

Ground Observers' Guide

DEPARTMENT OF THE AIR FORCE

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Foreword

1. **Purpose and Scope.** This manual is published for the information and guidance of the civilian General Officers in the Air Defense System. It provides a complete description of their duties and responsibilities.

2. **Contents.** The first part of this manual explains the operation of the Air Defense System and specifies the reporting procedures to be followed by General Officers. The second part of this manual includes the instructions and other data required for aerial identification.

3. **Changes to Manual.** Changes in reporting procedures of aerial identification data will be promulgated by new pages which will be published and distributed as required. When such new pages are prepared, they should be inserted in the manual in addition to or in replacement for the existing pages as shown.

BY ORDER OF THE SECRETARY OF THE AIR FORCE:

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. . . . *the role you play*

We are in a dangerous position. In a period of international unity and leadership, we stand on the brink of freedom. Every world leader knows that he can't go by unless he defines us first, he can't already—in our world war—the side of aggression has been named by the weight of our industrial production. The next time, an aggressor will certainly try to eliminate us first. He will strike first at our production plants and at the people who man them. What's worse, he can do it!

For the first time in our history, a potential enemy has the power to strike sudden, devastating attacks on any part of our country. The broad war which have prosecuted us up to now have been cancelled out by fast, long range planes; and the huge forces formerly required for strategic damage have been made unnecessary by the atomic bomb. A single plane carrying an atomic bomb can now wipe out an entire city. It is a dangerous situation.

Of course, the fact that we can hit him far harder than he can hit us should stop any enemy. We have the more atomic bombs, we have great fleets of mighty bombers, we have fast, efficient fighters, and every day we are producing more and better planes and bombs. Yet the enemy might decide to make the desperate gamble. If he does, he will try to catch us unprepared and strike such a devastating first blow that we cannot respond in time. We must make sure, therefore, that we can ward off his blow and come back immediately with terrible power. How can we do it?

There is little probability of turning back an enemy air attack completely. However, if we have adequate warning, we can destroy or force back a large number of his bombers and reduce considerably the harm that the war might cause. The big problem is adequate warning.

To provide such warning, we have set up many radar stations and are constantly enlarging and improving our radar





warning system. Still, radio has a limited range, and we cannot have complete radio coverage. There are bound to be many gaps in our radio networks through which hostile flights of enemy aircraft could pass undetected and strike unexpectedly. To avoid constant guard at these points in our armor, we must have alert, conscientious, and capable look-outs. That is where you come in.

You and hundreds of thousands of other Ground Observers throughout the country will be the eyes of the country. Your reports may constitute the first warning of an enemy

approach. The Aircraft Alert message you send in may put into motion forces that will save a whole city from destruction. In the very least, your reports will help keep much of the enemy's planes so that the attack against them can be started and the targets in their path can be warned.

This will not prevent completely the destruction and death that an enemy might exact, but it can help reduce our losses considerably. With sufficient warning, we might be able to reduce our possible losses by as much as 75 percent. Even a 10 percent difference in losses may spell the difference between defeat and victory. Your reports, therefore, and those of the other Ground Observers throughout the country, will play a vital role in our security.

You will get no pay for the job. It might often be tiring and seemingly routine. You can take pride, though, in the fact that you are an important part of our air defense forces, and you will have great satisfaction in knowing that you are contributing significantly to the safety of the country.

In preparing for your job, study this manual carefully. It explains every aspect of your job and will help you be a more efficient member of your country's defense team. Keep it up to date by inserting revision sheets as they are given to you. Carry it along with you, and refer to it frequently.

Observer on Duty



. . . the air defense system

The Observation Post of which you were member is one of the basic units of our air defense system. The other basic units are:



The Radar Warning Receiver stations, which are also on the lookout for enemy planes, but watch by electrical rather than by visual means.



The Ground Controlled Intercept (GCI) radar stations, which follow the course of enemy aircraft by radar and direct our fighter airplanes to the proper position and altitude to attack enemy aircraft, and



The Fighter Intercept Aircraft base, where our fighter planes stand ready to take off and attack approaching enemy aircraft.

Another basic unit in the system is the Filter Center, which acts as a clearing house for the information reported by your Observation Post and the others within the area.

In general, here is how the system works: From the various Observation Posts, reports of enemy aircraft come in to the Filter Center. There, the information is put together, and the course and position of the enemy aircraft are determined. These are plotted on a map and followed up as more reports come in. In this way, the number, type, course, altitude, and position of the enemy aircraft are kept track of constantly.

Filter Center Plotting Board





and their probable targets are determined. Meanwhile, the Filter Center notifies the appropriate Ground Controlled Intercept radar station of the type, number, and location of the enemy aircraft in its area. At the same time, the Early Warning Radar stations are scanning the skies, locating and tracking any enemy aircraft within the range of their radar beams; and sending appropriate information to the Ground Controlled Intercept radar station. Thus, information on hostile planes flows into the GCI radar station through two parallel pipe lines — from the Observer Posts via the Filter Centers and from the Early Warning radar stations. On the basis of this information, the appropriate Fighter Intercept Aircraft base is called into action, and they send up their fighter planes to attack the enemy. These fighter planes are controlled by the GCI radar station, which follows both our own and the enemy aircraft by radar and

directs our fighter planes to the best position for attack on the enemy aircraft.

It is a proved and tested system. In one form or another it was used in China, Great Britain, and the United States during the last war. In the United States, of course, the system did not have to cope with enemy aircraft, and its effectiveness was not really tested. In Great Britain, and China, however, the system certainly was given a trial by fire, and it worked.

Of course, their problems were a little different from ours. In China, they had only a haphazard communication system and had no real radar facilities. Thus, their warnings were transmitted by a variety of means, ranging from paper balloons and smoke signals to telephones and radio equipment. In England, the communication was entirely by private telephones, for the war to be defended was small. Therefore, while our air defense system is basically of the same type as those previously used, it is different in detail. We know, though, that it is good.

It was proved in September 1945 in a trial run known as Operation Lookout. This was directed from a Ground Observer Corps, using the experience we and our allies have gained, is capable of tracking modern planes for intercept purposes and of forwarding adequate information for identification. The few weaknesses which this trial revealed have been corrected in the present system. We can feel confident, therefore, that if we put our system completely into effect, we will have good protection.

. . . . *the organizational set-up*

The General Observer Corps works under the joint control of the civil authorities and the United States Air Force. The civil authorities are responsible for the administration of the General Observer Corps, taking care of such things as personnel, records, and the like. The Air Force is responsible for the actual operation of the General Observer Corps, that is, its specific defense operations, including training, reporting procedures, and the like.

In each state, the organization of the General Observer Corps is the responsibility of the state authorities. Under their guidance, most of the states have created departments for the purpose of carrying out the civil defense mission. While these departments are not all alike, they all follow the same general plan of organization. Under this plan, the governor appoints a state director of civil defense, who, in turn, appoints a director for the General Observer Corps activities. This director makes the cooperation of the county governments, coordinates between counties, and maintains the necessary direction at the state level. For each county or district, he generally appoints a General Observer Corps coordination officer. Usually, this is an individual who has direct knowledge of the population centers and the responsible personnel available in the county or district.

To handle several districts, the county coordination officer usually appoints an area supervisor for each area within the county or district, depending on geographical and other conditions. The area supervisor is responsible for the selection and organization of General Observer posts under his control. Within the area of his jurisdiction, the area supervisor sets up a number of General Observer posts like the one you've met and appoints a post supervisor to be responsible for the operation of each one. Then, the supervisor of your post operates under the supervision of the area supervisor and receives his orders for the administration of



the post from him. The area supervisor follows the directions of the country or district coordination officer, who, in turn, carries out the policies of the zone director.

With this type of set-up, there is a continuous chain of command from top to bottom. Each unit is clearly tied into the system, and there is a coordinated policy that the whole organization. Yet, sufficient control and responsibility are delegated down the line to permit modifications required by local conditions.

On the military side, there is a similar type of set-up. The responsibility for defending the United States against enemy air attack has been assigned to the United States Air Force. Within the Air Force, this responsibility has been assigned specifically to the Air Defense Command, with headquarters at the Air Force Base, Colorado Springs, Colorado. It is from

this headquarters that all orders governing air defense are issued.

To make for more direct control and more efficient operation, the Air Defense Command has set up three separate Air Forces based on geographic divisions of the country — the Eastern Air Defense Force, with Headquarters at Stewart Air Force Base, New York; the Central Air Defense Force, with Headquarters in Kansas City, Missouri; and the Western Air Defense Force, with Headquarters at Hamilton Air Force Base, California.

Each of these defense forces has the planes, personnel, and equipment necessary to protect its area of responsibility. These are located at strategic points under the immediate control of tactical commands known as Air Divisions (Divisions). Each Air Division (Division) operates a number of

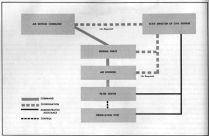




Fighter Intercept Aircraft Units, Early Warning subdivisions, Ground Controlled Intercept units systems, and Filter Centers. It is to you of these Filter Centers that you report.

Since the Filter Center is the point from which information flows directly into the military air defense set up, it is run jointly by military and civil authorities. The Administrative Supervisor of the Filter Center is a civilian appointed by the country as District communication officer or by the area supervisor, depending on how the center is organized for civil defense. He is responsible for receiving the volunteer civilian personnel for the Filter Center, maintaining personnel records, arranging duty shifts, and performing all other administrative duties. As you might infer from this, most of the personnel who operate the Filter Center are also civilians — volunteers who man the telephones, record the reports from the Observation Posts, plus the information, and perform all the other duties required. Thus, the individual in the Filter Center who answers the telephone and says, "air defense, air defense," when you call in an Aircraft Identification message is a civilian volunteer like yourself.

At the same time, the Filter Center is in the military chain of command, and operational control of the Filter Center is vested in an Air Force officer. This officer and his staff coordinate the reporting procedures of all the Observation Posts that report to their Filter Center and issue all operating instructions. They also act as technical advisors and instructors. Thus, their duties include the training of the ground observers in the Observation Posts connected with their Filter Center. To tie together the work of the various Observation Posts and to make proper reports to higher headquarters, they require certain reports. The supervisor of your Observation Post is responsible for submitting these reports. On the other hand, if the post needs any information or assistance in connection with its tactical operation — that is, its defense functioning — the post supervisor should put the request in writing and direct it to the Officer-in-Charge of the Filter Center. Thus, as far as your Observation Post is concerned, the civil control is exercised by the area supervisor, while the military control is exercised by the Officer-in-Charge of the Filter Center.



Control of the Ground Observer Copy

. . . . *administration of the observation post*

The "big man" in the Observation Post is the Observation Post Supervisor. He supervises all the operations of the post and is responsible for its efficient functioning, both to his immediate civil superior and to the Officer-in-Charge of the Filter Canon.

More specifically, the Observation Post Supervisor has the following duties:

1. He must maintain close coordination with all the agencies governing the operation of his post.
2. He must make sure that his post operates efficiently in accordance with the directions of his immediate superior in the civil chain of command and with those of the Officer-in-Charge of the Filter Canon.
3. Personally, or through a subordinate, he must administer all phases of the operation of the post, including maintenance of records, duty schedules, maintenance of equipment, instructional classes for assigned observers, strategy sessions, personnel training, and all other activities necessary for the efficient operation of the post.
4. He must call the attention of the proper military or civil authorities (usually by written correspondence) to problems which require their study or assistance.
5. He must maintain close liaison with local organizations and agencies which can be helpful to the post in the performance of its mission.

6. He must call all the meetings of the post necessary for instruction or other purposes.

7. He must review all applications for duty in the Observation Post as required by higher authorities.

8. He must make sure that all the observers in his post are qualified to perform their duties as indicated in later sections of this manual.

The Observation Post Supervisor thus has the responsibility for the successful operation of the post. He must, therefore, completely familiarize himself and his subordinates with the requirements essential for the proper accomplishment of the post mission. To help him carry out his duties, he appoints a Chief Observer, who performs such duties as the Supervisor directs. These may be any of the functions just listed as the duties of the Observation Post Supervisor. Generally, the Chief Observer handles the instruction of new observers, the scheduling of duty shifts, the maintenance of the post equipment and property and of such records as the Observation Post Supervisor requires. In short, he acts in behalf of the Supervisor to insure the smooth and efficient operation of the post.

If the requirements warrant, the Chief Observer may appoint Assistant Chief Observers to act for him in the performance of his various duties. At some Observation Posts, for example, the Assistant Chief Observers are assigned

specific duties, such as receiving, publicity, scheduling hours of duty, organization of meetings and classes, and procurement of supplies. Naturally, these assignments are made according to the individual's professional background or his natural ability to perform the specific duty.

This brings us to the key position in the whole set-up — that of the individual Ground Observer. It is to help this individual Ground Observer perform his duties that the whole organization just described has been established. As stated by the National Security Resources Board, "Civil defense rests on the principle of self protection by the individual, extended to include mutual self protection on the part of groups and communities."

The individuals who fill the positions of Ground Observers are volunteers. They are drawn from all walks of life and include men and women from both the home and the cities who volunteer their time to spot and report the movements of aircraft. In fact, any loyal American can be a Ground Observer if he has the following qualifications:

1. Normal hearing (but hearing aids are permissible).
2. Normal eyesight or corrected to normal when wearing glasses.
3. Ability to speak clearly and distinctly so that the Aircraft Fleet message can be accurately received at the Filter Center.
4. Ability to exercise good judgment and make proper decisions.
5. Definite loyalty to the United States which can be checked by a personal clearance.

Individuals who do not meet the qualifications listed in items 1, 2, and 3 may still act as observers if they agree with a qualified observer. Such persons are eligible for all the credits that can be earned in the performance of Observation Post duty.

The detailed and specific duties of an observer and the way he should perform them are described in the next section of the manual. In general, an observer must:

1. Attend training sessions designed to qualify him to fulfill his assigned duties.
2. Carry his assigned shift at the Observation Post as directed by the Chief Observer.
3. Report all aircraft properly as directed by the Filter Center.
4. Maintain an Observation Post log, including duty shifts, without notes, and any unusual happenings (not requiring a report to the Filter Center as explained on page 11).
5. Perform the duties directed by the Post Supervisor or Chief Observer in maintaining the Observation Post and the equipment assigned to it.

When you become a qualified Ground Observer, you will be entitled to wear the Observer's insignia shown on the opposite page. As you will notice, there are five types of insignia, differing only in the size about the circumference, for the various personnel of the Observation Post and Filter Center.

In addition to the insignia, it is planned to have several types of metal awards for meritorious service.

. . . . *operational instructions*

The effectiveness of the entire ground observer system is based on the speed and accuracy of your reporting as a Ground Observer. It is essential, therefore, that your report be precise, be entirely in accordance with the standard reporting procedure as outlined in the following pages of this manual, and be made clearly and concisely. To accomplish these purposes fully, you will have to study your operational instructions carefully and know them so thoroughly that you adhere to them automatically.

The entire contents and sequence of your report are indicated in the Manual (Main Message Form No. 0-1) as shown on the following page. Note that the form indicates

some preliminary statements that you make and then lists the items of information required for each report, namely: number of aircraft; type of aircraft; altitude of aircraft; time delay in reporting; unit name of Observation Post; direction of arrival from Observation Post; distance of aircraft from Observation Post; direction aircraft are flying; and special remarks. In the columns for each of these items, you will note some explanation of the type of statements you make for each. While these are quite short, each of the items will be taken up in later pages of this manual and explained more fully. First, however, let us establish the overall conditions of your reporting.



AIRCRAFT FLASH MESSAGE FORM NO. 6-3

PLANE NUMBER: 1 OPERATOR AND AIRCRAFT: 103 MAY 65 BOSTON JETT

CALL SIGN (SEE OPERATOR AND AIRCRAFT): 103000 JETT

OPERATOR WILL CONTACT YOU WITH YOUR AIR NUMBER WITH SOUND

FROM THE AIR SERVICE OPERATOR NUMBER AND DATE: "NO SOUND ON AIRCRAFT"

THIS IS A "TARGET PAGE" AND SHOULD BE KEPT FOR REFERENCE ON THIS PAGE, IN ORDER TO

1	2	3	4	5	6	7	8	9
CLASS OF MESSAGE	TO NUMBER	FROM NUMBER	OPERATOR AND AIRCRAFT	OPERATOR AND AIRCRAFT	CLASS OF MESSAGE	TO NUMBER	FROM NUMBER	OPERATOR AND AIRCRAFT
2	103	103	103 MAY 65 BOSTON JETT	103 MAY 65 BOSTON JETT	103	103	103	103 MAY 65 BOSTON JETT

1	2	3	4	5	6	7	8	9

103 MAY 65 BOSTON JETT

The area YOU COVER — that is, the reporting area of the Observation Post — will be assigned to your post as an area of responsibility by the Officer-in-Charge of your Filter Center. Your post will report only those aircraft that come within this designated area. You must therefore be thoroughly familiar with the limits of this reporting area. (Of course, if you are in doubt as to whether an airplane is within the reporting area of your post, you will report the airplane.) You must also know the distance to the various landmarks in your area so that you will be able to tell fairly accurately how far from your post the aircraft is flying, as required in Item 7 of the Aircraft Flash Message Form No. 1-2.

Your AIRCRAFT STATUS (YOU SHOULD REPORT) will be designated by the Filter Center. Thus, for example, you will not report airplanes obviously taking off or landing at an authorized airport unless ordered to do so by the Filter Center. Similarly, you will not report small, private airplanes unless you are directed to do so. However, you must realize that the orders governing the aircraft to be reported may change at any time, depending on the tactical situation. Keep up to date on such orders.

Timeliness of reports very important is also important. Because of the speed of modern aircraft, it is highly desirable that you report an airplane as far as time as it passes the point between your Observation Post. In the first place, that is when you get the best view of the airplane and can make the best report. In the second place, good timing helps the Filter Center make the best position plot.



You should, therefore, place the Aircraft Flash call to the Filter Center at such time that you will be telling the Air Defense Operator the position of the plane when it is at a point nearest your post. Obviously, it will require considerable experience to determine exactly how far ahead to place the call, and you might miss it occasionally because of misjudgment or a delay in the call. When that happens, you will report the plane as passing the nearest point to your post, but you indicate the time delay involved, as explained here in connection with Item 4 of the Aircraft Flash Message Form. This will enable the Filter Center to establish the approximate location of the airplane at the time the Aircraft Flash Message is received at the Filter Center.



Since delays are dangerous and since the Observation Post telephone is the only one authorized to report Aircraft Flash Messages, it should be a private line if possible. If it is necessary to use a party line, you should get the cooperation of the others on the line to give Aircraft Flash Messages the necessary priority over routine personal calls.

If, for one reason or another, there are unnecessary delays between your Post and your local telephone operator, one of the officials of your Post should discuss it with the local telephone company representatives. All other problems in communications should be directed to your Filter Center.

The minimum for reporting a flight of aircraft in a designated area of your Observation Post is a simple call.

However, you must be sure to follow it exactly so that there will be no possible confusion. It can best be carried out by two ground observers working together, but if that is not possible, one observer can handle the job.

Upon observing an airplane which, in your judgment, will pass through the area of responsibility of your Observation Post, one observer should begin to fill out the information sheet required on the Aircraft Flash Message Form No. 4-3. The other observer should call the local telephone operator and say, "necessary transmission," then give the telephone number of your Observation Post.

When the telephone operator receives your call, she will connect you immediately over specified telephone circuits to the Air Defense Filter Center. By this time, the first observer should have completed Item 1 in the necessary information on Form 4-3. The other observer can then use the completed form in giving the information to the Filter Center.

When the Air Defense Filter Center receives the Aircraft Flash call and says, "all stations, my report," you say "necessary transmission," and repeat the information you have entered on the Form 4-3 in the order indicated. Speak clearly and distinctly, with an even tone, directly into the telephone. Be accurate and calm, and repeat each item in its sequence without deviation.

When you complete the message as specified in the following pages, the Filter Center operator will say, "transmission over." Hang up as soon as that the line for other reports. Be sure, though, not to hang up until the Air Defense

Film Center has advised you with the statement, "CONFIDENTIAL."
 REPORT YOU."

The items included in the report have been carefully analyzed and selected so that individually they provide a definite portion of the information required, and collectively give a complete picture to the Film Center. Only Item 9 is for non-specific information. Use it only when necessary. If there is no information that should be reported in Item 9, do not say anything for that item. For the other items, however, if there is no information available, use "UNKNOWN."

ITEM 9 REPORTS THE NUMBER OF AIRCRAFT.

Report a single airplane flying independently of a formation, or an airplane flying alone in a definite area, as "ONE."

Report a flight of two to ten airplanes (inclusive) as "TWO" and not as an exact number.

Report a formation of eleven or more airplanes as "SEVEN."
 Do not attempt to count the number if there are that many for it will take your time, and the exact number is not required at the Film Center.

If you can see the airplanes themselves clearly, the problem of judging the number is, of course, simple. If you can see only their vapor trails, it is hard to tell how many there are. If you cannot see them but you only hear them, the problem of number is even more difficult. In these cases, try to get the information you have from pages 11 to 16 in the Aircraft Identification section of this manual. Do not guess the number. If you cannot make an accurate estimate, report Item 9 as "UNKNOWN."

ITEM 8 REPORTS THE TYPE OF AIRCRAFT.

Report type of aircraft as follows:

Regular stream aircraft with
 one motor as "REGULAR STREAM"



Regular stream aircraft with
 two motors as "REGULAR STREAM"



Regular stream aircraft with
 three or more motors as "REGULAR STREAM"
 (Precision work is not required)



Jet propelled aircraft with
 one jet—on the fuselage—
 as "JET"



Jet propelled aircraft with
 two or more jets (jet engines
 positioned side-by-side) in-
 stalled in the wings—as
 "JET"
 (Precision work is not required)



If an aircraft was both propeller and jet propelled with, report it as a propeller stream aircraft. Also, you would report a jet using its propeller and then jet as "JET"





If you see any other types of aircraft not included in the categories of propeller-driven or jet-propelled aircraft, report them under Item 9 — special remarks. Thus, if you see a single-engine helicopter, you would say "single-engine" under Item 2; then when you get to Item 9, you would say "helicopter." Or, if you see a two-engine blimp, you would report "no aircraft" under Item 1 and, then, when you get to Item 9, you would say "blimp."

To a certain extent, you will be able to tell the type of aircraft even when you can't see the airplane itself. From the vapor trails it leaves and from the sounds it makes, you can often tell much, as explained in the aircraft identification section, pages 13 to 20. Whatever you do report under this item, however, be sure it is right. Do we pass? If you cannot count the motor or identify the type of aircraft, report it as "unknown."

The identification section relies on the accuracy of the observation to make its proper identification of the aircraft. If your report is incorrect, it may make the identifica-

tion section believe that this is a new flight not previously reported and it will continue the flight operation at the File Center. Therefore, if you are not positive in your observations as to the type of aircraft, report Item 2 as "unknown." You will never be wrong in saying unknown, but you will be wrong in guessing.

ITEM 2 REPRESENTS ALTITUDE.

In reporting this item, use your experience in observing objects and gauge with a known altitude.

When the airplanes are under a thousand feet — that is, when they are just above buildings, trees, and ground — report them as "near low."

When the planes are at an altitude of 1000 to 2000 feet — that is, when they are considerably above the buildings but you can see their details, such as windows and identification markings — report them as "low."

Report planes that are at altitudes from 2000 to 15,000 feet — when you cannot make out details such as windows and identification markings — as "near."



If the planes are heavily visible, or if they cannot be seen at all but are readily heard indefinitely, or produce vapor trails, report them as "near seen."

Now, though, that this altitude is based on the elevation of the Observation Post and not on sea level. Many civilian aircraft fly within the categories of "near" and "seen." Tactical military aircraft of the modern propeller and jet driven type, normally operate above 10,000 feet, and thus normally are "near seen."

Here, again, if you are not certain of the altitude, report Item 1 as "UNKNOWN."

ITEM 4 REPORTS TIME DELAY IN REPORTING

This item explains the time between the moment the plane is at the point being reported for it in Items 6 and 7 of the Aircraft Search Message and the moment that the Air Defense File Operator answers, "AM CONTACT, ON AIRCRAFT."

The purpose of this item is to let the File Operator know that the plane is not seen (at the time of reporting) at the

point being given in Items 6 and 7, but passed that necessary minute before — the number of minutes being those reported in Item 4.

Compute this time delay in the nearest minute. Thus, if the delay is less than 30 seconds, report Item 4 as "LESS THAN 30." If it is more than 30 seconds but less than 15 minutes, report Item "DELAY 1 MINUTE." If it is more than 15 minutes but less than 24 minutes, report it as "DELAY 2 MINUTES," and so on.

If your Aircraft Search report is delayed longer than 24 minutes, do not complete the call to the File Center, but cancel it and enter the report in your log book with the notation, "Not reported, excessive delay."

Sometimes, though, the maximum allowable time delay will be greater than 24 minutes, depending on the proximity of your post to a vital target area, the number of other Observation Posts in the area, the extent of the reporting area of your post, and the communication facilities connecting your post with the File Center. The decision to allow a time

delay greater than 60 minutes is made by the Officer-in-Charge of your Filet Center. If your post is permitted a time delay greater than 60 minutes, the Officer-in-Charge of your Filet Center or his authorized representative will notify you. You don't have to question him about it. In other words, your maximum allowable time delay is 60 minutes unless you are otherwise notified.

ITEM 2 REPRESENTS THE CODE NAME OF YOUR OBSERVATION POST.

The code name of your Observation Post identifies the location of your post. Like a street address, it gives the exact location of your post on the geographic grid mapping system of the area used by the Filet Center. Each word in it plays a part in locating your post, and any omission or error will cause your report to be placed incorrectly. Therefore, repeat the code name in its entirety, for example, one one seven zero seven. Note the numbers in your code name separately, for example, seven zero — one thirty-five. In fact, you should pronounce each of the words in the code name very clearly and distinctly so insure correct receipt at the Filet Center.

ITEM 3 REPRESENTS THE DIRECTION OR ASPECT FROM YOUR OBSERVATION POST.

In reporting Item 3, use only the eight points of the compass as shown on your Observation Post Orientation Card, namely, NORTH, NORTHEAST, EAST, SOUTHEAST, SOUTH, SOUTHWEST, WEST, AND NORTHWEST. Do not say "between



Orientation Card

or east" or "southwest or west." Eliminate the unnecessary words and just give the direction, for example, "WEST" or "SOUTHWEST." To be sure of giving the proper direction, familiarize yourself with the direction of various landmarks from your post as shown on your Observation Post Observation Card. If there are any doubts in your mind at any time about the direction, refer to the card again to make sure.

If a plane passes within 1 mile of your post, report it as "overcast." In that case, the word "overcast" will be the report both for Item 4 and Item 5.

ITEM 4 REPRESENTS DISTANCE OF AIRCRAFT FROM OBSERVATION POST.

For this item you need experience and ability in estimating distance. To a large extent, relating the location of the airplane to an established landmark which is at a known distance from your Observation Post will help you considerably in determining distance. If you identify the plane, its relative size will also help you in judging its distance from the post. For your guidance in this matter, the aircraft identification system of this manual contains illustrations showing how the various airplanes appear at different distances from you.

If the aircraft is within 1 mile of the Observation Post, report it as "overcast." This will be a combined report both for Item 4 and for Item 5, as previously explained. If the aircraft is further than 1 mile away, report its distance to the nearest mile.

ITEM 5 REPRESENTS THE DIRECTION OF FLIGHT.

Report the direction in which the aircraft is flying according to the eight points of the compass as outlined under

Item 4. To prevent possible confusion at the Filter Center, give your report for this item as "NORTH, SOUTHWEST" or "WEST, NORTH." If an aircraft is entering within the reporting area of the Observation Post, report its only status it leaves the area is as established line-of-flight. If the airplane changes direction after you have completed the Aircraft Flash Message, you need make no further report, for it will be reported by the next Observation Post in its line-of-flight. If you keep on reporting continuously the planes that are circling, taking off, landing, etc., in your area, it will essential the communication facilities and the phonics' equipment at the Filter Center. Where your Observation Post has no cover an especially large area, however, you may get special instructions as to your requirements for reporting aircraft. If you get such instructions, of course, you should follow them.

ITEM 6 REPRESENTS SPECIAL REMARKS.

Use this final item of the Aircraft Flash Message form to report information which should be included but is not covered in the first eight items of the report. If, for example, the aircraft you report is an unconventional type — say a blimp or a helicopter — report that information under Item 6. Use Item 6 also to report special emergency situations. If you see an aircraft in distress — for example, *out of control* or *out of fuel* in damaged condition — report this information under Item 6 of the Aircraft Flash Message Form. If you see an airplane engaged in action that seems to be hostile — for example, dropping paratroopers or strafing the road — report this information under Item 6. In fact, if you observe

any unusual circumstances that you feel might be important, report them under this item.

Do not use Item 7, however, unless you have special information that it is to be reported to the Blue Center. If you have nothing to report under this item, just don't say anything for it, we see our "transmits."

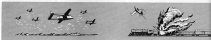
After transmission, you cannot keep your telephone conversation until you are released by the message: "Transmit, Transmit, Transmit." Don't hang up until you are released by the Blue Center; they have to ask you for additional information to enable it to take proper action on your report.

The COMPLETE AIRCRAFT BLAST REPORT should be delivered to the Blue Center operator in precisely the same sequence as the items are listed here. If any item of the message (other than Item 7) is unknown, cover it as "transmits" in your report. If the aircraft you are reporting is passing within 10 miles of the Observation Post, you may combine Items 4 and 7 into a single item and report it as "Overhead."

Read your report directly from the Form 8-1, and say it in a definite cadence for clarity. Follow the telephone procedure as outlined in this manual, speaking directly into the microphone. Do not speak rapidly — remember that the Blue Center operator must record your information on the Blue Board.

To see how the procedure works, consider the following situation as an example:

Suppose you observe some airplanes entering the designated area of responsibility of your Observation Post. Taking into account their speed and direction of flight, and using past experience as to normal time delay in the call (as explained on page 17), you wait an appropriate period, call your operator, and state, for example, "AIRCRAFT BLAST MESSAGE 17024." The local operator will connect you with your Blue Center, which will answer by saying, "AIR DEFENSE, AIR DEFENSE." Suppose now that you had determined that there were three F-4s flying in airplanes directly south of your post flying westerward at a very high altitude. At this



time, the airplane should have reached a point at the same distance to your point that their line of flight will permit. When the First Center Operator states, "all arrivals, no action," you say, "AIRCRAFT FLIGHT — TWO — SEPARATE — FROM FLIGHT — TWO THREE — TWO THREE — TWO THREE THREE TWO THREE — THREE — TWO — SYSTEM WORK." (Each dash indicates a slight pause. This will mean that the entire message should take 10 to 12 seconds.) The First Center Operator will then ask for a repeat on any number he has failed to receive by saying, "REPEAT FROM ..." For example, he might say, "REPEAT FROM 3." To reply, you would say, "FROM 3 — REPEAT FROM."

When the First Center has received your information correctly, the operator will say, "CORRECT, THANK YOU." You will immediately hang up your telephone to clear the line for additional reports from other Observation Posts.

If there are more than one type of aircraft less than 2,000 Feet Above Ground, flying within the area of responsibility of your Observation Post, or if aircraft of the same type are not flying in formation, report them by using subsequent

Aircraft Flight Messages. It may also happen that a second airplane enters your reporting area while you are in communication with the First Center reporting the flight of another aircraft. If any of these things occur, do not place a new call from your Observation Post. Instead, add a subsequent report to your first message. That is, when you have completed reporting the first airplane, you say, "I HAVE AIRCRAFT UNKNOWN FROM VIEW." He will in turn say the same, "I HAVE AIRCRAFT UNKNOWN FROM VIEW," before the First Center Operator says, "CORRECT, THANK YOU." If necessary, the First Operator will say "REPEAT"; when the plotting of your initial report is completed, the First Operator will say, "GO AHEAD, PLEASE." Then you say, "AIRCRAFT FLIGHT, TWO," giving all the items for the second Aircraft Flight Message.

Use this type of sequence in reporting more than one flight of aircraft whenever necessary, but use it with discretion. When you are in doubt, or when you do not have your Aircraft Flight Message form completed for the sub-



quent report, be sure to continue your observation. Never hold the Filter Center Operator on the line under these circumstances. You can not only bring up communication facilities from your Post in the Filter Center — you are trying up the Filter Center Operator as well. Hang up and place a new Aircraft Radio Message indicating the proper time delay, as explained under Item 4.

In addition to being careful about this item, here are some other important "DO'S" you should observe.

Don't Report The Column Heading Of The Aircraft Radio Message Form 6-1. Just give the items in their proper sequence and timing; for example, say, "AIRCRAFT FLAM — 001 — 000000Z — 000000Z — 000000Z DELAY — 000000Z THREE ONE BLANK — 000000Z — FIVE ONE SIXTY."

Don't Wait For A Confirmation Of Receipt For Each Column. At the end of the Radio Message, the Filter Center Operator will ask the report on any items not understood by saying, "NOT HEARD CODE . . ." If all is received properly, the Filter Center Operator will acknowledge the report by the statement, "CHECK, THANK YOU."

Don't Report Although Out Of Your Area Of Responsibility. This results in duplicate reports from your post and the adjacent Observation Post.

Don't Give Filter You Are Not Certain Of The Information In Any Column. Say "uncertain." Guessing may result in improper action at the Filter Center and additional delay in the Identification section. Guessing in the radio re-

ports reporting.

Don't Delay A Report By Waiting To Receive Information In Any Column Of The Radio Message Form. This will result in a delay which may prevent an interception of a hostile aircraft by our intercept fighters, since they may be relying on your information to give them the correct location of the hostile aircraft.

Besides observing and reporting aircraft, your duties will include also the responsibility for keeping a record, or log, of your observations. This will be a relatively easy task, for your Aircraft Radio Message Form No. 6-1 can well serve this purpose. By just adding the date at the top of the form and by recording the time of each observation in the margin to the right of Column 6, you can make your Aircraft Radio Message Form No. 6-1 a most useful log of your observations. For any special remarks or comments, you can use Column 8. However, if such special remarks or comments are not of the type that should be reported to the Filter Center as part of your report, do not write them in until after you have completed your call. Otherwise, you might inadvertently report them to the Filter Center and cause a certain amount of confusion.

Other types of records, such as diaries, duty logs, personal files, and the like, will also be needed at your Observation Post. However, you are not likely to be responsible for any of these, except, probably, in sign on and off duty. Whatever the situation, be sure to carry out your reported duties fully, do your work as a Ground Observer in an essential part of our Air Defense System.

. . . aircraft identification

Recognizing airplanes is just like recognizing people. When you barely know a person, especially if you see him infrequently, you have to look very closely to recognize him. Often you can't do it even then. However, when you know a person well, you can recognize him at a considerable distance, even before you can make out any one of his features. It is the same with airplanes. Of course, in the Aircraft Photo Montage you do not report airplanes by their specific designations — like F-4J or C-47. Your Aircraft Photo Montage requires only that you determine whether the airplane is a single motor, bi-motor, multi-motor, single jet, or multi-jet, tail, even that can be quite a difficult job when the airplane is plying the sky and you are not familiar with the particular plane. Determination of altitude for Item 5 and distance for Item 7 is also more difficult if you are not well acquainted with the airplane you are observing. To determine the information for these items quickly and accurately, therefore, you must be thoroughly familiar with the various types of aircraft and their appearance at various altitudes and distances. That's why this section on aircraft identification has been included here.

The airplanes pictured here have been divided into five classes according to type as reported in Item 3 — namely, single motor, bi-motor, multi-motor, single jet, and multi-

jet. Each class has been further divided into groups according to appearance; thus, within the bi-motored class, the bi-motored bombers have been grouped together, and the bi-motored transports have been grouped together. Within each group the airplanes that look most nearly alike have been placed together on the same page. This arrangement will make it quite easy for you to find the class for any airplane on the basis of its appearance.



B-29C Superfortress

Besides the pictures, the "Normal" Identification section includes a variety of other data for each of the various groups of airplanes. Each page in this section shows how the planes pictured on the page appear in silhouette from various angles. (While the silhouettes shown are of only one of the airplanes pictured, they are characteristic of all, for all the airplanes on the page closely resemble each other.) This section also shows the comparative size of the airplanes at various distances, and their size as compared with other types of airplanes. These pages also include measurements and other information about the airplanes so that you can learn to know them well.

You can make best use of this material and prepare yourself for your duties as Ground Observer by practicing aircraft recognition every time you have a chance. Whenever you see or hear an airplane, try to determine its type as

required for Item 2 of the Aircraft Flight Message Report. Look up the airplane in the Aircraft Identification section here to double check your identification and to learn about other characteristics of the plane. In this way, you will gradually familiarize yourself with the various aircraft and learn to call at a considerable distance whether they are single motor, bi-motor, multi-motors, single jet, or multi-jet. By referring to the comparative size diagrams on the proper page, and by checking against landmarks a known distance away, you will improve your judgment of distance and altitude and will gradually become an expert.

Incidentally, don't use field glasses in your observation to determine altitude and distance, for the magnification produced by the field glasses is quite likely to mislead you. There is no objection to your use of field glasses to help you determine the type of airplane, but in judging altitude and

4-11 Twin Mustang



Master Mustang (in front)



distance, you must depend on your eyes alone.

Sometimes, of course, you will not be able to see the airplane at all. Because of the extremely high altitudes at which modern aircraft fly, it is possible for them to be invisible, even when they are directly overhead. In such cases, there are other ways of making a determination of the information necessary for the Aircraft Flash Message Report.

For one thing, there is the matter of how the airplane sounds. Through this is not a reliable method, there are people who can often distinguish planes well on the basis of sound between jet and propeller driven aircraft and between single motor, bi-motor, and multi-motor aircraft. Again, it is probably more a matter of practice than anything else. Therefore, it would be well for you to practice trying to recognize type of aircraft by sound alone, then checking by sight. You will make a great many errors at first, but it is

quite possible that after considerable practice, you can become quite proficient at it.

Naturally, no one can give you a definite description of how the various types of aircraft sound. In general, though, you may use the following overall differentiations as a first guide. The sound of single-motored airplanes is normally steady in frequency (pitch) and relatively steady in intensity. The sound of bi-motored airplanes is usually steady in frequency but varying in intensity. In addition, there is a sort of loose note (chattering) effect. This loose note, if your ears are sharply attuned for it, may also help you distinguish between a bi-motored airplane and two single-motored airplanes flying together. In multi-motor airplanes, this loose note becomes a sort of steady drone of relatively high intensity. The only six-motored airplane — the B-29 — has a characteristic oscillating beat frequency, which is quite

PL-122A



B-29



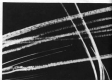
easy to distinguish once you become familiar with it. The jets make a different type of sound which is characteristic of them and is readily recognizable if you are familiar with them. In fact, in all the areas it is a matter of thorough familiarity that can be achieved only by regular practice. It will be interesting to you to try to become proficient in recognition by sound, but don't become discouraged if you can't achieve this. Most people can't.

A more reliable method of recognition when you can't see the airplane itself is recognition by vapor trails. At very high altitudes each propulsive unit of an airplane produces a separate and distinct vapor trail. Consequently, if you see a vapor trail in the sky, you will know right away that the airplane making that trail is at a very high altitude. That's one item for your Aircraft Flash Message form. Another item that vapor trails will tell you with a good amount of reliability when you learn to observe them correctly is the

number of propulsive units on the airplane. By counting the number of vapor trails, you can tell quite definitely how many propulsive units the airplane has. The number of vapor trails and their groupings can also give you a good clue as to the number of aircraft as required the item 1 in the Aircraft Flash Message Report. Of course, if there is a formation of planes and the vapor trails intermingle, the job becomes considerably more difficult.

All in all, then, there are a number of ways by which you can determine the information required for your Aircraft Flash Message Report. For maximum efficiency, though, every one of them requires that you know airplanes as well as you can determine the information required for your report almost automatically. There is no short cut to such knowledge. The only way you can achieve it is by constant practice.

Vapor Trails of Eight National Fighters and Two National Bombers



MULTI-ENGINE AIRCRAFT



B-24

WING SPAN
 141' 0"
 LENGTH 102' 0"
 HEIGHT 32' 0"
 WEIGHT 45,000 LBS
 RANGE 10,000 MILES

B-29

WING SPAN
 146' 0"
 LENGTH 162' 0"
 HEIGHT 38' 0"
 WEIGHT 60,000 LBS
 RANGE 10,000 MILES

B-29

REAR VIEW APPEARANCE OF B-29



REAR VIEW



COMPARATIVE SIZE OF B-29

MULTI-ENGINE AIRCRAFT

GRAND APPEARANCE OF BARABAZON



Barabazon

PRICE

← \$1,200,000

SPAN 147' 7"

LENGTH 107' 0"

WEIGHT 40,000 LBS

SPEED OVER 375 MPH

RANGE 4,700 MILES

PRICE

← \$1,200,000

SPAN 147'

LENGTH 107'

WEIGHT 40,000 LBS

SPEED 375 MPH

RANGE 4,700 MILES



BARABAZON



P-51



P-51

COMPARATIVE SIZE OF BARABAZON



747-100

REAR VIEW APPEARANCE OF 747-100

747-200

WINGS
 SPAN 221' 10"
 LENGTH 231'
 ENGINES 4 BOEING/TURBO TYPE
 SPEED 540 MPH
 RANGE 550,000 MILES

747-300

WINGS
 SPAN 221' 10"
 LENGTH 231'
 ENGINES 4 PW 6030E
 SPEED 540 MPH
 RANGE 540 MILES



747-100



747-100



747-200



747-300

COMPARATIVE VIEW OF 747-100

MULTI-ENGINE AIRCRAFT

1935 P-1
Boeing

BEHAVIOR APPEARANCE OF B-20

1935 P-1



1935 P-1



Boeing

UNITED STATES

SPAN 147' 0"

LENGTH 97'

WINGS & WEIGHT 8,133 LBS

SPEED OVER 300 MPH

RANGE 3,000 MILES COMB. 840



UNITED STATES

SPAN 147' 0"

LENGTH 97'

WINGS & WGT 8,133 LBS

SPEED OVER 300 MPH

RANGE 3,000 MILES COMB. 840



B-20



B-20



B-20

COMPARATIVE SIZE OF B-20





SR-71B BLACKBIRD

SR-71



SR-71



THIN APPEARANCE OF SR-71B

SR-71



SR-71

SR-71B DATA
 LENGTH 177'
 SPAN 167' 4"
 ENGINE GENERAL ELECTRIC J47
 SPEED 3,000 MPH (4,800 KPH)
 RANGE OVER 800 MILES (1,300 KPH)



SR-71

RUSSIAN
 LENGTH 107' 2"
 SPAN 127' 11"
 ENGINE WOODWARD-RUSSIAN
 SPEED 410 MPH AT 15,000 FT.
 RANGE 1,000 (1,600 KPH)



SR-71



SR-71



SR-71



SR-71

COMPARATIVE SIZE OF SR-71B

RECOGNITION FEATURES

TYPE OF WING INTERNAL JOINT



SHOULDER OF WING INTERNAL JOINT



TYPE OF WING TIP



TYPE OF LEAD



SHOULDER OF LEAD



WING POSITION



TYPICAL WING SECTION



WINGBARREL

