

UNCLASSIFIED

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AN/APN-9

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 over 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

**LORAN PRECISION NAVIGATION EQUIPMENT**  
 PERMITS NAVIGATION (UP TO 600 MILES DAY - 1200 MILES NIGHT) OF ANY AIRCRAFT EQUIPPED WITH LORAN RECEIVER. NAVIGATOR TAKES A READING ON ONE PAIR AND THEN OTHER OF TWO PAIRS OF STATIONS WITHIN TWO MINUTES TIME INDICATIONS (RIGHT) SHOW COMPUTATION MADE ON FIRST PAIR (DETERMINING LINE OF POSITION) COMPUTATION ON SECOND PAIR ARE MADE IN A LIKE MANNER (DETERMINING FIX) BY PLOTTING THESE COMPUTATIONS TO THEIR EQUIVALENT COORDINATES ON A MAP THE POSITION OF THE AIRCRAFT IS ESTABLISHED ACCURATELY WITHIN 1% OF RANGE

**Position 1** - Operator tunes slave pulse (A) to left edge and course delay dip (B) under master pulse (C) on right side of lower trace

**Position 2** - Operator tunes fine delay to move master pulse (A) of lower trace until it is directly under slave pulse (B) of upper trace

**Position 3** - Traces superimposed - Operator adjusts fine delay and amplitude balance until only one pulse is discernible

**Position 4** - Operator counts negative markers from right edge of trace leftward to course delay dip. Each marker = 1000 μ (reading shown = 4000 μ)

**Position 5** - Final calibrations measured by projecting vertically from the cross hair on lower trace to upper trace. Then reading to right to 1000 μ marker. read units, tens, hundreds in that order. Reading shown = 245 + 100 lag = 345 position of aircraft from station 1 = 4345 μ

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.



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		*

\* Weight less than one pound.  
Section 4 - Graphic Survey