

**THIS PAGE Declassified IAW E012958** 

RETURN TO:

RETURN TO:

RETURN TO:

Acrospace Studies Inst
ATIN. Archives Branch
Maxwell AFB, Alabama

UNCLASSIFIED

UNCLASSIFIED

UNCLASSIFIED

\$

**THIS PAGE Declassified IAW E012958** 

(\_\_'



SECURIAL PROPERTY OF THE SECURIAL SECUR

ARMY AIR FORCES HISTORICAL STUDIES: NO. 60

# UNCLASSIFIED

INDIVIDUAL TRAINING IN AIRCRAFT ARCANTEST BY THE AAF

The original of this monograph and the documents from which it was written are in the USAF Historical Division, Archives Branch, Bldg. 914, Maxwell Air Force Base, Alabama.

UNCLASSIFIED

Air Historical Office Headquarters, Army Air Forces

A STATE OF THE PARTY OF THE PAR

By not a second to have made they



# UNCLASSIFIED

FOREGORD

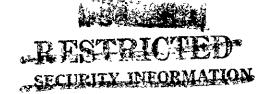
This monograph is one of a series written on the training aspects of the air program. An earlier study, AAF historical Study No. 8, Bombsight Maintenance Training, analyzes more in detail one of the subjects dealt with here but does not carry the history to the close of the war. Here we find the trends in aircraft armament training since world war I described, with in aircraft armament training since world war I described, with special emphasis on power-operated gun turret and remote-control turret courses, together with the instructional and administrative problems encountered.

Additional information and criticism will be welcomed by the Air Historical Office.

UNICLASSIFICI



AAFHS-60



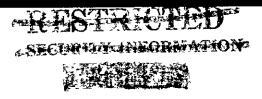
CONTENTS

	INTRODUCTION	1
I	EARLY ARMAMENT TRAINING	3
	Training for Enlisted Men	3 7
II	TRENDS IN ARMAMENT TRAINING, 1939-1945	.C
III	ARMAMENT COURSES FOR ENLISTED MEN	3
IV	FOLER OFERATED GUN TURRET AND REMOTE CONTROL TURRET COURSES . 3	9
	Power Operated Gun Turret Courses	
	First and second echelon	9
	Third and fourth echelon	
	First and second echelon	
	Third and fourth echelon	7
V	BOMBSIGHT MAINTENANCE COURSE	C
ΔI	CADET ARMALENT COURSE	2
VII	INSTRUCTIONAL AND ADMINISTRATIVE PROBLEMS	6
	GLOSSARY 10	)2
	NOTES 10	13
	BIBLIOGRAPHY 12	2
	INDEX	),

UNCLASSIFIED

PESTRICTED SECURITIONS





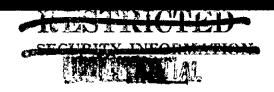
# UNCLASSIFIED

Individual Training in Aircraft Armament by the AAF, 1939-1945

UNCLASSIFIED



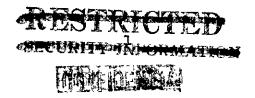
AAFFS-60



#### INTRODUCTION

The modern warplane is virtually a flying ordnance shop. It bristles with machine guns and cannon to attack or defend itself against enemy aircraft; some types are loaded with tons of bombs to be dropped with such accuracy that the war fabric of the enemy will be seriously broken. For the sake of convenience, the machine guns, cannon, and bombs carried on a plane, and the elaborate equipment necessary to operate them—power operated and remotely controlled gun turrets, bombsights, automatic pilots, and the like—are known as aircraft armament. Closely allied to aircraft armament are the spray tanks and other chemical containers with which planes may be equipped for lethal or camouflage purposes.

In the Army Air Forces, responsibility for the routine maintenance of armament and chemical warfare equipment in first-class fighting condition is placed on a commissioned ground duty officer known as the armament and chemical warfare officer; he supervises the work performed on the flying line by a crew of enlisted aircraft armorers, bombsight mechanics, power operated turret mechanics, and remote control turret mechanics. Repair work and maintenance of other than a routine nature, known as "third and fourth echelon maintenance" or "depot overhaul," is performed usually at depots and subdepots of the Air Materiel Command by enlisted men and

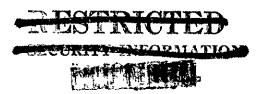


AAFHS-60



2

civilian employees. In the case of some of the heavy and very heavy bombers, enlisted aircrew members have been given training in armament as well as flexible gurnery so that they could not only operate but if necessary maintain the armament equipment.



-RESTRICTED

14FH3-60

#### Chapter I

LAKLY ADMILLER TAKINING

#### Training for \_nlisted Hen

The exact date when the technical schools of the Air Service began teaching aircraft armament to enlisted personnel is not known. Ine records of the "Air Service Rechanics Schools" at Kelly Field,

Texas, and at St. Paul, Minnesota, which gave technical training during Sorld Mar I, list 16 trades; but armament was not among them.

Then the school at Kelly Field was reorganized in October 1919,

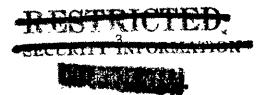
under the direction of Maj. George E. Stratemeyer, armament was one

of the 21 courses offered. In April 1921 the school was moved from

Kelly Field to Chanute Field, Ill., and armament training was given

as one of the courses in the Department of Mechanics there. Chanute remained the home of aircraft armorer training for the next 17 years.

Between 1919 and 1930 armament training was treated more or less as a stepchild of the Department of Mechanics. Students taking the course were mediocre at best—in many cases they were men with as many as 16 years of previous Army service spent as cooks or mess sergeants who felt that they could "handle" the course. This situation stemmed from the fact that at most airfields armament was considered an unimportant activity, and comparatively few graduates of the technical school course were ever actually assigned to armament work. From the fragmentary records which survive from this period, it appears



RECEPTOTED

4

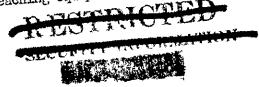
LAPHS-60

that normally five classes were enrolled each year, with eight or less students in each class. The usual length of the course was five and a half months, although occasionally it lasted a month longer. There has considerable variation in the topics presented from class to class; but the following curriculum, given to a class from class to class; but the following curriculum, given to a class fraduating on 25 May 1928, is probably as representative as any:

autient	Hours 147
Subject Hathematics and Principles of Shop Nork	153
Machine Guns	48
3 7 Amend	45
J Darrott.eciliitos	15
	117
	129
Advanced Field and Shopork	

During the first half of the 1930's two events occurred which did a good deal to improve the caliber of armament training. In 1930 the armament course was withdrawn from the Department of Mechanics, and assigned to a new Department of Armament. The step served to and assigned to a new Department of Armament. The step served to impress upon men in the Air Corps the importance with which armament work was coming to be regarded. Gradually better men were sent to Chanute to take the course and were later assigned to armament work in operational units.

The second development followed the appointment of Capt. Herbert ... Anderson as director of the Department of Armament in July 1935. Captain Anderson undertook a thorough reorganization that included renovation of the department's classrooms, replacement of included renovation equipment, and a revision of its curriculum.



A DOWN THE PARTY OF THE PARTY O

5

JAFHS-60

Starting with the school year 1935-36, the course of instruction was divided between four principal divisions: (1) Elementary and Specialized Division; (2) Eachine Gun Division; (3) Bomb Division; and (4) Chemical marfare Division. Each of these divisions was supervised by a commissioned officer charged with the responsibility of revising the subject matter of the course as well as the texts and teaching methods through which it was presented. The instructor ranks were combed thoroughly, and only men of unusual ability were retained. Instructors were told that they must master all phases of the course so that they could teach any part of it and thus fill any vacancy that might occur. The course called for 582 instructional hours over a 24-week period; 5 weeks were devoted to batic mechanic subjects, the remaining 19 to practical armament instruction. The

<u>aubject</u>	<u> Hours</u>
Lathematics	45
Mechanical praying	39
lements of Hetal .ork	57
llectrical Controls	30
Small Arms	45
Gun Cameras	30
Aircraft Lachine Gun Jights	27
Heat rreating	15
Aircraft Eachine Guns	10ĕ
Chemical Carfare Caterials	<b>5</b> 0
Bombsights and Camera Uuscura	48
Somb dacks	ψO
explosives and Ammunition	30
Tow largets	15
_	

subjects taught and the time devoted to each were as follows:

In the opinion of Captain underson, the men graduated during that year were the first armorers truly qualified to work on modern air-



(J.Fr.5-60

8 olanes.

The following year, 1936-37, the course was extended to 32 weeks. The additional eight weeks enabled the school to give three more weeks to basic machanic subjects and five additional weeks to more thorough training in electrical controls, the recognition and correction of malfunctions, and increased experience in handling live a munition and high explosives. The last type of training was nueded, it was relt, to overcome the students' native fear of explosives.

Liven these modifications did not fully answer the need for "practical" instruction, school officials felt. One of the chief factors behind the move of the Department of Armament from Chanute to newly established Loury Field, Colo., in February 1938 was the fact that close to Lowry were 64,000 unpopulated acres. Here students could learn to handle live bombs and high explosives and sequire some l'amiliarity with gunnery and bombing practices, without endangering the lives of civilians—features not available at Chanute.

within a few months of the move to Loury, the armament course was again drastically reorganized. "ith the hope of shortening the course, greatly increasing the number of fraduates, and stepping up the efficiency of the individual students, six highly specialized courses, each 24 weeks in length, were set up. Four were intended for inexperienced enlisted men: (1) primary attack aircraft armament; (2) primary pursuit aircraft armament; (3) primary bombardment aircraft armament; and (4) observation aircraft armament. A fifth course, the so-called idvanced irmorer's Course, was designed for men who had had at least a year and a half of experience in aircraft armament work,

M.FHS-60

preferably had graduated from one of the primary armament courses, but in any event had completed the basic mechanic phase in a technical school course. A sixth course, a Master Armorer's Course, was initiated for men who, among other qualifications, had at least five years of experience in the Air Corps, held a rank of sergeant or higher, had previously graduated from the Chanute armament course, possessed "outstanding interest in the subject of armament and exceptional mechanical ability," and were "considered reliable in every respect." It was expected, when this plan went into effect, that 255 men would be trained in the course of the yearan increase of more than tenfold. Approximately two-thirds of the students were to be in the four primary courses.

As might have been expected, the plan was so complicated that it proved unworkable and was dropped before the end of the school year. Another factor which hastened its abandonment was the inauguration of a vast Air Corps expansion program at the beginning of the school year In each of the two years the six-course plan was in effect 14 separate classes were matriculated, but the annual attendance never was higher than 196.

# Training for Officers

An Air Corps Engineering and Supply Conference held during 1927 it the hir Corps Materiel Division, .. right field, reached the conclusion that there was great need for the training of officers whose duty it was to supervise armament work. Accordingly, during the school year 1927-28, a course for Regular Army officers was established in the



AAFHS-60



Department of Mechanics at Chanute Field. It became the practice to give armament training to one class of officers each year, adhering rather closely to the curriculum of the enlisted men's course. When the separate Department of Armament was organized at Chanute in 1930, both officers' and enlisted men's courses were transferred to that department.

In 1934 the notion that officers ought to be equally familiar with aircraft maintenance and aircraft armament led the Chanute authorities to undertake an unhappy experiment. The two subjects were combined into one 10-month course, seven months being devoted to aircraft maintenance subjects and three months to armament topics. Two years of trial convinced the authorities that three months was far too short a period to cover armament—at least in peace time. At the start of the school year 1936-37 the armament course again became a separate entity, now seven months in length.

From the fragmentary records surviving from this period, it appears that in the 12 years between early 1928 and mid-1939, 15 classes with a total of 153 officers were graduated. Only in 1933, 1934, and 1936 was more than a single class graduated. The class records reveal that the topics presented varied greatly from year to year. 13

A notable experiment was conducted in connection with the classes graduated in 1935 and 1936. The officers taking the course at Chanute in these years were taken to Fort Knox, Ky., Fort Bragg, N. C., and an Air Corps tactical center near Valparaiso, Fla., for short periods



ALEGATION OF THE PROPERTY OF T

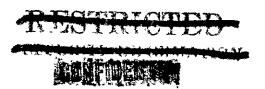
9

AAFH5-60

of practice gunnery and bombing missions. These field trips not only provided the students with valuable experience, but furnished the Air Corps with evidence of the desirability of bombing and gunnery practice in connection with armament training.

In February 1939, Maj. Gen. Henry H. Arnold, Chief of the Air Corps, ordered all armament training of Regular Army officers discontinued so that the facilities and personnel of the Air Corps technical schools might be entirely devoted to the training of enlisted technicians to meet the demands of the Air Corps expansion program.

Accordingly, the eight Regular Army officers who graduated 30 June 15



AAFHS-60



#### Chapter II

TRENDS IN ADJAMENT TRAINING, 1939-1945

By early 1939 the designs of the Facist powers had become so evident that Air Corps officials began to assess their resources to learn how they might meet any eventuality. Out of this stock-taking was developed a program designed to add 25,000 more enlisted men to the Air Corps by 30 June 1940. Of these, 1,584 were to be trained as aircraft armorers and 288 as bombsight mechanics between 7 August 1939 and 7 July 1941.

Once the program got under way, the practice was to send all Air Corps recruits to one of six fields possessing a basic training center. During their first month the men were given basic military training, innoculations, and tests to determine their capacity for technical training. Those found qualified for training as armorers were sent to Scott Field, Ill., for a one-month course in basic technical training—the instruction in shop mathematics, drafting, blue-print reading, elementary metalwork, and electricity—which had previously been given during the first weeks of the course at Lowry. Upon completion of this, the recruits were sent to Lowry to take the regular armament course.<sup>2</sup>

The procedure followed in billing the quotas for bombsight maintenance students, however, remained substantially unchanged from what it was before the expansion period. No recruits were admitted to the course; only men with three years! Army experience, a rating of qualified



RESIDENCE

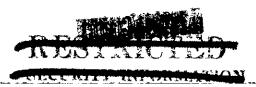
AAFHS-60

aircraft armorer, and the specific recommendation of their commanding officer were admitted. Eombsight students came on quotas from airfields and depots, and normally returned to them upon completion of the course.

To make room for the additional numbers of students in both courses, school buildings and barracks of the temporary type were constructed as rapidly as possible. To obtain the necessary new complements of instructors, students graduating from the course were impressed into teaching service. Lowry had little difficulty in meeting the goal set up for it; by the end of 1939 the school was regularly entering students at close to the desired rate—-06 armorers and 12 bombsight mechanics a month.

The alarming successes of the German Army in overrunning Western Europe and the threatened German invasion of Great Britain during the spring and summer of 1940 caused the Air Corps to supplant the first expansion program long before training under it had been completed. This second program, the so-called 136,000-man program, went into effect late in september 1940, and called for the training of 5.775 armorers and 602 bombsight mechanics by 1 April 1942.

The Lowry officials encountered considerable difficulty in achieving the pace that was now set for them. The housing, messing, and classroom facilities could accommodate only 264 students at one 7 time. For a little more than a month, from late September until the middle of November 1940, the school operated on a two-shift basis,



THIS PAGE Declassified IAW EO12958

11

SECURITY INDOMESTION

AAFHS-60

12

which relieved the strain on the available classroom—if not mess and barracks—facilities.

Not until the end of January 1941 did the War Department grant 9 the funds necessary to construct eight temporary school buildings.

As a result, it was not until the middle of 1941 that students were 10 entering Lowry at a rate great enough to achieve the goal.

As soon as the 136,000-man program was put into effect, the basic mechanic course given at Scott was discontinued and the subject matter previously included in it added to the armament course at Lowry without, however, any increase in the over-all length of the course. Although great numbers of men became available to the Air Corps through the operation of Selective Service about this time, none of the men so inducted were assigned to armament training. It was the view of the Air Corps that as belective Service inductees would remain in the Army only a year, it was not worth while giving these men an extended period of technical training only to have them return to civilian life soon afterward.

Owing to rapid and prodigious growth of the Air Corps, a need for additional officers to supervise the work of enlisted aircraft armorers and bombsight mechanics began to be felt during this period. Late in 1940 it was decided that a course of training for aviation cadets should be established. Upon graduation—these men were to be commissioned second lieutenants and assigned to ground duty as armament and bombsight officers. At first it was expected that this course would be filled with eliminees from the flying cadet course;



ACCEPTANCE OF THE PROPERTY OF

ALFHS-60

13

but when this source rapidly became depleted, quotas were filled with promising enlisted men and men from civilian life with some technical training and experience. After debate as to whether all the cadets should be given training in bombsight maintenance as well as armament, it was determined that approximately 25 per cent of them should be given a cadet bombsight course after completing a cadet armament course. This quota was based on the number of officers needed at that time for bombardment squadrons. The first class of 32 armament cadets entered Lowry on 3 March 1941; additional classes of the same size entered every four weeks thereafter.

The remarkable demonstration in Lurope of the effect of air power during 1940-41 convinced the Air Corps that it must again raise its goals for the production of planes, aircrews, and ground crews.

Ch 19 August 1941 it put into effect a program designed to produce 100,000 technicians a year—or twice as many as were then being graduated. Inasmuch as at the time the plans for the program were being drawn up, armorers were being trained at the rate of 5,005 a year and bombsight mechanics at approximately 500 a year, new goals were set at 10,000 and 1,000, respectively. These were to be accomplished through the use of two shifts—an "A" shift which attended classes from 0400 to 1245, and a "B" shift in session from 1300 to 2200 daily except Saturday and Sunday. No increase in classroom and teaching equipment was necessary, although additional instructor personnel had to be chosen 13 and trained and more economical use made of housing facilities.



PRETRICATED-

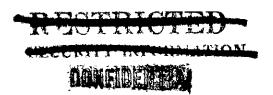
AAFHS-60

14

The work of the Lowry armament Department in meeting the demands of the 100,000-technician program, however, was made more difficult by the inauguration on 15 September 1941 of a new course in power operated turrets. Phases for such a course had been under discussion for a whole year, but it was not until actual installation of four types of power operated turrets in Air Corps bombers began to take place in the late summer of 1941 that the school officials were given word to go shead. The policy was to take the most outstanding 10 per cent of each armament class and give these men 12 weeks of training in turret maintenance. Actually, the shortage of qualified instructors, the complete lack of teaching equipment, and indecision as to which types of turrets were actually going to be used in combat caused the turret department to follow a somewhat spasmodic course curing its first 14 months.

The Japanese attack on Pearl Harbor on 7 becember 1941 and the resulting declaration of war against the facist powers led to an immediate scrapping of the 100,000-man program and the replacement of it by a far more ambitious program. The so-called Victory Program, which was put into effect during the following month, called for the training at the rate of 36,090 aircraft armorers, 3,000 power operated turnet mechanics, 3,480 bombsight mechanics, and 875 armament officers a month 15 by 31 Lecember 1942.

These goals had all been met by the end of 1942. In accomolishing them, some drastic wartime measures were resorted to. Immediately after

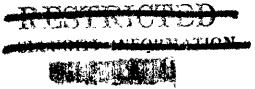


வ.FH3-60



Pearl Herbor the length of the courses was recuced by approximately one-fifth, through the introduction of a six-school-day week in all courses and three shifts in all courses except the cadet course; and through the elimination or shortening of phaces not considered absolutely essential in the case of the enlisted armorer course. The size of the classes, which were now begun at more frequent intervals, 16 was increased. Beginning in October 1942 all courses except the cadet courses were given on a seven-day week schedule, with one-seventh of the students and instructors off each day of the week.

As soon as the nation entered the war, lowry abandoned its policy of refusing to give technical training to Selective Service inductess. even in the case of the bombsight mechanic course, where previous Army experience had been considered indispensable, the shortage of old-time enlisted men made the school willing to accept even relatively recent recruits as long as they had graduated from the enlisted armorer course and met other physical, educational, and security prerequisites. For the cadet armament course, the ACCT (Army General Classification Test) score of 110 demanded of all officers was another requirement. In general, any man eligible for Army service was considered physically qualified for training in armament subjects, although from time to time limits were placed on the number of "limited service" men acceptable. An AGCT score of 100 and a mechanical aptitude score of 100-approximate average -- were set as the minimum for training in the enlisted courses.



E DS TO LOUIS AND A SECOND AND A SECOND ASSESSMENT OF THE SECOND ASSESS

16

LAFIIS-60

been but if the housing and classroom facilities available for armament training had not been considerably expanded. Luring July 1942 the enlisted armament course at Lowry was moved to a newly constructed school area known as Lowry Field No. 2.

A few days later a large new school, devoted exclusively to armament training, was opened at Buckley Field, a few miles east of Lowry Field in Colorado. Additional facilities were made available for armament training in January 1943 when the cadet armament course was armament training in January 1943 when the cadet armament course was moved to an AAF technical school at Yale University, where all ground duty cadet training was being centered.

armament course to Lowry No. 2 and Buckley, a policy of specialization armament course to Lowry No. 2 and Buckley, a policy of specialization in training was introduced which made it possible further to reduce the intraining was introduced which made it possible further to reduce the length of the course by one-quarter. Starting late in September 1942 length of the course by one-quarter. Starting late in September 1942 the course curriculum at Buckley was revised to train armorers for serveservice in pursuit squarrons, that at lowry to train armorers for serveser in bombarcment squarrons.

The entry of the United States into the war produced an immediate need for numbers of enlisted men capable of performing third and fourth echelon maintenance of armament equipment in the depots and subdepots of the Air Service Command. To meet this need the ASC in June 1942 set up the Armament Training School at the Indiana State Fairgrounds, Indiana. Courses in bombsight repair and power operated dianapolis, Indiana. Courses in bombsight repair and power operated



AAFHS-60



17

thereafter. Recognition that the newest types of planes were to employ a complicated system of remotely controlled guns led to the establishment of a Central Fire Control Equipment Course at Indianapolis the following November. The enlisted students for the bombsight and power operated gun turret (PCOT) courses came from the graduating classes of Lowry's first and second echelon courses; those for the CFCE course from Indianapolis FOGT course. In February 1943 administrative responsibility for the Armament Training Echool was assumed by the Technical Training Command, which thus was enabled to coordinate its work more closely with that done at Lowry.

In January 1943 an important new course on the first and second echelon level was established at Lowry. At first called the Central Mechanic Fire Control Equipment Course, later the Remote Control Turret/Course, this was designed to teach the maintenance of the new fire-control systems being installed in B-29 and B-32 aircraft. As the course included some very difficult subject matter, only men with unusual backgrounds—an ACCT score of 120 or over and experience in radio and electronics—were admitted.

During the first half of 1943 the AAF approached the 2,500,000-man strength which had been calculated as necessary to win the war in the air. The number of recruits made available to the AAF by Selective Service each month was sharply reduced. Losses of ground-crew men, including armorers, were light, and resulted in moderate demands for replacements. In the two-year period between the middle of 1943 and V-J

SECURIOR DEVIN

AAFHS-60



18

Tay in September 1945, armament training was characterized by three factors: a charp diminishment in the number of men under training; a reduction in the number of schools offering armament training until finally Lowry was again the only armament school; and the lengthening of the curricula of courses to permit more comprehensive and thorough instruction and the addition of newly adopted types of equipment. There is no reason to believe, however, that AAF training officials fully recognized that these factors were at work, at least not until late in 1944; up to that time the student flow, course length and content, and choice of schools followed a chaotic path for every one of the courses, indicating that improvisation was the rule at the higher headquarters.

The reduction in the number of students was most precipitous in the case of the basic armament and power operated turret courses. The enrollment of the armament course dropped from 12,547 in April 1943 to 2,292 in December 1944 to 14 on V-J Day. In the case of power operated turrets, the decline was from 248 in April 1943 to 120 in December 1944 to 2 on V-J Day. The drop would have set in earlier and would have been even sharper if it had not happened that in the last days of 1942 the Directorate of Individual Training issued a directive that henceforth all flexible gumners must be trained in some technical specialty either before or immediately after attending gumnery school. This meant that beginning in early 1943 large numbers of flexible gumnery graduates or men earmarked for service as gunners were assigned to the basic armament course, the power operated gun turret



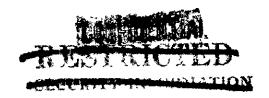
-HADITATOLED

AAFIIS-60

19

course, and the remote control turret/course. After this trend reached full force, approximately three-quarters of the basic armament students were gunners. But by early 1945 Headquarters, AAF concluded that to conserve equipment and personnel no additional armorer-gunners ought to be trained. There now appeared to be a surplus of this type, at any rate. Preci itous, although not to the same degree, was the decline in enrollment in the bombsight course. In April 1943, 1,255 bombsight mechanics were in training at Loury, while in December 1944 there were only 186. But by V-J Day there was actually a slight increase, to 198. This was the result of the AAF policy, inaugurated during the interval, of releasing enlisted men according to a point system in which length of service was an important factor. Inasmuch as most bombsight mechanics then in the AAF had long records of service, and as the AAF expected to need the services of this type of technician indefinitely, it was planned to continue such training steadily on this modest level,

training in armament. By the spring of 1944 it became apparent that the AAF had commissioned more ground duty armament officers than it could possibly use. But it did not seem advisable to curtail armament training on the officer level entirely: armament officers would be needed in the postwar AF. So the nature of the course was changed drastically; rated officers who planned to make a career of the AAF 30 were to be given the training. Thus the drop in the enrollment of



-TANGER CALED

AAFHS-60

20

the officer course was relatively slow: from 305 in April 1943 31 to 215 in December 1944 to 64 on V-J Day.

In the case of one armament course—that in remote control turrets—the enrollment actually increased from three students in June
1943 to 1,226 in December 1944 to 2,872 on V-J Day. The reason for
this gain was, of course, that remote control turrets were a type of
equipment found only in the new very heavy bombers which the AAF was
32
putting into operation in the war against Japan.

hile the volume of armament training was declining in general, the LLF made a comparable reduction and concentration of training facilities. The armament Training School at Indianapolis was closed in January 1944; and the three-cepot overhaul courses-bombsight, power operated turrets, and remote-control turrets-were resumed at Lowry during the following spring. The fulfillment of training requirements for armorers for pursuit squadrons and the diminution of needs for bombardment squadrons left the AAF with a surplus of facilities for the basic armament course. In the spring of 1944 the armament school at Buckley was closed, and Lowry No. 2 once again became the only school giving this course. During the summer of 1944 the AAF abanconed the recilities it had leased at Yale University, at the same time discontinuing the cadet armament course. The successor course, an Armament and Chemical .arfare Officers Course for rated personnel, was opened at Buckley in July, only to be moved to Lowry in January 1945. Thus the end of the war found the AAF giving all of its aircraft armament training at the same single station it had used at the start

RESTRICTED VALION

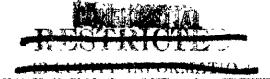
AAFHS-60

of the expansion period, Lowry Field.

of 1943 AAF officials could give more attention to the quality of the training. One of the first steps taken was to drop the third, or night, which was generally conceded to present barriers to good teaching which were difficult to surmount. Luring 1945, as most of the courses shifted to a "token" basis, a single shift became sufficient.

The school authorities undertook to extend the length of all the courses so as to make instruction more thorough and to permit proper presentation of new equipment which the AAF was adopting as it waged the war in the air. These requests were resisted for a time by Headquarters, AAF, which held that the necessity for economizing personnel and equipment, as well as "the present policy of this Headquarters" made it impossible to grant them. During the latter half of 1944 and in 1945, however, requests to extend the courses from one to three weeks were granted in most instances.

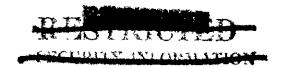
In the case of the basic armament course, where perhaps the sacrifices of quantity to quality had been greatest, the shift back to peacetime training standards was slower in coming than the school authorities would have liked. At the time of the discontinuance of the pursuit armament course in the spring of 1943, they proposed that hereafter basic armament training cover comprehensively and thoroughly all phases of armament work—even if that should require a doubling of the length of the course. The need for armament training for flexible



THIS PAGE Declassified IAW EO12958

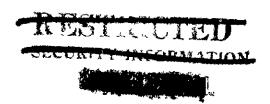
21

AAFHS-60



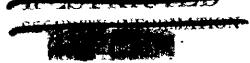
22

gunners provided Headquarters, AAF with an excuse to postpone the granting of this request. Thus it was not until the summer of 1945, when the AAF had a surplus of both gunners and ground duty armorers, that the course was reestablished on a standard compatible with that prevailing before the expansion period, but incorporating all the technical and pedagogical lessons learned during three and three-quarters years of war.



DEWELLS (ATTOM

/AFHS-60



#### Chaoter III

#### ARVAITENT COURSES FOR EMILISTED MEN

as soon as Air Corps officials realized that under the socalled Augmentation Program they would have to increase their
training rate more than 300%, they decided to scrap the complicated
three-level armament training they had been giving at Lowry Field
and concentrate on a single three-month basic armament course.
This new course started with a four-week phase called Basic Mechanics,
given to all Air Corps recruits selected for technical training. The
principal reatures of this phase, conducted at Scott Field, Illinois,

l
were as follows:

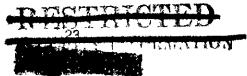
	Subject	Hours
III.	Shop Mathematics Mechanical Drafting and Elueprint Reading Air Corps Fundamentals Elements of Metalwork Elements of Metalwork	27 26 27 40 40
	TOTAL	160

Upon completing this phase, armament students were transferred to Lowry Field, Colorado, where they started on the following 12-week course of study:

Subject Hours

I. Chemical 'arfare Materials

"gents; weapons; supply; technique and
meteorological factors affecting their
use; chemical tanks; operation loading;
safety precautions.



24

RESTRUCTED

AJFHS-60

CECL IN A STATE OF THE STATE OF

24

	Subject	lours
II.	Explosives and Ammunition Military explosives, pyrotechnics, and ammunition use in the Air Corps; their composition, uses, properties, handling storage, safety precautions, inspection, and packing.	32
III.	Small Arms and Gun Cameras Description, nomenclature, operation, care, and maintenance of service-type shotguns, pistols, rifles, and gun cameras; film interpretation; details of range procedure and principles in- volved in the firing of a pistol and a shotgun.	32
IV.	Descrical Armament Controls Operation, maintenance, and inspection of all electrical armament controls.	32
٧.	Aircraft Machine Guns Description, nomenclature, theory of operation, adjustment, maintenance, inspection, handling during operation and correction of malfunctions during firing of caliber 30 and caliber 50 machine guns.	120
VI.	Synchronizers and Gun Installations Description, nomenclature, operation, installation maintenance, and inspection of standard aircraft machine gun synchronizers, controls, and mounts.	
VII.	Bomb Racks and Tow Target Equipment Description, nomenclature, operation, installati and maintenance of service type internal and ex- ternal bomb and flare racks, shackles, and tow target reels; chemical carrying and release mech anisms, their operation, installation, and maint	<u>.</u>
VIII.	Aircraft Machine Gun Sights Description, theory, installation, harmonization maintenance, and inspection of service-type air- craft machine gun sights.	
Iž.	Field _xercises  Practical work in inspection, installation, and maintenance of machine gun synchronizers; instal lation and harmonization of machine gun sights.	40 -
	TOTAL RESERVED TOTAL	480

RESTRICTED

AAFHS-60

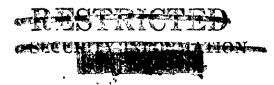
25

when the 136,000-man program, put into effect in September 1940, increased training goals of basic armorers 400%, the Air Corps discontinued the basic mechanic phase at Scott Field. Thereafter armament students reported directly to Lowry for both the basic mechanic and armament phases. The material in the former phase was compressed into two weeks so that the entire course could be given in 14 weeks:

	Subject	Hours
I.	Shop Mathematics	. 16
II.	L'etal Work	40
III.	Soldering	8
IV.	Electrical Armament Controls	40
٧.	Explosives and Ammunition	32
VI.	Chemical Warfare Katerials	24
VII.	Small Arms and Gun Cameras	ħΟ
VIII.	Aircraft Machine Guns	120
IX.	Aircraft Machine Gun Sights	40
$\mathbf{x}_{ullet}$	Synchronizers and Installations	80
XI.	Bomb Racks, Flare Racks, and Tow Targets	80
XII.		40
	TOTAL	560

A year later the course was lengthened to 15 weeks to permit the addition of a second week of field exercises. 4

The demand for armorers rocketed when the United States entered World War II late in 1941: between that time and March 1943, when the peak was reached, the training rate had increased about 900%. To meet these prodigious increments the course was progressively shortened; and the content of the instruction was made ever narrower—or more "specialized," as the term was. The day after the attack on Pearl



RESTRICTED

26

AAFHS-60

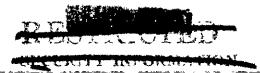
Harbor, the length of the course was ordered slashed from 15 weeks to 12. This was accomplished by making Saturday a regular eight-hour school day, and by eliminating certain "not absolutely essential" parts of the electrical answment controls, explosives and asmunition, metal work, chemical warfare, machine gun, and small 5 arms phases.

The course length was again reduced in Deptember 1942, in compliance with a directive of the Technical Training Commana (TTC) that as far as possible all technical courses here to be specialized. Two types of armament were to be taught—pursuit armament at recently opened luckley field, and bombardment armament at the new Lowry field to. 2. both courses were to be nine weeks in length. The phases and distribution of time of the two courses were as follows:

comocranent frament	Fursuit Armament		
<u>Phase</u>	Hours	<u>Phase</u>	Hours
Aircraft Pachine Guns .30-ano .50-cal. machine guns, fixed and flexible; 20-and 37-mm. aircraft cannon.	126	Aircraft Pachine Guns .30-and .50-cal machine guns, fixed; 20-and 37-am. aircraft compon.	126
lectrical Arrament Control	s 31\ 102	Llectrical Armament Contro	
Explosives and Ammunition		explosives and Amaunition	21
Domb weeks	42	Jynchronizing	84
Field Exercises	42	Aircraft Cun Sights	42
Power Turrets	<u> 126</u>	Field exercises	84
Tor:1.	378	TOPIL	378

Disserved to a second and

The principal differences between the two courses lay in the bomb ruck and power turnet phases, which treated equipment found only in



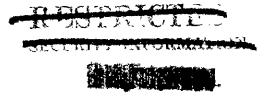
RESTRICTED

27

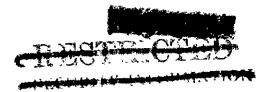
AAFHS-60

bombardment squacrons; and the synchronizing and sireraft gunsight phases, which covered material which would be of particular value to men who would be assigned to pursuit squadrons. During the field exercise phases, concucted in hangars, embryonic bombardment armorers were assigned work on bombers and bomber equipment, while prospective pursuit armorers practiced on fighter aircraft and equipment. Specialization was not carried to such a degree that no information on bombardment armament was given to pursuit armorers, or vice versa. During the 21 hours of instruction on explosives and ammunition given to oursuit armorers, there was some familiarization instruction on bombs and bomb shackles.

Then the AAF reached the limits of its expansion/in the spring of 1943, certain new factors appeared which considerably affected the curricula of the basic armament course. A few armorers were needed as replacements in pursuit and bombardment squadrons. Now, however, most of the students would be men earmarked for training as flexible gunners; they would need bombardment armament training. The Technical Training Command directed that beginning early in May almost three times as many men would enter the bombardment course as would enter the pursuit course (717 bombardment armorers per week as compared with 265 pursuit armorers). Inasmuch as the facilities at Lowry No. 2 and at buckley had been set up on the assumption that the number of bombardment armorers and pursuit armorers to be trained would be approximately equal, considerable readjustment was necessary to meet the new conditions. All equipment and



AMPES-60



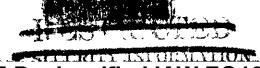
28

personnel of the aircraft machine gun phase was concentrated at Euckley, reginning in May. Thus all basic armament students now began their training at Euckley; upon completion of the machine gun phase, 73 per cent went to nearby Lowry for the later phases designed for boncardment armorers, while the remaining 27 per cent remained at Euckley to take pursuit armament.

The Technical Training Command officials recognized that this arrangement was at best a makeshift. They invited the authorities at the two schools to propose plans for the improvement of the course. Two plans were forthcomin, both based on the assumption that inasmuch as the demand for large numbers of armorers had now ceased, the course ought to be more comprehensive, more thorough, and considerably loss burried.

The first plan celled for a 16-week course—eight weeks to be spent at Buckley studying machine guns, cannon, explosives and ammunition, electrical armament controls, and such specialized pursuit—armament subjects as synchronizing and machine-gun sights; and a second eight-meek period to be spent at lowery covering bomb racks and power-operated turrets. The phase on turrets would be so comprehensive that it would obviate the need for the eight-week advanced course on power turrets then being offered at Lowry. It was suggested that a more thoroughly trained, all-around machine result from 10 this course.

The second proposal contemplated a course on the same teneral



CTC CONTRACTOR

MATES-60

۲.

29

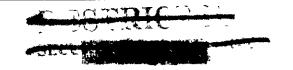
principles, but the pace was to be even less hurried—22 weeks in length. The first 10 weeks, devoted to general and pursuit armament phases, were to be given at Buckley. Of the 12 weeks to follow at Loury, nine were to be devoted to bomb racks and thorough training in power operated gun turrets, and three weeks to exercises in maintenance of bombardment and pursuit aircraft. 11

No action was taken on either of these proposals for more than two months. Finally, on 17 July 1943, the Assistant Chief of Air Staff (AC/AS), Training of Headquarters, AAF gave orders that the pursuit and bombardment courses were immediately to be combined into a single 12-week course. The switch in curriculum was to be conducted in such a way, the directive specified, that there would be no interruption in the regular flow of armorer graduates to the flexible runnery schools.

When this directive reached lowry Field, where it was generally supposed the combined course would be located, the school authorities protested vigorously that 12 weeks was not long enough a period to train an armorer comprehensively. In August they submitted as an alternative a 16-week curriculum that was in its essentials similar to the one they had proposed three months earlier. 13

The suggestion was rejected by the Training Command (the command which was created by the merging in July 1943 of the AAF Technical Training and the AAF Flying Training Commands), which now adopted the stand taken by Headquarters, AAF that a 12-week period was long enough.





30

AAFIIS-60

The 16-week curriculum, Headquarters, AAF told the Lowry officials, contemplated too thorough a presentation of turret maintenance.

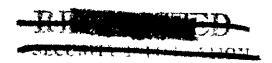
14

Familiarization instruction on this equipment would be adequate.

None too enthusiastically, the Lowry and suckley officials complied with the circuite. By 13 October 1943 they had shifted around enough personnel are equipment to put the following 12-week curriculum into 15 effect:

	Subject	<u> Hours</u>
T.	Explosives and Ammunition	18
II.	Chemical arfare	18
III.	Electrical Armament Controls	36
IV.	Comb kacks	36
v.	Cal50 Lircraft Machine Cuns	36
	Cal30 /ircraft Fachine Guns	12
VII.	20-mm. Aircraft Cannon	24
VIII.	37-444. Aircraft Cannon	24
	75-rum. Lircraft Cannon	12
	Synchronizing	36
AI.	Aircraft Machine Gun Sights	24
	Gunsight Alming Point Cemera	12
	Power Operated Gun Turrets & Tow Targets	108
	Martin upper turret; Consolidated tail turret;	
	umerson nose turret; Sperry upper locally con-	
	trolled turret; Sperry lower ball turret; Bell	
	11-6 and 11-7 twin gun mount; Bendix upper gun	
	turret; Sendix lower gun turret; Bendix chin	
	turret type 1-16; tow targets, windlasses, and	
	related equipment.	
VIX.	Field Axercises	36
	Pursuit and bombarcment armament.	***************************************
	TOTAL	432

This curriculum is interesting because it was a reversion to almost the same order of presentation of subject matter which had been used before the course had been made "specialized." Such



PERCECTED.

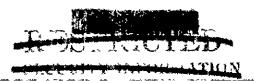
MATIS-60

31

subjects as explosives and ammunition, chemical marfare, electrical armament controls, etc., were relatively easier than machine guns and cannon for a beginning student to grasp, the school authorities felt, so it was better to present them at the start of the course. The phase on chemical warrare was restored in response to a protest from the Air Chemical Officer that such training ought to be given armorers because "virtually all tactical aircraft was a potential 17 carrier of spray tanks."

The new curriculum was noteworthy for another reason—it included subject matter which the school authorities had long believed ought to be included in the basic armament course, but for which they had never been able to secure approval from higher headquarters. In this category was instruction on the new 75-mm. cannon, used on B-25 air—18 planes, the merson nose turnet, and the sendix upper, lower, and chin a-16 turnets, which were being widely installed on heavy bombers. The 42 hours specified in the new 12-week basic armament curriculum permitted ramiliarization training for all armorers.

Lowry and Euckley had barely begun using the 12-week curriculum when their equanimity was upset by the receipt of AAF Training Standard No. 80-51, for aircraft armorers, dated 2 October 1943. At this time Headquarters, AAF, in an effort to standardize AAF training, was preparing a series of directives listing, in some detail, proficiencies which individuals must attain to be considered adequately trained in technical specialties. The Lowry and Buckley officials had understood



PESCALCARD

AAFHS-60

32

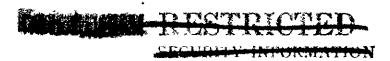
that the preliminary graft of the training standard for aircraft armorers would be gray up in Headquarters, mestern rechnical Training Command (MTTC), inasmuch as the greater part of armament training was conducted under the supervision of that command.

The Lowry officials in particular had several objections to AAF
Training Standard No. 80-51. The wording of a statement of the general
objectives of armament training and of another dealing with equipment
maintenance seemed to them inaccurate in details and open to misinterpretation. They suggested substitute statements to avoid these ob21
jections.

More serious so far as the school was concerned were certain specifications. Paragraph 2a, for example, provided that an armorer be able to demonstrate his proficiency in the "blindfold disassembly and assembly of the caliber .50 and caliber .30 machine gun . . . ."

As they then were giving the course, the school authorities had time for a blindfold test only on the caliber .50 machine gun. They did not consider it advisable to readjust the training schedule, "since the caliber .30 gun has a very limited use." Nor was the Lowry school meeting four other specifications:

- 2c. Care, adjustment, and operation of all small arms and weapons used by the army hir Force units.
- i. Adjustment and use of shut traps.
- 1. Safety regulations, range rules, and procedure.
- m. The use and purpose of all supply, maintenance and other forms, plus replenishment of supplies and survey procedure.



RESTRICTED

33

ALFES-60

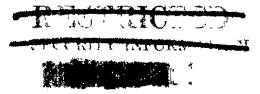
The lowry officials and the mestern lechnical Training Command authorities agreed that one of three things should be cone: (1) The training standard must be revised, omitting the parts in question; or (2) the length of the course must be extended to 15 weeks to allow time for the addition of necessary instruction; or (3) the familiarization training given on power turnets must be considerably reduced in scope to provide time for the addition of the required material.

The Lowry officials inclined toward the second alternative.

hen the Training Command presented to Heacquarters, A.F these suggestions, together with its own recommendation that the course be extended to 15 weeks, Headquarters, AAF replied that "in view of the existing need of armorers for new units," the request could not be 24 granted, but that it should be resubmitted in a out four months.

Meanwhile, however, the Lowry authorities had attempted to improve the general standard of the course through their own efforts. At the authorization of the TTC, in January 1944 they issued a detailed statement of proficiency standards which students were expected to attain in each phase of the basic course. Before being adopted they were reviewed by difficers one enlisted men recently returned from combat duty who had had experience in the type of work localized.

By the start of 1944 the AAF had trained all the armorers it would need as replacements. Accordingly, on 16 February, the Training Command announced that henceforth the only men to be given basic



34

: AFES-60

armament training would be men earmarked for service as armorer This, so the ATC concluded, made it possible flerible junners. to eliminate from the armament curriculum much of the material which was also curriculum of the flexible hounnery course. It had Leen impracticable to avoid the auplication of such material earlier, when embryonic armorer-gunners and ground duty armorers were taking the armament course side by side. Through the elimination of such phases as synchronization-useful only to pursuit armovers--and the introduction of a new type of specialization, it was possible to reduce the length of the armament course from 12 to seven weeks. As the quotas of armorer-gunners would be small enough to be accommodated at Lowry No. 2, it was decided to discontinue giving the course at Buckley.

Training under the seven-, cek specialized curriculum began at Lowry on 24 April 1944. The syllabus, originally drawn up by the Loury officials, was as follows:

	Phase	Days
Ι.	Technical orders and supply Bombs and fuzes Caliber .45 pistol Caliber .50 aircraft machine gum 20-mm. automatic aircraft gun	1 2 1 9
	TOTAL	18
II.	Power operated gun turrets Cun sights and cameras Martin upper turret Sperry lower ball and untractable turret Consolidated tail turret Flexible gun Field test on B-24 irplane	2 3 3 1 1
	TOTAL	22

Phone Property of the Property

35

Phase

AAFHS-60

Days

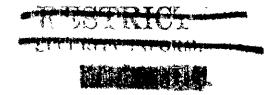
III.	Heavy Fombardment Armament Only for E-17 Ai	rcrews
	ilectrical armanent controls and bomb racks	9
	Power operated gun turrets	
	Cun sights and cameras	2
	Sperry upper turret	3
	Sperry lower ball and retractable turret	3 2
	Benoix chin turret	2
	Bell gun mount (K-6, K-7)	1
	Flexible guns	1
	Field test on B-17 airplane	<u> </u>
	TOTAL	22

IV.	Medium Bomberdment Armament—Only for Malectrical armament controls	<u>3-25 or <u>6-26</u> A</u>	ircrews
	Power operated gun turrets		
	Gun sights and cameras	2	
	Haraonization	1	
	Martin upper turret	3	
	Pendiz uoper turret	3	
	Bell gun mounts	1	
	75-mm. aircraft gun	2	
	Flexible guns	1,	
	Field test on B-25 and B-26 sirplanes	1	
	TOTAL	22	

V.	l'iscellaneous	Armament	iuipmentFor	all students
	Tow targets, shut traps	viidies 26:	<b>'</b> }	_2
	ምርም <i>L</i> ፒ			2

Quotas for the second, third, and fourth phases were set by the flexible gumnery schools, which in turn were determined by commitments for operational training and assignment of combat groups overseas. The 30 first classes were taught according to the following percentages:

365 B-17 crew members 365 B-24 crew members 285 medium bombardment crew members





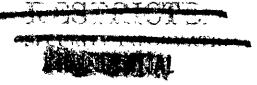
1.:::FIS-60

36

In the assignment of students to the three courses, an unusual screening process had to be followed, necessitated by the physical dimensions of the Sperry ball turret, installed on the B-24 airplane. It had been found that men taller than 5 feet 5 inches and heavier than 150 pounds could not operate this type of turret satisfactorily. Therefore, 36 per cent of the students whose height and height were closest to this limit here assigned to the B-24 course, the next 36 per cent to the E-17 course, and all the others to the medium bombardment course.

Then it was determined, in the autumn of 1944, that the aircrew of the new very heavy bomber, the B-29, would include an armorer-gunner, the Training Command directed that the scope of armament training at Lowry be expanded to offer instruction for these men before they entered the flexible gunnery schools. On the basis of this, a B-29 course was begun in January 1945 which called for 42 days of training. During the first 20 days the instruction covered the same material given in the B-17, B-24, and medium bombardment armament courses. The latter 34 days covered material from the remote control turret course.

The AAF expected that its other type of very heavy bomber, the B-32, would also require the services of an armorer-gunner. During the latter months of 1944 and early 1945 Headquarters, AAF continued to send directives and suggestions to Lowry to prepare a course of this type, and even set a number of starting dates. The Lowry officials tent to great pains to get ready, drawing up a syllabus and coaching instructors;



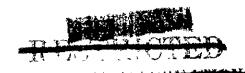
AMFHS-60

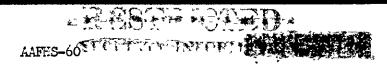
37

by December 1944 they were in a position to begin the course as soon as P-32 equipment arrived.

Meadquarters, Alf between officials of the Thentieth Air Force and the MC/AS Training early in February 1945. It was agreed there that the operation of the guns of E-29 and E-32 planes so occupied the time of a gunner that he did not have time to perform maintenance work on such equipment as armament; therefore, it seemed inacvisable to give him armament training. Moreover, the requirement for gunners with armament training on E-17, P-24, and medium tombardment crews had now been completely met. Therefore, during April the E-29, E-17, B-24, and medium bombardment courses were all discontinued, and plans for the E-32 course were dropped.

At this time Headquarters, AAF set as a goal for the Lowry school at type of besic armament trainin which the school authorities had been urging since April 1943—a long, comprehensive, thorough course, covering all types of sireraft armament and given at an unhurried pace. Such a "token" course would keep intact a shall corps of experienced instructor personnel and equipment, and by use of the "block system" make it possible for operational air forces to obtain instruction on part or all of the course for their assigned personnel. The reorganized course, with a curriculum calling for 20 meeks of instruction, was begun curing the subsect of 1945, with a new class of five men entering every two weeks. The course was as follows:

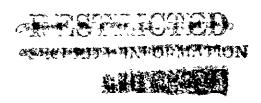




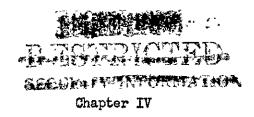
38

Subject	Days
Technical Orders and Supply	2
Chemical Larfare	3 1
Explosives and An unition	l
bombs, Fuzes, and Mircraft Rockets	4
Shop Practice and Basic Electricity	10
Bomb Racks	15
Meacons (small arms, machine guns, aircraft	•
cannon)	30
Fixed and Flexible Gun Younts	1
Sights, Cameras, and Harmonization	9
Turrets (locally and remotely controlled	•
turrets and (un mounts)	20
Tow Targets, Windlasses, and Skeet	1
Final Phase Testing	4

With this curriculum, the Lowry school undertook to train the armorers necessary to maintain the "Fostwar Air Force."



AAFHS-60



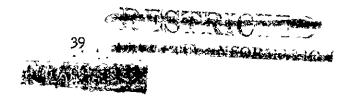
POWER OPERATED GUN TURRET AND LEMOTE CONTROL TURRET COURSES

The courses dealing with the maintenance of power operated gun turret and remote control turret (central fire control) systems are of peculiar interest because they were the only regularly given courses in the armament field exclusively concerned with equipment which came into use while World War II was being fought.

#### Power Operated Gun Turret Courses

First and second echelon. In the summer of 1940, reports reached Lt. Col. Early E.W. Duncan, Commandant of Lowry Field, that the RAF was experiencing considerable success in the use of power operated gun turrets and that the Air Corps was contemplating their installation on its bombers. These reports led Colonel Duncan to propose to the Chief of the Air Corps that steps be taken to establish a course in the maintenance of this type of equipment. Such training, he suggested, should be given not to all aircraft armorers, but only to men who would be concerned with the maintenance and operation of such equipment.

For six months no action was taken on his idea. Not until 5 December 1940 did the Air Corps make any definite plans for the procurement and installation of power operated gun turrets in its bombers. Not until 27 March 1941 did a board composed of an officer from Lowry and one from wright Field meet at wright Field to formulate recommendations as to





44FH5-60

40

how such a course should be essablished. Their chief proposals 3 were:

(1) The course should be completely distinct from the arisent course.

(2) It should be approximately 16 meeks in curation.

(3) It should graduate approximately 40 students each wonth.

(4) Eccouse turrets were extremely complicated equipment, frest care should be exercised in the selection of students.

(5) Fen already assigned to tactical units should not be sent to lowy to take the course. assigned personnel should receive instruction from civilian representatives of the factories manufacturing the turrets installed in the airplane used by their squaorons.

(6) In preparation for the course, eight Lowry enlisted instructors were to be sent to the four factories making the

turrets adopted by the fir Corps as follows:

- 2 instructors to General electric for 6 ..eeks' instruction
- 2 instructors to sperry for 6 weeks' instruction
- 2 instructors to Benoix for 4 .eeks' instruction
- 2 instructors to Consolidated for 2 weeks! instruction

(7) As it did not seem likely that more than one officer could be spared for the course, it would be necessary that he take training at each of the four factories. To estimate was made as to the amount of time this would require.

(b) The course should start just as soon as turrets necessary for instructional purposes had reached lowry and the instructors

had returned from their training at the factories.

ith a single important exception, all of the bourd's recomendations were approved by the fraining and Operations Division of the Office of Chief of the dir Corps. Owing to the critical times, Training and Operations felt that 16 teeks was too long a period for such a decourse; eight would be enough.

Capt. Milliam F. Day of Lowry was cetailed to make arrangements for training eight instructors and himself at the manufacturing plants.



#ESTRICIE:

111FH3-60

41

This was not easy to accomplish, for a complete set of the turret equipment was hard to come by, even at the factories. However, the manufacturers went out of their way to cooperate, and by the middle of September all eight instructors had had some sort of factory training. Euring the following inter Captain Day and his instructor corps paid second visits to the plants so as to keep abreast of the technical advances being made in this rapidly developing field.

Captain Day, who subsequently recame supervisor of the Fower Turret Division at Lowry, has left a vivid description of the conditions which prevailed when the new course was startin. "On Deptember 15, 1941," he wrote later, "this school, armed with six inexperienced turret instructors and no equipment, prepared to meet to thirty-three (33) students who had been sent/it by Air Corps tactical or anizations. The instructors had purposely avoided mailing a schedule of instruction to the tactical units, tecause they did not know the type of student who would appear, nor did they have any past experience as a base on which to allocate time of study on a given 7 subject."

It required only a few weeks of experimentation to convince the Lowry officials that the Oufice of Chief of the Air Corps had made a mistake in setting the length of the course at eight weeks. On 7 October they requested permission to extend it to 12 weeks; three weeks later the OCAC granted permission for a "temporary extension."



AAFHS-60



42

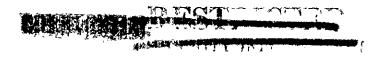
From the outset the school was handicapped by the "pitiful lack of sufficient power turnet equipment." Some Martin turnets trickled in during the first month the school was giving instruction, but six months passed before any Lendix or Consolidated equipment arrived.

"The Bendix instructors," Captain Day reported, "were forced to use the limited supply of blueprints, clagrams, and facts that were available. In short, the instructors were forced to teach a 'blackboard' turnet for more than six (6) months. This tended to confuse the instructors as well as the students as only two of the instructors had actually seen and operated the Lendix. The students rapidly lost interest in the 'blackboard' turnet . . . ."

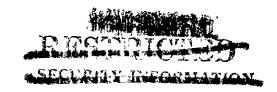
The school had some equipment which was, in the words of Coptain Day, "of great value, but only insofar as it was retter than nothing. For instance, the Sperry sight is fourteen inches square, and only four instructors and one student can study it with semi-effective results. This acute shortage of sights not only lengthens our period of study, but, in addition, fails to give students a chance to 'tear it down' and gain a working knowledge."

The turret course was still in this embryonic state when the attack on Pearl Harbor plunged the nation into war. On 8 December 1941 the Power Turret Division was alrected by the Technical Training from 12 Command that the course was to be shortened/to eight weeks, with a new class of 80 men entering each four weeks.

Under this new schedule, which went into effect on 13 December, instruction time was allotted as follows:



C3-EHILLA



43

4 days

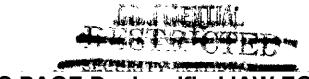
	Fhase	'l'ine	2
I.	Pendix Turrets Introductory naterial; Tendix lower turret; and Rendix upper turret.	2	weeks
II.	Sperry Turnets Sperry sights: maintenance, installation, and harmonization, 9 days; caliber .50 machine gun, 1 day; Sperry upper local turnet; Sperry locar ball turnet; and Sperry lower ball retractable turnet.	4	weeks
III.	Martin Turret	3	days

Consolidated Tail Turret

At the start of the first phase, considerable tire was devoted to explanations of the importance of turrets in borbardment warfare. This was done because it had been found that some students did not apply themselves to the course, declaring that they were not interested 13 in the subject.

Early in 1943, the curriculum was reorganized, with the four weeks devoted to Sperry equipment being given as the first phase and the two-week period on Pendix turrets becoming the last phase. Under this new arrangement, most of the first day of the course continued to be devoted to the caliber .50 machine gun. Experience had indicated that a "practical knowledge of machine guns" was so important to turret maintenance men in the field that this instruction was repeated on the first day of the Eartin course, the second phase under the varied lip curriculum.

The course was longthened to nine weeks the following 13 September so that a week's instruction could be given on two new types



## RESTRICTED-

MFHE-60

44

of equipment, the Lendin lower chin turnet and the Emerson nose 15
turnet. The Lowry difficials had made elaborate, in not completely successful preparations for these new phases. As soon as they heard that the two new types of turnets are being installed in ArF boncers, they undertook to obtain some for the school; but as operational units had priority, none could be produced until instruction on them had commenced at Lowry. The school did succeed in arranging to have several enlisted instructors visit modification centers, the arrangement Training School at Indianapolis, and the factory of the Emerson company to obtain data upon which to plan the course.

hen in the surfer of 1943 the Training Common put into practice a policy of having all technical courses organized into "blocks of instruction" so that students on detached service from tactical organizations might take only the instruction which they would use when they returned to their units, it became necessary to rearrange the syllabus of the turnet course more completely than was the case in other arrangent courses. The revision went into effect on 15 October, at which time the course was renamed "Power Operated Turnets and Gun l'echanic Sight Specialist/Course" out of respect to the highly important sights used in connection with the turnets. Under this revision, the instruction was arranged as follows:

Block	Subject	Days
, <b>1</b>	Caliber .50 Machine Gun	3
<sub>#</sub> 2	Consolidated Turret	3
÷~3	Sperry Upper Local Turret	6
<sub>4</sub>	Sperry Local ball Turret	6
ı 5	Sperry Automatic Computing Sight	12
<i>÷</i> 6	Lectricity	6
'n 7	artin Turret	6
<i>;</i> -8	Emerson Turret	6
.79	Eendix Turret	6

## LESTRICTED SECULO

ALFES-60

45

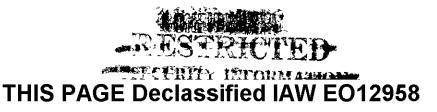
Under this system, a student from a unit operating:

17

Unassigned students would take the entire course as previously.

The K-series of gun sights caused the Lowry officials a number of problems during the winter of 1943-44. The first case crose then a copy of ALF Training Standard No. 80-52, prepared by Reacquarters, ALF and dated 20 September 1943, reached Lowry early in October. An analysis of the Standard convinced the school officials that their course prepared students to meet all the specifications except for the maintenance of the K-S, K-9, K-10, and K-11 computing gun sights, the Crocker-Theoler and Curtiss-right turrets, and the Pell gun mount. These were not being taught because the school had never received a directive to teach them, and old not possess any of the equipment in 18 question.

ipate the need for warker on the 1-8 several months earlier, but without success. In July one instructor was sent to the wairchild factory to study the eight, and three were sent the following October. These units, which were used in conjunction with the Martin turret, were complex in design and operated on the electronic principle. It would be necessary



RESTRICTED

AMPHS-60

46

to devote two weeks to teach them adequately. But for some time the school could not obtain permission to lengthen the turnet course 19 to 11 weeks or to set up a special two-week 1-3 sight course.

Larly in December two Sperry 1.—Il gun sights arrived at Lowry.

The school had no instructors qualified to teach their maintenance.

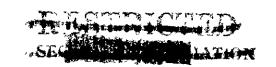
They remained idle several months while Lowry made an enfort to obtain civilian instructors from the Sperry Gyroscope Company, and finally 20 sent five of its own instructors to the Sperry factory.

By early 1944 it had become apparent that in the future the AAF would center its attention on very heavy bombardment. Inasmuch as this type of aircraft employed a central fire control system, with certain similarities to, as well as certain important differences from, the power operated turnet systems, some modification of AAF training in this field appeared necessary. On 16 February 1944 the Training Command issued a directive that the "Power Turnet and Gun sight Specialist Mechanic Course" be changed into a "Pre-central Fire Control Course" which would act as a feeder to a new "Central Fire Control Course."

The Lowry officials protected that of the mine weeks of work they offered in their Fower Turret and Gun Sight Specialist Mechanic Course, only the first three covered material which would be useful to men destined to maintain central fire control systems. These were the phases devoted to the caliber .50 machine run, basic electricity, and electricity as it applied to the amplidyne system. Therefore, they thought, only these three phases should be given to central fire control students.



ALFFE-60



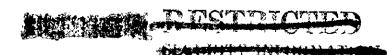
47

The Central Station Fire Control System," the Iraining Courand wrote each, "is still considered to be in the experimental stages, since it has not yet been proved in couldt." There was considerable consibility that it light have to be scrapped and a core conventional turnet system installed. In this should prove recessary, the Training To some added, it did not wish to have to re-train the en after the change was mide. Therefore, it circated, sen should be given complete instruction on both power turnets and/central fire control system, although obviously resultitious material might be eliminated.

ith obvious reductance, the Loury and ATC authorities complied with the order, revising the roder furret are Cun with Executalist "schemic Course to short it would serve to a fre-emeral sine Control Course. "Eximple on 10 April, the Leven Lee's of instruction was arrun ed as follows:

<u>iubject</u>	<u> </u>
table Licebricity Inchine Cuns and Martin Turret	6 6
Therson Turret Sperry Can Si his (1-3, 1-3) Sperry Taersis	12 12
7070.	42

It will be observed that to reduce the length of the course from nine to seven deets, instruction on Concoliented the sencial turnets was emitted. Their intercity was moved to the beginning of the course because it was felt that this interial was functionated to all turnet the instruction.



AAFT'S-60

# GRESTRICTEL GERCHRITY INFORMATION

પ્રિટ

After this syllabus had been in use just about a month, tre Lowry authorities returned to their earlier position that it wasted the student's time. Now they offered a rebuttal to the Training Command's objection that if there was a separate central fire control course celay in training might result, in the event that the central fire control system were scrapped and regular power turrets substituted in very heavy bombers -- it would take only seven weeks to retrain Central Fire Control Equipment (GFCL) men, less time than would be required to modify the airplanes themselves. 25 Cn Pay 20 the school officials were notified that beginning two days later they might substitute a three-week course in basic electricity and the caliber .50 machine gun for the seven-week course for men who were The three-week Pre-central 'ire roing to take a CFCE course. Control Course was consolidated with the Femote Control Turret courses on 21 Jugust 1944. Its vicissitudes ofter that date are discussed in the section on Periote Control Turret (AJT) courses.

destined to raintain the conventional type of power operated turrets. In its streamlined seven—week form, the course neglected many types of turrets and gun sights which its oraduates might later be called upon to service. To correct this, late in Pay 1944 the Lowry authorities recommended that the course be extended to 12 weeks, to include instruction on three types of equipment not previously taught, but which had come into general use—the Scorry run sights K-) and K-ll, and the Notor Froducts turret wheel. It also provided for a full week of instruction on machine runs, instead of the one-fay puriod, which Lowry

THE RESTRICTED

### MATA-60 SECHMIN INTERNAL

49

27

bulieved to be grossly inadequate.

request reaches as too long, Henequarters, ALF ruled then the request reaches it; 10 weeks are all that could be allowed. In this 10-teck period and the equipment proposed by longy dield, plus the 128 h-13 gun eight, west be taught:

Pachine Gund	3 d: 15
Lasic Electricity	l i sali
Applicanes	3 00%
Martin Turret	l day
imerson lurret	l hodi
Pendix Turret (upper and chin)	l week
Consolicated and Notor Products	
Turrets	l wee':
Sperry furret (upper and lower)	l wek
Sperry Cun oights (1-3, 1-4, 1-9,	
L-10, K-11, K-13)	3eeks

This schedule was put into effect with the class entering on 3 July 29 1944.

From the middle of 1944 to the end of the war the school officials kept incre sing the length of the source constantly—to 11 weeks in March 1945, to 13 weeks in May. These adultions were wase primarily to permit the incorporation of material on now types of equipment of turnets which the MAF was making use—the openry M-17 and A-171/, m-14 and m-15 sights; the openry Upper Aurret Type M-10, equipped with MM/AFG-5.

Not all the curriculum changes involved additions, however, for equipment which had he is supersedue or found incorporated in use was propped.

By M-1 Day the course had been lengthered to 16 weaks, and was operating on a token basic with only a New Yen in each chass:



AFRE-60 CONTROL INC. INC.

50

Subject	Days
Caliber .50 Machine Cun	3
Rasic Electricity Amplidyne	1 1 <sub>4</sub> 6
Martin Turret	
Emerson Furret (A-15 and A-15A)	6
Tendix Turret (upper and chin)	6
Motor Froducts Type Turrets and Tell Gun	6
l'ounts	
Sperry Turrets (upper, lower, lower retra-	ct-
Able, noce, and tail)	12
"H" corles cichts (H-3, K-4, K-10, K-11,	
d-13, K-14, and K-15 types)	30

Third and fourth echelon. In the oping of 17h2, about the time that the first and second echelon power turnet course was getting under way at Lowey Wield, the field Cervices Division at Weadquarters, ANT became concerned about the need for training on a third and fourth echelon level. Lost of this work was to be performed in the depote and subdepots of the Mir Service Command (ALD) by both civilian and military perconnel. At its direction a 10-weak course in first, second, third, and fourth achelon reincenance was established at the AT Storme Dopot, State Mair Grounds, Indianapolis, Ind., an installation of the Mir Service Command. The course was oper ted in two shirts, one for military personnel and one for civilian employees. As far as practicable, civilian instructors taught civilians, while enlisted instructors taught the military personnel. The principal 32 features of the course were:

Subject

..ceks

2

I. Pasic Fundamentals

Natheratics, electricity, hydraulics



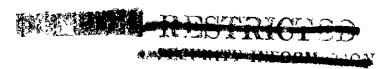
A4775-60

51

	SubjectCont 1.	ieeksContd.
II.	Sartin Turret (electrically operated upper) and Consolidated (hydraulically operated tail) Turret	2
III.	Fendix Turrets (electrically operated upper and lower)	2
IV.	Sperry Froducts Sperry cight, upper local and local ball turrets	14

Criginally all personnel at the school—military and civilian, instructor and student—had been furnished by the ALC, the organization which would use third and fourth echelon maintenance personnel in depots and subdepots. Although the ASC exercised a certain degree of selectivity in assiming students to the course, the school authorities found that the students did not always have the knowledge of mathematics, elementary electricity, elementary hydraulics, and simple soldering and wiring methods which they considered indispensable for turnet maintenance work. To cover this material they had incorporated the preliminary two-week phase known as "Pasic Fundamentals."

when the school was transferred to the Technical Iraining Command and its name chansed to Armanent Training Center No. 3, on 1 February 1943, the TTC assumed the responsibility of providing the enlisted students for the courses. The TTC decided that hereafter certain percentages of the graduates of the Lowry basic armament course would be selected for the Indianapolis course. The use of the Lowry armament course as a "feeder" for the Indianapolis turnet course in vitably



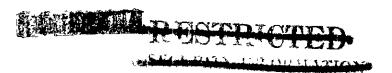
### A.FES-50 - SIACUMITY INPUR

52

produced a number of problems of coordination and friction between the two schools.

The first arose from a decire to avoid cuplication between the two courses. Furing this period, it will be recalled, the last three needs of the Lowy aradient course here devoted to study of power operated thereth on a familiarization level. The Indianapolis school urged that its cuota of students of each to it before taking this phase—in other words, three weeks before graduating from the Lowy course. The Lowy officials protected that this would lead to the loss to the Adfordamp potentially fine ermorers. If a man had computed the lowy course but was chimisted from the Indianapolis course, he was at loost qualified for the reduced as a pasic ermorer. On the other hand, if he left Lowy there he had graduated and then failed the turnet course, he would be qualified neither at a basic ermorer nor at a turn to an. The ITC ruled in favor of the lacianapolis school, and the man accordingly were sent on to the turnet course three weeks refere graduating from Lowy.

The second source of friction has the type of men which Lower sent to incisnapolic. In April 1943, after five classes had been received, the orficials of the incisnapolic school protested that, on the everage, being the quality of the new/sent them was for below that or those previously furnished by the Air Bervice Courand. Comparatively few had had any machanical appriance or training but re-entering Lower. In analysis of the fifth class, they declared, who ed that seven or the 24 en had not are ducted from high school, and five had had no previous—chanical





LALLO RESTRICTO

52a

#### CONCLUSION INFORMATION

training. These shortcodings here felt particularly during the course on the Partin turn. Init turnet employed the ambidgme system; to master it a men had to have had "the equivalent of a full college course in electricity." It has seen uncerstood that only top-ranking students are to be bent to inclanapolis. Homever, the school authorities declared, "he are inclined to believe that these men are run of the course, and are polected alphabetically only."

In coloning themselves the lower officials pointed out that, acting on circultys from higher authority, they were sliting their argament students into six categories when raking assignments. Four of these types of assignments had been given higher priority than the Indianapolis chool. They provided that hereafter they would select students for 36 Indianapolis from the fourth as well as the fifth categories. The Indianapolis authorities none too happily reconciled themselves to this situation. Their faculty board increased the rate of climinations, although trying always to give the benefit of the coult to men who were slow in grasping the subject satter, but who tried hard.

The increased use throughout the LLF of two pieces of turnet equipment made it necessary to extend the course by one week during deptember 1943. The first was the Fell N-6 gun mount. Three days were devoted to familiarization training, complete dismantling, and some practice in trouble shooting. The for this instruction was taken from the phase covering Sperry turnets, which had to be reduced from three to two and one-half weeks.

The other was the emerson turnet, which recembled the Consolicated



MARIE-60



53

#### CSECUMENT NEWRYLAND

turret in many respects but used electrical rather than hydraulic power, 39 and required a full week of instruction.

The problem of irriction between the two schools ended when, as part of an MF policy of centralizing all technical training, the Indianapolis school was ordered closed as of 31 January 1944, and all its willtary instructor personnel moved to Lowry.

There was a welay of several months in retting instruction on the thira and rought scholar level under way at the new location. The lowry authorities protested that the Sperry sights were too "diversified" in nature to include them in the same course with turrets, and proposed that two separate courses be given. This notion was rejected by the training 40 cound, however, and an eight-week fower Corrected Turret and Gun Sight Repairman Course was begun on 15 May 1964. Classes were small—usually four enlisted men to a group—selected from recent graduates of Lowry's first and second echelon course. Inhibted men sent by depots and subdepots on estached service were also accommodated from time to 41 time. Subject matter covered was:

Subject	Jeeks
Easic Fundamentals (tools, shop practice, repair of plexiglass, etc.)	1
Consolidated Turret	1
Bendix Turret	1
Martin Turret	1.
Laerson Turret	1
Sperry Turret	T,
Sperry Sights	1.';

It will be opperved that although the new course at the outset was two weeks shorter than it had been at Indianapolis, it included



AMPHS-60 RESTRICTED

54

#### CHEURITY INFORMATION

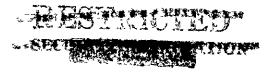
instruction on the Emerson turret, which had not been given previously. This arrangement was soon recognized as being unsatisfactory, and the course had to be longthened to permit more thorough instruction as well as the addition of new types of AAF turrets and sights—from 8, to 10, to 14 weeks. By V-J Day the course was being operated on a token basis, 10 students in a class, and classes 16 weeks in length:

<u>ubject</u>	<u>Days</u>
Basic Shop Practices	8
Motor Froducts Type Turrets	6
Eendix Turrets (upper and chin)	6
Hartin Turret	7
Alerson Turret (A-15 and A-15A)	6
Sperry Turrets (upper, lower, and lower- retractable)	12
"K" Series Sights (K-3, K-4, K-10, K-11, K-13, K-14, and K-15 types)	35

#### Remote Control Turret Courses

First and second echelon. During 1942 the LAF started making plans to train men to operate a radically different type of airplane—the very heavy bomber, the B-29. The armament on this plane was to be unique—five turrets which might be controlled by any one of five operators. Two firms were making equipment for it at that time—the General Alectric Company and the operry Company, although it was expected that for the time being only that manufactured by General Electric would be used.

The Lowry school was told to proceed with plans for training on the central fire control equipment (CFCE) in January 1943. The school authorities selected instructors experienced in teaching its Power Operated



SECURITY INFORMATION.

MFHE-60

55

Turrets Course to provide an initial instructional cadre. Groups of them here sent to the Ceneral Electric factory at Schenectady, M.T., and to the Bosing hircraft plant at highita, hans., for short periods of intensive training. In addition, the General Electric sent three of its employees to Lowry for a period to teach instructors there.

Escause of the complex nature of C.C., LAF training officials realized that enlisted her of an unusually high quality would have to be selected for the attacent body. The first and accond echelon FOST course would provide an ancellant background for the new course, they felt; hence the former case to be considered a prerequisite for the latter. But only the "cream" of the FOST classes were to be selected: they must have an ECCT acore of 120, a grade of 120 in the mechanical movement test, and a made of 120 in the Ermy mathematics test—and in addition, an understanding of the nature of radio, electricity, and mechanics. Since most of the students who possessed these qualifications were already assisted, the school found it difficult to find enough men to must the quotes. Escause of the high priority of the 2-29 project, basic of addition centers were verned that they must scrapallously fill all quotes for the course.

The number of ten trained in OFDI was fluged closely to the changing requirements of the XX tenter Colland, thich in turn were controlled by the production rate of the E-29 factories. At the outset o new class of 24 men was entered every two seeks. The length of the course was likewist bentative; when it started on 1 harch 1943 it ran



JuF111-30



56

 $L_{i}L$ 

for 16 weeks:

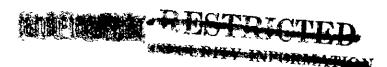
<u>Subject</u>	eelis
Yasic Liectricity	2
Soldering: Use of Tools; Lotating Machines; Cun Chargers	2
Vocuum Tutes; belogns function; pervo-	•
amplifier	2
Selsyn-zeroing; Follow-up System; Sighting Stations; Sasie L-29 Hring Diagram	2
B-29 Jiring Diograms	2
P-29 Malfunctions	4
Halfactions; Harmoniastion; Teas Operation	2

buring the last two weeks of the course the students worked on a mackup of the E-29 under simulated warfare conditions. These included sudden gas drills, enercises in alit-trench digging, inadequate lighting, rain, bending and strafling attacks, are shown

buring its first year the size of the classes was increased enormously—one class which entered in an use 1943 numbered 184 weathers.

Even wore of a problem from an accelerative point of view was the fact that the size of the classes fluctuated meetry. Coming to the classes fluctuated meetry. Coming to the classes fluctuated meetry, the classes high as 18 per cent.

These mounting commons and high elimination rates been made it impossible for the Loury officials to find enough qualified students many the producting classes of the coner courated turnet courses. To provide the needed numbers, additional sources were tapped: the Loury Field basic arrament course; the school at Euckley (curing the period the arrament course has being given there); and fruex, boott, and Sloux Falls,



AFFE-60 PESTRICTED
SECURITY INFORMATION

57

where courses in radio and electronics tere contacted. To meet their quotas, some of the tehools sent men whose ACCT scores tere below 120. The failure of a large purcentage of these caused the lowery officials to screen incoming students corefully and to accept only as many below the 120 mark as was absolutely necessary. Students who professed no interest in the course were also eliminated, so far as cossible, by 46 coreoning.

During 1944 the course underwent a series of revisions designed to obviate the necessity of students having an armament, redio, or electronics beckground to benefit from the training. This was recomplished first by the institution as a preliminary course of a three-week Pre-central fire Control Course consisting of instruction in basic electricity one the catiber .50 machine gun. Then, beginning in August 1944, the Central fire Control Course (which was now coming to be called the Lemote Central Turnet Pechanic Course) was longthened to 18 weeks to commit the incorporation of the Fre-central fire Control Course waterial. About a year later the course was a min lengthened, 47 this time to 20 weeks:

Subject .	<u>Da,75</u>
Caliber .50 Machine Gun	5
frinciples of electricity Applied to ACF Drive Units	20
Servo-Esplisier	10
Masic System Miring Diagrams and Muxiliary Equipment	20 20
l'alfunctions	20
Inspection and Isinton nee	5

Third and fourth echelon. In November 1942—three wonths before Lowy Field started it. first and second echelon GFCI course—the Lil



1.4.7H3-60

RESTRICTED SECURITY INFORMATION

58

started a four-week course in depot overhaul at the resment Training school at Indianapolis. The school chose graduates are each of its classes in power operated gun turnet depot overhaul for this training.

Two major difficulties were experienced in concucting the course.

One grew out of the fact that a four-eek period was much too short to cover adequately the difficult subject matter involved. This was a greveted by the manner in which the school selected students: men receiving top grades in the Fover Goerated Con Turret Depot/Course were assigned to CFCs training even though they had no particular interest in CFCs and in many cases—so it was charged—had obtained their high grades "through dublous means." Instructors at the school had the feeling that as a result many men were graduated from the course who were not actually qualifies. Another difficulty was that the school cic not have enough or the right kind of equipment. It had four cuts of F-61 equipment—probably enough for the four-to-eight—student wrougs thich composed the first 49 classes, but fur too few for the 30-to-40-min classes which followed.

The needs of the LSC for increased numbers of maintenance personnel and the policy of concentrating depot overhaul training at Lowy brought a drastic revision early in 1944. The school at indianapolis was closed down, and Lowy was directed to start a new course, to last 12 weeks, on the third and fourth echelon level. The Ceneral electric Company dispatched a representative to Lowy to assist the school authorities in setting up the new course. Hew classes of seven men each, graduates of the Lowy Power Operated Cum surrets repairman Course, were



AFSTRICTED?

entered weekly. Lowry had the benefit of a quantity and variety of equipment which the Indianapolis school had never enjoyed. 51

One part of the CFCE-or remote control turnet system—which created considerable maintenance problems was the computer. Most of the time of the lowry course was devoted to explanation of this computer. <sup>52</sup> In addition, the General Alcouric Company consucted at its achienectady factory a cix-week course in fourth echelon maintenance of the computer for key maintenance personnel who had graduated from the lowry first and second echelon remote control turnet course. <sup>53</sup>





**THIS PAGE Declassified IAW EO12958** 

59

/LIFILU-50



#### Chapter V

BOYBOIGHT ! MINAMMANCE COURSD

The Augmentation Program, first of the Air Corps expansion programs, provided that between March 1939 and June 1940 an average of 12 tombsight mechanics was to be graduated from the Air Corps technical achools each month. Responsibility for meeting this goal fell upon the school at lowey Field, which during the entire calendar year of 1938 had graduated a total of only 24 tombsight men; but by stretching material, personnel, and achool housing facilities, Lowey mearly was able/to achieve the page which the higher authorities had get for it. By Cotober 1939 it was entering 12 students a month; by November 1940 it was matriculating well over 24 students a month.

This record is the more impressive when one considers the various handicans created by changes in curriculum, shortages of personnel and equipment, and other difficulties under which the Lowry authorities had to later. In late 1939 and early 1940 they had substituted instruction on the new Sperry 0-1 sight for the now outmoded Sperry 1.-1 sight; they also began giving instruction on the new automatic pilots used in connection .1th Sperry and Morden eights. Although those pilots required considerable explanation, it was believed that the length of the course ought not to be extended beyond the 12-week period already allotted to it. As a consequence, the other subject matter in the curriculum had to be condensed to make room for this new material,

TO A RESTRICTED

60

PISTR-CTED

112HE-60

61

and the course as a whole became correscondingly more difficult.

In this form, however, the course pleased neither the lowry officials nor the Air Corps officials in machington. Both agreed that 12 weeks has too short a period for the amount of material the course attempted to cover. As the Director of the Lowry transent Department pointed out, the Mavy was devoting four months to instruction on the Morden sight and its associated silet alone, whereas the Air Corps was giving 12 weeks of training on the corps sight and its pilot plus the Sperry sight and its pilot; and the results in the Air Corps were not considered satisfactory by the school authorities.

ticular type of pilot are sight they were to be assigned to maintain. The aranhaek to this, as expressed by the Office of the Chief of Air Corps, the chat enlisted personnel here frequently moved from equatron to equatron, and that changes here often ande in the equipment used by tactical units. Therefore, the lervice tould be leverely handicapped in its corsonal here capable of maintaining only one type of equipment. Another solution, which has flavored by the Loury luthor—lities, was to lengthen the course to four months, devoting three months to the Morden sight and pilot, as held as to the mathematical and scientific principles necessary to its uncerstanoing, and one month to the Sperry sight and pilot. Admittedly this plan had one chortecating: it would require one—third more time, one—third more space, and three additional instructors. In forwarding these observations to the Chief of the Air Corps, the Office of the Commonant, Change Field,

CALLED AND THE PARTY OF THE PAR

M 713-60

FESTRICES

SEGURITY-INFORMATION

62

addod:

It is believed that instruction on Sperry equipment should be as accurate and as therough as that fiven for the Norden Sembelight, even though fouer sets of Sperry equipment are available to the Service. It is the experience of the armament granch that the operry sight is the more difficult of the two types to beach and that instruction is simplified if the course in operry follows lorden.

Cut of these discussions a new curriculum was developed which was gut into effect 1 July 1940:

<u> Subject</u>	<u> Ilours</u>
Theory Problems	44
Camera Coscura Problems	4
Llegentary Liectricity	16
Frinciales of Cyroscope	16
Disassembly of Horden !'-L Ecmbal ht by	
Instructor	16
Clock, Theory and Laintenance	12
Trainer miring, Treory and Practical	13
Complete Cisassembly of !'-1 by Instructor	16
Y-series Wight, Operation by Wreiner	24
Norden Automatic Flight Control Equipment	
(1.3.0.4.) Clausreen tork; study of Units	
and Their Aunctions	28
A.P.C.J. Printenance and Inspection of Equip-	_
ment in Plane	16
A.F.C Adjustment in Flight	. 16
"-3 Disasscably by Students	16
N-3 Maintenance and Cleaming	<b>1</b> 6
N-4 Naintenance and Devining	16
1-3 Calibration by Instructor, Students	
Observing, Poling Notes, and Practicing	
. djustments	16
1-3 Calibration by students	64
H-4 Calibration by Students	64 8
M- beries Gullary	દ
Operry 0-1 General study of Units and Their	/ •
Poneticas	64
O-1 Colibration by Instructor, Students	
Captrying and Practicing adjustments	3
C-1 valibration by students	32
0-1 Prainer Operation	24
0-1 Installation in Airplane	4
Plyin (dry rune)	12 16
0-1 Julyry	<del>- 16</del>
**************************************	J40

### BECUKEY-INPORMATION

63

hate in Lovenber 1940 the Loury authorities recognized that the approx 0-1 sight was no longer being used in the 'ir dorps, and discontinued giving instruction on it. The dropping of this equipment paralleles them to revise the syllabus to answer a criticism that had frequently been made that market. Equipment and conglicated that only superior students could matter it in two meshes, with the objection of Sperry material, the length of the course was made 14 mails, with nour meshes—the sixth to minth inclusive—devoted to hard.

Under this revision, during the eighth and minth weeks 24 hours were designated "flying time." Although the constitute which the interaction and we not expected to fly in the normal course of his work, this feature was incorporated because it was felt that he would have a keener appreciation of the incortance of his work if he had such experience. The school officials obtained to make the final flight a sort of eminination in which the student would at called upon to demonstrate his baility to adjust instruments in the air as well as on the groups. It was impossible to achieve such a goal because of the chortage of airplanes and flying personnel at lowry. In actual practice, only one-half of an eight-man chose could fly at one time, with the result that only 12 hours were actually egent on the aerial instruction of each student.

Is the pice of hir Corps expansion quickence in the autumn of ly41, increasing numbers of hen who had had no previous empirience in bombsight work in tractical units arrived at houry to take the course.



7.1.FHI-60



64

Recognizing that the course was too short and limited in scope to turn a novice into an expert, the Director of the exement Department gave an order that thereafter the fact that a man was not fully was qualified was to be entered on his qualification card when he/graduated.

By the sum or of 1942 production on the new sparry 3-1 bombsight and A-5 automatic pilot was well under way; it was planned ultimately to install them on 50 per cent of all new bombs rement planes. To be forearmed for the expected demand, training on the Sperry instruments was 12 insucurated on 20 July. At first all students were given eight works of first echelon training in both Sperry and Morden equipment, while certain ones continued for an additional four weeks of second echelon 13 training on either sperry or Morden equipment.

This arrangement, it soon was realized, was far from satisfactory. Tactical units expected all their mechanics to be able to perform at least second echelon maintenance. Thus, beginning 10 October 1942 all bombsight mechanics were given a 12-week course which covered second echelon maintenance of either sperry or Forcen equipment. All students took the first three phases:



1:FH3-60

### TRESTRECTED

65

of ROUNDAND

First .eek, 42 Cours
Tathematics; Vacuum Bombs; TF 1-277 "Theory of Ecmbing";
Ecmbing Problems; Cross frail; D-8 Sight.

Second week, 42 Hours

Fhysics of Cyroscopes; DC Electricity.

Third week, 42 Hours
AC Electricity and Vacuum Tubes.

At the end of this period, half of the class was used, ned to nine weeks of further study on Lordon equipment, the other half to an equal period 14 on Sperry equipment. The schedule for Mordon students was:

Fourth Leek, 42 Yours

Course and Lange Machanisms, "-bories bombsight; Partial Disassembly; and Mire Diagrams.

Firth meek, 42 Nours

Partial Disassembly of Nate End; Telescope Potor; Miring Diagram; Disassembly of Sight; Pechanical Operation and Disassembly of Stabilizer; Maintenance of 1-3; Freflight, Daily, 15 Hours; 15-day Checks of Stabilizer Cyro; Maintenance and Operation of D-8 Sight.

Sixth eek, 42 Nours

Changes between 1-3 and K-6; Radiliarization, Procedulions in Handling, Interchance of Units, Maintenance devered by Students and Instructor; Operation, Wiring and Ciling of the .....;

Field Check of the Late and; Laserbly of Low-altitude attachment.

Seventh Cal., A2 Hours

Colioration; Use of Synchronizing Feam; Fractical Landingtion.

Lighth cak, L2 Hourd Free Lairn Tune; Field Calibration; Trouble Shooting.

Hinth week, 42 Hours

Flight and Uperation of Control Corvicus; Stabilized alight;

A.F.C.A.S.; Coeration of M. .C.S. Lock-up towns; wheatstone

Friages and Servo Units; Inspection and Installation of Equipment in Airplanes.

Tenth ce't, 42 hourd

Cround and dight adjustments; lang other and ainvenues of A.F.C.J.S. in drolanes; dring thagraw; Frietical maximation.



RESTRICTED

11.37.3-60

\*PIOUNTY INFORMATION

STITLES MAN

Ileventh .cl., 42 Fours

A.F.C.... ock-up operation; riago Circuito; Inspection, Install tion, and Lemoval of Units; Ground Legistments; Fractical Landonston.

Welith Lelt, 12 Hours

Ground djustments; elying and hir hadusta ents; Inspections; Fractical Arestaction.

The acherula for Sparry students after the wires three weeks was:

Fourth . celt, 42 Hours

Course and ham a bechanismo, 5-1 sight; Furtial Discosembly; Firing Discret.

Right Leek, 42 Fours

Teke atic bradings, Couration and Lochanies of S-1 Dight; Chacking Dight for Proper Culibration and Operation; Proctical Dight institution.

Lith mel:, 42 nours

Calibrations and Operation; Inspections; dring blackers; Loutine Laintenance; Fractical Lamination.

Seventh lect; 42 ilours

Trainer Operation; Air Operation; Discussably, Procession Runs and Tendulum sulance; Fr etical Desinction.

ichth cell, 42 doues

out-searchly adjustment; heresembly and adjust unt; mintemane, Giling, and storage; recestrial Greek and brouble shooting; Fractical examination.

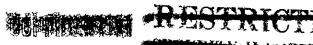
Finth selt, 42 Hours

winth well, 42 hours

Mileron Control Operation and adjustment; alcounter Control, Including tria rabe and Constant Atitude Control; rreflight Inspection and Mouting ainten new; prouble Proofing; Tractical adminishment

Bleventh cek, 42 Hours

Maintenance and Adjustment of Leimuth Unit (no rollow-up implifier; Disassembly, Faintenance, and Adjustment of Vertical Cyro Unit, Servo Unit, Constant Ititude Control Unit, Follow-up amplifier, and Frim Fab Control Unit; Fractical Leimantion.



THIS PAGE Declassified IAW EO12958

66

## TRESTRICTED

PERMITTY INFORMATION

67

h elfth leek, 42 Houre

Cround Check and hojustment; werial rlying adjustments; Trouble chooting and Maintenance; Fractical manination.

15

Of the total hours, students still spent only 12 hours in the wir.

Another drastic revision of the curriculus took place in the sum er of 1943, one desired in response to a curious combination of now desands. Prominent among them was the desire of Mesaguarters, and that "overspecialization" be discontinued so that every mechanic would be able to service both Morden and sparry equipment. This scened a practicable service the production rate which lowery had attained made it likely that there would be a surplus of mechanics by the end of the year. He departers, and insisted that 12 weeks, or at most 20, would be sufficient for such training. Inother factor was the need of the fir Service Columna for 1,022 be desight repairmen, checkle of performing third and fourth ochelon maintenance in its depote and subdepots by the end of 1943.

The new syllabus called for all students at worry to take a four-week "preliminary phase" dealing with electricity, tools, and the waintenance of the D-F bombsight. Then helf of the group devoted eight weeks to a Borden first and second echelon course, the other helf to an eight-week Sperry first and second schelon course. It the end of those 12 ecks of training, students in both groups were screened. The half of the borden roup which had demonstrated particular aptitude was then given eight additional weeks of Borden third and fourth echelon training, becoming qualified Borden depot overbaul



THIS PAGE Declassified IAW EO12958

AAFHS-60

68

men. The half of the Sperry group with unusual aptitude was given eight weeks of advanced training to qualify them as Sperry depot overhaul men. The remaining half of the Sperry group was given Norden first and second echelon training, the remaining half of the Norden group was given Sperry first and second echelon training, and thus were produced men qualified in the maintenance of both sights. 19

Another modification to the course was the inauguration of an on-the-job training program following graduation from the course.

Need for practical experience before assignment to tactical units became apparent as early as May 1941, then recruits were first admitted to the course. The situation became more acute as many organizations were shipped overseas and many additional ones activated. In June 1942 the Directorate of Bombardment made two proposals calling for Lowry graduates to serve on-the-job at bombardier schools for four weeks before proceeding to their permanent tactical units. But nothing was done because it was difficult to decide who should be administratively responsible for the men during the on-the-job training period. Loually important was the feeling that the shortage of mechanics made any lengthening of the training period inadvisable.

By the summer of 1943 both objections had disappeared. There was no longer an acute shortage of mechanics; the Flying Training Command and the Technical Training Command had been merged into the new Training Command. Under a directive from Headquarters, AAF, beginning early in September 1943, bombsight mechanics, upon their graduation from the Lowry course, were assigned to one of eight bombardier schools for eight weeks of practical experience. Only when this eight-week period had been satisfactorily completed

\*\* WHITH WITH THE PARTY OF THE

## THESTHERED

1...FIL3-60

69

could a man be ussigned to tuctical unit.

During 1944 bombsight saintenance training as modified considerably to conform to non developments in equipment and methods of operation. The most profound change has arought by the recommendation of a board of differs that use of the Sperry sight and pilot be discontinued by the AF. Teginning with the class entering Loury on 19 January 1944, all students received borden training. Another notable development has the adoption by the AF of the "Glide Angle Bomb," an ingenious device used in connection with the Horden sight to control 24 the flight of the bomb after it had left the plane.

To conform to these changes, the Lo.ry curriculum underwent constant modification during the first half of 1944. By 1 August 1944 the situation had become sufficiently stabilized to permit the announcement of the following syllabus:

#### For All Students, First and Second Schelon

Phase 1, 2 weeks: Manual Skills, Tools, Leters, DC Electricity, Electrical Devices; Supply Lethous, Technical Graers; the Lorden Stabilizer; UR Digest.

Phuse 2, 6 weeks:
Pombing Problem; B-S Sight; Forden M-deries Sight; ABC Computer; Bombsight Box, Field Repair; bombing Frainer, Uperation and Maintenance; bomb Melease Internal Controls; the Igastat.

Fhace 3, 2 weeks:
Glide Fombing Attachment, all Ichelons of Maintenance and Calibration.

Fhace 4, 6 weeks: Lutomatic Filot, Type C-1, Lainterance and Calibration.



PESTATOR

LAFRE-60

#### For Men Selected To Do Third and Fourth Lichelon ..ork

Phase 5, 4 weeks:
Norden "!" Series sight, Depot Cverhaul.

Fhase 6, 4 Lecks: Lutomatic Pilot, Type G-1, Depot Overhaul.

In September, on orders from Headquarters, AAF, all discussion of the D-8 bombsight was eropped, in recognition of the fact that this non-precision type of sight was no longer telms used by the AAF. Time previously devoted to the D-8 was not given to a more extended treatment of the C-1 Auto Filot Formation blick.

As in the case of all armament courses, those devoted to bombsight maintenance were gradually lengthened so as to include new material and to give a more thorough presentation of subject matter already
offered. At the same time, the first and second echelon phase and the
third and fourth echelon phase came to be considered as distinctly
ceparate courses once again, although successful completion of the former was still considered a necessary prerequisite for admission to the
latter. For convenience' cake, the first and secons echelon course
became known as the Bombaight Machanic Course, while the third and
fourth echelon course was called the Hombaight and Automatic Pilot
Lepairman Course. By V-J Day the length of the bombaight Mechanic
27
Course was 20 weeks:

Subject

Days

15

Pasic Electricity and M-Series Stabilizer
Hasic Electricity
Precision Instruments
Classification and Cuarding of Military
Information
Technical Publications

The Supply and Maintenance

RESTRICTED

THIS PAGE Declassified IAW E012958

70

## \*\* RESTRICTED \*

..: FIJ-60

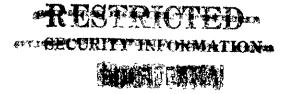
71

Subject Contd.	DaysContd.
M-Scrips tombed ht The Lombing Problem Functions of a compaight 1.—Series combaight Intervalometers Ticroflex Timer 1.—Scrips combing Trainer	35
M-Series Clice bombler attachment (lot to 4th echalon maintenance)	10
C-1 Automatic Filot (Calibration and Maintenance)	35
Formation Otick Control System (Calibration and Laintenance)	5

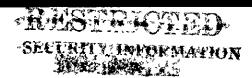
28

The Bomboight and Jutomatic Filot Depairman Course lasted 10 weeks:

Subject	Days
l'-Cories kombolight and stabilizer	25
C-1 Automatic Filot	30
Formation stick	5



AAFHS-60



#### Chapter VI

#### CADET ARMAMENT COURSE

The course for armament officers, given for many years at
Lowry Field, was discontinued early in 1939 when the Chief of the
Air Corps directed that all the personnel and facilities of the
technical schools should be used to train enlisted men under the
Augmentation Frogram.

This action soon produced a new problem:
From where were the large numbers of armament officers to be obtained
to man the greatly expanded Air Corps? The 54-Combat Group Program,
adopted late in 1940, called for 392 additional armament officers.

It was undesirable to reverse the order of the Chief of the Air Corps
because the demand for officers was now so great that none could be
spared for further training.

To the Office of the Chief of Air Corps it occurred that a likely source of officer material was the ranks of eliminees from the cadet flying schools. The notion was that these men would be given an armament course at Lowry Field; after they had successfully completed it and had spent at least nine months in the Army, they would be commissioned second lieutenants and normally would be assigned as armament officers.<sup>2</sup>

Asked for suggestions as to the course of training for such men, Maj. Lawrence A. Lawson of the Lowry school submitted three plans: (1) a 14-week course almost identical in scope with the

RESTRICTED

\*RESTRICTED\*

V.F.G-60 73

bable ar maint course for enlisted men for 75 per cent of the cadets; (2) a 16- to 19-med; tombuight maintanance course to be given 25 per cent of the cadeta earmerised for durvic. With tomburdment equadrons; and (3) a scheme calling for 25 per cent of the cadets to be calleded for the 16- to 19-med; bandwight maintenance course after completion of the 14- left are ment course.

The third of ajor beacon's olems and adopted. To, indinitith a class enterinion 3 earth 1941 and every four a six thereafter, 32 (33 on and after 23 June) will tion codets buyen a 14-week course in amount; upon completion, dight of the codets entered on a bomb-light adincenance course I office 16 weeks. This syllabus for the codet are much course closely resumbled that in one for the unitated men's table are course at the class.

	<u>Fricue</u>	Hours
Ι.	or maint administration Organizations and functions of Various Types of armament aletions. Inter- pretation and Use of Air Corps and Ordances forms, Circulars, and Tech- nical Publications. Buties of an Armament Officer.	16
II.	retal .ork	<mark>ረ</mark> ዐ
	Soldering	8
	Electrical Aracaunt Controls	40
У.	Explosives and Temanitica	32
TI.	Chemical warrare	24
VlI.	Jaell arms and Cun Comercs	40
VIII.	Aircraft Lichina Guno	120
1%	/iron It . Achina Cun Sights	40
da e	Synchronization	60
MI.	Found Linelis, FL rounding, and Ton Targets	G3
	Field inercises	<u>49</u>
	L' TOT	560



JEESTRICE ---

12.WF3-60

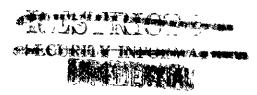
74

t.he

To copy has been located of the syllabus for/16-week tembsight course, to which 25 per cent of the greenatus of the armament
course were cent. It is responsed to assume that the Lowry
officials carries out their intention of using a curriculum almost
identical with that employed for the exhibited wents bomber ht course,
with some acced features from the discontinued officers' course.

A further degree of specialization was introduced a few worths after the course got under way. Comming in June 1941, the Director of Amament had the chases divided into three groups at soon as possibly after they entered: (1) 35 per cent of the men were to be earmerhed for pervice with pursuit squadrons; (2) 40 per cent with hight benderated equacrons; and (3) 25 per cent with heavy becaused ment squadrons. Furing the latter part of the training period, capacially during the field exercises phase, instruction was contered on the type of equipment with which the men would have to deal in their ultimate assignment. The addition of this feature die not affect the 16- eek bombsight maintenance course which the 25 per cent cornerhed for service with heavy boxbardment squadrons continued to take after gracuation from the unascent course.

The entry of the United States into the Lar in Localber 1941 had a more marked i mediace effect on the pace and effect of cadet training than it aid on the curricula employed. The length of the armament course was reduced training to 12, a new class was started every three weeks increased of four, and the size of the class



SECURITY INFORMATION

...'FH3-60

75

was raised from 33 to 74 men. In the case of the bombsight maintenance course, the work previously given in 16 weeks was given in 12 after 5 January 1942. A new class was entered every four weeks, as previously, but the size was raised from the armament course.

The enormous excansion in the Army hir Forces which took place in the months i mediately before and after rearl harlor made it nacessary repeatedly to modify the prerequisites necessary for admission to cadet training. In Jun: 1941 the Mar Department soccified that in addition to eliminees from flying training, men might be admitted "who had successfully completed two years in college, preforably in engineering or physical science .. . [provided they] are especially recommended by the CO Commending officer of the fir Corps school or training detachment for such training because of their evicence of outstanding mechanical aptitude as shown by their record at flying school or by previous experience." ation made it necessary—so the armament Department authorities believed at the time-to encorse the records of all graduates of the course with a statement that the men could not be considered as qualified to hold a position as armment officers until they had had a certain amount of practical armoment experience on the line.

Inother change, this one desirmed further to facilitate the admission of climinees to the course, was ordered by the Chief of



# -RESTRICTED SECURITY - THE RESTRICTED

....r.:3-60

76

the fir Corps late in November 1941. Then any ellinoos qualified physically and caucationally for the cadet argument course could make application directly for it. Here he had been eliminated from another caset course for uncatiofactory progress could be admitted the catety projects. By early 1942 an estimated 93 per cent of the students taking the course were eliminees from the flying achools. In it. Col. Charles C. Pearcy, Director of Argument accerted:

"About 75% of this number bring with them a kind of 'defeatist' attitude. They lack enthusiasm and ambition, and their morale is not the best. It is evident that their chief ambition is to become commissioned officers, and not to fit themselves professionally for 12

The close similarity between the content of the cacet course and the enlisted men's course naturally led the Lowry officials to compare the two types of students; and the concernion was not in favor of the cacets. A survey of a board of three officers appointed for the purpose declared that

there are among the enlisted wen's classes an average of 7.5, students whose basic educational becommon is comparable to the aviation cadet average, are those interpreted while taking the area and course/are higher than the cadet praces. This, in turn, indicates that there are also the enlisted asn's classes a large number of students who couses higher qualifications than the aviation cadet average. It is assumed that the higher 11.5, of the calisted men's classes would be later officer material, since this group is statistically higher than the aviation cadet average.

Seventeen per cent of the enlisted men made graces 2 or more per cent higher than the cadet's grades. The situation had become so



#RESTAICHED

*మీ.*కిప–60

77

notorious locally at Loury, according to Maj. Cen. John F. Curry, Co. manding Conerel of the Fourth District of the Technical Training Co. mane, that it was seriously harming the Torals of the Students 14 tableto course.

at the curvey initioned above, has criticized the caliber of the students alon who bear a moral lime, but nore collectly. Requirements for cashesian to the course of that time, he observed, called for a minimum of one years in collect, one year of which was to cause that in the study of physics as a sport angles. The continuous:

In checkin through the scacational records of the aviation Chacts sent to this school, it is found that most of them have the tere two pairs of confere are very few or then have abliored in unfindering. It is allieved that the go re .ajorim in sociology, psychology, history, etc., coss very little to qualify liviation Sadets towards a Jachnical and sectionical course such as surcraft anament. A large number of the creats entered weel that instructors at allying schools aid not give that a fair break and that the army med than condission as second lightenants as a remark for machine out of the flying beneat. It has even noted that worshe and the <u>-Strit de coras</u> of certain el cuas la vury lot or pauctically non-miltent. Inc. ence with which a co. Assion is attained by will blon brists in artigant may also have a direct buring on the number of ten unified out or alying retool since the runor is provalent at all flying schools that any ash-cut is practically accured a commission derely by coins entered in the or agent course. Of as recimetely 950 excets entered in this school, fore than 200 have seen eliminated, showing edistinctly that there are not adding an honest effort to master the armaint work, but are merely sarking time saiting wor the cormission.

In June, Caneral Jurry projected two mostures by which the situation slight by improved: (1) regulations overning aviation



## PRETRICTED\*

111F1-3-60

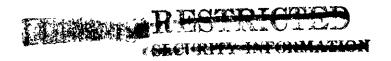
78

codets would be additive so that diviliant and emlisted arm outside the amount Miche would be additive to the course; and (2) at least one-half of the quotes for arms and endet elemes should be earmwhelf for the top ranking eight of each emlisted class. Hen in the second enterpry sould not be obtained to take the entire endet course, but only four weeks covering officer aministrative outside not given to the emlisted course.

The alcono request as franted by Head worters, MF, and beginning the contents of 1942 a spoth of 30 unliked her out of each arch intraviation each class of 74 and placed at the disposal of 17 the Loury school. The change has noted entablished by Colonel Pearcy, by then director of fraining at boury. The most procressive step that has been taken since the or animation of the Cadet Detachment . . .," he called it; "I believe the ultimate result will be superior officers . . . ."

The acritation of instructors and graduates of the enlisted armament and combainst courses to exact training made necessary a revision of the curricula so that this type of student would not waste time recenting as a codet the same course of instruction he had studied of an enlisted man. Turing the autumn of 1942 training for codets at body was revised so that three deparate courses were offered:

(1) A 14-mek course known as "13," designed for non recently insucted into the 'ray, with little military experience, but with two years of civilian college training. A class of 12 mem entered each



RICHTSTREE

79

neek. Before coding to lowry, these wen has completed nine to

12 weeks or basic military training, designed especially for cacets,

19

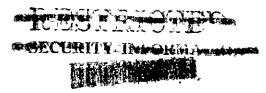
at Poca Maton, Florida. Their training at Lowry consisted of 10

20

phases, basel on a seven-hour day, seven-day week schedule:

	<u>Fhsce</u>	Hours
I.	Posic imposent electricity	49
II.	Spall - rais	49
III.	unplosives and assanition	49
IV.	chemical markers interials	93
٧.	Aircraft Achine Cuns and Carmon	98
VI.	Lireraft Lachine Gun bights and Cun Camera	5 49
VII.	Lord Lacks	48
VIII.	Four Operated Cun Turrets	98
	Administrative and Mechnical Luties of an	
•	aramont Officer	49
ž.	Pase and rield Operations	<u>49</u>
	TOTAL	686

(2) I six-week course, known as "IN," designed for instructors or recent graduates of lowry and suckley Fields. I class of six wen entered each week. Temore embarking upon this course, they had taken six weeks of back relitary training of the caset type, at Valley Forge ! illitary Academy, layne, Fernsylvania. These men took only phases IV (Chemical Larrare Materials), VI (Aircraft Lachine Gun Sights and Gun Cameras), VIII (Fouer Operated Cun Turrets), and X (Ease and Field Operations) of the "E" course. These four phases treated material which the students ourling their enlisted training had either studie, not at all or in insufficient detail to perform the cuties of an armament officer.



**THIS PAGE Declassified IAW EO12958** 

:::FHS-60

\*RESTRICTED

80

(3) A six-week course, known as "EV," for her who had taken the regular Lowry entiated men's boabsight course followed by the six-week Valley Forge course. A class of bit man entered each week. The course was designed to supplement the enlisted training so as 22 to qualify the students for service as possight officers:

	<u>Phase</u>	Ilours
II. III. IV.	Calibration Maintenance Chemical marfare Shall Tras, Machine Guns, and bomb Macks base and Field Operations	49 49 98 49 49
	Tom.	294

In January 1943 the three courses were moved from lowry to a new technical achool at Yale University, where all AAF ground duty cadet training was being centered. The extra facilities available there nade it possible, two months later, to increase the quotas of each of the classes by more than 100 per cent—the "...B" course to 25 new non-per week, the "AV" course to 12 per week and the "EV" 23 course to 12 per week.

During the opring of 1943 Headquarters, AAF concluded that, in order to excilitate the assignment of officers and to conform to recent tables of or anization, the category of "bombsight saintermore officer" should be eliminated. Thereafter, arranged officers were to be charged with responsibility for the maintenance not only of reneral arrangent, but of bombsights and power operated turrets as 24 well. Accordingly, on 31 May Heudquarters, AAF ordered the Technical



**THIS PAGE Declassified IAW E012958** 

# AUSTRICTED.

AFH5-60

 $\epsilon$ 1

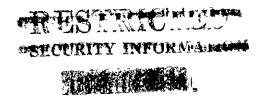
Training Command to discontinue the separate booksight course and to lengthen the irrament course to include phases on bombsight maintenance, making the transition as quickly as possible but gradually enough to produce an even flow of graduates.

The Yale school authorities took the opportunity to propose a thorough revision in the cadet program. Instead of three separate courses, only one hould be given. The "AV" course has to be discontinued entirely; and the chief features of the "AD" and "BV" courses were to be combined into one 20-week course, three weeks of which were to be devoted to Chemical Marrare. Headquarters, MAF cut the time devoted to this topic to one week, however, making the course only 18 weeks in length.

Training under this new curriculum began on 1 July 1943.

Subsequent minor modifications produced the following symbols, which 27 was placed in effect on 13 October 1943:

	Phooe	llours
I.	Armonent Administration	36
II.	Pachine Cuno and Small Arms	36
III.	Aircraft Cannon	36
IA.	ingincering Physics	36
V.	Formbs, Funes, Annunition and Racks	36
VI.	Synchronizing, Fireraft 'achine Gun Sights	
	ana Gun Camoras	36
VII.	Power Cherated Cun Turrets	$1l_{4}l_{4}$
VIII.	Pombsight Haintenance	180
Ib.	Cherical darfare	72
$\Sigma_{\bullet}$	armament Field Operations	72
	TCT/L	634



RESTRIC

##F#3-60

٤2

Two phases are worthy of contact they represent the first of considerable experimentation and modification by the Male school suthorities. The four-week phase on power operated gun turrets included two weeks of the material which had been taught for some time plus two weeks on the central fire system.

Five weeks here devoted to bombsight maintenance. The first week dealt with the "theory of bombsight; the decona week with the Forden bombsight! -6; the third seek with the Sperry S-1 bombsight; the fourth week with the Honeywell C-1 automatic pilot; and the fifth 29 seek with the Sperry 1-5 automatic pilot.

Two technical developments in the field of borbsights led to further modifications in the cidet course during the first half of 1944. Some worths after Heacquarters, MF decided that the aperry bombsight and A-5 automatic pilot equipment was to be discontinued by MF units, it directed the training Column to give only "familiarization" training to this type of equipment and use the time thus saved to add instruction on the worden M-3 bombsight and the C-3 automatic 30 pilot. As the Male school worked it out, starting early in Fabruary, two days were devoted to the Agarry equipment. The 10 days saved by the reduction permitted two extra weeks on horden equipment, greatly 31 increasing the thoroughness of that training.

At about the same time the AAF acopted the use of the "glice bomb," a device used in connection with the horden sight to control the flight of the bomb after it had left the plane. A sight week was added to the combaight maintenance phase to cover familiarization training on



JJE - 50

٤3

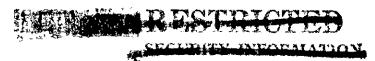
this equipment, relains the over-all length of the cadet course to 32 19 weeks.

By the spring of 19:4 Mondquerters, MAF became convinced that with the peak of TuF expansion already reached, it can inadvicable to continue commissioning men on any large scale. Future needs for technical officers, it can felt, could best be met by giving technical training to sen already consissioned for whom no suitable assignment training to sen already consissioned for whom no suitable assignment training to their previous specialty. Ultimately it was determined

that the new collected for this re-training should be noted pilot officers returned from overcess outy. This decision produced a new problem: To maintain at least minimum flying efficiency, these pilot students would require for better facilities than here evaluable at Yale, where the air bace was beveral miles may from the main part of the school. The colution reached was that technical training should be goven to regular MLF fields; the grammat course was to be moved to suchley field, Colorsoo.

Inc transfer of the amazent begarteent and ander phase-by-phase during the outer of ly44. As the instructors of each phase Tinished teaching their last class at Tale, they and their equipment woved to fuckley and resumed instruction there. Thus it was possible for the first class of 14 orficer pilots to start the course at Tuckley on 24 July, while the last class of casets also not products from Yale 35 until 15 loyaber.

ith the chan e in surpose of the course are in type of student, case additionations in the curriculum and teaching atthous. At Y-de



MAFHS-60

84

some entisted personnel had been used to teach the cadets; at buckley, as the students were officers, the instructors all had to be officers. Although the content of the course remained basically the same, the order and manner of presentation was drastically reorganized. Over a 19-week period, the following topics were presented:

I. Theory of Bombing

(a) Handling of Classified Material

(b) Handling of Bombanght Louipment

(c) Trigonometry of the Combing Problem; Japane Root and Trigonometry of Right Angles

(d) Indicated, Calibrated Indicated, and True Air Speed

(e) Ground Speed and Velocity of Closing

(f) Fhysics: Increasing Speed of Falling Objects

(g) Physics: The Vacuum Bomb

(h) Actual Bomb: Actual and hole Range

(i) Actual borb Trail

(j) netual somb Crosstrail

(k) Bomb Ballistic Charts: Use of Charts

(1) Gyroscopes: Characteristics and Laws

(m) Gyroscopes: Use of Gyros in Precision Ecabing Equipment

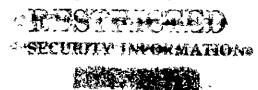
(n) Precision Pombing Equipment: Solution of Trail, Crosstrail, and Range on 1-9 Bombsight

(o) Precision Ecmbing Equipment: Manual Computers: E-6-B, ABC

#### II. <u>Machine Guns and Small Arms</u>

- (a) Pistol Caliber .45, Carbine Caliber .30, Submachine Gun L-3
- (b) Small Arms Ammunition; Storage, Handling a Target
- (c) browning LG: Assembly, Disassembly, Nomenclature
- (d) Headspace and Headspace Adjustment
- (e) Operation of Feeding Mechanism
- (f) Operation of Firing Mechanism
- (g) Inspection, Maintenance, Cleaning and Lubrication
- (h) Repuisition of Spare Parts

At Buckley instruction was carried on in a large hangar which had been partitioned into classrooms. Proximity of the classrooms to the flying line made it possible to give practical demonstrations of

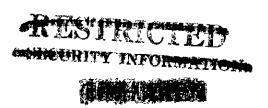


DESCRICATED

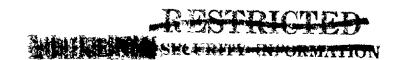
TIFF3-60

85

the material covered curing each phase instead of reserving it for 37 a "field emercise" period at the end of the course. Then the school at buckley was activated, plans called for the training of 38 classes there, with the last class graduating on 8 becember 1945.



MATE-60



#### Chapter VII

#### INSTRUCTIONAL AND INTIMARATIVE SECRETS

The foregoing chapters have described in some detail the vicissitudes of the principal courses in aircraft armament. In theory, the function of Readquarters, LAF, the braining Command, and the mestern Technical arabning to mand was to establish the over-all requirements and standards of armament training; upon the school authorities at lowry, Euckley, and Yale rested the responsibility of determining the detailed methods by which these objectives here to be achieved.

As the chapters on the particular courses have shown, these principles were not always strictly scheres to. Although in almost every instance the cyllabus was drawn up by the school giving the course, in many cases subsequent modifications ordered by higher headquarters altered it treasubously. This was particularly true when higher headquarters quarters would order the addition of considerable books, of now subject matter to the curriculum but yould cany the school any excension in the over-all length of the course.

Oftentimes school authorities complained that this occurred because the officers at the higher headquarters were uncamiliar with the problems of their school. They used such complaints in spite of the fact that, curing the war years at least, every one of the colland headquarters had on its staff at least one former official of an

86



ALESTICATE AND ALESTI

//FIS-60

87

armament acheol whose responsibility was the monitoring of the armament training program. That the school authorities torgot, when they complained, was that the occisions of higher headquarters here in most cases wided by rectors of which they had no knowledge. It the same time there was considerable merit to the school authorities' contention that after a tour of outy of a year or more on a headquarters staff, the most emperienced former armament school official lost touch with the changing conditions at the schools, and that much might be gained by a more frequent rotation of headquarters personnel.

that the armount courses might have been conducted on a more realistic and efficient level if the training officers had been termitted to make rather frequent trips to operational units in combat areas. In one or two instances such trips were made, but they were the exception rather than the usual practice. Intelligence reports and ritten suggestions quantited through channels by the using organization required a long time to reach the armament schools; by the time they did reach their destination, conditions usually had altered or the suggestions had been so watered down by the numbrous forwarding organizations of the war, as part of the MF's personnel rotation policy, wen the had had combat experience began to reach the armament schools as students and instructors; but the nurrowness of the experience of most of them and the constantly changing conditions of varfare



**THIS PAGE Declassified IAW E012958** 

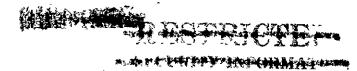
MPIS-60 CALCULATE INFORMATION OF THE PROPERTY OF THE PROPERTY

ජප

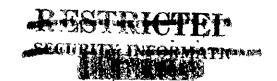
limited the value of this practice.

Although the armament school officials were responsible for drawing up the sylkbus which they provided their students and instructors, they deliberately refrained from making them very detailed. They did this for three reasons: to permit the instructors to exhibit individual initiative in their teaching; to allow constant modification of the course in the light of new equipment and techniques; and to avoid the numerous "gigs" they felt inspectors would be certain to sabrit if they observed any deviation from the announced standards. But the school authorities did succeed in maintaining definite standards of instruction by giving students examinations at the end of each phase and at the end of the course.

There was one particularly notable instance of a higher headquarters undertaking to establish detailed teaching procedures without the concurrence of the armament schools. At the start of the Air Corps expansion period, armament training tended to be theoretical. Euch of the instruction was presented to large class sections through the traditional lecture and blackboard method. Supplementary aids included Air Corps technical manuals and a few training films, none of which had been prepared specifically for the purpose of the course. Such methods caused the armament officer of the Third wing, GHQ Air Force to complain in the spring of 1940 that graduates of the Lowry bombsight course assigned to his wing appeared to know far more about what happened to a bomb after it was dropped and the relative merits of the Norden and Sperry sights than they did about the actual maintenance of the equipment. But armament instruction was not all



೧೨–೮/ಸ್ಪನ್ಷ



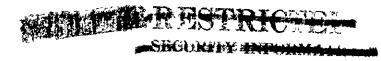
89

theoretical. In most phases there was an account a squipment for teaching surposes; and since the courses were given at a leisurely pace, students had fair opportunity caually to practice maintenance work in the eleusroom.

luring 1961 and 1968, when a rement araining the depending by leaps and issues, the trend toward the theoretical great atrender and otron or. Ath larger classes, inadequate numbers of appearing as almost inevitable. In some phases the ordicials uncortook to counterest this by preparing additional achievable charts, crinted or adject this ty preparing additional achievable charts, crinted or adject graphed student annuals are guides, and similar new-opical services. Short answer true-and-fulse examinations were succeitated for essay-type elaminations. But at best the efforts to prevent allegative theory were only partially successful.

Buring the autuan of 1942 Maj. Con. malter . Neuver, Commanding General of the Cochnical Training Commander took of crutic step to show the pendulum buck in the direction of the Toractical. He ordered an increase in the ratio of instructors to students so that there would never be now than wight students in a class roup. His directive further for ade the use of sectures, the histoin of notebooks by students, and the testing of students by ritten or oral engine tions. It ordered the relevant of all chairs and blue boards from classers of the ordered to the relevant of all chairs and blue boards from classers of the ordered at the relation of the testing of the chairs and blue boards.

Under the impatus of the directive, more charts and attacent  $\mu$  ruides were graphise for all phases. These training fills one film



-RESTRICTED-

JF1.J-30

90

string illustrating such thin a correspondent of disassembly, accepbly, and cleaning here obtained from A. S. totion micture services. additional cubacky recels of machine guns one common were obtained iron the remun churer, to venonetrate how the equipment operated. "Irudahoarda" and "mock-upo" word constructed by workers of the school starf to illustrate such things is the colfunctions common to the electrical system controlling creations and the internal construction of tout fures. Limits of dury a unition are touts are prepared so that students become familiar with their appearance. Hore " schine gun malifunction" laboratories were built, where students could learn to recognize the ejuptoms of the root common type of malfunctions. Acaitional chods were consequeted so both students : ight practice the synchronization of gunt. . . dibional that Mé simplemes were produced from the enterial authorities and installed in the school harders so that stucents might practice such routine cuties of the armorer to the Losding of adding our exemption and the fuzing and locain of boabs. This practice was followed even in the colet course at Yele, in spite of the inconveniences created by Lvy-covered buildings and an sirport seven miles from the clussrooms.

Fany of the armament school officials telieved that although the purpose tehing the directive abolishing theoretical instruction was worth while, its provision, went too for one were better suited for aircraft—values are training than for armament. In such phases as implosives and accountion, and electrical imparent Control, where the



# -H-EST-H-CTED\*

///FIS-60

بَ خ

91

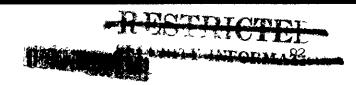
nature of the subject matter and advisable the use of the lecture method, supplemented by occasional demonstrations through charts and breadboards, the tan on lectures and chairs was winked at. In phases dealing ith memine cure and common, croups of eight attacents and an instructor bravely stood around a cannon or fun for the six hours of a school day.

The all-continuance of emainstions acced conclourably to the problems of the instructors in ground the statents. But by 1943 the elimination rate allowed most armaent courses has so tiny that statents had to be graduated whether their norm stually hat any standard or not. The alrective had one positive benefit: the ban on blackboards are statent notebooks hastened the preparation of seditional charts and breadboards to take their place.

by the fraining Co. mand in July 1943, permission was granted the armament school difficials to deviate from come of the provisions of the circular instituting practical methods, at first unofficially, and later difficially. Fitten examinations of the objective type were reinstated; instituting amount of lecturing to small groups was conconed; and chairs were returned to the classrooms for wany of the phases. But the pedacopical efficacy of breadboards, mock-ups, and charts having been accountated, there was no abatement in their use. As the supply situation regular eased, outsing as well as regular accels of equipment became more generally sveilable, further improving the effectiveness of the courses.

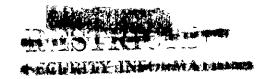


V 315-30



In its effort to stress the "practical," the amament school at lowry conducted an interesting experiment curing the first half or 1943. In area known as Camp Fizerte, simulating conditions characteristic of an advanced tactical base, was opened on the Colorado plains come miles east of Loury. Following the completion of the phases at Lory, students agent a week at Camb Eigerte living in tents, esting and working in the open, and practicin amio "runged" conditions the thing they had lurned in the classroom. heports received from the Lorth african theater were used to teach methods of armament maintenance uncer desert conditions. The camp was desired after about tix months, then the production "hung" of trmorers had blen surrounted. Uncoubtedly the students who took this training benefited fro. the lessons in Laprovisation which it taught. It is coubtful, however, whether the information they acquired about African conditions was of particular bunefit; by the time these students were sent overseas, the USASF was Fighting from Italy and northwestern Jurope.

By the end of the war the armoment school officials were inclined to relieve that they had achieved a happy solution to the "theoretical versus practical" instruction problem. Euch of this was made possible by the improvement in the supply and personnel situations. In most instances each student could be provided with his own piece of equipment. There were enough instructors now for at least one instructor for every five students in the depot overhaul courses, and one instructor for every eight students in every first and second echelon course. Formally an



**THIS PAGE Declassified IAW E012958** 



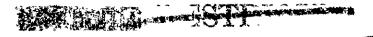
93

LAFH3-60

instructor gave a brief explanation of the theory which lay behind an operation, and followed it with a series of demonstrations and exercises which were participated in by all the students. The ratio between "practical" and "theoretical" instruction was then estimated at 80 to 20, with "practical" instruction running considerably higher during the phases on the bombsight, the C-l pilot, and the E-29 computer. Precautions were taken to guard against the natural tendency of instructors to become extremely voluble.

One administrative problem which vexed armament training officials more than it did those in charge of other technical courses was that of student-and-instructor morals. That this was so is illustrated by the elimination rate which obtained at lowry Field, the only school then giving the course, during the school year 1941-42. The elimination rate for students entering the basic armament course was 22.33 per cent; for those entering the bombsight maintenance course, 12.81 per cent; and for those entering the power operated gun turret course, 6.32 per cent. The rates of the first two courses were considered undesirably high; the goal for technical training was to keep eliminations well below 10 per cent. Particularly unsound was the rate in the basic armament course; this was not a particularly difficult subject and could easily be mastered by an eighth-grade graduate.

Morale was such a trying problem because aircraft armament was a strictly military specialty. When a man studied aircraft maintenance or communications or photography in an MAF technical school, he did it with the realization that the knowledge he was acquiring would have some utilitarian value in the civilian world to which he would ultimately



THIS PAGE Declassified IAW E012958

PERSONAL

AL FAB-60

94

return. He could not confort himself with any such thought in the case of sireraft erastent. We some students carconically expressed it: "Lifter the war I'll get a job telling care of Al Capone's machine gune."

loreover, ar whent lacked the glancur of the combat craw special—ties. The pilot, the book order, the reviewtor, even the flexible number, were relative heroes of the movies, the racio, and the codic atribute interest approx of knowledges the proportion are ever achieved and an enthusiastic tribute from the late armic fyle published in his syncicated column early in 1944. The situation was well outlined up by Col. Allium 1. Travis of AC/AL, training, termerly of the Lower arms ent repartment, when he wrote in November 1943:

The lowly status in which areas at has relien is one to the tremencous arount of publicity eigen runnery, to bing, etc., and an impression that a knowled wolf fraction is unnecessary to such popular jobs. The trament behoods have requested just one film to when to entrant students for the specific purpose of inciting interest. The scenarios have even turned in and turned form in the part three years, and the schools referred to shall a film on gurnery. Tany of our unsorers all never become purpose, and the use of such film our could as a substitute would escrete the morals which is already hom. The market section of the new Filot's Information File is typical of the carrel via totard in a tent, six little pares including a chart. There is a definite next for an equational pro run on instanct for all unit communers, pilots, and station technical inspectors.

There is no record that any rotion was taken on Volonal (revis) suggestion.

Cre time when the 'lifted let have used pliebles a jobs send country "welling" arrangest work to the men destined to be trained in that specialty



## P-ESTRICTED

95

constioning by school difficults of recruits sent to the documentation the constioning by school difficults of recruits sent to the documentation of the fact that the challifection interviewers at some body term is nor introduct the nature of an armore's tork, but here could present that the court distintion attendent to interviewers appeared to believe that an armore alle short motal work. Others told recruits that the court had to or covered erial currency—which has to be day shallow spirits when the man arrived at school to learn that only a few tools ever operate a machine, un or canada, even when interviewers were noted furthered, the ever-present distributive runors accomplished the same tipehior.

another factor which has to men dissabilitation as the cuota system under which the seef classification system operator. At classification centers recruits were allowed to state three choices as to course. Fany men picked mirphine analysis or reals at their first or second choice, listing small nt as third choice only because there was no other lively possibility. They are bitter than they learned that, in order to fill a large class at lower or tuckley, their reluctant thire choice has been hade their assignment.

The fillure of heregy riers, is the classification centure to improve the morale situation placed the problem almost entirely upon the shoulders of the immediate octools. In the moter operated run turnet course, considerable time two devoted to explanations of the importance of turnets in bombardant tarriers. In the even more critical case of the order immediate course, a cay or two turner astriculating



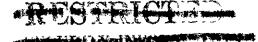
/LIFH3-50



students were given an orientation lecture during which an effort was more "to inorch upon the student the importance of the armorer's job in a tactical organization." Innou-hout the course, too, instructors were expected to reiterate this point to the students. But as the school authorities grimly observed, most of their efforts went for neight when students received letters from friends who hed/preducted from the course and had been assigned to miscellaneous post and squadron duties at their next station.

The aradient schools idopted a number of improvisations to control of tudent morale. Luring the period in which the schools were expanding, there was a great mood for enlicted personnel to perform clerical and other equinistrative choice around the post—the po-called "porm ment party" assignments. This need led post officers to detail climinees from the achools to such auties. As the prectice became common, many students, none too easer for assignments as armorers and attracted by the colors do climate, celiberately sought to be eliminated so that they might become per ment party members. But it was realized that this was pulling down the wordle of the student body as a whole, on order was issued that henceforth no eliminees were to be retained at the schools for such assignments. But by this time not of the mischief had been done, and all of the permanent party assignments were filled.

A fresh incentive to bacic armament students to et themselves eliminated area the course was provided by a cirective of the Training Command issued in December 1943 which required that all enlicted wen hereafter dropped from a basic course and qualified for combat crew training, were to be supplied to a provided purgery schools at once. As soon



**THIS PAGE Declassified IAW E012958** 

PESTRICTE.

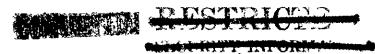
97

as they learned this, students desiring serial gunnery training began achievrately to fail their work, sometimes even remaining absent from class. There it was clear that failure was celiberate, the authorities entered the fact that the student had been dropped "with prejudice" on his service record.

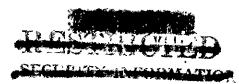
The situation free so electrossing that the Lowry officials proposed to higher headquarters that deliberate failures be transferred immediately to the Ground Forces, or at least be commandedly deprived of the privilege of taking flexible gunrery training. But the arching Gou and refused to authorize either proposal on the grounds that no means then existed for transferring men to the Ground Forces and that the need for 12 flexible gunners has so acute that they must be given high priority.

In the circumstances, the best the school wat able to do was establish an elaborate system of boards of orficers to interview men whose work was not satisfactory. If there was any reson to suspect that the cause of a man's failing work was his desire to obtain another assignment, he was to be disciplined under the 104th Article of Mar, or 13 threatened with it. But the lower authorities doubted whether these measures old any more than mitirate the situation. In the opring of 1944 the climination rate of the table course dropped to the vicinity of 14. The students during this period, however, were mostly eliminated flying cadets earnered for serial gumery training, whose worale, though low upon arrival at the school, improved regicly "through orientation and Judicious handling."

inother type of student-scrule problem developed during the spring of 1943, when a number of critisted on the had already been graduated



ALTIJ-10



93

the blaid remark school were cont to suchley the to ry to take the blaid remark source. It cannot school, according to the armound the course sutherities, there in his been induced it in the colief that they were the most important copy in the LF, and that their cannoty training his taught also all they assed to know about armount. They on them already halo history rank that the amount instructors, which created problems of circipline. The situation was ultimately is crossed by the adoption of a policy that all man picked may are much carried to receive their armount training before going to converge accord.

In the case of the central fire control course, 'very difficult on, which could be embedded only by the with unusual such intervious, ottoont morels was controlly retrieve to 'very high.' One retrieve that that, with one cloud mechanism, only an with 1937 scores of 1.0 are over-wall above to imaginary every—the confider the embedded control of the course to the right of corporal, under they always had that rank or a higher one, un sectionably also a room coal to improve the pairit of the course.

that of valuation constraint students in each class to take the cheet armaint course lessing to a condition and their manners as an or that of condition. Although amost righted are not by it also there is evidence to expect that proportionably nor are not instructors than exceents were liven the opportunity of taking could training. For this reason,



PESTRICTED

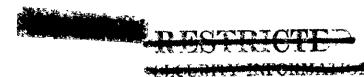
10,54..-60

the creet progress probably boosted the orale of the instructors even more than that of the students.

tenance, power oper test turnet, and central fire control system courses all involved an administrative problem found in few other types of technical training: theorety. The problem first appeared and was not neutre in the case of combinet, whiteheaves, a subject chassified to considerable. In 1509 the Chief of the mir Corps catablished a rule that the loyalty of the University, standard and the case of chastists of the base of unsustinged problem. The citizen of the University, standard and the charge of the last three years. The chatefant of the community officer of the post at thich the coldier cas stationed to a full filled this require and the case of sufficient proof.

The reveletion in July 1944 that a codet bomblight instructor had a relonious record so disturbed the Air Corps Level Division that it as anced in solute stiffening of the require ants. The Chief of the Air Corps responded with a new regulation specifying that no person would be trained as a temperature or temberght unintenance man until his application, together with a cot of his fin erprints, had seen submitted to CAC and approved. Lefter granting this approval, the Chief of the Air Corps had filitary Intelli once check the candidate's record and fin erprints with the Aceral Lureau of Investigation.

In practice, this investigation or loyalty qualifications took a low time-so loss that it became customary to mink at the letter of



PESTRIC SECTION

/LEII3-60

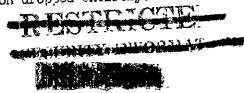
100

the regulation are allow students to start the course while their records were still under investigation. It was a common occurrence at the lower school for went to be permitted to reach the last two weeks of the course refore being cleared. In one instance a student was removed when an uniavorable report, as received the day before he are to requate.

Col. b. S. Smith, Birector of Individual Indining, made a rucical in March 1942

suggestion/ Secure of Perican losses of heavy borders, he believed it reasonable to assume that some bombsights had fallen into enemy hands. Thus, he thought, there was no longer any need for investigating the loyalty of men who assistations and operated bombsights any more than those who assistations and operated the planes.

as Colonel Chith's. The revision of Alf Regulation No. 35-13 issued in April 1942 continued to require that an investigation be made into a prospective student's loyalty, but prescribed a procedure desired to excedite the investigation. A few more months of excerimentation with this regulation, however, convinced the are Department of the validity of the point of view empressed by Colonel Smith. In Povember 1942 the decretary of an directed the commanding generals of the various air corces and commands to cause forwarding prospective students' fingerprint, to Reacquarters, A.F. Carly in 1943 the classification of bombsichts and literature relating to the was lowered to "restricted" 23 and the investigation dropped entirely.

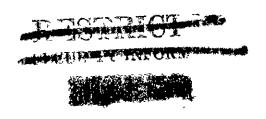


PUBLICATION OF THE PROPERTY OF

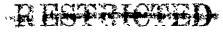
101

11F15-60

Despite the lowering in clustification, for some time afterward the officials at loary continued to treat combaight materials and information as conflictatial matter. Is before, at the start of the course, AF 350-5, couling with the handling of classified watter, and Lowy Field rules in respect to codesi hts here read to the students, who were then required to bigh a cortificate indicating their willingnest to abide by these security rejulations. The students were given passes accriting them to the contaight division buildings, which were constrated troutle rest of the field by a fence. They were termed not to ciscus the subject matter of the course with any outsider, military or civilian. Only on rare occasions were students permitted to remove textbooks and class notes from the classroom area, although this rule was later liberalized to permit their use in the burracks. With the in aguration in 1943 of the central fire control course, which dealt with occrut naturall, the lowry school followed in vereral the same practices then in effect in the bombeight mainten ace course.



AAFPS-60



### CECHAIT INFORMATION

GLOSSARY

AAF Army Air Forces

AAG Air Adjutant General

AC/AS Assistant Chief of Air Staff
AC/S Assistant Chief of Staff
ACTS Air Corps Technical School

ACTTC Air Corps Technical Training Command

AFASC Air Service Command

A.F.C.E. automatic flight control equipment

AFCTG AC/AS-3, Training Division, Technical and Services

Training Section

AFFIP Directorate of Military Personnel

AFRDB Directorate of Bombardment

AFRIT Directorate of Individual Training

AFSHO AAF Historical Office

AFIEC Air Forces Training Command

AFTTC Air Forces Technical Training Command

AG Adjutant General

AGGT Army General Classification Test

ASC Air Service Command
C/AAF Chief, Army Air Forces
C/AC Chief of the Air Corps

CFCE central fire control equipment

CG Commanding General
CO Commanding Officer

ETTC Eastern Technical Training Command

Comdt. Commandant

G-2 General Staff, Intelligence
GHQ AF General Headquarters Air Force

ind. indorsement

HEED Materiel, Maintenance, and Distribution

n.d. no date

OAS. Office of the Assistant Secretary of war

OCAC Office of Chief of the Air Corps

OC&R Operations, Commitments, and Requirements

POGT power operated gun turret

RSR routing and record sheet

RCT remote control turret

SSN specialist serial number

TAG The Adjutant General

TC Lemo Training Command Lemorandum

TS technical school

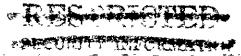
TTC Technical Training Command

TAX telegram

T&O Training and Operations UR unsatisfactory report

USAAF United States Army Air Forces
ATTC .estern Technical Training Command





111.11.3-60



m o T L D

Circler I

- 1. Medo on mechanics training curing world for I, until med dea underted, in LA 353.9 Schinics In .
- 2. Year, "The hir Corps Technical Johool," unsigned the unsated, in lictor, of may hir Corps technical training, 1917-41, doc. If.
- 3. Mintery of Granute Miele, 1 Jun. 1939-7 Dec. 1941, vol. 1, p. 13.
- ero, "The fir Corps reclaical behast," undi not the uncreed, in Vi tory of ray hir Corp. Actualed Training, 1,17-4, acc. 11.
- 5. Hictory of Loury Field, or a limit Lagartiant, vol. 2, ch. 2, pp. 31-31-
- "J. os, "The Lir Corpo recimient school," and "hi tory of the forest ant of free lent, "100," in history of frag hir fores recenter l'ariane, 1/17-41, core. If, lie.
- 7. Whitbory of the tegertant of arabent, Alie," in ibia., coc. lh.
- 2. irrual torort, school Tear 1935-55, begartment of research, Lour, [G. muto] Flold, in ride circs for Class 1-1-36, Quoteo in Fictory of Lowry Field . Townert Department, vol. 2, ch. 2, pp. 10-11.
- 9. Irio., op. 1, 2, 4, 5.
- 10. <u>II/1d</u>., 29. 13-16.
- 11. Whittory of the topart and of arament, ACLUM and two for Bir. .615 by C.d. 1 cors, chief instructor, 14 1 arch 1935, in History of Any Air Corps Rochmical Training, 1917-41, does. In, le.
- 12. Wistory of the assartment of Armanont, ACIS," in Abid., doc. 16.
- 13. Chara records quoted in michory of Lo.ry Fleid arequest depart-...nt, vol. 2, ch. 2, cp. 13-59.
- 14. Ibid., op. 2, 3.
- 15. <u>loid</u>., no. 55-53.

DECEMBER

11.773-60

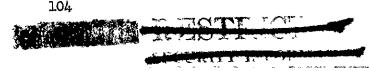


ROT 3

### Chapter II

- 1. Memo, School Secretary, ACTS, Lowry Field to Dir. of Armament Rept., 28 April 1939, cited in History of Lowry Field Armament Rept., vol. 2, ch. 2, p. 253; memo, C/IS to Lt. Col. Mussell L. Maxwell, CLS., 20 Jan. 1939, in ACG 353.94, Thr., Gen.
- 2. ltr., lt. Col. Tra C. Laker, Lace., 0/0 to W.G., 21 June 1939, in M.C 352.11 f Characte Ald. Course of Instruction; 1st ind., C/AC to WAG, 25 Jan. 1939, in M.G 353.9A, Thr., Gen.
- 3. 3/10 to AC/5, 6-2, 29 uec. 1942, in ACG 353.9-14, bombsight Thr.
- 4. Inspection deport on Scott, Loury, and Chanute Flds., "in accordance with par. 1, Office Femo 30-11, 23 Jugast 1938," signed by G.I. 3/tratemeyer/, Chief, T&O Div., cated 1 Nov. 1939, in FCFC files.

  OCAC.
- 5. /monthly reports of at:t. Control sec.
- 6. Ltr., C/AC to Lkec., Granute Fld., 21 cep. 1940, quoted in History of Lo ry Field Armanent Department, vol. 2, ch. 2, pp. 253-254.
- 7. Director of Armanent Dept., Lo ry Fld. to brij. Gen. Rush E. Lincoln, 15 Nov. 1940, quotea in <u>ibid</u>., p. 264.
- E. Hemo, Asst. Dir. of area ent Begt., to axec., ACTS, 12 Nov. 1940, quoted in ibid., p. 261.
- 9. Esaiogram, COMC to Loury Pla., 24 Harch 1941, quoted in ibid., p. 264.
- 10. OCAC, monthly reports of Stat. Control sec.
- 11. 2d ind., C/LC to CG, /CTTC, 15 Sep. 1941; and 5th ind., C/KC to CG, /CTTC, 27 Cct. 1941, in //G 220.66 /l, Letail of Students to Factory Tng., Misc.
- 12. Asst. Comat., Lowry Fld., to It. Gol. Brock, 20 Nov. 1940, in 126 353.9%, Denver Misc. The; History of Lowry Field Armement Department, vol. 2, ch. 2, pp. 95-96.
- 13. Pemo, Erig. Cen. Davenport Johnson to C/10, 10 Parch 1941, in History of Air Corps Technical Training, 1917-41, doc. 80; History of Loury Field Armament Department, vol. 2, ch. 2, pp. 264-265.



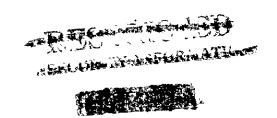
MARKS-60, Notes, Chap. II.

- 14. Condt., ACTS, Lowry Fld. to C/AC, 13 Sep. 1940, quoted in History of Lowry Field and the Department, vol. 2, ch. 2, p. 154; Capt. ...F. Bay, Supervisor Fower Turnet Phase, armament Sch. to Dir. of Armament Fost, Lowry Flo., 15 Nov. 1941, quoted in ibid., p. 166; Comot., Lowry Flo. to CG, ACTTC, 13 Cot. 1941, quoted in ibid., p. 167.
- 15. 1 emo, for Erig. Gen. Cousins, hecort Code No. 1, approximately 1 Jan. 1942, in Chimistrative Comercent Div. Files, Eureau of the Euget.
- 16. Madiogram, Mazon, ACTIC to GG, ACT, Loury Fld., 6 Lec. 1941, and Daily Diary of Loury Fld. Armament Dept. Dec. 1941, cited in History or Loury Flela, 7 Dec. 1941-31 Dec. 1942, vol. 2, ch. 6, p. 57; school regulation, Loury Fld. Lept. of Armament, 1 Jan. 1942, quoted in ibia., p. 26.
- 17. Cart. koy Collins, Actg. AG, 4th mist., AFITC to CO, Loury Fla., 13 Cct. 1942, quoted in ibia., p. 397.
- 18. CG, Buckley Fld., quoted in History of Euckley Field Armament School, 7 June-31 Dec. 1942, ch. 6, p. 11.
- 19. Lemo of telephone conversation, ... Litchel and L.L. teldmin, 18 April 1942, prepared by ... Mitchel for J.S. Canterbury, 20 April 1942, in Administrative Langement Div. files, Eureau of the budget; Hg. Mar, 1889, AFRDE to AFRIT, 8 June 1942, in AAG 353.9-LA, Fombsight Thg.
- 20. CG, ACTTC to CMC, 17 sep. 1941, in alG 353.9-14, Eomboight Tng.
- 21. Annual Report of Loury Fld. Armanisht Rept., 50 June 1942, quoted in Elitory of Loury Fld., 1942, vol. 2, ch. 6, p. 14.
- 22. History of Euckley Field, April-Dec. 1942, o. 13.
- 23. Lt. Col. Il iam F. Tay, Dir., recement Lept., to Supervising Officer, 59th Subdepot, Lowry Fld., 24 Dec. 1942, quoted in Fixtery of Lowry Field, 1942, vol. 2, ch. 6, p. 150.
- 24. Capt. key Collins, .ct -. 17, 4th Dist., AFTTG to CO, Loury Fld., 14 cep. 1942, quoted in ibid., p. 99.
- 25. History of Irmament Training School, 7 Dec. 1941-31 Bec. 1942, pp. 6-31.





- 26. See p. 54 ff., this study.
- 27. Hq. AAF, monthly reports of Stat. Control Sec.
- Col. L.O. Ryan, Deputy AC/AS, Tng. to AC/AS, OC&R, 10 Feb. 1945, in AFCTG files. 28.
- 29. Hq. AAF, monthly reports of Stat. Control Sec.
- TWX, ETTC to CO, TS, Yale University, 10 June 1944, reproduced in History of TS, Yale University, 1 May-30 June 1944, incl. 11.
- 31. Hq. AAF, monthly reports of Stat. Control Sec.
- 32. Ibid.



**THIS PAGE Declassified IAW E012958** 

D Recent Court 1.1FE3-60

ROTES

### Chapter III

- Lt. Col. Ira C. Laker to TAG, 21 June 1939, in AAG 352.11F, Characte Fld. Course of Instruction; schedule for school year 1939-40, reproduced in Mistory of Lowry Field armsment Department, vol. 2, ch. 2, pp. 69-74.
- exec., Loury Fld. to Dir. of armament, 19 Aug. 1940, quoted in 2.
- Schedule for school year 1940-41, reproduced in ibid., pp. 76-77. ibid., p. 21.
- Schedule for school year 1941-42, reproduced in ibid., pp. 78-79. 3.
- Daily Diary of Lowry Fld. Arrawent Dept., Dec. 1941, cited in History of Lowry Field, 1942, vol. 2, ch. 6, p. 57. L. 5.
- Goot. Low Collins, Loty. (G. 4th Dist., MITC to CO. Lovry Fld., 14 Sep. 1942, cited in ibid., p. 99. 5.
- let ind., Col. Karvey J. Burwell, TJ, Loury Fld., to GG, AFTTJ, 16 Sep. 1942, quotea in itid., pp. 99-111; srllabus of instruction, Fighter irrest armorer's Course, TS, Luckley Fld., 20 Cet. 1942, reproduced in History of Luckley field .rmment school, 7 June-31 Dec. 1942, 179.
- Copt. D.T. Mamilton, lost. AC, AFTTC to CG, Ath Dist., AFTTC, 24 April 1943, cited in mistory of Lory riold, 1 Jan-7 July 1913, vol. 2, ch. 11, p. 79.
- Capt. K. S. Irom, acts. ast. ic, 4th Dist., FTTC to CO, T5, lowry Fld., 29 April 1943, quoted in ibid., 2. EO.
- 10. Col. Ton. . weley, Comer., 15, 10 my ale. to CC, 4th Dist., .FITC, 29 ioril 1943, caolea in ibid., p. 81.
- Cric. Cen. Albert L. Sneer, Comdg., To, Io. ry Fla. to CG, 4th Dist., FTTC, 6 127 1943, cuotea in ibid., pp. 82-d4.
- 12. Grig. Gon. d. .. Harper, 10/25, Tag. to CG, LTLC, 17 July 1943, cited in History of Loury Field, 5 July-31 Dec. 1943, vol. 2, ch. 16, pp. 7, 8.

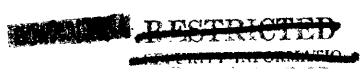
107

RESTRICT

# DECLESONGE

MIFEC-60, Lotes, Chap. Ill

- 13. Erig. Gen. A.L. Inced, Comag., To, Loury Fld. to CG, 4th Dist. ASTIC, & /Mg. 1943, quoted in ibid., op. 8-9.
- 14. Capt. T.L. Holcomb, Actg. Asst. 10, AFILE to CG, . T.C, 28 Aug. 1943, cited in ibic., p. 10.
- 15. Program of instruction, 18 Oct. 1943, reproduced in ibid., pp.
- 16. 2d ind., Capt. . T. Ajan, school secretory, Lo.ry Flu. to CG, TTC, 17 Sop. 1943, cited in ibid., no. 11-12.
- 17. Rest, Col. \_. Controlery, fir Chemical Officer, I D to 10/13, Tng. (Tech. Tng.), 2 June 1943, in . 10 353 Armament Tng.
- 18. Fixed forward-firing 75-mm. cannon (Type 1-4) had first been installed on E-25's in Spril 1943, and a demand immediately appeared for armorers qualified to maintain them. It the outcet it was relt that this large-size cannon would not be used widely enough to warrant including it in the basic armament course. Accordingly, in Parch Loury started offering a special six-day course for an average of 35 armorers on detached service from units which used this carmon. Lubsequently a few unassigned graduate armorers were also detailed to the class. (Mistory of Loury Field, 1 Jan. 7 July 1943, vol. 2, ch. 11, pp. 119-127.) Several months of experient convinced the Loury authorities that the cannon could be taught adequately in three school days. During that time the mernon was adopted more widely than had been exsected, and so a three-day phase was incorporated into the 12-week bacic ereament course. History of Loury Mala, & July-31 Dec. 1943, vol. 2, ch. 16, op. 27-28.
  - Ibid., p. 28. First and second echelon maintenance of these turrets was being bought in the nine-week power turnet course.
  - 20. 1st ind., Cupt. ..... Eroim, Lotg. .G, .TTC to CO, LTTLC, 2E Cot. 1943, cited in ibid., pp. 70, 71.
  - 21. Capt. lobert S. sirson, wir. of mament, TS, Lo.ry Flo. to Dir. of Thr., wire, my Cot. 1943, quoted in ibid., Fp. 74-75.
  - 22. ...F fraining utandard 80-51, 2 Oct. 1943.
  - 23. Maj. Cyrus S. (was, Adj., TS, lo ry Fld. to Ca, Tag, Cet. 1943; 1st ind., G.ot. . S. Erom, letz. 13, TEC to CS, LTC, 28 Oct. 1943; Ocot. Robert L. Junceh, Lete. Set. Dir., Letent Dept., 23, Loury Fld. to Dir. of Inc., To, Loury Fld., 27 Oct. 1943, cited in History of 10. ry Field, & July-31 Dec. 1943, vol. 2, ch. 15, pp. 60-72.



# RESTRICTE

MITEL-50, Lotes, Chap. III

China the second of the

109

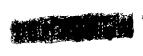
# 

- Marcer, 10/.5 in . to Ca, . 211.0, 15 Oct. 1943, in ... 0 353 .r.mant The.
- 25. History of Lory Field, & July-31 Dec. 1943, vol. 2, ch. 16, pp. 36-42; Circular ceries dell, Ioury Fla. Arthurst West., 15, 26 Jan. 1944, quotea in ibid., I Jen.-JeJune 1944, vol. 2, ch. 25, pp. 70-4.
- 26. Loury Ad. to CG, ATC, 29 Feb. 1944, olled in lbac., 1 Jan-30 June 1944, vol. 2, ch. 22, op. 9-10.
- 27. Ma. 'NTG to CO, TTG, 29 'rch 1914, cited in jbid., cp. 19, 20.
- 28. IF . TT. 3 to CO, lorry Fld., 25 Verch 1944, cited in History of Suckley Field, 1 Jan. 30 June 1944, v. 7; 03, 11.6 to 63, 13, 30 ! crel 1544, in 'FORT files.
- 29. Loury Fld. to 53, TTO, 22 April 1944, quoted in History of Loury Field, Jan.-June 1944, vol. 2, ch. 22, pp. 24-25.
- 30. IFTHE to 63, MTC, LA April 1944, cited in ibid., n. 20.
- 31. FIEL to 62, File, 5 pril 1944, citem in ibid., o. 25.
- 32. In <u>ibid</u>., p. 30.
- 33. From 3 July 1943 to 16 .. rril 1944 : four- el: "Crecial 1929 .. r.k-... nt Course" was ecudueted at to my to teach aireland mechanics, electrical specialists, and cover plant precialists how to make minor adjust, ant. of media- june are central-fire-control cuinment. "rincipal factures included:

Trikelient 1 and an	Lours
subject Cua	36 36
.50-0: Liber II chine Can 20-0: Liber II chine Can 20-0: iron it Common avaition and Caneral	_
mologives are the control farret bystom	36 30
control end lowling againment	ale re 60

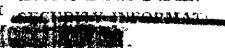
In tarch 1944 the in terms Terms, which was charted with develorment of the 2-25 training program, concluded that it is inthe cetter to cover the criment subjects in the course of il sible puntery training. coordinaly, Loury discontinued the -20 fry ant course. history of Lowry Mile, & July-ol 130. 1945, vol. 2, ch. 16, op. 1-45.

34. History of Lowry Field, 1 Jan.-29 Feb. 1945, p. 165.



### DECASIONE

N. Ma-60, Notes, Chap. III



110

- 35. <u>Thio.</u>, 1 Nov.-31 usc. 1944, pp. 165-166.
- 36. Col. L.O. Man, toput/ .C/W Var. to 1.C/W CX1, 10 Feb. 1945, in .FCIG files.
- 57. history of todry siele, 1 arch-30 april 1945, od. 157-161.
- 38. For a description of the "block system," see p. 44, this study.
- 39. 66, MF to 66, MFM, 7 March 1945, in MFM files; history of Lowry Field, 1 1 arch-30 April 1945, pp. 162, 163.
- 40. 10 ... 50-35-2, 29 Cct. 1945, in AFCHO Files.





**THIS PAGE Declassified IAW E012958** 

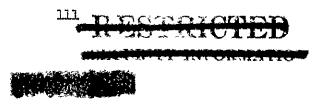
1.1.FF3-60



HOTLS

#### Chapter IV

- 1. 4t. Col. Larly 3... Duncan, Soudt., TS, foury Ald. to C/LC, 18 Sep. 1940, cited in Mictory of Loury Field or Ament Dept., vol. 2, ch. 2, p. 194.
- 2. \_mc., 63% to : steriel Div., 5 Dec. 1940, quoted in <u>ibid.</u>, p. 156.
- 3. Proceedings of a reard of Officers Convened at and ht sheld for the Purpose of Studying and Subditting Recommendations solutive to the Praining of Eintenance Personnel for Fower Operated Cun Jurets and Silnts, 27 Parch 1941, reproduced in ibid., pp. 174-179.
- 4. Report of Capt. illian F. May to School Lasc., TS, Loary Fld., 21 May 1942, cited in ibia., p. 160.
- 5. <u>Ibid.</u>, pp. 161-162.
- 6. Legart on Fower Coersted Con Turrets, by "ej. Lilliam r. Day, Eupervisor, Power Furret Div., Lowry Fld. Amenent Dept., 2 June 1942, reproduced in Fishery of Lowry Field, 1942, vol. 2, ch. 6, p. 237. (Hereinafter cited as hajor Day Legart.)
- 7. Capt in illian 2. Det, Justivisor, Power Turret Phase, runament Joh., Lowry Fld., Director of 15 lov. 1941, quoted in History of Lowry Field armament Ject., vol. 2, ch. 2, p. 166.
- E. CO, Lowry Flo. to CG, CATC, 7 Cct. 1941, in AFCTG files.
- 9. CO. C to CG, ACTTC, 30 Cct. 1941, in AFUTC files.
- 10. Lajor Day Report, pp. 238-39.
- 11. .-eno, Supervisor, Power Operated Gun Turrate Div., Lowry Md., to Dir. of Imagent, 15 Nov. 1941, quoted in Nistory of Lowry field Arament Dept., vol. 2, ch. 2, op. 168-69.
- 12. Daily Diary of Lowry Field Arabient topt., usc. 1941, cited in Fintery of to my Field, 1942, vol. 2, ch. 6, p. 199; CG, ACTTC to C/AC, 10 Dec. 1941, in AFCAC files.



7. July-60, Notes, Chap. IV

3, pp. 200–2d.



- 13. Johndule of instruction, Power Turnet Liv., Lowry Fld., 13 Dec. 1942, reproduced in History of Loury Field, 1942, vol. 2, ch.
- 14. Schedule of instruction, sourced Forer Operated Cun Turret Course, 73, Loury Fld., 2 Meb. 1943, reproduced in ibid., 1 Jan.-7 July 1943, vol. 2, ch. 11, pp. 205-22.
- 15. 1 %, CG, ATC to CG, Is, Loary Fld., 4 sep. 1943, cited in ibid., & July-31 Lec. 1943, vol. 2, ch. 17, p. 62.
- 16. <u>Ibid.</u>, pp. 62-54.
- 17. Maj. Allen E. Black, most. G, AFIAC to CG, MIC, 12 Cct. 1945; 'aj. Cyrus J. 1em, .dj., 'IJ, Loary Ald. to CG, TTC, 23 Uct. 1943 and syllabus, cited or reproduced in ibid., pp. 90-92.
- 13. 1st lt. Clifford D. Leen, Amedient Dept., Pb, Loury Fld., to Dir., Loury Fld. areaant Dept., 25 Cct. 1943, quoted in ibid., p. 94.
- 19. Paj. R.M. Birnen, Bir., Loury Fla. Artiagent Dept., to Bir. of Ing., Lowry Fld., 17 July 1943; 'aj. John Lane, Dir., Lowry Fld. Irmanent De-t. to Dir. of Tag., Lowry Fld., 7 Cet. 1943; 2d ina., Capt. P. B. McCouron, west. AG, AFTEC, 21 Oct. 1943, all cited in ibid., rp. 103, 104.
- 20. T.M. Brig. Cen. Albert L. Sneed, CG, Loury Fld. to Sperry Cyroscore Co., 9 Dec. 1943; and T.M., Cen. anded to CG, LTTC, 10 Dec. 1943, quoted in <u>ibid</u>., p. 105.
- TH, AFTAC to CG, ATC, 16 Feb. 1944, cited in Mistory of Loury Field, Jan.-June 1944, vol. 2, ch. 23, p. 44.
- 22. Loary Fld. to 63, 1773, 29 Feb. 1944, cited in ibid., pp. 44, 45.
- 23. ITTC to CC, TTC, 17 l'arch 1944, quoted in ibid., vol. &, ch. 2, pp. 20-21.
- 2d ind. Loury Fld. to ATC, 11 horil 1944 on ltr., Loury fld. to CG, MITC, 14 ! arch 1944; 2d ind., MITC to MITC, 26 Lpril 1944 on ltr., Low, Fld. to CG, TTC, 12 April 1944, all cited in <u>ibid</u>., vol. 2, ch. 23, cp. 38, 37.
- 25. ATC to CG, Loary Fld., 13 May 1944, cited in ibid., 9. 22.
- 26. Tic to CG, lo.ry fld., 20 1 ay 1944, cited in ibid., p. 22.

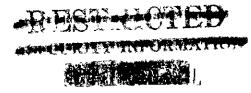


# PESTED .

i In J-60, Notes, Char. I/

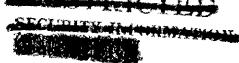
زللا

- 27. Lower Fld. to 31, TFS, 27 Leg 1944 and let inc., TFS to AFRIC, 3 dune 1944, in LeGal Filts.
- 25. 3d ind., 19j. Cen. ... . hergar, . 6/.3 in . to 60, iNh.6\_/1944, in inject Tiles.
- 29. History of Loury Michell, I July-51 July-1944, vol. 2, ch. 2., p. 5.
- 30. 00, AFAJ to 00, A M, 23 F.b. 1545, in FUNC riles; AFA.C Here werters from reas separt, 1 y 1945, in althouriles.
- 31. Lit ind., 00, MP to 00, MPAG, 18 by 1945, in MPGG files; TO 1 each 50-35-1, 10 Cet. 1945, in MPGG files.
- 32. History of rement braining achool, 7 tec. 1941-31 tec. 1942, o. 32.
- 33. <u>Ibic.</u>, 1 dan.-7 July 1943, p. 22.
- 34. Col. 6.J. Luet en, meet. .C, 2d rist. NTTC to CG, 4th Dist., 25 Feb. 19/3; Grat. M. T. Mir, School Lecretary, 13, Loury Fld. to CG, 4th bist. AFIG, 6 Wrach 1943; Capt. F... Finney, est. C, .Fig., to CG, 4th Dist. AFIG, 31 Warch 1943, all cited in Fistery of Larry Meda, 1 Jan.-7 July 1943, vol. 2, ch. 11, pp. 223-25.
- 35. Interview with eft. Courles L. Menley, cartin burnet instructor, undated, represented in Mistery of Arabbat regiming Johnson, 1 dan.—7 July 1943, App. 32 (hereinafter cited as Manley interview); 1 kj. Aden D. Forley, Could., TJ, Jotet Fringrounds, Indianapolis to CC, 20 Dist. APTC, 9 gril 1943, quoted in iblo., p. 226.
- 36. 4th ind., ough. illicar. .jax, school secretary, To, Loury Fld. to 60, 4th bist. Five, 3 lay 1943, proted in <u>ibid.</u>, p. 427.
- 37. Hanley interview.
- 38. Syllubus of instruction, Well 1-6 Cun Hount Course, in History of Armaent Training School, & July 1943-25 106. 1944, 100. 51.
- 39. <u>Ibid</u>., pp. 35, 37, 38.
- 40. CG, AFTI C to CG, TTC, 5 Jan. 1944 and inds., in .FCTG files.



# RECTIONS

A.F.2-60, Notes, Chap. I/



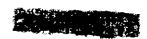
11/2

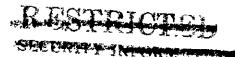
- 41. Miltory of lowry siele, Jan.-June 1944, vol. 2, ch. 23, 99. 37<del>-</del>33.
- 42. Nistory of Lowry Field, 1 sep.-31 Cot. 1944, pp. 530, 551; <u>1616., l Parch-30 April 1945, no. 186, 167; 1616., l Pay-</u> 30 June 1945, pp. 162, 163; CO, Lo ry Flo. to CC, 1110, 3 June. 1944, and ind., in AFDIC files; CG, LATEC to CC, 1917, 23 Job. 1945 and inds., in AF TO file.
- 43. TO Muso 50-25-8, 10 Cet. 1945, in AFAMO files.
- 44. Mictory of Loary Field, 1 Jan.-7 July 1943, vol. 2, ch. 11, pt. 2, no. 1-70.
- 45. Ibid., & July-31 Dec. 1943, vol. 2, ch. 13, p. 142.
- 46. Ibid., Jan.-June 1944, vol. 2, ch. 24, ob. 18-22.
- 47. TC "emo 50-53-6, 29 Cct. 1945, in GUTO miles.
- 48. Mictory of resent Praining Chool, 1942, p. 34.
- 49. Interview with Set. Merry Issuery, CMCL instructor, unanted, reproduced in ibid., 1 Jan.-7 July 1943, p. 114; interview. with oft. Clyde C. waith, CFC instructor, reproduced in ibia., E July 1943-25 Jeb. 1944, p. 139.
- 50. CG, AM to CG, AFFAC, 5 Usc. 1943, in AFORG files.
- 51. Mattery of Loary Meld, Jan.-June 1944, vol. 2, ch. 24, p. 31.
- 52. TO Meno 50-35-7, 9 Cct. 44, in . FSNO files.
- 53. 4th ind., laj. Cen. wil. Eurper, 18/12 Try. to CS, second IF, 8 /ug. 1944, in AFOIG files.





AAFES-60

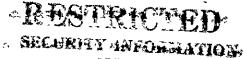




NOTES

#### Chapter V

- 1. Memo, School Secretary, ACTS, Lowry Fld. to Dir., Lowry Fld. Armament Dept., 28 April 1939, cited in history of Lowry Field Armament Dept., vol. 2, ch. 2, p. 253; R&R, Flans. Liv. to Exec., 9 Feb. 1940, in AAG 353.9-1A, Bombsight Tng.
- 2. Comdt. Lowry Fld. to Comdt., Chanute Fld., 3 Feb. 1939, cited in History of Lowry Field Armament Department, vol. 2, ch. 2, p. 127.
- 3. <u>Ibid.</u>, pp. 280-281.
- 4. Tbid., p. 129.
- Memo, Dir. of Armament, Lowry Fld., to Condt., Lowry Fld.,
   Jan. 1940, in <u>ibid.</u>, pp. 129-139; OCAC to Comdt., ACTS,
   Chanute Fld., 15 Jan. 1940, in AAG 353.9-1A, Bombsight ing.
- 6. 1st ind. (OCAC to Comdt., ACTS, Chanute Fld., 15 Jan. 1940), Comdt., ACTS, Chanute Fld. to U/AC, 30 Jan. 1940, in AAG 353.9-1A, Bombsight Tng.
- 7. 2d ind. (to above ltr.), OCAC to Comdt., ACTS, Chanute Fld., 16 Feb. 1940.
- 8. Memo, Asst. Dir., Armament Dept. to School Exec., Lowry Fld., 12 Nov. 1940, cited in History of Lowry rield Armament Dept., vol. 2, ch. 2, p. 261.
- 9. Ibid.
- 10. <u>Ibid</u>., p. 145.
- 11. Lt. Col. Early E.W. Duncan to CG, ACTIC, 13 Dec. 1941, quoted in History of Lowry Field, 1942, vol. 2, ch. 6, pp. 151-52.
- 12. CG, AFTTC to CG, AAF, 25 July 1942, in AAG 353.11, Lowry Fld.
- 13. Lt. Col. Early E.W. Duncan to UG, AFTTC, 4 April 1942; and AFTTC to CG, 4th Dist., AFTTC, 24 July 1942, quoted in history of Lowry rld., 1942, vol. 2, ch. 6, pp. 153-58.
- 14. Col. Harvey S. Hurwell to CG, 4th List., AFTTC, 11 Sep. 1942, quoted in history of Lowry Fld., 1942, vol. 2, ch. 6., pp. 159-60.
- 15. <u>Ibid</u>.



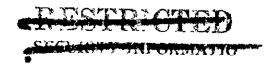


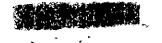
THIS PAGE Declassified IAW EO12958



A.FHE-60, Notes, Chap. V

- 16. Mg. MF, 16m, Nos. 1-3, between AFAF and AFMI, 17 Feb.-4 Harch 1943, in UG 221, Mechanics, Misc.
- 17. 5th ind., .FITC to CG, 4th Dist., AFTFC, 21 May 1943, cited in Mistory of Lowry Field, 1 Jan.-7 July 1943, vol. 2, ch. ll, p. 134.
- Brig. Cen. I..... Harper to CS, AFTTC, 30 Larch 1943; and AFTTC to CG, 4th Dist., AFTTC, 9 April 1943, cited in ibia., p. 139.
- 19. CC, AFTEC to CG, 4th Dist., AFTEC, 31 July 1943, in AFCEC files; syllabus or course of instruction, reproduced in History of Lo.ry field, 1 Jan.-7 July 1943, vol. 2, ch. 11, pp. 144-90.
- 20. Hg. AFF, REE, ANDE to AFRIT, 8 June 1942, in ALG 353.9-la, Tombsight Ing.
- 21. Hg. MF, 128, WHI to AFRIT, 12 June 1943; and MH., IFFTP to AFRII, 30 June 1942, in AG 353.9-11, porbeight Ing.
- 22. CG, LF to CC, FTMC, 26 Mug. 1943, in FUTC files; 1st ind., AFTMC to CC, Lowry Fld., 13 pep. 1943, cited in History of lowry Fiele, 3 July-31 Dec. 1943, vol. 2, ch. 17, pp. 2, 3; 2d ind., ATTC to CC, Lowry Fld., 18 Jep. 1943, cited in ibid.
- 23. Report of conference, board of officers appointed by CG, I. F to consider precision bombsights and their associated automatic oilots, 15 Lep. 1943, in files of immament Lec., AC/35, 1920.
- 24. Daily Diary, Technical Ing. Branch, AFCTG, 12 Nov. 1943; and Dally Diary, AFTnC, 21 Dec. 1943, in AFSHO files.
- 25. Syllabus of instruction, quoted in History of Lowry Field, July-Lug. 1944, vol. 2, ch. 23, p. 2.
- 26. T.M., Arnold to AFTRC, 31 Aug. 1944, in AFSHO files.
- 27. TC Memo 50-35-3, 27 dep. 1945.
- 28. TC Memo 50-35-4, 29 Jep. 1945.





02-CPW1



TO Pau

#### Consister VI

- 1. C/C to T/C, 23 feb. 1939, cited in History of Loary rield limit ent Depart ant, vol. 2, ch. 2, p. 93.
- 2. Naj. Com. Acced ... Michel, Chier, Mc Div., CC C to CG, ..CAS, Lowry Fld., 9 Cet. 1940, quoted in <u>ibid.</u>, pp. 94-95.
- 3. <u>Heid.</u>, co. 95-96; 'rst. Condo., Loury Pla. to it. Col. Prock, Ed lov. 1940, in 'LG 353.91, Donver, .ioc. 'm.
- A. Comôt., Marute Ald. to C/.C, 5 Lec. 1940, in ... G 353.9A Denver, Liec. mg.
- seproduced in History of Lowry Field or amont department, vol. 2, ch. 2, pp. 97-95.
- 6. school Circular No. 6, 10 June 1941, cited in ibid., p. 100.
- 7. Lt. Col. Larly C. . Loneum, Co. dt., School D. ., Loury Fld. to CC, 10775, 13 Lec. 1941, cited in history of Loury Field, 1942, vol. 2, ch. 6, p. 116.
- E. GG, IFITO to us dt., Loury Fld., 10 Dec. 1941, in LLC 352.11, lowry; let ind., Loury Fld., to GG, Mar, 2 June 1942, in 18300 files.
- 9. Ladrect from hir Becart and Graces to CG, ACRS, 16 Jame 1941, quoted in History of Loury Field in Alant Legart ent, vol. 2, ch. 2, p. 101.
- 10. Lowry and wrome went went. We wo, 24 wap. 1941, citem in ibid., pp. 102, 103.
- 11. Lest. 20, 'CMC to be dt., ACIS, Lowry Flu., 25 tov. 1941, cited in ibid., rp. 104, 105.
- 12. Notes for Col. /Inurence 1.7 Lausen on Wviotion Cudet raining one the Production of First It is went Cificers," by it. Col. Charles G. Learny, Dir., lowy Field . 1774 and Dept., 23 Jan. 1942, quoted in history of Lawry Field, 1942, vol. 2, ch. 6, p. 146.
- 13. Capt. May I'. Jinnen to bir. of Thg., lowy rld., 8 July 1942, cuoted in <u>ibid.</u>, p. 148.

PESTRICI -

MINIC-40, Notes, Chap. VI

THE THEODILATION

- 14. Pr.j. Cen. John P. Curry, 03, 4th Dist. Fill to 66, AFTIC, 24 June 1942, cited in ibid., p. 139.
- 15. Oapt. May . Dinnen, he injectrative Officer, he my ald. Arrament record and, to it. Col. Down, he haril 1942, ruoted in ibid., p. 437.
- 16. Let ina., "rj. H.F. Lonnewitz, Post. .G. MATC to CG, ...F, 4 July 1942, cited in ibid., op. 140, 141.
- 17. 2d inc., Col. John H. Ives, lilitary fersonnel biv., Mg. ... f to CG, AFTTG, 11 Aug. 1942, cited in ibia., p. 141.
- 18. Col. Charles G. Pearcy, Dir. of Inc., Loury Fld. to Col. Hervey J. Luruell, Color, Loury Fld., 27 Lur. 1942, quoted in <u>ibio</u>., o. LLL.
- 19. History of 73, Yele University, 1 Jan.-7 July 1943, vol. 2, p. 126.
- 20. Syllabus of instruction, IL Course, Cept. of Transcrt, TS, Yale Univ., ibid., incl. 79.
- 21. <u>Ibid.</u>, op. 126, 127; cyllabus of instruction, AV Course, Bept. of Traement, 75, Yale Univ., <u>loid.</u>, incl. 80.
- 22. History of M., Yalo Univ., 1 Non.-7 July 1943, vol. 2, p. 126; syllabus of instruction, DV Course, Bept. of Argment, Po, Yalo Univ., in ibid., incl. 61.
- 23. Ibid., pp. 131, 132.
- 24. Memo, Erig. Cen. L.M. Parper to AC/LS Thy., 31 May 1943 in AFORG files.
- 25. CG, MiF to CT, MFITC, 31 May 1943, in AC 353, areament Ing.
- 26. CG, AFFIC to CG, AAF, 9 July 1943, and lot inc., CG, AAF to CG, AFFIC, 17 July 1943, in AG 353, Area ent Tng.
- 27. Program of instruction, Armadent Course, 13, Yele Univ., 13 Cct. 1943, in AFSHO files.
- 25. History of 13, Yale University, & July 1943-1 March 1944, p. 156.
- 29. leno, Col. .. L. Travis to PC/IS Ing., 5 Cet. 1943, in APCIG files.
- 30. 1st ind., Of, AMF to OB, AMA C, 18 Jan. 1944, in AMG 353, Eochardier Ing. (Lomb.)



PESTRICTEL

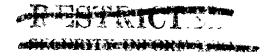
**THIS PAGE Declassified IAW E012958** 

### RESTRICTED

ALFER-60, Lotes, Chap. V.



- 31. History of TS, Yale University, & July 1943-1 Parch 1944, p. 165.
- 32. <u>Ibid.</u>, p. 165; Daily Liary, 17ThC, 31 Dec. 1943, in 1F5MO files.
- 33. T.M., CG., LTFC to CO., TS., Yele Univ., 10 June 1944, reproduced in History of TS., Yale University, 1 lay-30 June 1944, incl. 11.
- 34. History of T3, Yale University, 1 July-31 Aug. 1944, p. 6; CC, IFTRC to CC, A.F. 30 June 1944; and messageform, CG, ATC to CC, A3, Yale Univ., 12 July 1944, both cited in <u>ibid</u>., p. 7.
- 35. <u>Ibio.</u>, pp. 35, 26.
- 36. Syllabus of instruction, Officers Amament school, Euckley Fld., 5 Cct. 1944, in History of Euckley Field, Sep.-Cct. 1944, vol. 3, doc. 2.
- 37. <u>Ibid</u>., vol. 2, p. 207.
- 38. Schedule of classes, U.ficers Armament school, Euckley Fld., 7 Nov. 1944, cited in <u>ibid</u>., vol. 2, p. 206.





RESPERIORS.

12770-60

107.3

#### Chapter VII

- 1. This discussion of sythuble and their scalinistration is usual on the limits of a confurence of training officials consucted in 1945 by the Training Lessurch Condittee of less warters, 12. Copy in 1840 files.
- Copt. H. . I unlin to CG, 3d Ain, CD, AF, 1 June 1940, in A C 353.9-L, he Adight Ing.
- 3. 03, 17:70 to 1827, 24 Oct. 1942, in 113 161, Contract Schools.
- 4. The discussion which follows is used on interviews with inj. forest U. Spencer, 1986.
- History of Loury Field, 8 July 1945-31 Mar. 1943, vol. 2, ch. 2, prosite.
- 6. <u>4616</u>., 1 den. 1943-7 duly 1943, vol. 2, ch. 2, p. 65 m.
- 7. Trush report of to my viole, 19/1-/2, by Col. Hervey ... unwell, 10 June 1942, either in Bistory of to my Meld, 1942, vol. h, ch. k, g. 436.
- 8. Ashiraton Saily No. 3, 7 M role 1944a.
- y. Accord to CC, AND by Col. Alli A.L. Trivis, 27 Lov. 1943, quoted in history of to my viole, a duly-31 rec. 1943, vol. 2, ch. 14, qp. 52-53.
- 10. Cart. May 1. Limen to 15. Col. Duan, motor in history of Lamy Mola, 1982, vol. 1, ch. 4, rp. 491-7.
- 11. recining Inducation a port, no my Flo. or maint appart ant, by Let. 1943, noted in ikia., July-31 and 1943, vol. 2, ch. 14, n. 54.
- 12. lorr, Pla. to CD, Place, Collect 1994; Let inc., Plus to CD, Plus, CD, reh 1984; and 26 ind., Plus to CD, n.o., all evoted in History of Lorry riele, Jan.-Pure 1984, vol. 2, ch. 25, pp. 115, 116.
- 13. Pero Po. 24, houry Alc. Ar a ent Department to all division succevisors, 3 Poril 1944; Puch. In . As.s. 20-2 and 20-3, Lowry Pld., 28 and 25 arch 1944, all cited in iold., pp. 116-12.

A SIGN 9755

LATIS-60, Notes, C. (p. VII ....

121 (láz

- 14. Fraud Report, Lovry Fld. ar ament Dept., July 1944, quoted in ibid., p. 121.
- 15. Gast. Milliam 1. Mark, Dehool Escretary, Io.ry Flo. to CG, 4th Dist., FIFO, 7 April 1943, and let ind., 4th District, FFFO to CG, Lorry Fld., 9 april 1943, quoted in history of boury liela, 1 Jan.-7 July 1945, vol. 2, ch. 11, op. 30-53.
- 16. Luarterly Machinical Inspection Memort, 3d quarter, riscal year 1944, Loury Flat, 1 Farch 1944; and Flat, 69, TPC to 69, Loury Flat, 19 Feb. 1944, woted in Mictory of Loury Field, Jan.-June 1944, vol. 2, ch. 24, ot. 2, op. 1-3.
- 17. The circumstances which led to the adoption of this policy have already been discussed in the tection on the training of ordicers and cadets. (See ap. 76-78, this study.)
- 18. Pemo, C/.C to C/u, C-2, 29 Lec. 1959, in AC 353.9-14, Fombsight in .
- 19. Lemo, C/A3 to AAC, 21 July 1941; and Act; AC/3, G-2 to C/AAF, 1 Aug. 1941, in AAC 353.9-14, Loubsight In.
- 20. Statement by It. Col. Charles H. Leitner of 4th Dist., LTIC, in Hinutes of the District Collanders Conference at Mg. LTIC, 5-6 Apr. 1942, in LTCC files.
- 21. MA, 1.3.S. Col. L. J. writh, AFLIY, to AFLOS, 17 Merch 1942, in AFORG files.
- 22. Coerctary of ter to CG's, Defense C mas., Depots, and Dervice Commas., 15 Nov. 1962, in NFCTC files.
- 23. 03, ind to 03, AMDS, 3 June 1943, in AM 452.26, Sombsights.
- 24. History of Lorry Field, & July-31 Oec. 1943, vol. 2, ch. 17, pp. 59-41; ibid., ch. 18, pp. 116, 117.







#### BIBLIOGRAPHY

#### Official Publications

Headquarters, Army Air Forces:

Monthly reports of Statistical Control Division, SC-T-47

Headquarters, AAF Training Command:
Daily Diary, AFTRC

TC Menorandums

Headquarters Monthly Progress Report, AFTEC

#### Bureau of Budget Files

Administrative Management Division files

#### AAF Central Files (cited as AAG)

161	Contract Schools
220.66Al	Detail of Students to Factory Training, Miscellaneous
221	Mechanics, Miscellaneous
352.11F	Chanute Field Course of Instruction
353	Armament Training
353	Bombardier Training (Bombardment)
353.9	Mechanics Training
353.9A	Denver Miscellaneous Training
353.9A	Training, General
353.9-1A	Bombsight Training
353.11	Lowry Field
452.26	Bombsights

#### <u>Headquarters Staff Files</u>

AC/AS-3, Training Division:
Technical Training Branch files

AC/AS-4, Materiel Division:
Armament Section files

Secretary of Air Staff, Historical Office:

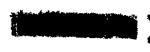
Sources and Reference Branch (Archives):

Daily Diaries of AC/AS, Training and AC/AS-3, Training Division Unit Histories:

Armament Training School, 7 Dec. 1941-31 Dec. 1942

1 Jan.-7 July 1943

8 July 1943-25 Feb. 1944





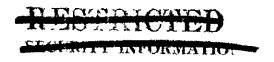
REGTRICTED
SECURITY INFORMATION

AAFHS-60

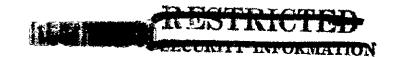
Army Air Corps Technical Training, 1917-41 Buckley Field Armament School, 7 June-31 Dec. 1942 Buckley Field, April-Dec. 1942 Sep.-Oct. 1944 Chanute Field, 1 Jan. 1939-7 Dec. 1941 Lowry Field Armament Department, to 7 Dec. 1941 Lowry Field, 7 Dec. 1941-31 Dec. 1942 1 Jan.-7 July 1943 8 July-31 Dec. 1943 1 Jan.-30 June 1944 1 Nov.-31 Dec. 1944 1 Jan.-29 Feb. 1945 1 March-30 April 1945 TS, Yale University, 1 Jan.-7 July 1943 8 July 1943-1 March 1944 1 May-30 June 1944

#### Miscellaneous

Washington (D.C.) Daily News, 7 March 1944







#### INDEX

A

AAF classification system, 95

AAF Headquarters (see also AAF policy), 18-19, 21-22, 29-31, 33, 36-37, 40-45, 49-50, 67-68, 70, 78, 80-83, 86, 94-95, 99-100, 120 (n 1)

AAF policy, 19-21, 33, 36, 46, 49, 52a-54, 69-70, 75, 82, 87, 94-95

AAF Reg. No. 35-13, 100

AAF Training Standards: No. 80-51, 31-33 No. 80-52, 45

"AB" course, 78-81

AC/AS, Training, 29, 37, 94

AFTRC. See Training Comd.

AGCT, 15, 17, 55, 57, 98

Air Corps expansion, 7, 9-14, 16-17, 21, 23, 25, 27, 60, 63, 72, 75, 83, 88

Air Materiel Comd., 1

Air Service Cond., 16, 50-52, 57-58, 67

"Air Service Mechanics Schools,"

Anderson, Capt. Herbert W., 4-5

AR 380-5, 101

Armament and chemical warfare officer, 1

Armament and Chemical Warfare Officers course, 20

Armanent Dept. (see also name of field):
Buckley Fld., Colo., 16, 20, 83

Chanute Fld., Ill., 4-6, 8, 62 Lowry Fld., Colo., 6, 14, 61, 64, 74-76, 83, 94

Armament (Lowry Fld.), Director of, 61, 64, 74, 76

Armament Training Center No. 3
(see also Armament Training School, Indianapolis, Ind.),
51

Armament Training School, Indianapolis, Ind., 16-17, 20, 44, 50-53, 58

Armorers' courses, 1, 6-7, 10, 13-15

Army officers, armament courses for, 7-9, 14-16, 19-20, 72-85, 98-99

Arnold, Maj. Gen. Henry H. (see also Chief of Air Corps ), 9

Attack Aircraft Armament course, 6

"Augmentation Frogram," 23, 60, 72

"AV" course, 79-81

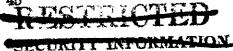
B

B-17, 35-37, 45

B-24, 34-37, 45

B-25, 31, 35, 45, 108 (n 18)

B-26, 35, 4<u>5</u>





B-29, 17, 36-37, 54, 56, 109(n 13)

B-32, 17, 36-37

Basic armament course, 18-21, 23-28, 31, 33-35, 37, 51-52, 56, 73, 93, 95-96

Bell gun mounts, 45, 50, 52a

Bendix company, 40

Bendix equipment, 31, 42-44, 47, 49-51, 53-54

Boca Raton, Fla., 79

Boeing Aircraft plant, Wichita, Kans., 55

Bombardment (AAF Hq.), Dir. of, 68

Bombardment aircraft armament courses, 6, 16, 26-29

Bombsight Maintenance courses, 1, 10, 13-16, 19-20, 64-65, 69-71, 73-75, 82, 88, 93, 99, 101

Buckley Fld., Colo., 16, 20, 26-31, 34, 56, 79, 83-86, 95, 98

"BV" course, 80-81

Ü

"Camp Bizerte," 92

Central Fire Control Equipment (CFCE) course (see also Pre-Central Fire Control course and Remote Control Turret Mechanic courses), 17, 46-48, 54,55, 57-59, 82, 98-99, 101, 109 (n 33)

Chanute Fld., Ill., 3-4, 6, 8, 61-62

Chief of Air Corps (see also Office of Chief of Air Corps), 9, 39-40 61, 72, 75-76

Conference, Air Corps Engineering and Supply, ?

Consolidated company, 40

Consolidated equipment, 42-44, 47, 49, 51, 53

Course. See specific name of course and Army officers, armament courses for.

Crocker-Wheeler turret, 45

Curry, Maj. Gen. John F., 77

Curtiss-Wright turret, 45

D

Day, Capt. William F., 40-42

Directorates (AAF Hq.): Bombardment, 68 Individual Training, 18, 100

Duncan, Lt. Col. E.W., 39

E

Emerson company, 44

Emerson turret, 30-31, 47, 49-50, 52a-54

Engineering and Supply Conference, Air Corps, 7

F

4th District, TTC, 77

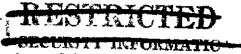
54-Combat Group Program, 72

Fairchild factory, 45

Federal Bureau of Investigation, 99

Field Services Div. (AAF Hq.), 50





# RESTRICTED

Flexible gunners, armament training for, 2, 18-19, 21-22, 27, 34-36, 96-98

Flying Training Comd., 29, 68

Fort Bragg, N.C., 8

Fort Knox, Ky., 8

G

General Electric Co., 40, 54-55, 58-59

GHQ Air Force, 88

"Glide Angle Bomb, " 69, 82

Ground Forces, 97

Gun turret. See specific name.

H

Headquarters AAF. See AAF Headquarters.

Honeywell C-1 automatic pilot, 82

1

Indianapolis, Ind., 16-17, 20, 50-53, 58-59

Individual Training (AAF Hq.), Dir. of, 18, 100

J

Japan, 14, 20

K

Kelly Fld., Tex., 3

L

Lawson, Maj. Lawrence A., 72-73

Legal Div., Air Corps, 99

Lowry Fld., Colo., 6, 10-12, 14-21, 23, 25, 28-41, 44-61, 63, 67-69, 72, 74, 76-80, 83, 86, 88, 92-93, 95, 98, 108 (n 18), 109 (n 33)

Lowry Fld. No. 2, Colo., 16, 20, 26-27, 34

М

Martin turret, 42-45, 49-51, 52a-54

Master Armorer's Course (see also Armorers' courses), 7

Materiel Division (Wright Fld.), Air Corps, 7

Mechanics Department (Chanute Fld.), 3-4, 8

Motor Products type turret, 48-50, 54

N

IX Bomber Command, 55

Navy, 61

Morden equipment, 60-62, 64-69, 82, 88

0

100,000-technician program, 13

136,000-Man Program, 11, 25

-RESTRICTED-

PESTRICTED

AAFHS-60

Observation Aircraft Armament course (Lowry Fld.), 6

Office of Chief of Air Corps, 40-41, 61, 72, 99

P

Pearcy, Col. Charles G., 76, 78

Pearl Harbor, 14-15, 25, 42, 75

Pilot's Information File, 94

"Postwar Air Force, " 19, 38

Power Operated Gun Turret courses (POGT), 1, 14, 16-18, 20, 28, 39-58, 82, 93, 95, 99, 111 (n 3)

Pre-Gentral Fire Control course (<u>see also</u> Central Fire Control Equipment course <u>and</u> Remote Control Turret Mechanic course), 46-48, 57

Pursuit Aircraft Armament course, 6, 16, 21, 26-29

R

Remote Control Turret Mechanic courses (see also Central Fire Control Equipment course and Pre-Central Fire Control course), 1, 17, 19-20, 36, 39, 48, 54-59

S

St. Paul, Minn., 3

Schenectady, N.1., 55, 59

School. See specific name of school and of Army Air Field.

Scott Fld., Ill., 10-12, 23, 25, 56

Secretary of War, 100

Selective Service inductees, 12, 15, 17

Sinnen, Capt. Ray M., 77

Sioux Falis, S. Dak., 56

Smith, Col. L. S., 100

Sperry equipment, 12, 36, 40, 42-44, 46-53, 60-64, 66-69, 82, 88

Sperry Gyroscope Co., 40, 46, 54

Storage Depot (AAF), Indianapolis, Ind., 50

Stratemeyer, Maj. George E., 3

4

3d Wing, GHQ Air Force, 88

20th Air Force, 37

XX Bomper Comd., 109 (n 33)

Technical School (AAF), Yale University, 16, 20, 80-84, 86, 90, 97, 100-101

Technical Training Comd., 17, 26-29, 42, 51-52, 68, 76-77, 80-81, 89, 91

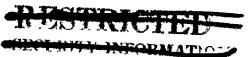
Test, Army General Classification, 15, 17, 55, 57,98

Training, AC/AS, 29, 37, 94

Training Comd. (AAF), 29, 33, 36, 44, 46-48, 53, 68, 82, 86, 91, 96-97

Training (Lowry Fld.), Director of, 78





-60

129

AAFHS-60

A ESTINCTED

Training and Operations Div. (AAF Hq.), 40

Training Research Committee (AAF Hq.), 120 (n 1)

Training Standards (AAF), 31-33,

Travis, Col. William L., 94

Truax Fld., Wis., 56

Turret. See specific name.

٧

Valley Forge Military Academy, Wayne, Pa., 79-80

valparaiso, Fla., 8

"Victory Program," 14, 16

V-J Day, 18-20, 49, 54, 70

W

War, Secretary of, 100

Wayne, Pa., 79

Weaver, Maj. Gen. Walter R., 89

Western Technical Training Command, 32-34, 47, 86

Wichita, Kans., 55

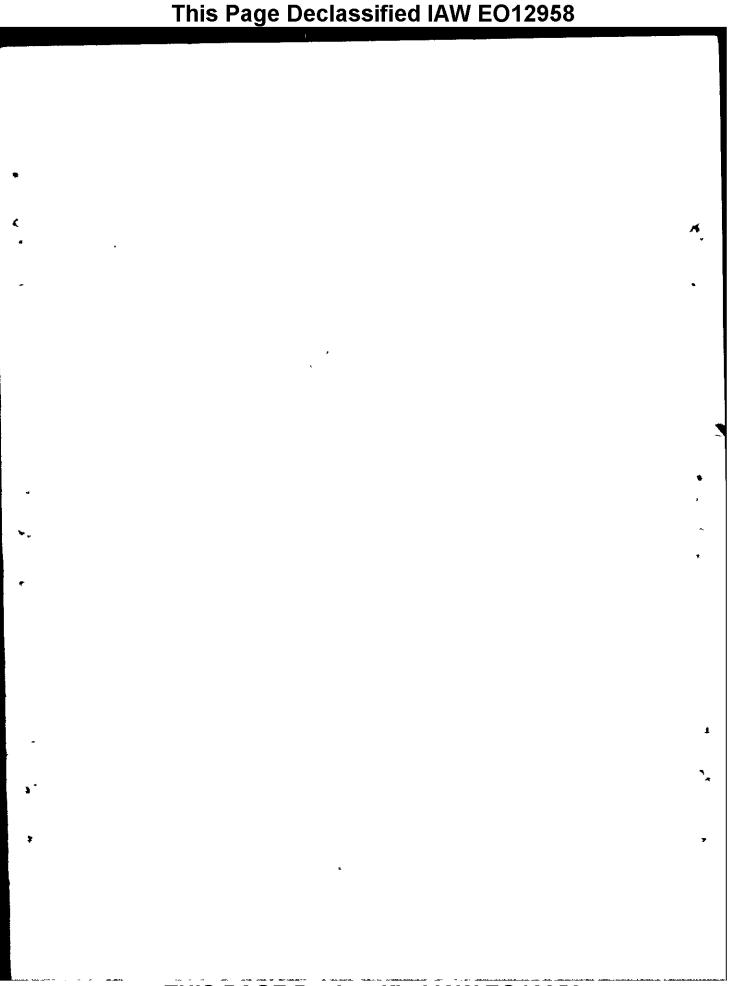
Wright Fld., Onio, 7, 39, 111 (n 3)

Y

Yale University Technical School (AAF), 10, 20, 80-84, 86, 90, 97, 100-101







THIS PAGE Declassified IAW E012958