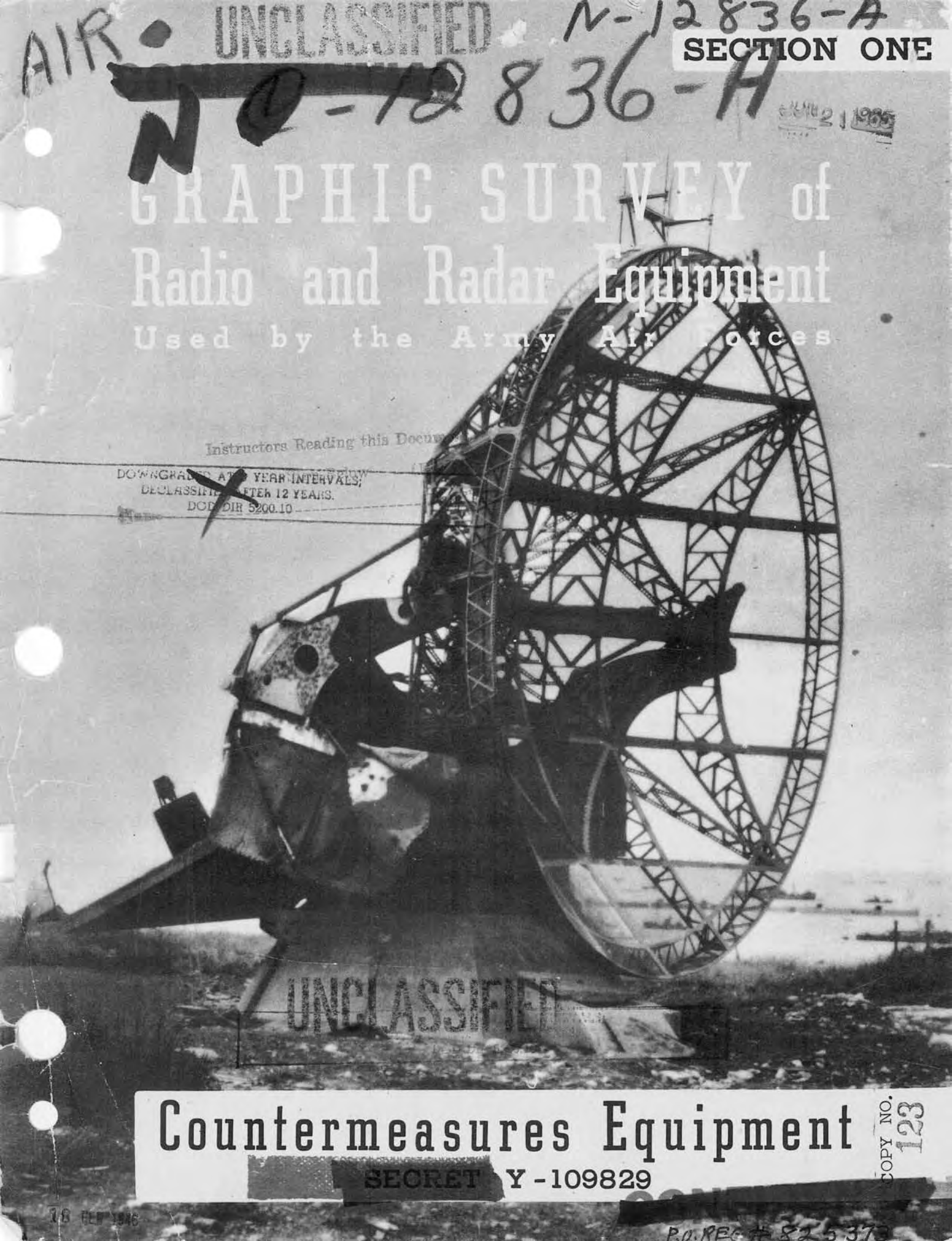
SECTION ONE

GRAPHIC SURVEY of Radio and Radar Equipment

Used by the Army Air Forces



Countermeasures Equipment

Army Air Forces ★ Air Technical Service Command
Wright Field — Dayton, Ohio

GRAPHIC SURVEY of Radio and Radar Equipment

Used by the Army Air Forces

BY AUTHORITY OF DIRECTOR, ATSC — 1 February 1945

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Hobart R. Yeager
Colonel, Air Corps

Clearance Number AAF-MD-E89

Foreword

Purpose : This Graphic Survey of Radio and Radar Equipment used by the Army Air Forces is intended to furnish authorized personnel with graphic and narrative data relative to description, electrical and physical characteristics, purpose, and tactical employment of the radio and radar equipment used by the Army Air Forces.

Restriction : The Graphic Survey is not authorized as a basis for procurement storage, or issue, but is prepared only for information and guidance of research, development, procurement, storage, issue, and staff and planning activities.

Scope : This publication is intended to cover all active equipment, both in use and in development. Publication is accomplished in a series of separate sections in order that reproduction and dissemination may be effected economically and expeditiously.

Format : Permanent binder covers are not furnished with the various sections of the Graphic Survey, but the pages of each section are printed on 8 1/2 x 11 inch paper and punched for the standard AAF three-hole binder, (binder, loose-leaf, 3 post, stock number 8700-043800), commonly known within the AAF as "Technical Order Binder". With a few exceptions, data concerning each equipment is presented on two pages. The first page contains a description and information relative to use, installation, and electrical characteristics; the second page, photographs of the various components and physical weights and dimensions. Within each section, the equipments are arranged alphabetically by official nomenclature and type designation.

Suggestions : Suggestions are invited for improvement of form, content, or to otherwise increase the ultimate utility to the user within the scope and purpose of this publication. Comments should be addressed to the Commanding General, Air Technical Service Command, Wright Field, Ohio, Attention: TSERR1B, for consideration.

Security : The Graphic Survey is classified [redacted] because of the broad scope of the equipment covered in each volume and the [redacted] classification of many of the equipments. Each addressee will be responsible for maintaining the security of his copies in accordance with the provisions of AR 380-5. Security classification of each individual equipment at the time of publication will be indicated on the pages relative to that equipment.

Distribution : Requests relative to distribution of this publication should be addressed to Commanding General, Air Technical Service Command, Attention: TSERR1B. Revisions and additions are forwarded periodically to original addressees in order that all copies may be kept up to date. Each copy has a serial number which is recorded on a master distribution file index.

Authority : Preparation, publication and distribution of the Graphic Survey is accomplished in accordance with letter, Headquarters, AAF(AFDMA-2F), dated 5 April 1945, subject "Graphic Survey of Radio and Radar Equipment Used by the AAF". AAF report clearance number AAF-MD-E89 has been assigned.

[redacted]

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1 February 1945

Section 1 - Radio and Radar Countermeasures Equipment

NOMENCLATURE	DESCRIPTION	TYPE*	STATUS**
AM-14/APT	Radio Frequency Amplifier	Standard	P
AM-18/APT	Radio Frequency Amplffier	Standard	P
AM-33/APT	Radio Frequency Amplifier	Limited Procurement	D
AN/APA-6	Radio Indicator Assembly	Standard	P
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AN/APA-10	Panoramic Adaptor		P
AN/APA-11	Radar Indicator Assembly	Standard	D
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AN/ARA-3	Modulator Assembly	Standard	D
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AN/ARQ-6	Direction Finding Receiver		D
AN/ARQ-7	Radio Jamming Equipment		P
AN/ARQ-8	Radio Jamming Equipment		D
AN/ARQ-9	Radio Jamming Equipment		P
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AN/ARR-8	Panoramic		P
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AN/ART-9	Radio Jamming Equipment	Standard	P
AN/ART-10	Radio Jamming Equipment	Standard	P
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AN/TPQ-T1	Training Set	Limited Standard	P
CHAFF	Deception Device		P
TU-60	Tuning Unit	Standard	P
TU-63-T1	Tuning Unit	Standard	P
TU-64-T1	Tuning Unit	Standard	P
TU-65-T1	Tuning Unit	Standard	P
TU-66-T1	Tuning Unit	Standard	P

RADIO AND RADAR COUNTERMEASURES TEST EQUIPMENT

BC-1255	Monitor Receiver	Limited Standard	P
TS-47/APR	Signal Generator	Standard	P
TS-69/AP	Frequency Meter	Limited Standard	P
TS-87/AP	Radio Frequency Wattmeter	Limited Standard	P
TS-92/AP	Amplifier Alignment Unit		P
TS-118/AP	Radio Frequency Wattmeter	Standard	P
TS-131/AP	Pickup Assembly	Standard	P
TS-174/U	Frequency Meter	Standard	P
TS-175/U	Frequency Meter	Standard	P
TS-206/AP	Radio Frequency Wattmeter		D
TS-213/U	Frequency Meter		D

* Type (Classification) Defined:

STANDARD---Equipment has been adopted as suitable for use by the Army, and the article is the most advanced and satisfactory that has been adopted, and is that which is preferred for procurement.

LIMITED STANDARD---Equipment has been adopted as suitable for use by the Army, but military characteristics are not as suitable as standard aritcles, but are usable substitutes for standard articles.

LIMITED PROCUREMENT---Equipment which has passed service tests favorably but is not ready for classification as an adopted type and which before such classification should be subject to an extended service test. Approval for limited procurement signifies the item is probably suited for service use but requires refinement in design or further operational use to determine definitely its suitability.

** Status Defined:

D - (DEVELOPMENT): Initial pilot run has not yet been completed.

P - (PRODUCTION) Initial pilot run has been completed, and quantity production is underway or has been completed.

COVER PICTURE: One of the most versatile of the German ground radars, a Giant Wurzburg, which was captured on the beach from which British troops advanced on Caen. Note the IFF (Identification, Friend or Foe) antenna array at the top.

Radio Frequency Amplifier AM-14/APT is a wide band power amplifier designed primarily for use with Transmitting Equipment AN/APT-1, but may be used with other similar equipments operating in its frequency range. It is intended to increase the power output and thus enhance the jamming effectiveness of the associated transmitter. The equipment is similar to the RF Amplifier AM-18/APT, except that it covers a lower frequency band. The equipment is to be used against enemy airborne and ground radar and search equipment operating within its frequency range.

The equipment is designed with a two stage push-pull amplifier and incorporates a built in power supply. Power is furnished from an 80/115 volt, 400-2600 c.p.s. source.

Production of this equipment started during the first half of 1944. Army Supply Program requirements as of 1 August 1944 were 2,725 for the calendar year 1944 and 1,050 for 1945.

Test equipments required for the maintenance and tuning of this equipment are Test Set I-139-A, Amplifier Alignment Unit TS-92/AP and Test Set I-56-K.

POWER INPUT	700 WATTS. 80/115 VOLTS; 400-2600 C.P.S. AND 20 WATTS, 24 VOLTS D.C.
POWER OUTPUT	100-150 WATTS
FREQUENCY RANGE	90-150 MC.
OUTPUT BANDWIDTH	3.5 MC.
DRIVING POWER	5-10 WATTS
INPUT IMPEDANCE	50 OHMS.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	4E27	2	836

Radio Frequency Amplifier AM-14/APT

RADIO FREQUENCY AMPLIFIER AM-14/APT TOTAL WEIGHT 62 LBS.

Component	Nomenclature	Size	Weight
R F Amplifier	AM-14/APT	7 5/8" x 10 1/8" x 21 3/4"	59 Lbs.
Mounting Base	MT-171/U	2 1/4" x 10 5/8" x 22"	3 Lbs.

and includes plugs, adapters and cables.

1 Dec. 1944

AM-18/APT

Radio Frequency Amplifier AM-18/APT is an airborne, wide band, power amplifier designed primarily to amplify the output of Transmitting Equipment AN/APT-1, but may be used with other similar equipments operating in its frequency range. A number of German and Japanese ground and airborne search and early warning radars are now operating over this range. The equipment is similar to RF Amplifier AM-14/APT, except that it covers a higher frequency range. It enables the associated transmitters to more effectively jam enemy radars operating within its frequency range.

The equipment is designed with a two stage push-pull amplifier, and incorporates a built in power supply unit. Power is furnished from an 80/115 volt, 400-2600 c.p.s. source.

Production of this equipment started in the first half of 1944. Army Supply Program requirements as of 1 August 1944 were 2,550 for the calendar year 1944 and 50 for 1945.

Test equipments required for the maintenance and tuning of this equipment are Test Set I-139-A and Amplifier Alignment Unit TS-92/AP.

POWER INPUT	700 WATTS, 80/115 VOLTS, 400-2600 C.P.S.
POWER OUTPUT	50-80 WATTS
FREQUENCY RANGE	107-230 MC.
OUTPUT BANDWIDTH	3.5 MC.
DRIVING POWER	10-5 WATTS
INPUT IMPEDANCE	50 OHMS

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	836	2	JAN 35TG

Radio Frequency Amplifier
AM-18/APT

RADIO FREQUENCY AMPLIFIER AM-18/APT TOTAL WEIGHT 60 LBS

Component	Nomenclature	Size	Weight
RF Amplifier	AM-18/APT	7 5/8" x 10 1/8" x 21 3/4"	55 Lbs.
Mounting Base	MT-171/U	2 1/4" x 10 5/8" x 22"	3 1/4 Lbs.

and includes plugs, adaptors and cables.

1 Dec. 1944

AM-33/ART

Radio Frequency Amplifier AM-33/ART is an airborne wide band power amplifier, designed primarily to amplify the output of Radio Set AN/ARQ-8, but may be used with other jamming transmitters such as AN/ARQ-1 and AN/ARQ-7 which operate over the same frequency range, thus enabling them to more effectively jam enemy radars operating in the 25-100 mc. frequency range. It also enables these transmitters to compete with the increased power employed by enemy ground stations and to aid in reducing the effectiveness of radio communications used by the enemy in the control of fighter aircraft, increasing the protection to our bomber formations against mass fighter attacks.

The amplifier is capable of normal operation on any frequency within the range of the AN/ARQ-8, and will operate over a 3 mc. frequency band without requiring retuning by the operator. Driver input of about 15 watts is amplified to an output of about 150 watts. Power is obtained from an 80/115 volt, 400-2600 c.p.s., a.c. source.

Production was expected to start during August 1944. Army Supply Program requirements as of 1 August 1944 were 1105 for the calendar year 1944 and 116 for the calendar year 1945.

Test equipments required for the maintenance and tuning of the equipment are Test Set I-139-A and Amplifier Alignment Unit TS-92/AP.

POWER INPUT	700 WATTS
POWER OUTPUT	150 WATTS
FREQUENCY RANGE	25-100 MC.
DRIVING POWER	10-15 WATTS
INPUT IMPEDANCE	50 OHMS.
OUTPUT BANDWIDTH	3 MC.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	836	2	4E27

Radio Frequency Amplifier AM-33(XA)/ART

RADIO FREQUENCY AMPLIFIER AM-33/ART TOTAL WEIGHT 50 LBS.

Component	Nomenclature	Size	Weight
Radio Frequency Amplifier	AM-33/ART	8" x 10 1/2" x 21"	39 Lbs.
Mounting Base	MT-171/U	2 1/4" x 10 5/8" x 22"	3 1/4 Lbs.
Control Unit		2" x 2 3/4" x 3"	

1 Dec. 1944

Radar Indicator Assembly AN/APA-6 is an airborne pulse analyzer equipment designed to operate with an associated search receiver for the analysis of detected radar signals. Its frequency range depends on the associated receiver and it is capable of analyzing signals having a pulse duration of 1 to 100 micro-seconds and a pulse repetition rate between 75 and 6000 pulses per second.

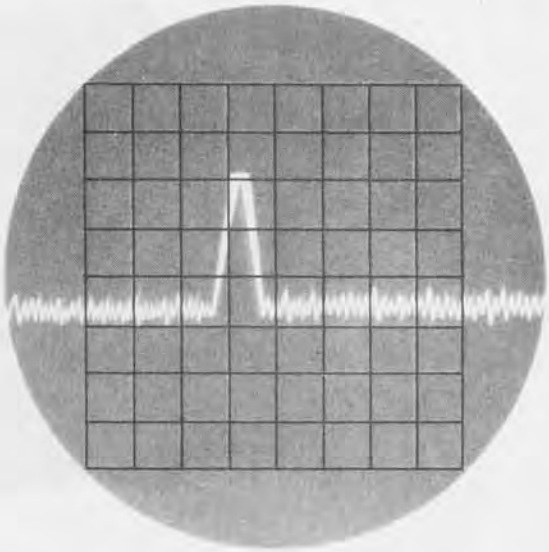
In operation the equipment is linked with the associated receiver by means of a special cable designed to prevent pulse distortion. A pattern of the received radar pulse is presented on the scope mounted on the panel of the set. The pattern can be analyzed for shape, pulse duration and amplitude. In addition, the pulse repetition frequency may be read directly from a meter on the panel of the set. When more than a single pulse is being picked up this latter reading will be erroneous in that it will indicate the sum of the pulse repetition frequencies being received. In that case an associated audio oscillator is used to furnish a horizontal sweep on the scope the same frequency as one of the pulses being received. This stops the one pattern on the scope and permits the others to drift across.

Power requirements are supplied from an 80/115 volt, 400-2600 c.p.s., a.c. source.

Test equipment required for the maintenance of this equipment includes R.C.A. Oscilloscope type 158A and Hickok type 110 Vacuum Tube Voltmeter.

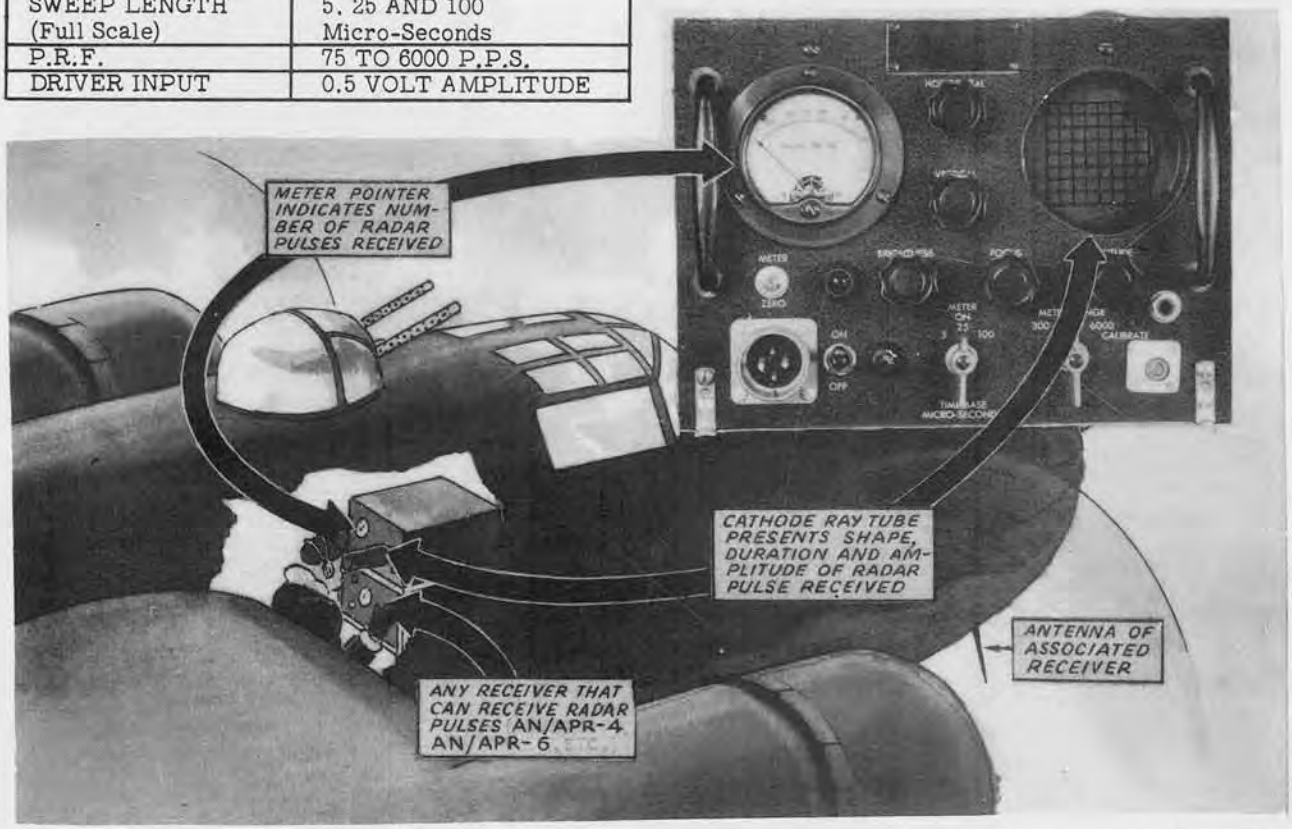
Army Supply Program requirements as of 18 August 1944 were 100 equipments for the calendar year 1944. This equipment is to be superceded by Radar Indicator Assembly AN/APA-11.

POWER INPUT	90 WATTS
INPUT IMPEDANCE	1000 OHMS
SWEEP LENGTH (Full Scale)	5, 25 AND 100 Micro-Seconds
P.R.F.	75 TO 6000 P.P.S.
DRIVER INPUT	0.5 VOLT AMPLITUDE



Enemy radar frequencies are analyzed and determined by position and/or size of pip.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	VR-150-30	1	5V3GT
2	6SN7GT	1	2X2
1	6AG7	3	6SJ7
1	3BP1		



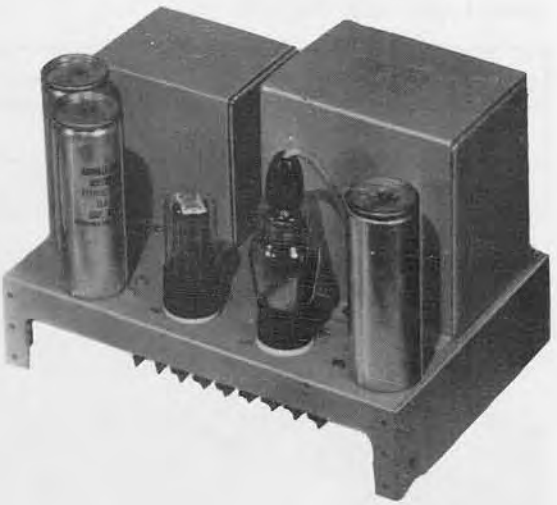
Radar Indicator Assembly AN/APA-6 is an airborne pulse analyzer used as an auxiliary unit with search receivers to study the characteristics of enemy radar transmitters.

1 Dec. 1944

AN/APA-6

Oscillator 0-10/APA-6X

Indicator ID-33/APA-6



Rectifier Power Unit PP-20/APA-6

RADIO INDICATOR ASSEMBLY AN/APA-6

TOTAL WEIGHT 75 LBS.

Component	Nomenclature	Size	Weight
Indicator	ID-33/APA-6	11 " x 9 1/2" x 21 "	30 Lbs.
Rectifier Power Unit or	PP-21/APA-6X	11 " x 9 1/2" x 7 "	12 Lbs.
Rectifier Power Unit	PP-20/APA-6	11 " x 9 1/2" x 7 "	18 Lbs.
Oscillator	0-10/APA-6X	7 " x 9 " x 15"	13 Lbs.
Mounting Base	MT-171/U	2 1/4" x 10 3/4" x 22 "	3 Lbs.
Mounting Base	MT-197/APA-6X	2 1/4" x 9 1/2" x 15 1/4"	3 Lbs.

and includes plugs, cable and adapters.

1 Dec. 1944

AN/APA—7

Photographic Adaptor AN/APA-7, which incorporates a cathode ray tube, is used to facilitate the photographing of the image on the screen of Raven equipment.

The equipment provides a means for obtaining a permanent photographic record of intercepted radar pulses which are being analyzed by Radar Indicator Assembly AN/APA-11. Such a photograph will show the pulse duration and shape of an enemy radar pulse

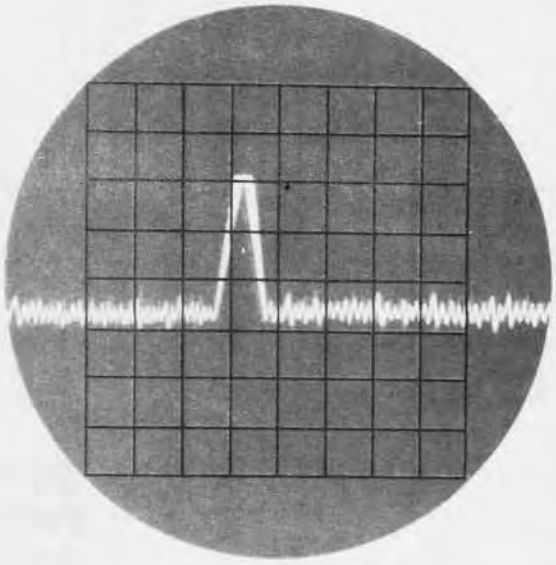
In use, the equipment is so arranged that when a record is required, a photograph may be taken by pressing a button on the panel of the equipment. Remote control is effected by pressing a button at the end of a length of cable.

A permanent focus camera is enclosed within Photographic Adaptor AN/APA-7, together with a cathode ray tube on which is duplicated the trace appearing on Radar Indicator Assembly AN/APA-11. The operator is thus provided with a permanent record of the picture appearing on the cathode ray tube, and valuable time is saved, since it is no longer necessary to trace the pattern on the screen by hand.

Power requirements are 80 watts input from an a.c. power source of 80-115 volts when the frequency is maintained within the limits of 400-2600 c.p.s. and 28 volts from a d.c. power source. No test equipment is required.

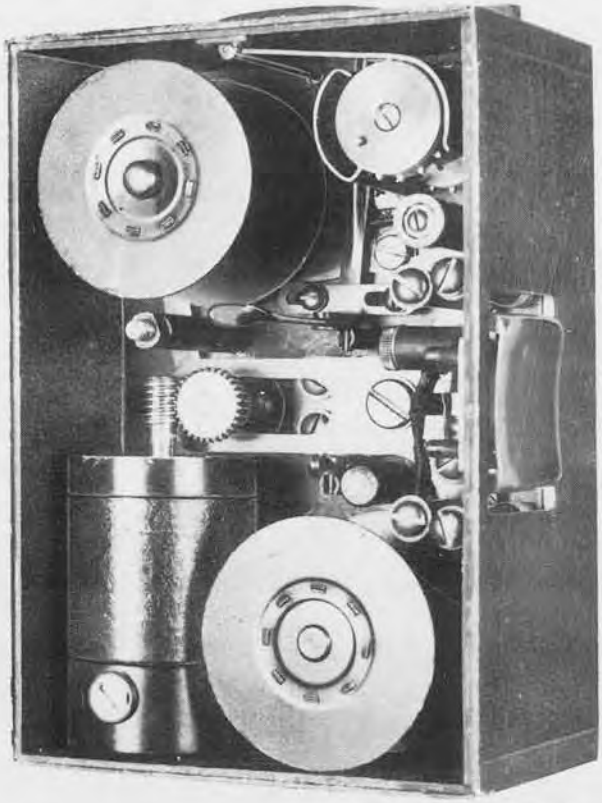
The equipment was deleted from the Army Supply Program requirements as of 22 June 1944.

POWER INPUT	80 WATTS



Enemy radar frequencies are analyzed and determined by position and/or size of pip.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6AC7	1	5Y3GT
1	6AG7	2	2AP1
1	2X2		



Photographic Adaptor AN/APA-7 With Cover Removed.

AN/APA-7

[redacted]

UNCLASSIFIED

EQUIPMENT
PHOTOGRAPHS
UNAVAILABLE

UNCLASSIFIED

PHOTOGRAPHIC ADAPTOR AN/APA-7 TOTAL WEIGHT 34 LBS.

Component	Nomenclature	Size	Weight
Indicator	ID-69/APA-7	7 5/8" x 4 7/8" x 21 3/4"	28 Lb.
Camera	PH-525/APA-7	2 1/2" x 1 1/2" x 4"	2 Lb.
Mounting Base	MT-167/U	2 1/4" x 5 1/4" x 22 "	2 3/4 Lb.

and includes plugs, cable adapter and Frequency cable.

1 Dec. 1944

AN/APA-10

Installed in medium and heavy bombers, Panoramic Adaptor AN/APA-10 is a universal adapter for use with Radio Receiving Set AN/ARR-5, Radio Receiving Equipment AN/ARR-7, Receiving Equipment AN/APR-1, Radio Receiving Equipment AN/APR-4, or other receivers having similar IF frequencies. In addition, it is a complete airborne oscilloscope with all required sweep circuits incorporated.

With this adapter in use, all signals adjacent to the signal to which the receiver is tuned are presented on a panoramic spectrum in which received signals are shown as vertical pips on a cathode ray tube, the horizontal axis of which is calibrated in frequencies. The bands presented are: 100 kc wide with AN/ARR-7, 1,000 kc wide with AN/ARR-5, and 2 mc. wide with AN/APR-4 and similar receivers.

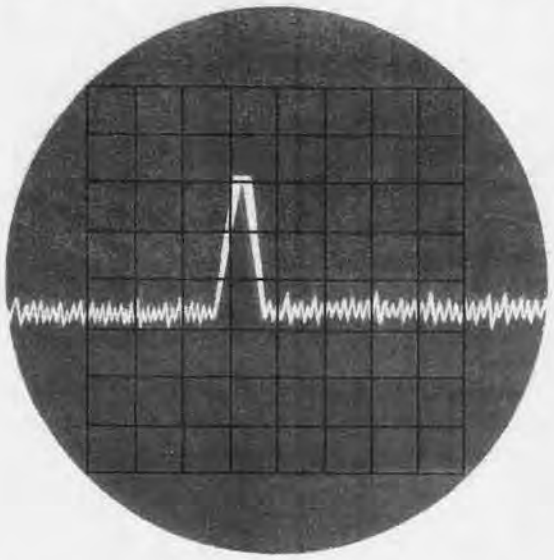
In operation, each receiver is connected to Panoramic Adapter AN/APA-10 by a cable. Switching one receiver to another is effected by a switch on the panel which may also be used to switch to the "oscillograph" mode of operation.

The equipment is capable of analyzing enemy signals and determining if they are AM, FM or CW. Since the horizontal axis of the cathode ray tube is calibrated, the frequency of the enemy signals may also be determined. With such information available, proper counter measures, such as "spot" or "barrage" jamming may be employed.

Power requirements of the adaptor are 140 watts input from an a.c. power source of 80-115 volts when the frequency is maintained within the limits of 400 to 2600 c.p.s.

Test equipment required for maintenance includes Signal Generator I-72 and Oscilloscope RCA Type 158.

Production of the equipment was started in May 1944. Army Supply Program requirements as of 30 April 1944 were 2,060 for the calendar year 1944.



Enemy radar frequencies are analyzed and determined by position and/or size of pip.

POWER INPUT	140 WATTS
TYPE OF SIGNAL	AM; FM: CW

TUBE COMPLEMENT			
NO.	TYPE	NO	TYPE
8	6AK5	3	6AG5
4	6SN7GT	3	VR/150/30
2	5R4GY	1	3BP1
2	6AG5		

Indicator ID-60/APA-10

PANORAMIC ADAPTOR AN/APA-10 TOTAL WEIGHT 50 LBS.

Component	Nomenclature	Size	Weight
Indicator	ID-60/APA-10	7 5/8" x 10 1/8" x 21 3/4"	37 Lb.
Mounting Base	MT-171/U	2 1/4" x 10 1/8" x 22 "	3 1/4 Lb
Cord	CG-53/AP (2 each)		
Cord	CG-113/AP	Length 2 1/2'	
Cord	CD-800 (2 each)	Length 20 "	
Cord	CD-800 (1 each)	Length 30"	

and includes, cords, cordage, adapters, misc. plugs and cables

1 Dec. 1944

Radio Indicator Assembly AN/APA-11 is an improved airborne pulse analyzer used with Receiving Equipment AN/APR-3, Radio Set SCR-587-A and Receiving Equipment AN/APR-1. It supercedes Radar Indicator Assembly AN/APA-6X and is installed in medium and light bombers.

It is used in analyzing enemy radar pulses, and as a complete airborne oscilloscope. Flexibility of design allows provision for 5, 25 and 100 microsecond pulses with a "horizontal shift" pulse duration calibrator. Pulse recurrence is measured by synchronizing patterns with a phase shift oscillator, so that the pulse recurrence of several radars simultaneously received can be determined. In general, no two radars will have exactly the same PRF, and any one signal may be "stopped" by a careful adjustment of the oscillator frequency, while the others will continue to move across the screen in one direction on the other, depending on whether their PRFs are higher or lower than that of the radar under observation.

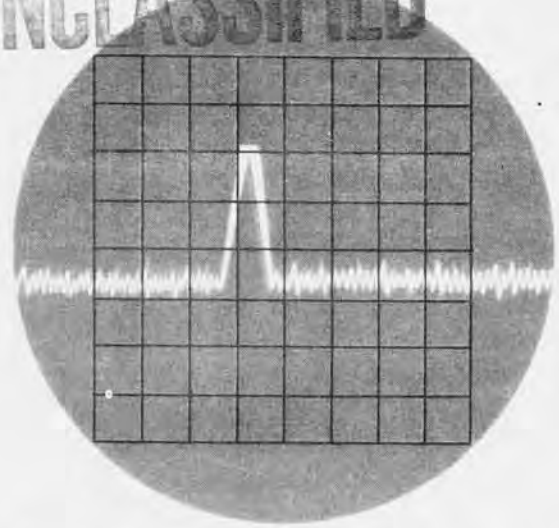
The set provides a calibrated sine wave oscillator. The operator varies the oscillator frequency until a complete sine wave trace appears on the CR screen; the sawtooth swept frequency and the oscillator frequency are then identical.

Tactical use of the equipment is the same as that for Radar Indicator Assembly AN/APA-6X, but there is the distinct advantage that Radio Indicator Assembly AN/APA-11 can be used in combat areas where enemy radar is concentrated. It is also simpler in operation than the other set, and can also be used as test equipment for different sets when used as an oscilloscope.

Power input is 150 watts from an 80/115 volt 400-2600 c.p.s. a.c. power source.

Test equipment required in maintenance includes RCA oscilloscope type 158.

Production of the equipments was begun during May 1944. Army Supply Program requirements as of 30 April 1944 were 1995 for the calendar year 1944.



Enemy radar frequencies are analyzed and determined by position and/or size of pip.

POWER INPUT	150 WATTS

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	2X2	4	6SN7GT
1	3BP1	1	6J5
1	5R4GY	1	6SJ7
4	6AC7	1	884
3	6AG7	2	VR/150/30

Indicator ID-59/APA-11

RADIO INDICATOR ASSEMBLY AN/APA-11 TOTAL WEIGHT 50 LBS.

Component	Nomenclature	Size	Weight
Indicator	ID-59/APA-11	7 5/8" x 10 1/8" x 21 3/4"	45 Lb.
Mounting Base	MT-171/U	2 1/4" x 10 1/8" x 22 "	3 1/4 Lb.

and includes plugs, cords and cable adapter

Radar Direction Finding Assembly AN/APA-17 is an airborne direction finding equipment for use in aircraft fitted with radar search receivers such as Receiving Equipment AN/APR-1, Radio Receiving Equipment AN/APR-4, Navy Model ARC-1 and Radio Set SCR-587-( ).

With the equipment in operation, investigating aircraft are able to take bearings on enemy radar stations to obtain data for appropriate counter measures.

The equipment consists essentially of a rotating type antenna assembly, video amplifier, indicator, power supply and associated cables. The antenna system has elements for the reception of horizontally and vertically polarized signals, with a switch which can select either one.

The system is easy to operate during flight, requiring a minimum of attention from the operator, other than that which is required for reading a bearing on the indicator. Output connection of the direction finder is quickly and easily connected to a search receiver similar to Radio Receiving Equipment AN/APR-4.

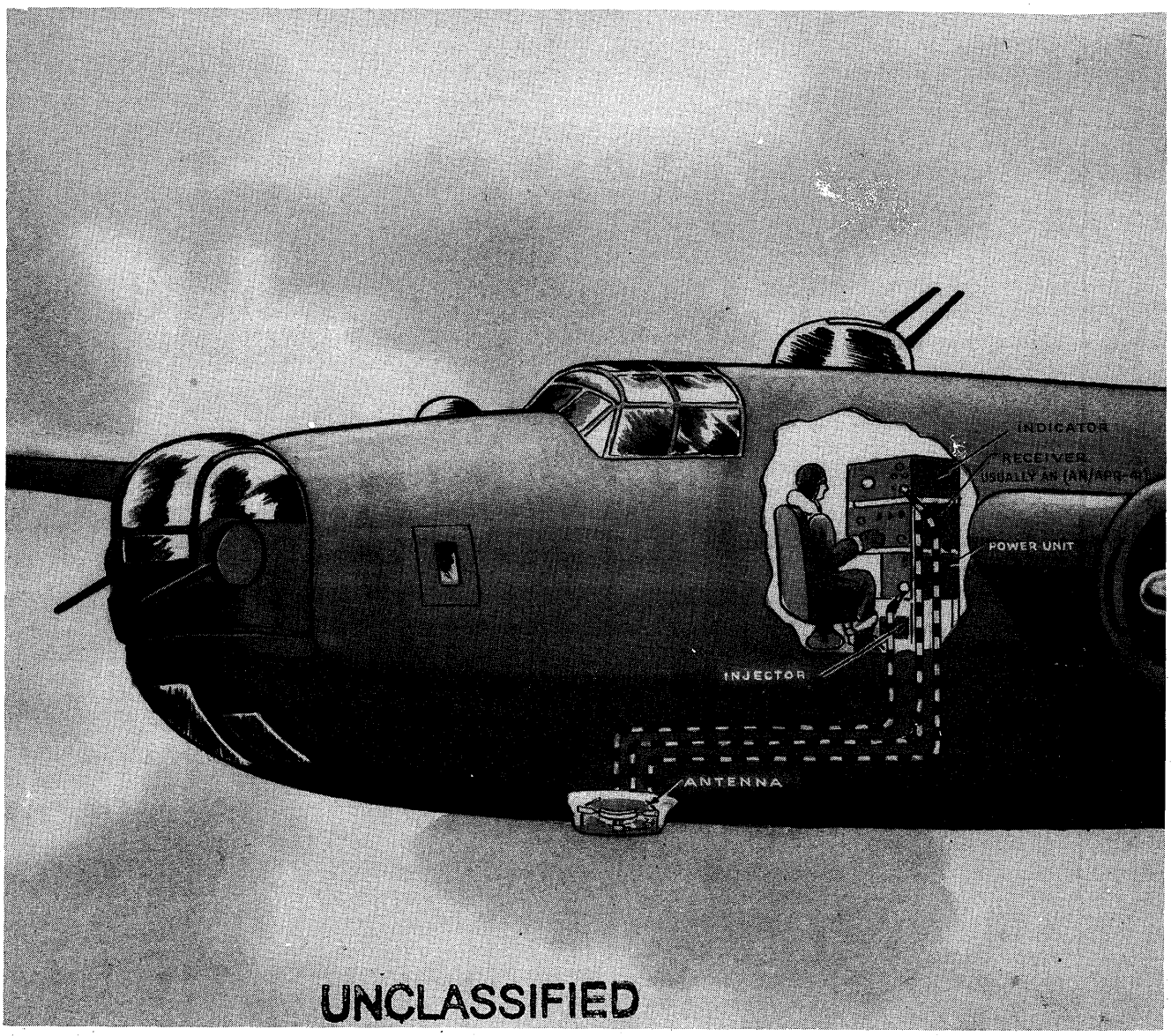
Test Equipment required for maintenance is Test Set TS-189/U.

Power is obtained from an 80/115 volt, 400-800 and 400-2600 c.p.s., a.c. source and a 28 volt d.c. source.

Army Supply Program requirements as of 14 June 1944 were 100 for the calendar year 1944 and 670 for 1945.

POWER INPUT	100 WATTS, 400-2600 C.P.S. 25 WATTS, 400-800 C.P.S. 80 WATTS, 28 VOLTS D.C.
FREQUENCY RANGE	30-950 MC. 300-950 M.C.
ACCURACY	±5 DEGREES IN AZIMUTH

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6SJ7	2	6H6-GT/G
1	6SH7	1	2X2/879
2	6AC7	1	5JP2
1	6V6	1	5R4-GY



Installation of Radar Direction Finding Assembly AN/APA-17 Radio Operator's Position - B-24 Airplane

1 Dec. 1944

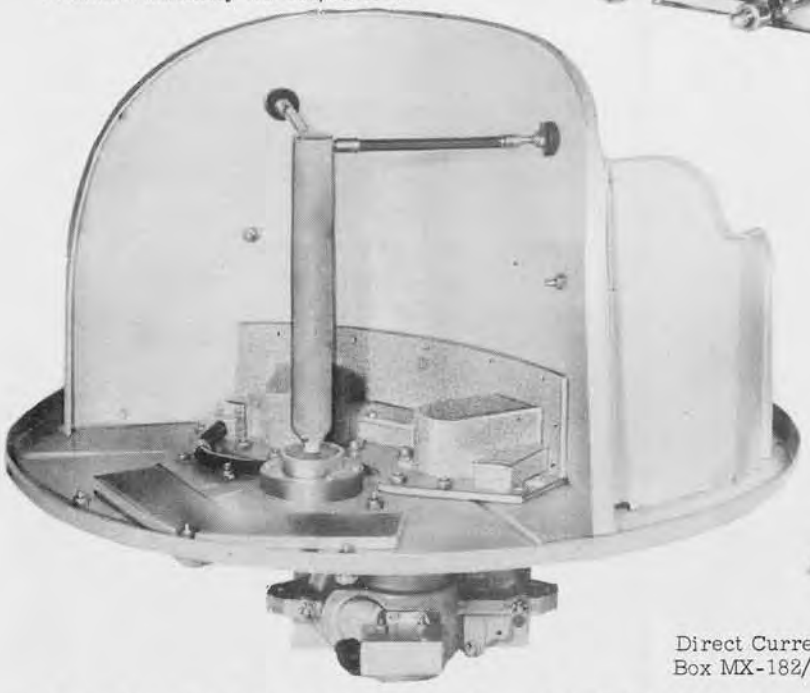
AN/APA-17

SECRET

Amplifier Indicator ID-80/APA-17

Rectifier Power Unit
PP-85/APA-17

Antenna Assembly AS-108/APA-17



Visor

Direct Current Injector
Box MX-182/APA-17

RADAR DIRECTION FINDING ASSEMBLY AN/APA-17

TOTAL WEIGHT 85 LBS

Component	Nomenclature	Size	Weight
Amplifier Indicator	ID-80/APA-17	7 5/8" x 10 1/8" x 21 3/4"	25 Lbs.
Rectifier Power Unit	PP-85/APA-17	7 5/8" x 4 7/8" x 21 3/4"	22 Lbs.
Antenna Assembly	AS-108A/APA-17	11 1/2 x Dia. 20"	7 1/2 Lbs.
D.C. Injector Box	MX-182/APA-17	5" x 4" x 2"	3 Lbs.
Antenna Drive Assembly	PU-29/APA-17		15 Lbs.
Mounting	MT-171/U	2 1/4" x 10 5/8" x 22"	3 Lbs.
Mounting	MT-167/U	2 1/4" x 5 1/4" x 22"	2 Lbs.

1 February 1945

Recording Assembly AN/APA-23 is an airborne recorder for use with Radio Receiving Equipment AN/APR-4, Radio Receiving Set AN/ARR-5 and Radio Receiving Set AN/ARR-7 and other similar radar search and radio receivers.

The recorder is coupled to the receiver by means of a mechanical link to provide the proper speed of rotation for the tuning dial. An electrical link is provided to feed the received signals into the recorder. By proper calibration the recorder provides a permanent record of the frequencies received and the time of reception. The recorder is calibrated for frequency by impressing a known frequency on the recorder and marking the stylus impression with that frequency.

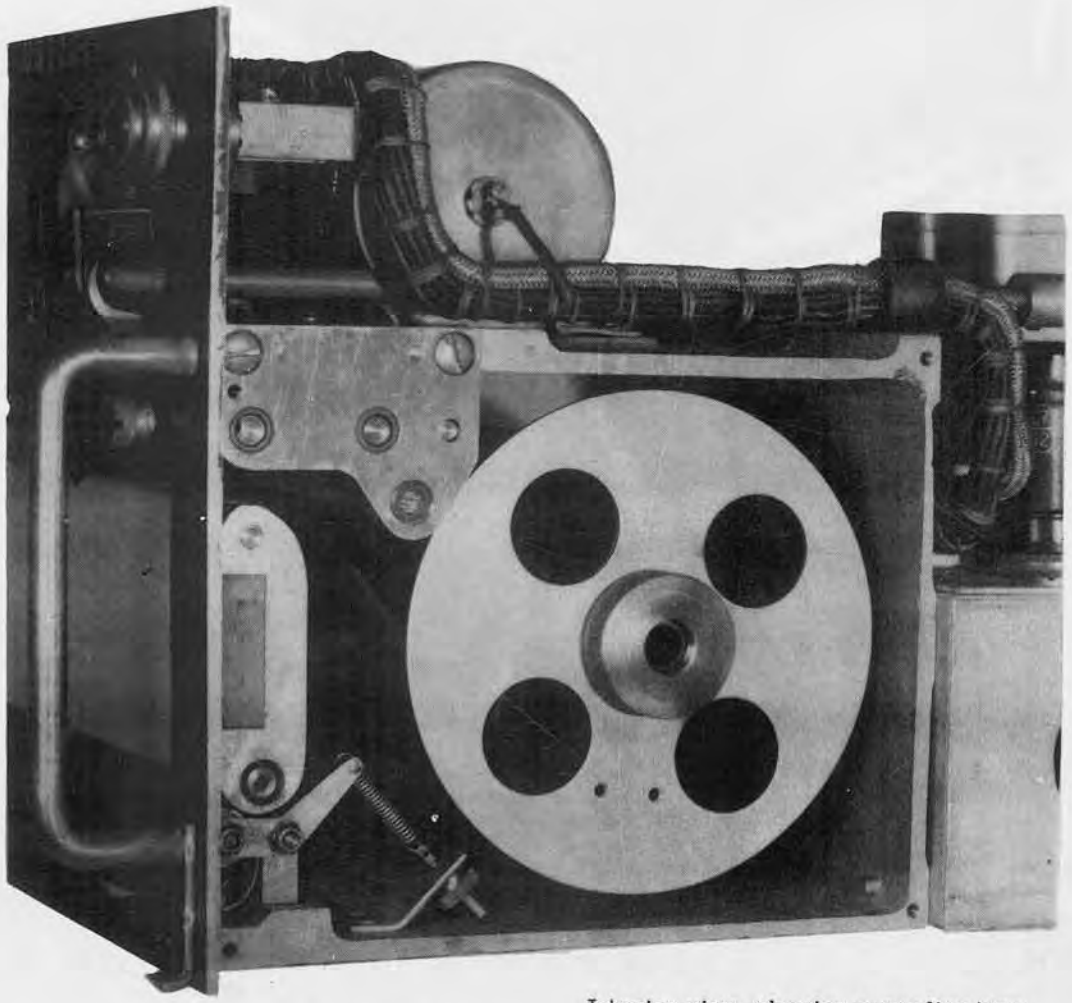
In operation the stylus on the recorder makes an impression on the tape only when a signal is picked up in the accompanying receiver. The time is indicated on the tape by marks at one minute intervals by means of a timing mechanism. The stylus is synchronized with the tuning dial and sweeps back and forth. An input signal of about 80 millivolts is sufficient to activate the stylus and mark the tape. Thus with the equipment in operation constant listening by an operator is unnecessary, leaving him free to investigate new signals. When a new signal appears on the tape the operator can switch to manual operation and tune to the signal for observation.

The frequency range of the recorder depends on the range of the associated receiver. Power is obtained from an 80/115 volt, 400-2600 c.p.s., a.c. source and a 28 volt d.c. source.

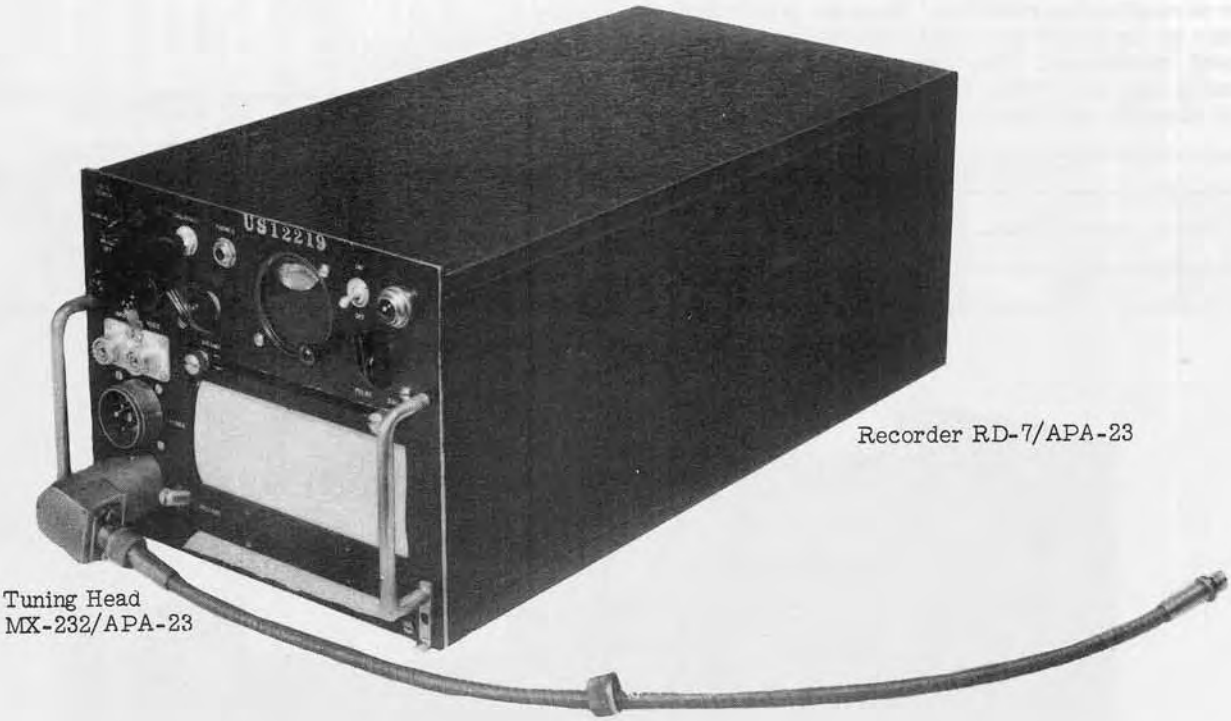
Army Supply Program requirements as of 24 August 1944 were 450 equipments for the calendar year 1944 and 2,078 for 1945. Procurement for the army is limited to 450 for the calendar year 1944 and 575 for 1945.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6AC7	2	2050
1	6SN7	1	5Y3GT

POWER INPUT	50 WATTS D.C. 60 TO 80 WATTS A.C.
SENSITIVITY	80 MILLIVOLTS FOR PULSES. 280 TO 70 MILLIVOLTS FOR SINE WAVES AT 50 TO 10,000 c.p.s.



Interior view, showing recording tape.



Recorder RD-7/APA-23

Tuning Head
MX-232/APA-23

RECORDING ASSEMBLY AN/APA-23 TOTAL WEIGHT 54 LBS.

Component	Nomenclature	Size	Weight
Recorder	RD-7/APA-23	7 3/4" x 10 1/4" x 21 3/4"	50 Lbs.
Mounting Base	MT-171/U	2 1/4" x 5 1/4" x 22 "	3 Lbs.
Tuning Head	MX-232/APA-23		1 Lb.
Adapter Kit (4 rolls, 400 ft. x 6 in. tape)			

1 Dec. 1944

Transmitting Equipment AN/APQ-2 is an airborne noise modulated transmitter for use in jamming enemy radars in the 200 to 550 mc. frequency range. It is used specifically to interfere with the enemy coast watching radar and some early warning radars operating in that frequency range between those of Transmitting Equipment AN/APT-1 and Radar Set AN/APT-2. It overlaps the frequencies of the two sets so that full coverage over the entire spectrum is available.

Frequency of the transmitter is usually pre-set prior to take-off to cover a specific channel. The equipment has a sufficiently high power output to effecitively screen a large bomber within the range of the enemy radars. It is effective in creating confusion at the enemy radars as to number of bombers approaching, and in preventing successful night fighter interception.

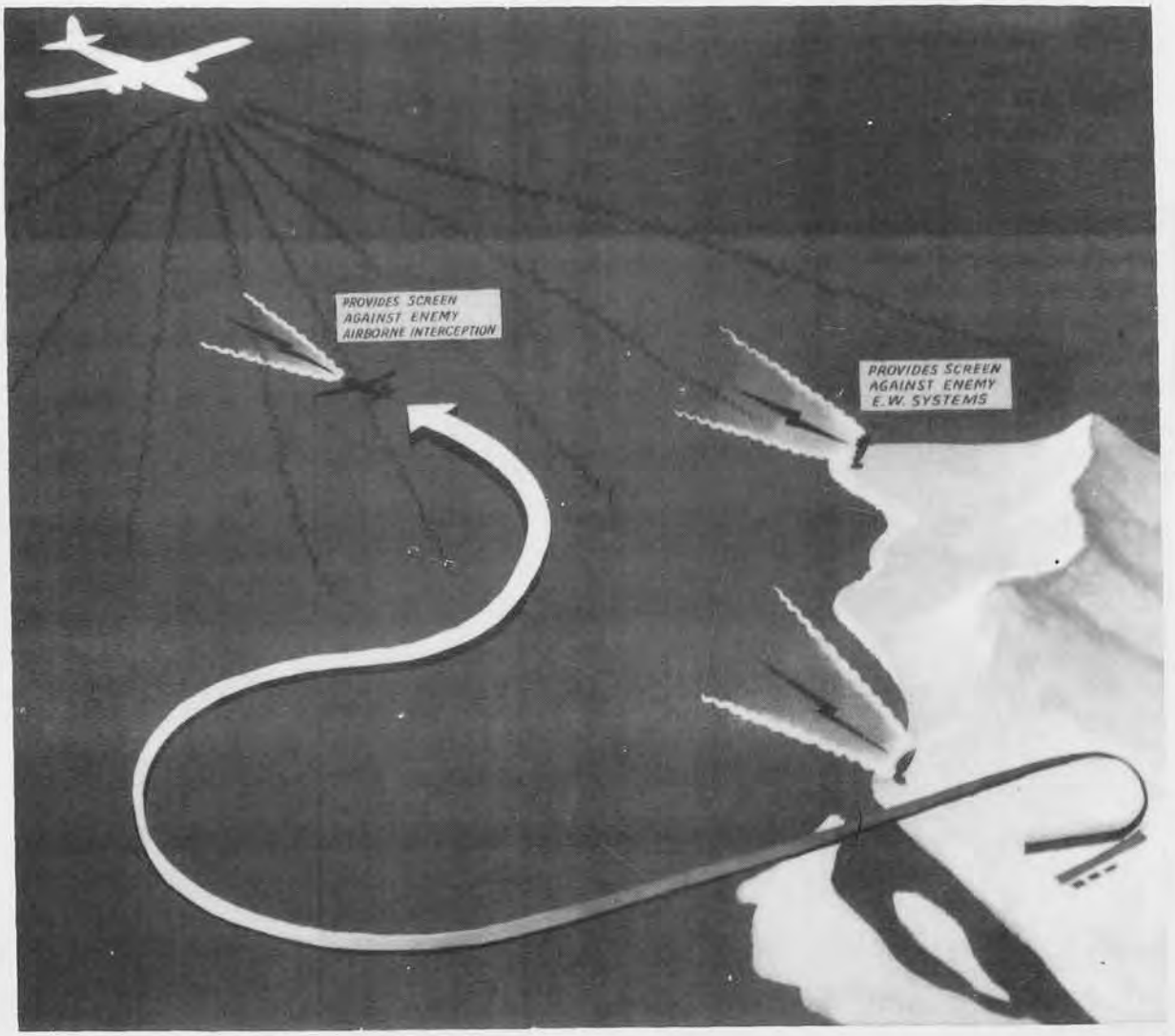
Power is obtained from an 80-115 volt, 400-2600 c.p.s., a.c. source.

Test equipment required for the maintenance and tuning of the equipment includes Test Meter I-139-A, Pickup Assembly TS-131/AP, Frequency Meter TS-175/AP, Hickok Voltmeter type 110, Radio Frequency Wattmeter TS-118/AP or TS-70/AP and Test Set I-56-K.

Army Supply Program requirements as of 31 July 1944 were 4,020 for the calendar year 1944, and 5,352 for 1945.

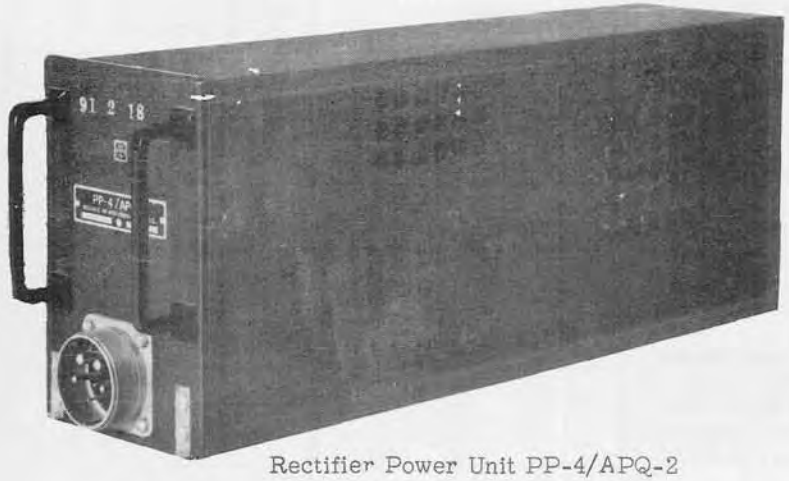
POWER INPUT	430 WATTS A.C. 35 WATTS D.C.
POWER OUTPUT	25 TO 5 WATTS
FREQUENCY RANGE	200 TO 550 MC.
TYPE OF SIGNAL	A.M. WITH NOISE AND INCIDENTAL F.M.
MODULATION BAND-WIDTH	7 MC.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	388A	1	6AG7
4	5R4GY	2	807
2	6AC7	1	931A



Transmitting Equipment AN/APQ-2 provides cover for bomber formations against enemy early warning and intercept radar.

UNCLASSIFIED



Rectifier Power Unit PP-4/APQ-2

Radar Transmitter T-9/APQ-2

Antenna Assembly AS-65/APQ-2

TRANSMITTING EQUIPMENT AN/APQ-2 TOTAL WEIGHT 94 LBS.

Component	Nomenclature	Size	Weight
Radar Transmitter	T-9/APQ-2	7 3/4" x 10 1/4" x 22 "	43 LBS.
Rectifier Power Unit	PP-4/APQ-2	7 3/4" x 5 " x 22 "	36 LBS.
Antenna Assembly	AS-65/APQ-2	16 1/2" x 3 " max. diameter	8 LBS.
Mounting Base	MT-171/U	2 1/4" x 10 5/8 x 22 "	3 LBS.
Mounting Base	MT-167/U	2 1/4" x 5 1/4" x 22 "	3 LBS.

and includes mountings, plugs, adapters and cables.

Radio Set AN/APQ-9 (Carpet III) is an airborne transmitter designed to jam enemy radar systems operating in the frequency range 475 to 585 mc. This range of frequencies is used extensively by the enemy for gun-laying, searchlight control, ground control of interception and aircraft interception radar.

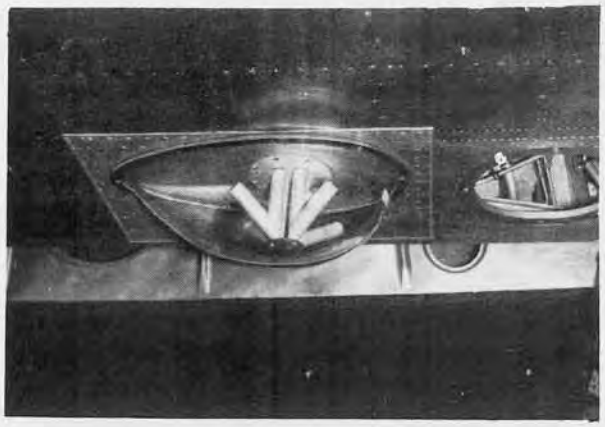
The set is designed primarily as a barrage jammer and when used for that purpose the frequency band to be covered during a mission is preset prior to take-off, after which no further tuning is required in flight. The set has sufficient power to screen a heavy bomber to within six miles of a Giant Wurzburg radar system.

With a trained operator in attendance the set may be used as a spot jammer within its frequency range. Tuning is accomplished by means of a single dial control.

The set consists of a transmitter mounted on an SARC B1-D case and a power supply mounted in an SARC A1-D case. The transmitter consisting of a push-pull oscillator tuned by parallel plates connected to the anodes and grids emits an A.M. noise signal of 20 to 10 watts with an output bandwidth of 7 mc. The equipment operates from an 80/115 volt, 400-2600 c.p.s., a.c. source and a 28 volt d.c. source.

Production of the equipment was begun during the first quarter of 1944. Army Supply Program requirements as of 1 September 1944 were 15,050 equipments for the calendar year 1944 and 5,885 for 1945.

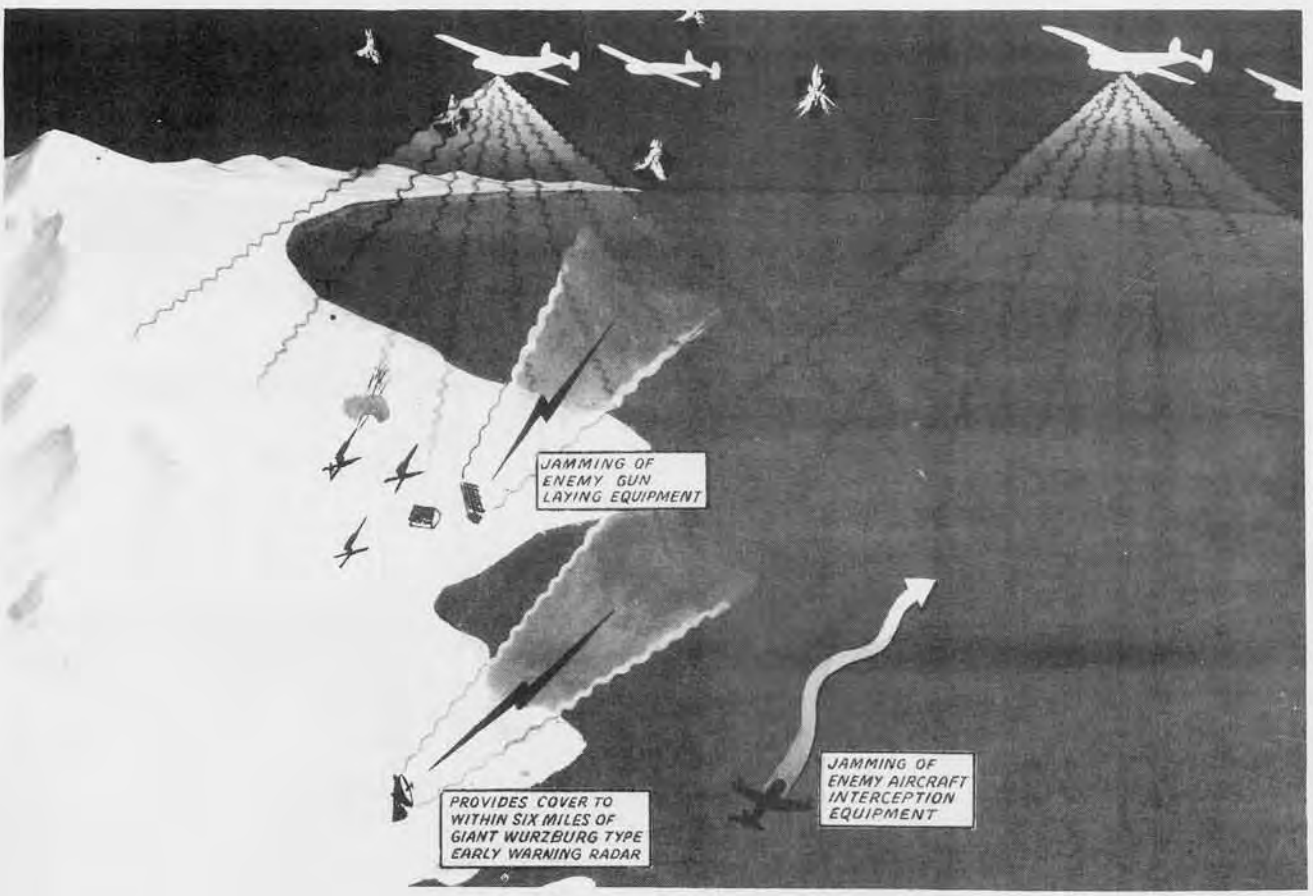
Test equipment used in the maintenance and tuning of the equipment includes, Test Set I-139-A, Pickup Assembly TS-131/AP, Test Set I-56-K, Hickok Voltmeter type 110, Frequency Meter TS-175/U and Radio Frequency Wattmeter TS-118/AP or TS-70/AP.



Antenna mounted on B-17 airplane.

POWER INPUT	450 WATTS A.C. AND 30 WATTS D.C.
POWER OUTPUT	20 TO 10 WATTS
FREQUENCY	475 TO 585 MC.
TYPE OF SIGNAL	A.M. NOISE WITH INCIDENTAL F.M.
OUTPUT BANDWIDTH	7 MC.

TUBE COMPLEMENT			
NO.	TYPE	NO.	
1	931A	1	6AG7
2	6AC7	2	8012
2	807	4	5R4GY



Radio Set AN/APQ-9 may be used for jamming any enemy radar search or ranging equipment operating in the frequency range from 475 to 585 mc.

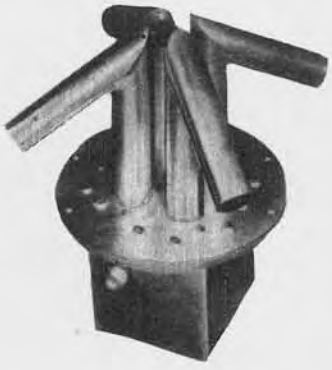
1 Dec. 1944

AN/APQ-9

CONFIDENTIAL

Rectifier Power Unit PP-51/APQ-9

Radar Transmitter TS-39/APQ-9



Antenna Assembly AS-69/APT-2

Antenna Assembly AS-33/APT-2

RADAR SET AN/APQ-9

TOTAL WEIGHT 115 LBS.

Components	Nomenclature	Size	Weight
Radar Transmitter	TS-39/APQ-9	7 3/4" x 10 1/4" x 22 "	44 Lbs.
Mounting Base	MT-171/U	2 1/4" x 10 5/8" x 22 "	3 Lbs.
Rectifier Power Unit	PP-51/APQ-9	7 3/4" x 5 " x 22 "	41 Lbs.
Mounting Base	MT-167/U	2 1/4" x 5 1/4" x 22 "	3 Lbs.
Antenna Assembly	AS-33/APT-2	12 1/2" high, 3" max. dia.	2 Lbs.
Antenna Assembly	AS-69/APT-2	10 1/2" high, 9" max. dia.	8 Lbs.
Antenna Cover	CW-44/APT	6 1/2" x 12 " x 21 "	

and includes plugs, mountings, cables and adapters.

1 Dec. 1944

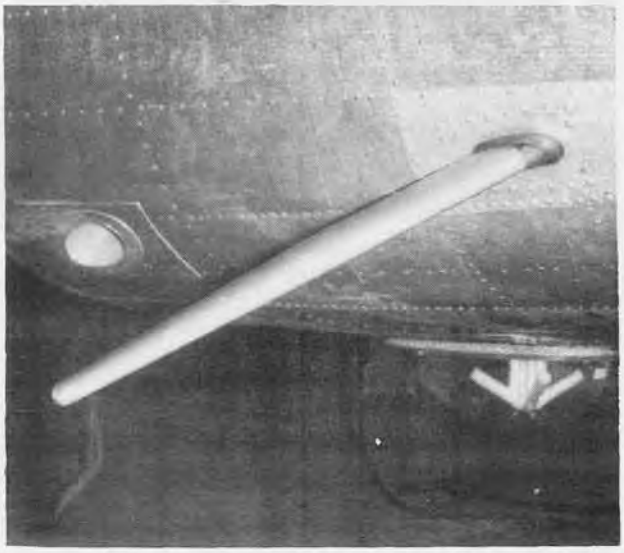
Radar Set AN/APQ-15 is a "spoofer" radar repeating device, designed for use in the Pacific theater. The equipment is a deception device, used to simulate a flight of planes. It picks up radar signals within its frequency range and retransmits an echo on the accepted frequency. The echo signal is adjustable in length and delay to simulate range and size of the false flight information to be transmitted.

The equipment has a narrow acceptance band to reduce the possibility of failure to repeat signals where the concentration of enemy radars in one frequency band is relatively great. With suitable precautions, the equipment may be used against several radars in the same frequency band. There is provision for adjustment in flight, of delay and pulse length, but the equipment may be tuned prior to take-off to simulate the desired effect In the latter case the only operation necessary in flight is turning the set on and off.

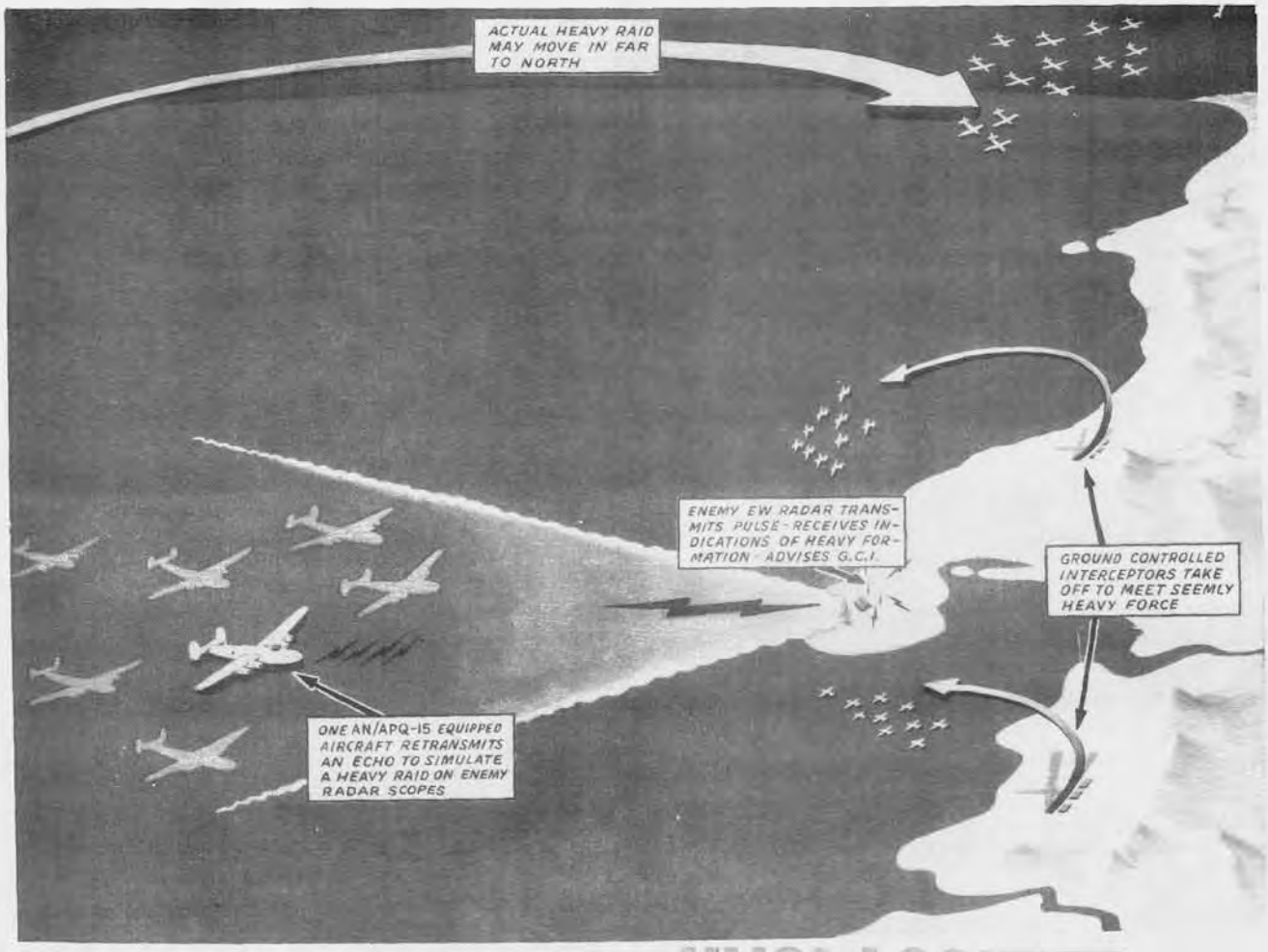
POWER INPUT	230 WATTS A.C.
POWER OUTPUT	5 WATTS, MAX,
SENSITIVITY	0.25 MILLIVOLTS
FREQUENCY RANGE	90-325 MC.
BANDWIDTH	4 MC.
PULSE LENGTH	ACCEPTS 1/3 to 40μsec. RETRANSMITS 20 to 60μsec.
DELAY	3 to 20 sec.

The equipment was designed to cover the 90-325 mc. band by means of seven tuning units. Power is obtained from an 80/115 volt, 400-2600 c.p.s., a.c. source.

Army Supply Program requirements as of 20 July 1944 were 200 for the calendar year 1944.



Installation of Antenna Stub AT-41/APT for Radar Set AN/APQ-15 on B-24.



Radio Set AN/APQ-15 "SPOOFER" repeating device plays an important role in deceiving enemy interceptor defense to the wrong place at the right time.

AN/APQ-15

~~RESTRICTED~~ ~~SECRET~~

Receiver-Transmitter
RT-64/APQ-15

TN-66/APQ-15

TN-64/APQ-15

AT-41/APT

AT-42/APT

AT-43/APT

Balancing Unit CU-43/APT
Disassembled View

RADAR SET AN/APQ-15

TOTAL WEIGHT 100 LBS.

Component	Nomenclature	Size	Weight
Receiver Transmitter	RT-64/APQ-15	7 5/8" x 10 1/8" x 21 3/4"	40 Lbs.
Tuning Unit	TN-64/APQ-15	4" x 4" x 10"	15 Lbs.
Tuning Unit	TN-65/APQ-15	4" x 4" x 10"	15 Lbs.
Tuning Unit	TN-66/APQ-15	4" x 4" x 10"	15 Lbs.
Tuning Unit	TN-67/APQ-15	4" x 4" x 10"	15 Lbs.
Tuning Unit	TN-68/APQ-15	4" x 4" x 10"	15 Lbs.
Tuning Unit	TN-69/APQ-15	4" x 4" x 10"	15 Lbs.
Tuning Unit	TN-70/APQ-15	4" x 4" x 10"	15 Lbs.
Mounting Base	MT-171/U	2 1/4" x 10 5/8" x 22"	4 Lbs.
Antenna Stub	AT-41/APT	16 1/2" Long	7 Lbs.
Antenna Stub	AT-42/APT	22 1/2" Long	7 Lbs.
Antenna Stub	AT-43/APT	29" Long	7 Lbs.
Balancing Unit	CU-43/APT	35" x 2" Diam.	5 Lbs.
Balancing Unit	CU-44/APT	52" x 2" Diam.	7 Lbs.

1 Dec. 1944

Radar Set AN/APQ-17 is an airborne selective radar jamming equipment covering the frequency range 50-220 mc. and is intended for use in the Pacific Theater. The only other equipments which are available in this frequency band are Transmitting Equipment AN/APT-1 (90-210 Mc) and Radio Set AN/ARQ-8 (25-108 Mc). Transmitting Equipment AN/APT-1 is difficult to tune for selective or "spot" jamming since this equipment was designed primarily for barrage jamming. Radio Set AN/ARQ-8 is also basically a barrage jamming set which has an added feature of selective tuning within the barrage band of 5 megacycles. The need for equipment tunable in the airplane for selective jamming over a wide band becomes evident upon considering present intelligence data and capture of various Jap radars wherein it is indicated that wide frequency ranges are employed.

The receiver and the transmitter are tuned with a single tuning control so that when the control switch is set to transmit it radiates a jamming signal with center frequency the same as that being received. The panel contains a selector switch for three bandwidths: 100 kilocycles, 1 megacycle and 2 megacycles.

Power is obtained from an 80/115 volt, 400-2600 c.p.s., a.c. and a 28 volt d.c. source. Power input of 530 watts produces a noise amplitude modulated output signal of 50 to 20 watts.

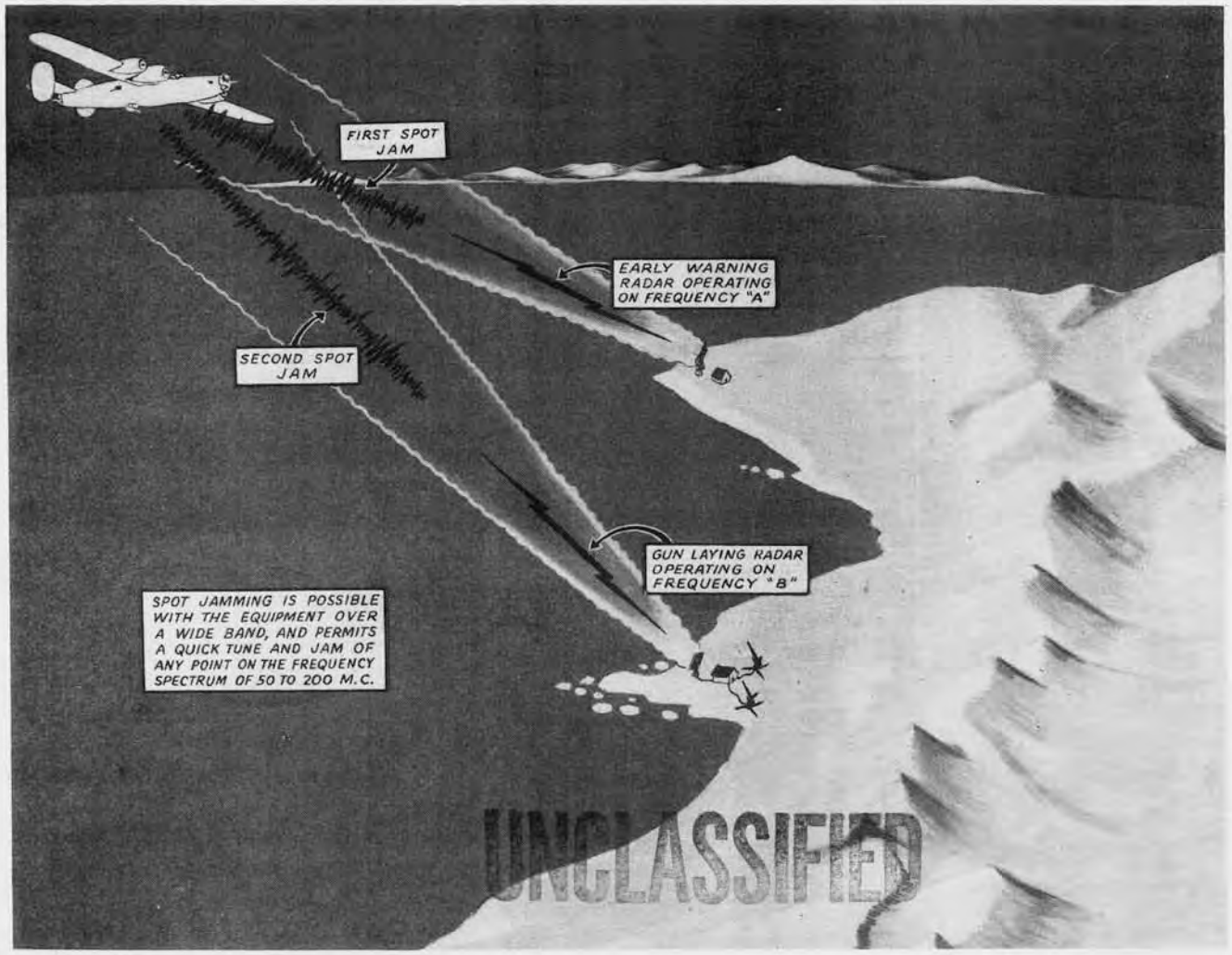
Suitable provision is incorporated in the equipment to prevent corrosion and fungus formation due to tropical climatic conditions.

Test equipment requirements for maintenance of this equipment have not yet been determined.

No requirements have been established on the Army Supply Program as of 1 December 1944.

POWER INPUT	530 WATTS @80/115V AC. 0.5 AMPERES @28V DC.
POWER OUTPUT	50 TO 20 WATTS
FREQUENCY	50-220 MC
TYPE OF SIGNAL	NOISE, AMPLITUDE MODULATED
OUTPUT BANDWIDTH	100 KC. 1 MC. 2 MC.
TUNING CONTROL	ONE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
4	24G	1	6C4
2	6AG7	1	9006
1	6D4	1	5R4G
1	829	2	836
1	6AG5		



Radar Set AN/APQ-17 is an airborne selective radar jamming equipment capable of rapid switching of jamming frequency when the enemy resorts to evasive changes in radar frequencies to counteract jamming operations.

AN/APQ-17

[redacted] SECRET

UNCLASSIFIED

Receiver-Transmitter
RT-79/APQ-17(XA-1)

Rectifier Power Unit
PP-137/APQ-17(XA-1)

RADAR SET AN/APQ-17

TOTAL WEIGHT 85 LBS.

Component	Nomenclature	Size	Weight
Receiver-Transmitter	RT-79/APQ-17	8" x 11" x 22"	33 Lbs.
Rectifier Power Unit	PP-137/APQ-17	8" x 5" x 22"	37 Lbs.
Mounting Base	MT-167/U	3" x 6" x 22"	3 Lbs.
Mounting Base	MT-171/U	3" x 11" x 22"	3 Lbs.

and includes miscellaneous cables, plugs and adapters.

Feb. 1945 - Y-109829

AN/APR-4

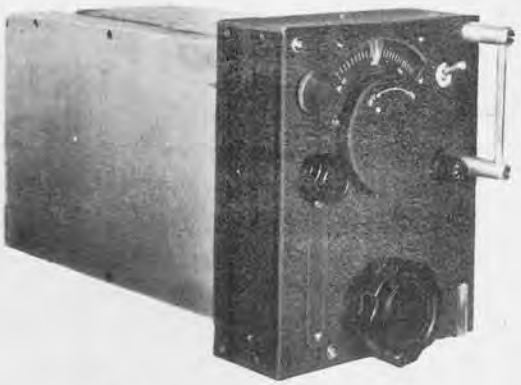
Radio Receiving Equipment AN/APR-4 is an airborne search receiver used to intercept enemy radar and communications signals in the 40 to 4000 mc. range, which includes the frequencies of all of the presently known enemy radar systems and many enemy communications channels. The equipment provides necessary information to determine effective countermeasures.

The set is an improved version of the SCR-587. comprises an assembly of three replaceable subassemblies; an r-f tuning unit; an i-f amplifier unit and a power supply. Two types of motor driven tuning units, with or without an adjustable sector sweep are available for the 40 to 1000 mc. range. These may also be tuned manually with a single dial control. Tuning Unit TU-59-A covering the 1000 to 3800 mc. frequency range is manually tuned with a two dial control. The i-f amplifier has controls for gain, automatic volume control and wide or narrow bandwidth operation. The set is designed for operation from an 80/115 volt, 60-2600 c.p.s., a.c. source and provides output for headphones, panoramic adapter and an analyzer.

The sensitivity of the set is such that it will receive signals from a much greater distance than that at which the radars it is searching will detect the plane in which it is installed. The accuracy of the frequency calibration is approximately 1% throughout its frequency range. In operation, search is conducted with the i-f adjustment set to wide band, about 4 mc. When an enemy signal is detected the i-f unit is switched to narrow band, about 0.5 mc., for greater signal discrimination. The detected signal can then be analyzed by means of Pulse Analyzer AN/APA-6, or AN/APA-11.

Test Equipments used in the maintenance and tuning of this equipment include Test Oscillator TS-47/APR, Signal Generators, Navy type LAE, LAF and LAG, General Radio Type 804C Signal Generator, Hickok type 110 Voltmeter and Test Set I-56-K.

Army Supply Program requirements as of 1 November 1944 were 1,580 for the calendar year and 1,017 for 1945.



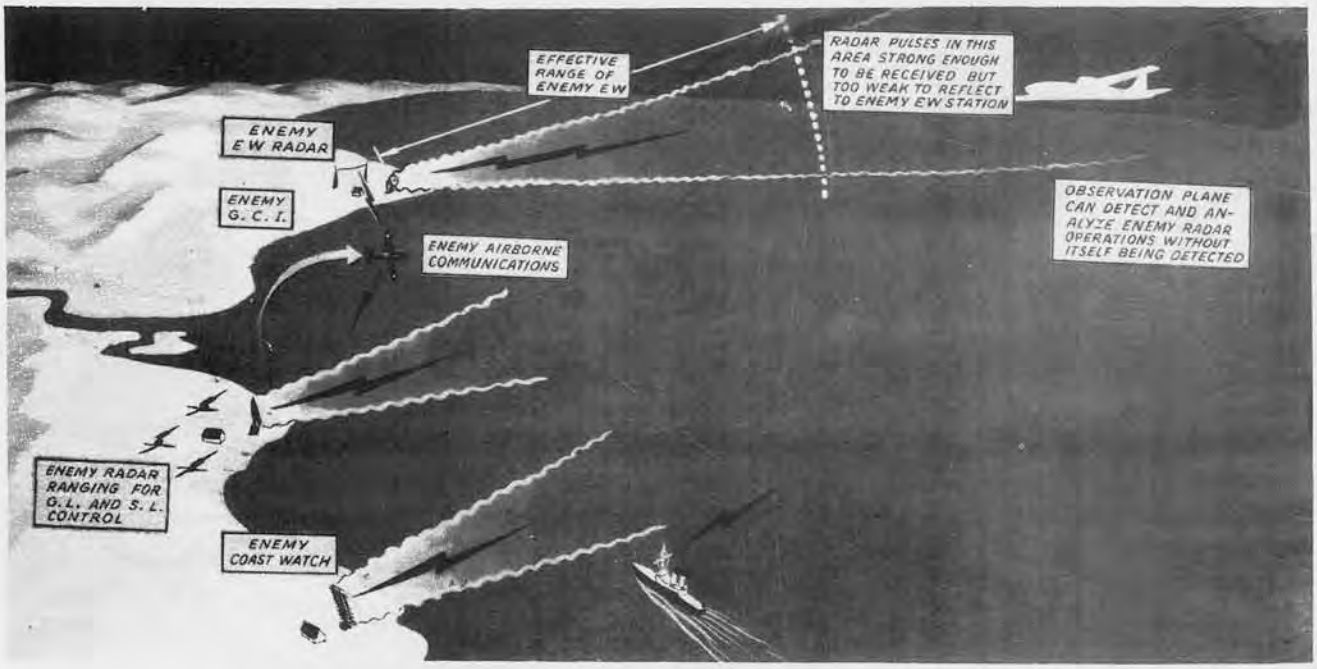
Tuning Unit TN-18/APR-4

POWER INPUT	110 WATTS A.C.
	10 WATTS D.C.
FREQUENCY RANGE	40 TO 4000 M.C.
TYPE OF SIGNAL	CW, MCW, RADAR PULSE
SENSITIVITY	50-100 MICRO-VOLTS
DIAL ACCURACY	± 1%

TUBE COMPLEMENT			
a. 1	6AC7	c. 2	955
1	6H6	d. 1	955
1	6AG7	*1	IN21B
2	5Y3GT	e. 1	703A
b. 2	9002	1	6E5
1	6AK5	f. 1	703A or 446A
		* 2	IN21B

*Crystals

a. R-54/APR-4, b. TN-16/APR, c. TN-17/APR, d. TN-18/APR, e. TN-19/APR, f. TN-54/APR.



This equipment determines frequency and function of enemy detection and ranging radar over all known and probable enemy frequencies being used.

AN/APR-4

UNCLASSIFIED

Antenna
AT-38/APT

Antenna
AT-49/APT

RADIO RECEIVING EQUIPMENT - AN/APR-4 TOTAL WEIGHT 100 LBS.

Component	Nomenclature	Size	Weight
Receiver	R-54/APR-4	8" x 10 1/4" x 21 3/4"	29 Lbs.
Tuning Unit	TN-16/APR-4	8" x 6 1/2" x 14 "	12 3/4 Lbs.
Tuning Unit	TN-17/APR-4	8" x 6 1/2" x 14 "	12 3/4 Lbs.
Tuning Unit	TN-18/APR-4	8" x 6 1/2" x 14 "	12 3/4 Lbs.
Tuning Unit	TN-19/APR-4	8" x 6 1/2" x 14 "	12 3/4 Lbs.
Tuning Unit	TN-54/APR-4	8" x 6 1/2" x 14 "	12 3/4 Lbs.
Antenna Stub	AT-38/APT	29" long	3 Lbs.
Antenna Cover	CW-33/APR-4	8 1/2" x 8 1/2" x 30"	2 Lbs.
Switching Assembly	AS-23/APR-4	3" diam.	
Case (3 required)	CY-31/APR	10 1/2" x 7 3/4" x 6 1/2"	7 Lbs.
Mounting Base	MT-171/U	2 1/4" x 10 5/8" x 22"	3 Lbs.
Antenna Assembly	AT-49/APT	7 1/2" x 8" diameter	3 Lbs.

and includes plugs and cable adapter.

1 Dec. 1944

AN/APR-7

Radar Set AN/APR-7 is an airborne direct detection radar search receiving equipment. It was developed at Radio Research Laboratory as "SPUD" under project D-2100. It is designed to receive pulsed signals in the frequency range 1000-3000 mc.

The equipment is designed to afford search of the frequency spectrum between 1000 and 3000 mc to determine whether the enemy is using equipment operating in that band. It has a single dial control and is manually tuned. Only audio output is provided. The crystal detector is followed by a super sonic amplifier, a diode rectifier and an audio amplifier.

The receiver is mounted in a standard aircraft radio case A1-D. Power is obtained from 115 volts, 60-2600 c.p.s., a.c. source.

Test equipment required for maintenance and tuning of the equipment includes Test Oscillator TS-252/AP, Navy Type Signal Generator LAG, Hickok type 110 Vacuum Tube Voltmeter, and Hewlett-Packard model 200C Audio Oscillator.

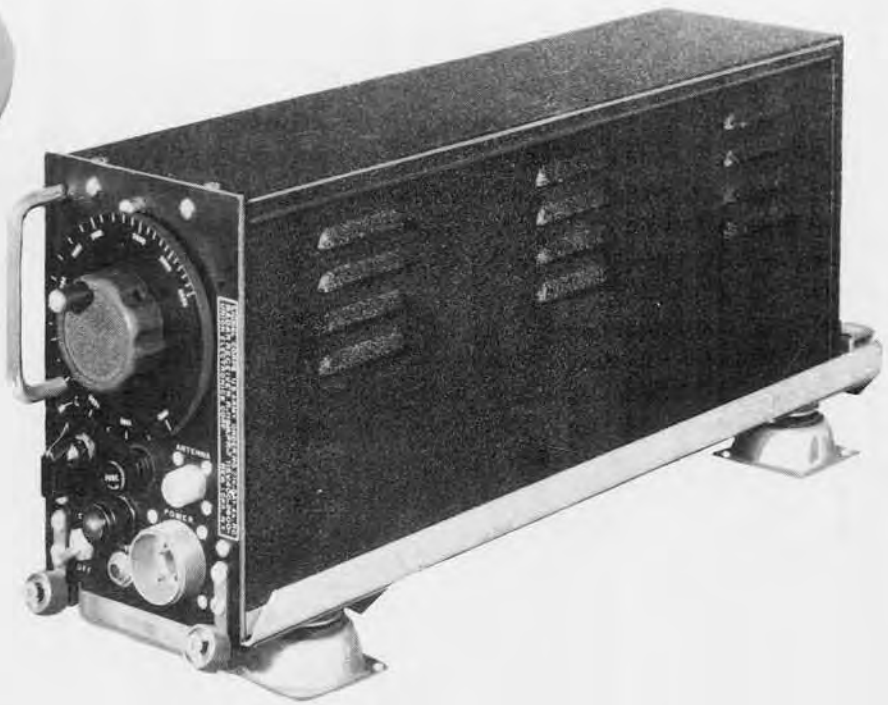
Army Supply Program requirements as of 1 October 1944 were 100 for the calendar year 1944 under a crash procurement program.

POWER INPUT	35 WATTS
FREQUENCY	1000-3000 MC.
BANDWIDTH	10-40 MC.
SENSITIVITY	1000 MICROVOLTS

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	6SJ7	1	6H6
2	6J7	1	5Y3GT
1	6G6G		

Cover

Antenna Assembly
AS-125/APR



Radar Receiver R-119/APR-7

RADAR SET AN/APR-7

TOTAL WEIGHT 25 LBS.

Component	Nomenclature	Size	Weight
Receiver	R-119/APR-7	8" x 5" x 21"	22 Lbs.
Mounting	MT-167/U	3" x 6" x 22"	3 Lbs.
Antenna Assembly	AS-125/APR		

and includes cables, connectors, etc.

1 Dec. 1944

Transmitting Equipment AN/APT-1 is an airborne transmitter used to jam enemy radars in the 95-210 mc. frequency range. This band includes most of the enemy early warning radars such as the German Freya, Hoardings and Wasserman and Japanese radars of equivalent type. The equipment employs the DINA (Direct Noise Amplification) type of transmission and may be used either as a spot jammer or as a barrage type jammer.

The carrier frequency is suppressed and all of the output power is concentrated in the side bands, affording more effective jamming coverage with less power. It will effectively screen an AN/APT-1 equipped bomber to within two miles of a Freya radar.

For barrage jamming the equipment is adjusted to the required frequency prior to take-off, after which only the power output need be controlled.

For spot jamming the set must be tuned in flight by means of the control unit. Employing R-F Amplifier AM-14/APT or AM-18/APT the output of the equipment can be increased effectively. Two sets of three antennas are available for complete frequency coverage. All are of the quarter-wave stub type. One set is designed for vertical mounting and the other set is designed for mounting at an angle of 45 degrees.

Power is obtained from an 80/115 volt, 400-2600 c.p.s., a.c. source and a 28 volt d.c. source.

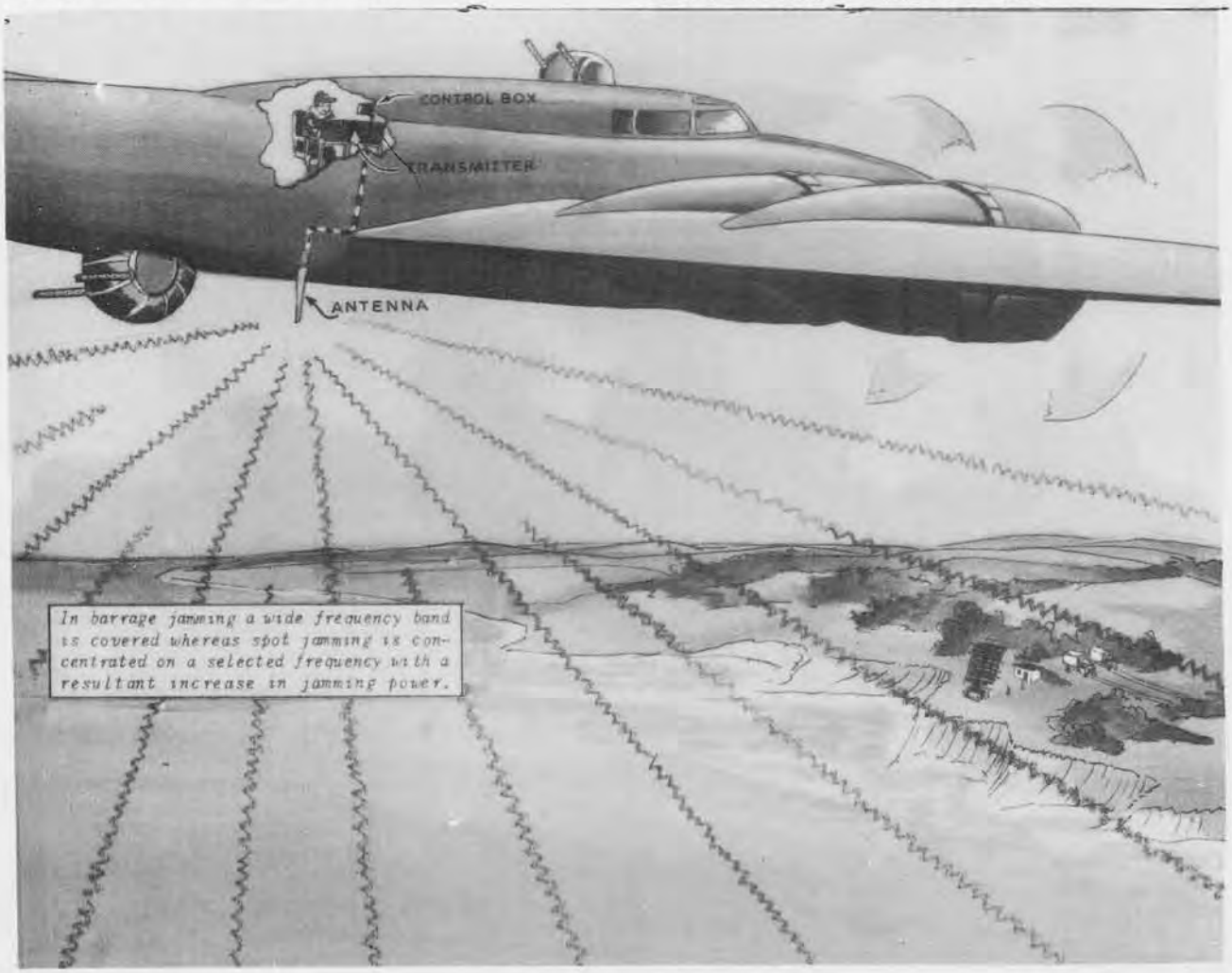
Test equipment required for the maintenance and tuning of the equipment includes Test Set I-139-A, Amplifier Alignment Unit TS-92/AP, Radio Frequency Wattmeter TS-118/AP or TS-92/AP, Picpup Assembly TS-131/AP, Test Set I-56-K and Frequency Meter TS-174/AP.

Army Supply Program requirements as of 20 November 1944 were 4,895 for the calendar year 1944 and 3,086 for 1945.

POWER INPUT	325 WATTS
POWER OUTPUT	30-8 WATTS (All sideband)
FREQUENCY	95-210 MC.
TYPE OF SIGNAL	DIRECT NOISE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	5R4GY	1	6X5GT
3	6AC7	1	931A
2	6C4	2	*832
1	6V6GT/X	1	*829B

* One 829B substituted for one 832 for increased power over 95-150 Mc.



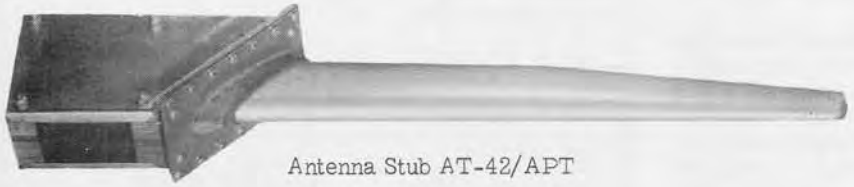
Radar Transmitting Equipment AN/APT-1 (Installed in B-17) may be used for spot or barrage jamming of enemy radars in the frequency range from 95 to 210 mc. (i.e. German Freya or Japanese equivalent types.)

1 Dec. 1944

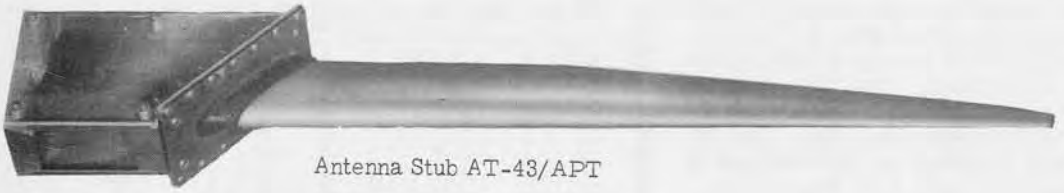
AN/APT-1

Antenna Stub AT-41/APT

Control Unit C-58/APT-1



Antenna Stub AT-42/APT



Antenna Stub AT-43/APT

Antenna Stubs AT-36/APT, AT-37/APT and AT-38/APT are similar except they are for vertical mounting.

Radar Transmitter T-28/APT-1

RADAR SET AN/APT-1

TOTAL WEIGHT 70 LBS.

Component	Nomenclature	Size	Weight
Radar Transmitter	T-28/APT-1	7 5/8" x 10 1/8" x 21 3/4"	43 Lb.
Control Unit	C-58/APT-1	3 1/2" x 3 1/2" x 2 1/2"	1 1/2 Lb.
Mounting Base	MT-171/U	2 1/4" x 10 5/8" x 22"	3 1/4 Lb.
Mounting Base	MT-114/APT-1	5" x 5" x 3/4"	1 1/4 Lb.
Antenna Stub	AT-36/APT or AT-41/APT	Length 16 1/2"	6 1/2 Lb.
Antenna Stub	AT-37/APT or AT-42/APT	Length 22 1/2"	6 1/2 Lb.
Antenna Stub	AT-38/APT or AT-43/APT	Length 29"	6 1/2 Lb.

and includes plugs, adapters, and misc. cables.

1 Dec. 1944

Radar Set AN/APT-2 (Carpet I), which supercedes Radio Transmitting Equipment RC-156-A, is an airborne radar transmitter designed for use as a barrage transmitter against enemy aircraft interception, gun-laying, ground controlled interception and searchlight control radars in the frequency range 450 to 710 mc. In operation it obscures the oscilloscope indications of the enemy radar.

When used as a barrage jammer the frequency is preset, prior to take-off, to the frequency band to be jammed. The only operation required in flight is to turn the transmitter on and off as required.

The equipment may be used as a spot jammer in conjunction with a receiver to determine the frequency to be jammed. For this type of operation a trained operator is required.

The set may be used in diversionary planes to distract the enemy while the actual raiding aircraft approach the target from another direction, or it may be used by the raiding aircraft to screen its approach to within 7 miles of a Giant Wurzburg system.

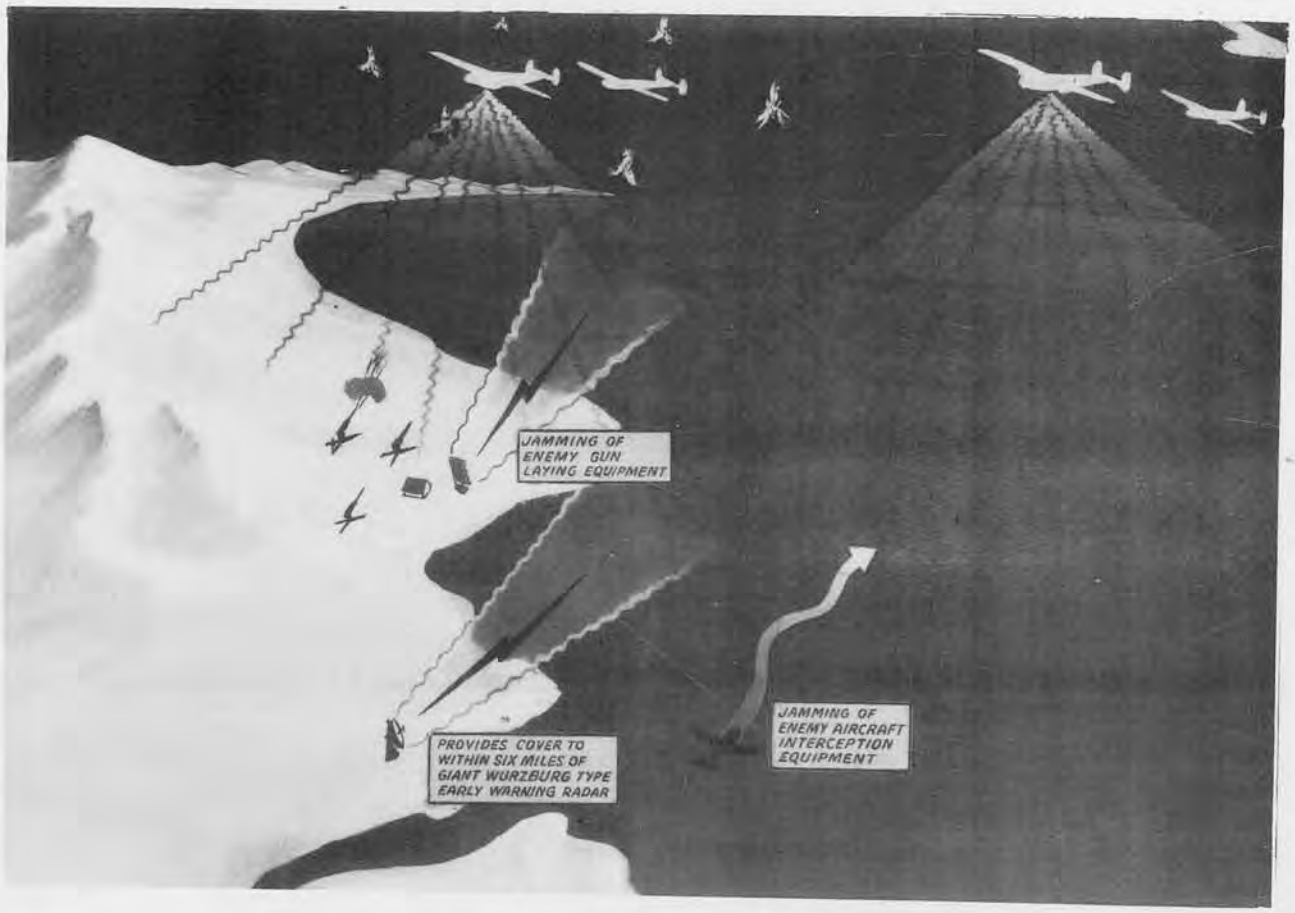
The set consists of a transmitter mounted in an SARC B1-D case and a control box for remote control of the equipment. It emits an A.M. noise signal with an output power of 8 to 4 watts over the frequency range of the set with an output band width of 7 mc. Power is obtained from an 80/115 volt, 400-2600 c.p.s., a.c. source and a 28 volt d.c. source.

Production of the equipment was started in 1943. Army Supply Program requirements as of 1 September 1944 were 6,562 for the calendar year 1944 and 3,302 for 1945.

Test equipment required for the maintenance and tuning of the equipment includes, Test Set I-139-A, Pick-up Assembly TS-131/AP, Frequency Meter TS-175/U, Hickok Voltmeter type 110, Radio Frequency Wattmeter TS-118/AP or TS-70/AP and Test Set I-56-K.

POWER INPUT	250 WATTS A. C. AND 35 WATTS D. C.
POWER OUTPUT	8 TO 4 WATTS
FREQUENCY	450 TO 710 MC.
TYPE OF SIGNAL	A.M. NOISE WITH RANDOM F.M.
OUTPUT BANDWIDTH	7 MC.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	2X2	2	368AS
2	5R4GY	1	807
2	6AC7	1	931A
1	6AG7		



Radio Set AN/APT-2 may be used for jamming any enemy radar search or ranging equipment operating in the frequency range from 475 to 585 mc.

AN/APT-2

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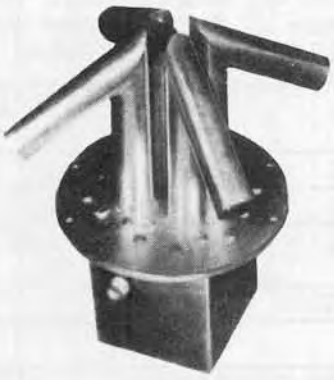
UNCLASSIFIED



Antenna Assembly AS-69/APT-2

Antenna Assembly AS-33/APT-2

Radar Transmitter T-26/APT-2

RADAR SET AN/APT-2

TOTAL WEIGHT 60 LBS

Component	Nomenclature	Size	Weight
Radar Transmitter	T-26/APT-2	7 3/4" x 10 1/4" x 22 "	43 Lbs.
Mounting Base	MT-171/U	2 1/4" x 10 3/4" x 22 "	3 Lbs.
Antenna Assembly	AS-33/APT-2	12 1/2" high, 3" max. dia.	2 Lbs.
Antenna Assembly	AS-69/APT-2	10 1/2" high, 9" max. dia.	8 Lbs.
Antenna Cover	CW-44/APT	6 1/2" x 12 " x 21 "	2 Lbs.

UNCLASSIFIED

and includes adapters, plugs and cable.

1 Dec. 1944

Radar Set AN/APT-3 is an airborne spot jamming transmitter using an amplitude noise-modulated carrier signal. Similar to Radio Transmitting Equipment RC-183-A, it is used to confuse or obliterate the information presented by the German Freya, Hoarding, Wasserman and Japanese Early Warning radars operating in the 85-135 mc. frequency range. TO-08-40-RC-183-21 has been issued by AAF to enable modification of the frequency to cover the 95-150 mc. range.

The equipment is sufficient to screen a heavy bomber to within six miles from a spot-jammed-Freya. It is most useful in the spot jamming of early warning sets to disguise the exact size of the incoming raid. For operation as a barrage jammer, the set is pretuned to the frequency band desired prior to take-off. The only adjustment required thereafter for this use is to adjust the modulator knob for maximum modulation. For spot-jamming, however, the transmitter must be tuned to the enemy frequency during flight. This is now done by means of a remote control tuning arrangement. Work is now in process on the production of a new control unit, C-85/APT-3, to replace the existing remote control and afford operation directly from the panel of the transmitter. Higher output can be obtained by use of Power Amplifier AM-14/APT with this set.

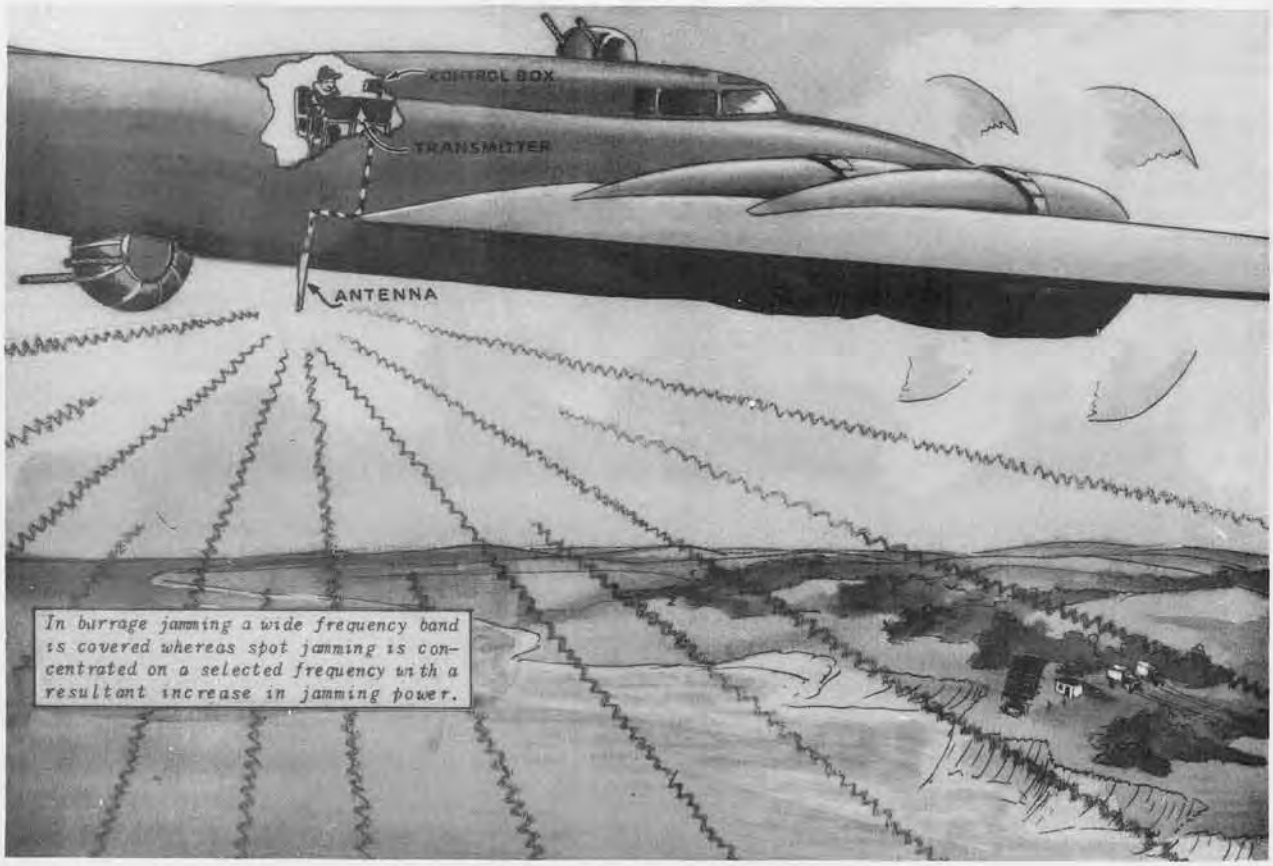
Antennas used with this equipment are quarter-wave stub antennas, AT-37/APT and AT-38/APT, and are mounted 45 degrees from the vertical to jam stations polarized other than vertically. The latter method of mounting results in some loss in jamming efficiency but permits more general use.

The equipment was in production prior to 1 Jan. 1944. Army Supply Program requirements as of 1 August 1944 were 1010 for the calendar year 1944.

Test equipments required for testing and tuning the equipment are: Test Set I-139-A; Radio Frequency Wattmeter TS-118/AP; Frequency Meter TS-174/UP; Test Set I-56K.

POWER INPUT	225 WATTS @ 80/115 VOLTS. 400-2600 C.P.S. AND 24 VOLTS D-C
POWER OUTPUT	12 TO 9 WATTS
FREQUENCY RANGE	85-135 MC.
OUTPUT BANDWIDTH	1-2 MC.
TYPE OF SIGNAL	AMPLITUDE NOISE MODULATED

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	5R4GY	1	829B
2	6AC7	1	832
1	6AG7	1	931A

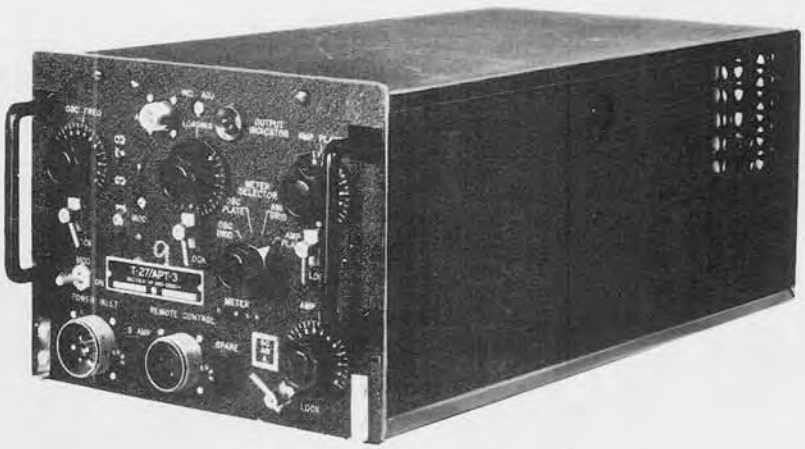


Radar Transmitting Equipment AN/APT-3 (Installed in B-17) may be used for spot or barrage jamming of enemy radars in the frequency range from 85 to 135 mc. (i.e. German Freya or Japanese equivalent types.)

AN/APT-3

Antenna Stub AT-42/APT

Antenna Stub AT-38/APT



Radar Transmitter T-27/APT-3

Control Unit C-85 APT/3

RADAR SET AN/APT-3

TOTAL WEIGHT 53 LBS.

Component	Nomenclature	Size	Weight
Radar Transmitter	T-27/APT-3	7 5/8" x 10 1/8" x 21 3/4"	35 Lbs.
Remote Control Unit	C-59/APT-3	2 3/4" x 4 1/8" x 2 1/4"	1/2 Lbs.
or			
Control Unit	C-85/APT-3	2 3/4" x 1 1/2" x 1 1/2"	1/2 Lbs.
Antenna Stub	AT-37/APT or AT-42/APT	Height 22 1/2"	6 1/2 Lbs.
Antenna Stub	AT-38/APT or AT-43/APT	Height 29"	6 1/2 Lbs.
Mounting	MT-23/A or MT-171/U	2 1/4" x 10 5/8" x 22"	3 1/4 Lbs.
Mounting	MT-80/ARC-5	1/16" x 3" x 4"	1/4 Lbs.

and plugs, adapters and cables.

1 Dec. 1944

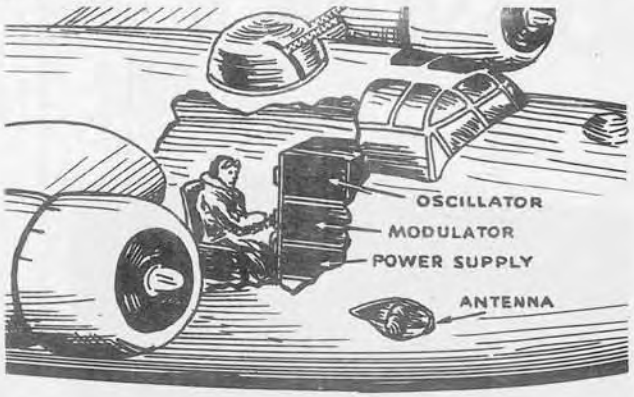
Radar Set AN/APT-4 is an airborne magnetron radar barrage or spot jammer for use against German radar systems such as the Rhubarb, Liechtenstein and Wurzburgs operating in the frequency range of 150 to 770 mc. A liquid cooled magnetron, GL-5J30 or GL-5J29, is used as an oscillator, resulting in simple tuning controls, and high efficiency. The transmitter involves simple components without critical adjustments.

The transmitter is continuously tunable in flight, if necessary, over the complete frequency band. Two tuning adjustments are necessary. In ordinary use the transmitter frequency will probably be set on the ground and three or four sets staggered to cover the entire band.

Power is obtained from a 80/115 volt, 400-2600 c.p.s., a-c source and 24 volt d.c. source. The power input of 1500 watts produces an output of 200 watts over the frequency range. The transmitted signal is a random noise modulated signal designed to jam the enemy signal in the frequency range of the transmitter.

Production of this equipment started in June 1944 Army Supply Program Requirements as of 30 April 1944 indicates no equipment for the calendar year 1944 and 300 for 1945.

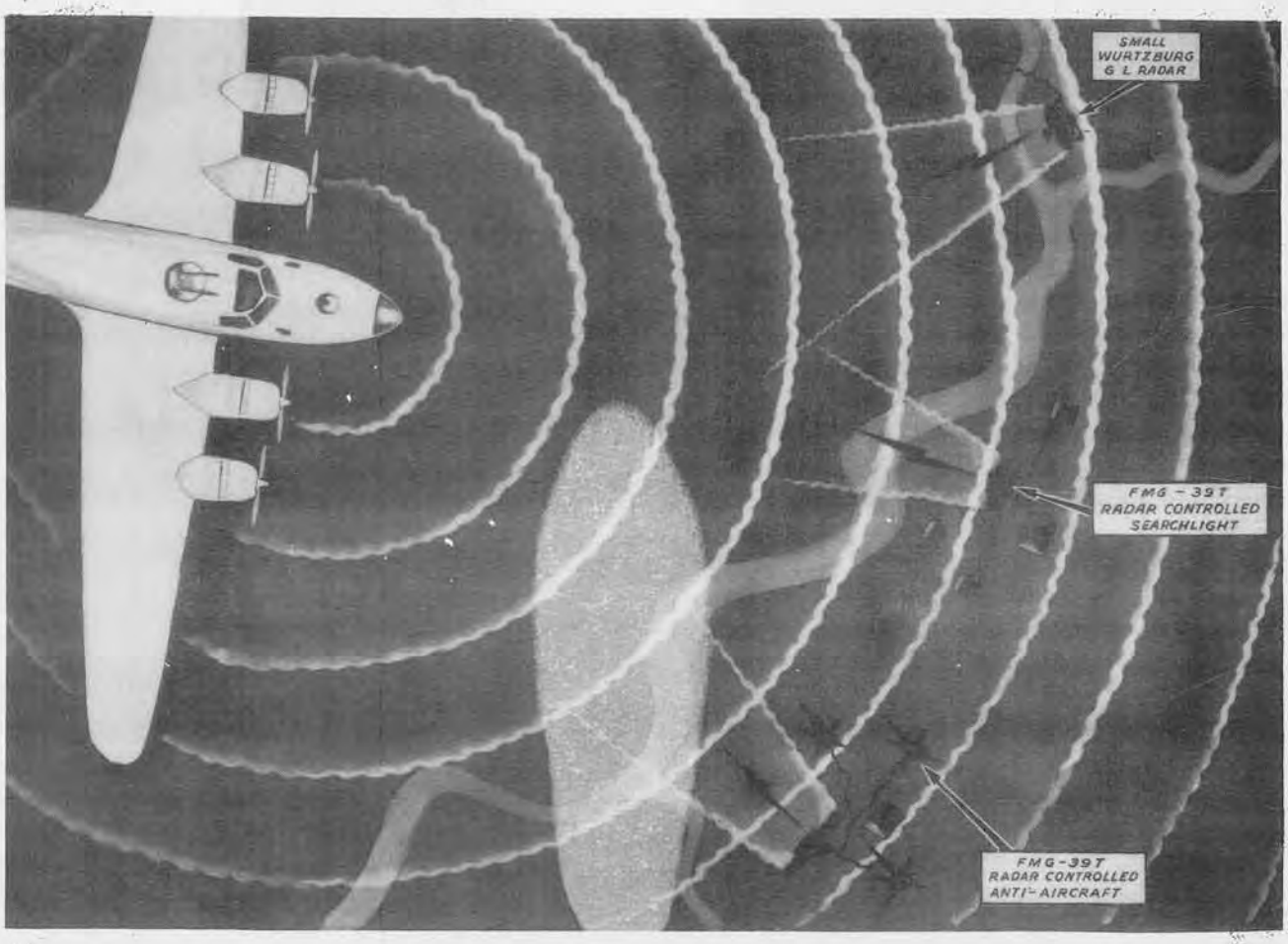
Test Equipment used in maintenance of Radar Set AN/APT-4 includes Test Set I-139-A, Frequency Meter TS-175/U, Analyzer TS-54/AP, Radio Frequency Wattmeter TS-118/AP, Pickup Assembly TS-131/AP, Hickok Voltmeter Type 110 and Fluxmeter TS-15A/AP.



Installation of Radar Set AN/APT-4 in B-24 Airplane.

POWER INPUT	1500 WATTS
POWER OUTPUT	200 WATTS
FREQUENCY RANGE	150-770 MC.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	GL-5J29	2	6AC7
4	836	1	6AG7
1	5R4GY	2	813
1	2X2	1	GL-5J30
1	931A	1	807



Radar Set AN/APT-4 is a high power jamming transmitter of sufficient power to screen a large bomber within two miles of enemy radar systems operating within its frequency band of 350 to 800 mc.

AN/APT-4

SECRET

Radar Transmitter T-75(XA)/APT-4(XA-2)

Modulator MD-30(XA)/APT-4(XA-2)

Rectifier Power Unit
PP-87(XA)/APT-4(XA-2)

Antenna Assembly AS-115/APT

Antenna Assembly AS-114/APT

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RADAR SET AN/APT-4

TOTAL WEIGHT 230 LBS.

Component	Nomenclature	Size	Weight
Radar Transmitter	T-75/APT-4	7 5/8" x 10 1/8" x 21 3/4"	80 Lb.
Rectifier Power Unit	PP-87/APT-4	7 5/8" x 10 1/8" x 21 3/4"	53 Lb.
Modulator	MD-30/APT-4	7 5/8" x 10 1/8" x 21 3/4"	61 Lb.
Antenna Assembly	AS-114/APT	Length 16.5"	6 1/2 Lb.
Antenna Assembly	AS-115/APT	Height 6" x Dia. 7"	2 1/4 Lb.
Mounting	MT-253/U (3 each)	2 1/4" x 10 5/8" x 22"	9 3/4 Lb.
Cord	CG-96/AP	Length 6'	1 Lb
Case	CY-149/AP	24 3/4" x 8 3/4" x 9 1/4"	
Antenna Cover	CW-33/APR-4	8 1/2" x 8 1/2" x 30"	2 1/2 Lb.

and includes plugs, adapters, jacks and cables.

1 Dec. 1944

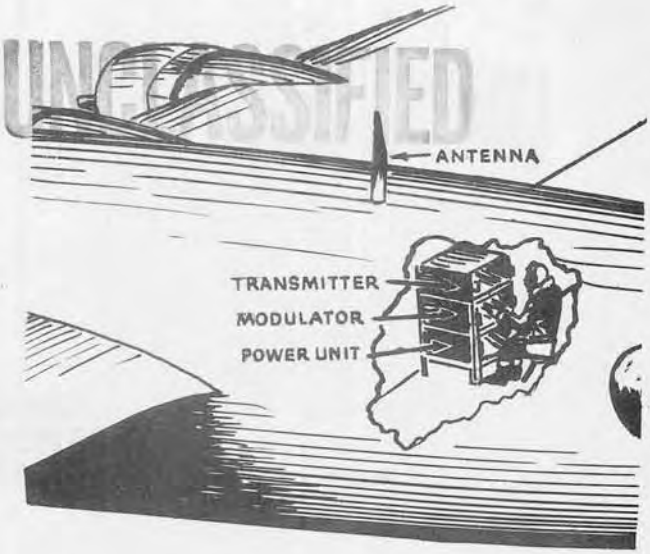
Radar Set AN/APT-6 is an airborne magnetron barrage or spot jammer for use against radar, communication, and the German GM control in the frequency range of 15 to 250 mc. Its advantages over existing communication barrage jammers are in its greater effectiveness for an equivalent amount of power especially against FM, in adjustable band width, and in the extremely wide range covered by the single unit. The frequency range is covered by a series of tuning units, each covering a band over which the transmitter is continuously tunable with one frequency and one coupling control. A single control is supplied for band width adjustment and all controls are adjustable in flight.

Power is obtained from an 80/115 volt, 400-2600 c.p.s. a.c. source and 28 volt d.c. source. The power input of 1500 watts produces an output of 150 watts over the frequency range of the transmitter. Random noise modulation with incidental frequency modulation is used for jamming the enemy signal.

Radar Set AN/APT-6 was deleted from the Army Supply Program as of 5 June 1944.

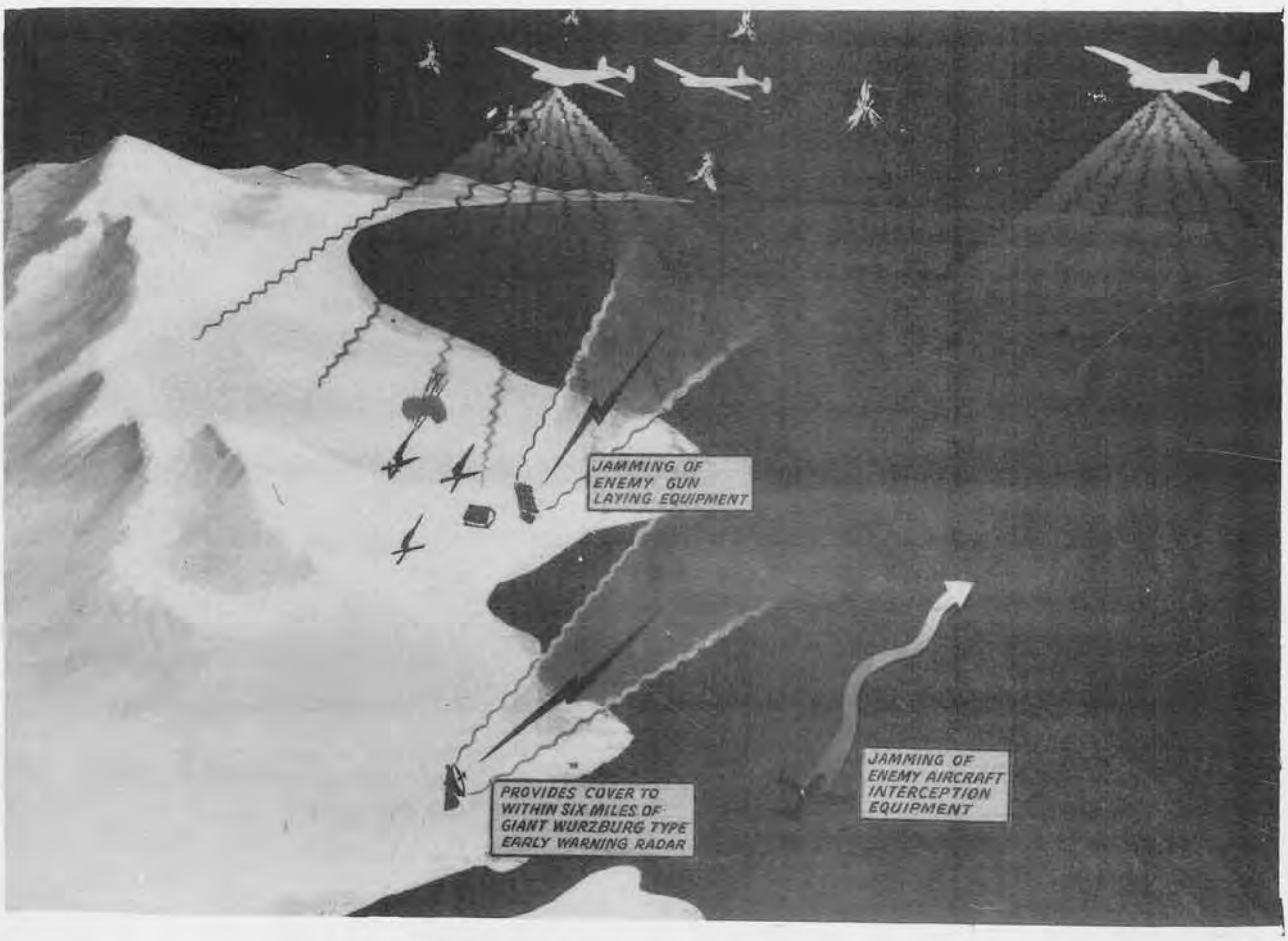
Test Equipment used in maintenance of the set includes Test Set I-139/A, Fluxmeter TS-15A/AP Analyzer TS-54/AP, Radio Frequency Wattmeter TS-131/AP, Frequency Meter TS-174/UP, and Hickok Voltmeter type 110.

POWER INPUT	1500 WATTS
POWER OUTPUT	150 WATTS
FREQUENCY RANGE	15-250 MC.



Installation of Radar Set AN/APT-6 aft Co-pilots position, B-29 airplane.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	GL-5J30	1	807
1	5R4GY	1	604
2	6AG7		



Radar Set AN/APT-6 is a high power jamming transmitter of sufficient power to screen a large bomber within six miles of a Giant Wurzburg Early Warning Radar.

AN/APT-6

[redacted]

EQUIPMENT PHOTOGRAPHS UNAVAILABLE

RADAR SET AN/APT-6 TOTAL WEIGHT 210 LBS.

Component	Nomenclature	Size	Weight
Radar Transmitter		4 5/8" x 10 1/8" x 21 3/4"	75 Lbs.
Rectifier Power Unit		4 5/8" x 10 1/8" x 21 3/4"	50 Lbs.
Modulator		4 5/8" x 10 1/8" x 21 3/4"	75 Lbs.
Mounting	MT-171/U	2 1/4" x 10 5/8" x 22"	3 1/4 Lbs.

1 Dec. 1944

SECRET

AN/APT-8

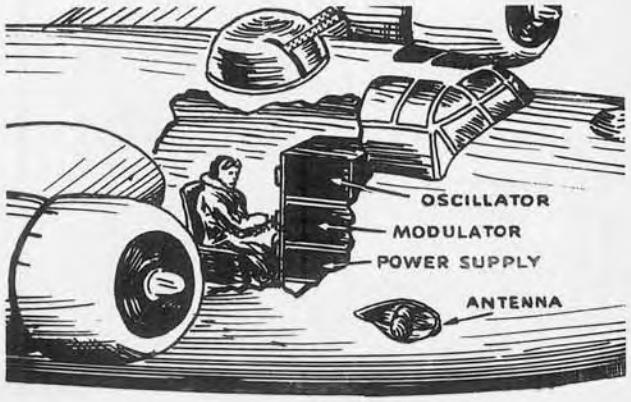
Radar Set AN/APT-8 is an airborne radar barrage jammer to cover the frequency range 700-1100 mc. It is known to the services as Broadloom.

It consists of an oscillator unit composed of a single, tuneable liquid-cooled magnetron, type ZP-584, a high voltage power supply, a modulator, low voltage supply and an autotransformer.

Power is obtained from an 80/115 volt, 400-2600 c.p.s., a.c. source and a 28 volt d.c. source.

Test equipment required for the maintenance and tuning of the equipment includes Test Set I-139-A, Fluxmeter TS-15/AP, Analyzer TS-54/AP, Radio Frequency Wattmeter TS-118/AP, Pickup Assembly TS-131/AP, Frequency Meter TS-175/U and Frequency Meter TS-213/U.

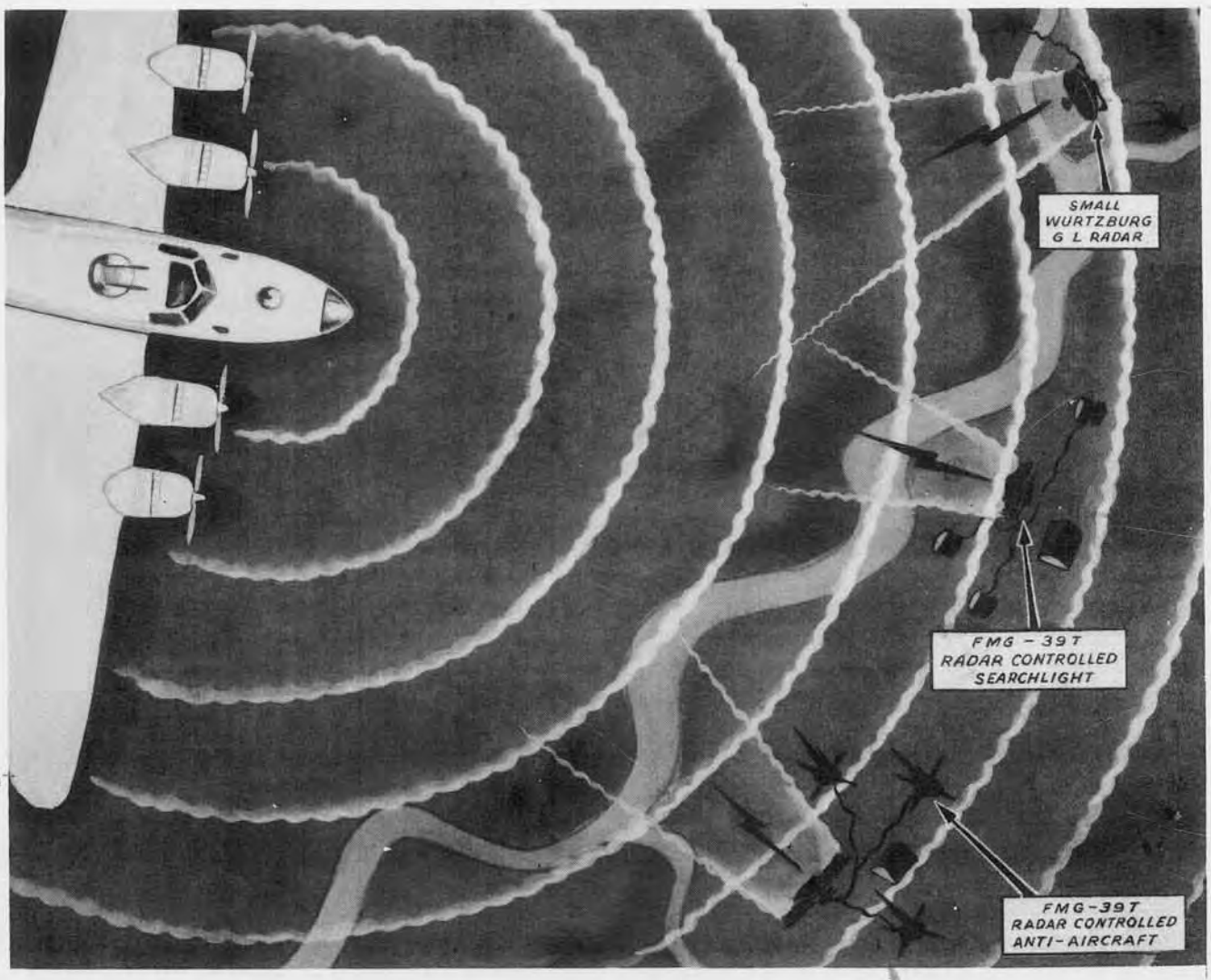
There were no Army Supply Program requirements as of 1 November 1944.



Installation of Radar Set AN/APT-8 in B-24 airplane.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	ZP-584	1	6D4
4	836	2	6AG7
1	5R4GY	1	807

POWER INPUT	1500 WATTS
POWER OUTPUT	100 WATTS
FREQUENCY RANGE	700-1100 MC.



Radar Set AN/APT-8 is an high power jamming transmitter operating over the frequency range 700-1100 mc.

AN/APT-8

[redacted]

EQUIPMENT PHOTOGRAPHS UNAVAILABLE

RADAR SET AN/APT-8

TOTAL WEIGHT 220 LBS.

Component	Nomenclature	Size	Weight
Radar Transmitter		7 5/8" x 10 1/8" x 21 3/4"	75 Lbs.
Rectifier Power Unit		7 5/8" x 10 1/8" x 21 3/4"	50 Lbs.
Modulator		7 5/8" x 10 1/8" x 21 3/4"	75 Lbs.

and includes cables, plugs and mountings.

1 Dec. 1944

AN/ARA-3

Modulator Assembly AN/ARA-3 is an airborne noise source used to convert Radio Set SCR-287-( ) into a spot jammer for use against enemy communications.

The noise source consists of a two-tube unit operated directly from a 24 volt d.c. source without the use of a dynamotor or other form of high voltage supply. Tubes are one 2050 gas tube and one 12SN7GT. The maximum noise output, measured with the unit connected to the microphone input of Radio Transmitter BC-375, is approximately 1.4 volts. About 0.2 volt is required for 100 percent modulation.

A four-position selector switch, operable from any one of four positions, is provided and functions as follows: (1) Normal operation of Radio Set SCR-287-( ); (2) Search for enemy signals with noise source energized but not connected; (3) Transmitter on CW so that oscillator can be tuned to zero beat on receiver BFO; (4) Transmitter on with noise modulation for spot jamming of enemy signal.

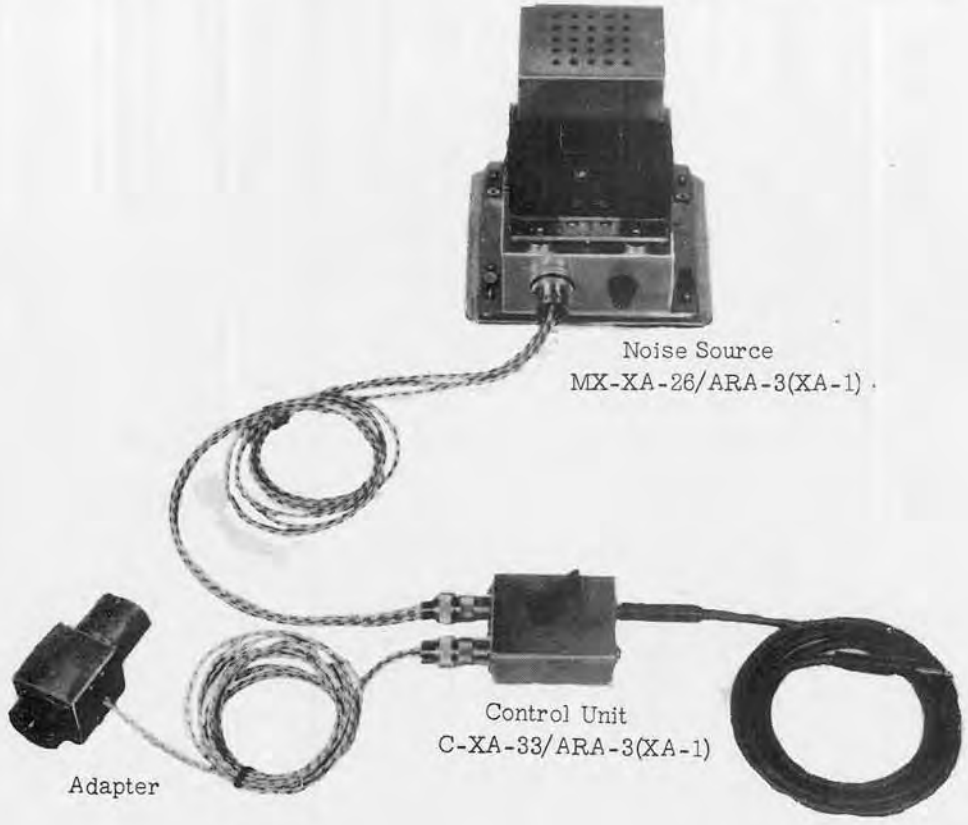
The noise source and four-position control switch are packaged in the same case used for Microphone Amplifier BC-216-A.

Installation of Modulator Assembly AN/ARA-3 in aircraft requires only the placement of Mounting FT-144 in a location convenient to the radio operator, the attachment of the noise source, and the insertion of a plug in the microphone input of Radio Transmitter BC-375, and the connection of the plug adaptor to the 24 volt d.c. source.

No test equipment is required for maintenance. Army Supply Program requirements as of 1 September 1944 were 100.

POWER INPUT	20 WATTS
POWER OUTPUT	150 MILLIWATTS
FREQUENCY RANGE	AUDIO FREQUENCIES
TYPE OF SIGNAL	RANDOM NOISE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	2050	1	6SN7GT



MODULATOR ASSEMBLY AN/ARA-3 TOTAL WEIGHT 11 LBS

Component	Nomenclature	Size	Weight
Noise Source	MX-XA-26/ARA-3(XA-1)	7 1/4" x 6 3/4" x 7 1/4"	7 1/2 Lb.
Control Unit	C-XA-33/ARA-3(XA-1)	4" x 4 1/2" x 1"	1 Lb.
Adapter			1/2 Lb.
Mounting	MT-XA-76/ARA-3(XA-1C)	7 1/4" x 6 1/2" x 7 1/4"	1/2 Lb.
Mounting Plate	MT-XA-78/ARA-3(XA-1C)	2 1/4" x 3 3/4" x 2 3/4"	1/4 Lb.
Cord	CX-XA-9/ARA-3(XA-1C)	Length 10'	1/2 Lb.
Cord	CS-XA-10/ARA-3(XA-1C)	Length 15'	1/2 Lb.
Cord	CX-XA-11/ARA-3(XA-1C)	Length 15'	3/4 Lb.

and includes plugs and adapter.

1 Dec. 1944

AN/ARQ-1

Radio Set AN/ARQ-1 is an airborne, low frequency, direct-noise-amplified jamming set, operating in the 14 to 50 mc. frequency range, with approximately 20 watts of noise-modulated output.

The band width of the noise signal varies from 200 to 250 kc., depending on the operating frequency. The equipment consists essentially of a band-pass TRF amplification of a noise signal produced by a type 931A photo-multiplier tube. When receiving, the same amplifier is connected to the antenna, and the output fed to a detector and audio amplifier. In this manner, the transmitter is automatically tuned to the same frequency as the receiver.

Radio Set AN/ARQ-1 is smaller, lighter, simpler in operation and extends to a lower minimum frequency than the Dina and Dina Mate. Self-monitoring is provided, permitting search and jamming to be accomplished in a single equipment.

The equipment will have application in both the European and Pacific theaters in coping with airborne VHF, air-to-ground communication, navigation, and possibly ground communication links where desirable.

Power requirements consist of an input of 300 watts from an a.c. power source of 80-115 volts, 400-2600 c.p.s., and an input of 14 watts from a d.c. power source of 28 volts. Sensitivity of the set is 150 microvolts.

Army Supply Program requirements as of 30 April 1944 were 1,000 equipments for the calendar year 1944.

POWER INPUT	300 WATTS A.C.; 14 WATTS D.C.
POWER OUTPUT	20 WATTS (All sideband)
FREQUENCY RANGE	14-50 M.C.
SENSITIVITY	150 MICROVOLTS
OUTPUT BAND WIDTH	25 KC AT 14 MC TO 150 KC AT 50 MC

Fan Antenna for Radio Set AN/ARQ-1 is installed on B-17.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
3	6SG7	1	931A
1	6AG7	1	2X2
1	807	1	5R4GY
1	6SJ7	1	5Y3GT
1	6J5		

Receiver-Transmitter RT-45/ARQ-1

RADIO SET AN/ARQ-1

TOTAL WEIGHT 55 LBS.

Component	Nomenclature	Size	Weight
Receiver - Transmitter	RT-45( )/ARQ-1	7 5/8" x 10 1/8" x 21 3/4"	40 Lb.
Mounting Base	MT-171/U	2 1/4" x 10 5/8" x 22 "	3 1/4 Lb.
Antenna System	AS-89/ART	72" x 1/2" Dia.	3 1/4 Lb.
Antenna Base	AB-29/ART (2 each)	6" x 7" Dia.	6 Lb.
Antenna	AS-97/ART	54" x 1/2" Dia.	3 1/4 Lb.

and includes plugs, adapters and cables

1 Dec. 1944

AN/ARQ-4

The AN/ARQ-4 (juke box) system is a receiver and control system which provides a continuous panoramic presentation of victim signals as upward deflections, and jamming signals as downward reflections. This enables the operator to follow enemy evasive actions in a crowded band and avoid jamming a signal which is already being jammed by another jammer.

The system is particularly suited for the simultaneous control of a group of transmitters and is sufficiently flexible to operate on a number of frequencies for which jamming sets are required. The AN/ARQ-4 system lends itself to communications work in which a high sweep rate can be used and in which a relatively long "look through" period can be tolerated.

In dealing with systems with push-button frequency change, or "flash" systems, the AN/ARQ-4 is capable of quicker response to changes in victim frequency.

Power requirements consists of a 80 to 115 volt, 400 to 2600 c.p.s. a.c. source and a 28 volt d.c. source. The equipment has power inputs of 62 watts d.c. and 120 watts a.c. and covers frequency range of 30 to 50 mc. Sensitivity is 50 microvolts for 3/4" deflection with signal to noise ratio of 5:2.

Radio Set AN/ARQ-4 has not as yet been placed in the Army Supply Program.

Test Equipment for maintenance of AN/ARQ-4 includes Test Set I-139-A, Pick-Up Assembly TS-131/AP, Hickok Voltmeter type 110 and Radio Frequency Wattmeter TS-118/AP.

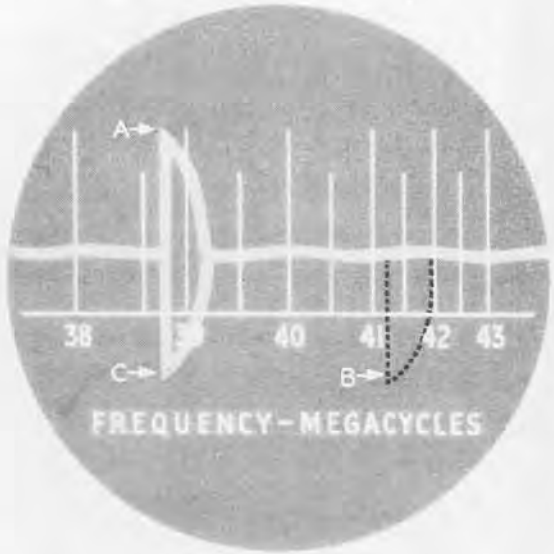
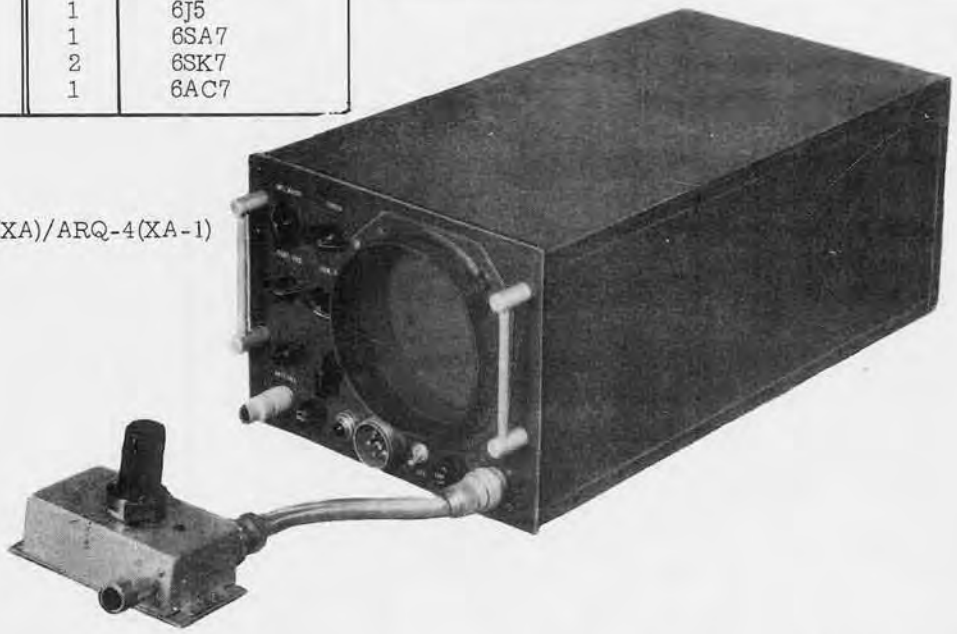


Diagram showing enemy signal (a) and jamming signal's position before (b) and after (c) being tuned to cover enemy transmission.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	5CP1	4	6SN7
1	2 x 2	1	6H6
1	RCA-927	1	9001
1	6X5GT	1	9002
1	6SJ7	1	6J5
1	6B4G	1	6SA7
1	RCA991	2	6SK7
1	2050	1	6AC7

POWER INPUT	62 WATTS D.C. 120 WATTS A.C.
FREQUENCY RANGE	30-50 M.C.
SENSITIVITY	50 μ-VOLTS FOR 3/4" DEFLECTION
SIGNAL TO NOISE RATIO	5:2



Radio Receiver R-63(XA)/ARQ-4(XA-1) and Filter

RADIO SET AN/ARQ-4

TOTAL WEIGHT 55 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver	R-63( )/ARQ-4	7 5/8" x 10 1/8" x 21 3/4"	50 Lb
Mounting Base	MT-1171/U	2 1/4" x 10 1/4" x 22"	3 1/4 Lb.

and includes cables, plugs and adapters.

Receiving equipment AN/ARQ-5 is an airborne, wide range, high frequency communications receiver which will scan a large spectrum at a rapid rate and present a panoramic chart on the screen of a cathode ray tube which will indicate instantaneously what frequencies are being received.

In this manner is it possible to watch for and quickly intercept any enemy signals which may appear at a hitherto unused portion of the spectrum.

Use of new portions of the spectrum may be expected as our jamming operations make enemy channels unserviceable. It may also be expected when new tactics or new weapons require additional radio channels.

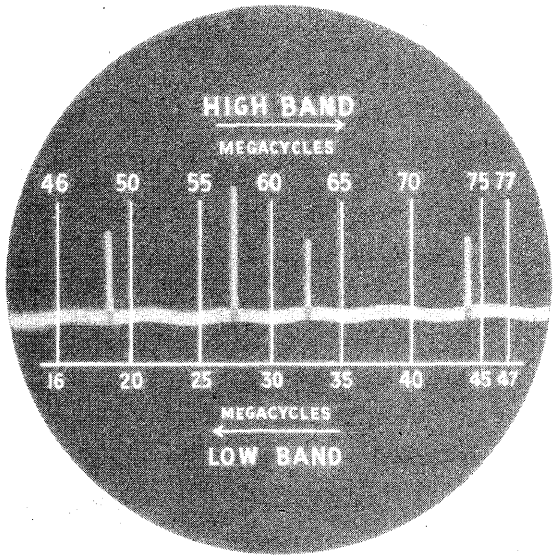
Frequency range of this equipment is from 18 to 80 megacycles. Power is obtained from an 80-115 volt. 400-2600 c.p.s., 24 volt source.

The receiver incorporates circuits for reception of AM, FM and CW signals. A cathode ray tube having a base line calibrated in megacycles gives a visual indication of the output. Incoming signals appear on the screen as "pips" rising from the base line. The position of the "pips" on the screen indicates the frequency of the incoming signal by reference to the calibrated scale on the screen.

When used with Radio Set AN/ARR-12, this equipment permits monitoring of friend or foe signals.

Test equipment used in maintaining this receiver are Signal Generator TS-47/APR, Test Set I-56, Oscilloscope Generator Radio type 804-C.

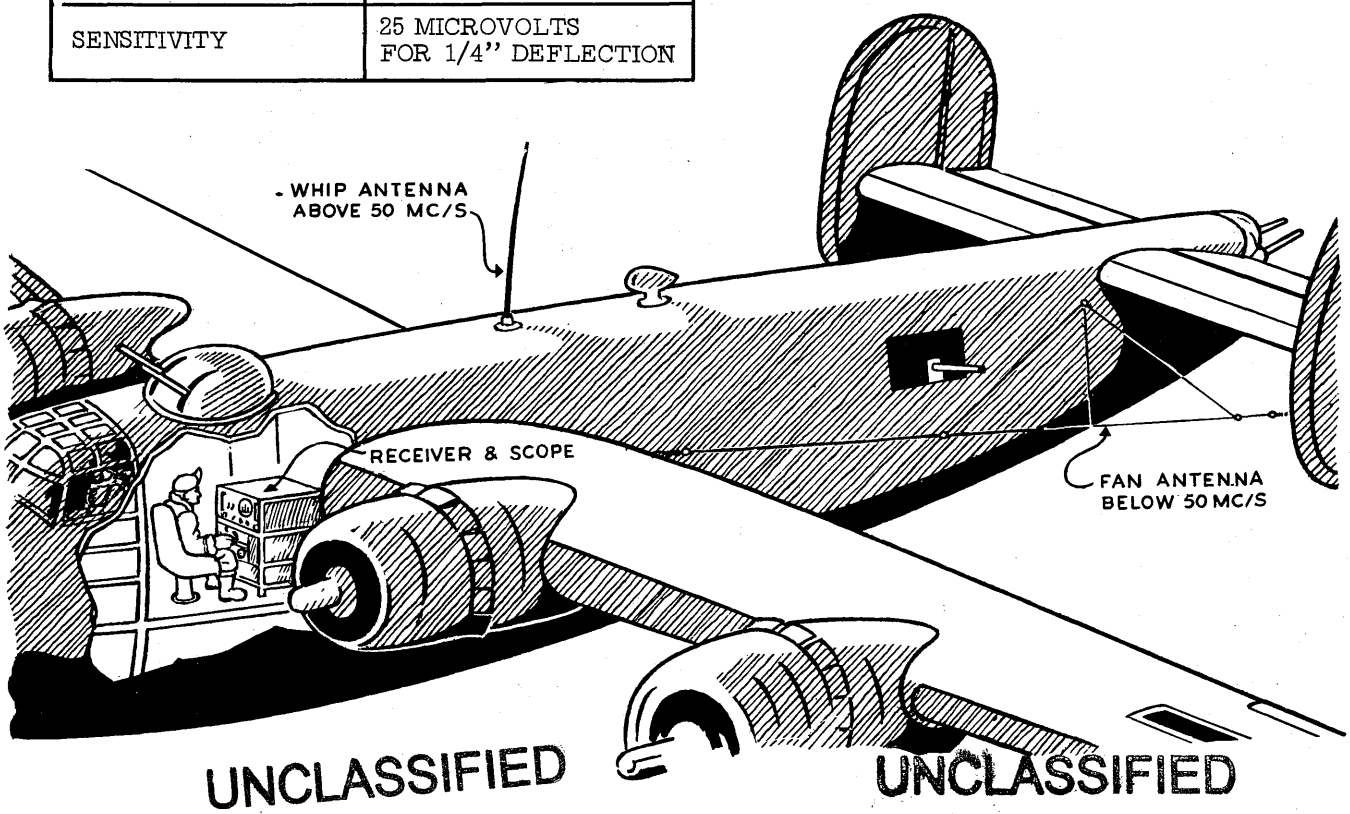
Army Supply Program requirements as of 22 June 1944 were 1020 for the calendar year 1944 and 2028 for 1945.



Large spectrum coverage permits quick interception of enemy operations in the frequency range of 18 to 80 mcs.

TUBE COMPLEMENT			
NO	TYPE	NO.	TYPE
2	6AG7	1	6SN7GT
2	9002	1	12H6
2	9003	1	5CP1
1	12J5GT	1	5Y3GT
1	12SA7	1	VR/105/30
1	12SQ7	1	2X2
1	2050	1	927
3	12SK7		

POWER INPUT	14 WATTS D.C. 120 WATTS A.C.
FREQUENCY RANGE	18-80 MC.
TYPE OF SIGNAL	AM;FM;CW
SENSITIVITY	25 MICROVOLTS FOR 1/4" DEFLECTION



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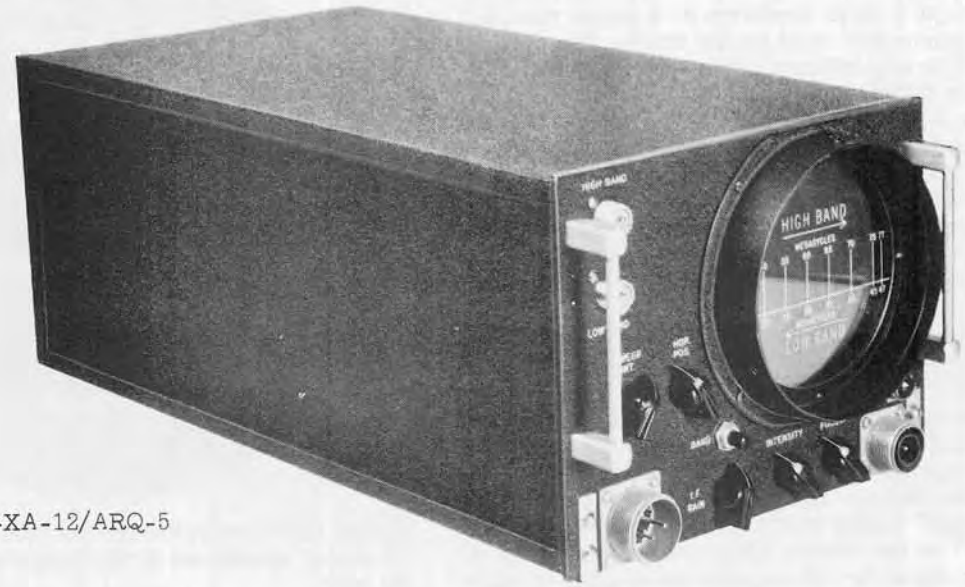
Installation of Radio Set AN/ARQ-5 in the Radio Compartment - B-24.

AN/ARQ-5



Radio Receiver R-XA-12/ARQ-5

Power Unit PU-XA-5/ARQ-5

RECEIVING EQUIPMENT AN/ARQ-5 TOTAL WEIGHT 80 LBS

Components	Nomenclature	Size	Weight
Radio Receiver	R-61/ARQ-5	7 5/8" x 10 1/8" x 21 3/4"	35 Lbs.
Mounting Base	MT-171/U	2 1/4" x 10 1/4" x 22 "	3 1/4 Lbs.
Antenna Support	AB-27-A	2 1/2" x 3 " Diam.	2 Lbs.
Mounting Base	MT-167/U	2 1/4" x 5 1/4" x 22 "	2 3/4 Lbs.
Rectifier Power Unit	PP-32/AR	7 5/8" x 4 7/8" x 21 3/4"	37 Lbs.

includes plugs, insulator, wire, cable adapter, tension unit and cables.

1 Dec. 1944

Radar Receiving Equipment AN/ARQ-6 is a complete airborne radar direction finding system including antenna, receiver and indicator providing continuous indication on a cathode ray tube. It may be used for accurate location of enemy radar stations with no immediate intention of bombing or it may be used for homing on the enemy station for the purpose of bombing or strafing the station and then passing over. The equipment may also be used to home on bombing formation. It is used in medium and heavy bombers.

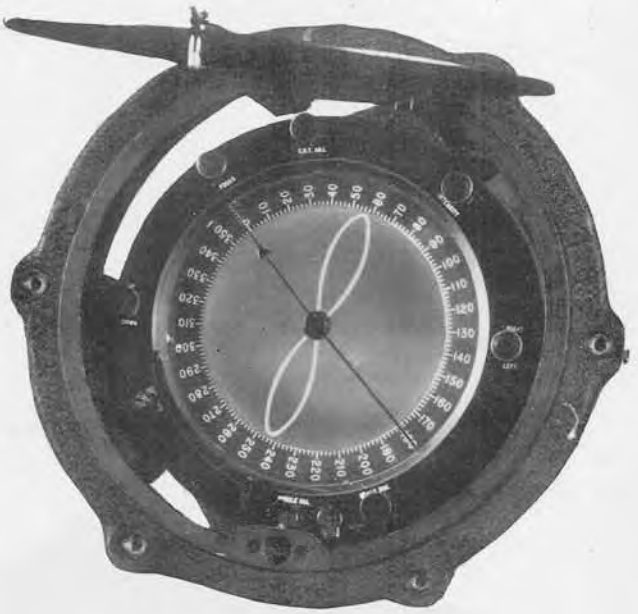
Power is obtained from a 115 volt, 400 to 2600 c.p.s. a.c. source and a 28 volt d.c. source. The equipment covers the frequency range of 100 to 160 mc., and the receiver input is 150 watts with sensitivity of 50 microvolts.

Army Supply Program requirements have not been established as of 30 April 1944.

POWER INPUT	150 WATTS A.C. 33 WATTS D.C.
FREQUENCY RANGE	100-160 Mc.
SENSITIVITY	50 MICROVOLTS

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	6AG5	1	5Y3GT/g
3	6J5	2	6SL7/GT
4	9001	1	2X2 or 1879
1	6C4	*1	5CP1
2	6AK5	1	Amperite Ballast
2	6N7		

* Crystal



AN/ARQ-6 Indicator, cathode ray tube 5CP1, showing DF on a strong signal with 180° ambiguity. Pressing "Sense" switch removes ambiguity. This is a continuous presentation.

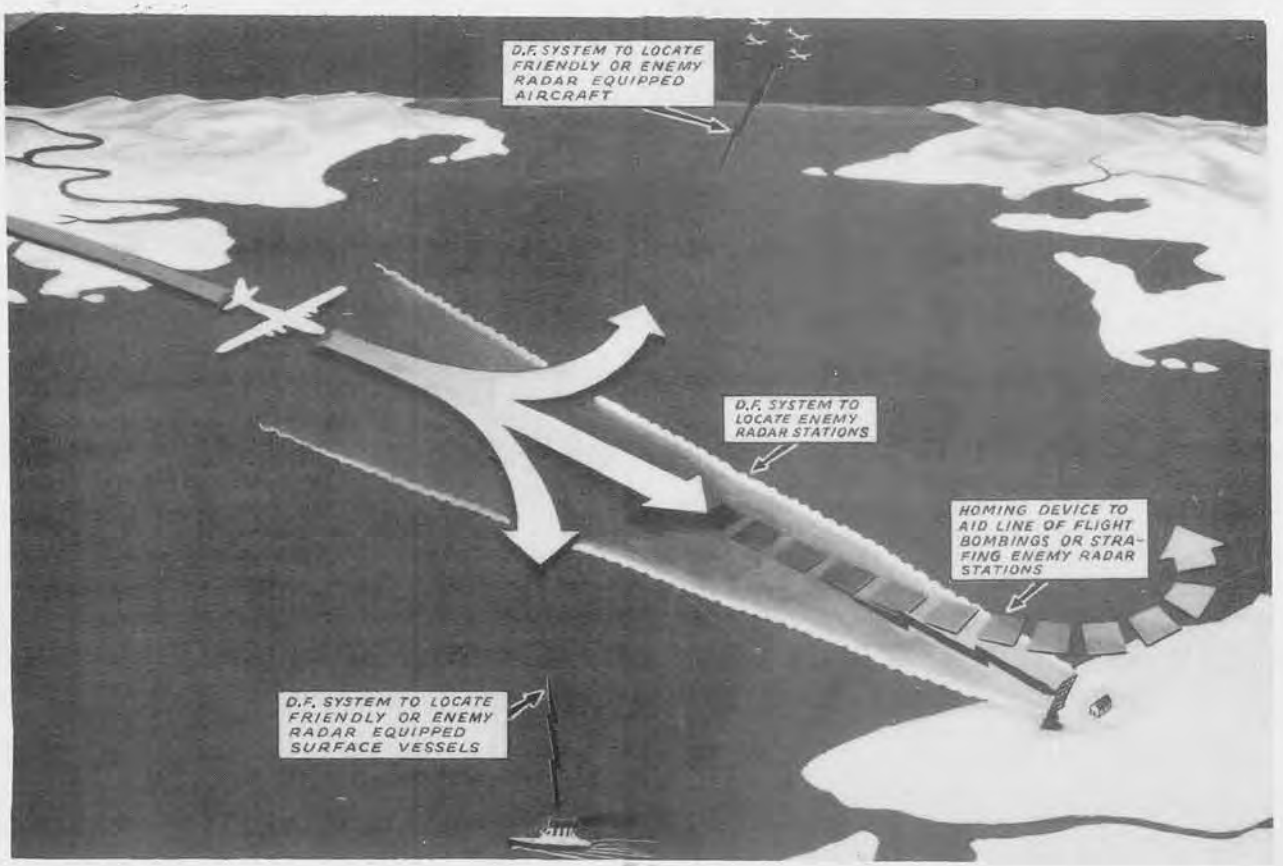


Diagram of Radar Receiving Equipment AN/ARQ-6 and its uses against land, airborne and seaborne targets for purposes of direction finding and homing.

Dec. 1944

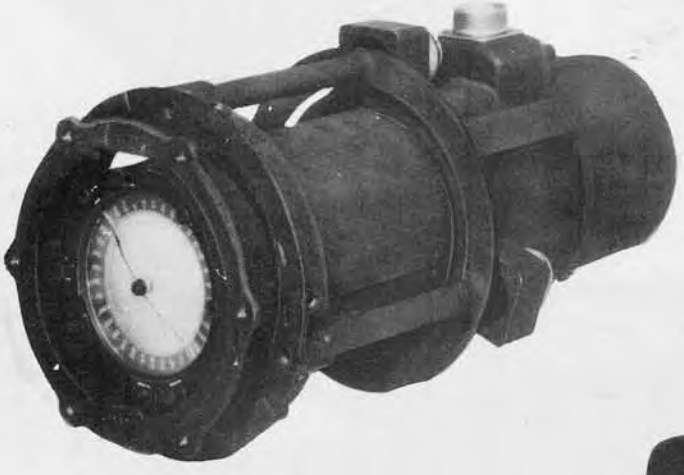
AN/ARQ-6

SECRET

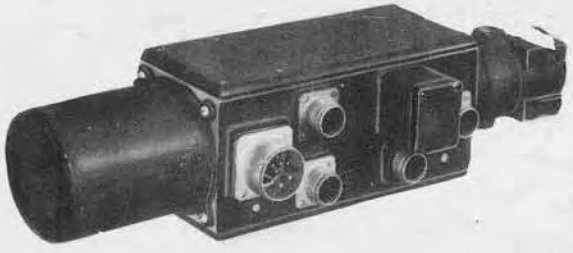
UNCLASSIFIED

Control Box

Receiver



Indicator



Goniometer

RADAR RECEIVING EQUIPMENT AN/ARQ-6 TOTAL WEIGHT 80 LBS

Components	Nomenclature	Size	Weight
Receiver		7 5/8" x 4 7/8" x 21 3/4"	17 1/4 Lb.
Indicator		10 1/8" x 21" Dia. 6 3/4"	20 3/4 Lb.
Goniometer		5" x 5" x 18"	7 Lbs.
Antenna Array			12 Lbs.
Control Box		4 1/2 " x 6" x 3"	4 1/2 Lb.
Interconnecting Cables		Various lengths and sizes	16 1/2 Lb.

UNCLASSIFIED

1 Dec. 1944

Radio Set AN/ARQ-7 (Spotkie) is an airborne frequency setting jammer for use against German fighter control (CGI) operators in the frequency range of 38.6 to 43.2 mc. This equipment consists of a receiver and jamming transmitter so designed that the operation of tuning a victim signal to zero-beat on the receiver automatically sets the transmitter on the exact jamming frequency. Jamming is effected by throwing a switch from receive to jam.

A single manual control simultaneously varies the frequency of the receiver and transmitter. A two-position switch, labeled receive–transmit, applies plate voltage to either the receiver section or the transmitter and noise generator sections. The transmitter is straight forward in design; parallel 807 tubes are employed in the final stage to produce a noise modulated output of approximately 50 watts. The noise source is a gas tube.

The modulated signal is approximately 10 kc. in width. A three-wire fan antenna, or other broad-band antenna may be used.

Use of Radio Set AN/ARQ-7 prevents enemy radio directed fighters from intercepting our bombers and prevents the fighters organizing a concerted attack after locating our bombers. Amplifier AM-33/ART can be used to increase the range of this set with some reduced ease of operation.

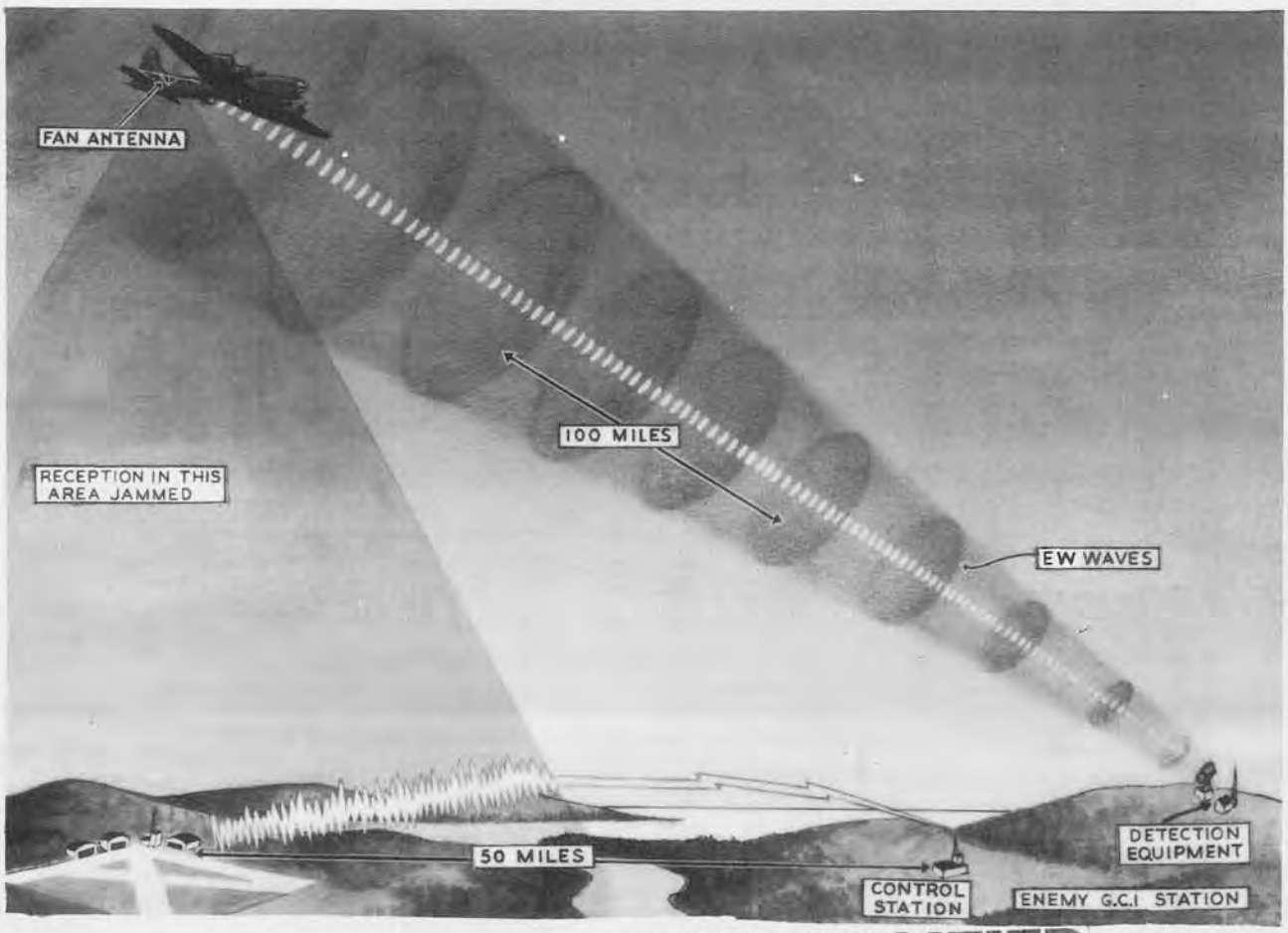
Power is obtained from 80/115 volt, 400 to 2600 c.p.s., a.c. source and a 28 volt d.c. source. The power input of 500 watts produces an output of 50 watts over the frequency range of the set. Random noise modulation with a 10 kc. band width is used to jam enemy signals. Sensitivity of the receiver is 50 microvolts.

Army Supply Program requirements as of 1 Sept. 1944 were 360 for the calender year 1944 and 1037 for 1945.

Test equipment used in maintenance of Radio Set AN/ARQ-7 includes Radio Frequency Wattmeter TS-118/AP, Signal Generator I-72, General Radio Signal Generator type 804-C and Hickok Voltmeter type 110.

POWER INPUT	400 WATTS A.C. & 100 WATTS D.C.
POWER OUTPUT	50 WATTS
FREQUENCY RANGE	38.6-43.2 MC.
SENSITIVITY	50 MICROVOLTS

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	807	2	6AC7
2	6V6GT/G	1	12SQ7
1	5R4GY	1	884
1	5U4G	1	6AG7
2	12SA7	2	6SK7
2	12SJ7	1	12SN7

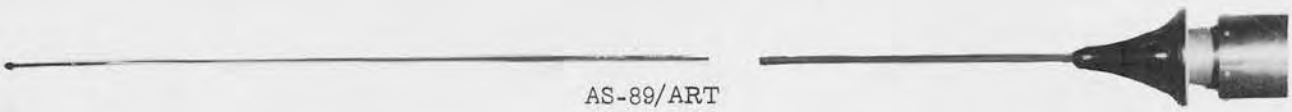


Radio Set AN/ARQ-7 prevents enemy radio directed fighters from intercepting our bombers and prevents the fighters organizing a concerted attack after locating our bombers.

AN/ARQ-7

CONFIDENTIAL

Receiver-Transmitter RT-49/ARQ-7



AS-89/ART

RADIO SET AN/ARQ-7

TOTAL WEIGHT 63 LBS.

Component	Nomenclature	Size	Weight
Receiver-Transmitter	RT-49/ARQ-7	7 5/8" x 10 1/8" x 21 3/4"	47 Lb.
Mounting Base	MT-171/U	2 1/4" x 10 1/4" x 22 "	3 1/4 Lb.
Antenna System	AS-89/ART	5" x 3 1/2" Dia.	5 Lb.

and includes plugs, adapters and cables

1 Dec. 1944

Radar Set AN/ARQ-8 is a combination search receiver and jamming transmitter designed for airborne operation against enemy communications in the frequency range 25-105 mcs. It may be used against enemy radar systems operating within its frequency range.

The function of the receiver portion of the equipment is to accurately set the jamming signal of the transmitter on the frequency required. The receiver and the transmitter are simultaneously tuned to the same frequency by means of a single search control.

For spot jamming the frequency of the equipment is preset to a 5 mc. band within its frequency range prior to take-off. The output of the narrow band pre-amplifier consists of random RF noise voltages. The noise signal is mixed with the signal from a JAN 6V6GT local oscillator tube. The resultant output has the carrier suppressed and consists of two noise sidebands either of which may be selected, amplified and radiated as the jamming signal.

For barrage jamming a wide band pre-amplifier strip is furnished to replace the narrow band pre-amplifier strip to enable the equipment to furnish a barrage type noise signal with about 4 mc. bandwidth. For this type of operation the receiver portion of the equipment is not used since the barrage band is set prior to take-off and the equipment continuously jams over the pre-set portion of the frequency spectrum.

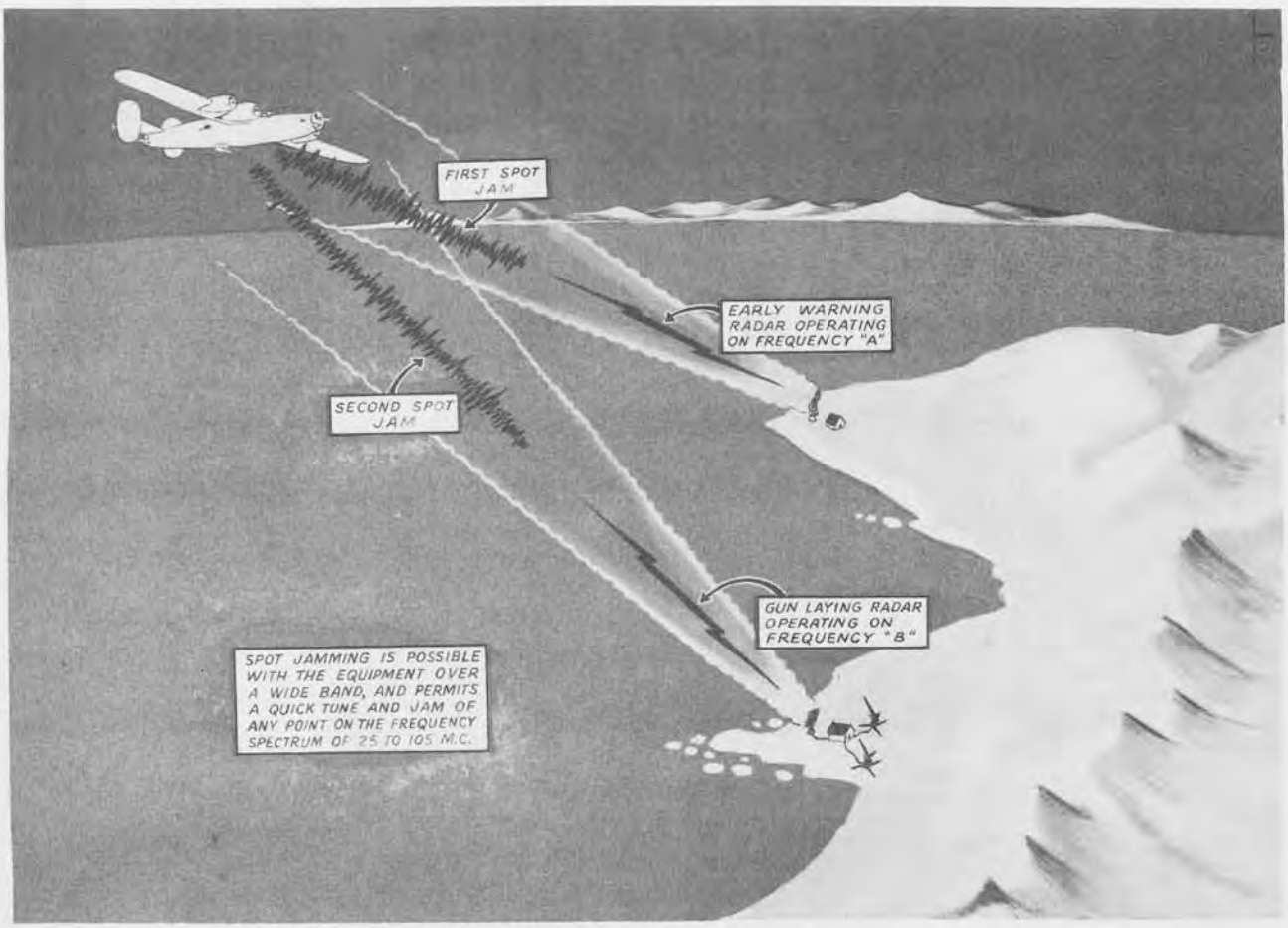
Power is obtained from an 80/115 volt 400-2600 c.p.s., a.c. and a 28 volt d.c. source.

Test equipment required for the maintenance and tuning of the equipment includes Test Set I-139-A, Signal Generator TS-47/APR, Radio Frequency Wattmeter TS-118/APR, Pickup Assembly TS-131/AP, Test Set I-56-K, General Radio Signal Generator type GR 804C and Hickok Voltmeter type 110.

Army Supply Program requirements as of 1 October 1944 were 1,335 for the calendar year 1944 and 2,152 for 1945.

POWER INPUT	400 WATTS
POWER OUTPUT	30 WATTS
FREQUENCY	25-105 MCS.
TYPE OF SIGNAL	CLIPPED NOISE, SUPPRESSED CARRIER
SENSITIVITY	200 MICROVOLTS FOR 10 MILLIWATT OUTPUT
SELECTIVITY	3 DB AT 100 KC FROM RESONANT FREQUENCY

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	9001	3	6C4
1	6SQ7	2	6AK5
3	6SG7	1	931A
1	6AG7	3	6AC7
1	5Y3GT	1	829B
2	5Y4G Y	1	832A
2	6Y6GT	1	6SN7GT
1	884		



Radar Set AN/ARQ-8 is an airborne selective radar jamming equipment capable of rapid switching of jamming frequency when the enemy resorts to evasive changes in radar frequencies to counteract jamming operations.

Feb. 1945 Y-109829

AN/ARQ-8

Radio Transmitter T-51/ARQ-8

Radio Receiver R-58/ARQ-8

Preamplifier Strip AM-23/ARQ-8

Control Unit C-93/ARQ-8

Antenna Assembly AS-150/ART

Antenna Assembly AS-161/ART

Antenna System AS-97/ART

Antenna System AS-89/ART

RADAR SET AN/ARQ-8

TOTAL WEIGHT 100 LBS.

Component	Nomenclature	Size	Weight
Tuning Shaft	MC-215		
PreAmplifier Strip	AM-22/ARQ-8	10" x 4" x 7"	3 Lbs.
PreAmplifier Strip	AM-23/ARQ-8	11" x 4" x 7"	4 Lbs.
Transmitter	T-51/ARQ-8	8" x 11" x 22"	35 Lbs.
Receiver	R-58/ARQ-8	8" x 5" x 22"	20 Lbs.
Control Unit	C-93/ARQ-8	4" x 5" x 10"	3 Lbs.
Mounting Base	MT-171/U	3" x 11" x 22"	3 Lbs.
Mounting Base	MT-167/U	3" x 6" x 22"	3 Lbs.
Mounting Base	MT-191/ARQ-8	2" x 5" x 10"	1 Lb
Antenna System	AS-89/ART	72" Long	4 Lbs.
Antenna System	AS-97/ART	54" Long	3 Lbs.
Antenna Assembly	AS-150/ART	30" Long	3 Lbs.
Antenna Assembly	AS-161/ART	40" Long	3 Lbs.
Antenna Matching Section	CU-50/ART	6"x 5"diameter	2 Lbs.
Antenna Matching Section	CU-51/ART	6"x 5"diameter	2 Lbs.

and includes cables, plugs and adapters, etc.

Feb. 1945 Y-109829

AN/ARQ-9

Radio Set AN/ARQ-9 is a combination search receiver and jamming transmitter designed for picking up and jamming enemy communication signals in the frequency band between 18 and 80 mc. It was formerly known as Radio Set SCR-596-T2.

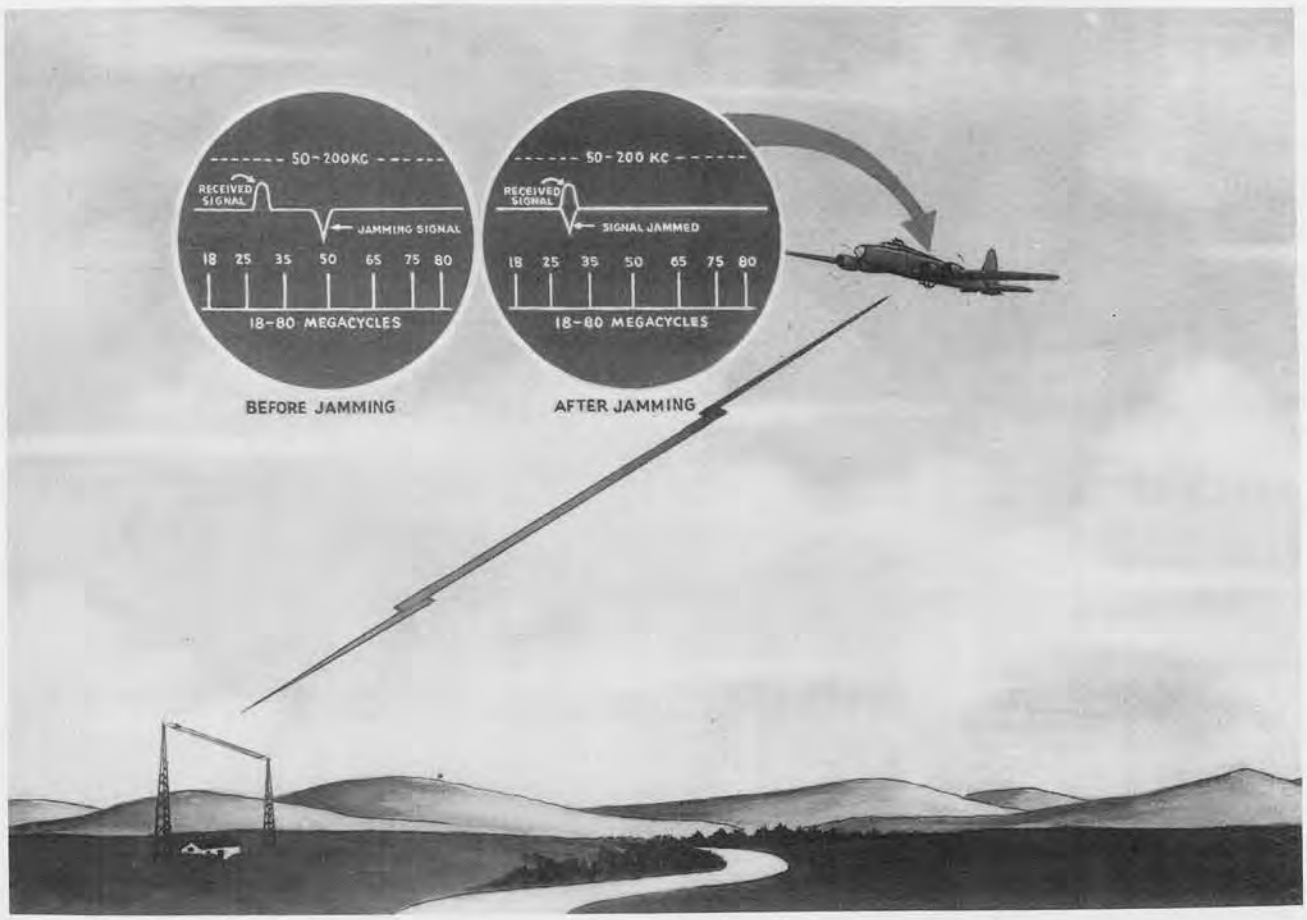
The transmitter and the receiver are gang-tuned to permit rapid frequency shifts such as are required when the victim transmission changes in frequency to avoid jamming. During the jamming operation the transmitter and the receiver are alternately connected to the antenna so that any change in the victim operating frequency may be detected immediately. The enemy signal appears on the scope of the receiver as an upward pip above the base line. The jamming signal appears as a downward pip from the same base line and when the two are lined up vertically the jamming signal is effectively on the victim frequency. The jamming signal consists of a carrier wave that is frequency modulated at a random rate.

Test equipment required in the maintenance and tuning of AN/ARQ-9 includes Test Set I-139, Test Oscillator TS-47/APR, Pickup Assembly TS-131/AP, Test Set I- 56-K, Hickok Voltmeter Type 110 and General Radio Signal Generator type 804C.

Army Supply Program requirements as of 1 November 1944 were 100 equipments for the calendar year 1944.

POWER INPUT	1000 WATTS
POWER OUTPUT	25 WATTS
FREQUENCY	18-80 MC
TYPE OF SIGNAL	Random FM

TUBE COMPLEMENT								
NO.	TYPE	T-44/ARQ-9	T-45/ARQ-9	T-46/ARQ-9	MD-15/ARQ-9	R-55/ARQ-9	ID-47/ARQ-9	PP-55/ARQ-9
6	5R4GY		2		0	0	0	4
4	6AC7		4		0	0	0	0
29	6AK5		3		8	7	6	5
2	6J6		1		0	0	1	0
2	6SA7		2		0	0	0	0
1	807		1		0	0	0	0
4	9003		2		1	0	1	0
1	829B		1		0	0	0	0
4	6H6				1	2	1	0
1	2050				1	0	0	0
21	9001				6	7	8	0
6	9002				0	1	5	0
1	2X2				0	0	1	0
1	5CP7				0	0	1	0
6	6SJ7				0	0	6	0
6	VR-150-30				0	0	3	3



AN/ARQ-9 provides visible indication of victim signal and of the jamming signal and permits changing the jamming signal to any frequency within its range when the enemy signal is changed.

Feb 1945 Y-109829

AN/ARQ-9

~~SECRET~~

Radio Transmitter T-44/ARQ-9,
T-45/ARQ-9, or T-46/ARQ-9

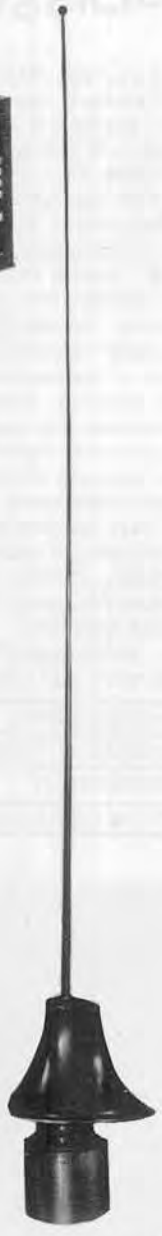
Rectifier Power Unit PP-55/ARQ-9

Radio Receiver R-55/ARQ-9

Receiver-Indicator R-102/ARQ-9

Scanner Unit ID-47/ARQ-9

Modulator MD-15/ARQ-9



Antenna System AS-97/ART,
AS-89/ART and AS-161/ART

RADIO SET AN/ARQ-9

TOTAL WEIGHT 280 LBS.

Component	Nomenclature	Size	Weight
Modulator	MD-15/ARQ-9	8" x 5" x 22"	18 Lbs.
Radio Receiver	R-55/ARQ-9	8" x 5" x 22"	15 Lbs.
Rectifier Power Unit	PP-55/ARQ-9	8" x 11" x 22"	35 Lbs.
*Radio Transmitter	T-46/ARQ-9	8" x 11" x 22"	60 Lbs.
*Radio Transmitter	T-45/ARQ-9	8" x 11" x 22"	60 Lbs.
*Radio Transmitter	T-44/ARQ-9	8" x 11" x 22"	60 Lbs.
Scanner Unit	ID-47/ARQ-9	11" x 16" x 22"	60 Lbs.
Receiver Indicator	R-102/ARQ-9	8" x 16" x 22"	60 Lbs.
*Antenna System	AS-97/ART	54" x 1/2" diameter	4 Lbs.
*Antenna System	AS-89/ART	72" x 1/2" diameter	4 Lbs.
*Antenna System	AS-161/ART	40" x 1/2" diameter	3 Lbs.
Mounting Base	MT-167/U(2 each)	3" x 6" x 22"	4 Lbs.
Mounting Base	MT-171/U	3" x 11" x 22"	5 Lbs.
Mounting Base	MT-173/U(2 each)	3" x 16" x 22"	5 Lbs.

and includes cables, plugs, adapters, antenna matching sections and etc.
*One used per installation.

Feb. 1945 _ Y-100820

Radio Receiving Equipment AN/ARR-5 is an airborne search receiver covering the frequency band 27.8 to 143 mc. This set has been adapted from Hallicrafter S-27 receiver for aircraft use and for operation in conjunction with Radar Indicator Assembly AN/APA-6 or AN/APA-11, Photographic Adapter AN/APA-7 and Panoramic Adapter AN/APA-10 or BC-1032. Provision has been made for an automatic scanning unit that can sweep through the whole frequency band or a sector of it. In addition a separate rectifier unit, Rectifier Power Unit PP-32/AR, has been developed to provide the power supply for two other receivers in addition to the AN/ARR-5.

A number of features make AN/ARR-5 extremely useful. It has an output of 50 milliwatts and a sensitivity of less than 10 microvolts at 30% modulation, 400 c.p.s. when delivering into an 8000 ohm load. There are three frequency bands, one from 27.8 to 48 mc., a second from 46 to 83 mc. and a third from 82 to 143 mc. AM, FM and CW reception are provided and provision is made for both broad and sharp tuning. Automatic volume control and noise limiting circuits are also incorporated.

To adapt the equipment for use with panoramic adapters, a lead is brought out from the plate circuit of the mixer stage to the proper receptacle. Video output is obtained by a lead through a cathode follower resister from the cathode circuit of the power output tube.

The sector sweep or scanning mechanism consists of a motor assembly, a magnetic clutch, a gear train and a sector selecting mechanism. When the motor is operating the magnetic clutch locks the gear to the tuning dial shaft. When the motor is switched off, the magnetic clutch is not energized and the tuning dial shaft is free of gears, making manual tuning possible.

Power requirements of the receiver are two d.c. sources of 270 and 28 volts and an a.c. source of 6.3 volts. Power input to power supply with one receiver is 175 watts. The receiver is capable of receiving three types of signals, namely, FM, AM and CW.

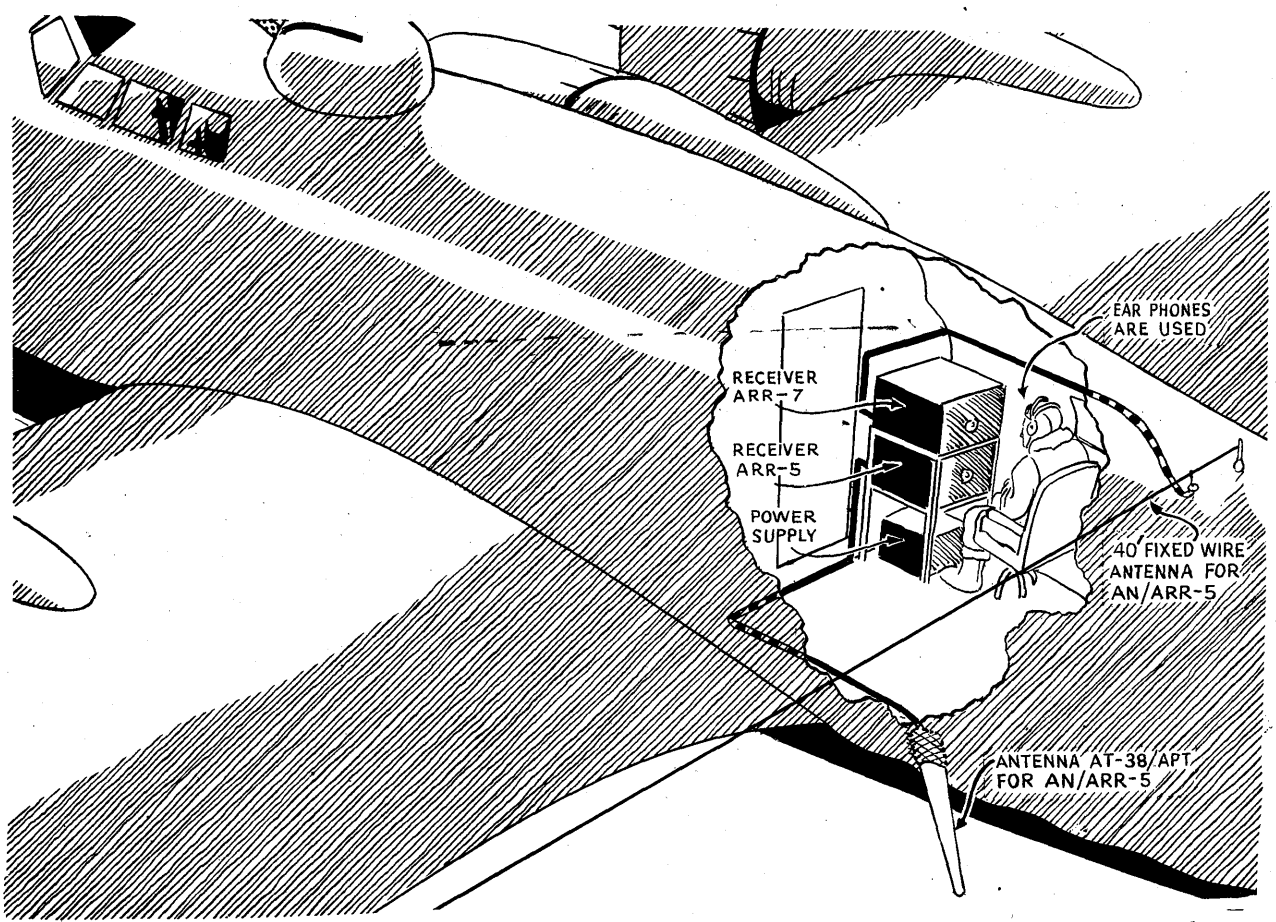
Army Supply Program requirements as of 14 June 1944 were 2060 equipments for the calendar year 1944. and 4051 for 1945.

Test Equipment used in maintenance of the Receiver includes Test Oscillator TS-47/APR, General Radio Signed Generator type 804-C, Signal Generator I-72, Hickok Voltmeter type 110 and Frequency Meter TS-213/U.

POWER INPUT	175 WATTS (INPUT TO POWER SUPPLY WITH ONE RECEIVER)
FREQUENCY RANGE	28-143 MC.
TYPE OF SIGNALS	FM AND AM, CW. RADAR.
SENSITIVITY	LESS THAN 10 MICROVOLTS

TUBE COMPLEMENT			
NO	TYPE	NO.	TYPE
2	956	2	6V6GT
1	954	1	VR/150/30
1	955	1	6SQ7
2	6AC7	1	6H6
1	6AB7	1	6J5
1	6SK7	* 3	5U4G OR 5R4GY

*TUBE COMPLEMENT FOR POWER SUPPLY



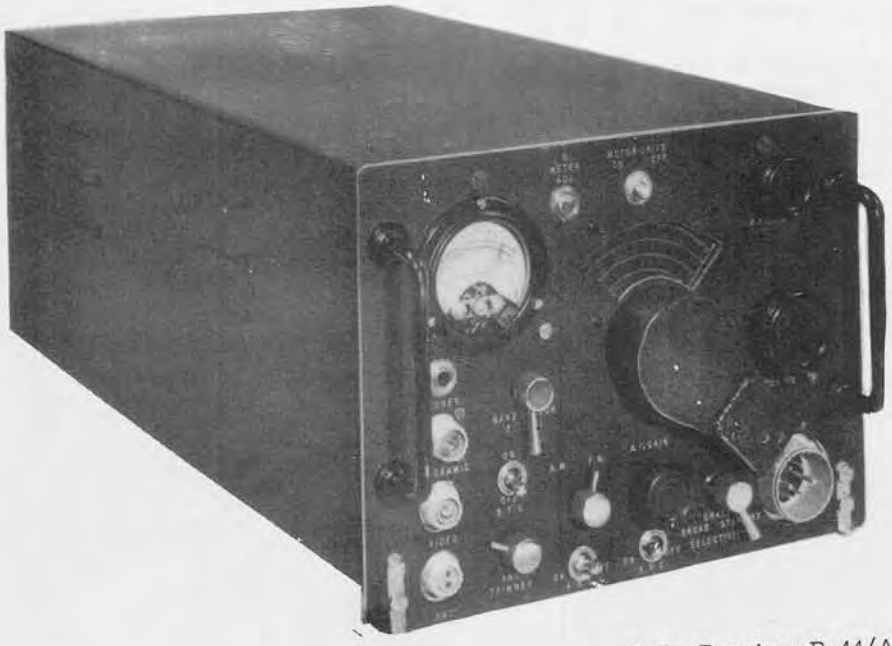
Installation of Radio Set AN/ARR-5, and Radio Set AN/ARR-7, in the radio compartment, B-17 airplane.

1 Dec. 1944

AN/ARR-5 UNCLASSIFIED

Rectifier Power Unit PP-32/AR

Antenna Stub AT-38/APT



Radio Receiver R-44/ARR-5

RADIO RECEIVING EQUIPMENT AN/ARR-5 TOTAL WEIGHT 85 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver	R-44/ARR-5	7 5/8" x 10 1/8" x 21 3/4'	40 Lb.
Mounting Base	MT-171/U	2 1/4" x 10 1/4" x 22 "	3 1/4 Lb.
Rectifier Power Unit	PP-32/AR	7 5/8" x 4 7/8" x 21 3/4"	25 Lb.
Mounting Base	MT-167/u	2 1/4" x 5 1/8" x 22"	2 3/4 Lb.
Antenna Stub	AT-38/APT	29" Long	6 1/2 Lb.
Antenna	AT-40/ARR-5	29" Long	6 1/2 Lb.

and includes plugs, adapters. misc.,cables.

1 Dec. 1944

UNCLASSIFIED

Radio Receiving Set AN/ARR-7 is an airborne intercept receiver covering the frequency band 550 kc. to 28 mc. The set has been adapted from a Hallicrafters SX-28 receiver omitting the band switching units used in the commercial receiver for reception above 28 mc. repackaged in a Standard Aircraft Radio Case B1-D. It is used in conjunction with Radar Indicator Assembly AN/APA-6 or AN/APA-11 and Panoramic Adaptor AN/APA-10. Provision is made for an automatic scanning unit that can sweep through the whole frequency band. Power is obtained from Rectifier Power Unit PP-33/AR for 110 volt, 60 c.p.s. operation or from PP-32/AR for 85-100 volt, 400 to 2600 c.p.s. operation.

The receiver has an output of greater than 50 milliwatts for 10 microvolts impressed on the input terminals of the receiver. It is extremely sensitive for continuous-wave and amplitude modulated signals. It operates on AM, FM and CW, and provision is made for broad or sharp tuning. Automatic volume control and noise limiting circuits are incorporated in the set.

To adapt the equipment for use with panoramic adaptors a lead is brought out from the plate circuit of the mixer stage to the proper receptacle. Video output is obtained by a lead through a cathode follower resistor from the cathode circuit of the power output tube.

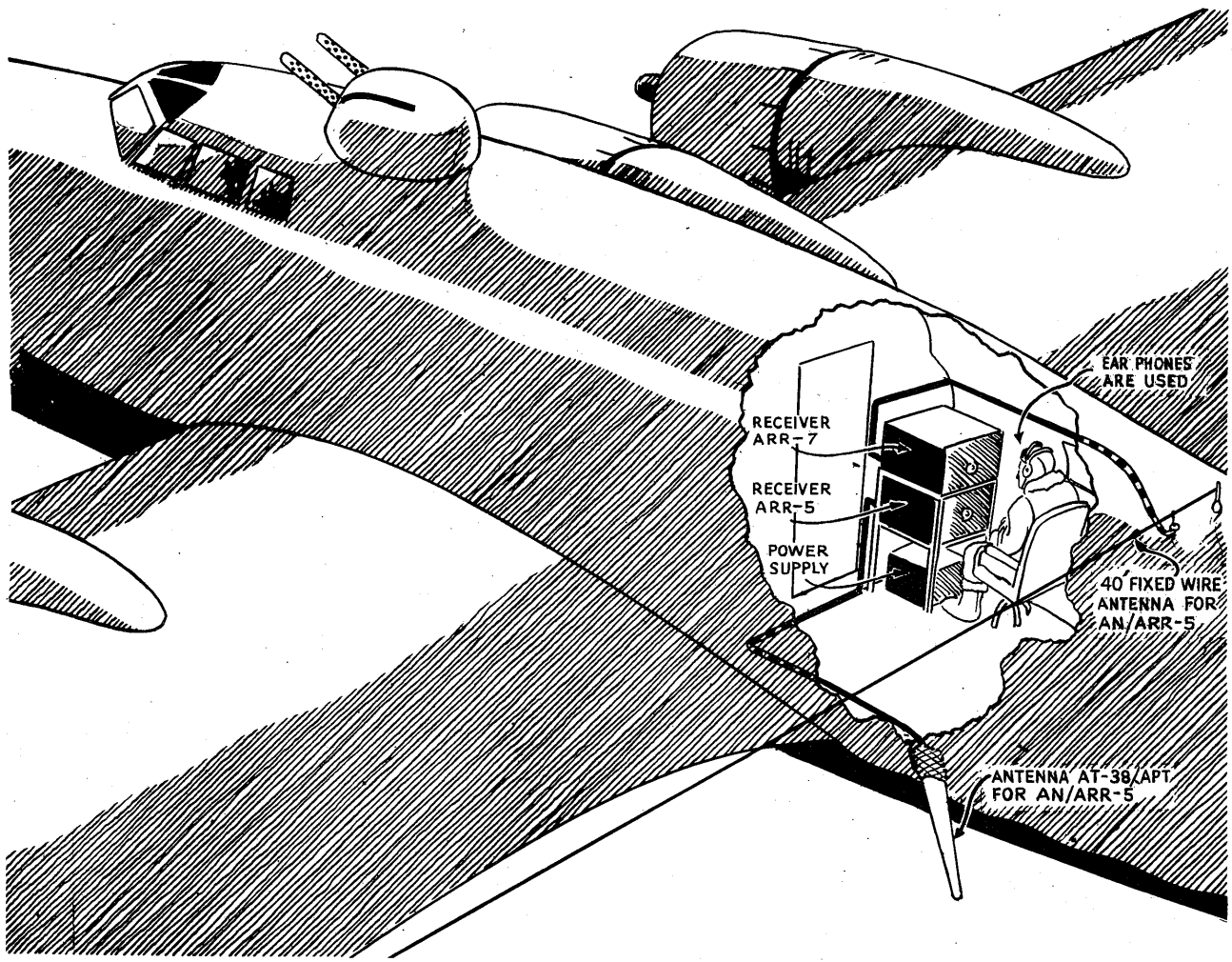
The sector sweep or scanning mechanism consists of a motor assembly, a magnetic clutch, a gear train and a sector selecting mechanism. When the motor is operating the magnetic clutch locks the gear to the tuning dial shaft. When the motor is switched off, the magnetic clutch is not energized and the tuning shaft is free of gears, making manual tuning possible.

Army Supply Program requirements as of 31 July 1944 were 2,060 equipments for the calendar year 1944 and 2,163 for 1945.

Test equipment required for the maintenance and tuning of the equipment includes Signal Generator TS-47/APR, General Radio Signal Generator Type 804C, Signal Generator I-72 and Hickok Voltmeter Type 110.

FREQUENCY	550 KC. to 28 Mc.
POWER INPUT	175 WATTS
TYPE OF SIGNAL	AM, CW, Pulse
SENSITIVITY	5 MICROVOLTS

TENTATIVE TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6AB7	1	6J5
4	6SK7	1	6V6GT/G
2	6SA7	1	VR/150/30
1	6SQ7	3	5U4G or 5R4GY
1	6H6		(for power supply)



Installation of Radio Set AN/ARR-5 and Radio Set AN/ARR-7 in the Radio Compartment -- B-17.

Rectifier Power Unit PP-32/AR

Receiver R-45/ARR-7

RADIO RECEIVING SET AN / ARR - 7 TOTAL WEIGHT 75 LBS.

Component	Nomenclature	Size	Weight
Receiver	R-45/ARR-7	7 5/8" x 10 1/8" x 21 3/4"	40 Lbs.
Rectifier Power Unit	PP-32/AR	7 5/8" x 4 7/8" x 21 3/4"	25 Lbs.
Antenna Support	AB-27/A	3" Diameter x 2 1/2"	2 Lb.
Mounting Base	MT-167/U	2 1/4" x 5 1/8" x 22"	2 3/4 Lbs.
Mounting Base	MT-171/U	2 1/4" x 10 5/8" x 22"	3 1/4 Lbs.

and includes plugs, adapters, cables, tension unit, wire thimble.

Radio Set AN/ARR-8(XA-1) is an airborne broad band panoramic receiver to cover the over all tuning range of 70 to 210 mc. All signals are presented at one time as "pips" on the calibrated base line of a five inch cathode ray oscilloscope. The receiver offers a rapid means of locating and measuring of the frequency of enemy signals which are on for a very short interval of time.

POWER INPUT	100 WATTS
FREQUENCY RANGE	70-210 MC.
SENSITIVITY	50 MICRO-VOLTS
SELECTIVITY	.5%

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
3 ea.	9002	1 ea.	2050
1 ea.	2X2	1 ea.	6SN7
6 ea.	6AC7	1 ea.	5Y3GT
4 ea.	6J5	3 ea.	6AG5

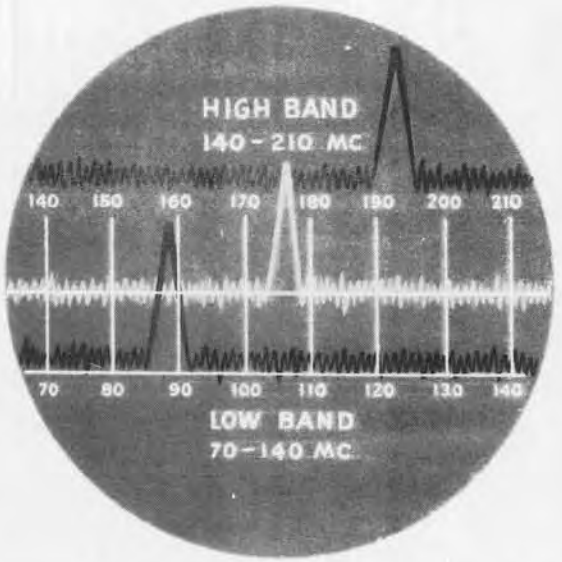
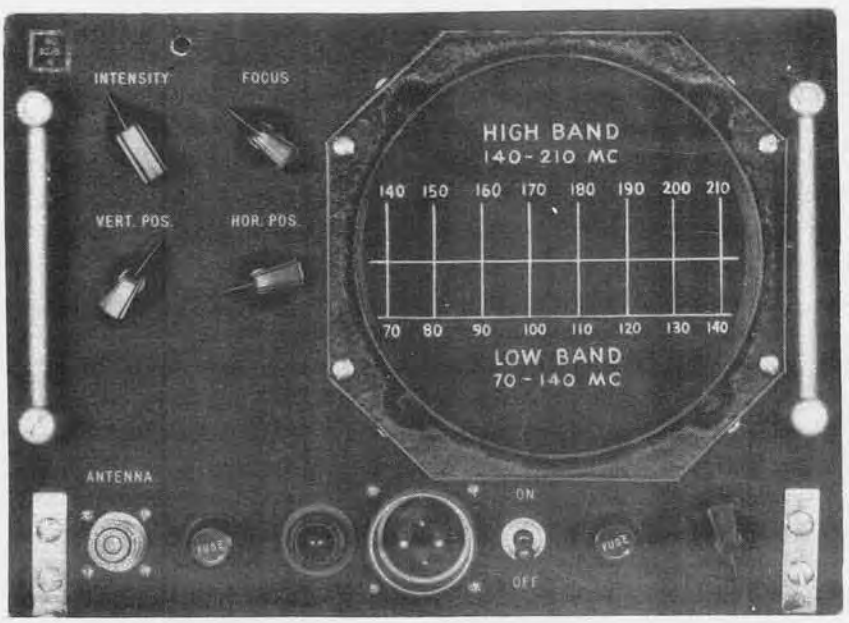


Diagram showing indication of Medium Band - and Relative position (black lines) when tuned to high or low frequencies.



RADIO SET AN/ARR-8

TOTAL WEIGHT 40 LBS.

Components	Nomenclature	Size	Weight
Panoramic Receiver		7 5/8" x 4 7/8" x 21 3/4"	30 Lbs.
Mounting Base	MT-167/U	2 1/4" x 5 1/8" x 22"	3 1/4 Lbs.

and includes plugs, mountings, and cables.

1 Dec. 1944

Radio Transmitting Equipment AN/ART-3 is an airborne high powered Jackal type barrage jammer for use against communications in the frequency range of 27 to 57 mc. This frequency range is covered by a series of tuning units provided with the equipment.

The transmitter has a tank coil with a motor driven short circuited turn (ring) to vary the frequency of the oscillator over the frequency range of the transmitter. The push-pull oscillator has two each type 304 TL tubes. The power supply consists of two full wave rectifiers using 371-B type tubes the D-C outputs of which are connected in parallel. Two inverter units type PE-218-B or C are connected to separate input terminals. No tuning or operating controls other than an "On-Off" switch are required while in flight. The present AN/ART-3 equipment will operate up to approximately 30,000 feet in altitude.

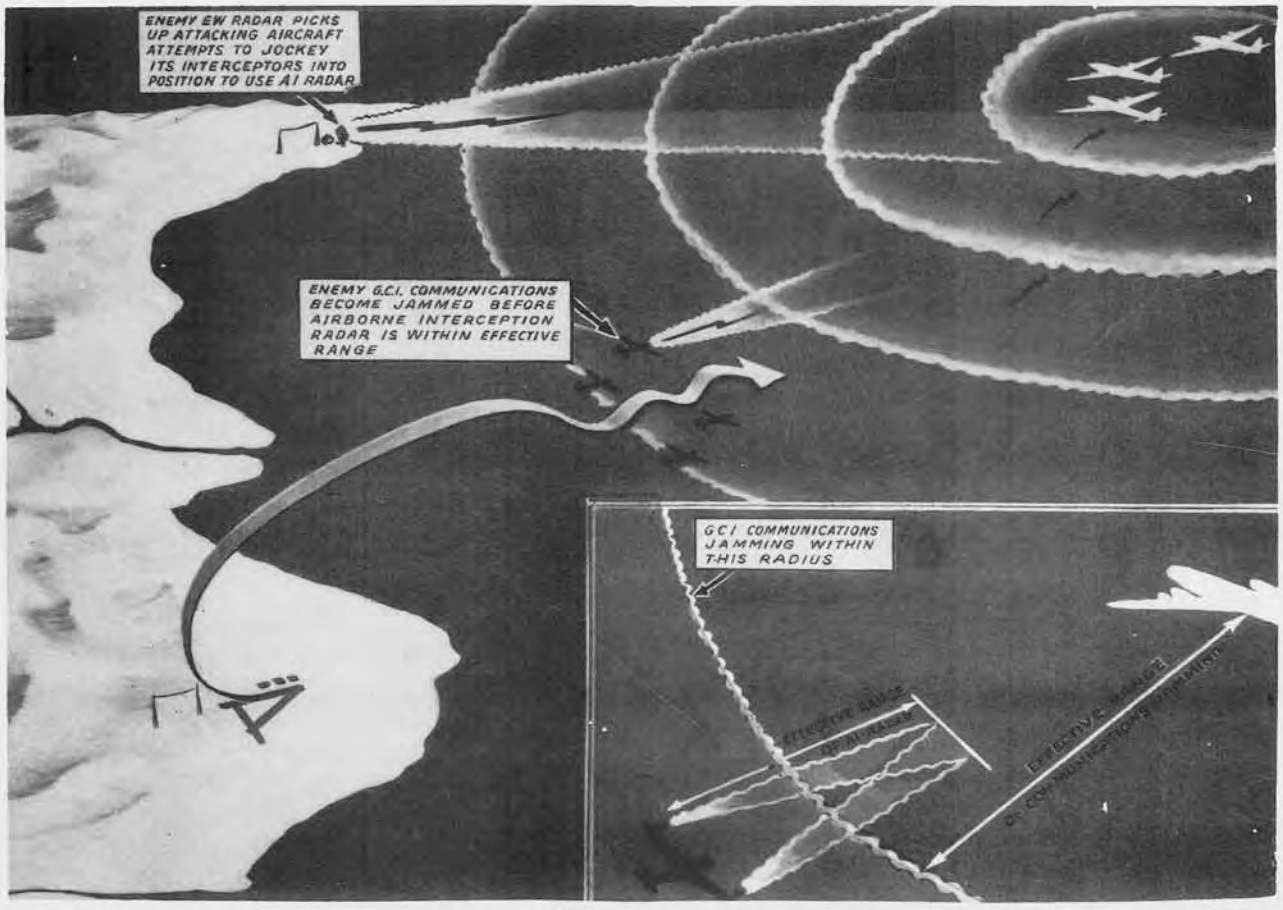
Power is obtained from a 80-100-115 volt, 400-2600 c.p.s. a.c. source and a 28 volt d.c. source. Power Input of 2.8 kw. a.c. and 130 watts d.c. produces an output of 1000 watts. The two inverters provided with the equipment are rated at 1300 and 1500 v.a. respectively.

Test Equipment for the maintenance of the transmitter includes a Radio Frequency Wattmeter TS-209/AR.

Fan Antenna for Radio Transmitting Equipment AN/ART-3 on B-17.

POWER INPUT	2.8 KW. A.C.; 130 WATTS D.C.
POWER OUTPUT	1000 WATTS
FREQUENCY RANGE	27-57 MC.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
4	371B	2	304TL



Radio Transmitting Equipment AN/ART-3 output is sufficient to prevent GCI communications well beyond effective range of enemy AI Radar.

AN / ART—3

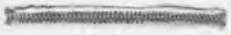
CONFIDENTIAL

Transmitter Unit T-43(XA)/ART-3(XA-2)
on Mounting Base MT-253/U

Power Supply PP-22/ART-3
on Mounting Base MT-253/U

Case CY-199/ART-3

Spring Assembly



Insulators for
Fan Antenna

Wire for Fan Antenna

Antenna Base
AB-45/ART

Antenna Base
AB-29/ART

Antenna System
AS-139/ART

RADIO TRANSMITTING EQUIP. AN / ART—3 TOTAL WEIGHT 195 LBS.

Component	Nomenclature	Size	Weight
Power Supply	PP-22/ART-3	10 5/8" x 10 1/8" x 21 3/4"	86 Lbs.
Transmitter Unit	T-43(XA)/ART-3(XA-2)	10 5/8" x 10 1/8" x 21 3/4"	25 Lbs.
Tuning Unit	TN-XA-9/ART-3	9 3/4" x 10" x 8 1/2"	8 1/2 Lbs.
Tuning Unit	TN-XA-10/ART-3	9 3/4" x 10" x 8 1/2"	8 1/2 Lbs.
Tuning Unit	TN-XA-11/ART-3	9 3/4" x 10" x 8 1/2"	8 1/2 Lbs.
Tuning Unit	TN-XA-12/ART-3	9 3/4" x 10" x 8 1/2"	8 1/2 Lbs.
Tuning Unit	TN-XA-13/ART-3	9 3/4" x 10" x 8 1/2"	8 1/2 Lbs.
Tuning Unit	TN-XA-14/ART-3	9 3/4" x 10" x 8 1/2"	8 1/2 Lbs.
Tuning Unit	TN-XA-15/ART-3	9 3/4" x 10" x 8 1/2"	8 1/2 Lbs.
Mounting Base	MT-171/U	2 1/4" x 10 5/8" x 22"	3 1/4 Lbs.
Antenna Assembly	AS-139/ART	72" long	8 Lbs.
Antenna Base	AB-29/ART	5 1/2" x 7" Dia.	3 Lbs.

and includes plugs, adapters, tension unit, wire, insulator and misc. cables.

1 Dec. 1944

AN/ART-7

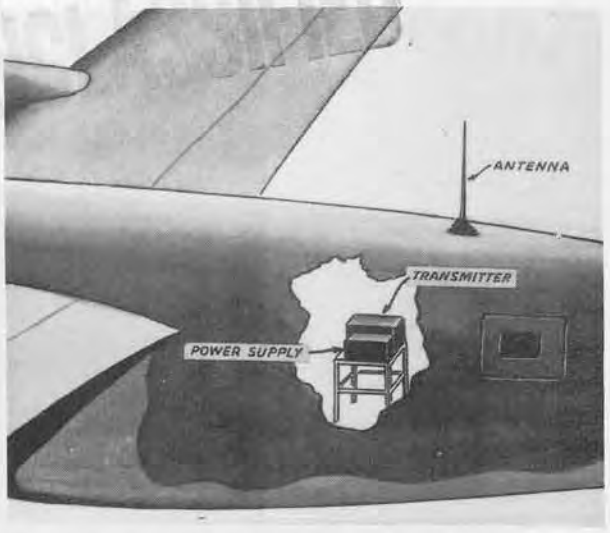
Radio Transmitting Set AN/ART-7 is an airborne barrage jammer that will operate unattended during flight and produce interference over the frequency range of 27 to 34 mc. employed by German tanks, battalion links and armored command in general. The transmitter consists of a push-pull oscillator using two each type 35TG tubes and a motor driven rotating condenser which sweeps the frequency over the tuning range at a rate of 300 to 500 c.p.s.

While this equipment has been found to be efficient in jamming AM signals, such as are emitted from German tank sets, it has practically no effect on FM equipment operating in the same frequency range. This equipment was formerly known as AN/ARQ-2.

Power is obtained from a 80/105/115 volt, d.c. 400-2600 c.p.s., a.c. and 28 volt source. Power input of 700 watts produces an output of 150 watts.

Army Supply Program Requirements as of 14 June 1944 were 600 for the calender year 1944 and 1360 for 1945.

Test Equipment used in maintenance of Radio Transmitting Equipment AN/ART-7 includes Test Set I-139-A, Pickup Assembly TS-131/AP, Test Set I-56J, K or L and Hickok Voltmeter type 110.



Installation of Radio Transmitting Equipment AN/ART-7 aft bombay port side, B-24 airplane.

POWER INPUT	700 WATTS
POWER OUTPUT	150 WATTS
FREQUENCY RANGE	27-34 MC.

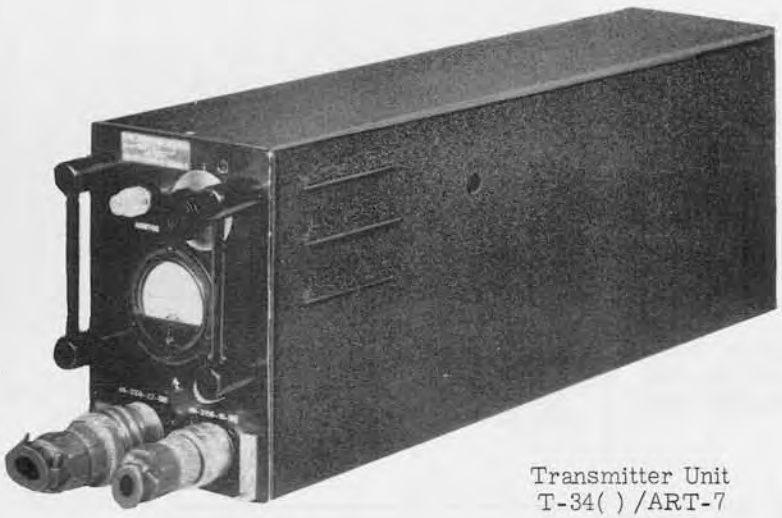
TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	35TG	2	836

Radio Transmitting Set AN/ART-7 is an airborne jammer used to disrupt enemy ground radio communications operating with-in its frequency range.

AN/ART-7

~~SECRET~~

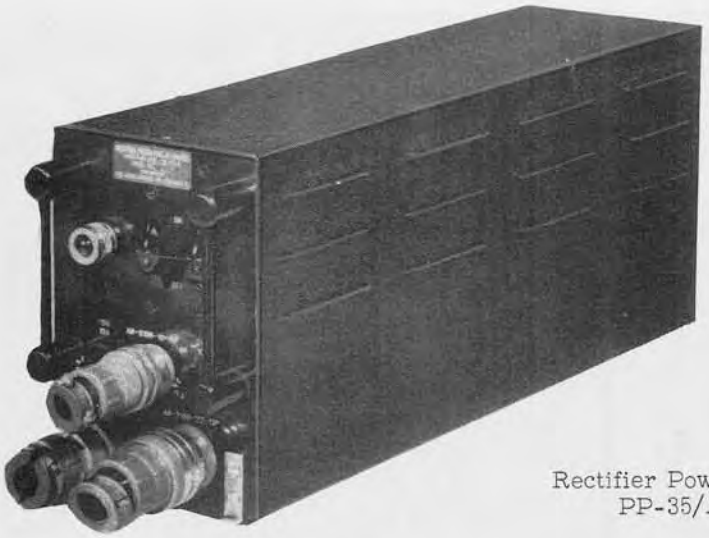
~~UNCLASSIFIED~~



Transmitter Unit
T-34( ) /ART-7

Antenna System
AS-89/ART

Antenna Base
AB-29/ART



Rectifier Power Unit
PP-35/ART

~~UNCLASSIFIED~~

RADIO TRANSMITTING SET AN/ART-7 TOTAL WEIGHT 74 LBS.

Component	Nomenclature	Size	Weight
Transmitter Unit	T-34( )/ART-7	7 5/8'' x 4 7/8'' x 21 3/4''	23 Lb.
Rectifier Power Unit	PP-35/ART	7 5/8'' x 4 7/8'' x 21 3/4''	37 Lb.
Mounting Base	MT-167/U (2 each)	2 1/4'' x 5 1/4'' x 22''	5 1/2 Lb.
Matching Section	CU-51/ART	5 1/2'' x 5'' Dia.	2 Lb.
Antenna Base	AB-47/ART	4'' x 5'' Dia.	1 Lb.
Filter	F-15/U	5'' x 6'' x 9''	2 Lb.

includes adapters, cable adapters, plugs, insulator, wire and misc. cables.

1 Dec. 1944

Radio Transmitting Set AN/ART-9 is an airborne barrage jammer, capable of operating unattended during flight, and which will produce interference over a frequency range of 37 to 43 mc. employed by German fighters and GCI communication links.

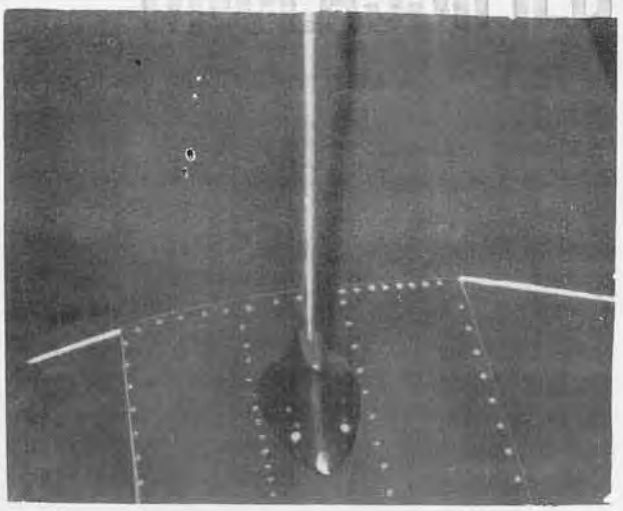
The transmitter, Radio Transmitter T-36/ART-9 consists of a push-pull oscillator using two each type 35 TG tubes and a motor-driven, rotating condenser which sweeps the frequency over the tuning range at a rate of 300 to 500 c.p.s.

This equipment has been found to be highly efficient in jamming AM signals, such as are emitted from German tank sets. It has practically no effect, however, on FM equipment operating in the same frequency range

Power requirements for the equipment are 80-115 volts, 400-2600 c.p.s. a.c. and 28 volts d.c. These requirements include Rectifier Power Unit PP-35/ART.

Test equipments required for maintenance are: Test Set I-139-A, Pick-Up Assembly TS-131/AP, Test Set I-56, and Voltmeter, Hickok Type 110.

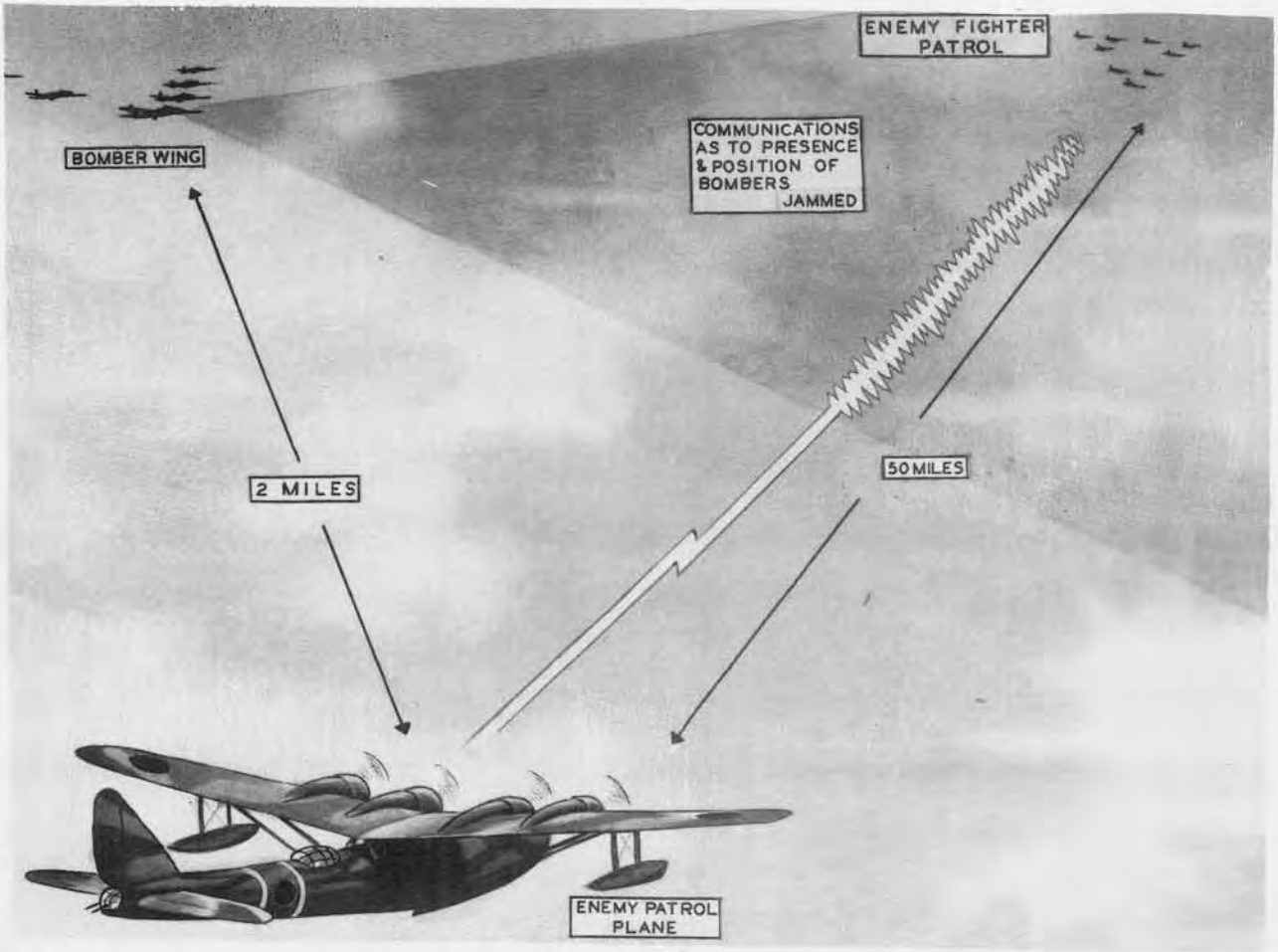
Army Supply Program requirements for Radio Transmitting Set AN/ART-9 as of 14 June 1944 were 8,802 for the calendar year 1944.



Antenna System AS-89/ART for Radio Transmitting Set AN/ART-9 as installed on B-24.

POWER INPUT	550 WATTS
POWER OUTPUT	115 WATTS
FREQUENCY RANGE	37-43 MC.
TYPE OF SIGNAL	FM 300 C.P.S. STEADY TONE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	35TG	2	836



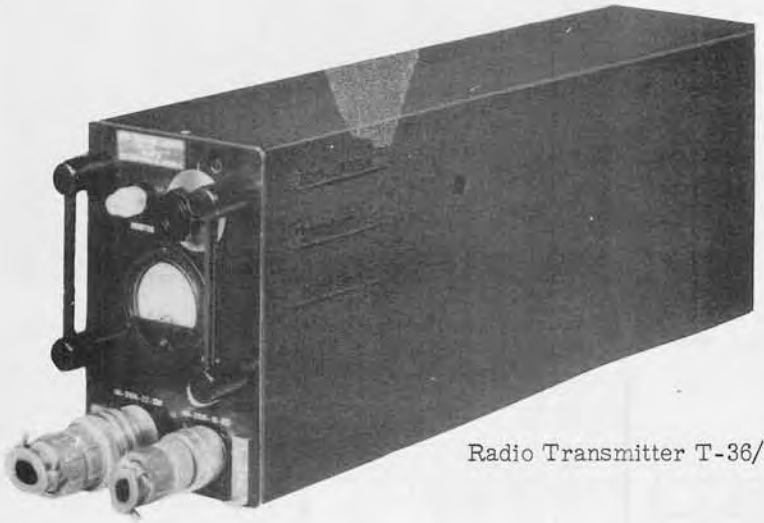
The above diagram shows the application of jamming as applied by attacking bombers to communications between enemy reconnaisance and interceptor planes.

1 Dec. 1944

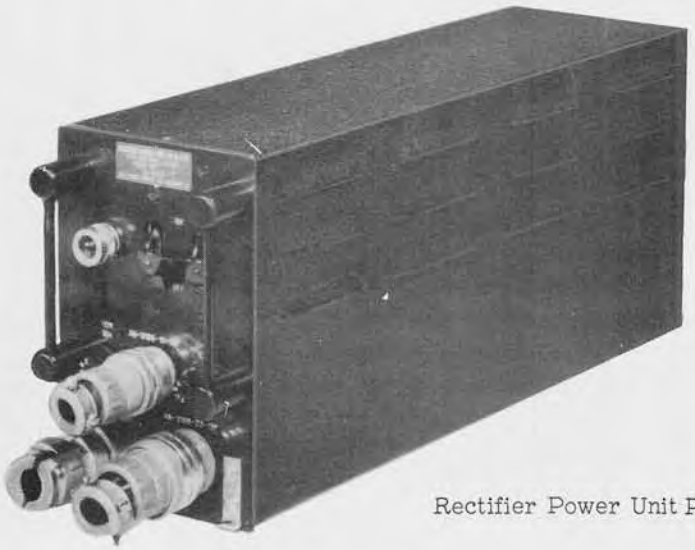
AN/ART-9

SECRET

UNCLASSIFIED



Radio Transmitter T-36/ART-9



Rectifier Power Unit PP-35/ART

Antenna System AS-89/ART

RADIO TRANSMITTING SET AN / ART-9 TOTAL WEIGHT 75 LBS.

Component	Nomenclature	Size	Weight
Radio Transmitter	T-36/ART-9	7 5/8'' x 4 7/8'' x 21 3/4''	23 Lb
Rectifier Power Unit	PP-35/ART	7 5/8'' x 4 7/8'' x 21 3/4''	37 Lb.
Mounting Base	MT-167/U (2 each)	2 1/4'' x 5 1/4'' x 22''	5 1/2 Lb
Antenna System	AS-89/ART	3 1/2'' Dia x 5'' Long	5 Lb.

and includes plugs, adapters and misc. cables

1 Dec. 1944

AN/ART-10

Radio Transmitting Set AN/ART-10 is an airborne barrage jammer capable of operating unattended during flight, and of producing interference over a frequency range of 42 to 48 mc., employed by the Japanese for communication with fighter aircraft and by the Germans for communication with bomber aircraft. It has been found to be efficient in jamming AM signals, such as are emitted from German tank sets, but it has practically no effect on FM equipment operating in the same frequency range.

The transmitter, Radio Transmitter T-37/ART-10, consists of a push-pull oscillator using two each type 35TG tubes and a motor-driven, rotating condenser which sweeps the frequency over the tuning range at a rate of 300 c.p.s.

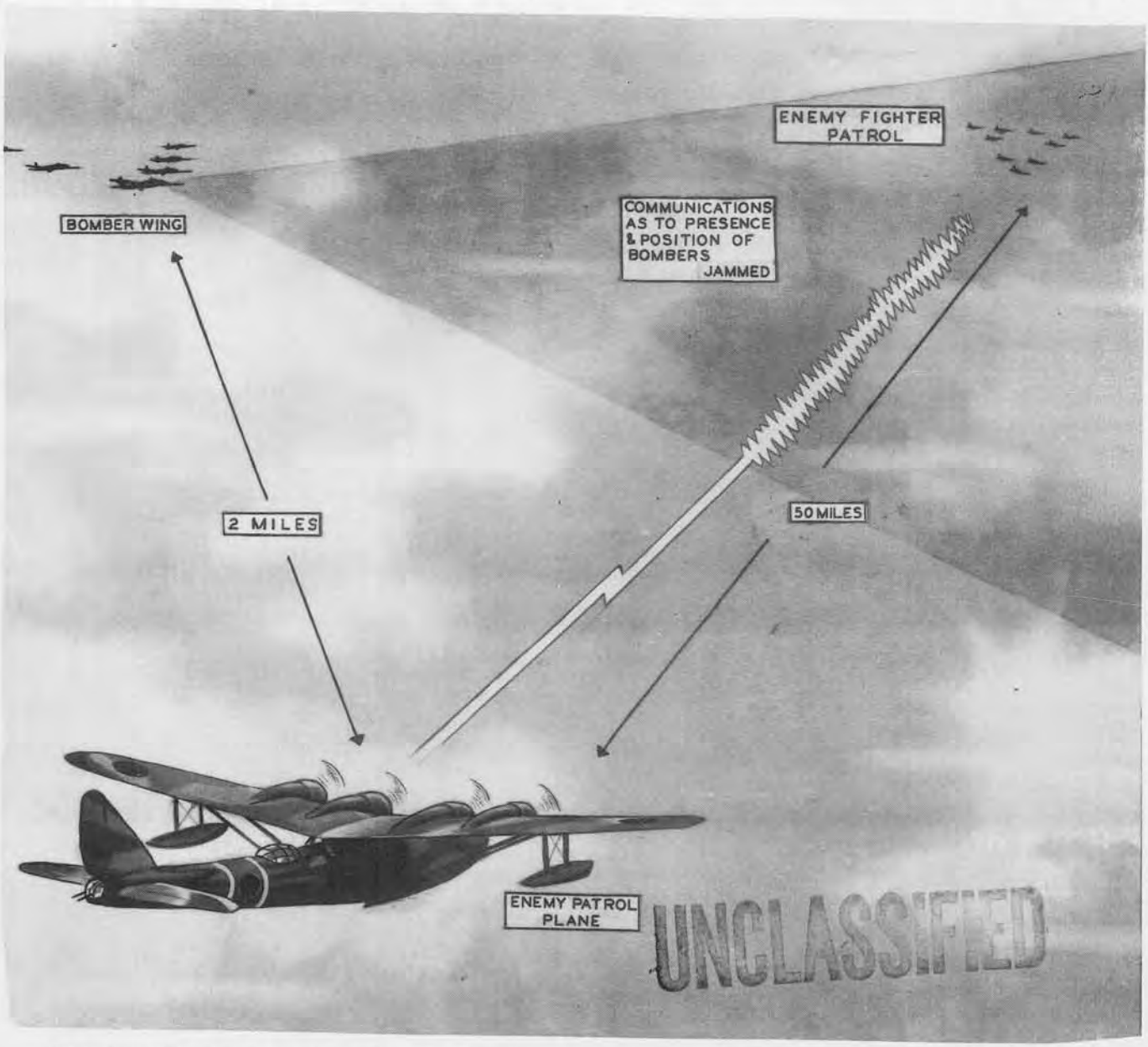
Power requirements, which include Rectifier Power Unit PP-35/ART, are 80-115 volts, 400-2600 c.p.s. a.c. and 28 volts d.c.

Test equipments required in maintenance are: Test Set I-139-A, Pick-Up Assembly TS-131/AP, Test Set I-56-J,K & L, and Voltmeter, Hickok Type No. 110

Army Supply Program Requirements for this equipment as of 1 September 1944 were 1,000 sets for the calendar year 1944.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	35TG	2	836

POWER INPUT	550 WATTS
POWER OUTPUT	105 WATTS
FREQUENCY RANGE	42-48 MC
TYPE OF SIGNAL	FM 300 CPS STEADY TONE

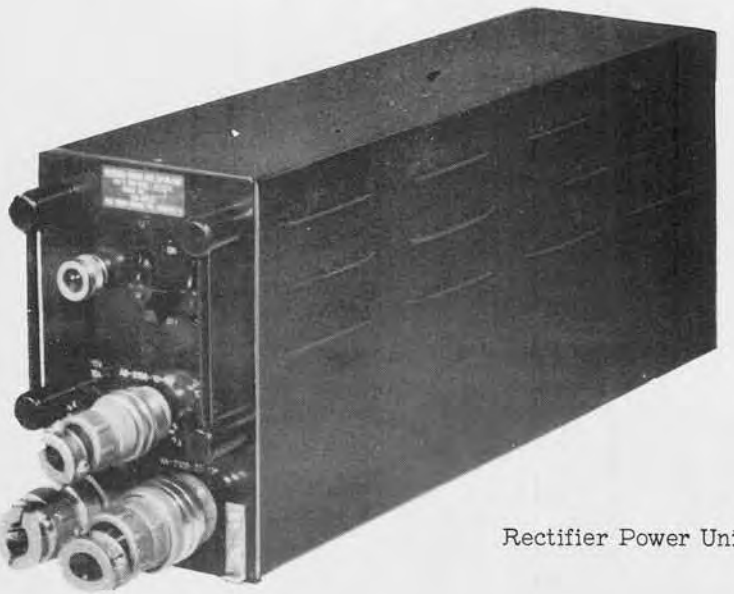


The above diagram shows the application of jamming as applied by attaching bombers to communications between enemy reconnisance and interceptor planes.

AN/ART-10

SECRET

Radio Transmitter T-37/ART-10



Rectifier Power Unit PP-35/ART

AS-89/ART

AB-29/ART

RADIO TRANSMITTING SET AN/ART-10 TOTAL WEIGHT 75 LBS.

Component	Nomenclature	Size	Weight
Radio Transmitter	T-37/ART-10	7 5/8" x 4 7/8" x 21 3/4"	23 Lb.
Rectifier Power Unit	PP-35/ART	7 5/8" x 4 7/8" x 21 3/4"	37 Lb.
Antenna System	AS-89/ART	72" x 3 1/2" Dia.	5 Lb.
Mounting Base	MT-167/U (2 each)	2 1/4" x 5 1/4 "'x 22"	5 1/2 Lb.
Antenna Base	AB-29/ART	5 1/2" x 3 1/2" Dia.	3 Lb.
Low Pass Filter		5" x 6" x 9"	2 Lb.

and includes plugs, adapter, cable adapters, and misc. cables.

1 Dec. 1944

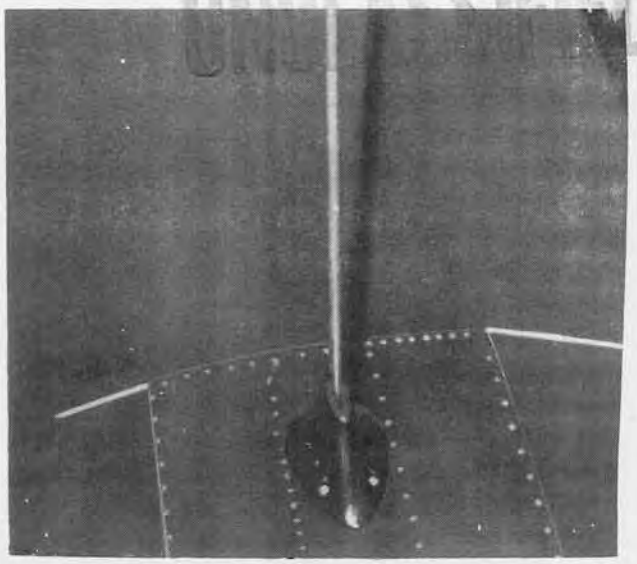
Radio Transmitting Set AN/ART-11 (Jackal) is an airborne barrage jammer that will operate unattended during flight and produce interference ove. the frequency range of 48 to 57mc. employed by German tanks, battalion links and armored command in general. The transmitter consists of a variable condenser which is controlled by a knob that can set it at any frequency within the range of the equipment. The motor driven condenser creates a barrage signal over the pre-selected section of the tuning range.

While this equipment has been found to be efficient in jamming AM signals such as are emitted from German tank sets, it has practically no effect on FM equipment operating in the same frequency range.

Power input is 600 watts with an a.c. power source of 80-115 volts, 400-2600 c.p.s. and d.c. power source of 28 volts. Power output is 150 watts.

Army Supply Program Requirements as of the 30 April 1944 were 600 for the calendar year 1944.

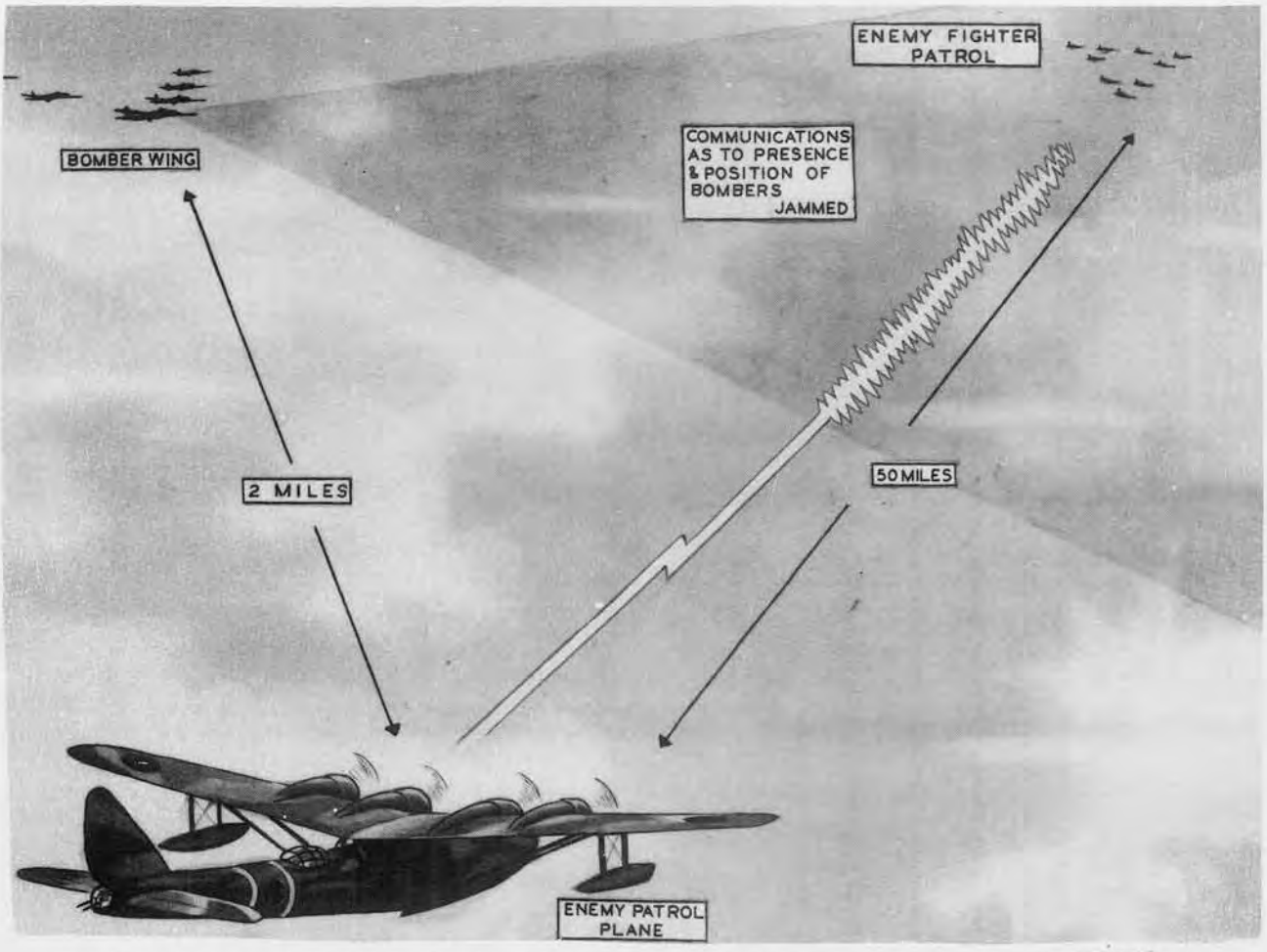
Test Equipment used in maintenance of Radio Transmitting Set AN/ART-11 includes Test Set I-139A Pickup Assembly TS-131/AP, Test Set I-56-J, K or L and Hickok Voltmeter type 110.



Antenna System AS-89/ART for Radio Transmitting Set AN/ART-11 as installed on B-24.

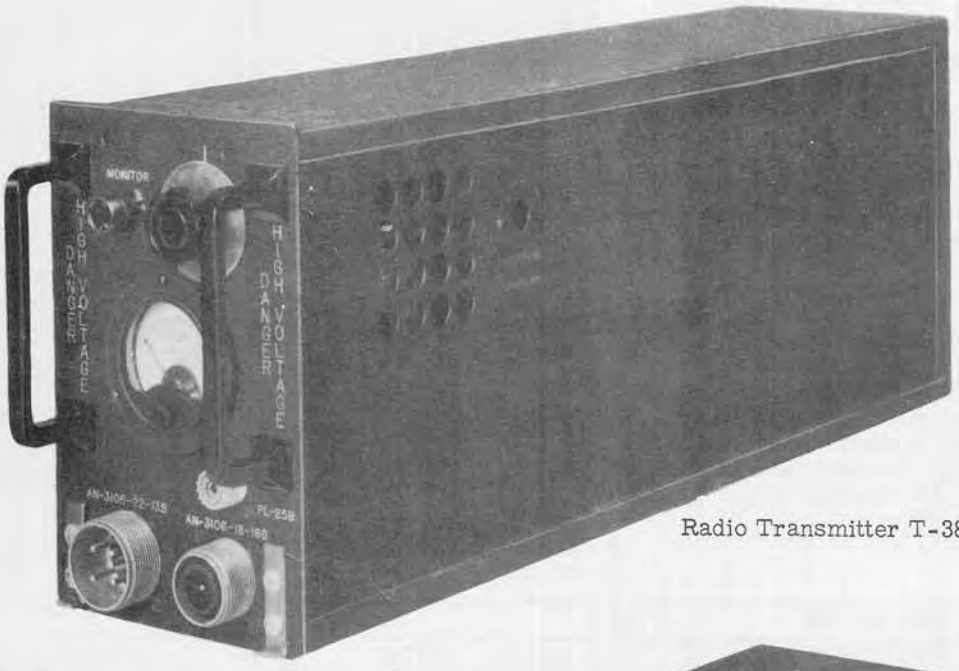
POWER INPUT	600 WATTS
POWER OUTPUT	150 WATTS
FREQUENCY RANGE	48-57Mc.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	35TG	2	836

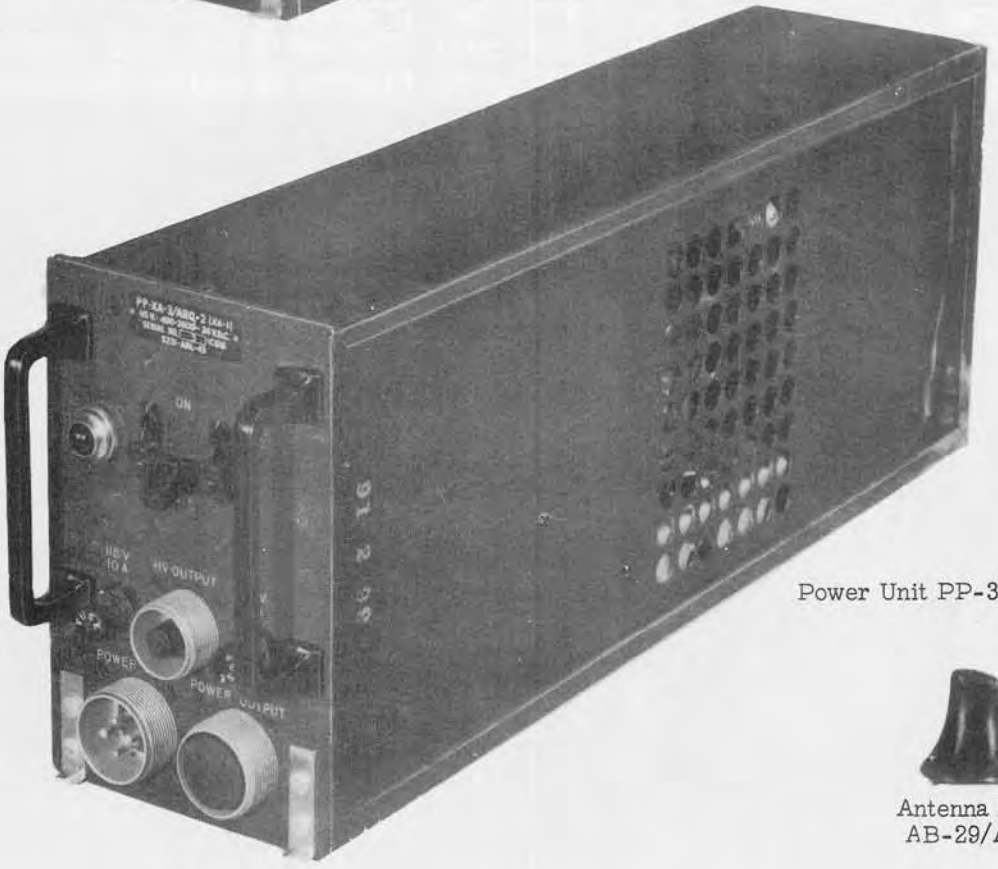


The above diagram shows the application of jamming as applied by attaching bombers to communications between enemy reconnisance and interceptor planes.

AN/ART—11 CONFIDENTIAL



Radio Transmitter T-38/ART-11



Power Unit PP-35/ART

Antenna Base
AB-29/ART

Antenna System
AS-97/ART

RADIO TRANSMITTING SET AN/ART—11 TOTAL WEIGHT 74 LBS.

Component	Nomenclature	Size	Weight
Radio Transmitter	T-38/ART-11	7 5/8" x 4 7/8" x 21 3/4"	23 Lbs.
Rectifier Power Unit	PP-35/ART	7 5/8" x 4 7/8" x 21 3/4"	37 Lbs.
Antenna System	AS-97/ART	54" x 1/2" Dia.	3 3/4 Lbs.
Antenna Base	AB-29/ART	6" x 7" Dia.	3 Lbs.
Mounting Base	MT-167/U (2 Each)	2 1/4" x 5 1/4" x 22 "	5 1/2 Lbs.

and includes plugs, adapters and misc. cables.

1 Dec. 1944

AN/TPQ-T1

Training Set AN/TPQ-T1 is a jamming transmitter designed to train operators in the use of anti-jamming equipment. It covers the frequency range 100 to 230 mc. The equipment provides sine-wave amplitude-modulated and frequency modulated signals. The equipment is set up close to the equipment to be jammed and has a low power output.

An operator is required to tune the set to the radar signal to be jammed and to select the type of jamming to be used. A trained instructor is necessary to observe and correct the reactions of the radar personnel against which the equipment is used and to outline the proper procedures to be followed in the presence of jamming signals.

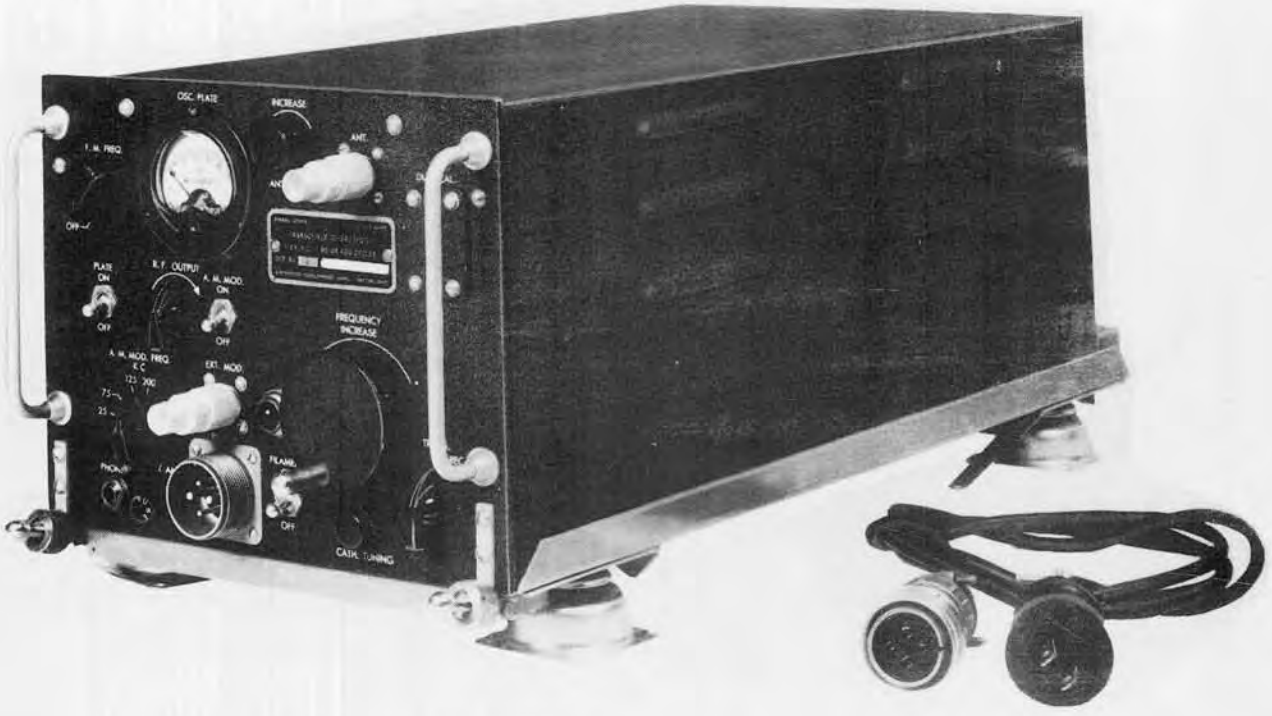
The equipment is transportable and may be set up in the vicinity of the radar against which it is to be used. Any convenient simple antenna may be used with it. A 115 volt, 60-400 c.p.s., a.c. power source is required for the operation of the set.

No special test equipment is required for maintenance.

Army Supply Program requirements as of 31 July 1944 were 20 sets for the calendar year 1944.

POWER INPUT	75 WATTS
POWER OUTPUT	3 WATTS
FREQUENCY RANGE	100 TO 230 MC.
TYPE OF SIGNAL	A.M. AT 25,75,125,200, 500, and 1000 KC. F.M.-1MC. VARIABLE FROM 1000 C.P.S. DOWN
RECEIVER SENSITIVITY	75 MICROVOLTS PER METER

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	7193	1	6J5GT
1	6F6GT	1	5U4G



Transceiver RT-54/TPQ-T1

TRAINING SET AN/TPQ-T1 — TOTAL WEIGHT 45 LBS.

Component	Nomenclature	Size	Weight
Transceiver	RT-54/TPQ-T1	7 3/4" x 10 1/4" x 21 3/4"	41 Lbs.
Mounting Base	MT-171/U	2 1/4" x 10 5/8" x 22 "	3 Lbs.

1 Dec. 1944

CHAFF

Chaff, known to the British as "Window," is a deception device employed by the Army Air Forces to create spurious responses on the oscilloscopes of enemy radar devices. (Official nomenclature of future developments of this device will be "Reflector.") It consists of aluminum foil cut into various length strips depending on operating frequency of enemy equipment to be jammed. Chaff is light in weight and when dropped from aircraft falls at a rate of about 260 feet per minute. Its effect depends directly on the slow rate of fall, slow rate of dispersal, and its response qualities which are determined by its dimensions and the conductivity of the metal foil. It is packaged in packets 10" x 3" x 1/2", containing approximately 2,000 strips of foil each. Each packet contains a number of different length strips to afford coverage of a wide frequency range.

Chaff, or Window, is dispersed by the bombardier or radio operator through special shutes placed at a 40 degree angle in the side or belly of the plane. Usually only the lead plane disperses the chaff since this provides sufficient coverage to mask the entire flight. Its use has the effect of disrupting automatic gun laying or automatic search light control and early warning equipment by introducing spurious responses in radar equipment causing the oscilloscopes to cloud over. Thus signals caused by the actual planes approaching or passing the enemy radar are lost in the echoes from the chaff.

Its advantageous use overseas has been proven by comparison of the number of ships lost on missions run without Chaff against the number of ships lost on those missions during which Chaff or Window was used.

No test equipment or power supply is required for the maintenance of this equipment.

In use Chaff is packaged in cardboard containers each packed with sufficient strips of Chaff to make up three units. A unit is defined as the number of strips of foil that will produce a pattern on a radar oscilloscope equivalent to that produced by a four motor bomber. The quantity of strips per unit varies from about 1000 at 400 mc. to 500,000 at 10,000 mc. and weight per unit from about 3 ounces at 400 mc. to 2 pounds at 10,000 mc.

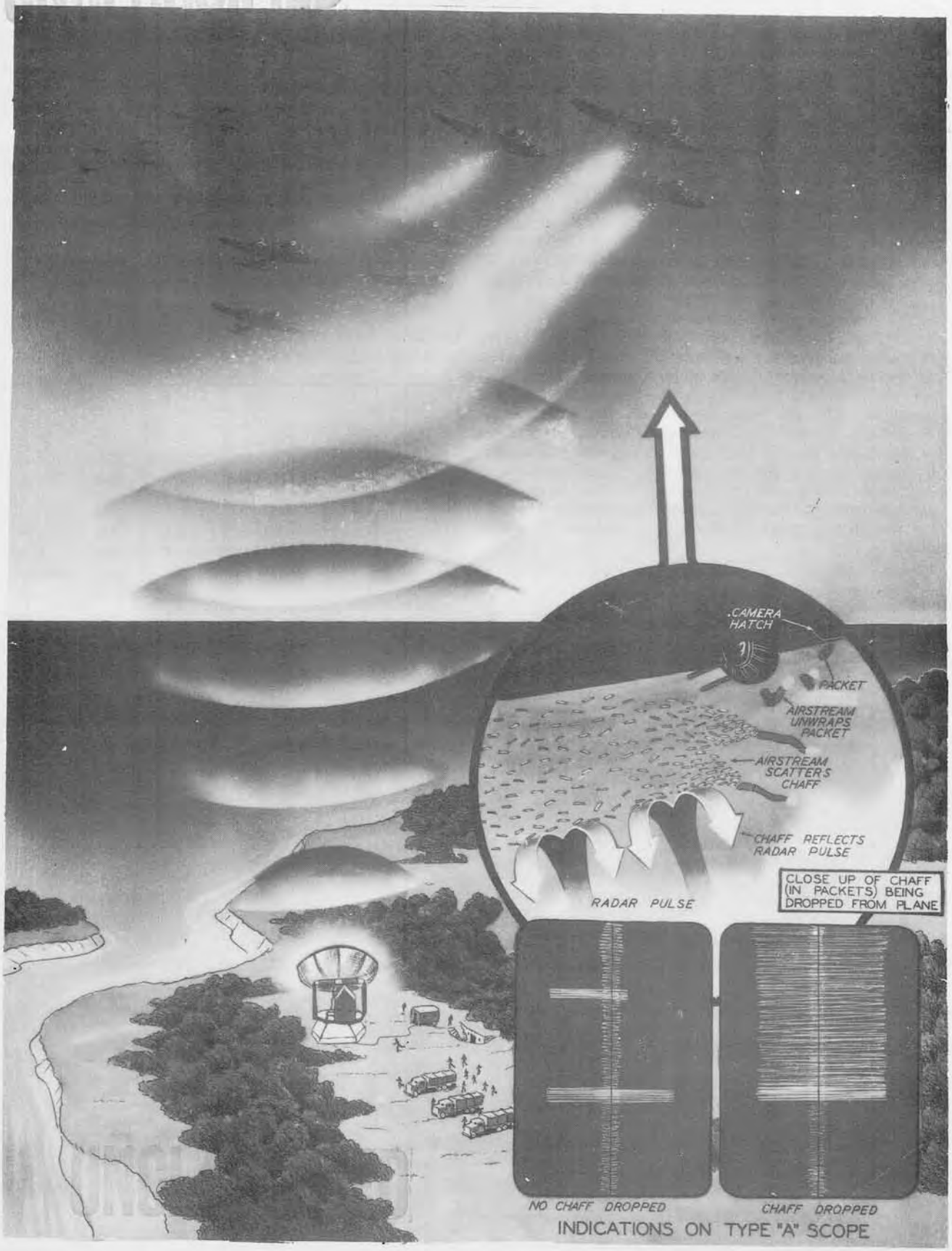
Army Supply Program requirements as of 13 October 1944 were 97,936,000 units for the calendar year 1944 and 98,124,000 for 1945.

TYPE	FREQUENCY	TYPE	FREQUENCY
CHA-2	347- 404 mc.	CHA-35	600- 875 mc.
CHA-3	520- 600 mc.	CHA-45	860- 3,000 mc.
CHA-4	660- 770 mc.	CHB-0	100- 116 mc.
CHA-5	2,700- 3,400 mc.	CHB-1	193- 224 mc.
CHA-6	8,100-10,600 mc.	CHK-1	10,000 mc. & up.
CHA-25	320- 600 mc.	CHR-1	50- 200 mc.
CHA-28	450- 600 mc.	CHR-2	50- 200 mc.

Strips of chaff are packaged in units to simulate one four motor airplane. Photograph shows one unit packaged and one open.

CHAFF

~~SECRET~~



When dropped from aircraft, "CHAFF" or "REFLECTOR" (aluminum foil) produces spurious echoes in enemy radar equipment as graphically illustrated in the oscilloscope sketch above. Oscilloscope indication on right is the ideal condition with scope saturated with reflections.

1 Dec. 1944

UNCLASSIFIED

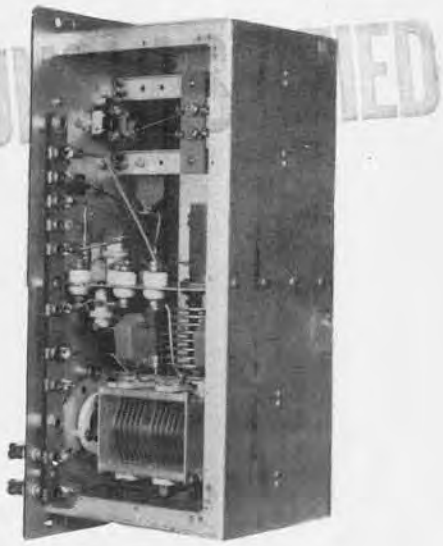
Tuning Unit TU-60 is a modification of a transmitter tuning unit, Tuning Unit TU-10-B, which converts Radio Transmitter BC-375 or Radio Transmitter BC-191 into a barrage jammer for use against enemy communications. In Radio Transmitter BC-375, it converts the oscillator and amplifier into a Hartley push-pull oscillator, which is frequency-modulated by a motor driven condenser.

The unit operates over a frequency range of 15 to 22 mc., with input power derived from Radio Transmitter BC-375. The power output of the transmitter with Tuning Unit TU-60 is 100 watts. There is mechanical frequency modulation over a band of 3 mc. average width at a frequency rate of 200 c.p.s.

Size of the unit is that of a standard tuning unit for Radio Transmitter BC-375.

No tube complement is required.

POWER OUTPUT	100 WATTS
FREQUENCY RANGE	15-22 MC.
MODULATION	MECHANICAL NOISE



Tuning Unit TU-60

Transmitter Tuning Unit TU-60.

TRANSMITTER TUNING UNIT TU-60

TOTAL WEIGHT 15 LBS

Component	Nomenclature	Size	Weight
Tuning Unit	TU-60	7 3/4'' x 8 1/2'' x 17''	15 Lb.

1 Dec. 1944

TU-63-T1

Transmitter Tuning Unit TU-63-T1 is a modification of Transmitter Tuning Unit TU-6, used to convert Radio Transmitter BC-375 or Radio Transmitter BC-191 into a barrage jammer for use against enemy communications and radio-controlled missiles.

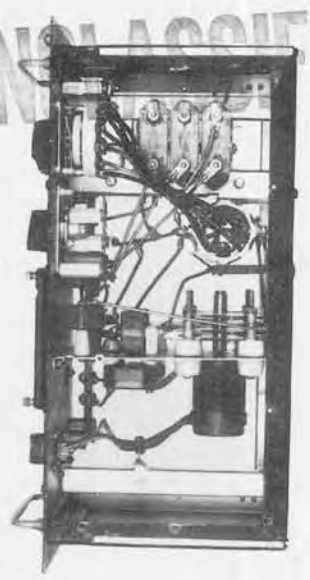
The center frequency of a 5 per cent barrage band can be adjusted to any point within the frequency range, permitting frequency operation of 2-3.85 mc.

Use of this unit does not require any modification of Radio Transmitter BC-375. With the exception of difference in frequency, it is the same as Transmitter Tuning Unit TU-60-( ).

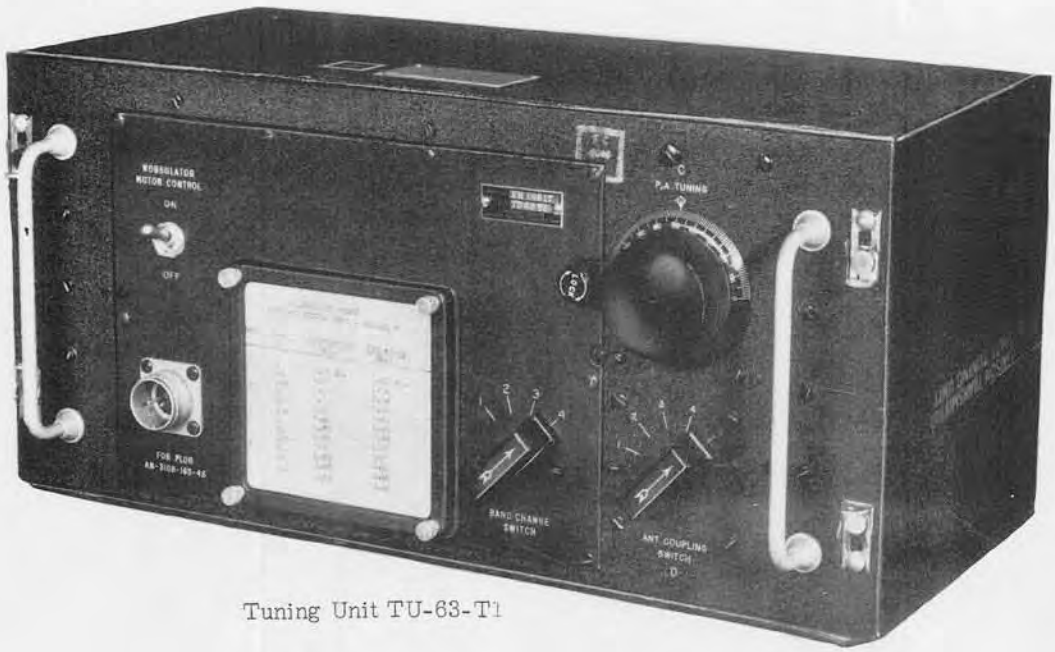
Power requirements are 1 ampere at 24 volts.

No tube complement is used, and no test equipment is required.

POWER OUTPUT	100 WATTS
FREQUENCY RANGE	2-3.85 MC.
TYPE OF SIGNAL	AUDIO FREQUENCY WOBBULATED
TRANSPORTATION	AIRBORNE



Transmitter Tuning Unit TU-63-T1 (Bottom View, dust cover removed);



Tuning Unit TU-63-T1

TRANSMITTER TUNING UNIT TU-63-T1 TOTAL WEIGHT 15 LBS.

Component	Nomenclature	Size	Weight
Tuning Unit	TU-63-T1	7 3/4" x 8 1/2" x 17	15 Lbs.

1 Dec. 1944

Transmitter Tuning Unit TU-64-( ) is a modification of Transmitter Tuning Unit TU-7, used to convert Radio Transmitter BC-375 or Radio Transmitter BC-191 into a barrage jammer for use against enemy communications and radio-controlled missiles.

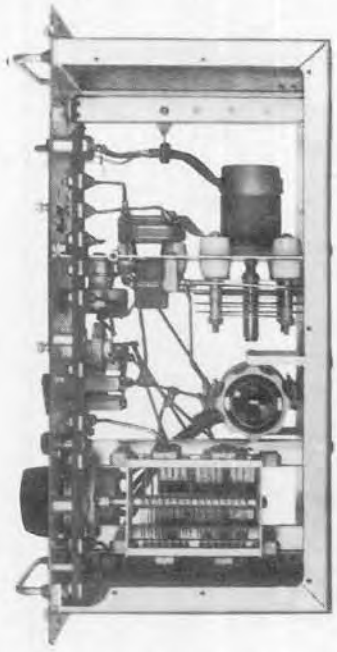
The center frequency of a 5 per cent barrage band can be adjusted to any point within the frequency range, permitting frequency operation of 3.85-6.31 mc.

Use of this unit does not require any modification of Radio Transmitter BC-375. With the exception of the difference in frequency, it is the same as Transmitter Tuning Unit TU-60-( ).

Power requirements are 1 ampere at 24 volts.

No tube complement is used, and no test equipment has been assigned.

POWER OUTPUT	100 WATTS
FREQUENCY RANGE	3.85-6.31 MC.
TYPE OF SIGNAL	AUDIO FREQUENCY WOBBULATED
TRANSPORTATION	AIRBORNE



Transmitter Tuning Unit TU-64-T1 (Top View, cover removed);

Tuning Unit TU-64-T1.

TRANSMITTER TUNING UNIT TU-64-T1 TOTAL WEIGHT 15 LBS.

Component	Nomenclature	Size	Weight
Tuning Unit	TU-64-T1	7 3/4" x 8 1/2" x 17"	15 Lbs.

[redacted] SECRET

TU-65-T1

Transmitter Tuning Unit TU-65-T1 is a modification of Transmitter Tuning Unit TU-8, used to convert Radio Transmitter BC-375 or Radio Transmitter BC-191 into a barrage jammer for use against enemy communications and radio-controlled missiles.

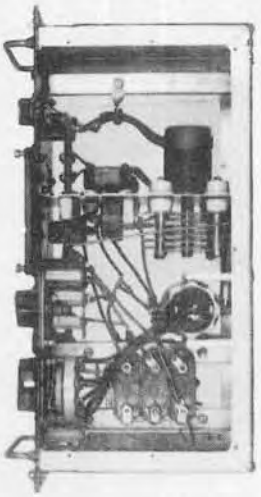
The center frequency of a 5 per cent barrage band can be adjusted to any point within the frequency range, permitting frequency operation of 6.31-10.2 mc.

Use of this unit does not require any modification of Radio Transmitter BC-375. With the exception of difference in frequency, it is the same as Transmitter Tuning Unit TU-60-( ).

Power requirements are 1 ampere at 24 volts

No tube complement is used, and no test equipment has been assigned.

POWER OUTPUT	100 WATTS
FREQUENCY RANGE	6.31-10.2 MC.
TYPE OF SIGNAL	AUDIO FREQUENCY WOBBULATED



Transmitter Tuning Unit TU-65-T1 (Bottom View, dust cover removed);

Tuning Unit TU-65-T1

TRANSMITTER TUNING UNIT TU-65-T1 TOTAL WEIGHT 15 LBS.

Component	Nomenclature	Size	Weight
Tuning Unit	TU-65-T1	7 3/4" x 8 1/2" x 17"	15 Lbs.

1 Dec. 1944

TU-66-T1

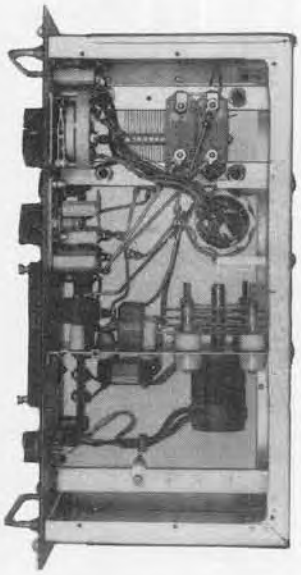
Transmitter Tuning Unit TU-66-T1 is a modification of Transmitter Tuning Unit TU-9, used to convert Radio Transmitter BC-375 or Radio Transmitter BC-191 into a barrage jammer for use against enemy communications and radio-controlled missiles.

The center frequency of a 5 per cent barrage band can be adjusted to any point within the frequency range, permitting frequency operation of 10.2-15.8 mc.

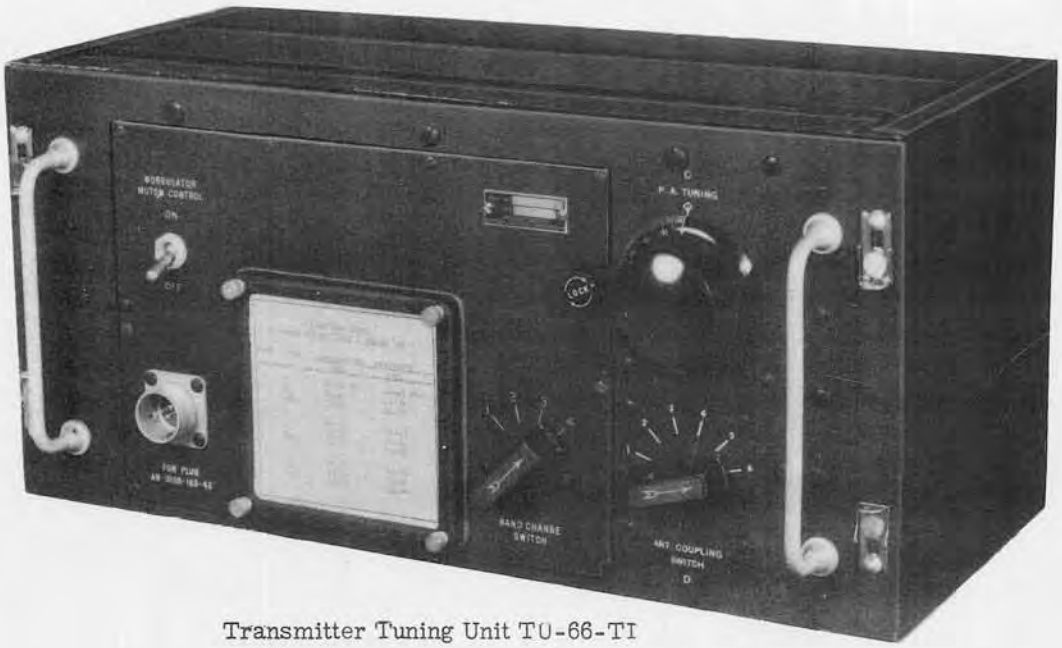
Use of this unit does not require any modification of Radio Transmitter BC-375. With the exception of the difference in frequency, it is the same as Transmitter Tuning Unit TU-60-( ). Power requirements are 1 ampere at 24 volts.

No tube complement is used, and no test equipment has been assigned.

POWER OUTPUT	100 WATTS
FREQUENCY RANGE	10.2-15.8 MC
TYPE OF SIGNAL	AUDIO FREQUENCY WOBBULATED



Transmitter Tuning Unit TU-66-T1 (Bottom View, dust cover removed);



Transmitter Tuning Unit TU-66-TI

TRANSMITTER TUNING UNIT TU-66-T1 TOTAL WEIGHT 15 LBS.

Component	Nomenclature	Size	Weight
Tuning Unit	TU-66-T1	7 3/4" x 8 1/2" x 17"	15 Lbs.

1 Dec. 1944

TEST Equipment

Monitor BC-1255 is a portable, battery operated, heterodyne frequency meter designed to check and adjust the frequencies of transmitters such as Trans - mitting Equipment AN/APT-3 and Radar Set AN/APT-1. The monitor is designed to cover the frequency range 75 to 150 mc. on fundamental frequencies and the range 150 to 300 mc. on the second harmonic. The frequency of its oscillator is adjustable over the frequency range to zero beat with the signal of the transmitter being checked. Audible indication is provided for the determination of zero beat, or visible indication may be obtained by connecting Test Set I-139 to the meter connection of the set.

Power is supplied by Batteries BA-15A and BA-56.

Army Supply Program requirements as of 30 April 1944 were 800 equipments for the calendar year 1944.

FREQUENCY RANGE	75 TO 150 MC.(Fundamental)
SENSITIVITY	20 MILLIVOLTS AT 75 MC. 5 MILLIVOLTS AT 150 MC.
POWER SOURCE	1 BATTERY BA-15A 2 BATTERIES BA-56
ACCURACY	± 1 %

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	958A	2	1S5

Heterodyne Monitor BC-1255-A

MONITOR BC-1255 — TOTAL WEIGHT 6 LBS.

Component	Nomenclature	Size	Weight
Monitor	BC-1255	6" x 6" x 6"	6 Lbs.

1 Dec. 1944

TS-47/APR

Test Oscillator TS-47/APR is a portable signal generator used for checking the operation and calibration of Radio Set SCR-587, Radio Receiving Equipment AN/APR-4 and Radio Receiving Equipment AN/APR-5A. It covers the frequency range 40 to 500 mc. on fundamental frequencies over two bands and with harmonic output is useable up to 3000 mc. The oscillator output, controlled by a three way switch, may be unmodulated, or modulated by pulses or 1000 cycle audio frequency to simulate signals of enemy radar and communication systems.

TS-47/APR complete with shock mounts is housed in a waterproof wooden case. Power may be supplied from either 80, 115 or 230 volt, 60-2600 c.p s., a.c. source or from dry batteries.

Army Supply Program requirements as of 31 July 1944 were 2,141 for the calendar year 1944 and 1,030 for 1945. As of 2 August 1944, procurement was limited to 660 equipments for 1944.

POWER INPUT	12 WATTS
POWER OUTPUT	3 MILLI-WATTS
FREQUENCY RANGE	40 TO 500 MC. (fundamental) 500 TO 2000 MC. (harmonics)
TYPE OF SIGNAL	500 P.R.F., 70 U SEC WIDE 1000 C.P.S.
ACCURACY	± 1%

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6X5GT	2	9002

Test Oscillator TS-47/APR

TEST OSCILLATOR TS-47/APR

TOTAL WEIGHT 15 LBS.

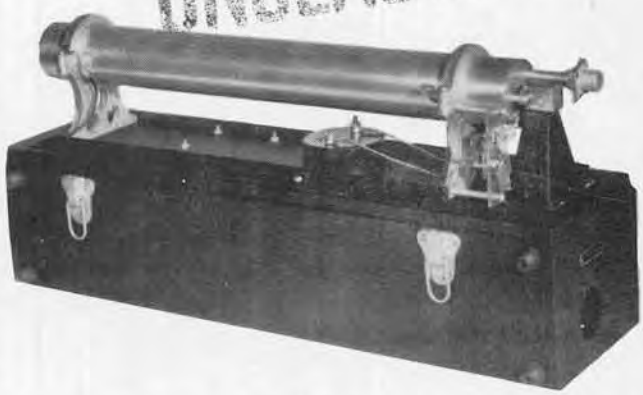
Component	Nomenclature	Size	Weight
Test Oscillator	TS-47/APR	6 1/2" x 10" x 8 1/2"	15 LBS.
Cord	CX-153/U	5 ft. long	

1 Dec. 1944

Frequency Meter TS-69/AP is a Class A test equipment for use with radio transmitters such as Radar Set AN/APT-2, Radar Set AN/APT-4, Radio Set AN/APQ-9 and others in the frequency range 350 to 1000 mc. It is an absorption type frequency meter containing a co-axial tuned cavity circuit with a crystal rectifier output circuit. It is designed to permit accurate adjustment of the frequency of the transmitters being tuned prior to take-off for barrage jamming operations. By means of the frequency meter the various transmitters in the flight may be tuned to overlap in frequency and cover the band of frequencies used by the enemy radars that may be encountered during the mission.

The frequency of any desired signal being examined is indicated on a calibration chart. The equipment, intended principally for squadron use, is hand transportable and is housed in a 7" x 7" x 24" box.

Army Supply Program requirements as of 1 September 1944 were 3,179 equipments for the calendar year 1944.

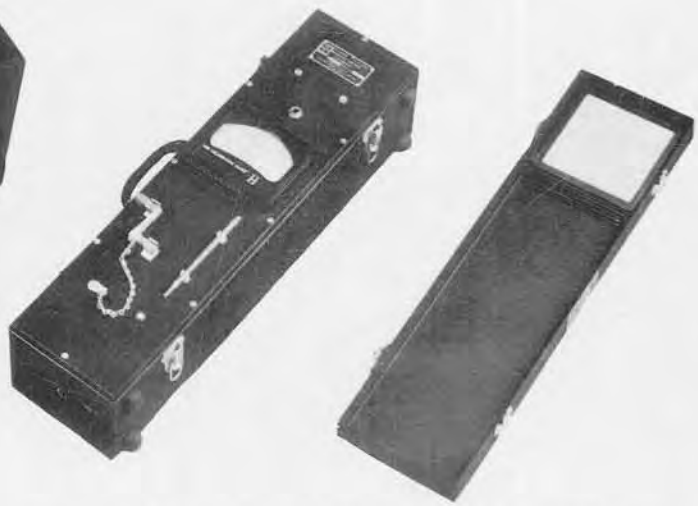


Frequency Meter TS-69/AP (Cavity removed from case)

POWER INPUT	25 MICRO-VOLTS. MINIMUM
FREQUENCY	350 TO 1000 MC.
ACCURACY	0.10% AT 350 MC. TO 0.25% AT 1000 MC.
INPUT IMPEDANCE	50 OHMS

Probe Antenna AS-122/AP

Case CY-149/AP



Frequency Meter TS-69/AP (Dust cover removed)

FREQUENCY METER TS-69/AP

TOTAL WEIGHT 20 LBS.

Components	Nomenclature	Size	Weight
Frequency Meter	TS-69/AP	6" x 6" x 22"	13 Lbs.
Case	CY-149/AP	7" x 7" x 24"	5 Lbs.
Probe Antenna	AS-122/AP	10" Long	1/4 Lb.

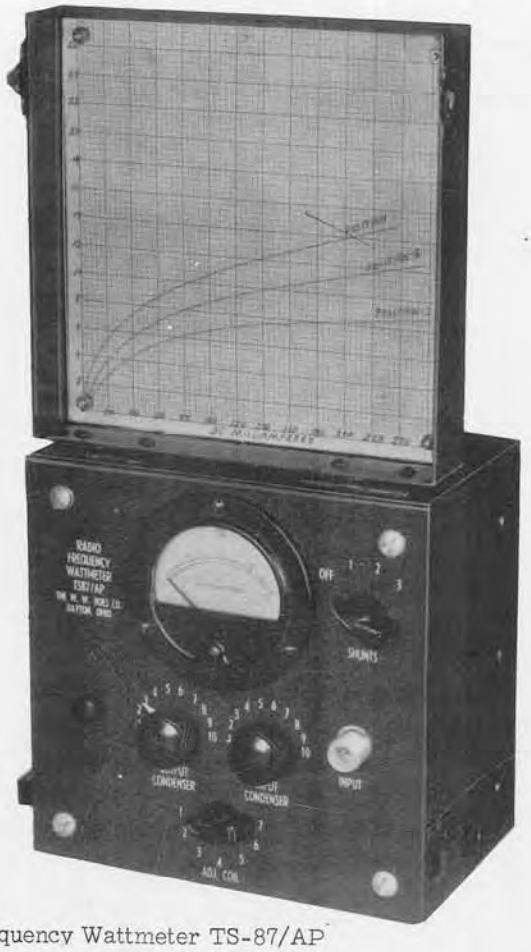
1 Dec. 1944

Radio Frequency Wattmeter TS-87/AP is a class B general test equipment designed to measure the power output of relatively low power transmitters such as RAdar Set AN/APT-3 and Transmitting Equipment AN/APT-1. A d-c milliameter is employed for direct reading and the power in watts is interpolated from an attached calibration chart. The wattmeter has a range of 2 to 30 watts over a frequency range of 85 to 220 mc. It is capable of measuring the power output of transmitters operating on CW and MCW modulated by noise, voice or tone. The accuracy of the instrument in measuring radio frequency power is ± 10 percent within its frequency range.

The equipment is being procured on an interim basis pending the quantity procurement of Radio Frequency Wattmeter TS-118/AP. Army Supply Program requirements as of 31 July 1944 were 375 equipments for the calendar year 1944.

POWER RANGE	2 TO 30 WATTS
FREQUENCY RANGE	85 TO 220 MC.
SELECTIVITY	10 MC. PASS BAND
ACCURACY	± 10%

Case
CY-82/AP



Radio Frequency Wattmeter TS-87/AP

Cord CG-56/U

Cord CG-55/U

RADIO FREQUENCY WATTMETER TS-87/AP TOTAL WEIGHT 26 LBS.

Component	Nomenclature	Size	Weight
Power Meter	TS-87/AP	8" x 8" x 6"	18 Lbs.
Case	CY-82/AP	10" x 9 1/2" x 10 1/2"	6 Lbs.
Cord	CG-55/U	6" Long	3/4 Lbs.
Cord	CG-56/U	60" Long	3/4 Lbs.

1 Dec. 1944

~~RESTRICTED~~ UNCLASSIFIED TS-92/AP

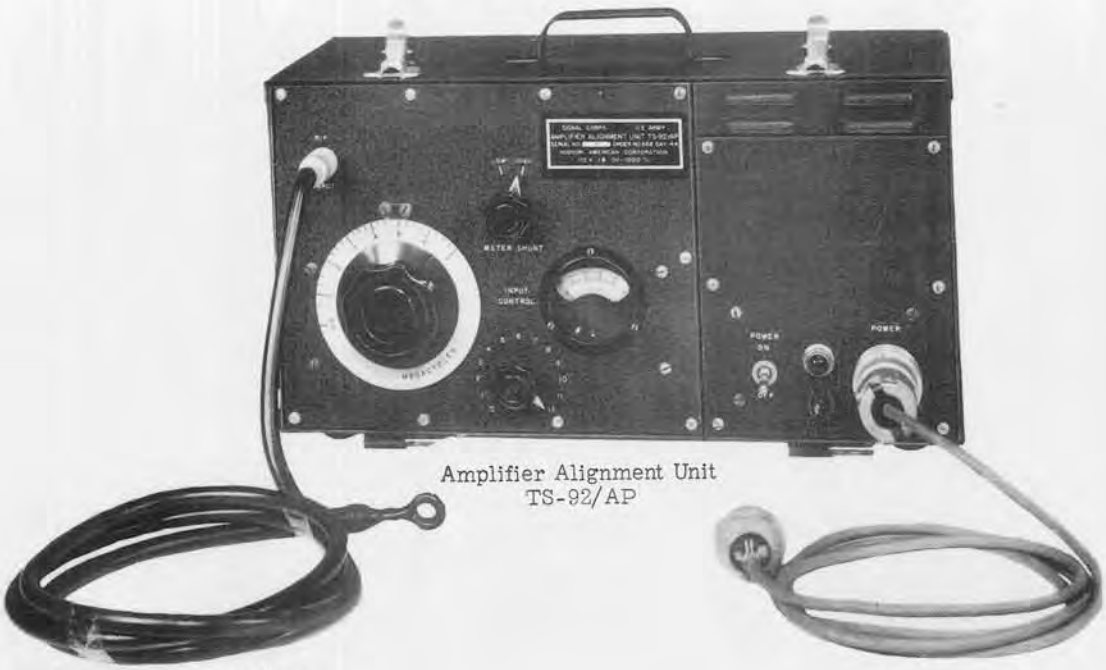
Amplifier Alignment Unit TS-92/AP is a class A special test equipment used in aligning the amplifier stages of radar jamming transmitters. It can be used with Transmitting Equipment AN/APT-1, Radio Set AN/ARQ-8. Using the TS-92/AP the amplifier of the transmitter may be adjusted to give optimum performance at any band width between 0.5 to 7 mc. for any carrier frequency in the range from 15-250 mc. This simple device is intended for use in the field where more elaborate equipment, such as oscilloscope and sweep oscillator, is not available. It consists essentially of a radio receiver designed in such a way that the two peaks in the amplifier response curve may be maximized to give optimum adjustment of the amplifier.

Power is obtained from a 115 volt 60-2600 c.p.s., a.c. power source. A one-tenth volt input gives full scale meter indication.

Army Supply Program requirements as of 10 November 1944 were 660 equipments for the calendar year 1944 and 1,667 for 1945.

POWER INPUT	35 WATTS @ 110 VOLTS 60-2600 c.p.s.
FREQUENCY	15-250 MC
OUTPUT BANDWIDTH	0 5-7 MC
SENSITIVITY	0.1 VOLT FOR FULL SCALE DEFLECTION
SELECTIVITY	3DB ATTENUATION 50 KC FROM RESONANT FREQUENCY
INPUT IMPEDANCE	100 OHMS
ACCURACY	DIAL CALIBRATION ± 5%

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6SA7	1	6J5
2	6AC7	1	5Y3GT
1	6H6		



Amplifier Alignment Unit TS-92/AP

Loop Probe AS-142/AP

Cord CX-153/U

AMPLIFIER ALIGNMENT UNIT TS-92/AP — TOTAL WEIGHT 22 LBS.

Component	Nomenclature	Size	Weight
Tuning Indicator	TS-92/AP	16" x 8" x 6"	20 Lbs
Loop Probe	AS-142/AP		
Antenna Probe	AS-122/AP	6" Long.	
Cord	CG-69/AP	6' Long	
Cord	CG-153/AP	6' Long	

Feb. 1945 Y-100829

Radio Frequency Wattmeter TS-118/AP is a class B general test set. It is a portable untuned wattmeter of the thermo-couple type designed to measure the power output of radio transmitters such as Transmitting Equipment AN/APT-1, Radar Set AN/APT-4, Radio Equipment AN/APQ-9, Radio Frequency Amplifier AM-14/APT and Radio Frequency Amplifier AM-18/APT. The equipment operates over a frequency range from 20 to 750 mc. and is capable of measuring power from 2 to 500 watts.

TS-118/AP will Supersede Radio Frequency Wattmeters TS-70/AP and TS-87/AP.

Army Supply Program requirements as of 31 July 1944 were 310 equipments for the calendar year 1944 and 210 equipments for the calendar year 1945.

FREQUENCY RANGE	20 TO 750 MC.
POWER RANGE	2 TO 500 WATTS
ACCURACY	± 10%

Wattmeter TS-118(XA-A)/AP

Thermocouple MX-205/AP

Thermocouple MX-206/AP

Thermocouple MX-207/AP

Cord CX-237/U

RADIO FREQUENCY WATTMETER TS-118/AP TOTAL WEIGHT 66 LBS.

Component	Nomenclature	Size	Weight
Power Meter	TS-118/AP	12'' x 10'' x 26''	50 Lbs.
Case	CY-174/AP	12 1/2'' x 14'' x 31''	12 Lbs.
Thermo-Couple	MX-205/AP	4'' Long	3/4 Lbs.
Thermo-Couple	MX-206/AP	4'' Long	3/4 Lbs.
Thermo-Couple	MX-207/AP	4'' Long	3/4 Lbs.
Cord	CX-237/U	10'' Long	1/2 Lbs.
Cord	CG-122/U	9'' Long	1/4 Lbs.
Cord	CG-123/U	8'' Long	1/2 Lbs.
Cord	CG-58/U	9'' Long	1/4 Lbs.

1 Dec. 1944

Pickup Assembly TS-131/AP is a simple testing device designed to indicate the relative output at the antenna during the pre-flight tuning of high frequency transmitters such as Transmitting Equipment AN/APT-1, Transmitting Equipment AN/APQ-2 and Radar Set AN/APT-5 The equipment consists of a pickup unit to be mounted near the antenna assembly to pick up and rectify the output and a meter control box to provide indication near the transmitter being tuned. A test meter such as Test Meter I-139-A attached to the control box provides visual indication of maximum current output at the antenna.

Army Supply Program requirements as of 31 July 1944 were 4,900 equipments for the calendar year 1944 and 4,416 equipments for 1945.

Components of Pickup Assembly TS-131/AP packed in Case CY-108/AP.

Pickup Assembly TS-131/AP

Control Box C-111/AP

Cord CX-149/AP

PICKUP ASSEMBLY TS 131/AP

TOTAL WEIGHT 8 LBS.

Component	Nomenclature	Size	Weight
Pickup Assembly	TS-131/AP	5 1/2" x 1" x 4"	
Control Box	C-111/AP	2" x 3 1/4" x 1 1/2"	
Case	CY-108/AP	10" x 6" x 6"	
Cord	CX-149/AP	35 feet long	
Adapter	M-359	1 1/2" x 1 1/4" x 3/4"	

1 Dec. 1944

Frequency Meter TS-174/U is a general purpose Class A heterodyne frequency meter used to check frequencies in the 20 to 280 mc. range. It is of the heterodyne type operating on fundamental frequencies in the range 20 to 40 mc. and on harmonics in the range 40 to 280 mc. Accuracy of the instrument for measuring radio frequencies is ± .05 percent throughout its frequency range. Crystal check points are provided for checking meter accuracy. It is used to check and set frequencies for such transmitters as Radar Set AN/APT-1, Radar Set AN/APT-3 and Radar Set AN/ARQ-8.

Frequency Meter TS-174/U can replace in part Frequency Meter TS-99/AP, General Radio Heterodyne Frequency Meter type 720-A and Monitor BC-1255.

The equipment is designed to determine or set the frequency of transmitters operating on CW or MCW, with noise, voice or tone modulation, and is suitable for checking frequencies of pulse type transmitters and CW type receivers.

The case, chassis, dial mechanism and battery complement are the same as for Frequency Meter BC-221, the major component of SCR-211.

Army Supply Program requirements as of 11 August 1944 were 1,070 equipments for the calendar year 1945.

FREQUENCY RANGE	20 TO 280 MC.
POWER SOURCE	4 BATTERIES BA-23 2 BATTERIES BA- 2
ACCURACY	± .05 %

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1 1	6SJ7Y 6K8	1	6SJ7

Frequency Meter TS-174/U

FREQUENCY METER TS-174/U

TOTAL WEIGHT 42 LBS.

Components	Nomenclature	Size	Weight
Frequency Meter	TS-174/U	14 1/4" x 10 1/4" x 9 3/4"	42 Lbs. (incl. batteries)

1. Dec. 1944

TS-175/U

Frequency Meter TS-175/U is a general purpose Class A meter used to check frequencies in the 85 to 1000 mc. range. It is of the heterodyne type, operating on fundamental frequencies through the range 85 to 200 mc. and on harmonics through the range 200 to 1000 mc. Accuracy of the instrument for measuring radio frequencies is ± .05 percent throughout its frequency range. Crystal checkpoints are provided for checking meter accuracy. The equipment is used to check and set frequencies of transmitters, such as Radar Set AN/APT-2. Transmitting Equipment AN/APQ-2, Radio Equipment AN/APQ-9 and others within its frequency range, on the desired frequency. It may also be used in aligning receivers within its frequency range.

Frequency Meter TS-175/U can replace Frequency Meters TS-69/AP and TS-99/AP, Test Set TS-53/AP and General Radio Heterodyne Frequency Meter type 720A.

The case, chassis, dial mechanism and battery complement are the same as for Frequency Meter BC-221, the major component of SCR-211.

Army Supply Program requirements as of 31 July 1944 were 1,500 equipments for the calendar year 1944 and 2,663 equipments for 1945. As of 31 July 1944 the equipment was classified as a Limited Procurement Type with Army procurement limited to 1,500 for the calendar year 1944 and 650 for 1945.

FREQUENCY RANGE	85 to 1000 MC.
POWER SOURCE	4 BATTERIES BA-23 6 BATTERIES BA- 2
ACCURACY	± .05 %

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1 1	7002 6C8G	. 1	6K8

Cord CG-55/U

Frequency Meter TS-175/U

Antenna AT-66/U

Cord CG-55/U

FREQUENCY METER TS / 175 - U

TOTAL WEIGHT 42 LBS.

Component	Nomenclature	Size	Weight
Frequency Meter	TS-175/U	12 1/4" x 10" x 9 1/4"	40 Lbs. (includes batteries)
Antenna	AT-66/U	8" Long	
Cord	CG-55/U	6" Long	
Cord	CG-56/U	60" Long	

1 Dec. 1944

Radio Frequency Wattmeter TS-206/AR consists of a heavy duty 50 ohm resistor which dissipates the energy from the transmitter being checked. It is operated as an air-flow calorimeter. The equipment was designed to test Radio Transmitter AN/ART-3 but can be used with any other similar transmitter within that frequency range.

No requirements had been established on the Army Supply Program as of 1 October 1944.

POWER INPUT	100 WATTS AT 28 VOLTS
FREQUENCY	20-60 MC.
POWER RANGE	50-1000 WATTS
INPUT IMPEDANCE	50 OHMS

Radio Frequency Wattmeter TS-206(XA)/AR

RADIO FREQUENCY WATTMETER TS-206/AR TOTAL WEIGHT 40 LBS.

Component	Nomenclature	Size	Weight
Wattmeter	TS-206/AR	27"x 9" x 12"	
Case	CY-185/AR		
Power Cord	CX-356/U		
Cord	CG-123/U		

Feb. 1945 - Y-109829

TS-213/U

Frequency Meter TS-213/U is a heterodyne frequency meter designed for use in setting or determining the frequency of transmitters operating within its frequency range. The meter consists of a cavity tuned oscillator, a mixer, a crystal oscillator-doubler and a video amplifier. Resonance will be indicated visually on a meter or audibly through a headset.

The equipment is being designed for general squadron use and is to operate from the aircraft's power supply.

No requirements had been established on the Army Supply Program as of 1 October 1944.

POWER INPUT	150 WATTS @ 115 VOLTS
FREQUENCY	500-1000 MCS. (FUNDAMENTAL) 1000-5000 MCS. (HARMONICS)
ACCURACY	+ 0.05%
CRYSTAL CHECK POINTS	EVERY 20 MCS.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	GL446	2	6J5
1	9006	1	IN-21
1	6SJ7		

Frequency Meter TS-213(XA)/U

FREQUENCY METER TS-213/U

TOTAL WEIGHT 50 LBS.

Component	Nomenclature	Size	Weight
Frequency Meter	TS-213/U	10" x 12" x 10"	
Carrying Case	CY-216/U		
Cord	CG-55/U		
Cord	CG-56/U		
Antenna	AT-66/U		

Feb. 1945 Y-109829

SECTION TWC

GRAPHIC SURVEY of Radio and Radar Equipment

Used by the Army Air Forces

Communications Equipment

Army Air Forces ★ Air Technical Service Command
Wright Field Dayton, Ohio

GRAPHIC SURVEY of Radio and Radar Equipment

Used by the Army Air Forces

[redacted]

BY AUTHORITY OF DIRECTOR, ATSC 1 March 1945

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Hobart R. Yeager
Colonel, Air Co[redacted]

GRAPHIC SURVEY

Nomenclature	Description	Present Security Classification
AN/AIA-1A	Glider Interphone Equipment	Unclassified
AN/AIC-1	Interphone Equipment	Unclassified
AN/AIC-2	Interphone Equipment	Unclassified
AN/AIC-3	Interphone Equipment	Unclassified
AN/ANQ-2	Recorder	Unclassified
AN/ARA-10	Control Assembly	Unclassified
AN/ARC-3	VHF Command Set (8 channel)	Unclassified
AN/ARC-6	Protected Communications Set	Unclassified
AN/ARC-7	VHF Glider Equipment	Unclassified
AN/ARC-9	Communications Receiver	Unclassified
AN/ARC-10	Radio Relay Equipment	Unclassified
AN/ARR-11	Radio Receiving Set	Unclassified
AN/ARR-13	Radio Receiver	Unclassified
AN/ART-13A	Auto-tune Transmitter	Unclassified
AN/ASA-3	Static Discharger	Unclassified
AN/CRC-1	Ground-Air Communications Set	Unclassified
AN/CRR-1	Radio Receiving Equipment	Unclassified
AN/GNQ-2	Recorder-Reproducer	Unclassified
HS-33	Headset	Unclassified
HS-38	Headset	Unclassified
ANB-M-C1	Microphone	Unclassified
M-1/A	Face Microphone	Unclassified
M-3/A	Lip Microphone	Unclassified
T-17	Hand Microphone	Unclassified
T-30	Throat Microphone	Unclassified
T-44	Magnetic Microphone	Unclassified
RC-26	Interphone Equipment	Unclassified
RC-27	Interphone Equipment	Unclassified
RC-35	Interphone Equipment	Unclassified
RC-36	Interphone Equipment	Unclassified
RC-45	Interphone Equipment	Unclassified
SCR-274N	Command Set	Unclassified
SCR-283	Command Set	Unclassified
SCR-287	Liaison Set	Unclassified
SCR-522	VHF Command Set	Unclassified
SCR-585	Glider Receiver-Transmitter	Unclassified
SCR-624	Air Transportable Command Set	Unclassified
	Test Equipment	
AN/AIM-1	Test Equipment	Unclassified
AN/ARM-1	Test Equipment (8 channels)	Unclassified
I-56	Tube Tester (Ground)	Unclassified
I-72	Signal Generator	Unclassified
I-77	Test Set	Unclassified
I-83	Dynamotor Test Set	Unclassified
I-139	Test Set	Unclassified
IE-12	Test Set (for SCR-522)	Unclassified
IE-19	Test Set (for SCR-522)	Unclassified
IE-36	Test Set	Unclassified
SCR-211	Frequency Meter	Unclassified
TS-164/AR	Frequency Meter	Unclassified

Foreword

Purpose : This Graphic Survey of Radio and Radar Equipment used by the Army Air Forces is intended to furnish authorized personnel with graphic and narrative data relative to description, electrical and physical characteristics, purpose, and tactical employment of the radio and radar equipment used by the Army Air Forces.

Restriction : The Graphic Survey is not authorized as a basis for procurement storage, or issue, but is prepared only for information and guidance of research, development, procurement, storage, issue, and staff and planning activities.

Scope : This publication is intended to cover all active equipment, both in use and in development. Publication is accomplished in a series of separate sections in order that reproduction and dissemination may be effected economically and expeditiously.

Format : Permanent binder covers are not furnished with the various sections of the Graphic Survey, but the pages of each section are printed on 8 1/2 x 11 inch paper and punched for the standard AAF three-hole binder, (binder, loose-leaf, 3 post, stock number 8700-043800), commonly known within the AAF as "Technical Order Binder". With a few exceptions, data concerning each equipment is presented on two pages. The first page contains a description and information relative to use, installation, and electrical characteristics; the second page, photographs of the various components and physical weights and dimensions. Within each section, the equipments are arranged alphabetically by official nomenclature and type designation.

Suggestions : Suggestions are invited for improvement of form, content, or to otherwise increase the ultimate utility to the user within the scope and purpose of this publication. Comments should be addressed to the Commanding General, Air Technical Service Command, Wright Field, Ohio, Attention: TSERR1B, for consideration.

Security : The Graphic Survey is classified "Secret" because of the broad scope of the equipment covered in each volume and the secret classification of many of the equipments. Each addressee will be responsible for maintaining the security of his copies in accordance with the provisions of AR 380-5. Security classification of each individual equipment at the time of publication will be indicated on the pages relative to that equipment.

Distribution : Requests relative to distribution of this publication should be addressed to Commanding General, Air Technical Service Command, Attention: TSERR1B. Revisions and additions are forwarded periodically to original addressees in order that all copies may be kept up to date. Each copy has a serial number which is recorded on a master distribution file index.

Authority : Preparation, publication and distribution of the Graphic Survey is accomplished in accordance with letter, Headquarters, AAF(AFDMA-2F), dated 5 April 1945, subject "Graphic Survey of Radio and Radar Equipment Used by the AAF". AAF report clearance number AAF-MD-E89 has been assigned.

Section 2 Radio and Radar Communications Equipment

NOMENCLATURE	DESCRIPTION	TYPE	STATUS*
AN/AIA-1A	Glider Interphone Equipment	Standard	P
AN/AIC-1	Interphone Equipment		D
AN/AIC-2	Interphone Equipment	Standard	P
AN/AIC-3	Interphone Equipment	Limited Procurement	D
AN/ANQ-2	Recorder	Sub/Standard	P
AN/ARA-10	Control Assembly	Standard	P
AN/ARC-3	VHF Command Set(8 channel)	Standard	P
AN/ARC-6	Protected Communications Set		D
AN/ARC-7	VHF Glider Equipment		P
AN/ARC-9	Communications Receiver	Sub/Standard	P
AN/ARC-10	Radio Relay Equipment		D
AN/ARR-11	Radio Receiving Set	Standard	P
AN/ARR-13	Radio Receiver	Standard	P
AN/ART-13A	Auto-tune Transmitter	Standard	P
AN/ASA-3	Static Discharger	Standard	P
AN/CRC-1	Ground-Air Communications Set	Limited Standard	P
AN/CRR-1	Radio Receiving Equipment		P
AN/GNQ-2	Recorder-Reproducer	Standard	P
Headsets			
HS-33	Headset	Standard	P
HS-38	Headset	Standard	P
Microphones			
ANB-M-C1	Microphone	Standard	P
M-1/A	Face Microphone	Standard	P
M-3/A	Lip Microphone		D
T-17	Hand Microphone	Standard	P
T-30	Throat Microphone	Standard	P
T-44	Magnetic Microphone	Standard	P
RC-26	Interphone Equipment		P
RC-27	Interphone Equipment	Standard	P
RC-35	Interphone Equipment	Standard	P
RC-36	Interphone Equipment	Standard	P
RC-45	Interphone Equipment	Standard	P

UNCLASSIFIED

~~RT-XA-17/AP~~	~~Microwave Receiver-Transmitter~~ Dropped		D
SCR-274N	Command Set	Standard	P
SCR-283	Command Set	Limited Standard	P
SCR-287	Liaison Set	Limited Standard	P
SCR-522	VHF Command Set	Sub/Standard	P
SCR-585	Glider Receiver-Transmitter	Limited Standard	P
SCR-624	Air Transportable Command Set	Standard	P
AN/AIM-1	Test Equipment	Standard	P
AN/ARM-1	Test Equipment(8 channels)	Standard	P
I-56	Tube Tester (Ground)	Standard	P
I-72	Signal Generator	Standard	P
I-77	Test Set	Standard	P
I-83	Dynamotor Test Set	Standard	P
I-139	Test Set	Standard	P
IE-12	Test Set (for SCR-522)	Standard	P
IE-19	Test Set (for SCR-522)	Standard	P
IE-36	Test Set	Standard	P
SCR-211	Frequency Meter	Standard.	P
TS-164/AR	Frequency Meter	Standard	P

*Status Defined:

D - (DEVELOPMENT): Initial pilot run has not yet been completed.

P - (PRODUCTION): Initial pilot run has been completed, and quantity production is underway or has been completed.

Interphone Equipment AN/AIA-1A is accessory to the tow plane interphone system which provides interphone communication between a glider and tow plane. This equipment includes three major groups of components: Tow plane components; tow cable components, and glider components.

It is designed to work from tow plane interphone equipment of the type such as RC-36 and RC-45. The components used in the glider provide one outlet position for headset and microphone connection and includes one microphone and a maximum of three headsets, together with required extension cords.

Components used on the tow rope provide the necessary electrical conductors for the microphone and circuits. Components used in the tow plane provide a multicircuit to a corresponding socket on the tow rope conductors and the interphone equipment wiring.

Test equipment required for maintenance includes AN/AIM-1.

Army Supply Program requirements as of 1 December 1944 were 7,978 glider components, 11,182 tow cable components and 10,536 tow plane components for the calendar year 1944.

POWER INPUT	GETS POWER FROM TOW PLANE
FREQUENCY	AUDIO
TYPE OF SIGNAL	VOICE

Installation photo showing tow plane connections for AIA-1A.

Installed in gliders, Interphone Equipment AN/AIA-1 enables personnel within the glider to communicate with the tow plane through the cord attached to the tow rope. Power is derived from the radio equipment of the tow plane. In newer tow ropes, the interphone cord is interwoven into the rope.

Glider Components

Components of 75 ft. Tow Rope Kit.

Components of 15 ft. Tow Rope Kit.

Components of 350 ft. Tow Rope Kit and Tool Kit.

INTERPHONE EQUIPMENT AN/AIA-1A

TOTAL WEIGHT 85 LBS.

Component	Nomenclature	Size	Weight
Kit for 350 feet tow rope			27 Lbs.
Kit for 75 feet tow rope			7 Lbs.
Kit for 15 feet tow rope			3 Lbs.
Glider components			3 Lbs.
Tow plane components			1 Lb.

March 1945

RESTRICTED

AN/AIC-1

Interphone Equipment AN/AIC-1 is a multi-place interphone system, under development, in which will be incorporated the following facilities in addition to those available on standard interphone systems: More selector switch positions for the additional radio equipment; positive interphone channel operated by a single control, including all member of the crew, without interference from any other equipment; uninterrupted operation of certain radio equipment by certain members of the crew; positive separation of radio and interphone controls to reduce the possibility of inadvertent radio transmissions by pilots and gunners.

Selection of the following "A" box communications channels will permit transmitting and receiving on the channel selected: Interphone; Command; Radio Compass Special 1; Special 2. A special thru-position selector switch on the "B" box may be locked on any one of three Interphone position as, Interphone, Interphone--Radio 1; and Interphone--Radio 2.

The "B" box circuits are to be so designed that when the selector switch is locked in position, interphone signals may be received without passing through relay contacts within the box. To facilitate interphone operation, a push-to-talk switch may be mounted on the gun control handle at each gun position, and conveniently located at the engineer's station.

The interphone amplifier will provide satisfactory operation for as many as 15 headsets HS-33 at altitudes up to 40,000 feet. The speech input will be through one microphone, ANB-M-C1, or equivalent.

Test equipment required for maintenance will include general purpose test equipment, such as multimeters and tube testers.

Mounted conveniently on the gun Microphone Switch (press to talk) SA-26/U can be operated without interfering with gunner's other duties.

There were no Army Supply Program requirements for this equipment as of November 30, 1944.

FREQUENCY	AUDIO
TYPE OF SIGNAL	VOICE

Interphone Amplifier
AM-26/AIC

Switch Box
SA-XA-3/AIC-1

Remote Gain Control
C-97/AIC-2

Control Box
C-XA-40/AIC-1

Microphone Switch
SA-26/U

Control Box
C-XA-41/AIC-1

INTERPHONE EQUIPMENT AN/AIC-1 — TOTAL WEIGHT 15 LBS

Component	Nomenclature	Size	Weight
Interphone Amplifier	AM-26/AIC	5" x 5" x 10"	8 Lbs.
Control Box	C-XA-40/AIC-1(XA-3)	3" x 4" x 5"	1 Lb.
Control Box	C-XA-41/AIC-1(XA-3)	2" x 4" x 5"	1 Lb.
Switch Box	SA-XA-3/AIC-1(XA-3)	2" x 4" x 5"	1 Lb.
Remote Gain Control	C-97/AIC-2	3" x 3" x 2"	1 Lb.

Interphone Equipment AN/AIC-2, an airborne multiplace interphone system operating on 24 volts d.c., is designed for use in medium and heavy bombardment aircraft. It provides for interphone communication between crew positions and switching facilities for partial control of three radio sets and one additional radio receiver. Interphone Amplifier AM-26/AIC provides adjustable gain control and power output levels adequate for operation of as many as 15 headsets at altitudes up to 40,000 feet.

Based on extensive laboratory and flight tests, it was determined that for an interphone amplifier to be used at 35,000 feet in conjunction with a carbon oxygen mask Microphone ANB-M-C1 and a low impedance Headset HS-38, the over-all voltage gain should be approximately 30 db for the best articulation results. Furthermore, with this gain provided, it was found that the amplifier should have a power output capability of at least 200 milliwatts per headset to prevent distortion of speech peaks.

As a result of these tests, AM-26/AIC was designed to provide sufficient gain and power output to compensate for these natural losses in the levels of speech, thereby increasing the ease and intelligibility of interphone communications at high altitudes. The new amplifier has a power output up to 4 watts and an increase in voltage gain of 16 db over that of Interphone Amplifier BC-347-C. It is provided with an initial gain of approximately 16 db, and provision for obtaining 16 db. additional gain in three steps, each step corresponding roughly to the gain required for the different altitudes. The settings on the gain control is left to the discretion of the crew but the suggested settings of the gain control switch for various altitudes are given on the amplifier.

AM-26/AIC is being introduced in medium and heavy bombardment type aircraft as part of Interphone Equipment AN/AIC-2 to replace Interphone Equipment RC-36. In addition to the new amplifier, the AN/AIC-2 equipment includes Microphone Switch SA-26/U, which mounts on machine guns and other convenient parts of equipment that are used by the navigator, radio operator, etc.

Interphone Amplifier AM-26A/AIC is the same as AM-26/AIC except that it contains Automatic Gain Control C-158/AIC and incorporates several minor mechanical and electrical changes.

Test equipment required for maintenance includes general purpose test equipment such as multimeters and tube testers.

Army Supply Program requirements as of 26 December 1944 were for 39,567 for the calendar year 1944, and 20,306 for 1945.

POWER INPUT	30 WATTS @ 28 VOLTS D.C.
POWER OUTPUT	AM-26/AIC 4 WATTS MAX.
FREQUENCY	AUDIO
TYPE OF SIGNAL	VOICE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	12J5GT	2	12A6

Microphone Switch SA-26/U

Remote Gain Control C-97/AIC-2

Interphone Amplifier AM-26/AIC

Jack Box BC-1366

INTERPHONE EQUIPMENT AN/AIC-2 TOTAL WEIGHT 22 LBS.

Component	Nomenclature	Size	Weight
Interphone Amplifier	AM-26/AIC	5" x 5" x 10"	8 Lbs.
Mounting	MT-28/ARN-5	2" x 5" x 10"	2 Lbs.
Remote Gain Control	C-97/AIC-2	3" x 3" x 2"	1 Lb.
Jack Box	BC-1366 (10 each)	5" x 4" x 3"	1 Lb.
Microphone Switch	SA-26/U (5 each)	3" x 1" diam.	1 Lb.
Dynamotor	DM-32-A	5" x 3" x 3" (mounted on AM-26/AIC)	3 Lbs.

and includes plugs, cordage and jacks.

March 1945

Interphone Equipment AN/AIC-3 is an inter-communication system designed to be used in transport Army Aircraft. This equipment provides intercommunication between any number of positions up to a maximum of five, and permits the mixing of the audio output of any combination of several facilities including HF and VHF command receivers, liaison receiver, automatic radio compass receiver, auxiliary radio compass receiver and marker beacon receiver.

Test equipment required for the maintenance of the set includes Tube Tester I-177 and a Voltohmmeter such as Multimeter TS-297/U.

Army Supply Program requirements as of 26 December 1944 were 3,530 for the calendar year 1944 and 3,826 for 1945.

POWER INPUT	28 VOLT D.C.
TYPE OF SIGNAL	AUDIO

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	28D7		

Control Box C-166/AIC-3

Filter F-21/ARA-9

Junction Box J-XA-17/AIC-3

INTERPHONE EQUIPMENT AN/AIC-3 — TOTAL WEIGHT 15 LBS.

Component	Nomenclature	Size	Weight
Control Box	C-166/AIC-3	9" x 6" x 3"	4 Lbs.
Junction Box	J-90/AIC-3	21" x 5" x 3"	3 Lbs.
Filter	F-21/ARA-9	3" x 3" x 3"	2 Lbs.

and includes plugs, cordage, and jacks.

March 1945

Recorder AN/ANQ-2 is an airborne recorder which records voice and radio signals by embossing on a plastic disk. Its associated ground equipment, Recorder-Reproducer AN/GNQ-2, records in a similar manner and provides playback by means of a pickup, amplifier and loud speaker.

Recordings are made by embossing on a cellulose acetate disk with a special wax surface treatment. The disk is 0.010 inches thick by 7 inches in diameter. The disk is driven by an off-center pin which engages a hole in the disk and one of a series of corresponding off-center holes in the turntable. The drive pin is mounted on a spring-loaded record clamp which holds the disk on the turntable. The embossing stylus consists of a sapphire point (tip radius 0.0015") on an aluminum alloy shank 3/4 inch long by 0.063 inch in diameter. Turntable speed is 11.75 r.p.m., line spacing 210 lines per inch, and recording time 30 minutes on each side of the disk. The outer and inner groove radii are 3.38 and 1.70 inches, respectively, and the corresponding groove speeds are 4.2 inches/second and 2.1 inches/second.

The magnetic recording head is mounted on a short counterbalanced arm which is pivoted at its center of gravity. The recording head arm is spring-loaded, and the vertical force at the stylus is approximately 5 ounces. The recording head carriage is driven by an overhead feed mechanism of conventional design.

The turntable is driven by a rubber-rimmed idler which engages the bottom surface of the turntable. The idler is driven by a knurled drive wheel which is driven through a flexible coupling, by a gear reduction box built into the motor. The motor is a 28 volt series motor (shaft speed 4100 r.p.m.) with a Lee governor mounted directly on the shaft.

The turntable consists of two halves joined by a sponge rubber pad. The upper half is supported on a stainless steel shaft which rests in a journal assembly consisting of two oilite sleeve bearings and a single ball bearing at the bottom.

The control box provides remote operation for the recorder. The operator's microphone and headset are plugged into the control box, and the control box is wired to the operator's interphone jack box and to Recorder Unit RD-6/ANQ-2. Terminals are also available in the control box for connection to the output of a radio receiver not wired into the airplane interphone system.

A five position switch allows the operator to select one of the following types of recorder operation: Interphone; Microphone; Off; Record Radio; Monitor Radio.

For all ordinary uses of AN/ANQ-2, only the first three positions (i.e., Interphone, Microphone, and off) are needed, and that the operator is connected to the interphone system in each of these positions. The last two positions (i.e., Record Radio and Monitor Radio) are intended for certain specialized applications, and the operator is completely disconnected from the airplane interphone system in these two positions.

The equipment operates at a nominal voltage of 115 volts, 60 cycles per second and draws 0.5 ampere when the motor is running. Standby current is 0.2 ampere.

Army Supply Program requirements as of 31 July 1944 were for 270 equipments for the calendar year 1944.

POWER INPUT	28 VOLTS D.C.
FREQUENCY	AUDIO
TYPE OF SIGNAL	VOICE
RECORDING TIME	30 MINUTES(One side)
TURNTABLE SPEED	11.75 R.P.M.
FREQUENCY RESPONSE	400 TO 2500 CYCLES PER SECOND WITHIN +3 DB and -6 DB
SIGNAL TO NOISE RATIO	40 DB at 1000 C.P.S.
LINE SPACING	210 LINES PER INCH

Recorder Unit RD-6/ANQ-2

RECORDER AN/ANQ-2

TOTAL WEIGHT 27 LBS.

Component	Nomenclature	Size	Weight
Recorder Unit	RD-6/ANQ-2		20 Lbs.
Mounting	MT-199/ANQ-2		5 Lbs.
Control Box	C-99/ANQ-2		2 Lbs.
Mounting	MT-200/ANQ-2		

and includes plugs and adapters.

March 1945

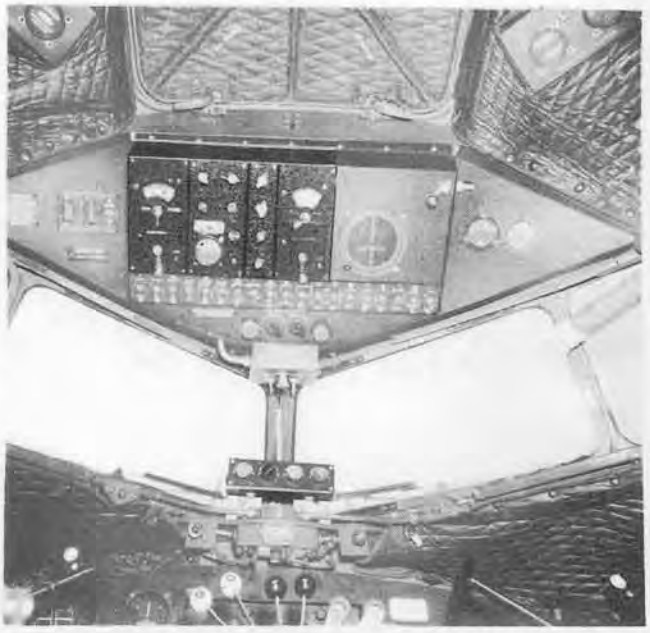
Control Assembly AN/ARA-10 is an airborne auxiliary assembly combining all radio communications and navigation control functions of the pilot-operated radio equipment in ATC airplanes. These functions are performed by five control panels (Control Panels C-177/ARA-10, C-178/ARA-10, C-179/ARA-10, C-180/ARA-10, and C-181/ARA-10) and the associated junction box (Junction Box J-89/ARA-10).

With the increasing number of aircraft being assigned to Air Transport Command and the increasing variety of radio and radio-navigational equipment becoming available for installation in aircraft, a standard complement of radio equipment for heavy transports became necessary.

Present standard equipment complement for heavy transports is: Transmitting Set AN/ART-13, Radio Set AN/ARC-9, Radio Compass AN/ARN-11, AN/ARN-7, Radio Receiving Equipment RC-103, AN/ARN-5, AN/ARN-8, Radio Set AN/APN-1, Static Discharger Assembly AN/ASA-1, Radio Set AN/APN-4, and Interphone Equipment AN/AIC-3.

A consolidated radio control panel was developed to meet the requirements, incorporating in one unit all of the radio controls which must be available to the pilot and co-pilot of heavy transports. In the C-46 and C-87 aircraft it is mounted overhead on the ceiling of the cockpit; and separate small panels are provided, one containing the sensitivity controls for the AN/ARN-7 and AN/ARN-11, the other containing the meter sensitivity control for the AN/ARN-11 and the volume control for the AN/ARC-9. These small panels are mounted on the pedestal for maximum accessibility.

The main panel is constructed in four sections of identical dimensions, connected to the aircraft wiring by means of locknut terminal strips. It is thus possible to arrange the four sections in any manner best suited to the particular aircraft installation. Approximate dimensions of the main panel are 17 inches long by 8 inches wide by 4 inches deep, and the small panels are 4 inches long by 2 inches wide by 3 inches deep.



Installation of Control Assembly AN/ARA - 10 Pilot's Position C-48-A.

Present estimates indicate that aircraft produced during February 1945 should contain this installation.

No special test equipment is required for maintenance.

Army Supply Program requirements as of 26 December 1944 were 2,000 for the calendar year 1944 and 2,334 for 1945.

Control Assembly AN/ARA-10(XA-1)

CONTROL ASSEMBLY AN/ARA-10 TOTAL WEIGHT 50 LBS.

Component	Nomenclature	Size	Weight
Control Panel	C-177/ARA-10	8" x 5" x 4"	4 Lbs.
Control Panel	C-178/ARA-10	8" x 5" x 4"	4 Lbs.
Control Panel	C-179/ARA-10	8" x 3" x 4"	2 Lbs.
Control Panel	C-180/ARA-10	8" x 3" x 4"	2 Lbs.
Control Panel	C-181/ARA-10	8" x 5" x 4"	4 Lbs.
Junction Box	J-89/ARA-10	53" x 5" x 1"	27 Lbs.

and includes set of installation components

March 1945

Radio Set AN/ARC-3 is an eight channel, crystal-controlled, command set operating over the frequency range of 100 to 156 mc. Major components are a transmitter, receiver, control box and power junction box. Components have form of factors comparable to twice the size of similar components of Radio Set SCR-274-N and are capable of being installed on the mountings of the SCR-274-N.

All of the operating functions of the set are remotely controlled. The only operation required to change the frequency of a particular channel is to insert the crystal units in the transmitter and receiver and roughly setting a dial on the receiver to the carrier frequency. Crystal units and their harmonic relations are identical with those used in Radio Set SCR-522. Access is provided to a terminal in the receiver socket so that a localizer may be used as an auxiliary piece of equipment. Access is also provided to the terminals in the receiver socket that the audio output of an auxiliary receiver or any other equipment may be fed through the fixed audio amplifier stage.

Operating from a 28 volt d.c. nominal primary power source, the equipment transmits voice amplitude modulated signals with tone transmission on any channel.

Designed to receive amplitude modulated signals only because of its low frequency response, the receiver is satisfactory for use in flying CAA localizer courses and ranges, if the receiver is provided with the proper crystals and external filters and indicators.

This set is intended for use on all initial installations in place of SCR-522 in heavy, very heavy, medium, and light bombers, one and two-engine fighters, photographic airplanes, heavy and medium transports.

AN/ARC-3 presents advantages over VHF components of the SCR-274-N in that high altitude limit is increased from 30,000 feet to 50,000 feet and production is simplified.

Include more simple design, saving of weight, increase to eight channels, simplification of setting-up channels, and automatic modulation control.

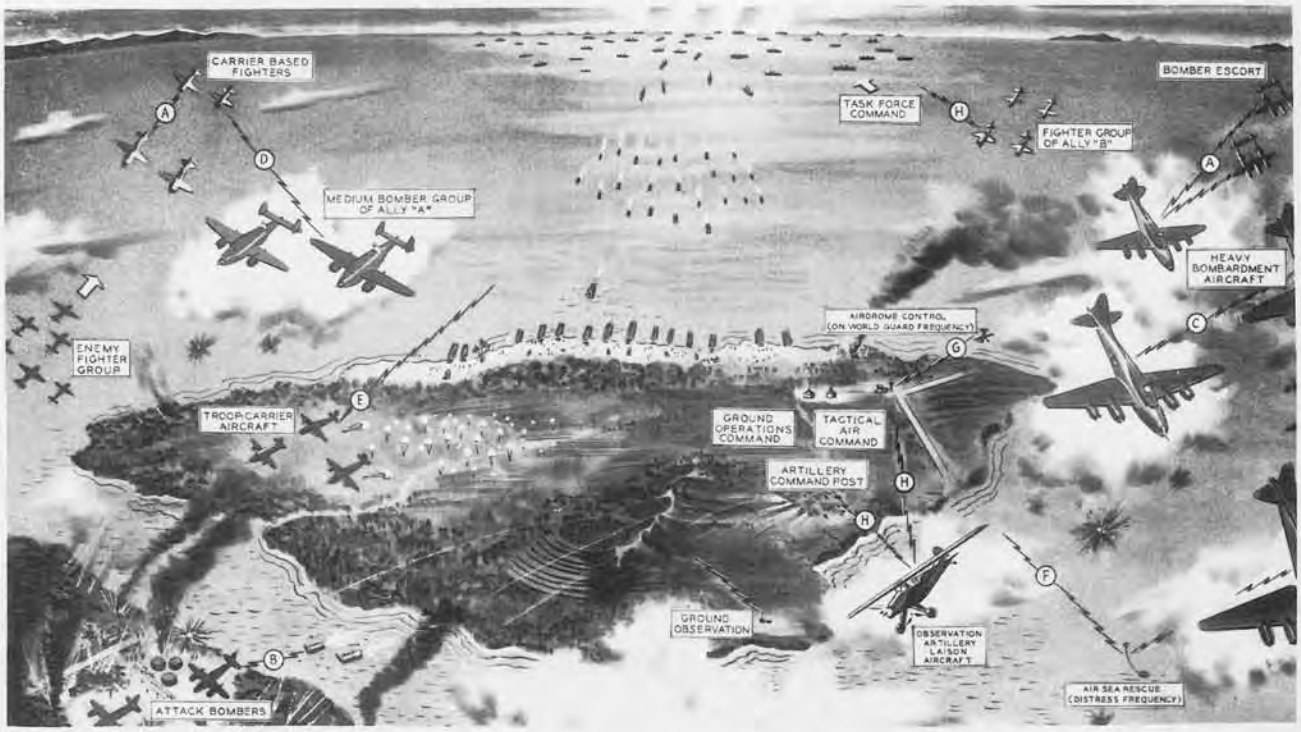
Because the AN/ARC-3 has eight channels available, this equipment has a superior anti-jamming feature when compared to the SCR-522 with its four channels. Quantity production of this equipment started in December 1944.

Test equipment required for the maintenance and tuning of the set includes; Test Set AN/ARM-1 and Phantom Transmitter Antenna TS-78.

Army Supply Program requirements as of 1 December 1944 were 50,000 for the calendar year 1945.

POWER INPUT	28 VOLTS DC
POWER OUTPUT	1 WATT(peak)RECEIVER 15 WATTS(peak) TRANSMITTER
FREQUENCY	100-156 MC
TYPE OF SIGNAL	RECEIVER TRANSMITTER AM: MCW
SENSITIVITY	5 MICROVOLTS
SELECTIVITY	100 KC AT 2X INPUT
RANGE	100 MILES AT 10,000 FT. ALTITUDE 200 MILES AT 25,000 FT. ALTITUDE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	6L6	1	9002
3	6V6/GT	3	12SG7
2	832A	2	12SN7GT
2	12SH7	1	12SN7GT
1	6J5	1	12H6
6	6AK5	1	12A6GT
1	9001		



With eight remotely controlled channels, Radio Set AN/ARC-3 permits intercommunication between all elements of a tactical air force, definite assignment of a channel to each element and effective coordination of ground and air forces. Separate operating channels may be assigned to each element or function, as illustrated: (A) Fighters; (B) Fighter-Bombers; (C) Heavy Bombers; (D) Medium Bombers; (E) Troop Carriers; (F) Air-Sea Rescue; (G) "World Guard"; (H) Observation and other aircraft.

AN/ARC-3

~~RESTRICTED~~

Radio Transmitter T-67/ARC-3

Radio Receiver
R-77/ARC-3

Control Box
C-118/ARC-3

Dynamotor Unit
DY-22/ARC-3

Dynamotor Unit
DY-21/ARC-3

Power Junction Box
J-68/ARC-3

Antenna Mast AN-104-B

RADIO SET AN/ARC-3

TOTAL WEIGHT 85 LBS.

Component	Nomenclature	Size	Weight
Radio Transmitter	T-67/ARC-3	8'' x 13'' x 15''	19 Lbs.
Mounting Base	MT-238/ARC-3		
Radio Receiver	R-77/ARC-3	6'' x 1'' x 16''	18 Lbs.
Mounting Base	MT-237/ARC-3		
Power Junction Box	J-68/ARC-3	4'' x 9'' x 10''	7 Lbs.
Dynamotor Unit	DY-21/ARC-3	4'' x 4'' x 8''	9 Lbs.
Dynamotor Unit	DY-22/ARC-3	4'' x 4'' x 8''	5 Lbs.
Mounting Base	MT-236/ARC-3		
Control Box	C-118/ARC-3	6'' x 2 1/2'' x 6 1/2''	2 Lbs.
Mounting	FT-240-A		
Antenna Mast	AN-104-A		3 Lbs.
Control Unit	C-197/ARC-3		

and includes plugs, adapter and RF cable.

March 1945

Radio Set AN/ARC-6 (PREP) is an Ultra High Frequency Command Set now under development, providing line-of-sight communication of voice only, by means of pulse-modulated waves between aircraft and between aircraft and ground stations. The set consists of a combined U.H.F. Transmitter-Receiver with dynamotor mounted in a single standard shock absorbing ANB mounting, and a control box which enables push button selection of eight preset channels which may be any of 33 channels within its frequency range of 225-285 megacycles. Switches for manual control of the set are located on the control box, which is mounted on Mounting FT-240-A.

The equipment operates on an input voltage of 28 volt D.C. and has an average power output of 4 to 6 watts into a 50 ohm resistance load. Side-tone feature is availalbe.

Anti-jamming feature of the set is highly developed. The equipment is a narrow band systems necessitating the use of relatively slow speeds of transmission. It utilizes a printer mechanism in conjunction with other apparatus.

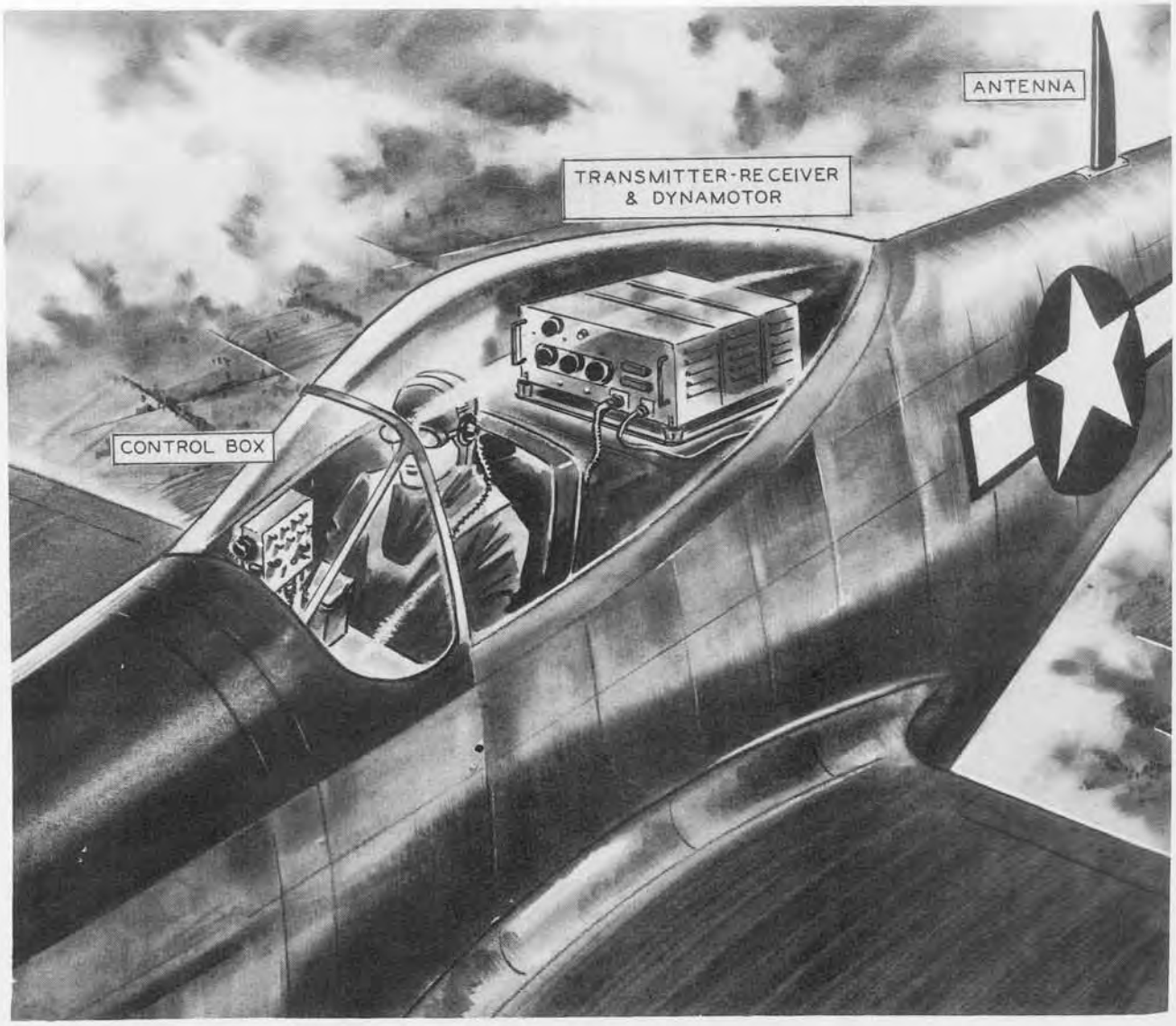
This equipment was designed, not to replace existing communication equipment in the aircraft, but merely to supplement the present equipment.

Test equipment required for maintenance includes Oscilloscope Unit TS-XA-49/ARC-6(XA-1) and Oscilloscope Unit TS-XA-23/ARC-6(XA-1).

There were no Army Supply Program requirements as of 30 November 1944.

POWER SOURCE	28 VOLTS D.C.
POWER OUTPUT	4 TO 6 WATTS AVERAGE
FREQUENCY	225 - 285 MC
TYPE OF SIGNAL	VOICE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
3	6AC7	1	12SJ7
2	6AG5	2	12SL7GT
1	6J6	2	829B
5	12A6	2	832A
2	12H6	1	OC3/VR-105
10	12SH7		



Radio Set AN/ARC-6 is a ultra high frequency command set which provides push button selection of 8 preset channels which may be any of 33 channels within its frequency range of 255-285 Mc.

Radio Set AN/ARC-7 is a single channel VHF receiver and transmitter to be installed in gliders for communication with tow planes and with ground stations. It is designed to be operable on any frequency in the frequency range of Radio Set SCR-522 (100 to 156 Mc.). It is capable of five hours continuous operation, assuming 5 per cent transmitting time, without recharging the glider battery, and it is also capable of operation over a distance of 30 miles, air-ground, from an altitude of 1,000 feet, when used in conjunction with Radio Set SCR-624.

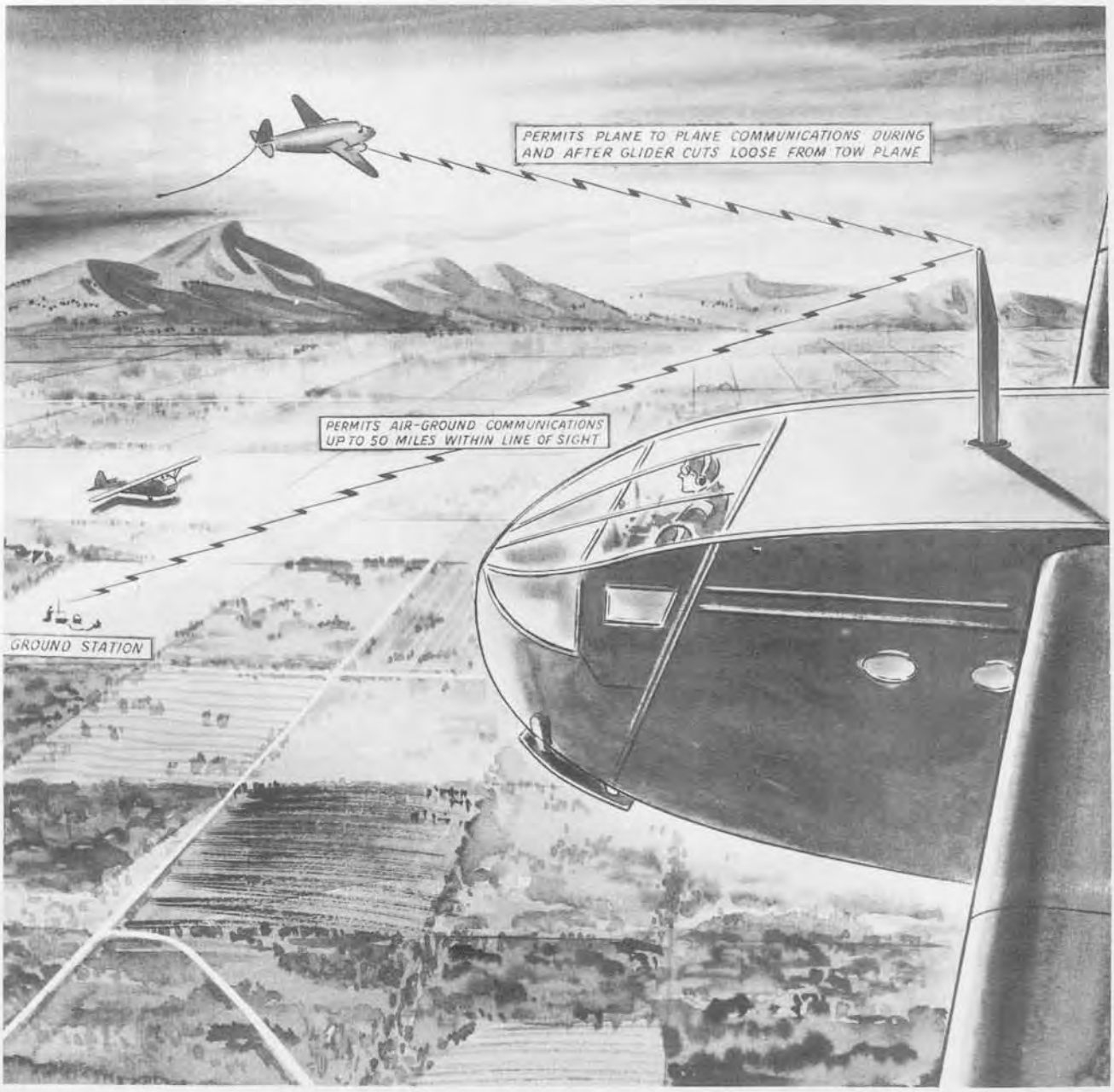
As a possibility exists that the receiver component of the set, if it is proved satisfactory, may be used separately as a ground receiver with Radio Set SCR-522, the receiver is built as a separate unit, containing its own power supply.

Test equipment for the maintenance and tuning of the radio set includes Test Equipment IE-19, Test Equipment IE-36 and Phantom Antenna TS-273/U.

There were no Army Supply Program requirements as of 1 December 1944.

POWER INPUT	24 VOLTS D.C.
POWER OUTPUT	0.5 WATTS
FREQUENCY	100-156 MC.
TYPE OF SIGNAL	CW; MCW; VOICE
RANGE	AIR TO GROUND- 120 MILES AT 10,000 FEET

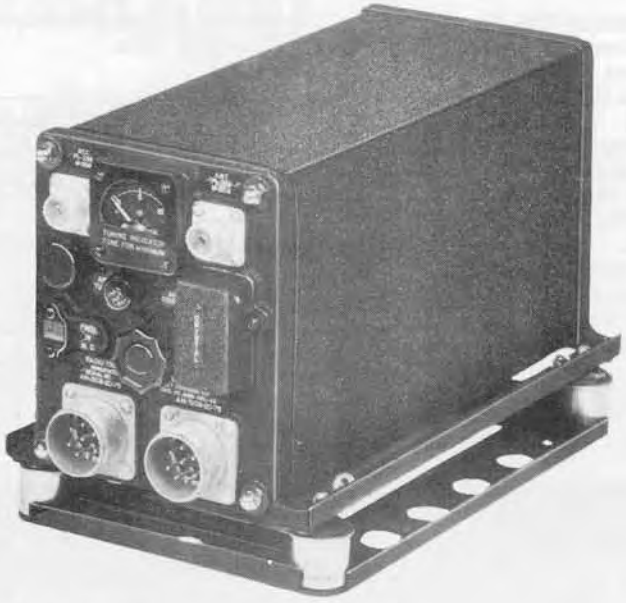
TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
4	9003	5	6AQ6
9	6AK5	4	6AK6
1	12H6	1	1629



Installed in gliders, Radio Set AN/ARC-7 enables the glider pilot to communicate with tow planes other gliders and temporary ground stations.

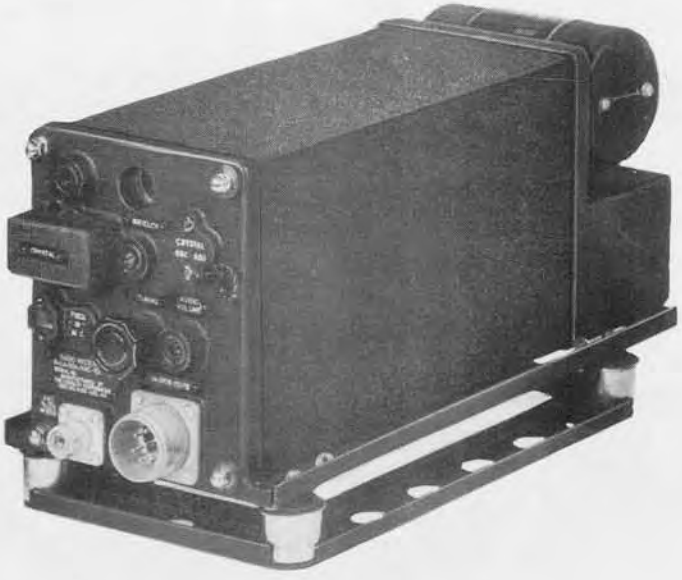
March 1945

AN/ARC-7



Radio Transmitter

Antenna Mast



Radio Receiver

Control Box

RADIO SET AN/ARC-7

TOTAL WEIGHT 25 LBS.

Component	Nomenclature	Size	Weight
Antenna Mast	AN-104	32" x 3" x 1"	3 Lbs.
Radio Transmitter	T-XA-28A/ARC-7(XA-2)	7" x 12" x 7"	15 Lbs.
Radio Receiver	R-XA-30A/ARC-7(XA-2)	14" x 7" x 7"	5 Lbs.
Control Box	C-XA-48A/ARC-7(XA-2)	3" x 3" x 2"	1 Lbs.

and includes cables, plugs and adapters.

March 1945

Radio Set AN/ARC-9 is a high power, multi-channel, quick shift pilot operated transmitter-receiver for installation in aircraft operating under Air Transport Command on regular route. It makes possible elimination of the liaison set and the radio operator on some routes and will permit the pilot to establish voice contact over long ranges on all routes. This combines transmitter-receiver operation on any ten pre-determined crystal controlled channels within the frequency range of 2500-13000 kilocycles.

Radio Set AN/ARC-9X is similar to AN/ARC-9 except for input voltage. The former operates from a 12/24 volts D.C. and the latter from a 24 volt D.C. source.

This equipment is primarily intended for transport aircraft where pilot operation is a major requirement. It is designed for installation in C-47A, C-46, C-54, C-87 and C-93 type aircraft.

Radio Set AN/ARC-9 is an interim equipment that will be used until such time as a suitable complementary receiver is developed for use with Radio Transmitting Set AN/ART-13.

Army Supply Program requirements as of 1 December 1944 were 3,530 for the calendar year 1944 and 305 for 1945.

POWER INPUT	50 WATTS @ 25 VOLTS D.C.
FREQUENCY	2.5 TO 13 MEGACYCLES: 10 FIXED CHANNELS WITHIN THIS RANGE, CRYSTAL CONTROLLED
TYPE OF SIGNAL	VOICE
RANGE	300 MILES

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
4	807	3	12SK7
1	6L6	1	12SA7
1	6V6	2	12A6
2	12C8		

Remote Control Box MS-44-F

Transmitter-Receiver Unit RTA-1B

RADIO SET AN/ARC-9

TOTAL WEIGHT 93 LBS.

Component	Nomenclature	Size	Weight
Communication Unit	Bendix Type RTA-1B	10" x 16" x 26"	
Mounting Base	Bendix Type MT-68E	2" x 16" x 26"	
Remote Control Unit	Bendix Type MS-44F	2" x 4" x 5"	
Interconnecting Cable			

and includes right-angle plug

March 1945

Radio Set AN/ARC-10 is an airborne radio relay which uses a VHF transmitter and receiver assembly similar to that of Radio Set SCR-522. It will simultaneously receiver signals from one station and retransmit them without mutual interference, on suitable combinations of receiving and transmitting carrier frequencies, and will maintain communication with VHF equipped aircraft beyond line of sight distances when tactical or terrain conditions prohibit the establishment of an effective fixed relay station. Audio circuits of the receiver are electrically connected to the speech input circuit of the transmitter through a limiting amplifier which maintains a substantially constant modulating voltage independent of variations in received signal strength.

The equipment provides four crystal-controlled channels for reception and transmission, with simultaneous mechanical shifting of transmitter and receiver frequencies by the monitor. The "break-in" as required is provided by the monitoring operator who can modulate the relay transmitter at any time. The "break-in" transmission will be received by all stations served by the relay station if they are not transmitting.

When used as a normal transmitter-receiver, it permits two-way communication with Radio Set SCR-522 over a distance of 135 miles from 12,000 feet altitude. Power is obtained from a 24 volt d.c. primary power source.

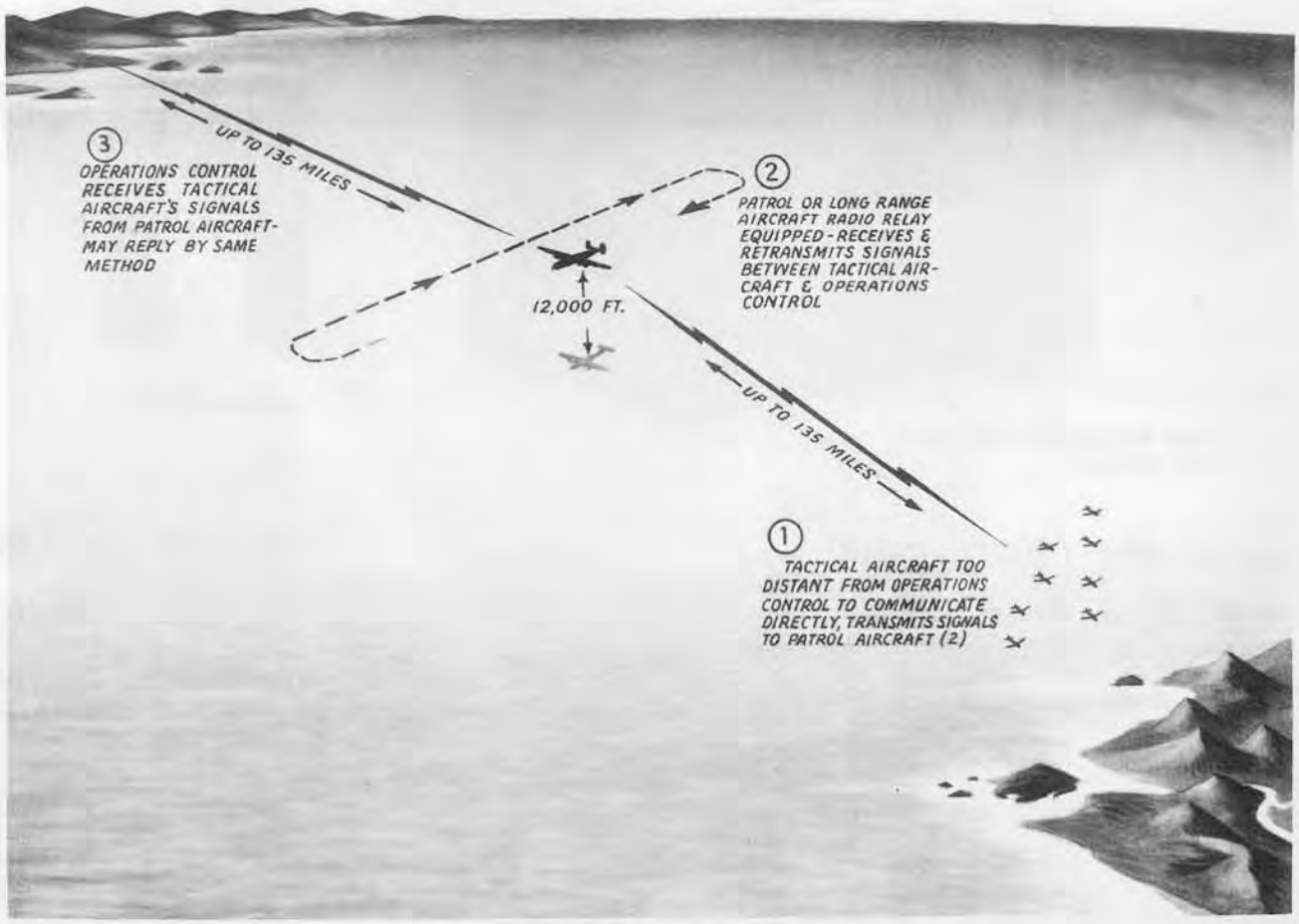
AN/ARC-10 is not duplicated by or similar to any existing standard equipment in use by the Army Air Forces. Its development was required by a tactical need for the extension of the reliable range between VHF ground stations and aircraft equipped with VHF radio. It is expected that the equipment will greatly aid the operations of the AAF by extending the range of such communication systems.

Test equipment required for the maintenance and tuning of AN/ARC-10 has not been determined.

There were no Army Supply Program requirements as of 1 December 1944.

POWER INPUT	24 VOLTS D.C.
FREQUENCY	100-156 M.C.
TYPE OF SIGNAL	VOICE
RANGE	135 MILES AT 12,000 FEET.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6G6G	1	12H6
1	6SS7	3	12SG7
3	12A6	1	9002
2	832	3	9003
3	12AH7GT	2	12J5GT
1	12G8		



Radio Set AN/ARC-10 is an airborne radio relay which will simultaneously receive and retransmit signals (on frequencies 100 to 156 Mc.) up to a range of 135 miles, providing extended range for VHF command radio sets.

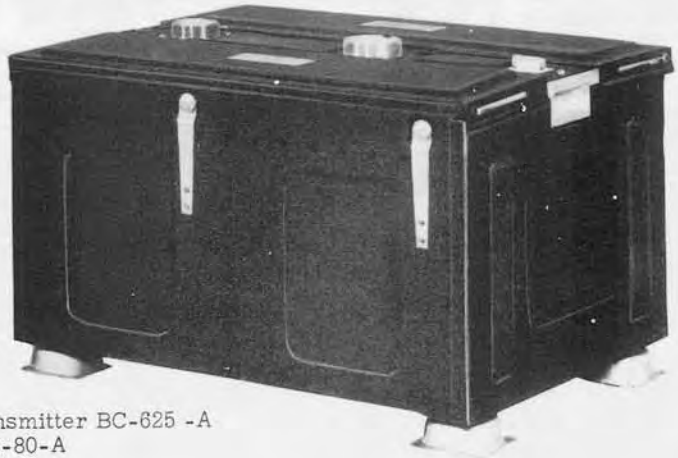
March 1945

AN/ARC-10

CONFIDENTIAL

Junction Box J-75(XA-A)/
ARC-10(XA-2)

Control Box
C-132(XA)/ARC-10(XA-1)



Radio Transmitter BC-625 -A
in Case CS-80-A

Radio Receiver BC-624-AM in
Case CS-80-A

Antenna AN-104

RADIO SET AN/ARC-10

WEIGHT 120 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver	BC-624-AM	10" x 17" x 16"	32 Lbs.
Radio Transmitter	BC-625-A	10" x 17" x 16"	34 Lbs.
Rack	FT-244-A	16" x 12" x 2"	
Case	CS-80-A	1" x 17" x 13"	
Junction Box	J-75/ARC-10	3" x 6" x 9"	7 Lbs.
Mounting Plate	MT-256/ARC-10	2" x 6" x 1"	
Cord	CX-233/ARC-10	15" long	1 Lb.
Cord	CX-230/ARC-10	21" long	1 Lb.
Control Box	C-132/ARC-10	2" x 4" x 6"	3 Lbs.
Dynamotor	PE-94	13" x 9" x 6"	38 Lbs.
Antenna	AN-104 (2 each)		

and includes cords, plugs, etc.

UNCLASSIFIED

March 1945

AN/ARR-11

Radio Receiving Set AN/ARR-11 is an airborne set which receives MCW or voice modulated signals within the 200 to 500 kilocycle band and the 1.5 to 18 megacycle band. It operates from a 24-volt power supply and comprises certain of the radio receiving components of the present Radio Set SCR-287-A, the principal component of which is Radio Receiver BC-348-(). Any production type of this receiver may be used except production type BC-348-B, BC-348-C or BC-348-D. Any mounting FT-154-() for this receiver may be used except FT-154-A.

Radio Receiver BC-348 is capable of receiving voice, MCW, or CW signals in the frequency range of 1.5 to 18.0 mc.

It is now being used as the companion receiver to the AN/ART-13A transmitter. The receiver and transmitter operate from a common liaison antenna AN/ARA-4. The three units together are known as Radio Set AN/ARC-8.

Test equipment required for maintenance includes general purpose testing equipment only.

Army Supply Program requirements as of 11 December 1944 were 19,401 equipments for the calendar year 1944 and 18,443 for 1945.

POWER INPUT	65 WATTS @ 28 VOLTS
POWER OUTPUT	400 MILLIWATTS
FREQUENCY	200-500 KC. 1.5-18 MC. (5 bands)
TYPE OF SIGNAL	CW; MCW; VOICE
RANGE	800 MILES (Approx.)
SENSITIVITY	LESS THAN 5 MICRO-VOLTS 1.5-18.0 MC. LESS THAN 8 MICRO-VOLTS 200-500 MC.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
3	6K7	4	6SK7
1	6J7	1	6SA7
1	6C5	1	6SJ7
1	41	1	6SR7
1	6B8	1	6K6GT
1	6F7		
1	RCA-991 neon bulb		

Radio Receiver BC-348-R

RADIO RECEIVING SET AN/ARR-11 — TOTAL WEIGHT 42 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver	BC-348-()	10" x 18" x 11"	35 Lbs.
Mounting	FT-154-()	2" x 9" x 18"	4 Lbs.

and includes plugs, cable, and adapters.

March 1045

Radio Receiving Set AN/ARR-13 is a small, light weight airborne radio range receiver providing ranges and tower reception.

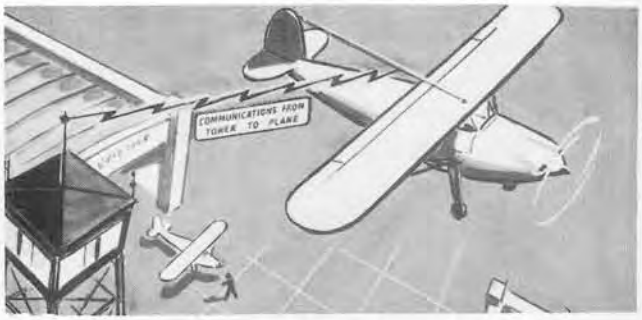
The receiver operates from 12-14 volts d.c. with plate power supplied from RCA model AVA-126 power supply. This receiver operates in conjunction with radio installation in type L-5 observation planes, when RCA model AVR-20 radio receiver and model AVT-112 transmitter is installed. This receiver covers 195 to 405 kc. with a preset 278 kc. channel for airport tower reception. The equipment includes cables for interconnection with above components.

Radio Receiver R-76/ARR-13 is the commercial Setchell Type 512 Radio Receiver.

No special test equipment is required for maintenance and tuning.

Army Supply Program requirements as of 1 December 1944 were 3,850 for the calendar year 1944.

POWER SUPPLY	12-14 VOLTS D.C.
FREQUENCY	195-405 KC
TYPE OF SIGNAL	MCW



Installed in light aircraft, Radio Set AN/ARR-13 provides facilities for the reception of range signals and tower control communications.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	14A4	1	14B6
2	14A7	1	14J7

Interconnecting Cable

Radio Receiving Set AN/ARR-13

RADIO RECEIVING SET AN/ARR-13

TOTAL WEIGHT 5 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver	R-76/ARR-13	4" x 4" x 7"	3 Lbs.
Cord	CX-180/ARR-13		

and includes 20,000 ohm resister for power supply modification.

March 1945

Radio Transmitting Set AN/ART-13A, an improved version of the Navy type ATC transmitter, is a long range liaison transmitter of 100 watts nominal power output, providing CW, MCW or voice emission, and using either fixed or trailing wire aircraft antennas. The set is designed to provide a multi-channel airborne liaison transmitter for use by the Army and Navy, and is intended to replace Radio Transmitter BC-375 in Army bombardment and transport aircraft.

Of the master oscillator type, the transmitter incorporates an automatic tuning system which permits transmission on any of 11 pre-set frequencies. Frequency selection is obtained automatically by use of a rotary switch operated either locally at the transmitter or by means of a remote control box. The transmitter provides CW, MCW and voice modulated types of emission. The audio system is capable of modulating the carrier (100 watts normal) at least 90 percent for MCW or voice emission.

Provision is made for the use of either a standard carbon microphone or magnetic microphone. Power output varies from 5.5 watts at 200 kc. to 30 watts at 600 kc. and approximately 90 watts in the range 200 to 18,100 kc. The equipment is designed to operate from the 28-volt d.c. power supply used in the aircraft.

AN/ART-13A has several outstanding features not provided by the BC-375. These include units covering 11 pre-set channels, one in the 200 to 600 kc. band and 10 in the 2 to 18 mc. band, any one of which may be placed in operation in 20 seconds, with provision for remote position channel selection. No plug-in units are required. The transmitter also contains a calibrated frequency indicator (CFI unit) which eliminates the need of a frequency meter for setting up the transmitting channels.

Operation is provided for altitudes up to 40,000 feet and is accomplished by means of an automatic pressure switch which reduces the transmitter to about half power at altitudes above 15,000 feet.

The low frequency oscillator has been designed as a separate unit, since in operations not requiring low frequencies, the oscillator and antenna loading coils may be removed, thus saving space and weight. Oscillator O-17/ART-13A covering the 200 to 600 kc. band is an insertion unit to provide an additional channel for low frequency operation. Panel MX-128/ART-13 is inserted in place of the oscillator when low frequency operation is not to be used.

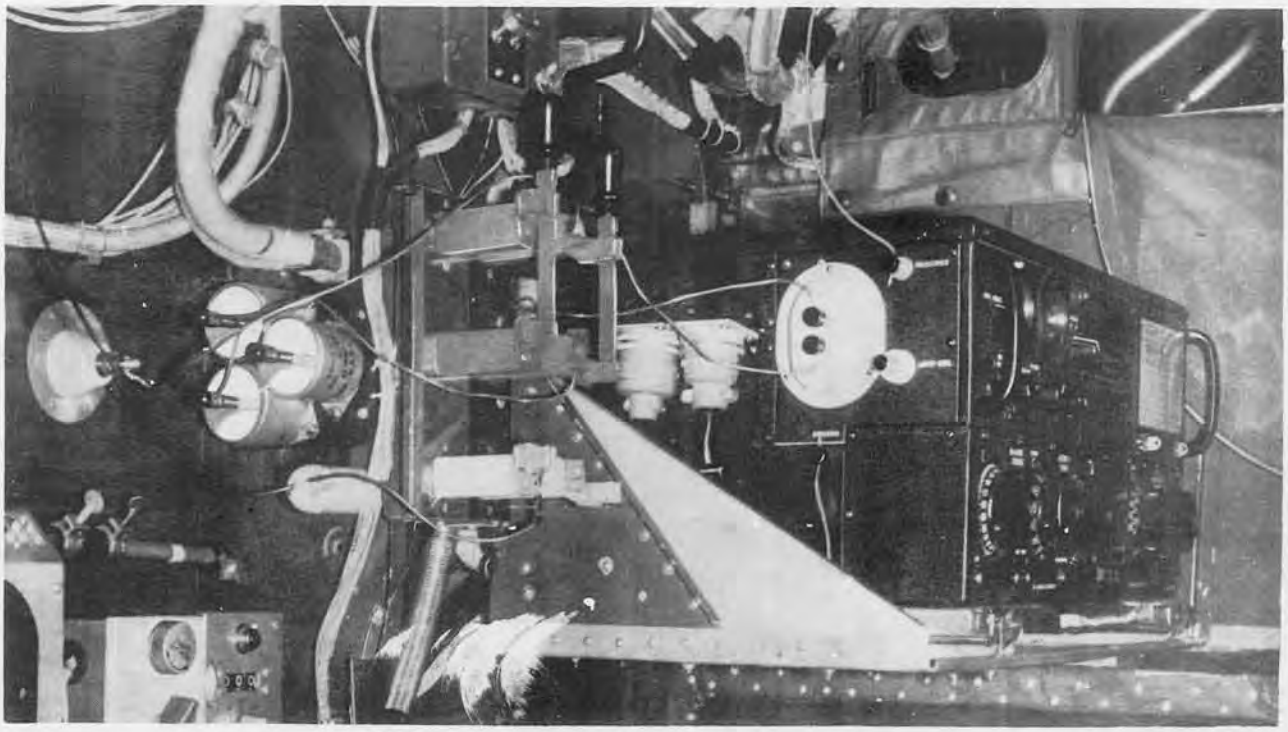
Further improvements include a combined antenna loading coil and switching unit, Antenna Loading Unit CU-32/ART-13A. This loading unit is replaced by Switch SA-13/U when low frequency operation is not required. An improved CFI unit provides a more accurate and uniform signal for lining up the channels of the transmitter over the entire frequency range.

Standard, general purpose test equipment, available in the services, and a few special tools provided with the transmitter, are all the test equipment needed for servicing this set.

Army Supply Program requirements as of 30 November 1944 were 11,251 for the calendar year 1944, and 21,119 for 1945.

POWER INPUT	1100 WATTS @ 28 VOLTS D.C.
POWER OUTPUT	10 WATTS 200 TO 600 KC, 90 WATTS
FREQUENCY	200-600 KC. AND 2-18 MC.
TYPE OF SIGNAL	CW, MCW, VOICE
RANGE	CW-750 MILES, MCW-500 MILES, VOICE-250 MILES
FREQUENCY SHIFT TIME	25 SEC.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	837	1	12SJ7
2	1625	2	6V6GT
1	813	1	12SA7
2	811	2	12SL7



Radio Set AN/ART-13, installed aft of bomb bay in B-25J. This equipment serves as a long range transmitter and supercedes Transmitter BC-375.

AN/ART-13 A

~~RESTRICTED~~

Radio Transmitter
T-47/ART-13

Control Unit
C-87/ART-13

Antenna Loading Coil
CU-26/ART-13

Antenna Loading Coil
CU-25/ART-13

Dynamotor Unit
DY-11/ART-13

Antenna Shunt Capacitor
CU-24/ART-13

RADIO TRANSMITTING SET AN/ART-13 A TOTAL WEIGHT 150 LBS.

Component	Nomenclature	Size	Weight
Switch	SA-46/ART-13A	4" x 2" x 5"	1 Lbs
Radio Transmitter	T-47A/ART-13	11" x 13" x 24"	66 Lbs.
Mounting Plate	MT-283/ART-13	21" x 14" x 2"	2 Lbs.
Mounting Base	MT-284/ART-13	20" x 15" x 3"	3 Lbs.
Dynamotor Unit	DY-17/ART-13A	7" x 12" x 9"	28 Lbs.
Mounting Plate	MT-164/ART-13	7" x 1" x 2"	1 Lb.
Control Unit	C-87/ART-13	4" x 4" x 7"	2 Lbs.
Antenna Shunt Capacitor	CU-24/ART-13	5" x 5" x 4"	2 Lbs.
Antenna Loading Unit	CR-32/ART-13A	12" x 23" x 13"	26 Lbs.
Oscillator	0-17/ART-13A	10" x 6" x 5"	5 Lbs.

and includes plugs, wire, casing, shafting, sleeves, etc.

March 1945

AN/ASA-3

(AND AN/ASA-1; AN/ASA-1A)

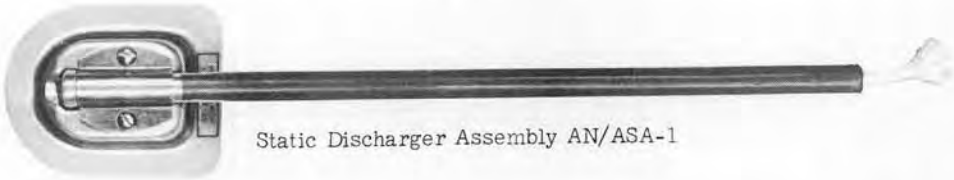
Static Discharger Assembly AN/ASA-1 is a wick type discharger for discharging of accumulated precipitation static on aircraft while in flight. It consists of an aluminum tube containing an ethylene glycol saturated wick and is mounted on the wings tips and tail assembly of medium and heavy bombers and transports. Six to ten Static Discharger Assemblies AN/ASA-1 and/or AN/ASA-1A are required per airplane.

This assembly was procured as an interim measure for the purpose of alleviating extreme static conditions encountered in aircraft until a final solution on this problem could be obtained. Static Discharger Assembly AN/ASA-1A differs from AN/ASA-1 only in the mounting bracket used. This equipment is now substitute standard.

Static Discharger AN/ASA-3 has replaced Static Discharger AN/ASA-1 as standard equipment. It consists of a cotton wick made conducting by chemical precipitation of silver into the wick fiber. The wick is enclosed in a 10 1/2 inch length of vinylite tubing which is secured in a 3 inch length of aluminum tubing. This equipment is somewhat more effective as a discharger than Static Dischargers AN/ASA-1 and AN/ASA-1A and requires much less maintenance. Ten to twelve Static Dischargers AN/ASA-3 are required for an airplane installation.

No test equipment is required for maintenance.

Army Supply Program requirements as of 30 November 1944 were 196,250 AN/ASA-1 assemblies, and 328,860 AN/ASA-3 assemblies for the calendar year 1944, and 129,264 AN/ASA-3 assemblies for 1945.



Static Discharger Assembly AN/ASA-1

Static Discharger Assembly AN/ASA-1A

Static Discharger AN/ASA-3 (XA-1)

AN/ASA-1

*TOTAL WEIGHT LESS THAN 1 LB

Component	Nomenclature	Size	Weight
Static Discharger	MX-43/ASA-1	Length 12" x diam. 1/2"	
Mounting Bracket	MT-133/ASA-1	3" x 4" x 1 "	

AN/ASA-1A

* TOTAL WEIGHT LESS THAN 1 LB

Component	Nomenclature	Size	Weight
Static Discharger	MX-43/ASA-1	Lengtn 12" x diam. 1/2"	*
Mounting Bracket	MT-134/ASA-1A	4" x 2" x 3"	*

AN/ASA-3

* TOTAL WEIGHT LESS THAN 1 LB

Component	Nomenclature	Size	Weight
Static Discharger	AN/ASA-3	Length 14" x 9/32" diam.	*

*

Radio Set AN/CRC-1 is a VHF communication equipment for ground-to-air communication. It is designed to be dropped by parachute from an aircraft and is packaged to permit subsequent man-drawn mobility on the ground. It was improvised for use as interim equipment until a lighter and more compact parachute-dropped VHF equipment could be developed.

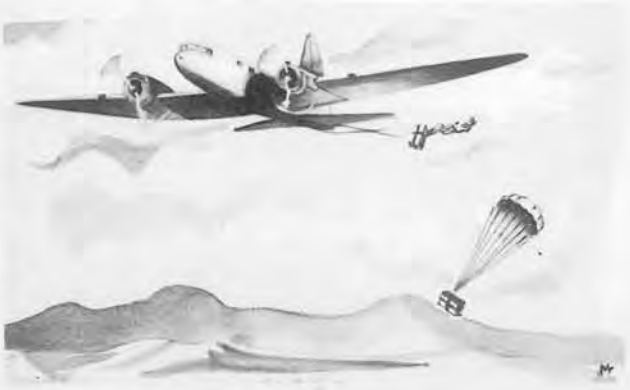
It consists mainly of the transmitter-receiver components of Radio Set SCR-522, Power Unit PE-214-A, Rectifier RA-62 and the necessary containers, parachutes and accessories. It is similar to Radio Set SCR-624 except for the elimination of remote control features, changes in power unit, packaging containers and parachutes arranged to minimize landing shock.

The set used a crystal controlled voice transmitter and a superheterodyne receiver. It operates over a frequency range of a 100-156 mc. Power is supplied from a 115/230 volt, 50-60 cycle a.c. power source.

Test equipment required for the maintenance and tuning of AN/CRC-1 includes Test Set I-139-A and Test Equipment 1E-36 for class A maintenance and Test Equipment 1E-19 for class B maintenance.

Army Supply Program requirements as of 1 December 1944 were 140 for the calendar year 1944.

POWER INPUT	325 WATTS
POWER OUTPUT	6 WATTS (peak)
FREQUENCY	100-156 MC. (4 preset crystals)
TYPE OF SIGNAL	VOICE
RANGES	LINE OF SIGHT TO 130 MILES (max.)



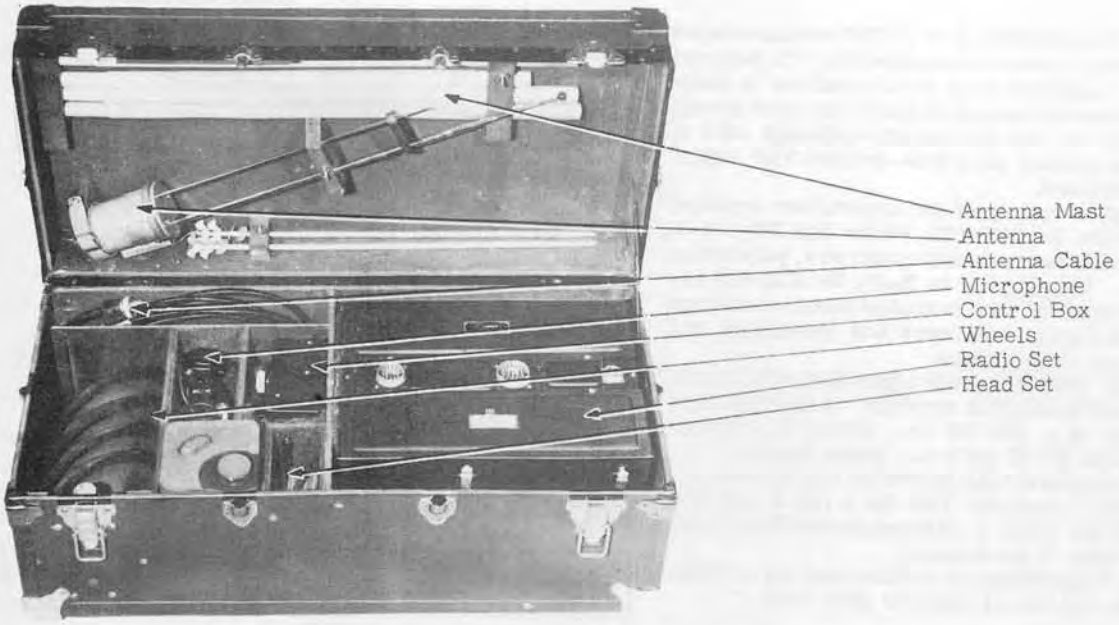
Radio Set AN/CRC-1 may be dropped (in two chests) from aircraft to provide forward ground troops or paratroops with means of transmitting information on which air support or relief may be orgainzed.

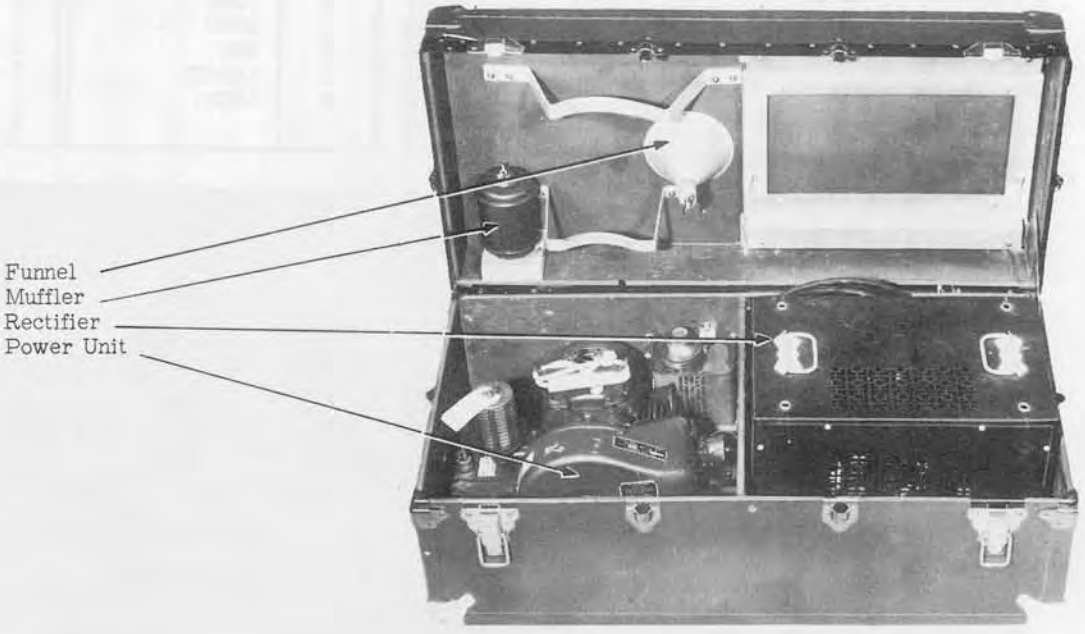
TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	832	1	9002
3	12A6	3	9003
1	6G6G	1	12AH7GT
2	6SS7	3	12SG7
1	12J5GT	2	6X5GT/G
1	12C8	1	12A6GT
		2	5U4G

When assembled for operation, Radio Set AN/CRC-1 may be used as a ground-to-air command set to transmit information from ground troops to combat aircraft relative to strategic ground targets against which strafing or bombing action is desired.

AN/CRC-1

[redacted]





RADIO SET AN/CRC-1

TOTAL WEIGHT 275 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver	BC-624		
Radio Transmitter	BC-625		
Rack	FT-244		
Case	CS-80		
Rectifier	RA-62		
Power Unit	PE-214-A		
Control Box	C-50/CRC-1		
Antenna	AT-18/CRC-1		
Chest	CY-26/CRC-1	34" x 17" x 15"	159 Lbs. *
Chest	CY-27/CRC-1	34" x 17" x 15"	116 Lbs. *

also earphones, headsets, cords, plug, etc.

Weights of chests includes components packed in each.

March 1945

Radio Receiving Equipment AN/CRR-1 is a lightweight assembly of equipment including a battery operated radio receiver (Setchell Carlson Model #591) providing voice and modulated continuous wave reception over the frequency range of 195 to 405 kilocycles. The equipment also includes a headset, a disconnect cord, a length of antenna wire and a set of batteries. The assembly, weighing less than 15 pounds, is packaged in a water repellent container suitable for hand carrying. The use of a superheterodyne circuit with a stage of RF provides good sensitivity with ample selectivity.

Reception is provided over a range of 150 miles. This equipment, when used in conjunction with the sea rescue transmitter BC-778, which is a part of Radio Set SCR-578, will provide for two-way radio communication between aircraft forced down on the Arctic ferry routes and rescue agencies.

No special test equipment is required for maintenance.

Army Supply Program requirements as of 1 December 1944 were 420 for the calendar year 1944.

Radio Set AN/CRR-1 may also be dropped by parachute to isolated air-crews.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	1LN5	1	1LH4
1	1LA6	1	1LB4

POWER INPUT	25 WATTS @ 24/28 VOLTS DC
FREQUENCY	195-405 KC.
TYPE OF SIGNAL	VOICE; MCW
RANGE	150 MILES

Developed for emergency rescue work along the northern ferry routes, Radio Set AN/CRR-1 is used by stranded air crews to receive communications transmitted by rescue parties in the 195-405 kc. band, either voice or MCW. Transmission facilities for stranded parties is provided by SCR-578.

March 1945

AN/CRR-1 UNCLASSIFIED

Battery AB-194

Receiver Model 591

Battery AB-194

Antenna Wire

Ear Cushions

Headset HS-23

Disconnect Cord CD-198

RADIO RECEIVING EQUIPMENT AN/CRR-1 TOTAL WEIGHT 15 LBS.

Component	Nomenclature	Size	Weight
Radio Range Receiver	Setchell-Carlson Model 591	4'' x 4'' x 7''	4 Lbs.
Battery, Ray-O-Vac No.	AB-194 (2 each)		
Headset	HS-23		
Cord	CD-307-A		
Antenna Assembly			

March 1945

Recorder-Reproducer AN/GNQ-2 is ground equipment which records in a similar manner as associated airborne recorder AN/ANQ-2. In addition, it provides playback by means of a pickup, amplifier and loudspeaker.

Recordings are made by embossing on a cellulose acetate disk with a special wax surface treatment. The disk is 0.010 inch thick by 7 inches in diameter. The disk is driven by an off-center pin which engages a hole in the disk and one of a series of corresponding off-center holes in the turn-table. The drive pin is mounted on a spring-loaded record clamp which holds the disk on the turn-table. The embossing stylus consists of a sapphire point (tip radius 0.0015") on an aluminum alloy shank 3/4 inch long by 0.063 inch diameter. Turntable speed is 11.75 r.p.m., line spacing 210 lines per inch, and recording time 30 minutes on each side of the disk. The outer and inner groove speeds are 4.2 inches second and 2.1 inches second, respecitvely.

The magnetic recording head is mounted on a short counter-balanced arm which is pivoted at its center of gravity. The recording head arm is spring-loaded, and the vertical force at the stylus is approximately 5 ounces. The recording head carriage is driven by an overhead feed mechanism of conventional design.

The turntable is driven by a rubber-rimmed idler which engages the bottom surface of the turntable. The idler is driven by knurled drive wheel which is driven, through a flexible coupling, by a gear reduction box built into the motor. The motor is a 115 volt induction motor with a rotor speed of 1700 r.p.m.

The turntable consists of two halves joined by a sponge rubber pad. The upper half is supported on a stainless steel shaft which rests in a journal assembly consisting of two Oilite sleeve bearings and a single ball bearing at the bottom.

The pickup is a crystal type cartridge and is mounted on ball pivots on a carriage which is moved by a feed screw which is out on the same shaft as the recorder feed screw. The cartridge mounting is pivoted at its center of gravity and spring loaded, with vertical force at the stylus approximately 3/4 oz.

The equipment operates at a nominal voltage of 115 volts, 60 cycles per second and draws approximately 0.6 ampere when the motor is running. Standby current is 0.3 ampere.

AN/GNQ-2A differs slightly from GNQ-2 in that a 6V6GT tube replaces on 6SJ7GT, the radio switch is removed, and includes microphone M-9/V, mounting MT-335/V, cord CV-583/GNQ-2A and case CY-87/GNQ-2.

Test equipment require for maintenance includes general purpose testing equipment, such as multimeters and tube testers.

Army Supply Program requirements as of 30 November 1944 were for 96 AN/GNQ-2 for the calendar year 1945; and 270 AN/GNQ-2A for 1944 and 100 for 1945.

POWER INPUT	115 VOLTS A.C.
FREQUENCY	AUDIO
TYPE OF SIGNAL	VOICE
RECORDING TIME	30 MINUTES (ONE SIDE).
TURNTABLE SPEED	11.75 R.P.M.
FREQUENCY RESPONSE	WITHIN 3 DB & 12 DB
SIGNAL TO NOISE RATIO	32 DB AT 1000 C.P.S.
LINE SPACING	210 LINES PER INCH

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	6SJ7	1	6X5
1	6V6GT/G	1	NE-45 NEON

Recorder-Reproducer Lid

Dynamic Microphone

Recorder-Reproducer

RECORDER-REPRODUCER AN/GNQ-2 TOTAL WEIGHT 79 LBS

Component	Nomenclature	Size	Weight
Recorder-Reproducer Unit	RD-5/GNQ-2	10" x 12" x 11"	27 lbs.
Case	CY-87/GNQ-2	12" x 12" x 13"	18 lbs.
Recording Disc.	MX-119/GNQ-2	0.010" by 7" Diam.	
Loudspeaker	LS-107/GNQ-2	3" x 6" x 9"	3 lb
Mounting	MT-279/GNQ-2		
Microphone	T-17		
Headset	HS-33		

and includes a set of operating accessories

March 1945

HS-33

Headset HS-33 is a low impedance (600 ohms), flat-response headset of the headband type primarily intended for use in cabin type aircraft in conjunction with various radio and interphone systems. It consists of two Receivers, ANB-H-1, Cushion M-162-A or Headset Cushion MX-41/AR, Headband HB-7 and Plug PL-354.

Headset HS-33 and Headset HS-38 are the new standard headsets developed for use with aircraft radio and interphone equipment. These headsets replace Headsets HS-23 and HS-18. Headset HS-33 is used with Headband HB-7, while Headset HS-38 is for use with the Air Corps helmet.

Superiority of the new headsets from the viewpoint of speech intelligibility is especially evident under high noise level conditions and at high altitudes. Carefully controlled tests, both in flight and in the laboratory, in which the more severe service conditions were simulated, show increases of approximately 20 percent in the intelligibility of speech heard through the equalized high-fidelity headsets as compared to Headsets HS-23 and HS-18.

Army Supply Program requirements as of 15 December 1944 were for 247,424 HS-33 for the calendar year 1944 and 302,451 for 1945.

Headset HS-33

HS-38

Headset HS-38 is a low impedance (600 ohms), flat response headset of the helmet type primarily intended for use in a flyer's helmet and used in conjunction with radio and interphone systems installed in aircraft. The assembly consists of two Receivers ANB-H-1, two chamois cap covers, two chamois grid covers, Plug PL-354 and and Cap CO-328 with identification tag attached.

Headset HS-38 is the same as Headset HS-33 except for the chamois cap covers and the grid covers which are securely cemented to the receivers as an aid in preventing the ears from becoming frost bitten.

Headset HS-38-A is installed in Helmet A-11 and is used with various airborne radio sets. The headset is provided with a disconnector in the cord so that in case of a forced jump, the cord will automatically be disconnected.

Army Supply Program requirements as of 30 November 1944 were for 427,704 HS-38 for the calendar year 1944 and 212,997 for 1945.

Headset HS-38

ANB-M-C1

Microphone ANB-M-C1 is a carbon microphone designed for use in A-9, A-10 or A-10-A oxygen mask. It has a response that compensates for low frequency within the mask giving essentially a flat characteristic. It is used with various radio sets and interphone equipment.

Microphone ANB-M-C1 will provide considerably better performance than any throat type microphone. It is designed to obtain performance when used in an oxygen mask. Its electrical response efficiently compensates for the acoustical defects of the oxygen mask. Any oxygen mask provides an acoustical chamber for the voice, having distinct resonance at the lower frequencies. This must be offset by increased electrical response in the higher voice frequencies, if maximum fidelity in the reproduction of speech is to be obtained.

Army Supply Program requirements as of 30 November 1944 were for 342,705 ANB-M-C1 microphones for the calendar year 1944, and 203,797 for 1945.

Microphone ANB-M-C1

M-1/A

Microphone M-1/A is a face type, noise shielding, carbon microphone developed to provide a face microphone with good intelligibility in high ambient noise levels. It is electrically interchangeable with Microphone T- 30 and ANB-M-C1 and uses Microphone ANB-M-C1 as a component mounted in a noise shield, specially designed for attachment to an Army Air Force helmet in the same manner as the oxygen mask.

It is suitable for use in an open cockpit type where the microphone is subjected to extremely high ambient noise levles and high wind velocities and is intended for use by personnel in airborne operations which do not require oxygen masks and which do not permit the use of hand-held microphones.

Army Supply Program requirements as of 30 November 1944 were 9,180 M-1/A microphones for the calendar year 1944.

Microphone M-1/A

M-3/A

Microphone M-3/A is a lip microphone for use in aircraft and includes suspension harness for properly attaching the microphone to the head of wearer or to a flyer's helmet. It includes a short cord terminating in Plug PL-291. This microphones is used in conjunction with equipment using Microphones ANB-M-C1 or T-30.

There were no Army Supply Program requirements as of 30 November. 1944.

Lip Microphone M-3/A

Microphone T-17

T-17

Microphone T-17 is a hand, carbon microphone with switch for changing from transmitting to receiving. It is a rugged, sturdy instrument , and when used with the moisture-proof Microphone Cover M-367, it will perform satisfactorily under the most severe service conditions.

It has, however, the two inherent disadvantages of hand-held microphones: It picks up and transmits the engine and propeller noise of the aircraft about as efficiently as it does the voice; and aircraft crew members have too many duties requiring the use of both hands, and the handling of a microphone at a critical moment during a mission is undesirable.

There were no Army Supply Program requirements for T-17 as of 26 December 1944.

Microphone T-30-P

T-30

Microphone T-30 is a carbon throat microphone which is actuated by mechanical vibrations of speech present at the throat of the speaker. It is generally used in conjunction with a radio transmitter and is controlled by a push-to-talk switch. It can be used as a part of an interphone system or with a chest unit for a telephone.

Because the microphone is excited chiefly by contact, it is performed well with respect to masking airplane and other noises, but because of its reliance upon contact excitation, rather than varying impact velocities of sound waves, it is not uniformly a good reproducer of speech. It is deficient in transmitting the higher frequency components of speech. The intelligibility of its output varies widely according to the shape of the throat, voice, and accent of the individual speaker. Its important practical advantage is that it leaves the hands free and may be worn with or without the oxygen mask.

Output of Microphone T-30 is comparable to Microphone T-17. It does not require a pre-amplifier and is a part of various interphone equipment, aircraft and vehicular radio sets. It is also used as an auxiliary to Microphone T-17.

Army Supply Program requirements as of 30 November 1944 were for 328,647 T-30 microphones for the calendar year 1944, and 249,531 for 1945.

Microphone T-44-A

T-44

Microphone T-44 is a magnetic type microphone for use in A-9, A-10 or A-10-A oxygen mask. It has the same performance characteristics as Microphone ANB-M-C1. It is used rather generally by the British in their aircraft command sets and was adapted to accomplish complete interchangeability in the operation of command equipment.

Not electrically interchangeable with a carbon microphone, T-44 operates at voltage levels considerably lower than the carbon microphones.

Army Supply Program requirements as of 30 November 1944 were for 9,838 T-44 microphones for the calendar year 1944.

RC-26

Interphone Equipment RC-26 is a two-place interphone equipment for tactical use. Interphone Box BC-334 (master) is installed in the pilot's cockpit. Interphone Box BC-335 (remote) is for installation in the cockpit remote from the pilot. Interphone Amplifier BC-212 is so located that the leads connecting it to the control boxes and to the radio set junction box are as short as it is convenient to make them.

Electrically, it is identical with Interphone Equipment RC-27. The two differ mechanically, in that Interphone Equipment RC-27 has a remote-control switch which allows the occupant of the cockpit, in which Interphone Box BC-335 (remote) is installed, to mechanically operate the switch on Interphone Control Box BC-334 (master) mounted in the other cockpit.

Normally, power for the equipment is obtained from Radio Set SCR-( )-183 or SCR-240. Power to operate the equipment can also be obtained from any other adequate d.c. power source (200-350 volts, 16 ma; 12 volts, 0.42 amps).

Test equipment required for maintenance includes general purpose test equipment such as multimeters and tube testers.

There were no Army Supply Program requirements as of 30 November 1944.

POWER INPUT	5 WATTS @ 12 VOLTS
TYPE OF SIGNAL	VOICE

Interphone Amplifier
BC-212-D

Control Box
BC-327

Interphone Control Box
BC-334

Interphone Box
BC-335

INTERPHONE EQUIPMENT RC-26

TOTAL WEIGHT 4 LBS.

Component	Nomenclature	Size	Weight
Interphone Amplifier	BC-212	6" x 6" x 3"	2 Lbs.
Interphone Control Box	BC-334	4" x 4" x 4"	1 Lb.
Interphone Box	BC-335	4" x 3" x 2"	*
Control Box	BC-327	4" x 3" x 2"	*
Control Shaft and includes cords, plugs connectors etc.	MC-166	6 feet long	*

*Less than one lb.

March 1945

Interphone Equipment RC-27 is a two-place interphone equipment for basic training aircraft. Electrically, it is identical with Interphone Equipment RC-26. The two differ mechanically in that Interphone Equipment RC-27 has a remote-control switch which allows the occupant of the cockpit in which Interphone Box BC-335 (remote) is installed to mechanically operate the switch on Interphone Control Box BC-334 (master), mounted in the other cockpit.

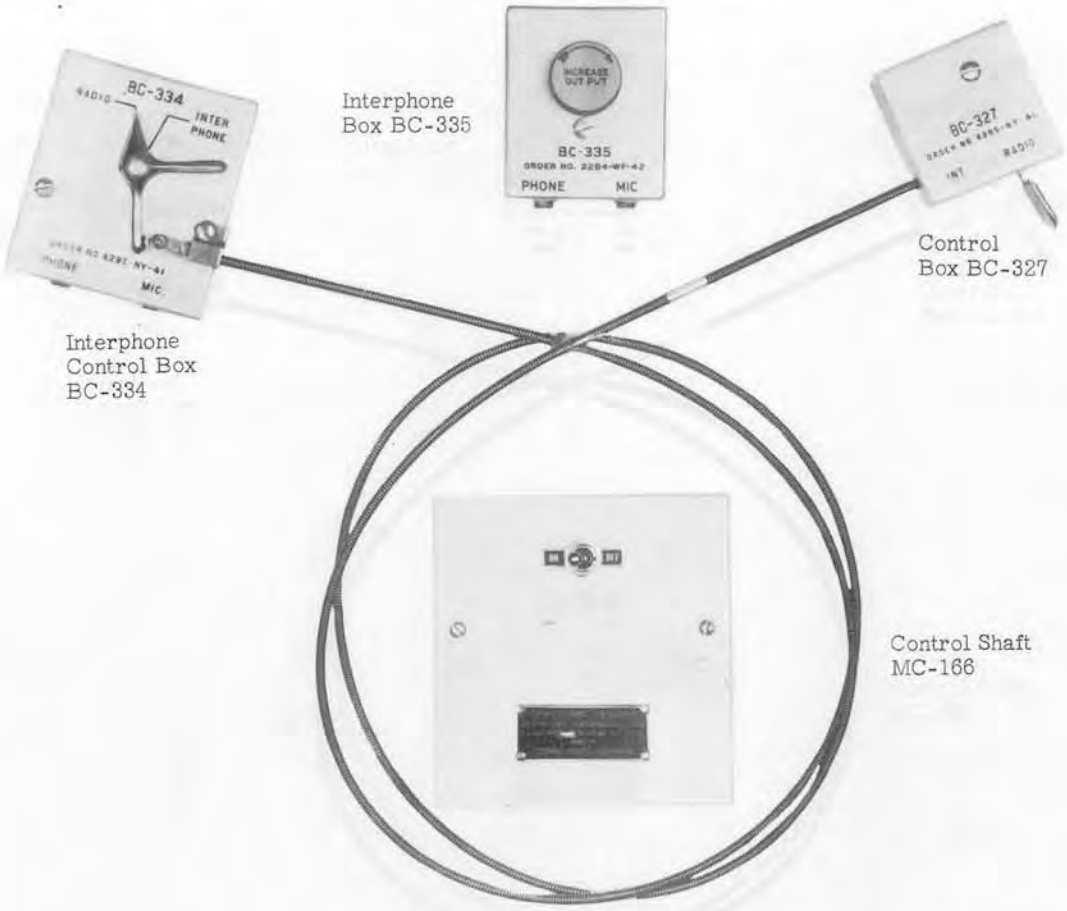
Normally, power for the equipment is obtained from Radio Set SCR-( )-183 or SCR-240.

Test equipment required for maintenance includes general purpose testing equipment, such as multimeters and tube testers.

There were no Army Supply Program requirements as of 30 November 1944

POWER INPUT	5 WATTS @ 12 VOLTS
TYPE OF SIGNAL	VOICE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	6C5		



INTERPHONE EQUIPMENT RC-27

TOTAL WEIGHT 5 LBS.

Component	Nomenclature	Size	Weight
Control Box	BC-327	4'' x 3'' x 2''	*
Control Shaft	MC-166	6 feet long	*
Jack	JK-26		
Interphone Amplifier	BC-212-D	6'' x 5'' x 3''	2 Lbs.
Interphone Control Box	BC-334	4'' x 4'' x 4''	1 Lb.
Interphone Box	BC-335	4'' x 3'' x 2''	*

*Less than one lb.

and includes lever assembly, bearing, cordage and plug.

March 1945

Interphone Equipment RC-35 is a high impedance two-place interphone equipment used in basic training aircraft. A remote control switch is provided which permits the occupant of the cockpit in which Interphone Box BC-335 (Remote) is installed to mechanically operate the switch on Interphone Control Box BC-334 (master), mounted in the other cockpit. RC-35-A is identical to RC-35 except it is a low impedance set using BC-335.

General purpose test equipment only is required for maintenance.

Army Supply Program requirements as of 30 November, 1944 were for 3,494 the calendar year 1944, and 3,55 and 1945

POWER INPUT	24 WATTS @ 28 VOLTS
POWER OUTPUT	7 WATTS
FREQUENCY	AUDIO
TYPE OF SIGNAL	VOICE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6F8G		

Dynamotor Unit
PE-86-A

Interphone Amplifier
BC-347-C

Interphone Control Box
BC-334 (Master)

Interphone Box
BC-335 (Remote)

Control Shaft
MC-166-A

Control Box
BC-327 (Remote)

INTERPHONE EQUIPMENT RC-35

TOTAL WEIGHT 10 LBS.

Component	Nomenclature	Size	Weight
Interphone Box	BC-335	4" x 3" x 2"	*
Interphone Amplifier	BC-347-C	6" x 4" x 3"	2 Lbs.
Dynamotor Unit	PE-86-( )	5" x 1" x 5"	4 Lbs.
Interphone Control Box	BC-334	4" x 4" x 4"	1 Lb.
Control Box	BC-327	4" x 3" x 2"	*
Control Shaft	MC-166-A	6 feet long	*

* Less than one pound

and includes cords, plugs, and adapters.

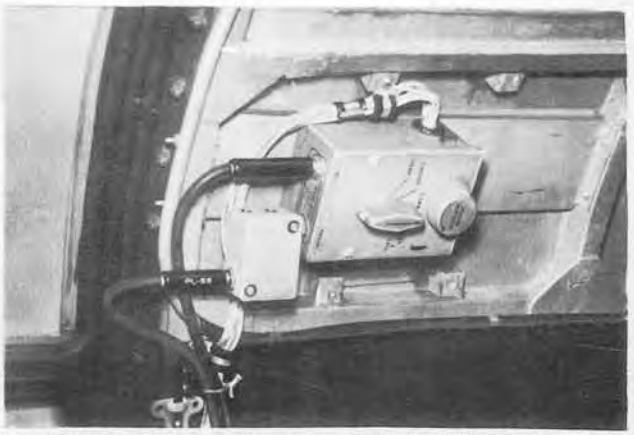
March 1945

Interphone Equipment RC-36 is designed for multiplace airplanes and provides intraplane communication between the various interphone stations. Switching facilities whereby the operation of two complete radio sets and one additional radio receiver can be partially controlled are also provided.

Normally, plate voltage (250 volts nominal) for operation of the interphone amplifier will be obtained from the dynamotor which is supplied from a 24 volt d.c. primary source. D.C. power to operate the equipment can be also obtained from any other source capable of furnishing 200 to 300 volts at 18 ma, such as a Dynamotor Unit PE-86-A, and 24 volts at 0.72 amperes, direct current.

Test equipment required for maintenance includes general purpose test equipment, such as multimeter and tube testers.

Army Supply Program requirements as of 30 November were for 31,771 equipments for the calendar year 1944 and 13,227 for 1945.



Installation Photo of Jack Box BC-366, Waist Gunner's Position B-17

POWER INPUT	24 WATTS @ 28 Volts
POWER OUTPUT	7 WATT
FREQUENCY	AUDIO
TYPE OF SIGNAL	AUDIO

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6F8G		

Interphone Amplifier
BC-212-D

Dynamotor Unit PE-86-B

Jack Box
BC-366

Headset Adapter
MC-385-C

Plug PL-55

Jack JK-26

Cord CD-307-A

Switch SW-191-( )

Plug PL-68

Jack JK-48

Cord CD-508

INTERPHONE EQUIPMENT RC-36 TOTAL WEIGHT 11 LBS.

Component	Nomenclature	Size	Weight
Interphone Amplifier	BC-347-M	6" x 4" x 3"	2 Lbs.
Dynamotor Unit	PE-86-( )	5" x 1" x 5"	4 Lbs.
Jack Box	BC-366	5" x 1" x 3"	1 Lb.
Mounting	FT-486	4" x 6" x 1"	2 Lbs.
Headset Adapter	MC-385-C	2" x 1" x 2"	1 Lb.
Cord	CD-307-A	1 to 10 feet	
Cord	CD-508-A	9 feet.	1 Lb.

and includes microphone extension cord.

March 1945

Interphone Equipment RC-45 is designed for multiplace aircraft provided with a 12-volt direct-current primary source. It provides intra-plane communications between the various interphone stations and switching facilities whereby the operation of two complete radio sets and one additional radio receiver can be partially controlled.

Normally, plate voltage for the interphone amplifier is obtained from the command set dynamotor, which is supplied from the 12 volt d.c. primary power source.

Test equipment required for maintenance includes general purpose test equipment such as multimeters and tube testers.

There were no Army Supply Program requirements as of 30 November 1944

POWER INPUT	5 WATTS @ 12 VOLTS
TYPE OF SIGNAL	VOICE

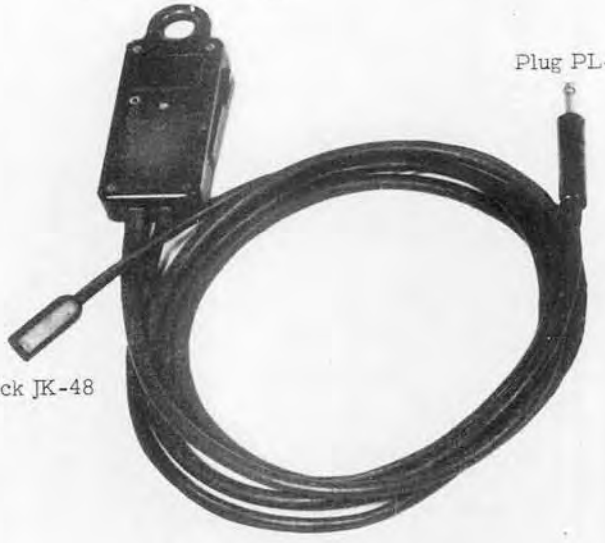
TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	6C5		

Interphone Amplifier
BC-212-D

Jack Box BC-366

Switch SW-191-( )

Plug PL-68



Jack JK-48

Cord CD-508

Plug PL-55

Jack JK-26

Cord CD-307-A

INTERPHONE EQUIPMENT RC-45

TOTAL WEIGHT 7 LBS.

Component	Nomenclature	Size	Weight
Interphone Amplifier	BC-212	6" x 5" x 3"	2 Lbs.
Jack box	BC-366	5" x 4" x 3"	1 Lb.

including cords, plugs and 3 additional jack boxes.

March 1945

Radio Set SCR-274-N is an airborne command set designed with multiple units to provide a light weight installation for command communications. The receivers and transmitters are each interchangeable as a unit to cover the various frequency bands between 3.0 to 9.1 mc and 100 to 156 mc. Reception on the 90-550 kc band is provided by one receiver.

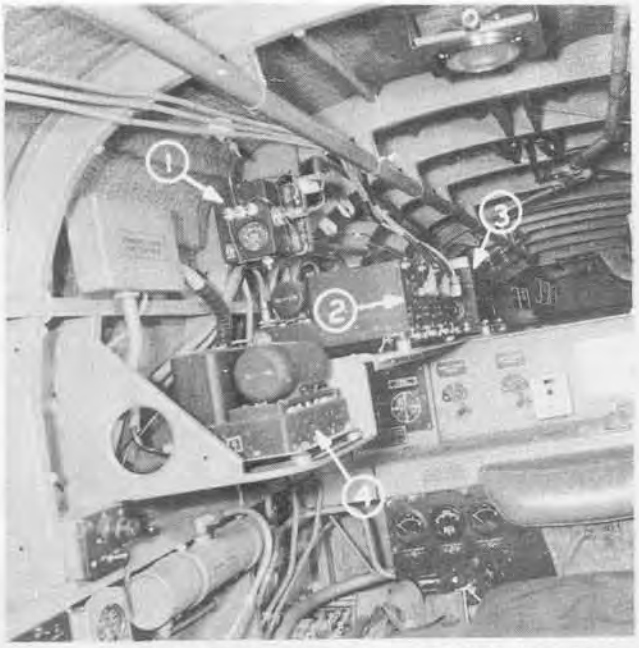
Various combinations of receivers and transmitters are used in installations in all types of aircraft. Five transmitters and four receivers are provided.

Radio Set SCR-274-N has replaced Radio Sets SCR-( )-183, SCR-( )-283, and SCR-262-( ), and is similar to Navy models ANB-5 and AN/ARC-4, and AN/ARC-5. It is being replaced, in turn, by a lighter, more efficient, eight-channel, crystal-controlled set, AN/ARC-3.

Test equipment required for maintenance includes Test Set RC-54-A and Test Set RC-55-A.

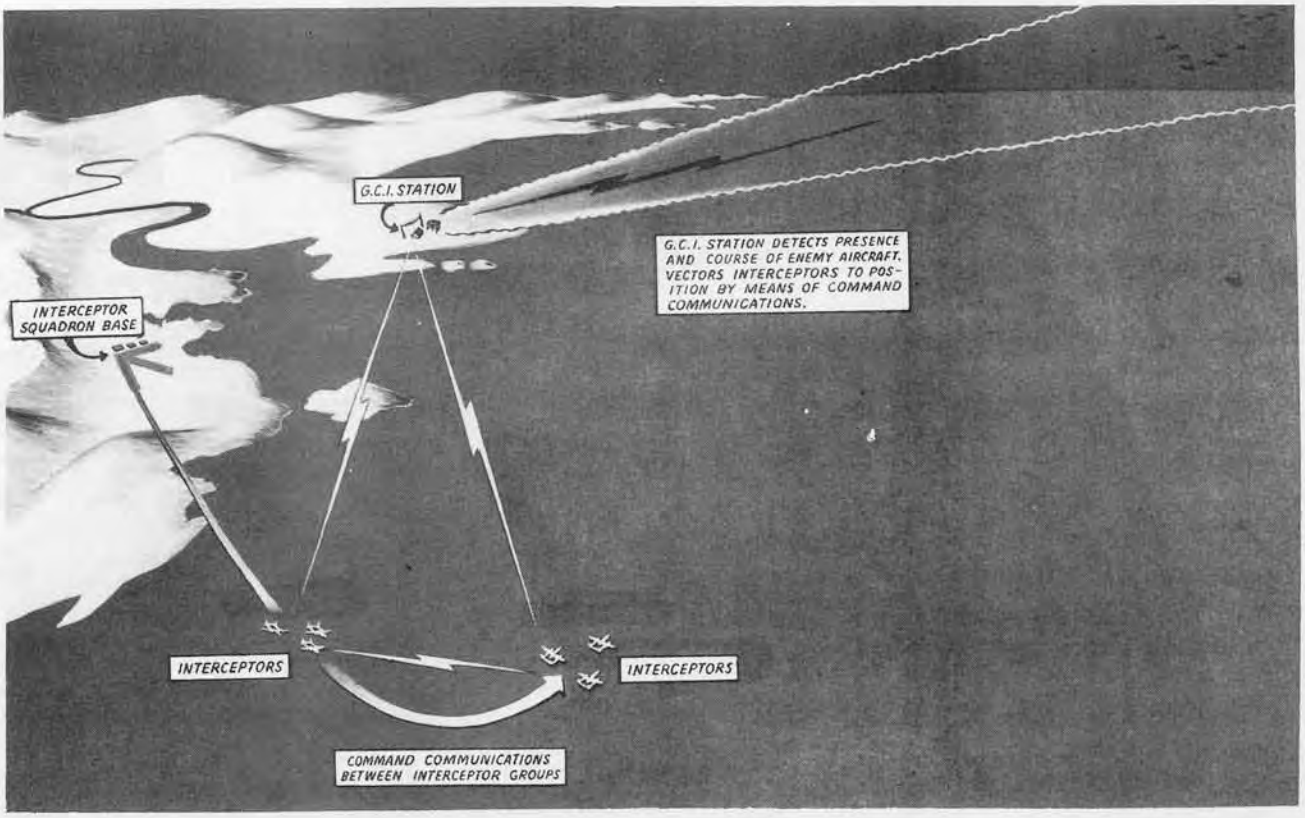
Army Supply Program requirements for this equipment are based on individual components.

POWER INPUT		350 WATTS @ 28 VOLTS DC. (trans)
POWER OUTPUT	VOICE:	5-10 WATTS PEAK
	CW:	40 WATTS PEAK
RANGE	CW or TONE:	150 MILES
	VOICE:	75 MILES
TRANS. FREQ.		3-4 MC. (BC-696) 4-5.3 MC. (BC-457) 5.3-7 MC. (BC-458) 7.9.1 MC. (BC-459) 100-156 MC. (BC-950) CW, TONE, VOICE
REC. FREQ.		190-550 KC. (BC-453) 3-6 MC. (BC-454) 6-9.1 MC. (BC-455) 100-156 MC. (BC-942)



Installation of SCR-274 N in B-25 aircraft. (1) Antenna Relay (2) Receivers (3) Transmitter (4) Modulator Unit

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
9	12SK7	9	1625
3	12K8	1	VR-150-30
3	12SR7	4	1626
3	12A6	4	1629
1	12J5GT		



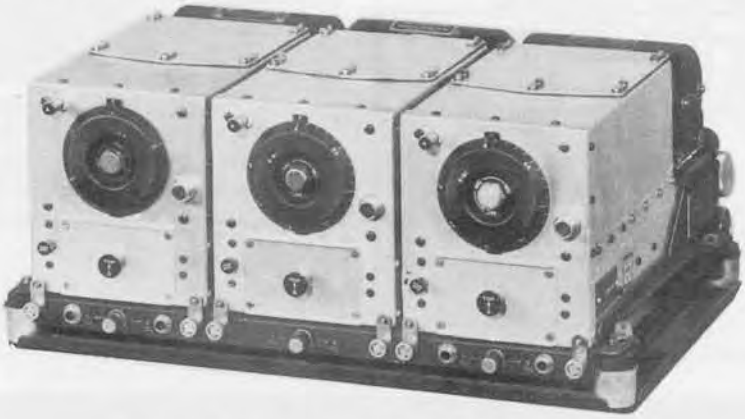
Installed in many types of tactical aircraft to provide medium frequency command communication facilities, SCR-274N is a manually-operated equipment, which transmits in five bands and receives in four.

SCR-274 N

~~RESTRICTED~~

Radio Transmitters BC-457, BC-458

Modulator Unit BC-456



Radio Receivers BC-453, BC-454, BC-455

Antenna Relay Unit BC-442

Radio Control Box BC-450

Radio Control Box BC-451

RADIO SET SCR-274 N

TOTAL WEIGHT 79 LBS.

Component	Nomenclature	Size	Weight
Antenna Relay Unit	BC-442	7" x 6" x 7"	2 Lbs.
Modulator Unit	BC-456	8" x 9" x 10"	9 Lbs.
Radio Control Box	BC-451	3" x 4" x 5"	1 Lb.
Radio Transmitters	BC-696	9" x 5" x 12"	9 Lbs.
Radio Transmitters	BC-457	9" x 5" x 12"	9 Lbs.
Radio Transmitters	BC-458	9" x 5" x 12"	9 Lbs.
Radio Transmitters	BC-459	9" x 5" x 12"	9 Lbs.
Radio Receivers	BC-454	8" x 6" x 12"	10 Lbs.
Radio Receivers	BC-453	8" x 6" x 12"	10 Lbs.
Radio Receivers	BC-455	8" x 6" x 12"	10 Lbs.
Radio Receivers	BC-946	8" x 6" x 12"	10 Lbs.
Radio Control Box	BC-450	5" x 9" x 6"	3 Lbs.

plus cords, cables, plugs, etc.

SCR-( )-283

Radio Set SCR-( )-283 is intended for installation and operation in aircraft having 24-28 volt d-c power supply systems.

The frequency range of the receiver is 201-398 kc. and 2.5-7.7 mc. (Although it is technically possible to extend the ranges beyond these bands by the use of additional coil sets, the extension of the frequencies is not authorized for this radio set. Such additional coil sets have not been procured and cannot be furnished.)

The radio receiver may be used to receive modulated or damped-wave signals at any frequency within these ranges. Frequency range of the transmitter is 2,500 to 7,700 kilocycles, and it may be used to transmit unmodulated, tone-modulated, or voice-modulated signals.

Test equipment required for maintenance and tuning of the set includes Test Set I-56-K.

Army Supply Program requirements as of 1 December 1944 were 680 for the calendar year 1944.

POWER INPUT	300 WATTS @ 28 VOLTS
POWER OUTPUT	3 WATTS (peak)
FREQUENCY	201-398 KC 2500-7700 MC
TYPE OF SIGNAL	CW-MCW VOICE
RANGE	15 MILES

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	45 Special	1	37
2	10 Special	1	38
4	39/44		

Radio Transmitter
BC-AR-430

Dynamotor Unit
BD-AR-93

Radio Receiver
BC-AR-429

Coil Unit C-379

Radio Control Box
BC-AR-231

Antenna Switching Relay
BC-AR-408

Coil Set C-381

Radio Control Box
BC-AR-232

RADIO SET SCR-( )-283 TOTAL WEIGHT 50 LBS.

Component	Nomenclature	Size	Weight
Dynamotor Unit	BD-( )-93	5" x 8" x 8"	10 Lbs.
Radio Transmitter	BC-( )-430	7" x 14" x 8"	11 Lbs.
Radio Receiver	BC-( )-429	9" x 16" x 8"	12 Lbs.
Mounting	FT-100		2 Lbs.
Mounting	FT-99		2 Lbs.
Coil Unit	C-400	12" x 6" x 7"	3 Lbs.
Coil Set	C-396	7" x 4" x 4"	1 Lb.
Mounting	FT-141		
Coil Sets	C-401 to C-405	12" x 6" x 7" (each)	1 Lb. (each)
Radio Control Box	BC-( )-232	4" x 5" x 3"	1 Lb.
Radio Control Box	BC-( )-231	4" x 5" x 3"	1 Lb.
Mounting	FT-118		2 Lbs.
Antenna Switching Relay	BC-( )-408	5" x 5" x 3"	2 Lbs.
Mounting	FT-118		2 Lbs.
Junction Box	FM-( )-172	6" x 3" x 8"	3 Lbs.

and includes cables, plugs, and adapters.

March 1945

Radio Set SCR-287 is an airborne liaison set used for plane-to-ground communication over ranges extending from 50 to several hundred miles. The set is similar to Radio Set SCR-187 with the exception of the 24-volt primary power supply employed in SCR-287.

Radio Transmitter BC-375 is designed for use in aircraft and other applications requiring a medium-power equipment having strength, light weight, flexibility, and portability. The equipment is designed to provide communication by voice, tone or continuous wave telegraphy over a frequency range of 150 to 12,500 kc. Suitable tuning equipment is provided in the radio transmitter to permit satisfactory operation over most of the frequency range when connected to the available airplane antenna. Antenna Tuning Unit BC-306 may be used to extend the range of antenna tuning for frequencies between 150 to 800 kc.

The transmitter and its associated equipment may be expected to give satisfactory service on CW at all altitudes up to 27,000 feet. On tone and voice, however, insulation breakdown may occur in Transmitter Tuning Unit TU-8-B above 25,000 feet and in Transmitter Tuning Unit TU-9-B above 19,000 feet. These altitude limitations may be exceeded slightly with the exercise of extreme caution in tuning and keeping the equipment clean. Satisfactory operation between 6,200 and 10,000 kc. may be obtained on CW alone at altitudes between 19,000 and 27,000 feet, and Transmitter Tuning Unit TU-26-B may be expected to give satisfactory performance at all altitudes up to 15,000 feet.

Radio Receiver BC-348 and Radio Receiver BC-224 are locally controlled, eight-tube, six-band superheterodyne receivers which cover the frequency ranges of 200-500 kc. and 1.5 to 18 mc. All receivers in the BC-348 series are interchangeable, as are all receivers in the BC-224 series. Each Radio Receiver BC-348 and Radio Receiver BC-224 are capable of voice, tone, or c-w reception with manual or automatic volume control. The total power consumed by these receivers is 56 watts from either a 28-volt or 14-volt d.c. source.

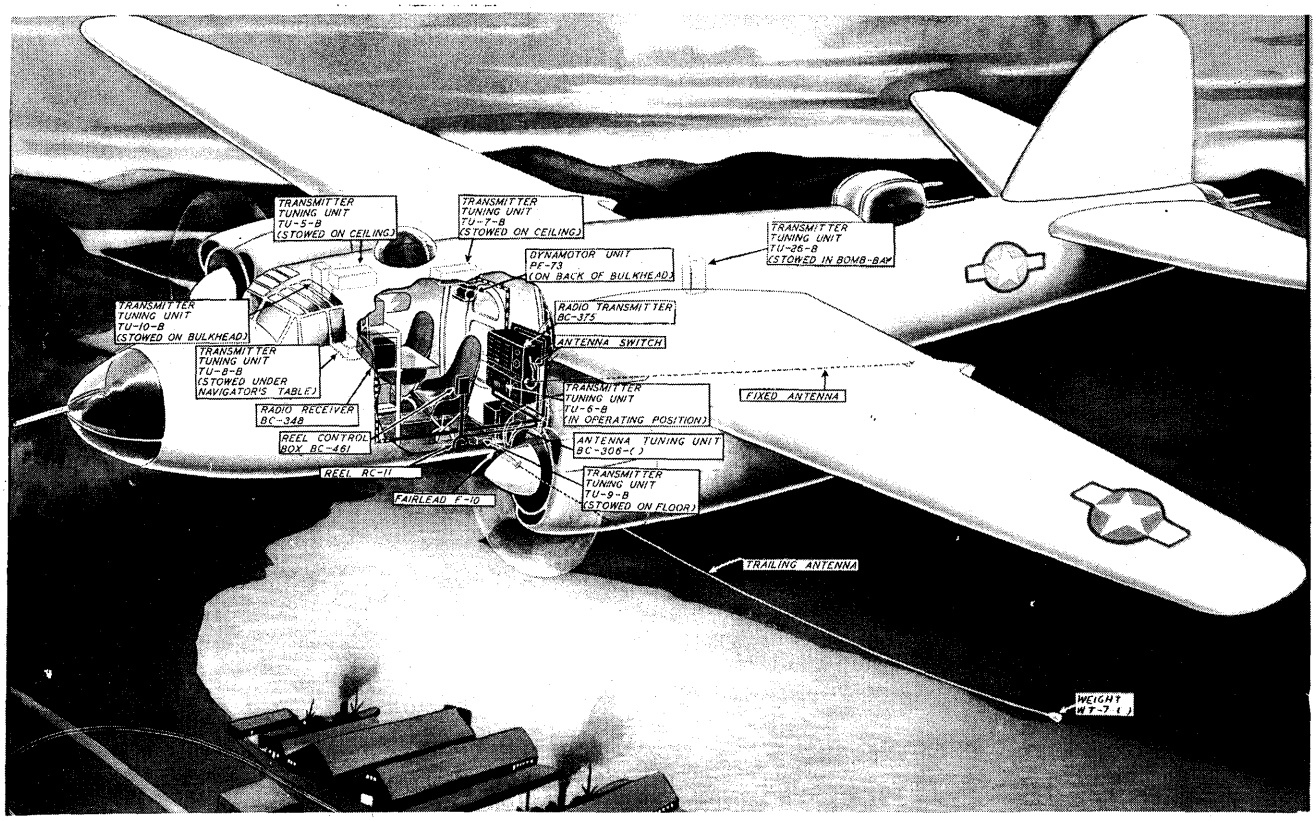
Electrically, the receiver comprises two stages of tuned radio frequency amplification preceding the first detector, a temperature-compensated heterodyne oscillator, three intermediate-frequency amplifier stages, a second detector and one stage of audio-frequency amplification with a transformer output circuit. A crystal band-pass filter and beat-frequency oscillator are also included. The former is for increasing selectivity and the latter for receiving c-w signals.

The frequency range of 1.5 to 18 mc. is covered in six bands which are under the control of a band-change switch. These frequency ranges are: 0.2 to 0.5 mc.; 1.5 to 3.5 mc.; 3.5 to 6.0 mc.; 6.0 to 9.5 mc.; 9.5 to 13.5 mc.; 13.5 to 18.0 mc.

General purpose test equipment only is required for maintenance. There were no Army Supply Program requirements as of 30 November 1944.

POWER INPUT	600-840 WATTS @ 24-28 VOLT D.C.
POWER OUTPUT	80 WATTS PEAK
TYPE OF SIGNAL	CW-TONE - VOICE
RANGE	APPROX. 800 MILES
RECEIVING FREQUENCY	200-500 KC.-18.0 MC. 5 BANDS
TRANSMITTING FREQUENCY	150 KC. TO 12.5 MC.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
4	211 SPC.	1	6F7
1	10	3	6K7
1	41	1	6J7
1	6C5	1	6B8



With its many components, including the numerous tuning units, Radio Set SCR-287 requires considerable installation space, as shown in above installation of SCR-287 in a B-26.

SCR-287

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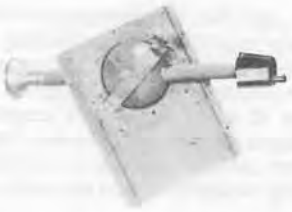


Fair Lead F-10

Reel Control Box BC-461

Weight WT-7-A

Reel RL-42-A

Dynamotor Unit PE-73-B

Radio Transmitter BC-385-C

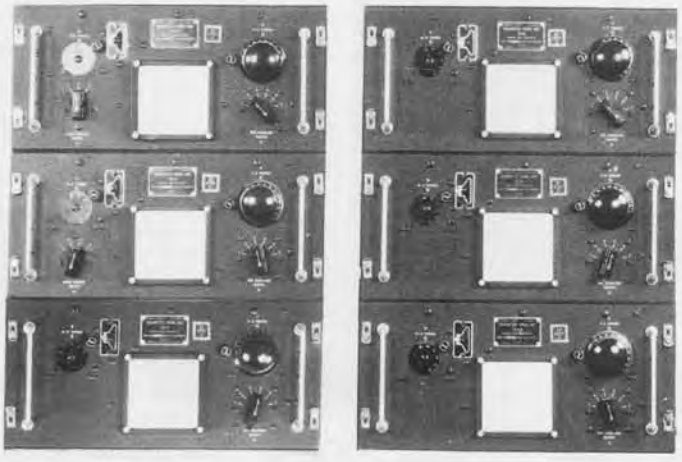
Antenna Tuning Unit

Radio Receiver BC-348-H

Tuning Unit TU-26-B

Tuning Unit TU-5-B

Tuning Unit TU-7-B



Tuning Unit TU-8-B

Tuning Unit TU-9-B

Tuning Unit TU-10-B

NOT SHOWN: Tuning Units TU-6-A and TU-22-A

RADIO SET SCR-287 TOTAL WEIGHT 275 LBS.

Component	Nomenclature	Size	Weight
Radio Transmitter	BC-375-( )	24" x 22" x 10"	49 Lbs.
Antenna Tuning Unit	BC-306-A, BC-306-B	18" x 10" x 10"	10 Lbs.
Reel	RL-42-A	6" x 9" x 5"	6 Lbs.
Reel Control Box	BC-461	4" x 6" x 3"	2 Lbs.
Radio Receiver	BC-348-( )	18" x 10" x 11"	40 Lbs.
Tuning Unit	TU-26-B	17" x 8" x 9"	15 Lbs.
Tuning Unit	TU-5-B	17" x 8" x 9"	15 Lbs.
Tuning Unit	TU-7-B	17" x 8" x 9"	12 Lbs.
Tuning Unit	TU-8-B	17" x 8" x 9"	12 Lbs.
Tuning Unit	TU-9-B	17" x 8" z 9"	12 Lbs.
Tuning Unit	TU-10-B	17" x 8" x 9"	12 Lbs.
Tuning Unit	TU-6-B	17" x 8" x 9"	13 Lbs.
Tuning Unit	TU-22-A	17" x 8" x 9"	13 Lbs.
Dynamotor	PE-73-B	11" x 11" x 8"	39 Lbs.

and includes plugs, cables, adapters etc.

March 1945

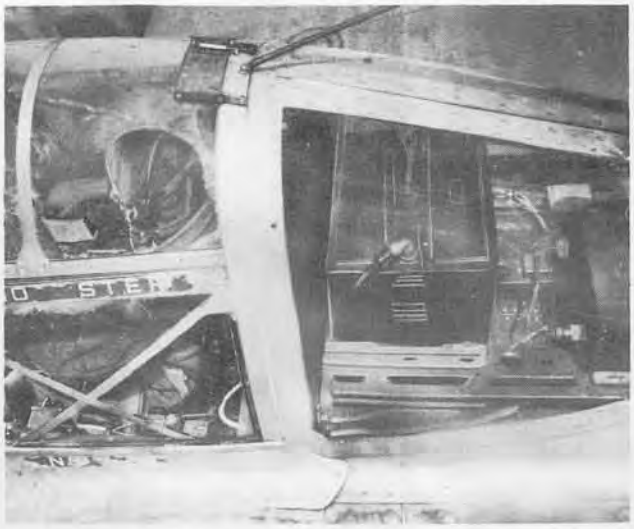
Radio Set SCR-522-A is a VHF, 24-volt command set, identical with SCR-542, with the exception of the latter's 12-volt dynamotor. It is also similar to, and interchangeable with the British VHF Command Equipment, Type TR-1143.

Radio Set SCR-522-A is used in interceptor pursuit planes and provides communication between planes in flight, and between planes and the ground, the latter in conjunction with Ground Control Net System SCS-2 and SCS-3, and Control Net Addition SCS-4. The equipment is also used with bombers and transports for communication with escort fighter planes.

The equipment has four push button operated, crystal-controlled channels within the frequency range of 100 to 156 mc, with voice transmission on three channels and "pip squeak" transmission on the fourth channel. Reception is usually on the same four frequencies, three of which are ordinarily used.

Test equipment required for maintenance includes Test Equipments IE-36, IE-19 and IE-12.

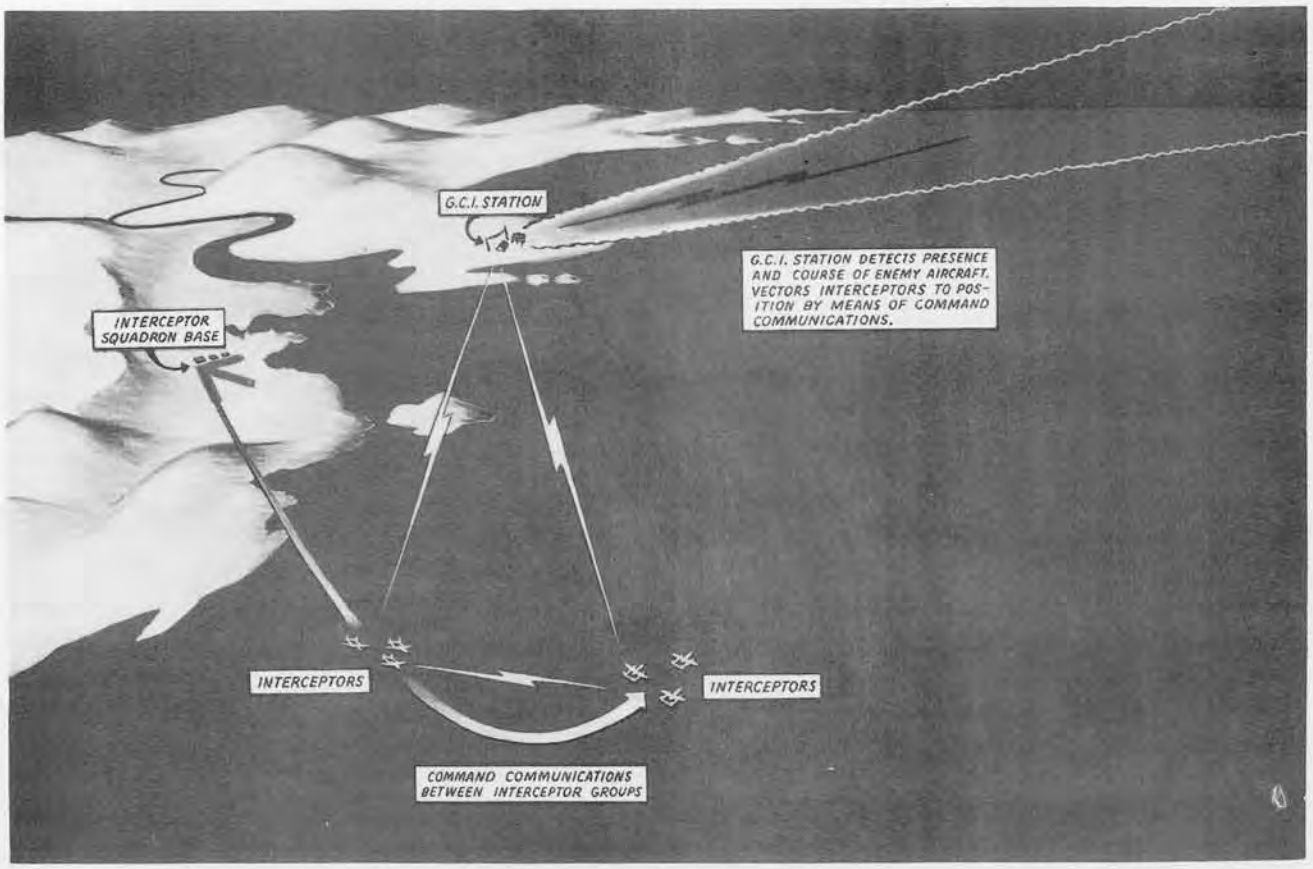
Army Supply Program requirements as of 27 December 1944 were 93,555 for the calendar year 1944, and 21,095 for 1945.



Radio Set SCR-522 installed in P-38E aft of pilot position

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	12J5GT	3	12SG7
1	12C8	2	832
1	9002	3	12A6
3	9003	1	6G6G
1	12AH7GT	2	6SS7

POWER INPUT	325 WATTS @ 28 VOLTS
POWER OUTPUT	6 WATTS
FREQUENCY	100-156 MC.
TYPE OF SIGNAL	VOICE
RANGE	130 MILES AT 10,000 FEET (LINE OF SIGHT)



Installed in most types of tactical aircraft for providing command communication facilities, Radio Set SCR-522, capable of being operated on any one of four preset channels in the 100-156 mc. range, may be employed by pilots of fighter aircraft to receive information to aid in the interception of enemy planes.

SCR-522-A

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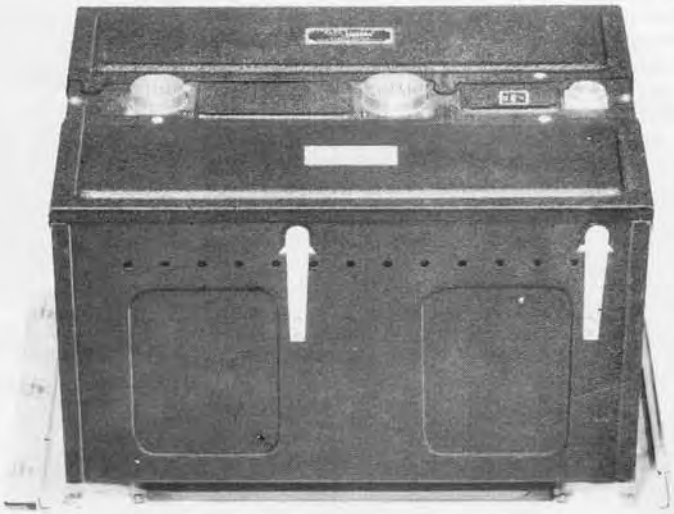
Antenna Mast AN-104



Radio Receiver BC-624-A
Radio Transmitter BC-625-A
In Case CS-80

Radio Control Box BC-602-A

Dynamotor Unit PE-94-C

RADIO SET SCR-522-A

TOTAL WEIGHT 125 LBS.

Component	Nomenclature	Size	Weight
Case	CS-80	17" x 13" x 11"	29 Lbs. with
Radio Transmitter	BC-625-A		transmitter and
Radio Receiver	BC-624-A		receiver and rack.
Rack	FT-244-A		
Crystal Unit	DC-11-A (8 each)	2" x 2" x 1"	*
Dynamotor Unit	PE-94-A	13" x 9" x 7"	37 Lbs.
Dynamotor Unit	PE-98-A	13" x 9" x 7"	37 Lbs.
Jack Box	BC-629-A (Pilot)	5" x 3" x 2"	*
Jack Box	BC-630-A (Pilot Crew)	5" x 3" x 2"	*
Jack Box	BC-631-A (Other Crew)	5" x 3" x 2"	*
Junction Box	JB-29-A	9" x 5" x 3"	2 Lbs.
Radio Control Box	BC-602-A	6" x 6" x 3"	3 Lbs.

and includes cables, plugs, connectors, and etc.
* Less than 1 lb.

March 1945

SCR-585

Radio Set SCR-585 is a dual-purpose radio receiver and transmitter designed for two-way glider communication over distances up to one mile. It is a portable radio telephone, receiving and transmitting on the same frequency.

When operated in a glider, headphones and a throat microphone are used. While headphones are available for both pilot and co-pilot, provision is made for only one microphone.

By unbuckling the strap and buckle assembly, and pushing the release lever, Radio Receiver and Transmitter BC-721 is released and becomes a press-to-talk self-contained portable radio telephone resembling an ordinary hand telephone set. When operated in this manner, Radio Receiver and Transmitter BC-721 is automatically turned on by fully extending the self-contained telescopic antenna. No volume control is used with the radio receiver and transmitter when it is being operated as a portable radio telephone.

Radio Set SCR-585 is crystal controlled on both reception and transmission, and will operate over the frequency range of 3500 to 6000 kc. Each unit, however, is adjusted to operate at only one frequency at a time in this band. Reception and transmission are on the same frequency. The set can be made to operate at any frequency in the band by proper choice of crystals and coils. For correct performance, each set must have coils adjusted to the crystals used. The coils and crystal changes and their adjustments cannot be made by the operator, but are set by the manufacturer, or by maintenance men at authorized repair depots.

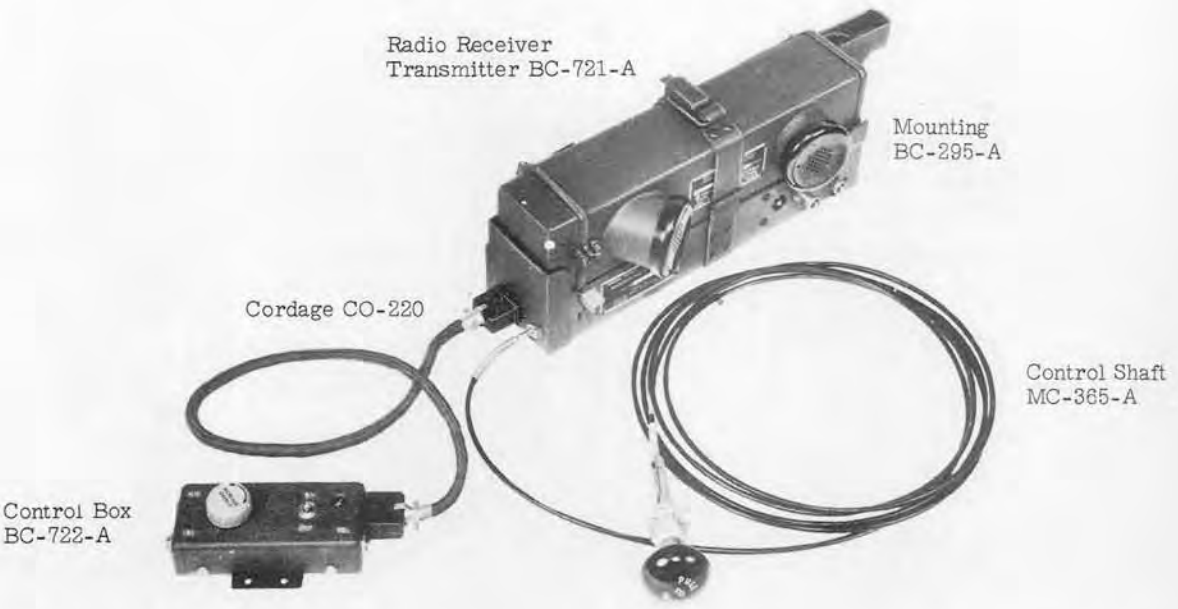
Test equipment required for maintenance includes test equipment IE-17-B.

There were no Army Supply Program requirements as of 30 November 1944.

Installation of Control Box and "pull to talk" switch on instrument panel, pilots position in CG-4A glider.

POWER SUPPLY	BA-37 AND BA-38 BATTERIES
POWER OUTPUT	0.25 WATTS PEAK
FREQUENCY	ONE PRETUNED FREQ. IN 3500-6000 KC BAND
TYPE OF SIGNAL	VOICE
RANGE	GLIDER TO GROUND-5 MILES, GROUND TO GROUND . 1 MILE.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2 1	1R5 1T4	2	3S4



RADIO SET SCR-585

TOTAL WEIGHT 10 LBS

Component	Nomenclature	Size	Weight
Mounting	FT-295-( )	5" x 5" x 17"	4 Lbs
Radio Receiver & Transmitter	BC-721-( )	4" x 6" x 17"	5 Lbs.
Radio Control Box	BC-722-( )	2" x 3" x 6"	1 Lb.

March 1945

Radio Set SCR-624 is a VHF ground-air communication set which utilizes components of the SCR-522 airborne VHF command set and necessary auxiliary equipment for use as a ground station. It is especially designed for transportation by air with the major components contained in two foot-locker chests.

It is intended for use at advance landing fields to provide ground-air communications with aircraft equipped with SCR-522; the equipment may also be used to some extent for point-to-point communication on the ground. The SCR-522 four-channel crystal controlled transmitter and receiver is used in this equipment with the d.c. dynamotor unit replaced by a special a.c. rectifier, RA-62-C, operating from the gasoline engine-driven power unit PE-75-D. When available, a commercial 100-130 volt or 230-260 volt, 40 to 60 cycles, single phase power source can be used.

Remote control facilities except "on-off" switching are provided for operation up to a maximum of 500 feet. Remote send-receive operation is possible up to two miles where field or open wire lines are available. Channel selection is accomplished at the transmitter-receiver chest or at the remote control station up to 500 feet away.

Loudspeaker LS-10 is a part of this radio set. While the loudspeaker may not be required under certain conditions, it is particularly useful in tower control work.

Radio Set SCR-624-B is the same as SCR-624-A except CH-170 has been eliminated, and its contents have been placed in Chest CH-172-B and Chest CH-173-B.

Test Equipment required for the maintenance and tuning of SCR-624 includes Test Equipment IE-19 or Test Set I-139-A.

Army Supply Program requirements as of 1 December 1944 were 5,068 for the calendar year 1944 and 988 for 1945.

POWER INPUT	165 WATTS @ 110 VOLTS
POWER OUTPUT	8 TO 10 WATTS (max.)
FREQUENCY	100-156 MC
TYPE OF SIGNAL	AM-VOICE ON 4 PRE-SET CRYSTAL FREQUENCIES
RANGE	LINE OF SIGHT TO 100

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	832	2	12AH7GT
4	12A6	3	12SG7
1	6G6G	1	12H6
1	12C8	1	6SS7
1	9002	1	6X5GT/G
3	9003	2	5U4G

Radio Set SCR-624 provides an easily assembled short range ground - to air command communications facility for use at newly established landing strips and on captured enemy air fields.

March 1945

SCR-624

Chest CH-173-B
(Interior View Showing Equipment in Place, Except Control Boxes).

Chest CH-172- A
Completely Packed

Control Box
BC-1313

Control Box
BC-1314

Control Box
BC-1312

Antenna Mast MA-7-A
Crated for Shipment

RADIO SET SCR-624

TOTAL WEIGHT 500 LBS.

Component	Nomenclature	Size	Weight
Radio Transmitter	BC-625-AM		
Radio Receiver	BC-624-C		
Rack	FT-244-A		
Case	CS-80-C		
Mounting	FT-488		
Control Box	BC-1313		
Control Box	BC-1312		
Chest	CH-172-B	17" x 18" x 35"	205 Lbs.
Chest	CH-183-B	17" x 18" x 35"	124 Lbs.
Antenna	AN/94-C		
Mast	MA-7-A		152 Lbs.
Loudspeaker	LS-10-A		
Power Unit	PE-75-D		
Rectifier	RA-62-C		

and includes cords, set of metal stakes, kit of tools and spare tube boxes.
Weight of chests include weight of components packed in each.

March 1945

TEST Equipment

Test Equipment AN/AIM-1 is a Class A special test equipment designed to test installations of Interphone Equipment AN/AIA-1 and AN/AIA-1A in glider, tow plane and tow rope. It consists of Test Set TS-161/AI, Test Set TS-162/AI, Test Set TS-163/AI and Carrying Case CY-112/AIM-1.

Test Set TS-161/AI is a portable test set employed as a visual indicating device for checking the continuity of the conductors on a tow rope prior to attachment to glider and tow plane.

Test Set TS-162/AI is a portable test set for checking the wiring and operation of the glider components installed in gliders.

Test Set TS-163/AI is a portable test set for checking the wiring and operation of the two plane components installed in a tow plane.

Carrying Case CY-112/AIM-1 has a removable lid with carrying handle, and fasteners on two sides. It is used to carry Test Sets TS-161/AI, TS-162/AI and TS-163/AI.

No test equipment is required for maintenance.

There were no Army Supply Program require - as of 30 November 1944.

POWER INPUT	BATTERIES TS-161/AI-2-BA-30, TS-162/AI-2-BA-30.
FREQUENCY	AUDIO FREQUENCIES
TYPE OF SIGNAL	VOICE

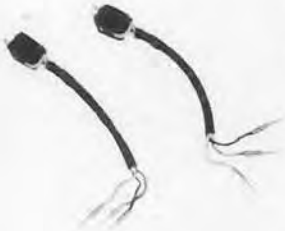
Carrying Case CY-112/AIM-1

Test Set TS-161/AI

Adapter U-14/AI

Test Rod M-143/AI

Test Set TS-162/AI



Cord CX-151/AI

Test Set TS-163/AI

TEST EQUIPMENT AN/AIM-1

TOTAL WEIGHT 8 LBS.

Component	Nomenclature	Size	Weight
TEST SET TS-161/AI			
Test Set	TS-161/AI	6" x 4" x 2"	1 Lb.
Adapter	U-14/AI		*
Test Rod	MX-143/AI		*
and includes batteries*, pilot light and plug.			
TEST SET TS-162/AI			
Test Set	TS-162/AI	6" x 4" x 2"	1 Lb.
Cord	CX-151/AI	Length 5 inches	*
and includes batteries*, jacks, transformer, cordage and plug.			
TEST SET TS-163/AI			
Test Set	TS-163/AI	3" x 4" x 2"	*
Cord	CX-151/AI	5"	*
and includes jacks, cordage and plug.			
Carrying Case	CY-112/AIM-1	8" x 7" x 6"	4 Lbs.

*Batteries not furnished

*Less than one pound

March 1945

AN/ARM-1

Radio Test Set AN/ARM-1 is Class B special test equipment for Radio Set AN/ARC-3 consisting of Test Unit TS-178/ARM-1, Power Junction Box J-68/ARC-3, Dynamotor Units DY-21/ARC-3 and DY-22/ARC-3, Chest CY-146/ARM-1, Control Box C-118/ARC-3 and associated cords and tools.

Test Unit TS-178/ARM-1 provides means for measuring the various grid currents and voltages necessary for completely testing and aligning Radio Transmitter T-67/ARC-3 and Radio Receiver R-77/ARC-3. It consists of a case containing a single meter, a rotary selector switch with eight positions and necessary shunt and series resistors. The unit has a permanently attached 5 foot cord with Plug PL-152 on the end for connection to the transmitter or receiver.

Control Box C-118/ARC-3 is a push button control box for remotely controlling the operation of both the receiver and transmitter. It contains eight channel selection push buttons, one "Off" button, on phone jack and one microphone jack. Channel selection buttons have on top letters, A to H inclusive, filled with fluorescent paint.

Adapter MX-293/ARM-1 is a device for connecting a 12 mc. signal generator to the mixer grid of Radio Receiver R-77/ARC-3.

Dynamotors DY-21/ARC-3 and DY-22/ARC-3 are used to supply plate currents to the transmitter and receiver respectively.

Shunting Unit MX-294/ARM-1 is an IFF shunting unit used in the alignment of the IFE stages of Radio Receiver R-77/ARC-3. It consists of a condenser and resistor in series.

Radio Test Set AN/ARM-1(XA-1)

No test equipment is required for maintenance.

Development of this equipment has been completed and production is expected to start in February 1945. Army Supply Program requirements for AN/ARM-1 as of 30 November 1944 were 2,500 for the calendar year 1945.

POWER INPUT	28 VOLTS D.C.

Radio Test Set AN/ARM-1(XA-1) (as used in testing AN/ARC-3)

RADIO TEST SET AN/ARM-1

TOTAL WEIGHT 40 LBS.

Component	Nomenclature	Size	Weight
Test Unit	TS-178/ARM-1	2" x 6" x 3"	2 Lbs.
Power Junction	J-68/ARC-3	4" x 10" x 9"	6 Lbs.
Mounting	MT-236/ARC-3	9" x 11" x 2"	1 Lb.
Dynamotor Unit	DY-21/ARC-3	4" x 8" x 4"	9 Lbs.
Dynamotor Unit	DY-22/ARC-3	4" x 8" x 4"	5 Lbs.
Control Box	C-118/ARC-3	6" x 7" x 3"	2 Lbs.
Mounting	FT-240-A	1" x 6" x 7"	1 Lb.
Shunting Unit	MX-294/ARM-1	2" x 1" x 1"	1 Lb.
Adapter	MX-293/ARM-1	1" x 1" x 1"	1 Lb.
Shorting Plug	U-30/ARM-1	2" x 2"	
Alignment Tool	MX-174/ARM-1		
Chest	CY-146/ARM-1	10" x 15" x 17" (filled)	55 Lbs.
Tuning Wand	MX-173/ARM-1		
Cord	CX-214/ARM-1	12 feet long	
Cord	CX-215/ARM-1	5 feet long	
Cord	CX-216/ARM-1	5 feet long	
Cord	CX-217/ARM-1	10 feet long	

and includes adapter and relay forming tools.

March 1945

Test Set I-56 is a universal, general purpose radio test set which consists of a Carrying Case CS-130 containing the following major units: Voltohmmeter I-166, Test Unit I-176 and Tube Tester I-177.

Voltohmmeter I-166 is a general utility test instrument and includes the necessary leads. It provides for the measurement of the following:

AF output voltage 0-1.5-5-15-50-150(4000 ohms)
AF output voltage 0-5-15-30- (300 ohms)
AC volts 0-500 (1000 ohms/volts)
DC volts 0-5-15-50-150-500-1500(1000 ohms/volt)
Ohms 0-1000-10,000-100,000-1,000,000

Test Unit I-176 is used in free point testing of radio equipment and includes the necessary leads. It provides for the measurement of the following:

DC volts 0-5-25-100-250-1000-5000(200 ohms/volt)
AC volts 0-5-25-100-250-1000 (1000 ohms/volt)
DC current 0-1.5 amperes
AC current 0-0.5-1-5-10 amperes
Ohms 0-1000-100,000-10,000,000
DC volts 0-5-25-100-250-1000(1000 ohms/volt)
DC milliamperes 0-1-10-100-500 ma
DC microamperes 0.50

Tube Tester I-177 is a portable tube tester of the dynamic of mutual transconductance type capable of operation on 110 and 220 volts 50-60 cycles a.c. The tester has a three inch circular meter in its own case and will check practically all tubes in current use by the Army under 10 watts plate dissipation.

This test set differs from previous versions of I-56 in that it does not include an analyzer and it has a smaller case. The tube tester is also of the mutual conductance type.

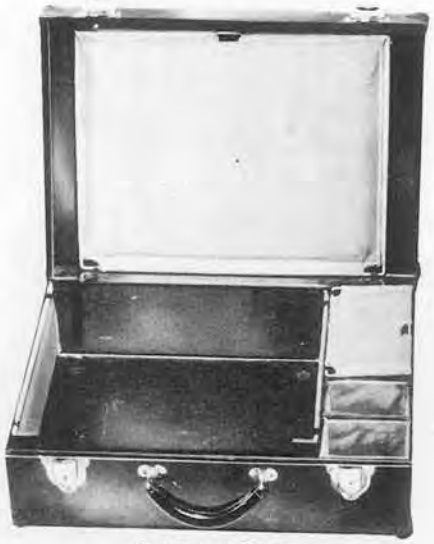
Army Supply Program requirements as of 1 October 1944 were 11,818 for the calendar year 1944 and 6,513 for 1945.

POWER INPUT	I-177; 110 VOLTS, 60 CYCLE AC. I-176; I-166 SELF CONTAINED BATTERIES

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	83	1	5Y3GT/G

Voltohmmeter
I-166

Output Meter
I-176



Carrying Case

Tube Tester
I-177

TEST SET I-56

TOTAL WEIGHT 60 LBS.

Component	Nomenclature	Size	Weight
Voltohmmeter	I-166	7" x 6" x 6"	5 Lbs.
Test Unit	I-176	12" x 8" x 6"	11 Lbs.
Tube Tester	I-177	16" x 8" x 6"	15 Lbs
Adapter	M-418	3" x 3" x 2"	1 Lb.
Minature Tube Pin Die.	TL-220	Height 2" x Diam. 2"	1 Lb.
Minature Tube Socket Tool	TL-219	Height 2" x Diam. 1"	1 Lb.
Tube Cap Lead			
1 set Data Card (mounted on inside cover)			

and includes test leads

March 1945

Signal Generator I-72 is a portable test equipment, incorporating a radio frequency oscillator, for use in aligning radio sets. It has a range of 100 kc. to 32 mc. in five bands with 400 cycle modulation. The RF output voltage which is uncalibrated with the attenuator set for maximum is over 30,000 microvolts on all bands except in the region of 10,000 to 20,000 kc. where the maximum obtainable output may be 10,000 microvolts or over. It operates on 110-125 volt, 60 cycle a.c. and is contained in a metal cabinet. A shielded output lead and a spare fuse are mounted on clips attached to the inside of the cover. The generator consists of a tuned plate oscillator, modulator, attenuators, and filament and plate supply.

The following types of signals are available and may be selected by means of a switch on the front panel: Radio frequency, radio frequency 30 percent modulated and 400 cycles audio frequency. Two knobs control the output-one, a four step course control; the other, a continuously variable potentiometer.

I-72 is used for the general alignment of RF and IF stages and for rough frequency checks of various radio sets. It is a part of Maintenance Set RC-30 and Test Equipment IE-26 and IE-27.

No test equipment is required for maintenance.

There were no Army Supply Program requirements as of 30 November 1944.

POWER INPUT	115 VOLTS, 60 CPS
FREQUENCY	100 KC TO 32 MC IN 5 BANDS
TYPE OF SIGNAL	CW; MCW; 400 CYCLE AM.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1 1	76 80	1	6J5GT/G

Signal Generator I-72-( )

SIGNAL GENERATOR I-72

TOTAL WEIGHT 23 LBS.

Component	Nomenclature	Size	Weight
Signal Generator	I-72-( )	10" x 16" x 7"	20 Lbs.

and includes plus cords, plugs, tubes, etc.

March 1945

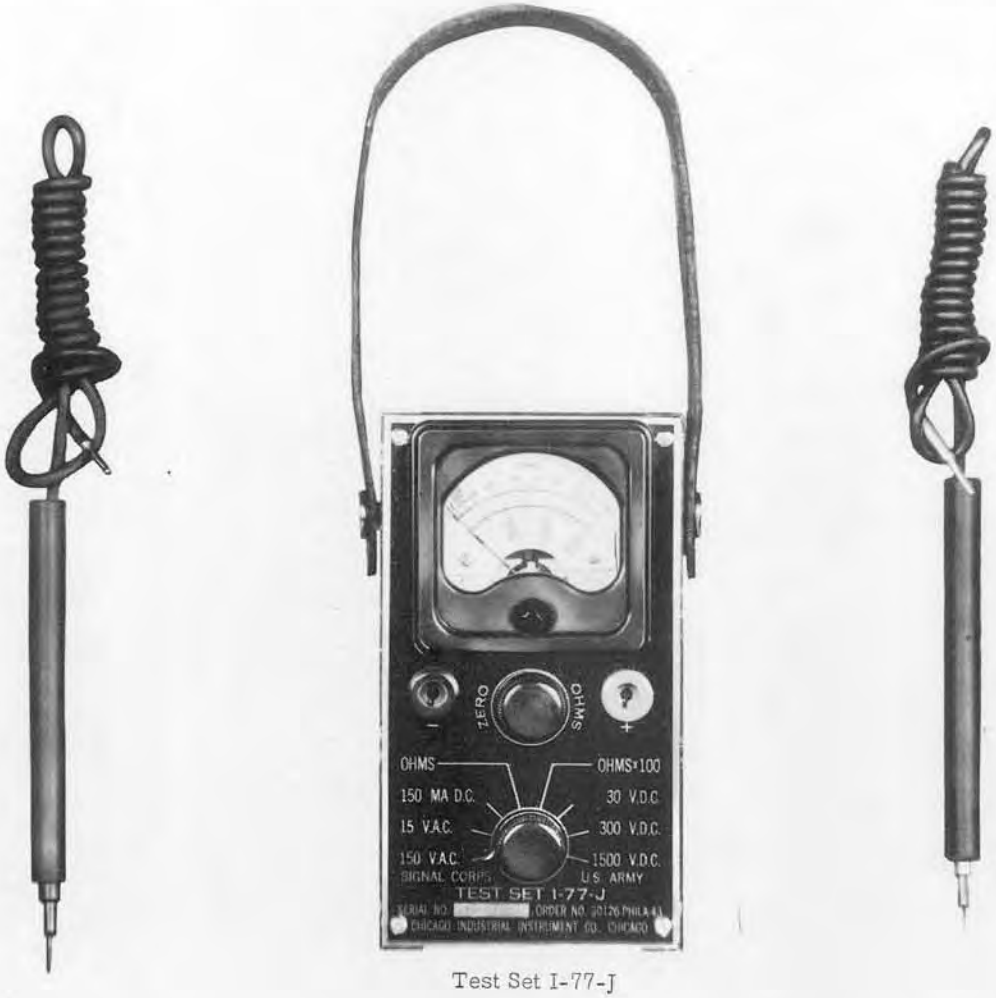
Test Set I-77 is a pocket-size, multi-range meter for rapid testing of voltage, current and resistance. It provides for direct reading over all ranges by means of the various scales printed directly on the face of the meter. Selection of the various measurement ranges is made by means of a single knob which operates a two-pole, light-position switch. A second knob is provided for obtaining zero adjustment of the indicating needle when measuring resistance. Red and black test leads and a leather carrying strap are provided.

This test set is a part of Radio Set SCR-277. Multimeter TS-297/U; now under development, is to replace Test Set I-77 for AAF use. It differs from I-77 in that the instrument is hermetically sealed, has greater ranges, and the selector switch is omitted.

No test equipment is required for maintenance.

There were no Army Supply Program requirements as of 30 November 1944.

POWER INPUT		Battery; 1-BA-42, 1.5 volts
RANGE:	AC. Voltage	0-150 Volts (1000 ohms per volt) 0-15 Volts (1000 ohms per volt)
	DC. Voltage	0-30 Volts (1000 ohms per volt) 0-300 Volts (1000 ohms per volt) 0-1500 Volts (1000 ohms per volt)
	Current DC.	0-150 Milliamperes
	Resistance	0-3000 ohms (35 ohms 1/2 scale) 0-300,000 ohms (3500 1/2 scale)
SENSITIVITY		1000 Ohms/volt



Test Set I-77-J

TEST SET I-77

TOTAL WEIGHT 2 LBS.

Component	Nomenclature	Size	Weight
Test Set	I-77	5" x 3" x 3"	1 Lb.
1 set test leads			*

* Less than one pound.

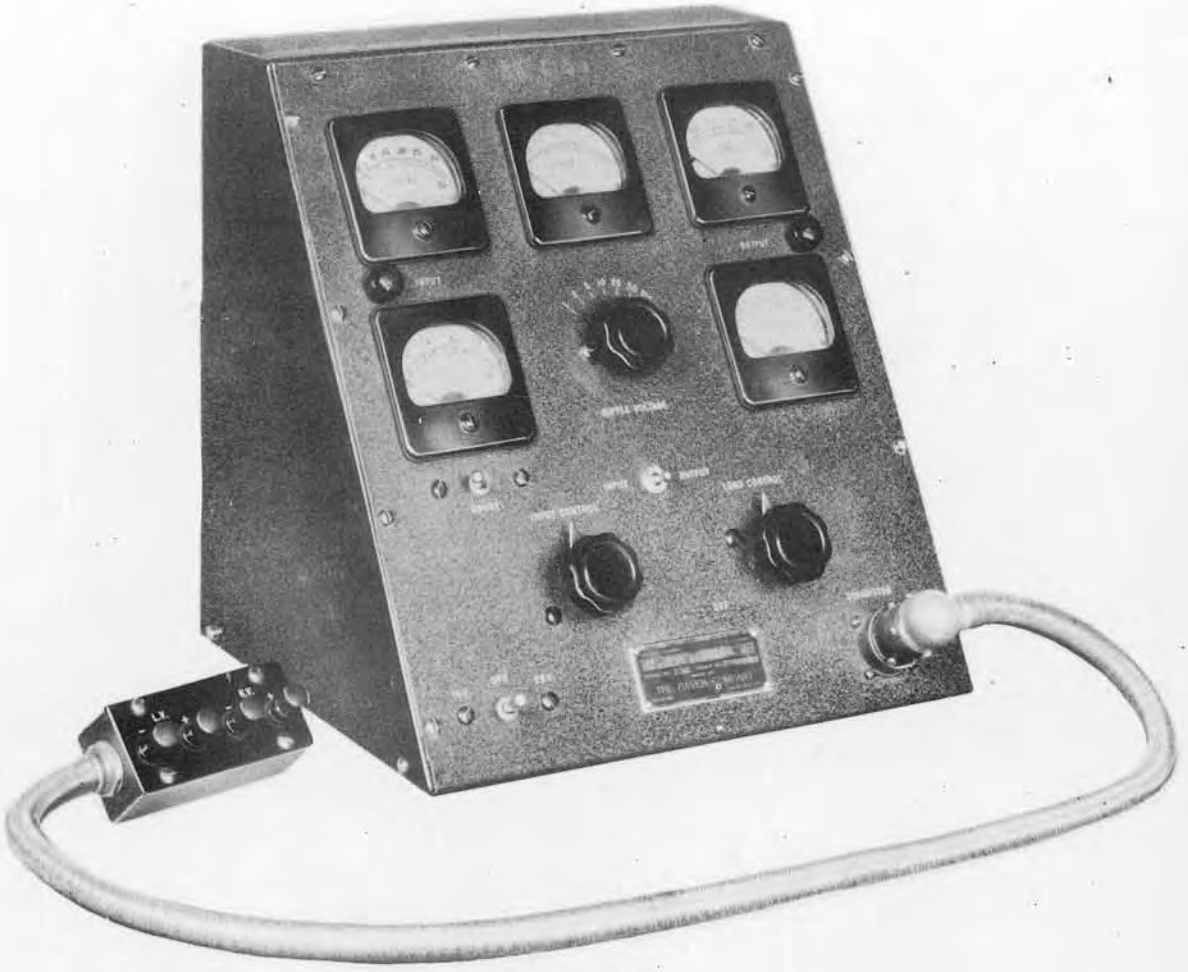
March 1945

Test Set I-83 consists of a primary voltage selector, meters for both input and output current and voltage, selector for input ammeter, input series rheostat and output local rheostat. This test set is used with various radio sets for measuring input currents and voltage, output current voltage and input and output ripple voltage of various 12 and 24 volt dynamotors and dynamotor units.

No test equipment is required for maintenance.

Army Supply Program requirements as of 1 October 1944 were 1,370 I-83 for the calendar year 1944.

POWER INPUT	14 AND 28 VOLTS DC
RANGE	CURRENT 0-250-MA DC. VOLTAGE 0-10 AMPERES DC. 0-2 VOLTS DC. 0-35 VOLTS DC. 0-500 VOLTS DC.



Test Set I-83-( )

TEST SET I-83

TOTAL WEIGHT 24 LBS.

Component	Nomenclature	Size	Weight
Test Set	I-83-( )	13½ x 13" x 11"	23 Lbs.

and includes cords and plugs.

March 1945

Test Set I-139, which has been designated TS-60/U, consists of a 2 1/2 inch diameter 0 to 1 milliampere d.c. meter inclosed in a container to which is attached a 5 foot cable with a special plug. It is capable of measuring current in five positions for radio transmitters, one position for receivers and two positions in Signal Generator I-130. The combined series resistance of the meter and resistor is 75 ohms. It is used for general test purpose and to permit proper tuning of various radio equipments.

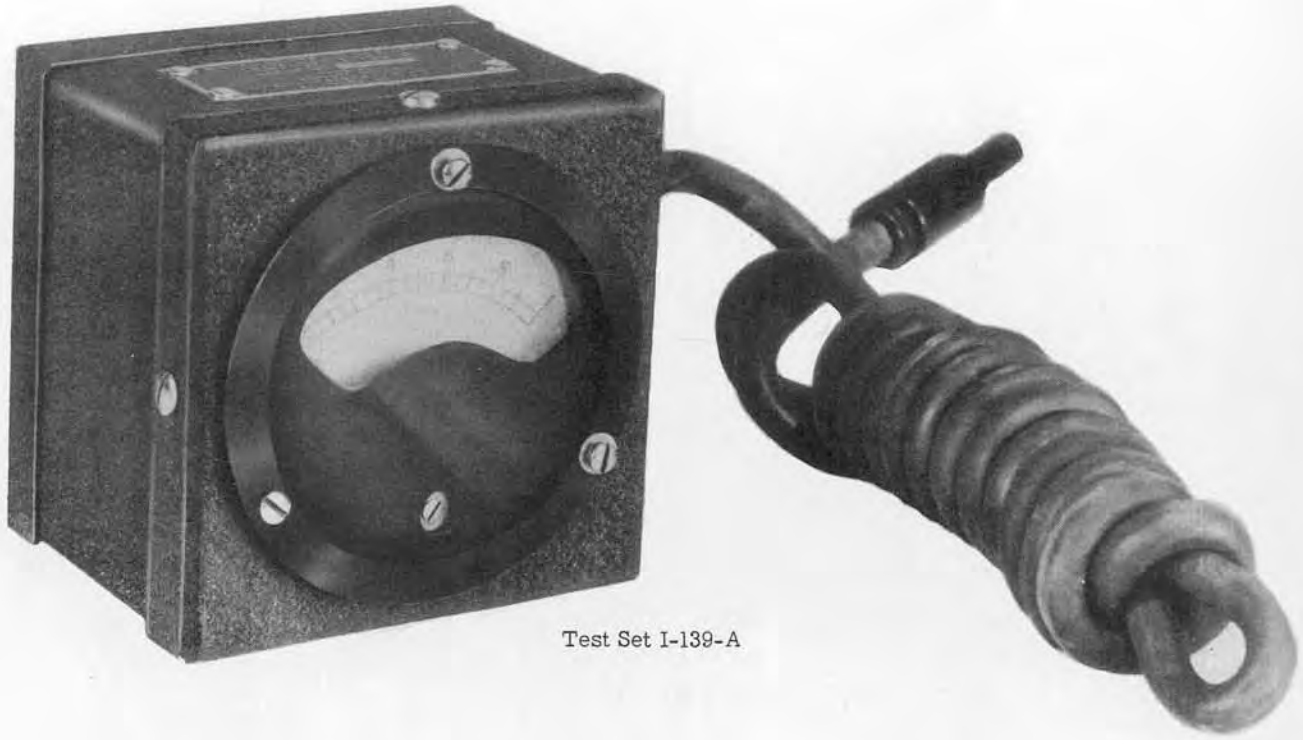
This test set is also used to measure RF output when used with Pickup Assembly TS-131/AP for tuning various RCM equipments. By the use of external multipliers, currents and voltage measurements may be made on various equipments.

No test equipment is required for maintenance.

This test set may be used separately or as a part of Test Equipment IE-19.

Army Supply Program requirements as of 30 November 1944 were for 20,387 for the calendar year 1944, and 2,135 for 1945.

RANGE	0-1 MILLIAMPERE D.C.



Test Set I-139-A

TEST SET I-139

TOTAL WEIGHT 2 LBS.

Component	Nomenclature	Size	Weight
Test Set	I-139-A	4" x 4" x 4"	2 Lbs.

March 1945

Test Equipment IE-12, used in testing, tuning, aligning and servicing Radio Sets SCR-522 and SCR-542, is primarily designed for bench servicing at higher echelon repair sections. When completely assembled, the test equipment simulates the actual installation of the radio set in the airplane. Since the equipment includes a complete SCR-522 with Dynamotor PE-94, a means of checking by comparison is also available for individual assemblies, components and units of SCR-522 or SCR-542 on test. This test set also permits alignment of the IF stages which cannot be accomplished by Test Equipment IE-19.

Signal Generator I-96 is used in tuning and aligning BC-624 and BC-625. The wooden carrying case, which contains all the components of the signal generator, is divided into six compartments, five of which are shielded.

Field Strength Meter I-95 is an uncalibrated vacuum tube voltmeter designed to indicate the relative field strength and frequency of the radiation from the antenna of SCR-522 and SCR-542. The instrument may also be used to indicate modulation of the carrier. The field strength meter consists of a case on which the front panel and rear cover are mounted. A telescopic antenna, a front panel guard and all the electrical components (except the batteries) of the field strength meter are mounted on the front panel.

The transmitter-receiver assembly consists of Case CS-80-A which contains Rack FT-244-A, Radio Transmitter BC-625 and Radio Receiver BC-624. When properly interconnected to the other components of Test Equipment IE-12 this assembly provides transmission or reception of amplitude-modulated RF energy on any one of four crystal-controlled frequencies within the range 100-156 mc. Only voice communication facilities are available, but continuous audio-tone modulation is also provided. The AF amplifier portion of BC-624 is so designed that interphone communication between two or more stations is possible.

Both the transmitter and receiver are simultaneously switched to any one of the four available pre-set crystal-controlled channels whenever the appropriate channel-selector push button is pressed. Remote control only is provided.

Army Supply Program requirements as of 30 November 1944 were 1,711 equipments for the calendar year 1944 and 456 for 1945.

TYPE OF SIGNAL	VOICE: MCW
RANGE	0-1 MA. D.C.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	832	7	9003
4	12A6	2	12AH7GT
1	6G6G	3	12SG7
1	6SS7	1	0D3/VR-150
1	12H6	1	5Y3GT
1	12C8	1	1S5
3	9002		

Signal Generator I-96-A

Special Tool Set

Field Strength Meter I-95-BM

Microphone T-17

Microphone Adapter M-299

Headset HS-33

PHOTOGRAPHS OF SCR-522 COMPONENTS LISTED BELOW SHOWN ON PAGE "SCR-522"

TEST EQUIPMENT IE-12

TOTAL WEIGHT 200 LBS.

Component	Nomenclature	Size	Weight
Radio Transmitter	BC-625-AM	16" x 9" x 6"	18 Lbs.
Radio Receiver	BC-624-C	16" x 9" x 6"	18 Lbs.
Rack	FT-244-A	17" x 13" x 3"	7 Lbs.
Case	CS-80-C	17" x 13" x 11"	4 Lbs.
Radio Control Box	BC-602-B	6" x 6" x 3"	3 Lbs.
Dynamotor Unit	PE-94-C	13" x 9" x 7"	37 Lbs.
Jack Box	BC-631-B	4" x 3" x 2"	*
Field Strength Meter	I-95-BM	7" x 9" x 7"	11 Lbs.
Signal Generator	I-96-A	27" x 19" x 10"	82 Lbs.
Mounting	FT-488	19" x 13" x 1"	2 Lbs.
Mounting	FT-498	13" x 9" x 1"	*
T Junction Box	JB-29-A	4" x 3" x 3"	3 Lbs.
Special Tool Set		8" x 8"	*
Headset	HS-33		1 Lb.
Microphone Adapter	M-299	4" x 3" x 2"	1 Lb.
Microphone	T-17		*

and includes cords, plugs, and receptacles.
*less than one pound.

Test Equipment IE-19 is a portable test equipment for use by tactical organizations in aligning the channels in Radio Sets SCR-522 and SCR-542. The test equipment is especially designed for use inside or near the aircraft in which the radio sets are installed. It consists of Signal Generator I-130, Test Set I-139, Field Strength Meter I-95 and Chest CH-93-A.

Signal Generator I-130 is used in tuning Radio Transmitter BC-625 and Radio Receiver BC-624 and produces tone-modulated signals in the frequency range 100-156 mc. The modulation frequency is 1000 cycles. The output, which is uncalibrated, is variable from nearly zero to more than 5000 microvolts.

Test Set I-139 is a 0-1 milliampere d.c. meter designed for measuring current in five positions in BC-625, one position in BC-624 and two positions in I-130. The combined series resistance of the meter and resistor is 75 ohms.

Field Strength Meter I-95 is an uncalibrated vacuum-tube voltmeter designed to indicate the relative field strength and frequency of the radiation from the antenna of SCR-522. This instrument may also be used to indicate modulation of the carrier. The field strength meter consists of a metal case on which the front panel and rear cover are mounted. The total power consumption of I-95 is 0.87 watts.

Chest CH-93-A is designed for use in storing or transporting IE-19. Each component of the test equipment fits into a separate compartment and requires no special packing in the chest.

No test equipment is required for maintenance.

Army Supply Program requirements as of 29 December 1944 were 4,093 for the calendar year 1944, and 1,552 for 1945.

FREQUENCY	100-156 MC.
POWER SOURCE	DRY BATTERIES
METER ACCURACY	± 3%
METER MOVEMENT	0-1 MA.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
	I-130-( )		I-95-( )
2	9002	1	1S5
3	9003		

Signal Generator I-130-A

Cord CD-477

Chest CH-93-A

Field Strength Meter I-95-BM

Test Set I-139-A

Battery Box BX-33-A

TEST EQUIPMENT IE-19

TOTAL WEIGHT 100 LBS.

Component	Nomenclature	Size	Weight
Signal Generator	I-130-A	19" x 10" x 8"	28 Lbs.
Test Set	I-139-A	4" x 4" x 4"	2 Lbs.
Field Strength Meter	I-95-BM	9" x 8" x 8"	11 Lbs.
Chest	CH-93-A	11" x 20" x 23"	49 Lbs.
Cord	CD-477	10 feet long	1 Lb.
Battery Box	BX-33-A	10" x 9" x 9"	10 Lbs.

and includes special tool kit.

March 1945

Test Equipment IE-36 is a portable squadron test equipment designed to make field tests of Radio Sets SCR-522-A and SCR-542-A. It can also be used for Radio Set SCR-624 and Radar Set AN/CRC-1. This item is now in production for the purpose of issue, together with Test Set I-139, as a partial replacement for Test Equipment IE-19.

Particularly designed to fill the need for a small readily portable test unit which can be used at the point of installation, IE-36 provides a means for making trouble-shooting tests and tuning adjustments on the above radio equipments. Although it is usually used with and contains mounting space in the chest for Meter I-139, this meter is used as a separate item.

Main application of IE-36 is in airplane squadrons where a check of SCR-522 installation and/or a change in channel frequencies can be made in the airplane quickly and without using large, heavy test equipment.

Control Unit BC-1303 is the major item. It provides a channel selection switch, carbon-magnetic microphone and headset jacks, a buzzer with on-off switch for use in tuning the receiver, a "Contactor on-off" switch, and a "Transmit-Receive-Remote" switch.

Phantom Antenna A-29 consists of 12 resistors, each 820 ohms, and a pilot lamp, all connected in parallel on a coaxial fitting which plugs into Socket SO-153 of the radio set.

IE-36 provides a means for testing the following: Starting and stopping mechanisms of BC-625 and BC-624; functioning of the channel selection circuits; Receiver-Transmit-Remote switching function; contactor operation in the transmitter; relative signal to microphone and resultant input modulation in the transmitter; relative sensitivity of BC-624.

IE-36 has the following limitations: It will not give an indication of field strength produced by the transmitter; it will give only relative power output as indicated by the brightness of the lamp of Phantom Antenna A-29; it will give only a relative index of modulation, not the actual percentage.

No test equipment is required for maintenance.

Army Supply Program requirements as of 30 November 1944 were 19,487 for the calendar year 1944, and 2,135 for 1945.

POWER INPUT	14 VOLTS D.C.
FREQUENCY	100-156 MC.
TYPE OF SIGNAL	BUZZER

Chest CH-234

Control Unit BC-1303

Test Set I-139-A

Phanton Antenna A-29

Cord CD-1169

Lamp extractor

Spanner Wrench

Cord CD-1170

TEST EQUIPMENT IE-36

TOTAL WEIGHT 10 LBS.

Component	Nomenclature	Size	Weight
Chest	CH-234	4" x 10" x 10"	5 Lbs.
Control Unit	BC-1303	3" x 8" x 4"	2 Lbs.
Phantom Antenna	A-29	length 3" x diam. 2"	*
Cord	CD-1169	length 16"	*
Cord	CD-1170	length 39"	*
Adjustable Spanner Wrench			
Lamp Extractor			

and includes maintenance kit and I-139.

*less than one pound.

March 1945

Frequency Meter Set SCR-211 is designed to measure or radiate any frequency between 125 kc. and 20 mc. It is a portable device used to adjust radio receivers and transmitters in the field.

The instrument is completely enclosed in a black wrinkle-finished, aluminum-alloy cabinet. Mounted on the top surface of the cabinet are a carrying handle, the antenna binding post, and a latch. On the sides are mounted two small rings to which the carrying strap is ordinarily hooked.

The cabinet consists of three principal sections: (1) Lower half containing the batteries or power supply, (2) Upper half containing the frequency meter proper, and (3) Small compartment at the front holding the headset when it is not in use.

All power for the equipment is supplied by "A" Batteries BA-23 and "B" Batteries BA-2. They are mounted in a special tray in the lower compartment of the cabinet.

Army Supply Program requirements for all services, as of 15 May 1944, were 25,266 for the calendar year 1944 and 16,748 for 1945

Frequency Meter BC-221-M

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6K8	2	6SJ7

POWER INPUT	POWER SUPPLIED BY BATTERIES
FREQUENCY	125-20,000 KC
CRYSTALS	DC-9-F (2 ea.)

Frequency Meter BC-221-J

Headset P-18 or P-20

Bag BG-81-J

FREQUENCY METER SET SCR-211

TOTAL WEIGHT 39 LBS.

Component	Nomenclature	Size	Weight
Frequency Meter	BC-221	13" x 10" x 9 1/2"	17 Lbs.
Crystal Unit	DC-9-F		
Calibration Book	MC-177		
Bag	BG-81-A		
Battery	BA-2(12 ea., 6 in use, 6 spare)		
Battery	BA-23(8 ea., 4 in use, 4 spare)		
Headset	P-18 or P-20		

March 1945

Frequency Meter TS-164/AR is a heterodyne **frequency meter adaptable** for operation in the range from 125 to 20,000 kc. with an error of .01 percent. It includes **Frequency Meter** BC-221, except the B or Q model, a **heterodyne oscillator, a high gain detector** and an audio **frequency amplifier.** Power is obtained from the aircraft 28 volt d.c. supply and from the high voltage dynamotor of Radio Receiver BC-348 in the aircraft.

TS-164/AR is designed for permanent installation in the aircraft, in association with Radio Receiver BC-348.

This equipment is similar to Frequency Meter Set SCR-211 except that it makes provision for operation without dry batteries and is contained in a different case, Case CY-182/AR.

TS-164/AR is used for calibration of medium frequency communication equipment. Principal advantages over the standard Frequency Meter Set SCR-211 are: Elimination of dry batteries; reduction in weight of approximately 20 pounds.

No test equipment is required for maintenance.

This equipment had not been placed on the Army Supply Program as of 30 November 1944.

POWER INPUT	200-250 VOLTS FROM BC-348 28 VOLTS DC FROM AIRCRAFT SYSTEM
FREQUENCY	125-20,000 KC
TYPE OF SIGNAL	CW
ACCURACY	.01 PERCENT

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	6SJ7	1	6K8

Frequency Meter TS-164/AR

FREQUENCY METER TS-164/AR

TOTAL WEIGHT 19 LBS

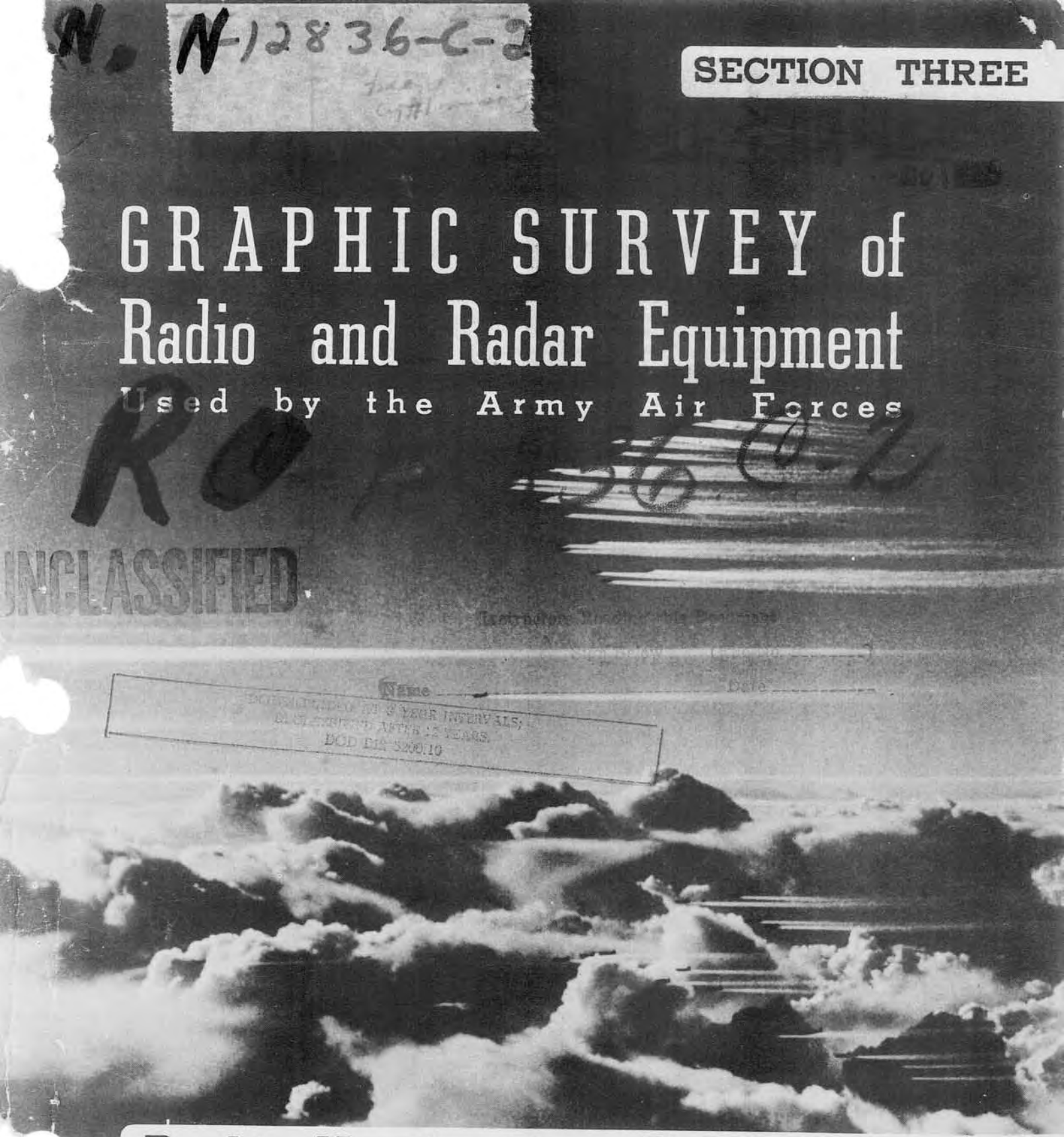
Component	Nomenclature	Size	Weight
Frequency Meter	BC-221-( )	10" x 9" x 8"	8 Lbs.
Case	CY-182/AR	8" x 12" x 10"	6 Lbs.
Cord	CX-243/AR	10 feet long	1 Lb.
Mounting	MT-269/AR	11" x 11"	2 Lbs.

March 1945

SECTION THREE

GRAPHIC SURVEY of Radio and Radar Equipment

Used by the Army Air Forces



Radio Navigation Equipment

Army Air Forces ★ Air Technical Service Command
Wright Field — Dayton, Ohio

GRAPHIC SURVEY of Radio and Radar Equipment

Used by the Army Air Forces

[redacted]

BY AUTHORITY OF DIRECTOR, ATSC — 1 May 1945

DISTRIBUTION RECORD OF THIS DOCUMENT IS MAINTAINED BY: Air Technical Service Command, Wright Field, Dayton; Att: TSERR1B

[redacted]

Hobart R. Yeager
Colonel, Air Corps

[redacted]

SECTION 3 - "RADIO NAVIGATION EQUIPMENT"

[boilerplate] GRAPHIC SURVEY

Nomenclature	Description	Present Security Classification
AN/ARA-8	VHF Homing Adapter	Unclassified
AN/ARA-9	Filter Equipment	Restricted
AN/ARN-5	Glide Path Receiver	Unclassified
AN/ARN-6	Radio Compass	Unclassified
AN/ARN-7	Radio Compass	Unclassified
AN/ARN-11	Radio Compass	Unclassified
AN/ARN-12	Marker Beacon Receiver	Unclassified
AN/ARR-1	Compass Adapter	Restricted
AN/ARR-2	Radio Receiving Equipment	Restricted
AN/ARR-6	Automatic Alarm Receiver	Restricted
AN/CRM-3	Radio Monitoring Set	Unclassified
AN/CRN-1	Buoy Transmitter	Unclassified
AN/CRN-2	Glide Path Transmitter	Unclassified
AN/CRN-4	Paratroop Beacon	Unclassified
AN/CRN-10	Air-Transportable Localizer	Unclassified
AN/CRT-3	Sea Rescue Transmitter	Unclassified
AN/MRN-1	Localizer Transmitter	Unclassified
AN/MRN-2	Radio Range Transmitter	Unclassified
AN/MRN-3	Marker Beacon Transmitter	Unclassified
BC-1206	Radio Receiver	Unclassified
RC-43A	Marker Beacon Receiver	Unclassified
RC-103A	Localizer Receiver	Unclassified
RC-115A	Marker Beacon Transmitter	Unclassified
RC-193A	Marker Beacon	Unclassified
RC-198	Filter Equipment	Unclassified
RC-210	Filter Equipment	Unclassified
SCR-269G	Radio Compass	Unclassified
SCR-277	Radio Range Transmitter	Unclassified
SCR-~~278~~ 578	Sea Rescue Transmitter	Unclassified
SCR-610	FM Receiver-Transmitter	Unclassified
SCR-629	Radio Range Transmitter	Restricted
	Test Equipment	
I-76	Test Set	Unclassified
I-100	Test Set	Unclassified
I-173	Test Set	Unclassified
TS-1/ARR-1	Test Set	Restricted
TS-41/CRN-1	Test Set	Restricted
TS-67/ARN-5	Test Set	Restricted
TS-170/ARN-5	Test Oscillator	Unclassified

[redacted]

UNCLASSIFIED

Foreword

Purpose : This Graphic Survey of Radio and Radar Equipment used by the Army Air Forces is intended to furnish authorized personnel with graphic and narrative data relative to description, electrical and physical characteristics, purpose, and tactical employment of the radio and radar equipment used by the Army Air Forces.

Restriction : The Graphic Survey is not authorized as a basis for procurement storage, or issue, but is prepared only for information and guidance of research, development, procurement, storage, issue, and staff and planning activities.

Scope : This publication is intended to cover all active equipment, both in use and in development. Publication is accomplished in a series of separate sections in order that reproduction and dissemination may be effected economically and expeditiously.

Format : Permanent binder covers are not furnished with the various sections of the Graphic Survey, but the pages of each section are printed on 8 1/2 x 11 inch paper and punched for the standard AAF three-hole binder, (binder, loose-leaf, 3 post, stock number 8700-043800), commonly known within the AAF as "Technical Order Binder". With a few exceptions, data concerning each equipment is presented on two pages. The first page contains a description and information relative to use, installation, and electrical characteristics; the second page, photographs of the various components and physical weights and dimensions. Within each section, the equipments are arranged alphabetically by official nomenclature and type designation.

Suggestions : Suggestions are invited for improvement of form, content, or to otherwise increase the ultimate utility to the user within the scope and purpose of this publication. Comments should be addressed to the Commanding General, Air Technical Service Command, Wright Field, Ohio, Attention: TSERR1B, for consideration.

Security : The Graphic Survey is classified "[redacted]" because of the broad scope of the equipment covered in each volume and the [redacted] classification of many of the equipments. Each addressee will be responsible for maintaining the security of his copies in accordance with the provisions of AR 380-5. Security classification of each individual equipment at the time of publication will be indicated on the pages relative to that equipment.

Distribution : Requests relative to distribution of this publication should be addressed to Commanding General, Air Technical Service Command, Attention: TSERR1B. Revisions and additions are forwarded periodically to original addressees in order that all copies may be kept up to date. Each copy has a serial number which is recorded on a master distribution file index.

Authority : Preparation, publication and distribution of the Graphic Survey is accomplished in accordance with letter, Headquarters, AAF(AFDMA-2F), dated 5 April 1945, subject "Graphic Survey of Radio and Radar Equipment Used by the AAF". AAF report clearance number AAF-MD-E89 has been assigned.

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X-126564-256

INDEX 1 MAY 1945

Section 3 Radio Navigation Equipment

NOMENCLATURE	DESCRIPTION	TYPE	STATUS*
AN/ARA-8	VHF Homing Adapter	Limited Procurement	P
AN/ARA-9	Filter Equipment		D
AN/ARN-5	Glide Path Receiver	Standard	P
AN/ARN-6	Radio Compass	Service Test	D
AN/ARN-7	Radio Compass	Standard	P
AN/ARN-11	Radio Compass	Standard	P
AN/ARN-12	Marker Beacon Receiver		D
AN/ARR-1	Compass Adapter	Standard	P
AN/ARR-2	Radio Receiving Equipment	Standard	P
AN/ARR-6	Automatic Alarm Receiver		D
AN/CRM-3	Radio Monitoring Set		D
AN/CRN-1	Buoy Transmitter	Standard	P
AN/CRN-2	Glide Path Transmitter	Standard	P
AN/CRN-4	Paratroop Beacon	Standard	P
AN/CRN-10	Air-transportable Localizer	Standard	P
AN/CRT-3	Sea Rescue Transmitter	Standard	P
AN/MRN-1	Localizer Transmitter	Standard	P
AN/MRN-2	Radio Range Transmitter		P
AN/MRN-3	Marker Beacon Transmitter	Standard	P
BC-1206	Radio Receiver		P
RC-43A	Marker Beacon Receiver	Standard	P
RC-103A	Localizer Receiver	Standard	P
RC-115A	Marker Beacon Transmitter		D
RC-193A	Marker Beacon		P
RC-198	Filter Equipment	Limited Standard	P
RC-210	Filter Equipment	Standard	P
SCR-269G	Radio Compass	Standard	P
SCR-277	Radio Range Transmitter	Standard	P
SCR-578	Sea Rescue Transmitter	Sub-Standard	P
SCR-610	FM Receiver-Transmitter		P
SCR-629	Radio Range Transmitter		D

Radio Navigation Test Equipment			
I-76	Test Set	Standard	P
I-100	Test Set	Standard	P
I-173	Test Set	Standard	P
TS-1/ARR-1	Test Set		P
TS-41/CRN-1	Test Set	Standard	P
TS-67/ARN-5	Test Set	Limited Standard	D
TS-170/ARN-5	Test Oscillator	Standard	D

*Status Defined:

D - (DEVELOPMENT): Initial pilot run has not yet been completed.

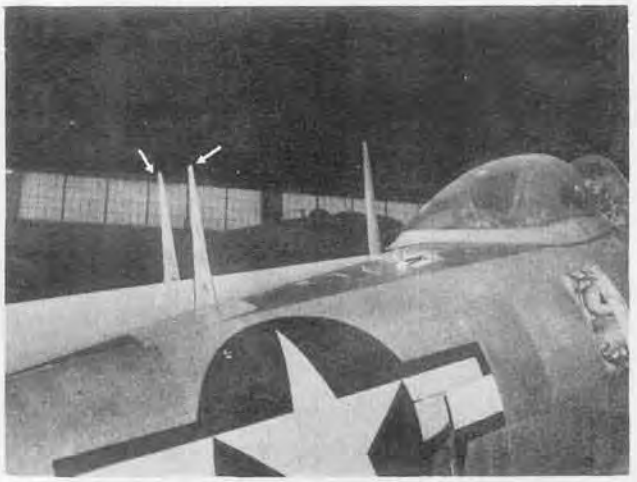
P - (PRODUCTION): Initial pilot run has been completed, and quantity production is underway or has been completed.

Homing Adapter AN/ARA-8 is an adapter unit for use with VHF receivers, such as those used in Radio Sets SCR-522 or AN/ARC-3, to provide the pilot with means of homing on any transmitted carrier wave within the frequency range of 120 to 140 mc. This adapter gives a dot-dot-dash or dash-dot-dot signal when the aircraft is off the course to the left or right. While on course, a continuous tone is heard. When off course, the pilot turns right if a dot-dot-dash signal is heard and left if he hears the dash-dot-dot signal.

Principal application of AN/ARA-8 is in fighter aircraft equipped with VHF command sets. This equipment can be used for air-to-air homing for purposes of rendezvous and the gathering in of scattered combat planes. Homing can be accomplished on either CW, MCW or audio pulse signals.

Chief limiting factor in the operation of AN/ARA-8 is that the distance range is limited to line of sight. Reliable frequency range of this adapter is not the full range of VHF communication equipment but is limited to a range of approximately 20 mc. between 120 and 140 mc. While this 20 mc. range can be shifted up or down slightly in the frequency band of the communication equipment, the cable lengths furnished with the adapter required frequencies between 120 and 140 mc. for proper operation.

Army Supply Program requirements as of 31 January 1945 were 3,500 for the calendar year of 1945.



AN/ARA-8 Antenna Installation, AFT Fuselage of P-51 Airplane

POWER INPUT	36 WATTS
FREQUENCY	120-140 MC.
TYPE OF SIGNAL	CW OR MCW OR AUDIO PULSE

Homing Adapter AN/ARA-8 is used with VHF receivers to provide aircraft with means of homing on any transmitted carrier wave within the frequency range of 120 to 140 mc.

AN/ARA-8

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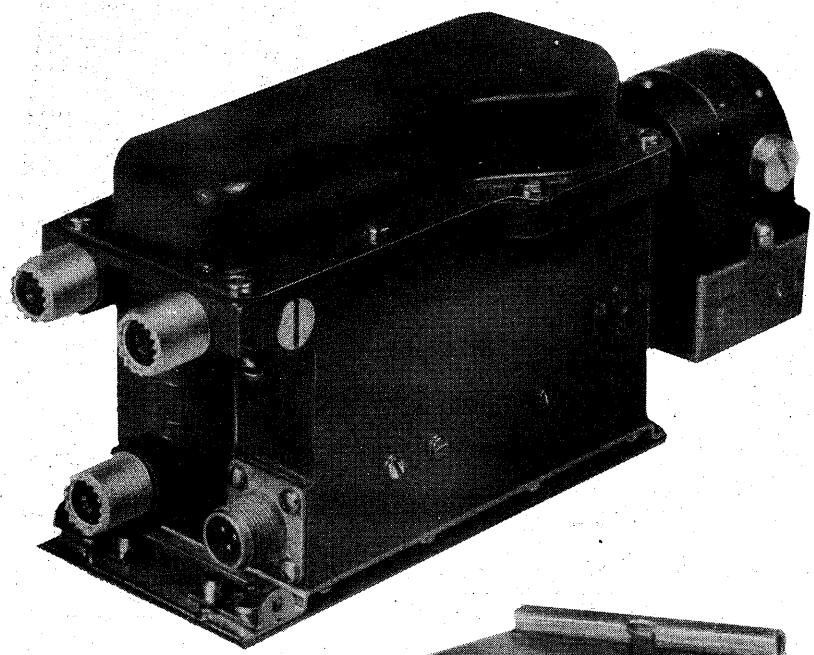
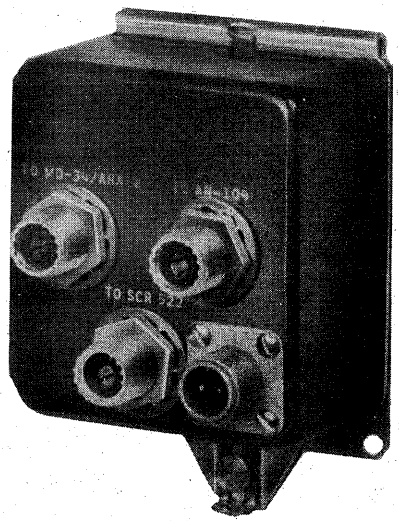
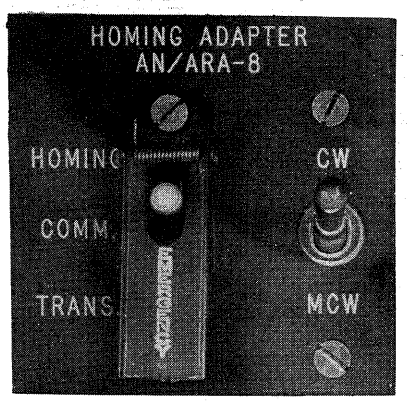


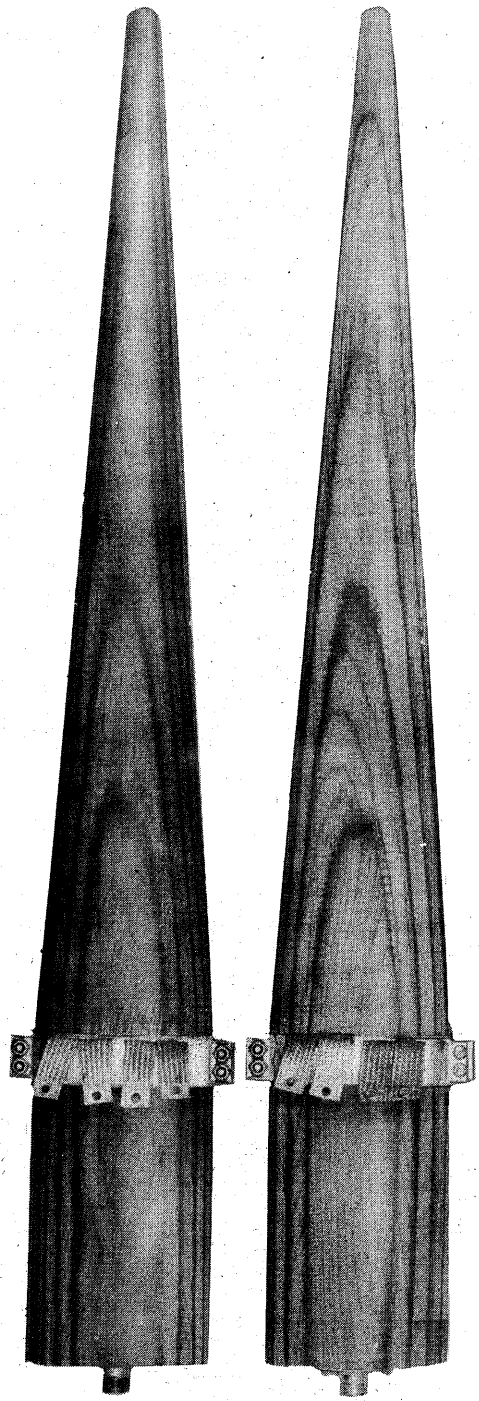
Modulator Keying Unit
MD-34/ARA-8



Antenna Relay
RE-12/ARA-8



Escutcheon
MX-359/ARA-8



Antenna Assembly AS-148/ARA-8

HOMING ADAPTER AN/ARA-8

TOTAL WEIGHT 12 LBS.

Component	Nomenclature	Size	Weight
Modulator Keying Unit	MD-34/ARA-8	9'' x 3 ' x 5''	5 Lbs.
Mounting Bracket	MT-282/ARA-8	9'' x 4''	*
Antenna Assembly	AS-148/ARA-8	27'' x 3'' x 2''	5 Lbs.
Antenna Relay	RE-13/ARA-8	1'' x 2'' x 4''	1 Lb.
Mounting Bracket	MT-288/ARA-8	5'' x 3''	*
Escutcheon	MX-369/ARA-8		

Includes plugs, adapters, cord, switch, etc.
* Less than one Pound.

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Filter Equipment AN/ARA-9 is a radio range filter equipment consisting of a low impedance filter which has a 1020-cycle band pass section and 1020-cycle band reject section; and a switch for selecting either of the above filter sections or a filter-out position.

The primary purpose of this equipment is to permit the user (normally pilot or co-pilot) to isolate either the voice or the range signal during periods of reception of simultaneous transmissions of these signals. The equipment provides by means of a switch, facilities for voice reception only, range reception only, or normal use (no filter in circuit). The switch, separate from the filter unit, is used to provide the selection of the desired facility. AN/ARA-9 is used in low impedance installations in which the output circuits of all of the radio equipments are connected for low impedance operation.

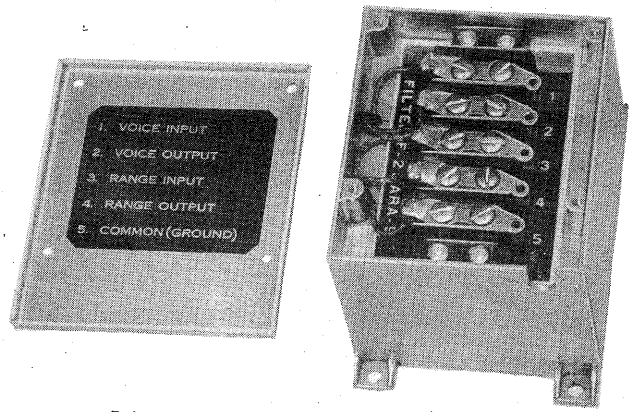
The switch is designed in such a way that it can be used either mounted on the lid of the Filter F-21/ARA-9 or mounted as a separate unit.

The filter is now being delivered as part of Interphone Equipment AN/AIC-3.

Filter Equipment AN/ARA-9 is designed for use with low impedance interphone and radio equipments in U. S. Army Aircraft.

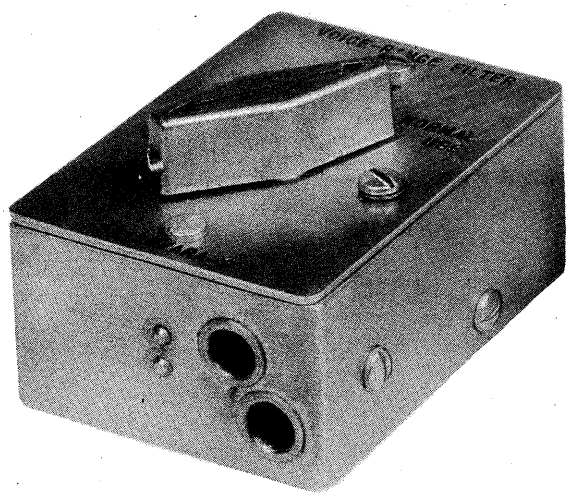
There is no special test equipment required for the maintenance of the AN/ARA-9.

There were no Army Supply Program requirements as 1 February 1945.

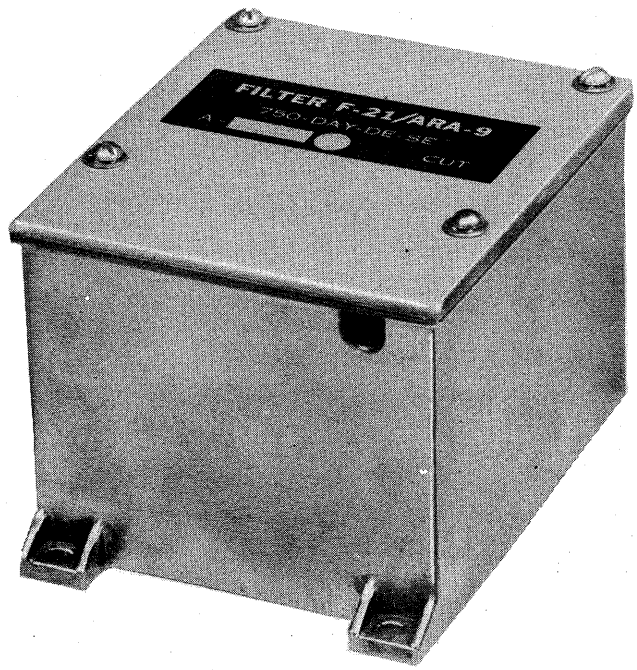


Interior view of Filter F-21/ARA-9

POWER INPUT	4-6 V.
TYPE OF SIGNAL	AUDIO
BAND PASS SECTION	1020 CYCLE
BAND REJECT SECTION	1020 CYCLE



Switchbox SA-58/ARA-9



Filter F-21/ARA-9

FILTER EQUIPMENT AN/ARA-9

TOTAL WEIGHT 2 LBS.

Component	Nomenclature	Size	Weight
Filter	F-21/ARA-9	2" x 3" x 4"	2 Lbs.
Switchbox	SA-58/ARA-9	3" x 2" x 2"	

Radio Receiving Equipment AN/ARN-5 is an airborne radio receiving equipment used in conjunction with the glide path transmitter of the AAF Instrument Approach System to provide a visual indication of the glide path course to be followed by the pilot of the aircraft during instrument landing operation.

Output of the receiver is fed into a cross-pointer indicator, and the position of the meter's horizontal pointer with respect to the center of the face gives the pilot an indication of whether to fly up or down to remain on a predetermined descent path to ground.

The receiving equipment operates on one of three frequencies 332.6 mc, 333.8 mc, or 335 mc. In the event of receiver failure, or the absence of a signal from the glide path system for any reason, a "fly up" indication is obtained.

Antenna System AS-27/ARN-5 is used with the dual installation of the glide path and localizer receivers. Antenna System AS-61-( )/ARN-5 is used when the glide path receiver is installed without the localizer receiver.

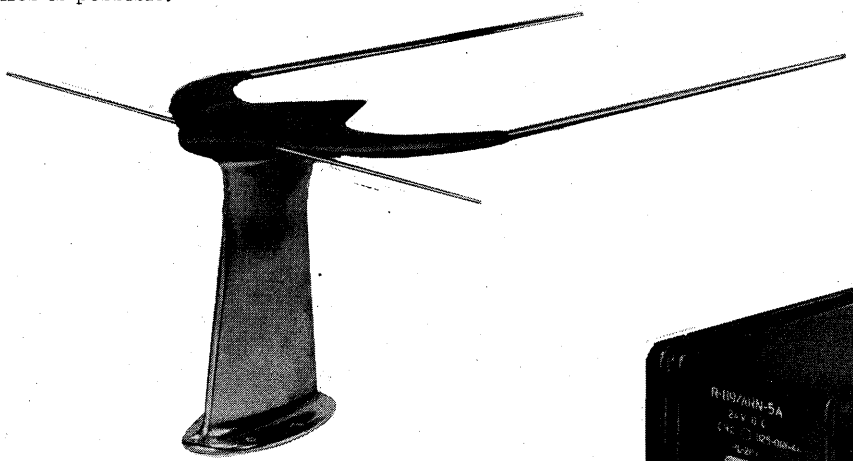
Power input of the receiver is 1.35 amperes at 28 volts d.c. Reception of a 90 and 150 cycle modulated signal from the glide path transmitter over a range of 15 miles is possible.

Test equipment required for maintenance includes TS-170/ARN-5 and TS-67/ARN-5.

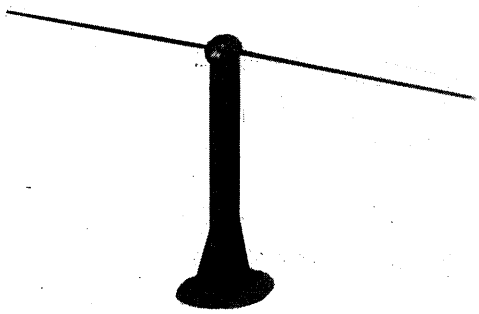
Army Supply Program requirements as of 1 February 1945 were 33,718 equipments for the calendar year 1945 and 19,630 for 1946.

POWER INPUT	37 WATTS @ 28 VOLTS DC.
FREQUENCY	332.6, 333.8 MC, 335 MC
TYPE OF SIGNAL	CW
RANGE	15 MILES
SENSITIVITY	AVERAGE 50 MICRO-VOLTS
SELECTIVITY	6DB DOWN AT 400 KC OFF RESONANCE 60 DB DOWN AT 2000 KC OFF RESONANCE

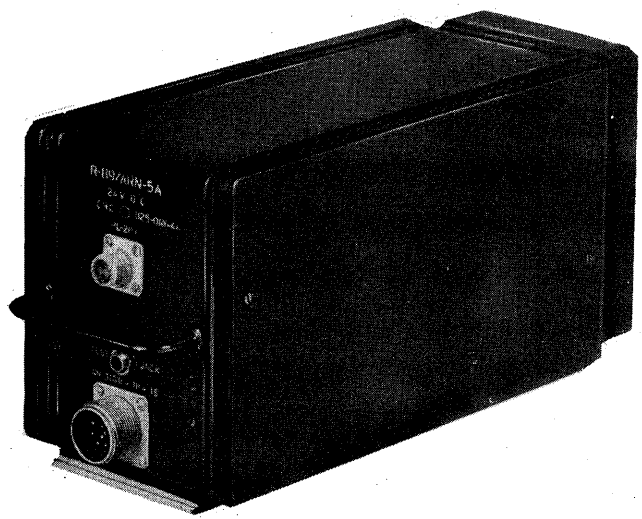
TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
7	6AK5	1	125R7
2	12SN7GT	1	28D7



Antenna System AS-27A/ARN-5



Antenna Assembly AS-61/ARN-5



Radio Receiver R-89/ARN-5A

RADIO RECEIVING EQUIPMENT AN/ARN-5 TOTAL WEIGHT 20 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver	R-89/ARN-5	6" x 12" x 7"	11 Lbs.
or Radio Receiver	R-57/ARN-5	6" x 12" x 7"	11 Lbs.
Mounting	MT-28/ARN-5	6" x 12" x 3 '	3 Lbs.
Antenna Assembly	AS-61/ARN-5	Width 15 inches	8 Lbs.
or Antenna System	AS-27/ARN-5	10" x 20" x 15"	2 Lbs.

and includes plugs, adapters, resistor, capacitor and rf cable.

May 1945

AN/ARN-6

Radio Compass AN/ARN-6 is an automatic radio compass which will provide either aural reception of modulated radio signals in the frequency range of 100-1750 kilocycles, aural-null directional indications of the arrival of signals using a loop antenna, or automatic loop orientation and loop azimuth indication in degrees.

In addition to the four band frequency coverage from 100 to 1750 kilocycles, a 2800 to 5900 kilocycle high frequency band has been added for emergency communication use. The set will not function as an automatic compass on this band.

Two loops are being developed: Loop AS-141/ARN-6 having the electrical characteristics of the LP-21 and Loop AS-140/ARN-6 having the characteristics equal to a 12 inch air core loop. Both loops contain an iron core type of loop in order to decrease overall size. These loops have the best possible anti-precipitation static characteristic and are of the blister type to reduce drag to a minimum. The smaller Loop AS-141/ARN-6 is to be used on fighters and the larger Loop AS-140/ARN-6 is to be used on bomber and cargo planes.

The equipment operates from a 24 volt d.c. power source.

Test equipment for maintenance will consist of a test set incorporating I-100 and a special adaptor.

Army Supply Program requirements as of 8 February 1945 were 2,000 equipments for the calendar year 1945.

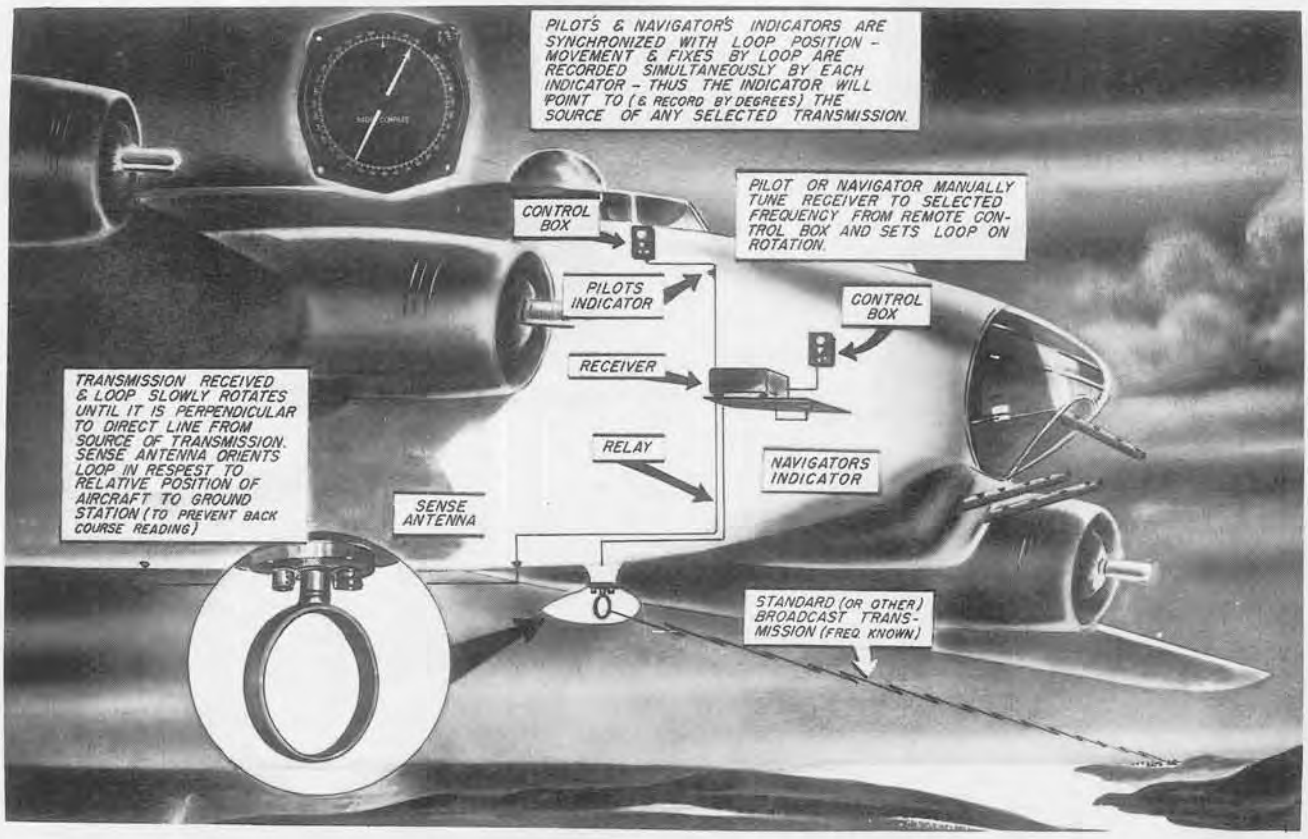
TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
5	12SK7	4	12SX7GT
1	12SY7	2	6A7GT
1	12SW7	2	2050

Indicator ID-XA-6/ARN-6

Indicator ID-XA-7/ARN-6

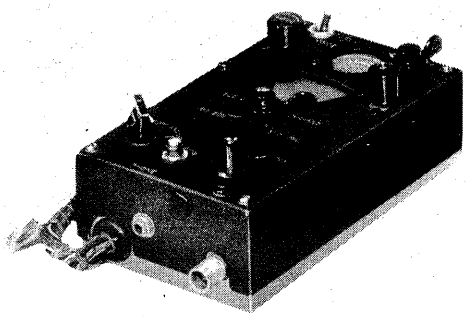
Indicators of AN/ARN-6 record simultaneously transmission bearing in respect to flight course.

POWER INPUT	130 WATTS @ 26.5 VOLTS D.C.
POWER OUTPUT	700 MILLIWATTS PEAK
FREQUENCY	100-1750 KC AND 2800-5900 KC.
TYPE OF SIGNAL	CW; MCW/VOICE
SENSITIVITY	5 MICROVOLTS/METER
SELECTIVITY	
ANTENNA	LOOP FIXED OR ROTATABLE, WITH REMOTE INDICATION OF LOOP POSITION. (DUAL-REMOTE CONTROL AND ONE SET OF LOCAL CONTROLS.)

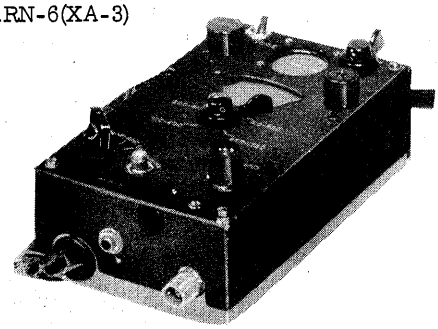


Radio Compass AN/ARN-6, intended for installation in all types of aircraft, provides visual indication of the direction from any equipped aircraft to any broadcast band transmitter operating on the 100-1750 kc band.

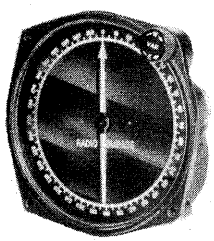
AN/ARN-6



Radio Control Boxes
C-149/ARN-6(XA-3)

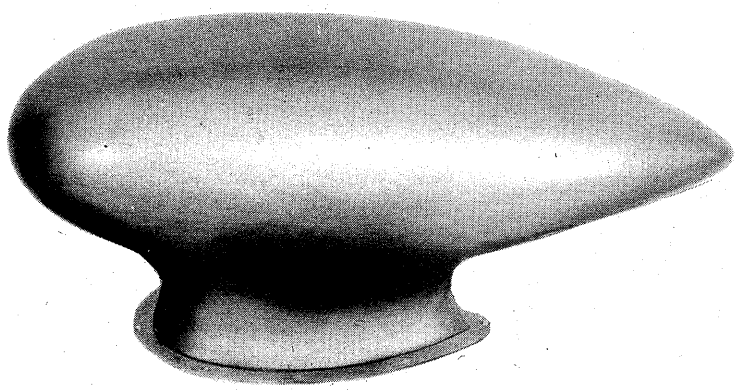


Radio Compass Unit
R-101/ARN-6(XA-3)



Indicator ID-92/ARN-6(XA-3)

Indicator ID-91/ARN-6(XA-3)



Loop AS-141/ARN-6(XA-3)

RADIO COMPASS AN/ARN-6

TOTAL WEIGHT 55 LBS.

Component	Nomenclature	Size	Weight
Radio Compass Unit	R-101/ARN-6	16" x 12' x 8"	32 Lbs.
Mounting	MT-274/ARN-6	16" x 12" x 3"	7 Lbs.
Indicator	ID-91/ARN-6		*
Indicator	ID-92/ARN-6		*
Coupling Unit	CU-65/ARN-6		
Control Box	C-149/ARN-6	5" x 8' x 4"	3 Lbs.
Loop	AS-141/ARN-6	7" x 6" x 17"	10 Lbs.

* less than one pound
and includes cables, cords, connectors, etc.

AN/ARN-7

Radio Compass AN/ARN-7 is an automatic bearing-indicating radio compass operating from a 400-cycle, 115-volt power supply. It provides aural reception of modulated radio signals as an ordinary 100 to 1750 kc. radio receiver and automatic loop orientation and loop azimuth indication in degrees. It is similar to Radio Compass SCR-269-G and employs all its components with the exception of Radio Compass Unit BC-433-G and Radio Control Box BC-434-A.

Frequency range of the AN/ARN-7 is divided into four bands covering 100 to 1750 kc. It is manually tuned from either of two remote positions, with bands switched electrically from the position having control. When installations are made which use only one remote control, no switching of control is necessary and the one radio control box used has control at all times.

The new receiver, Radio Compass R-5/ARN-7, is a 15-tube superheterodyne capable of C.W., tone and voice reception. The addition of the 100-200 kc. band makes possible long range operation in connection with established low frequency transmitters in many parts of the world.

AN/ARN-7 was designed originally as an interim compass, capable of low frequency reception, pending completion of the development of Radio Compass AN/ARN-6.

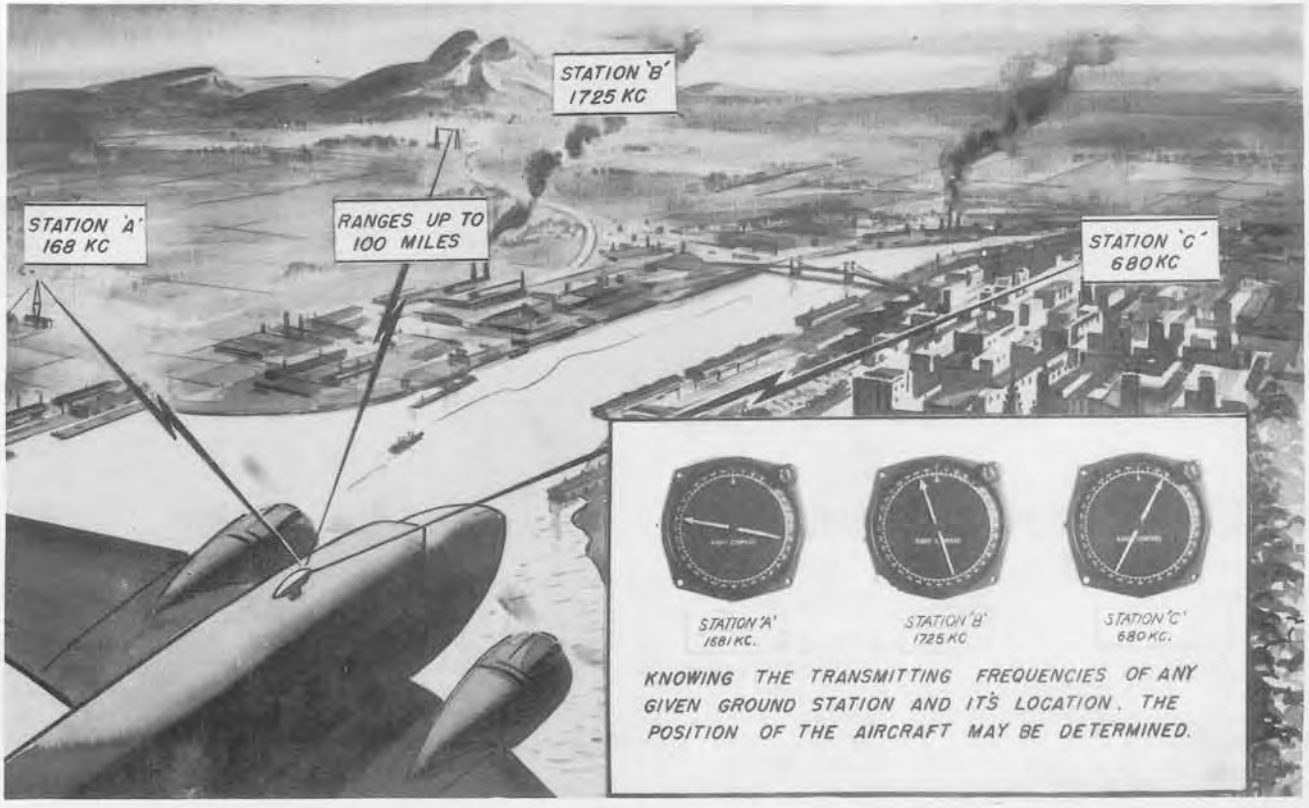
Test equipment for AN/ARN-7 includes Test Set I-100-A.

Army Supply Program requirements as of 19 October 1944 were 25,394 for the calendar year 1945.

Loop and Loop Housing for AN/ARN-7 installed in fuselage above pilot and co-pilot on C-64 aircraft.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
4	6K7	1	6L7
2	6F6	1	6J5
2	6B8	1	6N7
2	2051	1	6SC7
1	5Z4		

POWER INPUT	115 VOLTS, 400 CYCLES
FREQUENCY	100 KC TO 1750 KC
TYPE OF SIGNAL	CW, TONE, VOICE
RANGE	100 MILES
SENSITIVITY	40 MV/METER
SELECTIVITY	10 TIMES RESONANT INPUT FOR 6.3 KC.
ANTENNA	LOOP



In addition to its high frequency band of 2800 to 5900 kc., Radio Compass AN/ARN-7 provides facilities for homing and plotting of aircraft positions similar to those of other Automatic Radio Compasses.

AN/ARN-7

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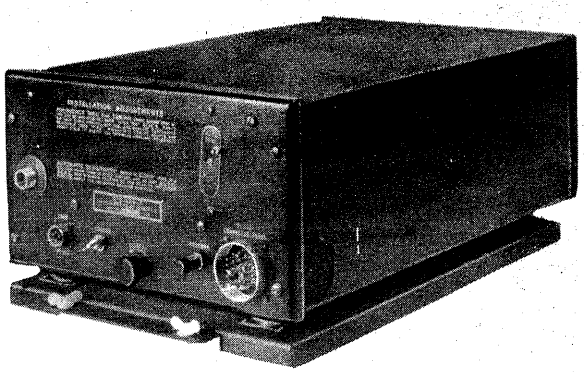
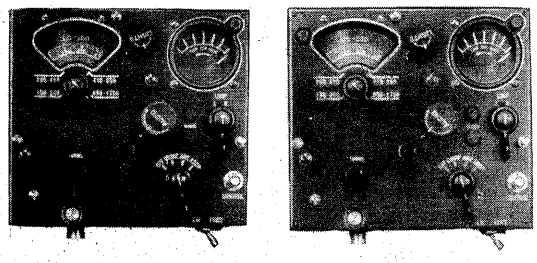
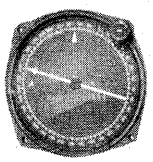


Radio Compass Unit
R-5/ARN-7



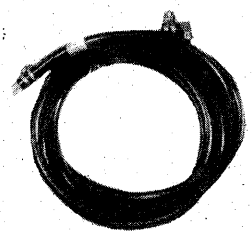
Radio Control Boxes C-4/ARN-7



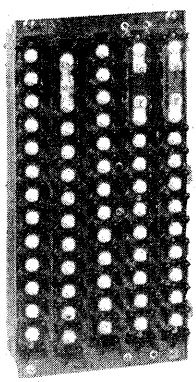
Indicator I-82-A

Indicator I-81-A

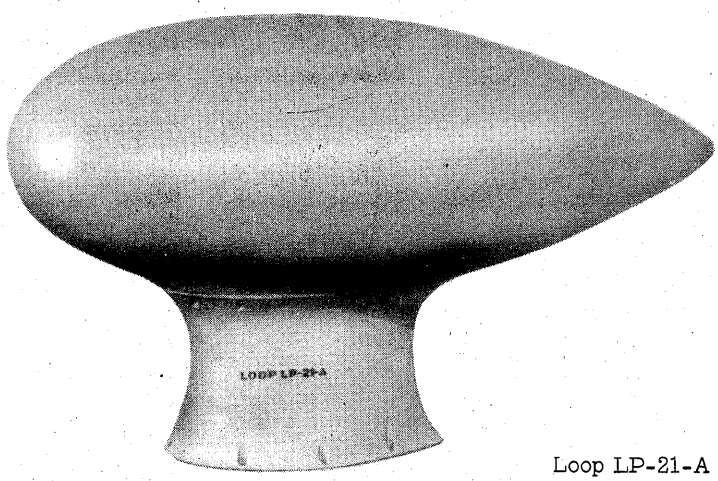
Dehydrator



Dehydrator Hose



Relay BK-22-E



Loop LP-21-A

RADIO COMPASS AN/ARN-7

TOTAL WEIGHT 98 LBS.

Component	Nomenclature	Size	Weight
Radio Compass Unit	R-5/ARN-7	8" x 12" x 20"	47 Lbs.
Radio Control Box	C-4/ARN-7(2 each)	8" x 8" x 4"	4 Lbs.
Loop	LP-21-AM	26" x 15" x 9"	10 Lbs.
Indicator (Navigator's)	I-82-A	4" x 4" x 4"	1 Lb.
Indicator (Pilot's)	I-81-A	5" x 5" x 4"	1 Lb.
Indicator	ID-65/ARN		
Relay	BK-22-K	12" x 7" x 3"	7 Lbs.

and includes plugs, adapters, cords, insulators, operating chart, shaft and casing, tag, wire and set of fittings.

May 1945

AN/ARN-11

Radio Compass AN/ARN-11 is an aircraft navigational equipment which indicates the direction of a selected transmitting station and also functions as a general radio receiver.

Loop reception on two of the three bands, that is, on the 200-400 kc. and 550-1200 kc. bands, provides left-right compass coverage, while a non-directional antenna offers reception on the 2900-6000 kc. band.

Visible indication by means of a left-right indicator gives the general direction from which the received signal is transmitted, and visible indication of relative bearing between the aircraft and the transmitting station by means of an azimuth dial.

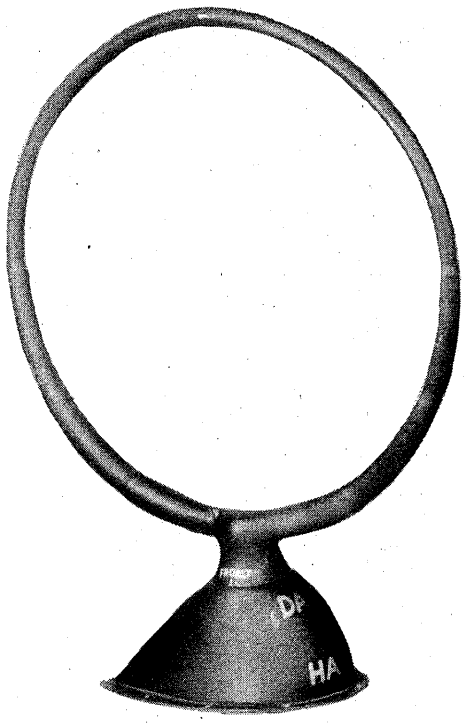
Generally, a 9-inch rotatable loop, such as the MN-20, is used with this equipment, but on slower aircraft, such as cargo aircraft, an 18-inch loop is often used. The 18 inch MN-24 is a preferred loop for use with this equipment when installed on low-speed airplanes because of its excellent anti-precipitation-static qualities.

Any of the MN-28 series remote control boxes may be used to provide band switching.

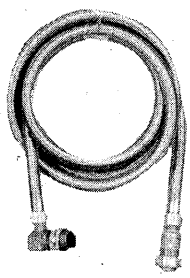
Army Supply Program requirements as of 1 February 1945 were 2,921 for the calendar year 1945 and 2,390 for 1946.

POWER INPUT	84-126 W
FREQUENCY	COMPASS RECEPTION 200-400, 550-1200 KC COMMUNICATION RECEPTION 200-400, 500-1200, 2900-6000 KC
TYPE OF SIGNAL	VOICE, MCW
RANGE	100-150 MILES

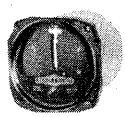
TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
5	6K7	2	6J5
2	6N7	1	6F6
1	6L7	1	6B8



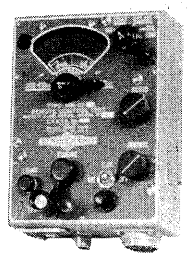
Loop MN-24C



Loop Transmission Cable



Indicator IN-4D



Remote Control Unit MN-28LB

Meter Field Load Assembly

Radio Compass Receiver MN-26LB

RADIO COMPASS AN/ARN-11 — TOTAL WEIGHT 60 LBS.

Component	Nomenclature	Size	Weight
Radio Compass Unit	MN-26LB	8" x 12" x 18"	37 Lbs.
Remote Control Unit	MN-28LB	4" x 5" x 8"	3 Lbs.
Azimuth Control Unit	MN-40D		
Left-Right Indicator	IN-4D	3" x 3" x 3"	2 Lbs.
Meter Field Load Assembly	Bendix No. AA18824-1		
Rotatable Loop	MN-24C	18" diam.	5 Lbs.
Loop	AS-138/ARN	14" x 11" x 10"	4 Lbs.
Loop Transmission Cable	Bendix No. AC55966-1	42" and 168" long	*
Control Unit	MC-204-A		
Control Panel	C-135/AR	17" x 8" x 5"	
Control Panel	C-136/AR	5" x 3" x 2"	

and includes plugs, set of fittings, shaft and casing and tag.

* Less than one pound.

May 1945

AN/ARN-12

Marker Beacon Receiving Set AN/ARN-12 is a lightweight airborne marker beacon receiver utilizing a superheterodyne type circuit with a crystal controlled oscillator. It is designed to give aural and visual indications when flying over any army marker beacon transmitter at altitudes between 10 and 4,000 feet, and over CAA marker beacon transmitters at altitudes between 100 and 35,000 feet. Reception is on the standard marker beacon channel of 75 mc. The equipment responds to a 75 mc. signal which is modulated by 400, 1,300 and 3,000 cycles. The receiving set is designed for operation from the aircraft 24 volt dc. system.

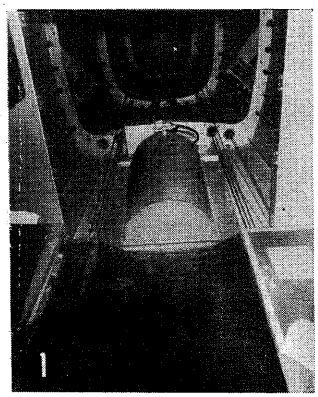
A filter is required for selection of indication of 400, 1,300 and 3,000 cycle modulation. This is provided in a separate unit which may be installed or omitted depending upon the mission of the aircraft.

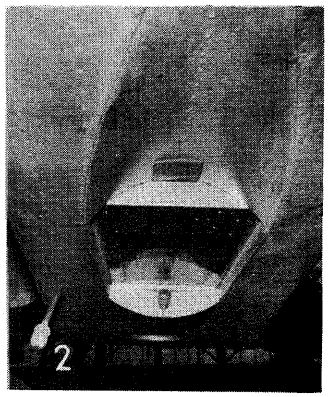
This equipment will replace Marker Beacon Receivers RC-193, RC-39, and RC-43.

Test Equipment required for maintenance includes Test Set I-76.

Army Supply Program requirements as of 1 February 1945 were 11,860 sets for the calendar year 1945, and 23,599 sets for 1946.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2 5	28D7 6AJ5	2	6AL5

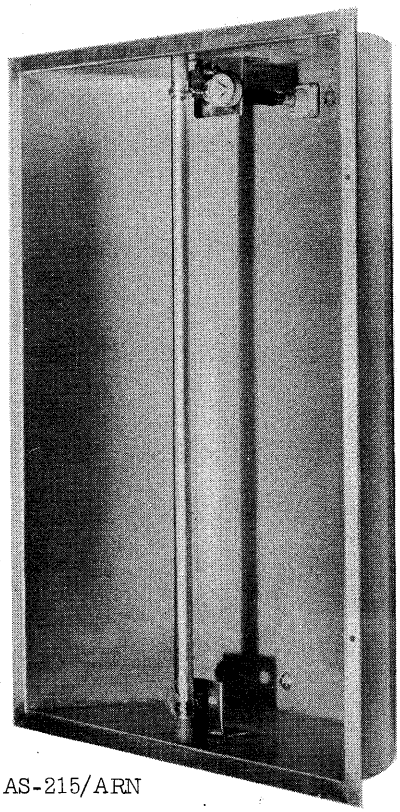




Antenna Assembly AS-215(XA)/ARN installed bottom mid-fuselage AT-11 airplane. 1-Interior 2-Exterior

POWER INPUT	72 WATTS @ 24 VOLTS DC.
FREQUENCY	75 MC
TYPE OF SIGNAL	MCW
RANGE	ARMY BEACONS 10 TO 400 FEET CAA BEACONS 100 TO 35,000 FT.
SENSITIVITY	500 - 1500 MICROVOLTS
SELECTIVITY	600 at 700 KC.

Radio Receiver R-122/ARN-12



Antenna Assembly AS-215/ARN

MARKER BEACON RECEIVING SET AN/ARN-12 TOTAL WEIGHT 25 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver	R-122/ARN-12	6" x 10" x 6"	9 Lbs.
Applique Unit			7 Lbs.
Mounting	MT-28/ARN	10" x 2" x 6"	1 Lb.
Antenna Assembly	AS-215/ARN	Length 19" x Diam. 12"	5 Lbs.

and includes cords, plugs, cables, etc.

May 1945

Radio Receiving Equipment AN/ARR-1 (Navy ZB Adapter) is an airborne compass adapter used for reception of signals covering the range 234 to 258 mc, amplitude modulated by a keyed rf signal in the 540 to 830 kc. range.

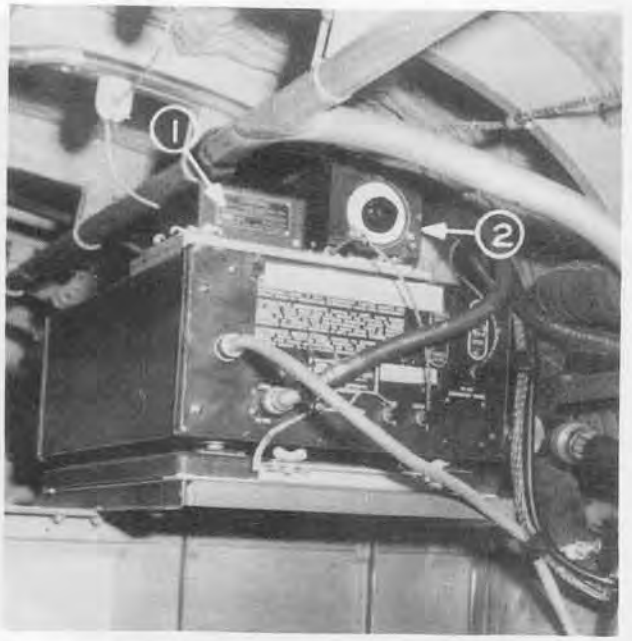
When the pilot is provided with a decode card, he is able to use this equipment to interpret the directional signals transmitted by the Navy Model YG Homing Beacon, or other homing beacons operating a rotating, directional antenna and transmitting within the frequency range of the receiver. In addition to the 12 30-degree direction sectors which are separately identified by code letter, a true north position relative to the transmitter is indicated by the code letter to assist the pilot in compass orientation.

Effective range of this equipment is 40 to 70 miles at 10,000 feet, with greater range possible at higher altitudes.

Test equipment required for maintenance includes Test Set TS-1/ARR-1 and Test Oscillator TS-24/ARR-2.

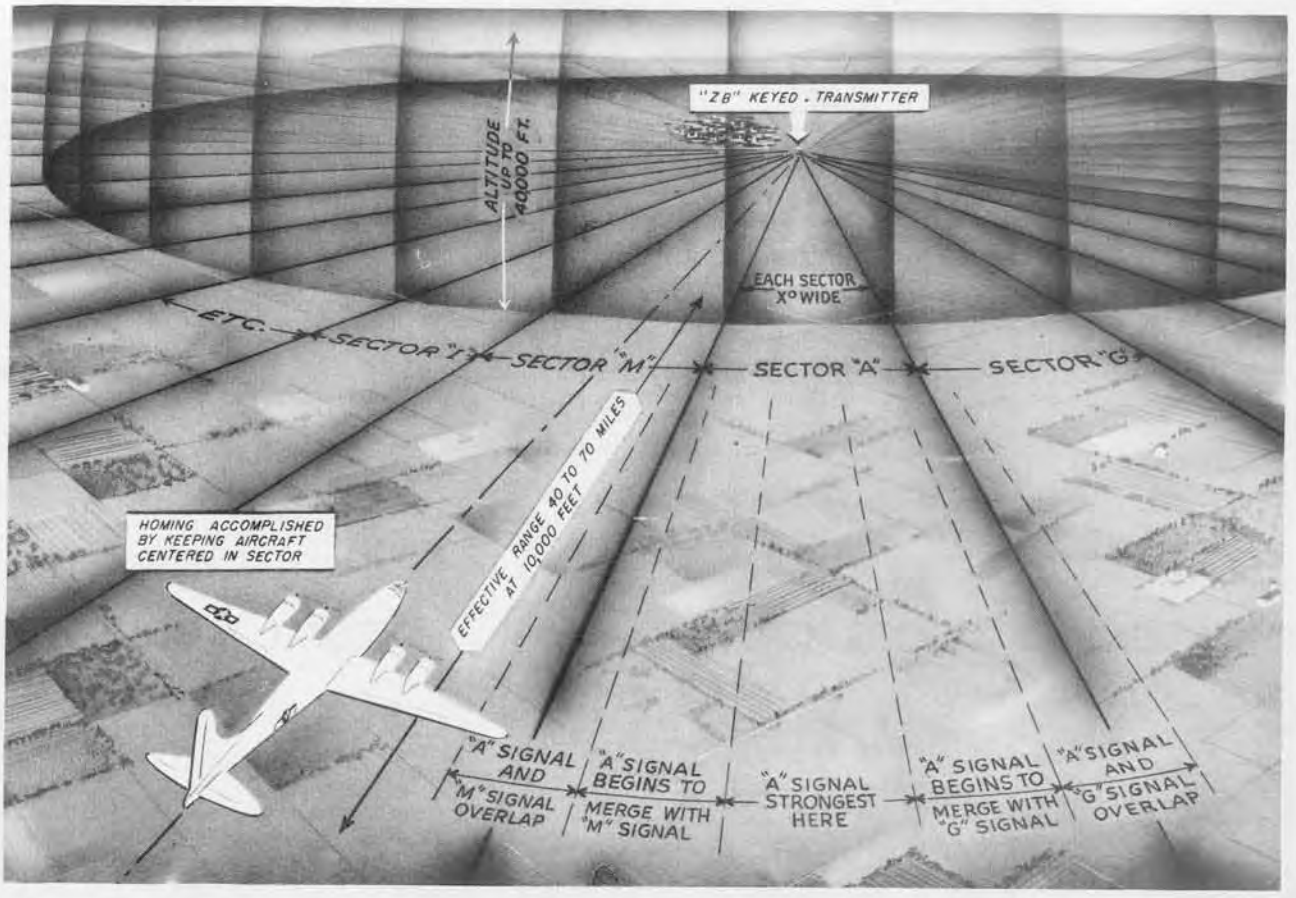
There were no Army Supply Program requirements as of 1 February 1945.

POWER INPUT	6 WATTS @ 28 VOLTS 3 WATTS @ 250 VOLTS
FREQUENCY	234-258 MC
TYPE OF SIGNAL	CW; MCW; VOICE
SENSITIVITY	40 MICROVOLTS
SELECTIVITY	20 DB. DOWN AT 1.5% OFF RESONANCE
RANGE	40-70 MILES AT 10,000 FEET



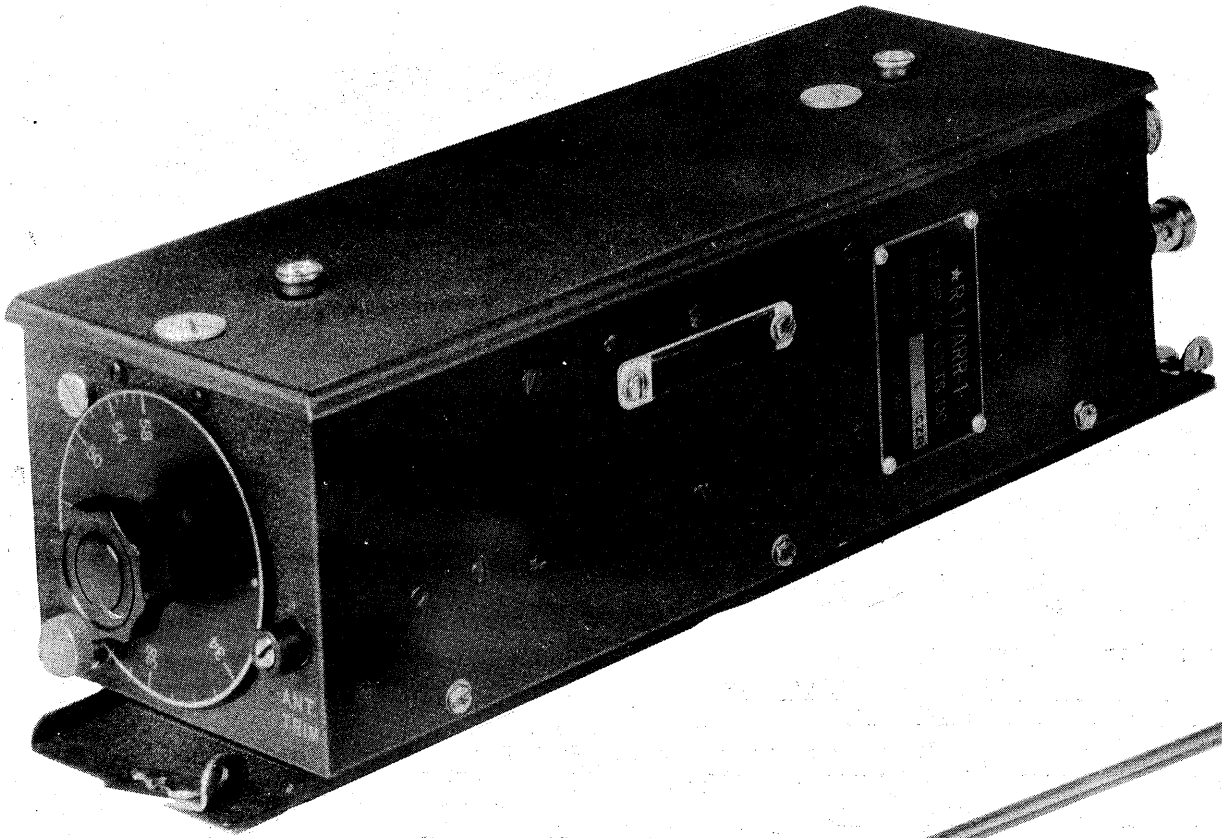
Installation photograph indicates (1) Relay RE-1/ARR-1, and (2) Radio Receiver R-1/ARR-1

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
4	954		

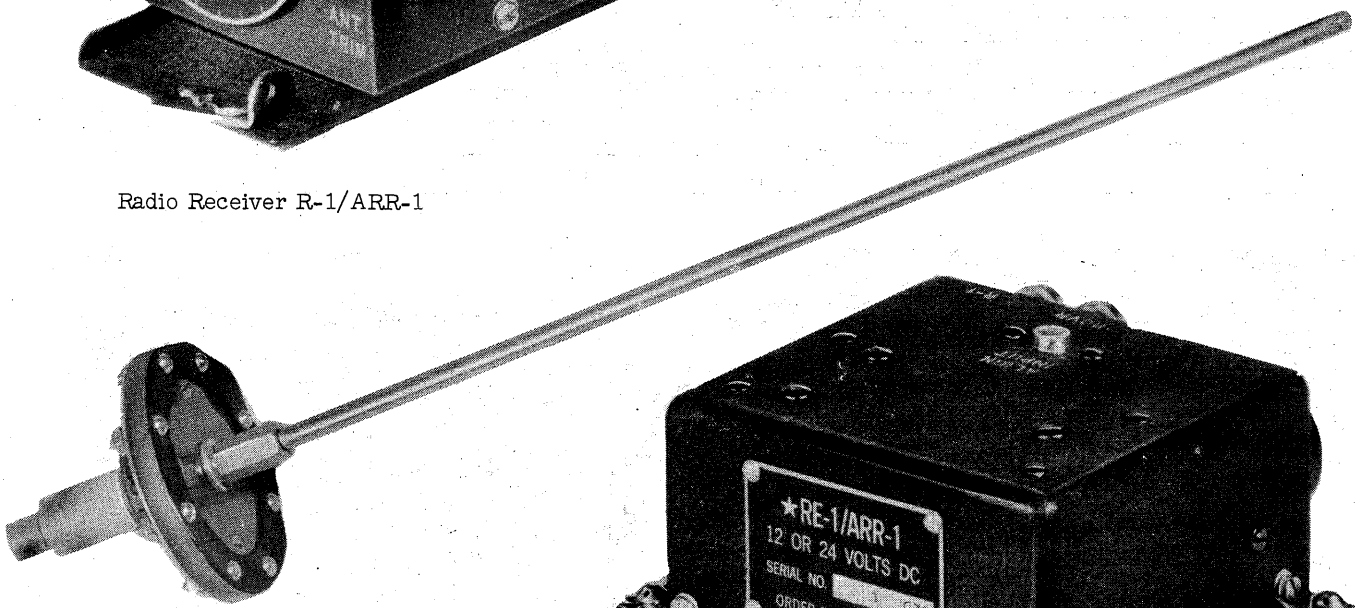


Used with a suitable receiver, Radio Receiving Equipment AN/ARR-1 permits aircraft to home on a ZB keyed transmitter which sends out coded signals to each 30° of 360°

AN/ARR-1



Radio Receiver R-1/ARR-1



Antenna AT-5/ARR-1

Relay RE-1/ARR-1

RADIO RECEIVING EQUIPMENT AN/ARR-1 TOTAL WEIGHT 11 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver	R-1/ARR-1	4" x 4" x 13"	4 Lbs.
Mounting	MT-2/ARR-1	12" x 4" x 1/8"	*
Relay	RE-1/ARR-1	3" x 4" x 5"	2 Lbs.
Antenna	AT-5/ARR-1	12" long	1 Lb.
Adapter	M-359	1" x 1" x 1"	*
Mounting Plate	MT-3/ARR-1	5" x 4" 1"	*

*Less than one pound.
and includes slip cover, plugs, and radio frequency cable.

May 1945

AN/ARR-2

Radio Receiving Equipment AN/ARR-2 is a self-contained high frequency radio receiving and homing equipment capable of providing the pilot with directional orientation within 15 degrees when used with the YG Beacon Transmitter which operates at a carrier frequency of 234 to 258 mc modulated at a frequency of 540 to 830 kc.

The receiver, may be mounted on its own rack or installed in the racks of the SCR-274-N. It employs two separate circuits, one to amplify and detect the UHF signal the other to produce an output at the modulated frequency. Output from the high frequency circuit is fed to a superheterodyne receiver incorporated within the receiver. A beat-frequency oscillator is used in the i-f circuit of the superheterodyne portion of the receiver to provide a CW beat note for aural reception of the keyed modulation frequency of the transmitter.

The UHF carrier frequency is turned by means of a calibrated dial located on the front panel. Coverage of the 540 to 830 kc modulation frequencies is accomplished by using six channels, each capable of being tuned and preset anywhere within the modulation frequency range.

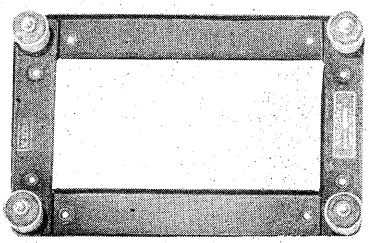
A switching arrangement allows any one of these six preset channels to be selected by means of a rotating switch in the control box, and a beat note is provided in the remote control box for adjustment of the audio pitch. A volume control for adjustment of the output to the desired level is also provided.

Test Oscillator TS-24/ARR-2 is used to check operation of this equipment.

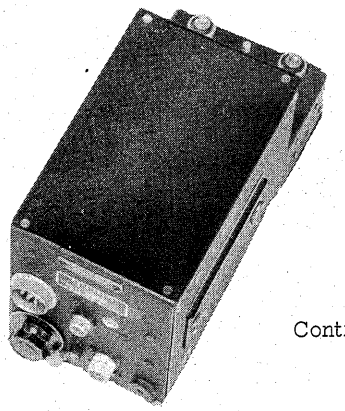
There were no Army Supply Program requirements of 1 February 1945.

POWER INPUT	45 WATTS @28 VOLTS D-C
FREQUENCY	234-258 MC CARRIER SIGNAL 540-830 KC (6 CHANNEL) MODULATED BY CW;MCW VOICE
TYPE OF SIGNAL	CW, MCW, VOICE
RANGE	40-70 MILES AT 10,000'
SENSITIVITY	10 MICROVOLTS
ACCURACY	PLUS OR MINUS 15 DEGREES

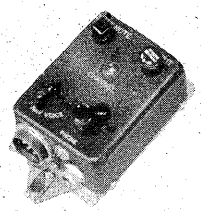
TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
3	6AK5	7	9001
1	12A6		



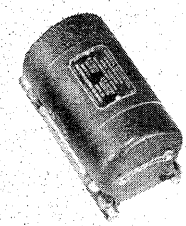
Mounting Base MT-5/ARR-2



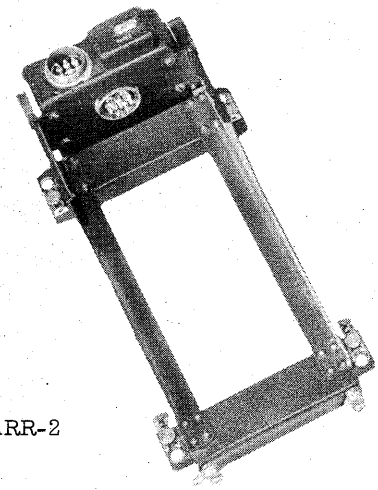
Radio Receiver R-4/ARR-2



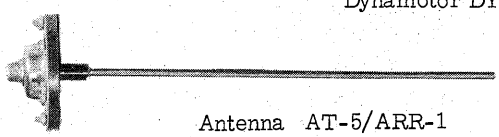
Control Box C-2/ARR-2



Dynamotor DY-2/ARR-2



Mounting Rack MT-7/ARR-2



Antenna AT-5/ARR-1

RADIO RECEIVING EQUIPMENT AN/ARR-2 TOTAL WEIGHT 19 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver	R-4/ARR-2	12" x 5" x 6"	7 Lbs.
Mounting Rack	MT-7/ARR-2	14" x 6" x 5"	2 Lbs.
Control Unit	C-2/ARR-2	4" x 6" x 3"	1 Lb.
Mounting Plate	MT-4/ARR-2	6" x 4"	*
Mounting Base	MT-5/ARR-2	11" x 7" x 2"	1 Lb.
Dynamotor Unit	DY-2/ARR-2	5" x 3" x 3"	3 Lbs.
Adapter	MX-2/ARR-2	1-1/4" dia.	1 Lb.
Right Angle Coupling	MX-22/ARR-2	1-1/4" dia,	1 Lb.
Antenna	AT-5/ARR-1	length 12"	1 Lb.

and includes plugs, tuning shaft and radio frequency cable.

*Less than one pound.

May 1945

AN/ARR-6

Radio Receiving Set AN/ARR-6 is an airborne automatic receiver designed to receive a fixed 500 kc, signal. It provides for automatic reception of signals in international distress frequency, and upon receipt of a signal a light is automatically flashed on at the receiver and on a jack box at some remote point.

The radio receiver is tuned to the international distress frequency. Sufficient band width is provided to compensate for small frequency variation between transmitters used and to guarantee reception of signals within the greater portion of the guard band on either side of the international distress band.

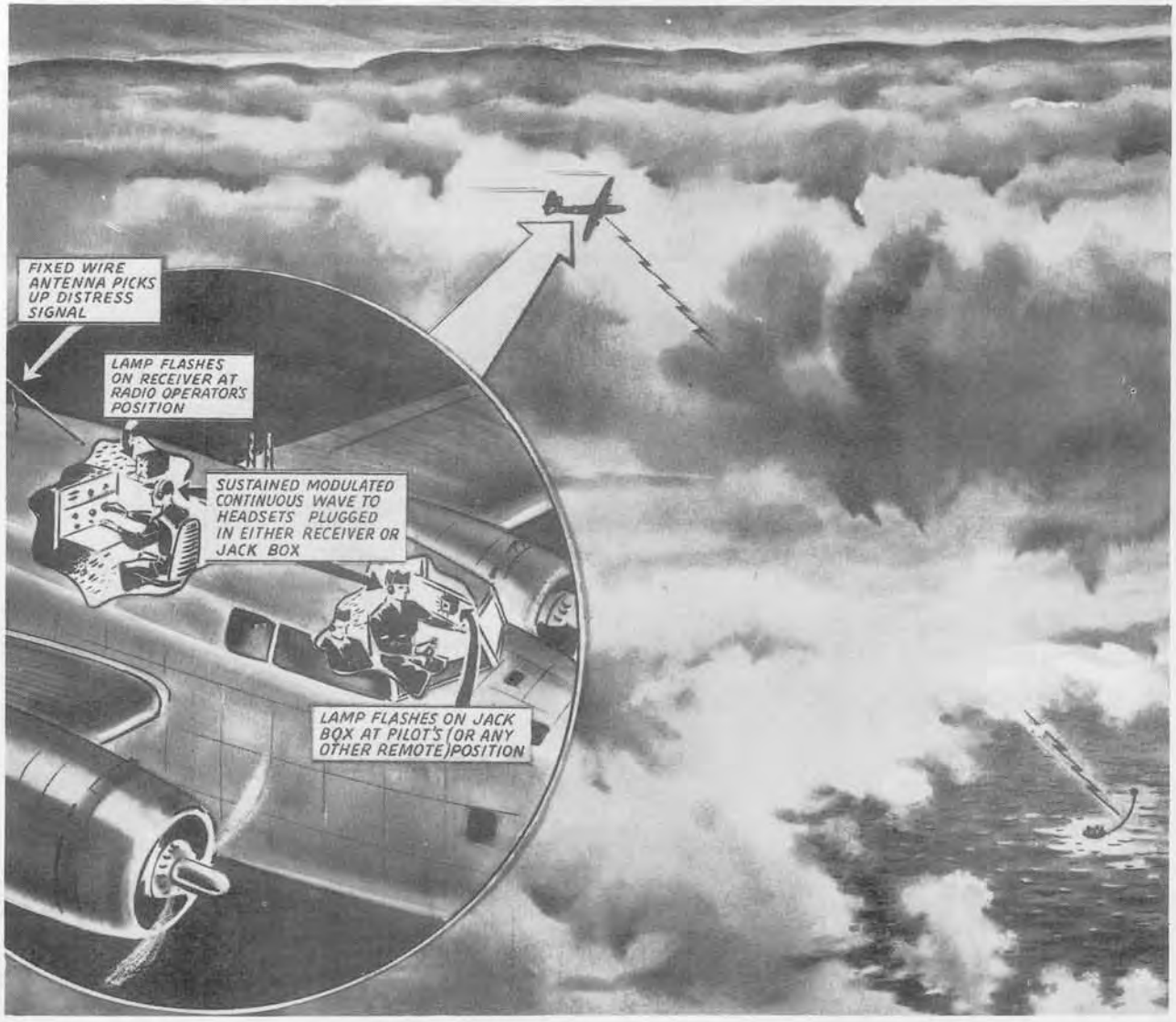
The receiver is so designed that the indicating device is not activated under the influence of atmospheric discharges. Sensitivity is such as to assure the reception of a distress signal from Radio Set SCR-578 at a distance of at least 150 miles over water. Power is supplied directly from the 28-volt source in the aircraft. The equipment operates at altitudes up to 50,000 feet and utilizes the fixed antenna on the aircraft.

No special test equipment is required for maintenance.

There were no Army Supply Program requirements as of 30 November 1944.

POWER INPUT	28 VOLTS D.C.
POWER OUTPUT	10 MILLIWATTS
FREQUENCY	500 KC. FIXED TUNED
TYPE OF SIGNAL	SUSTAINED MCW
RANGE	150 MILES OVER WATER
SENSITIVITY	3 MICROVOLTS
SIGNAL ACCEPT. KEYING RATE	20 WORDS PER MINUTE
TIME DELAY	50 TO 15 SECONDS

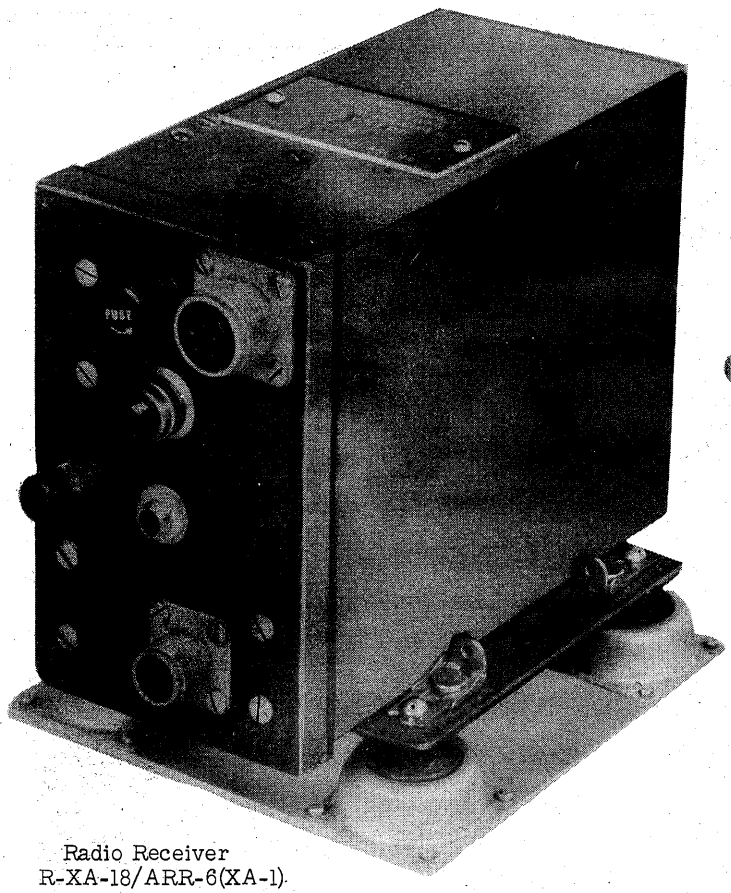
TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	6AK5	1	6H6
1	12C8	3	65G7
1	28D7	1	25L6



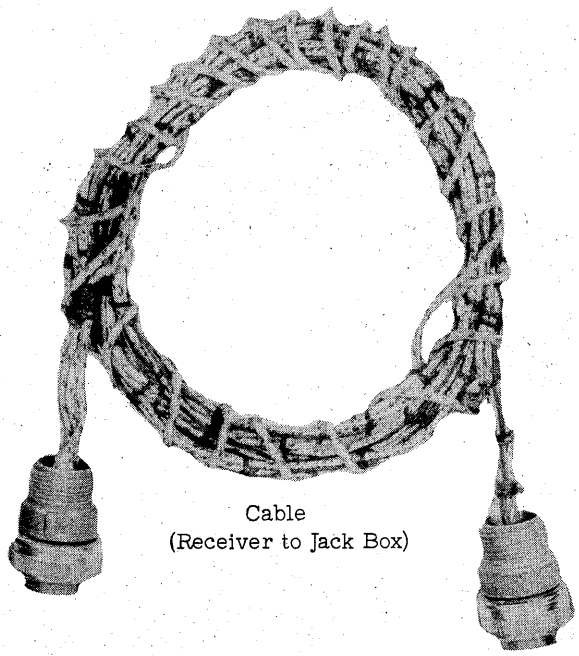
Relieving radio operators from manually monitoring the international distress frequency, Radio Set AN/ARR-6 provides an automatic alarm in the equipped aircraft, bringing to the attention of the pilot and/or radio operator that a distress signal is being transmitted in the vicinity.

May 1945

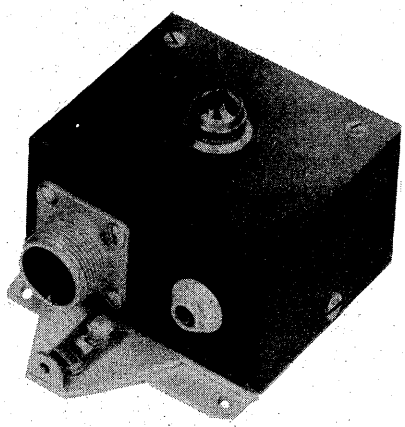
AN/ARR-6



Radio Receiver
R-XA-18/ARR-6(XA-1)



Cable
(Receiver to Jack Box)



Jack Box
J-XA-10/ARR-6(XA-1)

RADIO RECEIVING SET AN/ARR-6

TOTAL WEIGHT 5 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver		7'' x 6'' x 8''	4 Lbs.
Jack Box		2'' x 3'' x 4''	1 Lb.

and includes cables, adapters, plugs, etc.

May 1945

AN/CRM-3

Radio Monitoring Set AN/CRM-3 is a radio receiving equipment mounted in a plywood cabinet provided with an external antenna mounted on the top of a 15-foot mast. Power to operate the receiver is supplied from a voltage regulated power supply mounted in the same plywood cabinet. This equipment is used with Transmitting Equipments AN/MRN-1, AN/CRN-3 and AN/CRN-10.

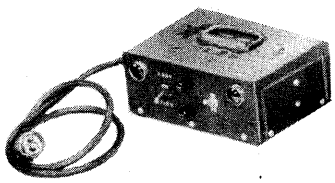
AN/CRM-3 provides means of locating the course with respect to the runway, checks the course width and transmitter radiation pattern and can also be used at any point within two miles of the transmitter to give an on-off indication of signal. A green pilot lamp indicates the localizer signal is being received by the radio monitoring set, and a red pilot lamp and a continuous buzz indicates the absence of a localizer signal.

No test equipment is required.

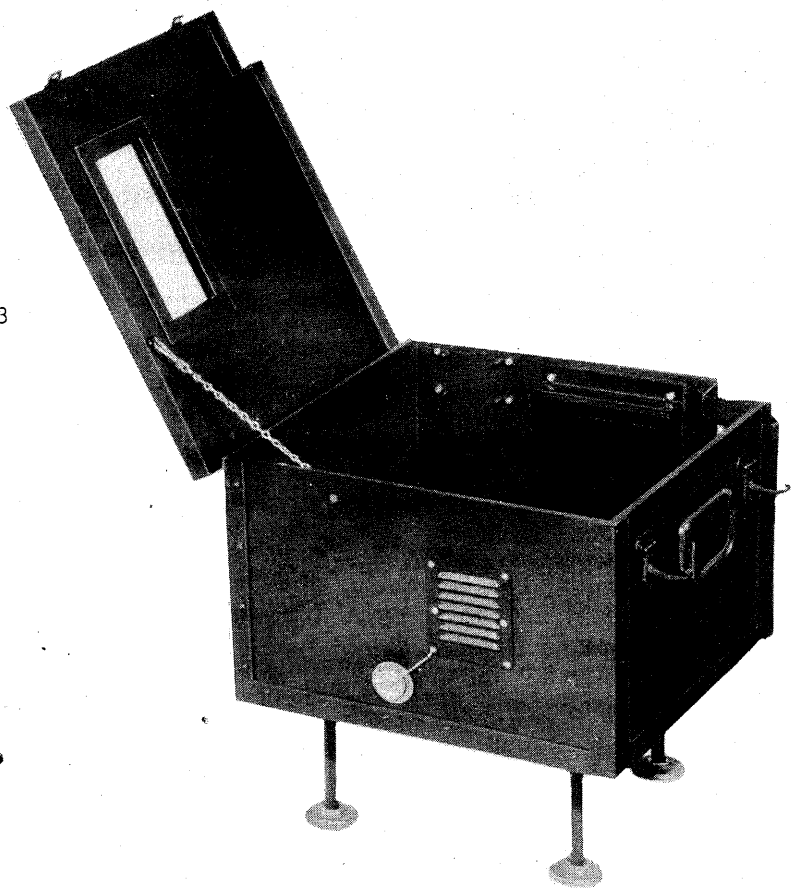
There were no Army Supply Program requirements as of 1 February 1945.

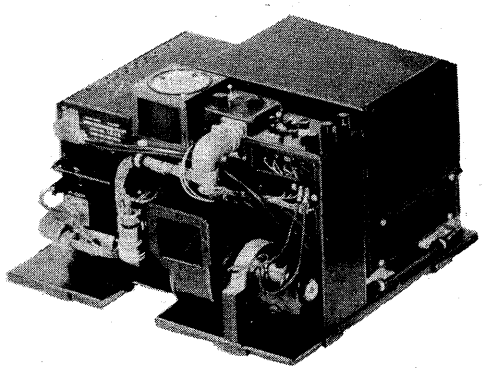
POWER INPUT	115/230 VOLTS AC: 12 VOLTS DC.
FREQUENCY	50-65 CYCLES PER SECOND
RANGE	2 MILES WHEN USED AS MONITOR 1000 FT. WHEN CHECKING COURSE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	12A6	3	717A
1	12AK7GT	1	5U4 G
2	12SG7	1	6SJ 7
2	12SQ7	1	VR-105
2	12SR7	2	6Y6



Alarm Assembly ID-85/CRM-3





Radio Monitoring Set
AN/CRM-3

Indicator Power Supply Console
CY-151/CRM-3

RADIO MONITORING SET AN/CRM-3 TOTAL WEIGHT 150 LBS.

Component	Nomenclature	Size	Weight
Antenna Assembly	AS-111/CRM-3	15 foot mast	10 Lbs.
Indicator Power Supply Console	CY-151/CRM-3	15" x 20" x 13"	70 Lbs.
Alarm Assembly	ID-85/CRM-3	8" x 4" x 6"	5 Lbs.
Radio Control Box	BC-732-A	3" x 3" x 4"	1 Lb.
Radio Receiver	BC-733-D	7" x 5" x 13"	21 Lbs.
Indicator	I-101-C or D	3" x 3" x 4"	2 Lbs.
Dynamotor	DM-53-AZ	3" x 3" x 5"	3 Lbs.

Includes mooring anchor, mountings, cords and adapter.

May 1945

AN/CRN-1

Radio Transmitting Equipment AN/CRN-1 is a single-tube, battery-powered, low frequency buoy transmitter, normally launched into the water from the bottom hatch of bombardment-type aircraft to mark the location of a life raft or other object. It is housed in a cylindrical case and consists of a radio transmitter, set of tubes, batteries, and a ballistic telescopic antenna. A base-ball type parachute is used to lower the equipment safely from the aircraft to the water.

This equipment covers the frequency range of 1400 to 1750 kilocycles and provides for automatic transmission of a predetermined signal on which aircraft equipped with standard radio compasses may home. The transmitted signal consists of a CW signal keyed 180 times per minute and interrupted every 30 seconds by a single code letter. Signals may normally be picked up over at least 50 miles of open sea.

The equipment is battery-operated and has a useful life of 12 hours. A timer is provided so the transmitter will automatically turn on at any predetermined time up to 12 hours after which the transmitter will still operate for 12 hours. The buoy has a soluble plug which will cause it to sink after 50 to 60 hours in the water.

This equipment is used to provide a reference point for search patterns in sea rescue work and in anti-submarine activity. No special training or instructions are necessary for its use.

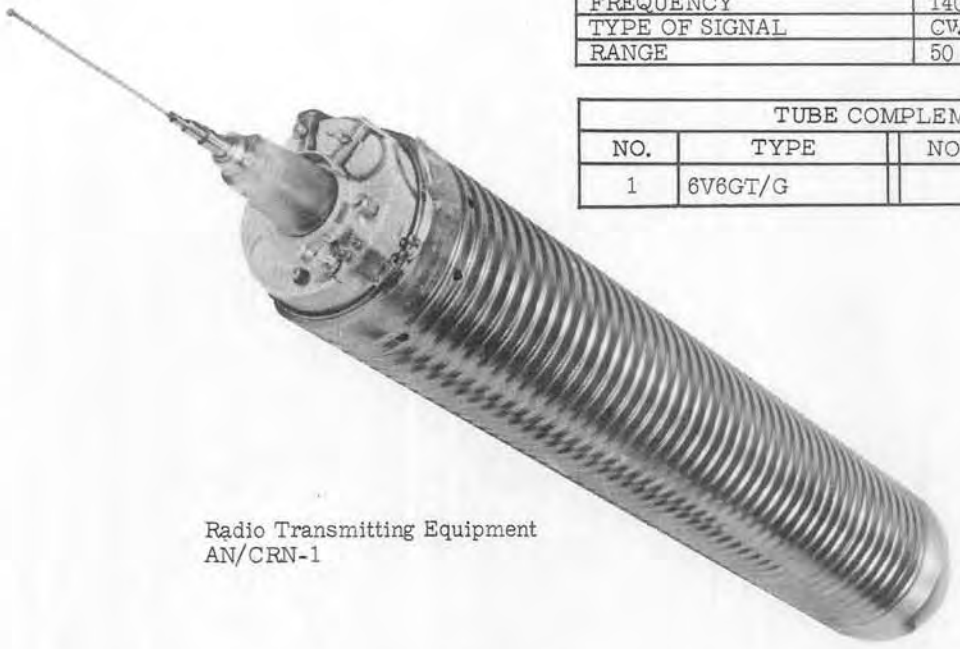
Test equipment required for maintenance includes Test Equipment TS-41/CRN-1.

Army Supply Program requirements as of 30 November 1944 were 1,050 equipments for the calendar year 1944 and 1,500 equipments for 1945.

In releasing this bouy the crew member must be securely lashed.

POWER INPUT	BATTERY PACK
POWER OUTPUT	8 WATTS
FREQUENCY	1400-1750 KC.
TYPE OF SIGNAL	CW
RANGE	50 MILES

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6V6GT/G		



Radio Transmitting Equipment
AN/CRN-1

RADIO TRANSMITTING EQUIPMENT AN/CRN-1 TOTAL WEIGHT 52 LBS.

Component	Nomenclature	Size	Weight
Radio Transmitter	T-2/CRN-1	49" high x 8" diam.	34 Lbs.
Parachute	MX-91/CRN-1	12" high x 7" diam.	4 Lbs.
Battery	BA-201/CRN	14" long x 6" diam.	14 Lbs.

May 1945

AN/CRN-2

Radio Set AN/CRN-2, an air transportable glide-path transmitter, is a component of the AAF Instrument Approach System. Signals from the transmitter are received by the pilot of the aircraft to be landed over Receiving Equipment AN/ARN-5, providing visual indication of the proper course of descent in the vertical plane during instrument landing operation. At an altitude of 3,000 feet it provides a straight-line glide path course with good definition from a minimum distance of 15 miles from the point of landing contact with the ground. The angle indicated between the horizontal and the glide path is readily adjustable between 2 and 5 degrees.

The equipment operates in the frequency range of 329 to 335 mc. At present, crystals are supplied to operate at 332.6, 333.8 and 335 mc.

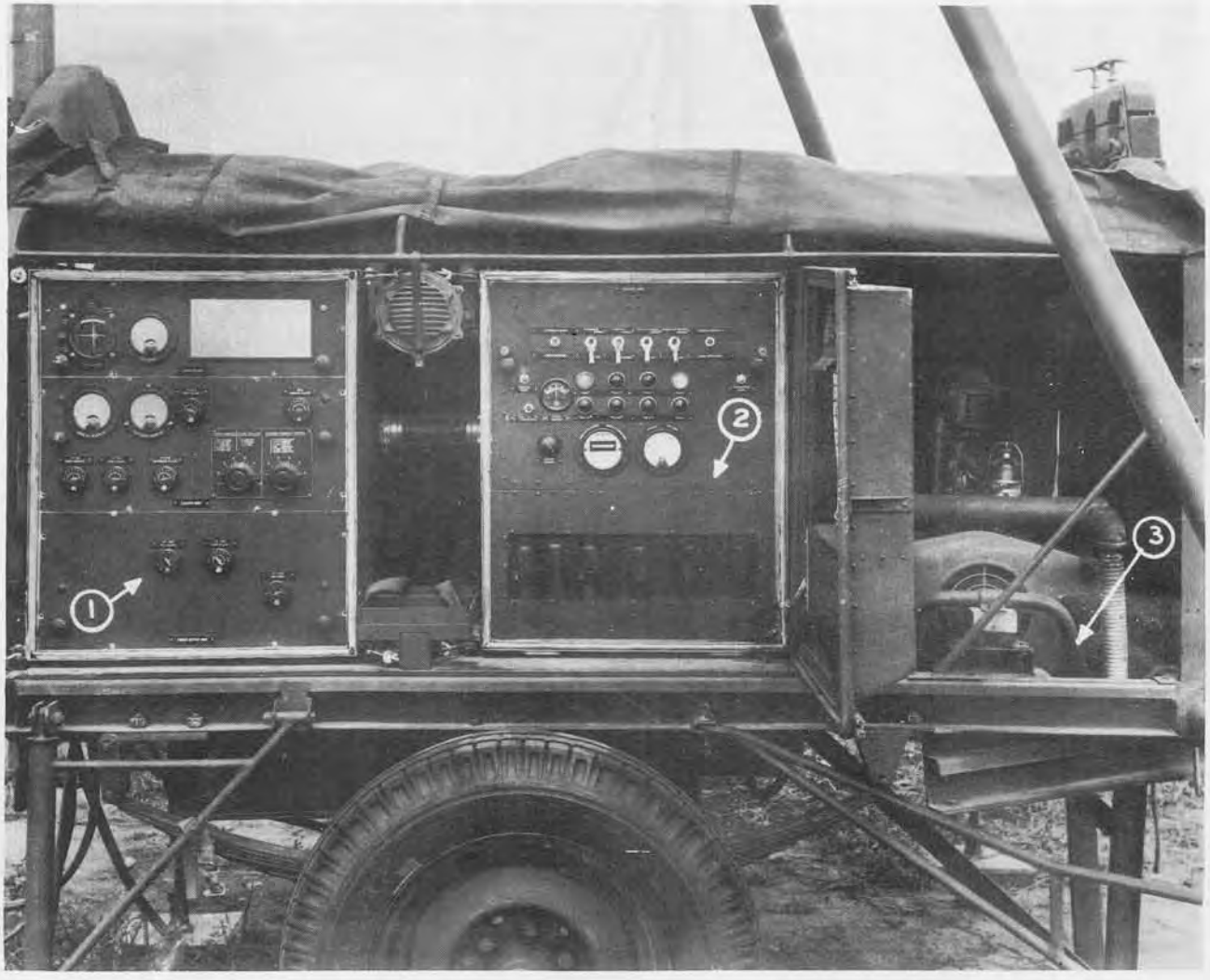
Transmitting components are installed in an air transportable trailer which is a part of the equipment. The antenna system consists of a 30-foot mast which supports the folded dipole antennas. A monitor is included in the equipment to provide automatic cut-off of the glide path carrier in the event of change in path positions, modulation frequency, field strength and/or failure of the monitor. Two-way communication between the set and the control center of the instrument approach system is provided by Radio Set SCR-610.

Test equipment required for maintenance is furnished with the basic equipment. Power for operation is obtained from a 115 volt, 60-cycle power source.

Army Supply Program requirements as of 27 December 1944 were for 450 equipments for the calendar year 1944 and 145 equipments for 1945.

POWER INPUT	115 WATTS@115 VOLTS
POWER OUTPUT	25 WATTS OF CW POWER
FREQUENCY	329-335 MC. CRYSTAL FREQUENCIES 332.6 MC. 333.8 MC. 335 MC.
TYPE OF SIGNAL	STRAIGHT LINE GLIDE PATH-DOUBLE BEAM MCW SYSTEM
RANGE	15 MILES AT 3000 FEET.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	6SJ7	3	5U4G
1	832	2	836
1	829B	1	957
4	8025	1	1LH4
1	9002	1	1LC6
1	6SK7	5	1LN5
3	6SN7GT	2	3B7/1291
1	6J5	1	1B4/1294
2	OB3/VR-90	4	3D6/1299
1	OD3/VR-150	1	1005

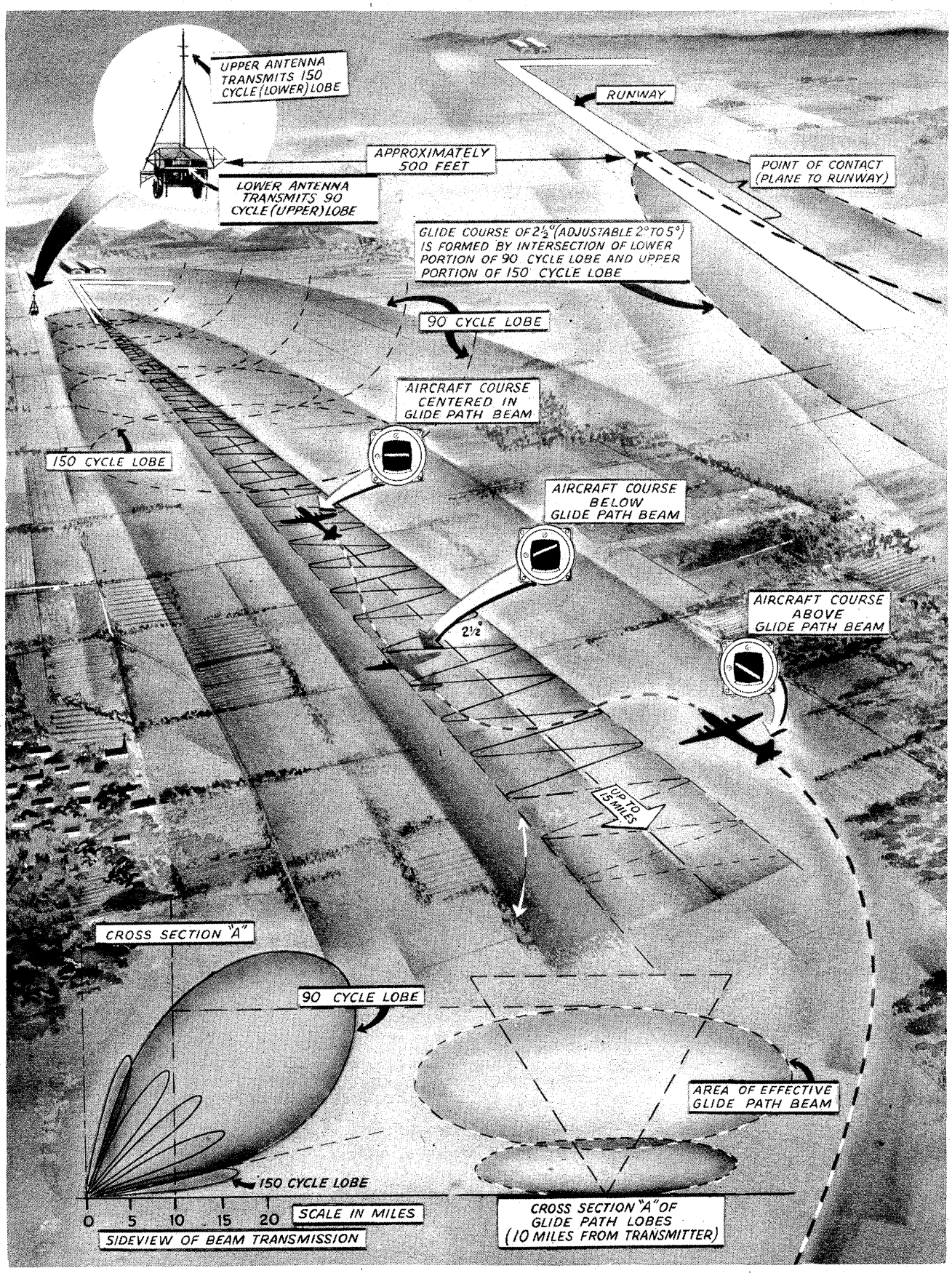


Close up of Radio Set AN/CRN-2 showing 1.Transmitter 2.Power Supply 3.Power Unit

In operation Radio Set AN/CRN-2 is located approximately 750 feet from the approach end of the runway and 400 feet to one side (or the other) of the runway's center line.

May 1945

AN/CRN 2



Radio Set AN/CRN-2 is a self contained glide path transmitter, part of the AAF instrument approach system. The glide path beam is obtained by two lobes which intersect and project outward from the runway at an angle of 2½° for a distance of approximately 15 miles.

May 1945

AN/CRN-2

Radio Set AN/CRN-2 packs into a simple trailer which permits rapid transport by air or ground.

RADIO SET AN/CRN-2

TOTAL WEIGHT 1800 LBS.

Component	Nomenclature	Size	Weight
Radio Transmitter	T-3/CRN-2	39" x 25" x 24"	227 Lbs.
Rectifier Power Unit	PP-29/ARN-2	24" x 21" x 25"	254 Lbs.
Auto Transformer	MX-95/CRN-2	8" x 8" x 12"	48 Lbs.
Antenna System	AS-2/CRN-2		
Trailer	C-1/CRN-2	5' x 10' x 5'	1033 Lbs.
Power Unit	PU-1/CRN-2	20" x 32" x 16"	226 Lbs.
Chest	CY-63/CRN-2	16" x 16" x 17"	77 Lbs.
Kerosene Obstruction Light		15" x 6" diam.	7 Lbs.
Battery	BA-57 (2 each)	16" x 7" x 10"	62 Lbs.
Voltmeter	TS-40/CRN-2	12" x 5" x 4"	23 Lbs.
Radio Receiver-Transmitter	BC-659-( )	7" x 14" x 15"	25 Lbs.
Power Unit	PE-120-( )	7" x 14" x 15"	25 Lbs.
Vibrator	VB-12 (2 each)	2" x 3" x 2"	1 Lb.
Antenna	AN-29-C	154" long extended	1 Lb.
Handset	TS-13-( )	10" x 3" x 3"	1 Lb.
Vibrator	VB-13 (2 each)	2" x 3" x 2"	1 Lb.

and includes mountings, tools, cables, crystals, and other accessories.

May 1945

AN/CRN-4

Radio Transmitting Equipment AN/CRN-4 is an air transportable, low-powered radio homing equipment for ground use in troop carrier operations. The equipment is packaged in such a manner as to allow it to be carried to the ground by either one or two paratroopers and set up for operation in approximately 30 minutes. It is capable of providing a signal for the homing of aircraft equipped with radio compasses of the type SCR-269 or the AN/ARN-7 over a range of 30 miles.

The tuning range is 1400 to 1750 kc. The set is designed to permit simultaneous operation of eight beacons within a 10-mile radius without interference between beacons. Power is supplied by a special dry battery pack.

Radio Transmitting Equipment AN/CRN-4-A is a modification of AN/CRN-4 in that a vibrator power supply has been substituted for the dry battery pack, and a vertical antenna mast which acts as an antenna, replacing the two supporting masts and antenna assembly formerly used.

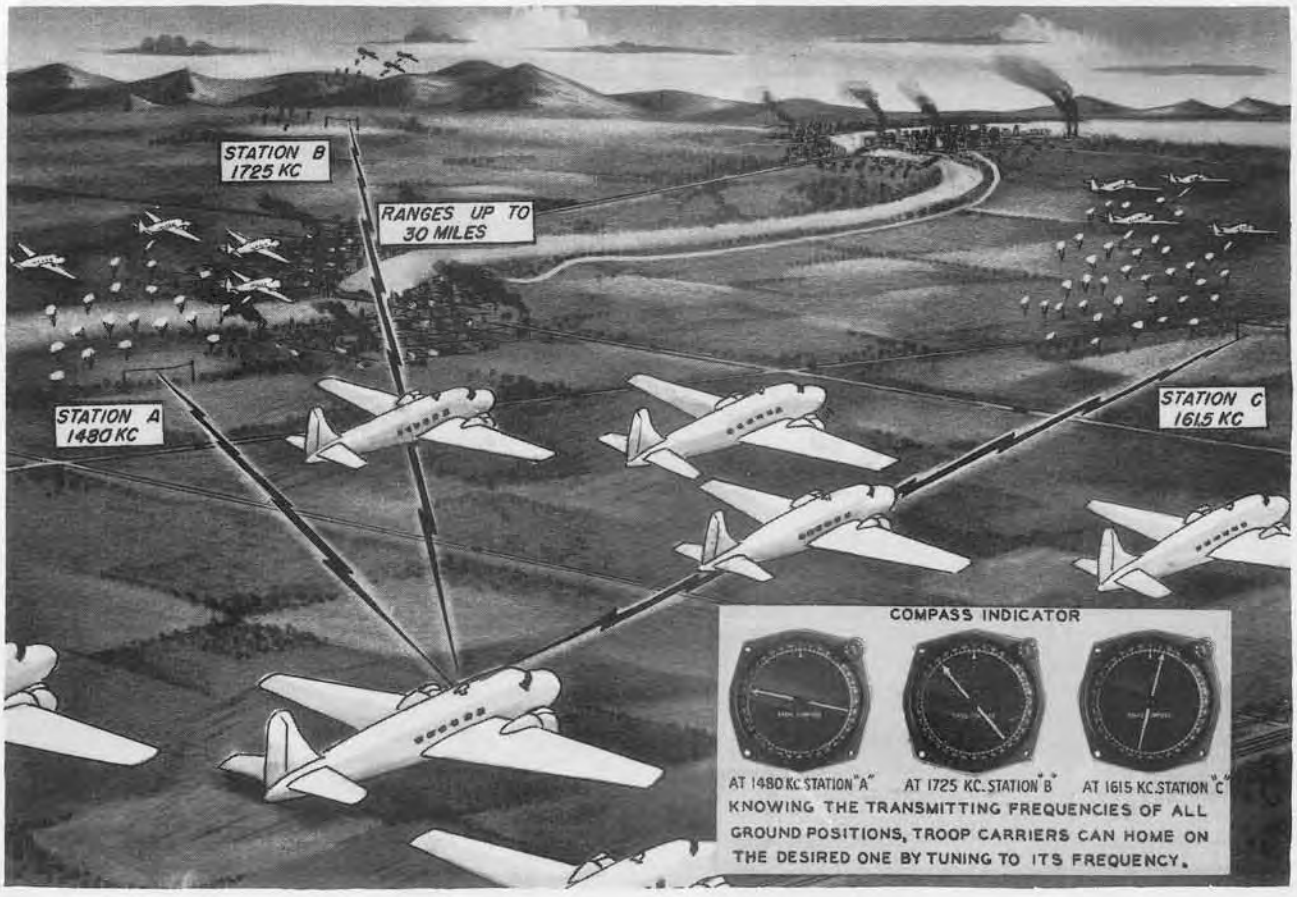
Standard test equipment, including a frequency meter, SCR-211, and a multimeter, TS-297/U, are the only test equipments required for maintenance.

Army Supply Program requirements as of 30 November 1944 were 450 equipments for the calendar year 1944.

Radio Set AN/CRN-4 dropped with pathfinder troops may be set up in 30 minutes.

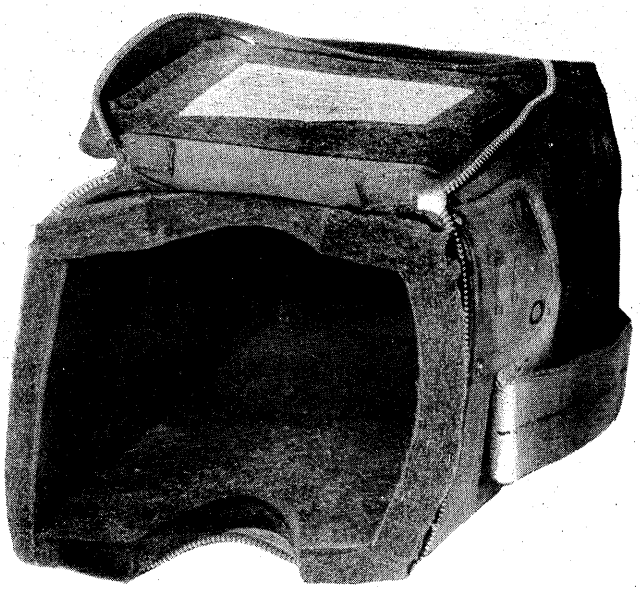
POWER INPUT	SPECIAL DRY BATTERY PACK
FREQUENCY	1400 TO 1750 KC.
TYPE OF SIGNAL	AUTOMATICALLY KEYED CW TONE MODULATED
RANGE	30 MILES

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6V6GT/G		

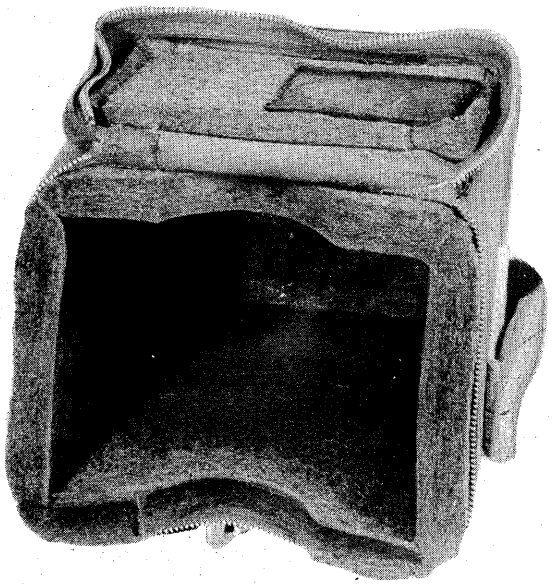


Radio Transmitting Equipment AN/CRN-4 was designed primarily to provide homing facilities for troop carrying aircraft operating behind enemy lines or under conditions of poor visibility.

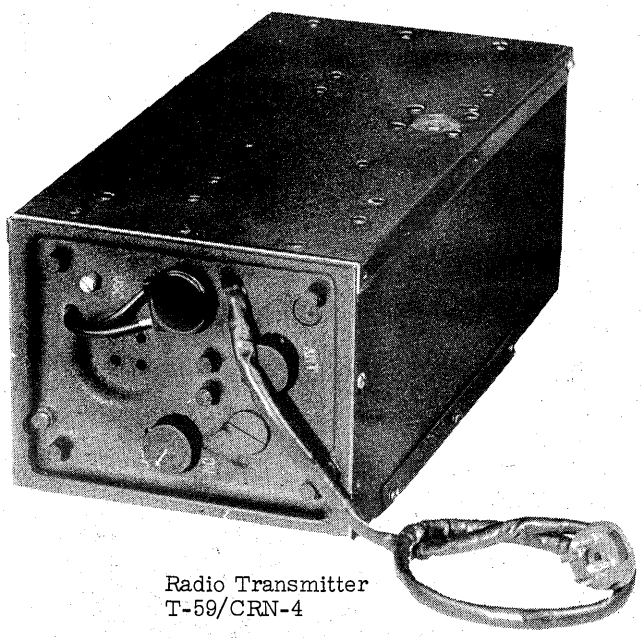
AN/CRN-4



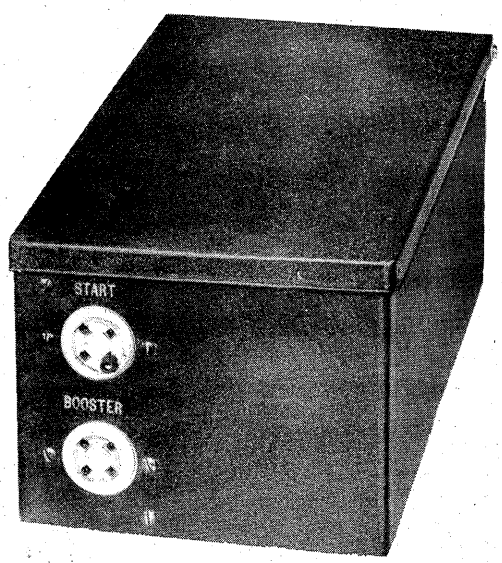
Bag CW-25/CRN-4
(For Transmitter)



Bag CW-26/CRN-4
(For Battery)



Radio Transmitter
T-59/CRN-4



Battery Box
CY-83/CRN-4

RADIO TRANSMITTING EQUIPMENT AN/CRN-4 TOTAL WEIGHT 55 LBS.

Component	Nomenclature	Size	Weight
Radio Transmitter	T-59/CRN-4	7" x 6" x 13"	10 Lbs.
Antenna Assembly	AS-85/CRN-4	33" x 12" x 5"	16 Lbs.
Battery Box	CY-83/CRN-4	13" x 6" x 7"	17 Lbs.
Bag	CW-25/CRN-4	9" x 8" x 14"	4 Lbs
Bag	CW-26/CRN-4	9" x 8" x 14"	4 Lbs.
Antenna Assembly	AS-243/CRN-4A	13" x 6" x 7"	5 Lbs.
Vibrator Power Unit	PP-161-()-CRN-4A	6" x 5" x 13"	5 Lbs.
Bag	CW-125/CRN-4A	4" diam. x 36" long	1 Lb.

and includes operating spare parts kit.

May 1945

AN/CRN-10

Radio Set AN/CRN-10 is an air transportable trailer mounted localizer equipment used in the AAF Instrument Approach System. Function of this equipment is to provide a signal to guide an RC-103 equipped aircraft to the line of a runway. This equipment is lighter in weight but functionally similar to Radio Set AN/MRN-1. It is intended for use where air transportable localizer equipment is desirable and is expected ultimately to replace Radio Set AN/MRN-1.

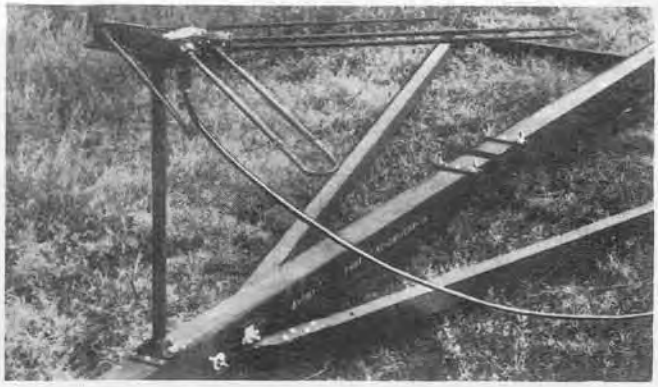
Mounted on a trailer similar to that utilized for Radio Set AN/CRN-2 (glide path transmitter), the equipment is suitable for transportation in cargo type aircraft. Care must be taken when installing the equipment and its radiation system to insure a minimum hazard to aircraft. The power unit is mounted on wheels rather than in the trailer and is also air transportable.

Provision is made for remote start-stop control and also for two-way communications between the monitor location, the localizer equipment, and the control center of the instrument landing system.

The equipment is operable from a 115-230 volt, 50-60 cycle power source and includes a standard auxiliary gasoline engine power unit which is capable of continuous operation. A course monitor provides visual and aural alarm in the event of change in course positions, modulation frequencies, field strength, or failure of the monitor. Accuracy of the course definition and the straightness or stability of the defined course permits the landing of military aircraft on a runway 100 feet wide at a minimum distance of 6,000 feet from the localizer equipment. This equipment represents considerable improvement over Radio Set AN/MRN-1 in its reduced size and weight and improved antenna pattern.

Test equipment required for maintenance is included in parts for the set.

Army Supply Program requirements as of 1 February 1945 were 146 sets for the calendar year 1945.

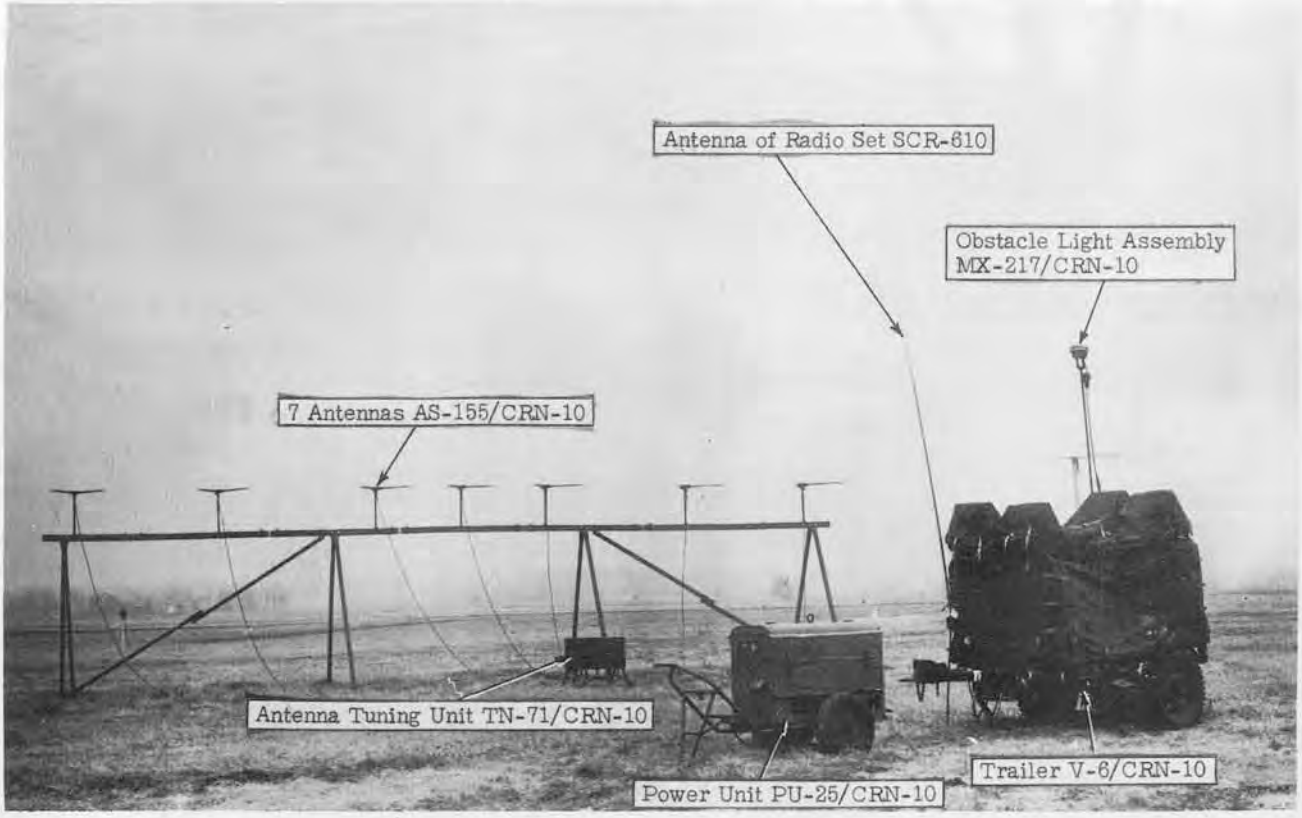


One of seven antenna arrays require to produce field pattern.

POWER INPUT	1 KW @ 115 VOLTS
POWER OUTPUT	35 WATTS
FREQUENCY	108.3-110.3 MC
TYPE OF SIGNAL	MCW
RANGE	40 MILES AT 2500 FEET ALTITUDE

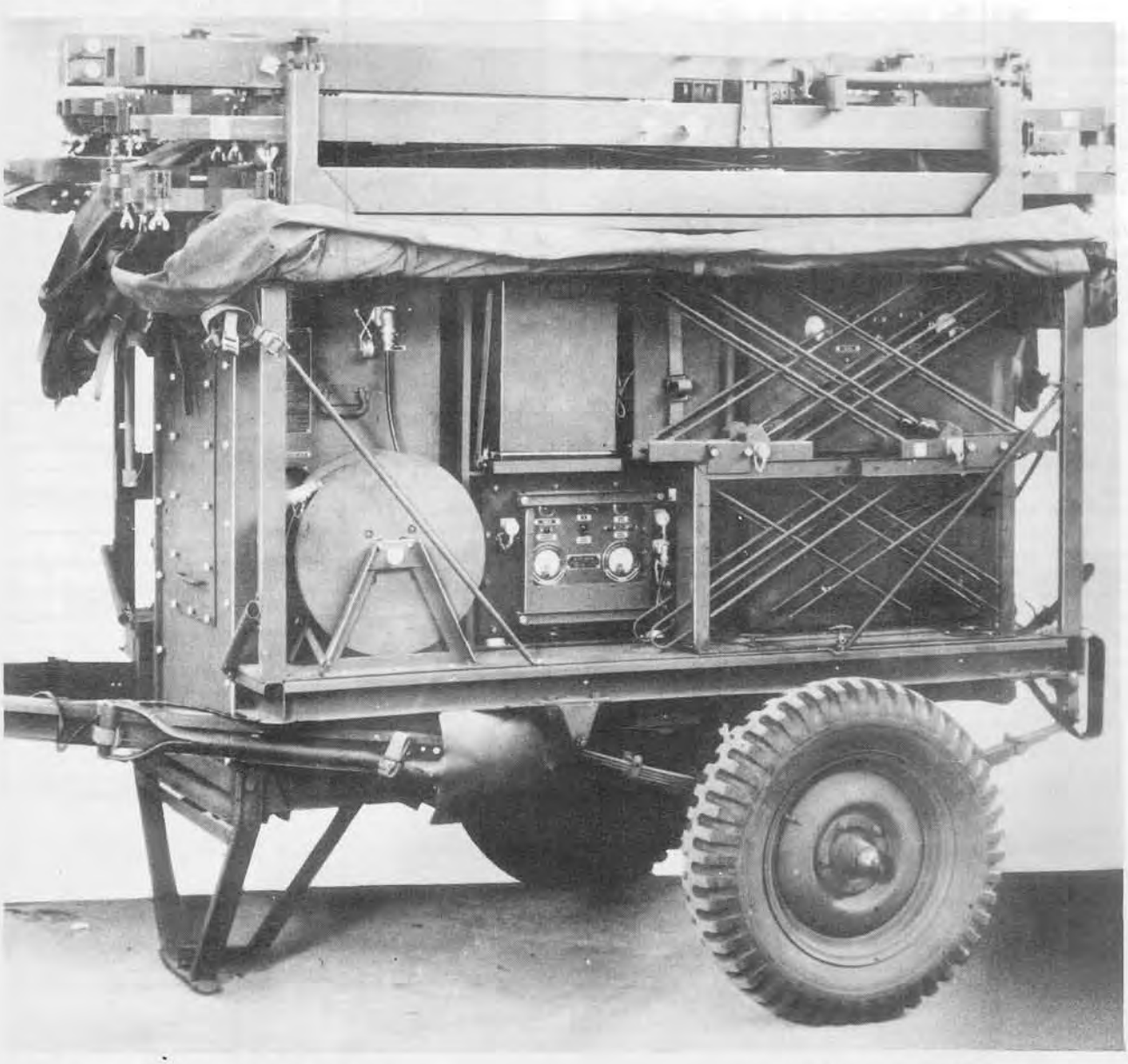
* TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	1R5	2	6H6
1	957	2	2051
2	1LN-5	1	6K6GT/G
1	1S5	2	807
1	3S4	3	4E27
1	9002	1	5V4G
1	6X5GT/G	4	836

* Does not include tubes for SCR-610 and AN/CRM-3.



Radio Set AN/CRN-10 set up for operation provides landing aircraft with alignment of runway in instrument approaches.

AN/CRN-10



RADIO SET AN/CRN-10

TOTAL WEIGHT 4000 LBS.

Component	Nomenclature	Size	Weight
Transmitter	T-66/CRN-10	26" x 26" x 31"	412 Lbs.
Mechanical Modulator	MD-24/CRN-10	24" x 44" x 21"	153 Lbs.
Tube Case	CY-242/CRN-10	25" x 12" x 7"	10 Lbs.
Indicator Box	ID-70/CRN-10	19" x 13" x 13"	77 Lbs.
Trailer	V-6/CRN-10	6'7" x 5'2" x 5'3"	
Chest	CY-184/CRN-10	12" x 16" x 8"	100 Lbs.
Cable Case	CY-241/CRN-10	55" x 23" x 5"	87 Lbs.
Reel Assembly	RL-107/CRN-10	17" x 16" x 9"	9 Lbs.
Obstacle Light Assembly	MX-217/CRN-10	8" x 14" x 6"	8 Lbs.
Radio Monitoring Set	AN/CRN-3	20" x 20" x 17"	75 Lbs.
Power Unit	PU-25/CRN-10	28" x 48" x 20"	685 Lbs.
Frequency Converter	PU-15/CRN-10		300 Lbs.
Radio Set	SCR-610	16" x 14" x 51"	137 Lbs.
Antenna System	AS-156/CRN-10	492" x 119" x 85"	
Antenna Tuning Unit	TN-71/CRN-10	33" x 18" x 12"	39 Lbs.
8 Antennas	AS-155/CRN-10	37" x 30" x 3"	5 Lbs.
Course Detector	TS-179/CRN-10	12" x 9" x 31"	26 Lbs.

and includes cords, plugs, mountings, etc.

May 1945

AN/CRT-3

Radio Set AN/CRT-3 is an air-transportable, hand-powered emergency transmitting system designed for operation from a rubber life raft and to serve as an aid to sea rescue. It consists of a modified SCR-578-A and operates on the international distress frequency of 500 kc.

AN/CRT-3 also operates on a frequency of 8280 kc. with a 1000 cycle MCW note on 500 kc. and CW emission only on 8280 kc. Transmission is automatically shifted every 40 seconds from one frequency to the other. Operational manual keying on the international distress frequency is provided. When manually keyed, the transmitter operates only on the international distress frequency. The frequency shifting mechanism is then inoperative.

Use of 8280 kc. provides a means of obtaining long range bearing from landbased direction finding stations so that ships or aircraft can be dispatched to the general location, and the 500 kc. transmitter is used by the rescue craft to home on the life raft. On test using the 8280 kc. frequency, satisfactory bearings have been obtained up to 1,600 miles. Included in the equipment is a parachute to permit dropping of the set into the sea without damage.

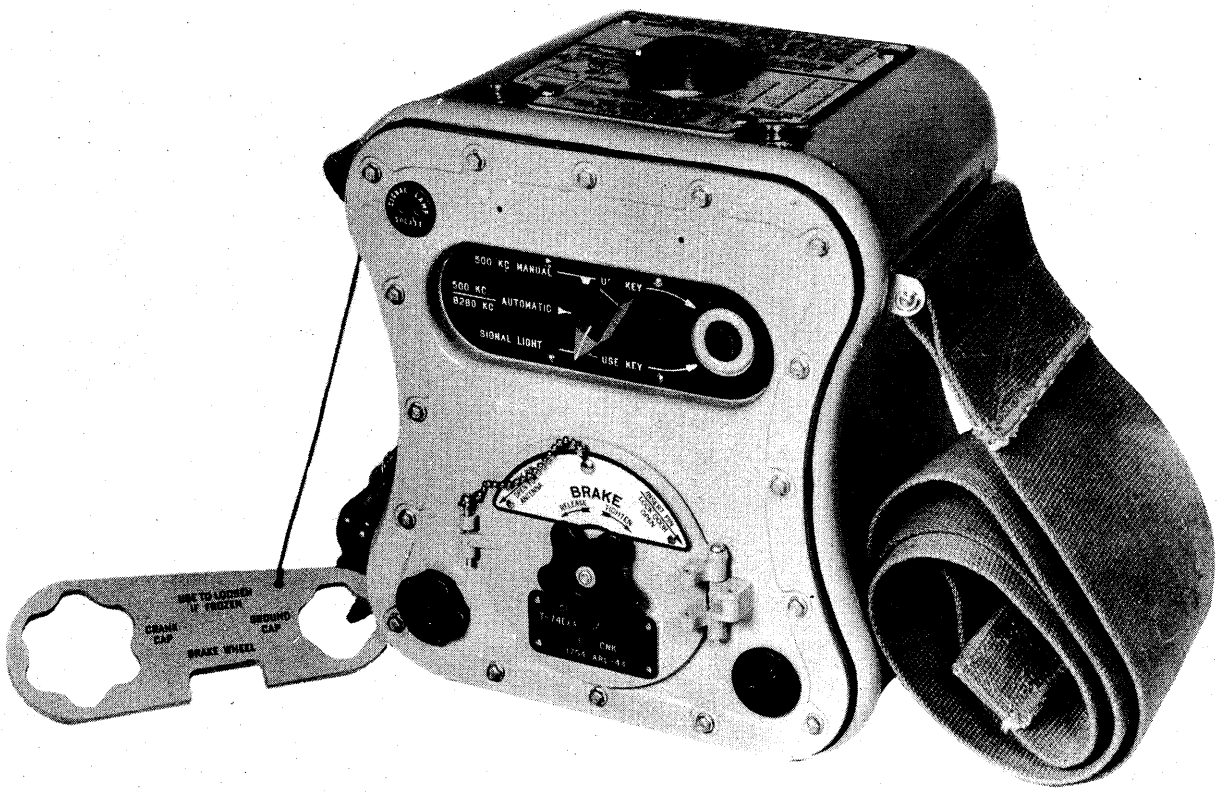
Test equipment for maintenance is under development.

Army Supply Program requirements for AN/CRT-3 and/or SCR-578 as of 31 October 1944 were 40,742 equipments for the calendar year 1944 and 43,023 for 1945.

POWER INPUT	HAND CRANKED
FREQUENCY	500 KC. & 8280 KC.
TYPE OF SIGNAL	MCW FOR 500 KC. CW FOR 8280 KC.
RANGE	200 MILES AT 500 KC. 1600 MILES AT 8280 KC.
DUAL FREQUENCY	40 SECONDS

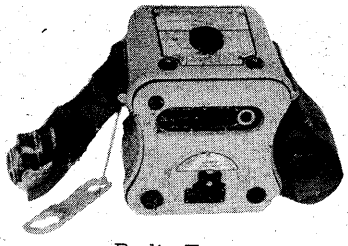
Radio Set AN/CRT-3 packed with parachute M-340-A attached.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	12A6	1	12SC7



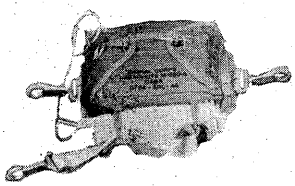
Front View of Radio Transmitter T-74(XA-A)/CRT-3(XA-2)

AN/CRT-3



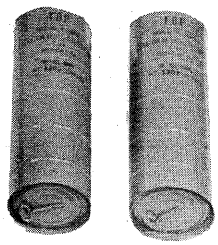
Radio Transmitter
T-74(XA-A)/CRT-3(XA-2)

Bag BG-155-A

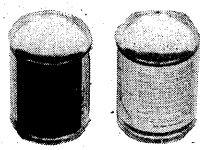


Parachute
M-390-A

Signal Lamp
M-308-B

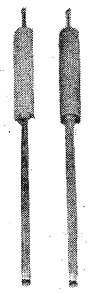


Generators
M-315-B



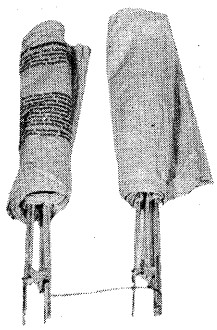
Balloons
M-278-A

Antenna Reels



Inflating Tubes

Inner Bag



Kite
M-357-A

RADIO SET AN/CRT-3

TOTAL WEIGHT 32 LBS.

Component	Nomenclature	Size	Weight
Radio Transmitter	T-74/CRT-3	10" x 14" x 9"	16 Lbs.
Antenna Assembly	AS-207/CRT-3 (2 each)	3" x 3" Diam.	*
Signal Lamp	M-308-B	2" x 3" Diam.	*
Kite	M-357-A	18" x 4" Diam.	1 Lb.
Balloon	M-278-A	5" x 4" Diam.	1 Lb.
Generator	M-315-B	12" x 4" Diam.	3 Lbs.
Parachute	M-390-A	9" x 9" x 5"	3 Lbs.
Bag	BG-155-A	20" x 17" x 14"	7 Lbs.
Lamp	LM-58-A		

*less than one pound.

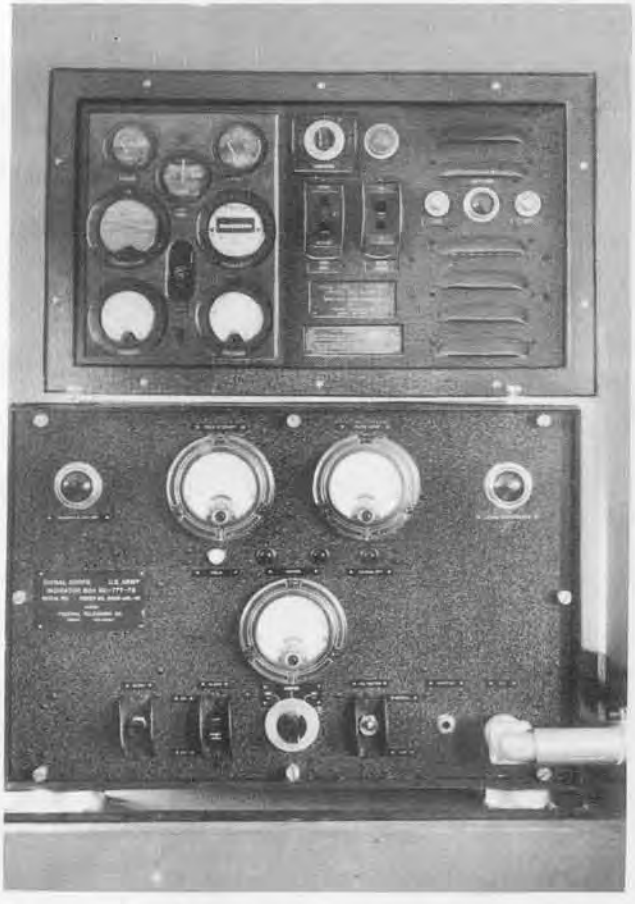
March 1945

Radio Set AN/MRN-1 is a portable multi-frequency instrument approach localizer, a part of the AAF Instrument Approach System. The function of the equipment is to provide a signal to guide an RC-103 equipped airplane to the line of a runway. It furnishes signals for orienting an airplane in the horizontal plane to provide positioning along the centerline of the landing runway. Other components of the Army Air Force Instrument Approach System furnish signals for orienting an airplane in the vertical plane (glide path) to provide a path for descent, and marker beacon signals to indicate the position of an airplane with relation to the location of the landing strip. The equipment is installed in a K-53-D truck.

The set radiates two intersecting field patterns, one of which is modulated at an audio frequency of 90 cycles per second and the other at an audio frequency of 150 cyles per second. The shape of the radiated patterns is such that they intersect in a vertical plane, called the "Course", which can be oriented (by positioning the truck) to intersect the ground in a line which coincides with the center line of a landing runway. A localizer receiver-equipped airplane is thereby provided a course to be flown to a predetermined runway under conditions of poor visibility.

The range of the equipment is a function of the elevation of the receiving antenna; approximately 40 miles at an elevation of 2,500 feet; 70 miles at 6,000 feet; and 100 miles at 10.000 feet.

Radio Set AN/MRN-1 has a frequency range from 108.3 to 110.3 mc., and may be operated on any frequency within that range by merely inserting the proper crystal unit and properly tuning Radio Transmitter BC-751-A. Six Crystal Units DC-17-A are provided for operation on 108.3, 108.7, 109.1, 109.5, 109.9 and 110.3 mc. Although the equipment is designed for operation on six frequencies, the frequencies assigned for instrument approach use are 108.7, 109.5 and 109.9 mc. Power is furnished from a 115 volt, 60 cycle source.



Indicator BC-777 installed in truck.

Radio Transmitter BC-751 installed in truck.

As used by the 13th and 14th Air Forces in the CBI theater, with the upper antenna array mounted on a 70-foot support to project the beam over mountainous terrain, its range is 100 miles at 10,000 feet altitude. It is used as a navigational aid for cargo airplanes flying over the "hump."

Radio Set AN/CRN-10, a portable localizer transmitter will ultimately replace the AN/MRN-1 since it provides the same type of signals, is of reduced size and weight, and has improved antenna pattern which reduces the energy in reflecting objects to the rear of the localizer.

Test equipment required for maintenance and tuning is contained in the parts list for the equipment.

As of 1 February 1945 there were no requirements on the Army Supply Program.

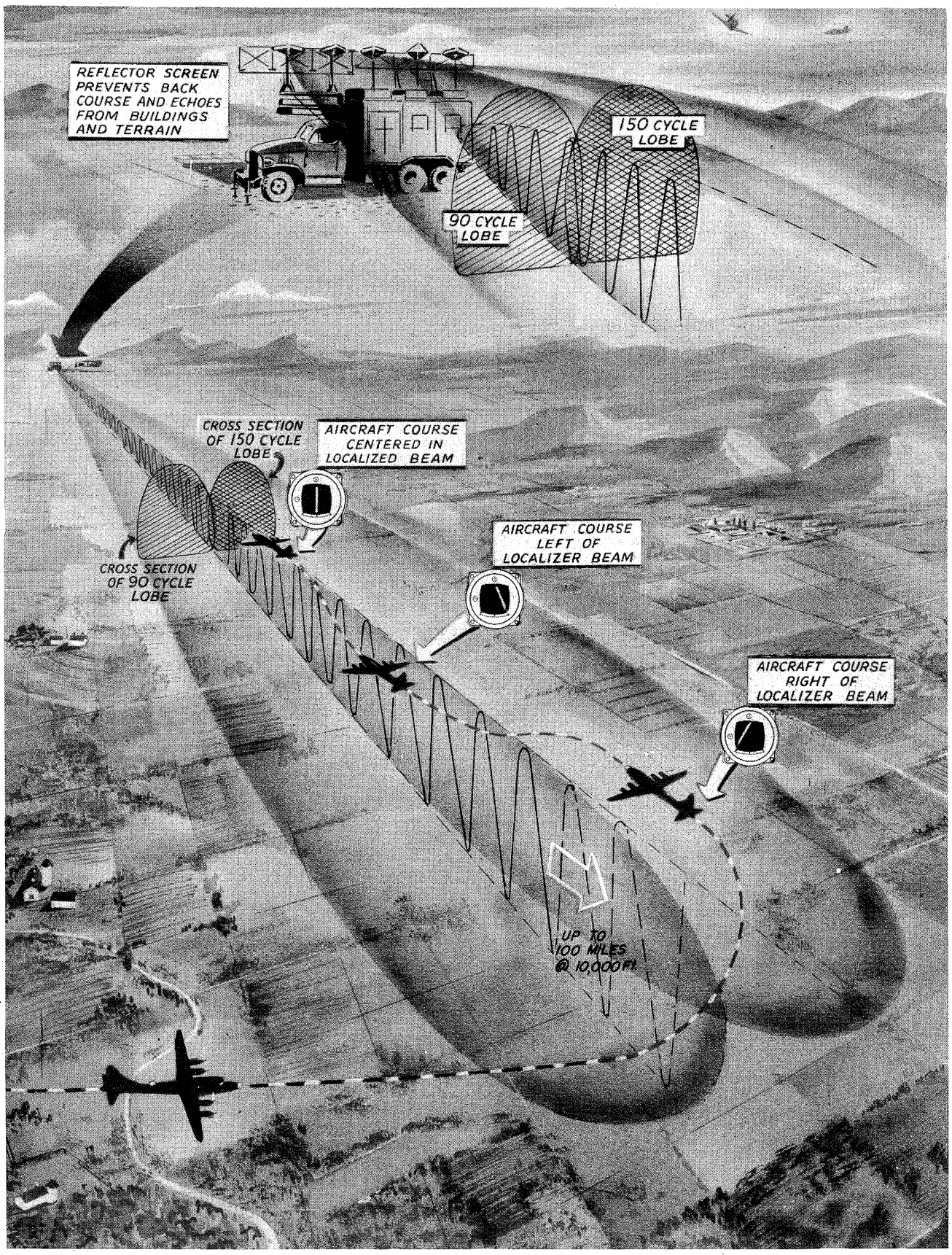
AN/MRN-1

POWER INPUT	1250 WATTS@115 VOLTS
POWER OUTPUT	CW & VOICE-100 WATTS PEAK MCW-25 WATTS PEAK
FREQUENCY	108.3-110.3 MC.
TYPE OF SIGNAL	CW, MCW & VOICE
RANGE	40 MILES @ 2500 FEET ALTITUDE--70 MILES@ 6000 FEET ALTITUDE 100 MILES @ 10,000 FEET ALTITUDE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	9002	2	6H6
1	6SF5	2	2051
1	6K6GT/G	4	807
1	6X5GT/G	3	4E27
1	1R5	1	6F6
1	957	1	6SN7GT
2	1LN5	1	5V4G
1	1S5	4	836
1	3S4	2	VR-150-30

Course Detector BC-753 is generally placed well away from and parallel to antenna equipment RC-109.

AN/MRN-1



Radio Set AN/MRN-1 is a portable multi-frequency instrument landing localizer used in conjunction with Airborne Radio Receiving Equipment RC-103-A,-AZ. It transmits a forward course beam which enables approaching aircraft to establish lateral alignment with the runway.

May 1945

AN/MRN-1

RADIO SET AN/MRN-1

TOTAL WEIGHT 16,900 LBS.

Component	Nomenclature	Size	Weight
Control Box	BC-915-A	24'' x 14'' x 8''	49 Lbs.
Course Detector	BC-753-A	20'' x 13'' x 22''	65 Lbs.
Course Detector	BC-754-A	32'' x 10'' x 8''	24 Lbs.
Fuel Pump		22'' x 6'' diam.	13 Lbs.
Heater	M-321-A	69'' x 13'' x 14''	120 Lbs.
Indicator Box	BC-777-A	19'' x 14'' x 13''	60 Lbs.
Junction Box	JB-58-A	15'' x 10'' x 4''	8 Lbs.
Junction Box	J-7/MRN-1	7'' x 6'' x 3''	3 Lbs.
Modulator & Bridge	BC-752-A	47'' x 33'' x 23''	330 Lbs.
Power Unit	PE-141-A	49'' x 37'' x 21''	804 Lbs.
Radio Transmitter	BC-751-A	47'' x 31'' x 28''	549 Lbs.
Range Poles	M-382-A	72'' long	4 Lbs.
Maintenance Parts in Chest	CH-181	65'' x 37'' x 22''	851 Lbs.
Tool Equipment		17'' x 11'' x 6''	24 Lbs.
Truck	K-53-D	252' x 116' x 93'	11,700 Lbs.
Radio Set	SCR-610		137 Lbs.
Radio Monitoring Set	AN/CRM-3		
Antenna Equipment	RC-109	226'' x 48'' x 34''	564 Lbs.

and includes cables, mountings, batteries, cords, etc.

May 1945

AN/MRN-2

Radio Set AN/MRN-2 is a ground, mobile, two-course VHF aural radio range with station identification, periodic sector identification and simultaneous voice transmission. It is a crystal controlled set and operates in the frequency range of 100 to 156 mc. for use in guiding aircraft equipped with VHF communications receivers, such as Radio Set SCR-522, to landing field, or for use in flying ferry routes.

Adjustable over the frequency band of 100 to 156 mc., operation without readjustment is limited to a band of 5 mc. The equipment, including the antenna, can be readjusted to any frequency within one-half to one hour provided the necessary crystals are available. The selection of operating frequency depends on the proposed use of the equipment.

Considerable attention to siting the VHF radio range equipment is required. The use of vertical polarization gives rise to some reflection from trees within 500 feet of the radio range site. Thus it must be located in a cleared space of 500 feet radius. To obtain nearly perfect courses a cleared space of 1,000 feet radius is recommended.

Extensive flight tests indicate that course bends produced by the location of Radio Set AN/MRN-2 in mountainous terrain are not too severe to make its operation unsatisfactory; bends produced by location of the transmitter in a valley are more severe than those produced by its location on top of a mountain; location on top of a mountain greatly increases distance range obtained; and operation of the voice modulation channel is very satisfactory. Power for operation is furnished by a 2 KVA gasoline driven power unit.

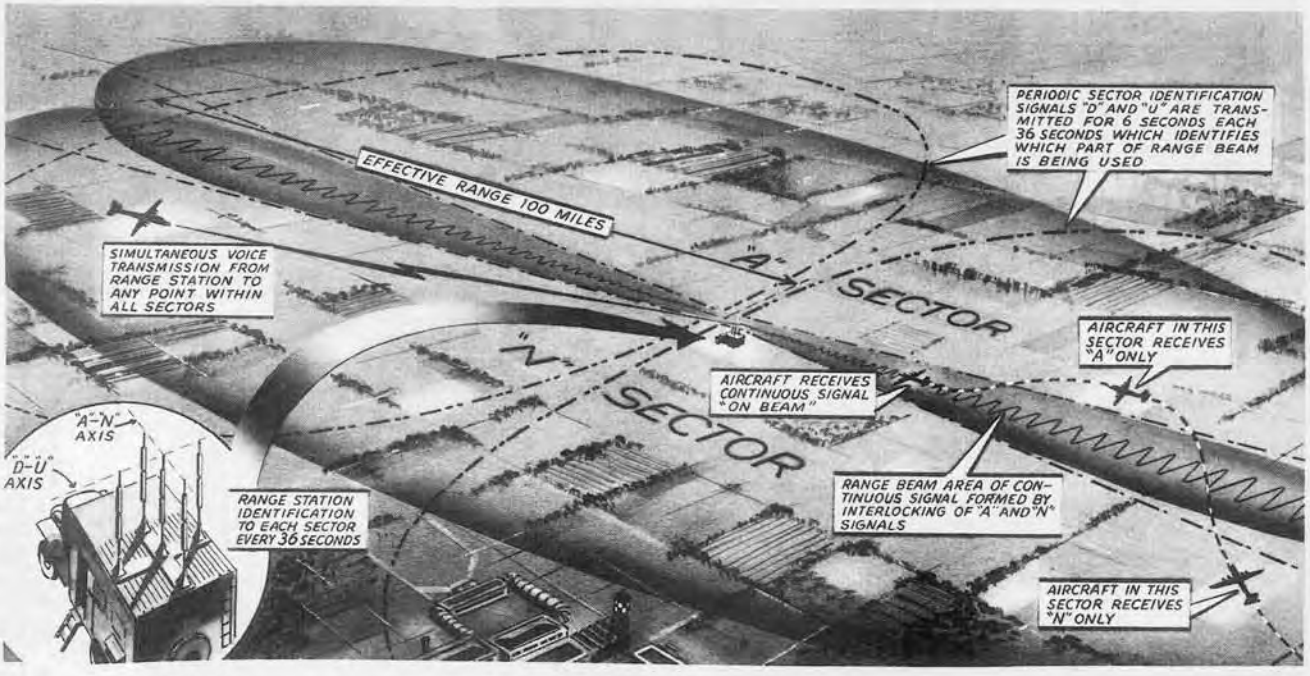
Range Transmitters installed in forward part of truck.

Test equipment required for maintenance and tuning is furnished with the basic equipment.

There were no Army Supply Program requirements as of 1 February 1945.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6B8	4	807
3	6H6	2	829
2	6J5	2	832
2	6SJ7	6	836
3	6SN7GT	1	2050
3	6V6GT	1	OD3/VR-150
2	6X5GT	1	6SK7GT/G

POWER INPUT	200 WATTS@ 115 VOLTS 60 CYCLES
POWER OUTPUT	CONE OF SILENCE-25 WATTS; TRANSMITTER CARRIER - 100 WATTS SIDE BAND -50 WATTS
FREQUENCY	100-156 MC.
TYPE OF SIGNAL	CW; MCW; VOICE
RANGE	100 MILES
ANTENNA POLARIZATION	VERTICAL



Radio Set AN/MRN-2, a ground, mobile two course VHF aural radio range, provides station identification, periodic sector identification and simultaneous voice transmission.

AN/MRN-2

RADIO SET AN/MRN-2

TOTAL WEIGHT 13,500 LBS.

Component	Nomenclature	Size	Weight
Amplifier	AM-11/CRN-5	10" x 6" x 4"	14 Lbs.
Antenna	AT-7/CRN-5	135" x 6" diam.	46 Lbs.
Monitor	TS-22/URN	8" x 6" x 29"	11 Lbs.
Phaser	CU-3/CRN-5	5" x 13" x 44"	41 Lbs.
Power Control Unit	C-49/CRN-5	30" x 14"	41 Lbs.
Power Unit	PU-3/CRN-5	18" x 36" x 31"	460 Lbs.
Radio Transmitter	T-10/CRN-5	62" x 23" x 18"	384 Lbs.
Rectifier Modulator	MD-3/CRN-5	62" x 23" x 18"	561 Lbs.
Test Set	I-77-A	4" x 3" x 7"	2 Lbs.
Voltmeter	TS-21/CRN-5	4" x 5" x 12"	3 Lbs.
Antenna Base	AB-1/CRN-5	8" x 10" x 24"	
Compass Assembly	B-16		2 Lbs.
Truck	K-53-D		11,700 Lbs.

May 1945

Marker Beacon Set AN/MRN-3 is a jeep-mounted transmitter providing a vertical fan-shaped pattern for boundary marking and a channel for communication with the airport control tower.

AN/MRN-3 replaces the Instrument Landing Equipment SCR-241 in the AAF Instrument Approach System. Each system requires three marker beacon sets, one to be located in the airport runway boundary, one at approximately one mile from the approach end of the runway and one 4 1/2 miles from the approach end of the runway all on the center line of the runway to be used.

The equipment transmits a vertical pattern to be received by Marker Beacon Receiving Equipments RC-39, RC-43, RC-193-( ), AN/ARN-8 or AN/ARN-12, marking reference points in the instrument landing system. A signal amplitude modulated at 1300 cycles per second, may be keyed at two dashes per second, six dots per second or may be unkeyed. A power input of 125 watts from a power source of 115 volts 60 cycles per second is required for operation.

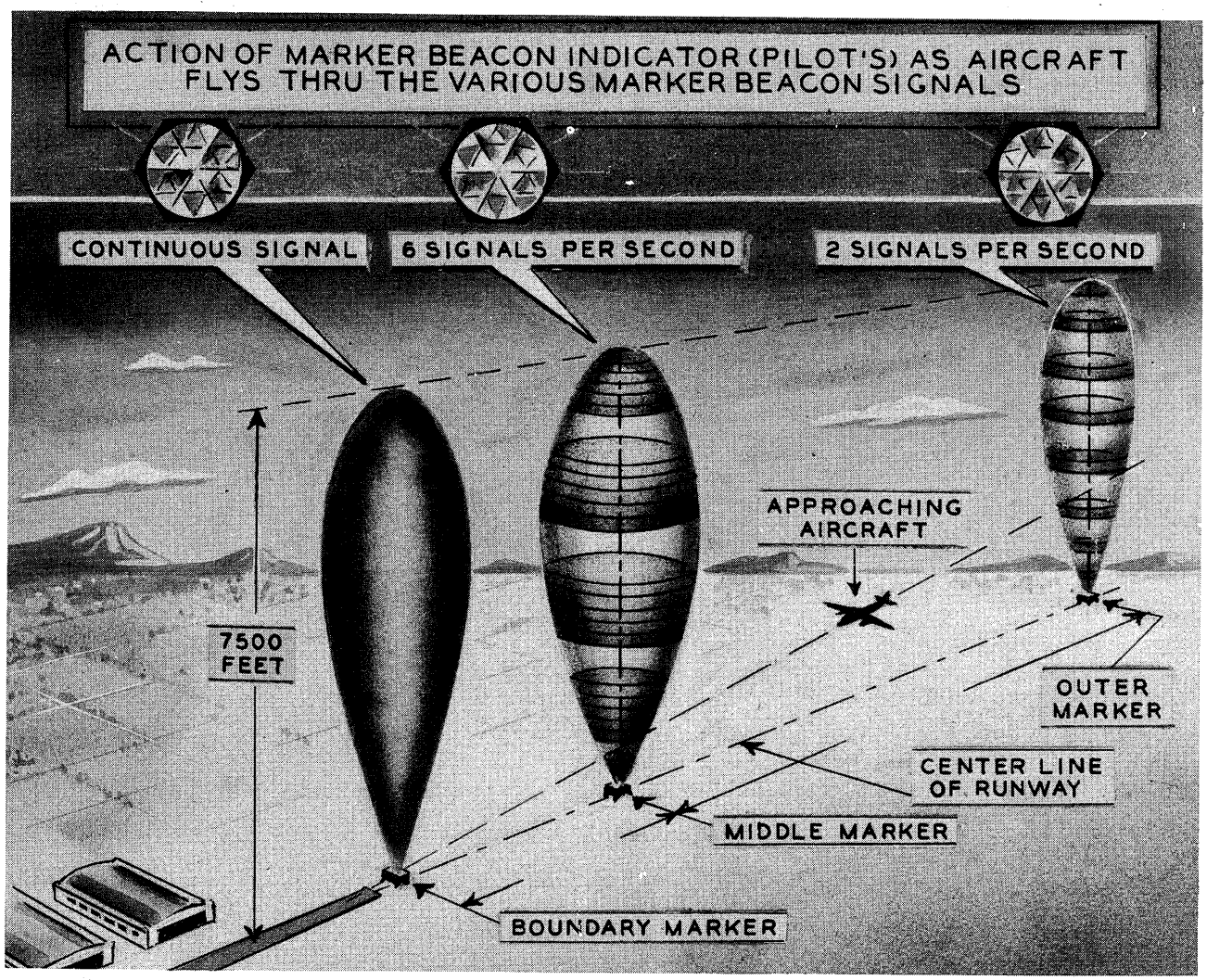
The marker beacon transmitter projects a vertical fan-shaped pattern to a height of approximately 3,000 feet. The transmitter is placed so that the longer horizontal axis of the beam is perpendicular to the line of approach. A pilot flying through the marker signal at an altitude of 900 feet and a speed of 120 miles per hour will receive an indication from his marker beacon receiver for approximately 12 seconds. Flying through the same pattern at 200 feet (speed 120 miles per hour), he will receive an indication for approximately 6 seconds.

Test equipment required for maintenance includes Maintenance Equipment ME-13.

Army Supply Program requirements as of 1 February 1945 were 497 equipments for the calendar year 1945.

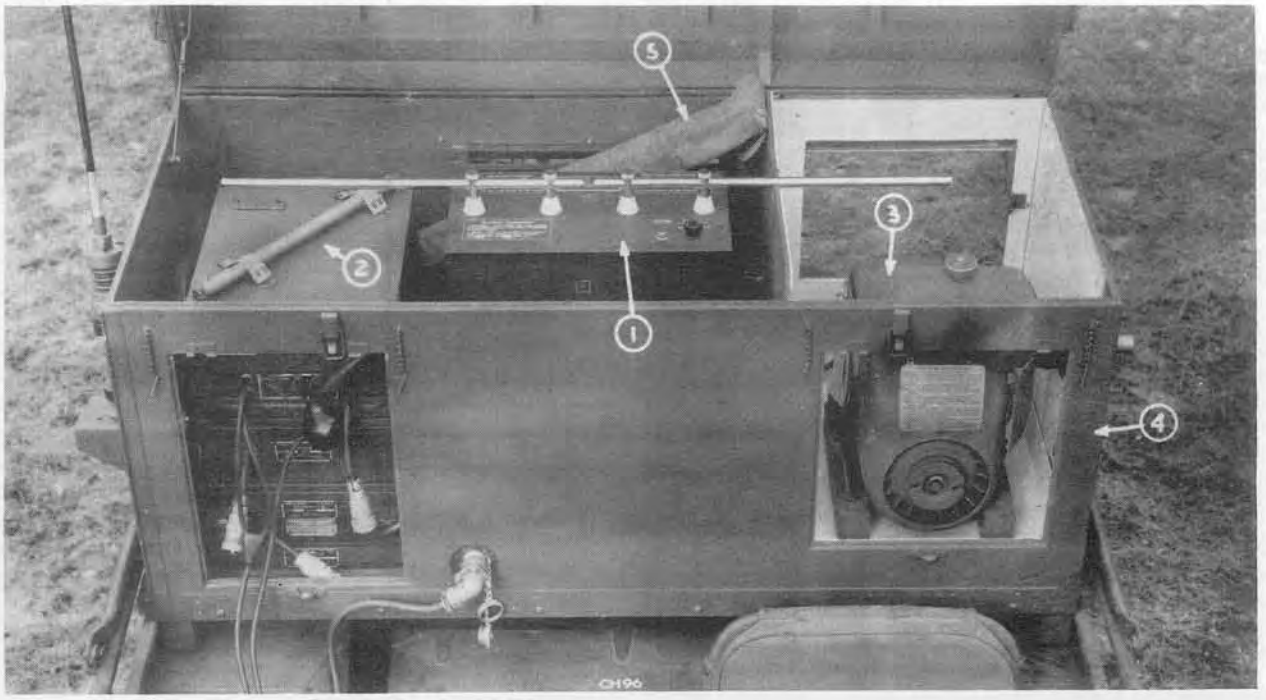
POWER INPUT	125 WATTS@115 VOLTS A.C.
POWER OUTPUT	1 WATT
FREQUENCY	75 MEGACYCLES
TYPE OF SIGNAL	MCW
RANGE	3,000 FEET(VERTICAL)

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	5Z4	2	1291
2	VR-150-30	4	1299
1	7E6	1	1LH4
2	7E7	1	1294
1	7N7	1	1LC6
5	7C5	1	1005
5	1LN5		



The Airborne Marker Beacon receiver picks up and records on an indicator lamp (pilots position) the transmissions of the respective marker beacons. Thus orienting the approaching aircraft (in distance) to the runway

AN/MRN-3 UNCLASSIFIED



1. Radio Transmitter BC-902-B 2. Radio Set SCR-610-A 3. Power Unit PE-88 4. Shelter S-2/MRN-3 5. Roll BG-56

MARKER BEACON SET AN/MRN-3 TOTAL WEIGHT 2600 LBS.

Component	Nomenclature	Size	Weight
Shelter	S-2/MRN-3	56'' x 24'' x 28''	
Power Unit	PE-88-A	20'' x 10'' x 16''	85 Lbs.
Radio Transmitting Equipment	RC-115-A	43'' x 18'' x 23''	60 Lbs.
Radio Set	SCR-610		140 Lbs.
Truck		1/4 ton 4' x 4'(jeep)	

and includes maintenance kit for power unit PE-88-A.

May 1945

Beacon Receiver BC-1206 is a small, airborne, light weight superheterodyne receiver having a frequency coverage of 200 to 400 kc. for use in connection with radio beacon transmitters.

By receiving a signal from the beacon transmitters on the ground, BC-1206 indicates by aural signal the aircraft's position in relation to right or left bearing of the transmitter. Installed in fighter aircraft, the equipments are intended for use in this country and are removed from the aircraft prior to entering combat overseas.

Beacon Receivers BC-1206-A, B, C and D are essentially the same with the exception of minor electrical differences.

No special test equipment is required for maintenance.

Army Supply Program requirements as of 1 February were 11,860 receivers for the calendar year 1945, and 23,599 for 1946.

POWER INPUT	24 WATTS @ 28 VOLTS
FREQUENCY	195-405 KC
TYPE OF SIGNAL	VOICE & MCW
RANGE	150 MILES

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	14A7/12B7	1	14R7
1	14J7	1	28D7

Receiver

BEACON RECEIVER BC-1206

TOTAL WEIGHT 5 LBS.

Component	Nomenclature	Size	Weight
Detrola Receiver	Model 438	5" x 5" x 8"	4 Lbs.

and includes cable and connectors.

May 1945

Marker Beacon Receiving Equipment RC-43-A, an ultra-high frequency receiving equipment used in aircraft as an aid to navigation and landing, provides visual indication when flying over a 75 mc. marker beacon.

Operating in the frequency range of 67-80 mc., RC-43-A is designed to receive the 75 mc. marker beacon signals used in the AAF Instrument Approach System and the cone of silence and fan marker beacons of the Civil Aeronautics Administration, and other facilities employing modulated 75 mc. horizontally polarized transmission.

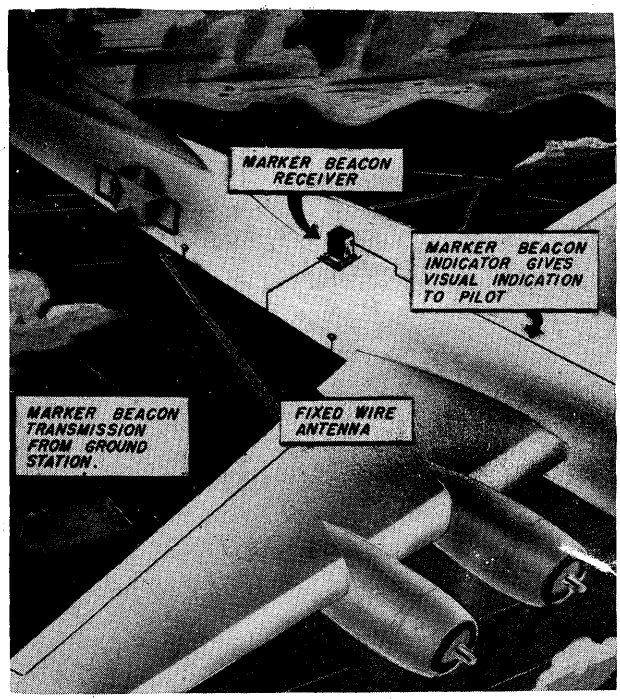
When the receiver is over a transmitter operating on a frequency within the receiver's limits, an indicator lamp on the instrument panel of the aircraft gives visual signal to the pilot in accordance with the output of the receiver. When over a "keyed" transmitter, such as a CAA marker, or certain types of army transmitters, the indicator lamp flashes in definite sequence, identifying the transmitter.

Plate voltage supply is obtained from the radio compass power supply, and is controlled simultaneously with the power to the compass.

Marker Beacon Receiving Equipment RC-39-A consists of equipment similar to RC-43-A with the exception of the filament voltage which, in the RC-39-A is 12 volts, instead of 24 volts as in RC-43-A.

There were no Army Supply Program requirements as of 31 January 1945.

POWER INPUT	24 VOLTS
FREQUENCY	67 TO 80 MC.
TYPE OF SIGNAL	75 MC. CARRIER MODULATED WITH 400. 1300 or 3000 CYCLES
RANGE	12,000 FT. OVER CONE MARKER 16,000 FT. OVER FAN MARKER



As Aircraft passes through area of Marker Beacon Transmission the Impulse is received and recorded by Indicator Lamp on Instrument Panel, Pilot's Position.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	12SQ7	1	12C8 Special

Radio Receiver BC-357-M

MARKER BEACON RECEIVING EQUIPMENT RC-43-A

TOTAL WEIGHT 7 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver	BC-357-( )U/WRC-43-A	6' x 6" x 4"	3 Lbs.
Mounting	FT-161	6" x 6" x 2"	*
Insulator (2 ea.)	IN-88	3" x 1"	*

*Less than one pound.
and includes plugs, terminals, couplings, cables, antenna wire, etc.

May 1945

RC-103-A

Radio Receiving Equipment RC-103-A is an airborne localizer receiver used to indicate a landing course in conjunction with the AAF Instrument Approach System. Signals received from a transmitter, located at one end of the runway to be used, are fed into the cross-pointer indicator to indicate "on course", "fly right" or "fly left." Audio indication is also provided.

The equipment operates from a 28 volt d.c. power source. RC-103-AZ is similar to RC-103-A except that it operates from a 14 volt d.c. power source.

Crystal control is provided for operation on six fixed frequencies between 108.3 and 110.3 mc.

Antenna System AS-27/ARN-5 is used with the dual installation of the localizer and glide path receivers. Antenna AN-100 is used when only the localizer receiver is installed in the aircraft.

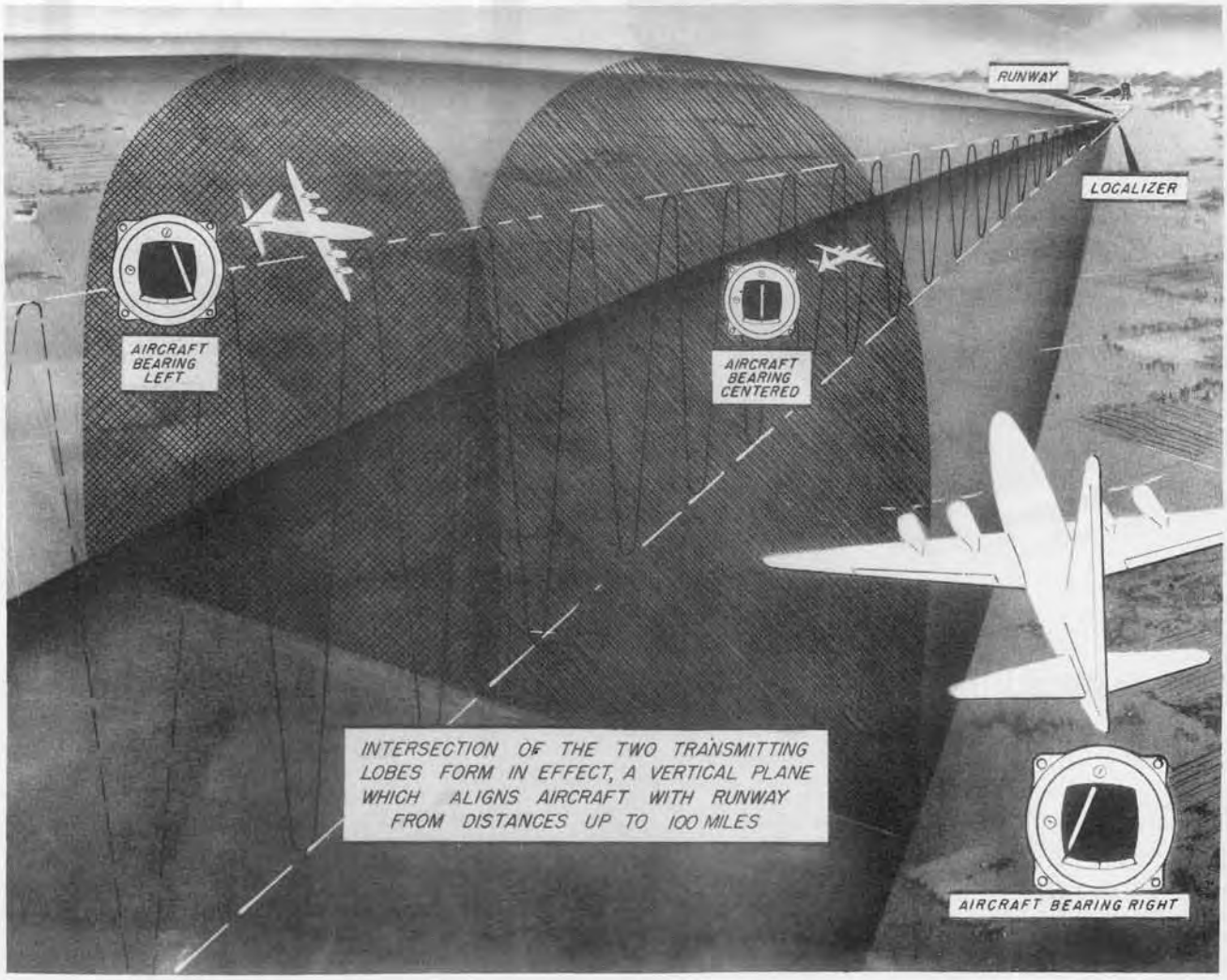
Test equipment used in maintenance and tuning includes Test Set I-173 and Test Set TS-67/ARN-5.

Army Supply Program requirements as of 1 February 1945 were 33,856 equipments for the calendar year 1945 and 19,730 for 1946.

The Vertical Pointer of Indicator I-101 records position o aircraft with regard to alignment to runway.

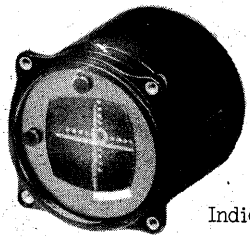
POWER INPUT	65 WATTS @ 28 VOLTS D.C.
POWER OUTPUT	500 MILLIWATTS
FREQUENCY	108.3 - 110.3 MC
RANGE	95 MILES AT 5000 FEET

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	12A6	1	12SQ7
1	12AH7GT	2	12SR7
2	12SG7	3	717A

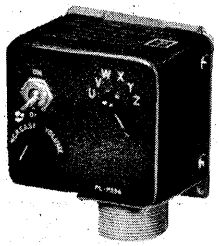


Radio Receiving Equipment RC-103 is an Airborne Receiver used in conjunction with a Ground Localizer Transmitter to align incoming aircraft with landing strips.

RC-103-A

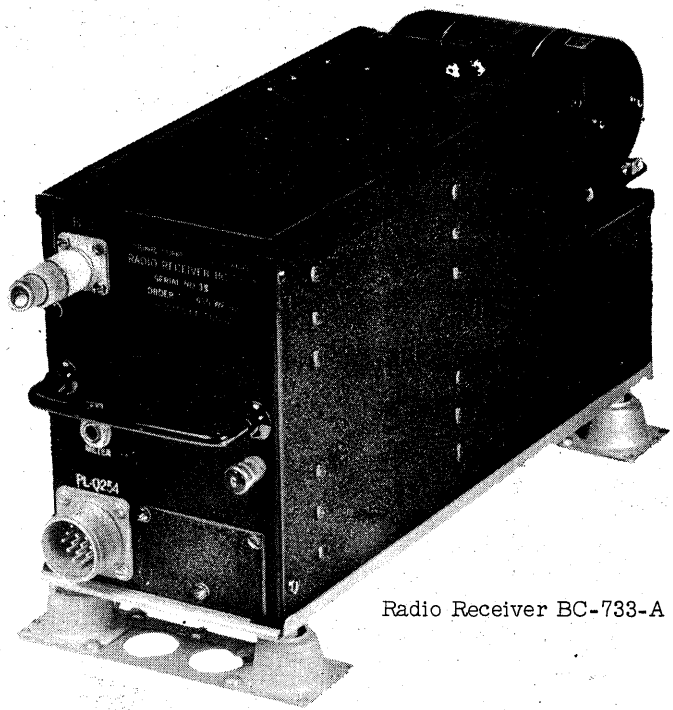


Indicator I-101-C

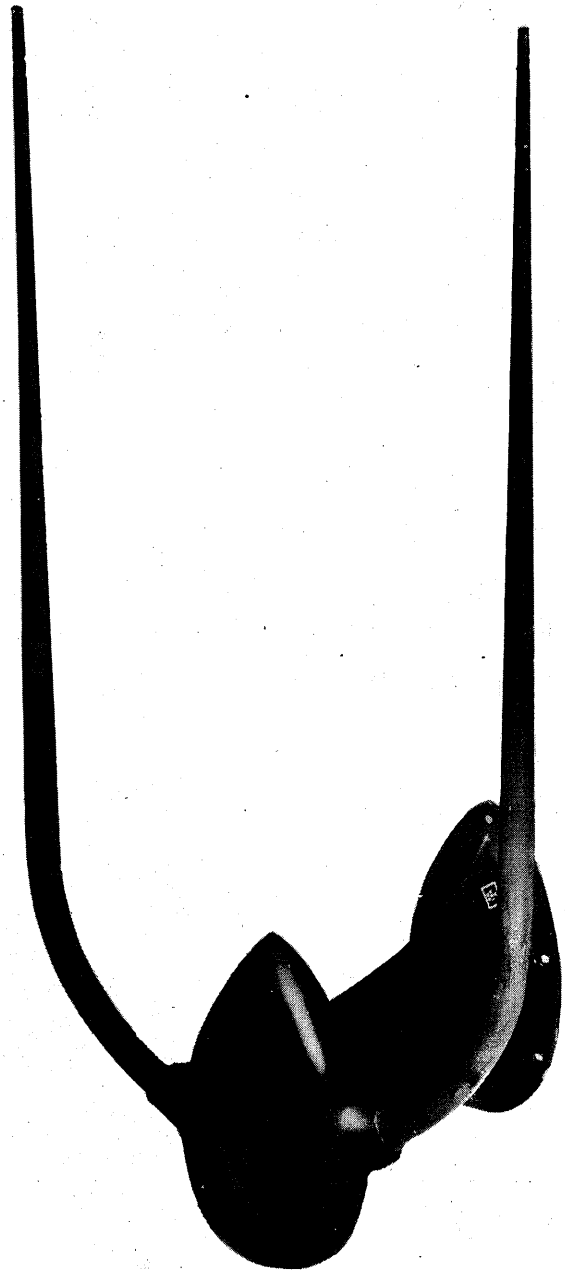


Radio Control Box BC-732-A

Dynamotor DM-53-A



Radio Receiver BC-733-A



Antenna AN-100

RADIO RECEIVING SET RC-103-A

TOTAL WEIGHT 36 LBS.

Component	Nomenclature	Size	Weight
Indicator	I-101-( )	Diam. 3 1/4 Depth 3 1/4	3 Lbs.
Dynamotor	DM-53-AZ	5" x 3" x 3"	3 Lbs.
Mounting	FT-293-A	13" x 6" x 2"	2 Lbs.
Mounting	FT-292-A	4" x 3" x 1"	*
Radio Control Box	BC-732-A	3" x 4" x 3"	1 Lbs.
Radio Receiver	BC-733-D	13" x 5" x 7"	21 Lbs.
Antenna	AN-100-( )		4 Lbs.
Antenna System	AS-27/ARN-5	10" x 20" x 15"	2 Lbs.

and includes adapter, set of crystals and spare vacuum tube set.
*Less than one pound.

May 1945

Marker Beacon Transmitting Equipment RC-115, when used with Marker Beacon Receiving Equipments RC-39, RC-43, RC-193, AN/ARN-12 or AN/ARN-8 constitutes complete marker beacon transmitting facility for any one ground position in connection with the AAF Instrument Approach System. This equipment generates and radiates vertically a keyed, or continuous, modulated signal in a fan shaped pattern. The signal thus transmitted is effective only when the receiving antenna is directly above and approximately parallel to that of the transmitter. It is, therefore, possible for the pilot to obtain visual and aural indication of his approximate horizontal position along his line of flight with respect to the landing field.

The transmitter is a rugged, portable, weatherproof unit, complete with radiating antenna and power cord. The controls accessible to field personnel are the minimum number possible. The antenna is a removable half-wave dipole mounted with stand-off insulators from the top of the transmitter, and is so constructed that it may be used as a carrying handle.

The equipment is designed to operate from a power source of 105 to 135 volts, 50 to 70 cycles, a.c.

Marker Beacon Transmitting Equipment RC-115-B is the same as RC-115-A except that it uses a crystal-controlled transmitter with increased power output.

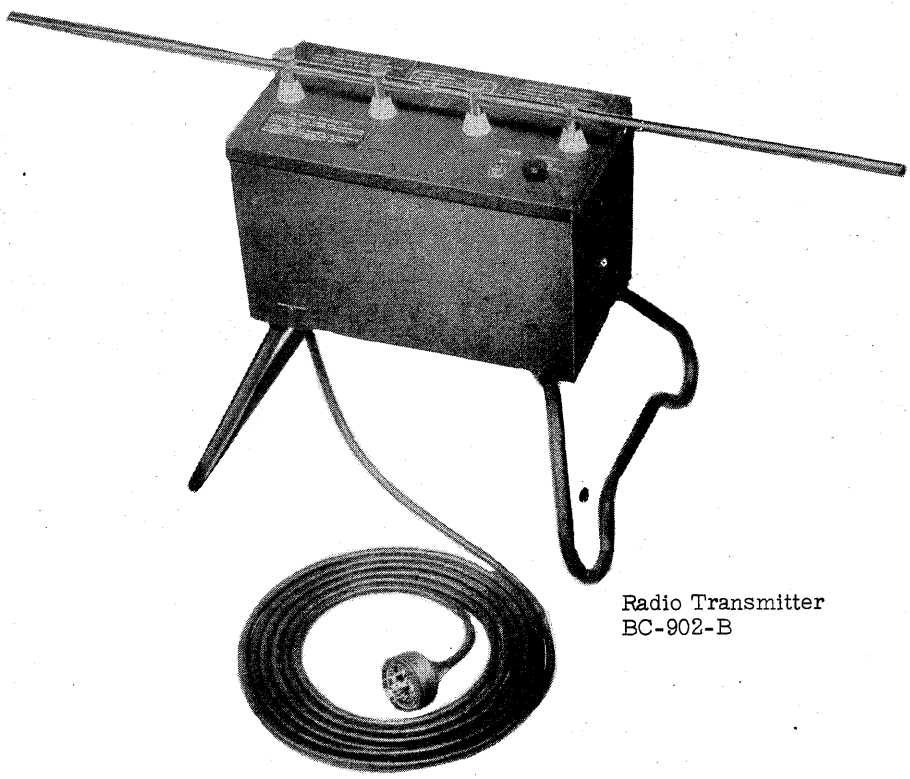
This equipment is part of the AAF Instrument Approach System. The transmitted operates at 75 mc and emits a horizontally polarized fan-shaped to a height of approximately 7,500 feet. The signal is modulated at 1,300 cycles and may be keyed at two dashes per second, six dots per second, or unkeyed. Three equipments are used for marking each landing strip; the outer marker located approximately 4 1/2 miles from the approach end of the runway is keyed at two dashes per second; the middle marker located approximately one mile from the approach end of the runway is keyed at six dots per second; and the boundary marker, located near the end of the runway, is unkeyed.

Test equipment required for maintenance includes Test Set I-56, Test Set I-76 and Indicator ID-101/MRN-3

Army Supply program requirements as of 1 February 1945 were 200 equipments for the calendar year 1945.

POWER INPUT	112 WATTS: 115 VOLTS AC.
POWER OUTPUT	1 WATT
FREQUENCY	75 MEGACYCLES
TYPE OF SIGNAL	MCW
RANGE	7500 FEET VERTICAL

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	5Z4	2	OD3/VR-150
1	7E6	1	7N7
2	7F7	5	7C5



Radio Transmitter
BC-902-B

MARKER BEACON TRANSMITTING EQUIPMENT RC-115-A

TOTAL WEIGHT 60 LBS.

Component	Nomenclature	Size	Weight
Radio Transmitter	BC-902-B	22" x 43 " x 18"	51 Lbs.
Adapter	M-268-A	20" overall length	2 Lbs.
Maintenance Spare Parts Kit		5" x 11" x 5"	5 Lbs.

and includes cables, plugs etc.

May 1945

RC-193-A

Marker Beacon Receiving Equipment RC-193-A is an ultra-high frequency airborne equipment used as an aid to navigation and landing.

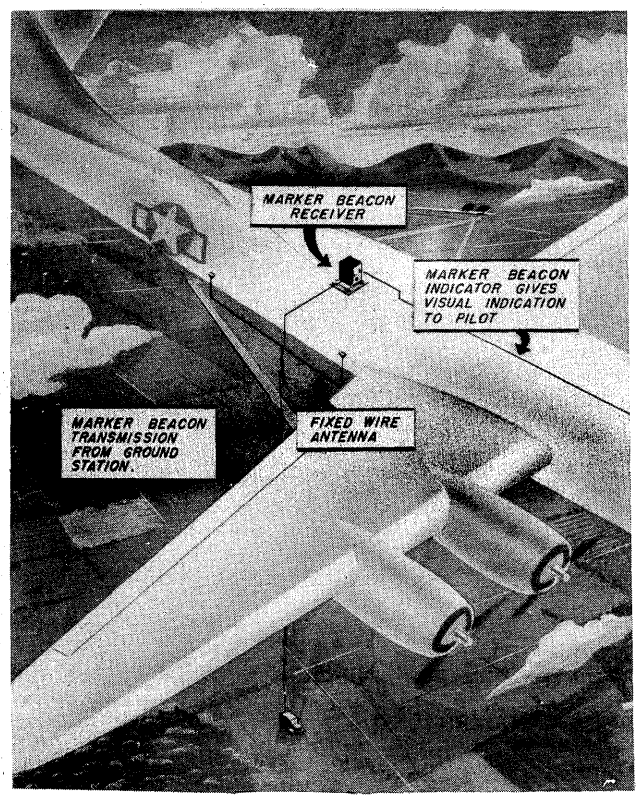
Operating in the 68-80 mc. range, visual indication of the proximity of an AAF Instrument Approach System transmitter or other transmitter producing horizontally polarized and modulated 75 mc. signals is given the pilot by means of an indicator lamp mounted on the instrument panel. "Keyed" signals, such as those produced by CAA markers or certain army transmitters, cause the indicator lamp to flash in a definite identifying sequence.

RC-193-A operates directly from 24 volt d.c. electrical system of the aircraft and does not require a source of high voltage for the tube plate supply. Signals are received by a half-wave antenna and conducted to the receiver by a coaxial transmission line. RC-193-AZ is a similar equipment designed for 12 volt d.c. operation.

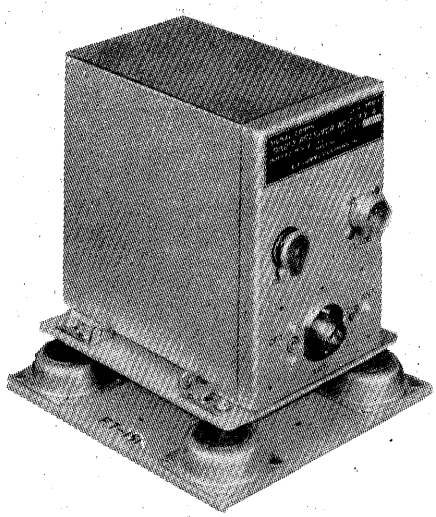
Army Supply Program requirements as of 30 November 1944 were 0 for 1944, and 27,196 for 1945.

POWER INPUT	24 VOLTS DC. .31 AMP
FREQUENCY	68-80 MC.
TYPE OF SIGNAL	R.F. CARRIER OF 75 MC. MODULATED WITH 400-3000 CYCLES
RANGE	3 MILES

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
	RC-193-A		RC-193-AZ
1	6SL7-GT	1	6SQ7
1	12SN7-GT	1	6SC7
1	6SH7	1	12SH7
		1	6U6-GT



As aircraft passes through area of Marker Beacon Transmission the impulse is received and recorded by Indicator Lamp on instrument panel pilot's position.



Radio Receiver BC-1033-A

MARKER BEACON RECEIVING EQUIPMENT RC-193-A

TOTAL WEIGHT 5 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver	BC-1033-( )	6" x 4" x 6"	3 Lbs.
Insulator (2)	IN-88	3" x 1"	*
Mounting	FT-161	6" x 6" x 2"	1 Lb.

and includes plugs, cable, terminal, etc.
* Weight less than 1 pound.

May 1945

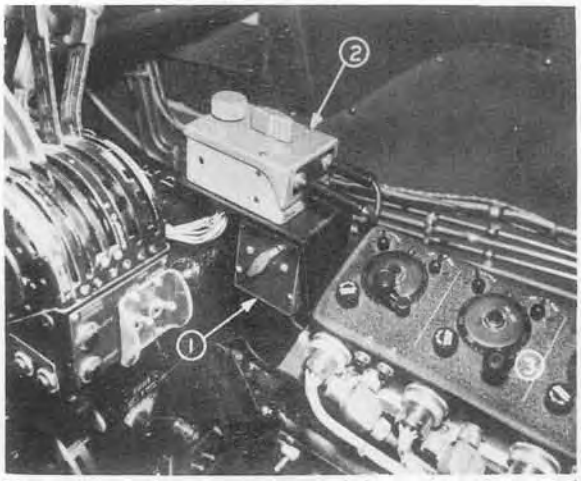
Filter Equipment RC-198 is an airborne audio filter for use in reception of radio range signals.

This equipment replaces Filter Equipment RC-32 and is used by pilots and co-pilots in conjunction with compass and command radio sets. It provides filter action to the interphone system to suppress either voice or range signals as required.

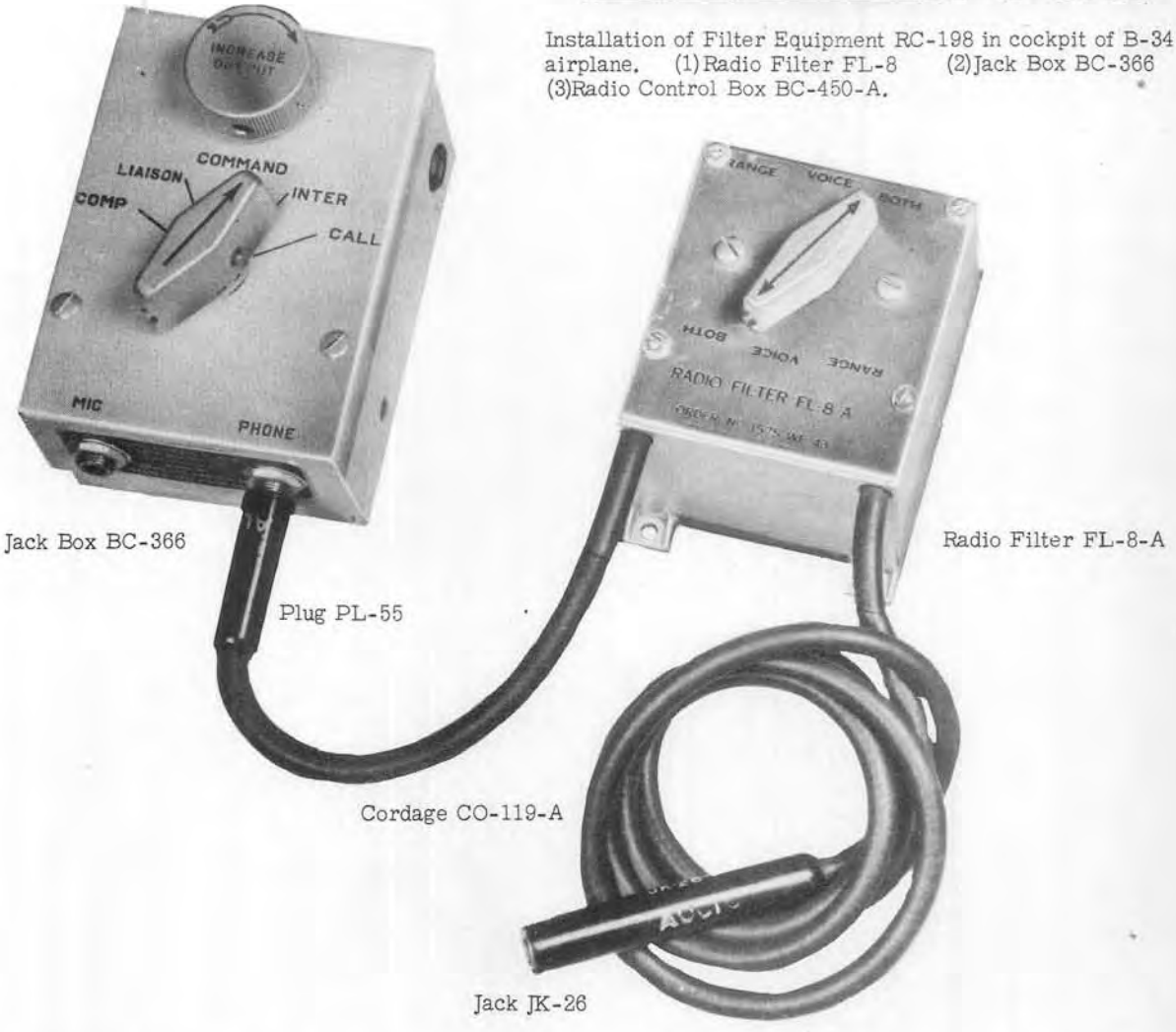
General purpose test equipment only is required for maintenance.

There were no Army Supply Program requirements as of 1 February 1945.

FREQUENCY	AUDIO FREQUENCIES



Installation of Filter Equipment RC-198 in cockpit of B-34 airplane. (1) Radio Filter FL-8 (2) Jack Box BC-366 (3) Radio Control Box BC-450-A.



Jack Box BC-366

Radio Filter FL-8-A

Plug PL-55

Cordage CO-119-A

Jack JK-26

FILTER EQUIPMENT RC-198 TOTAL WEIGHT 5 LBS.

Component	Nomenclature	Size	Weight
Radio Filter	FL-8-( )	3" x 3" x 4"	2 Lbs.
Plug	PL-55		*
Cord	CO-119-B (2 each)		*
Jack	JK-26		*

* Less than one lb.

May 1945

RC-210

Filter Equipment RC-210 is an airborne audio filter designed to isolate either voice or range signal during periods of simultaneous reception of these signals.

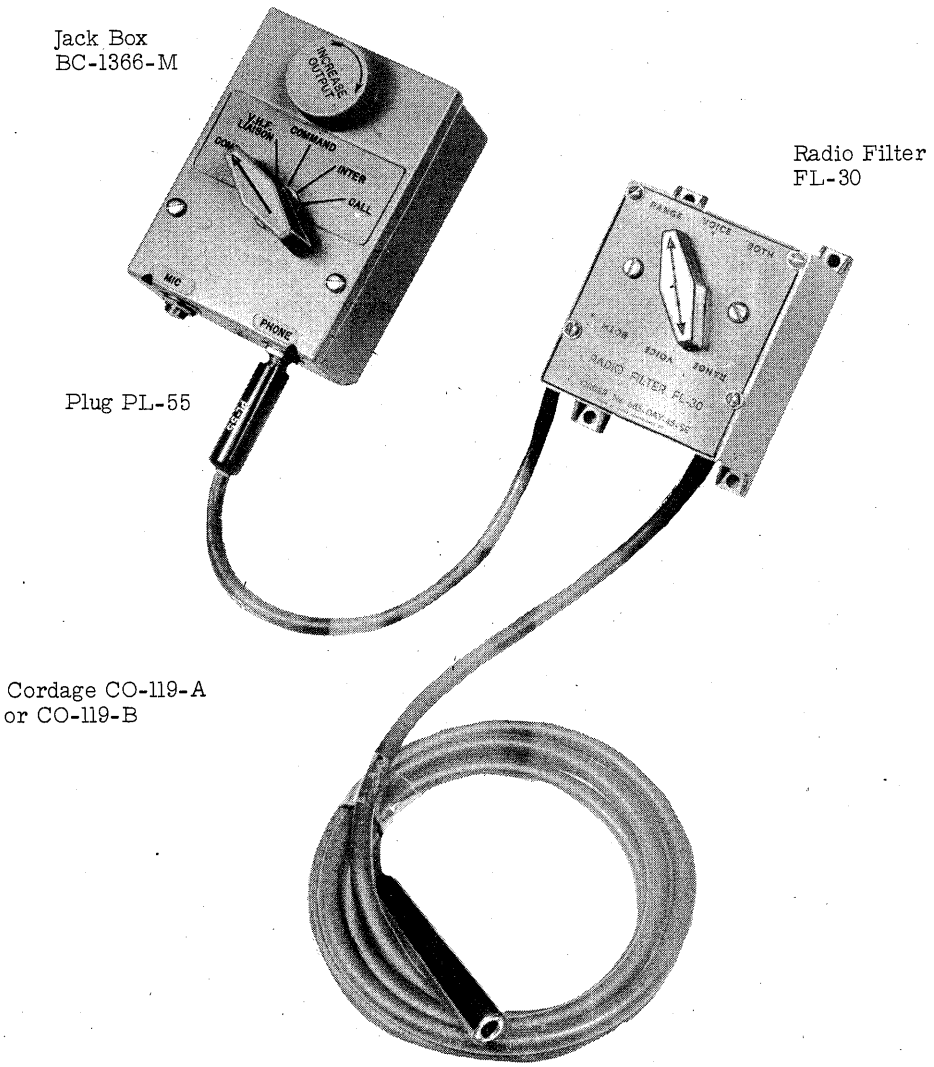
This equipment is used by pilots and co-pilots in conjunction with compass and command radio sets. It is not a part of any radio set but may be used with any standard radio receiver connected for low impedance operation.

A three position switch on top of this filter box marked VOICE-RANGE-BOTH provides selection. When the selector switch is in the VOICE position, a 1020 c.p.s. band reject filter is placed in the circuit. This filter greatly attenuates the 1020 cycle range tone, and passes the voice frequencies, other than those in the 800-1200 c.p.s. band, with only a slight amount of attenuation. When the switch is in the RANGE position, a 1020 band pass filter is placed in the circuit, and rejects practically all the voice frequencies. In the BOTH position, both the band pass end and band reject filters are disconnected from the circuit. Therefore, the signals are not affected by the filter.

Filter Equipment RC-210 is designed to operate with a 600 ohm load. Headsets HS-33 or HS-38 offer impedance of 600 ohms.

Army Supply Program requirements as of 31 January 1945 were 69,628 equipments for the calendar year 1945 and 48,866 for 1946.

FREQUENCY	AUDIO FREQUENCIES



FILTER EQUIPMENT RC-210

TOTAL WEIGHT 5 LBS.

Component	Nomenclature	Size	Weight
Radio Filter	FL-30-( )	3" x 3" x 4 '	2 Lbs.
Jack	JK-26		*
Plug	PL-55		*
Cordage	CO-119-A(-B)		*

*Less than one pound.

May 1945

Radio Compass SCR-269-G was primarily designed to be used as a navigational instrument in army aircraft. Basically, the equipment is a radio receiver employing a superheterodyne circuit and certain additional essential circuits necessary for radio compass operation. Two remote controls are provided, and, although only one control functions at a time, control may be readily switched from one to the other.

The equipment has a frequency range of 200 kc to 1750 kc, covered in three bands, and calibrated in kilocycles. Only the frequency band in use is visible on the tuning scale. Radio Compass SCR-269-G is manually tuned from either of two remote positions, with the bands switched electrically from the position having control. When installations are made which use only one remote control, no switching of control is necessary and the one radio control box used has control at all times.

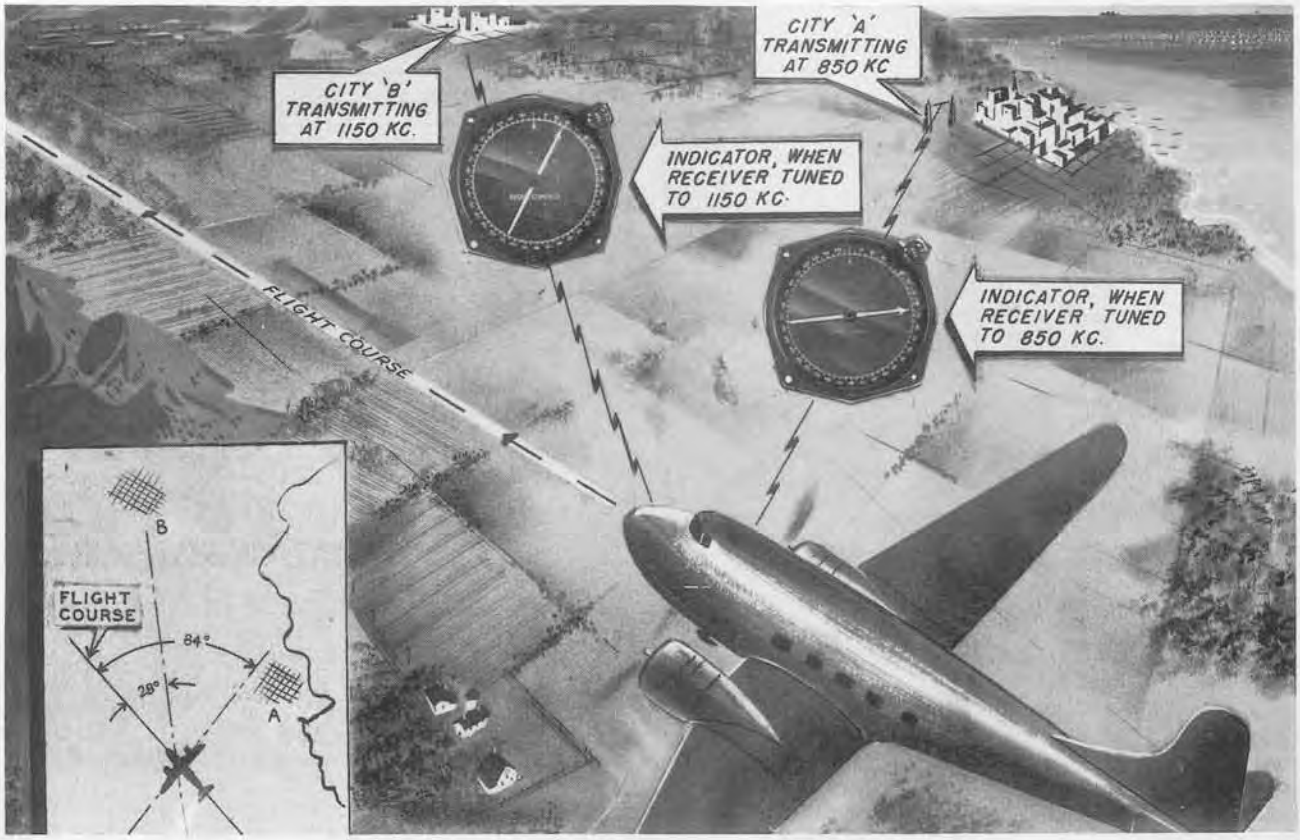
When used in conjunction with a suitable nondirectional (vertical) antenna, a 14 or 28 volt dc supply, one or two headsets, and necessary interconnecting wiring, Radio Compass SCR-269-G is a complete operable unit capable of providing the pilot with automatic bearing indication of the direction, relative to the line of flight, of the transmitter creating the received signal. Also, by use of a loop antenna, aural-null directional indications of a transmitted signal may be obtained. Aural reception of modulated radio frequency signals is possible with either the vertical or loop antenna, and aural reception of unmodulated signals is possible in each of the four cases. Selection of either type of reception is made by use of a C.W.-VOICE switch.

There were no Army Supply Program requirements as of 31 January 1945, since Radio Compass AN/ARN-7, covering the 100-200 kc band in addition to the 200-1750 kc coverage of SCR-269-G, more nearly meets a military requirement for a compass adaptable for long range operation in connection with established low frequency transmitters in many parts of the world. Radio Compass AN/ARN-6, in development, is intended as the eventual replacement of both SCR-269-G and AN/ARN-7 in army aircraft.

Test equipment for SCR-269-G includes Test Set I-56-A and Test Set I-100.

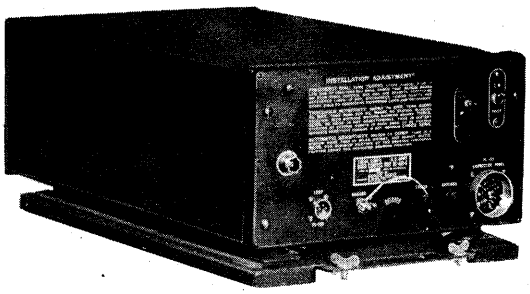
POWER INPUT	0.5 AMPERES @ 28 VOLTS DC 115-140 VOLTS, 400 CPS; AC
POWER OUTPUT	600 MILLIWATTS PEAK
FREQUENCY	200-1750 KC IN 3 BANDS
TYPE OF SIGNAL	CW; MCW; VOICE
SIGNAL STRENGTH	40-50 MICROVOLTS PER METER
ANTENNA	8" LOOP AND FIXED VERTICAL MAST WITH ONE OR TWO REMOTE CONTROL POSITIONS AND AUTOMATIC ROTATION
SENSITIVITY	3.5 MICROVOLTS
SELECTIVITY	4.5-13 KC

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	6F6	1	6J5
1	5Z4	1	6N7
4	6K7	1	6SC7
1	6L7	2	2051
2	6B8		

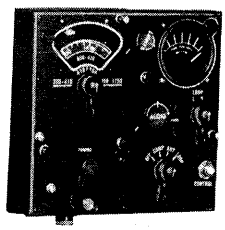


In addition to its high frequency band of 2800 to 5900 kc., Radio Compass SCR-269-G provides facilities for homing and plotting of aircraft positions similar to those of other Automatic Radio Compasses.

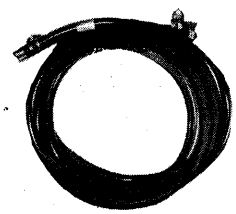
SCR-269-G UNCLASSIFIED



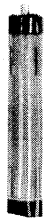
Radio Compass Unit BG-433-G



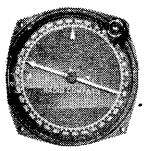
Radio Control Box BC-434-A



Dehydrator Hose

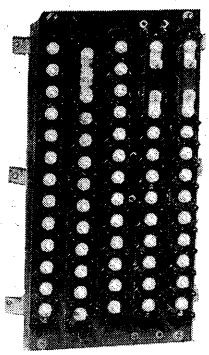


Dehydrator

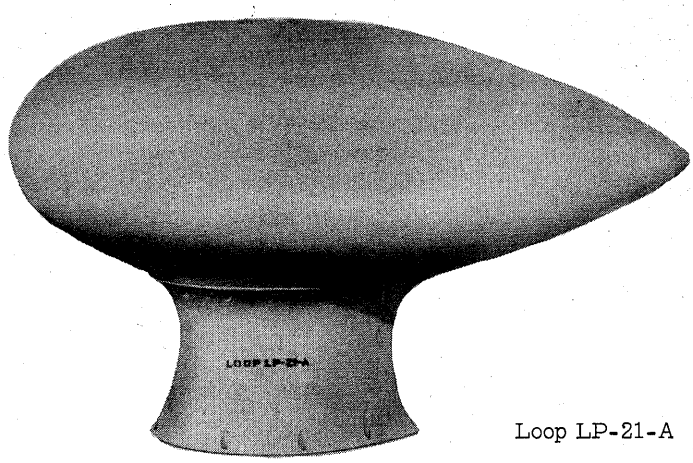


Indicator I-81-A

Indicator I-82-A



Relay BK-22-E



Loop LP-21-A

RADIO COMPASS SCR-269-G

TOTAL WEIGHT 98 LBS.

Component	Nomenclature	Size	Weight
Radio Compass Unit	BC-433-G	20" x 12" x 8"	46 Lbs.
Radio Control Box	BC-434-A	8" x 8" x 4"	4 Lbs.
Loop	LP-21-A	25" x 9" x 15"	10 Lbs.
Indicator	I-81-A (Pilot's)	4" x 4" x 4"	1 Lb.
Indicator	I-82-A (Navigator's)	5" x 5" x 5"	2 Lbs.
Relay	BK-22-A or E	12" x 7" x 3"	6 Lbs.
Rectifier Unit	RA-59-A	7" x 5" x 4"	6 Lbs.

and includes cords, conduits, etc.

May 1945

SCR-277

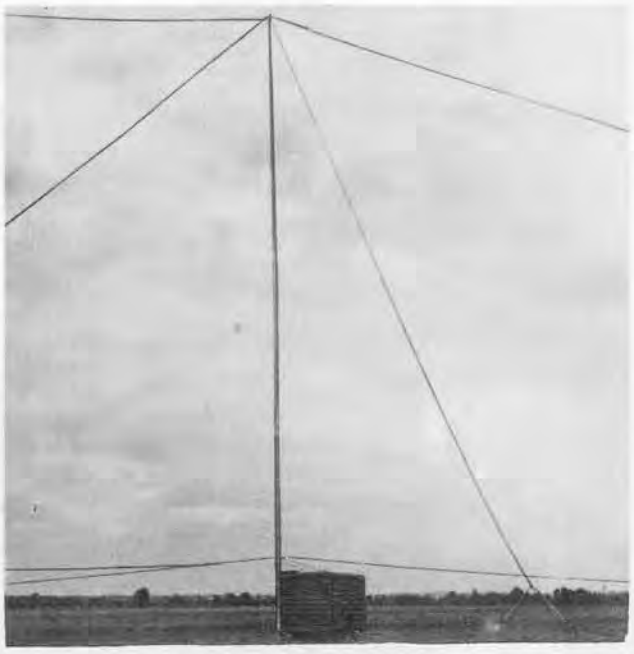
Radio Set SCR-277 is a mobile ground radio range transmitter used to set up ranges at regular intervals along air routes to provide beacon facilities for navigation of aircraft from point to point. The equipment is mounted in a trailer type K-29-C, to provide portability.

In operation the transmitter sends out signals coded "A" or "N" in each of the four quadrants around the beacon. The signals overlap on the range, providing the pilot of the aircraft an indication of his position in relation to location of the beacon. Thus, if he is heading toward the beacon he will receive an aural signal coded "A" or "N" if he is between the beam, and when he is on the beam he will receive an "AN" signal. Over land areas the beacon has a range of about 300 miles, while over water areas the range is extended to about 1,000 miles. Charts prepared for air navigation show the position and the orientation of the various beacons.

Power for operation of the equipment is furnished by a gasoline driven power unit that provides 7.5 kilowatts at 115 volts and 500 cycles per second, and two six volt storage batteries.

Test equipment required for maintenance includes Tool Equipment TE-60 and Test Set I-77.

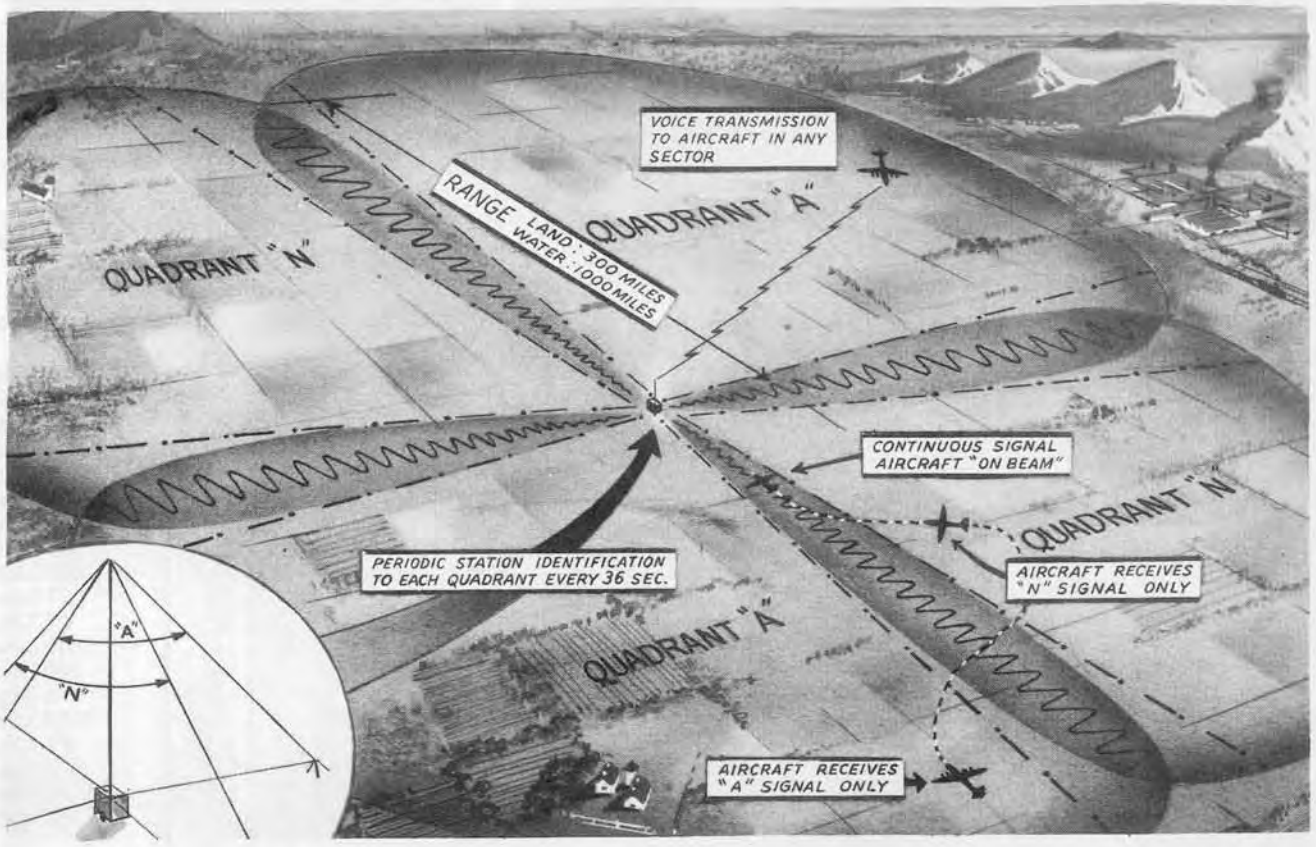
Army Supply Program requirements as of 1 February 1945 were 11 equipments for the calendar year 1945.



Radio Range SCR-277 set up for operation.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	6C5	2	807
1	6F6	1	814
4	6K7	1	F-128-A
1	6L7	1	5A3
1	6R7	2	866/866A
1	5W4	2	872-A

POWER INPUT	7.5 KW@110 VOLTS
POWER OUTPUT	810 WATTS
FREQUENCY	200-400 KC.
TYPE OF SIGNAL	CW; MCW
RANGE	LAND-300 MILES; WATER-1000 MILES
ANTENNA	CROSSED LOOPS 70 FEET HIGH



Radio Set SCR-277 is a portable low frequency loop radio range - providing a 4 course range with facilities for voice transmission and periodic station identification.

May 1945

SCR-277

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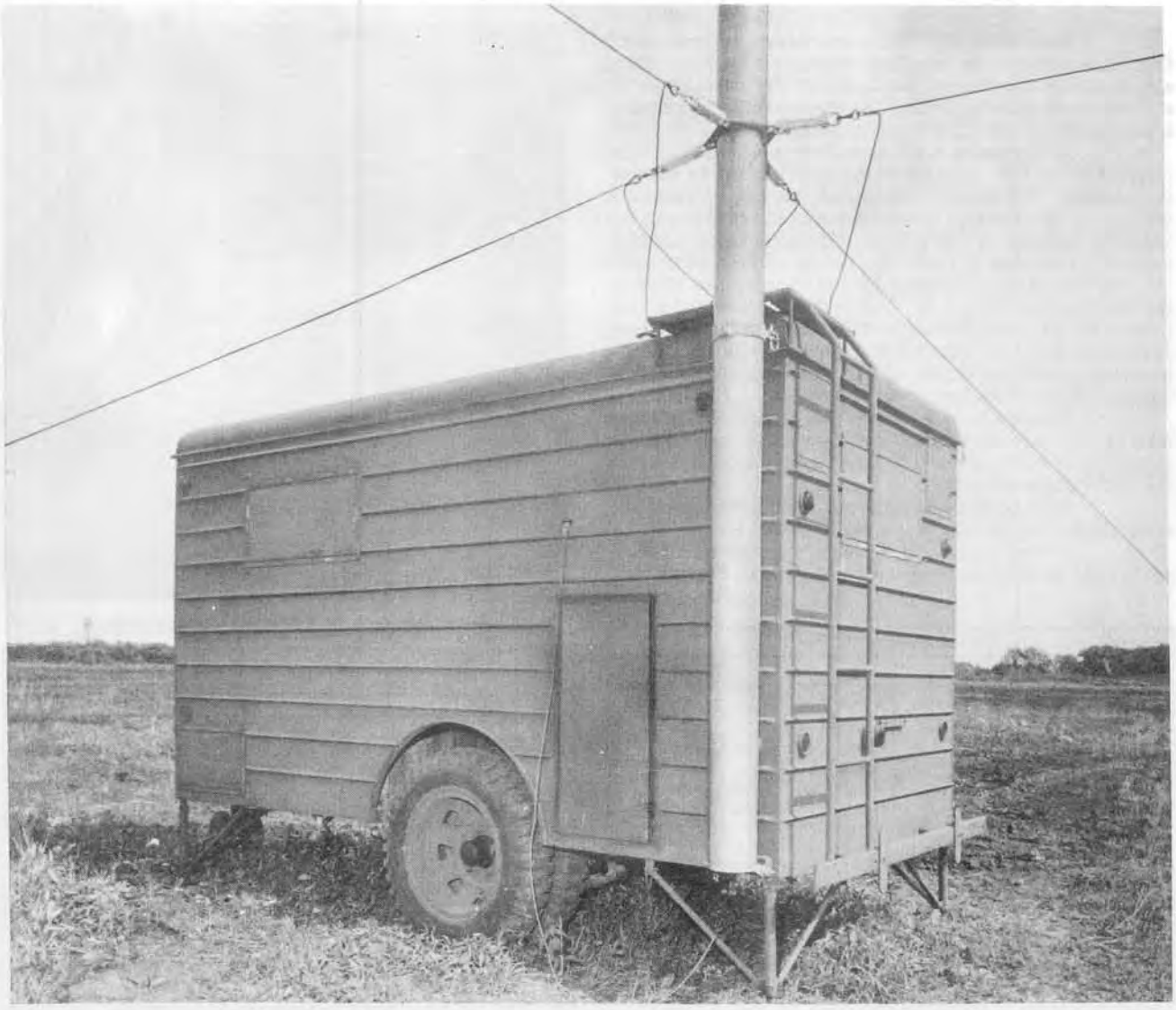

RADIO SET SCR-277

TOTAL WEIGHT 7000 LBS.

Component	Nomenclature	Size	Weight
Antenna	AN-33(horizontal)4 each	148' long	58 Lbs.
Antenna	AN-34(sloping)4 each	164' long	60 Lbs.
Antenna Tuning Unit	BC-469-C	33" x 24" x 16"	141 Lbs.
Auxiliary Control Box		9" x 5" x 3"	4 Lbs.
Batteries, storage	(2 each)	16" x 8" x 10"	158 Lbs.
Control Box	BC-466-C	10" x 9" x 7"	19 Lbs.
Fire Extinguisher		23" x 8" x 7"	35 Lbs.
Goniometer Unit	BC-468-C	44" x 22" x 29"	235 Lbs.
Mast	MA-4-C	76' x 7" diam.	250 Lbs.
Pole	MS-75 (3 each)	144" x 4" x 2"	17 Lbs.
Pole Extension	MS-90 (3 each)	44 ' long x 2" diam.	17 Lbs.
Power Unit	PE-90-C	51" x 36" x 35"	1075 Lbs.
Radio Transmitter	RC-467-C	49" x 54" x 22"	555 Lbs.
Reel	RL-40	13" x 9" x 10"	5 Lbs.
Trailer	K-29-C	200" x 76" x 107"	3359 Lbs.
Radio Receiver	BC-342-( )	19" x 10" x 10"	61 Lbs.
Antenna	AN-19	62' long	2 Lbs.
Headset	P-19		2 Lbs.
Test Set	I-77	6" x 4" x 3"	2 Lbs.
Tool Equipment	TE-60		

and includes cords, cables, clamps, accessories, spare parts, etc.

May 1945

SCR-578

Radio Set SCR-578 is a simple, rugged emergency transmitting system designed for operation from a life raft. No receiving equipment is incorporated in the set. The set provides automatic code transmission of predetermined signals so that any operator, with or without training, can send distress signals which, when received by rescue parties, will permit bearings to be taken. The set operates on the international distress frequency of 500 kc. with a 1000-cycle tone modulation.

It may be used as a hand-powered signal light with manual keying to transmit instruction, or as a constant signal light. If the signal light is used, no radio transmission takes place.

Various models of the transmitter differ only in details of electrical or mechanical design. A Kite M-357-A and two Balloons M-278-A are provided to raise the antenna. The kite is a collapsible box kite measuring 17"x17"x36" inches assembled. It will fly in wind of 7 to 40 miles per hour velocity. The balloon is used when lack of wind does not permit the use of the kite. It is inflated by means of a hydrogen generator to approximately four feet diameter.

Power for the operation of the equipment is obtained from a hand generator, which is a part of the equipment.

This equipment is to be superseded by a dual frequency radio set AN/CRT-3. Army Supply Program requirements for the two equipments as of 1 December 1944 were 40,742 equipments for the calendar year 1944 and 55,025 for 1945.

Radio Transmitter 778-E

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	12SC7	1	12A6

POWER SUPPLY	HAND GENERATOR
POWER OUTPUT	2.5 WATTS (PEAK)
FREQUENCY	500 KC
TYPE OF SIGNAL	TONE
RANGE	200 MILES, RAFT TO AIRPLANE

Principal use of Radio Set SCR-578 is to provide air crews forced down over water with a means of transmitting an international distress signal from life rafts. It is automatically keyed to transmit the signal and is powered by a hand-driven generator.

May 1945

SCR-578

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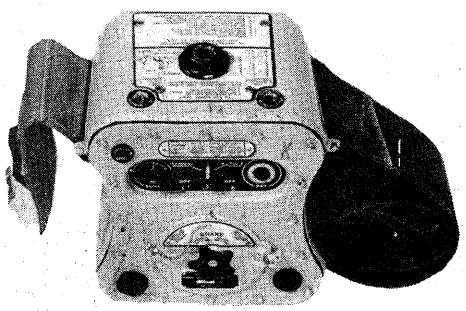
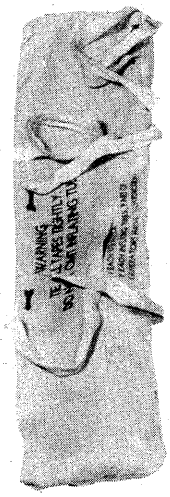
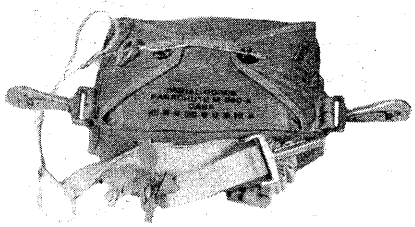


Radio Transmitter BC-778-D



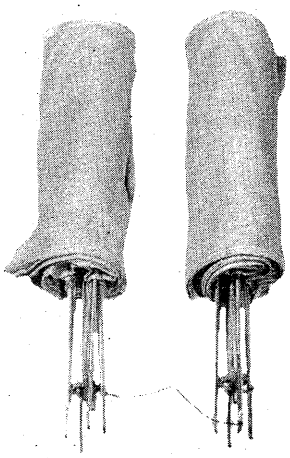
Inner Bag

Bag BG-155-A

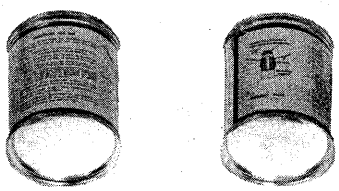


Parachute M-390-A

Signal Lamp M-308-B

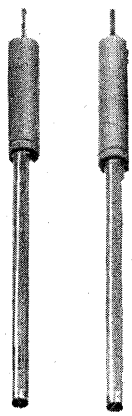


Kite M-357-A

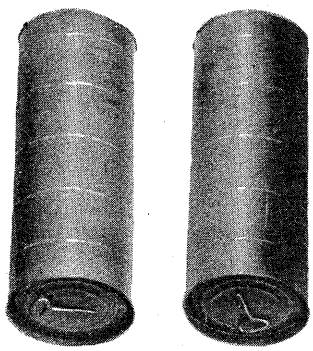


Balloon M-278-A

Wire W-147



Inflating Tubes



Canisters

RADIO SET SCR-578

TOTAL WEIGHT 42 LBS.

Component	Nomenclature	Size	Weight
Antenna Wire	W-147 or W-148	3" x 3" diam.	1 Lb.
Bag	BG-155-A	21"x 17" x 15"	7 Lbs.
Balloon (2 each)	M-278-A	6" x 5" diam.	2 Lbs.
Hydrogen Generator (2 each)	M-315-B	12 " x 5" diam.	10 Lbs.
Kite	M-357-A	18" x 4"	2 Lbs.
Parachute	M-390-A		3 Lbs.
Radio Transmitter	BC-778-D	13" x 10" x 9"	16 Lbs.
Signal Lamp	M-308-B	3" x 3" diam.	

May 1945

Radio Set SCR-610 is a short range ground communication equipment used with the AAF Instrument Approach System. It is a portable, low-powered FM transmitter and receiver, forming part of Instrument Landing Equipment SCR-241-A, AN/MRN-1, AN/MRN-2, AN/MRN-3 and AN/CRN-7. It was developed for use in ground communications and has been adapted for use in communicating with control towers in connection with airport control. A further application is being made in installations in aircraft in which electrical power supplies preclude the use of a.c. operated equipment.

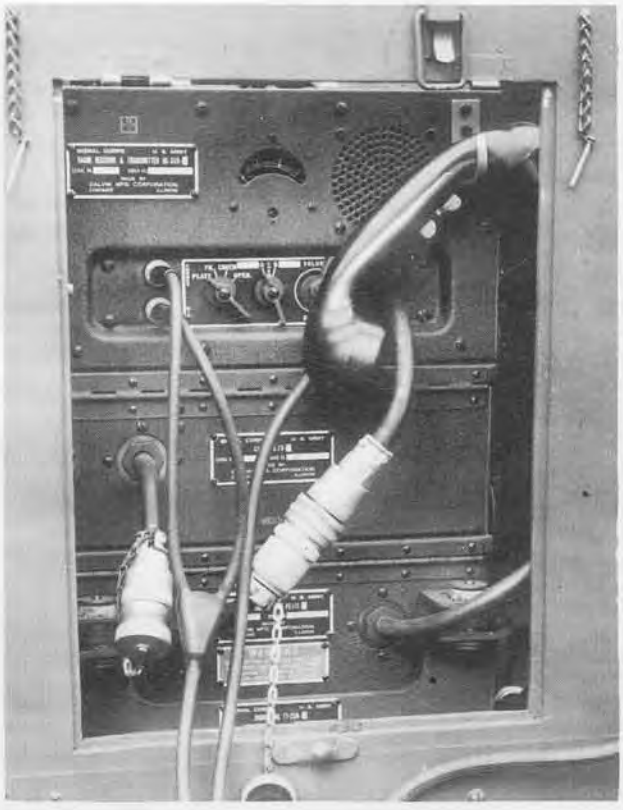
It is a battery operated low-powered FM transmitter-receiver equipment operating over the frequency range 27-38.9 MC.

The equipment is furnished to the AAF by ASF and AAF requirements are included in the requirements for the various equipments with which it is used.

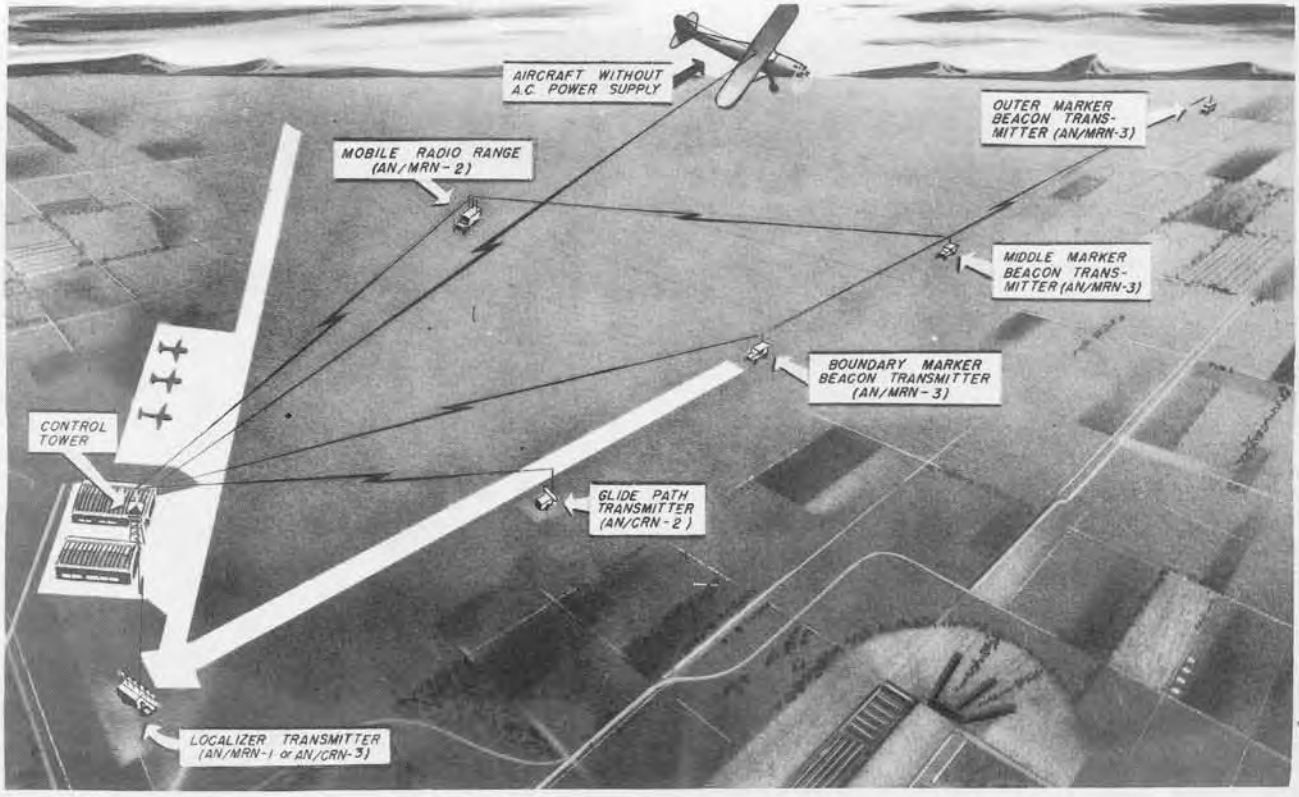
Maintenance Equipment ME-13 is required for maintenance and tuning of the set.

POWER INPUT	20 WATTS AT 6.2 VOLTS 32 WATTS AT 12.4 VOLTS
POWER OUTPUT	2 WATTS AVERAGE
FREQUENCY	27-38.9 MC
TYPE OF SIGNAL	FM
RANGE	5 MILES

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	1LH4	1	1R4/1294
1	1LC6	1	VR-90-30
5	1LN5	4	3D6/1299
2	3B7/1291	1	CK-1005

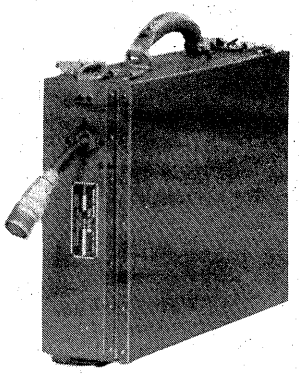


Radio Set SCR610- Installed in AN/MRN-3 Marker-Beacon Transmitter Truck

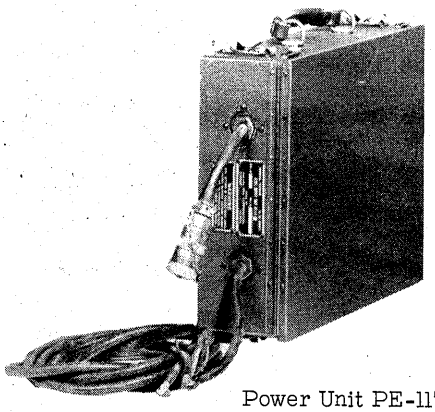


Radio Set SCR-610 is a short range communications equipment used principally for communication between the various transmitters of the AAF Instrument Approach System and the airport control tower.

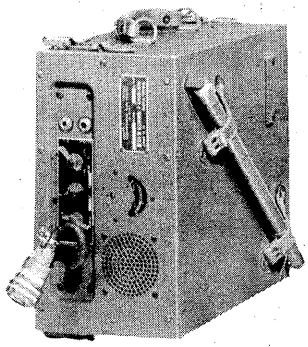
SCR-610



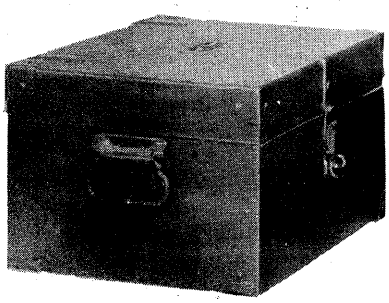
Case CS-79-A



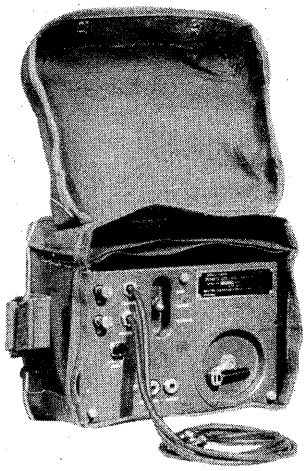
Power Unit PE-117-C



Radio Receiver and Transmitter BC-659-A



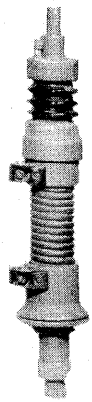
Chest CH-96-( )



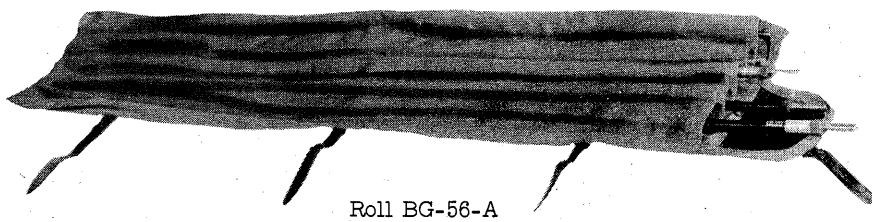
Remote Control Unit RM-29-( )

Hand Set TS-13-( )

Antenna AN-29-C



Mast Base MB-48



Roll BG-56-A

RADIO SET SCR-610

TOTAL WEIGHT 135 LBS.

Component	Nomenclature	Size	Weight
Alignment Tool	TL-150		*
Antenna	AN-29-C	12' 6" extended	2 Lbs.
Box	BX-32-B	2" x 8" x 11"	2 Lbs.
Case	CS-79-C	14" x 17" x 8"	9 Lbs.
Chest	CH-72-B	9" x 13" x 20"	17 Lbs.
Handset	TS-13-( )	6" long x 3" diam.	2 Lbs.
Mast Base	MP-48	16" high 4" diam.	11 Lbs.
Mast Bracket	MP-50		4 Lbs.
Mast Section	MS-50	35" long	*
Mast Section	MS-51	35" long	*
Mast Section	MS-52	35" long	*
Mounting	FT-250-C	5" x 12" x 20"	12 Lbs.
Power Unit	PE-117-C	5" x 14" x 17"	29 Lbs.
Radio Receiver & Transmitter	BC-659-B	8" x 14" x 18"	26 Lbs.
Roll	BG-56-A	1/4" x 36" x 10"	2 Lbs.
Strap	ST-19-A	7" x 3" x 3"	*

and includes wire, tools, etc.
* Less than one pound.

May 1945

SCR-629

Radio Set SCR-629 (modified) is a VHF, omnidirectional radio range which enables aircraft to determine relative position with respect to the station location.

The equipment is built into two cabinets and is mounted in a small weapons carrier truck to facilitate transportation in a rapidly changing theater of operations, and may be used in conjunction with the airborne Radio Set SCR-522, or an equivalent, to provide aircraft so equipped, with a homing signal. The operating frequencies provided cover a continuous range from 100 to 156 mc.

When operating as a radio range, an interlocked course is produced, simliar to that made by the conventional low frequency radio ranges except that the keyed letters "A' and "N" are replaced by the letters "E" and "T." These letters are sent from the transmitter and radiated from its antenna which rotates at a constant speed, producing a pre-determined pattern. Thus, there would be received with Radio Set SCR-522, or its equivalent, a series of dots at any one point over 180 degrees rotation of the antenna, followed by any "on course" signal, then a series of dashes would be heard over another 180-degree arc, followed by a second "on course" signal.

Course produced during the change from dots to dashes is arbitrarily considered as the main course, and the one produced during the change from dashes to dots is regarded as the back course. The time interval between the sound of an indexing signal as the course passes through north and when the course passes through the aircraft's position, is a function of the heading from the station to the aircraft. If, however, an indexing signal is used when the course passes through south, the reciprocal (or opposite) of the above heading, or the one needed for homing, will be obtained. This indexing signal consists of a 3000-cycle note to clearly differentiate it from the 1020-cycle modulation of the interlocked course.

Time interval noted above may be measured by a stop watch held by the radio operator, and the speed of the rotating elements of the antenna set in such a manner that a multiplication factor of 10 may be used so that 6 seconds will equal 60 degrees. A scale calibrated in degrees may be fitted to the dial of the stop watch, and bearings accurate to ±5 degrees may be obtained. An indicator attachment for VHF receivers to provide direct reading of bearings is now under development. Characteristic distance range is approximately 125 miles at 10,000 feet over level ground.

The equipment has a crystal-controlled transmitter and provides periodic station identification and simultaneous voice transmission in addition to the range signals.

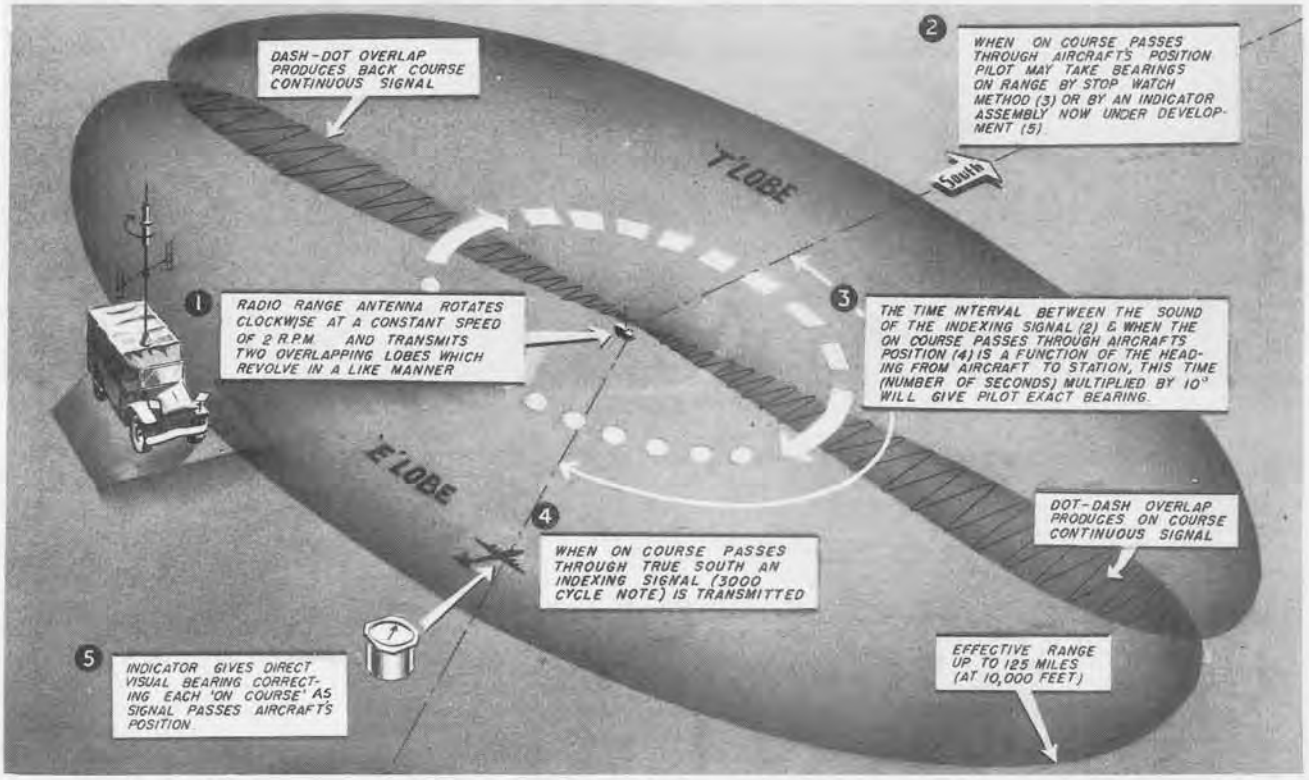
The antenna system consists of a centrally-located vertical antenna and two other vertical antennas. The carrier, plus half of the sideband energy is fed to the center antenna, and the other half of the sideband energy is fed to the sideband antennas. The phasing of the radio frequency energy fed to the antennas is such that a cardioid pattern is produced, and the overlapping portions of the transmissions produces the course. The south indicating signal, station identification and voice are all fed to the center antenna and are radiated nondirectionally.

Primary power is supplied by a 2 1/2 kw gasoline-driven power unit.

Test equipment required for maintenance has not been determined.

There were no Army Supply Program requirements for this equipment as of 1 April 1945. Development of this equipment was nearly complete as of 1 April 1945.

POWER INPUT	60 AMPERES @ 110 VOLTS AC.
POWER OUTPUT	50 WATTS
FREQUENCY	100-156 MC
TYPE OF SIGNAL	CW; MCW; VOICE
RANGE	100 MILES AT 10,000 FEET



Radio Set SCR-629 (modified) is a mobile VHF omni-directional radio range which enables aircraft to determine relative position with respect to station location and provides periodic station identification and simultaneous voice transmission.

SCR-629

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RADIO SET SCR-629

TOTAL WEIGHT 21,000 LBS.

Component	Nomenclature	Size	Weight
Transmitter			
Modulator			
Power Supply			
Keyer and Rotator			
Antenna System			
Gas Engine Generator	ARL-116		
Course Monitor and Field Detector			
Probe Detector	TS-21		
Preamplifier			

~~UNCLASSIFIED~~

and includes cord and radio frequency cable.

May 1945

TEST Equipment

Test Set I-76 is used for pre-flight tuning of marker beacon receivers, and consists of Test Indicator BE-67 and Test Oscillator BC-376.

Test Indicator BE-67 is a 0-1 milliammeter designed for adjusting and tuning of marker beacon receivers. It acts as an output meter for tuning marker beacon receivers and also supplies direct current to the relay of the marker beacon receiver for proper relay adjustment. This equipment consists of a meter, variable resistor, phone jack and switch all self-contained in a wood carrying case.

Test Oscillator BC-376 is used for tuning and adjusting marker beacon receivers and transmitters and furnishes a fixed 75 megacycle signal for aligning marker beacon receivers. This oscillator is self-contained in a portable metal case with a compartment for self-contained batteries.

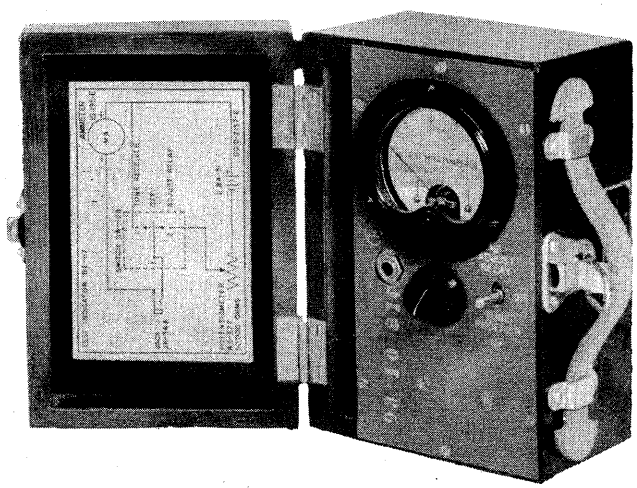
It is essentially a low power crystal controlled transmitter with a fixed signal output which may be internally modulated at 400, 1300 or 3000 cycles per second. A 12.5 megacycle crystal output is tripled and then doubled to provide a 75 megacycle output. A horizontal telescoping antenna is used for radiation and 0-1 milliampere d.c. meter is provided on the front panel to measure the battery voltage and plate current of tubes and for use as a visual check in tuning of the receivers and transmitters.

Army Supply Program requirements as of 1 February 1945 were 2,523 test sets for the calendar year 1945.

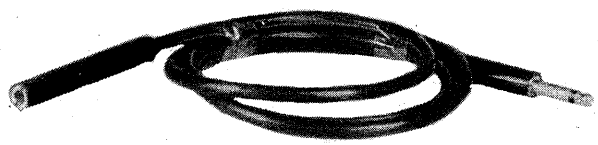
POWER SOURCE	BATTERIES
FREQUENCY	75 MC
TYPE OF SIGNAL	AUDIO MODULATED AT 400, 1300 or 3000 CPS.
METER RANGE	0-1 MA.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
3	1A5	1	1C5

Test Oscillator
BC-376-H



Test Indicator
BE-67



Cord CD-307-A

TEST SET I-76

TOTAL WEIGHT 33 LBS.

Component	Nomenclature	Size	Weight
Test Oscillator	BC-376	9" x 13" x 8"	25 Lbs.
Test Indicator	BE-67	8" x 6" x 5"	8 Lbs.
Headset	HS-23		
Cord	CD-316		
Cord	CD-307		
Battery	BA-31		
Battery	BA-35		
Battery	BA-36		

May 1945

Test Set I-100 is a compass test set designed to test the operation and performance of Radio Compass SCR-269-G and Radio Compass *AN/ARN-7. It consists of a vacuum tube voltmeter with push button selection of voltage measurements of principal points in loop orientation circuits and four milliammeters for measuring currents of the loop motor and indicator circuits.

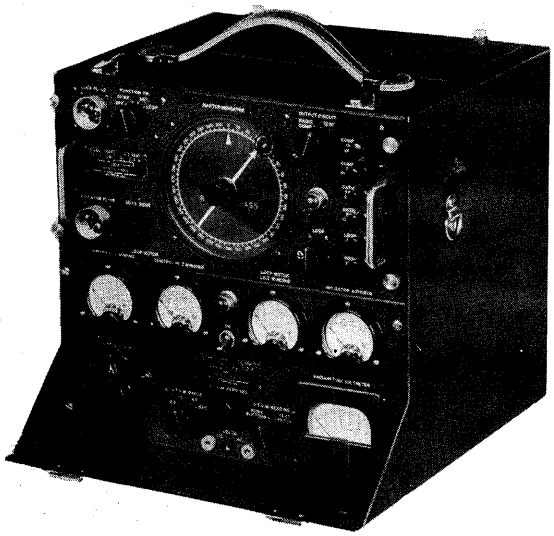
The voltmeter covers 0-2.5, 0-10, 0-50, and 0-250 volts a.c. and d.c. The milliammeter ranges are 0-500 ma. d.c. and 0-250, 0-500 and 0 750 ma. ac. The components are packed in single cabinet.

Power is obtained from a 115 volt 400 cycle a.c. source.

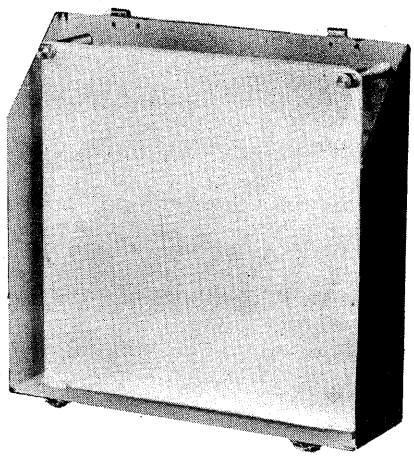
Army Supply Program requirements as of 1 February 1945 were 448 for the calendar year 1945.

POWER SUPPLY	115 VOLT 400 CYCLE AC

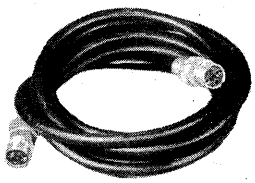
TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
3	5Z4	2	6B8
1	6H6	2	2051
1	6J5	2	6F8G
3	150-30	1	6SQ7
1	6F6	1	6SC7



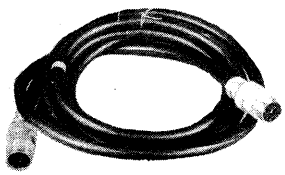
Cabinet, (Cover Removed, Showing Front Panels of Test Units BC-713-A and BC-714-A)



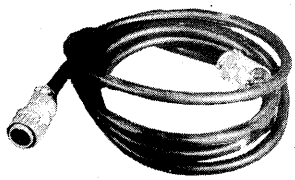
Front Cover



Cord CD-548-A



Cord CD-549-A



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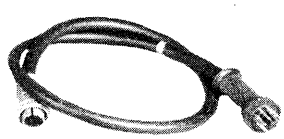


Cord CD-551-A

Cord CD-552-A

Test Prod

Test Prod

TEST SET I-100

TOTAL WEIGHT 55 LBS.

Component	Nomenclature	Size	Weight
Test Unit	BC-713-A	14" x 13" x 15"	21 Lbs.
Test Unit	BC-714-A	13" x 6" x 11"	18 Lbs.
Cord	CD-548-A	120" long	2 Lbs.
Cord	CD-549-A	120" long	2 Lbs.
Cord	CD-550-A	120" long	2 Lbs.
Power Cord	CD-551-A	36" long	1 Lb.
Cord	CD-552-A	36" long	1 Lb.

May 1945

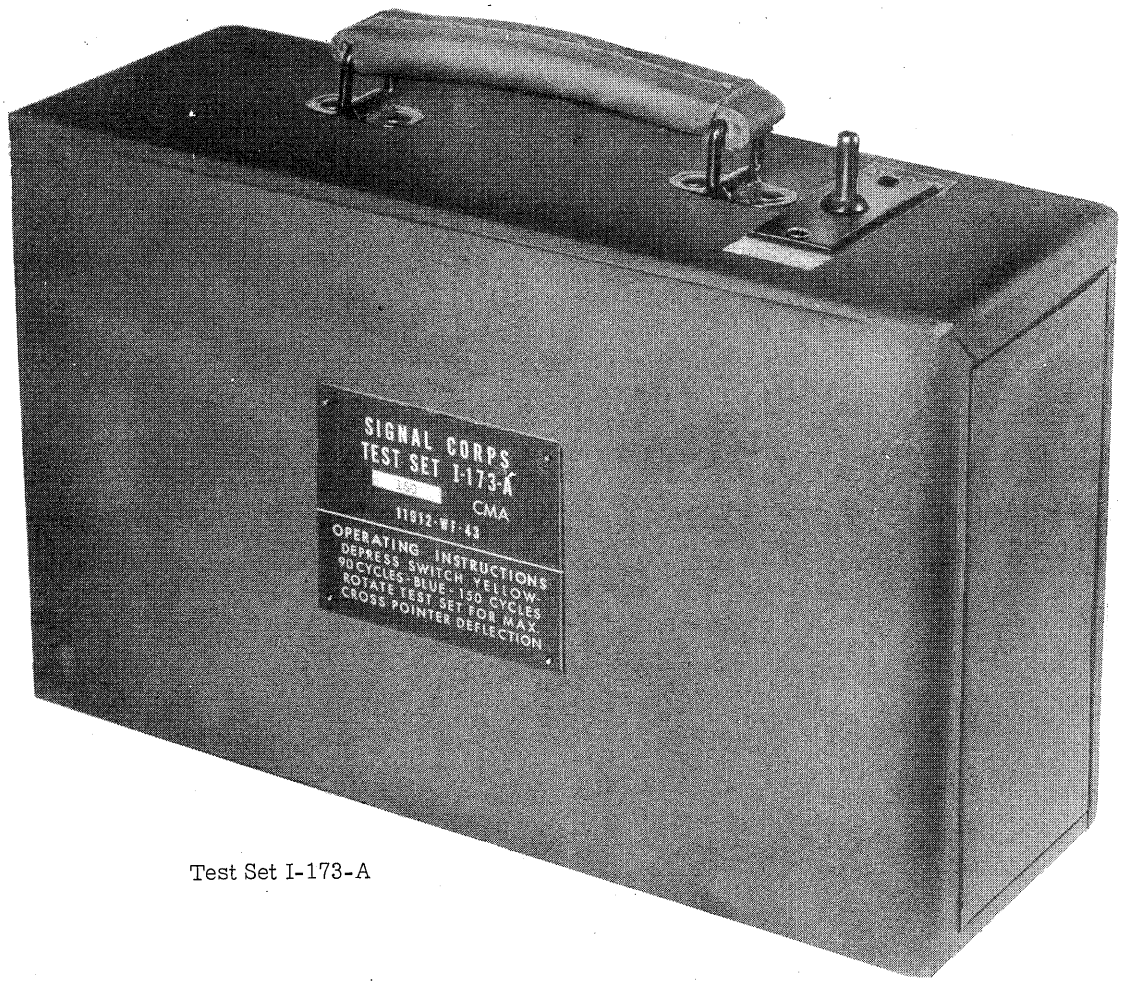
I-173

Test Oscillator I-173, specifically designed for pre-flight checking of localizer receivers, provides radio frequency oscillation modulated by 90 and 150 cycle spark gap and radiates a signal for checking the receiver under test. Indicator I-101, a component of the localizer receiver installation, indicates operation by right or left movement of the vertical needle.

This oscillator is mounted within a wooden carrying case which also provides space for the two Batteries BA-35 required to power it, and a two position toggle switch on the top of the case provides a choice of the 90 or 150 cycle modulation.

Army Supply Program requirements as of 22 January 1945 were 4576 for the calendar year 1944 and 253 for 1945.

POWER SOURCE	2 BATTERIES BA-35 (1.5 VOLTS)
POWER OUTPUT	RF CARRIER UNCALIBRATED AND MODULATED AT 90 OR 150 CYCLES
FREQUENCY RANGE	108.3-110.3 MC
TYPE OF SIGNAL	MODULATED



Test Set I-173-A

TEST OSCILLATOR I-173

TOTAL WEIGHT 9 LBS.

Component	Nomenclature	Size	Weight
Test Set	I-173	12" x 4" x 7"	9 Lbs.

May 1945

TS-1/ARR-1

Test Set TS-1/ARR-1 is a test oscillator used for the alignment of Radio Receiving Equipment AN/ARR-1.

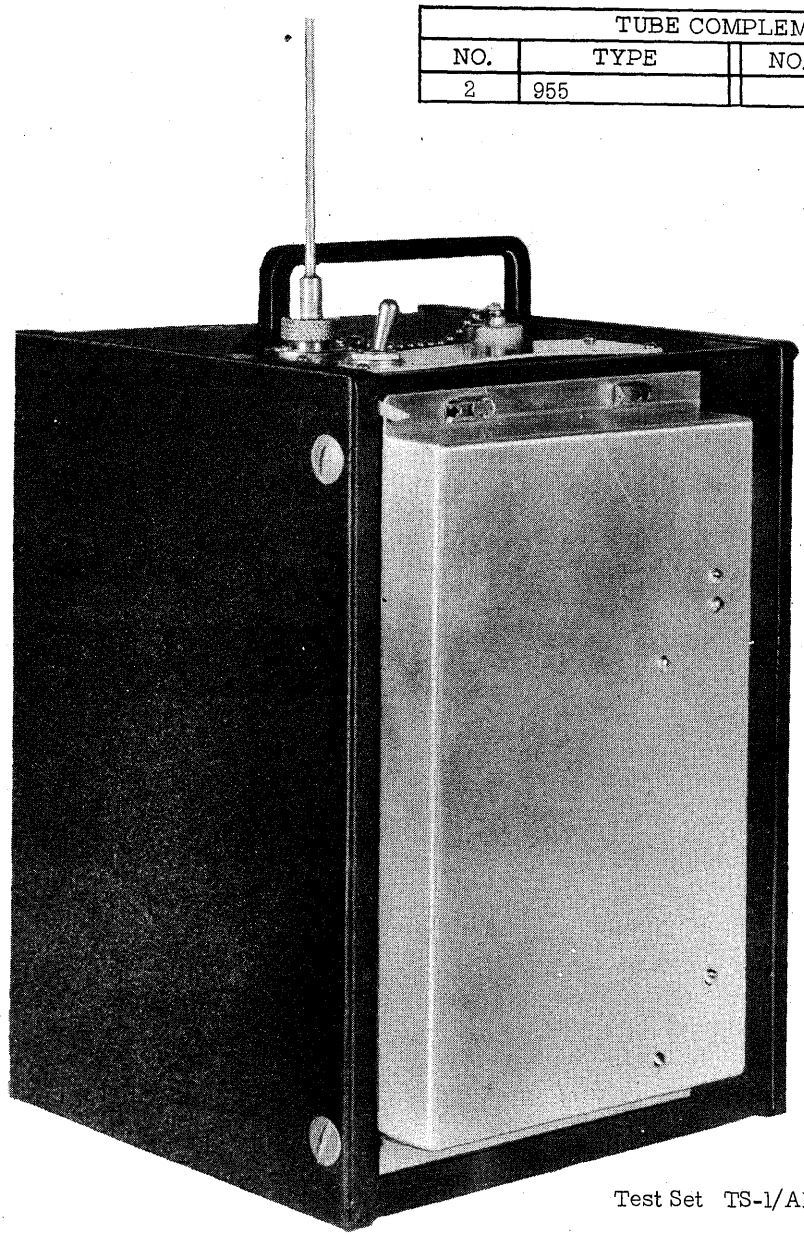
A type 955 tube in a tuned grid tuned plate circuit provides a 246 mc. signal which is modulated at 710 kc. by a circuit employing a second 955 tube. About 70% modulation is obtained.

This portable test oscillator is housed in a sturdy weather proof metal case provided with a metal carrying handle. It contains a compartment for batteries necessary for operation. A weather proof canvas duck cover is provided for the protection of the test set.

There were no Army Supply Program requirements as of 1 February 1945.

POWER SUPPLY	2 BATTERIES BA-59 (45 VOLTS) 2 BATTERIES BA-203/U (6 VOLTS)
FREQUENCY	246 MC
TYPE OF SIGNAL	CW
MODULATION FREQUENCY	710 KC
FREQUENCY ACCURACY	± 3MC
MOD. ACCURACY	± 1KC
OUTPUT CHARACTERISTICS	MODULATED CARRIER UNCALIBRATED

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	955		



Test Set TS-1/ARR-1

TEST SET TS-1/ARR-1

TOTAL WEIGHT 15 LBS.

Component	Nomenclature	Size	Weight
Test Set	TS-1/ARR-1	7" x 7" x 11"	15 Lbs.
Cover	CW-1/ARR-1		*
Wrench			

*Weight less than 1 pound.

May 1945

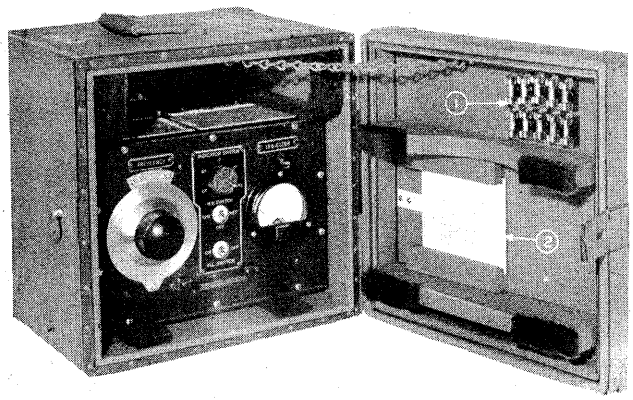
TS-41/CRN-1

Test Set TS-41/CRN-1 consists of a meter 0-1.0 milliamperes which by means of a five position "Indicator Switch" is connected to various circuits in Radio Transmitter T-2/CRN-1. A copper oxide rectifier bridge circuit is included in Test Set TS-41/CRN-1 to convert a.c. antenna currents to d.c. for measurements and an absorption wavemeter is included for measurement of frequency. Finally, a motor and keying switch are included in the test set so that operating tests can be made without using the equivalent circuits in Radio Transmitter T-2/CRN-1.

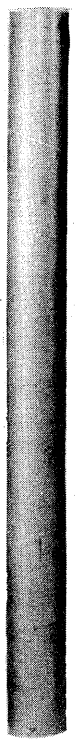
This set is contained in a metal box which is mounted when in use on the Stand MX-176/CRN-1. This stand is designed specifically for holding Radio Transmitting Equipment AN/CRN-1 when being tested. The stand is collapsible and all components of Test Set TS-41/CRN-1 are carried in two wood cases.

Army Supply Program requirements as of 30 November were 100 for 1944 and 100 for 1945.

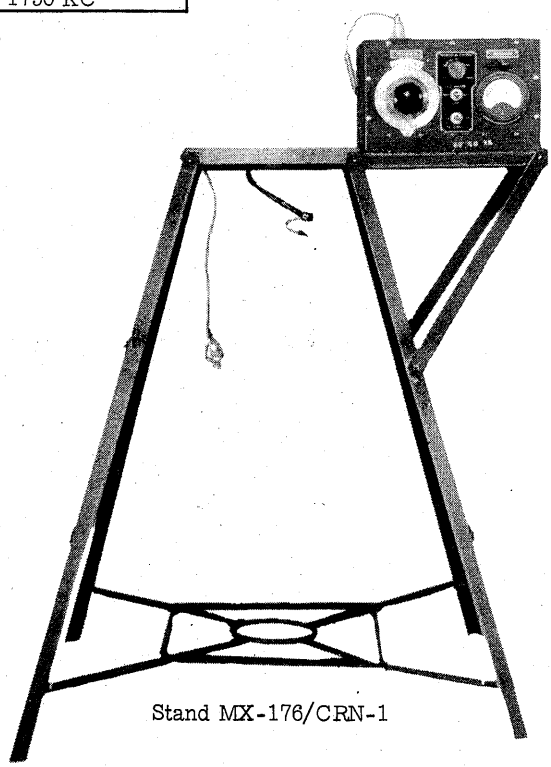
POWER INPUT	OBTAINED FROM EQUIPMENT UNDER TEST
FREQUENCY	1400 TO 1750 KC



Test Set TS-41/CRN-1 in case CY-147/CRN-1 (1) Spare Fuses (2) Spare Calibration Charts.



Dummy Antenna TS-181/CRN-1



Test Set TS-41/CRN-1

Stand MX-176/CRN-1

TEST SET TS-41/CRN-1 TOTAL WEIGHT 150 LBS.

Component	Nomenclature	Size	Weight
Test Set	TS-41/CRN-1	11" x 10" x 9"	13 Lbs.
Stand	MX-176/CRN-1	30" x 30" x 38"	27 Lbs.
Assembly Tool	MX-201/CRN-1	20" x 8"	3 Lbs.
Assembly Tool	MX-179/CRN-1	20" x 8"	3 Lbs.
Code Assembly Tool	MX-178/CRN-1	25"	1 Lb.
Dummy Antenna	TS-181/CRN-1	44" x 3"	4 Lbs.
Socket Wrench		6"	*
Screw Driver			*
10 Fuses (spares)			
Case (for accessories CY-148/CRN-1)		49" x 7" x 34"	80 Lbs.
Case (for metering equipment CY-147/CRN-1)		13" x 14" x 14"	18 Lbs.

* Less than one pound.

May 1945

TS-67/ARN-5

Test Set TS-67/ARN-5, designed to simulate frequency and radiation characteristics of the glide path transmitter and localizer associated with the AAF Instrument Approach System, consists essentially of three radio frequency oscillators and one audio oscillator combined with a signal generator unit for aligning and testing localizer and glide path receivers.

In addition, the following assemblies are built into this test set: Calibrated audio radio DB control which provides fixed differentials between the 90 and 150 cycle modulating voltages when used simultaneously; monitor circuit to indicate correct balance when 90 and 150 cycle modulating voltages are applied together; three calibrated attenuators of the variable mutual inductance type in the output circuits of the three RF oscillators. A jack is available on this front panel of Test Set TS-67/ARN-5 which supplies 150 volts d.c. to the junction box for the purpose of testing early type marker beacon receivers. A marker beacon indicating lamp is located in the junction box case. No source of rf is furnished for operation of marker beacon receivers.

The equipment is used for bench testing, adjustment and alignment of receivers in Radio Receiving Equipment RC-103-A, RC-103-AZ, AN/ARN-5 and AN/ARN-5A.

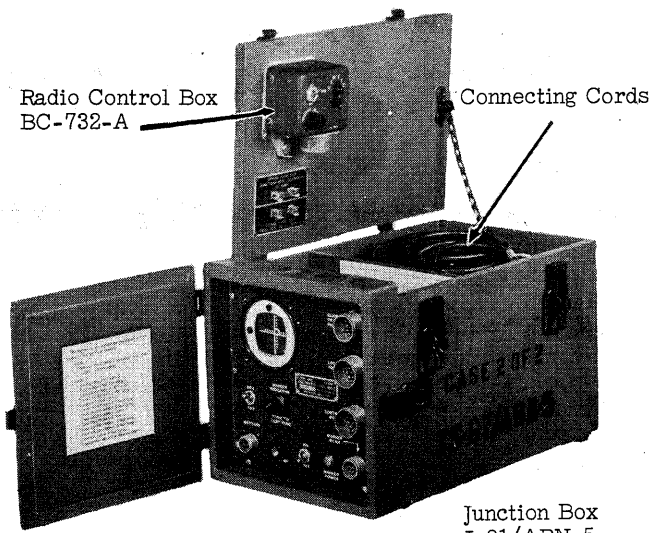
Two units, Test Set TS-67/ARN-5 and Junction Box J-81/ARN-5 comprise this equipment and both are contained in plywood carrying cases.

Army Supply Program requirements as of 31 January 1945 were 309 for the calendar year 1945.

POWER INPUT	105-130 VOLTS AC 50 OR 60 CYCLES
POWER OUTPUT	1 TO 100,000 MICRO-VOLTS
FREQUENCY	6.9-20.7 MC. 106-114 MC. 327-339 MC
TYPE OF SIGNAL	RF MODULATED
MODULATION FREQUENCY	1000 CYCLES. 90 CYCLES, 150 CYCLES OR COMBINED 90 AND 150 CYCLES
OUTPUT IMPEDANCE	95 OHMS
TEMPERATURE RANGE	OPERATING -10° TO + 60° C NON-OPERATING -55°C TO + 71°C

TUBE COMPLEMENT

NO.	TYPE	NO.	TYPE
1	6X5	2	6SQ7
1	5Y3	1	6SJ7
2	OD3-VR-150	2	6SN7
1	OA3-VR-75	2	955
5	6G6	3	6AK5



Test Set TS-67/ARN-5

TEST SET TS-67/ARN-5

TOTAL WEIGHT 107 LBS.

Component	Nomenclature	Size	Weight
Test Set	TS-67/ARN-5	21" x 11" x 15"	50 Lbs.
Indicator	I-101-( )	3" x 3" x 4"	2 Lbs.
Junction Box	J-81/ARN-5	16" x 11" x 10"	20 Lbs.
Radio Control Box	BC-732-A	4" x 3" x 3"	*
Tuning Shunt	MX-234/ARN-5	2" long	*
Cord	CG-59/ARN-5	3 1/2'	
Cord	CG-142/ARN-5	3 1/2'	
Cord	CX-237/U	10'	
Cord	CX-277/ARN-5	3'	
Cord	CX-278/ARN-5	3'	
Cord	CX-279/ARN-5	1'	
Cord	CX-279/ARN-5	3'	
Cord	CX-280/ARN-5	3'	
Cord	CX-281/ARN-5	6'	
Cord	CD-316-A	3'	

*Less than one pound.

May 1945

TS-170/ARN 5

Test Oscillator TS-170/ARN-5, a special purpose, portable, high frequency test oscillator, for preflight checking of Radio Receiving Equipment AN/ARN-5 and AN/ARN-5A, will check receiver sensitivity and the audio channels within the receiver.

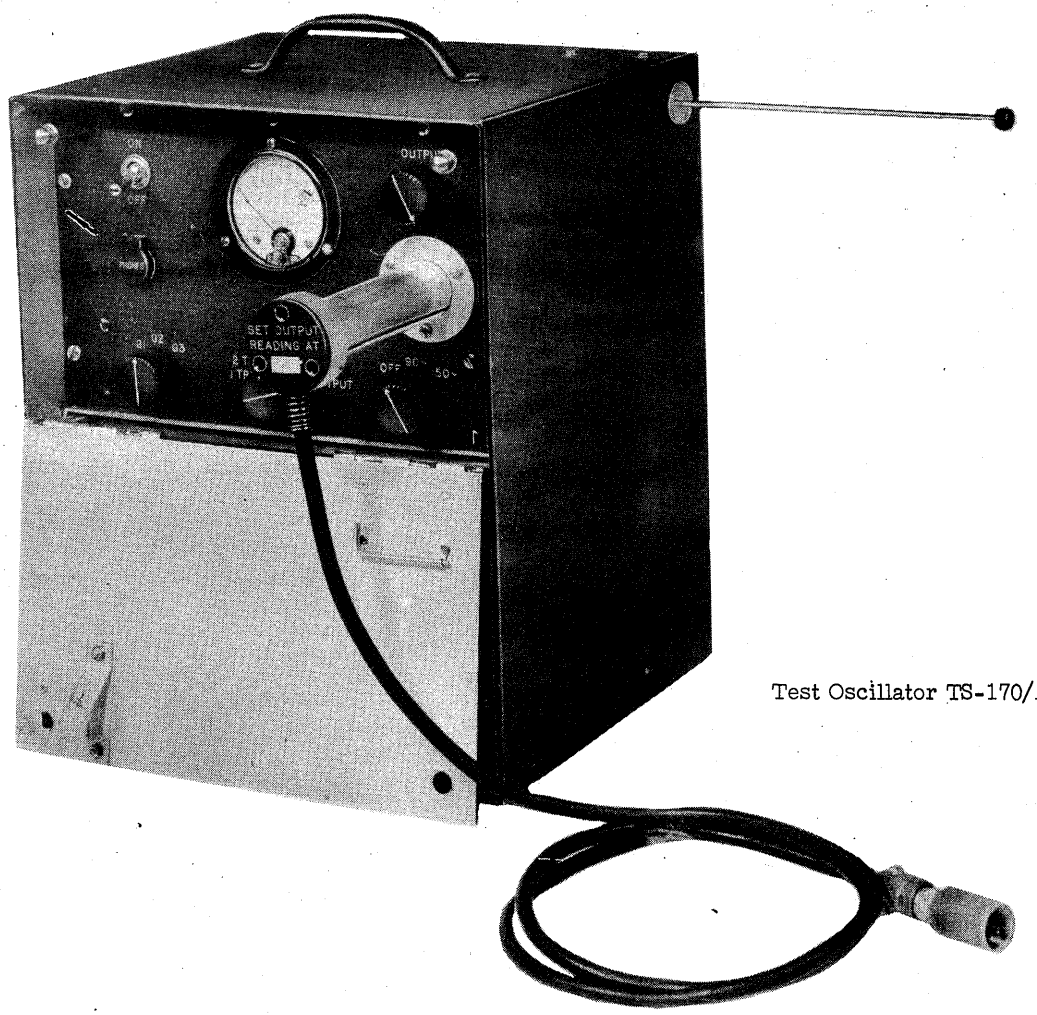
Three frequencies are provided capable of being modulated with either 90 or 150 cycles and are crystal controlled. Modulation is provided by a self-contained audio oscillator. The output available at the end of the transmission line can be attenuated approximately within the limits of 10 to 1,000 microvolts.

This equipment is contained in a metal case, with controls and attenuator located on the front panel, protected by a cover when not in use. A collapsible antenna is mounted on the side of the test set.

Army Supply Program requirements as of 20 January 1945 were 5,000 for the calendar year 1944 and 600 for 1945.

POWER SOURCE	2 BATTERIES BA-35 1.5 VOLT 2 BATTERIES BA-36 45 VOLT
POWER OUTPUT	10 TO 1000 MICROVOLT
FREQUENCY	332.6 MC. 333.8 MC. 335.0 MC.
TYPE OF SIGNAL	CW
IMPEDANCE	APPROX. 50 OHMS
AUDIO MODULATION	90 AND 150 CYCLES
TEMPERATURE RANGES	OPERATING- -10°C TO+60°C NON-OPERATING - -55°C TO +71°C

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	959	1	IN21A
4	3Q4		



Test Oscillator TS-170/ARN-5

TEST OSCILLATOR TS-170/ARN-5

TOTAL WEIGHT 25 LBS.

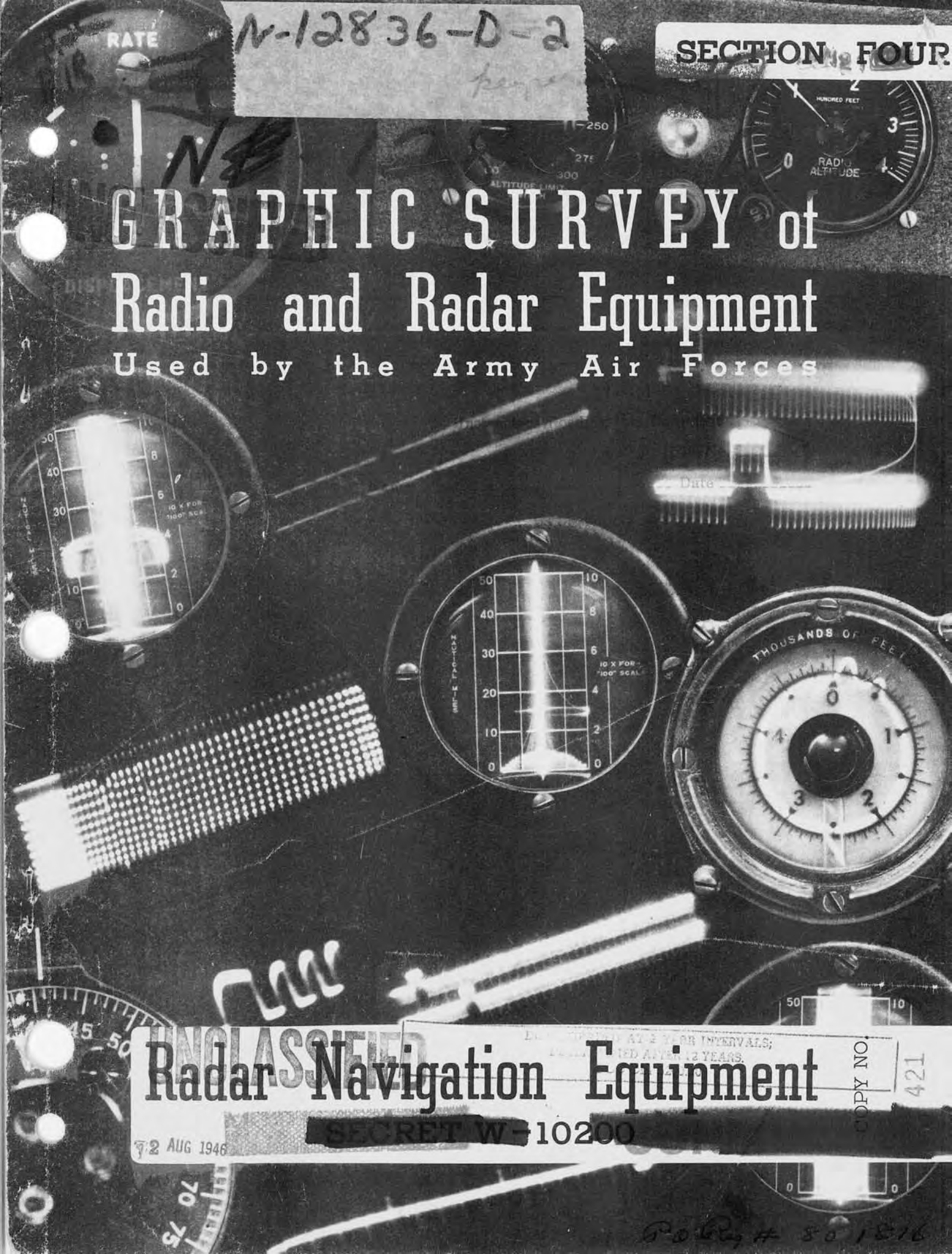
Component	Nomenclature	Size	Weight
Test Oscillator Tube 959 (Supplied as spare) and includes batteries.	TS-170/ARN-5	13" x 8" x 9"	21 Lbs.

May 1945

SECTION FOUR

GRAPHIC SURVEY of Radio and Radar Equipment

Used by the Army Air Forces



Radar Navigation Equipment

Air Technical Service Command

Wright Field Dayton, Ohio

GRAPHIC SURVEY of Radio and Radar Equipment

Used by the Army Air Forces

[redacted]

BY AUTHORITY OF DIRECTOR, ATSC 1 July 1945

[redacted]

Hobart R. Yeager
Colonel, Air Corps

SECTION 4 - "RADAR NAVIGATION EQUIPMENT"

GRAPHIC SURVEY

Nomenclature	Description	Present Security Classification
AN/APA-9	Precision Navigation Equipment	Unclassified
AN/APN-1	Altimeter	Unclassified
AN/APN-2	Airborne Interrogator Responser	Restricted
AN/APN-2T1	Trainer Equipment	Restricted
AN/APN-3	Airborne Precision Navigation and bombing Equipment (Shoran)	Unclassified
AN/APN-4	Navigation Equipment (Loran)	Unclassified
AN/APN-7	Airborne Transponder Beacon	Unclassified
AN/APN-9	Simplified Loran Equipment	Unclassified
AN/APN-10	Glider Interrogator Responsor	Restricted
AN/APN-12	Beacon Interrogator Responsor	Unclassified
AN/APN-19	Airborne Beacon	Unclassified
AN/APN-T1	Trainer Equipment	Unclassified
AN/CPA-1	Beacon Antenna Assembly	Restricted
AN/CPN-2	Air Transportable Precision Navigation & Bombing Equipment	Unclassified
AN/CPN-3	Homing Beacon	Unclassified
AN/CPN-6	Homing Beacon (BGX)	Unclassified
AN/CPN-7	Blind Approach Beacon(BABS)	Confidential
AN/CPN-8	Portable Beacon (BPS)	Unclassified
AN/CPN-11	Transportable "Loran" Ground Station	Unclassified
AN/CPN-12	Air Transportable "Double Master Loran" Ground Station	Unclassified
AN/CPN-16	Sea Rescue Beacon	Unclassified
AN/CPT-2	Sea Rescue Beacon	Restricted
AN/TPN-1	Portable Transponder Beacon	Restricted
AN/TPN-3	Portable Transponder Beacon	Restricted
AN/UPN-1	Ultra Portable Beacon	Unclassified
AN/UPN-2	Ultra Portable Beacon	Unclassified
AN/UPN-3	Ultra Portable Beacon	Unclassified
AN/UPN-4	Ultra Portable Beacon	Unclassified
MX-137/A	Reflector Target	Unclassified
MX-138/A	Reflector Target	Unclassified
SCR-718-C	Altimeter	Unclassified
YJ	Homing Beacon	Unclassified
	Test Equipment	
AN/UPM-1A	Radar Maintenance Equipment	Restricted
TS-10/APN	Test Set	Unclassified
TS-16/APN	Test Set	Unclassified
TS-23/APN	Test Set	Restricted
TS-111/CP	Test Set	Unclassified
TS-251/UP	Test Set (Loran)	Restricted

Foreword

Purpose : This Graphic Survey of Radio and Radar Equipment used by the Army Air Forces is intended to furnish authorized personnel with graphic and narrative data relative to description, electrical and physical characteristics, purpose, and tactical employment of the radio and radar equipment used by the Army Air Forces.

Restriction : The Graphic Survey is not authorized as a basis for procurement storage, or issue, but is prepared only for information and guidance of research, development, procurement, storage, issue, and staff and planning activities.

Scope : This publication is intended to cover all active equipment, both in use and in development. Publication is accomplished in a series of separate sections in order that reproduction and dissemination may be effected economically and expeditiously.

Format : Permanent binder covers are not furnished with the various sections of the Graphic Survey, but the pages of each section are printed on 8 1/2 x 11 inch paper and punched for the standard AAF three-hole binder, (binder, loose-leaf, 3 post, stock number 8700-043800), commonly known within the AAF as "Technical Order Binder". With a few exceptions, data concerning each equipment is presented on two pages. The first page contains a description and information relative to use, installation, and electrical characteristics; the second page, photographs of the various components and physical weights and dimensions. Within each section, the equipments are arranged alphabetically by official nomenclature and type designation.

Suggestions : Suggestions are invited for improvement of form, content, or to otherwise increase the ultimate utility to the user within the scope and purpose of this publication. Comments should be addressed to the Commanding General, Air Technical Service Command, Wright Field, [redacted] Attention: TSERR1B, for consideration.

Security : The Graphic Survey is classified "Secret" because of the broad scope of the equipment covered in each volume and the secret classification of many of the equipments. Each addressee will be responsible for maintaining the security of his copies in accordance with the provisions of AR 380-5. Security classification of each individual equipment at the time of publication will be indicated on the pages relative to that equipment.

Distribution : Requests relative to distribution of this publication should be addressed to Commanding General, Air Technical Service Command, Attention: TSERR1B. Revisions and additions are forwarded periodically to original addressees in order that all copies may be kept up to date. Each copy has a serial number which is recorded on a master distribution file index.

Authority : Preparation, publication and distribution of the Graphic Survey is accomplished in accordance with letter, Headquarters, AAF(AFDMA-2F), dated 5 April 1945, subject "Graphic Survey of Radio and Radar Equipment Used by the AAF". AAF report clearance number AAF-MD-E89 has been assigned.

Section 4 Radar Navigation Equipment

NOMENCLATURE	DESCRIPTION	*TYPE	**STATUS
AN/APA-9	Precision Navigation Equipment		D
AN/APN-1	Altimeter	Standard	P
AN/APN-2	Airborne Interrogator Responser	Standard	P
AN/APN-2T1	Trainer Equipment		P
AN/APN-3	Airborne Precision Navigation and bombing Equipment (Shoran)	Standard	P
AN/APN-4	Navigation Equipment (Loran)	Standard	P
AN/APN-7	Airborne Transponder Beacon		P
AN/APN-9	Simplified Loran Equipment		D
AN/APN-10	Glider Interrogator Responsor		D
AN/APN-12	Beacon Interrogator Responsor	Sub-Standard	P
AN/APN-19	Airborne Beacon		D
AN/APN-T1	Trainer Equipment		P
AN/CPA-1	Beacon Antenna Assembly	Standard	P
AN/CPN-2	Air Transportable Precision Navigation and Bombing Equipment	Standard	P
AN/CPN-3	Homing Beacon	Sub-Standard	P
AN/CPN-6	Homing Beacon (BGX)		P
AN/CPN-7	Blind Approach Beacon (BABS)	Standard	P
AN/CPN-8	Portable Beacon (BPS)	Standard	P
AN/CPN-11	Transportable "Loran" Ground Station	Limited Procurement	D
AN/CPN-12	Air Transportable "Double Master Loran" Ground Station	Limited Procurement	D
AN/CPN-16	Sea Rescue Beacon	Limited Procurement	D
AN/CPT-2	Sea Rescue Beacon	Limited Procurement	D
AN/TPN-1	Portable Transponder Beacon	Limited Standard	P
AN/TPN-3	Portable Transponder Beacon	Limited Standard	P
AN/UPN-1	Ultra Portable Beacon	Limited Procurement	D
AN/UPN-2	Ultra Portable Beacon	Limited Procurement	D
AN/UPN-3	Ultra Portable Beacon	Limited Procurement	D
AN/UPN-4	Ultra Portable Beacon	Limited Procurement	D
MX-137/A) MX-138/A)	Reflector Target	[redacted]	P

See reverse side for addenda and errata information.

NOMENCLATURE	DESCRIPTION	*TYPE	**STATUS
SCR 718-C	Altimeter	Standard	P
YJ	Homing Beacon	Standard	P
MAINTENANCE AND TEST EQUIPMENT			
AN/UPM-1A	Radar Maintenance Equipment		P
TS-10/APN	Test Set	Standard	P
TS-16/APN	Test Set	Standard	P
TS-23/APN	Test Set	Standard	P
TS-111/CP	Test Set	Standard	P
TS-251/UP	Test Set (Loran)	Standard	P

* For definition of Type classification terms see AR 850-25
**STATUS Defined:
D - (Development): Initial pilot run has not been completed.
P - (Production): Initial pilot run has been completed and quantity production is underway or has been completed.

ERRATA

AN/APN-2
AN/APN-2T1

Scope illustration caption: "Scope display shows range vertically on three scales, and azimuth horizontally right or left of beacon response centerline. Signal above shows range to beacon 33 miles and 30° left."

AN/APN-3

"Computor: this is a bombing computor (AAF type K 1) which automatically releases bombs and corrects for ballistics and wind."

AN/APN-10

Scope illustration should show only statute mile scale with ranges of 0 to 5 and 0 to 50 miles. Illustration showing "Nautical Miles" and 0 to 10 scale is incorrect.

AN/CPN-3

First paragraph: "Radio Set AN/CPN-3, is an air transportable radar beacon for ground installation, designed to provide range, direction, and identification for homing of planes equipped with 10 cm band search radars."

AN/CPN-16

Illustration caption: "Sea Rescue Beacon Transmitter AN/CPN-16X for use in one man life rafts."

Radar Assembly AN/APA-9, is an airborne navigational equipment designed to operate with the British Oboe Mark II navigation system. It is informally known as the "Aspen," and is functionally similar to the AAF Shoran system.

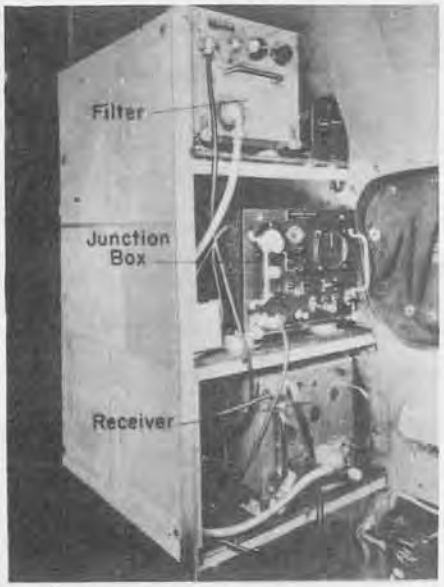
The "Aspen Kit", as Radar Assembly AN/APA-9 is called, essentially consists of an antenna; a modified AN/APS-2A modulating assembly with a RT Box; a mechanical bearing indicator, and certain minor components for operation of the set.

"Aspen" is a navigation system whereby the airborne equipment (AN/APA-9) acts as a transponder unit upon being triggered by the two ground interrogator beacons commonly known as the "Cat" and "Mouse" stations. By measuring, with accurate ranging circuits, the time required for the radar signal to make the "round-trip" (station-plane-station), the ground station computer can plot the airplane's location with an accuracy of 50 feet of his actual position.

Blind-bombing is accomplished by flying the aircraft along a given arc centered around the "Cat" station with the release point at a predetermined range from the "Mouse" station. The point of intersection of the pulse signal arcs from these two stations is the correct bomb release point. The bombardier is given aural warning and release signals by variation of pulse repetition rate from the "Mouse" station The pilot is given left-right aural signals by variation of pulse repetition rate from the "CAT" station. One target can be attacked by this technique.

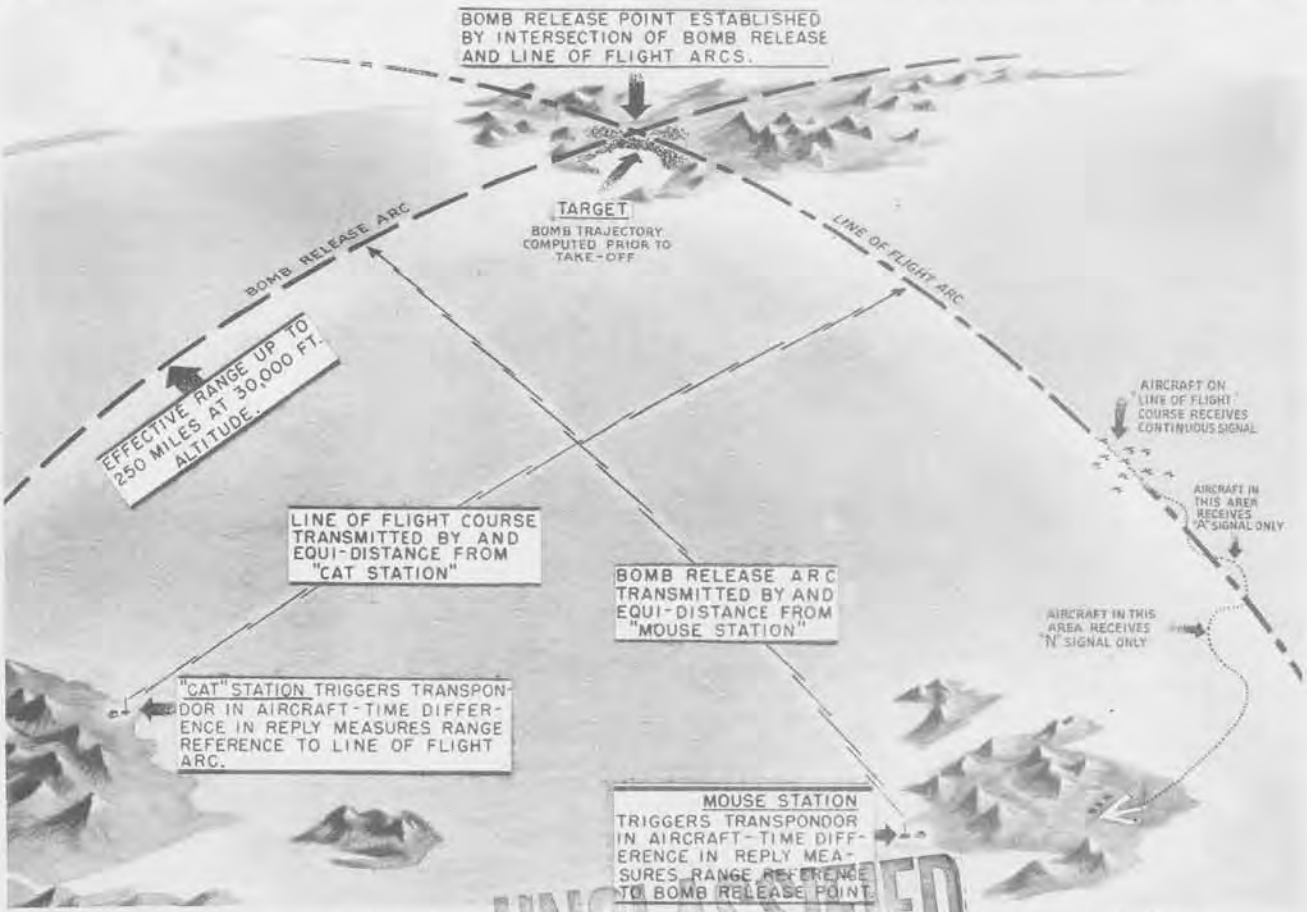
Ground Oboe stations are supplied by the British, while the airborne equipment is supplied by both the British and the United States.

Test equipment used for maintenance includes Test Set AN/CPM-1



Installation AN/APA-9 in B-24

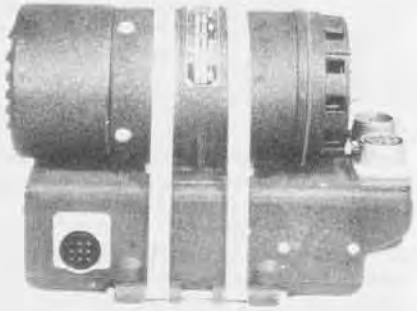
POWER INPUT	600 WATTS, 26 VOLTS DC
POWER OUTPUT	50 KW (PEAK)
FREQUENCY	3243-3155 MC
RANGE	250 MILES AT 30,000 FT.
ACCURACY	BOMBING 100 YARDS RANGE 20 YARDS



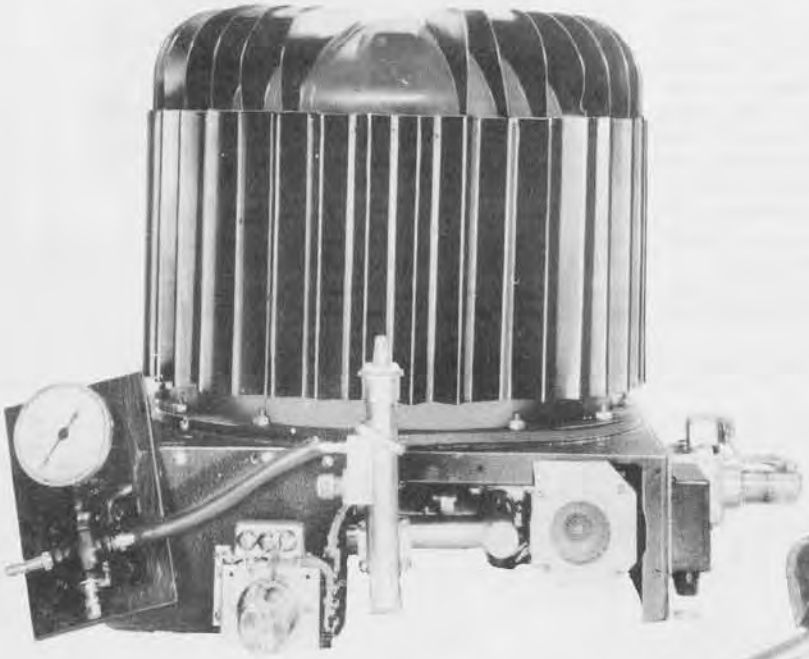
Radar Assembly AN/APA-9 ("ASPEN") is the airborne element of the OBOE Navigation System which in addition to facilitating precision blind bombing - may be used as a navigation device to direct reconnaissance or troop carrying aircraft to predetermined areas.

Penwiper Receiver

Filter Type 68



Motor Generator



Transmitter Converter

Control Box

Antenna

RADAR ASSEMBLY AN/APA-9

TOTAL WEIGHT 250 LBS.

Component	Nomenclature	Size	Weight
Control Box	C-10/APA-9		
Antenna Assembly	AS-66/APA-9	Heighth 18" x Diam 4"	10 Lbs.
Jack Box	J-47/APA-9	5" x 4" x 3"	1 Lb.
Motor Generator	PU-43/A		30 Lbs.
Regulator Box	CN-10/A		10 Lbs.
Headset	H-14/A		
Transmitter Converter	RT-38/APA-9	24" x 24" x 24"	100 Lbs.
Control Box	C-84/APA-9	8" x 11" x 20"	32 Lbs.
Mounting	MT-157/APA-9	24" x 24" x 24"	10 Lbs.
Cord	CG-51/APA-9		5 Lbs.
Mounting	MT-176/APA-9		1 Lb.
Mounting	FT-447		
Mounting	MT-23/A		
Antenna Cover	CW-17/APA-9		5 Lbs.
Filter	British Supplied		
Mounting	FT-446	14" wide x 18" long	
Coupling	M-297		
Receiver			
Transformer			

and includes plugs, forrule, nuts, cords, connectors, cable clamps, Flexible conduit, adapters, cordage and misc. Cable.

*AN/APN-1

Radio Set *AN/APN-1 is an airborne frequency modulated radar altimeter designed for installation in aircraft to provide direct indication of altitude above terrain during flight.

This equipment is designed to emit, in a downward direction from the transmitter antenna, a radio freguency carrier which is frequency modulated at a rate of 120 cycles per second between the approximate limits of 420 and 460 mc on the low range (0-400 feet) and 443 to 447 mc on the high range (400-4000 feet). The earth's surface reflects some of this radiated carrier, and the reflected signal is received on a separate receiver antenna.

During the time interval required for the signal to travel to earth and return to the aircraft, the transmitter frequency will have changed. The combination of the received signal with a signal obtained directly from the transmitter will result, by process of detection, in an audio frequency signal the average frequency of which is proportional to the altitude of the aircraft above the ground.

This equipment provides a dual range indicator of 0-400 feet and 400-4000 feet; having an accuracy within plus or minus 6 feet on the 400-foot range and within plus or minus 60 feet on the 4000-foot range.

Radio Set *AN/APN-1A differs from *AN/APN-1 only in that it is equipped with a single-range indicator and a two-position external range switch is used to provide dual range altitude readings. Both sets may be used in conjunction with an automatic pilot.

This equipment is designed for dc operation and consumes approximately 2.5 amperes with 27.5 volts delivered to the battery input receptacle of the transmitter-receiver. The input current at 27 volts is increased to approximately 2.7 amperes when a limit indicator is used.

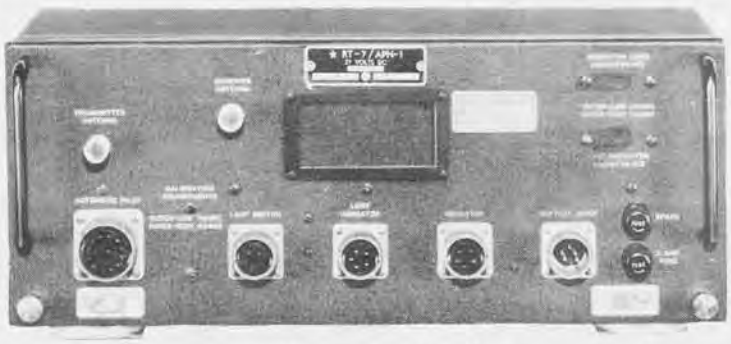
The following test sets are required for the maintenance and tuning of *AN/APN-1: Test Set TS-10C/APN or Test Set TS-10B/APN; Test Set TS-16/APN; RCA 158 Oscilloscope; and Multimeter TS-352/U.

Requirements as of 1 February 1945 were 10,870 for the calendar year 1945.

POWER INPUT	73 WATTS
FREQUENCY	420-460 MC 442-446 MC
TYPE OF SIGNAL	FM
RANGE	0-400 FT. + 6 FT. 400-4000 FT. + 60 FT.
SWEEP RATE	120 CPS

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	12H6	2	955
3	12SJ7	2	9004
4	12SH7	1	0D3/VR-150

Altitude Limit Switch
SA-1/ARN-1



Altitude Indicator
ID-14/ARN-1

Transmitter Receiver RT-7/APN-1 On Mounting Base MT-14/ARN-1

Antenna AT-4/ARN-1

RADIO *SET AN/APN-1

TOTAL WEIGHT 45 LBS.

Component	Nomenclature	Size	Weight
Transmitter-Receiver	*RT-7/APN-1	8" x 19" x 9"	19 Lbs.
Mounting Base	*MT-14/ARN-1	3" x 19" x 8"	2 Lbs.
Altitude Indicator	*ID-14/APN-1	4" x 4" x 6"	2 Lbs.
Altitude Limit Switch	*SA-1/ARN-1	6" x 4" DIAM	2 Lbs.
Antenna	*AT-4/ARN-1	8" x 12" x 2"	2 Lbs.
Lamp	LM-38 (3 EA)		

and includes plugs, cable marker tags, cable clamps, conductors, adapters, circuit breaker, indicators, misc. cable, and brackets.

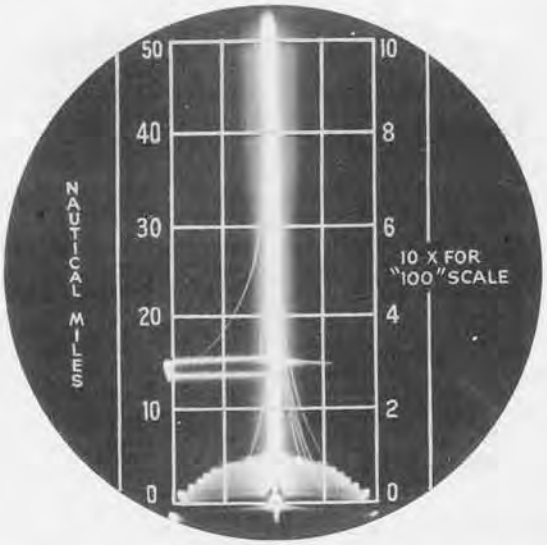
*AN/APN-2

Radio Set *AN/APN-2 is an airborne radar interrogator-respondor of the "Rebecca" type that will enable an aircraft to home on ground radar beacons of the "Eureka" type such as AN/PPN-1 and AN/PPN-2 and the heavier beacons, AN/TPN-1 and AN/TPN-2. It is used in conjunction with suitable beacons for night landing of parachute troops, landing of gliders and maintaining airborne supply operation to isolated positions.

In operation the Rebecca (*AN/APN-2) emits a pulse, "triggering" the Eureka (AN/PPN-1) and causing it to return a pulse. This returned pulse is received by the Rebecca in the aircraft and appears as a signal pip on the scope, thereby indicating range and direction of the beacon.

A form of communication between Rebecca and Eureka is also provided. The Eureka operator, while listening for triggering through his earphones, can send the Rebecca operator a coded message by depressing a key provided for that purpose. Such messages are read in the Rebecca indicator as a blinking of the signal pip. This type of communication, though slow, can be used to notify Rebecca planes of any last minute changes caused, for example, by change of wind direction or surprise enemy action.

Chief difference between Rebecca - Eureka and other beacon systems lies in the size and weight of the units. Rebecca is designed solely to interrogate an Eureka; it serves no other function and requires no other radar in the aircraft. Hence Rebecca can be installed in a troop carrier airplane at a cost in weight of only 85 pounds compared to an installed weight of 400-500 pounds for an ASV radar.



Scope records range vertically on three scales & azimuth horizontally right or left of centerline of beacon response signal above shows beacon 33 miles away & approx. 30° right.

As soon as an Eureka has been set up (usually it can be done in less than 10 minutes) it is ready to be triggered and to signal in return to incoming Rebecca equipped troop carriers.

Rebecca and Eureka must each use the proper frequency channel - i.e., Rebecca interrogates and Eureka is triggered on one frequency; Eureka responds and Rebecca receives the response on another frequency. This allows 20 different channels, enough to act as a safeguard against tapping by the enemy.

Radio Set *AN/APN-2 is designed to direct an airplane to within 200 yards of the ground beacon and will provide a good homing signal at a distance of 50 miles from transportable Beacon Transmitter-Receiver AN/TPN-3, and 80 miles from transportable Beacon Transmitter-Receiver AN/TPN-2.

Power requirements of the equipment are 185 watts at 80 or 115 volts, 400-2400 c.p.s. and 25 watts at 24 volts dc.

Radio Set *AN/APN-2Y is identical to *AN/APN-2 except for its voltage supply requirement of 12 volts dc.

Test equipment used in the maintenance of Radio Set *AN/APN-2 includes Squadron Test Equipment IE-56-A and Depot Test Equipment IE-45-A.

Army requirements as of 1 February 1945 were 5512 for the calendar year 1945.

(1) Indicator BC-929-A (2) Radio Control Box BC-1145-A
Radio Receiver and Transmitter BC-800-A (not shown)

POWER INPUT	185 WATTS - 80/115V.AC 25 WATTS @ 24V. DC
POWER OUTPUT	500 WATTS (PEAK)
FREQUENCY	214-234 MC
TYPE OF SIGNAL	PULSE
RANGE	50 MI WITH AN/TPN-1 25 MI WITH AN/PPN-1 80 MI WITH AN/TPN-2
SENSITIVITY	20 MICROVOLTS

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	955	1	5U4G
3	956	1	2C26
6	6AC7	1	6V6GT/G
1	6SL7GT	1	6X5GT/G
3	6SN7GT	1	6G6G
3	6H6GT/G	1	3BPI
2	2X2		

*AN/APN-2

~~UNCLASSIFIED~~
~~RESTRICTED~~

Radio Receiver and Transmitter
*RT-1A/APN-2
on Mounting FT-416-A

Indicator BC-929-A
on Mounting FT-409-A

Visor

Remote Control
Device C-134/APN

Tuning Shaft MC-215

Tuning Adapter
MX-196/APN

Antenna
*AT-1/APN-2

Control Box
*C-3/APN-2
Mounting
FT-406-A

Antenna *AT-2/APN-2

RADIO SET *AN/APN-2

TOTAL WEIGHT 85 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver and Transmitter	*RT-1/APN-2	13" x 12" x 9"	34 Lbs.
Radio Control Box	*C-3/APN-2	3" x 4" x 8"	2 Lbs.
Indicator	BC-929-A	9" x 9" x 16"	26 Lbs.
Antenna	*AT-2/APN (2 ea)	8"	5 Lbs.
Mounting	FT-409-A	9" x 16"	3 Lbs.
Mounting	FT-416-A	13" x 9"	3 Lbs.
Mounting	FT-406-A	4" x 8"	1 Lb.
Antenna	*AT-1/APN-2	8"	2 Lbs.
Remote Tuning Device	C-134/APN	4" x 3" x 3"	1 Lb.
Tuning Adapter	MX-196/APN	3" x 3" x 2"	1 Lb.
Tuning Shaft	MC-215		1 Lb.

and includes plugs, adapters, fuses and RF cable.

Training Equipment AN/APN-2T1 is a bench trainer designed to train students in the operation of Radio Set *AN/APN-2. It is intended to present the conditions which may arise during actual flight. Provision is made for the selection of similated video range, azimuth, beacon signals etc., chosen by the instructor, training the student to make the necessary adjustments or observations on the *AN/APN-2 normally required during actual flight.

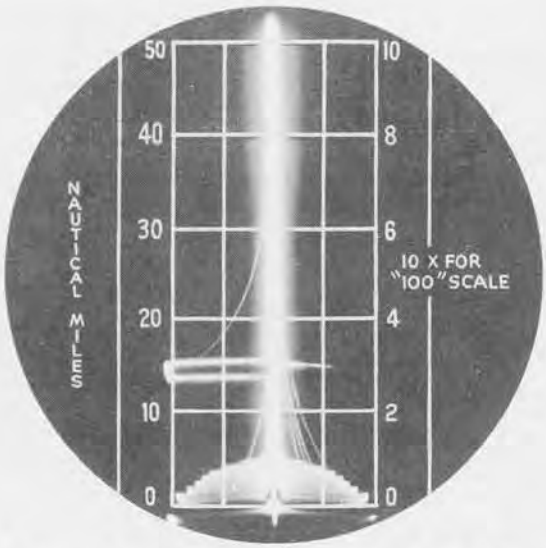
Signals furnished by the various beacons used with the *AN/APN-2 can be similated by the trainer. The equipment contains all the components of the *AN/APN-2 with the addition of a Radio Frequency Oscillator O-7/APN-2T1.

AN/APN-2T1 requires no special test equipment.

There were no Army Air Force Requirements as of 1 February 1945.

POWER INPUT	160 WATTS @ 80 VOLTS A.C.
TYPE OF SIGNAL	PULSE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	955	1	5Y3GT/G
2	6SN7GT		



Scope records range vertically on three scales & azimuth horizontally right or left of centerline of Beacon Response signal; above shows simulated beacon 33 miles away and approx. 30° right.


Visor


Indicator BC-929-A


Training Unit


Indicator BC-929-A


Visor


Inverter Unit PE-115-A


Radio Receiver and Transmitter


Control Panel BC-793-A Radio Control Box

TRAINING EQUIPMENT AN/APN-2T1 TOTAL WEIGHT 200 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver and Transmitter	RT-1/APN-2	13" x 12" x 9"	35 Lbs.
Mounting	FT-416-A	12" x 10" x 3"	3 Lbs.
Indicator	BC-929-A(2 each)	9" x 9" x 16"	26 Lbs.
Mounting	FT-409-A(2 each)	15" x 9" x 2"	3 Lbs.
Radio Control Box	C-3/APN-2	3" x 4"x 8"	2 Lbs.
Mounting	FT-406-A	7" x 4" x 2"	1 Lb.
Radio Frequency Oscillator	O-7/APN-2-T1	11" x 22" x 15"	65 Lbs.
Inverter Unit	PE-115-A	12" x 8" x 12"	33 Lbs.
Control Panel	BC-703-A	9" x 10" x 12"	20 Lbs.

and includes plugs and misc. cables.

Radio Set AN/APN-3 is the airborne portion of the precision aircraft navigational system known as Shoran. Used for precision navigation, permitting positioning of aircraft within 75 feet of any point in the range of the system.

Shoran consists of a single aircraft equipment (AN/APN-3) and two identical ground station equipments (AN/CPN-2). The AN/APN-3 measures the distance from the aircraft to each of the two ground stations (AN/CPN-2). A maximum of 20 AN/APN-3's can use a single pair of ground beacons simultaneously.

Used as a bombing system, the course of each aircraft is determined with the aid of accurate maps. The AN/APN-3 is adjusted so that when the aircraft reaches the point of bomb release the pips indicating the distance to each of the ground stations will coincide with the reference mark on the indicator. Approach to the target may be made from any direction in a given arc. (For further details on the operation of Shoran see Radio Set AN/CPN-2).

The following major components of AN/APN-3 perform the operations indicated:

Transmitter; this unit operates alternately on two different frequencies (about 20 mcx apart) which permits discrimination between the two receiving ground stations.

Receiver-Indicator; this unit receives the response from the two ground beacons (AN/CPN-2) by means of a scrambling device relays them to the indicator in their proper relation. The 3-inch "J-type" scope (circular scan) indicates the time delay in miles distance between the arrival of the two signals.

Comparator; this unit indicates the departure or error of the aircraft in respect to the predetermined course.

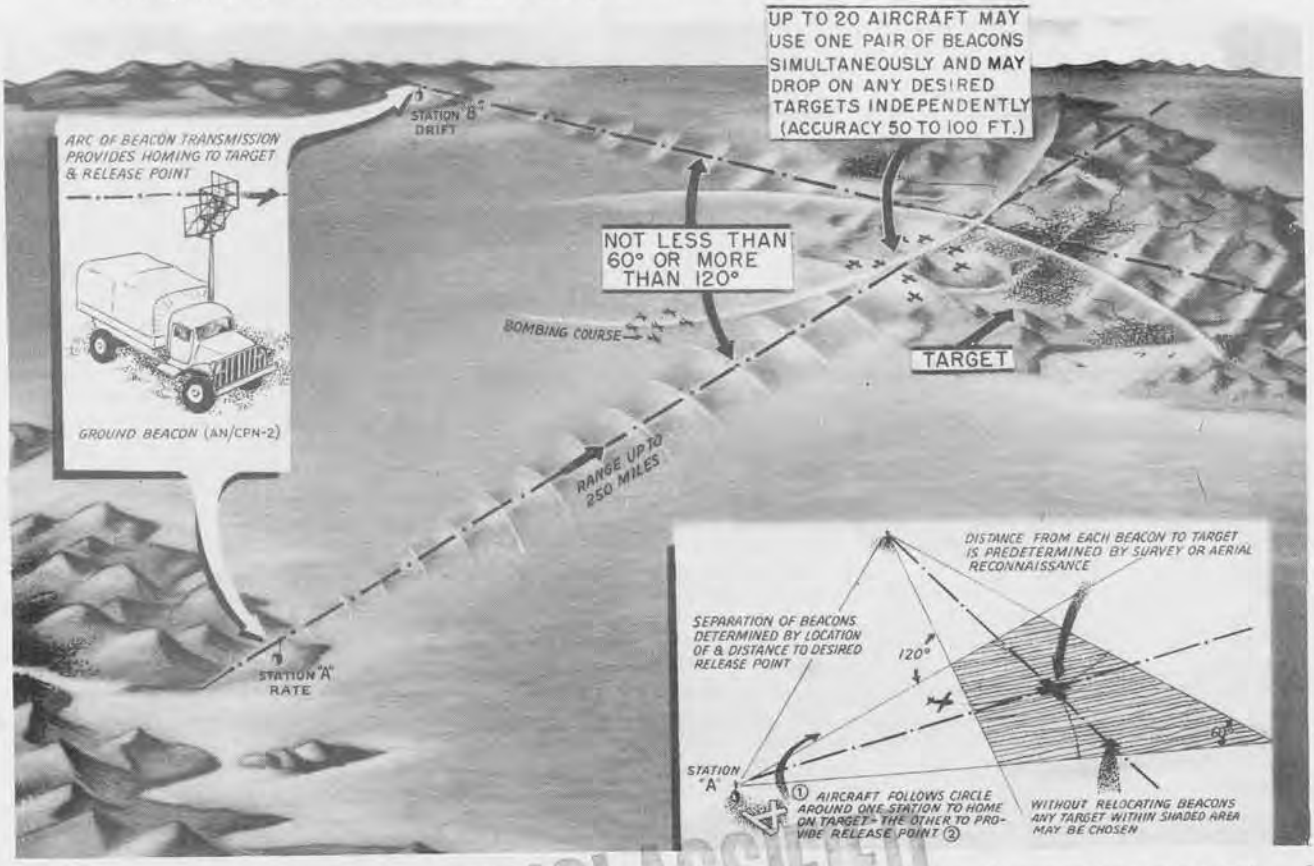
Computor; this is a bombing computor (AAF type K 1) which automatically releases the bombs and corrects for bassistics or wind.

Antenna; this component is used to transmit and receive the rf signals. It consists of two vertical coaxial units and is omnidirectional.

Test equipment required includes Wavemeter TS-247/APM-48, Voltemeters IS-185 and IS-189, Power Meter TS-305/UP, Cord CX-187/APN-3.

POWER INPUT	700 WATTS, 115 VOLTS, 400 TO 2400 CPS. 495 WATTS, 27.5 VOLTS D.C.
POWER OUTPUT	12 KW (PEAK)
FREQUENCY (TRANSMIT.)	220 TO 270 MCS
FREQUENCY (RECEIV.)	220 TO 330 MCS
SWITCHING RATE	10 CPS
PULSE LENGTH	0.5 MICROSECOND
RECEIVER SENSITIVITY	10 MICROVOLTS
RANGE	280 MILES AT 40,000'
ACCURACY	INDICATED DISTANCE: ±75'; BOMBING: 12.5 MILS

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
3	3E29	2	6J6
3	5R4GY	1	2X2
2	5Y3GT/G	1	3DP1
11	6A7	5	6SA7
4	6AG7	8	6SL7GT
1	6H6	19	6SN7GT
1	RKR73	4	6V6GT/G
2	4C28	3	OD3/VR-150
7	6AG5	1	OC3/VR-105



Radio set AN/APN-3 is the airborne element of an Aircraft Navigation System employing radar ranging and principles known as SHORAN. It may be used for precision bombing, dropping paratroops and supplies, aerial mapping, or precision navigation of aircraft and surface vessels.

AN/APN-3

Radio Transmitter T-11/APN-3
On
Mounting MT-215/APN-3

Indicator ID-17/APN-3
On
Mounting MT-216/APN-3

Comparator CM-3/APN-3
On
Mounting Base MT-167/U

Antenna
AT-13/APN-3

Antenna
AT-14/APN-3

Pilot Direction
Indicator ID-103/APN-3

RADIO SET AN/APN-3

TOTAL WEIGHT 335 LBS.

Component	Nomenclature	Size	Weight
Computer	K1	9" x 17" x 20"	56 Lbs.
Radio Receiver	R-15/APN-3	(included as indicator)	
Indicator	ID-17/APN-3	15" x 18" x 25"	77 Lbs.
Antenna	AT-14/APN-3	3" x 3" x 12"	1 Lb.
Radio Transmitter	T-11/APN-3	20" x 23" x 21"	106 Lbs.
Visor	M-387	4" x 4" x 4"	
Antenna	AT-13/APN-3	3" x 3" x 14"	1 Lb.
Mounting	MT-215/APN-3	2" x 20" x 21"	9 Lbs.
Mounting	MT-216/APN-3	12" x 18" x 21"	16 Lbs.
Cord	CX-198/APN-3	Length 5'	
Inverter	PU-16/AP		
Pilot Direction indicator	ID-103/APN-3	4" x 4" x 4"	1 Lbs
Mounting	MT-182/AP		
Comparator	CM-3/APN-3	5" x 8" x 23"	19 Lbs.
Mounting	MT-167/APN-3	2" x 22" x 8"	3 Lbs.

and includes plugs, adapters, connectors, switch and miscellaneous cable.

Radio Set *AN/APN-4, the airborne receiver element of the Loran navigation system (long range navigation), is utilized in conjunction with Loran ground stations to determine the geographical position of an aircraft in flight. This system, comprising a set of three or more fixed transmitters operated in conjunction with appropriate special receiver equipment, provides, by the utilization of radar ranging principles, long range navigation information, used for the guidance of aircraft.

Comparable in accuracy to celestial navigation, Loran has the advantage that it can be used under unfavorable weather conditions. Maximum range of Loran operation is approximately 600 miles over water and 300 miles over land when working with direct radio waves (ground waves) from the associated ground stations, and approximately, 1,200 miles when sky waves (reflected waves) are used.

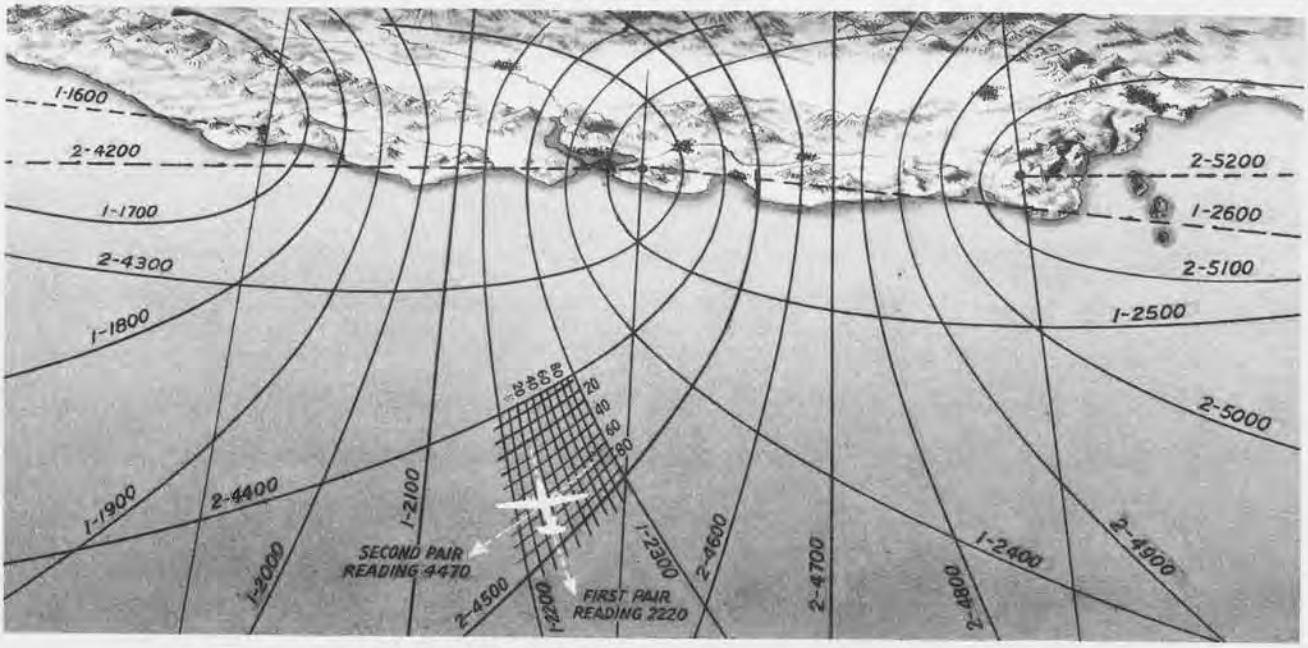
Synchronized ground stations operating in pairs generate radio frequency energy in the form of short wave trains having predetermined recurrence rates. The control station is designated the "Master" and the other, the "Slave." The difference in time of arrival of the two pulses at the airborne receiver is accurately measured by displaying the received pulses on timing markers on the screen of the cathode-ray tube of the airborne indicator. This information gives location of the airplane on a line of constant time difference which is plotted on a map of the region. To establish a navigational "fix," line of position must be obtained from another pair of stations, and the point of intersection of these lines is the position of the aircraft. Loran maps have been prepared for those areas now covered by the Loran net.

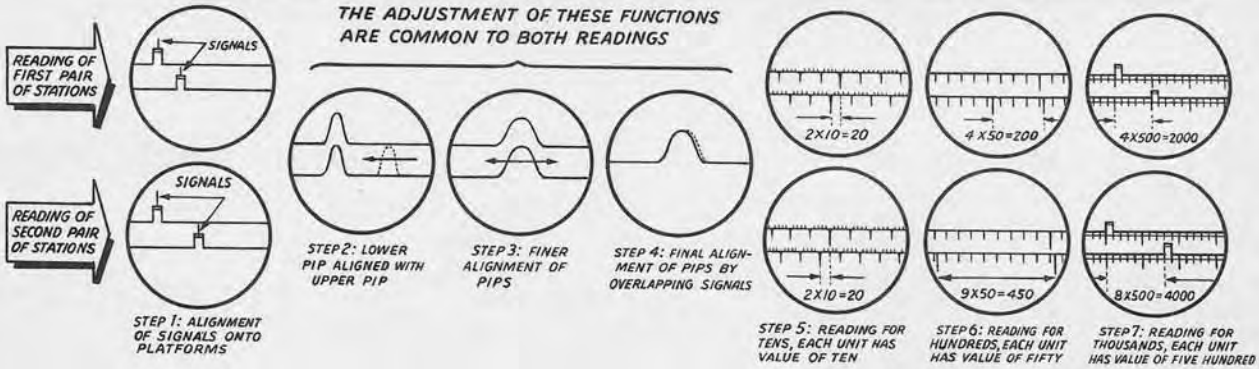
Radio Set *AN/APN-4 fulfills the need for a radio navigational device to be used over areas far removed from radio range transmitters. It is not intended to replace the radio compass, but to extend the use of radio navigation beyond the range of low frequency transmitters. It is particularly useful on long ranges over water when overcast makes celestial navigation impossible.

Test Equipment used in the maintenance of this equipment includes TS-20/APN-4.

POWER INPUT	260 WATTS, 80 or 115 V.
FREQUENCY	1.7 TO 2.0 MC (4BANDS)
TYPE OF SIGNAL	PULSE
RANGE	600 MILES (GROUND WAVES) 1200 MILES (SKY WAVES).

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
4	6SK7GT	1	5U4G
1	OC3/VR-105	2	2X2
16	6SN7GT	1	6SA7GT
4	6SL7GT	1	5CP1
2	6SJ7GT	8	6H6GT/G
3	6B4G		





Radio Set *AN/APN-4 is the airborne receiver element of the Loran Navigation System with which a radar fix is obtained by taking a reading on each of two Loran chains in the order shown.

*AN/APN-4

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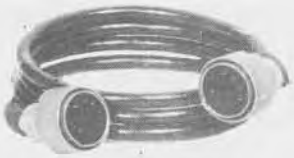
Indicator *ID-6B/APN-4.

Radio Receiver *R-9A/APN-4

Cord CD-946



Cord CD-540

Cords CD-946

Power Cord

RADIO SET AN/APN-4 — TOTAL WEIGHT 75 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver	R-9/APN-4	20'' x 9'' x 8''	26 Lbs.
Mounting	FT-447-A		3 Lbs.
Indicator	ID-6/APN-4	20'' x 9'' x 12''	36 Lbs.
Mounting	FT-446		3 Lbs.

and includes plugs, cordage, couplings, cable clamps, wire and RF cable.

Radar Beacon AN/APN-7 is an airborne transponder beacon employed to establish the identity of the aircraft in which it is installed. The equipment is designed particularly for operation with ASG, SCR-517 and SCR-717 and provides navigational aid to other aircraft, acting as a "rooster" on which they may home. It facilitates the location of a predetermined meeting place with other aircraft.

The receiver has a 12mc. bandwidth and can be tuned over the 3220 mc. to 3320 mc. range. The transmitter uses a 446B lighthouse tube, with a power output of 200 watts. The transmitter may be tuned over the 3220 mc. to 3320 mc. range.

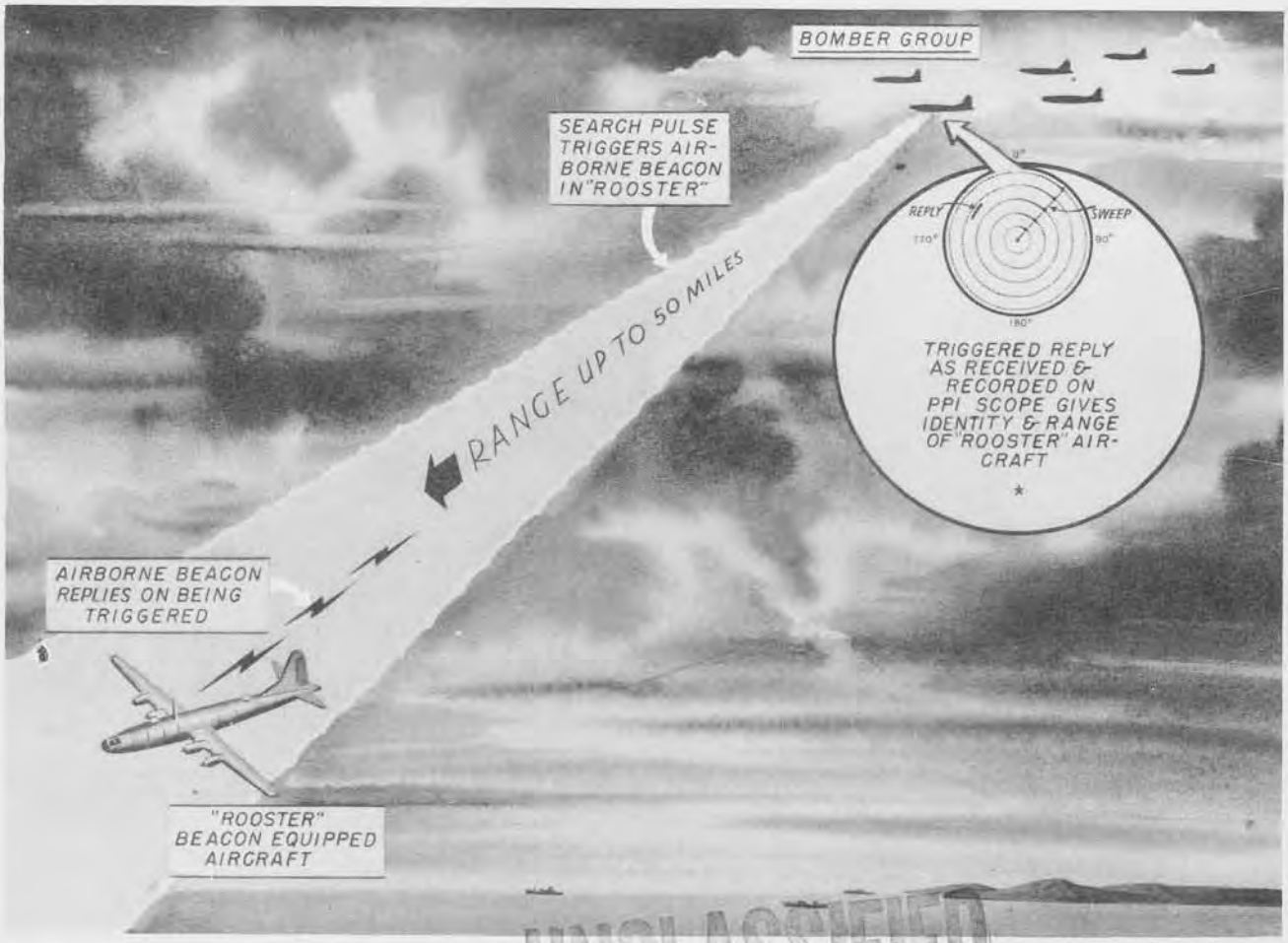
Test equipment required for maintenance includes Test Set TS-14/AP, Frequency Meter TS-46/AP, Dumont 241 Oscilloscope and RCA type MI-18709 Signal Generator.

AAF requirements as of 22 February 1945 were 225 for the calendar year 1945.

Receiver-Transmitter RT-21/APN-7 installed for operation.

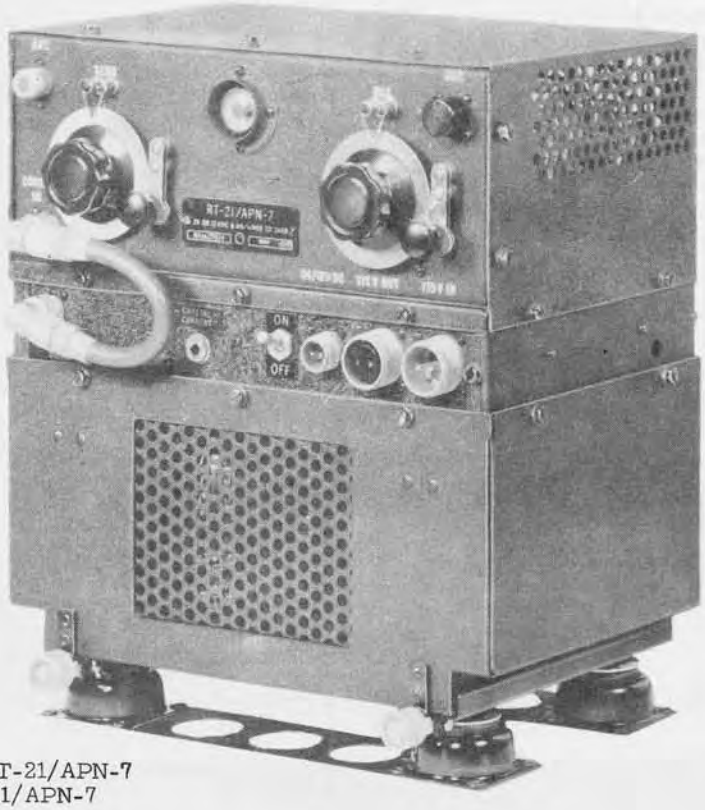
TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	721-A	1	OC3/VR-105
1	707-B	1	OD3/VR-150
1	446-B	1	6E5
3	6SN7GT	1	6B4G
1	RK-34	1	2X2
11	6AG5	1	5U4G
1	13T4	1	6X5GT/G

POWER INPUT	200 WATTS, 105-130 V, 400 TO 2400 CPS; 10 WATTS, 12/24 V, DC
POWER OUTPUT	200 WATTS (PEAK)
FREQUENCY	3220-3320 MC
TYPE OF SIGNAL	PULSE
RANGE	50 MILES



Radar Beacon AN/APN-7 is an airborne transponder beacon used to establish the identity of the aircraft in which it is installed and provide navigational aid to other aircraft.

CONFIDENTIAL



Receiver-Transmitter RT-21/APN-7
on Mounting Base MT-111/APN-7

Antenna Assembly
AS-31/APN-7

Coder KY-3/APN-7
on Mounting Rack MT-148/APN-7

RADAR BEACON AN/APN-7

TOTAL WEIGHT 53 LBS.

Component	Nomenclature	Size	Weight
Receiver-Transmitter	RT-21/APN-7	13'' x 13'' x 10''	36 Lbs.
Antenna Assembly	AS-31/APN-7	25'' x 4'' x 4''	3 Lbs.
Mounting Base	MT-11/APN-7	2'' x 12'' x 10''	3 Lbs.
*Coder	KY-3/APN-7	7'' x 5'' x 16''	9 Lbs.
*Mounting Base	MT-148/APN-7	2'' x 6'' x 17''	2 Lbs.

and includes antenna cable assembly, plugs and cable adapter.

* optional items

Radar Set AN/APN-9 is an airborne long range navigational equipment operated in conjunction with Loran ground stations to provide navigation aid for heavy and medium bombardment and transport type aircraft.

This set, known as "Simplified Loran", is a single unit receiver-indicator weighing about 40 pounds, excluding power source. Radar Set AN/APN-9 will replace Radio Set AN/APN-4, which is heavier and consists of several units.

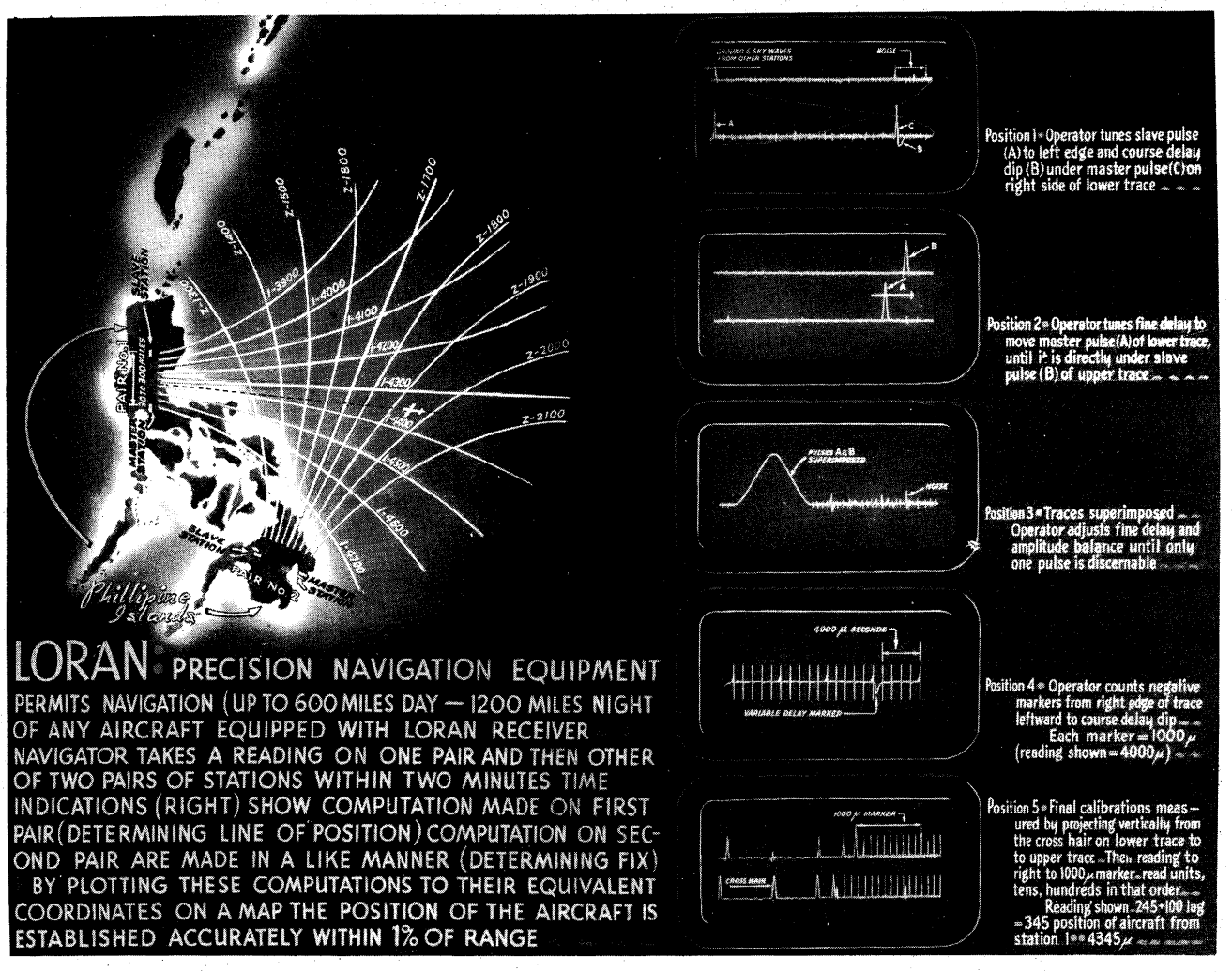
Comparable in accuracy to celestial navigation, Loran has the advantage that it can be used under unfavorable weather conditions. Maximum range of Loran operation is approximately 600 miles over water and 300 miles ever land, when working with direct radio waves (ground waves) from the associated ground stations, and approximately 1,200 miles when sky waves or reflected waves from three ground stations are used.

Ground stations operating in synchronism generate radio frequency energy in the form of short wave trains having predetermined recurrence rates. These stations operate in pairs, one designated the "master" station, and the other, a "slave" station. The difference in time of arrival of the two pulses at the airborne receiver is accurately measured by displaying the received pulses superimposed on timing markers on the screen of the cathode-ray tubes of the airborne indicator. This information locates the airplane on a line of constant time difference which is plotted on a Loran chart of the region. To establish a navigation fix, a line of position must be obtained from another pair of stations. The point of intersection of the two lines of constant time difference locates the position of the aircraft on the Loran Chart.

Test equipment required in the maintenance of Radio Set AN/APN-9 includes Test Set TS-251/UP, RCA Oscilloscope Type 158, Signal Generator I-72 and Weston Output Meter model 571 Type 3A.

POWER INPUT	190 w. @ 80/115 v. 400 - 2400 cps
FREQUENCY	1.7 - 2 Mc
TYPE OF SIGNAL	pulse
RANGE	600 miles (ground waves) 1,200 miles (sky waves)

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	3BP1	3	6SL7GT/G
1	2X2	13	6SN7GT/G
1	5Y3GT/G	7	6H6GT/G
1	6Y6G	3	6SK7GT/G
2	6SJ7GT/G	1	6SA7GT/G
1	OC3/VR-105	1	6N7



Radio Set AN/APN-9 is the airborne receiver element of the Loran Navigational System with which a radar fix is obtained by taking a reading on each of two Loran chains in the order shown.

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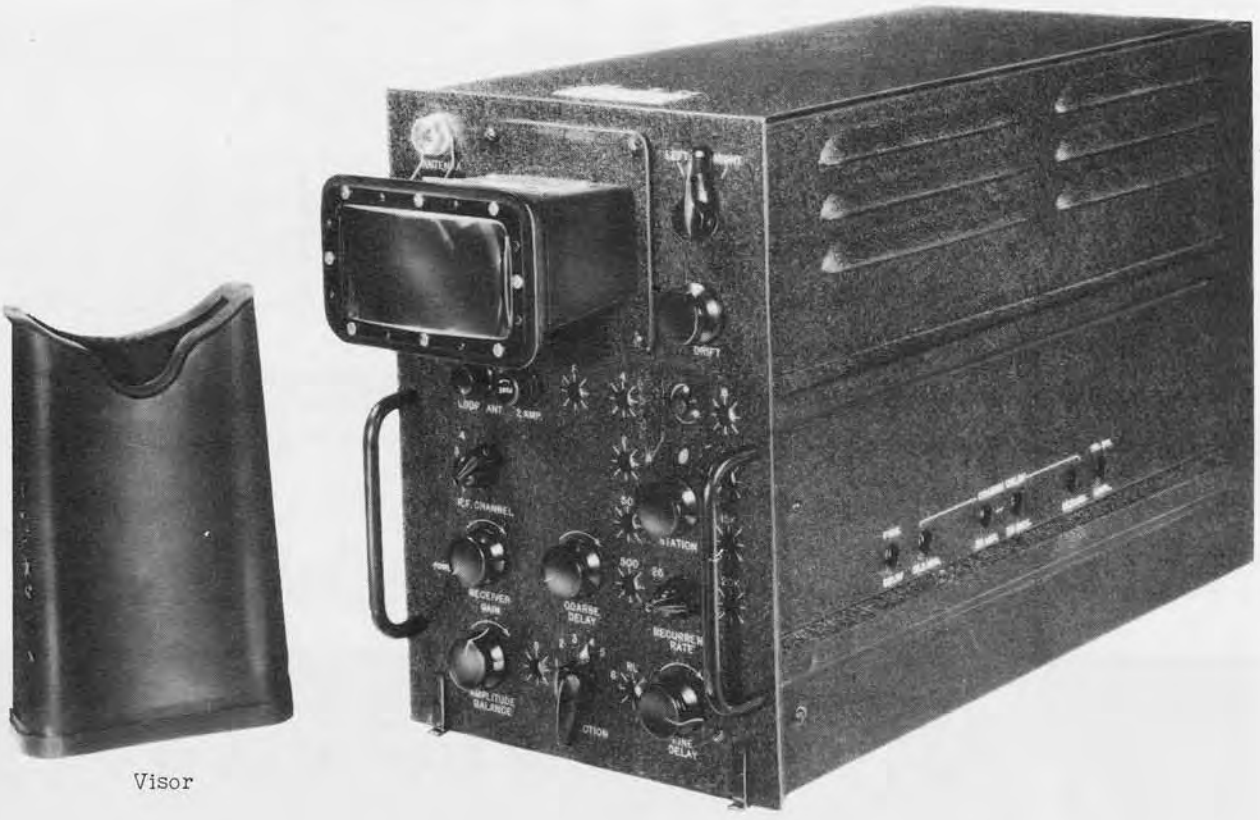


Visor

Receiver Indicator R-65(XA) /APN-9(XA-2)

RADAR SET AN/APN-9

TOTAL WEIGHT 41 LBS.

Component	Nomenclature	Size	Weight
Receiver-Indicator	R-65/APN-9	11" x 9" x 19"	35 Lbs.
Mounting	MT-203/APN		3 Lbs.
Coupling	MC-277		*
Cable Clamp	M-297		*
Radio Frequency Cable	RG-8/U	40'	1 Lb.
Coupler	CU-92/APN	3" x 2" x 2"	*
Adapter	M-359		*
Plugs	PL-259-A		*

Uses either fixed or trailing wire antenna.

* Weight less than one pound.

SECRET

AN/APN-10

Radar Set AN/APN-10, a light weight, interrogator-responsor type, airborne navigational equipment, is designed to direct an airplane to within 200 yards of a ground or airborne beacon. The set will provide a good homing signal at a distance of fifty miles from transportable Beacon Transmitter-Receiver AN/TPN-2 or Radio Set SCR-695, and at twenty-five miles from portable Beacon Transmitter-Receiver AN/PPN-1 or AN/PPN-2.

In conjunction with suitable companion beacons, this equipment may be used for landing parachute troops or gliders by night; maintaining airborne supply operations to isolated positions at night; demarcation of bombing line for close support bombers; identification of certain advanced units; homing on airfield beacons; homing on airborne beacons; identification of other friendly airplanes, and as a ground interrogator-responsor for identifying friendly airplanes and checking IFF equipment in aircraft during take-off or landing.

This equipment is essentially a radio transmitter-receiver with a cathode ray indicator. A pulse modulated signal is transmitted by Radar Set AN/APN-10, received by the ground or airborne beacon which then automatically transmits a reply on the same or a different frequency, which when received is displayed on the cathode-ray indicator.

The airplane is directed toward the beacon by turning until signals of equal amplitude are observed on each side of the indicator.

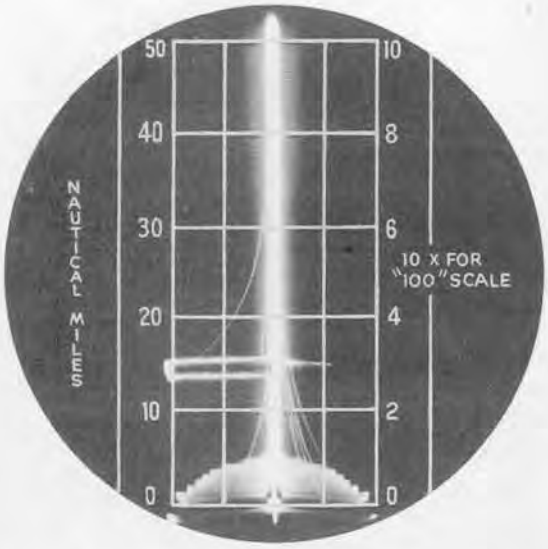
This receiver-transmitter is housed in a single unit and will transmit and receive on any frequency between 160 and 240 mc. Desired frequencies are selected by means of a tuning knob on the front panel of the unit.

Radar Set AN/APN-10 may be installed in bombers, transports, gliders, and fighter airplanes, having a radio operator's or navigator's compartment. One individual is required to operate this equipment.

Radar Set AN/APN-43 is similar to AN/APN-10, and may be used in connection with any Eureka type beacon such as AN/TPN-2, AN/PPN-1, or AN/PPN-2. It also operates in conjunction with YH and YJ type beacons and SCR-695 IFF equipment.

Test equipment required for maintenance and tuning of AN/APN-10 includes Test Equipment IE-45 (depot) and Test Equipment IE-56 (field).

There were no AAF requirements as of 1 February 1945.



AN/APN-10 scope displays ground station responses on two scales with 0 to 5 and 0 to 50 mile ranges, and indicates right-left direction of the ground station relative to the line of flight.

POWER INPUT	100 WATTS @ 22-30 VOLTS DC.
POWER OUTPUT	100 WATTS (PEAK)
FREQUENCY	160-240 MC
TYPE OF SIGNAL	PULSE
RANGE	25-50 MILES

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6F4	1	3BP1
6	6AK5	1	VR-150/30
4	6J6	2	955
3	6C4	1	6V6
1	6AG5	1	8016

RADAR SET AN/APN-10

TOTAL WEIGHT 30 LBS.

Component	Nomenclature	Size	Weight
Transmitter-Receiver-Indicator	RT-XA-16/APN-10(XA-2)	11" x 8" x 19"	30 Lbs.

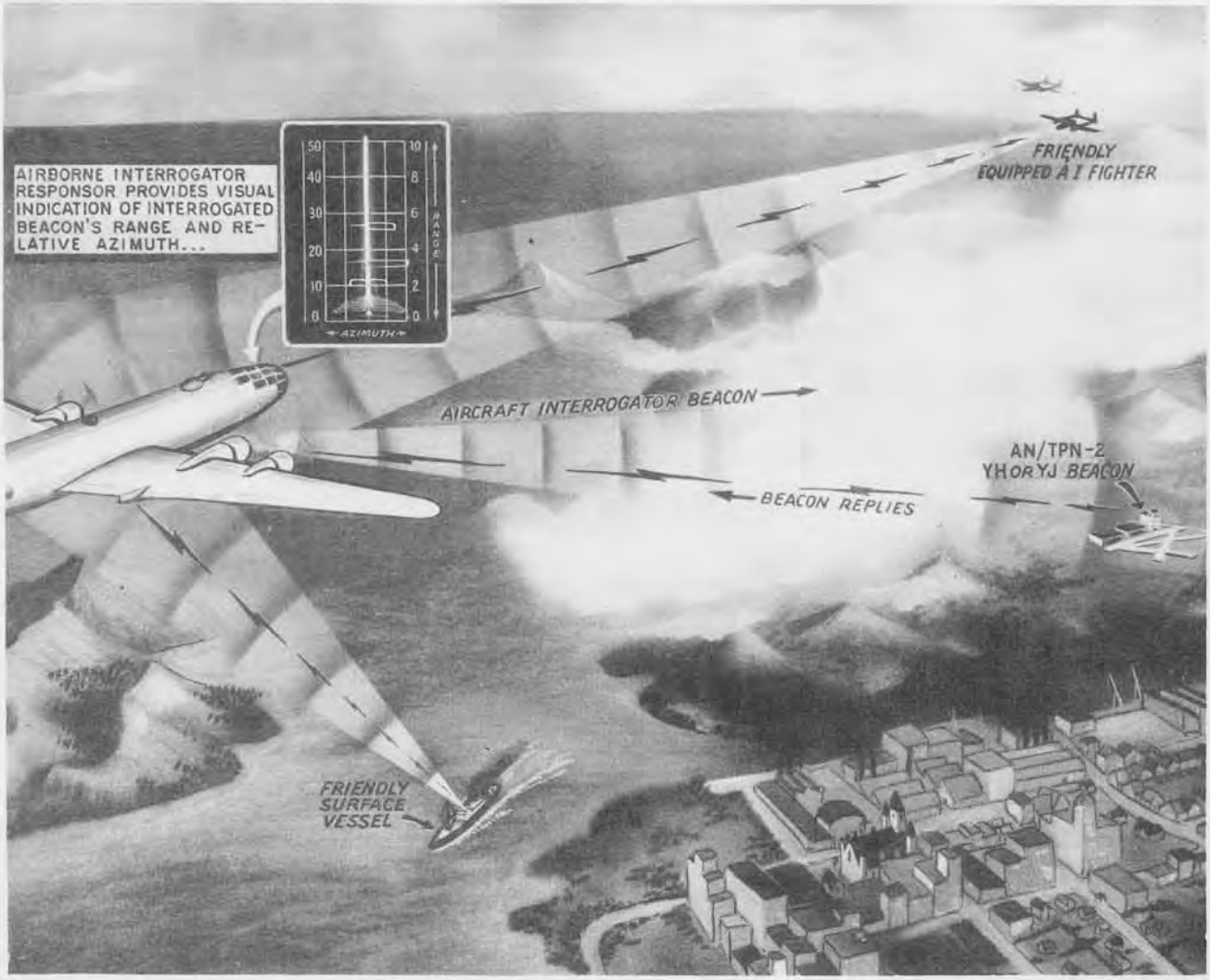
Radar Set AN/APN-12 is an airborne interrogator responsor equipment designed to indicate range and relative azimuth in conjunction with ground installations of radar beacons of the Eureka type, BABS equipment, and YH and YJ radar beacons. A modified "A" scope is used to give right left indications and range. This set is similar to Radio Sets SCR-729 and AN/APN-2 and is intended to supplement and eventually replace these sets since it combines their functions and frequency coverage. Shape and mounting of the AN/APN-12 is comparable to that of the SCR-729 and AN/APN-2.

This equipment consists of a Receiver-Transmitter RT-11/APN-12 which can transmit and receive on at least three separate frequencies in the Mark III IFF band and on the five Rebecca-Eureka frequencies. Frequency of the transmitter and receiver are independently adjustable. Selector switch tuning permits use of any preset transmitter or receiver frequency while the aircraft is in flight. Normally the unit will operate as an interrogator responsor; however, the basic circuits have been so designed that the equipment may also operate as a transpondor beacon. The choice of either one depends on the tactical requirements.

Test Equipment required for the operation and maintenance of AN/APN-12 includes Test Equipment IE-56-A, Signal Generator GR-804-C and Oscilloscope RCA-158.

POWER INPUT	30 WATTS D.C. @ 24-28 VOLTS - 150 WATTS @ 80 OR 115 VOLTS, 400 to 2400 C.P.S.
POWER OUTPUT	400-500 WATTS
FREQUENCY	200-240 MC and 156-186 MC
TYPE OF SIGNAL	PULSE
RANGE	20 MI. FOR EUREKA BEACON, 90 MI. FOR YH OR YJ BEACON, 50 MI. FOR AN/TPN-1, AN/TPN-3, SCR-695, 100 MI. FOR AN/TPN-2

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
6	6SN7GT	1	6J6
4	6H6GT/G	7	6AC7
2	2X2	1	6V6GT/G
2	6X5GT/G	2	6SL7GT
1	6G6GT	1	5U4G
1	3BP1	1	2C26A
1	6AK5	1	6E5
1	9002	1	6SJ7



Radar Set AN/APN-12 is an airborne interrogator responsor equipment used in conjunction with ground beacons for aircraft navigation and for Mark III IFF land, sea and air operations.

AN/APN-12

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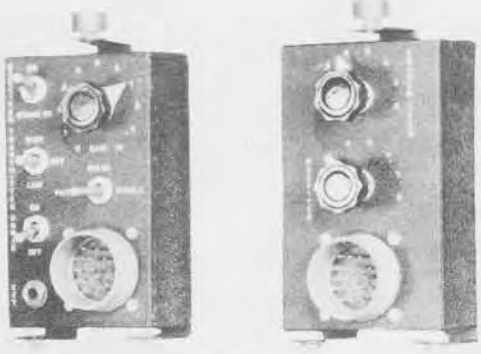
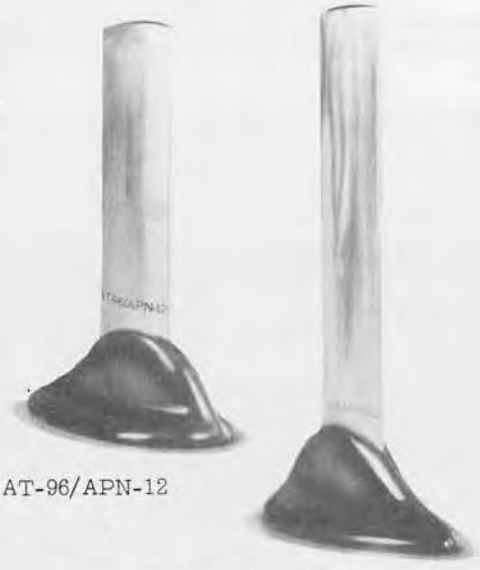
Receiver Transmitter
RT-11/APN-12

Video Gate MX-284/APN-12



Control Boxes



Antenna AT-96/APN-12

Antenna AT-97/APN-12

RADAR SET AN/APN-12

TOTAL WEIGHT 105 LBS.

Component	Nomenclature	Size	Weight
Receiver-Transmitter	RT-11/APN-12	12" x 12" x 13"	40 Lbs.
Control Box	C-169/APN-12	4" x 6" x 3"	1 Lb.
Control Box	C-170/APN-12	4" x 10" x 3"	1 Lb.
Indicator	ID-169/APN-12		26 Lbs.
Mounting	FT-406-A (2 each)		*
Mounting	FT-409-A		3 Lbs.
Mounting	FT-416-A		3 Lbs.
Antenna	AT-96/APN-12 (3 each)		5 Lbs.
Antenna	AT-97/APN-12 (2 each)		5 Lbs.
Video Gate	MX-284/APN-12	5" x 6" x 10"	9 Lbs.
Mounting Base	MT-165/U	6" x 2" x 10"	2 Lbs.
Cable Clamp	M-297		*
Coupling	MC-277		*
Remote Tuning Device	C-195/APN-12	3" x 3" x 3"	1 Lb.
Receptacle	UG-191/AP	1" long x 1" diam.	*

and includes plugs, adapters, cable adapters and r-f cables.
* less than one pound in weight.

Radar Beacon AN/APN-19, (Rosebud) is an airborne range coded beacon which is installed in fighters to enable Ground Radars AN/CPS-1, AN/CPS-6 and SCR-584 to identify and vector these airplanes at ranges greater than the ground radars normally can function with airplanes not so equipped. This equipment increases the range and reliability for close support bombing and photo-reconnaissance when used with modified SCR-584 radars.

The set is capable of being interrogated by radars having beacon functions and replying with a range coded signal permitting the beacon to be located in range and azimuth. A tunable 7 megacycle-bandwidth cavity is available when it is desired to eliminate all frequencies except those of one interrogating radar. Reply may be coded by three code pips, the spacing of which may be varied so that seven combinations are possible.

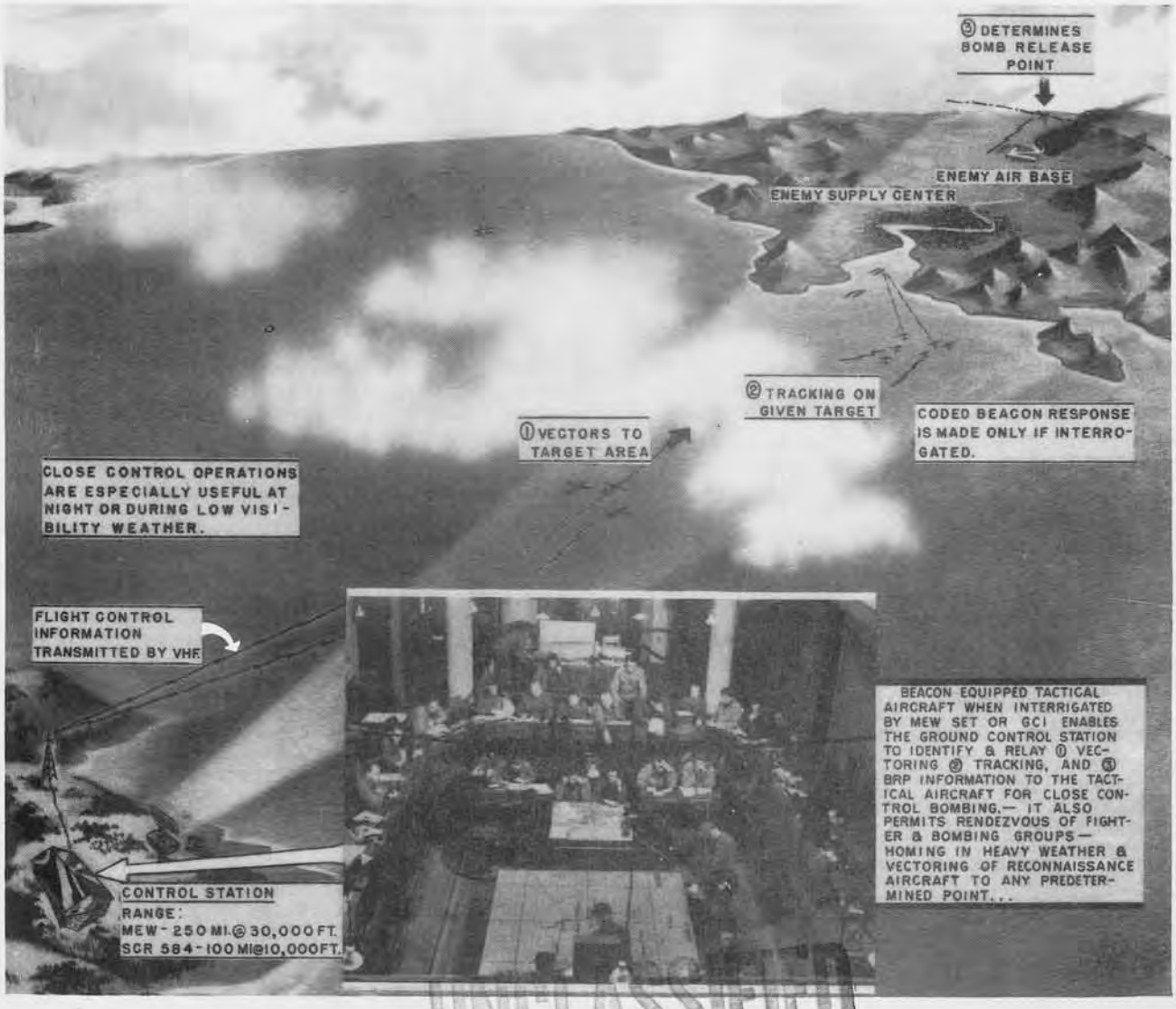
The equipment is similar to Radio Set AN/UPM-2 adapted for airborne operation. Antenna Assembly AS-172/AP, the horizontally polarized antenna designed for airborne operation, consists of a dual linear array of six dipoles for receiving and transmitting. Present indications show that for fighter planes, vertically polarized antennas are preferred as the vertically polarized dipoles will be only one and one-half inches long.

Test equipment required for maintenance and tuning includes Test Set TS-125/AP, Wavemeter TS-117/GP, Test Set TS-3A/AP, Signal Generator TS-155C/UP, Pressurizing Kit MK-20/UP, Multimeter TS-297/U, Oscilloscope TS-239/UP, Oscilloscope TS-34/AP, Voltage Divider TS-890/AP, Multimeter TS-352/U, Dynamotor Test Set TS-414/U, and Tube Tester I-177.

Army Air Forces requirements as of 1 February 1945 were 3273 for the calendar year 1945.

POWER INPUT	120 WATTS @ 28 VOLTS D-C
POWER OUTPUT	50 WATTS (PEAK)
FREQUENCY	2700-3400 MC
TYPE OF SIGNAL	RANGE CODED PULSES
SENSITIVITY	2 TO 5 x 10-8 WATTS

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
3	2D21	1	2C40
2	7F8	5	7F8



Radar Beacon AN/APN-19 installed in fighter or other light aircraft permits close control operations at much greater ranges than are possible with normal detection radar in that the aircraft contact is maintained with the control station by beacon pulse rather than with the weaker reflected pulse.

AN/APN-19

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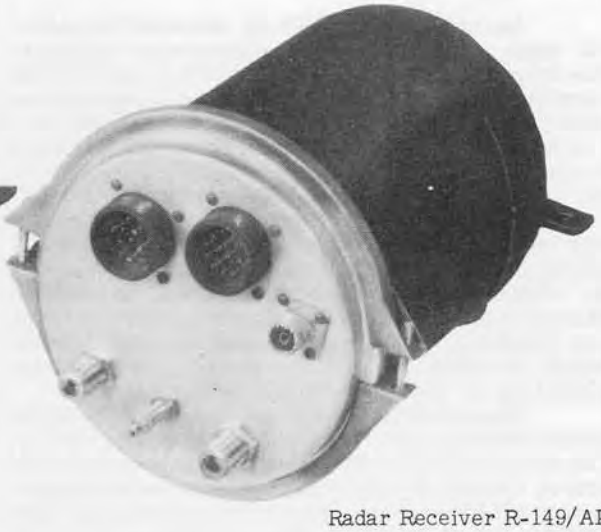
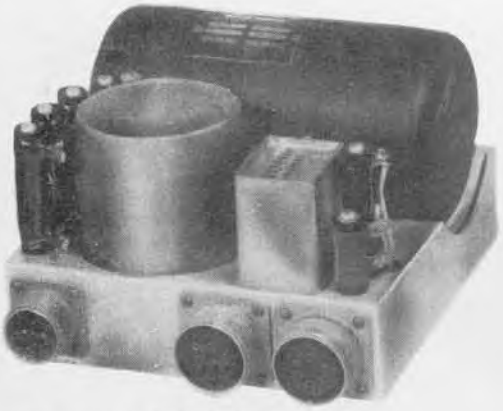
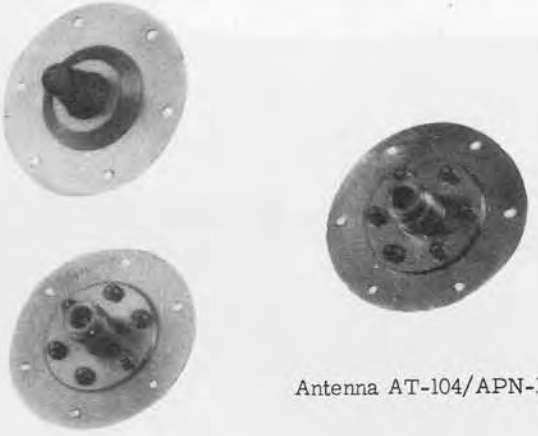
Radar Transmitter T-128/APN-19



Radar Receiver R-149/APN-19



Dynamotor DY-30/APN-19



Antenna AT-104/APN-19

Control Box C-238/APN-19

Control Box C-239/APN-19

RADAR BEACON AN/APN-19

TOTAL WEIGHT 30 LBS.

Component	Nomenclature	Size	Weight
Control Box	C-238/APN-19	4" x 3" x 7"	*
Control Box	C-239/APN-19	4" x 4" x 5"	1 Lb.
Antenna	AT-104/APN-19	2" x 3" Diameter	*
Radar Transmitter	T-128/APN-19	9" x 7" Diameter	7 Lbs.
Radar Receiver	R-149/APN-19	9" x 7" Diameter	6 Lbs.
Dynamotor	DY-30/APN-19	5" x 8" x 7"	10 Lbs.

and includes plugs cable adapters etc.

Training Equipment AN/APN-T1 is a bench trainer designed to train students in the operation of Radio Set SCR-729. It is intended to present realistically to the student as many as possible of the situations which may arise under actual flight conditions in connection with the performance of SCR-729.

Training Equipment AN/APN-T1 comprises various components of SCR-729, slightly modified. The training unit consists of two chassis, mounted one above the other, and assembled in a double-deck cabinet. The upper chassis contains Code Selector KY-2/APN-T1, while the lower contains RF Generator O-6/APN-T1. Either chassis may be removed through the front of the cabinet by disconnecting the interconnecting cable and removing the proper rack panel screws.

Synchronizing pulses from Radio Receiver and Transmitter BC-800-A are applied to the input circuit of the generator and enter two parallel channels. One channel generates a signal which simulates ground reflections. The other channel generates signals which simulate responses from various beacons and IFF equipment. The code selector works in conjunction with the generator, providing mechanical switching to simulate coding; and also provides a means of switching for the selection of the desired signals. Each of the two generator channels contains an RF oscillator which is modulated by the video signals generated in that channel. The resulting RF pulses from both oscillators are coupled into a common RF output cable and applied to the receiver antenna input of Radio Receiver and Transmitter BC-800-A. These RF pulses are detected and the video pulses applied in the normal manner to Indicator BC-929-A. Thus, so far as the student is concerned, the indications on the indicator are similar to those occuring under flight conditions. The selection of the video signal, range, azimuth, etc., are at the discretion of the instructor. The instructor can, by suitable manipulation of the controls of the unit, require the student to make any adjustments or observations on SCR-729 which would normally be required of the student under flight conditions.

Two indicators may be connected in parallel in order to provide separate indications for instructor and student. The BC-800-A and BC-929-A are wired so that they can be operated from the 80-volt supply. This permits all units of the equipment to be operated from a common power supply.

No special test equipment is necessary for maintenance of this trainer.

There were no AAF requirements as of 1 February 1945.

POWER INPUT	28 AMPS 24 V. DC
TYPE OF SIGNAL	PULSE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6AC7	2	6SN7GT
1	6J5	1	5Y3GT/G
2	955		

Indicator BC-929-A

Visor

Radio Frequency Generator O-6/APN-T1

Visor

Indicator BC-929-A

Inverter Unit PE-115-A

Radio Receiver and Transmitter

Control Panel BC-703-A

Control Box BC-1145-A

TRAINING EQUIPMENT AN/APN-T1 — TOTAL WEIGHT 196 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver and Transmitter	BC-800-A	13'' x 13'' x 9''	34 Lbs.
Mounting	FT-416-A	12'' x 10'' x 3''	3 Lbs.
Indicator	BC-929-A (2 each)	9'' x 9'' x 16'' (ea)	26 Lbs.
Mounting	FT-409-A (2 each)	15'' x 9'' x 2''	3 Lbs.
Radio Control Box	BC-1145-A	3''x 4'' x 8''	2 Lbs.
Mounting	FT-406-A	7'' x 4'' x 2''	3 Lbs.
Radio Frequency Generator	O-6/APN-T1	9'' x 19'' x 15''	18 Lbs.
Code Selector	KY-2/APN-T1	9'' x 19'' x 15''	36 Lbs.
Double Deck Cabinet		18'' x 19'' x 15''	36 Lbs.
Inverter Unit	PE-115-A	12'' x 8'' x 12''	33 Lbs.
Control Panel	BC-703-A	9'' x 10'' x 12''	20 Lbs.

and includes plugs, adapters, wire and misc. cable.

Beacon Antenna Assembly AN/CPA-1 is an air transportable adapter equipment used to convert Beacon Transmitter-Receivers AN/TPN-1, AN/TPN-2 or AN/TPN-3 for blind approach of aircraft equipped with interrogator responsor equipments, such as Radio Set AN/APN-2 or SCR-729 under adverse weather conditions. Approaches can be accomplished to within one mile of a runway. The actual landing is then accomplished visually.

This assembly consists of a collapsible triangular frame-like antenna reflector, and a switching unit for alternating the antenna leads. This set when used with the radar homing beacon, will form a "BABS" system, similar to Radio Set AN/CPN-7.

Power is obtained from 110 volts, 50-60 cycle power source or from a 24 volt dc. source utilizing an inverter. Power input is 20 watts. The equipment operates over a frequency range of 214 - 234 mc.

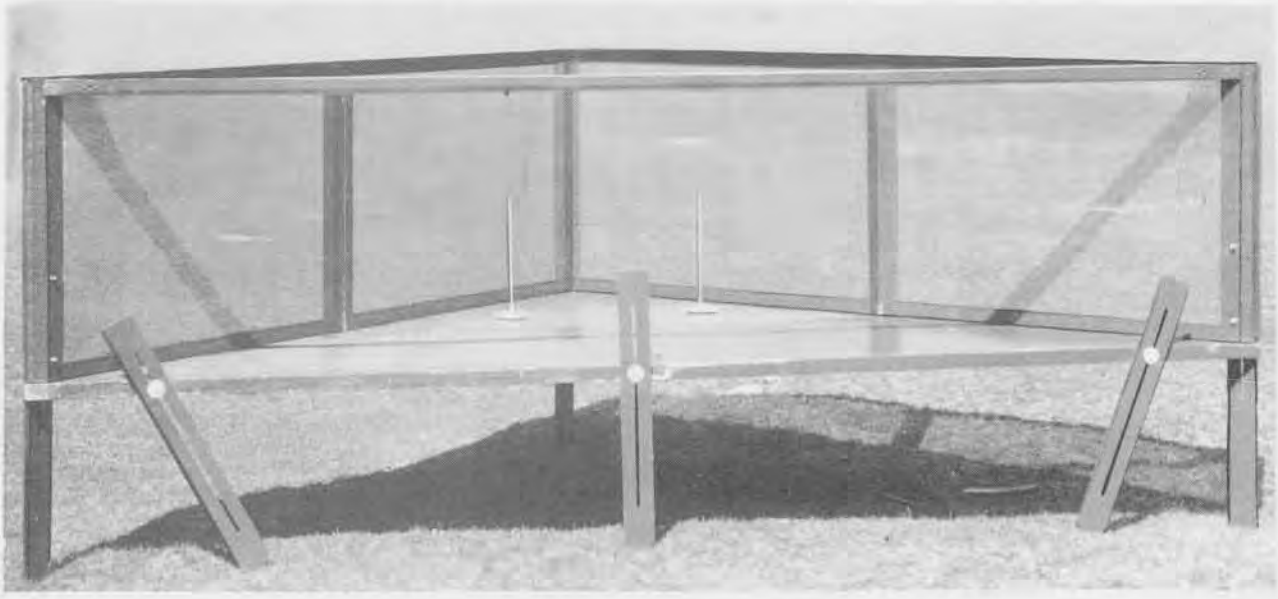
AN/CPA-1 requires no special test equipment for maintenance or operation.

There were no AAF requirements as of 1 February 1945.

POWER INPUT	20 WATTS @ 110 VOLTS
FREQUENCY	214 - 234 MC.

Switching Assembly SA-7/CPA-1.

Inverter Unit PP-76/CPA-1.



Antenna System AS-30/CPA-1 assembled for operation.

RADAR ANTENNA ASSEMBLY AN/CPA-1 TOTAL WEIGHT 155 LBS.

Component	Nomenclature	Size	Weight
Antenna System	AS-30/CPA-1	54" x 122" x 62"	90 Lbs.
Switching Assembly	SA-7/CPA-1	9" x 10" x 19"	27 Lbs.
Inverter Unit	PP-76/CPA-1	6" x 7" x 7"	10 Lbs.

and includes plugs and cords.

Radio Set AN/CPN-2 is the ground portion of the precision aircraft navigational system known as Shoran which employs radar ranging and beacon principles. This system is used for precision navigation, permitting positioning of aircraft within 75 feet of any point in the range of the system.

Shoran consists of one aircraft equipment (AN/APN-3) and two identical ground station equipments (AN/CPN-2). The AN/CPN-2's provide signals which are utilized by the aircraft equipment (AN/APN-3) to measure the distance from the aircraft to each of the two AN/CPN-2 ground stations. In practice one performs the "rate" duties while the other acts as the "drift" station. The "drift" station is the one which provides the course or arc flown by the navigator. The "rate" station provides the intersecting or bombing point. These indications depend on the plane's receiver-indicator system, i.e., a ground station may be a "rate" station for one airplane and a "drift" station for another. A maximum of 20 airborne equipments can use a single pair of ground beacons simultaneously. (For further details on the operation of Shoran refer to Radio Set AN/APN-3.)

Radio Transmitter T-12/CPN-2

POWER INPUT	1200 WATTS, 115 VOLTS, 400 CPS; 400 WATTS, 24 VOLTS, D.C.
POWER OUTPUT	30 KW (PEAK)
FREQUENCY	290 TO 330 MCS (TRANSMITTER), 220 to 330 MCS (RECEIVER)
TYPE OF SIGNAL	PULSE
PULSE LENGTH	0.55 MICROSECONDS
PRF	930 TO 9300 CPS
RANGE	AIRCRAFT AT 40,000', 280 MILES
OPERATORS	TWO

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
5	3E29	2	705 A
1	5X3GT	1	6E5
13	6AC7	7	6AG5
3	6AG7	1	2X2
3	5R4GY	1	3BP1
5	6H6	2	6V6GT/G
6	6J6	1	OD3/VR-150
9	6SN7GT		

Monitor ID-18/CPN-2

The following major components of AN/CPN-2 perform the functions indicated:

Transmitter; when interrogated by AN/APN-3 this unit responds by transmitting a pulsed signal at the proper rf frequency.

Monitor; this component contains the rf receiver unit for receiving the signals from AN/APN-3. It also incorporates a network for controlling the overall delay of the station, and a master timing unit used as a reference standard for the airborne timer. An oscilloscope is provided for checking the delay and a wavemeter is included for checking the frequency of the rf receiver.

Shoran may be used as an aid in photographic reconnaisance, aerial mapping for establishing a bombing line, dropping paratroopers and supplies over a pre-selected point, and for precision navigation of aircraft and of ships to the ground stations.

Additional test equipment used in the maintenance of Radio Set AN/CPN-2 includes Voltmeters IS-185 and IS-189, and Power Meter TS-305/UP.

Radio set AN/CPN-2 should be placed on the highest terraine available and away from surrounding hills or buildings.

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Complete installation of Vehicular Mounting Kit for Radio Set AN/CPN-2.

RADIO SET AN/CPN-2

TOTAL WEIGHT 1163 LBS

Component	Nomenclature	Size	Weight
Transmitter	T-12/CPN-2	26" x 20" x 41"	209 Lbs.
Monitor	ID-18/CPN-2 with receiver	26" x 20" x 22"	98 Lbs.
Antenna Mast & Reflector	AN-28/CPN-2	12" x 9" x 144"	191 Lbs.
Antenna Bed			78 Lbs.
Mast Accessories		19" x 44" x 14"	195 Lbs.
2 Homelite Power Type HRU-AD	PU-4/CPN-2	17" x 35" x 21"	140 Lbs.
2 Gas Cans in case packed for shipment		13" x 14" x 29"	49 Lbs. (Ea.)

AN/CPN-3

Radio Set AN/CPN-3, is an air transportable radar beacon for ground installation, designed to provide range, direction and identification for the homing of planes equipped with search radars, 10 cm band.

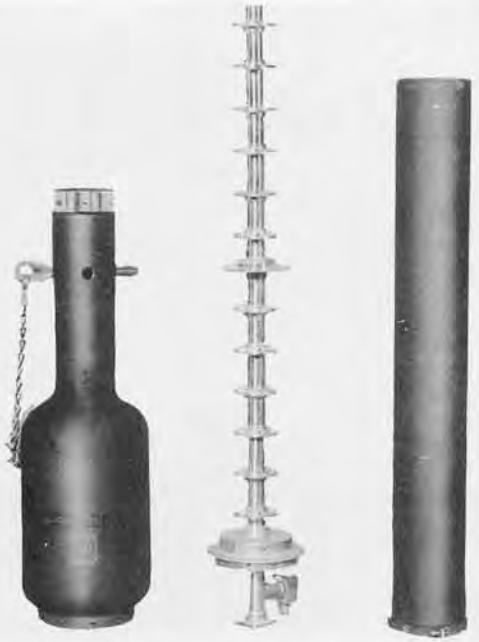
When attempting to home on this equipment, the aircraft equipped with airborne search equipment switches from radar "search" to "beacon" position. The signals from the aircraft, when received at the beacon, actuate the beacon transmitter, causing a group of coded pulse signals to be generated and transmitted to the aircraft where they appear as echoes on the indicator of the radar equipment. The distinctive keying or pulse grouping of the beacon signals identifies the beacon to the homing aircraft.

Performance, in general, has been good, and these beacons are in operational field and training use. In the British Isles, the beacons are operated in pairs, one automatically being put into operation by the failure of the other. An over interrogation gate and local interference eliminator have been incorporated in the system.

This equipment uses separate receiving and transmitting antennas; each a linear array of six elements of three horizontal dipoles, curved and equally spaced about a point.

It is expected that Radio Set AN/CPN-3 will be replaced by Radio Set AN/CPN-8.

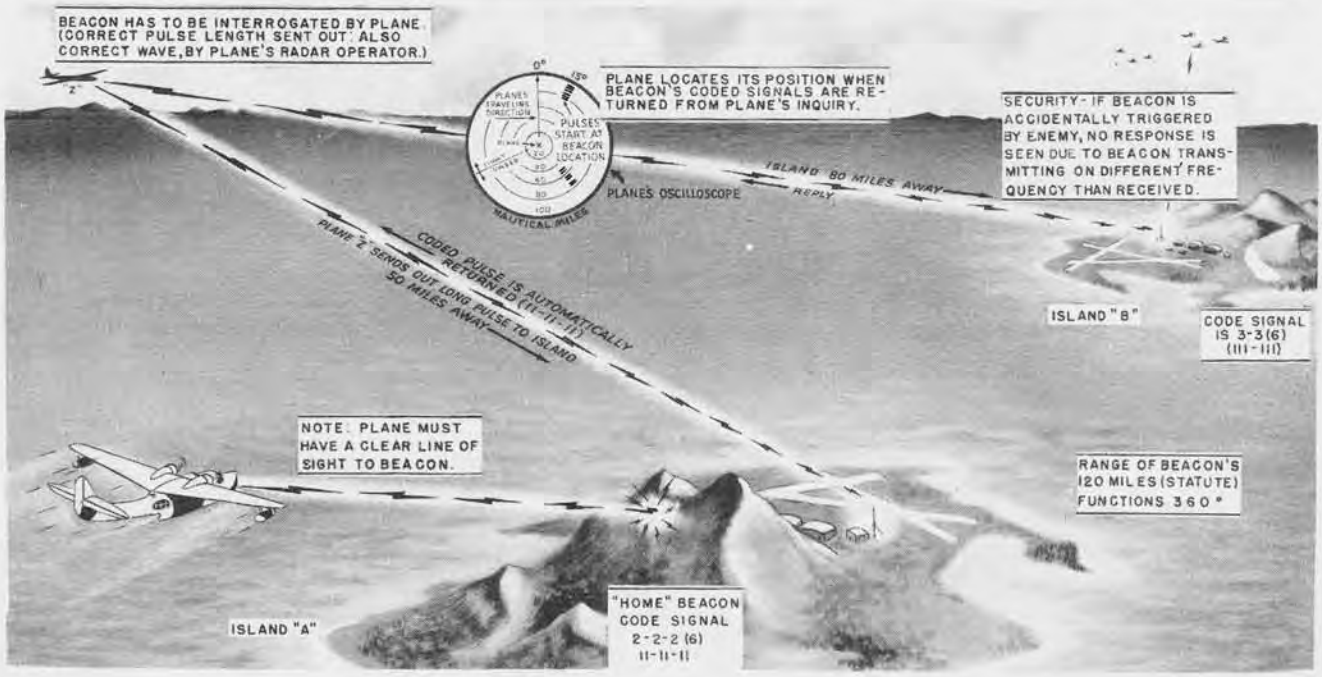
Test equipment required in the maintenance and tuning of this equipment includes Voltmeter IS-189, Test Set TS-14/AP, Synchroscope TS-28/APN, Phantom Antenna and Attenuator TS-74/UPM, Voltage Divider TS-89/AP, Wavemeter TS-111/CP.



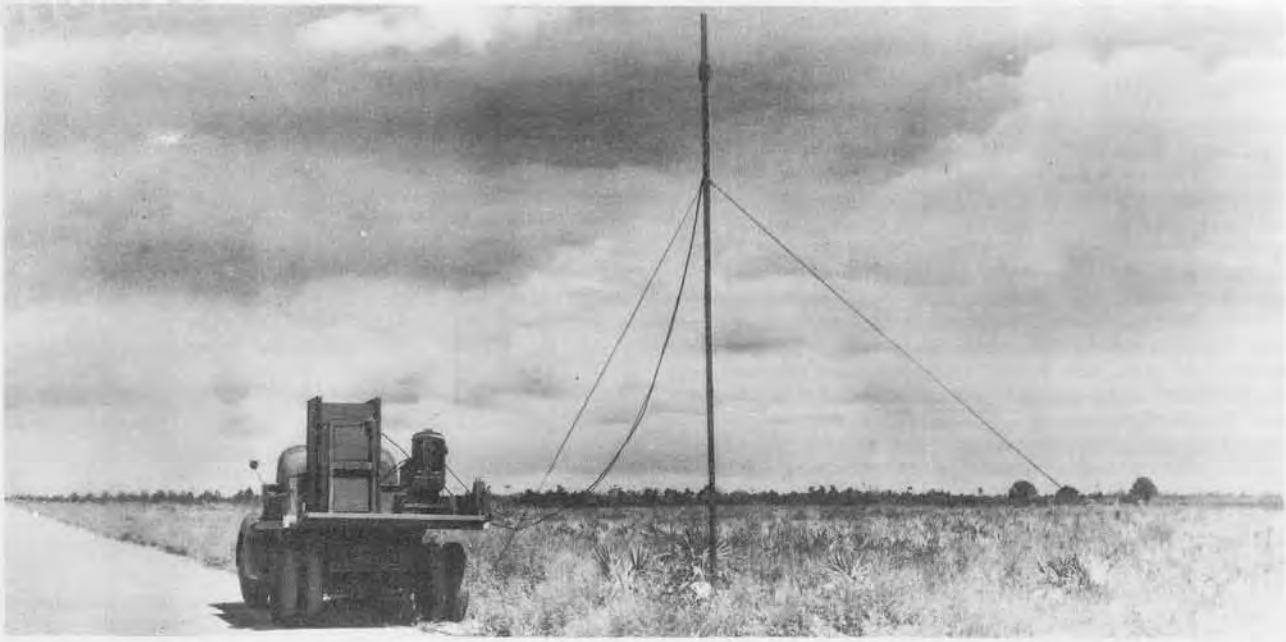
Mast Head AS-9/CPN-3

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	417A	1	VR-150-30
3	5U4G	1	2AP1
2	5Y3GT	1	6X5GT
8	6AC7	1	2J37
1	6H6	2	304TH
3	6L6G	1	829
4	6SJ7GT	2	1616
17	6SN7GT	2	8020
1	6Y6G	2	VR-90-30
1	VR-105-30	2	6AG7

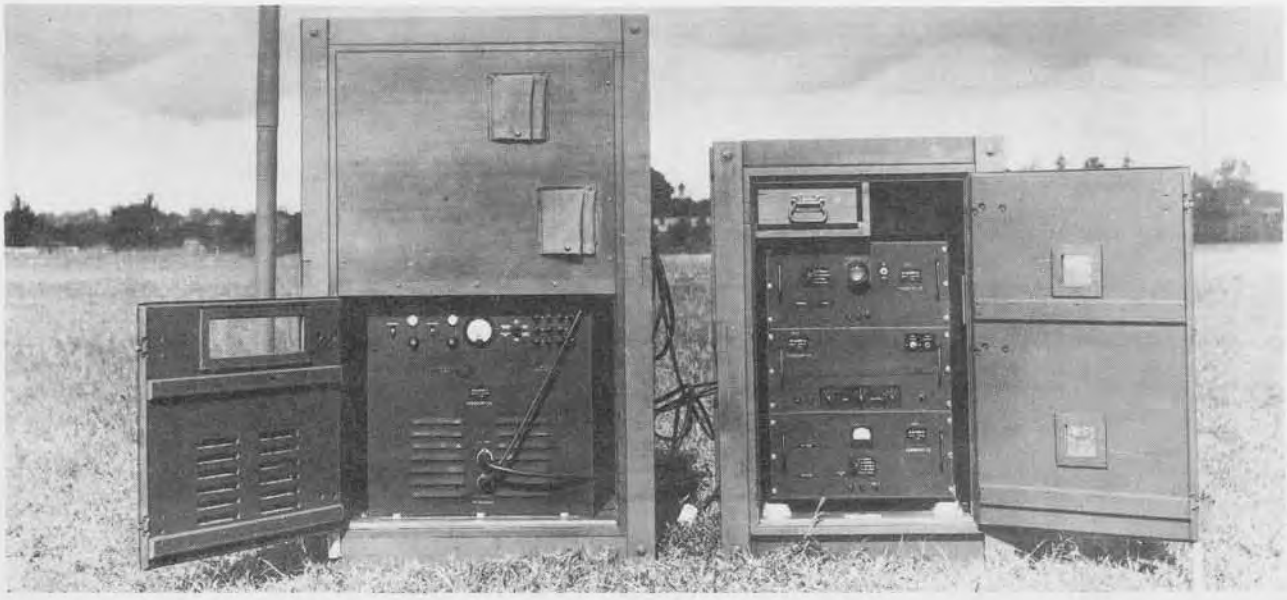
POWER INPUT	1.7 KW @ 115 VOLTS
POWER OUTPUT	10 KW (PEAK)
FREQUENCY	TRANS. 3256 MC. REC. 3267 - 3333 MC
TYPE OF SIGNAL	CODED PULSE
TYPE OF PRESENTATION	RANGE CODED DISPLAY ON RADAR SCREEN
DATA SUPPLIED (TO AIRBORNE SET)	BEACON IDENTIFICATION, RANGE AND AZIMUTH FROM BEACON
MAXIMUM RANGE	LINE OF SIGHT TO 100 MI.
PULSE LENGTH	0.5 MICROSECONDS



Radio Set AN/CPN-3 is an air transportable radar beacon designed to provide range, direction and identification for the homing of 10 cm band ASV radar equipped aircraft.



Radio Set AN/CPN-3 in rear of truck.



Radio Set AN/CPN-3 front view, doors of housings open.

RADIO SET AN/CPN-3 TOTAL WEIGHT 1400 LBS.

Component	Nomenclature	Size	Weight
Radio Receiver	R-11/CPN-3	8" x 18" x 13"	53 Lbs.
Coder	KY-1/CPN-3	8" x 19" x 13"	40 Lbs.
Monitor	ID-13/CPN-3	8" x 19" x 13"	27 Lbs.
Radio Transmitter	T-8/CPN-3		
Power Supply	PP-8/CPN-3		
Mast Head	AS-9/CPN-3	43" x 4" diam.	
Antenna Support	AB-2/CPN-3 includes Mast Head 20' High		127 Lbs.

and includes plugs cable adapters etc.

Radio Set AN/CPN-6, an air transportable coded beacon for ground installation, provides range, direction and identification for the guidance of aircraft and is similar to Radio Set AN/CPN-3 but operates on a higher frequency.

This equipment is a homing beacon which, when used in conjunction with suitable airborne radar interrogator-responsor equipment, will aid aircraft in navigating to a designated spot on the ground.

When attempting to home on this beacon an aircraft equipped with airborne interrogation equipment flies toward the beacon with the interrogator operating. Signals from the aircraft, when received at the beacon actuate the beacon transmitter, causing a coded group of pulse signals to be generated which are transmitted to the aircraft, where they appear as echoes on the indicator of the interrogator-responsor equipment. The distinctive keying or pulse grouping of the beacon signals identifies the beacon to the homing aircraft. The discriminator accepts 2 to 5 microseconds interrogating pulses, rejecting pulses shorter than 2 microseconds or longer than 5 microseconds. A selection of 56 codes are available in each transmitter.

This equipment has a linear array of slotted wave guide elements, 12 for the receiver and 12 for the transmitter. The pattern is uniform in azimuth, 3 db down at 5 degrees above or below the horizontal. There is a special two-element broad beam antenna for shipboard installation.

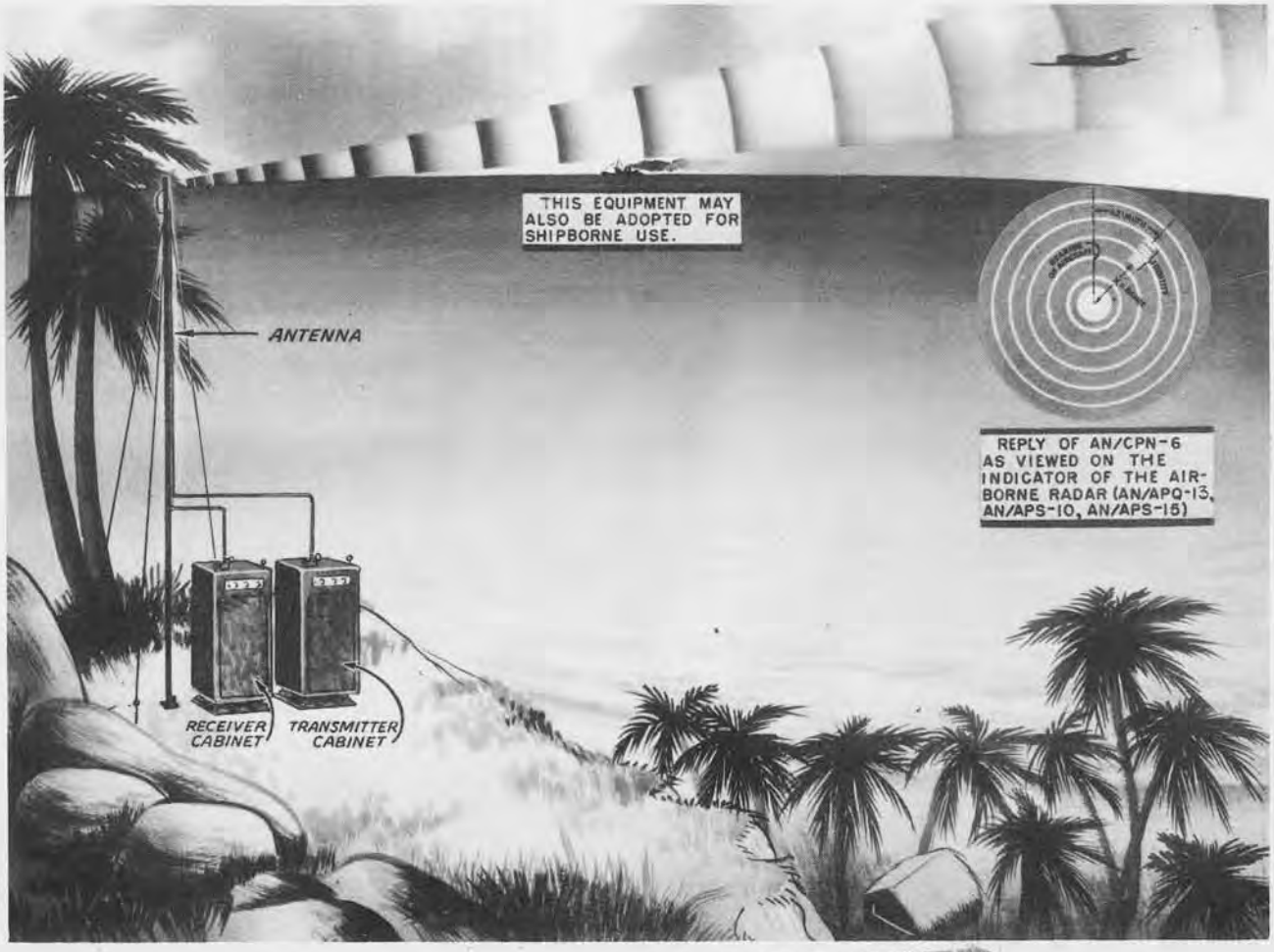
Power is obtained from a 115/230 volt, 50-70 cps source with a power consumption of 2 kilowatts and a peak power output of 25 to 50 kilowatts. Maximum range of the equipment is 100 miles.

Test equipment required for the maintenance of Radio Set AN/CPN-6 includes Detector Amplifier Assembly AN/UPA-1, Voltmeter IS-189, Synchroscope TS-28/UPM, Voltage Divider TS-89/AP, Radio Frequency Test Load TS-108/AP, Test Set TS-120/UP.

AAF requirements as of 1 February 1945 were 240 for the calendar year 1945 and 60 for 1946.

POWER INPUT	2 KW @ 115/230 VOLTS 50-70 CPS
POWER OUTPUT	25-50 KW (PEAK)
FREQUENCY	TRANSMITTER 9310 MC; RECEIVER 9320-9430 MC
TYPE OF SIGNAL	RANGE CODED
RECEIVER SENSITIVITY	0.0004 MICROWATTS
RANGE	100 MILES
PULSE LENGTH	1/2 MICROSECOND

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	723B	5	OD3/VR-150
14	6AC7	1	6AG7
7	6SN7GT	1	815
7	6SL7GT	2	5D21
6	5R4GY	1	2J48
3	6B4G	2	705A
2	6SJ7GT	2	IN23
1	OC3/VR-105		



Radio Set AN/CPN-6 installed as ground station for homing identification and guidance of aircraft.

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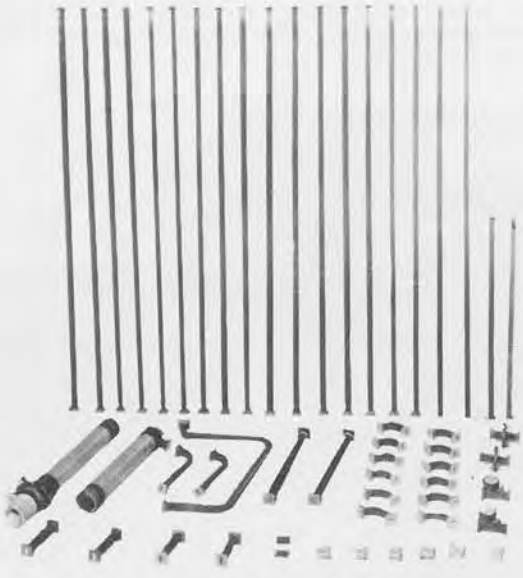
Receiver Cabinet

Transmitter Cabinet

Antenna Mast Assembly (AB-42/CPN-6)



Antenna Assembly (AS-119/CPN-6)

RADIO SET AN/CPN-6

TOTAL WEIGHT 1800 LBS.

Nomenclature	Component	Size	Weight
Antenna Assembly	AS-119/CPN-6		177 Lbs.
Antenna Mast Assembly	AB-42/CPN-6	20" x 4" dia.	193 Lbs.
Transmitter-Modulator	T-79/CPN-6	17" x 15" x 20"	115 Lbs.
Radar Receiver	R-88/CPN-6	11" x 16" x 20"	45 Lbs.
Coder	KY-6/CPN-6	11" x 16" x 20"	57 Lbs.
Modulator Driver	AM-44/CPN-6	11" x 16" x 20"	74 Lbs.
Discriminator	F-12/CPN-6		45 Lbs.
Transmitter Power Supply	PP-93/CPN-6	18" x 17" x 12"	143 Lbs.
Auto Transformer	MX-202/CPN-6	12" x 8" x 10"	66 Lbs.
Receiver Cabinet	CY-170/CPN-6	18" x 50" x 24"	265 Lbs.
Transmitter Cabinet	CY-169/CPN-6	18" x 50" x 24"	265 Lbs.

and includes set of connecting and interconneting cords and test accessories kit.

Radio Set AN/CPN - 7, sometimes known as "BABS", is a modification of the airborne IFF Radio Set SCR-695 to form a ground, air-transportable, radar beacon transponder to provide a means of landing aircraft equipped with Radio Set SCR-729 or Radio Set AN/APN-2 under conditions of poor visibility and low ceiling. Use of the equipment will permit approaches in line with and to within one mile of the runway and to an altitude of 200 feet, the actual landing being conducted visually.

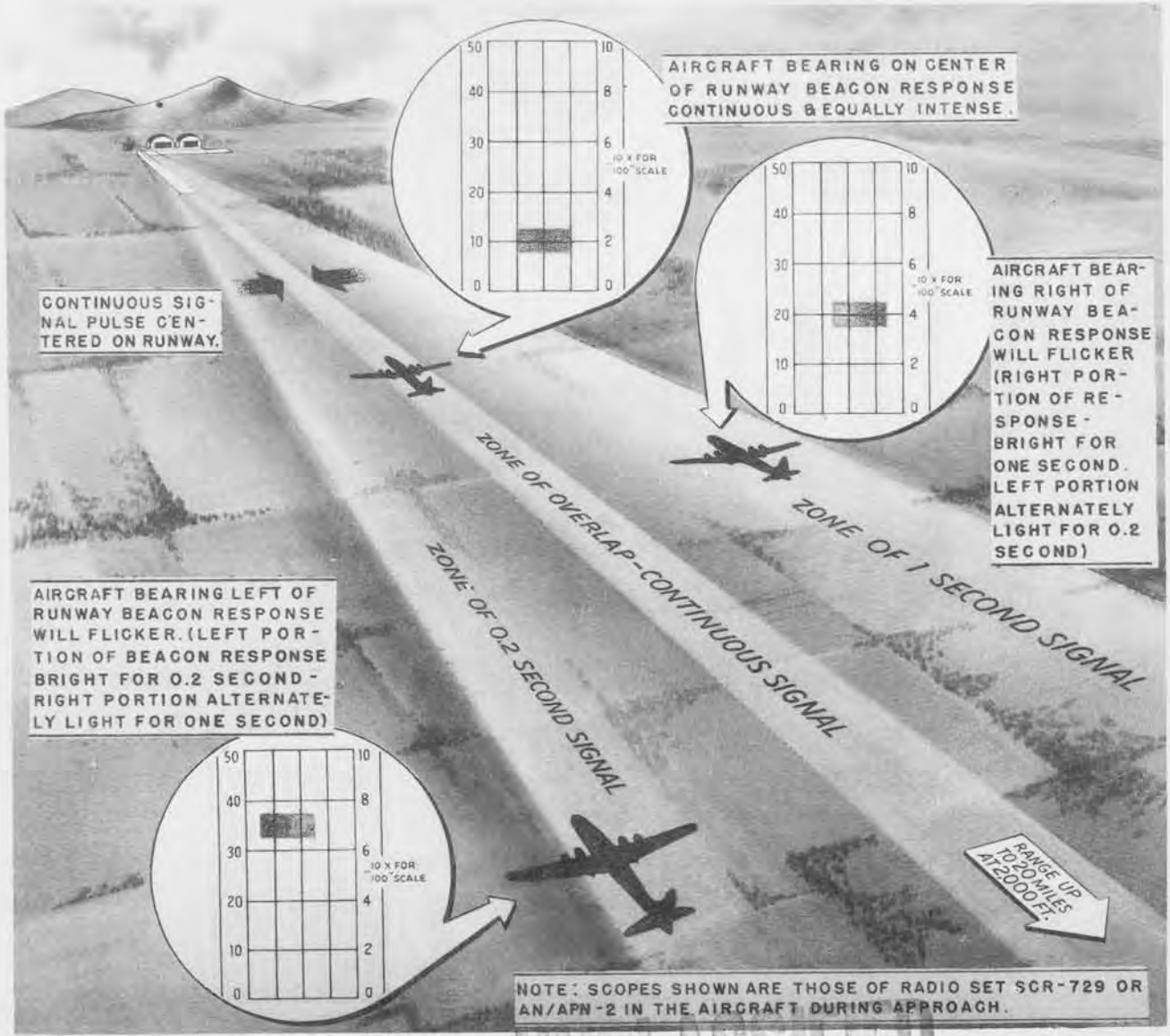
When interrogated by an interrogator-responsor such as SCR-729, the BABS beacon transmits a beam slightly off the right of the runway (as viewed from the approaching aircraft) for approximately 1 second, and then another to the left of the runway for about 0.2 seconds. When exactly on the runway, the approaching aircraft is in a field of constant signal strength and receives a signal of unchanging amplitude, this manifesting itself as a steady signal (without flicker) on the airborne indicator. If the airplane is to the right or to the left of the runway, the amplitude of the signal will be different and an amplitude flicker will be observed on the right or left of the indicator corresponding to the side of the runway that the airplane may be approaching.

This equipment requires a 110 volts 60 cycle power source.

Test equipment used in the maintenance of this equipment includes Test Equipment IE-46.

POWER INPUT	95-160 WATTS, 110 V, 60 CPS
POWER OUTPUT	10 WATTS
FREQUENCY	RECEIVER 171-181 MC. TRANSMITTER 168.5 - 178.5 MC.
TYPE OF SIGNAL	PULSE
RANGE	20 MI. AT 2000 FT.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	5U4G	3	6H6
3	7193	6	6SH7



Radio Set AN/CPN-7 (BABS) is air transportable radar beacon transponder which provides means of landing aircraft equipped with Radio Set SCR-729 or Radio Set AN/APN-2

AN/CPN-7

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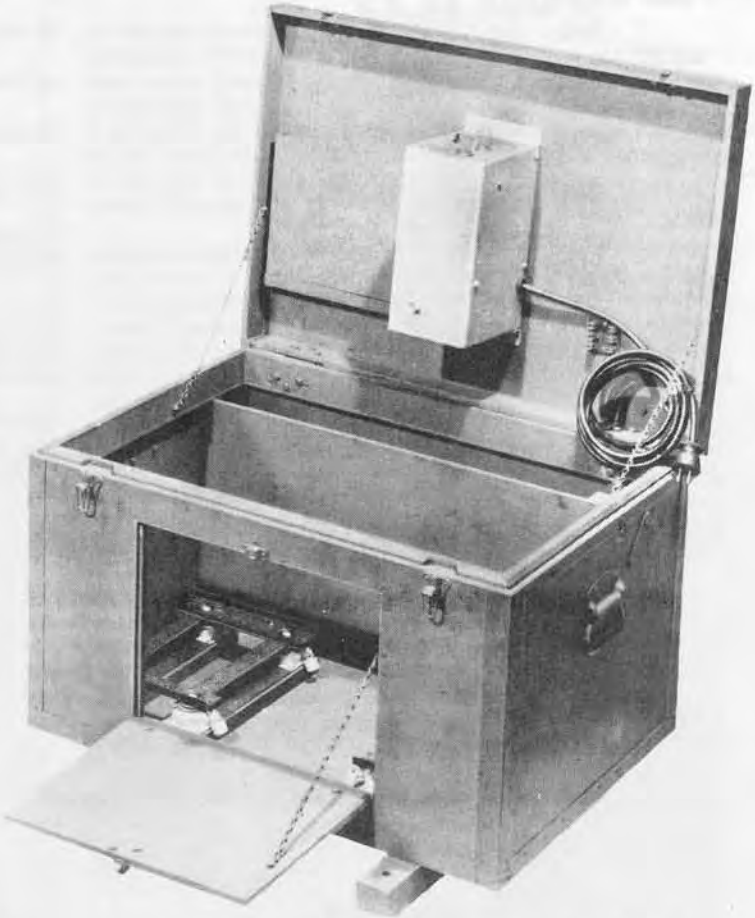
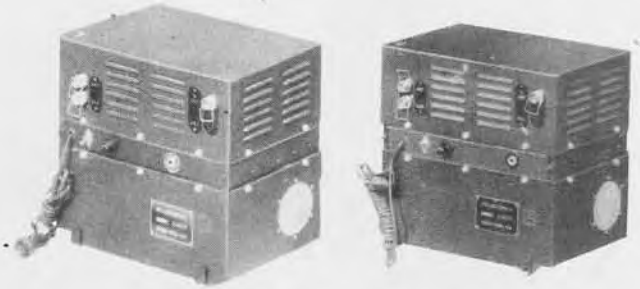
Case CY-47/CPN-7 with Power Unit, Onan Model 358RS



Case CY-46/CPN-7 with Mountings FT-247-F and Switching Assembly SA-10/CPN-7

Antenna AT-31/CPN-7

Antenna Mast AB-3/TPN-1



Receivers-Transmitters RT-29/CPN-7

RADIO SET AN/CPN-7

TOTAL WEIGHT 200 LBS.

Component	Nomenclature	Size	Weight
Case	CY-46/CPN-7	28'' x 20'' x 18''	45 Lbs.
Receiver-Transmitter	RT-29/CPN-7	13'' x 14'' x 10''	40 Lbs.
Switching Assembly	SA-10/CPN-7	8'' x 3'' x 13''	11 Lbs.
Antenna	AT-31/CPN-7	Length 18''	
Antenna Mast	AB-3/TPN-1	Length 20' Diam. 2''	7 Lbs.
Case	CY-47/CPN-7	28'' x 20'' x 18''	45 Lbs
Onan Power Plant	#358RS		
Antenna System	AS-48/CPN-7	8'' x 8'' x 11'' Height 27''	
Mounting	FT-242-F		

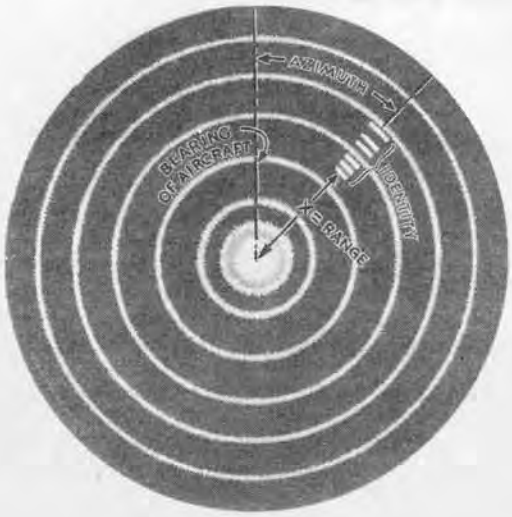
Radio Set AN/CPN-8, an air transportable coded beacon for ground installations is similar to Radio Set AN/CPN-3 except that AN/CPN-8 is much smaller. Designed to respond to 10 cm band radar sets having provision for beacon interrogation, provides range, direction and identification for the guidance of planes.

When attempting to home on this beacon, an aircraft equipped with airborne interrogation equipment flies towards the beacon with the interrogator operating. The signals from the aircraft, when received at the beacon actuate the beacon transmitter, causing a group of coded pulse signals to be generated and transmitted to the aircraft where they appear as echoes on the indicator of the interrogator-responser equipment. The distinctive keying or pulse grouping of the beacon signals identifies the beacon to the homing aircraft. The discriminator rejects pulses shorter than 2 micro-seconds or longer than 4 micro-seconds. Coding is provided by means of 6 code pips, making 50 codes possible.

The antenna consists of a linear array of vertically stacked triple dipoles, 14 in transmitting and 14 in receiving antennas. It is omnidirectional in azimuth with 7 degree vertical half power beam width, mounted on a mast so that total height is 25 feet. Usual polarization is horizontal but vertically polarized antennas are available.

Radio Set AN/CPN-8 transmits coded pulses on 3256 mc. and receives in the frequency range of 3267 to 3333 mc. The equipment operates on 100-130 volts or 200-260 volts, 50-70 cycles. An input of 1300 watts produces a peak power output of 2.25 kw or more. The maximum range of the equipment is more than 100 miles.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	5R4GY	3	3B24
11	6AC7	4	6X5GT/G
3	6AG7	1	715B
2	6B4G	2	807
1	6SJ7	2	OD3/VR-150
7	6SL7GT	1	5CP1
10	6SN7GT	2	2X2
3	OC3/VR-105	2	6H6
1	2J38	1	446B or 2C40



Airborne Equipment Records Beacon Range (distance from center of scope to first pip), azimuth (position on scope), and identity (number & arrangement of pips)

Test equipment required for the maintenance of Radio Set AN/CPN-8 includes: Wavemeter TS-111/CP, Voltage Divider TS-89/AP, Phantom Antenna and Attenuator TS-74/UPM, Antenna Dipole Assy. AS-23/AP, Power Meter TS-125/AP, and Voltmeter IS-189.

Army Air Forces requirements as of 1 February were 338 for the calendar year 1945 and 40 for 1946.

POWER INPUT	1.3 KW @ 100-130 OR 200-260 VOLTS
POWER OUTPUT	2.25 KW (PEAK)
FREQUENCY	TRANSMITTER 3256 MC RECEIVER 3267-3333 MC
TYPE OF SIGNAL	CODED PULSE
RANGE	100 MILES
PULSE LENGTH	.5 MICRO SECONDS

Radio Set AN/CPN - 8 is an Air Transportable Radar Beacon designed to provide range, direction, and identification for homing 10 cm band radar equipped aircraft.

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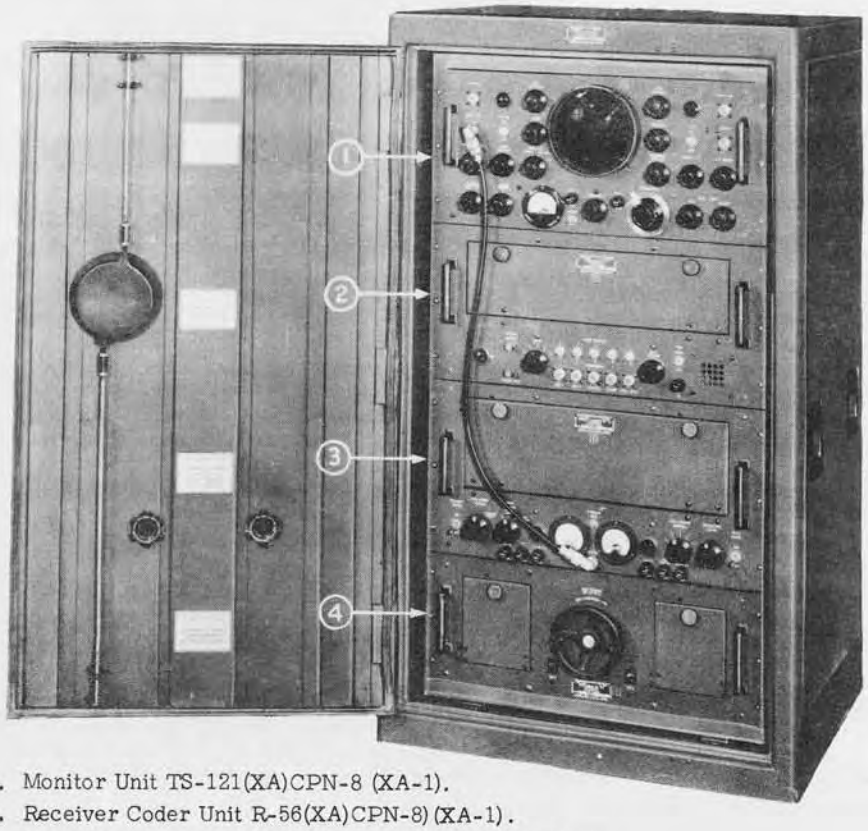


1. Monitor Unit TS-121(XA)CPN-8 (XA-1).
2. Receiver Coder Unit R-56(XA)CPN-8)(XA-1).
3. Modulator & Transmitter Unit T-50(XA)CPN-8 (XA-1)
4. Voltage Control Unit CN-11(XA) CPN-8 (XA-1)

RADIO SET AN/CPN-8

TOTAL WEIGHT 1900 LBS.

Component	Nomenclature	Size	Weight
Receiver Coder Unit	R-56/CPN-8	10" x 17" x 22"	73 Lbs.
Transmitter and Modulator	T-50/CPN-8	11" x 17 ' x 22"	110 Lbs.
Voltage Control Unit	CN-11/CPN-8	8" x 17" x 22"	64 Lbs.
Monitor Unit	TS-121/CPN-8	10" x 17" x 22"	90 Lbs.
Mast Head	AS-72/CPN-8	5" x 4" dia.	25 Lbs.
Mast Head	AS-80/CPN-8	6" x 5" dia.	30 Lbs.
Case	CY-68/CPN-8	23" x 27" x 46"	188 Lbs.
Antenna Support	AB-18/CPN-8	20' x 4" dia.	90 Lbs.
Case	CY-166/CPN-8	15" x 17" x 68"	110 Lbs
Case (2 Operating spares)	CY-248/CPN-8	32" x 26" x 20"	450 Lbs.
Transmission Line	CG-172/CPN-8	44' long	25 Lbs.
Transmission Line	CG-173/CPN-8	48' long	25 Lbs.
Cord	CG-119/U		

and includes connecting and interconnecting cords

Radar Sets AN/CPN-11 and AN/CPN-12 comprise an air-transportable ground Loran chain which provides a signal for position "fixing" by aircraft equipped with Radar Set AN/APN-4 or Radar Set AN/APN-9. In operation, two AN/CPN-11's are used as "slave" stations and are triggered by the double master station AN/CPN-12.

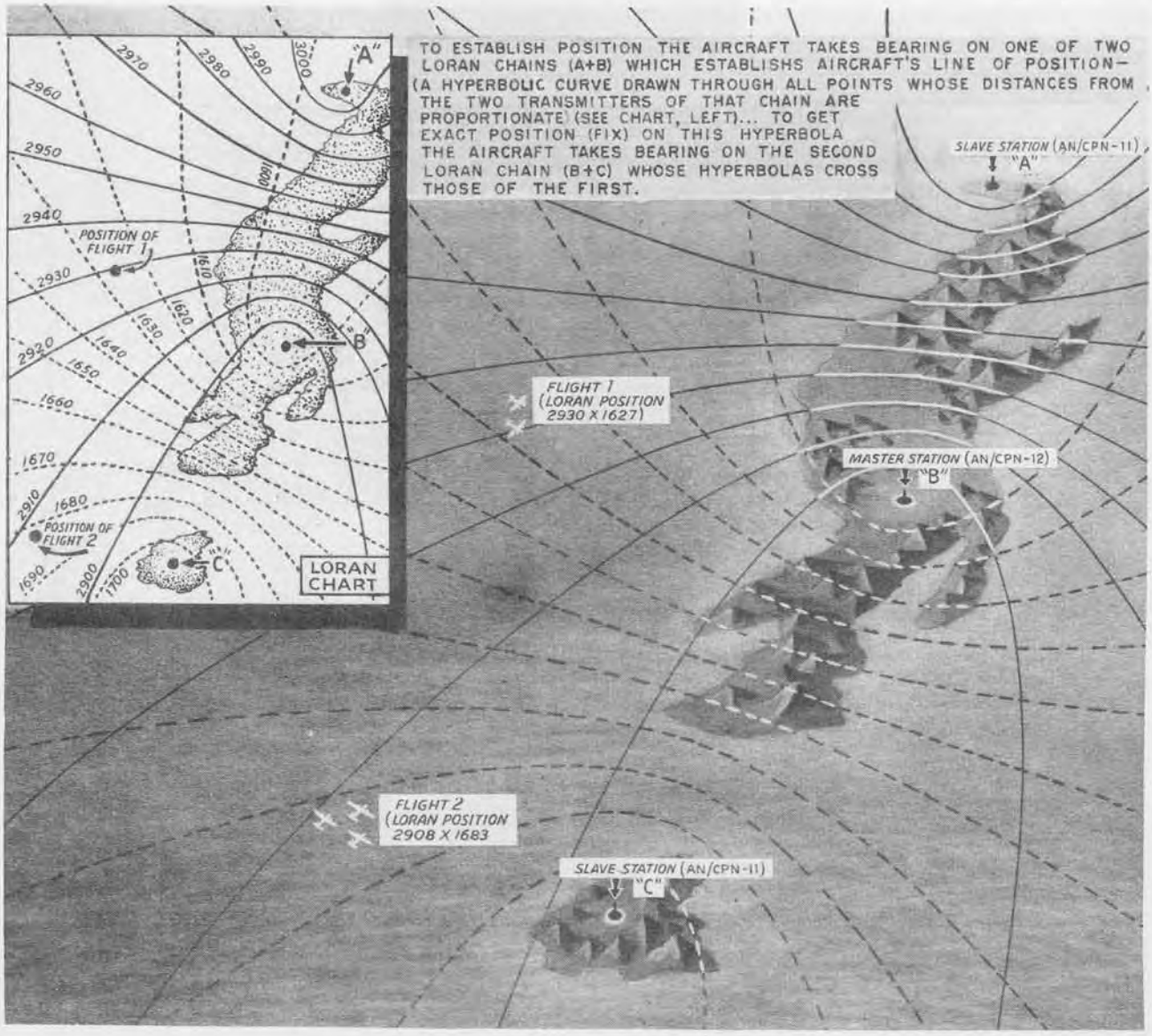
This is lightweight equipment intended for use in operations where time will not permit the installation of heavier conventional fixed or mobile Loran equipment, and in other installations where the latter equipment is considered impracticable for other reasons.

The standard airborne Loran receiving equipment AN/APN-4 is used as the basic timing device. Each station includes 100 percent spare components with 200 percent spare power supply components. Equipment is designed for continuous 24 hours per day operation for at least three months. Components are interchangeable in AN/CPN-11 and AN/CPN-12.

Test equipment required for the operation and maintenance of AN/CPN-11 includes General Radio Wave Meter (566A), Simpson Test Meter (IS-189), Oscilloscope 3" Dumont 224A, Signal Generator I-72, and Hickok Model 110.

POWER INPUT	115 VOLTS, 400 CYCLES
POWER OUTPUT	25 KW. (PEAK)
FREQUENCY	1700 - 2000 KC.
TYPE OF SIGNAL	PULSE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	5D21	18	6H6GT
2	807	20	6SL7GT
6	3B24	2	2050
50	6SN7GT	2	5CP1
6	5U4G	2	6V6GT
4	OC3/VR-105	4	2X2
10	6B4G	2	6SA7/GT
4	6SJ7GT	8	6SK7GT/G
12	6AC7		



Radar Sets AN/CPN-11 and AN/CPN-12 constitute an air transportable ground Loran chain which provides properly equipped aircraft with means whereby they may obtain a fix of position at any time within the range of 200 miles by day and 400 miles at night.

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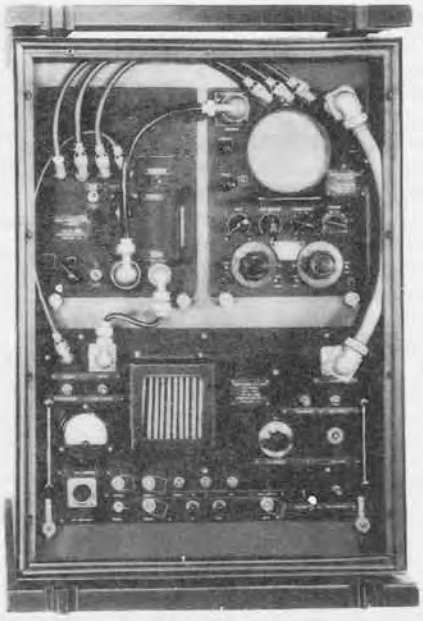
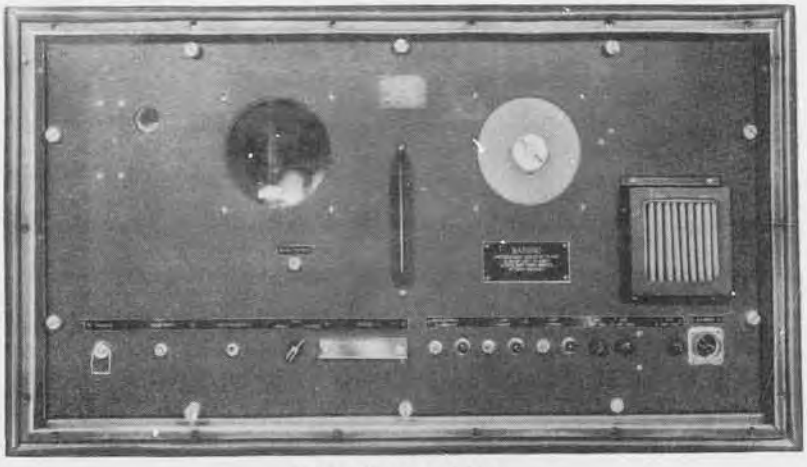


Timer Cabinet



Radar Transmitter

RADAR SETS AN/CPN-11

TOTAL WEIGHT 13,000 LBS.

Component	Nomenclature	Size	Weight
Antenna Assembly	AS-130/CPN		
Ground Kit	MX-209/CPN		600 Lbs.
Case	CY-173/CPN (2 each)	29" x 21" x 24"	
Radar Transmitter	T-82/CPN-(2 each)	24" x 24" x 40"	101 Lbs.
Synchronizer	SN-16/CPN (2 each)	10" x 24" x 29"	50 Lbs.
Case	CY-187/CPN (2 each)	30" x 30" x 18"	62 Lbs.
Antenna Mast	AB-46/C (4 each)	Length 60'	750 Lbs.
Power Unit	PU-6/TPS-1 (4 each)	20" x 20" x 30"	225 Lbs.
Indicator	ID-102/CPN (2 each)	9" x 12" x 20"	32 Lbs.
Junction Box	J-111/CPN (2 each)	2" x 3" x 15"	5 Lbs.
Junction Box	J-110/CPN (3 each)	2" x 3" x 15"	5 Lbs.
Timer Cabinet Assembly	CY-249/CPN (2 each)	21" x 24" x 29"	58 Lbs.
Antenna Coupling Unit	CU-76/CPN (2 each)	10" x 15" x 20"	30 Lbs.
Antenna Coupling Unit	CU-77/CPN (2 each)	6" x 6" x 6"	3 Lbs.
Radar Receiver	R-133/CPN (2 each)	9" x 12" x 20"	25 Lbs.

and includes tent, shelter assembly, set of interconnecting cables and fittings including r-f transmission lines and tool equipment set

Radar Sets AN/CPN-12 and AN/CPN-11 comprise an air-transportable ground Loran chain which provides a signal for position "fixing" by aircraft equipped with Radar Set AN/APN-4 or Radar Set AN/APN-9. In operation, two AN/CPN-11's are used as "slave" stations and are triggered by the double master station AN/CPN-12.

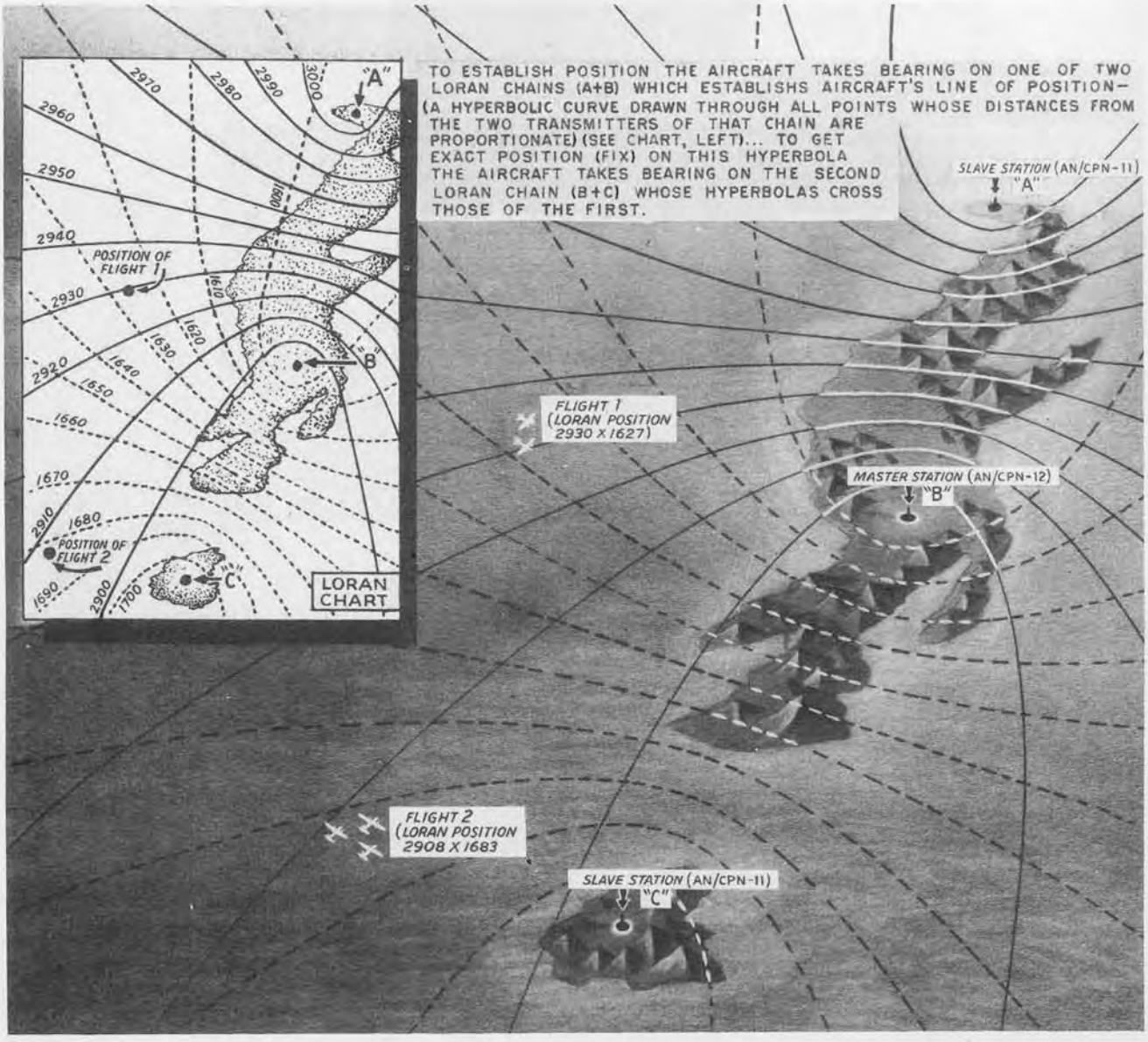
This lightweight equipment is intended for use in operations where time will not permit the installation of heavier conventional fixed or mobile Loran equipment, and in other installations where the latter equipment is considered impracticable for other reasons.

The standard airborne Loran receiving equipment AN/APN-4 is used as the basic timing device. Each station includes 100 percent spare components with 200 percent spare power supply components. Equipment is designed for continuous 24 hours per day operation for at least three months. Components are interchangeable in AN/CPN-11 and AN/CPN-12.

Test equipment required for the operation and maintenance of AN/CPN-12 includes General Radio Wave Meter (566A), Simpson Test Meter (IS-189), Oscilloscope 3" Dumont 224A, Signal Generator I-72, and Hickok Model 110.

POWER INPUT	115 VOLTS, 400 CYCLES
POWER OUTPUT	25 KW. (PEAK)
FREQUENCY	1700 to 2000 KC
TYPE OF SIGNAL	PULSE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
2	5D21	20	6B4G
2	807	8	6SJ7
6	3B24	4	2050
96	6SN7GT	2	6V6GT/G
10	5U4G	4	5CP1
8	OC-3/VR-105	16	6SK7GT/G
24	6AC7	4	6SA7GT/G
36	6H6GT/G	8	2X2
40	6SL7GT		



Radar Set AN/CPN-12 and AN/CPN-11 constitute an air transportable ground Loran chain which provides properly equipped aircraft with means whereby they may obtain a fix of position at any time within the range of 200 miles by day and 400 miles at night.

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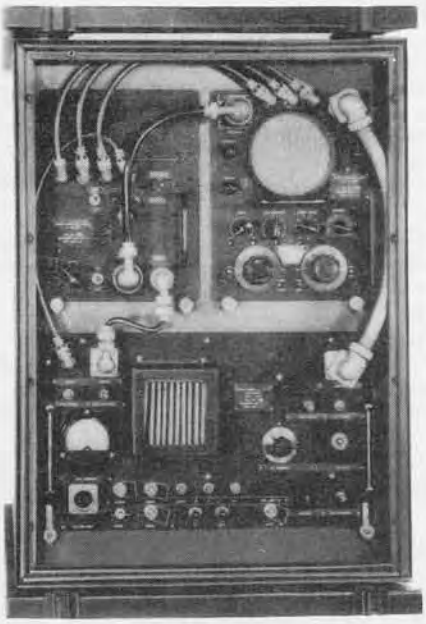
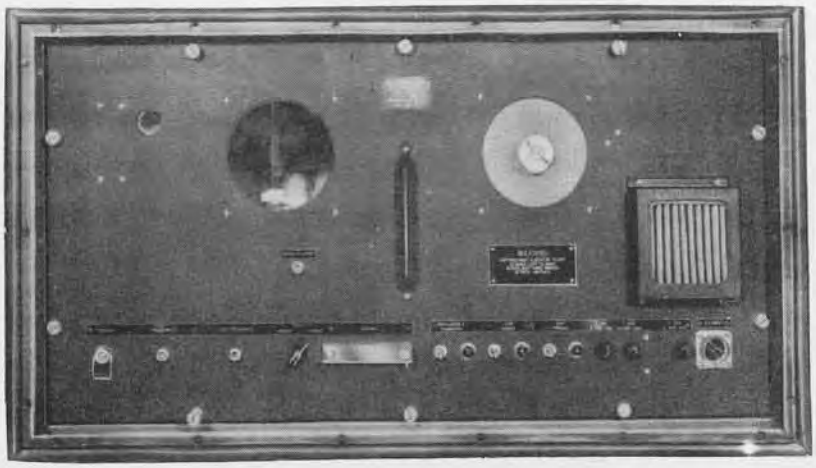


Timer Cabinet



Radar Transmitter

RADAR SET AN/CPN-12

TOTAL WEIGHT 18 000 LBS.

Component	Nomenclature	Size	Weight
Radar Transmitter	T-82/CPN (2 each)	24" x 24" x 40"	101 Lbs.
Synchronizer	SN-16/CPN (4 each)	10" x 24" x 29"	50 Lbs.
Case	CY-187/CPN (2 each)	30" x 30" x 18"	62 Lbs.
Antenna Mast	AB-46/C (4 each)	60' long	750 Lbs.
Power Unit	PU-6/TPS-1 (4 each	20" x 20" x 30"	225 Lbs.
Case	CY-173/CPN (4 each)	29" x 21" x 24"	
Antenna Assembly	AS-130/CPN		
Indicator	ID-102/CPN (4 each)	9" x 12" x 20"	345 Lbs.
Ground Kit	MX-209/CPN		600 Lbs.
Junction Box	J-111/CPN (2 each)	2" x 3" x 15"	5 Lbs.
Junction Box	J-110/CPN (2 each)	2" x 3" x 15"	5 Lbs.
Timer Cabinet Assembly	CY-249/CPN (4 each)	21" x 24" x 29"	20 Lbs.
Junction Box	J-112/CPN (3 each)	2" x 15"	5 Lbs.
Antenna Coupling Unit	CU-76/CPN (2 each)	10" x 15" x 20"	30 Lbs.
Antenna Coupling Unit	CU-77/CPN (2 each)	6" x 6" x 6"	3 Lbs.
Radar Receiver	R-133/CPN (4 each)	9" x 12" x 20"	25 Lbs.

and includes set of interconnecting cables and fittings including r-f transmission line.

AN/CPN-16

(AND AN/CPN-16X)

Radar Beacons AN/CPN-16 and AN/CPN-16X are lightweight, air transportable sea rescue transponders designed to facilitate the location of life rafts by radar equipped searching aircraft. AN/CPN-16 is designed for multiplace rafts while AN/CPN-16X is designed for single-place-raft installation. It operates in conjunction with and provides range and azimuth information to such radars as SCR-521-A, SCR-729-A and AN/APN-12. No special skill is required for the operation of the unit.

In operation this equipment may be automatically interrogated by a searching aircraft, or it may be operated in morse code fashion by the life raft occupant. A monitoring circuit is provided whereby the pilot may search for aircraft in his vacinity and monitor the units transponder action. A continuous operating life of at least 30 hours is expected under most conditions.

The collapsible antenna mast is approximately 59 inches high when extended and is vertically polorized. It is so constructed that it mounts into the life raft socket normally provided for a corner reflector target.

Although the pulse transmitted by AN/CPN-16 is four miles long an experienced scope operator encounters very little difficulty in tracking to a point directly over the raft. The expected range for this beacon is 50 miles against the above radars.

This unit is similar to AN/CPT-2 in application only. It will eventually replace it.

Test Equipment IE-45 is used for the maintenance of AN/CPN-16 and AN/CPN-16X.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	455A	1	1D8GT

Sea Rescue Beacon Transmitter AN/CPN-16, 16X for use in one-man life rafts.

POWER INPUT	"A" BATTERY; 1.5 VOLTS 200 MA "B" BATTERY; 135 VOLTS
POWER OUTPUT	0.5 WATTS (PEAK)
FREQUENCY	176 MCS.
TYPE OF SIGNAL	PULSE
RANGE	50 MILES
PULSE LENGTH	10 MICROSECONDS (APPROX.)

Components of Radar Beacon AN/CPN-16

RADAR BEACON AN/CPN-16

TOTAL WEIGHT 6 LBS.

Component	Nomenclature	Size	Weight
Receiver Transmitter	RT-103(XA)CPN	2" x 3" x 15"	1 Lb.
Battery Case	CY-439(XA-3)/CPN-16(XA-2)	10" x 5" x 3"	5 Lbs.

RADAR BEACON AN/CPN-16X

TOTAL WEIGHT 5 LBS.

Component	Nomenclature	Size	Weight
Receiver Transmitter	RT-103(XA)CPN	2" x 3" x 15"	1 Lb.
Battery Case	CY-440(XA-1)/CPN-16(XA-1)	10" x 5" x 2"	4 Lbs.

AN/CPT-2

Radar Set AN/CPT-2 is a lightweight, air transportable, sea rescue beacon intended for use by a fighter pilot forced down on over-water flight. Used in one-man life rafts, this set enables searching aircraft, equipped with radar sets such as SCR-521, SCR-729 and AN/APA-12, to locate the raft. No special skill is required for operation.

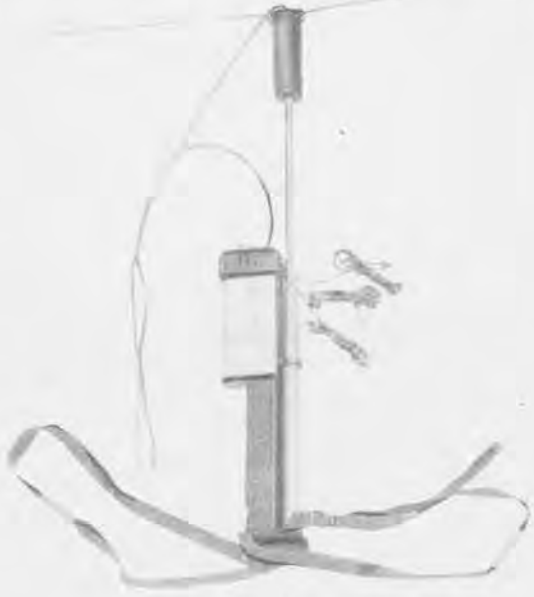
The above oscilloscope pattern illustrates how a typical signal from AN/CPT-2 will appear on the radar receiver-indicator located in the searching aircraft.

An improved higher-powered version of this sea rescue beacon for single or multiplace rafts is now under development. It will operate on the crossband principle and contain such additional features as monitoring facilities and coded output signals. See AN/CPN-16 for further information.

AN/CPT-2 will transmit continuously at 176 mc. with a range of approximately 12 to 18 miles, permitting direction finding (DF) bearings to be taken on the equipment. Range of the aircraft from the beacon cannot be determined directly although a rough idea of range is indicated by the signal intensity.

Frequency stability is achieved by careful construction of the transmitter circuits and by choosing the batteries so the plate voltage does not vary appreciably during the life of the beacon. Pulse rate is 45 kc, plus or minus 5 kc. Frequency is adjustable from 166 to 186 mcs.

Continuous operating life of the beacon is at least 30 hours at normal temperatures, decreasing to about 12 hours at zero temperature.



Radar Set AN/CPT-2 (XA-3)

Radio Set AN/CPT-2 is installed in life raft after being forced down and operates automatically.

After the signal is picked up, the searching aircraft is turned to give equal strength on both sides of the screen. A sudden decrease in signal strength indicates passing directly over the raft.

Power source for Radar Set AN/CPT-2 is two 1-1/2 volt "A" batteries and one 93-1/2 volt "B" battery.

This set is similar in purpose to the British T-3180 (Walter) but is improved mechanically and is designed for American production techniques.

Test equipment required for use in maintenance and operation of the equipment includes Test Equipment IE-56-A and Signal Generator BC-906-C or D.

AAF requirements as of 1 February 1945 were 5,000 for the calendar year 1945.

POWER SOURCE	BATTERY
POWER OUTPUT	100 MILLI WATTS
FREQUENCY	176 MC
TYPE OF SIGNAL	PULSE
ANTENNA	2 QUARTER-WAVE DIPOLES
RANGE	12-18 MILES

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	3A5		

RADAR SET AN/CPT-2

TOTAL WEIGHT 4 LBS.

Component	Nomenclature	Size	Weight
Beacon and Antenna		2" x 15" x 5"	3 Lbs.
Battery (2 ea.)	BA-30		*
Battery	BA-38-R		*

* Weight less than one pound.

July 1945

Beacon Transmitter Receiver AN/TPN-1 is an air transportable ground beacon responder consisting of a modified SCR-695, power supply, and antenna. This device when in operation, and only when interrogated by the proper airborne equipment, emits a radio signal which, when interpreted by suitable apparatus, provides navigational information for homing purposes.

This equipment is used in conjunction with Radio Set AN/APN-2 by the Troop Carrier Command for marking glider landing and drop zones.

Beacon Transmitter Receiver AN/TPN-1 (Big Eureka) weighs 150 pounds. It can be set up in about half an hour and requires no operator once it is turned on.

The equipment is operated from a 24-volt battery with a power input of 90 watts producing a power output of 15 watts over a frequency range of 214 to 234 mc. Its operating range is approximately 90 miles.

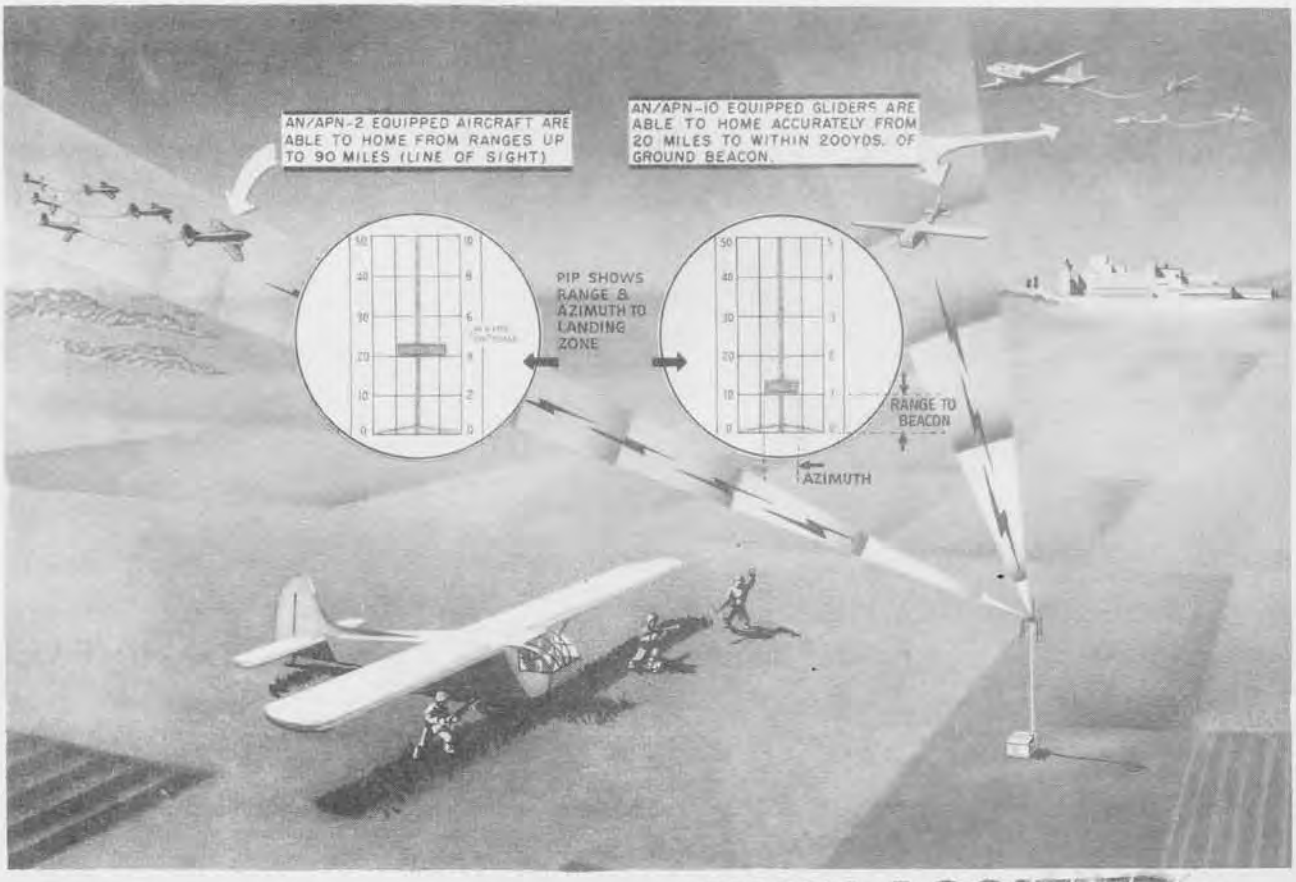
Test equipment used in the maintenance and operation of the equipment includes IE-46-B and IE-45.

There were no Army Supply Program requirements as of 1 February 1945.

POWER INPUT	90 WATTS, 24 V. DC
POWER OUTPUT	15 WATTS (PEAK)
FREQUENCY	214 - 234 MC (REC. AND TRANS.)
TYPE OF SIGNAL	PULSE
RANGE	90 MILES

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
3 3	7193 6H6	6	6SH7

AN/TPN-1 packed in Case CY-21/TPN-1 is air transportable and easily assembled.



Beacon Transmitter Receiver AN/TPN-1 is an air transportable ground beacon which operates unattended to guide tow planes and gliders to predetermined disembarkation zones.

AN/TPN-1

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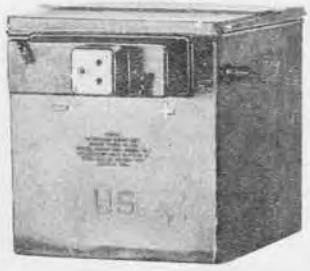
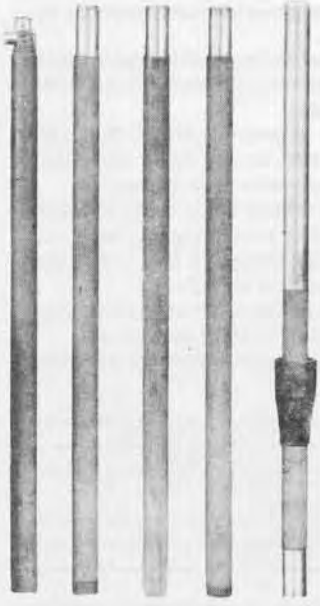
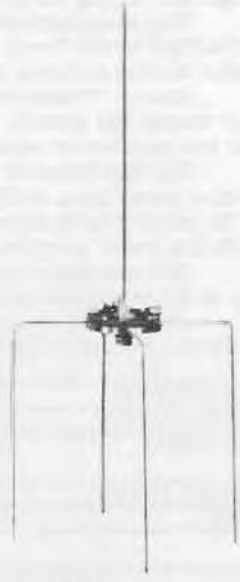


Aircraft Battery
Type G-1



Antenna Mast

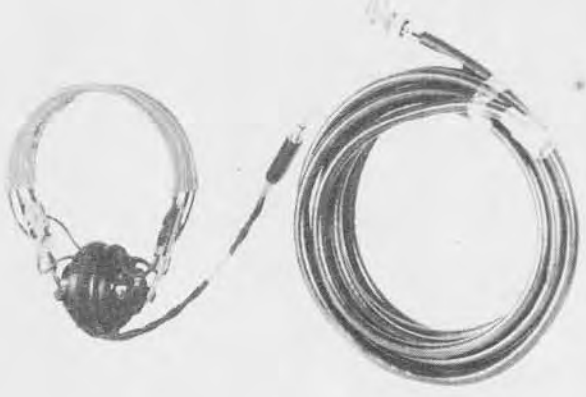


Modified
Antenna AN-95

Control Equipment
RC-255-A

Modified Radio
Receiver BC-966-A

Case



Headset
HS-23

Transmission Lines
(Antenna)

BEACON TRANSMITTER RECEIVER AN/TPN-1 TOTAL WEIGHT 240 LBS

Component	Nomenclature	Size	Weight
Case	CY-21/TPN-1	28'' x 20'' x 18''	47 Lbs
Antenna Mast	AB-3/TPN-1	11'' x 2''	5 Lbs
Modified Antenna	AN-95-A	14'' x 4''	1 Lbs
Modified Radio Receiver	BC-966-A	13'' x 14'' x 10''	36 Lbs
Radio Control Equip	RC-255-A	6'' x 7'' x 3''	3 Lbs
Air Corps Type G-1 Battery		10'' x 10'' x 11''	77 Lbs

Beacon Transmitter Receiver AN/TPN-3 is an air transportable ground beacon used in conjunction with Rebecca Mark I, II, III, Radio Set AN/APN-2 and Radio Set AN/APN-5. Provides homing facilities for Troop Carrier Command squadrons and BABS facilities when used in conjunction with Beacon Antenna Assembly AN/CPA-1.

This equipment consists of a lightweight modified Radio Set SCR-695 housed in a single chest, which may easily be carried be two men, and can be set up for operation in approximately 15 minutes.

Power for operation of Beacon Transmitter Receiver AN/TPN-3 may be obtained from a local 115 or 230 volt, 50-60 cycle power supply. When being used in enemy territory, power can be supplied from any one of a number of suitable power supply equipments that can also be transported with this equipment.

Test Equipment IE-45 and IE-46-B may be used for maintenance and tuning.

POWER INPUT	70 WATTS
POWER OUTPUT	15 WATTS (PEAK)
FREQUENCY	214 MC TRANSMITTER AND 234 MC RECEIVER
TYPE OF SIGNAL	PULSE
RANGE	90 MILES (LINE OF SIGHT)

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
3	7193	5	6SH7
2	6H6	1	5U4G

Beacon Transmitter-Receiver AN/TPN-3

Beacon Transmitter AN/TPN-3 is an air transportable Radar Beacon providing homing facilities to troop carrying aircraft under conditions of poor visibility.

AN/TPN-3

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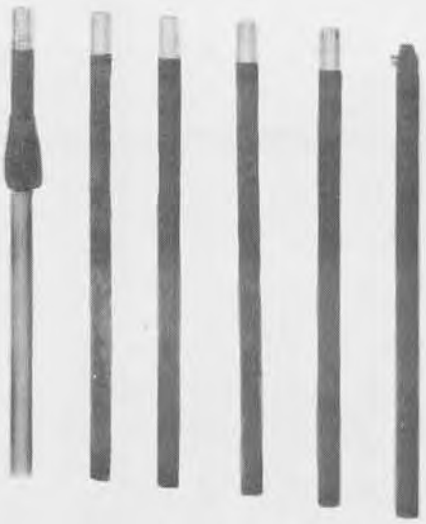
Case CY-21/TPN-1

Receiver-Transmitter RT-14/TPN-3

Antenna AT-16/TPN-



Antenna Mast AB-3/TPN-1

Cord CX-74/TPN-3

Cord CX-16/TPN-1

Headset HS-23

BEACON TRANSMITTER RECEIVER AN/TPN-3 TOTAL WEIGHT 100 LBS.

Component	Nomenclature	Size	Weight
Modified Radio Receiver	BC-966-A	13'' x 14'' x 10''	47 Lbs.
Modified Antenna	AN-95-A	14'' x 4'' Diam.	2 Lbs.
Antenna Mast	AB-3/TPN-1	121'' x 2'' Diam.	4 Lbs.
Case	CY-21/TPN-1	28'' x 20'' x 18''	47 Lbs.

Radar Beacon AN/UPN-1, sometimes known as BUPS, is an ultra portable beacon for ground, paratroop or shipboard use having a range of 35-50 miles. The set is capable of being interrogated by airborne radars operating on beacon function and replying with a coded signal permitting the beacon to be located in range and azimuth.

Capable of transmitting five different codes, this beacon is housed in a rectangular chassis containing a control panel with a knob for selecting operation (on-off-stand-by-tune), a knob for selecting codes and a knob for tuning the transmitter. The antenna consists of a dual linear array of six dipoles each (receiving and transmitting) housed in a weatherproof plastic cylinder and having horizontal polarization. It transmits signals on 3256 mc. and receives over the frequency range of 3267 to 3333 mc.

Power is obtained from a special 12 volt battery pack with power input of 36 watts. Peak Power output of the equipment is 50 watts.

Twelve experimental d-c units were built for field tests and are now in operational use. Production deliveries were being made in April 1945.

Test equipment used in the maintenance of Radar Beacon AN/UPN-1 includes Test Set TS-3/AP, Test Set TS-14/AP, Oscilloscope TS-34/AP, Voltmeters IS-185 and 189, and Audio Oscillator Hewlett-Packard 200C.

Army Air Forces requirements as of 26 February 1945 were 672 for the calendar year 1945 and 45 for 1946.

Aircraft Interrogation Triggers Beacon Reply which establishes its identity & position in range and azimuth.

Battery Charger & Battery in carrying position-entire equipment may be packed in 2 packages & carried by one man. (1) Harness MX-253/UPN-1 (2) Rectifier Battery Charger PP-116/UPN (3) Battery Case CY-222/UPN-1.

POWER INPUT	36 WATTS AT 12 VOLTS
POWER OUTPUT	50 WATTS (PEAK)
FREQUENCY	RECEIVER 3267-3333 MC
	TRANSMITTER 3256 MC
TYPE OF SIGNAL	PULSE
TYPE PRESENTATION	CODE DISPLAY ON THE RADAR SCREEN
DATA SUPPLIED (TO AIRBORNE SET)	IDENTIFICATION, RANGE AND BEARING FROM BEACON
RANGE	35-50 MILES AIRBORNE RADAR TO GROUND
PULSE LENGTH	0.5/MICROSECONDS

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
5	1LN5	2	8016
2	7F8	1	446B
6	3B7/1291	2	1N27

AN/UPN-1

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Battery Case CY-222/UPN-1

Harness MX-252/UPN-1

Antenna Assembly
AS-171-UP

Rectifier Battery Charger
PP-116/UPN-1

Case CY-225/UP

Antenna Support
AB-49/UP

Receiver Transmitter RT-72/UPN-1

RADAR BEACON AN/UPN-1

TOTAL WEIGHT 115 LBS.

Component	Nomenclature	Size	Weight
Transponder Assembly	RT-72/UPN-1	13'' x 7'' x 13''	27 Lbs.
Case	CY-220/UPN-1	13'' x 7'' x 15''	8 Lbs.
Harness	MX-242/UPN-1		1 Lb.
*Chest	CY-221/UPN-1	13 ''x 13'' x 9''	12 Lbs.
Battery Case	CY-222/UPN-1 (2 each)	7'' x 8'' x 11''	25 Lbs.
Rectifier Battery Charger	PP-116/UPN-1	7'' x 8'' x 11''	14 Lbs.
Harness	MX-253/UPN-1		1 Lb.
Antenna Assembly	AS-172/AP	4'' x 7'' x 14''	5 Lbs.
Antenna Assembly	AS-171/UP	25 1/2'' x 4'' Diameter	10 Lbs.
Cord	CX-237/U	50'	2 Lbs.
Cord	CG-92/U (2 each)	4' 6'' long	**
Antenna Support	AB-49/UP	32'' high	7 Lbs.
Case	CY-225/UP	6'' x 6'' x 40''	1 Lb.

*includes operating spare parts
**weight less that one pound.

Radar Beacon AN/UPN-2, sometimes known as BUPS, is an ultra portable beacon for ground, paratroop or shipborne use with a range of 35-50 miles. It is similar to AN/UPN-1 except for power source. The airborne version of AN/UPN-2 is known as Radar Beacon AN/APN-29. The set is capable of being interrogated by airborne radars of the proper frequency on beacon function and replying with a coded signal permitting the beacon to be located in range and azimuth.

This beacon is housed in a rectangular chassis containing a control panel with a knob for selecting operation (on-off-standby-tune), a knob for selecting codes, and knob for tuning the transmitter. It transmits signals on 3256 mc. and receives over the frequency range of 3267 to 3333 mc.

Power input of 150 watts, 50-2400 cycles, 115 or 230 volts produces a peak power output of 50 watts.

Radar Beacon AN/UPN-2 requires a ground Antenna Assembly AS-171/UP consisting of a dual linear array of six dipoles each (receiving and transmitting) housed in a weatherproof plastic cylinder and having horizontal polarization.

Twelve experimental ac units were built for field tests and are now in operational use. Production deliveries were being made in April 1945.

Test equipment used in the maintenance of Radar Beacon AN/UPN-2 includes Test Set TS-3/AP, Test Set TS-14/AP, Oscilloscope TS-34/AP, Voltmeters IS-189 and IS-185, and Audio Oscillator Hewlett-Packard 200C.

Army Air Forces requirements as of 1 February 1945 were 304 for the calendar year of 1945 and 18 for 1946.

POWER INPUT	150 WATTS AT 115/230 VOLTS, 50-2400 CPS
POWER OUTPUT	50 WATTS (PEAK)
FREQUENCY	RECEIVER: 3267 TO 3333 MC; TRANSMITTER: 3256 MC
TYPE OF SIGNAL	PULSE
RANGE	35-50 MILES
SENSITIVITY (RECEIVER)	0.05 MICROWATTS
PULSE LENGTH	0.5 MICROSECONDS
BLANKING GATE LENGTH	500 MICROSECONDS

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
3	6AK5	1	OD3/VR-150
7	6SL7GT	1	10-4B
1	2X2	1	446B
2	2C26	2	OC3/VR-105
1	5R4GY	2	IN27

Radar Beacon AN/UPN-2 on being interrogated by airborne radar (on beacon function) replys in code permitting the beacon to be located in range and azimuth.

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Antenna Assembly
AS-171/UP Mounted On
Antenna Support AB-49/UP

Receiver Transmitter RT-73/UPN-2
In Case CY-223/UP-2

RADAR BEACON AN/UPN-2

TOTAL WEIGHT 80 LBS.

Component	Nomenclature	Size	Weight
Transponder Assembly	RT-73/UPN-2	7" x 14" x 20"	40 Lbs.
Case	CY-223/UPN-2	7" x 13" x 21"	5 Lbs.
Harness	MX-254/UPN-2		1 Lb.
*Chest	CY-224/UPN-2		12 Lbs.
Antenna Support	AB-49/CP	32" high	5 Lbs.
Case	CY-225/CP	6" x 6" x 40"	1 Lb.
Cord	CX-237/U	50'	2 Lbs.
Antenna Assembly	AS-171/UP	36" x 4" Diameter	10 Lbs.
Cord	CG-92/U (2 each)	5'	**

* includes operating spare parts

** weight less than one pound.

Radar Beacon AN/UPN-3 (BUPX) is a portable set designed for use as a navigation and homing beacon and for bomb run designation. When interrogated by airborne radars on beacon functions it transmits a range coded signal identifying the beacon so that it may be located in range and azimuth.

Twelve code combinations are selectable. Provision is made for earphone monitoring of the set for interrogation. The complete equipment, less power supply source, but including the antenna is suitable for transportation by two men with harness pack or a small trailer or jeep and for mounting therein for operation from any location. Antenna consists of a linear array of coaxial fed horizontally polarized, vertically stacked dipoles. There are 10 rows of probe fed slots, 4 in each row, giving a 360° azimuth pattern.

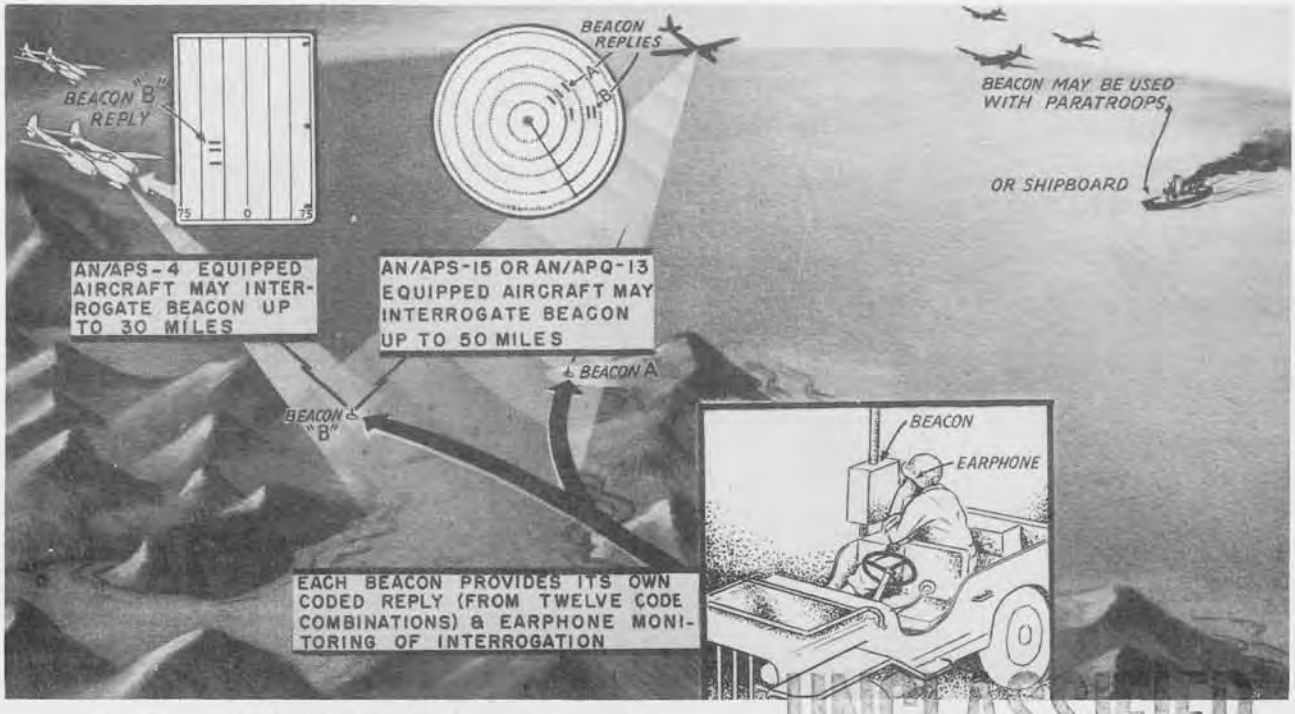
This set formerly designated AN/PPN-6, will operate in conjunction with the following Radio Sets: AN/APS-3, AN/APS-4, AN/APS-10, AN/APS-15, AN/APQ-13.

Test equipment required in maintenance and operation of AN/UPN-3 includes Test Set TS-120/UP, Voltage Divider TS-89/AP, Voltmeter IS-189, Spectrum Analyzer TS-148/UP, Oscilloscope TS-239/UP, Radio Frequency Test Load TS-108/AP.

POWER INPUT	300 WATTS @ 115 V 50-400 CPS
POWER OUTPUT	300 WATTS (PEAK)
FREQUENCY	9320-9440 MC.
TYPE OF SIGNAL	RANGE CODED PULSE
RANGE	50 MILES AN/APQ-13 @ 10,000'; 30 MILES AN/APS-4 @ 10,000'; 100 MILES AN/APS-10 @ 10,000'
SENSITIVITY (RECEIVER)	2 x 10-9 WATTS

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
14	7F8	1	VR-105/30
7	6AK5	1	VR-150/30
1	2J41	1	6X5GT
1	3D21	1	5Y3GT
2	2X2A	1	2K25
1	6L6	2	IN23
1	5T4	1	IN23B

Radar Beacon AN/UPN-3



Radar Beacon AN/UPN-3 (BUPX) is an ultra portable ground, paratroop and shipborne beacon designed to provide navigation information, act as homing beacon and designate bomb runs.

AN/UPN-3

SECRET

Cordage
Container

Rectifier Power Unit
PP-156 (XA) /UPN-3 (XA-1)
In Case
CY-355 (XA) /UPN-3 (XA-1)

Antenna Assembly
AS-241 (XA) /UPN-3 (XA-1)

Receiver-Transmitter
RT-84 (XA) /UPN-3 (XA-
In Case
CY-354 (XA) /UPN-3 (X/

Mounting
373 (XA) /UPN-3 (XA-1)

RADAR BEACON AN/UPN-3

TOTAL WEIGHT 124 LBS.

Component	Nomenclature	Size	Weight
Receiver-Transmitter	RT-84/UPN-3		39 Lbs.
Case	CY-354/UPN-3		22 Lbs.
Mounting	MT-273/UPN-3		
Harness	ST-105/UPN-3		
Rectifier Power Unit	PP-156/UPN-3		42 Lbs.
Case	CY-255/UPN-3		15 Lbs.
Harness	ST-104/UPN-3		
Antenna Assembly	AS-241/UPN-3		
Case	CY-356/UPN-3		
Cord	CX-770/U	10' long	
Cord	CX-789/UPN-3	30" long	

and includes set of interconnecting cords.

Radar Beacon AN/UPN-4 (BUPX) is an ultra portable ground and shipborne beacon weighing approximately 97 pounds and designed to provide navigation information, act as homing beacon, and designate bomb runs. When interrogated by an airborne radar, it replies with a coded signal which identifies the beacon and its location.

This set differs from Radar Beacon AN/UPN-3 in that it operates from a self-contained storage battery which has a life of 4 to 6 hours without recharging, and is suitable for transportation in small trailers or jeeps and may be mounted therein for operation. This model is being considered for paratroop use.

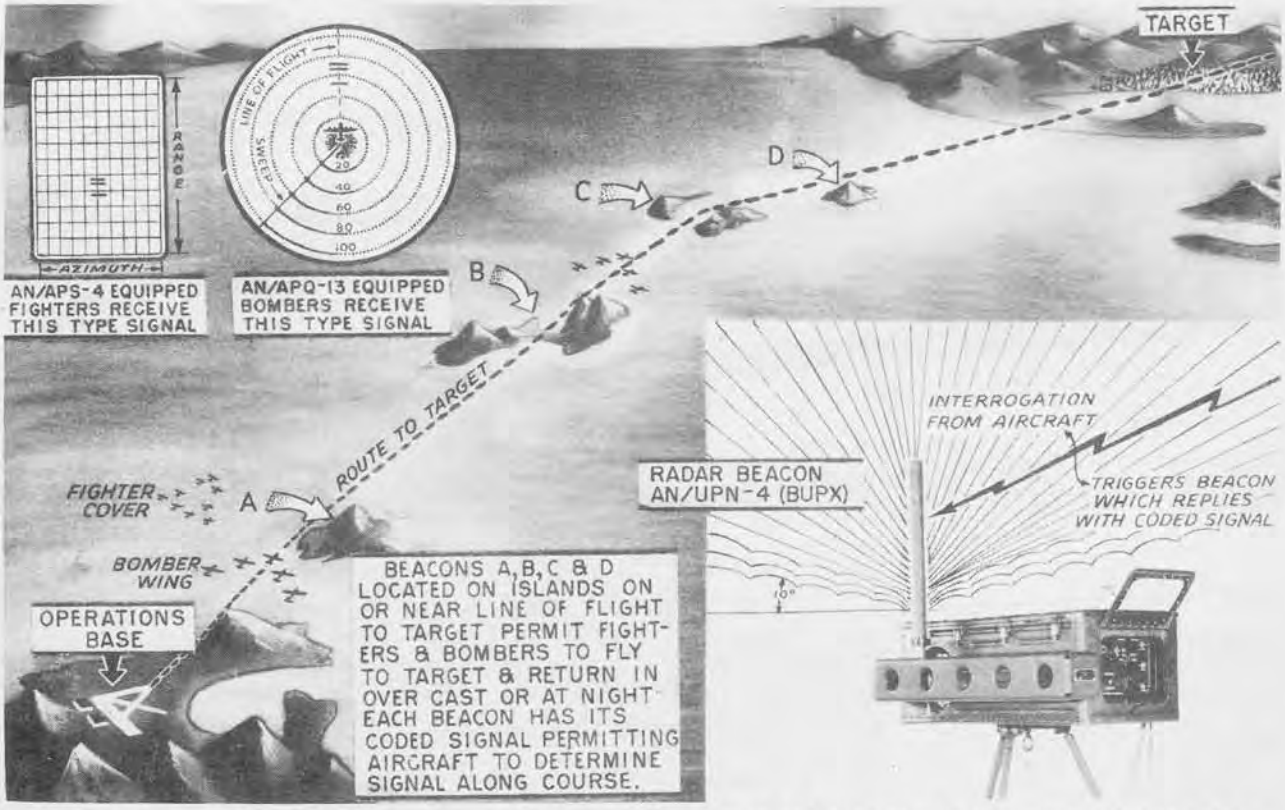
Five coded combinations are possible with this equipment. The antenna consists of a linear array of coaxial fed, horizontally polarized dipoles, vertically stacked, with 360° azimuth pattern.

Radar Beacon AN/UPN-4 formerly known as AN/PPN-7 is used with airborne Radar Set AN/APS-3, Radio Sets AN/APS-4, AN/APQ-13 and Radar Equipment AN/APS-15.

Test equipment recommended for use in the operation and maintenance of AN/UPN-4 includes Test Set TS-120/UP, Oscilloscope TS-239/UP, Radar Maintenance Equipment AN/UPM-1A, Synchroscope TS-28/UPN, R-F Test Load TS-108/AP, Spectrum Analyzer TS-148/UP, Pressurizing Kit MK-20/UP, Voltmeter IS-189, Multimeter TS-352/U and Tube Tester I-177.

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
6	3A5	2	VR-150
6	1L4	1	VR-90
4	6C4	1	1N23A
1	3D21A	1	1N31
1	2J41		

POWER INPUT	12 VOLTS D.C. 45 WATTS
POWER OUTPUT	300 WATTS (PEAK)
FREQUENCY	9320 - 9430 MC REC. 9310 MC TRANS.
TYPE OF SIGNAL	CODED PULSE
RANGE	30 MILES



Radar Beacon AN/UPN-4 is an ultra portable ground, paratroop and shipborne beacon designed to provide navigation information, act as homing beacon and designate bomb runs to aircraft equipped with radars operating in its frequency range.

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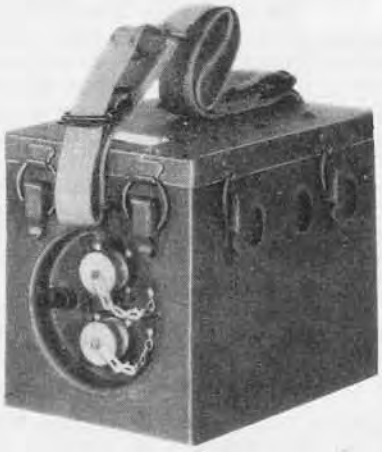
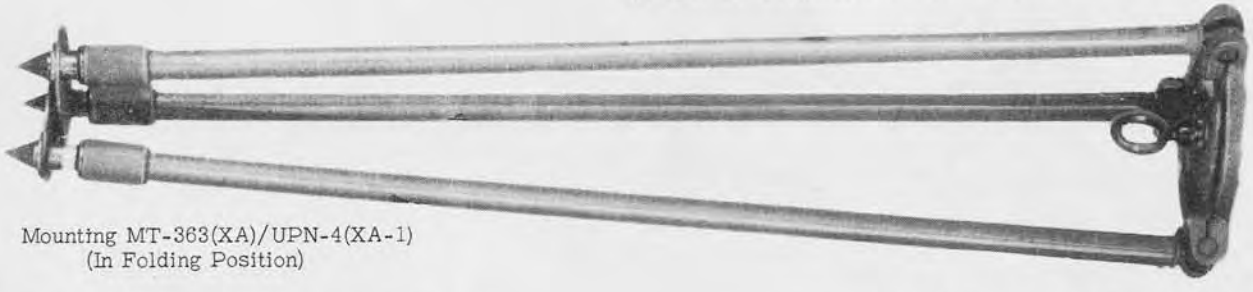


Battery Pack BB-222(XA)/UPN-4(XA-1)

Receiver-Transmitter RT-83(XA)/UPN-4(XA-1)
In Case CY-336(XA)/UPN-4(XA-1) (Antenna Erected)



Mounting MT-363(XA)/UPN-4(XA-1)
(In Folding Position)

RADAR BEACON AN/UPN-4

TOTAL WEIGHT 97 LBS.

Component	Nomenclature	Size	Weight
Receiver-Transmitter	RT-83/UPN-4		35 Lbs.
Case	CY-336/UPN-4	26" x 13" x 10"	18 Lbs.
Antenna Assembly	AS-235/UPN-4	24" long	4 Lbs.
Power Pack	BB-222/UPN-4 (2 each)	10" x 7" x 6"	ea. 27 Lbs.
Harness	ST-103/UPN-4		2 Lbs.
Case	CY-338/UPN-4	8" x 13" x 12"	14 Lbs.
Harness	ST-102/UPN-4		1 Lb.
Mounting	MT-363/UPN-4	34" x 7" x 7"	10 Lbs.
Antenna Guard attached to Case CY-336/UPN-4		28" x 5" x 4"	

and includes set of interconnecting Cords.

Reflector Target

MX-137/A, MX-138/A and MX-138A/A

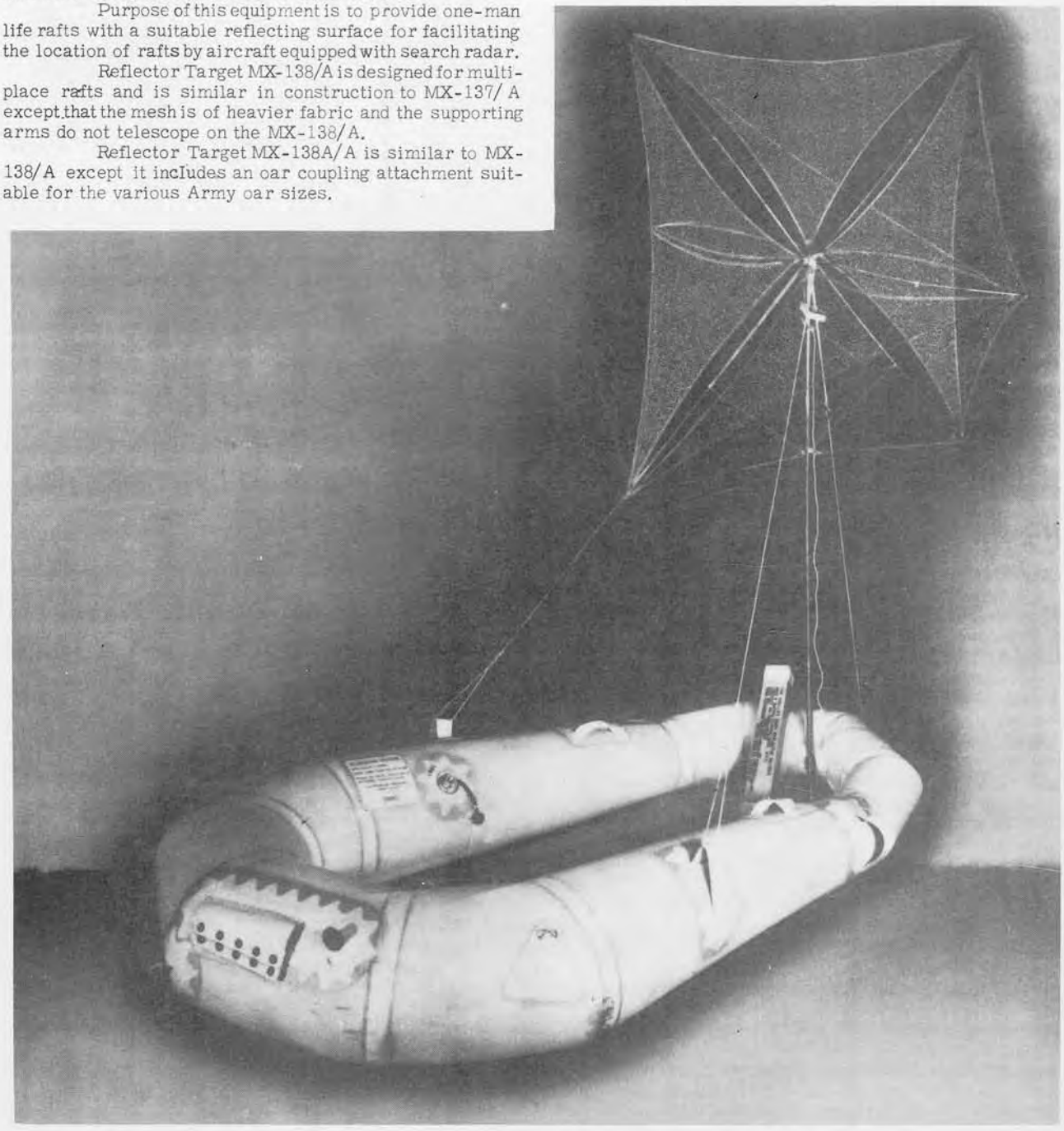
Reflector Target MX-137/A is a collapsible assembly of monel metal mesh and telescoping duralumin tubing. When set up for operation it forms eight corner reflectors designed to provide dependable response to any S or X band radar equipped search aircraft within a six to twelve nautical mile radius. The reflector assembly is small, lightweight, of simple construction and may be packed in the standard one-man life raft package.

Purpose of this equipment is to provide one-man life rafts with a suitable reflecting surface for facilitating the location of rafts by aircraft equipped with search radar.

Reflector Target MX-138/A is designed for multiplace rafts and is similar in construction to MX-137/A except that the mesh is of heavier fabric and the supporting arms do not telescope on the MX-138/A.

Reflector Target MX-138A/A is similar to MX-138/A except it includes an oar coupling attachment suitable for the various Army oar sizes.

RANGE MX-138/A RANGE MX-138A/A	AN/APS-2 - 12 TO 18 MILES AN/APS-3 - 5 MILES SCR-717-B - 12 MILES
ANTENNA	TWELVE TRIANGULAR REFLECTING ELEMENTS OF KNITTED FABRIC SILVER-PLATED



REFLECTOR TARGET

TOTAL WEIGHT 2 LBS.

Component	Nomenclature	Size	Weight
Reflector Target	MX-137/A	2"x2"x16" (collapsed)	2Lbs.
Reflector Target	MX-138/A	2"x2"x24" (collapsed)	2Lbs.
Reflector Target	MX-138A/A	2"x2"x28" (collapsed)	2Lbs.

July 1945

SCR-718-C

Radio Set SCR-718-C is an altimeter equipment used in aircraft to determine absolute altitude above terrain. It provides indication of actual altitude above terrain rather than altitude above sea level as indicated by barometric altimeters.

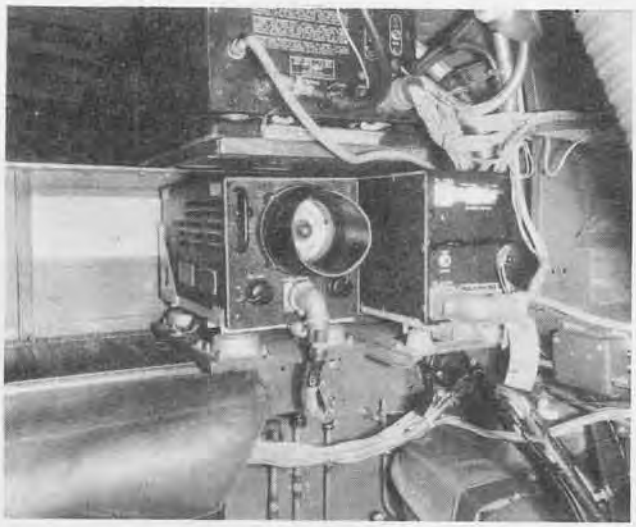
Designed for comparatively accurate altitude indication, this set has two scale ranges - 0 - 5,000 ft., 0 - 50,000 ft., however ranges in excess of 40,000 ft. are considered unreliable. Considerable utilization of this equipment has been effected in aircraft used for high-level precision bombing, weather reconnaissance, topographic recognition, and photographic missions.

Essential principle of this equipment operation is the same as any radar device, namely: the transmission of pulses of radio energy; the reception of the pulse after reflection from the earth's surface; and the measurement of the time elapsing between transmission and reception.

Selection of either range scale may be effected by use of the switch, mounted on the Indicator Unit, which changes the oscillator frequency and sweep rate. In altitude determination of ranges in excess of 5,000 ft., the 0 - 50,000 ft., range scale is normally used, however, a more accurate determination of altitude may be effected by use of both the low and high range scales, switching alternately from one to the other. This feature is the principal improvement in this equipment over the predecessor equipments SCR 718-A and SCR 718-AM, which have only one scale, 0 - 5,000 ft.

Test equipment required for the maintenance and tuning of SCR-718-C is: Test Set TS-10B/APN or TS-10C/APN, Test Set TS-23/APN and RCA 158 Oscilloscope, or equal.

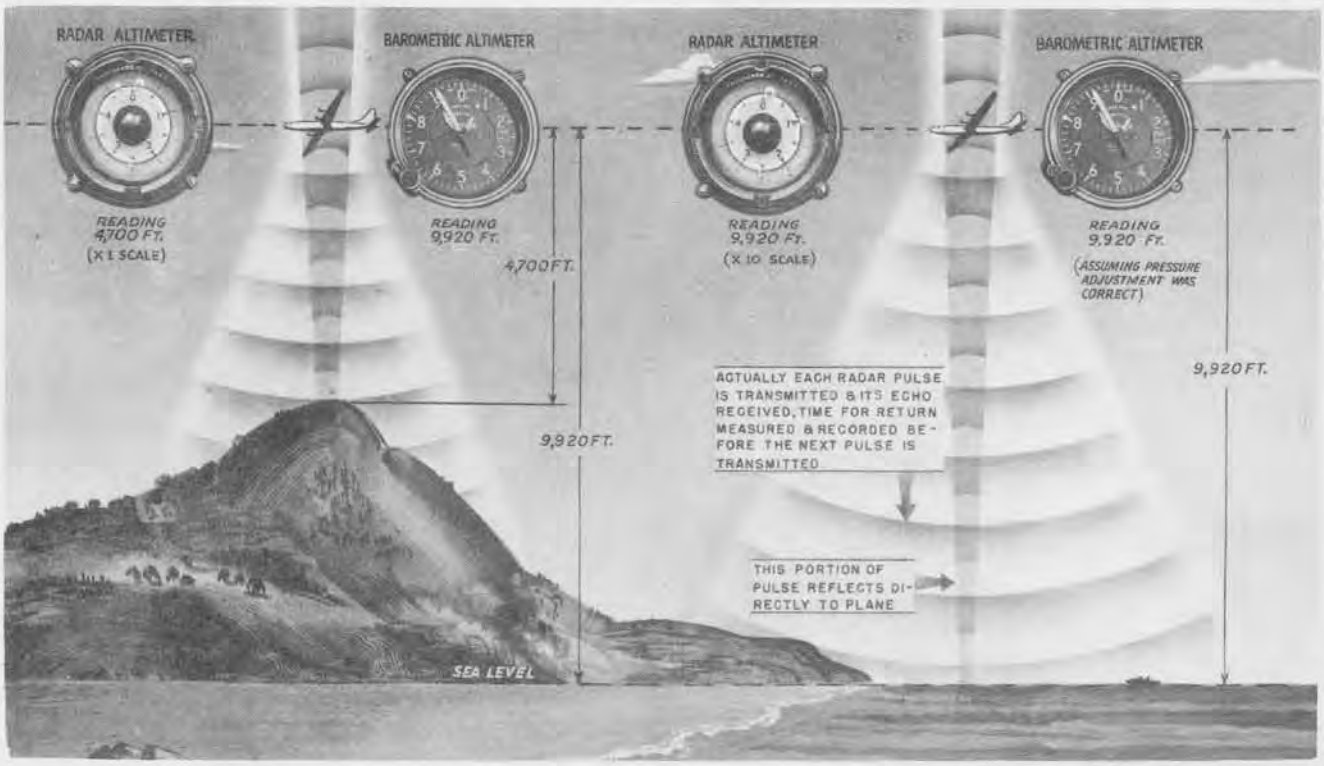
TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
3	6J6	1	6L6
12	6AG5	1	2X2A
1	5Y3GT/G	1	3DP1-S2



Indicator I-152-( ) installed in aircraft.

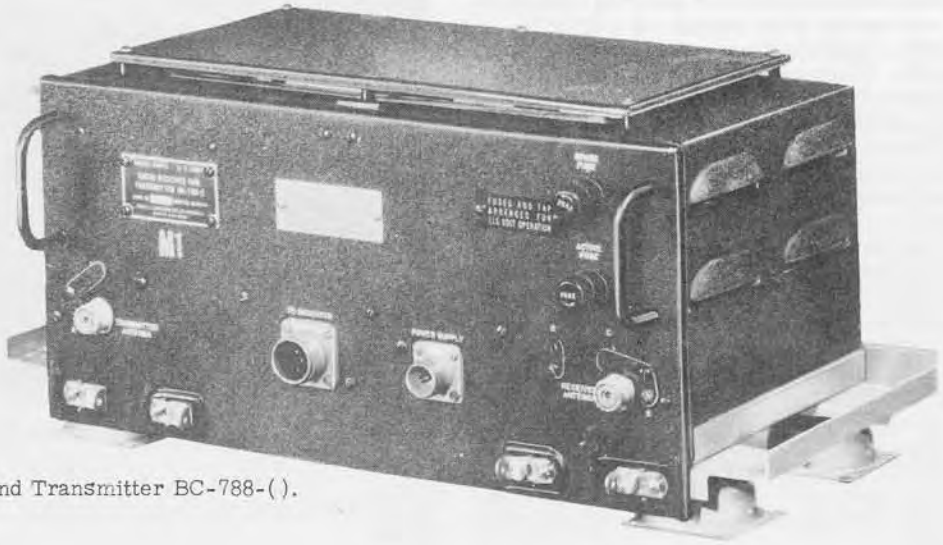
AAF requirements as of 22 February 1945 were 10,353 sets for the calendar year 1945, and 10,292 sets for 1946.

POWER INPUT	135 WATTS @ 80-115 V.
POWER OUTPUT	6-10 WATTS (PEAK)
FREQUENCY	440 ± 5 MC.
TYPE OF SIGNAL	PULSE
RANGE	0-40,000 FT.
ACCURACY	± (50 FT. PLUS 0.25% INDICATED ALTITUDE)
ANTENNAS	1 TRANSMITTING AND 1 RECEIVING HALF-WAVE DIPOLE.

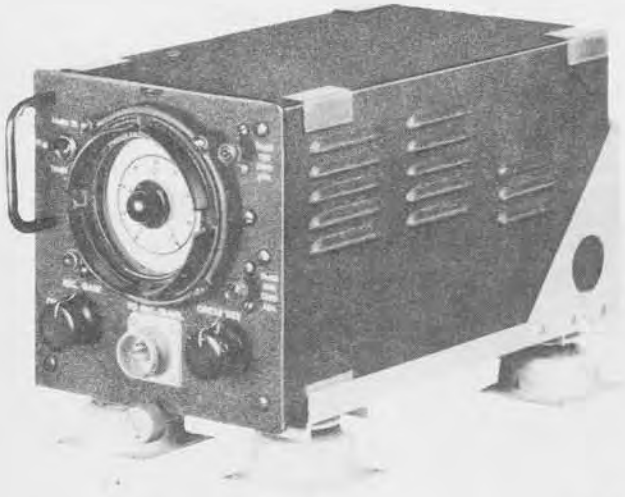


Radio Set SCR-718 is a precision altimeter which records the absolute altitude of an aircraft above the terrain, regardless of air pressure or variations in temperature.

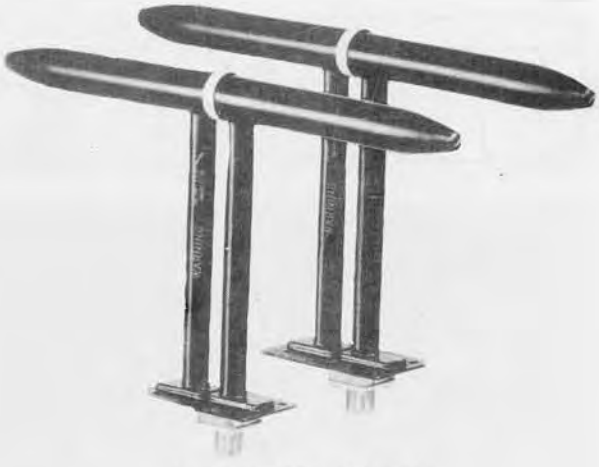
SCR-718-C



Radio Receiver and Transmitter BC-788-().



Indicator I-152-()



Antennas *AT-4/ARN-1.

Visor M-387.

RADIO SET SCR-718-C

TOTAL WEIGHT 34 LBS.

Component	Nomenclature	Size	Weight
Indicator	I-152-()	7'' x 13'' x 7''	10 Lbs.
Radio Receiver and Transmitter	BC-788-()	16'' x 9'' x 8''	10 Lbs.
Antenna (2ea)	*AT-4/ARN-1	8'' x 12'' x 1''	
Mounting Base	*MT-14-ARN-1		
Mounting	FT-445-A		
Visor	M-387		

and includes plugs, adaptors, cable etc.

Model YJ Radio Equipment is a two-channel, automatic responding radar beacon ("racon") used by the Navy for shore installation. This equipment will automatically transmit coded signals in reply to interrogating signals from craft equipped with radar equipment operating in the 176 mc. and the 515 mc. band.

An aircraft or ship equipped with appropriate radar equipment may interrogate and receive a resppnse from any YJ beacon within its range. The coded signal from the beacon is presented visually on the indicater of the airplane, indicating relative direction and range from the beacon.

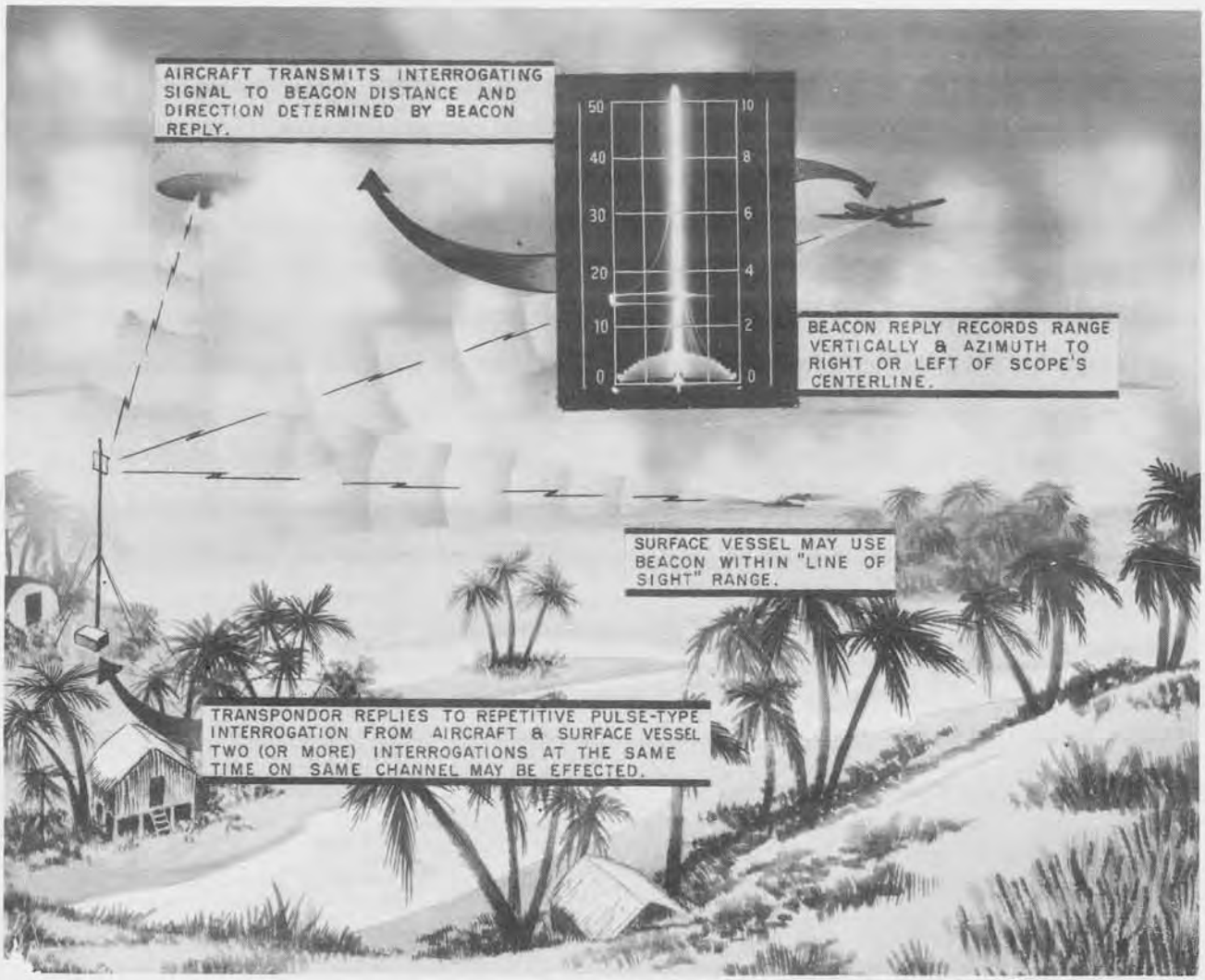
In operation the transponder replies to a repetitive pulse-type signal transmitted by the interrogating radar equipment. This signal is picked up by the antenna of the transponder and is passed through the receiver circuit. The output of the receiver is of a pulse character and causes the transmitter to emit a similar pulse. The response is keyed with one or two letters of the International Morse code (dot and dash) for identification purposes.

When the beacon receives two (or more) interrogating signals on the same channel at the same time, it tries to reply to each, pulse-for-pulse. So far as the equipment is concerned it is receiving and replying to a single interrogation of twice the repetition rate; however, if two interrogating pulses arrive at or about the same instant, the equipment may reply as to one pulse.

Test Equipment required in the maintenance of the YJ beacon includes Radar Maintenance Equipment AN/UPM-1A and Frequency Meter TS-127/U.

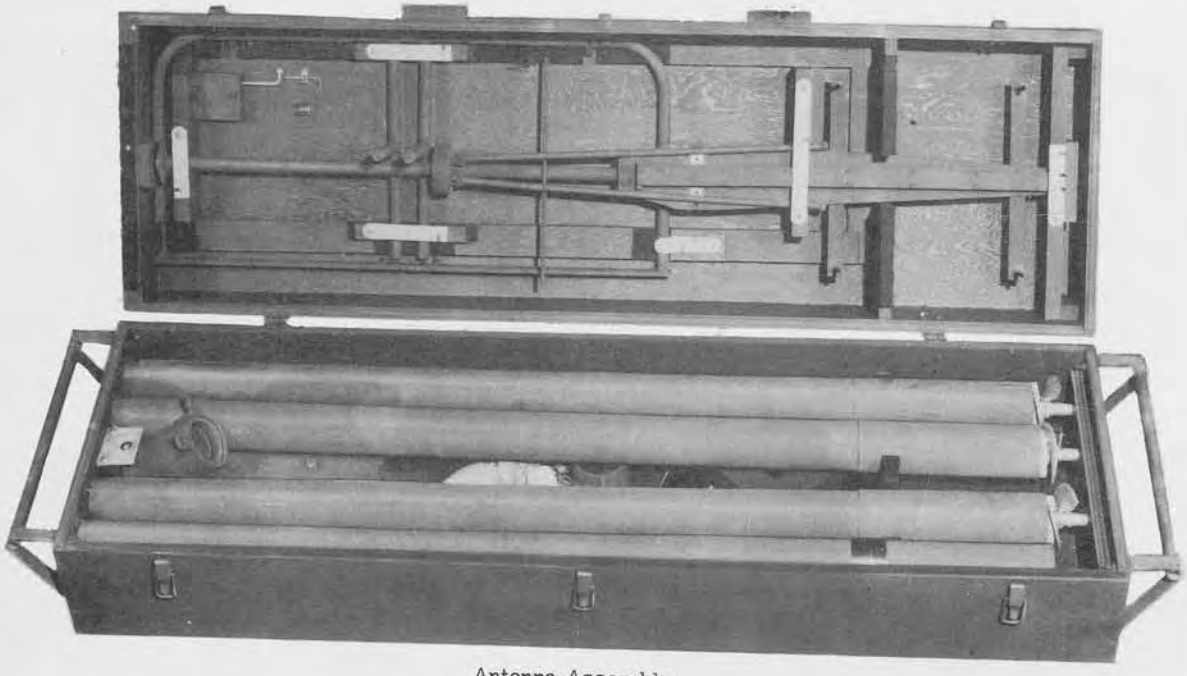
POWER INPUT	150 WATTS @115/230 V, 60 CPS
FREQUENCY	176 OR 515 MC.
TYPE OF SIGNAL	PULSE
RANGE	100 MILES

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
7	6SN7GT	1	807
2	5R4GT	2	6SH7
1	38205	2	8025
1	6X5GT	1	829
1	7193	1	6V6GT
2	9004	1	955
8	6SK7	1	



Model YJ equipment is a two channel (176mc. & 515mc bands) automatic responding radar beacon used by the Navy for shore installation. It has a maximum range of 100 miles.

Model YJ



Antenna Assembly

MODEL YJ

TOTAL WEIGHT 695 LBS.

Component	Nomenclature	Size	Weight
Rectifier Power Unit	CMD-20ACH	16'' x 13'' x 11''	57 Lbs.
"A" Band R-F Unit	CMD-43ABW	13'' x 11'' x 8''	14 Lbs.
"B" Band R-F Unit	CMD-43ABX	13'' x 11'' x 8''	18 Lbs.
Housing Assembly (in carrying case)		60'' x 23'' x 22''	*197 Lbs.
Antenna Assembly (in case)	CMD-66AEY	68'' x 19' x 15''	*333 Lbs.
Accessories: Cables, Plugs etc			*76 Lbs.

*Crated Weight

TEST Equipment

Radar Maintenance Equipment AN/UPM-1A is a ground portable beacon and monitor test set used to test and monitor radar beacons and other equipment operating in the frequency range of 155-235 mc, and 460-570 mc.

This test equipment may be used to measure or check transmitter frequency, power output pulse width and pulse shape; measure and check receiver sensitivity and band width; measure or check pulse shape at receiver output; give an indication of the approximate repetition rate of transponders; provide for beacon monitoring; and measure or check delay time in transponder or beacons.

A 3- inch oscilloscope is used as an indicator and voltage measuring instrument. The usual focus, intensity and centering control are provided by a linear sweep of 40, 200, or 2000 micro-seconds duration. Horizontal timing calibration is provided.

Oscillators of pulse radio frequency signals are provided in each frequency band. They may be synchronized from an external source or from an internal synchronizing generator.

Wavemeters with separate diode detectors measure the frequency of either the internal pulse signal generators or external pulse radio frequency signals over the range of 155 to 235 mc. and 460 to 570 mc.

Antennas may be connected to the r-f jacks for monitoring permanently installed equipments. When connected in this way the voltage indicating detectors and frequency meters are actuated by both internal and external generated signals. The r-f jacks may also be interconnected with the equipment under test through a 6-foot cable and shielded diode head. The probe is provided with a detector for indicating peak voltages (or power) at the output terminals of the probe. Both sensitivity and power output of associated equipment may be measured.

The equipment is mounted in an all metal case with compartments provided for storing accessories and cordage.

POWER INPUT	200 WATTS @ 80/115/230 VOLTS; 50-60 CPS
FREQUENCY	155-235 MC AND 460-570 MC.
TYPE OF SIGNAL	PULSE

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
10	6SN7GT	3	6C4
1	2X2	3	9005
2	6SH7	2	9006
1	6AG7	2	6J6
1	OD3/VR-150	1	3BP1
		1	5U4G

RADAR MAINTENANCE EQUIPMENT AN/UPM-1A TOTAL WEIGHT 140 LBS.

Component	Nomenclature	Size	Weight
Detector Junction Box	J-94/UPM-1	4" x 3" x 3"	
Console Rack	MT-189/UPM-1	16" x 26" x 12"	
Dust Cover	CW-24/UPM-1		
Oscillator (155-235 mc)	O-12/UPM-1		
Oscillator (460-570) mc)	O-13/UPM-1		
Wavemeter (155-235 mc)	TS-133/UPM-1		
Wavemeter (460-570) mc)	TS-134/UPM-1		
Antenna	AT-50/U		
Cord Set	AT-51/U		
Diode Head	CV-11/UPM-1		

All the above listed components are mounted or stored with Console Rack MT-189/UPM-1

TS-10/APN

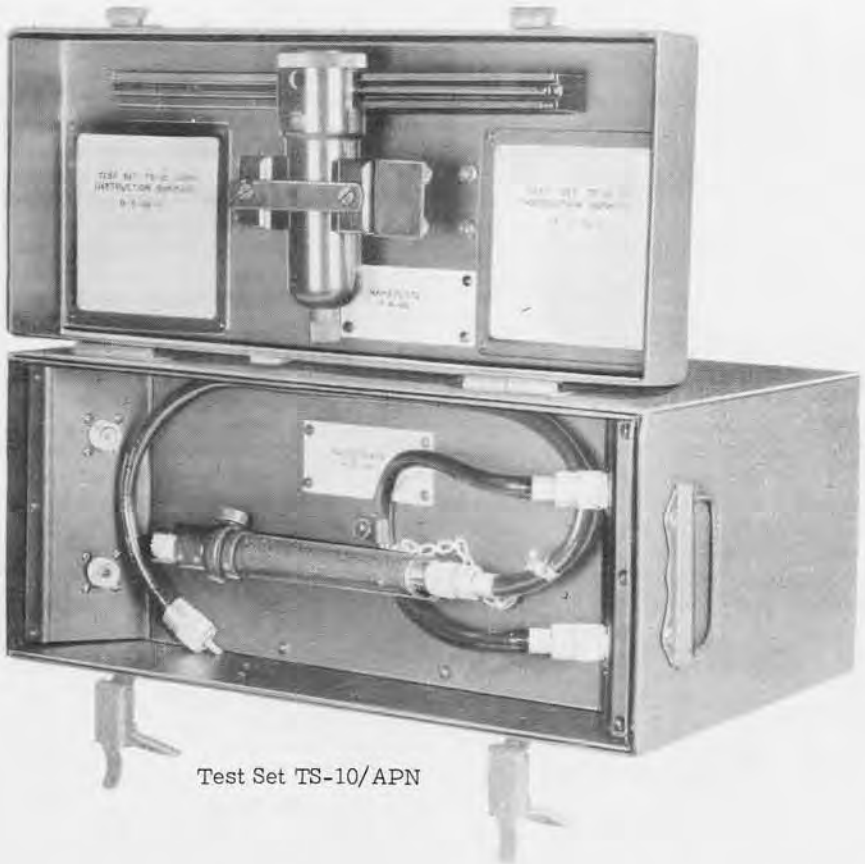
Test Set TS-10/APN is designed for testing various radio altimeter systems such as Radio Set *AN/-APN-1 and SCR-718. It will check low range calibration, will give rough check of antenna condition and power output, and will measure or check loop sensitivity and receiver alignment.

The set consists essentially of a delay unit, a variable attenuator and either one or two indicators.

The delay unit consists of two coils which can be used separately for short delay or in series for long delay. The signal delay obtained by use of the short coil is equivalent to a 65-foot altitude. The long coil gives the equivalent of a 297-foot altitude. When both coils are used in series a signal delay equivalent to a 350-foot altitude is obtained. The known delay periods provide a means for checking the calibration of the altimeter systems under test, by observing their altitude indications.

The variable attenuator, calibrated in decibels from 30 to 100 and used in conjunction with the delay lines, provides a voltage attenuation equivalent to actual signal loss and allows a check of overall system sensitivity and tuning. The indicator used with Test Set TS-10/APN and TS-10A/APN consists of a tuned dipole with a lamp, which can be attached to or used in close proximity to the altimeter antenna. Indicator ID-98/APN or ID-98A/APN used in TS-10B/APN and TS-10C/APN respectively contains a 1.5 volt battery, variable resistor, lamp and pickup dipole. The lamp indicates the approximate power being fed to the antenna. It is used for checking the condition of the antenna system.

POWER SOURCE	BA-30 (1.5V) REQUIRED FOR ID-98/APN & ID-98A/APN
FREQUENCY	420 - 460 MC
INPUT IMPEDANCE	50 OHMS
OVERALL ATTENUATION	60 TO 130 DB (APPROX.)
DELAY	0.7 MICROSECOND (APPROX.)



Test Set TS-10/APN

TEST SET TS-10/APN

TOTAL WEIGHT 38 LBS.

Component	Nomenclature	Size	Weight
Delay Unit		16" x 14" x 7"	
Attenuator and Cord Assy.		20" long	
Output Indicators (2)		10" long	
Cord (2) CD-800	CG-107/APN or CG-108/APN	8' long	
Cord CD-800	CG-107/APN or CG-108/APN	1' long	
Spare Lamps (2) for indicators			

TS-16/APN

Test Set TS-16/APN is a portable equipment designed for aligning and calibrating various radio altimeters such as Radio Set AN/APN-1, AN/ARN-1 and Altimeter Equipment RC-24-B

This equipment consists essentially of a precision audio frequency oscillator and a precision UHF frequency meter for checking and aligning FM altimeters. When the necessary connecting cables are attached, the counter circuits of the altimeter can be calibrated, the frequency modulating oscillator can be checked and the band width of the altimeter transmitter can be set.

It is self-contained in a wooden case with handle. A compartment within the case is provided for storing the accessory cordage. The phantom antenna and spare fuses are mounted inside the top cover of the test set.

AAF requirements as of 1 February 1945 were 2903 for 1945.

POWER INPUT	38 WATTS @ 28 VOLTS
FREQUENCY RANGE	410 TO 470 MC
ACCURACY	ERROR NOT TO EXCEED PLUS OR MINUS .3 MC
AUDIO OSCILLATOR RANGE	340 TO 7250 CYCLES
MODULATOR FREQUENCY ACCURACY	.5 CYCLES PLUS OR MINUS
AUDIO ACCURACY	1 % UP TO 5000 CPS. 2 % 5000 TO 7250 CPS
INPUT IMPEDANCE	50 OHMS

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	9002	1	12A6
2	12SJ7	2	12J5GT

Test Set TS-16/APN

Test Unit With Tee Connector On Cord CX-35/APN

TEST SET TS-16/APN

TOTAL WEIGHT 45 LBS.

Component	Nomenclature	Size	Weight
Test Set	TS-16/APN	16" x 11" x 17"	40 Lbs.
Cord	CX-35/APN	8 Feet	2 Lbs.
Phantom Antenna Unit	TS-63/AP	2" x 1"	*

*Weight less than one pound.

July 1945

TS-23/APN

Test Set TS-23/APN an altimeter test set is used for depot testing of certain operational characteristics of Radio Set SCR-718-( ).

The set consists essentially of a fixed-tuned wavemeter, diode detector and a d-c microammeter. The Transmitter frequency is set by tuning for a maximum deflection on the meter. Relative power output measurements are also indicated on the same meter at a calibrated marking of 375 volts. The other calibrated marking of 320 volts is for measuring low voltage B+ in Radio Set SCR-718-( ).

The equipment is self-contained in a metal case with all operating controls on front panel. There are four accessory operating cables; three are permanently attached to the unit and the fourth is detachable. The test set is normally mounted within a wooden carrying case but may be removed if desired.

AAF requirements as of 8 March 1945 were 386 for the calendar year 1945.

POWER INPUT	1.5 WATTS @ 115 VOLTS
FREQUENCY	440 MC

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	9004		

Case


Cord CD-800


Test Unit

TEST SET TS-23/APN

TOTAL WEIGHT 14 LBS.

Component	Nomenclature	Size	Weight
Test Set	TS-23/APN	9" x 4" x 4"	5 Lbs.
Cord	CD-800	34"	
Carrying Case		12" x 9" x 8"	7 Lbs.
Allen Wrench			

TS-111/CP

Test Set TS-111/CP is an adjustable coaxial cavity wavemeter designed to test airborne radar or beacon systems. It is used with the AN/CPN-3 and AN/CPN-8.

This equipment will measure or check the frequency of pulsed, CW or modulated radar transmitters or signal generators. The wavemeter sensitivity is such as to require 2 milliwatts of CW RF power to give full scale deflection of the microammeter.

The RF attenuator is continuously variable from a minumum of zero DB attenuation to a maximum of approximately 25 DB attenuation.

A dc mircoammeter is used to indicate resonance, and frequency is read from a calibration chart supplied with the wavemeter. The set is enclosed in a waterproof plywood transit case.

AAF requirements as of 3 March 1945 were 334 for 1945.

FREQUENCY	3000 TO 3600 MC
TYPE OF SIGNAL	PULSE OR CW
INPUT IMPEDANCE	50 OHMS

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	IN21 B		

Case CY-167/CP

Wavemeter TS-111/CP

Cord CG-114/U

Attenuator CN-15/CP

Cord CG-99/AP

TEST SET TS-111/CP

TOTAL WEIGHT 22 LBS.

Component	Nomenclature	Size	Weight
Wavemeter	TS-111/CP	7" x 5" x 5"	8 Lbs.
Attenuator	CN-15/CP	6" x 3" x 3"	*
Cord	CG-244/AP	5 Feet	1 Lb.
Cord	CG-100/U	5 Feet	1 Lb.
Case	CY-167/CP	10" x 10" x 12"	10 Lbs.

July 1945

CONFIDENTIAL

TS-251/UP

Test Set TS-251/UP (Loran Test Set) is a portable RF signal generator. Various RF channels and output voltages are indicated and selected by rotary switches located on the front panel. All visual indications appear on the receiver indicator. A table of correct readings is posted on the signal generator panel for comparison.

This equipment is designed to measure or check time performance (including crystal frequency adjustment), stability of sweep generating circuits, receiver alignment, possible video distortion and accuracy of time delay measurements on Loran Sets AN/APN-4, AN/APN-9, SCR-722A, DAS-1, and LRN.

POWER INPUT	23 WATTS @ 100-130 VOLTS
FREQUENCY	1750 KC TO 2000 KC
TYPE OF SIGNAL	PULSED OR CW

TUBE COMPLEMENT			
NO.	TYPE	NO.	TYPE
1	6J5	1	6SN7GT
1	6SK7	1	6X5/GT
1	6SJ7	1	6SL7

CX-404/UP

CG-223/UP

CQ-222/UP

PL-258

Navy Type 49544

U-46/U

U-45/U

TEST SET TS-251/UP

TOTAL WEIGHT 11 LBS.

Component	Nomenclature	Size	Weight
Test Set	TS-251/UP	10" x 12" x 8"	11 Lbs.

Includes: Cords, plugs, adapter etc.