

UNCLASSIFIED

AD NUMBER	
ADA953056	
CLASSIFICATION CHANGES	
TO:	UNCLASSIFIED
FROM:	CONFIDENTIAL
LIMITATION CHANGES	
TO: Approved for public release; distribution is unlimited. Document partially illegible.	
FROM: Distribution authorized to U.S. Gov't. agencies and their contractors; Administrative/Operational Use; 06 MAR 1943. Other requests shall be referred to Air Force Proving Ground Command, Eglin AFB, FL. Document partially illegible.	
AUTHORITY	
1 Jul 1952 per APGC; AFATL ltr dtd 17 Jan 1984	

THIS PAGE IS UNCLASSIFIED

OTIC FILE COPY

AD A 953056

This document has been approved
for public release and sale, in
particular for unclassified.

FILE COPY
LOAN ONLY

OTIC
LECTE
1130 7 1984
E

STI No. 177/88

**Best
Available
Copy**

DISCLAIMER NOTICE

**THIS DOCUMENT IS BEST QUALITY
PRACTICABLE. THE COPY FURNISHED
TO DTIC CONTAINED A SIGNIFICANT
NUMBER OF PAGES WHICH DO NOT
REPRODUCE LEGIBLY.**

ATI NO. 77188
ASIA FILE COPY
①

~~Classification cancelled~~

Date 18 Nov. 54 FINAL REPORT

ON

TACTICAL SUITABILITY OF THE P-33F TYPE AIRCRAFT

Accession For
NTIS GFA&I
DTIC TAB
Unannounced

Serial No.; 4-42-3 No. of Pages: 10 Date: 6 March 1943.

Copy available to DTIC does not permit fully legible reproduction

UNANNOUNCED

Distribution/
Availability Codes
Avail and/or
Dist Special

DUDLEY W. WATKINS, A-1
Colonel, Air Corps,
Chief, Proof Department.

APPROVED:

GRANDISON GARDNER, Classified
Brigadier General, U. S. Army, by 3rd Ind
Commanding.

Classification cancelled

AUTH

8.

Date _____

This document has been approved for public release and sale; its distribution is unlimited.

CONFIDENTIAL

~~CONFIDENTIAL~~

1. OBJECT:

To determine the relative tactical value of the P-38F type aircraft for combat service.

2. INTRODUCTION:

This test was initiated by a letter from the Director of Military Requirements, Headquarters Army Air Forces, Washington, D. C., dated 9 April 1942, to the Commanding Officer, Proving Ground Command, Eglin Field, Florida, concerning the testing of aircraft to determine their operational suitability. The test was started August 7, 1942, and was terminated January 26, 1943.

a. Description. The articles tested were the standard P-38F type airplanes, A.C. Serial Numbers 41-7536 and 41-7612. The P-38F is a tricycle geared, single-seated, monoplane, powered with two (2) twelve (12) cylinder turbo supercharged Allison engines, models V-1710-49 (R.H.) and V-1710-53 (L.H.), which turn propellers in opposite directions. The length is thirty-seven (37) feet, nine and five-sixteenths (9-5/16ths) inches; height nine (9) feet, nine and three-fourths (9-3/4ths) inches, and the span fifty-two (52) feet, zero (0) inches. It is equipped with racks to carry two (2) external droppable gas tanks of normal load of one-hundred-fifty-five (155) gallons each, or two (2) with a capacity of three-hundred (300) gallons each, if desired. In normal flight operations with internal fuel tanks full (three-hundred (300) gallons of gas), two-thousand (2,000) rounds of .50 caliber ammunition, and one-hundred-fifty (150) rounds of 20mm; the gross weight is fifteen-thousand-eight-hundred (15,800) pounds. The armament consists of four (4) free firing .50 caliber machine guns and one (1) free firing 20mm cannon situated in the nose.

3. CONCLUSIONS:

It is concluded that:

a. For a general combination of rate of climb, range, endurance, speed, altitude and fire power, the P-38F is the best production line fighter tested to date at this station. Types tested include the P-47, P-51, P-40F and P-39D-1.

b. The allowable maximum diving speed is not as great as desired for combat operations.

c. At speeds above allowable diving speeds especially over twenty-thousand (20,000) feet, violent vibrations from tail buffeting are experienced.

d. The maintenance difficulties experienced were greater than with any other standard production type of American fighter.

Classification cancelled

3240 *Rest*
By [Signature]
Date [Signature]

Serial No.: 4-42-3
No. of Pages: 10
Page No.: 1

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

e. The subject aircraft is easy to fly. However, a longer period of time will be required for a pilot to become familiar with the operations and maximum performances of the aircraft than is required for a normal single-engine fighter.

f. The cockpit installations are crowded and not arranged in a specific orderly fashion.

g. While the rate of climb is superior to all other types tested to date, this is not as great as required, especially below twenty-thousand (20,000) feet, and all excess weight in the structure and installations not vital to combat operations should be reduced or eliminated wherever possible.

h. Cooling capacity of the intercooler is not sufficient to allow maximum horsepower to be extracted from the engine at altitude.

i. The guns will not feed properly during maneuvers which create a pull of greater than $3\frac{1}{2}$ G's.

4. RECOMMENDATIONS:

It is recommended that:

a. Steps be taken to eliminate tail buffeting, and flight restrictions be retained until the correction is accomplished.

b. Suitable means of maintaining cockpit heat at altitude be installed. (Cockpit heater on P-39D is best seen to date.)

c. Continued efforts be made to increase rate of climb and level high speed.

d. Automatic shutter control of coolant and oil temperature be installed.

e. One (1) gun switch be installed for all guns.

f. The generators and battery switch be incorporated with the master switch and the booster pump's switch incorporated with the individual engine switches.

g. The rate of aileron roll be increased.

h. The case ejection chute control be removed from the cockpit.

i. Elevator trim be moved to rear nearer the pilot for more

accessibility

Classification

or

3rd Div. for

AD

By Mary

Date

12-1-42

Serial No.: 4-42-3

No. of Pages: 10

Page No.: 2

~~CONFIDENTIAL~~

C O N F I D E N T I A L

i. The offset control column be replaced by a straight control column in the middle of the cockpit, if possible. If not, the control column be reduced to a minimum safe size to increase the visibility of the instrument panel and save space in the cockpit.

k. Until an automatic turbo governor is installed, a turbo tachometer be added to the instrument panel. This should be done on future types which will have intercoolers of sufficient cooling ability to allow maximum horsepower to be extracted.

l. The energizing and starter switches be placed next to the main motor switches. Also all other switches that have to be used either for starting the engines or during take-offs be grouped together. These switches should be placed in a horizontal row, "off" when down and "on" when up. A drop bar should be placed below this so all switches could be turned on when the bar is lifted, after which the bar will drop back down.

m. Provision be made for sufficient intercooling to permit maximum horsepower to be extracted from the engines at all altitudes up to the service ceiling.

n. One (1) button on front of wheel be provided to fire 20mm cannon and machine guns, eliminating machine gun button and retaining only safety switch.

o. The toggle switch type of primer (Stromberg Electric Priming Valve-T.O. - 03-10BA-25) be installed for ease and speed of operation in interception work.

p. The starters be of such type that both engines may be started at the same time for interception work.

q. The top glass of the canopy be redesigned so the shell will extend four (4) inches lower, thus putting the metal strip where the canopy joins the windows below level of pilot's eyes, instead of level with them as is now the case.

r. Only one (1) landing light of a stationary type be installed on the leading edge of the left wing.

s. The gun sight be of the type which will accommodate a 100 mil circle, permit bulb change in flight and reflection adjustment for low level bombing.

t. As soon as the .50 caliber machine gun installations are corrected so they fire in more than a 3.5 G turn, that the gun chargers be eliminated from the cockpit.

u. The front wind screen be made of bulletproof glass.

Classification cancelled

By *Mary* *8/21/45*
Signature and Date

Serial No. : 4-42-3

No. of Pages: 10

Page No.: 3

Date: *8/21/45*

C O N F I D E N T I A L

C O N F I D E N T I A L

v. Paddle blade propellers be incorporated in the P-38 design to improve climbing capabilities.

w. A gun sight be installed that will allow the 161 mil view over the nose to be used in deflection shooting.

5. RECORD OF TEST:

This test was conducted pursuant to the "Program for Testing the Tactical Suitability of Service Aircraft," this headquarters, dated 9 July 1942, a copy of which is attached as Inclosure No. 1.

6. DISCUSSION:

a. Performance.

(1) Speed (See Inclosure No. 2).

(2) Rate of Climb (See Inclosure No. 2).

(3) Range (See Inclosure No. 2).

(4) Maneuverability: The subject aircraft was flown in mock combat against P-39D, P-40F, P-47C-1, and P-51 types of aircraft and the following results were obtained:

(a) The subject aircraft could outclimb all other types used in the test.

(b) The P-47C-1 was faster at all altitudes, and the P-40F and P-51 were faster up to fifteen-thousand (15,000) feet. The P-39D was considerably slower.

(c) Against the P-39D, P-51, and P-40F, the P-38F had a longer radius of turn below twelve-thousand (12,000) feet. From twelve-thousand (12,000) feet to approximately fifteen-thousand (15,000) feet, the radius was almost the same, and from fifteen-thousand (15,000) feet on up, the P-38F had an equal or shorter radius of turn. In the initial turn, due to the slowness of aileron roll of the P-38F, the other types could roll into a turn faster and close up the circle rapidly before the P-38F would reach its minimum radius of turn. It would then take the P-38F sometime, if ever, to overcome this initial disadvantage. The P-38F's best maneuver against all types tested was to climb rapidly out of range and then turn and commence the combat from a superior altitude. Once gaining this altitude it should retain it, making passes and climbing again rapidly. Knowledge of the local enemy fighter performance will dictate the tactics to be used by the

Classification cancelled

Or c

AU

By

Date

8/21/45

C O N F I D E N T I A L

Serial No.: 4-42-3

No. of Pages: 10

Page No.: 1

P-38F in the combat zone. It is doubtful if this aircraft will meet in combat any type of enemy aircraft in which close-in dog fighting will be its best offensive action.

- (5) Ceiling: The operational ceiling was approximately thirty-thousand (30,000) feet and the service ceiling approximately thirty-eight-thousand (38,000) feet, due to engine coolant and carburetor air temperatures becoming excessive.

b. Flying Characteristics:

The subject aircraft is simple and pleasant to fly. However, the number of instruments and controls will give a new pilot the feeling that he is flying a complicated aircraft. The cockpit drill should be stressed and the inexperienced pilot should spend twice the normal time of sitting in the cockpit and studying the controls and instruments. If possible, a new pilot should spend a minimum of thirty (30) hours in a single-engine fighter to build up his confidence and then several familiarization flights as a co-pilot in a twin-engine ship to help his twin-engine technique. Taxiing single-engine operation, use of the throttles and use of cross-over feed should be covered on these flights. An experienced pilot should have no trouble with a P-38F aircraft. However, a longer period of transition will be required before the pilot feels that he can get the maximum performance from the aircraft. The aircraft is quite stable at lower altitudes, but at higher altitudes it has a slight lateral instability. While flying at high altitude at high speeds, a tail buffeting is felt, and if a tight turn is then executed, the buffeting increases markedly. At lower altitudes this buffeting becomes objectionable only in very tight turns.

- (1) Due to tail buffeting, the maximum allowable diving speed is four-hundred (400) miles per hour indicated air speed at sea level, which is not as great as desired. This decreases with altitude, and pilots should be familiar with limitations. The aircraft is difficult to stall with the power on and will approach almost a vertical position before stalling. In a power-off stall, the aircraft falls forward and recovers easily. Due to restriction, no spins were attempted.
- (2) Little torque is noticed in the aircraft in changing speeds and going from a dive into a climb. The temperature of the oil and prestone changes rapidly in dives and climbs requiring constant changing of both shutter positions. (Automatic shutter control was recommended.)
- (3) It is not possible to climb the P-38F to thirty-five-thousand (35,000) feet at constant maximum allowable horsepower without exceeding allowable carburetor air temperatures.

Classification cancelled

or

By

Date

8/20/46

Serial No.: 4-42-3

No. of Pages: 10

Page No.: 5

C O N F I D E N T I A L

Constant exceeding of these temperatures will cause detonations and possible engine failure.

- (4) The landing glide is good and the aircraft lands easily; however, due to its weight the plane settles very rapidly if landed high.

c. Cockpit Arrangement.

The cockpit is crowded and the switches and controls are arranged in a disorderly fashion. This is due in part to the large offset control column and the wheel which prevents the right side of the cockpit from being used for any control handles or switches. This large control column also hides the switch panel at the bottom of the instrument panel. The oil cooler control switches are too hard to reach for switches that have to be used numerous times during a flight and they require the pilot to keep his head in the cockpit during the time the oil shutters are changing positions. (Automatic coolers are recommended.) The trim controls are separated widely in the cockpit. (An ideal arrangement of trim controls may be seen in a P-51.)

d. Pilot Comfort.

In temperate weather the cockpit at lower altitudes is warm enough, but in climbing to altitude the cockpit becomes very cold and remains that way. This will require pilots flying in tropical climates to wear heavy flying clothes when going on normal missions that may require altitude flying.

e. Armament.

- (1) The armament combination, which consists of the free firing four (4) .50 caliber machine guns and one (1) 20mm cannon, is considered satisfactory for fire power.

(a) It is concluded that, on the whole, the armament installation on the P-38F airplane is satisfactory, with the exception of the following conditions which were unsatisfactory:

- (1) The blast tube of the lower left .50 caliber gun is unsatisfactory.
- (2) The guns will not feed properly during maneuvers which create a pull of more than 3-1/2 G.
- (3) The effort required to operate the gun chargers in the air is too great.
- (4) The system of switches and triggers for the firing circuit is too complicated.
- (5) The field of view is unsatisfactory forward, due to gun sight and armor plate glass.

Classification cancelled

or changed to

By

By

Date

8/24/45

C O N F I D E N T I A L

Serial No.: 4-42-3

No. of Pages: 10

Page No.: 6

C O N F I D E N T I A L

- (6) The present sight reticle pattern is unsatisfactory.
- (7) The blast tube cover plate of the 20mm cannon is unsatisfactory.
- (8) When fired at night the flash from the guns is unsatisfactory.
- (2) The position of the free firing guns in the nose so close to the line of sight is considered the best of all standard American fighter planes. Fire should be more accurate at longer ranges, and center of impact will remain practically the same at all ranges for the four (4) .50 caliber guns. (See Inclosure No. 4 for recommended gun harmonization.)

f. Armor.

See Inclosure No. 3 for armor diagram.

g. Vulnerability of Vital Installations.

No test on vulnerability of P-38F's was made at this station.

h. Gun Platform.

- (1) The plane offers a stable gun platform at all angles and speeds, except for tail flutter. Little effect is noticed in firing of the guns, although a small amount of smoke is blown back into the cockpit during the firing.
- (2) The vision through the sight is 58 mils down. However, looking around the sight the angle from the line of sight down to the nose is 161 mils. This calls for a different type sight.

i. Visibility.

The visibility over the nose is satisfactory for deflection shooting, but the armor plate window and gun sight obstruct the forward vision for search.

- (1) To the sides the view downward is limited definitely by the position of the wings and engine, and searching below will have to be accomplished by banking the aircraft from side to side. The search view on both sides is greatly obstructed by metal strips where canopy joins the window. The view to the rear is limited by the boom and rudders, and rear armor plate.

Classification cancelled

changed to RESTRICTED

2nd Ind. Hq. 8/14/45

AUTH.

By Mary Dyer

Signature and Grade

Date 8/21/45

- (2) A slightly stepped down position will be required for formation flying due to position of engine. A looser formation will be required than for single-engine fighters due to two (2) engines and to lag, and the overspeeding of turbos.

Serial No.: 4-42-3
No. of Pages: 10
Page No.: 7

C O N F I D E N T I A L

C O N F I D E N T I A L

j. Night Flying.

- (1) The aircraft is satisfactory for night flying. Landings and take-offs are simplified by the view over nose and level position of aircraft while on the ground.
- (2) The flash from guns being fired cause a short period of blindness to the pilot. Suitable flash hiders will be required if the P-38F is used for night fighting.
- (3) The turbo, when hot, can be seen for approximately two-thousand (2,000) feet in the air.

k. Instrument Flying.

The aircraft is considered satisfactory for instrument flying. Once trimmed up, pilots should be able to make long flights on instruments.

l. Speed of Servicing.

Crew - four (4) armorers, one (1) crew chief, and one (1) helper;
Time - minimum ten (10) minutes. This was done with a pressure gas tank. In the field with hand pump for gasoline and with unknown amount of ammunition to be loaded, it is believed the time to service will be in the neighborhood of thirty (30) minutes.

m. Maintenance.

- (1) It has been reported that carburetor temperatures have been running too high. Intercoolers are easily subjected to damage of the floating baffles which tend to distort and bend out of alignment due to the back firing or sudden acceleration of engine.
- (2) Exhaust cooling shrouds are unsatisfactory due to the constant trouble encountered in maintaining them. It is believed that the material is not of a sufficient strength to withstand the intense heat applied to them which results in their disintegrating and cracking.
- (3) Considerable time is being lost due to the difficulties in removing inspection panels throughout the airplane structure. It is believed that a great percentage of these panels could be installed with drive fasteners which could then be removed in a matter of seconds and not hours. All panels now installed with Phillips head screws have a tendency to freeze making their removal impossible without the aid of an easy-out tool.

Classification Canceled

3rd Ind. Hqs. 8/21/45

By Mary Dykewicz

Date 8/21/45

Serial No.: 4-42-3

No. of Pages: 10

Page No.: 8

C O N F I D E N T I A L

~~CONFIDENTIAL~~

- (4) It is recommended that the voltage regulator and battery relay switch be relocated to a position where it can be more easily and quickly gotten to for inspection and repair. It is also recommended that a small dzus panel be installed for this electrical control if relocation of voltage and battery relay is possible.
- (5) It is recommended that a safety catch be installed on the fuselage gun and ammunition door to eliminate possible danger of props striking door if accidentally not fastened when engines are started.
- (6) It is recommended that an inspection panel or door be installed directly over battery in left boom so that ground crews can inspect and service battery without removing it entirely from airplanes.
- (7) Pilot's seat is unsatisfactory as far as its removal and installation. Ground crews have found that many man hours are lost when seat has to be removed. It is believed that an installation similar to the airplane type P-36 installation could be used; the seat can then be removed and installed in a matter of a few minutes.
- (8) Inspection plate be installed to allow inspection in rear of instrument panels. At present there are ninety-six (96) Phillips' head screws that have to be removed to perform inspections or maintenance work on instruments.
- (9) A study should be made of the P-38 fuel system to determine a method of eliminating the siphoning of gasoline from gas tanks while in flight when descending from altitudes due to change of pressure; this is considered a dangerous condition and a considerable loss of fuel might result.
- (10) Oil and coolant lines installed in engine compartment are not sufficiently secured. It is recommended that more securing clamps be installed to hold vibrations of these lines to a minimum.
- (11) Pilots have reported that the heating of the cockpit is unsatisfactory. Inspection of the heating system revealed that the heating blast ducts are too small to be sufficient in heating the cockpit satisfactorily. It is recommended that the ducts be made of a larger diameter to secure more heating volume, and an attempt be made to make the cockpit airtight.

Classification cancelled

or changed to

3d Prof. Hqs. 8/14/45
ALL: *[Signature]*
By *[Signature]*
Signature and Grade

Date

8/14/45

Serial No.: 4-42-3

No. of Pages: 10

Page No.: 9

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

7. INCLOSURES:

- Inclosure No. 1 - Test Program.
- Inclosure No. 2 - Charts.
- Inclosure No. 3 - Armor Diagrams.
- Inclosure No. 4 - Bore Lighting Diagrams.

Prepared by: _____

L. B. TUNG,
Major, Air Corps,
Project Officer.

Concurred in: _____

L. A. GERRICH,
Captain, Air Corps,
Group Test Officer.

Approved by: _____

L. B. COATES,
Lt. Colonel, Air Corps,
Chief, Tactical Combat Section.

Approved by: _____

J. O. GUTHRIE,
Lt. Colonel, Air Corps,
Chief, Testing Branch.

DISTRIBUTION:

- 6 Copies - C.G., Army Air Forces, Dir. of War Org. & Mov.
Attn: Special Projects Division, Wash., D. C.
- 1 Copy - C.G., AAF Mat. Command, Hq. Army Air Forces,
Wash., D. C.
- 2 Copies - C.G., AAF Mat. Ctr., Attn: AFPG Projects Office,
Exp. Engr. Section, Wright Fld., Dayton, Ohio.
- 1 Copy - Chief, Field Services, Patterson Field, Ohio.
Attn: Col. Paul E. Shanahan.
- 1 Copy - C.G., AAF School of Applied Tactics, Orlando, Florida.
- 1 Copy - P. D. File.

Serial No.: 4-42-3
No. of Pages: 10
Page No.: 10

~~CONFIDENTIAL~~

~~CONFIDENTIAL~~

PROOF DEPARTMENT
ARMY AIR FORCES PROVING GROUND COMMAND
EGLIN FIELD, FLORIDA

9 July 1942

SUBJECT: Program for Test of the Tactical Suitability of the P-38F.
(S. T. No. 4-42-3)

TO: Commanding Officer, Army Air Forces Proving Ground Group,
Eglin Field, Florida.

1. GENERAL:

- a. Two (2) standard P-38F's were furnished this station for test.
- b. This is a FIRST PRIORITY Tactical Suitability Service test.
- c. Major E. L. Strickland is appointed Group Test Officer.
- d. This test was requested in a letter from Brigadier General Fairchild, dated April 9, 1942, to Commanding Officer, Proving Ground Command, Eglin Field, Florida.
- e. Major L. B. Meng is designated as the Tactical Combat Section Project Officer for this test.
- f. At the conclusion of this test the Commanding Officer of the Army Air Forces Proving Ground Group will be informed by the Chief of the Proof Department as to the disposition of the test articles.

2. OBJECT:

To determine the relative tactical value of the P-38F type airplane for combat service.

3. METHOD OF CONDUCTING TEST:

a. First Phase:

- (1) Calibration speed runs will be flown with each of the

Inclosure No. 1
COPY

- 1 -

Classification cancelled
or changed to Secret

3rd 2nd 1st 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th 17th 18th 19th 20th 21st 22nd 23rd 24th 25th 26th 27th 28th 29th 30th 31st 32nd 33rd 34th 35th 36th 37th 38th 39th 40th 41st 42nd 43rd 44th 45th 46th 47th 48th 49th 50th 51st 52nd 53rd 54th 55th 56th 57th 58th 59th 60th 61st 62nd 63rd 64th 65th 66th 67th 68th 69th 70th 71st 72nd 73rd 74th 75th 76th 77th 78th 79th 80th 81st 82nd 83rd 84th 85th 86th 87th 88th 89th 90th 91st 92nd 93rd 94th 95th 96th 97th 98th 99th 100th 101st 102nd 103rd 104th 105th 106th 107th 108th 109th 110th 111th 112th 113th 114th 115th 116th 117th 118th 119th 120th 121st 122nd 123rd 124th 125th 126th 127th 128th 129th 130th 131st 132nd 133rd 134th 135th 136th 137th 138th 139th 140th 141st 142nd 143rd 144th 145th 146th 147th 148th 149th 150th 151st 152nd 153rd 154th 155th 156th 157th 158th 159th 160th 161st 162nd 163rd 164th 165th 166th 167th 168th 169th 170th 171st 172nd 173rd 174th 175th 176th 177th 178th 179th 180th 181st 182nd 183rd 184th 185th 186th 187th 188th 189th 190th 191st 192nd 193rd 194th 195th 196th 197th 198th 199th 200th 201st 202nd 203rd 204th 205th 206th 207th 208th 209th 210th 211st 212nd 213th 214th 215th 216th 217th 218th 219th 220th 221st 222nd 223rd 224th 225th 226th 227th 228th 229th 230th 231st 232nd 233rd 234th 235th 236th 237th 238th 239th 240th 241st 242nd 243rd 244th 245th 246th 247th 248th 249th 250th 251st 252nd 253rd 254th 255th 256th 257th 258th 259th 260th 261st 262nd 263rd 264th 265th 266th 267th 268th 269th 270th 271st 272nd 273rd 274th 275th 276th 277th 278th 279th 280th 281st 282nd 283rd 284th 285th 286th 287th 288th 289th 290th 291st 292nd 293rd 294th 295th 296th 297th 298th 299th 300th 301st 302nd 303rd 304th 305th 306th 307th 308th 309th 310th 311st 312nd 313th 314th 315th 316th 317th 318th 319th 320th 321st 322nd 323rd 324th 325th 326th 327th 328th 329th 330th 331st 332nd 333rd 334th 335th 336th 337th 338th 339th 340th 341st 342nd 343rd 344th 345th 346th 347th 348th 349th 350th 351st 352nd 353rd 354th 355th 356th 357th 358th 359th 360th 361st 362nd 363rd 364th 365th 366th 367th 368th 369th 370th 371st 372nd 373rd 374th 375th 376th 377th 378th 379th 380th 381st 382nd 383rd 384th 385th 386th 387th 388th 389th 390th 391st 392nd 393rd 394th 395th 396th 397th 398th 399th 400th 401st 402nd 403rd 404th 405th 406th 407th 408th 409th 410th 411st 412nd 413th 414th 415th 416th 417th 418th 419th 420th 421st 422nd 423rd 424th 425th 426th 427th 428th 429th 430th 431st 432nd 433rd 434th 435th 436th 437th 438th 439th 440th 441st 442nd 443rd 444th 445th 446th 447th 448th 449th 450th 451st 452nd 453rd 454th 455th 456th 457th 458th 459th 460th 461st 462nd 463rd 464th 465th 466th 467th 468th 469th 470th 471st 472nd 473rd 474th 475th 476th 477th 478th 479th 480th 481st 482nd 483rd 484th 485th 486th 487th 488th 489th 490th 491st 492nd 493rd 494th 495th 496th 497th 498th 499th 500th 501st 502nd 503rd 504th 505th 506th 507th 508th 509th 510th 511st 512nd 513th 514th 515th 516th 517th 518th 519th 520th 521st 522nd 523rd 524th 525th 526th 527th 528th 529th 530th 531st 532nd 533rd 534th 535th 536th 537th 538th 539th 540th 541st 542nd 543rd 544th 545th 546th 547th 548th 549th 550th 551st 552nd 553rd 554th 555th 556th 557th 558th 559th 560th 561st 562nd 563rd 564th 565th 566th 567th 568th 569th 570th 571st 572nd 573rd 574th 575th 576th 577th 578th 579th 580th 581st 582nd 583rd 584th 585th 586th 587th 588th 589th 590th 591st 592nd 593rd 594th 595th 596th 597th 598th 599th 600th 601st 602nd 603rd 604th 605th 606th 607th 608th 609th 610th 611st 612nd 613th 614th 615th 616th 617th 618th 619th 620th 621st 622nd 623rd 624th 625th 626th 627th 628th 629th 630th 631st 632nd 633rd 634th 635th 636th 637th 638th 639th 640th 641st 642nd 643rd 644th 645th 646th 647th 648th 649th 650th 651st 652nd 653rd 654th 655th 656th 657th 658th 659th 660th 661st 662nd 663rd 664th 665th 666th 667th 668th 669th 670th 671st 672nd 673rd 674th 675th 676th 677th 678th 679th 680th 681st 682nd 683rd 684th 685th 686th 687th 688th 689th 690th 691st 692nd 693rd 694th 695th 696th 697th 698th 699th 700th 701st 702nd 703rd 704th 705th 706th 707th 708th 709th 710th 711st 712nd 713th 714th 715th 716th 717th 718th 719th 720th 721st 722nd 723rd 724th 725th 726th 727th 728th 729th 730th 731st 732nd 733rd 734th 735th 736th 737th 738th 739th 740th 741st 742nd 743rd 744th 745th 746th 747th 748th 749th 750th 751st 752nd 753rd 754th 755th 756th 757th 758th 759th 760th 761st 762nd 763rd 764th 765th 766th 767th 768th 769th 770th 771st 772nd 773rd 774th 775th 776th 777th 778th 779th 780th 781st 782nd 783rd 784th 785th 786th 787th 788th 789th 790th 791st 792nd 793rd 794th 795th 796th 797th 798th 799th 800th 801st 802nd 803rd 804th 805th 806th 807th 808th 809th 810th 811st 812nd 813th 814th 815th 816th 817th 818th 819th 820th 821st 822nd 823rd 824th 825th 826th 827th 828th 829th 830th 831st 832nd 833rd 834th 835th 836th 837th 838th 839th 840th 841st 842nd 843rd 844th 845th 846th 847th 848th 849th 850th 851st 852nd 853rd 854th 855th 856th 857th 858th 859th 860th 861st 862nd 863rd 864th 865th 866th 867th 868th 869th 870th 871st 872nd 873rd 874th 875th 876th 877th 878th 879th 880th 881st 882nd 883rd 884th 885th 886th 887th 888th 889th 890th 891st 892nd 893rd 894th 895th 896th 897th 898th 899th 900th 901st 902nd 903rd 904th 905th 906th 907th 908th 909th 910th 911st 912nd 913th 914th 915th 916th 917th 918th 919th 920th 921st 922nd 923rd 924th 925th 926th 927th 928th 929th 930th 931st 932nd 933rd 934th 935th 936th 937th 938th 939th 940th 941st 942nd 943rd 944th 945th 946th 947th 948th 949th 950th 951st 952nd 953rd 954th 955th 956th 957th 958th 959th 960th 961st 962nd 963rd 964th 965th 966th 967th 968th 969th 970th 971st 972nd 973rd 974th 975th 976th 977th 978th 979th 980th 981st 982nd 983rd 984th 985th 986th 987th 988th 989th 990th 991st 992nd 993rd 994th 995th 996th 997th 998th 999th 1000th 1001st 1002nd 1003rd 1004th 1005th 1006th 1007th 1008th 1009th 1010th 1011st 1012nd 1013th 1014th 1015th 1016th 1017th 1018th 1019th 1020th 1021st 1022nd 1023rd 1024th 1025th 1026th 1027th 1028th 1029th 1030th 1031st 1032nd 1033rd 1034th 1035th 1036th 1037th 1038th 1039th 1040th 1041st 1042nd 1043rd 1044th 1045th 1046th 1047th 1048th 1049th 1050th 1051st 1052nd 1053rd 1054th 1055th 1056th 1057th 1058th 1059th 1060th 1061st 1062nd 1063rd 1064th 1065th 1066th 1067th 1068th 1069th 1070th 1071st 1072nd 1073rd 1074th 1075th 1076th 1077th 1078th 1079th 1080th 1081st 1082nd 1083rd 1084th 1085th 1086th 1087th 1088th 1089th 1090th 1091st 1092nd 1093rd 1094th 1095th 1096th 1097th 1098th 1099th 1100th 1101st 1102nd 1103rd 1104th 1105th 1106th 1107th 1108th 1109th 1110th 1111st 1112nd 1113th 1114th 1115th 1116th 1117th 1118th 1119th 1120th 1121st 1122nd 1123rd 1124th 1125th 1126th 1127th 1128th 1129th 1130th 1131st 1132nd 1133rd 1134th 1135th 1136th 1137th 1138th 1139th 1140th 1141st 1142nd 1143rd 1144th 1145th 1146th 1147th 1148th 1149th 1150th 1151st 1152nd 1153rd 1154th 1155th 1156th 1157th 1158th 1159th 1160th 1161st 1162nd 1163rd 1164th 1165th 1166th 1167th 1168th 1169th 1170th 1171st 1172nd 1173rd 1174th 1175th 1176th 1177th 1178th 1179th 1180th 1181st 1182nd 1183rd 1184th 1185th 1186th 1187th 1188th 1189th 1190th 1191st 1192nd 1193rd 1194th 1195th 1196th 1197th 1198th 1199th 1200th 1201st 1202nd 1203rd 1204th 1205th 1206th 1207th 1208th 1209th 1210th 1211st 1212nd 1213th 1214th 1215th 1216th 1217th 1218th 1219th 1220th 1221st 1222nd 1223rd 1224th 1225th 1226th 1227th 1228th 1229th 1230th 1231st 1232nd 1233rd 1234th 1235th 1236th 1237th 1238th 1239th 1240th 1241st 1242nd 1243rd 1244th 1245th 1246th 1247th 1248th 1249th 1250th 1251st 1252nd 1253rd 1254th 1255th 1256th 1257th 1258th 1259th 1260th 1261st 1262nd 1263rd 1264th 1265th 1266th 1267th 1268th 1269th 1270th 1271st 1272nd 1273rd 1274th 1275th 1276th 1277th 1278th 1279th 1280th 1281st 1282nd 1283rd 1284th 1285th 1286th 1287th 1288th 1289th 1290th 1291st 1292nd 1293rd 1294th 1295th 1296th 1297th 1298th 1299th 1300th 1301st 1302nd 1303rd 1304th 1305th 1306th 1307th 1308th 1309th 1310th 1311st 1312nd 1313th 1314th 1315th 1316th 1317th 1318th 1319th 1320th 1321st 1322nd 1323rd 1324th 1325th 1326th 1327th 1328th 1329th 1330th 1331st 1332nd 1333rd 1334th 1335th 1336th 1337th 1338th 1339th 1340th 1341st 1342nd 1343rd 1344th 1345th 1346th 1347th 1348th 1349th 1350th 1351st 1352nd 1353rd 1354th 1355th 1356th 1357th 1358th 1359th 1360th 1361st 1362nd 1363rd 1364th 1365th 1366th 1367th 1368th 1369th 1370th 1371st 1372nd 1373rd 1374th 1375th 1376th 1377th 1378th 1379th 1380th 1381st 1382nd 1383rd 1384th 1385th 1386th 1387th 1388th 1389th 1390th 1391st 1392nd 1393rd 1394th 1395th 1396th 1397th 1398th 1399th 1400th 1401st 1402nd 1403rd 1404th 1405th 1406th 1407th 1408th 1409th 1410th 1411st 1412nd 1413th 1414th 1415th 1416th 1417th 1418th 1419th 1420th 1421st 1422nd 1423rd 1424th 1425th 1426th 1427th 1428th 1429th 1430th 1431st 1432nd 1433rd 1434th 1435th 1436th 1437th 1438th 1439th 1440th 1441st 1442nd 1443rd 1444th 1445th 1446th 1447th 1448th 1449th 1450th 1451st 1452nd 1453rd 1454th 1455th 1456th 1457th 1458th 1459th 1460th 1461st 1462nd 1463rd 1464th 1465th 1466th 1467th 1468th 1469th 1470th 1471st 1472nd 1473rd 1474th 1475th 1476th 1477th 1478th 1479th 1480th 1481st 1482nd 1483rd 1484th 1485th 1486th 1487th 1488th 1489th 1490th 1491st 1492nd 1493rd 1494th 1495th 1496th 1497th 1498th 1499th 1500th 1501st 1502nd 1503rd 1504th 1505th 1506th 1507th 1508th 1509th 1510th 1511st 1512nd 1513th 1514th 1515th 1516th 1517th 1518th 1519th 1520th 1521st 1522nd 1523rd 1524th 1525th 1526th 1527th 1528th 1529th 1530th 1531st 1532nd 1533rd 1534th 1535th 1536th 1537th 1538th 1539th 1540th 1541st 1542nd 1543rd 1544th 1545th 1546th 1547th 1548th 1549th 1550th 1551st 1552nd 1553rd 1554th 1555th 1556th 1557th 1558th 1559th 1560th 1561st 1562nd 1563rd 1564th 1565th 1566th 1567th 1568th 1569th 1570th 1571st 1572nd 1573rd 1574th 1575th 1576th 1577th 1578th 1579th 1580th 1581st 1582nd 1583rd 1584th 1585th 1586th 1587th 1588th 1589th 1590th 1591st 1592nd 1593rd 1594th 1595th 1596th 1597th 1598th 1599th 1600th 1601st 1602nd 1603rd 1604th 1605th 1606th 1607th 1608th 1609th 1610th 1611st 1612nd 1613th 1614th 1615th 1616th 1617th 1618th 1619th 1620th 1621st 1622nd 1623rd 1624th 1625th 1626th 1627th 1628th 1629th 1630th 1631st 1632nd 1633rd 1634th 1635th 1636th 1637th 1638th 1639th 1640th 1641st 1642nd 1643rd 1644th 1645th 1646th 1647th 1648th 1649th 1650th 1651st 1652nd 1653rd 1654th 1655th 1656th 1657th 1658th 1659th 1660th 1661st 1662nd 1663rd 1664th 1665th 1666th 1667th 1668th 1669th 1670th 1671st 1672nd 1673rd 1674th 1675th 1676th 1677th 1678th 1679th 1680th 1681st 1682nd 1683rd 1684th 1685th 1686th 1687th 1688th 1689th 1690th 1691st 1692nd 1693rd 1694th 1695th 1696th 1697th 1698th 1699th 1700th 1701st 1702nd 1703rd 1704th 1705th 1706th 1707th 1708th 1709th 1710th 1711st 1712nd 1713th 1714th 1715th 1716th 1717th 1718th 1719th 1720th 1721st 1722nd 1723rd 1724th 1725th 1726th 1727th 1728th 1729th 1730th 1731st 1732nd 1733rd 1734th 1735th 1736th 1737th 1738th 1739th 1740th 1741st 1742nd 1743rd 1744th 1745th 1746th 1747th 1748th 1749th 1750th 1751st 1752nd 1753rd 1754th 1755th 1756th 1757th 1758th 1759th 1760th 1761st 1762nd 1763rd 1764th 1765th 1766th 1767th 1768th 1769th 1770th 1771st 1772nd 1773rd 1774th 1775th 1776th 1777th 1778th 1779th 1780th 1781st 1782nd 1783rd 1784th 1785th 1786th 1787th 1788th 1789th 1790th 1791st 1792nd 1793rd 1794th 1795th 1796th 1797th 1798th 1799th 1800th 1801st 1802nd 1803rd 1804th 1805th 1806th 1807th 1808th 1809th 1810th 1811st 1812nd 1813th 1814th 1815th 1816th 1817th 1818th 1819th 1820th 1821st 1822nd 1823rd 1824th 1825th 1826th 1827th 1828th 1829th 1830th 1831st 1832nd 1833rd 1834th 1835th 1836th 1837th 1838th 1839th 1840th 1841st 1842nd 1843rd 1844th 1845th 1846th 1847th 1848th 1849th 1850th 1851st 1852nd 1853rd 1854th 1855th 1856th 1857th 1858th 1859th 1860th 1861st 1862nd 1863rd 1864th 1865th 1866th 1867th 1868th 1869th 1870th 1871st 1872nd 1873rd 1874th 1875th 1876th 1877th 1878th 1879th 1880th 1881st 1882nd 1883rd 1884th 1885th 1886th 1887th 1888th 1889th 1890th 1891st 1892nd 1893rd 1894th 1895th 1896th 1897th 1898th 1899th 1900th 1901st 1902nd 1903rd 1904th 1905th 1906th 1907th 1908th 1909th 1910th 1911st 1912nd 1913th 1914th 1915th 1916th 1917th 1918th 1919th 1920th 1921st 1922nd 1923rd 1924th 1925th 1926th 1927th 1928th 1929th 1930th 1931st 1932nd 1933rd 1934th 1935th 1936th 1937th 1938th 1939th 1940th 1941st 1942nd 1943rd 1944th 1945th 1946th 1947th 1948th 1949th 1950th 1951st 1952nd 1953rd 1954th 1955th 1956th 1957th 1958th 1959th 1960th 1961st 1962nd 1963rd 1964th 1965th 1966th 1967th 1968th 1969th 1970th 1971st 1972nd 1973rd 1974th 1975th 1976th 1977th 1978th 1979th 1980th 1981st 1982nd 1983rd 1984th 1985th 1986th 1987th 1988th 1989th 1990th 1991st 1992nd 1993rd 1994th 1995th 1996th 1997th 1998th 1999th 2000th 2001st 2002nd 2003rd 2004th 2005th 2006th 2007th 2008th 2009th 2010th 2011st 2012nd 2013th 2014th 2015th 2016th 2017th 2018th 2019th 2020th 2021st 2022nd 2023rd 2024th 2025th 2026th 2027th 2028th 2029th 2030th 2031st 2032nd 2033rd 2034th 2035th 2036th 2037th 2038th 2039th 2040th 2041st 2042nd 2043rd 2044th 2045th 2046th 2047th 2048th 2049th 2050th 2051st 2052nd 2053rd 2054th 2055th 2056th 2057th 2058th 2059th 2060th 2061st 2062nd 2063rd 2064th 2065th 2066th 2067th 2068th 2069th 2070th 2071st 2072nd 2073rd 2074th 2075th 2076th 2077th 2078th 2079th 2080th 2081st 2082nd 2083rd 2084th 2085th 2086th 2087th 2088th 2089th 2090th 2091st 2092nd 2093rd 2094th 2095th 2096th 2097th

subject aircraft over the speed range at a minimum of six (6) different speeds.

- (2) Trial speed runs will be made with each of the subject aircraft at maximum cruising power, normal rated power, and the maximum power obtainable at each five-thousand (5,000) foot (pressure altitude) level, from sea level to the service ceiling of the subject aircraft.
- (3) Trial climbs will be made with each of the subject aircraft from the start of the take-off run and the time taken on each five-thousand (5,000) foot level (pressure altitude) up to the service ceiling of the subject aircraft.
- (4) A trial climb will be made as in paragraph (3) above, with a three-ship formation of the subject aircraft, the airplanes to take-off individually from the same runway and join formation in the air.
- (5) The subject aircraft will be flown in mock combat against all available contemporary fighter types to determine their comparative turning and combat characteristics.
- (6) The rate of acceleration in dives will be studied by comparison with contemporary types.
- (7) Trial flights will be made to determine the range of the subject aircraft at normal rated power.
- (8) Trial flights will be made to determine the range of the subject aircraft at maximum cruising power.
- (9) Trial flights will be made to determine the maximum range of the subject aircraft and how it is obtained.
- (10) Trial flights will be made for the purpose of studying the stability of the subject aircraft while firing the guns or cannon.
- (11) Night flights will be made to determine the suitability of the subject aircraft for night flying.
- (12) All pilots engaged in the flight tests of the subject aircraft will submit their flight data cards to the test officer and report on the following subjects:
 - (a) Flying characteristics of the subject aircraft during take-off, climb, level flight, acrobatics, dives, and landings.

Classification cancelled
or changed to ~~Secret~~

AUTH:

By ~~Mary D. [illegible]~~

Date 8/24/45

- (b) Ease, speed, and adequacy of the trimming devices.
- (c) Suitability of the subject aircraft for instrument flight.
- (d) The visibility and field of view from the cockpit.
- (e) The simplicity of the cockpit arrangement.
- (f) The adequacy of the oxygen supply.
- (g) The adequacy and arrangement of the instruments.
- (h) Pilot comfort under all simulated combat conditions.

b. Second Phase:

The subject aircraft will be studied carefully on the ground to determine:

- (1) The adequacy of its armament.
- (2) The adequacy of the armor plate protection for the pilot.
- (3) The protection or vulnerability of vital installations.
- (4) The means and size of the emergency exit.
- (5) The accessibility of the oxygen supply.
- (6) The accessibility of the radio.
- (7) Time and number of men required to completely service the subject aircraft with fuel, oil, coolant, oxygen, and ammunition.

c. Third Phase:

When the test has been completed and a draft of the final report has been prepared, all the officers involved in the test will meet in the office of the Tactical Combat Section, Proof Department, to discuss and approve the final report.

4. RECORDS:

a. A table will be kept which will describe all maintenance difficulties encountered during the test, corrective action taken, and the approximate time required to complete the corrective actions. This table will also contain the man hours required to complete the routine twenty-five (25) hour and fifty (50) hour inspections, and any particular part or accessory that consistently malfunctions will be noted.

Classification cancelled
or changed to: *Secret*

Auth:

By *Mary A. [illegible]*, Clk

~~CONFIDENTIAL~~

b. All flight test data reports will be collected by the Test Officer and turned over to the Project Officer as soon as practicable.

5. REPORTS:

a. A final report covering all phases of the test, with conclusions and recommendations, will be submitted by the Project Officer to the Chief of the Proof Department, through the Chiefs of the Testing Branch and Tactical Combat Section as soon as possible after the conclusion of the test.

b. Any consistent failures or malfunctions of any equipment will be reported to the Chief of the Testing Branch as soon as possible after they are discovered.

By command of Brigadier General CARDNER:

DUDLEY W. WATKINS,
Colonel, Air Corps,
Chief, Proof Department.

Prepared by:

L. B. MING,
Major, Air Corps,
Project Officer.

Approved by:

L. B. COATS,
Lt. Colonel, Air Corps,
Chief, Tactical Combat Section.

Approved by:

J. O. GUTHRIE,
Lt. Colonel, Air Corps,
Chief, Testing Branch.

Classification cancelled
or changed to

Auth:

By

Signature and Date

Date

Declassified 8/18/45
By Mary [unclear] - Cline
8/2/45

~~CONFIDENTIAL~~

CONFIDENTIAL

SPEED RUN

P-38F

41-7612

SPEED RUN							RATE OF CLIMB			
Alt.	T.A.S.	P.A.T.	C.I.A.S.	M.P.	R.P.M.	T.A.S.	Alt.	Time	I.A.S.	F.A.T.
5,000	310	+19	316	47	3000	345	500	0	180	
"	302	+16	290	38	2600	315				
"	269	+14	260.5	30.5	2280	285	5000	2:00	175	
10,000	325	-5	312	47	3000	359				
"	296	+10	285	38	2600	340	10000	4:00	170	
"	263	+9	255	30.5	2280	302				
15,000	318	-3	305	47	3000	380	15000	6:15	165	
"	282	+7	272	38	2600	350				
"	259	+5	251	30.5	2280	325	20000	8:35	155	
20,000	289	-2	279	47	3000	392				
"	265	-4	257	38	2600	362	25000	11:20	145	
"	240	-5	234	30.5	2280	327				
25,000	255	-16	248	41.5	3000	384	30000	14:20	135	
"	248	-15	241	38	2600	363				
"	225	-16	220	30.5	2280	340	35000	19:05	125	
30,000	228	-31	223	36.5	3000	367				
"	225	-32	220	36.5	2600	363				
"	208	-28	205	30.5	2280	339				
35,000				31.5	3000		(Intercoolers not capable to permit carburetor air temperatures)			
"	191	-38	189	31.5	2600	346				
"	178	-40	177	30.5	2280	317				

Inclosure No. 2

CONFIDENTIAL

~~CONFIDENTIAL~~

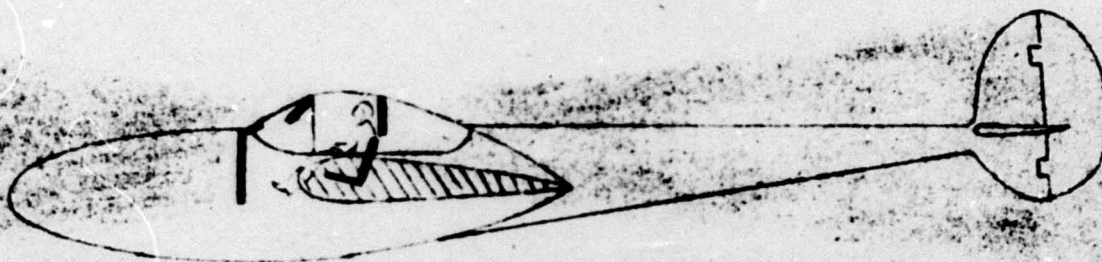
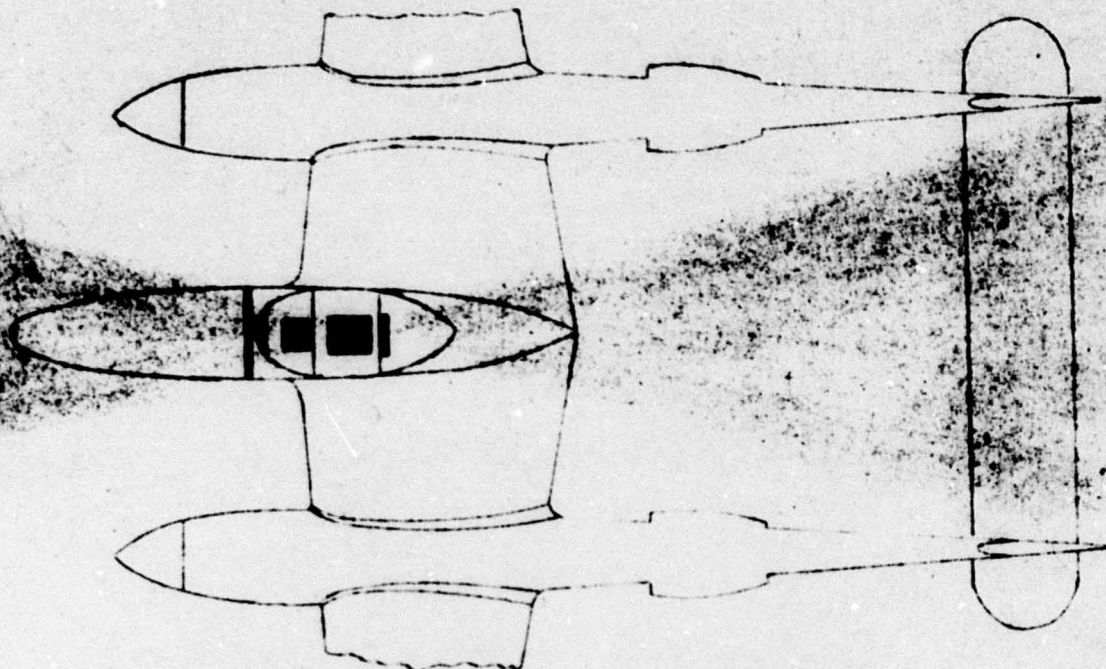
P.M.	T.A.S.	RATE OF CLIMB								Indicated rate of climb ft./min.
		Alt.	Time	I.A.S.	F.A.T.	T.A.S.	M.P.	R.P.M.	Turbo	
00	345	500	0	180			14.5	2800		3500'
00	315									
00	285	5000	2.00	175			14.5	2800		3000'
00	359									
00	340	10000	4.00	170			14.5	2800		2500'
00	302									2300'
00	380	15000	6.15	165			14.5	2800		2200'
00	350									
00	325	20000	8.35	155			14	2600		2000'
00	392									
00	362	25000	11.20	145			14	2600		1800'
00	327									
00	344	30000	14.20	135			35	2600		1600'
00	363									1000'
00	340	35000	19.05	125			30	2600		600'
00	367									
00	363									
00	339									
00		(Intercoolers not capable to perform required work) This setting could not be used as carburetor air temperatures went to 500° and above which is too high for these engines.								
00	346									
00	317									

~~CONFIDENTIAL~~

1

2

~~CONFIDENTIAL~~



ARMOR PROTECTS PILOT FROM MACHINE GUN FIRE WITHIN SHADED AREA

Classification cancelled
or changed to Ref

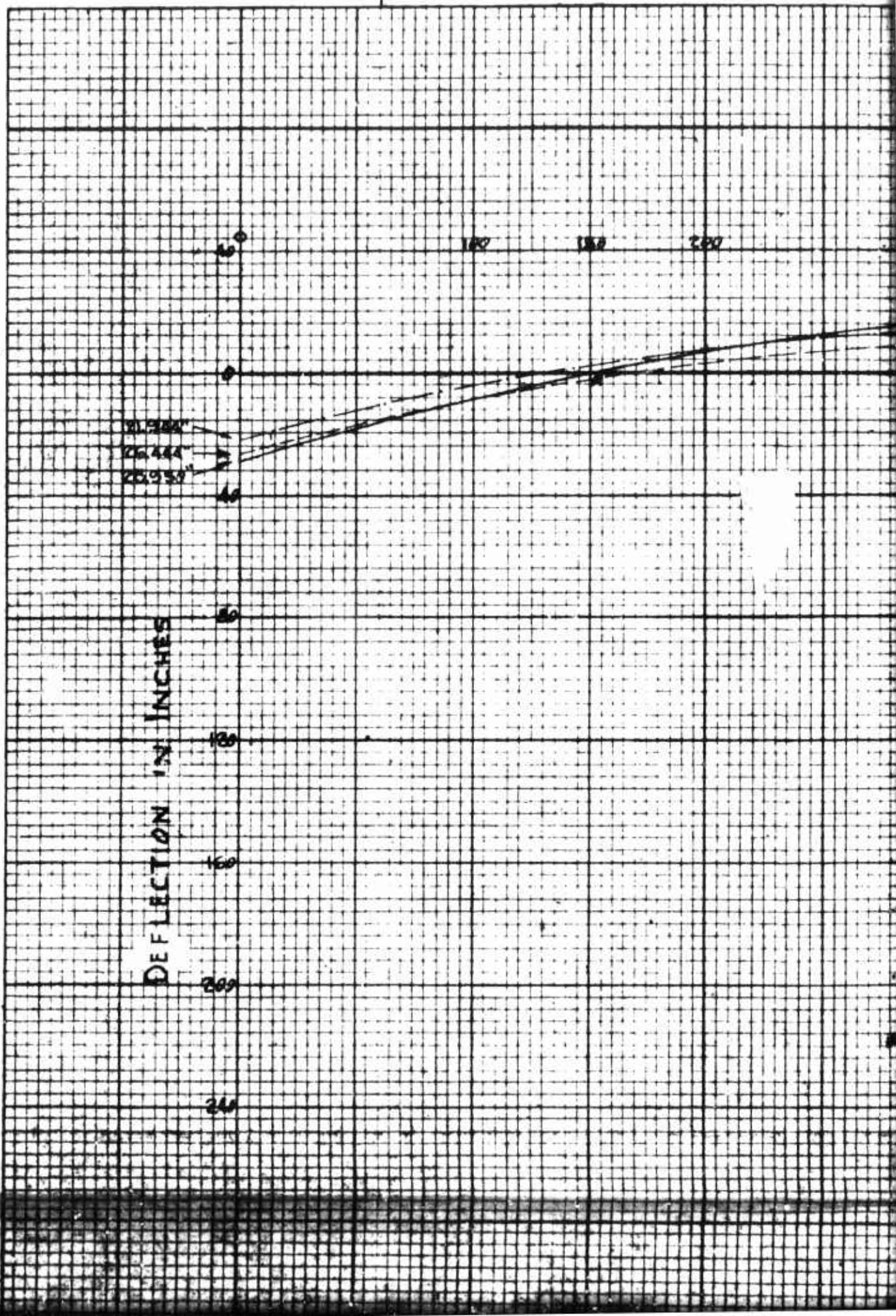
AUTH.

By M. R. Hughes

Signature and Title

Date

9/2/45



CONFIDENTIAL

RANGE IN YARDS.

300

400

500

600

Trajectory Data: Caliber .50

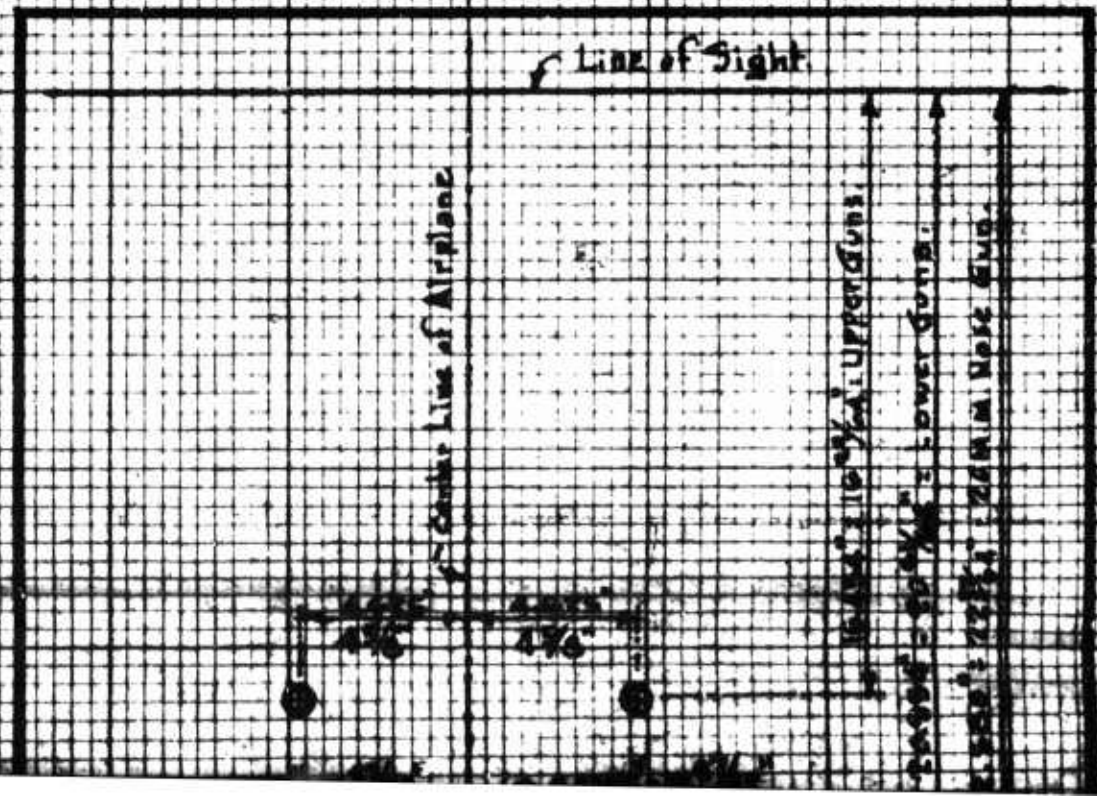
Fixed in Aircraft.

Muzzle Velocity = 2,700 Ft. Per Second.

Angle of Flight = 0 Degrees.

Indicated Air Speed = 250 M.P.H.

Aerial Target; Altitude 13,000 Feet.



RANGE IN YARDS.

300

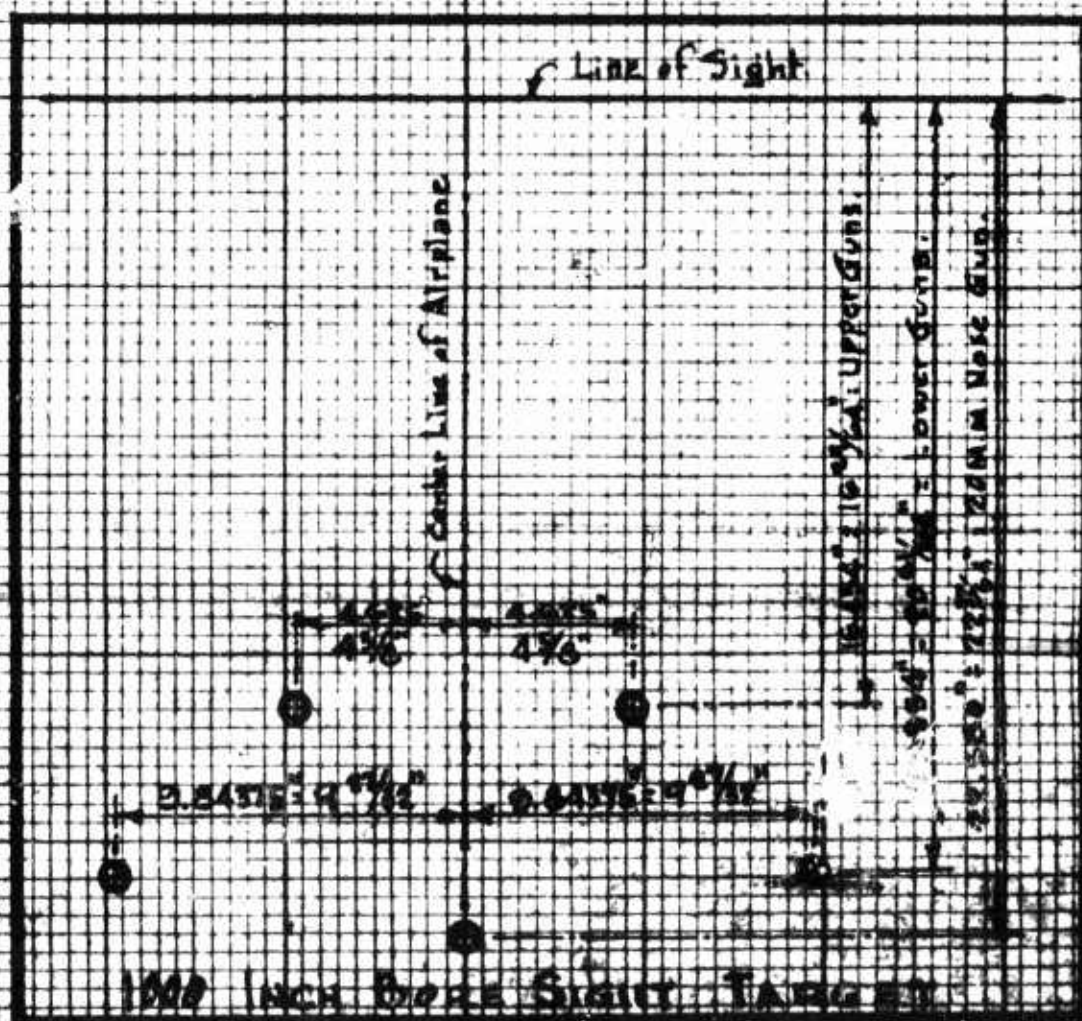
400

500

600

700

Trajectory Data: Caliber .50
 Fired in Aircraft.
 Muzzle Velocity = 2,700 Ft. Per Second.
 Angle of Flight = 0 Degrees.
 Indicated Air Speed = 250 M.P.H.
 Aerial Target; Altitude 3,000 Feet.



No. 7-24

UNOFFICIAL

1000 800 600 400

LINE OF SIGHT

Trajectory - 20 mm Machine Gun (Used Cal. 0.50 for Trail)
Trajectory - Cal. 45 - L & R Upper Guns
Trajectory - Cal. 45 - L & R Lower Guns

4.5

Second
P.M.
met.

20 mm Machine Gun
Cal. 45 - L & R Upper Guns
Cal. 45 - L & R Lower Guns

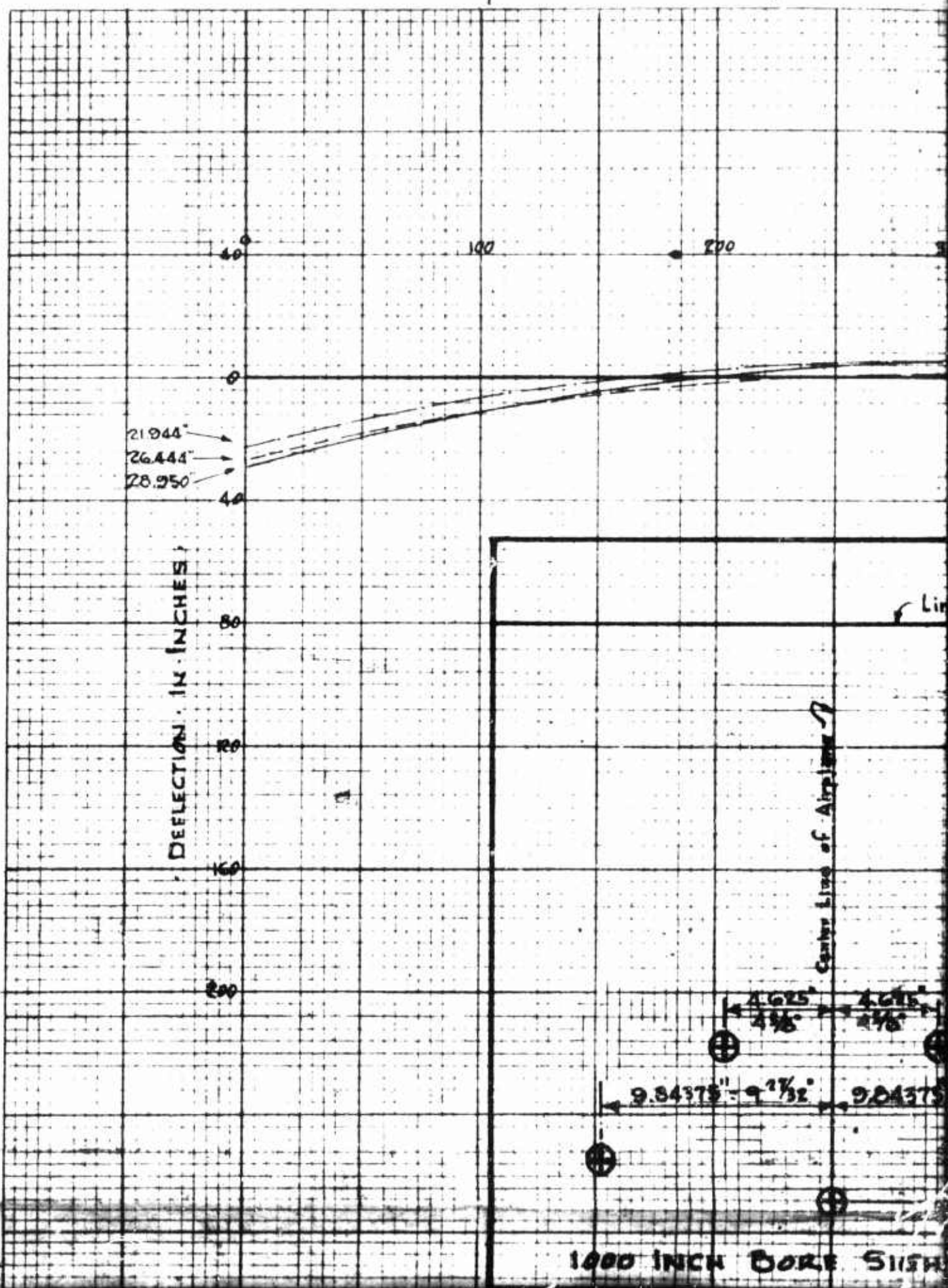
P-38 AIRPLANE

(Based on Line of Sight Passing Thru
20 mm Trajectory at 150 Yards)

Sheet No. 2A

6

150 Yd.



CONFIDENTIAL

RANGE IN YARDS

300

400

500

600

LINE OF

Line of Sight

Trajectory Data: Caliber .50

Fixed in Aircraft.

Muzzle Velocity: 2700 Ft. Per

Angle of Flight = 0 Degrees

Indicated Air Speed = 250

Aerial Target; Altitude: 3

17.209" - 17 1/4" - Upper Guns.

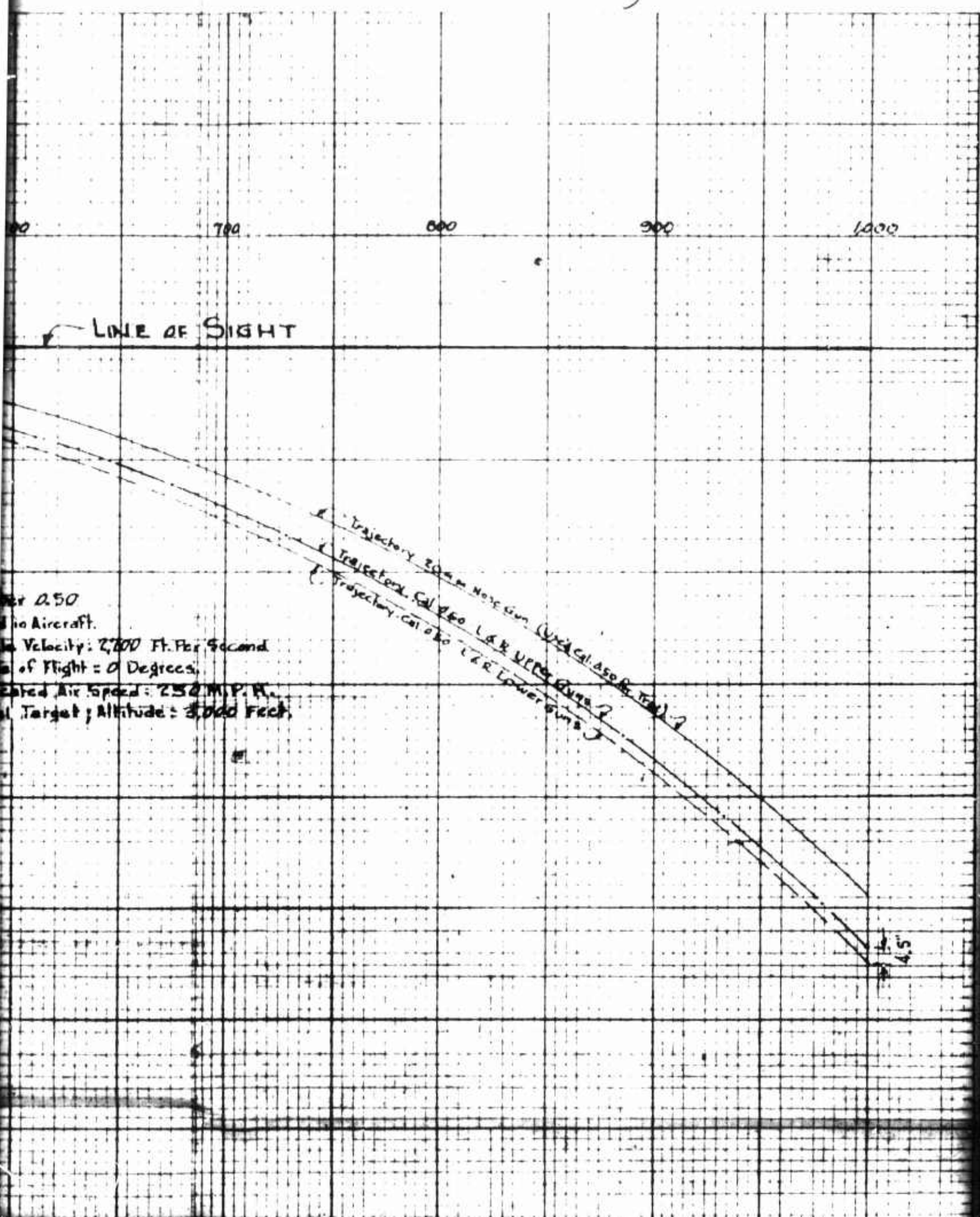
21.700" - 21 3/4" - Upper Guns.

28.555" - 28 1/2" - 20 M.M. Nose Gun.

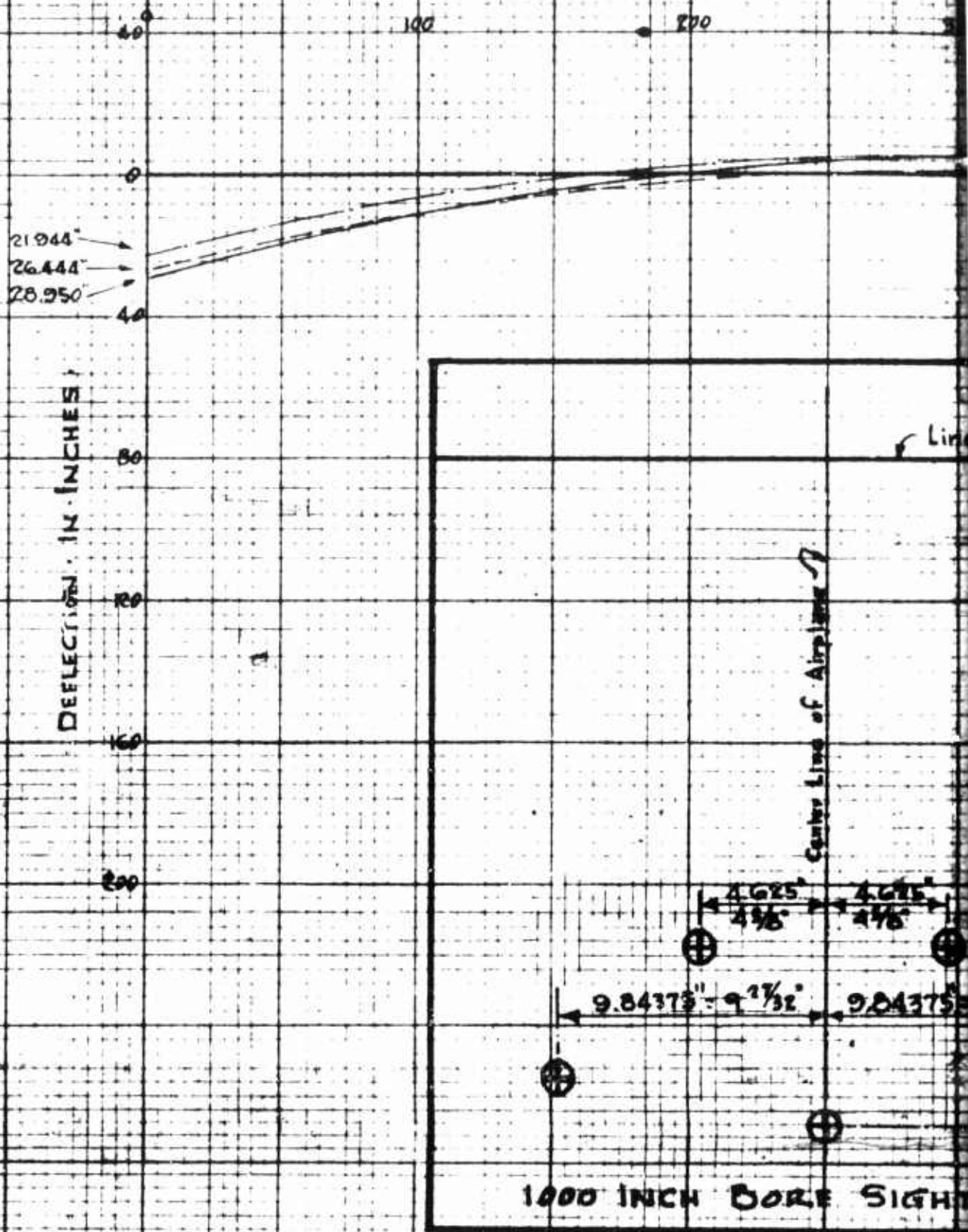
Center Line of Aircraft

904375 = 9 7/32"

SIGHT TARGET



Per 0.50
in Aircraft.
Velocity: 2700 Ft. Per Second
of Flight = 0 Degrees.
Rated Air Speed: 250 M.P.H.
Target; Altitude: 3000 Feet



Prepared By: Design Section, Proof Dept. A. F. P. G. C. Eglin Field, Fla. 9 Feb, 1943. Job No T-24.

RANGE IN YARDS

300

400

500

600

700

LINE OF SIGHT

Line of Sight

Trajectory Data: Caliber .50

Fixed in Aircraft.

Muzzle Velocity: 2,700 Ft. Per Sec.

Angle of Flight: 0 Degrees.

Indicated Air Speed: 250 MPH

Aerial Target; Altitude: 3,000

17.209" = 17 1/2" = Upper Guns

21.709" = 21 3/4" = Upper Guns

28.555" = 28 1/2" = 20 M.M. Nose Gun

9.84375 = 9 7/32"

SIGHT TARGET

T-24

CONFIDENTIAL

700

800

900

1000

LINE OF SIGHT

0.50

Aircraft.

Velocity: 2,800 Ft. Per Second

Flight: 0 Degrees.

Air Speed: 250 M.P.H.

Target; Altitude: 3,000 Feet.

Trajectory 20mm Nose Gun (Used Cal. 50 R. Tr.)
 Trajectory Cal. 50 L & R Upper Guns
 Trajectory Cal. 50 L & R Lower Guns

4.5"

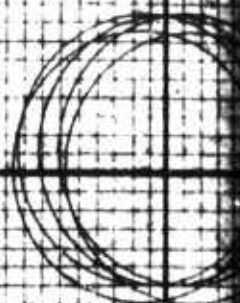
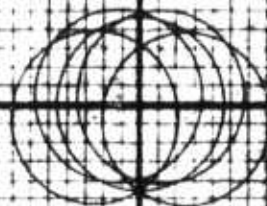
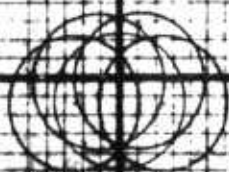
P-38 AIRPLANE

(Based on Line of Sight Passing Thru
 20mm Trajectory at 200 Yards)

Sheet No. 1A

200 W.

Sight line 7

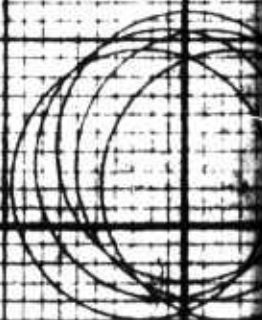
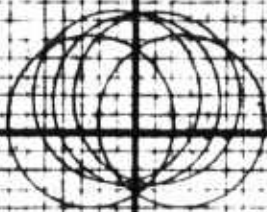


150
Yds.

200
Yds.

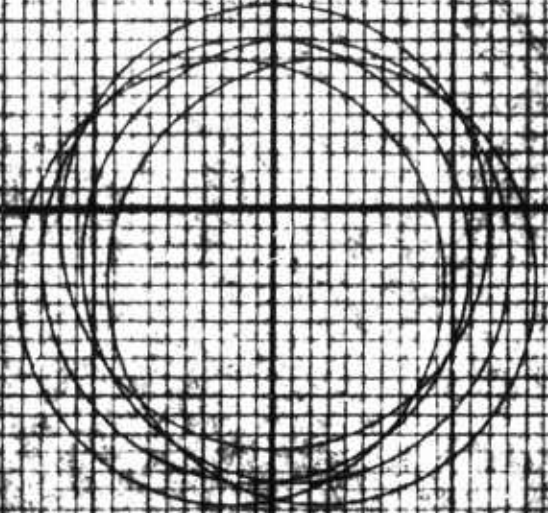
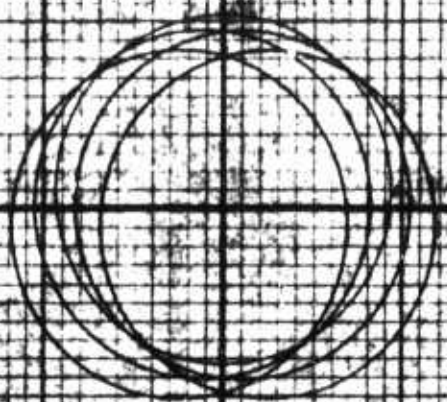
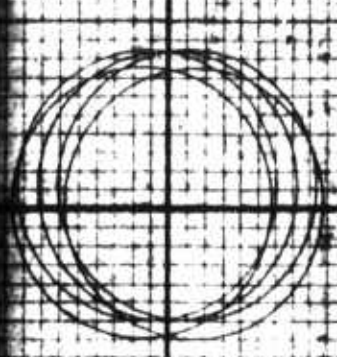
250
Yds.

Sight line 7



1

2

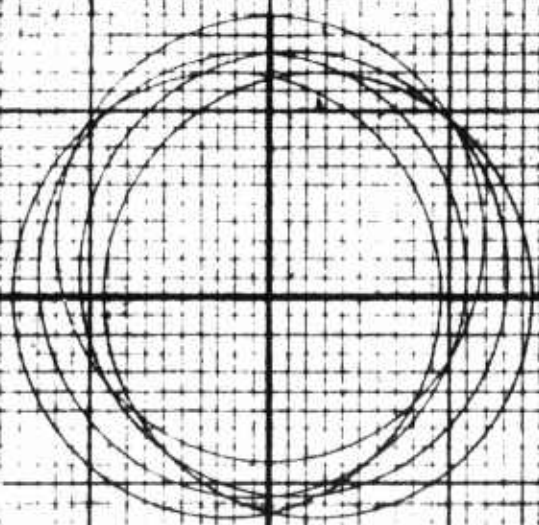
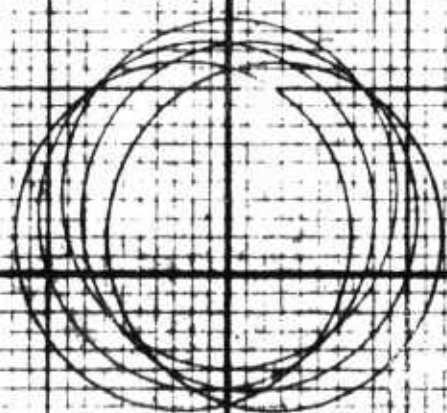
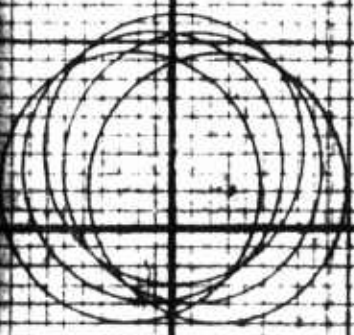


Sight line crossing 20 mm
trajectory at 200 yards
Each small square = 1 inch

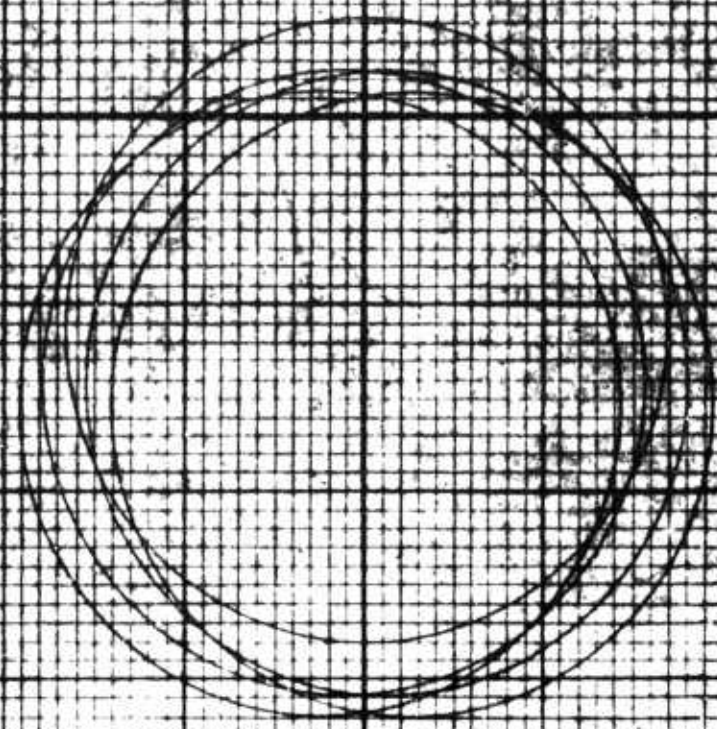
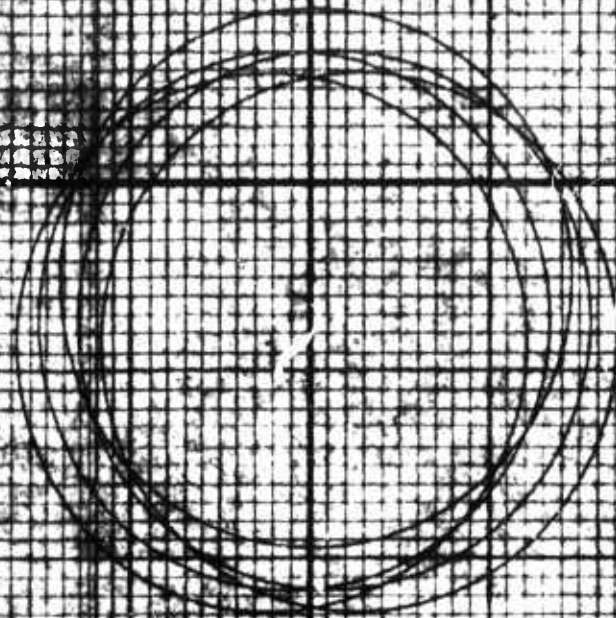
200
Yds.

400
Yds.

500
Yds.

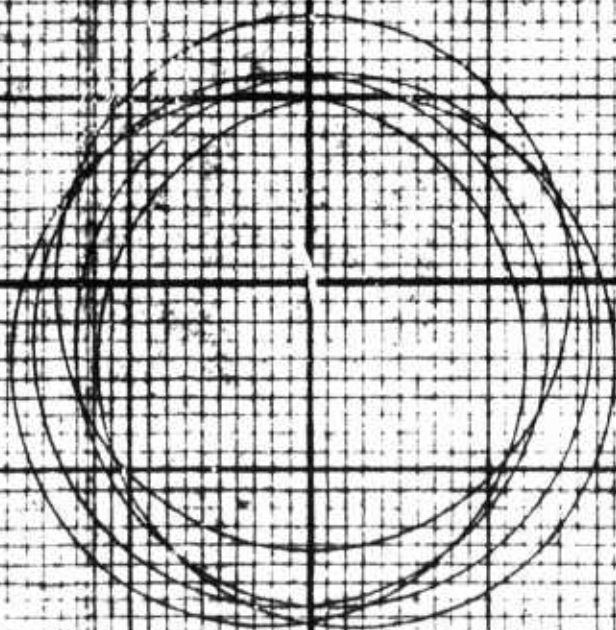


3



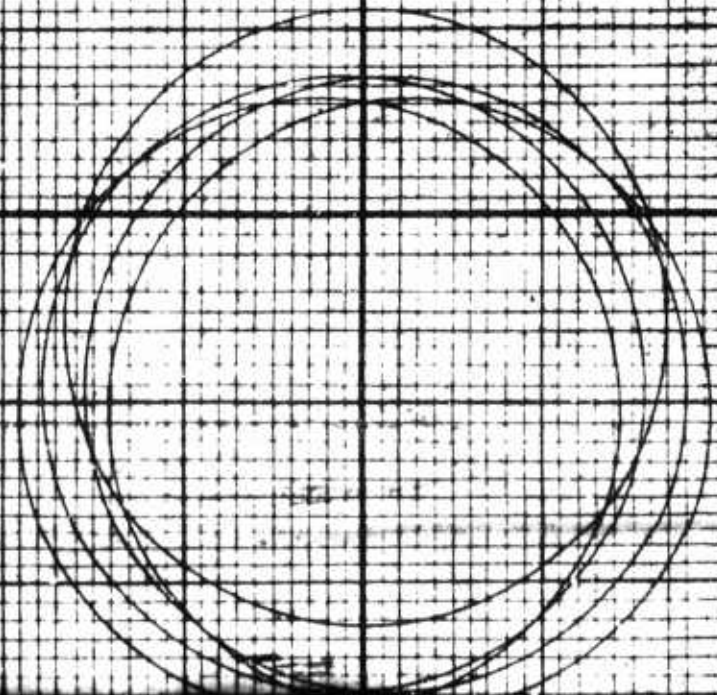
600

Y&L

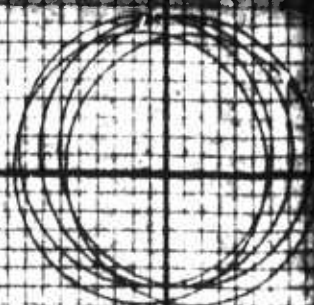
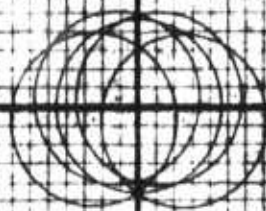


700

Y&L



Sight line 2

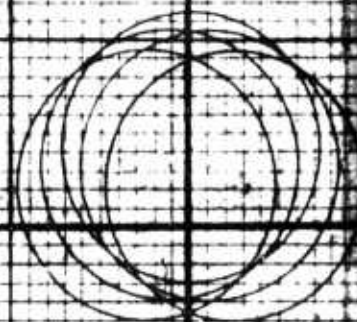
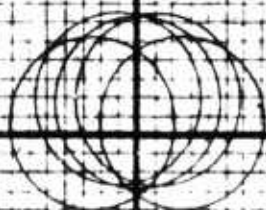
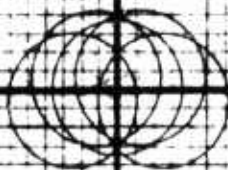


150
Yar.

200
Yar.

300
Yar.

Sight line 2



Sight line crossing 20 mm
trajectory at 200 yards
Each small square = 4 inches

400

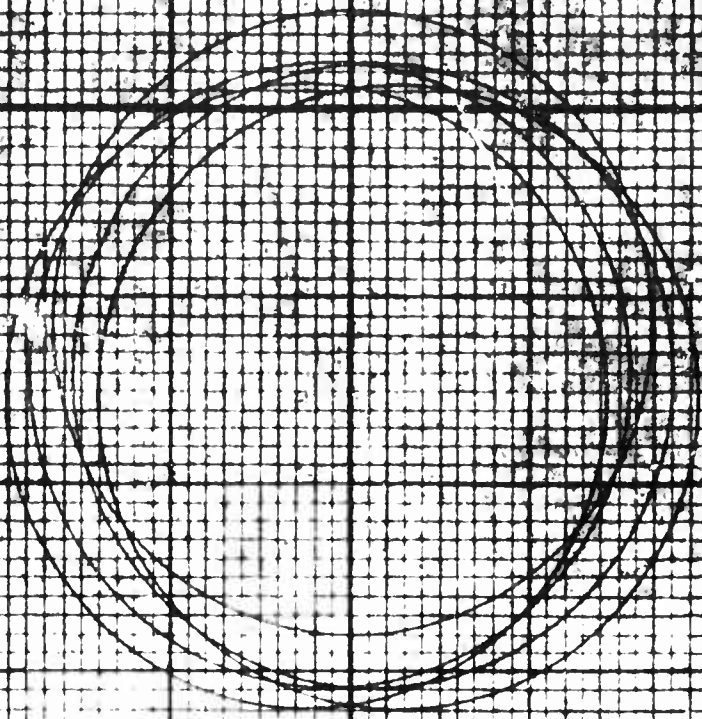
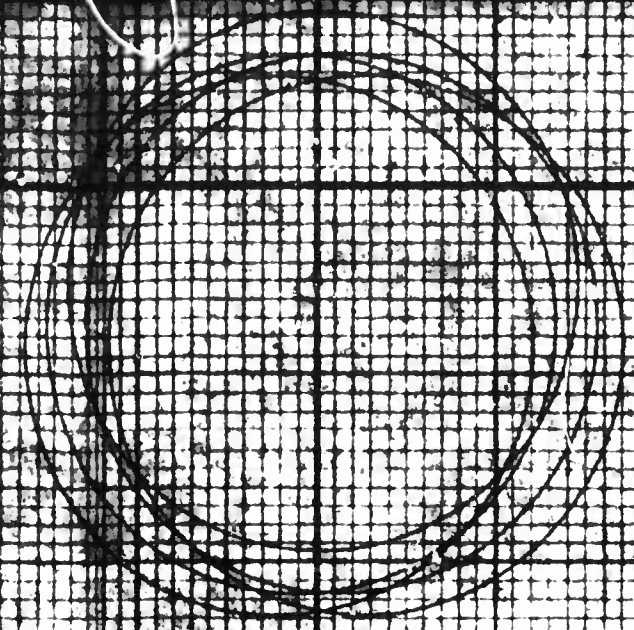
500

Yds.

Yds.

Sight line crossing 20 mm
trajectory at 150 yards
Each small square = 4 inches

Job No. T-24

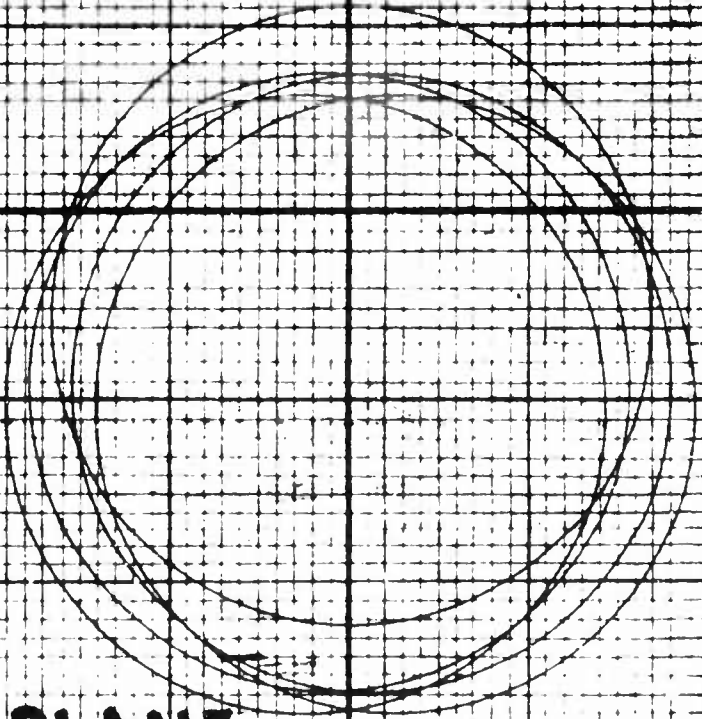
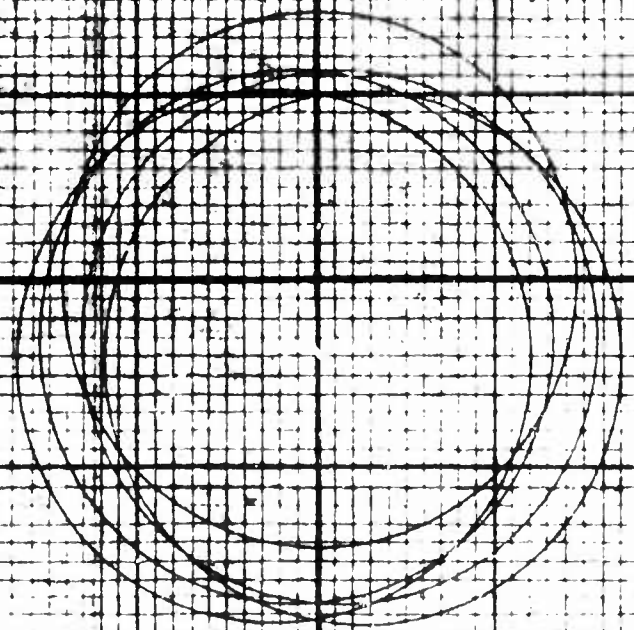


500

Yd.

700

Yd.



P-38 AIRPLANE

DISPERSION PATTERNS

(Based on 8 ft dispersion
at 1500 ft.)