

GET



THAT FIGHTER



RESTRICTED

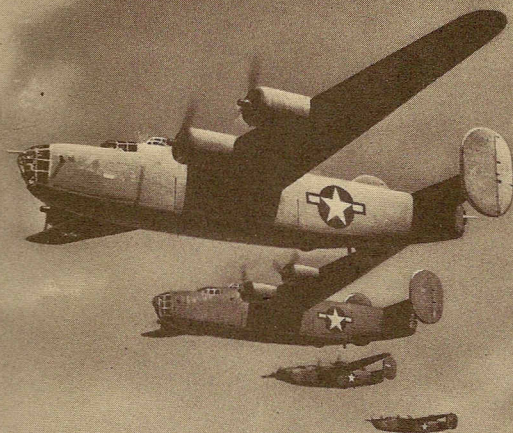
PREPARED BY
ARMY AIR FORCES
OPERATIONS ANALYSIS SECTION
AND A.A.F. TRAINING AIDS DIVISION
IN COLLABORATION WITH U.S. NAVY AND
CENTRAL FLEXIBLE GUNNERY INSTRUCTORS SCHOOL
WITH THE ASSISTANCE OF TIME INC.
NOVEMBER 1, 1943

This book deals

ONLY

with the shot you make
against a fighter

***WHEN HE
IS ACTUALLY
COMING IN
AT YOU***



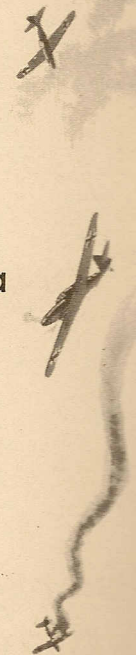
"The success of the mission and the lives of the crew depend on your gunnery. If you will LEARN and USE the simple directions in this book, you can shoot from the sky any fighter which attacks you."

W. B. E. N. T.
Brig. Gen. U.S.A.



4

Every enemy fighter
is dangerous and
needs watching
BUT he becomes
really dangerous
only when he starts a
DIRECT ATTACK
on you.



That's when he is
EASIEST TO HIT

5

THIS BOOK IS NOT ABOUT HIM

OR HIM

**IT TELLS HOW TO GET
THIS ONE
BEFORE HE GETS YOU**

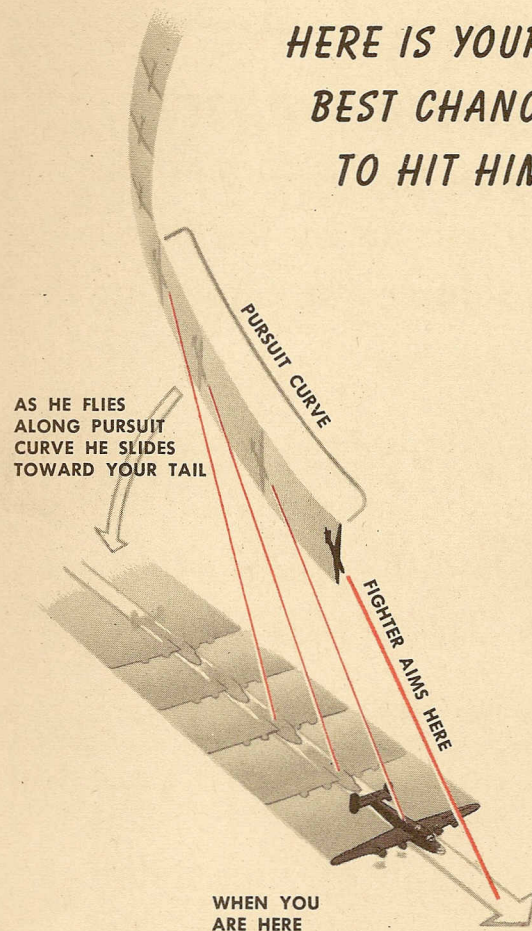


The fighter coming in to attack you must keep aiming at the spot where you will be by the time his bullets get there.

In order to keep aiming at this spot he must fly in a slight curve, called the pursuit curve.

As he flies along this curve he slides in toward your tail.

*HERE IS YOUR
BEST CHANCE
TO HIT HIM*



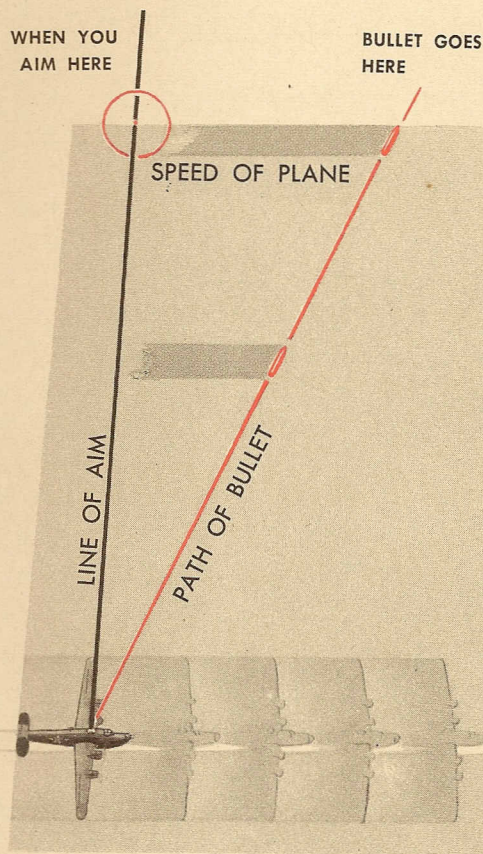
Believe it or not —

WHEN A FIGHTER IS MAKING HIS ATTACK

You don't aim ahead as in most other shots.

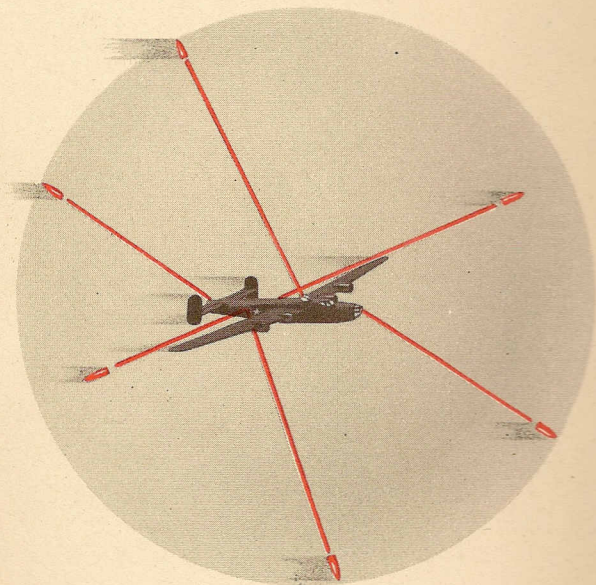
ALWAYS AIM BETWEEN HIM AND THE TAIL OF YOUR OWN PLANE

because the forward speed of your plane is added to the speed of your bullet.

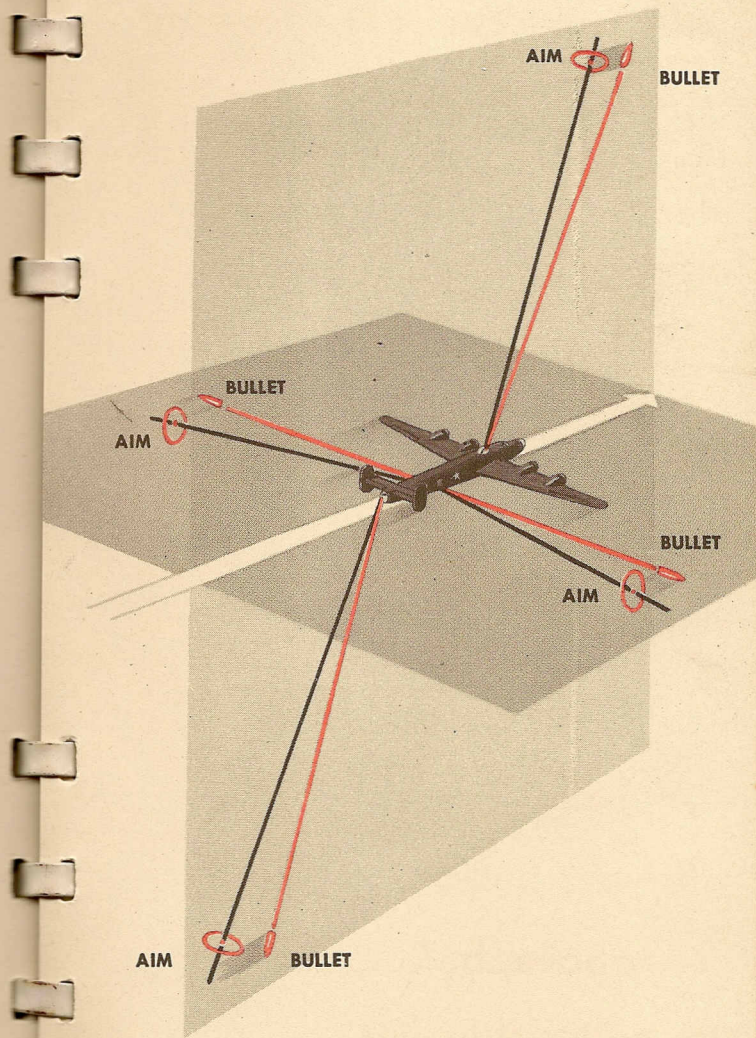


A bullet shot from a moving plane keeps the forward speed of that plane as well as its own velocity.

The bullet keeps this forward speed no matter in what direction you shoot——



——above, below, or to either side



If you make the mistake of
leading ahead of where he
is pointing while he is
shooting at you

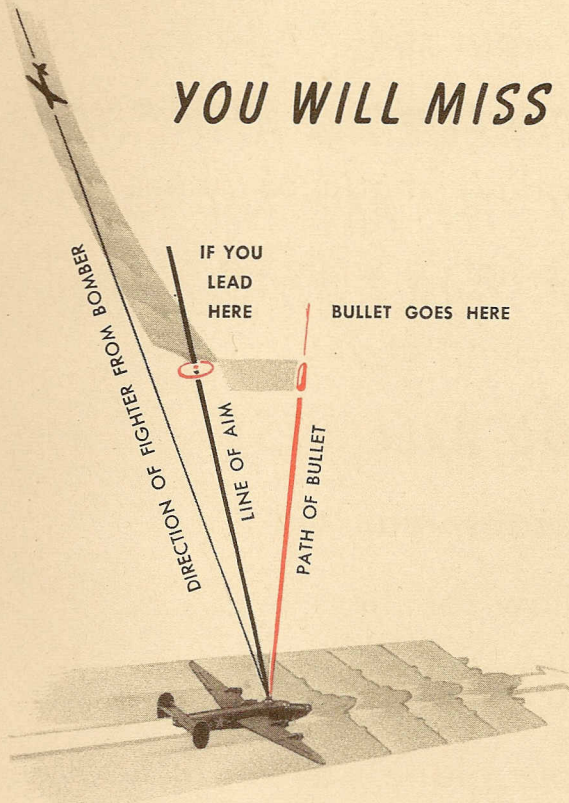
YOU WILL MISS

because you did not
allow for the

FORWARD SPEED

your plane gave
to your bullet

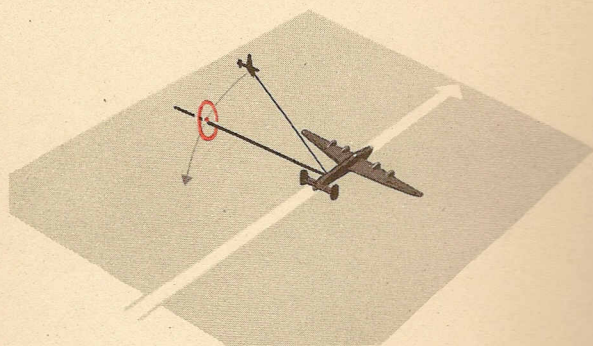
YOU WILL MISS



The way to allow for your forward speed is to aim

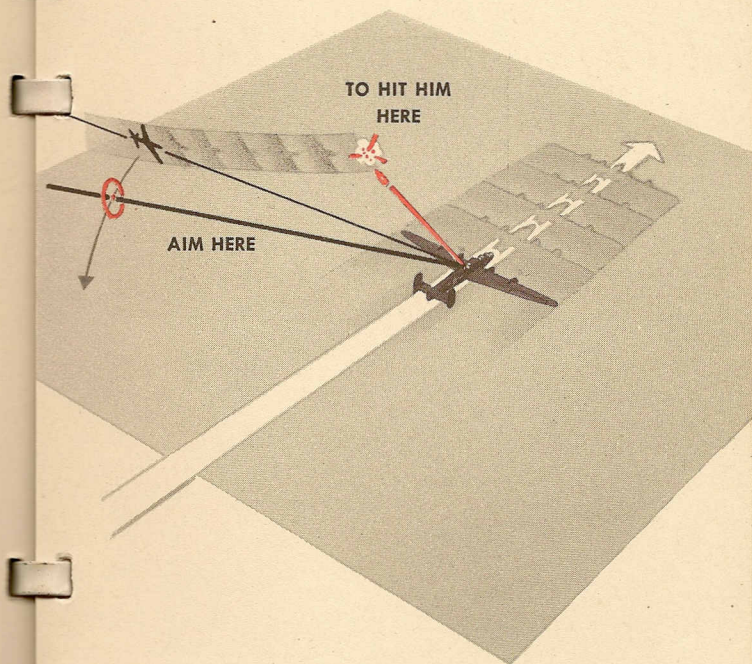
***BETWEEN THE ATTACKING
FIGHTER AND THE TAIL
OF YOUR OWN PLANE***

at a point on the line along
which the fighter slides
toward your tail



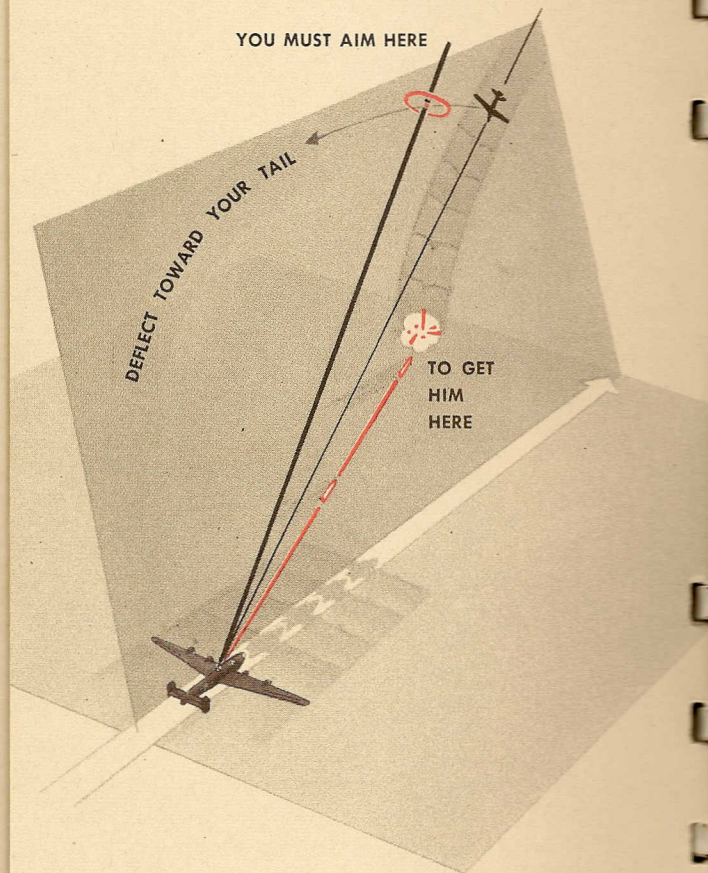
***THE AMOUNT YOU AIM
BEHIND IS DEFLECTION***

ATTACK FROM THE SIDE

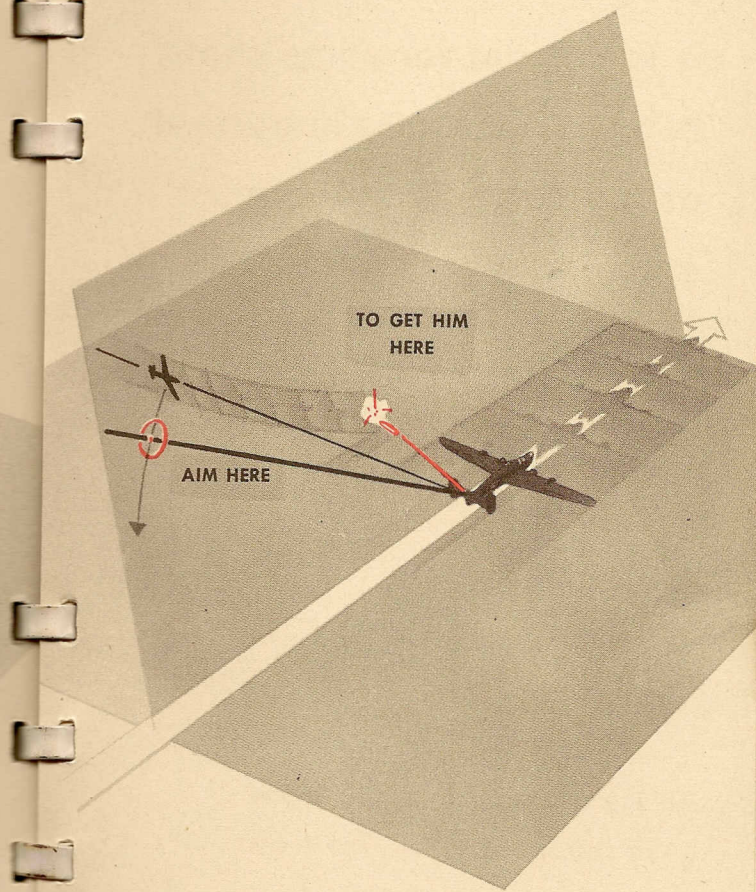


You aim toward your own tail no
matter whether he attacks from
above, below or at your side.

ATTACK FROM THE FRONT



ATTACK FROM THE REAR



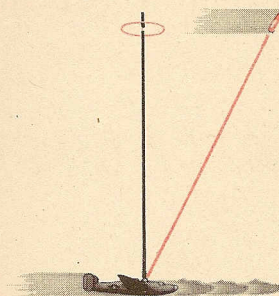
A word about **TRAIL**

Of course trail, which is the drag of the air on the bullet, is important for some shots, but not nearly as important as the correction you must make for your own speed.



All the deflections in this book have been corrected for trail

Remember how the bullet is carried forward by the speed of your plane and how the fighter slides toward your tail—



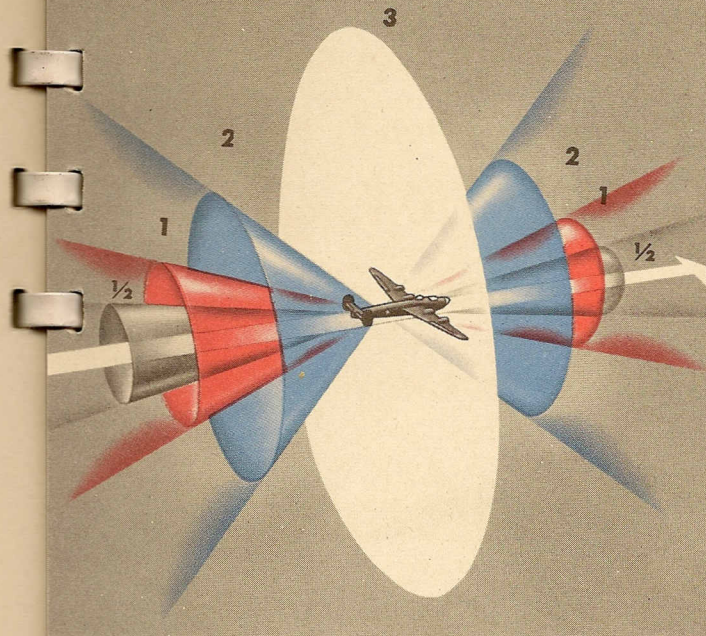
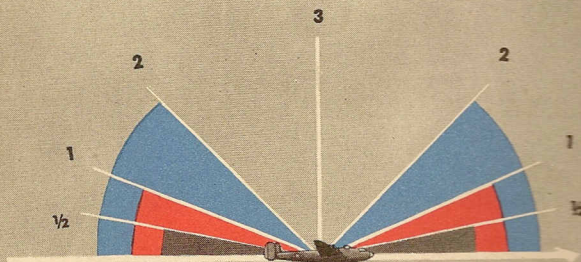
—NOW, LET'S SEE HOW YOU MUST AIM TO GET THE FIGHTER BEFORE HE GETS YOU—

The **AMOUNT** of the deflection depends on the **DIRECTION** from which the fighter attacks.

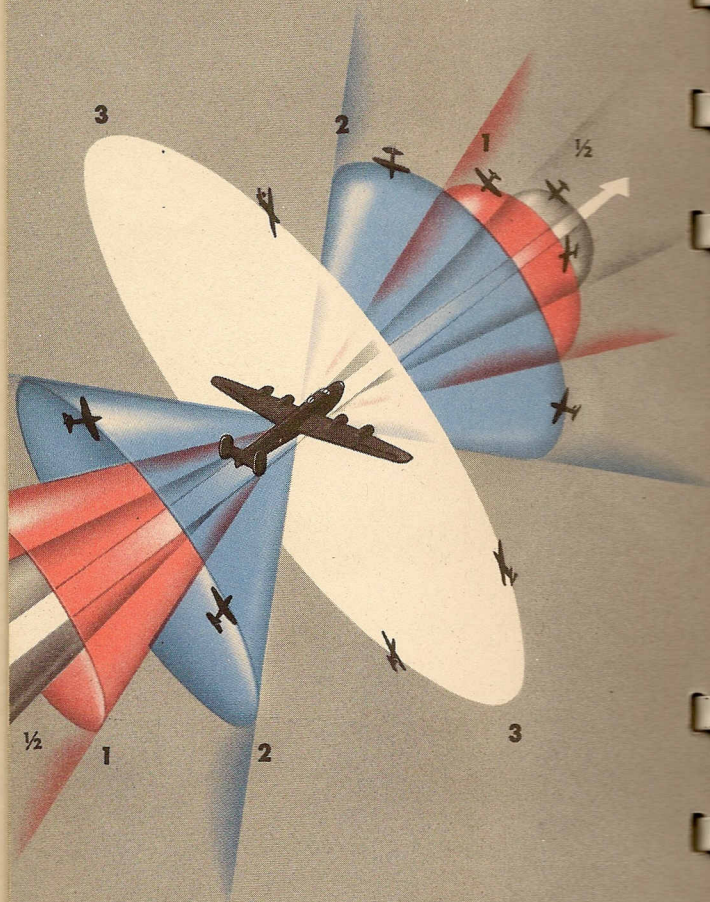
You must learn to recognize

4 DIRECTIONS

and then learn the deflection for each



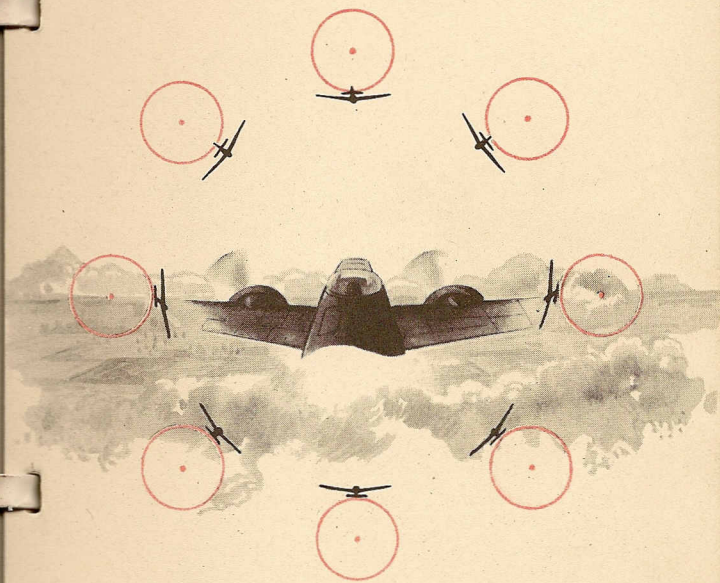
These directions go all around your line of flight and form **SURFACES OF CONES** which go out from your plane into space.



Give all fighters attacking from the surface of the same cone the same deflection.

ATTACKS FROM THE NOSE

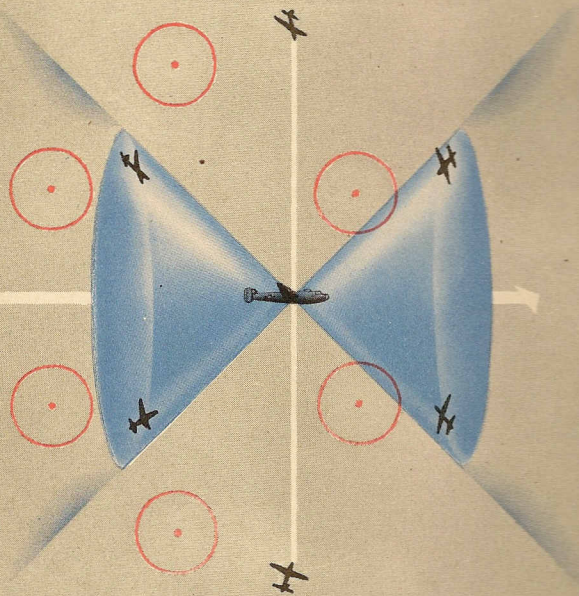
The amount of deflection shown is for CONE 1.



Notice that when he dives on you from ahead you aim ABOVE him, and that when he climbs you aim BELOW him—always back toward your tail.

ATTACKS FROM THE SIDE

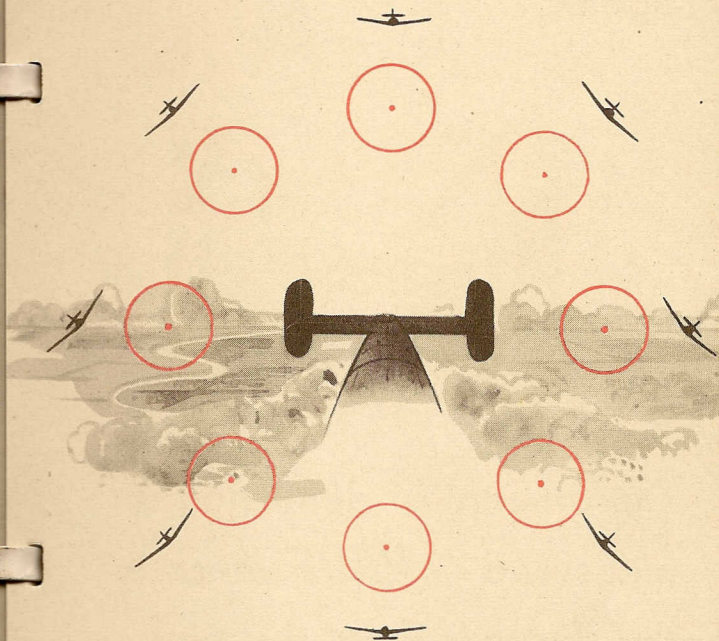
The amount of deflection shown is for CONES 2 & 3.



The deflections are the same for both front and rear CONE 2—all back toward your tail.

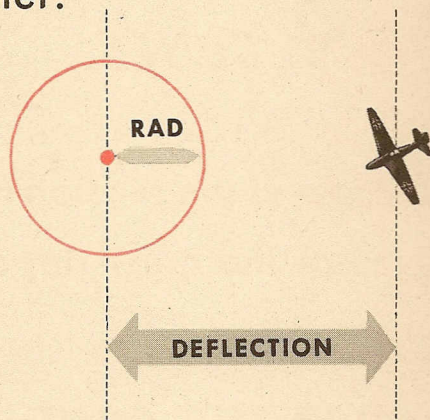
ATTACKS FROM THE TAIL

The amount of deflection shown is for CONE 2.



In all these attacks the deflection is the same as for front CONE 2. But when he dives from the rear you aim **BELOW**, and when he climbs you aim **ABOVE** him, in toward your tail.

In your sight the deflection is the distance between the bead, or pipper and the fighter.



The amount of deflection is measured in **RADS** which is the distance from the pipper to the edge of the ring.

The following drawings show the exact deflection for each of the

4 CONES

The success of the mission and the lives of the crew depend on whether you

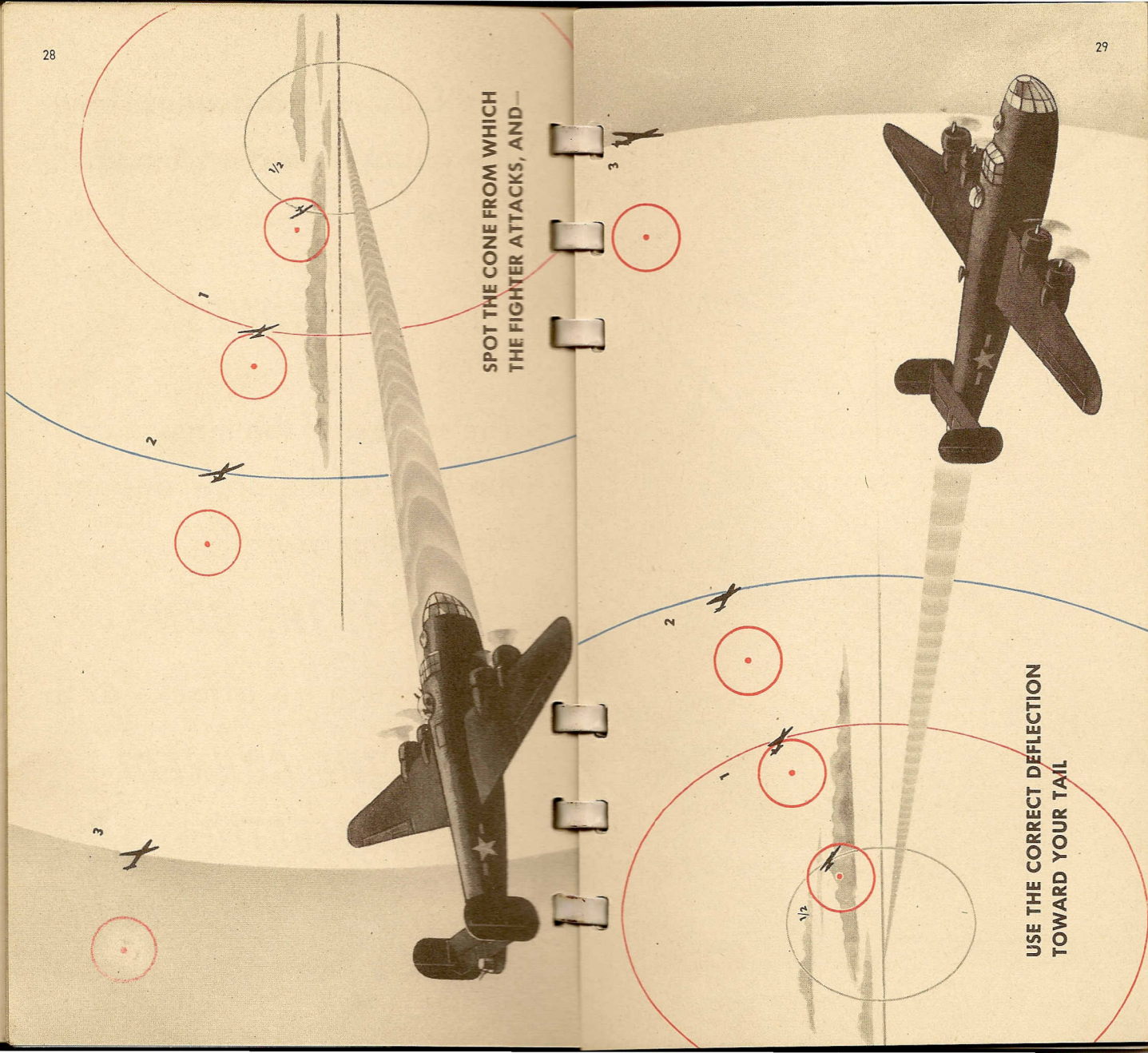
SPOT THE CONE

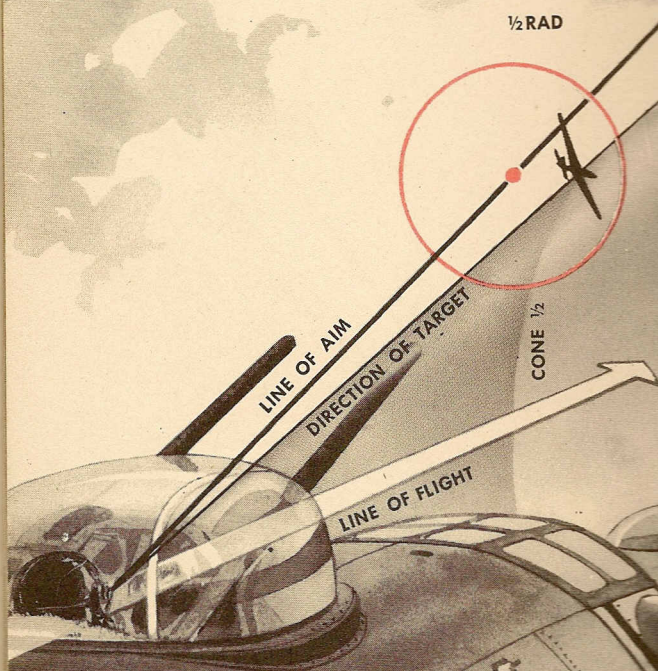
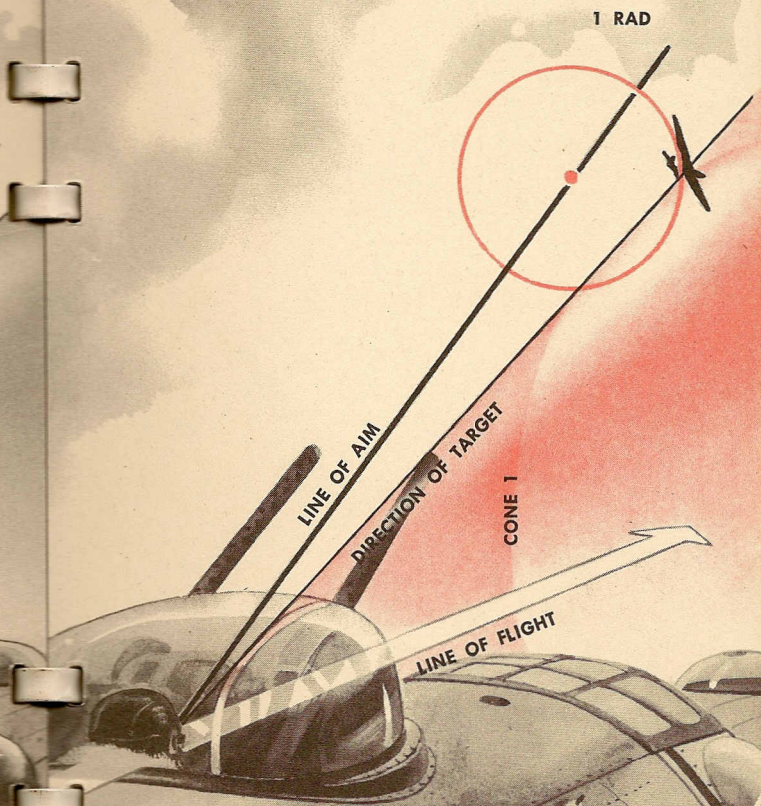
from which he attacks and

USE THE CORRECT DEFLECTION

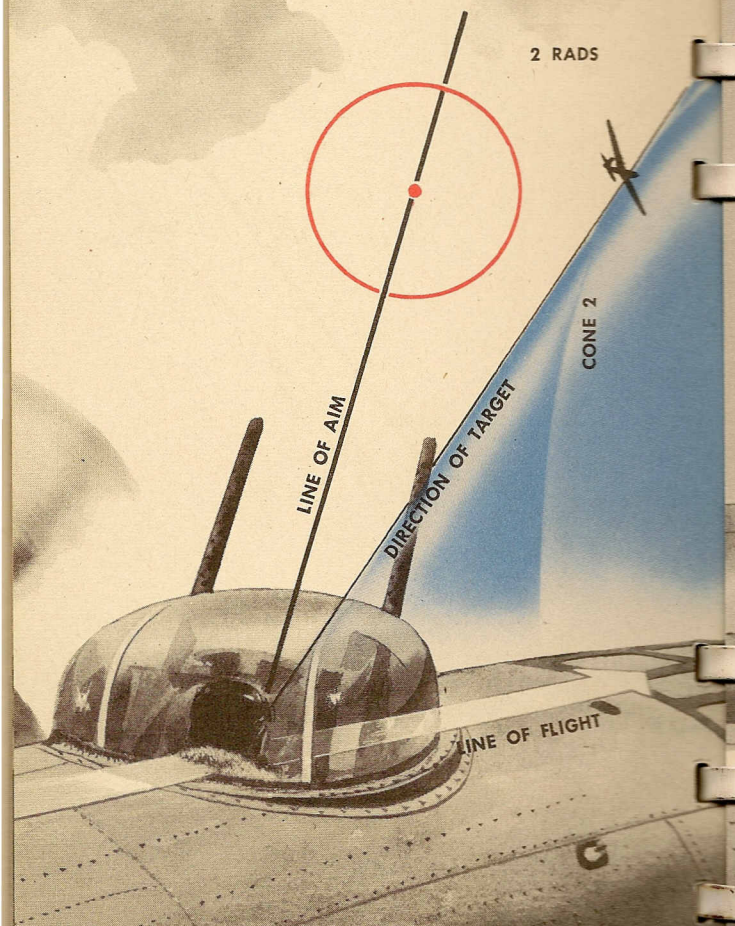
SPOT THE CONE FROM WHICH
THE FIGHTER ATTACKS, AND—

USE THE CORRECT DEFLECTION
TOWARD YOUR TAIL

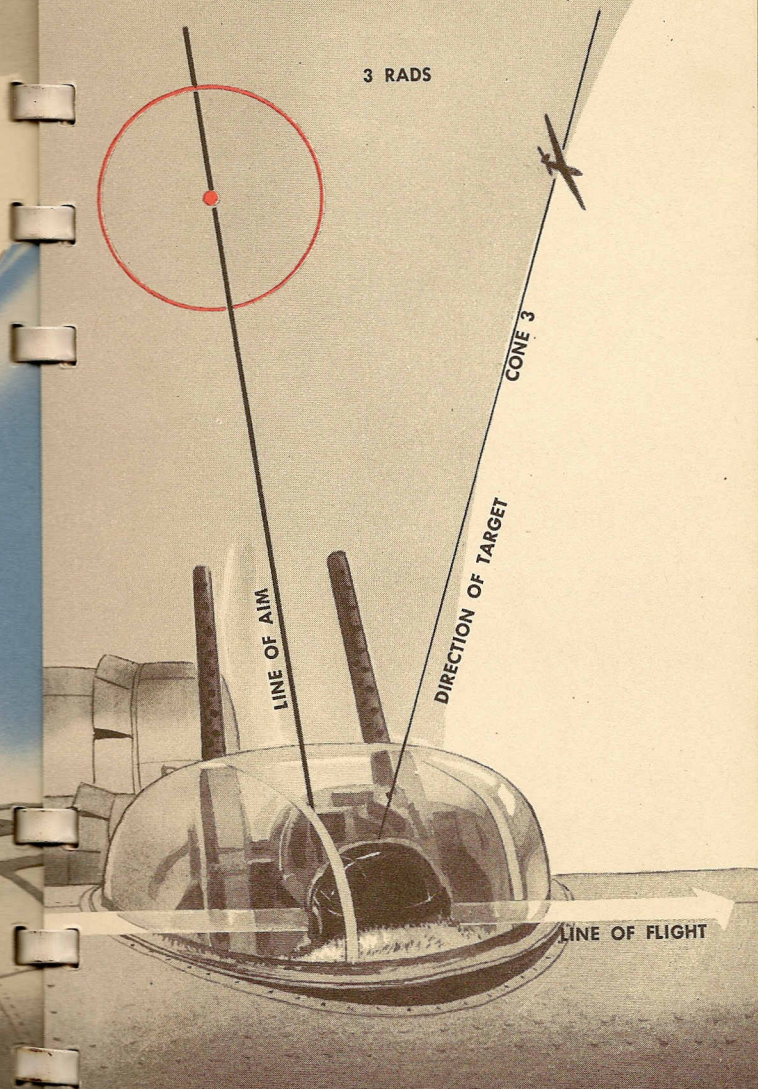


DEFLECTION FOR CONE $\frac{1}{2}$ 

DEFLECTION FOR CONE 1



DEFLECTION FOR CONE 2



DEFLECTION FOR CONE 3

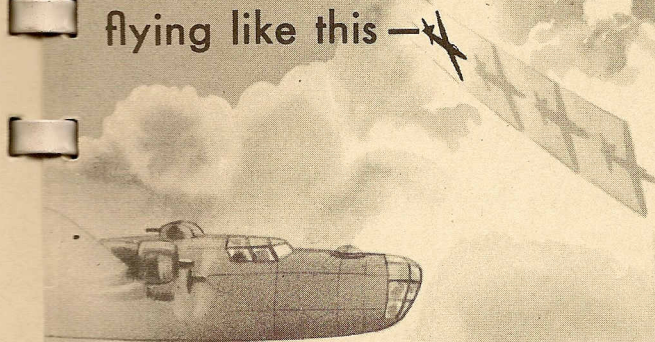
When a fighter flies an attack course he always slides in toward your tail.

A rear attack begun on Cone 2 moves toward Cone 1.

Front attacks from Cone 1 move toward Cone 2, etc.

When you aim towards the tail of your plane it is along this line of apparent motion of the fighter.

If the fighter attacks from the side, you **KNOW** he is flying like this —



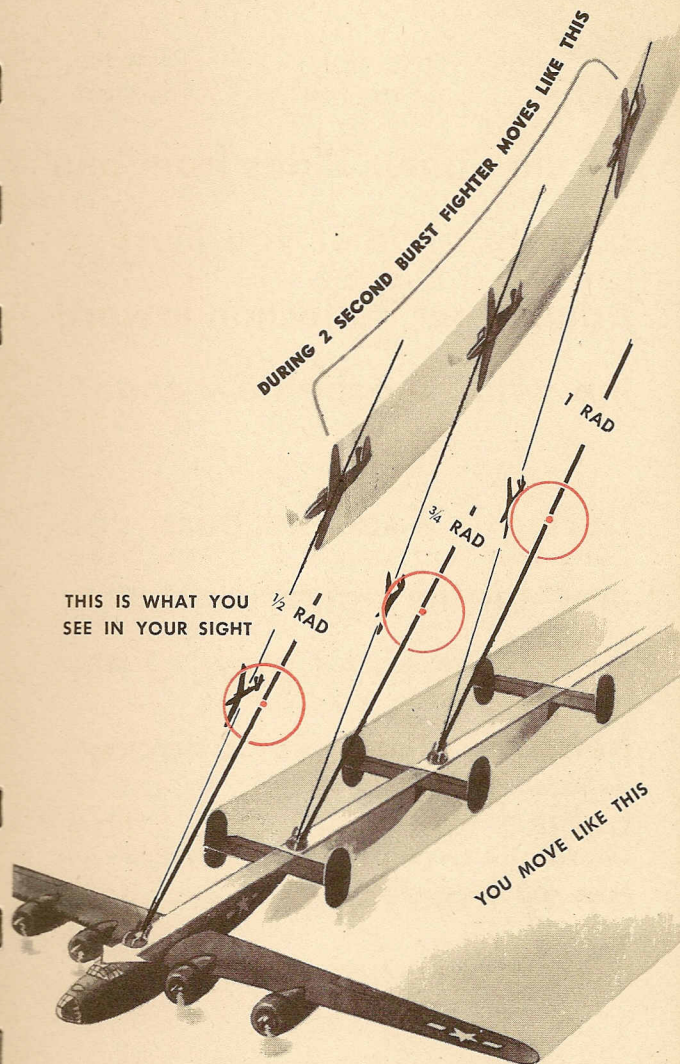
Now, point your gun at him and hold it still —



and he will **SEEM** to slide sideways toward your tail

As the fighter slides from one cone to another you must adjust your deflection toward the value for the new cone.

During a 2 second burst you must let the fighter drift in your sight $\frac{1}{2}$ rad toward the bead or pipper for attacks behind the beam, and $\frac{1}{2}$ rad away from the pipper for attacks forward of the beam.



CONE OF
ATTACKDIRECTION
OF FIGHTERDEFLECTION
IN RADS

0	DEAD AHEAD OR ASTERN	0
$\frac{1}{2}$	$11\frac{1}{4}^{\circ}$	$\frac{1}{2}$
1	$22\frac{1}{2}^{\circ}$	1
2	45°	2
3	90°	3

These deflections apply to a 225 mph true air speed for bomber and 325 mph for fighter.

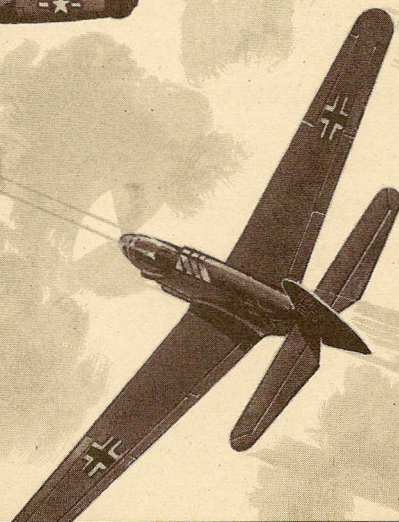
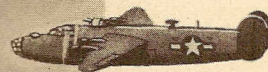
For each 25 mph increase in bomber's speed, increase deflection $\frac{1}{4}$ rad.

For each 25 mph decrease in bomber's speed, decrease deflection $\frac{1}{4}$ rad.

Changes in speed of fighter on pursuit curve have almost no effect on deflection.

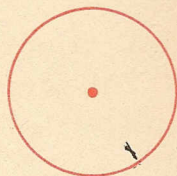
DON'T WASTE AMMUNITION

on fighters you
can't hit. At
1000 yards or
more you have
hardly a
chance.



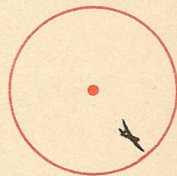
In the Army 70 mil—and the
Navy 35 mil sight a 35 foot
single engine fighter covers—

$\frac{1}{4}$ RAD at about
1200 YDS (Army)
4000 FT (Navy)



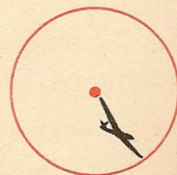
NOT A CHANCE

$\frac{1}{2}$ RAD at about
600 YDS (Army)
2000 FT (Navy)



START SHOOTING

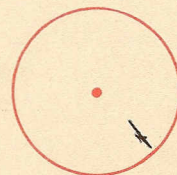
1 RAD at about
300 YDS (Army)
1000 FT (Navy)



POUR IT ON

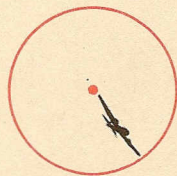
In the Army 70 mil—and the
Navy 35 mil sight a 60 foot
twin engine fighter almost
covers—

$\frac{1}{2}$ RAD at about
1200 YDS (Army)
4000 FT (Navy)



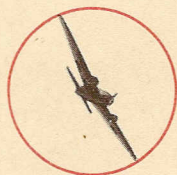
TOO FAR—SAVE IT

1 RAD at about
600 YDS (Army)
2000 FT (Navy)



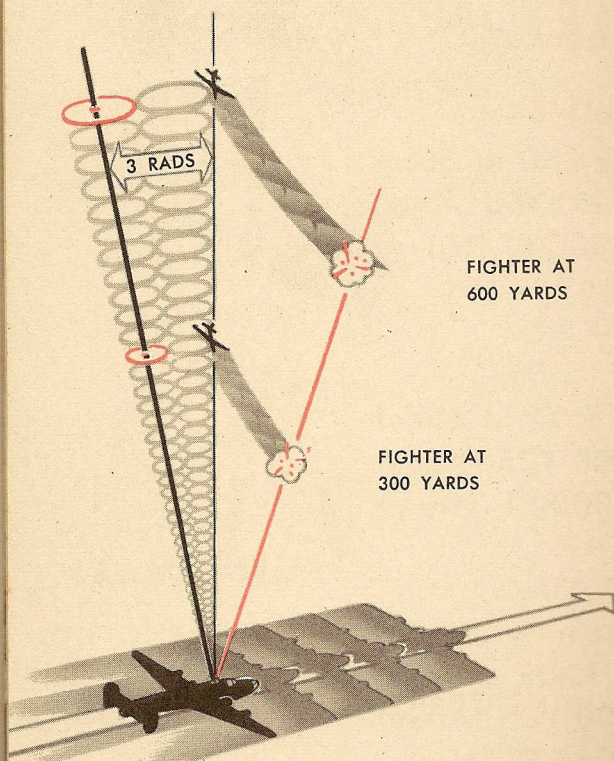
START SHOOTING

2 RADs at about
300 YDS (Army)
1000 FT (Navy)



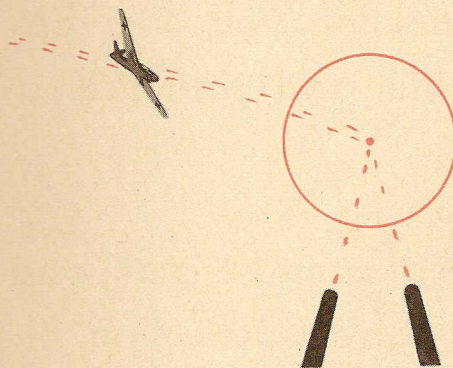
NOW OR ELSE

**THE NUMBER OF RADS IS
NOT AFFECTED BY RANGE**



If you need a 3 rad deflection to hit a fighter at 600 yards, you need the same 3 rad deflection at 300 yards as long as the fighter stays on the same cone.

**DON'T DEPEND ON
TRACERS. THEY ARE
VERY LIKELY TO
FOOL YOU**



Even when they appear to be going through the fighter, they may be missing him completely — over, beyond, short or under.

REMEMBER THESE SIMPLE RULES—

1.

When the fighter has started his attack on you, aim between him and your tail.

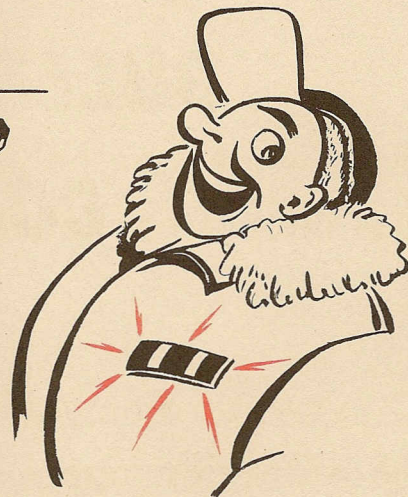
2.

Spot what cone he is on, and use the correct deflection.

3.

Don't waste ammunition when he is out of range.

GET THAT FIGHTER

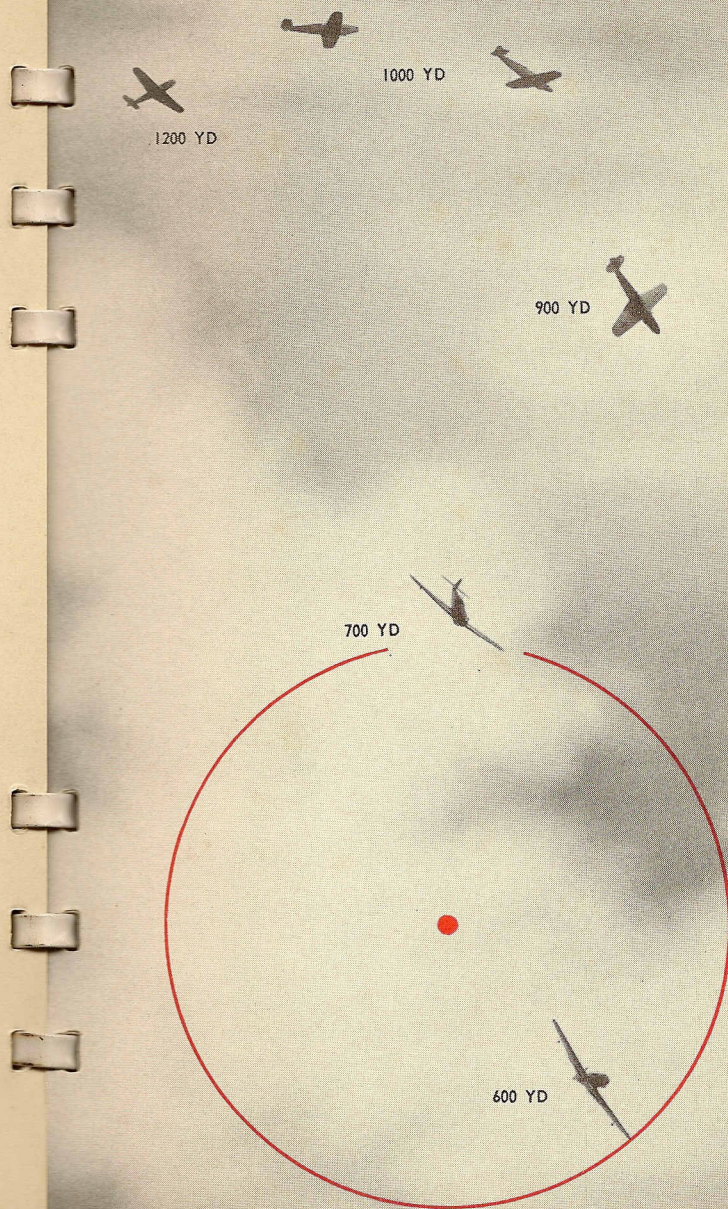


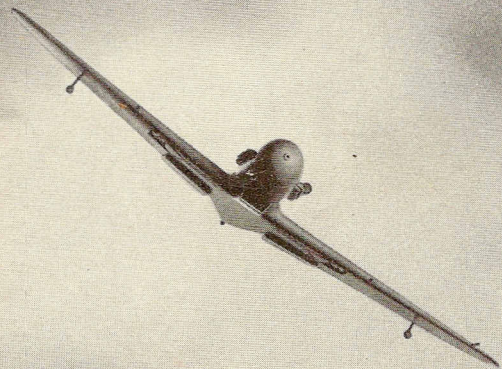
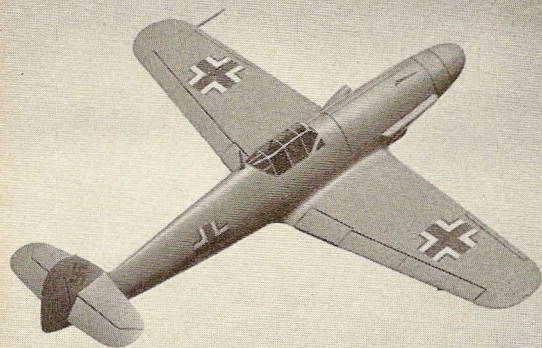
AND FINALLY—

BE SURE YOU **KNOW** THE FOLLOWING ENEMY FIGHTERS AND **MAKE** **EVERY** **BULLET** **COUNT**

The performance graphs for the following fighters are for comparative purposes in accordance with information available Sept. 1943. For more detailed data, variations in type, and later developments consult latest Informational Intelligence Bulletins.

The red ring on the following pages shows the size of the fighter at 600 yards in the Army 70 mill and the Navy 35 mill sight.





2500

500

25



1200 YD



1000 YD



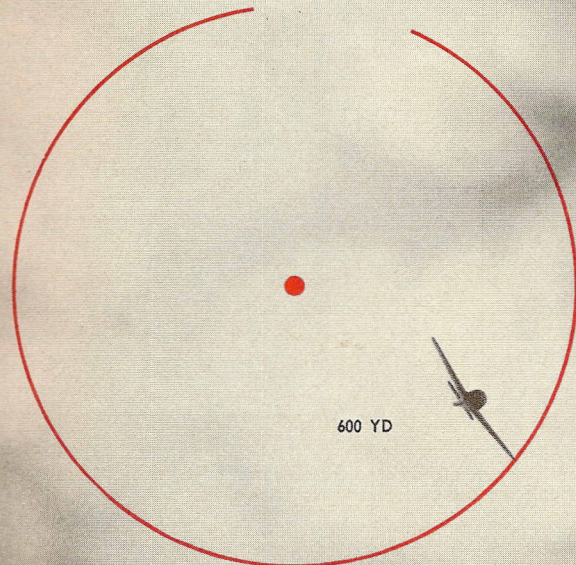
900 YD

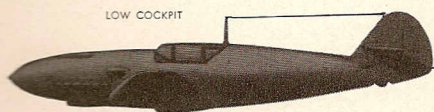
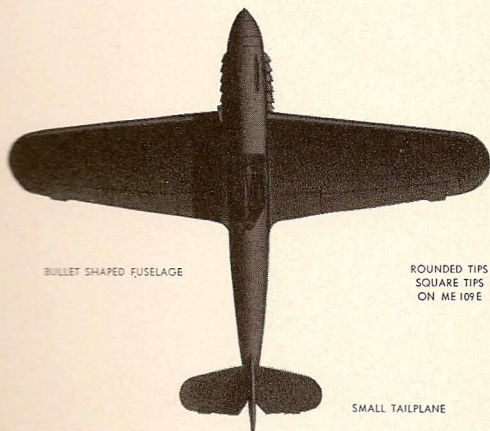


700 YD



600 YD



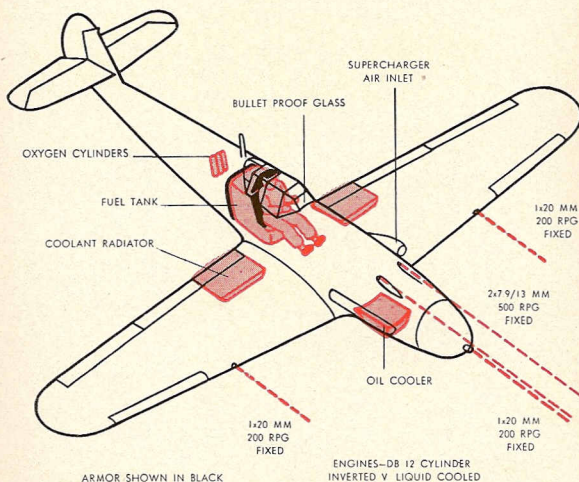
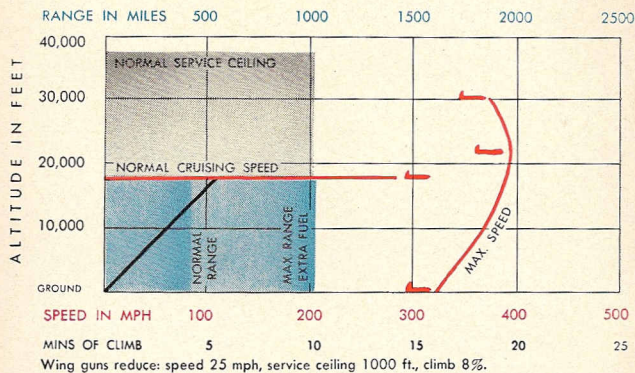


ME 109G FIGHTER

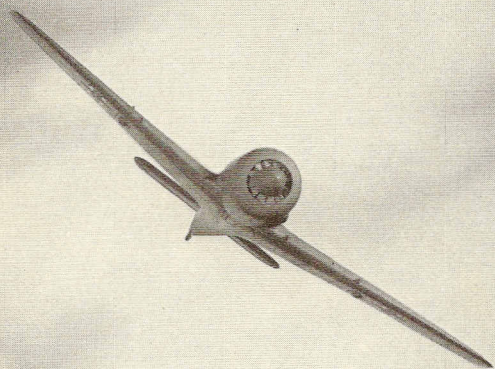
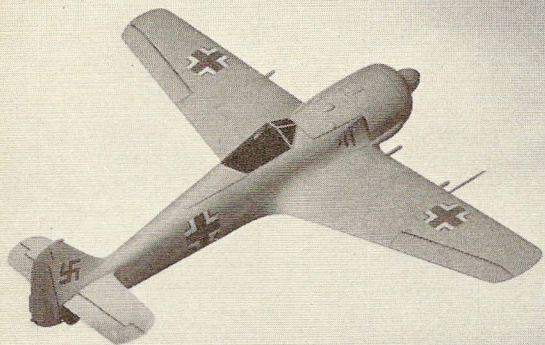
SPAN—32' 7"

LENGTH—29' 4"

MAX. WEIGHT—7,230



The ME 109 has been in the thick of action wherever the Luftwaffe has operated. It has maneuverability, climbing ability, and its ceiling is higher than some of the Allied fighters sent against it. Some subtypes have pressurized cabin for sustained operation at high altitude, and "GM-1" equipment for short emergency acceleration at high altitude may be installed.



500

100

25

100

25

100

25

100

25

100

25



1200 YD



1000 YD



900 YD

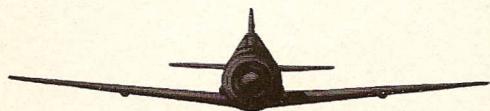


700 YD

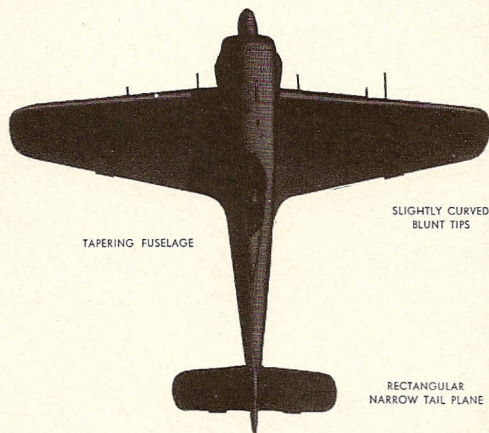


600 YD





RADIAL ENGINE

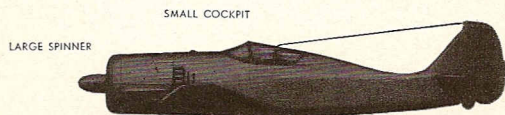


TAPERING FUSELAGE

SLIGHTLY CURVED
BLUNT TIPS

RECTANGULAR
NARROW TAIL PLANE

ANGULAR EDGE
CORNER ON FIN



SMALL COCKPIT

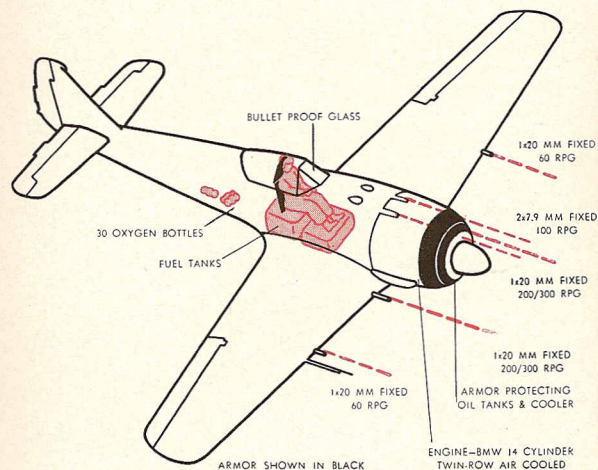
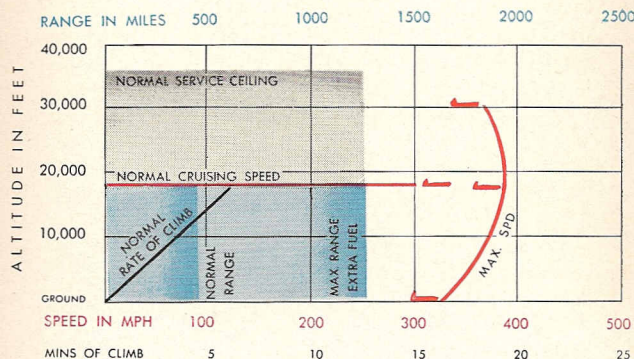
LARGE SPINNER

FW 190 FIGHTER

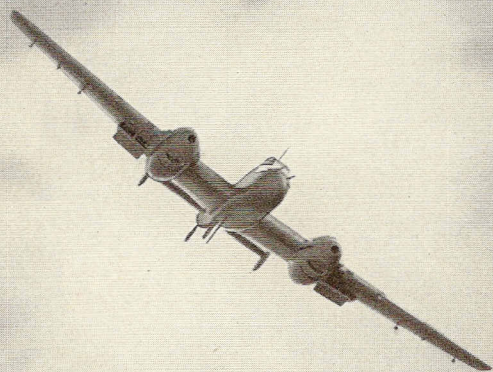
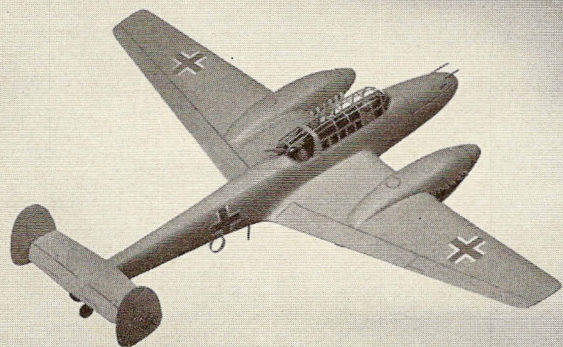
SPAN—34' 6"

LENGTH—29' 1"

MAX. WEIGHT—10,350



The only single engine German fighter with a radial engine, the FW 190 is as good as any fighter in the world today at medium altitudes. Excellent features are numerous automatic devices that afford the pilot maximum freedom from manual operation in combat; such as master control for boost mixture, ignition, propeller pitch, throttle. Exceptionally maneuverable, very high initial acceleration in climbs and dives, can be rolled at fighting speed. Prominent weakness is inability to make tight turns. Engine warms up slowly and it is difficult to taxi. Subtypes have GM-1 power boosting equipment.



1200 YD



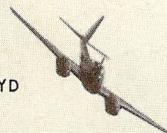
1000 YD



900 YD

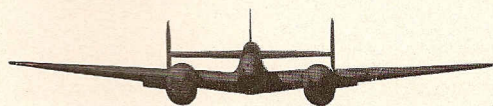


700 YD



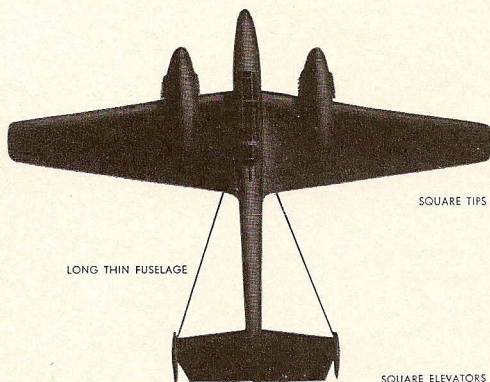
600 YD





RADIATOR UNDER WINGS

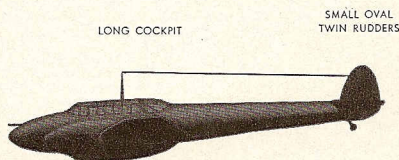
NACELLES BACK OF NOSE



LONG THIN FUSELAGE

SQUARE TIPS

SQUARE ELEVATORS



LONG COCKPIT

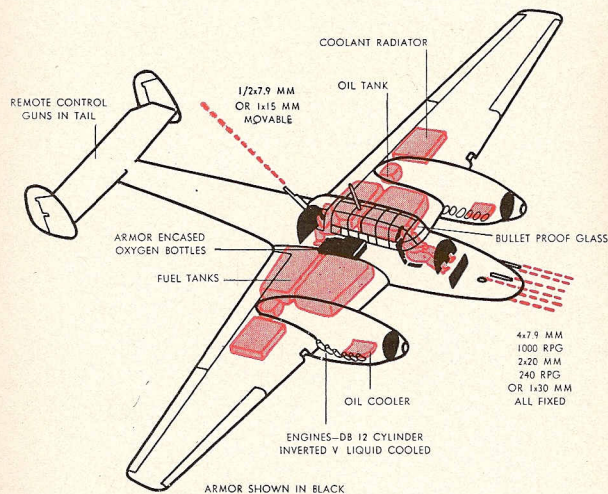
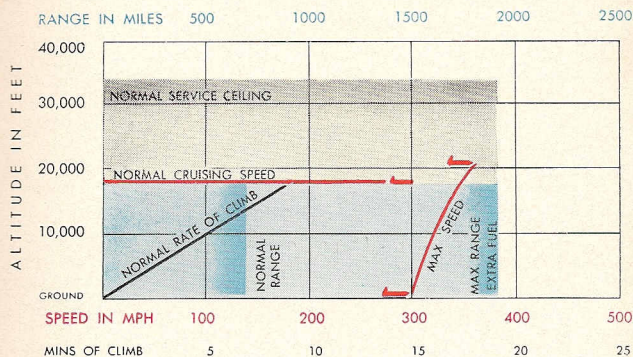
SMALL OVAL
TWIN RUDDERS

ME 110 LONG RANGE AND NIGHT FIGHTER

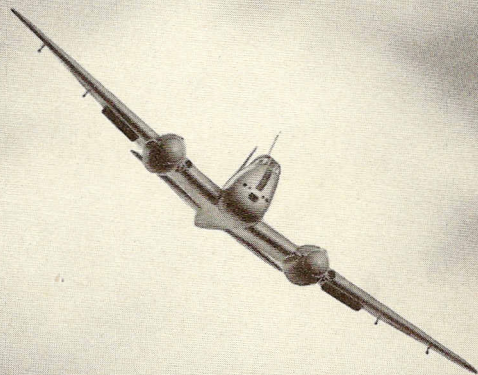
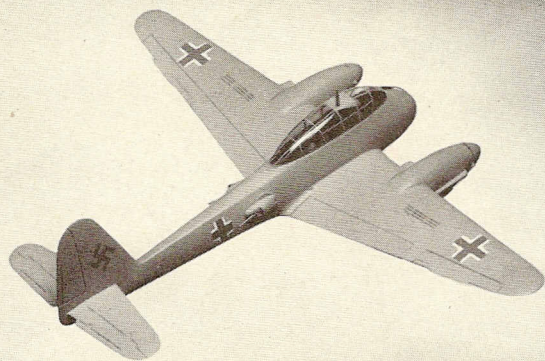
SPAN—53' 11"

LENGTH—40' 4"

MAX. WEIGHT—20,400



Used principally as long range day and night fighter and for reconnaissance, the ME 110 can fly long distances with considerable overloads. It can be fitted with jettisonable wing and blister belly tanks. Pilot has exceptionable visibility, controls are simple, and single engine performance is very good. All guns point straight ahead, giving constant pattern throughout bullet range instead of single focus point.



1200 YD



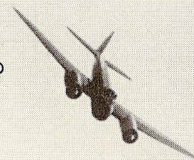
1000 YD



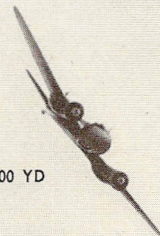
900 YD

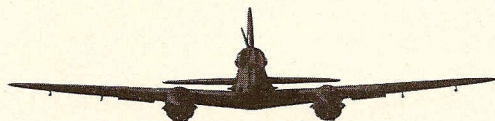


700 YD

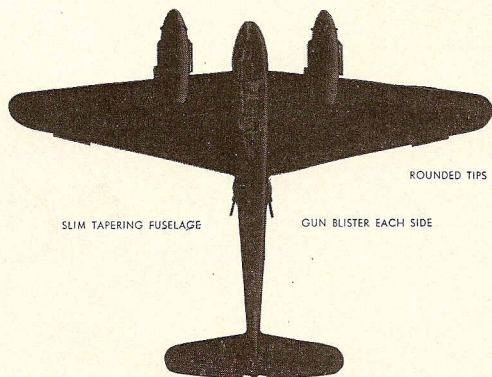


600 YD





NACELLES PROJECT BEYOND NOSE



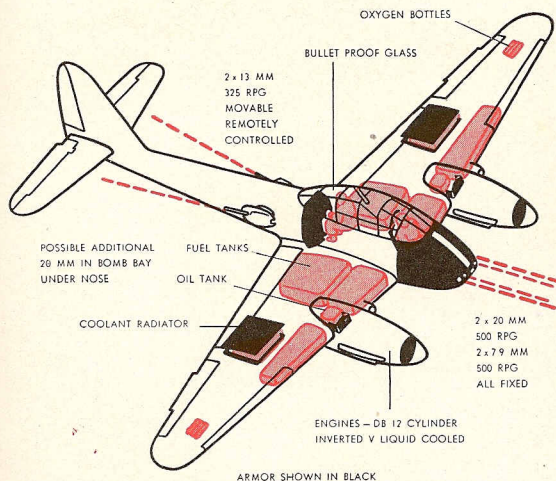
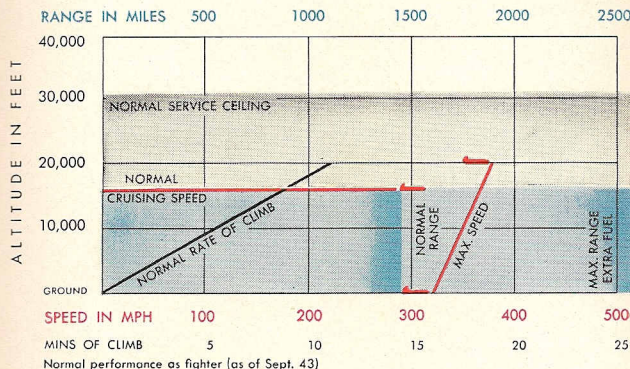
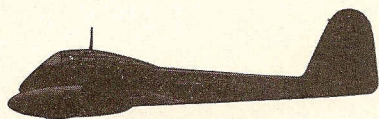
SLIM TAPERING FUSELAGE

ROUNDED TIPS

GUN BLISTER EACH SIDE

"BULGED" GREENHOUSE FORWARD

TRIANGULAR TALL SINGLE FIN



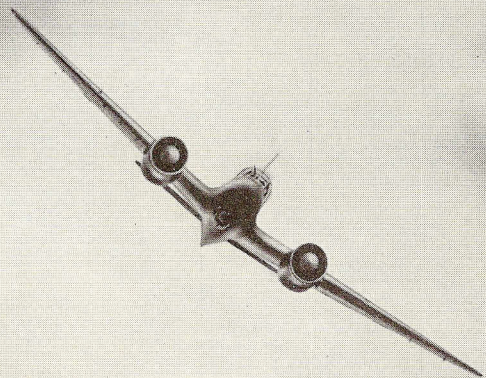
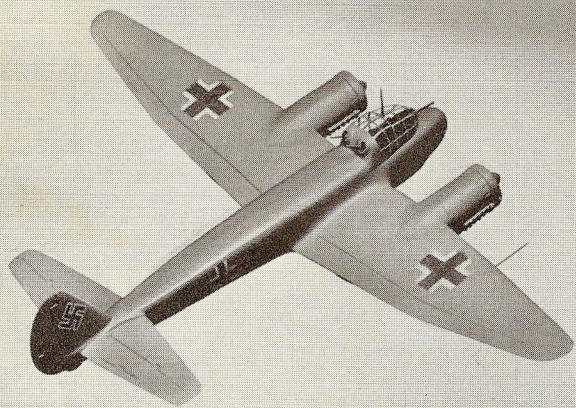
ME 210 FIGHTER, LIGHT BOMBER

SPAN—53' 9"

LENGTH—40' 3"

MAX. WEIGHT—24,750

This is one of the latest Nazi aircraft intended for both fighter and bomber use. Called by some the German answer to the Mosquito. The fuselage sides contain movable guns in revolving blisters remotely controlled by the radio operator. They have a wide cone of fire and sighting is done by means of a reflector sight. The ME410 is a re-engined, considerably faster version with the same airframe.



500

300

25



1200 YD



1000 YD



900 YD



700 YD



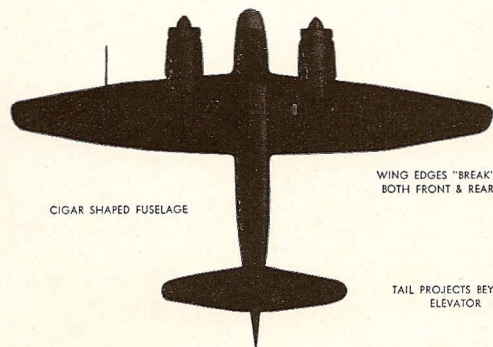
600 YD





OFF CENTER
GUN GONDOLA

ANGULAR NACELLES EVEN WITH NOSE



CIGAR SHAPED FUSELAGE

WING EDGES "BREAK"
BOTH FRONT & REAR

TAIL PROJECTS BEYOND
ELEVATOR

"BULGED" GREENHOUSE FORWARD

TAIL ROUNDED AFT

SOLID NOSE

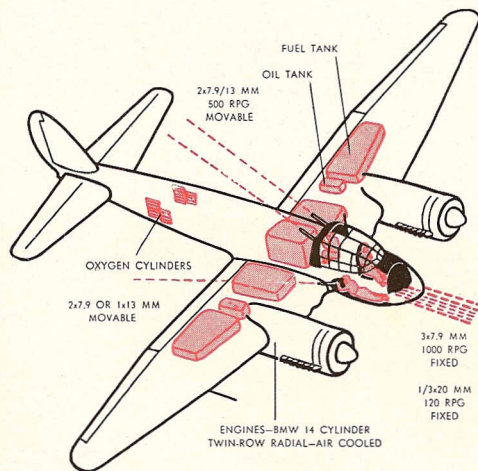
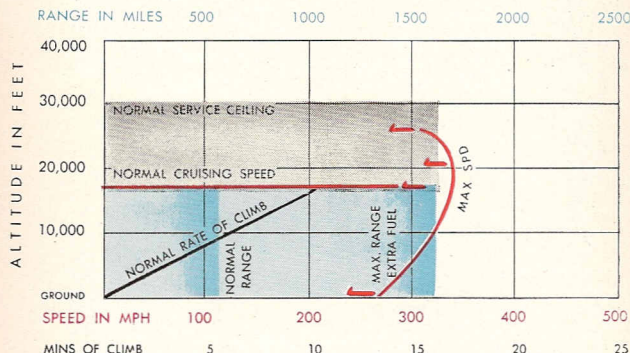


JU 88-C6 INTRUDER, NIGHT FIGHTER

SPAN—66'

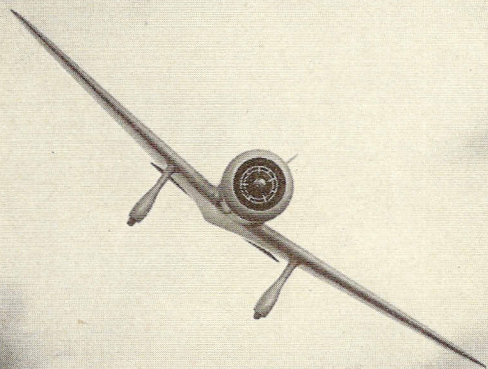
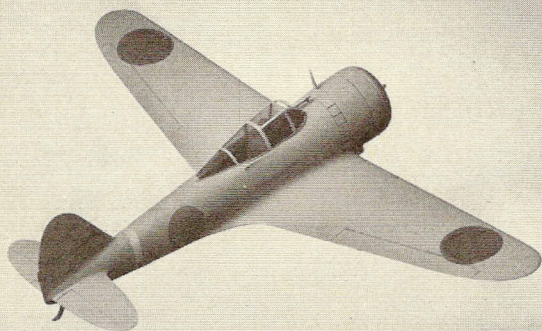
LENGTH—47'

MAX. WEIGHT—28,500



ARMOR SHOWN IN BLACK

The JU 88 is one of the chief offensive weapons of the Nazis, in service on all fronts. The C series is used as a long range day and night fighter; the A series for dive and level bombing of both land and sea targets. The A series' liquid cooled Jumo engines resemble radials because of the circular radiators; they can be fitted with rockets for assisted takeoff. Because of the many uses to which the JU 88 is put, there are a number of different arrangements in armament and some structural variations.



1200 YD



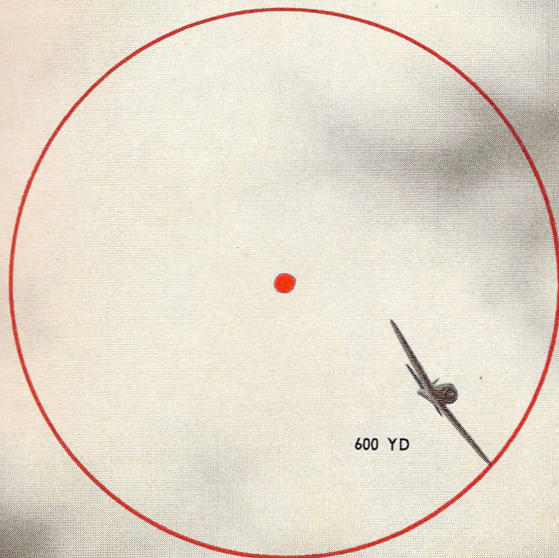
1000 YD



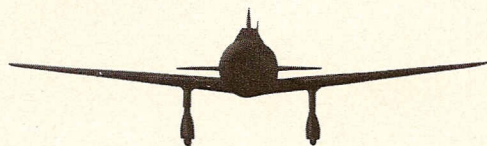
900 YD



700 YD

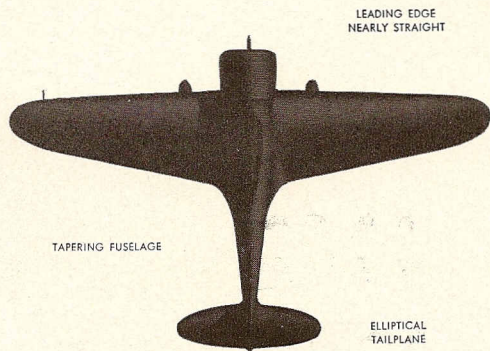


600 YD



FIXED LANDING GEAR

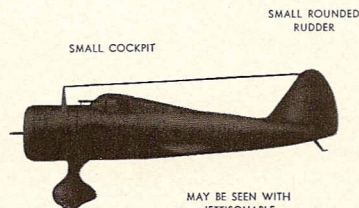
RESEMBLES OSCAR EXCEPT FOR FIXED LANDING GEAR



LEADING EDGE
NEARLY STRAIGHT

TAPERING FUSELAGE

ELLIPTICAL
TAILPLANE



SMALL COCKPIT

SMALL ROUNDED
RUDDER

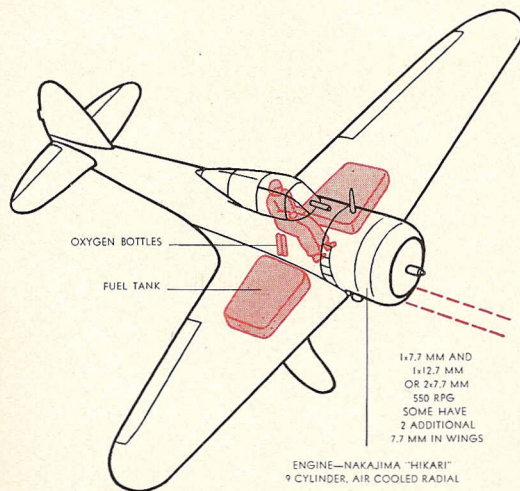
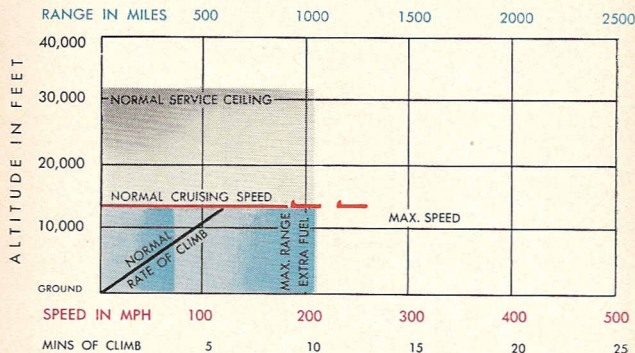
MAY BE SEEN WITH
JETTISONABLE
BELLY TANKS

NATE FIGHTER

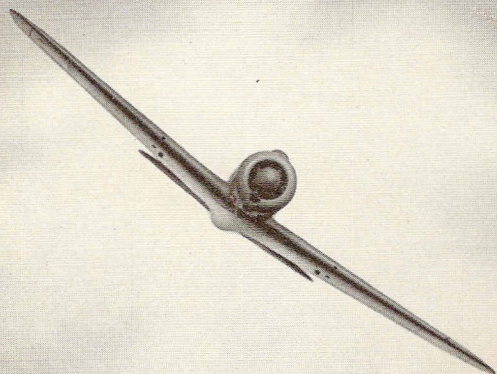
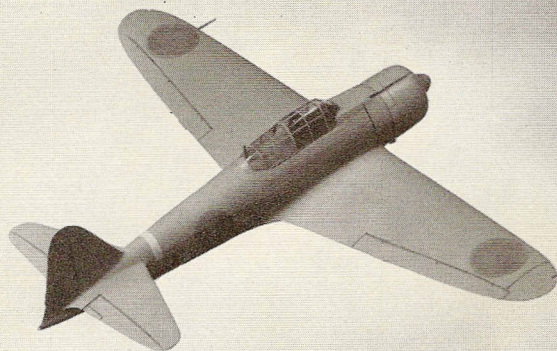
SPAN—35' 10"

LENGTH—24' 4"

MAX. WEIGHT—5,500



A forerunner of Japanese modern fighter aircraft, NATE is small, light, and maneuverable, with an unusually high rate of climb. Slower than more modern planes, without leakproof tanks, and of light construction, it is very vulnerable. NATE was used in the war with China, took part in the conquest of Burma, and has been seen occasionally in the Southwest Pacific. Since it is not carrier-based, its appearance may indicate the presence of Japanese Army Units in an operating area.



500

100
25



1200 YD



1000 YD



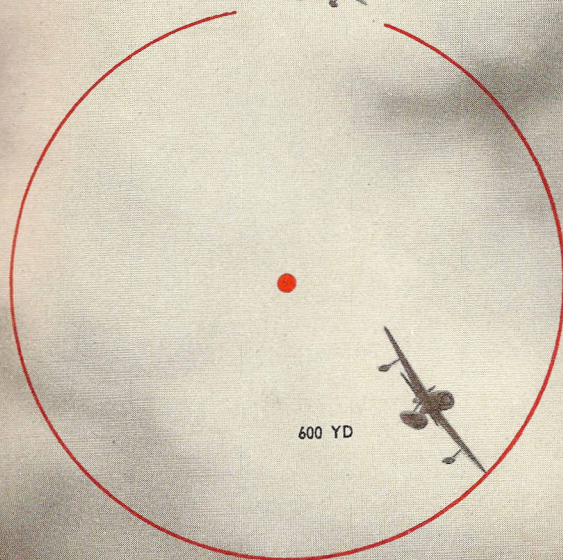
900 YD



700 YD



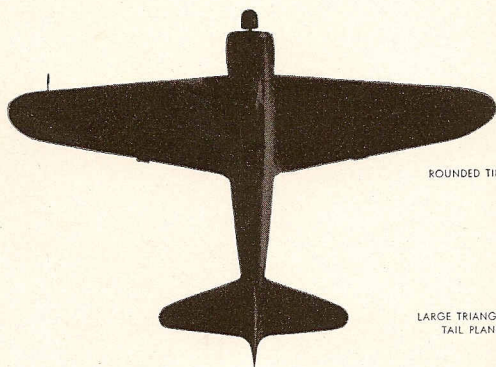
600 YD





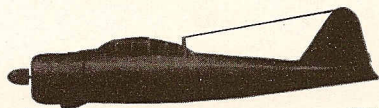
SCOOPS

RESEMBLES HAP EXCEPT FOR ROUNDED TIPS



ROUNDED TIPS

LARGE TRIANGULAR
TAIL PLANE



HIGH SET COCKPIT ENCLOSURE

LARGE FIN
AND RUDDER

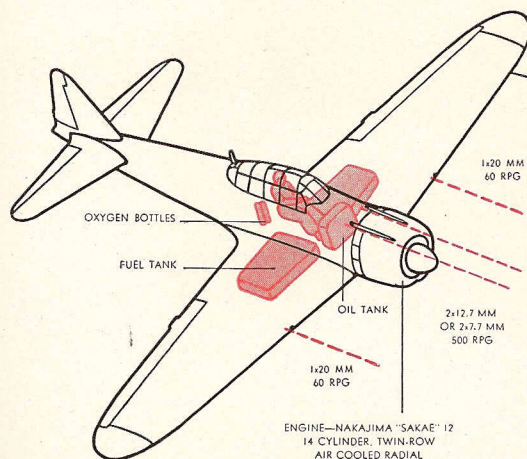
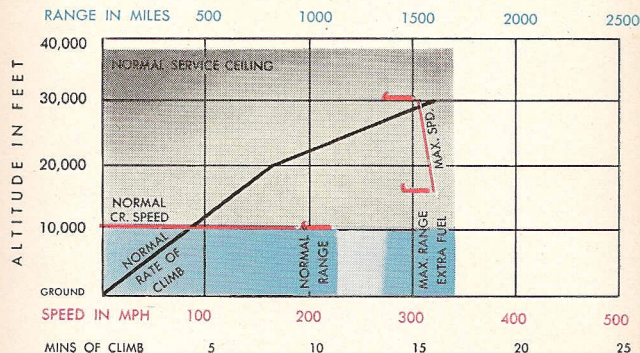
POINTED TAIL

ZEKE FIGHTER

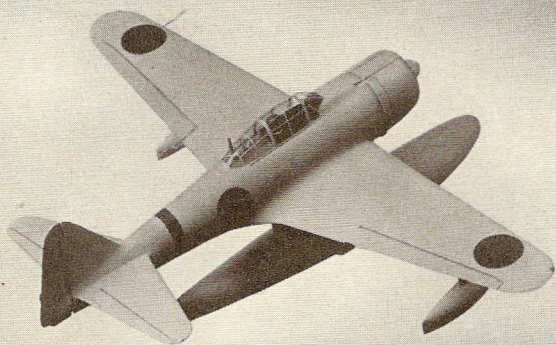
SPAN—39' 5"

LENGTH—29' 7"

MAX. WEIGHT—5,689



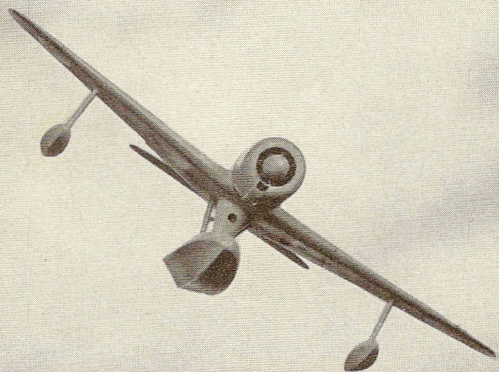
Reports of the formidable qualities of this aircraft have been largely disproved since a captured "Zero" has been tested. While notable for its light weight, high rate of "zoom", great maneuverability at speeds under 300 m.p.h., and excellent stalling characteristics, ZEKE is not the equal of the more modern American planes. It has a slow rate of roll at high speeds, and its engine tends to fail under negative acceleration. This plane can carry small anti-personnel bombs or a disposable fuel tank attached below the fuselage.



500

00

25



1200 YD



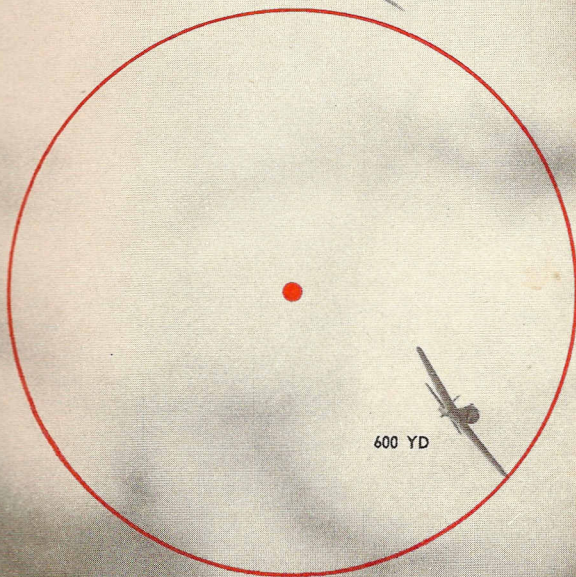
1000 YD



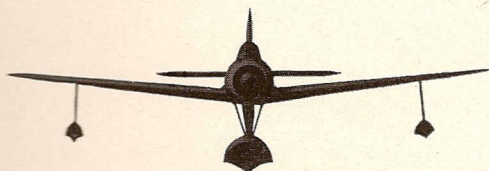
900 YD



700 YD

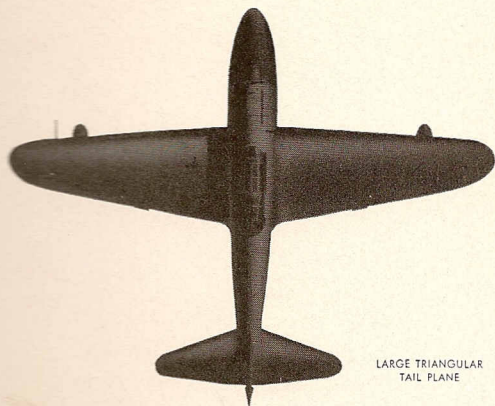


600 YD



SINGLE FLOAT

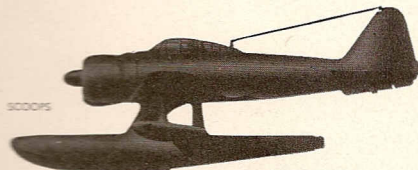
RESEMBLES ZEKE EXCEPT FOR FLOAT



LARGE TRIANGULAR
TAIL PLANE

HIGH SET COCKPIT ENCLOSURE

LARGE FIN
AND RUDDER



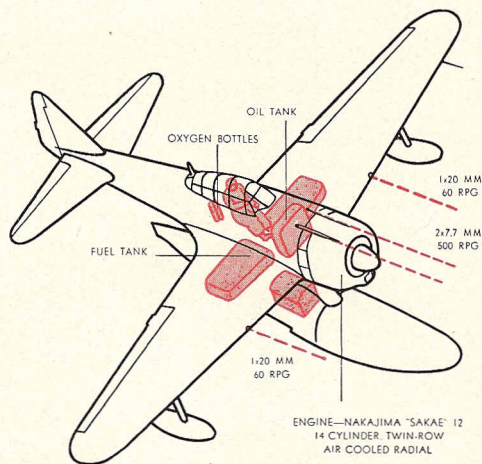
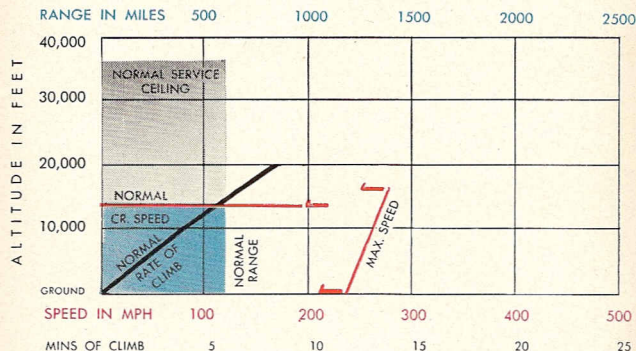
SCOOPS

RUFE FIGHTER, RECONNAISSANCE

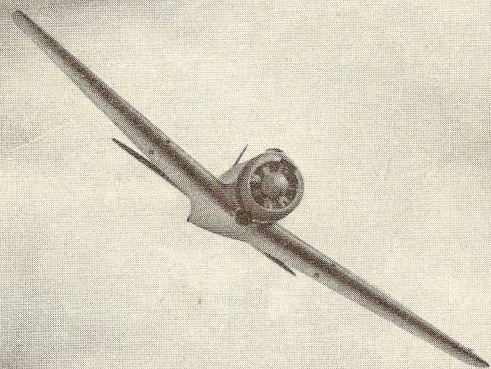
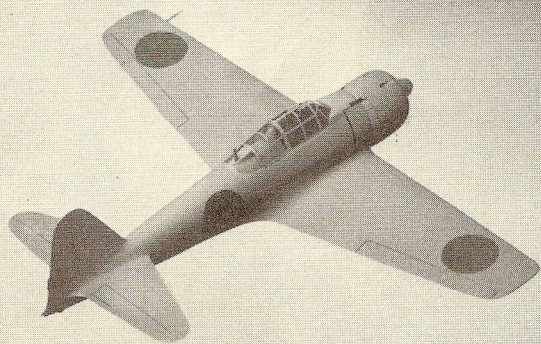
SPAN—39' 5"

LENGTH—33' 10"

MAX. WEIGHT—6,436



A float-plane conversion of ZEKE, RUFE is structurally similar. With the added weight and drag of the floats, however, it has poorer performance than ZEKE, being about 40 m.p.h. slower, with a slightly lower rate of climb, a much decreased range, and a lower service ceiling. RUFE has appeared in all theaters as a fighter and reconnaissance aircraft, being used largely in those areas where adequate facilities for land based planes are not available.



500

00

25



1200 YD



1000 YD



900 YD

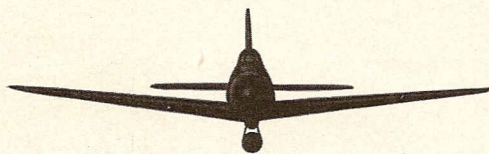


700 YD



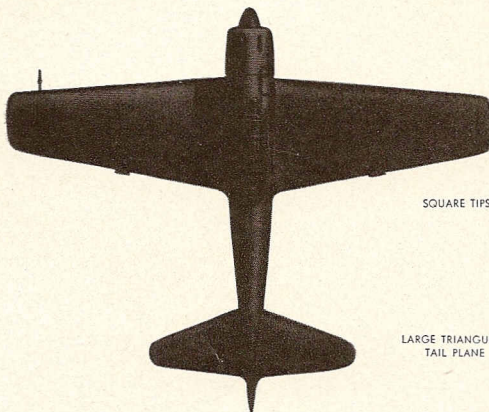
600 YD





JETTISONABLE
BELLY TANKS

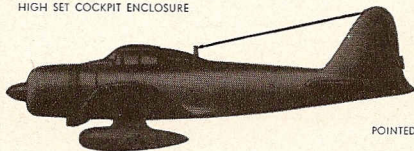
RESEMBLES ZEKE EXCEPT FOR SQUARE WING TIPS



SQUARE TIPS

LARGE TRIANGULAR
TAIL PLANE

HIGH SET COCKPIT ENCLOSURE



LARGE FIN
AND RUDDER

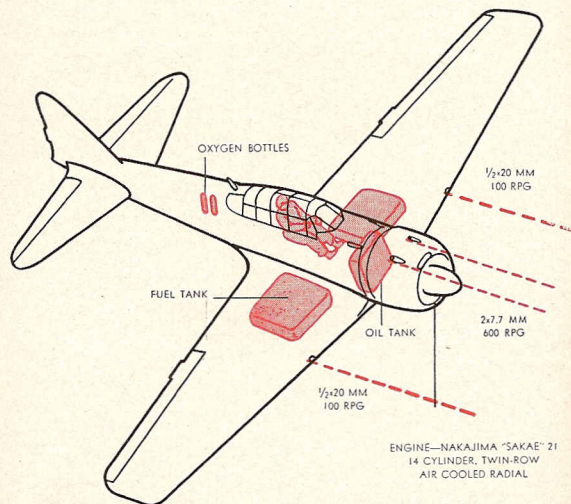
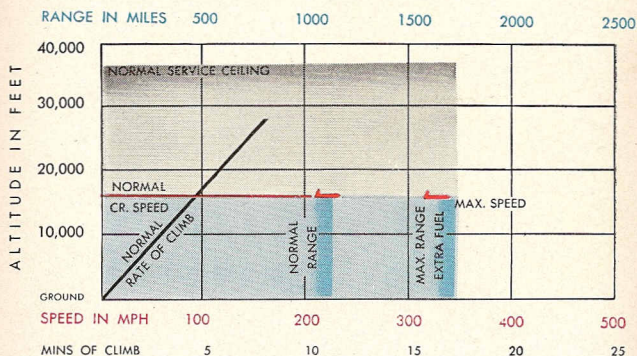
POINTED TAIL

HAP FIGHTER

SPAN—36' 6"

LENGTH—29' 7"

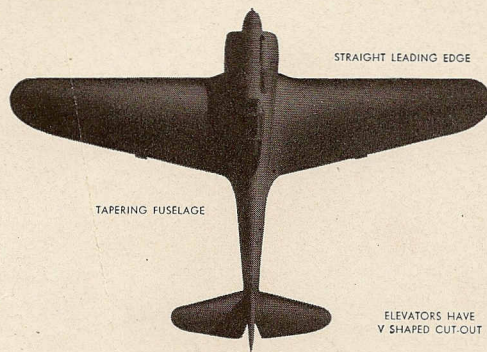
MAX. WEIGHT—6,200



The Mark 2 version of the "Zero", HAP is essentially the same aircraft equipped with a more powerful engine. The alterations are reflected in a different cowling and air intake location; and ZEKE's hinged wingtip was removed and the aileron shortened to provide greater maneuverability at high speeds. HAP is somewhat faster than ZEKE and possesses a higher rate of climb, but has considerably less range. This aircraft first appeared in the South and Southwest Pacific during the fall of 1942 and has since become one of the important fighters in that area.



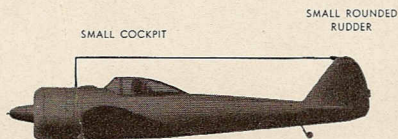
RESEMBLES NATE EXCEPT FOR RETRACTABLE LANDING GEAR



STRAIGHT LEADING EDGE

TAPERING FUSELAGE

ELEVATORS HAVE
V SHAPED CUT-OUT



SMALL COCKPIT

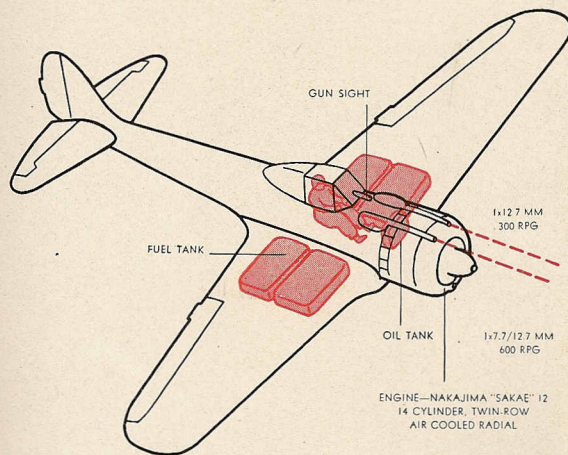
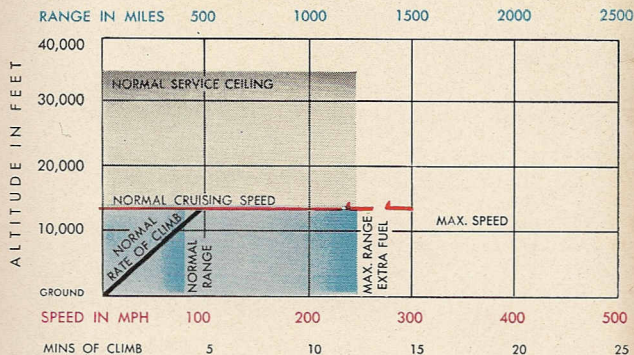
SMALL ROUNDED
RUDDER

OSCAR Mk 1 FIGHTER

SPAN—37' 7"

LENGTH—28' 7"

MAX. WEIGHT—6,150



Developed from NATE, Type 97 fighter, this aircraft is similar to its prototype in appearance; differences, however, occur in the undercarriage, which is retractable, in the rudder, and in the shape of the horizontal stabilizer. OSCAR is a very light plane as compared with our average fighter weight of 9000 to 11,000 lbs., has excellent maneuverability, and a higher rate of climb than either NATE or ZEKE. OSCAR has been the principal fighter in the Burma-India theater, where ZEKE is seldom used, and appeared in quantity in the Southwest Pacific in 1943. This aircraft is one of the first Japanese planes in which leakproof gasoline tanks have been installed.