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Misc

WAR ZONE

Familiarization

China-Burma-India Theatre of Operations

HEADQUARTERS, I TROOP CARRIER COMMAND

28 AUGUST 1944

3214

Instructors Reading this Document
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Name Boyer Date 6 Oct 44

ARMY AIR FORCES
HEADQUARTERS I TROOP CARRIER COMMAND
STOUT FIELD, INDIANAPOLIS, INDIANA

TCCCT

2 October 1944

SUBJECT: War Zone Familiarization, C.B.I.

TO: Commanding General
Command and General Staff School
Ft. Leavenworth, Kansas.

Inclosed herewith, for your information, is one (1) copy of ITCC Manual "War Zone Familiarization, C.B.I.", 28 August 1944.

For the Commanding General:

S. T. EDWARDS
Captain, A. G. D.,
Asst. Adjutant General

1 Incl:
ITCC Manual, War Zone
Familiarization, C.B.I.,
28 August 1944.

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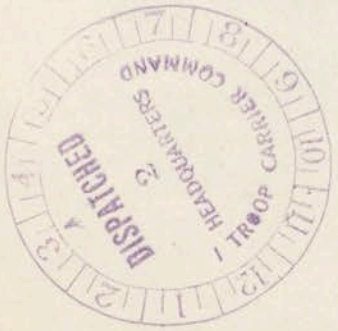
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2
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4 OCT 1944

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Army Air Forces
HEADQUARTERS, I TROOP CARRIER COMMAND
Stout Field, Indianapolis, Indiana

TCCCT 20 September 1945

SUBJECT: Change No. 2 to C-B-I Manual - War Zone Familiarization.

TO: Commanding General
Command and General Staff School
Ft. Leavenworth, Kansas

1. Inclosed changes are forwarded for proper insertion in your copy (copies) of the War Zone Familiarization Manual on the China, Burma-India Theater.

2. Remove pages outlined below and destroy in accordance with AR 380-5:

	Pages
a. Table of Contents	
b. General Information	1 thru 14
c. Section I	15 thru 20A 23 - 24 27 thru 36 45 thru 48
d. Section II	20

FOR THE COMMANDING GENERAL:

M. S. Tilghman
M. S. TILGHMAN
Lieutenant Colonel, AGD
Adjutant General

4 Incls:
Incl 1 - Table of Contents ( )
Incl 2 - General Information: Pages 1 thru 14A ( )
Incl 3 - Section I: Pages 15 thru 19; 23 - 24; 27 thru 36; 45 thru 48 ( )
Incl 4 - Section II: Page 20 ( )

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

Army Air Forces
HEADQUARTERS, I TROOP CARRIER COMMAND
Stout Field, Indianapolis, Indiana

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Incl 3 - Section I: Pages 15 thru 19; 23 - 24; 27 thru 36; 45 thru 48 (1)
Incl 4 - Section II: Page 20 (1)

29 OCT 1945

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

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Army Air Forces
HEADQUARTERS I TROOP CARRIER COMMAND
Stout Field, Indianapolis, Indiana

TCCCT 16 February 1945

SUBJECT: Change No. 1 to C-B-I Manual - WZF

TO: Commanding General
Command & General Staff School
Ft. Leavenworth, Kansas

1. Inclosed changes forwarded for proper insertion in your (copy) (copies) of the War Zone Familiarization Manual on the C-B-I Theater.

2. The following pages will be removed and destroyed in accordance with AR 380-5.

a. Section I - Pilots, Navigators and Glider Pilots.

(1) Page 17 - 18.

(2) Page 19 - 20.

(3) Page 39 - 40.

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b. Section II - Communication, Radio Operators.

(1) Page 18 - 19 (Part VI).

FOR THE COMMANDING GENERAL:

H. H. JONES,
Lt Col, A.G.D.
Adjutant General

5 Incls:
1 - Page 17-18 C-B-I Manual (1)
2 - Page 19-20 C-B-I Manual (1)
3 - Page 20a C-B-I Manual (1)
4 - Page 39-40 C-B-I Manual (1)
5 - Page 18-19 (Part VI), C-B-I Manual (1)

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Army Air Forces
HEADQUARTERS I TROOP CARRIER COMMA
Stout Field, Indianapolis, Indian

TCCCT 16 February 1945

SUBJECT: Change No. 1 to C-B-I Manual - WZF

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FOREWARD

Upon arrival in the China-Burma-India Theater of Operations, personnel will be aware that flying safety regulations and procedures within the interior are comparable to those in effect within the United States. Extensive non-operational flights in this theater are going on twenty-four hours per day. For this reason flying control is essential. It is administered by the Air Transport Command Operations using Army Airways Communication System facilities.

British and American briefing materials: radio aids, maps, communication procedures, restrictions, regulations, cross-country facilities, accomodations, etc., are available within the theater. This information is supplied by briefing officers prior to departure of any flight in the form of cross-country hand books for pilots, navigators and radio operators. These books are constantly being revised and kept up to date. Material is prepared simply and understandably.

Recently, combined operations of allied forces have been established under SEAC (South East Asia Command). Under this command all British and American procedures are being combined into a standardized system which will simplify methods of operations, control and communications against our mutual enemy.

This theater is in an expanding stage of development and within a short time installations of new equipment and procedures will be completed.

REFERENCE TEXTS AVAILABLE FOR REQUISITION THROUGH HEADQUARTERS, I TROOP CARRIER COMMAND.

I. TRAINING AIDS OFFICER:

1. Pocket Guides:

a. China.
b. Burma.
c. India.
d. Netherlands East Indies.

2. Publications:

a. AAF Manual No. 21 W - "Survival".
b. Oxygen Sense.
c. T-I The Tropics - "General Conditions".
d. T-II The Tropics - "Personal Care, Maintenance and Electronic Equipment".
e. T-III The Tropics - "Survival".

II. OFFICE OF THE SURGEON:

1. "Medical and Sanitary Data on Burma" TB Med 77, 2 August 1944.

III. COMMAND WEATHER OFFICER:

1. "Climate and Weather of Southeastern Asia", Vol. V, No. 3, Part I - India, Burma and Southern China.

2. "Climate and Weather of Southeastern Asia", Vol. V, No. 3, Part II - Farther India and Netherlands East Indies.

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Change No. 2
July 1945

Types

ABBREVIATIONS

CBI	Chine Burma India
IBS	India Burma Sector
SEAC	South East Asia Command
OPTI	Operations Plans Training Intelligence
RAF	Royal Air Force
RIAF	Royal Indian Air Force
AACS	Army Airways Communication System (U.S.A.)
ATC	Air Transport Command
ATC-ICW	ATC - India China Wing
CNAC	Chinese National Airways Cooperation
GMT	Greenwich Mean Time
IST	Indian Standard Time (6-1/2 hrs ahead of GMT)
CST	Chinese Standard Time (7 hrs ahead of GMT)
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
ETIC	Estimated Time in Commission
ADF	Automatic Direction Finder
DF	Direction Finder
HF	High Frequency
MF	Medium Frequency
LF	Low Frequency
UHF or VHF	Ultra or Very High Frequency
CW	Wireless Telegraph (continuous-wave)
WT	Wireless Telegraph
RT	Radio Telephone
MCW	Modulated Continuous Wave
AO	Airdrome Officer
ACO	Air Control Officer

Change No. 2
July 1945

General Information

CLOTHING

A. Authorized uniform in cities and rear echelon headquarters will consist of one of the following:

1. Tropical uniform is most generally worn, however, O.D. is required in China during winter.

2. Khaki shirt and trousers with tie.

3. Bush jackets and khaki trousers.

4. Woolens worn occasionally in cool weather at the option of the individual.

B. In operational areas and while flying, choice of wearing apparel is left to the individual.

1. Flying suits, summer.

2. Khaki

3. Shorts

4. Recommended that boots or high shoes be worn when flying, also sufficient warm clothing carried for high altitude flying, Paratrooper boots are required for all crew members in Burma and China. Recommended that officers purchase boots in the United States, enlisted men receive government issue in the theater.

C. Purchase of Clothing:

1. American officers are allowed to purchase clothing from British Officers' Shop (similar to U.S. QM sales store).

2. Civilian stores in India carry complete stocks of Allied army uniforms. No ration coupons are needed.

3. Stocks of QM equipment in China and the forward bases in India and Burma are very limited.

4. QM stocks in the rear bases, however, are well stocked with all items of clothing and equipment.

D. Desirable Items of Equipment Are:

Raincoat	Clothes Hangers
Overshoes	Sewing Kit, Extra Buttons
Slippers	Electric Iron
Bathrobe	Small-Size Hammer
Swimming Trunks	Screwdriver
Fountain Pen	Pliers
Wrist Watch	Nails
Flashlight and Batteries	Screws
Cigarette Lighter	Hinges - Hasps
Electric Cord Extension - 15'	Padlocks
Plug, Socket, Tape and Bulb	Coolers

1. Each Troop Carrier Group is given 10,000 pounds of Red Cross shipping space from POE to destination. Red Cross furnishes about 1,000 pounds of equipment. The balance can be used to transport milk-can coolers that were found to be extremely useful. Both four and six-can capacity coolers were used. Larger containers are not satisfactory due to shipping difficulties.

2. Washing machines are not advisable as natives seem to be able to break them the first time they are used. Washing machines can be made out of oil drums. (Reference T.O. No. OO-80B-1, 15 Oct 1944.)

SUPPLIES

Post exchanges have been established on main bases and separated units.

All units draw from the post exchange on the basis of their strength reports.

Commodities are rationed and personnel must present a ration card to draw supplies from any exchange.

Units in forward areas receive a limited supply of articles through the rear bases.

Supplies consist of:

1. Toilet articles, complete stock of all items.
2. Tobacco:
   a. Cigarettes, one carton per week or ten days.
   b. Cigars, limited one per day.
   c. Smoking tobacco, unlimited.
   d. Chewing tobacco, unlimited.

3. Beverages:

a. Beer - available on ration within Burma and India, twenty-four cans per month.

b. Coca Cola - available throughout the theater.

c. Fruit juices, sixty ounces per month.

4. Reading Matter:

a. Magazines, all popular weekly and monthly.

b. Pocket books.

5. Confections:

a. Candies, rationed.

b. Chewing gum, rationed.

6. Writing Material:

a. Stationery.

b. Writing ink.

7. Souvenirs, Trinkets, Rugs, Linens, etc.:

a. Can be purchased from natives but PX has controlled prices.

8. Liquor:

a. Officers are rationed one quart of liquor per month in India and Burma. Liquor is not available in China except upon special occasions.

b. Local gin, rum and imported South African brandy can be purchased from civilian stores in India.

COMMUNICATION:

1. V-Mail is the fastest and safest method of correspondence.

2. Regular mail may be used.

a. All China, India-Burma letter-mail is transported by the ATC. Affixing air mail stamps on such letters furnishes additional service, where available, within the continental limits of the United States.

3. Parcels can be sent and received by water transportation but delivery involves a time lag from three to five months.

a. Parcels mailed to the United States from Burma and China shall not exceed seventy pounds in weight and one-hundred inches in length and girth combined. Parcels mailed from India are limited to one package per month per person not to exceed ten pounds. This restriction has been imposed upon the request of the British to hold down inflation.

b. Official parcels weighing four pounds or less can be mailed at an APO without payment of postage.

c. Parcel post within the theater or to the United States may be insured. Fees vary from five cents for five dollars indemnity to thirty-five cents for two-hundred dollars indemnity.

(1) In the theater, postage is at the local rate, seven cents for the first pound and one cent for each additional two pounds.

(2) Rates for parcel post to the United States are the same as if presented for mailing at New York City, inasmuch as China, India-Burma APO is a station of the New York City Post Office. Packages of ten pounds sent first class to United States usually go by air to the United States, then by rail to destination.

4. Upon arrival at a permanent base and receiving a permanent APO number, EFM messages (Expeditionary Force Message) may be sent subject to censorship. Fixed texts may also be used. EFM messages sent from India are not satisfactory due to British censorship delays.

FINANCE

1. Money Orders:

a. Postal money orders may be sent and received through the APO.

b. Personnel Transfare Account is most satisfactory provided a finance office is available.

2. Checks violate security and are not acceptable in the theater.

3. Bonds can be purchased through the finance department.

4. India and Burma:

a. Pay will be with Indian currency at the rate of 330 rupees to one hundred dollars.

b. American money or any foreign money can be exchanged through the finance office only.

c. All transactions with other than U.S. personnel will be with local currency.

5. China:

a. Army pay in China is with American currency, commonly referred to as "gold dollars."

b. Finance will not exchange U.S. currency to Chinese, due to "black market" and inflation.

c. U.S. currency can be exchanged on the current "black market" rate in most cities.

LIVING CONDITIONS AT AIR BASE

New units arriving in the theater can expect one of two probabilities. First, that they will be stationed upon a base that has been in operation for some time. Here complete accommodations should exist and be available to them. Secondly, they may be sent to a base just recently constructed with no facilities whatsoever, with the exception of shelters for living quarters.

1. The recently constructed base:

a. Housing:

(1) Permanent and temporary shelters for personnel, mess, hospital, operations, supply, etc. Shelter in India and Burma may consist of:

(a) Tents.

(b) Bamboo and thatch roofed "bashas."

(c) Bashas with concrete or brick floors, mud lined or mosquito proofed bamboo walls and thatched roofs.

(2) Shelter in China is usually of a permanent nature. Dwellings are called "hostels" and built of unfinished lumber, sun dried mud bricks, plaster and tile roofs.

(3) Furnishings to a limited extent are installed.

Additional chairs and tables can be purchased locally at the individual's expense.

(a) Army canvas cots are used.

(b) Bed frames with weaved rope support are manufactured locally. Such beds are called "Charpoys."

(c) Mattresses, pillows and sheets can be purchased in large cities.

(d) Rugs and additional items must be purchased.

(4) Electricity will be available at most installations. British installations use 220 volts.

b. Sanitation:

(1) Latrines must be constructed.

(2) Garbage disposal arranged.

(3) Mosquito regulations posted and enforced, with control of breeding places.

(4) Hired help within the area must be examined by medical section.

(5) All water must be boiled and chlorinated before drinking. Chlorination will not take care of amoebic dysentery.

c. Messing:

(1) Mess kits are a necessary part of equipment.

(2) Supplies will consist of C and K rations until additional foodstuffs can be supplied.

(3) During the duration of an officer's stay in China, a deduction of seventy-five cents per day is automatically taken from his pay. This money is placed in a fund to be given to the Chinese government. Personnel may eat at any base in China with no additional charge.

d. Security:

(1) Slit trenches must be dug or bomb shelters arranged.

(2) Guards must be posted through the area.

(3) Aircraft are on alert unless sufficient revetments are available.

(4) Some natives are pro-Japanese and have a good understanding of English. Watch conversation and make secure all valuable papers.

2. Old Bases in Operation:

a. Housing:

(1) Accommodations usually complete and of a permanent nature.

(2) Electricity available from dusk until 2200 or 2230, except on special occasions or emergencies, and from 0300 to dawn.

(3) (a) House boys or bearers are available in India at low rate of pay, usually the equivalent of ten dollars per month. Efficient at keeping house and washing clothes.

(b) The WASC, War Army Service Corps, a Chinese organization, provides housing, messing, laundry service and house boys. Laundry charges in China are by the piece for officers and deduction by month for enlisted men.

b. Sanitation:

(1) Plumbing is available in most of India but very little exists in China.

(2) Necessary precautions to be observed as to location of drainage and disposals.

(3) Drinking water must always be boiled and chlorinated.

(4) Mosquito nets are always used.

c. Messing:

(1) In China, all personnel live "off the land."

Chinese cooks are employed, sometimes under supervision of American personnel.

(2) In India and Burma, rations are supplemented by local foodstuffs, British rations, dehydrated food and frozen meats from U.S.; American personnel employed in kitchens.

(3) Vitamin tablets are supplied to augment improper diet.

(4) Combat flying crews are rationed additional fruit juices.

3. Recreation and Entertainment:

a. Sports available are:

Baseball	Badminton
Volley Ball	Tennis
Football	Indoor Games
Basketball	Riding
Swimming	Golfing

b. Entertainment consists of:

Movies	Sight-seeing
Traveling USO Units	Squadron Parties
Red Cross Canteens	Officers' Clubs

4. Restrictions:

a. Native villages are "off limits" from dusk to dawn, occasional exceptions.

b. Gun fire on the post is not permitted except in the forward posts. Base regulations will apply.

c. Remain indoors unless properly covered for protection from malaria carrying mosquitoes, etc.

CLIMATE:

One of the most important factors affecting life in the China, India-Burma Theater is the weather. The entire theater is dominated in winter by the "dry" monsoon from the north, and in summer by the "wet" monsoon from the south, bringing with it vast quantities of rainfall. Particularly during the summer months, when the humidity is extremely high, all clothing, leather goods, and all photographic equipment and supplies must be stored in a dry place and aired frequently to prevent their mildewing.

1. China:

a. Southern Unoccupied China.

(1) Summer, warm and sultry. Winter, remarkably cool for latitude.

(2) Heavy rains continually during summer monsoon with maximum in June. Relatively dry winter; only occasional light rain.

(3) Prevailing winds generally light, southwest in summer; stronger from north in winter.

(4) Air bases located above 5000 feet.

(a) At these high altitudes, warm clothing is needed at night during the winter because of lack of heating facilities.

b. Northern Unoccupied China.

(1) Summer, uncomfortably warm and humid. During winter, very cold and dry, bright clear skies at higher altitudes; warmer, cloudy, damp at low altitudes and in Yangtze valley.

(2) Considerable summer rains of long duration; winter rain negligible and infrequent.

(3) Air bases from sea level to 2000 feet.

c. Extreme Scutheastern China.

(1) Summer, fairly hot and damp. Winter, chilly but not extremely cold. Rather slow movement of air all seasons.

(2) Sky cloudy both winter and summer. More uniform distribution of rainfall year-round.

(a) Considerable monsoon rain late in spring and early summer.

(b) Tropical cyclones, most frequent in fall.

(3) Summer surface winds fairly light, from south to southeast. Winter winds stronger, from north to northeast.

(4) Bases located below 5000 feet.

2. Burma:

a. Uncomfortably warm all year-round, cooler in the mountain areas. Air depressingly humid in summer, drier in winter.

b. Summer monsoon rains excessive in the coastal and mountain regions, less intense on plains and plateaus. Little precipitation in winter months.

(1) Heavy thunderstorms accompany the beginning and end of the summer monsoon.

(2) Occasional tropical hurricanes forming in Bay of Bengal hit the coast in early summer.

c. Winds predominantly from north in winter, southwest in summer.

3. India:

a. Central Desert Area:

(1) Winter, extremely arid. Summer, uncomfortably hot and considerably moist.

(2) Frequent wind and sand storms immediately followed by rain showers in summer.

(3) Winds ordinarily light, from northwest year-round, occasional tornadoes in summer.

b. Northwestern Portion and the India-Burma Border:

(1) Generally cool in winter, hot in summer; air changeably damp and dry during both seasons.

(2) Extremely heavy and prolonged rainfall during the summer monsoon; comparatively little in winter.

(3) Surface winds from southwest in summer, northerly in winter.

c. Coastal Regions of India:

(1) Warm in winter; periods of extreme heat in summer.

(a) West coast cooler than east coast.

(2) Rainfall heavy in summer, very light in winter.

(a) West coast rainfall greater than east coast.

d. Southern Interior Section:

(1) Days cooler, nights warmer than in Northern India.

(2) Heavy rains during summer monsoons, much lighter in winter.

LEAVES AND FURLOUGHS

1. Any person may be given leave at any time if the leave is to be used for convalescence and is recommended by a medical officer.

2. To be eligible for attendance at rest camps for normal leave or furlough, personnel must have been in this theater for six months.

3. Personnel in China are not permitted to go to India on leave. There are several rest camps in China.

REST CAMPS

1. The CG, SOS, USAF, China, India-Burma, is charged with the establishment, organization and administration of rest camps for military personnel in this theater. He distributes quotas for attendance, designates camps to be used by various units, and arranges transportation.

2. Most camps open about the first of May and close the 31st of October. There are a few all-year camps.

3. The period for attendance at rest camps is usually D.S. for fifteen days, plus travel time.

4. Requests for quotas for attendance are sent by each Air Force unit to the CG, SOS, USAF, China, India-Burma Theater, for personnel whom they desire to send to rest camps each month during the open period. Quotas are divided between officers and EM for each month of the period.

5. Facilities at these resorts include the usual sports and games found at any summer resort. During the winter, snow sports may be had. Equipment is obtainable at the resorts. Elevations are high and warm clothing will be needed throughout the year.

6. Three excellent resorts or rest camps in India are available for civilians and service men. They are:

a. Darjeeling, about 350 miles north of Calcutta in the foothills of the Himalayan Range.

b. Shillong, in the Khasi Hills midway between Calcutta and the furthermost bases in Northeastern India. Eighty-five miles by bus from Sylhett Air Base.

c. Kashmir, in the extreme northern portion of India, the most popular resort country.

7. A rest camp is available for all personnel in Calcutta. Certain quotas are established, attendance authorized by C.O. of unit.

CITIES

1. China is overcrowded and there is a lack of modern conveniencies. With the exception of sightseeing, entertainment is scarce.

2. Burmese in large cities are pro-Japanese; villages lean to British influence.

3. India, cities of modern design. Most important and likely to be visited by you are Karachi, Bombay, Bangalore, New Delhi, Agra, Lahore and Calcutta.

a. Housing:

(1) American Officers' Club in Calcutta (Karnani Estates), hotel service, tailor, shops, two bars, night club, bush jackets for rent - deposit thirty rupees charge, one rupee per night rent, service charge per night two rupees, meals one-eighth to four rupees. Highly recommended.

(2) Hotels restricted for civilians' and officers' use. Enlisted personnel allowed entertainment facilities at the hotels.

(a) Reservations difficult to secure in advance.

(b) Private rooms accommodate one to five. Dormitory rooms for large groups.

(c) Baths adjoining, no showers.

(d) Twenty-four hour service on dry cleaning and laundry.

(e) Barber shops, lounge, dining rooms, ballroom, private bearers and room service.

(f) Military rate about three to four dollars per day per person, European plan.

(3) Enlisted personnel accommodated by American Red Cross, YMCA and government controlled barracks.

(4) Private rooming homes with boarding facilities.

(5) Airdromes located ten to fifteen miles from cities, shuttle service to and from. Limited housing facilities on the field.

b. Messing:

(1) Hotel dining rooms, American and European prepared dishes. Frequently inspected by Army personnel.

(2) Restaurants, of "on limits", Chinese, American and European dishes.

(3) Night clubs, officers and civilians only, dinner and dancing. EM have their private clubs also.

c. Recreation and Entertainment:

(1) Sight-seeing.

(2) Sports, indoor and outdoor, all types British and American.

(3) Night clubs.

(4) Theaters, air conditioned, late features.

4. General:

a. Native sections "off limits."

b. Proper dress required, local regulations apply.

c. All personnel indoors at 0100 hours.

d. Sidewalks usually "pulled in" at midnight.

TRANSPORTATION

1. All traffic is on the left hand side of roads, highways, airdromes and cities.

2. Gasoline rationed in India for civilian use and scarce in China. Motor fuel in China is a mixture of Jing Bow juice (a local alcohol hard on the stomach) and gasoline, three parts to one.

3. Transportation in Burma confined to:

a. Foot traffic
b. Ox-cart
c. Horse
d. Elephant
e. Rivercraft
f. Limited number of Army vehicles

4. China:

a. Rickshas
b. Carriages
c. Sedan Chairs
d. Few trucks and private cars.
e. Public bus transport within cities.
f. Air line, CNAC

5. India:

a. Richsha - carriage

b. Bicycles

c. Street cars in Karachi, Bombay, Calcutta and several other cities in the extreme south.

d. Taxi-cabs in abundance throughout the larger cities. Before you hire a taxi, insure that meter is reset and pay meter rate only for entire car.

e. Train service

f. Commercial air line

g. Abundance of Army transportation, all types

REGULATION GAME SHOOTING AND HUNTING IN INDIA

1. Permits:

a. Enlisted men are required to obtain shooting permits from the C.O. of the area in which shooting is to be done, or from headquarters at which he is stationed.

b. Officers are not required to obtain permits but will familiarize themselves with all restrictions contained in permits issued to enlisted men.

c. Unit commanders will adopt regulatory measures and control to prevent indiscriminate shooting of weapons, not

in the line of duty. Care must be exercised by all to avoid injury to personnel or damage to property.

2. Licenses, Civil:

a. Both officers and enlisted men must obtain hunting licenses from civil authorities if required by local laws to do so. Every person who engages in game shooting or a hunting trip shall comply with all civil restrictions and regulations applicable in the particular area.

b. Shooting of game is not permitted within 500 yards of any populated area, cultivated area, or area adjoining same if within the maximum range of weapon, or within the immediate vicinity of any barracks or military camp.

SECTION I

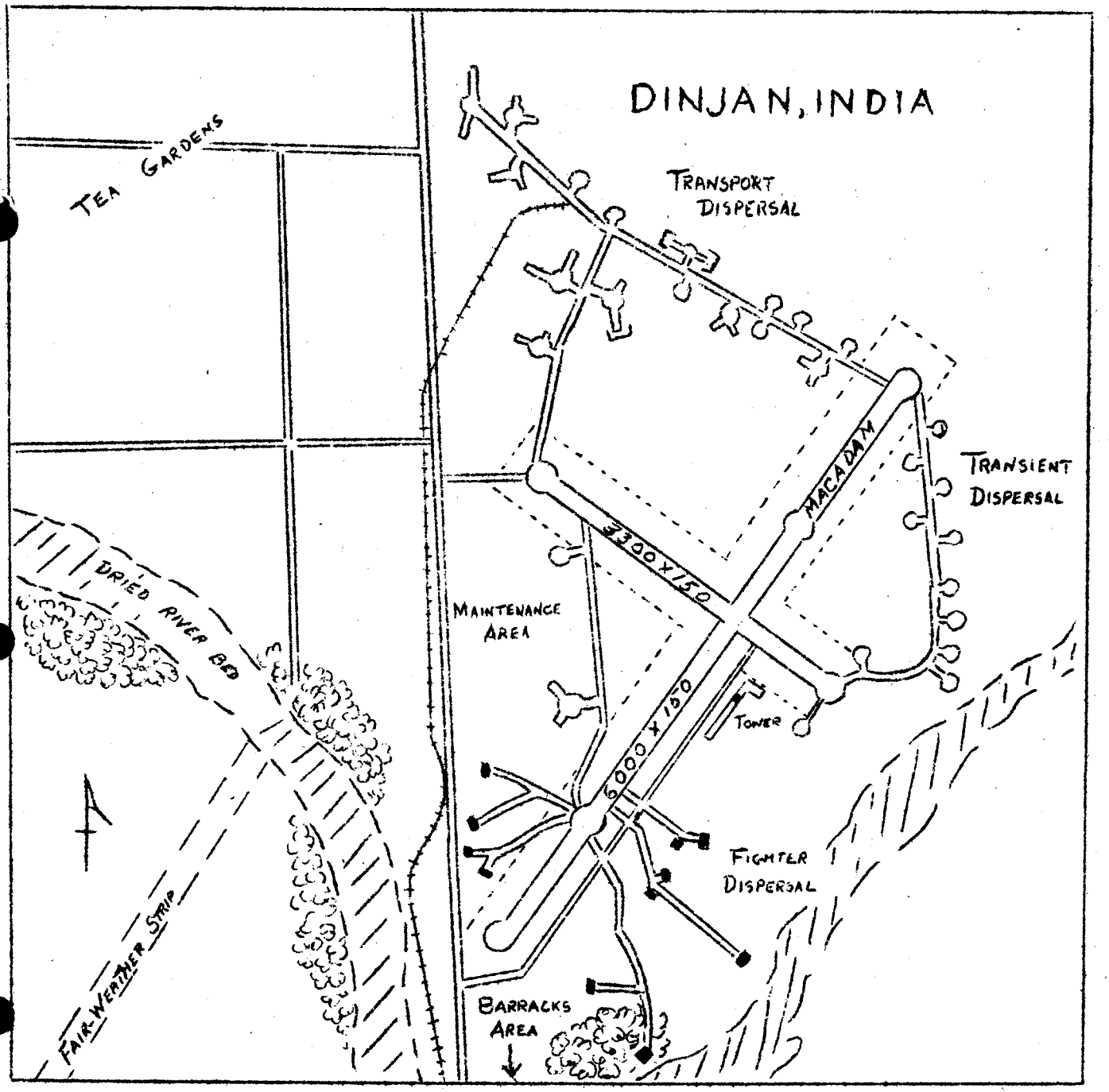
PILOTS

NAVIGATORS

AND

GLIDER PILOTS

TYPICAL AIRDROME INSTALLATION



AIRDROMES

A. TYPES.

1. India-Rear Zone Bases.

a. Permanent type airdromes located near large cities and forward strategic areas.

b. Auxiliary airdromes of permanent construction spaced at regular intervals along the various air routes in the interior.

2. Eastern India And Northern Burma.

a. Temporary landing grounds in open fields.

b. Jungle strips.

3. China.

a. Permanent airdromes near large cities.

b. Auxiliary landing grounds in the forward areas.

B. FACILITIES.

1. Runways and Taxi Strips.

a. Permanent Fields in India. - One or more runways varying from 4000' to 6500' in length, and usually 150' in width. All strips and runways are constructed of brick, concrete, asphalt or macadam and several fields have steel mats.

b. Auxiliary Fields in India. - One hard surface runway, 5000' to 6500' in length, and some taxi strips.

c. Temporary Fields in CBI - Open fields on hard ground, some with packed gravel, oil and tar.

d. Jungle Strips. - Narrow strips, short fields varying from 2000' to 4500'. Soft ground in wet weather, some strips unusable for twelve hours after heavy rain.

e. Fields in China. - One runway and, if space permits, an open field for multi-direction take offs and landings in dry weather. Runways built by hand labor of Chinese coolies, crushed

rock and packed, good in all weather but taxi strips usually soft after rain. Most bases in Western China are located within valleys from 5000 to 8000 feet MSL, surrounded by mountains from 3000 to 4000 feet higher.

2. Parking Areas, Revetments and Hangars:

a. Some permanent fields have one or two hangars for repair work, no storage facilities.

b. Other fields in China and India have dispersal area or parking areas adjacent to the landing strip or within the field if dry ground exists.

c. Jungle strips are restricted for parking more than four or five aircraft at one time, unless a cleared dry rice paddy is located adjacent to the strip.

d. Most fields in operational zones have revetments.

3. Maintenance, Repair and Supply:

a. China.

(1) Limited repair and engine change facilities.

(2) Supplies flown in from India when needed, limited stock on hand.

(3) Since opening of Stilwell Road (Ledo-Burma), the Service Command has extended facilities in China for service and repair. However, excess equipment is slow in arriving in China.

b. Burma.

(1) Limited facilities.

c. India.

(1) All major overhaul accomplished at air repair depots in the interior, Bengal, Tezgon, Agra and Jorhat.

(2) Squadron supply for routine maintenance complete. All supplies requisitioned when needed for replacement; as: wing tips, engines, flight instruments, etc.

4. Servicing:

a. Aircraft engines should be run at 10% less HP than normal due to poor quality of fuel gasoline [illegible] for an emergency.

b. China.

(1) Gasoline is scarce and equipment for delivery usually inadequate, consisting of hand pumps, or 400 gallon capacity trucks.

(2) Enough gasoline will be taken when leaving India to complete round trip without drawing on China supply.

c. Burma.

(1) Gas and oil is flown in as needed.

d. India.

(1) Bases controlled by RAF.

(a) Old equipment in use, servicing very slow.

(b) Gas and oil plentiful on permanent bases. Limited on operational bases to units stationed there.

(2) Bases under USAAF.

(a) Modern equipment, quick service.

(b) Locally refined 90 octane used by transport type aircraft.

(c) Supply of 100 octane limited and for use of fighters and bombers only.

C. ACCOMMODATIONS.

1. All permanent and operational bases will have facilities limited in some instances, for mess, billets and hospitalization.

2. Forward areas have limited accommodations for transients.

3. Recreation and entertainment. (See Page 8, "Recreation and Entertainment".)

D. CONTROL TOWERS.

1. Pilots are required to request tower clearance for all movements of aircraft. This procedure is necessary for avoidance of accidents and congestion.

a. Permanent airdromes have towers completely equipped with radio, lights, and flares.

b. Most fighter bases have no tower facilities and traffic is left to the pilot's discretion.

c. Auxiliary strips have limited facilities, usually light signals and flares.

d. Control may be administered by single aircraft on VHF (SCR 522), during emergencies, or as in sustained operations.

2. Tower exercises complete control over all aircraft taking off, landing and taxiing. Stay tuned and/or observe tower until parked. Command (SCR 274) or any standard equipment can be used for communication.

3. Ground crews on many airdromes assume control after aircraft lands and clears the runway, by directing to parking area, dispersal or revetments, and assist in parking by using standard hand signals, flags or signals at night.

E. SIGNALS.

1. In order to make proper use of RAF controlled airdromes, American pilots must understand British communication procedure, interpretation of the signal area and visual signals for day and night control. Some British controlled airdromes have no radio control for local flying. Other airdromes, controlled by American personnel, use standard signal facilities when and if available. Local regulations obtained from briefing, operations, intelligence, and the air control officer, will apply as directed. Radiotelephone procedure will be in accordance with FM 1-46, FM 24-9 (CCBP-3), TM 1-460, and CCBP 11-2. Radiotelegraph procedure will be in accordance with FM 24-10, FM 24-13, CCBP-7 and TM 11-454. The "Pilots Information File" is an additional reference and contains pertinent radio procedure.

2. Radio:

a. All types of call-ups, air-ground, whether normal or shortened, should contain the aircraft call sign in order to insure clarity of instructions.

b. Spell out peculiar words by using the phonetic alphabet.

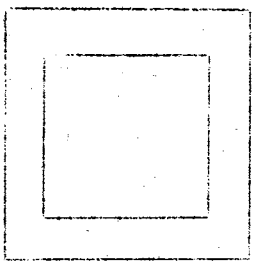
c. Do not repeat unless requested to do so.

d. Make all calls short and concise.

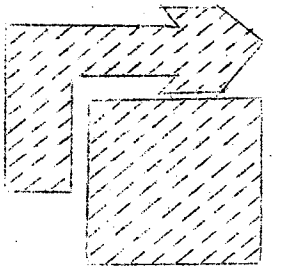
3. Ground Signals:

a. India - British system on RAF fields only.

(1) A signal area is located adjacent to the control tower on the ground, or on the roof of a nearby building. Various signals are displayed within, which give aircraft instructions for landings. The signal area measures forty feet inside measurements and is bordered by white strips of cloth or wood.



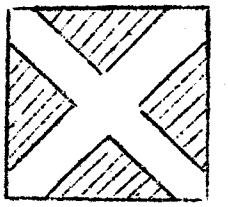
(2) (a) A red square ten feet by ten feet in one corner of the signal area indicates RAF rules for landing are in force and a left hand pattern or circuit will be made.



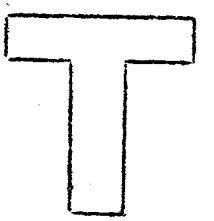
(b) If there is a red arrow along two sides it will indicate that a right hand pattern or circuit will be made.

(3) (a) A yellow strip placed diagonally upon the red square will indicate obstructions on the field. "Land with care and caution."

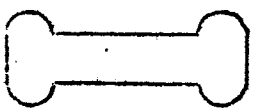
(b) Two yellow strips crossed diagonally on the red square will indicate that no landings are to be made.



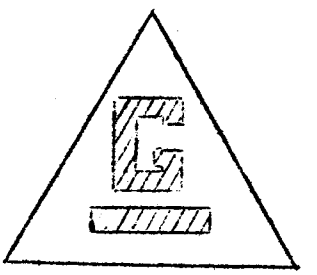
(4) A white "T", 6-1/2' x 6-1/2' will be displayed in the signal area and at the beginning of the runway in use, indicating direction of landing.



(5) A white dumbbell indicates that "runways only" will be used for landing.

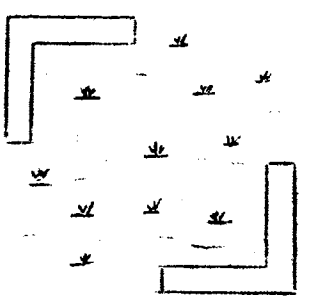


(6) (a) A solid white equilateral triangle with a red "G" in the middle denotes a gas attack. You may land and taxi upwind to await further instructions.



(b) However, if there is a red bar below the "G", landing is forbidden, as gas has not cleared the field enough.

(7) Obstructions on the field will be indicated by yellow or red flags during the day and red lamps at night. Unserviceable portions of the field will also be indicated by white "L" strips of wood or cloth and red flags around the bad ground.



b. India-Burma-China; American system.

(1) Wind sox displayed near control tower.

(2) Landing "T" displayed near the runway in use showing direction of landing. Illuminated at night on some airdromes.

(3) Obstructions marked with red flags and red lamps at night.

(4) Pertinent information concerning field conditions given by radio from the control tower.

(5) Daily coded communications sent to all units via teletype and/or radio, with detailed information concerning partially serviceable fields and new obstructions, etc.

4. Light Signals - Standard method of control with use of Aldis lamp or Very pistol.

a. Aldis Lamp.

(1) Red, steady - Do not land.
Stop taxiing.

(2) Red, flashing - Return to parking ramp.

(3) Green, steady - Clear to land.
Clear to take-off.

(4) Green, flashing - Continue taxiing.

b. Very Pistol.

(1) Green from A/C - request permission to land.

(2) Green from ground - permission granted to land.

(3) Red from ground - permission denied for landing.

c. Additional Signals.

(1) Information for additional light signals at individual airdromes will be supplied by briefing officers and cross-country hand books which are available within the theater.

d. Recognition Signals.

(1) Aircrews will make full use of approved recognition signals (colors or letter of the period by lamp signal or pyrotechnic). Recognition to be given when:

(a) Mistakenly engaged by friendly A.A. defenses.

(b) Challenged in flight over restricted areas.

(c) Investigated by fighter aircraft.

(2) At night the pyrotechnic signal can be seen in good visibility up to twenty miles away. It's use by night is liable to give away the color combination of the period to the enemy. Therefore this type signal will not be used at night unless:

(a) Downward recognition light has been used without avail, and

(b) the aircraft is threatened and the use of the Very pistol is necessary for its safety.

F. FIELD LIGHTING.

1. India.

a. Permanent Airdromes.

(1) Runway lighting - permanent and portable type.

(2) Beacon - revolving type.

(3) Obstruction Lighting.

(a) Permanent red lights on high buildings, telephone poles, etc.

(b) Red lamps on ground obstructions.

(4) Taxi-strips - limited lighting.

(5) Floodlights - on some airdromes.

(6) Landing "T" - illuminated on some airdromes.

(7) Line up lights - for take-offs and approaches on some airdromes.

b. Auxiliary Fields.

(1) Runways - flarepots and lamps.

(2) Obstructions - limited lighting.

c. General.

(1) All lighting controlled from control tower.

(2) Fields without permanent installations usually set up a flare path before dark each day. Within a few minutes notice an alert crew can effect illumination.

2. Burma.

a. Jungle Strips.

(1) Runway - Outlined with brush fires, string of flare pots or lamps along one side of the strip. Automobile headlights also used if available.

(2) Portable Equipment - If field is to be used for extensive night operations, necessary lighting equipment can be supplied from rear bases.

b. Some permanent airdromes with good facilities.

3. China.

a. Permanent Airdromes.

(1) Runways - portable lighting.

(2) Obstructions - permanent and temporary lighting.

(3) Floodlights - on some bases.

b. Auxiliary Landing Grounds.

(1) Runways - flare pots, lamps or brush fires.

(2) More complete lighting aids available at some fields in the form of portable runway lights and obstruction lighting.

FLYING REGULATIONS AND RESTRICTIONS

Controlled flights are essential throughout the CBI Theater.

1. Heavy cross country traffic demands observance of all safety procedures and regulations and use of all facilities available.

2. Combat areas require stipulated procedures for positive detection of enemy aircraft. Fighters and anti-aircraft are on the alert constantly.

3. Formation flights are not to be engaged in unless cleared through proper clearance authority before departure of proposed flight.

4. Complete information on procedures and regulations is obtainable upon entry into the theater from briefing and operations officers and through written material in the form of hand books which are constantly brought up to date.

A. ALERTS.

It is a peculiarity in China and India, that the civilian population seem to have a "sixth-sense" whenever an aerial attack is about to begin. Minutes before an alarm is sounded the native people can be seen running away from military objectives and cities, heading usually for the open tea plantation and surrounding hills. They are a good signal in that you can expect an alert shortly afterwards. Proper precautions should be heeded at all times in combat and forward areas.

Wear your helmet.

Take care of your gas mask and have it within reach.

Know the location of the nearest slit trench or suitable cover.

All airplanes in areas of probable aerial attack will at all times be alerted by at least one pilot.

1. Warning Signals.

a. Air Raid Alert.

In anticipation of an attack the following signals or combinations of signals are to be expected throughout CBI.

(1) Siren.

(2) Anti-aircraft gunfire, three rounds repeated.

(3) Red sphere of cloth or paper hoisted in conspicuous area.

(4) Telephone, notification to units of probable attack.

(5) Radio, to airborne aircraft - with instructions.

In China warnings are received about an hour before an attack on rear bases. In forward zones warning is usually very short. China incorporates a system of three red balls (approximately 2-1/2 feet in diameter) displayed in a conspicuous place on the airfield. The usual employment is:

(1) One ball alert - enemy aircraft within 150 miles.

(2) Two ball alert - enemy aircraft within 75 miles.

(3) Three ball alert - enemy aircraft within 30 miles.

b. Gas Alarm.

(1) Constructed of material that will give sufficient warning volume to cause an alarm when hit with a striker.

(2) This type not used for any other alarm system.

(3) Alarm given by gas sentinel or any person detecting gas. Alarm will be sounded for two minutes.

2. Procedure.

a. When alerted, personnel will take cover in previously assigned slit trenches or shelters.

b. Valuable records and equipment will be placed in as safe a place as possible.

c. Transportation will be removed from the airdrome if there is time.

d. Aircraft not under repair or in revetments will have been alerted by at least one pilot and will take off immediately, giving fighter type aircraft right of way. Upon taking off they will fly in a predesignated direction at tree top level, remaining tuned to the ground radio station for further instruction.

3. Control.

a. Fighter Control Room - "Movements" or "Filter Room."

(1) Has knowledge of all aircraft movements and positions of unidentified aircraft.

(2) Telephone communication with all nearby bases and anti-aircraft units.

(3) Controls and directs fighter type aircraft for interception and inspection of unidentified aircraft.

(4) RAF and USAAF control systems are similar.

b. Ground Stations.

(1) Located in strategic areas and remain in operation throughout the alert.

(2) Notifies, by general call, all ships within range of radio, giving all pertinent information in code.

4. Plotting.

a. Fighter control maintains plotting boards in all areas along the front and as far to the rear as enemy action may be expected.

b. Plotting room receives information on all flights terminating at, passing through, or leaving their assigned area, and each ship in flight is noted and plotted.

c. Information on all aircraft is obtained from the following:

(1) Operations on all bases.

(2) TWX from communications sections.

(3) Air Raid Warning Stations.

(a) Visual positions.

(b) Radar positions.

d. All questionable plots are investigated immediately by fighter patrols in that area.

e. IFF is used in all forward areas. (See Page 44, "IFF")

f. China employs an air raid warning net which extends

into occupied territory. Enemy aircraft have been detected upon taking off from their home bases.

5. Ground Defense.

a. Anti-aircraft units, both British and American, are employed in India and Burma. China has very limited defense from the ground. Most advance bases use .50 caliber MG for protection against strafing aircraft.

b. Strategic areas in India such as oil fields, dock areas, military installations, and airdromes are well defended.

c. Balloon barrages are used extensively near dock areas.

d. Bomb shelters in China consist of caves in nearby mountains and slit trenches. In Burma, slit trenches are available. In India sandbag fortifications, slit trenches and bomb blast shelter-walls of reinforced concrete have been constructed.

B. Local Flying Regulations at Airdromes.

1. Left hand pattern at all times, making a complete circuit of each airdrome before landing. Exceptions are:

a. Authorization by control tower to make right hand pattern.

b. Signals (RAF) displayed in the signal area authorizing right hand pattern.

2. Approach airdrome for identification before buzzing. Permission required at most airdromes.

3. a. Pilots are required to request permission to land or take off. This will be done by radio whenever possible, unless radio silence is desired. In that case light signals will be used.

b. If no response is given to your request for landing instructions either by radio or signal, see that landing area is clear, then proceed to land without delay.

4. Stay on runways and taxi strips unless otherwise directed by ground personnel.

5. Further restrictions and regulations applicable to individual airdromes are received from briefing in the theater.

C. Obstructions and Restricted Areas.

1. Balloon Barrage.

a. Located at docking areas near coastal cities of India.

b. Flown during daylight hours at altitudes from 400' to 3000 feet.

c. Lowered during inclement weather or haze.

d. Location and local procedure received from briefing.

2. Calibration Balloon - guaging anti-aircraft elevation and azimuth.

a. Flown within traffic patterns, near gun installations.

b. Altitude varies from 400' to 800'.

c. All units notified of obstructions through briefing.

3. Corridors - Air routes through restricted areas.

a. Specified altitude, usually a maximum of 1500'.

b. Wheels down.

c. Corridors plainly marked upon some maps received in the theater.

d. Details received from cross country handbooks or briefing.

4. Anti-aircraft.

a. Positions near all airdromes, military installations, oil fields, etc.

b. Several days prior to practice firing all units are warned. Details consist of time of firing, arc of fire, height of bursts, and limit of fire.

5. Restricted Area.

a. Have "colors of the day" or identification letters ready upon being challenged. Very pistols, recognition lights, or Aldis lamps are used.

b. Continue in straight and level flight and lower undercarriage. Avoid violent movements or evasive action.

6. Birds.

a. Huge vultures and chicken hawks in large numbers are to be found in India. They are a serious impediment to aerial flight and can be found flying from ground level up to seven and eight thousand feet.

b. By remaining alert, these flocks and the individual bird can be avoided. Contact with them causes serious damage to aircraft. There have been cases of windshields being shattered and broken, and aircraft engines knocked out of commission.

c. Extreme caution must be observed on landings and take-offs as runways seem to be their favorite "playground".

d. It is believed that these birds have "no night flying aids or facilities" and are "grounded" after sundown.

7. Unusual Weather.

a. Cloudbursts may close some fields for periods of approximately thirty minutes. Do not attempt a landing under these conditions. Either wait it out or go to an alternate field.

b. Vertical currents will be encountered over the "Hump." Approach all the high ridges at an angle which will allow a rapid pull-away; then if the downdrift becomes too strong, a retreat in good order can be accomplished.

c. Nor'westers - India.

(1) Occur during March, April and May.

(2) Commencement of Nor'westers brings rising dust and reduces visibility, horizontally and vertically, to zero.

(3) Frequently accompanied by hail large enough to damage aircraft.

(4) Vertical currents are quite high and horizontal winds have been registered up to 100 MPH.

d. Monsoon - China, Burma, India.

(1) SW monsoon from June through September, periods of zero visibility, heavy thunderstorms and severe turbulence.

e. Dust and Haze - India, Northern China, Central Burma.

(1) During summer months dust raising winds are frequent, resulting in poor visibility.

(2) Dust usually remains in atmosphere several days after winds dissipate.

(3) Haze in Burma and parts of India is very dense in the pre-monsoon season, rises to 12,000 feet and restricts visibility to one-fourth mile.

f. Fog.

(1) During winter months fog is common before sunrise.

(2) Generally dissipated by midmorning.

D. Cross Country Flight Procedure. India, trans Burma and China.

On all local or cross country flights, the pilot is responsible to see that all crew members are properly briefed and that all necessary equipment is on hand. Check with the following sections:

a. Intelligence - escape aids, latest information on the enemy.

b. Briefing - maps, facilities, conditions and obstructions along the route.

c. Weather - latest and forecast weather on route.

d. Communications - alaco, codes, colors and letters of the day.

e. Operations - final clearance and instructions.

1. Clearance of Flights - Non-operational.

a. The aircraft clearance form is completed in duplicate before A/C is permitted to take off on any cross country non-operational flights from bases controlled by the Air Transport Command. Clearing from RAF bases and Chinese fields, the pilot will sign out in a Pilots Register.

b. Pilots will make sure that all equipment is aboard. Very pistol and cartridges, emergency equipment, maps, codes, radio, etc.

c. The operations section will see that all information required by crew members is available for their use.

d. New clearance obtained at each non-operational station at which the aircraft lands. After a delay of more than one hour beyond ETD, a new clearance will be obtained and filed.

e. Original clearance form carried by pilot and turned in at destination station. Duplicate kept on file in operations at departure point.

f. Operations will dispatch a departure message to destination station using AACS facilities and telephone a coded message to Fighter Control and Movements.

g. Station of destination initiates investigation on overdue aircraft.

2. In Flight.

a. Personnel must know the RAF and USAAF facilities and services available to assist aircraft; how to request them, how to use them after obtaining them. Material from briefing and cross-country handbooks is complete and detailed in this respect.

b. All aircraft enroute will check in over predesignated position reporting points along the various air routes by calling AACS stations. (See Page 38 -- "Position Reports." Also Page 39 -- "Off Route Position Reports.")

c. Flight plans are strictly adhered to. Flying is going on twenty-four hours a day and the regular air routes are crowded with air traffic.

d. Weather is broadcast at regular intervals in Alaco and upon request in an emergency.

e. Standard flying safety procedures and regulations are followed closely to eliminate avoidable losses.

f. Navigation lights illuminated on all night flights, except those flights in combat areas.

g. If overdue at destination more than fifteen minutes, request a QDM immediately from nearest DF station.

E. LOST AIRCRAFT.

1. China Area.

a. Aircraft lost in the China area will call the nearest DF station requesting bearing on frequency assigned for that purpose.

b. As soon as the request for a bearing is given and until it is received, the pilot will fly a box pattern on definite headings, two minutes to each leg.

c. The pilot will receive a bearing from the DF station first contacted. Any cross bearing taken by other DF stations will be relayed through the first station to the pilot.

d. In an emergency, an attempt will be made by Air Traffic Control to fix the lost aircraft's position by means of the China Fighter Net, provided the aircraft has visual contact with the ground.

(1) To function effectively, the pilot must fly a circle pattern over the nearest town or village (the larger the better).

(2) Ground observers will communicate via telephone with the Fighter Net giving the position of the circling aircraft. These observers are located in or near all populated areas.

(3) Aircraft will circle as low as safety permits.

2. Bengal Area, India.

a. When in doubt regarding your position and correct course to destination, contact the closest US or RAF ground radio station requesting homing or bearing information.

b. In this zone of operations, additional navigational aid is available through the use of RDF (Radio DF) and visual air warning installations.

(1) An altitude of 5000 feet to 6000 feet should be maintained to give satisfactory indications to the RDF.

(2) All flights in this area, when in range, are constantly plotted at the US and RAF filter rooms.

c. To obtain assistance.

(1) Call nearest US ground station and request homing transmitter be turned on.

(2) For a bearing, contact a US ground station which will call RAF through filter room for necessary procedure.

(a) Pilot may be instructed to fly in a five to ten mile wide circle for RDF recognition.

(b) Plane must be in range of RDF or AW stations.

(c) Correct position and course to destination will then be given to aircraft.

(3) If unable to obtain assistance as in (1) and (2), aircraft will contact nearest civil or RAF ground station with DF facilities and request bearings.

(4) Facilities at all stations are listed in various facility books and handbooks available in the theater.

(a) Use correct procedure.

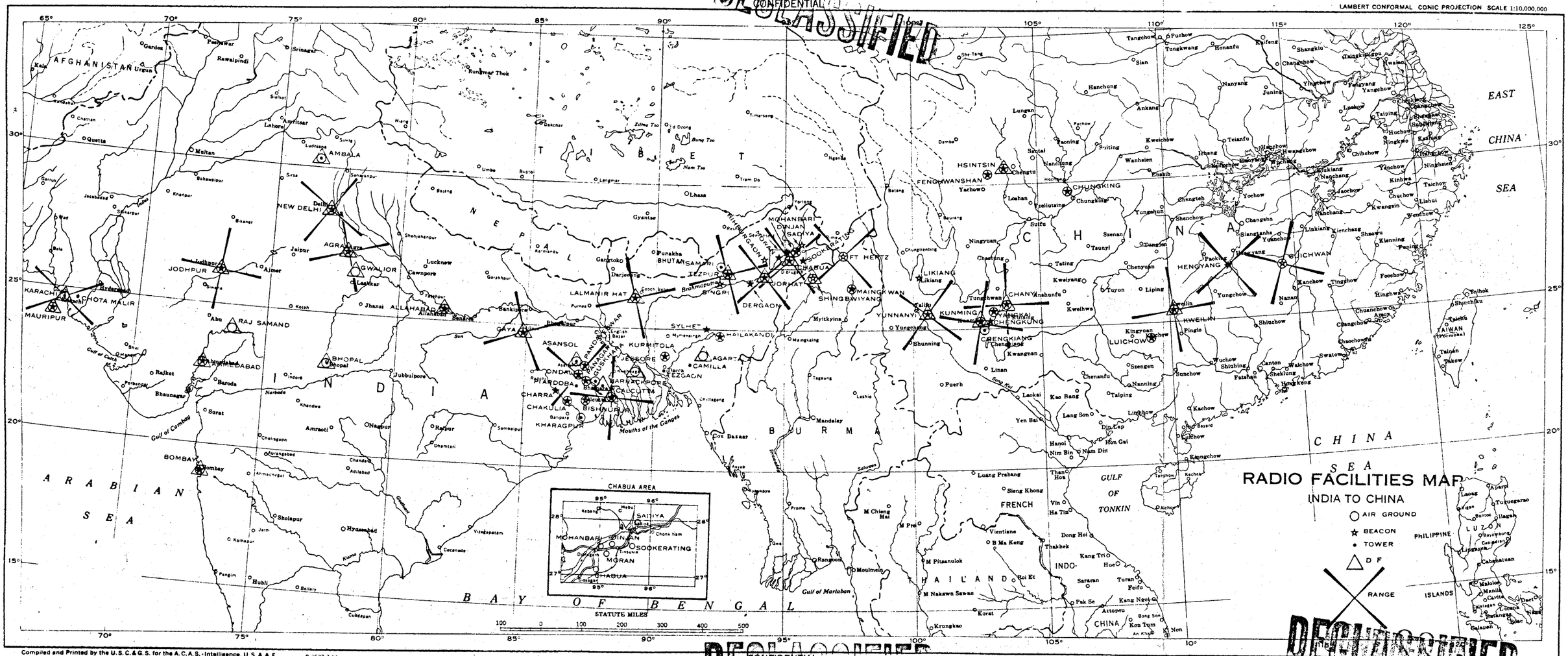
(b) Be prepared to authenticate request if challenged by the station.

3. Radio Equipment.

a. VHF DF found to be very accurate for distances up to seventy-five miles.

CONFIDENTIAL

LAMBERT CONFORMAL CONIC PROJECTION SCALE 1:10,000,000



RADIO FACILITIES MAP
INDIA TO CHINA

○ AIR GROUND
★ BEACON
• TOWER
△ D F
RANGE

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PHONETIC ALPHABET

The following phonetic alphabet is used extensively in radio communication with RAF and USAAF stations in voice.

A	Able	N	Nan
B	Baker	O	Oboe
C	Charlie	P	Peter
D	Dog	Q	Queen
E	Easy	R	Roger
F	Fox	S	Sugar
G	George	T	Tare
H	How	U	Uncle
I	Item	V	Victor
J	Jig	W	William
K	King	X	X-Ray
L	Love	Y	Yoke
M	Mike	Z	Zebra

RADIO FACILITIES

A. Communication.

1. Ground Stations - AACS has in operation complete radio facilities for control of twenty-four hour per day air traffic in India and over the "Hump" to China. In addition, RAF units using British equipment within India, maintain their point to point radio and unit control stations in coordination with AACS.

a. Net.

(1) Stations located on all permanent bases and several positions in Burma.

(2) Departure messages passed through net to destination station.

(3) Emergency messages in code are also relayed.

(4) Communication on several frequencies in voice and CW.

b. Control Points.

(1) Selected stations at regularly spaced intervals.

(2) Clearance given to A/C to proceed on flight plan to next Control Point.

c. Position Reports.

(1) Position reports will be made at specified position reporting points under CFR, as well as instrument conditions using the following procedure.

(a) Radio call sign of aircraft.

(b) Time over reporting point in GMT, actual or estimated.

(c) Reporting point by number.

(d) Altitude (in thousands of feet).

CONFIDENTIAL

Change No. 1
16 Feb 1945

EXAMPLE: "Victor George Tower - This is King Seven Able - Time one zero three four - Passing Number one five - At eight thousand - Over".

(2) The pilot will be responsible to give the radio operator the necessary information if he is handling the transmission.

(3) Necessary instructions, if needed, will be given to the aircraft by the station called.

(4) Reporting points are numbered within the CBI and are available from briefing offices.

(5) If no contact is made after two calls, the message should be transmitted just as though contact had been established, and should be repeated once again after a 3 to 5 minute interval.

d. Off Route Position Reports.

(1) Hourly reports will be made using the procedure outlined in c (1). In addition if no check point number available, the time away from point of origin, indicated air speed, and the statement "on course" will be given.

(2) Reports are made to AACS stations at point of departure until a point halfway to the station of destination is reached. When contact with destination station is made, station of origin will be advised so no further reports will be expected at that station.

(3) If contact cannot be made with aforementioned stations, messages will be given to any AACS with the information "Relay to ______________ (appropriate station)".

e. Weather Reports.

(1) Alaco is used and changed daily for security.

(2) Collective weather reports given at hourly intervals by Control Points, also upon request from control towers.

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f. Advisory Service from Control Point.

(1) Aircraft are warned of alerts along route and given appropriate procedure to follow.

(2) Information on new conditions or changes since flight departed are given.

(3) Requests passed to aircraft. For instance, maintain lookout for overdue aircraft, or pass information to other aircraft out of range of station radio.

2. Control Towers. (See Page 17 "Control Towers" and Page 18, "Signals"., Also Page 28 - "Control Towers").

3. Squadron Communication.

a. All tactical units have individual ground stations on assigned frequencies, maintained by squadron communication section.

b. Maintains contact with aircraft on missions and supplies coded information of tactical advantage, such as alerts, plotting of unfriendly aircraft if liable to interfere with success of mission, general recall to base, change of target, etc.

4. Radio Silence.

a. Employed to a great extent on all missions for security.

b. Restrictions vary between different units in accordance with the type mission engaged in.

5. Code.

a. Very little plain language used and codes are changed frequently. Different codes are available from briefing officers.

b. Cross-country code used with AACS stations. Incorporates all useful phrases and important words likely to be used in ordinary communications. Changes every four days.

c. Alaco code changes daily.

d. Additional codes are maintained by tactical units for security and success of missions.

~~CONFIDENTIAL~~ SAMPLE

[redacted]

CHINA CROSS COUNTRY CODE
EFFECTIVE: 0001 HRS., 28 FEBRUARY TO 2400 HRS., 3 MARCH
SERIAL NUMBER CH ISSUED BY COMM., 14TH USAF

(33) INSTRUCTIONS

33 CHARLIE	May I land now?
33 LOVE	I am taking off
33 QUEEN	Take off
33 DOG	What is your/my position
33 OBOE	My position is --
33 VICTOR	Send support to -
33 EASY	Target of opportunity
33 NAN	--- Ship(s) return to base and land
33 YOKE	Return to designated position
33 FOX	Planes stand by over base
33 JIG	Bombing raid: stay clear
33 ABLE	I have made forced landing near ---
33 ZEBRA	Stand by for further orders
33 BAKER	Land at ---
33 TARE	Investigate plots
33 HOW	We are sending support to ---
33 GEORGE	All clear
33 UNCLE	Raiders near: stay clear

(38) HOMING AND PX

38 SUGAR	E.T.A.
38 FOX	Turn on homing
38 DOG	PX me to ---
38 MIKE	Turn on DF
38 VICTOR	Give me a bearing
38 WILLIAM	Turn on radio range

(20) DIRECTION

20 CHARLIE	North
20 ITEM	South
20 LOVE	East
20 HOW	West

(31) WEATHER

31 XRAY	What is WX?
31 DOG	WX bad: don't come in
31 VICTOR	WX closing in
31 ITEM	WX improving
31 OBOE	WX very good
31 GEORGE	Which direction from your station does WX appear to be best?
31 ABLE	Has there been any change in the WX?
31 QUEEN	Give wind direction

(25) CLOUDS

25 PETER	Are base of clouds or overcast in contact with mts near your field?
25 MIKE	Are there any holes in o'cast near or over your field?

(37) FIELD CONDITIONS

37 BAKER	What are field conditions
37 PETER	Field closed: don't land here. Land at ---
37 TARE	Bomb holes on runway
37 OBOE	Field conditions good
37 FOX	Use runways only

(47) TIME OR NUMBERS

47 KING	Ø hours
47 VICTOR	1 Hour
47 BAKER	2 Hours
47 JIG	3 Hours
47 DOG	4 Hours
47 PETER	5 Hours
47 GEORGE	6 Hours
47 QUEEN	7 Hours
47 LOVE	8 Hours
47 NAN	9 Hours

(47) TIME OR NUMBERS (contd)

47 OBOE 5 Minutes
47 ABLE 10 Minutes
47 YOKE 15 Minutes
47 CHARLIE 30 Minutes
47 FOX 45 Minutes

(46) TYPES OF PLANES

46 ZEBRA Bomber(s)
46 JIG Pursuit Plane(s)
46 UNCLE Transport(s)

(42) MISCELLANEOUS

42 OBOE Yes
42 SUGAR No
42 WILLIAM Unknown
42 NAN Where do I refuel
42 YOKE Refuel at ---
42 ZEBRA Do you have a mission out?
42 LOVE Is there a patrol up at your station?
42 KING Brass aboard
42 CHARLIE Major repair needed upon landing.
42 FOX Minor repair needed upon landing.
42 ABLE How many HRS/MINS fuel have you left?

(22 & 23) STATIONS

22 SUGAR Chan Yi
22 YOKE Chengkung
22 ABLE Chengtu
22 PETER Chihkiang
22 XRAY Chungking
22 MIKE Fungwangshaw
22 JIG Hengyang
22 DOG Kanchow
22 LOVE Kunming
22 QUEEN Kwangnan
22 HOW Kweilin
22 WILLIAM Lingling
22 EASY Liuchow
22 VICTOR Hsinching

23 KING Mengtsz
23 SUGAR Namyung
23 OBOE Nancheng
23 FOX Nanning
23 TARE Paoching
23 BAKER Peishiyi
23 ZEBRA Suichwan
23 ITEM Szemao
23 YOKE Tsuyung
23 LOVE Yangkai
23 PETER Yunnanyi
23 VICTOR Tapansau
23 EASY Wenkiang

EXAMPLE:

Body of message, using the Cross Country Code. Used with Air-Ground Stations and Control Towers.

A/C to Gd - "38 DOG, 22 ABLE". (PX me to Chengtu)
Gd to A/C - "First three words 33 DOG, 38 SUGAR" (What is your ETA)
A/C to Gd - "38 SUGAR, 47 BAKER, 47 FOX, 22 ABLE".
(ETA, 2 Hours, 45 Minutes, Chengtu.)
Gd to A/C - "Roger and out".

B. Navigation Aids - Radio facilities for navigation aids are being improved with more equipment being supplied to the theater.

1. Airways, Radio Range.

a. Standard four leg ratio ranges at AACS Control Points.

b. Operates upon request during daylight hours, continuous at night.

c. Effective limit of range reception changeable due to atmospheric conditions and terrain.

2. Homing - Automatic Direction Finder, Radio Compass.

a. Facilities available at most bases.

b. Caution - The enemy has employed radio beacons for homing to mislead lost personnel. Very hard to detect as they are on the same frequencies and use the same signal characteristics as our stations do. Double check with other homing facilities before using indications.

c. In case of breakdown or of Homing Beacon power failing, aircraft in flight will be notified of same and given notice of any other facilities available to assist them if so desired.

3. Direction Finder.

a. British.

(1) Bearings taken upon request after identity established.

(2) See Section II - Radio Operators for procedure.

b. American.

(1) Requested through AACS Control Points.

(2) Procedure and instructions given by AACS to aircraft at time of distress.

c. Employment. (See Page 34 - "Lost Aircraft")

C. Equipment.

1. Command Set.

a. SCR-274.

(1) Air-ground communication.

(2) Plane to plane communication.

(3) Receive radio navigation signals.

b. SCR-522 (V.H.F.)

(1) Plane to plane communication.

(2) Air-ground communication where equipment is available.

2. Liaison Set. SCR-287 (Voice or CW)

a. Communications with AACS.

b. Communications with Troop Carrier Channels.

c. Communications with British DF and Ground Stations.

3. Radio Compass. SCR-269.

a. Homing or bearings on LF radio beacons.

b. Auxiliary receiver for LF transmissions.

c. Bendix Radio Compass installed on some aircraft, which covers LF and MF bands.

4. IFF.

Certain zones are established where IFF must be turned on. These boundaries are changing from time to time and local briefing will dictate procedure to be followed. IFF is not used over enemy occupied territory. The enemy has equipment with which they can "home in" on your IFF. Whenever leaving India detonators will be plugged in.

5. Rebecca and Babs.

This equipment has been recently acquired within the theater.

6. Radar.

In some sections of CBI, Radar is employed where topographical features permit its use. Plotting of all aircraft arriving in India from China and all other unidentified aircraft movements are detected.

NAVIGATION

A. Maps.

1. Types.

a. Aeronautical Charts 1:1,000,000 are used extensively in CBI. They are published by the AAF Aeronautical Chart Service.

b. Mercator Charts - occasionally used by navigators on extended cross-countries.

c. Photographic Strips - used to supplement sectional maps where great accuracy is needed in a particular area.

d. Quarter inch Sectional Maps covering most of Burma and parts of Eastern India are available upon requisition from A-2 in rear areas. Great detail and very accurate.

e. Half inch sectional - in use for target spotting, ground troops use extensively.

2. Symbols.

a. Standard code symbols used for cities, airports, railroads, etc.

b. Relief shown by contours and tinting.

3. Accuracy.

a. China - Burma area maps are not accurate.

b. Surveys and maps of India are comparatively accurate.

c. Altitudes of mountains are given, either in meters or feet, and may have an error of 3000' in extreme cases.

d. Mountain ranges, rivers, lakes and cities should not be used as check points but may be used to identify an area, particularly applicable in China where surveying has been incomplete and is unreliable.

B. Map Reading.

1. Railroads in India are not good landmarks for often they are covered with dust and are invisible to aircraft in flight.

2. Care must be taken in using rivers as landmarks and check points because during the rainy season small streams in flood may take on the appearance of broad rivers.

3. Check to see if heights of mountains are in meters or feet. Conversion tables are printed on each map.

4. All courses, restricted areas, airports, corridors, and obstructions should be plotted on your maps.

C. Types of Navigation.

1. Dead Reckoning and radio navigation are most satisfactory for navigation in this theater.

2. Pilotage is used as a secondary check.

3. Celestial may be used by navigators on long cross-countries.

D. Flight Plan.

1. Planning.

a. Stress accuracy.

b. Navigators get together and make a single flight plan.

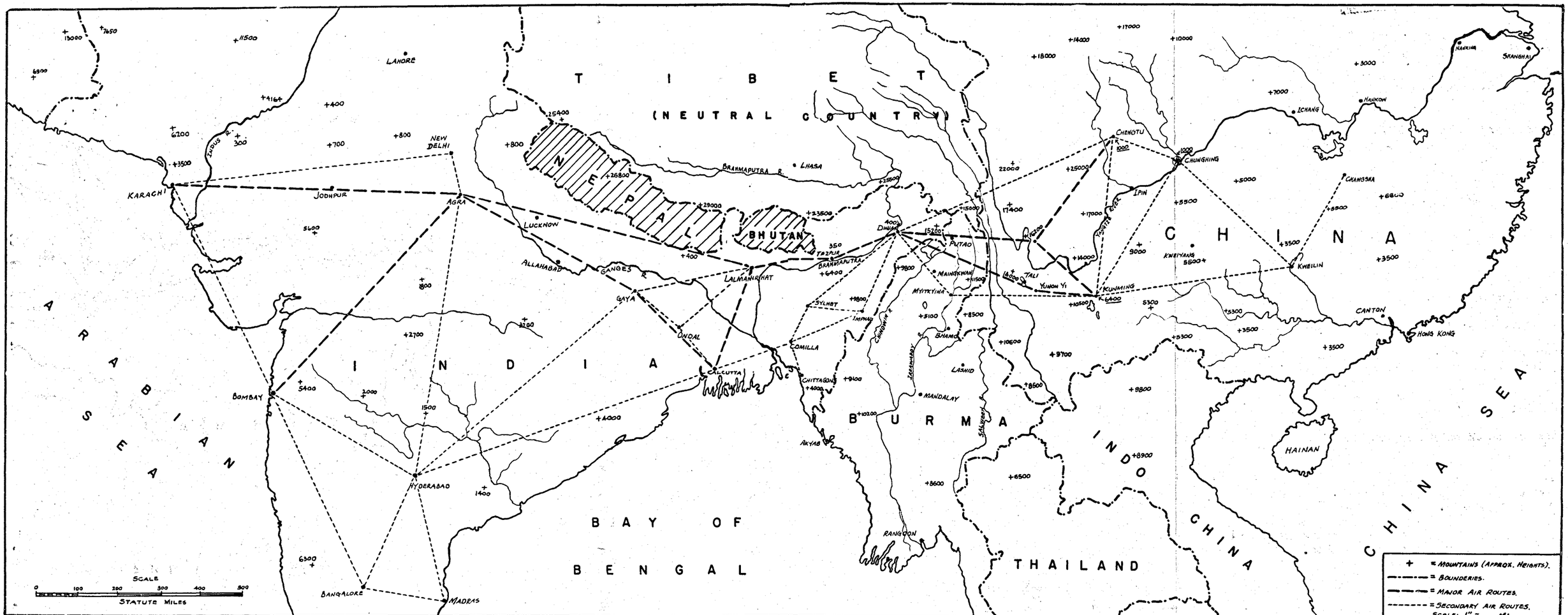
c. Obtain maps to cover entire route of flight plus additional maps covering a wider area adjacent to route to take care of unforeseen changes enroute.

2. Use in Flight.

a. Check off check points as you pass them, making careful note of time.

b. Be conscious at all times of wind changes and make note of drift angle, revising flight plan and ETA whenever necessary to avoid overshooting your destination.

c. Many flights will be made without navigators, so pilots are well advised to keep a flight plan on all flights. A navigator is required on all flights in the interior of China.



OPERATIONAL FLYING

A. Types of Flying - Transport Type Aircraft.

1. Non-operational.

a. Ferrying.

b. Supply.

c. Movements - personnel and equipment.

d. Testing and transition.

2. Operational.

a. Supply - air dropping and landing.

b. Evacuation.

c. Glider tow - airborne invasion.

d. Search Missions.

B. Armament.

1. Flak suits are available to Troop Carrier crew members which cover the back, side and front of the individual.

C. Evasive Action - Enemy interception and attack is probable and to be expected at all times in the operational area. The transport type aircraft can take advantage of natural conditions and precautionary measures to avoid detection and possible attack.

1. Avoid formation flights unless accompanied by fighter escort.

2. Use cloud cover and weather to full advantage.

3. Low contour flying - camouflage will tend to blend in with terrain.

4. Use a crew member as lock-out in the astro dome to avoid surprise attack from rear - he can also report actions of attacking aircraft to pilot.

5. If attacked, avoid a straight away run. Employ violent skidding action and tight turns, etc., toward attacking aircraft.

6. If it becomes necessary to jump from high altitudes, use a delayed fall.

7. Don't hesitate to make emergency landings in clearings and small rivers. Leave aircraft immediately.

D. Coordination With Fighter Aircraft.

1. Briefing.

a. Air Control, Operations, Liaison or Briefing Officers arrange with "Fighter Control" for supporting protection. Patrols, top cover or escort, are supplied when desired on special missions.

b. Details supplied to all transport and fighter pilots at briefing:

(1) Time of take-off and estimated time of flight.

(2) Location of target (destination) and time over.

(3) Route to be followed and alternate in event of weather closing proposed route.

(4) Call signs and total number of aircraft engaging in mission.

(5) Intelligence briefing of enemy activities and weather conditions, etc., supplied when necessary.

2. Communications.

a. Radio silence observed unless emergency.

b. Frequencies assigned and tuned several hours prior to take-off.

c. Visual signals used in formations.

d. Fighters equipped with either VHF or SCR 274.

3. Rendezvous.

a. Never keep fighters waiting at designated point of rendezvous. Plan to arrive on time.

E. Night Missions.

1. Preparation of Airdrome.

a. Obstructions on airdromes are removed if possible or outlined with red lamps.

b. If runway lights are not available a flare path outlining the runway will be laid before dark.

c. Taxi strips may be lighted using available lighting facilities.

d. Parking positions are numbered in a conspicious manner for each aircraft. These positions may be located along the sides of the runway or in a dispersal area adjacent to the runway.

e. If aircraft are not loaded during the day while in revetments, loads will be placed near each parking position to be loaded when aircraft park in their respective places.

2. Briefing of Crews.

a. Parking positions and time of take-off are assigned to each aircraft.

b. Maps of the airdrome will be prepared and used during briefing to inform crews of the location of obstructions, taxi strips and runway to be used and location of parking positions.

c. Intelligence, communication, weather and operations sections give detailed information, procedures and facilities concerning the entire mission to ensure its successful completion.

3. Parking of Aircraft.

a. Sometime prior to scheduled take-off time, aircraft will be taxied to assigned parking posisions. This is usually accomplished before dark.

b. During blackout conditions, standard hand signals with flash-lights are employed by ground personnel to assist in parking aircraft.

4. Take-off Procedure.

a. Established during briefing.

b. Tower controls all movements with light signals. If communication cannot be detected by the enemy due to long range, VHF or SCR-274 may be used.

5. Communications Procedure.

a. Prior to Take-off.

(1) All equipment to be checked and in working order. Tuning should be accomplished several hours prior to the mission to avoid forewarning the enemy.

(2) Have all codes and necessary radio information on hand.

b. Take-off.

(1) Refer to Paragraph 4, "Take-off Procedure", part b.

c. In Flight.

(1) Radio silence essential to safety.

(2) IFF procedure obtained from briefing.

F. Dropping Grounds.

1. British.

a. Description.

(1) Suitable location, free of obstructions to aerial flight, outlined by fires or lights at night and by smoke or panels during daylight hours.

(2) Arrangement of lights form an inverted "L", three lights on the short arm, five lights to the long arm, one light being common to both arms.

(3) Lights are spaced at intervals of about 200'; if space permits.

b. Procedure

(1) The "L" is laid out in such a manner that a rectangular left hand pattern will avoid high ground

or nearby mountains. To accomplish this the approach is always along the long arm towards the short arm.

(2) Upon passing the short arm, a 90 degree left turn is made and a rectangular pattern is completed.

(3) Dropping is accomplished within an area bordered by the long arm and an imaginary line about 200' to the side.

c. Signals and Communication - Prior to departure on missions, briefing officers will supply letters and colors of the period for challenging and identification, barometric pressure at the target, altitude of the target, obstructions, etc.

(1) Radio communication between ground and aircraft at some targets. Corrections on point of release of supplies reported to aircraft.

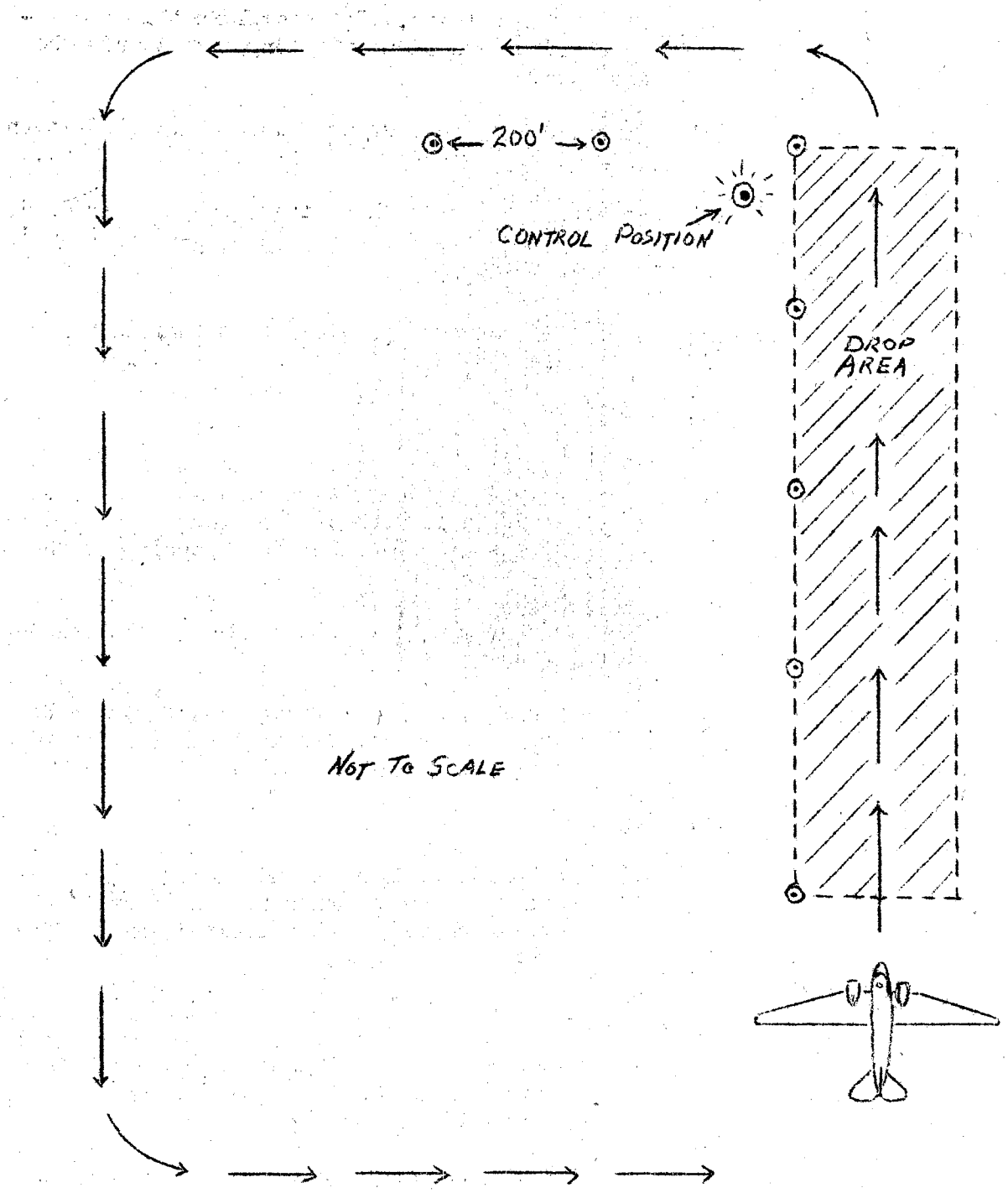
(2) Challenging between ground and air with Aldis Lamp or Very pistol is encouraged to avoid dropping supplies to the enemy.

(3) Control Position - Located at the intersection of the long and short arms of the "L", where aircraft are signaled with an Aldis lamp in the following manner:

(a) Steady Red Light - unable to take drop, return to base.

(b) Blinking Red Light - stand by, do not attempt drop.

(c) Green - all clear, proceed with drop.



2. American and Chinese.

a. Description

(1) Permanent locations adjacent to jungle landing strips, supplies dropped & landed.

(2) Temporary locations consisting of natural clearings, sand bars and mountain ridges.

(3) Air Raid warning stations situated on high peaks.

b. Procedure.

(1) Selection of pattern is left to the individual with consideration of weather and topographical features. Some targets will designate desired approach for dropping by the use of panels.

(2) British system may be in use on some targets.

(3) Accuracy necessary at all times, as most targets have small dropping areas. Under or over shooting results in total loss of supplies due to dense jungle.

c. Signals.

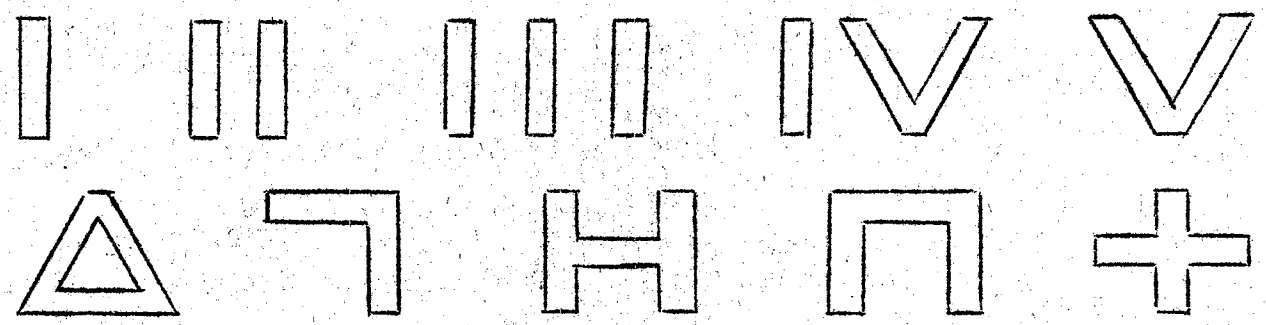
(1) No homing facilities and limited radio communication. Forward units have hand crank - low power, MF radios, with a limited range of from eight to ten miles.

(2) Emergency night drops on temporary locations are effected by outlining the target with brush fires or flares. Emergencies develop in extreme forward areas only and those units will usually have radio contact with aircraft.

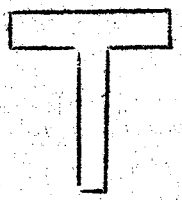
(3) Panels used for identification of target and signaling purposes.

3. Common American, British and Chinese Panel Signals.

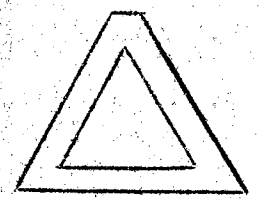
a. Numerals



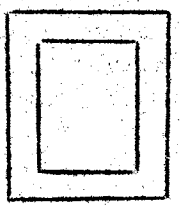
b. Descriptive Panels, most common.



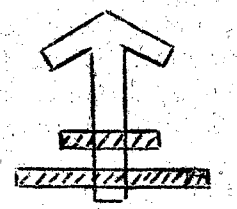
Direction of approach for drop.



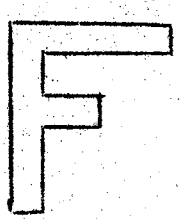
Drop to be made on this panel



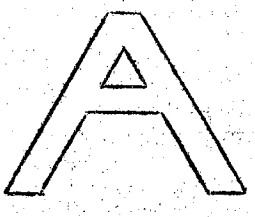
Position surrounded by enemy



Enemy in direction of arrow - 1500 yds. (each long cross bar indicates 1000 yds.)



Drop Food



Drop Ammunition

c. In addition short messages will be spelled out with the use of block letters.

Force Landings

All personnel are well advised to anticipate possible force-landings by taking with them on all missions, necessary items that may be needed. Some of the more important items are:

1. Heavy GI shoes which will not fall off your feet if forced to bail out.

2. Outer clothing consisting of long-sleeved shirts and trousers for protection against insects and scratches from jungle foliage.

3. Ensure that the jungle kit attached to your parachute contains at least a long knife, compass, first aid equipment, halizone tablets, quinine, sulfa drugs, etc., and mosquito netting. These items can be supplemented by the individual to include:

a. Fish hooks and line.

b. Vitamin tablets.

c. A small pouch of trinkets, glass beads, razor blades, nails, salt, tobacco, etc., used for gifts to friendly natives for any assistance they can give you.

d. Soap, foot powder, extra stockings, gloves, etc.

4. In addition to the foregoing your S-2 Section will have escape kits, consisting of a money belt and silk maps to aid your return to safety. Prior to going on a mission get your briefing from S-2 concerning latest enemy activity and route to follow if forced to walk out through enemy occupied territory.

A. SECURITY.

1. Destroy all secret documents, codes and equipment, and the aircraft itself, if forced down in occupied territory. All unnecessary maps and papers should never be carried over enemy territory.

2. Before departing on a mission, have S-2 hold your wallet, personnel papers and letters until your return. Clean out your pockets and carry necessary articles only.

3. If bailing out over occupied territories, hide your parachute upon reaching the ground and remain in hiding yourself until

positive you can proceed with reasonable safety. Enter native villages in a cautious but friendly manner after careful observation for signs of any enemy activity.

4. Additional Security measures applicable to local conditions will be given to crew members prior to departure by S-2.

B. RESCUE.

1. Have radio operator notify home base or AACS of position when aware of distress.

2. In unoccupied territories, display your parachute and employ smoke fires to attract attention of searching aircraft.

3. Panels should be laid out, using the parachute or parts of the aircraft. In some forced landings you may have serviceable radio equipment to contact aircraft and give particulars of your plight.

4. Remain with your parachute or aircraft until such time as you think searchers are unable to locate you.

5. If found, supplies and equipment can be dropped to you, along with instructions. Possibly a small liaison type aircraft can land near your position to evacuate you.

6. However, if forced to walk out, much help can be obtained from friendly natives in the form of food, lodging, and guides by giving them trinkets, strips of silk from your parachute, or money which is a part of the "escape aids" supplied by S-2.

C. C-B-I TERRAIN.

In the event of engine failure over densely wooded or hilly country, an attempted forced landing should not be made, but the A/C should be abandoned in the air.

In other jungle country, the force landing should be made in open water close to the bank of the stream, or on a railroad or road.

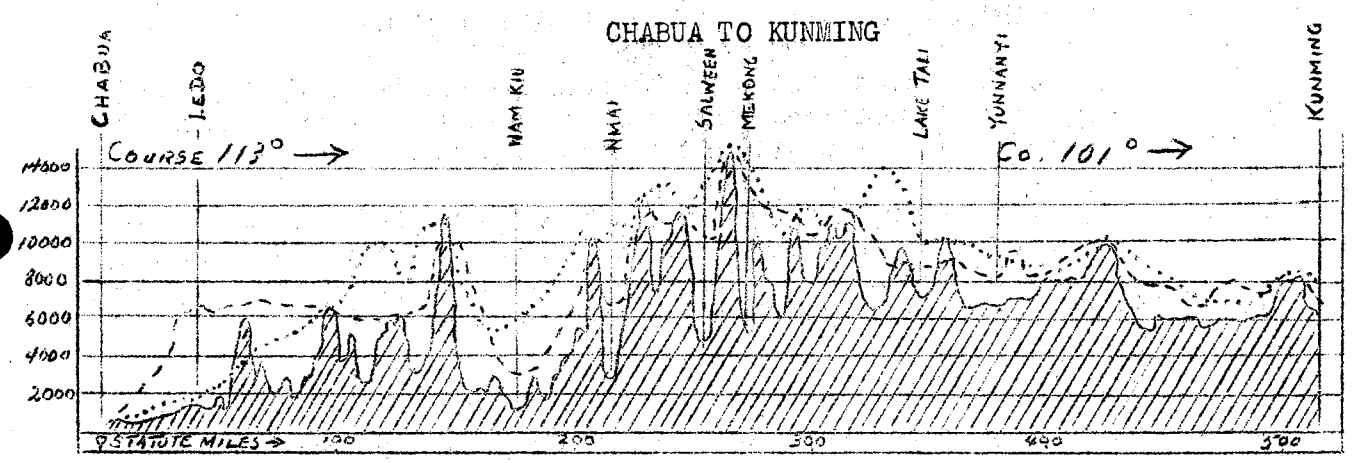
Check your parachute to see that it fits and know exactly where your own chute is located. If forced to jump, all personnel should jump in close succession.

1. China - Rugged mountainous terrain with very few level fields. Abounds with terraced rice and tea paddies on sides of mountains, very little natural vegetation. Know the location of closest landing strip in relation to your position in flight at all times.

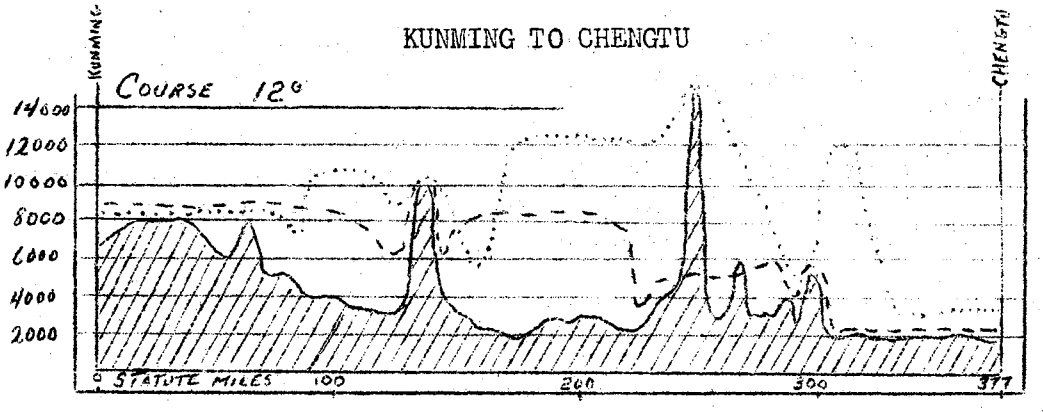
2. The "Hump" - Many mountain ranges running in a northerly and southerly direction with altitudes varying from 8500' in the south to 16000' on the direct route from India to Southern China, to 25000' in the north. Valleys between these ranges are very low. A controlled crash landing over the "HUMP" is near impossible, although there have been the exceptions where pilots have managed to land on mountain tops and ridges. Crews are walking out of the HUMP continuously, guided by natives. In some instances it has taken as long as two months to reach advance bases.

PROFILE OF THE "HUMP"

CHABUA TO KUNMING



KUNMING TO CHENGTU



..... NORTH of COURSE
- - - - SOUTH of COURSE
} 30 MILES

3. Burma - Extensive forests throughout, some cultivated land towards the south. Trees grow to enormous heights and ground vegetation, very thick with cane, bamboo, vines, and palms. Landings can be made in occasional clearings, and bamboo patches which cover large areas within the jungle.

4. India - Terrain of varied type, thick vegetation, numerous rivers, vast desert landscape in north, central and western area, small mountain ranges to the south, flooded fields and marsh lands in eastern sector. Landing strips have been constructed at regular intervals for emergency landings, usually spotted at 100 mile intervals throughout the interior.

GLIDER OPERATIONS

The following data is compiled from the observation and records of the recent Troop Carrier-Airborne invasion into Central Burma.

A. Problems of Maintenance. - CG-4A.

1. Tow Ropes - Proper maintenance and care of tow ropes in the CBI is highly essential.

a. Ropes must be coiled and kept in a dry storage room whenever possible.

b. When ropes are stored outdoors they should be strung out full length on a rack built to keep them off the ground and then covered by tarpaulins or other suitable materials.

c. Ropes left on the ground will be attacked by the large ants in this area which may or may not affect the ropes.

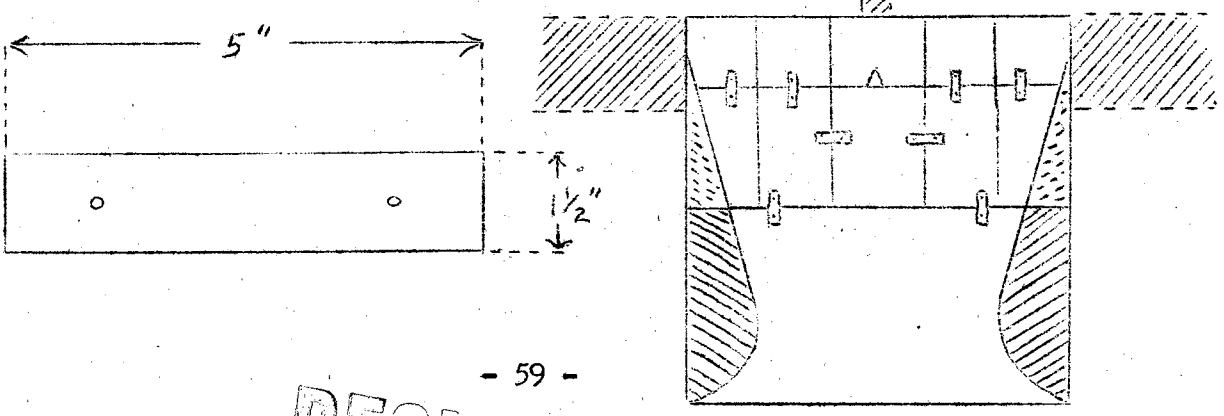
d. Tow ropes left on the ground or in the open will absorb moisture during the night and during the day the extreme heat and direct rays of the sun will tend to deteriorate the ropes in time.

2. Plexiglass.

a. All gliders which may be exposed to the sun must have nose covers to prevent warpage of plexiglass.

b. In many cases it was found that warpage would completely pull the plexiglass from its attachments or weaken it, causing the plexiglass to blow in during flight.

c. To eliminate this possibility, small strips of reinforcement about 5" long and 1-1/2" wide can be attached to various points in the nose section.



3. Moisture and Airing.

a. Due to excessive heat and humidity, especially during the spring and summer months, it is essential that all instruments be removed from gliders and stored when aircraft are not in use.

b. Moisture on control cables must be wiped off daily, and after wiping, the application of a coating of oil or grease is essential.

c. All inspection plates should be removed and doors opened daily for airing. A small slit in the bottom of the fuselage aft of cargo compartment will facilitate complete drainage of condensation.

4. General.

a. All ships seriously damaged in crashes should be stripped of all available parts to repair damage to other ships, as spare parts are very seldom available in this theater.

b. C-2 tensiometers are not available and should be taken along with units departing for this theater.

c. All ships should be test flown prior to assignment of a mission since it was found that, due to atmospheric conditions, last minute adjustments to trim tabs and cables had to be made.

B. Difficulties in Operations.

1. Greatest mistake made was failure to remove single lead rope from double tow ropes to tow plane. Coupled with atmospheric disturbances and overload in gliders, terrific surging developed causing some lead ropes to part.

2. Single tows are desirable when a small force is employed and tow ships are available.

3. Double tow should be used only when maximum lift is desired in accord with the tactical situation.

4. When double tow is used and mountains above 5000' are to be crossed, payload in gliders should not exceed 4000 pounds.

5. Loading of all gliders must be supervised by the glider pilot who should be thoroughly familar with weights and balance. In the case of engineering or other equipment, the slide rule should be consulted.

C. Combat Approaches to Target.

1. Straight-in Approach.

a. Used only when double tows are applied to saturate target quickly, and when terrain allows time for men to reach release point to set up release light.

b. Target.

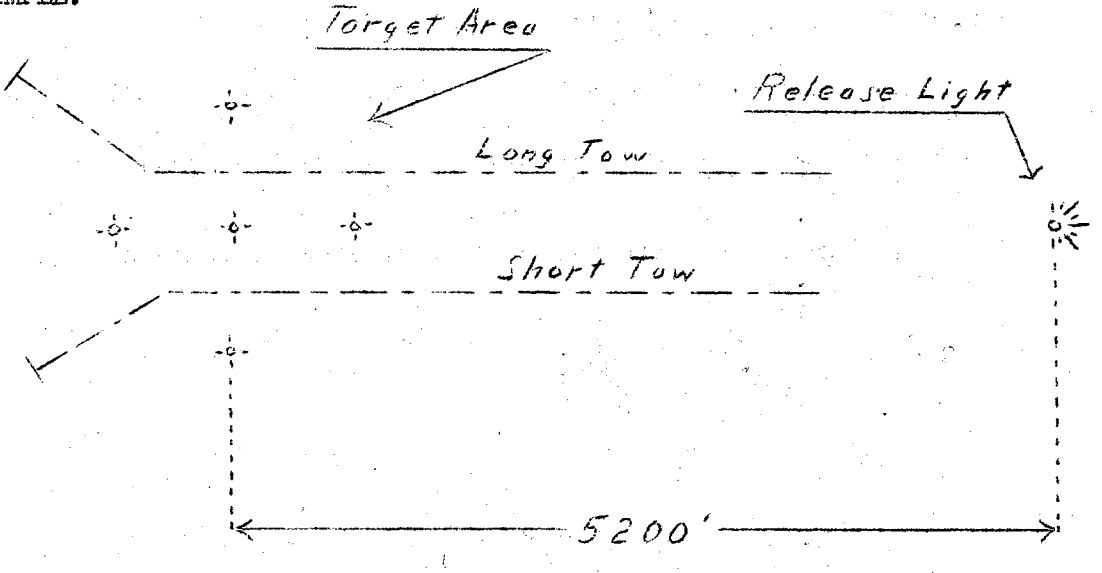
(1) Five flare pots on the ground in shape of a diamond mark the landing area.

(2) Pilots fly over the target to identify same, then let down to 200 feet is accomplished for straight-in approach.

(3) When glider pilots reach the release light, they release, hold altitude of 200 feet to dissipate airspeed until glide speed of 70 MPH is attained. Glide speed of 70 MPH is held to the target.

(4) It was found that a CG-4A with a payload of approximately 3750 pounds released at 200' altitude with airspeed of tow plane at 100 MPH, would glide about 5200 feet.

EXAMPLE:



c. This procedure removes most of pilot error.

c. Criticisms.

(1) The straight-in approach should never be used in jungle terrain, as it is very uncertain and difficult for men operating release light to reach release spot on time to signal following aircraft.

(2) If crack-ups develop and target becomes saturated, the pilot does not have time to change his flight path.

2. 180° Approach.

a. This approach is recommended from an altitude of approximately 400' when the landing area is small - 700' to 1000', as will usually be the case in this theater.

b. The 180° side approach decreases pilot error. The smaller the pattern, the smaller margin for error in judgment.

D. Emergency Landings on Sand Bars.

1. Always land down-stream if forced to land on a sandbar. In so doing you will run down hill and jump from one tide wash to another. In landing up stream, you will run into these small "washes" in the sandbar and damage your ship, usually beyond repair.

E. Typical Forward Operational Base in Assam.

1. Strips.

a. Sod, surrounded by jungle or dense wooded area.

b. Grass covered strips from 5000 to 5500 feet long.

c. Only limited automotive equipment should be driven across these strips as tracks or roads eventually result in a dust hazard for night take offs.

2. Camouflage.

a. Natural foliage should always be used.

b. Bamboo growth around these strips is usually dense and affords excellent camouflage by merely cutting out spaces in the jungle and pulling the fuselage back as far as the wings. The overhanging bamboo can be pulled down over the aircraft to make it almost invisible from the air.

F. General.

1. Glider Flying.

a. Throughout India severe turbulence is generally encountered during daylight hours at low altitudes. To avoid the possibility of structural failure and loss of control due to weakened cable tension, the recommended altitude for extended cross-country glider flights is at least 5000 feet above ground level.

b. Surging resulted when the rate of descent of the towship was greater than that of the glider or vice versa. To combat this surging, the use of spoilers and skidding was employed successfully.

2. Pick-up Equipment.

a. The jungle abounds in pick-up poles as bamboo, which can be cut into the proper lengths, can be found anywhere.

3. Clothing.

a. The "Paratrooper" with boots is most desirable.

(1) Trousers and jackets have pockets in which ammo and necessary equipment can be carried, decreases the necessity for a pack.

(2) Boots are preferable to puttees. In walking any distance in the jungle through streams, it was found that puttees irritated the ankles and legs.

b. The overseas cap or one similar should be worn. The Japanese usually wears a peaked cap and a man wearing a cap with a visor can be easily mistaken for an enemy in the distance.

4. Weapons.

a. Desirable weapons are the carbine, .45 automatic pistol, grenades, and a good knife.

5. Dealing with Natives.

a. Try to contact the chief of the village as they are usually in favor of the allies.

b. Wait outside the village and ask that the chief be brought to you. Then you can effect a get-away should the natives bring enemy troops.

c. Do not boldly walk into a village without proper observation. Natives do not usually like intruders.

SECTION II

COMMUNICATIONS

RADIO OPERATORS

TABLE OF CONTENTS

INTRODUCTION

GENERAL

1. The purpose of the following communications notes on the China-Burma-India theater is to familiarize the Troop Carrier Radio Operator Mechanic with the facilities and procedures available in that sector so as to enable him to operate efficiently with a minimum amount of additional training. While the radio facilities for navigation and flight control in the CBI theater are very similar to those used in this country, the procedures used and the duties of the ROM differ greatly. One of the most apparent differences in Communications procedures from the standpoint of the operator is the fact that, as a general rule, the radio operator accomplishes all normal contacts except the landing and take-off instructions, with the ground station on the prescribed voice frequency. When working greater distances, under poor atmospheric conditions, securing D/F assistance from AACS, RAF, or Civil stations, and in emergencies however, CW comes in for its share of importance in the CBI.

2. During routine or operational flights in the CBI, the ROM will have occasion to work stations operated and maintained by the Army Airways Communications System, Royal Air Force, and Civil units. In order to be able to conduct satisfactory communications under any circumstance, it is imperative that the operator be familiar with the procedures used by all three of these organizations.

3. The AACS organization now operates an extensive aeronautical communication chain, covering most of the Allied territory in the CBI. From Karachi, India, to Suichwan, China, the AACS operates approximately sixteen (16) radio ranges giving adequate coverage along the most commonly flown routes. In addition to the ranges, numerous non-directional beacons are operated on other routes and at isolated stations which are used mostly as check points. Other radio facilities in this theater and operated by AACS personnel include D/F stations, control towers, air-ground, point-to-point, and weather stations at all important Allied bases.

4. In the theater, it is customary for U. S. planes to contact AACS stations if possible, however, if these cannot be reached, RAF or Civil stations are used. At various airdromes throughout the CBI, the RAF and Civil authorities maintain tower, air-ground, D/F, and range facilities which are available to U. S. crews. The procedures necessary to secure use of these facilities are covered later in this chapter.

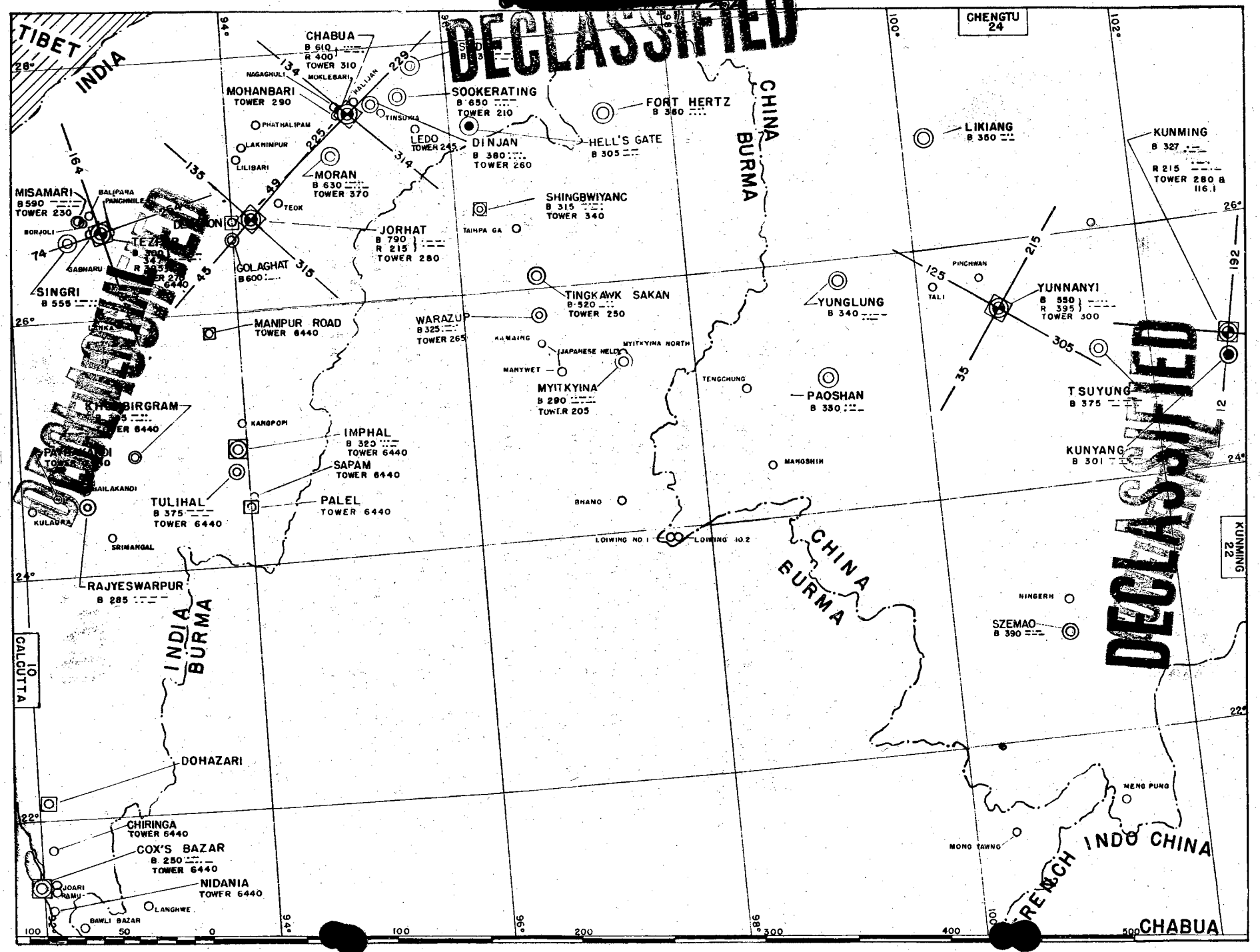
5. The Radio Facilities Map, included in the Pilot Section of this Manual, indicates by symbol, most of the aeronautical aids along the various routes, including ranges, homing beacons, towers, air-ground and D/F Facilities. Radio Facility Charts and Instrument Letdown Procedure for China-Burma-India are compiled by the India-China Wing, ATC, and are available in the

theater. The Facility Charts in that theater are similar to those used in this country and crews should have little difficulty interpreting them. An investigation of the Facility Chart Extract (see samples at the end of this chapter) reveals the extent of the communication facilities in that area, and also indicates some of the systems maintained by RAF and civilian units. It must always be borne in mind that Troop Carrier operators on practically every occasion will have an opportunity to work AACS, RAF, or Civil installations.

6. In addition to the communication facilities operated by the AACS, RAF, and Civil organizations, Troop Carrier units located in that theater maintain other air-ground stations at their home bases. These stations maintain contact on Voice or CW with individual flights or ships on routine cross country missions for the purpose of handling any administrative traffic between ground units and planes. Codes, similar to the China Cross Country Code (Reference Pilots' Section, pages 41 and 42) are issued by the individual groups to be used when communicating between planes in flight and the ground organization.

7. On operational missions, as a general rule, radio silence is maintained for security purposes. However, recalls to the departure base, or a change to another target, are given from the air-ground station at the departure base. On missions of any type, routine or operational, radio operators MUST stand a continuous headphone watch on the frequencies along the various routes.

8. Wide usage of Rebecca AN/APN-2, BABS (Blind Approach Beacon System), and Loran AN/APN-4 by Troop Carrier units in this theater is contemplated. As a result, crews must be thoroughly trained and familiar with these systems in order to operate efficiently and effectively against the enemy.


DECLASSIFIED
DECLASSIFIED
DECLASSIFIED
DECLASSIFIED
TIBET
INDIA
CHABUA
B 610
R 400
TOWER 310
MOHANBARI
TOWER 290
NAGAGHULI
MOKLEBARI
PALIJAN
TINSUKIA
PHATHALIPAM
LAKHIMPUR
LILIBARI
LEDO
TOWER 245
MORAN
B 630
TOWER 370
TEOK
MISAMARI
B 590
TOWER 230
BALIPARA
PANCHMILE
BORJOLI
GABHARU
SINGRI
B 555
JORHAT
B 790
R 215
TOWER 280
GOLAGHAT
B 600
MANIPUR ROAD
TOWER 6440
LUMKA
KANGPOPI
IMPHAL
B 325
TOWER 6440
SAPAM
TOWER 6440
PALEL
TOWER 6440
TULIHAL
B 375
TOWER 6440
KULAURA
SRIMANGAL
RAJYESWARPUR
B 285
INDIA
BURMA
DOHAZARI
CHIRINGA
TOWER 6440
COX'S BAZAR
B 250
TOWER 6440
JOARI
RAMU
NIDANIA
TOWER 6440
LANGHWE
BAWLI BAZAR
SOOKERATING
B 650
TOWER 210
FORT HERTZ
B 360
DINJAN
B 380
TOWER 260
HELL'S GATE
B 305
SHINGBWIYANG
B 315
TOWER 340
TAINPA GA
TINGKAWK SAKAN
B 520
TOWER 250
WARAZUP
B 325
TOWER 265
KAMAING
MYITKYINA NORTH
JAPANESE HELD
MANYWET
MYITKYINA
B 290
TOWER 205
TENGCHUNG
PAOSHAN
B 330
YUNGLUNG
B 340
MANGSHIH
BHANO
LOIWING NO 1
LOIWING 10.2
CHINA
BURMA
CHINA
EURMA
CHENGTU
24
LIKIANG
B 350
KUNMING
B 327
R 215
TOWER 280 & 116.1
PINCHWAN
TALI
YUNNANYI
B 550
R 395
TOWER 300
T'SUYUNG
B 375
KUNYANG
B 301
KUNMING
22
NINGERH
SZEMAO
B 390
MENG PUNG
MONG TAWNG
FRENCH INDO CHINA
CHABUA
CALCUTTA
10
94°
96°
98°
100°
102°
26°
24°
22°
100
50
0
100
200
300
400
500

AIRPORT		TOWER			AIR GROUND											RADIO HOMING BEACON				RADIO RANGE STATION				D/F	REMARKS	CONTROL
					CW					VOICE																
ELEV	NAME	IDENT	XMIT	GUAR	IDENT	XMITS		GUARDS		IDENT	XMITS		GUARDS			IDENT	XMIT	BRG	DIST	IDEN	XMIT	BRG	DIST	FREQ		
370'	CHABUA	VG	310	4495	WUTE	4595		4595		WUTE	4220 5588 5690 5157.5	5535 2070N	4220 5588 5690 5157.5	5535 4815 2070N		VG	610	332°	2.0	VG	400	229°	5.2	2000 TO 8000 KCS	AACS TOWER AIRGROUND HOMING AND RANGE CONTINUOUS EXCEPT 2070 WHICH IS NIGHT FREQUENCY. CALL RECEIVED ON 4815 WILL BE ANSWERED ON 5588. D/F ON REQUEST. 5157.5 IS SPECIAL WEATHER FREQUENCY.	U.S.
115'	CHIRINGA	FLAT-FOOT	6440	6440																					TOWER CONTINUOUS	BR
[illegible]	COX'S BAZAR	LIGHT-EN	6440	6440	D8Q	4575D	3105N	4575D	3105N	SPLEN-DID	116.1 (MEGS)		116.1 (MEGS)			AX	250							116.1 4575D 3105N	TOWER CONTINUOUS D/F ON REQUEST HOMING TRANSMITS 1ST 5 MIN IN EACH 1/4 HOUR	BR
286'	DERGAON									RE-DOUBT	116.1D (MEGS)		116.1D (MEGS)											116.1D (MEGS)	AIRGROUND SUNRISE TO SUNSET	BR
397'	DINJAN	FJ	260	4495 4815	5YL 3RH 5RH 9RH	5140D 8430D 6000D 3085N		5140D 8430D 6000D 3085N								RH	380	105°	5.2						BR. AIRGROUND SUNRISE TO SUNSET. AACS TOWER CONTINUOUS. CNAC 3RH AIRGROUND OPERATES 0630-1730 IST. HOMING CONTINUOUS EXCEPT FROM 2330 TO 2400 IST.	BR US CHIN
90'	DOHAZARI									EDICT	116.1D (MEGS)		116.1D (MEGS)											116.1D (MEGS)	BR. AIRGROUND SUNRISE TO SUNSET. D/F ON REQUEST.	BR
1200'	FORT HERTZ				WUTI	4595		4595		WUTI	4220 5588	5535 2070N	4220 5588	5535 2070N		DH	360	50°	0.4						AACS AIRGROUND CONTINUOUS EXCEPT 2070 WHICH IS NIGHT FREQUENCY HOMING CONTINUOUS 5157.5 IS SPECIAL WEATHER FREQUENCY.	US
300'	GOLAGHAT															EL	600								AACS HOMING CONTINUOUS	US
	HELL'S GATE															MD	305								AACS HOMING CONTINUOUS. IDENT. OF POINT TO POINT NET IS WZPJ	US
2500'	IMPHAL	FRITTER	6440	6440						BAYLISS	116.1 (MEGS)		116.1 (MEGS)			VU	320							116.1 (MEGS)	BR TOWER SUNRISE TO SUNSET. AIRGROUND CONTINUOUS. HOMING TRANSMITS 2ND 5 MIN IN EACH 1/4 HOUR & OPERATES IN EVENT OF FAILURE OF TULIHAL BEACON. D/F ON REQUEST.	BR
[illegible]	JORHAT	PW	280	4495 4815	WUTC	4595		4595		WUTC	4220 5588 2070N	5535 5690 5157.5	4220 5588 2070N	5535 5690		PW	790	278°	1.8	PW	215	45°	4.5	2000 TO 20000 KCS	AACS TOWER & AIRGROUND CONTINUOUS EXCEPT 2070 WHICH IS NIGHT FREQUENCY. RANGE SUNSET TO SUNRISE AND ON REQUET. HOMING CONTINUOUS. D/F ON REQUEST. 5157.5 IS SPECIAL WEATHER FREQUENCY.	US
250'	KUMBHIRGRAM	SCUTTLE	6440	6440												DL	305								BR TOWER SUNRISE TO SUNSET. HOMING TRANSMITS 1ST 5 MIN IN EACH 1/4 HOUR.	BR
6230'	KUNMING	RQ	280 116.1	4495 6048 116.1	WUTK CL7 3AW 5AW 9AW	4595 6048D 8430D 6000D 3085N	4060N	4595 6048D 8430D 6000D 3085N	4060N	WUTK CL7	2070N 5535 6048 6048D	4220 5588 5157.5 4060N	2070N 5535 6048 6048D	4220 5588 5157.5 4060N		AW	327	175	1.9	RQ	215	192°	2.5	2000 TO 8000 KCS	AACS TOWER AIRGROUND CONTINUOUS. RANGE CONTINUOUS ON MINIMUM INSTRUMENT CONDITIONS OTHERWISE ON REQUEST. D/F ON REQUEST. 5157.5 IS SPECIAL WEATHER FREQUENCY. 14TH AF AIRGROUND CONTINUOUS ON VOICE & CW. C.N.A.C. HOMING CONTINUOUS. AIRGROUND CONTINUOUS.	US CHIN
	KUNYANG															QR	301								HOMING CONTINUOUS.	U.S.
900'	LEDO	ZA	245	4495						WUTU	5588	5305	5588	5305											AACS TOWER & AIRGROUND 0730-0100 IST.	US
8156'	LIKIANG				DM	6220D 8430D	3085N	6220D 8430D	3085N							DM	350	0°	12.0						CNAC HOMING 1330-1630 & 1700-1130 IST. NOTIFY KUNMING CNAC OFFICE BEFORE ATTEMPTING CONTACT. AIR GROUND CONTINUOUS	CHIN
	MANIPUR ROAD	ROMPER	6440	6440						TOPSAIL	116.1D		116.1D											116.1D	TOWER CONTINUOUS, D/F ON REQUEST FROM SUNRISE TO SUNSET	BR
323'	MISAMARI	QK	230	4495												QK	590	50	4.0						AACS TOWER & HOMING CONTINUOUS	US
365'	MOHANBARI	KC	290	4495 4815																					AACS TOWER CONTINUOUS	US
350'	MORAN	LX	370	4495 4815 6595												LX	630	247°	1.5						TOWER & HOMING CONTINUOUS	US
450'	MYITKYINA	FC	205	4495 5305 4815						WUTR	5588D	5305D	5588D	5305D		FC	290	168°	0.3						AACS TOWER & AIRGROUND SUNRISE TO SUNSET HOMING CONTINUOUS	US
	NIDANIA	SILO	6440	6440																					TOWER CONTINUOUS	BR
2500'	PALEL	SPRIGHT-LY	6440	6440						NEW-SHAM	116.1D (MEGS)		116.1D (MEGS)											116.1D (MEGS)	AIRGROUND SUNRISE TO SUNSET. D/F ON REQUEST	BR
5500'	PAOSHAN									MC8	6048D	4060N	6048D	4060N		SW	330								14TH AF AIRGROUND CONTINUOUS. HOMING CONTINUOUS	US
	PATHAKANDI	HAIRPIN	6440	6440																					TOWER CONTINUOUS	BR
	RAJYESWARPUR															JU	285								HOMING TRANSMITS 3RD 5MIN IN EACH 1/4 HOUR	BR
430'	SADIYA									WZPH						OR	535	135°	0.25						AACS HOMING CONTINUOUS	US
	SAPAM	CLASSIC	6440	6440																					TOWER CONTINUOUS	BR
660'	SHINGBWIYANG	CR	340	4495 8000 4815						WUTH	4220 5588 5690 5305	5535 5690 5157.5	4220 5588 5690 5305	5535 5690		CR	315	179°	5.9					2000 TO 8000 KCS	AACS TOWER SUNRISE TO SUNSET. AIRGROUND & HOMING CONTINUOUS. D/F IDENT IS RK AND ON REQUEST. 5157.5 IS SPECIAL WEATHER FREQUENCY.	US
	SINGRI															LD	555								AACS HOMING CONTINUOUS	US
420'	SOOKERATING	OH	210	4495 4815												OH	650	360°	1.5						AACS TOWER & HOMING CONTINUOUS.	US
4340'	SZEMAO				BYI	6048D	4060N	6048D	4060N	BYI	6048D	4060N	6048D	4060N		KO	390								14TH AF AIRGROUND 0400-1930 IST ON VOICE & CW. HOMING ON REQUEST	US
240'	TEZPUR	YP ASCOT	270 6440	4495 6440	WUTA D5C	4595 4575D	3105N	4595 4575D	3105N	WUTA	4220 5588 2070N	5535 5690 5157.5	4220 5588 2070N	5535 5690		YP YP	300 347	152° 45°	0.6 3.5	YP	395	344°	1.5	4575D 3105N	AACS TOWER & AIRGROUND CONTINUOUS EXCEPT 2070 WHICH IS NIGHT FREQUENCY. HOMING CONTINUOUS. RANGE SUNSET TO SUNRISE & ON REQUEST. 5175.5 IS SPECIAL WEATHER FREQUENCY. BR TOWER SUNRISE TO SUNSET. AIRGROUND CONTINUOUS. D/F ON REQUEST.	US BR
	TINGKAWK SAKAN	ID	250	4495 4815						WZPE	5305	5588	5305	5588		ID	520	161	0.8						AACS AIRGROUND & HOMING CONTINUOUS	US
6800'	TSUYUNG									LQ7	6048D	4060N	6048D	4060N		YG	375								14TH AF AIRGROUND 0400-1930 IST ON VOICE HOMING CONTINUOUS	US
2500'	TULIHAL (IMPHAL)	COR-SAIR	6440	6440												OM	375	25	0.8						TOWER SUNRISE TO SUNSET. HOMING CONTINUOUS.	BR
	YUNGLUNG				3YU 5YU	8430D 6000N		8430D 6000N								YU	340								CNAC 3YU 0630-1730 IST. 5YU 1730-0630 IST. HOMING CONTINUOUS.	CHIN
6480'	YUNNANYI	BJ	300	4495 6048 4220	WUTJ BBI	4595 6048D	4060N	4595 6048D	4060N	WUTJ BBI	4220 5588 5157.5 6048D	5535 2070N 6048 4060N	4220 5588 5157.5 6048D	5535 2070N 6048 4060N		BJ	550	238°	2.4	BJ	395	215°	2.5	2000 TO 8000 KCS.	AACS TOWER & AIRGROUND CONTINUOUS EXCEPT 2070 WHICH IS NIGHT FREQUENCY. HOMING CONTINUOUS. RANGE CONTINUOUS ON MINIMUM INSTRUMENT CONDITIONS OTHERWISE ON REQUEST. TOWER GUARDS 4220 ON REQUEST FROM 0430 IST UNTIL ALL AIRCRAFT ARE CLEARED. 5157.5 IS SPECIAL WEATHER FREQUENCY. 14TH AF AIRGROUND CONTINUOUS ON VOICE & CW.	US
	WARAZUP	LR	265	4495 4815						WZPD						LR	325	270°	45°						AACS TOWER & [illegible] SUNRISE TO SUNSET ONLY	US

CHABUA

RADIO FACILITIES

1. Radio Facilities available for navigational aid, traffic control, routine reporting, and emergency assistance, include Control Towers, Air-Ground Stations, Radio Ranges, Radio Beacons, and Direction Finding (D/F) equipment. Panels, Pyrotechnics, and the Aldis Lamp are also used to a great extent for identification, recognition, and other signalling.

a. Control Towers:

(1) Practically all control towers maintain a continuous watch and are set up to furnish services as in the U. S. Call signs and code names are assigned each location and the clear text designation is not used. The British operated bases usually assign codes names to be used when contacting the towers (example: Flatfoot, Corsair, Ascott, Scuttle) while the U. S. stations use call signs using the phonetic alphabet (BJ- Baker Jig, VG-Victor George, LR- Love Roger).

(2) AACS towers all guard 4495 kc and transmit on the low frequency range - both the transmitting and receiving frequencies are listed in the Facility Charts. British operated control towers employ 6440 kc for transmitting and receiving. Certain British controlled bases utilize VHF for tower purposes, but, as yet, AACS has not installed that type equipment.

(3) All radiotelephone (R/T) contacts are based on the procedures shown in CCBP-3 (FM 24-9).

(4) Landing, take-off, and taxiing instructions are given from the tower in the customary manner, utilizing radio and light signals. Weather information is available from the towers and the Alaco Code is used for this purpose.

b. Air-Ground Stations:

(1) Air-Ground stations are higher powered units set up for the purpose of:

(a) Maintaining contact with aircraft at greater distances.

(b) Providing weather information to planes in flight.

(c) Acting as control points for cross-country and ferrying missions.

(d) Notifying aircraft in the vicinity of air-raid warnings and alerts and giving the appropriate procedure to follow.

(2) Both the British (RAF) and the American (AACS) stations are equipped for A-1 and A-3 transmission and reception, but as a general rule, Voice is used unless satisfactory communication cannot be maintained. The majority of the AACS Stations transmit and receive on 4595 (CW) and 4220 (Voice) as in the U. S.

(3) Coded names are used by the British to designate the Air-Ground stations, whereas the U. S. System employs call signs for CW and Voice transmissions.

c. Radio Ranges:

(1) The radio ranges in the CBI are the standard four-leg ranges and are identified by the coded call signs which are listed in the facility charts.

(2) As indicated on the Radio Facility Charts, the radio ranges in the CBI are not in operation twenty-four hours daily as is customary in this country. The usual hours of operation are from sunset to sunrise, however, the ranges are available at any time upon request. To secure the range during the daytime, the procedure is to call the air-ground station on voice at the location and request that the facility be made available. If voice contact fails, CW is used.

(3) Most of the ranges in operation are of the portable types, readily shifted from one location to another should the need arise. As a result, extreme caution should be exercised under instrument conditions when utilizing these ranges.

d. Beacons:

(1) Approximately one hundred (100) non-directional beacons operating in the frequency range of 200 kc to 800 kc are in operation at different airfields for navigational purposes. The homing beacons are keyed at thirty-second intervals with identification call signs (noted in facility charts) and as a general rule are in continuous operation.

(2) Enemy interference with the operation of the beacons can be expected. This interference is accomplished either by jamming or meaconing. Jamming will be immediately obvious to the operator who should resort to other means available for navigational aid. Meaconing, on the other hand, is not so easily recognized and the operator must constantly be on guard. Meaconing can be described as a type of interference caused whenever a distant transmitter is keyed accurately on the same frequency as the transmissions with which it is desired to interfere. The effect on bearings from the beacon which is being meaconed may be evidenced by one of the following phenomena:

(a) Widening of the minimum.

(b) Displacement of the minimum.

(c) Swinging of the minimum.

(d) Duplication of the minimum.

(e) Fading of Signals.

(3) If meaconing is detected by the operator that particular beacon should not be relied upon and other means available for navigational purposes should be used.

e. Visual Signalling:

(1) The various panel displays used for marking dropping zones are shown in the Pilots Section of this manual, page 54.

(2) Some airfields in the CBI, especially those of a temporary nature, have no radio facilities for control tower purposes. As a result, pyrotechnics and Aldis lamps are used for landing and take-off instructions at these bases.

f. IFF:

(1) Identification of friendly aircraft in the CBI by means other than visual recognition is an absolute necessity. IFF, in conjunction with other ground Radar equipment permits aircraft to identify themselves as friendly.

(2) Certain areas are established in the CBI where the IFF must be turned on. These boundaries are changing from time to time and local briefing will dictate the procedures to be followed.

(3) Detonators in the units are plugged in as soon as the ship is airborne and are to be removed just prior to the landing.

PART II

D/F FACILITIES

1. MF/DF, HF/DF, and VHF/DF are available in the CBI from AACS, RAF, and Civil organizations. Reference is made to the Radio Facilities Map in the Pilots' Section of this manual for some of the existing D/F facilities. The D/F stations on the above-mentioned chart are listed below:

Location	Operating Agency	Frequencies	Remarks
Karachi	British	6666 D) 3925 N) C. W.	On Request
Mauripur	British	116.1 Megs-Voice 333 D) 3110 N) C. W. 4570 D)	On Request
Jodhpur		116.1 Megs-Voice 3105 N) 4515 D) C. W. 333 D)	On Request
Ahmedabad	British	333, 4575) C. W.	On Request
Raj Samand	British	333 C. W.	On Request
Bombay	British	333 C. W. 4570 C. W. 3105 C. W. 6666 C. W. 3925 C. W.	D/F station receives on 333, 4515, 3105, 6666, 3925.
Ambala	Civil	4575 kc C. W.	Daytime
New Delhi (Wellingdon)	British	333 C. W.	On Request
Agra	AACS	4495 - Voice 4595 - C. W. 5168 - Voice	On Request
Gwalior	Civil	333 C. W.	On Request

Location	Operating Agency	Frequencies	Remarks
Allahabad	British	333 C. W. Transmitting 4570-D 3110-N C.W. " 116.1 Megs Voice	D/F Station Receives on 333, 4575, 3105 kc, 116.1 megs.
Gaya	AACS	4595 C.W. 5168 Voice	On Request
Ansansol	Civil	4575 C. W.	Dawn to Dusk
Calcutta	Civil British	333 4575 C.W. 3105	On Request
Lalmanir Hat	AACS	4595 C. W. 4220 Voice 5690 Voice 2070 Voice-N 5588 Voice	On Request
Tezpur	Civil	4575 C. W.	On Request
Agartala	Civil British	4575 C. W.	On Request
Jorhat	AACS	2000 to 8000 Voice or CW	On Request
Chabua	AACS	4595 C.W. 4220 Voice 5588 Voice 5690 Voice	On Request
Yunnanyi	AACS	4595 C. W. 4220 Voice 5588 Voice	On Request
Kunming	AACS	4595 C. W. 4220 Voice 2070-N Voice	On Request
Chanyi	AACS	4595 C.W. 4220 Voice 5588 Voice 6048 Voice	On Request

Location	Operating Agency	Frequencies	Remarks
Kweilin	AACS	4595 C. W. 4220 Voice 5535 Voice	On Request

NOTE: Day frequencies are indicated by the letter "D"--thus 4570-D; night frequencies are indicated by the letter "N"--thus 3110-N. Frequencies listed and not followed by the letters "D" or "N" are continuous frequencies unless otherwise noted in the Remarks column.

2. As a general rule, the AACS D/F stations provide QTE's and QUJ's and when operating in nets will furnish a QTF. On the other hand, however, RAF (British Stations) furnish QDM's, while the stations operated by Civil Agencies usually provide QDR's. It is of the utmost importance, therefore, that the radio operator be familiar with the use of all these signals.

a. QDM - the magnetic course to steer with zero wind to reach the D/F station.

b. QUJ - the true course to steer with zero wind to reach the D/F station.

c. QDR - the magnetic bearing of the aircraft in relation to the D/F station (reciprocal of a, above)

d. QTE - the true bearing of the aircraft in relation to the D/F station (Reciprocal of b, above).

e. QTF - the position of the aircraft in degrees of longitude and latitude as determined by the D/F stations operating in a net.

3. The above list of D/F stations operated by AACS, RAF (Br), and Civil units indicates that D/F assistance is available with either voice or CW transmissions. At present, the British operated stations are the only stations which furnish VHF/DF assistance on Voice; however, all the British and Civil MF and HF/DF stations operate on CW with no A-3 type emission available. The customary frequencies for British and Civil stations are 333 kc on the MF band and 4575 kc on the HF band. D/F facilities, as a general rule, can be obtained from AACS stations on 4595(C. W.), 4220 (Voice), 5588 (Voice).

4. Providing that correct call signs and procedures are used when requesting bearings, no authentication is made. If the identity of an aircraft attempting to work a D/F station is in doubt, it will be challenged. However, since the use of verification tables slows down the service given, D/F stations do not challenge unless they have good reason to suspect that the call sign is not genuine. In view of the fact that the Verification Table presently in use is being replaced by a universal code, the challenge and answer are not shown in the following CW example for securing a QDM from a British station.

BVK V 495 - INT - QDM - K
495 V BVK - R - INT - QTG - K
BVK V 495 - R 10 seconds 495
(repeat for sixty seconds)
495 V BVK - R - QDM - 165 - 1405

5. When using CW, the procedure for securing bearings from RAF and AACS stations is the same. It must be borne in mind, however, that RAF stations usually furnish QDM's while AACS stations furnish QTE's and QUJ's.

6. As pointed out above, Civil stations usually furnish QDR's and, with a slight exception, the procedures used with these stations are the same. When communicating with Civil stations, "IMI" follows the "," Signal to indicate that the "Q" signal is used in the form of a question.

7. Routine bearings, on Voice, may be requested from any station possessing the facilities by using the following procedure:

A/C -"Tare Easy, this is King Seven Able, QDM over"

or"Tare Easy, this is King Seven Able, request a magnetic bearing, over"

Gnd -"King Seven Able, this is Tare Easy, send your call for one minute, over."

A/C -"Tare Easy, this is King Seven Able (repeated for one minute)"

Gnd -"King Seven Able, this is Tare Easy, QDM three zero zero, repeat, three zero zero degrees, over"

8. Summarizing the D/F procedures and facilities, the radio operator MUST:

a. Know what D/F stations are available and the service rendered.

PART III

ROUTINE AIR-GROUND PROCEDURE
(Position Reporting)

1. On routine ferrying or cross-country flights between the major airfields from Karachi on the West to Suichwan on the East, a definite policy with regard to "in flight" reporting to ground stations is observed. From Karachi to the East are selected stations (airfields) at regular spaced intervals known as "reporting points." Having filed clearances from certain bases, Karachi for example, upon flying over or near any of the "reporting points" on the route, a routine position report is made. The majority of the reporting points have air-ground stations manned by AACS personnel and under normal conditions, the contacts are made by the radio operator on the prescribed voice frequency. A definite reporting procedure is used and a code number is used for each reporting point. The position reports are made at the specified position reporting points and include:

a. Plane radio call sign.

b. Time over reporting point (time used is GMT expressed in minutes.*

c. Reporting point by number.

d. Altitude (in thousands of feet only)

An example would be: "William Dog this is King Seven Able time one five, passing number twenty, altitude seven over."

2. It is the responsibility of the pilot to advise the radio operator of the arrival over the reporting point, either actual or estimated, and the altitude at which the aircraft is flying.

3. The following locations are used as reporting points:

Place	Check Point Number
Karachi	1
Delhi	15
Agra	10
Gaya	25
Lalminar Hat	39

Place	Check Point Number
Tezpur	43
Jorhat	45
Chabua	49
Yunanyi	200
Kunming	202
Bangalore	65
Bombay	84

4. In the event voice frequency fails, communications will be handled on CW using 4595 kcs, 4575 kcs, or a frequency as shown on the Facility Chart.

5. When communicating with the air-ground stations on Voice, the China Cross Country Code as discussed in the Pilots' Section of this manual is used. On CW, traffic with these stations is handled by employing the Ferry Rekoh Device which is almost identical with the Rekoh Card now used within this Command. All R/T and W/T contacts are conducted under the procedures as specified in CCBP-3 and CCBP-1.

PART IV

WEATHER BROADCASTS

1. AACS operates approximately thirty-five (35) different weather collecting stations from Karachi, throughout India and China, to Kweilin China. Hourly weather broadcasts are made from four of these stations at which time the weather reports from all collecting stations are broadcast. In lieu of calling the air-ground stations and in order to eliminate unnecessary transmissions, radio operators are instructed to copy these "F" broadcast reports thereby securing the information for any particular point.

2. The following is a list of the four stations making hourly broadcasts using the WAF-2 Weather Form:

SCHEDULED WEATHER BROADCASTS

STATION	TIME	FREQ.	BDCSTS WX OF FOLLOWING STATIONS
KUNMING, CHINA WUTK	H+27	2575, 6385, 8905, 15630 kc SIMULTANEOUSLY	KUNMING, LIKIANG, SICHOW, YUNNANYI, CHENKIANG, YANGKAI, CHANYI, KWEILIN, & CHENKUNG
CHABUA, INDIA WUTE	IMMEDIATELY AFTER KUNMING BROADCASTS	2575, 6385, 8905, 15630 kc SIMULTANEOUSLY	LALMANIR HAT, DERGAON, TEZPUR, JORHAT, MISAMARI, SOOKERATING, MOHANBARI, CHABUA, DINJAN, FORT HERTZ, & MORAN.
CALCUTTA, INDIA WXWX	IMMEDIATELY AFTER CHABUA BROADCASTS	2575, 6385, 8905, 15630 kc SIMULTANEOUSLY	GAYA, ONDAL, BUSHKARA, CHAKULIA, DUM DUM, KURMITOLA, AND MADHAIGANJ
AGRA, INDIA WXWD	IMMEDIATELY AFTER CALCUTTA BROADCASTS	2575, 6385, 8905, 15630 kc SIMULTANEOUSLY	KARACHI, JODHPUR, DELHI, AGRA, BANGALORE, AND CAWNPORE.

3. Alaco broadcasts on Voice are given at regular intervals from Chabua and Kunming at which time reports are given for various locations in that vicinity. Operators are instructed to copy the reports of the stations along the route in order to eliminate unnecessary transmissions or delay in securing the weather information.

ALACO BROADCAST

STATION	TIME	FREQ.	BDCSTS. WX COLLECTED FROM THE FOLLOWING STATION
CHABUA, INDIA	H+00 H+30	5157.5	DINJAN, FORT HERTZ, JORHAT, KUNMING, MISAMARI, MOHANBARI, SOOKERATING, TEZPUR.
KUNMING, CHINA	H+15 H+45	5157.5	CHABUA, CHANYI, CHENGMUNG, KWEILIN, LIKIANG, SICHOW, YANKAI, YUNNANYI.

PART V

AIR ALERTS AND AIR RAIDS

1. The majority of airfields in China and Burma are subject to enemy attacks at almost any time. While raids are usually detected beforehand and, as a result, routine flights are cancelled or evasive action taken, numerous instances arise where aircraft in flight must be warned of alerts or raids along the route and diverted to other bases. In the event of an alert or raid at a particular base, the air-ground stations at the location notify aircraft in the vicinity by transmitting messages using appropriate "Q" signals. It is imperative, therefore, that the radio operator maintain a continuous headphone watch on the assigned frequencies for messages of this type.

2. The following "Q" Signals are used to designate air alerts and raids:

QZS - (1. Alert 2. Air Raid) began at ____hours GMT at____(call sign)

QZT - (1. Alert 2. Air Raid) which has been in progress at ____(call sign) ended at ____ hours GMT.

QGN - May I land at ____? You may land at ____.

QGO - You may not land at ____.

An example of an air alert at Chabua would be sent by the air-ground station as follows:

"QZS 1 1630 VG" (The tower identification is used to designate the field)

An air raid at Sookerating would be transmitted as:

"QZS 2 1400 OH"

4. When an airfield is closed for a short period because of emergency other than enemy action (such as dust storms or wrecked aircraft on the runway), the signal QGO is used to

signify a closed airfield. To designate an alternate field, the signal QGN followed by the call sign of the tower of the alternate airfield will be sent. When the airfield is again open, the signal QGN followed by the tower call will be sent.

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

Change No. 1
16 Feb 1945

PART VI

EMERGENCY PROCEDURE

1. An aircraft in distress or faced with imminent distress should immediately establish and conduct distress communication with its usual aeronautical station or with another known Army, Navy, RAF or Civil Station in the vicinity on the assigned frequencies and using the prescribed operation procedure insofar as practicable.

2. When contact with the usual air-ground station cannot be established, the operator should direct the distress call toward any other stations available. The most widely used frequencies in the CBI by AACS, RAF, and Civil authorities offer the best choice for emergency communication and are indicated below:

(a)	(4495 Voice (4595 C. W.	Army Air Common Calling Wave for use in the vicinity of Army Aviation activities.
(b)	(4220 Voice (5168 Voice	Additional widely used AACS Air-Ground Frequencies
(c)	(333 CW (6590 CW (4575 CW (3105 CW	RAF and Civil frequencies in wide usage throughout the CBI
(d)	500	International distress wave normally used at sea.

3. When distress signals, Mayday or SOS, are heard a bearing or a fix is taken by the ground station without specific request, other than to request the aircraft to repeat the call for one minute. If available, the distress message should include the position of the aircraft, nature of distress, and any other particulars which might aid in a speedy rescue.

a. Example: R/T

"Mayday, Mayday, Mayday - William Dog - This is King Seven Able - Ten Minutes gas - Above overcast - Request homing - Over".

"King Seven Able - This is William Dog - Roger - Transmit for homing - Over".

"William Dog - This is King Seven Able - Transmitting for homing"

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

28 FEB 1945
INCL. No. 5

(on HF: Aircraft will transmit for a 20-second period during which no voice transmission is made but microphone button is depressed)

(of on VHF: aircraft will transmit a count from one to five and back)

"This is King Seven Able - Over".

"King Seven Able - This is William Dog - Steer two five two - Time 1915 Over".

"William Dog - This is King Seven Able - Wilco - Out".

b. Example: CW - General scheme

SOS SOS SOS V K7A K

K7A V WD K

WD V K7A $\overline{\text{INT}}$ QDM K

K7A V WD $\overline{\text{AS}}$ (Contacts D/F Operator) QTN K

WD V K7A 20-second dash K7A K

K7A V WD $\overline{\text{AS}}$ (Receives bearing from D/F Operator) QDM 252 A 1910Z K

WD V K7A R $\overline{\text{AR}}$

Before abandoning the aircraft, the radio operator, or pilot will screw down the CW transmitting key so that D/F stations may fix the aircraft's position.

4. Information with regard to the distress calls, automatic alarm system, and transmission periods are given in the SOI of this Command and are a standard procedure in the CBI theater.

PART VII

REBECCA-EUREKA SYSTEM

1. Rebecca-Eureka is a navigational homing system composed of an airborne piece of equipment called Rebecca and a ground beacon equipment called Eureka.

2. This system, when using the Eureka beacon adapted for the particular situation, can be used for the following purposes:

a. Landing of parachute troops by night.

b. Landing of gliders at night.

c. Maintaining airborne supply operations to isolated formations at night.

d. Demarkation of bombing line for close support bombers.

e. Identification of certain advancing units.

f. Homing on high power airdrome beacons.

g. Also for homing-in in adverse weather conditions.

3. From the CRT (Cathode Ray Tube) display located in the Indicator of the Rebecca equipment, both the range (distance from the beacon) and the direction of the ground beacon can be obtained. The operator directs the course of the airplane until it is heading towards the beacon. As the range from the beacon is given, the pilot then can reduce his altitude progressively so as to pass over the beacon at the optimum height. The moment the plane is directly over the beacon can be determined by the Rebecca operator by noting the momentary collapse of the image on the CRT.

4. In the event that several beacons are being used in the neighboring localities, the operator of the Rebecca, by using the correct frequencies for transmitting and receiving and by reading a code letter sent manually from the ground beacon, can select the desired beacon.

PART VIII

BLIND APPROACH BEACON SYSTEM (BABS)

1. BABS is a BLIND APPROACH BEACON SYSTEM employing a Radar type beacon and a Rebecca equipped airplane. It is not a blind landing system.

2. The purpose of BABS is to provide a means of blind approach through an overcast of one hundred to two hundred feet and one-half mile visibility. The system employs a radar beacon and a set of highly directional antennas located at the upwind end of the runway. Indications are received in the aircraft on the scope of the AN/APN-2. The system enables the radar operator to direct the pilot to an "on-course" beam which is the extending center line of the runway being used for landing. The equipment is designed to give a beam of 1° width. Troop Carrier units operating in the CBI are equipped with the BABS antenna kits and are using the equipment for Blind Approaches.

3. BABS antenna kit consists of directional antenna array and switching box, which is attached to AN/TPN-1 to complete the ground installation necessary for BABS system. The BABS system is directional and cannot be used for homing.

4. Prior to the BABS approach, the airdrome should be located by use of a Eureka homing beacon, radio device, or other navigational aid.

Technical Operation

1. The idea behind BABS is analogous to that of a Radio Range. Consider the BABS "on-course" signal which is spread down the middle of the runway to be the leg of a Radio Range. When the airplane is "on-course" a constant signal is received. Similarly there is a constant signal on the screen of the oscilloscope when the airplane is in the "on-course" signal of BABS. As the airplane tends to move to the left or right of the "on-course" signal a distinctive signal is seen on the screen designating the area in which the airplane is flying. On the left side of the "on-course" signal as the aircraft approaches the airdrome is the DOT Sector and on the right side is the DASH Sector.

2. The BABS system gives indication of range, azimuth with respect to "on-course" signal, and amount of "crabbing" of airplane.

3. The RANGE of the aircraft from the beacon at the far (upwind) end of the runway is indicated by the scale. This information should be passed to the pilot directly, thus "range 4 miles", "range 1-1/2 miles", as the case may be. It should be noted by both the pilot and radar operator that range readings are from upwind end of the runway. The pilot should have information as to length of runway and subtract this from the given range in order to know when he is over approach end of runway.

4. The SECTOR in which the aircraft is flying is determined by observing the changes in the appearance of the indication. Unless the aircraft is exactly "on-course", the indication will be observed to change every second. If the indication becomes LESS for a short interval, the aircraft is in a DASH sector; if it becomes GREATER for a short interval, it is in a DOT sector. The indication is steady when the aircraft is "on-course". By noting the ratio of size between the lesser and greater indications, the operator determines how much correction is necessary according to the following table:

RATIO	SECTOR
1 to 1	"On-Course"
4 to 3	1° off course
2 to 1	2° to 6° off course
4 to 1	6° to 12-1/2° off course
Greater	12-1/2° to 40° off course

These sector readings are given with the BABS beacon as the vertex of an angle and the "on-course" signal as one leg of the angle. The other leg of the angle is the line of flight of the airplane. The BABS operator must hold in mind at all times that it is essential to get "on-course" as far away from the end of the runway as possible.

5. The HEADING of the aircraft relative to the beacon is given by relation of the indication to the vertical reference line. If the indication is central, then the aircraft is heading directly toward the beacon, if it is off-center to the right or left, then the beacon lies to the right or left of the aircraft heading. This information should be passed to the pilot directly, thus "beacon

to left" or "beacon to right". In this respect, it should be noted that a cross-wind on the landing runway would necessitate a certain amount of crabbing. Thus, the heading indication, I.E., the relation of the indication with respect to the vertical reference line might be to left or right, but as long as the "on-course" signal remains constant the pilot should continue crabbing until he gains visual contact with the runway.

6. Figures 1, 2, 3, and 4 show the patterns that will appear on the screen in the airplane. From these indications, the radar operator should be able to extract the necessary information to put the pilot "on-course".

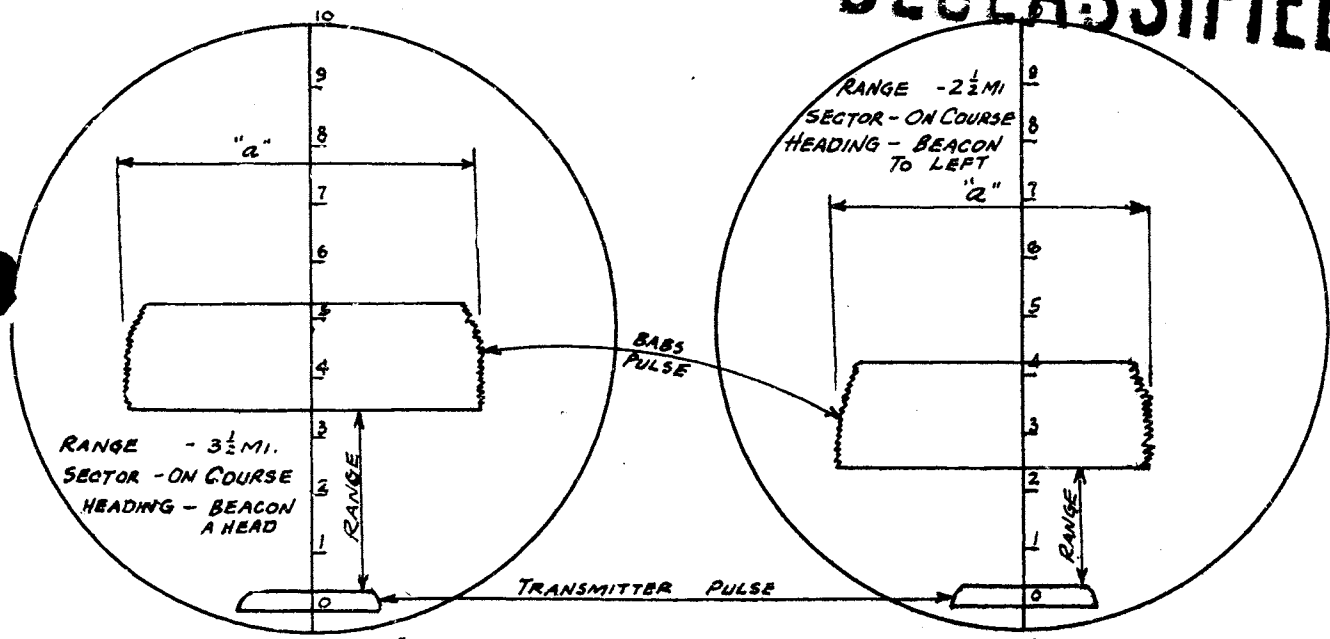
7. The "on-course" pattern is illustrated in Figure 1. Range is measured from the transmitter blip to the lower edge of the BABS pulse as shown in the figure. When the plane is flying the "on-course" beam, the over-all amplitude of the pulse, as represented by "a", is constant. No evidence of coding will be visible. This does not mean that the echo need necessarily be equally spaced across the vertical trace when "on-course" for if the ship is crabbing, the picture will be displaced to one side.

8. Figure 2 represents a ship crabbing down the "on-course" beam. Note that "a" is still constant. If the ship drifts off to the right, it moves into the "dash" area and coding becomes visible, the degree of coding being a function of the number of degrees the ship is off to the right (or left).

9. The dash, or "to the right" indication is a momentary collapse of the echo occurring at regular intervals. Figure 3 shows this effect in which "b" represents the amplitude of the longer interval of coded time and "c" is the momentary collapse. It appears to the observer, then, that the echo's normal size is "b", broken at regular intervals by short decreases to "c".

10. The dot, or "to the left" indication, is a momentary increase in the echo occurring at regular intervals. Figure 4 shows the effect when the ship is off to the left ot the beam and is the exact opposite of that of Figure 3. Here the normal amplitude of the echo, "b", momentarily increases to the amplitude "c" at regular intervals. The ship is not crabbing in Figures 3 and 4. The duration of the indication referred to as the dash signal is four-fifths (.8) of a second and that referred to as the dot signal is two-tenths (.2) of a second duration. These indications are spaced so that the dot starts immediately after the dash stops, making the "on-course" signal a constant image on the screen.

11. In Figures 3 and 4, the ratio of maximum echo to minimum echo will enable the radar operator to estimate how many degrees "off-course" the aircraft is flying. In Figure 3, the airplane would be about 5° to the right, and in Figure 4, the airplane would be about 5° to the left.



"ON COURSE"

FIG. 3

"ON COURSE" (AIRPLANE CRABBING)

FIG. 4

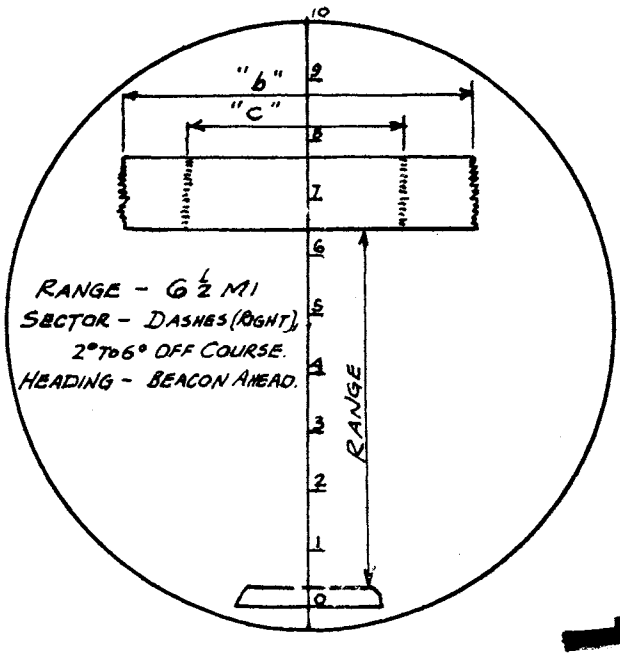


FIG. 5

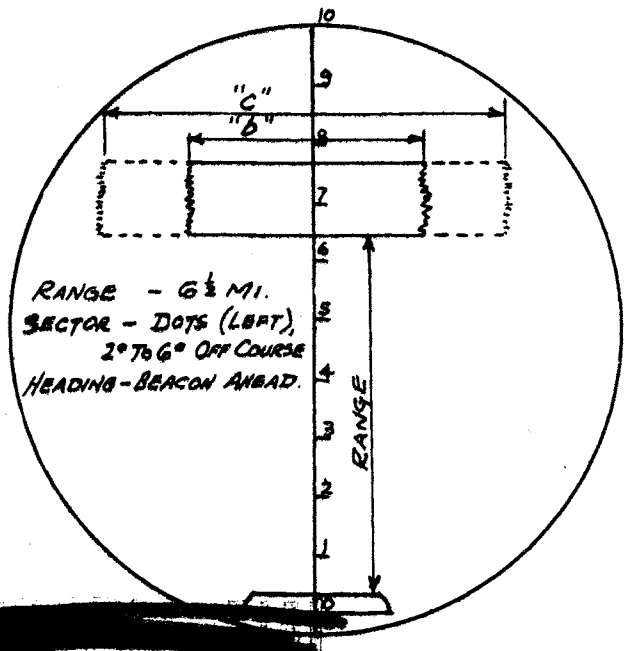


FIG. 6

PART IX

LORAN

1. In view of the extensive installation of the ground components in the CBI, the importance of, and eventual utilization of Loran equipment for navigational purposes, a brief description of the purpose and use of this equipment is given.

2. Loran, AN/APN-4, an abbreviation for Long Range Navigation provides accurate navigation over long distances - a means that compares with or is better than celestial navigation and can be used in unfavorable weather conditions when celestial navigation cannot. The maximum range of AN/APN-4 operation is approximately 500 miles when working with direct radio waves from its associated ground stations, and approximately 1200 miles when working with sky waves or reflected waves from these ground stations. Accuracy in determining a location fix can be within one thousand feet when using direct waves from the ground station, and may be as accurate when using sky waves, but in this case the accuracy cannot be depended upon to be within four or five miles. Depending upon the ability of the operator, accuracy in determining a location fix will be better than with celestial navigation even with best weather conditions, due to the speed with which a reading can be taken.

3. This equipment is used in conjunction with specific ground stations which are operated in pairs - each pair of ground stations operating in synchronism. A pair of stations consists of what is called a master and a slave station usually lettered "A" and "B". The "A" and "B" stations are separated from each other by approximately 70 to 300 miles or greater depending on the geographical location; the "B" station being synchronized with the "A" station by either land line or radio control.

4. Due to the fact that ground stations do not send out a continuous wave but transmit pulses of energy, very high RF power can be transmitted with comparatively small ground station equipment. The AN/APN-4 is able to determine the <u>time difference</u> in arrival at the airplane of RF pulses transmitted by a pair of ground stations. In other words it is a time measuring device, capable of measuring time in micro-seconds or millionths of a second.

5. Loran charts covering a definite area, are furnished the operator for the purpose of determining the fix of the aircraft. These Loran charts contain numerous lines (hyperbola) along which and at any point on the line the difference in time in arrival of the RF pulses transmitted by a pair of ground stations is the same. Pairs of stations are so located that the hyperbola of one pair intersect the hyperbola of another.

6. To determine an exact fix at least two pairs of stations are necessary. In such a case, the operator takes a time reading first on one pair of stations and then on the other, and determines two lines of positions or hyperbolas, with reference to each pair of stations. There the two lines meet or intersect as shown on the Loran maps indicates the location of the aircraft.

7. Important facts about AN/APN-4 to be rembered and noted are:

a. AN/APN-4 fills need for Long Range Navigation.

b. Operating distance from each pair of ground stations - 500 miles ground waves, 1200 miles sky waves.

c. Ground waves should be used if available. Care should be taken with sky waves when used.

d. Used in conjunction with pairs of ground stations (usually eight) located at points along a navigation route.

e. Provision made in design for operator to determine position by properly prepared maps (Loran charts).

f. AN/APN-4 is a time measuring device capable of measuring time in micro-seconds or millionths of a second.

g. Equipment designed for use in plane from conventional plane power supply.

EXAMINATION QUESTIONS

TRUE -- FALSE

1. Control towers are contacted by using the clear text designation. Example: "CHABUA TOWER, THIS IS KING SEVEN GEORGE, OVER" F

2. Voice communication is used exclusively in the CBI theater. F

3. Control towers furnish weather information to planes utilizing the Alaco Weather Form. T

4. Air-Ground stations furnish weather information to planes in flight upon request only. F

5. Non-directional beacons, as a general rule, are in continuous operation. T

6. The operating frequency and call letters of the non-directional beacons are listed in the Facilith Chart. T

7. Radio ranges in the CBI are of the portable type, and, as a result, can never be reliable. F

8. The radio operator requests that a range be turned on from the air-ground station at the particular location. T

9. VHF/DF assistance is not available at any bases in the CBI. F

10. AACS stations can provide D/F assistance either on VOICE or CW. T

11. The procedure to secure D/F assistance from AACS, RAF, or Civil stations is the same. F

12. As a general rule, the AACS D/F stations provide QTE's, QUJ's and when operating in nets, QTF. T

13. When using a "Q" Signal in the form of a question to Civil stations, INT follows the "Q" signal. F

14. In the event of an air alert in the vicinity of certain bases, the air-ground stations at that location will notify planes in flight by appropriate "Q" Signals. T

15. Operators in the CBI are instructed to copy the "F" method weather broadcasts from AACS stations, and under no circumstances must weather information be requested by planes in flight. F

16. Loran is used primarily to furnish homing assistance to planes in flight. F

17. The AN/APN-4 determines the time difference in arrival at the airplane of RF pulses transmitted by a pair of ground stations. T