13/16	
	(1) Cable -491697		
1	Set of Equipment Spares		

NOTES *Supplied w/AN/URD-2 only
**Supplied w/AN/URD-2A only

DIRECTION FINDER SET AN/URD-4 (XN-1)



Direction Finder Set AN/URD-4 (XN-1)

Radio-Navigational Aids

AN/URD-4 (XN-1) DIRECTION FINDER SET

April 1958

FUNCTIONAL DESCRIPTION

The AN/URD-4 (XN-1) is designed for installation for either shore or ship board to provide instantaneous visual direction finding information from radio frequency signals. The antenna system is designed to accept only vertically polarized signals. Accurate direction finding information is provided, however, from signals polarized as far as 45 deg from vertical. Tuning is accomplished by means of a remotely-controlled device which selects any one of 20 pre-set frequencies, 1750 of which are available.

No field changes in effect at time of preparation (13 February 1958).

RELATION TO OTHER EQUIPMENT

Equipment Required but not Supplied: (1) Headset NT-49016, (4) Guy Wires, (1) Target Transmitter.

ELECTRICAL AND MECHANICAL CHARACTERISTICS

FREQUENCY RANGE: 225.0 to 399.9 mc, spaced 0.1 mc.
NUMBER OF BANDS: 1.
PRE-SET FREQUENCIES: 20.
TYPE RECEIVER: Superhetrodyne.
INTERMEDIATE FREQUENCY: 15.325 mc and 2.8072 mc.
RECEIVER AUDIO OUTPUT: 500 mw into 200 ohm impedance headphones.
TYPE RECEPTION: A0, A1, A2, A3, F1, F2, F3.
SQUELCH LEVEL: 7 to 22 uv.
IMPEDANCE
- ANTENNA: 52 ohms.
- RF INPUT: 52 ohms.
- HEADPHONES: 200 ohms (audio output impedance).

POWER SOURCE REQUIRED: 115 v, 55 to 65 cps, single ph, 370 W.
HEAT DISSIPATION
- R-353 (XN-1)/URD-4: 105 W.
- IP-93 (XN-1)/URD-4: 130 W.
- AS-514(XN-1)/URD-4: 135 W.

ANTENNA: Rotable Adcock Array, two dipoles vertically mounted, rotating capacitance joint.

MANUFACTURER'S OR CONTRACTOR'S DATA

Bendix Radio Div of Bendix Avaition Corp, Baltimore, Md.
Contract: NObsr-42385, dated 10 June 1945.

TUBE AND/OR CRYSTAL COMPLEMENT

(2) 1Z2	(11) 2C51
(1) 5CP12	(1) 5R4GY
(1) 5V4	(4) 6AK5
(5) 6AL5	(18) 6AS6
(1) 6AS7G	(3) 6F4
(1) 6X4W	(2) 6Y6G
(1) 5651	(6) 5670
(1) 5686	(2) OA2/VR150
(1) OA3/VR75	(1) OC3/VR105

Total Tubes: (62)

(1) CR-18/U	(17) CR-27/U
(1) CR-28/U	

Total Crystals: (19)

REFERENCE DATA AND LITERATURE

NAVSHIPS 91482: Technical Manual for Direction Finder Set AN/URD-4 (XN-1).

TYPE CLASSIFICATION
DESIGN COGNIZANCE BUSHIPS
PROCUREMENT COGNIZANCE
STOCK NO.

SHIPPING DATA

NUMBER OF BOXES	CONTENTS AND IDENTIFICATION	VOLUME (Cu.Ft.)	OVERALL DIMENSIONS (inches)	WEIGHT PACKED (lbs.)
6	Direction Finder Set AN/URD-4 (XN-1)	50.7		1083

DIRECTION FINDER SET AN/URD-4 (XN-1)

EQUIPMENT SUPPLIED DATA

QUANTITY PER EQUIPT	NAME AND NOMENCLATURE	OVERALL DIMENSIONS (inches)	WEIGHT (lbs.)
1	Antenna AS-514(XN-1)/URD-4	15 dia x 72	70.5
1	Mast (two 10-foot sections) AB-198(XN-1)/U	240 lg	
1	Cabinet CY-890(XN-1)/URD-4 consists of:	20-1/16 x 22-1/8 x 25-1/4	150
1	Radio Receiver R-353 (XN-1)/URD-4		
1	Power Supply PP-556(XN-1)/URD-4		
1	Azimuth Indicator IP-93(XN-1)/URD-4	10-15/16 x 17-21/32 x 15-31/32	67.5
2	Power Cable Assy CX-1525/U	144 lg	
1	Power Cable Assy CX-1524/U	1200 lg	
1	Special Purpose Cable Assy CX-1526/U	3600 lg	
1	Cord CG-92A/U	1200 lg	
1	Spare Parts Box		