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O.D. No. 4392

7 Pages

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INSTRUCTION PAMPHLET  
FOR  
ANTIAIRCRAFT RANGE INDICATOR MARK 1

THE A. C. GILBERT COMPANY  
NEW HAVEN, CONNECTICUT

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APPROVED 13 MAY, 1942

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REVISIONS			
LOC.	NO.	DATE	Changes appear on sheets

**RESTRICTED**

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## TYPES OF FOREIGN AIRCRAFT WHICH MAY BE ENCOUNTERED AND THEIR WING SPAN

GERMAN		ITALIAN	
VF (Fighter)		VF (Fighter)	
Name	Wing Span	Name	Wing Span
<b>Single Engine</b>		<b>Single Engine</b>	
*Me 109 F4, G	33'	Caproni-Vizzola F5	39' 1"
He 113 (He 100)	31'	*Fiat CR42	31' 8"
*FW 190 A3	34' 6"	Fiat G50	35' 9"
Me 209	31' 3"	Macchi MC200	35'
		*Macchi MC202	35'
<b>Twin Engine</b>		Regianne Re2000	36'
*Me 110	54'	*Regianne Re2001	36'
Me 210	55'	S.A.L. 207	29' 8"
*Ju 88	65'		
Hs 129 (Henschel)	50'	<b>VB (Bomber)</b>	
FW 187	51'	<b>Two or Three Engine</b>	
		Breda Ba65	39' 9"
<b>VB (Bomber)</b>		Breda Ba88	50' 10"
<b>Single Engine</b>		*Cant. Z1007 bis.	81' 10"
*Ju 87B	45' 4"	Caproni Ca135 bis.	61' 8"
		*Caproni Ca312	53' 4"
<b>Twin Engine</b>		Fiat Br20M	70' 6"
*Ju-96P2	77'	Piazza P32 bis.	59'
Ju 288	63'	Piazza P108	106'
Do 217E2	62' 5"	*Savoia-Marchetti SM79	69' 6"
He 111	73' 11"	*Savoia Marchetti SMB4	69'
He 177	103' 4"	Savoia Marchetti SMB6	48'
Hs 129	50'	<b>Seaplanes</b>	
		*Cant. Z506B	86' 10"
<b>Four Engine</b>		Cant. Z511	132'
Ju 290	123'	*Caproni Ca312 bis.	53' 4"
He 116P	72' 3"	Caproni Ca316	53' 2"
FW 200K	108'		
<b>Seaplanes — Bombers — Reconnaissance</b>		<b>JAPANESE</b>	
<b>Transport</b>		<b>Single Engine</b>	
<b>Single Engine</b>		Name	Type
Ar 196	49' 6"	T-97	Army Fighter
*He 114	44' 5"	T-00	Navy Fighter
Fi 167	44' 4"	T-01	Navy Fighter
		FW 190	Fighter
<b>Twin Engine</b>		Me 109F	Fighter
Ha 140	68' 10"	T-95	Navy Recon. F/P
*He 115	72' 10"	T-00	Navy Recon.
*Do 18	77' 9"	*T-97/3	Navy Torpedo
		*T-99	Navy Dive Bomber
<b>Three Engine</b>		<b>Twin Engine</b>	
Do 24	88' 7"	*T-96/4	Navy Med. Bomber
		*T-97	An Med. Bomber
<b>Four Engine</b>		*T-01	Navy Med. Bomber
Do 26	98' 6"	<b>Four Engine</b>	
Ha 139	96' 10"	*T-97	Navy Flying Boat

\*Types most likely to be met in combat.

## DESCRIPTION AND PRINCIPLE OF OPERATION

The Antiaircraft Range Indicator Mark 1 is a device designed to indicate to a machine gunner when an airplane target has approached within the range of his machine gun. This distance is determined by the stadimeter principle of similar triangles. One triangle is formed by a point at the eye of the operator and a pair of wires held at a fixed distance from the eye. The separation between the wires is adjustable at will. The other triangle is formed by the eye and the wing-spread of the airplane target at the firing range.

The indicator is designed, like a hand mirror, to be held in the hand at arm's length. In place of the mirror is a graduated plate. A two-inch hole in the plate exposes a pair of vertical wires. The distance between these wires may be varied by moving a pointer over the face of the plate.

This indicator is designed to be used against targets approaching directly toward the operator.

## INSTRUCTIONS FOR OPERATOR

The following procedure should be followed in determining the range for opening fire:

1. The lanyard attached to the indicator should be adjusted so that the distance from the indicator to the eye is maintained at 24 inches when the loop is dropped around the operator's neck and the lanyard is taut.
2. Estimate the wing span of the airplane target. These estimates may be aided by recognition of the silhouettes of the various airplanes. Several of the known airplanes are marked in the corresponding wing span zones on the indicator. Others are shown on page 3 of this pamphlet. In the zone corresponding to the airplane target wing span, set the pointer at the maximum effective range of the antiaircraft gun, or at any other optimum range.
3. Sight at the aircraft through the vertical wires, holding the indicator perpendicular to the line of sight.
4. When the gap between the vertical wires is bridged by the wing-spread of the aircraft, the signal for opening fire should be given.

## REPAIR

The cover plate of the indicator is not to be removed, except by those specifically authorized to repair the instrument. In case the vertical wires become warped or the instrument requires adjustment, the indicator should be turned over to the proper repair or maintenance personnel.

### DESCRIPTION OF MECHANICAL OPERATION OF THE INDICATOR

The following detailed description of the operation of the linkages inside the Antiaircraft Range Indicator Mark 1 is provided for use in adjustment or repair. Referring to the drawings on pages 6 and 7, when pointer (A) on the face side of the dial (D) is rotated, it moves ring (B) to which it is permanently fastened. The movement of ring (B) causes link (C) to rotate link (E) about pivot stud (F). This movement causes wire carrier (G) to move in one direction, and wire carrier (H) in the opposite direction, since both are connected to link (E) on opposite sides of pivot stud (F). The other ends of wire carriers (G) and (H) are supported by link (J) which pivots about stud (K) simultaneously and in the same direction as link (E). Therefore, since both links (E) and (J) rotate in the same direction at the same time, wires (L) move parallel to each other, and come together or go apart depending on the direction of rotation of the pointer. The flat spring (M) bears against ring (B) to provide slight friction, ensuring smooth operation of moving parts.



