

PHOTOGRAPH THIS SHEET

AD A950818

DTIC ACCESSION NUMBER



LEVEL



INVENTORY

Central Intelligence Agency
Wash, DC

National Intelligence Survey No. NIS 64

DOCUMENT IDENTIFICATION

May 60

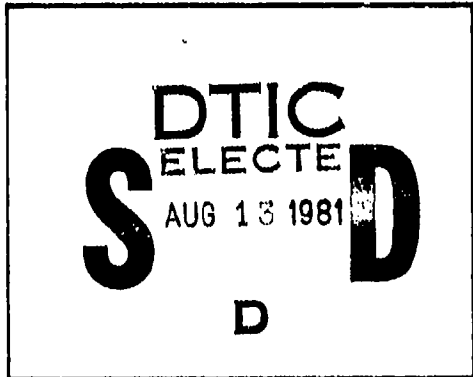
DISTRIBUTION STATEMENT A

Approved for public release;
Distribution Unlimited

DISTRIBUTION STATEMENT

ACCESSION FOR	
NTIS	GRA&I
DTIC	TAB
UNANNOUNCED	
JUSTIFICATION	
(May 1960)	
BY	
DISTRIBUTION / For Ltr. on file	
AVAILABILITY CODES	
DIST	AVAIL AND/OR SPECIAL
A	

Released



DATE ACCESSIONED

DISTRIBUTION STAMP

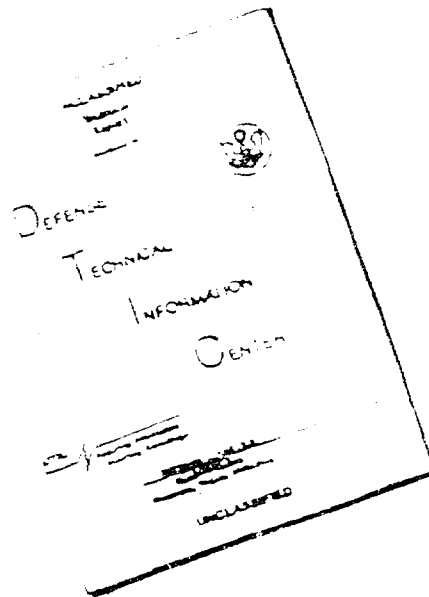
UNANNOUNCED

81 6 09 143

DATE RECEIVED IN DTIC

PHOTOGRAPH THIS SHEET AND RETURN TO DTIC-DDA-2

DISCLAIMER NOTICE



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

AD A950818

NATIONAL INTELLIGENCE SURVEY
SOUTH ATLANTIC ISLANDS

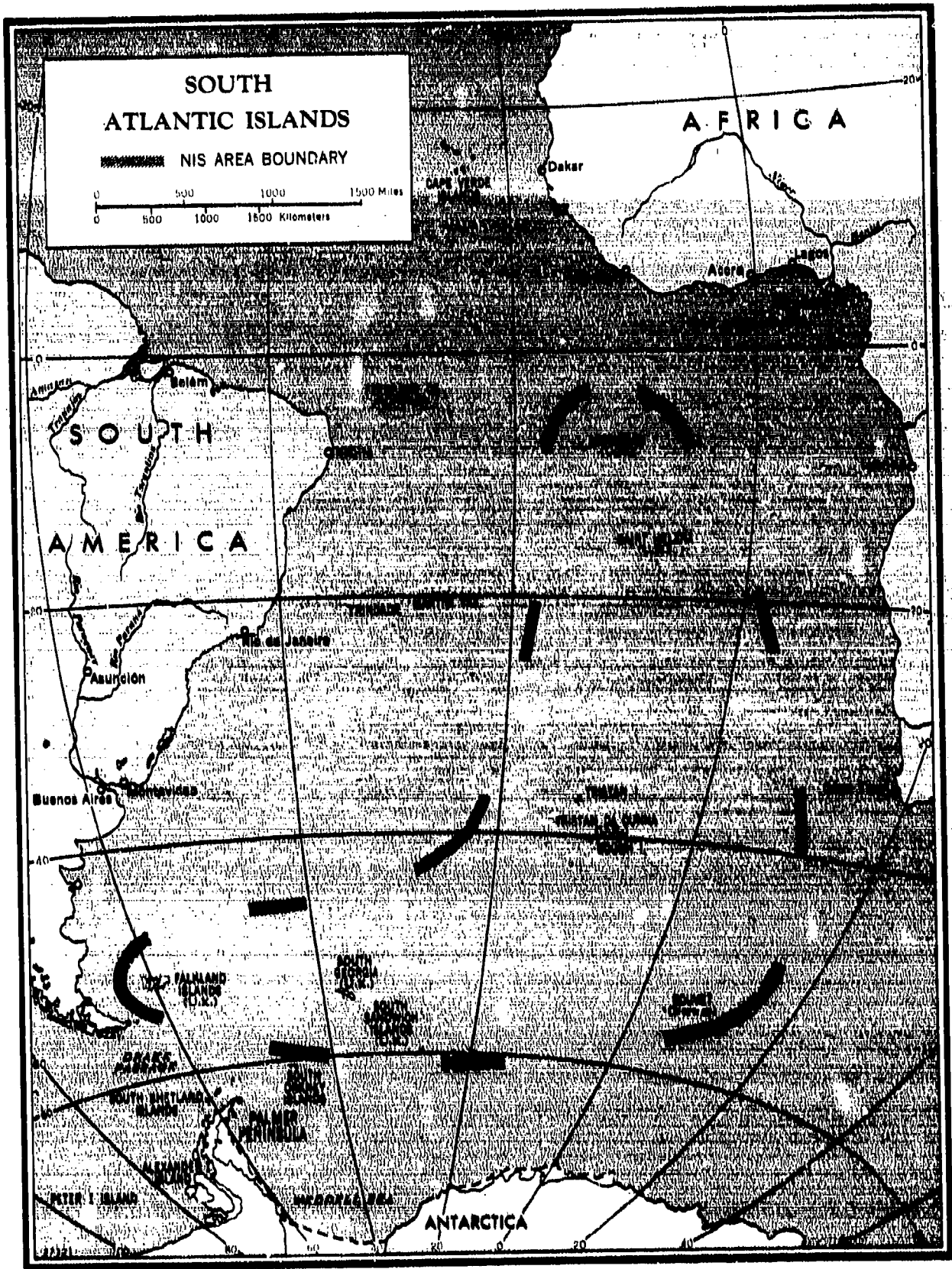
SECTION 23
WEATHER AND CLIMATE

CLASSIFIED BY CIA
EXEMPT FROM GENERAL DECLASSIFICATION
SCHEDULE OF EXECUTIVE ORDER 11652
EXEMPTION CATEGORY A3, 1, 2, & 3
DECLASSIFY ON: ONLY ON APPROVAL OF
DIRECTOR OF CIA

DISTRIBUTION STATEMENT A
Approved for public release;
Distribution Unlimited

CENTRAL INTELLIGENCE AGENCY
Washington, D. C.

CHAPTER II
Declassify
CIA LTR 3 Sep 80



WARNING

This document contains information affecting the national defense of the United States, within the meaning of Title 18, Section 793 and 794, of the U.S. Code, as amended. Its transmission or revelation of its contents to or receipt by an unauthorized person is prohibited by law.

TABLE OF CONTENTS FOR SECTION 23

	<i>Page</i>
A. General weather and climatic conditions	23 - 1
1. Introduction	23 - 1
2. Climatic controls	23 - 1
a. General circulation and air masses	23 - 2
b. Topographic influence	23 - 2
c. Latitude and oceanic influences	23 - 2
d. Transitory weather phenomena	23 - 3
3. Climatic regimes	23 - 3
a. Tropical regime	23 - 3
b. Temperate regime	23 - 3
c. Subpolar regime	23 - 6
B. Weather and military operations	23 - 7
1. Air operations	23 - 7
a. Cloudiness	23 - 7
b. Thunderstorms and turbulence	23 - 9
c. Upper-air winds	23 - 9
d. Upper-air temperatures and aircraft icing	23 - 9
2. Air-ground operations	23 - 12
a. Ceiling	23 - 12
b. Visibility	23 - 12
c. Combined ceiling and visibility	23 - 16
d. Surface winds	23 - 17
3. Ground surface operations	23 - 18
a. Temperature	23 - 18
b. Relative humidity	23 - 18
c. Precipitation	23 - 21
d. Overall effect of surface weather on clothing, storage, and shelter	23 - 24
(1) Clothing	23 - 24
(2) Storage	23 - 25
(3) Shelter	23 - 25
4. Amphibious operations	23 - 25
a. Ascension Island and Saint Helena Island	23 - 25
b. Tristan da Cunha Group	23 - 25
c. Falkland Islands	23 - 26
d. South Georgia	23 - 26
e. South Sandwich Islands	23 - 26
f. Bouvet Island	23 - 27
C. Meteorological facilities and organization	23 - 27
1. Ascension Island	23 - 27
2. Saint Helena Island	23 - 27
3. Tristan da Cunha Group	23 - 27
4. Falkland Islands and South Georgia	23 - 27
D. Climatic data tables	23 - 28
E. Comments on principal sources	23 - 39

UNCLASSIFIED

LIST OF FIGURES

			Page
Fig. 23-1	Maps	Mean sea-level pressure and predominant paths of extratropical cyclones, January and April	23 - 4
Fig. 23-2	Maps	Mean sea-level pressure and predominant paths of extratropical cyclones, July and October	23 - 5
Fig. 23-3	Map	Days with various cloud amounts at specified hours	23 - 8
Fig. 23-4	Diag.	Upper-air wind roses, Ascension Island	23 - 10
Fig. 23-5	Diag.	Upper-air wind roses, Stanley, Falkland Islands	23 - 11
Fig. 23-6	Map	Frequency of specified ceiling ranges at specified hours	23 - 13
Fig. 23-7	Map	Frequency of specified visibility ranges at specified hours	23 - 14
Fig. 23-8	Map	Days with ceiling \leq 1,000 feet and visibility \leq 2½ miles at specified hours	23 - 15
Fig. 23-9	Map	Surface wind roses, December - February	23 - 16
Fig. 23-10	Map	Surface wind roses, June - August	23 - 17
Fig. 23-11	Map	Temperatures	23 - 19
Fig. 23-12	Map	Mean relative humidity at specified hours	23 - 20
Fig. 23-13	Map	Mean precipitation	23 - 22
Fig. 23-14	Map	Days with precipitation $>$ 0.04 inch	23 - 23
Fig. 23-15	Table	Days with various cloud amounts at specified hours	23 - 28
Fig. 23-16	Table	Mean upper-air temperatures at standard pressure surfaces	23 - 30
Fig. 23-17	Table	Mean heights of standard pressure surfaces	23 - 30
Fig. 23-18	Table	Frequency of specified ceiling ranges at specified hours	23 - 31
Fig. 23-19	Table	Frequency of specified visibility ranges at specified hours	23 - 32
Fig. 23-20	Table	Days with ceiling \leq 1,000 feet and visibility \leq 2½ miles at specified hours	23 - 34
Fig. 23-21	Table	Mean daily temperature	23 - 34
Fig. 23-22	Table	Mean daily maximum and minimum temperatures	23 - 35
Fig. 23-23	Table	Absolute maximum and minimum temperatures	23 - 35
Fig. 23-24	Table	Mean relative humidity at specified hours	23 - 36
Fig. 23-25	Table	Mean precipitation	23 - 36
Fig. 23-26	Table	Maximum 24-hour precipitation	23 - 36
Fig. 23-27	Table	Days with precipitation $>$ 0.04 inch	23 - 37
Fig. 23-28	Table	Days with snow at specified hours	23 - 37
Fig. 23-29	Table	Days with hail at specified hours	23 - 37
Fig. 23-30	Map	Station locations	<i>follows</i> 23 - 39

This Section was prepared for the NIS under the general supervision of the Assistant Chief of Staff, Intelligence, USAF, by the Air Weather Service, with contributions on clothing, storage, and shelter from the Office of the Quartermaster General, Department of the Army, and on amphibious operations from the Naval Weather Service Division.

23. Weather and Climate

The user can supplement the information in this Section by referring to the Section on Marine Climate, in the NIS on Ocean Areas, NIS 104-IV, V, VI, VII, and VIII.

A. General weather and climatic conditions

1. Introduction

The NIS 64 Area, South Atlantic Islands, is located within an ocean expanse extending from the tropics to the subpolar regions. Making up this NIS Area are Ascension Island, Saint Helena Island, the Tristan da Cunha Group, the Falkland Islands, South Georgia, the South Sandwich Islands, and Bouvet Islands (FIGURE 23-30).

Ascension Island, with an area of about 34 square miles, is located at 7°57'S. and 14°22'W. in the heart of the southeast trade winds. It is of volcanic origin and its irregular surface presents a rugged and uninviting appearance when viewed from the sea. The greatest elevation on the island, the summit of Green Mountain, is about 2,800 feet. Saint Helena Island, with an area of about 47 square miles, is located at 15°57'S and 5°42'W. in the southeast trade-wind belt. It is also of volcanic origin. The coastline is precipitous, with cliffs 1,000 to 1,800 feet high intersected by gorges through which streams emerge from the interior highlands. The island is divided into two unequal parts by a ridge of mountains from 2,000 to nearly 2,700 feet in height. The Tristan da Cunha Group consists of Tristan, Inaccessible, Stoltenhoff, Middle, Nightingale, and Gough Islands. The last four islands are uninhabited, and Tristan is the only island for which meteorological data are available. This group of islands, all of volcanic origin, lie between 37°02' and 40°22'S. latitudes and 9°52' and 12°42'W. longitudes. The coastline of each is steep and rugged, and the highest point in the group is on Tristan at about 7,000 feet. The Falkland Islands consist of two main islands, East and West Falkland, located near 51°45'S. and 59°30'W. They are separated by Falkland Sound, which is 5 to 10 miles wide. A number of smaller islands lie close to the two main ones. Much of the surface is low, rolling terrain covered with peat; however, a number of

NOTE Requests for solutions to specific problems involving the interpretation of the weather factor in the user's unique operational terms should be directed to the Commander, Climatic Center, Headquarters Air Weather Service, Annex 2, 225 D Street, S.E., Washington 25, D.C.

hills rise to elevations of about 2,000 feet on the two main islands. South Georgia, located at about 54°30'S and 36°30'W., is a long narrow island. Its main axis extends about 100 miles in a northwest to southeast direction and its width varies from about 2 to 22 miles. The entire island is mountainous, with peaks between 6,000 and 9,000 feet separated by deep glacier-filled valleys. The South Sandwich Islands are a group of uninhabited islands located between 56°00'S. and 59°30'S. latitudes and at approximately 27°W. longitude. Bouvet Island near 54°25'S. and 3°25'E. is a rugged, uninhabited, and relatively unexplored island situated in a key meteorological position in the southern part of the South Atlantic.

Since the South Atlantic Islands are scattered over such a vast ocean area, the climate varies greatly from north to south. For discussion purposes, therefore, the islands may be grouped under three climatic regimes: tropical, temperate, and subpolar. This grouping places Ascension Island under the tropical regime, Saint Helena Island and the Tristan da Cunha Group under the temperate regime, and the remaining islands under the subpolar regime. Because the South Atlantic Islands are far removed from large land masses, extreme ranges of temperature and relative humidity, such as might be observed at continental stations near the same latitudes, do not occur. The surrounding ocean area has a strong moderating effect upon these elements.

The seasons referred to in this Section are summer (December, January, and February), autumn (March, April, and May), winter (June, July, and August), and spring (September, October, and November).

2. Climatic controls

The general climatic conditions existing at island locations in the South Atlantic are the result of the vast South Atlantic high-pressure cell and the maritime influence of the ocean water. The high-pressure cell dominates much of the South Atlantic Ocean in all seasons of the year, literally steering storm centers around its periphery. At lower levels in the atmosphere, the ocean exerts a strong moderating influence on

all weather elements. The large climatic variations usually apparent at continental locations are not so evident in this NIS Area.

a. GENERAL CIRCULATION AND AIR MASSES — The South Atlantic *high*, with its counterclockwise circulation, produces or greatly influences the prevailing lower-level wind systems north of about 45°S. latitude. The intensity and position of this pressure center and its seasonal variations influence the climatic regimes of Ascension Island and the Tristan da Cunha Group and probably to some extent that of Saint Helena. During the summer season and into the autumn, this pressure center is weakest and at its southernmost position. During the month of April the intensity and position of the *high* combined with the formation of a secondary or split intertropical convergence zone extending from the vicinity of Ascension Island to the coast of Africa permit easterly waves to pass close to Ascension Island. During the winter season the high-pressure cell is strongest and at its northernmost position, and the polar frontal zone, which is also strongest during the winter, is located along the southern edge of the high-pressure cell. As a result, the Tristan da Cunha group experiences the seasonal maximum effect of the storm centers moving along the polar frontal zone. South of about 45°S. latitude the circulation throughout the year is from west to east, a part of the strong, deep polar westerlies surrounding the Antarctic continent.

Tropical maritime air masses, warm and moisture-laden, characteristic of the South Atlantic high-pressure cell, dominate Ascension Island, Saint Helena Island and the Tristan da Cunha Group throughout most of the year. However, during April when Ascension Island is affected by intertropical convergence zone (ICZ), this island is dominated by equatorial maritime air masses, which are slightly warmer than tropical maritime air masses and have a source region nearer the Equator. During the winter, the Tristan da Cunha Group occasionally experiences polar maritime air masses, characterized by cool or cold temperatures. These polar air masses have a source region south of the polar frontal zone and are associated with the passage of storm centers and their frontal systems. Overlying the South Atlantic *high*, and in contrast to the maritime air near the surface, is superior air, which is relatively warm and extremely dry and rarely, if ever, descends to the surface. Polar maritime air dominates the islands south of 45°S. throughout the year.

b. TOPOGRAPHIC INFLUENCE — Specific data as to the variability of the weather elements due to topography in this NIS Area are not available since most of the islands have only one observing station; an exception is the Falkland Islands. As a consequence, only general statements concerning topographic influences can be made. The variations in elevation on these relatively small islands do not seriously alter their general climatic conditions. However, changes in elevations from sea level to the highest points on some islands do influence the values and ranges of certain climatic elements. Temperatures, precipitation, and wind speed are the elements most noticeably affected. In general, mean and extreme temperatures are lower and precipitation amounts and frequencies as well as wind speeds are higher over high terrain than they are near sea level. Tristan Island with one peak near 7,000 feet and South Georgia with several peaks between 6,000 and 9,000 feet are affected in this manner. These two islands experience greater ranges in temperature, precipitation, and wind speed than the other South Atlantic Islands. Relative humidity values, which decrease sharply with such elevations, also vary more widely on these two islands.

One marked effect on temperature, relative humidity, and cloud amount is the warming and drying caused by air descending from a higher elevation. The foehn wind, as it is generally called, occurs frequently at Grytviken on South Georgia, because of air descending from the mountains to the west. The following tabulation shows the warming and drying effect at this station when the winds shift from an easterly to a westerly direction:

DATE	TIME (GMT)	WIND		TEMP. (°F.)	R.H. (%)	LOW CLOUD
		DIRECT. (DEG.)	SPEED (KNOTS)			
22 Sep	1800	020	3	33.0	83	2/8
23 Sep	0000	290	22	48.0	22	0
23 Sep	0600	290	24	46.7	14	0

c. LATITUDE AND OCEANIC INFLUENCES — The climate of the NIS 64 Area islands is not affected by their individual latitudinal extent. However, the latitudinal extent of the Area with its variation of solar insolation does affect the general characteristics of the climate over the ocean area within which these islands are located. The solar insolation is one of the prime factors determining the climatic regime (tropical, temperate, or subpolar), in which each island is located. The ocean exercises a strong moderating effect on the climate in the lower levels of the atmosphere, especially with regard to temperature, relative humidity, wind velocities, and cloud cover. These elements, when compared with the same elements at continental locations of the same latitude in

either hemisphere, exhibit a marked uniformity from season to season and from year to year. In general, the climate of islands, especially those under the tropical and temperate regimes, is notably lacking in change.

d. TRANSITORY WEATHER PHENOMENA — All the South Atlantic Islands, with the exception of Saint Helena Island, experience weather associated with moving systems or storm centers. During the month of April the intertropical convergence zone splits into two sections, the southern portion extending from Ascension Island to the coast of Africa. At this time, Ascension Island is affected by the westward progression of tropical disturbances, usually referred to as easterly waves but occasionally called low-pressure troughs, squall lines, or tornadoes. During periods of easterly wave activity, maximum cloud and precipitation amounts, as well as the most intense precipitation, are associated with the wave passage; minimum cloudiness and little, if any, precipitation occur during the period between wave passages. The Tristan da Cunha Group lies near the storm paths of the central South Atlantic during all seasons of the year except spring, when the storm path is at its southernmost position. During summer, autumn, and winter, storm centers moving from the central South American Continent are diverted around the South Atlantic high-pressure center and affect these islands. Although storm frequency data are not available, indications are that these migratory storms occur most frequently during the winter season. This deduction is based primarily on the fact that the frequency of precipitation is at a maximum during the winter. The Falkland Islands, South Georgia, and the South Sandwich Islands are under the influence of the storm centers moving eastward from their origin in the Antarctic. The greatest frequency of these storms occurs during winter and spring. Bouvet Island, situated to the east of these islands, is located near the predominant paths of transitory storm centers during all seasons. This island is affected by storms moving from both the vicinity of the Tristan da Cunha Group and from the islands to the west. Specific data as to the frequency and intensity of migratory storms are not available, but the predominant paths of these storms are shown in FIGURES 23-1 and 23-2.

3. Climatic regimes

The season-to-season and year-to-year climatic variations in the South Atlantic Islands result from the seasonal and yearly movements of the South Atlantic high-pressure cell, the intertropical convergence zone (ICZ) in the north, and the

polar frontal zone in the south. These three systems are at their northernmost position in the winter season (June through August) during which time the polar front is most active. The three systems are at their southernmost position in the summer season (December through February). April is the month of maximum activity along the ICZ in the South Atlantic. Except on Ascension Island, temperatures vary typically according to the season, maximum temperatures occurring during the summer and minimum during the winter. The month of maximum precipitation varies from station to station.

a. TROPICAL REGIME — On Ascension Island, which is under the influence of the tropical regime, the climate is warm and dry, with only slight seasonal variations. Precipitation amounts to a little more than 5 inches per year. It is influenced by the seasonal oscillation of the ICZ and reaches its maximum amount, intensity, and frequency during April, although the mean amount is only 1.1 inch and the frequency is only 4 days per month. At this time the equatorial trough takes on a double structure, with the southern branch extending from near Ascension Island to the African shore. Temperatures reach a maximum during March and April; however, the yearly range is quite small, with mean daily maximums in the 80's and minimums in the 70's. Relative humidities at this location, mostly in the 60's or low 70's, are lower than at the other South Atlantic Islands and exhibit no marked maximum or minimum in any particular season. Visibility is usually good in all months, averaging above 6 miles most of the time. Windflow is almost constantly from an easterly direction, with its mean speed between 13 and 19 knots. Cloudiness is at a maximum during the months of September through November and at a minimum in February through July. Cloudy days (cloud cover equal to or greater than 6-tenths) are recorded about 200 days annually. Thunderstorms are rare, with only 4 being reported in a 7-year period—1 in February, 2 in March, and 1 in April.

b. TEMPERATE REGIME — Under the influence of the temperate climatic regime are Saint Helena Island and the Tristan da Cunha Group. Precipitation on Saint Helena varies markedly from year to year; seasons of drought have occurred and there are records of at least one season of severe floods which caused much damage. The annual mean is about 32 inches. Maximum rainfall is generally recorded during early autumn and winter and minimum rainfall, in late spring. Thunderstorms have never been reported in the vicinity of this island. Only slight temperature variability throughout the year is observed;

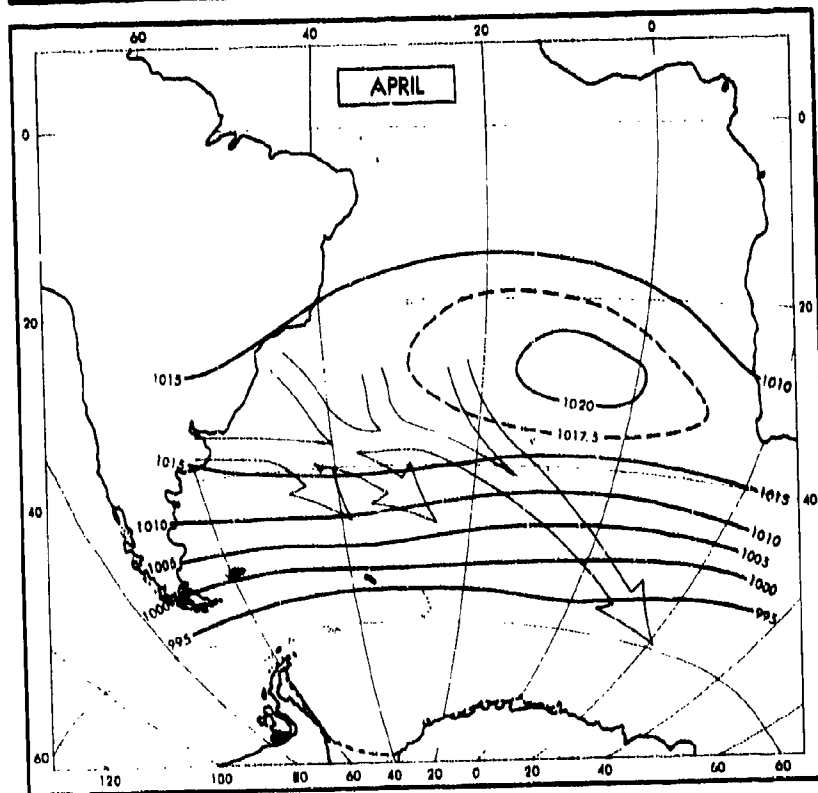
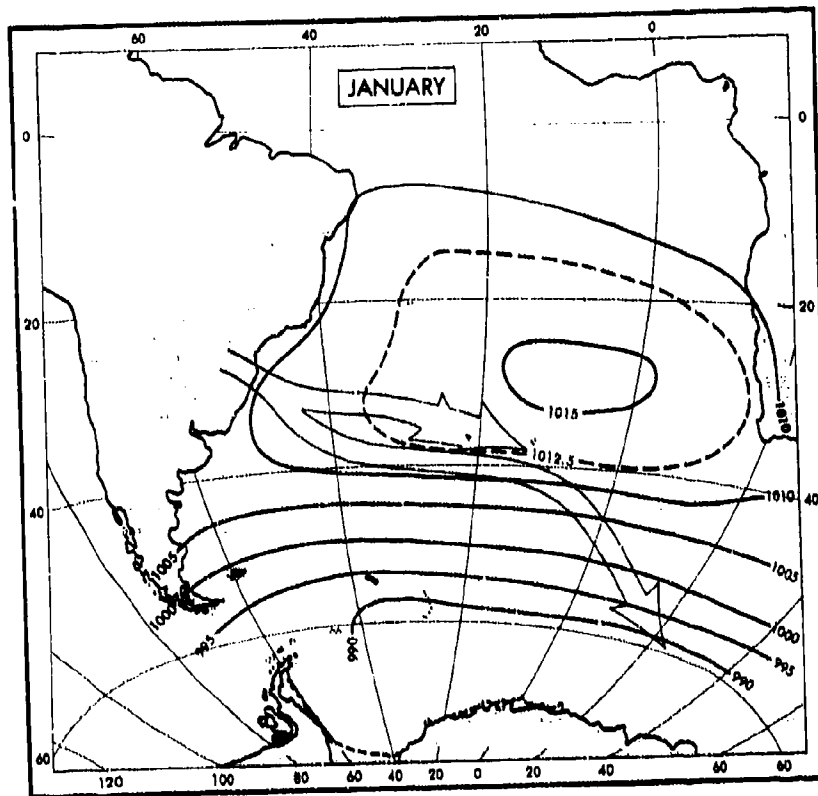


FIGURE 23-1. MEAN SEA-LEVEL PRESSURE (MILLIBARS) AND PREDOMINANT PATHS OF EXTRATROPICAL CYCLONES, JANUARY AND APRIL

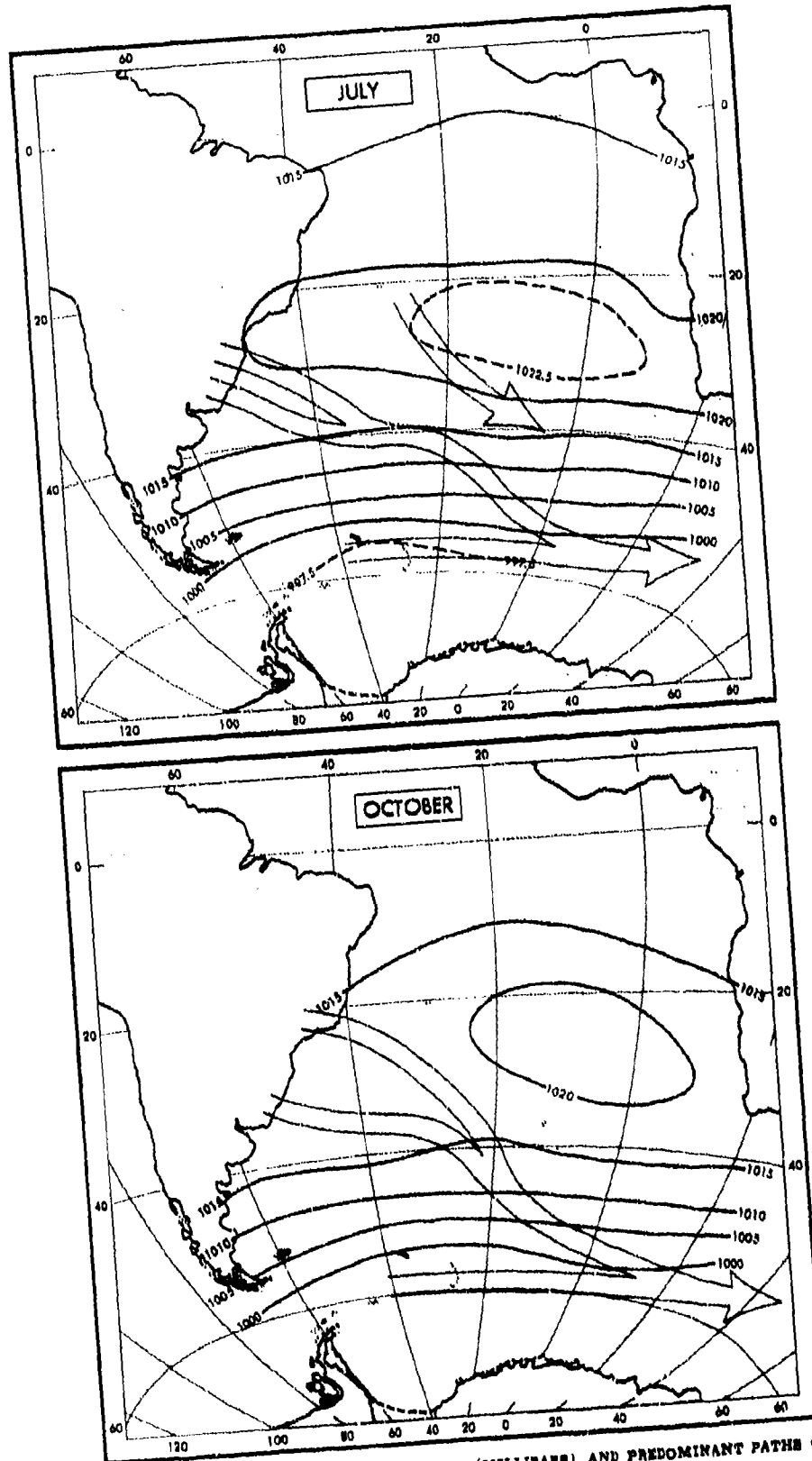


FIGURE 23-2. MEAN SEA-LEVEL PRESSURE (MILLIBARS) AND PREDOMINANT PATHS OF EXTRATROPICAL CYCLONES, JULY AND OCTOBER

NOT RELEASABLE TO FOREIGN NATIONALS

the range of the mean daily temperature is less than 10 Fahrenheit degrees. Mean daily maximum temperatures, mostly in the 60's, are highest during the late summer and early autumn. Cloud amounts are greater than 5-tenths over 300 days a year, with minimum cloudiness occurring in March. Relative humidity, in the 80's and 90's, is steady throughout the year, with the maximum occurring during the early morning hours. Calm winds are the exception, and, in general, easterly winds averaging over 10 knots are observed.

The Tristan da Cunha Group, lying southward of the South Atlantic high-pressure cell, is affected by storm centers passing to the south. The frequency of precipitation, which is closely related to the frequency of these passing storm centers, reaches a maximum in winter. However, monthly precipitation amounts at Tristan Island, although generally high during winter, reach maximums in May and September. Mean annual precipitation is greater than on any of the other islands in the Area, averaging over 66 inches. Although snow is observed during the winter on high ground, temperatures lower than 38° F. have never been reported at the observing station near sea level. The mean daily temperature, in the 50's and 60's at the coastal station, ranges only about 10 Fahrenheit degrees throughout the year, reaching a maximum in the late summer and a minimum in winter. Relative humidity remains almost constant throughout the year, with little diurnal variation; most values are near 80%. Sky conditions vary little from month to month or from season to season. Cloudiness equal to or greater than 7-tenths is observed on an average of about 20 to 25 days per month. Windflow in the vicinity of this group of islands is generally from the west, with the speed averaging 17 knots. Maximum winds occur during the winter and spring seasons during passage of storm centers to the south; gale-force winds are frequent at these times.

c. SUBPOLAR REGIME — The South Atlantic Islands south of 45 S. are under the influence of the subpolar climatic regime. Over the Falkland Islands, precipitation, for the most part, is associated with the passage of storm centers. It generally reaches a minimum during September and October and a maximum during December and January, with annual amounts averaging about 26 inches. Snow occurs occasionally over most of the islands, particularly during the winter months. Temperatures on the Falkland Islands indicate a slight continental influence; mean daily temperatures are usually above freezing in every month of the year, with maximums in the

upper 40's occurring in summer and minimums in the middle 30's in winter. Cloudiness is extensive over most of the Falkland Islands throughout the year. The frequency of days with cloud cover equal to or greater than 7-tenths averages well over 200 days per year, with only a slight month-to-month variation. Relative humidity is high in every month and averages a little over 80% for the year. Winds are generally from the west, with speeds averaging slightly less than 17 knots. Gales are frequent, especially during winter. Occasionally, gusts to 70 knots are observed during the month of April.

South Georgia has no marked variation of precipitation from season to season, but there is a tendency for a maximum in winter. Although this island is approximately at the same latitude as the Falklands, the average annual precipitation, about 55 inches, is more than twice as much, probably resulting from the greater number of depressions moving through the Drake Passage from the southwest to northeast. Snow falls at this location in all months and the ground is snow-covered most of the year. Temperatures show a seasonal variation, with mean daily maximums varying from the middle 30's to the upper 40's, and daily minimums from the middle 20's to the middle 30's. Freezing temperatures have occurred in every month of the year. Mean relative humidity ranges from the high 60's to the high 70's, with the yearly mean near 73%. Cloudiness at South Georgia is great all year, with a slight maximum during the summer season and a minimum during late winter and early spring. The average number of cloudy days (cloud cover equal to or greater than 7-tenths) is more than 200 per year, with the highest frequency of such cloud cover observations occurring in the afternoon. The mean wind speed at the observation location on South Georgia is less than 10 knots, with calm being reported over 25% of the time. However, gale winds are frequent at exposed locations.

No meteorological observations are available for the South Sandwich Islands; however, the climatic regime is believed to approximate that of South Georgia, with somewhat lower temperatures.

Bouvet Island experiences frequent variations in weather. Almost all the storm centers from the west and northwest parts of the South Atlantic pass over or near this island. This condition alone indicates that Bouvet Island receives more adverse weather, with the exception of temperature extremes, than any other island in this NIS Area. In general, a location which experiences a maximum occurrence of storm center passages, when compared with other locations having

fewer storms, would have the largest number of days with precipitation, cloudy days, and days with strong winds.

B. Weather and military operations

This Subsection is concerned with the effects of the meteorological elements upon military operations, which are here divided into four basic groups: air, air-ground, ground surface, and amphibious. Under each group are discussed the weather elements primarily relevant to the operations in that group. However, weather elements which are considered most applicable to one basic group may also affect operations in others. In such cases, reference should be made to the appropriate Subsection. The meteorological information contained herein is organized to highlight conditions that may be pertinent factors in planning. Discussion of the effects of weather on specific operations is not attempted since the weather factor in an operation is subject to change with the changing requirements of the operation itself.

1. Air operations

a. **CLOUDINESS** — Data illustrated in FIGURE 23-3 and presented in tabular form in FIGURE 23-15 show that the South Atlantic Islands record cloudy days about 60% to 95% of the time annually. It should be noted that the data indicate a cloudy day by 6-tenths or greater cloud cover on some islands and by 7-tenths or greater cloud cover on other islands.

Ascension Island has the least frequency of cloudy days, approximately 57%, of any island in the NIS 64 Area. It is the only island in the Area where seasonal variation in cloudiness is pronounced. A close relationship between cloudiness at this island and the north-south movement of the South Atlantic high-pressure cell is observed. Cloudy days are most likely during September through November, the season when the high-pressure cell moves from its northernmost position of winter to its southernmost position of summer. At Ascension Island, cloud amounts equal to or greater than 6-tenths occur on an average of about 25 days each month during September through November as compared to only 12 to 15 days during February through July.

NOTE Air operations are defined as those operations taking place primarily above the frictional influence of the surface terrain on atmospheric circulation. The meteorological elements discussed in this Subsection are those which are of primary importance to such operations as high-level visual bombing, radar bombing, aerial photography, most types of aerial reconnaissance, and fighter support and interception.

The other South Atlantic Islands experience very little seasonal variation; however, at most islands there is a slight increase in cloudiness during the afternoon hours.

Saint Helena Island has the highest frequency of cloudy conditions of any of the islands for which data are available. The data for this island may be biased, however, because of the location of the observation station at an elevation of slightly over 2,000 feet. Observations taken close to sea level might well reduce the frequency of cloudy days. At the observation site, a cloud cover equal to or greater than 6-tenths is observed approximately 25 to 30 days per month throughout the year.

The Tristan da Cunha Group has cloudy days slightly over 75% of the time. Cloud amounts equal to or greater than 7-tenths occur on an average of 20 to 25 days a month throughout the year, with no pronounced diurnal variation.

Cloudiness over the Falkland Islands and South Georgia is roughly the same. The frequency of cloudy days (cloud cover equal to or greater than 7-tenths) is high over these islands, averaging over 235 days a year, but less than over Tristan da Cunha. At most stations, cloudiness is generally greater during the afternoon. The frequency of observations with 7-tenths or greater cloud cover ranges between 60% and 70% during the early morning hours and increases to almost 75% during the afternoon. Although the seasonal variation in cloudiness is not pronounced, there appears to be a tendency for a slight maximum in December and January.

Cloudiness over the South Sandwich Islands is believed to be similar to that over South Georgia. At Bouvet Island, another island for which no data are available, the cloudiness can be assumed to be as great as that at any other island in the entire NIS 64 Area. This assumption is based on the position of Bouvet near the mean paths of the migratory storm centers.

Days with clear skies are rare at all island locations. Saint Helena Island experiences the minimum number of clear days and almost never records an observation without clouds. The greatest number of clear days (cloud cover equal to or less than 3-tenths) occurs at the Falkland Islands and South Georgia generally during the late winter and early spring months.

The only available island statistics on types of clouds are for Ascension Island, Saint Helena Island, Tristan da Cunha Group, and Falkland Islands and are based on ship observations taken at noon GMT. Because these statistics are of doubtful reliability, only general conclusions can be

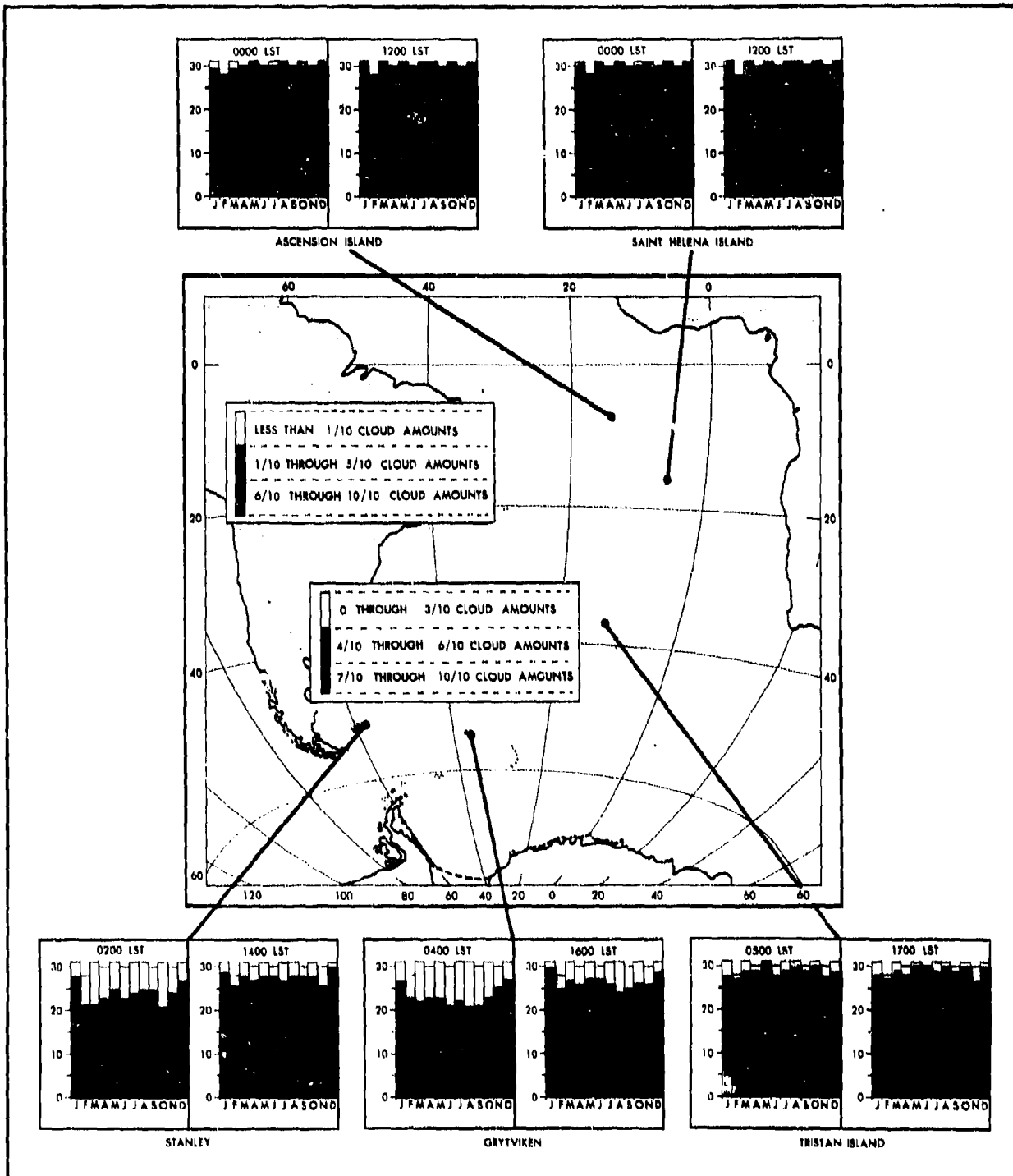


FIGURE 23-3. MEAN NUMBER OF DAYS WITH VARIOUS CLOUD AMOUNTS AT SPECIFIED HOURS. (For tabular data see Figure 23-15.)

drawn. Low cloud types (cumulus, stratus, and stratocumulus) predominate, with high clouds (cirrus, cirrostratus, and cirrocumulus) next in frequency. The middle cloud types (altocumulus and altostratus) are recorded least often.

b. THUNDERSTORMS AND TURBULENCE — The data indicate that thunderstorms over the South Atlantic Islands are the exception rather than the rule. Only two stations, Ascension Island and Tristan Island, have recorded thunder or thunderstorms, and these stations record thunderstorms in less than 1% of their observations. The observed thunderstorms are probably linked with frontal passages. Turbulence is associated with wind shear, either vertical or horizontal, and should be expected under such conditions. Thunderstorms, although rare, produce severe turbulence at all altitudes. Frontal zones such as might occur near Tristan da Cunha during the winter season can be expected to produce moderate turbulence; if a thunderstorm is associated with the zone, heavy turbulence may be expected. Light turbulence in the lower levels may be expected during the normal daily convective activity, occasionally becoming moderate when shower precipitation occurs. Clear-air turbulence may vary from light to severe and is likely to be severe at any altitude in the vicinity of thunderstorms. Light to moderate clear-air turbulence quite often occurs near the jet-stream core, usually above 20,000 feet; unfortunately few data are available concerning the mean location and intensity of the jet stream in the South Atlantic. The indications are that it is in the vicinity of the polar frontal zone during winter and therefore in the vicinity of the Tristan da Cunha Group during this season. Mechanical turbulence, created by strong windflow over rough terrain, may be expected over most of the islands in all seasons. Such turbulence is usually not too severe and is usually restricted to the lower levels.

c. UPPER-AIR WINDS — Data on upper-air winds are available for Ascension Island and for Stanley in the Falkland Islands (FIGURES 23-4 and 23-5). Over Ascension Island, as is characteristic of the tropics, the winds flow from the east in the lower levels, averaging usually less than 15 knots, up to approximately 20,000 feet. Above this level, westerly winds prevail, with maximum speeds averaging between 20 and 35 knots; during the summer season westerly winds prevail to approximately 60,000 feet, and during the winter season to approximately 75,000 feet. Above the westerlies, easterly winds are again found, with maximum speeds averaging about 50 knots. The wind pattern over Saint Helena Island is similar to that over Ascension Island in that easterly winds are

found in the lower levels. Because of the lack of data, little is known regarding the heights and seasonal variability of these winds. The Falkland Islands experience westerly winds almost exclusively at all altitudes during all seasons of the year. Below approximately 10,000 feet, speeds in excess of 60 knots are infrequent. Wind speeds increase with height to approximately 30,000 feet above which they decrease. Wind speeds between 40 and 60 knots are the speeds most frequently observed, and only occasionally are speeds in excess of 150 knots recorded. This westerly wind-flow regime is believed to be characteristic of the other islands at approximately the same latitude as the Falklands, namely, South Georgia and South Sandwich and Bouvet Islands. Unfortunately, upper-air wind data are not available for the Tristan da Cunha Group, but westerly winds are believed to predominate.

d. UPPER-AIR TEMPERATURES AND AIRCRAFT ICING — Temperature data for the upper air over Ascension Island and over Stanley, Falkland Islands, are presented in FIGURE 23-16. Temperatures decrease poleward on the isobaric surfaces. Seasonally, little change is indicated in temperatures over Ascension Island; however, over the Falkland Islands maximum temperatures are observed at all levels during the summer season and minimum temperatures during the winter season. The heights of the isobaric surfaces over the Falkland Islands (FIGURE 23-17) vary in about the same manner as the temperatures, with the maximum heights of all except the lower surfaces at Stanley occurring in late summer and the minimum during the winter. In general, the height of the tropopause decreases from the Equator toward the poles and also is at lower heights during the winter season. During the winter its height averages near 30,000 feet over the Falkland Islands and increases to an average of over 50,000 feet over Ascension Island. During the summer season the tropopause over the Falkland Islands is at an average height near 35,000 feet, increasing northward to an average over 55,000 feet over Ascension Island. A more detailed and analytic record of average monthly values of pressure and temperature at the tropopause over the Falkland Islands is presented in the following tabulation:

	JAN	FEB	MAR	APR	MAY	JUN	
Pressure (mb)	257	249	255	251	251	240	
Temperature (° C.)	-53	-55	-50	-58	-61	-62	
	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Pressure (mb)	252	249	250	251	262	257	253
Temperature (° C.)	-62	-62	-61	-61	-57	-57	-59

Aircraft icing may occur in clouds and/or precipitation with temperatures near the freezing point. At temperatures above freezing, some types of icing are possible but rare. However, icing does occur at temperatures below freezing, down to temperatures of -20° C. This condition is observed frequently in stratus-type clouds consisting of the smallest sized cloud droplets. Below -20° C. the icing rate generally becomes in-

significant. The most severe aircraft icing in the South Atlantic occurs in storm centers moving along the polar frontal zone in winter. The Tristan da Cunha Group is located near this zone. Data concerning the height of the freezing level are extremely limited over the South Atlantic. However, sufficient data are available to give an indication of the seasonal values over Ascension Island and the Falkland Islands. Little variation

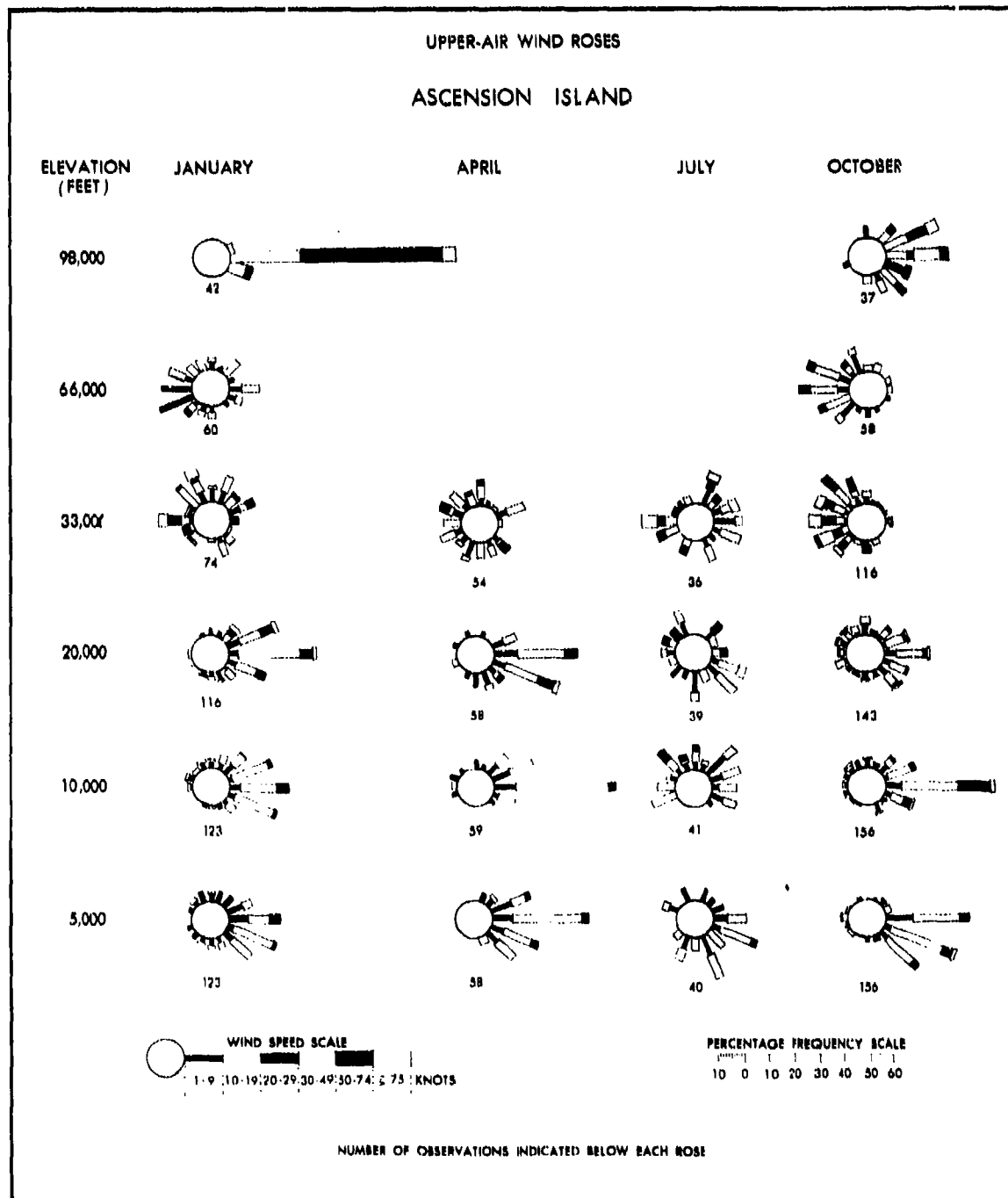


FIGURE 23-4. UPPER-AIR WIND ROSES, ASCENSION ISLAND

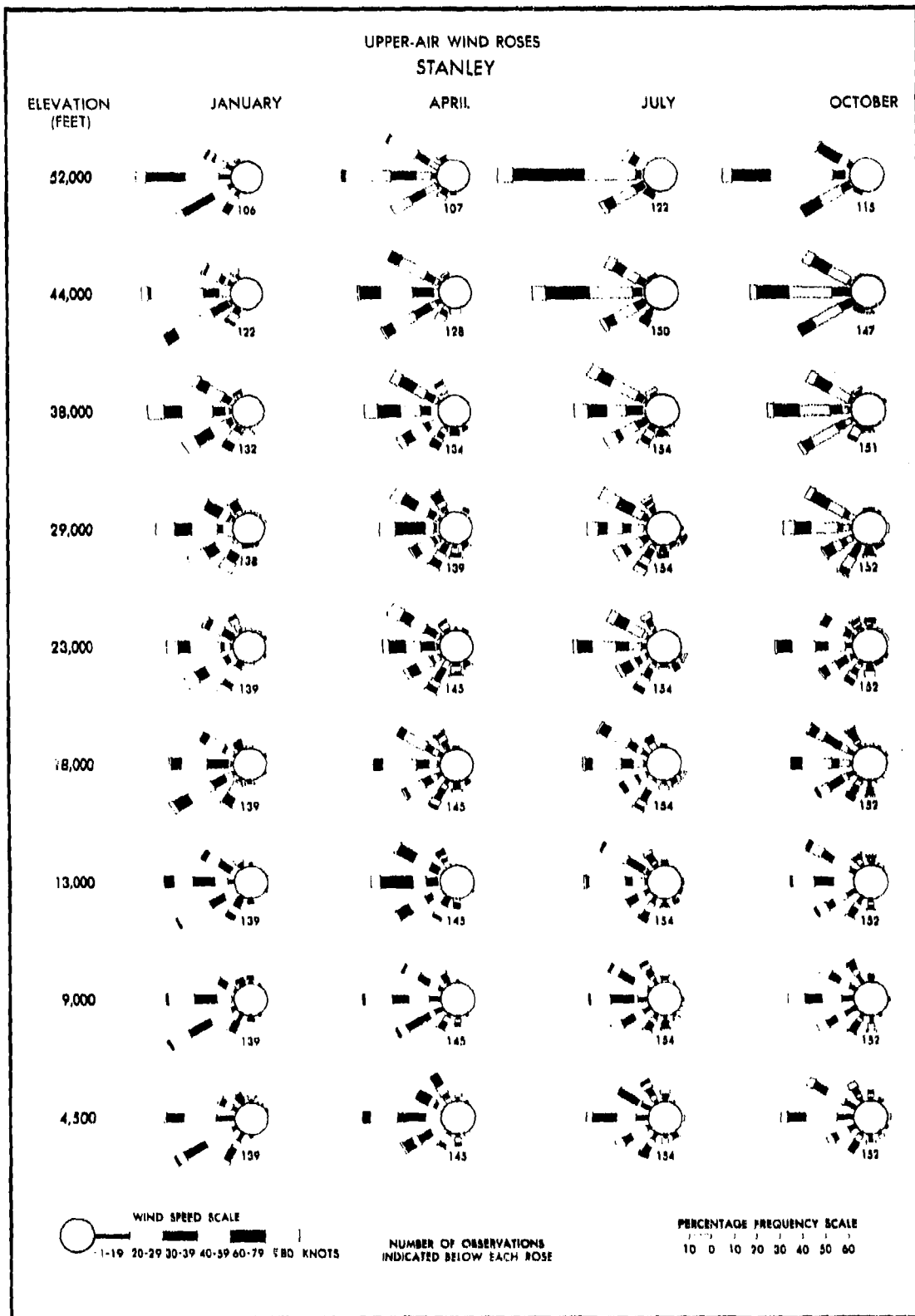


FIGURE 23-5. UPPER-AIR WIND ROSES, STANLEY, FALKLAND ISLANDS

of the height of the freezing level occurs over Ascension Island and the yearly average height is near 15,000 feet. Over the Falkland Islands the average winter height of the freezing level is near 1,000 feet, and in the summer season it averages near 4,000 feet.

2. Air-ground operations

a. **CEILING** — One of the prime factors to be considered in any operation involving aircraft flying within the surface friction layer is whether they will have sufficient airspace between the ground surface and the base of the lowest clouds in which to maneuver and accomplish their mission. This becomes a very important consideration where the terrain is hilly or mountainous and a prevalence of low or ragged-based clouds exists. Since cloud heights are recorded in heights above the observation point, the elevation of the terrain, especially at stations where cloud observations are made, must always be considered. This consideration is especially important on islands such as those in the South Atlantic. A ceiling is defined as the height above the ground of the lowest layer of clouds which cover a designated amount of the sky. In the NIS 64 Area, two definitions of ceiling are used; ceiling is defined as the height ascribed to the lowest level at and below which the cloud cover aloft hides 6-tenths or more of the sky at Ascension and Saint Helena and 7-tenths or more of the sky at the other South Atlantic Islands. The percentage frequencies of various ceiling heights at specified hours are given in graphic form in **FIGURE 23-6** and in tabular form in **FIGURE 23-18**.

Ascension Island rarely experiences ceilings below 1,000 feet. Ceilings below 5,000 feet occur approximately 50% of the time annually. The greatest frequency of occurrence is during the spring season; the highest value, over 80%, is recorded in November. Saint Helena Island records, on an annual basis, ceilings below 3,000 feet over 90% of the time and ceilings below 1,000 feet over 50% of the time. It should be noted that

NOTE Air-ground operations are defined as those operations taking place in, or primarily influenced by, the meteorological conditions existing within the friction layer above the earth's surface. The meteorological elements discussed in this Subsection are those which are of primary importance to such operations as parachute drops, chemical and biological warfare, tactical support, low-level reconnaissance, and air rescue. The success or failure of many of these operations may also depend to a large degree upon the behavior of elements above the friction layer or near the surface. A detailed discussion of such elements may be found in Subsections B, 1 and B, 3.

the observation site on this island is near 2,000 feet above sea level and that cloud heights are measured from this location. Ceilings below 3,000 feet occur most often during the summer season and least often during autumn and early winter. Diurnally, the hours of darkness have the greatest occurrence of low ceilings, especially those below 1,000 feet. Data for Tristan Island, which are considered applicable to the entire Tristan da Cunha Group, indicate that ceilings below about 5,000 feet occur less frequently than at any other island in the Area. Such ceilings occur annually less than 40% of the time, with the greatest frequency during the months of June through September.

The Falkland Islands have ceilings below about 3,000 feet close to 40% of the time annually and less than 1,000 feet from 15% to 25% of the time. The greatest frequency of ceilings at all increments below 5,000 feet, especially those below 1,000 feet, occurs during the months April through September at most places; this reflects the increased number of storm centers passing the Falkland Islands during this period. South Georgia experiences ceilings less than 5,000 feet close to 45% of the time annually and ceilings less than 1,000 feet about 10% of the time annually. The seasonal variation from the annual value is generally small, and little significant diurnal change is noted. The South Sandwich Islands and Bouvet Island, although no data are available, can be expected to have approximately the same ceiling conditions as South Georgia.

b. **VISIBILITY** — Visibility data for the South Atlantic Islands indicate that all islands have visibilities greater than 6 miles most of the time (**FIGURES 23-7** and **23-19**). Ascension and Saint Helena represent the extremes in the frequency of visibilities within various limits. Ascension Island records visibility 6 miles or less only 2% of the time, while Saint Helena Island records such restricted visibility slightly over 20% of the time. Visibilities of 2½ miles or less almost never occur at Ascension, but Saint Helena experiences such visibilities annually about 20% of the time at midnight and about 10% of the time at noon. The frequency of these low visibilities, as well as those below 1 mile and those below ½ mile, also show a seasonal variation at Saint Helena, with the lowest visibilities occurring mostly during February and March and again in August, September, and October. It should be noted again that the observations on Saint Helena are made at nearly 2,000 feet above sea level, much higher than at any other island in the Area. Observations taken at such an elevation may show a bias in the frequencies of low visibilities, especially at

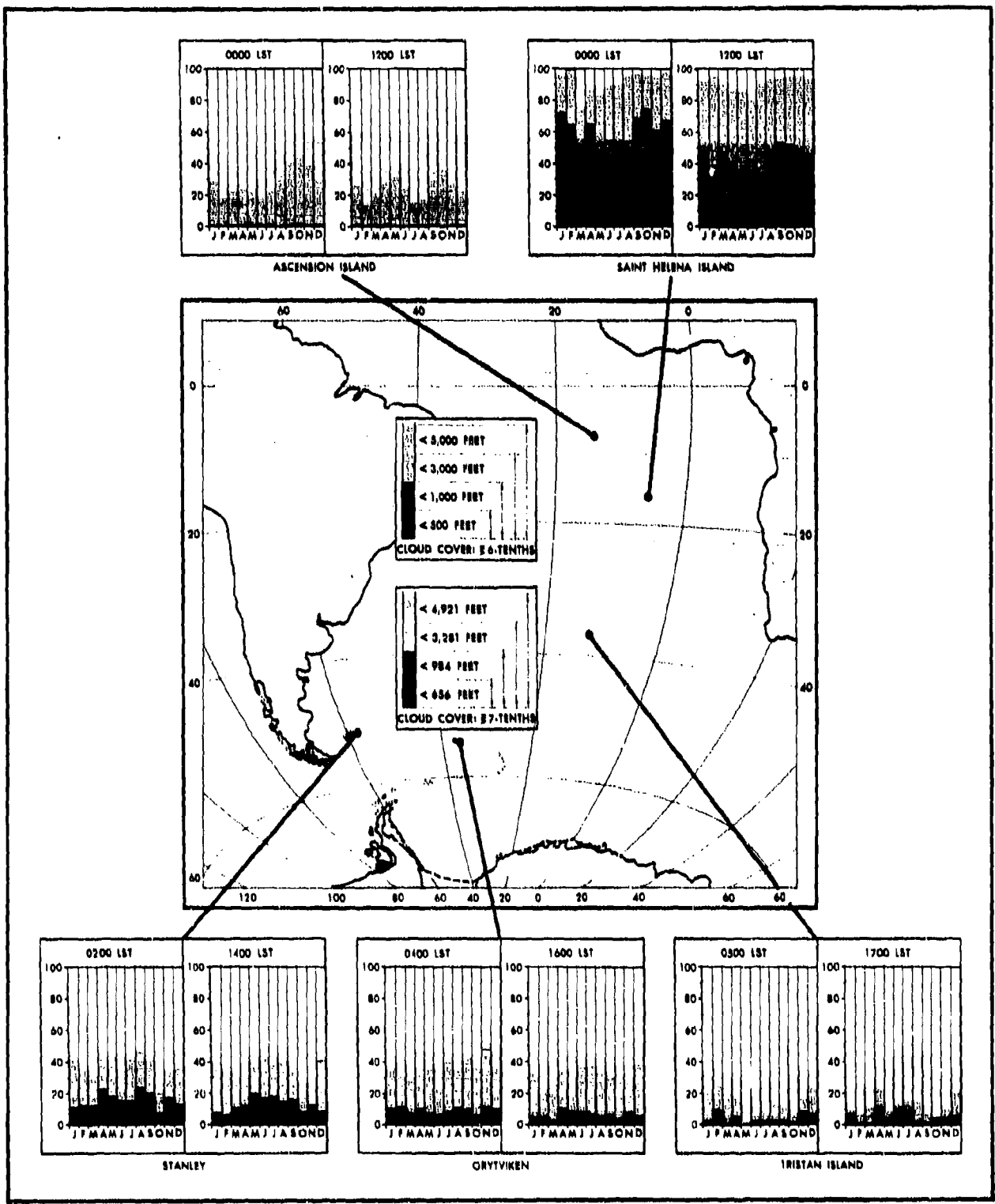


FIGURE 23-8. PERCENTAGE FREQUENCY OF SPECIFIED CEILING RANGES AT SPECIFIED HOURS. (For tabular data see Figure 23-18.)

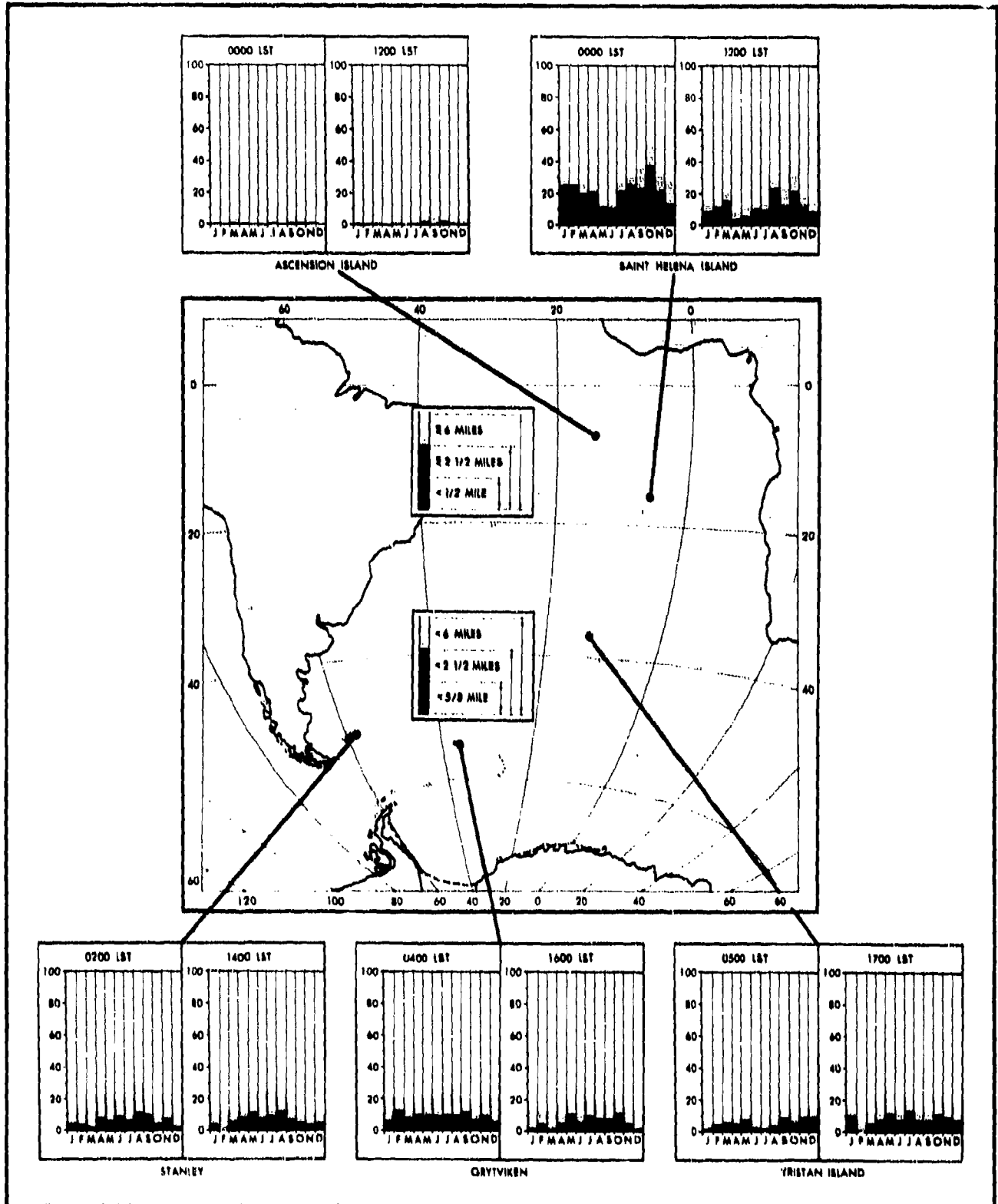


FIGURE 23-7. PERCENTAGE FREQUENCY OF SPECIFIED VISIBILITY RANGES AT SPECIFIED HOURS. (For tabular data see FIGURE 23-19.)

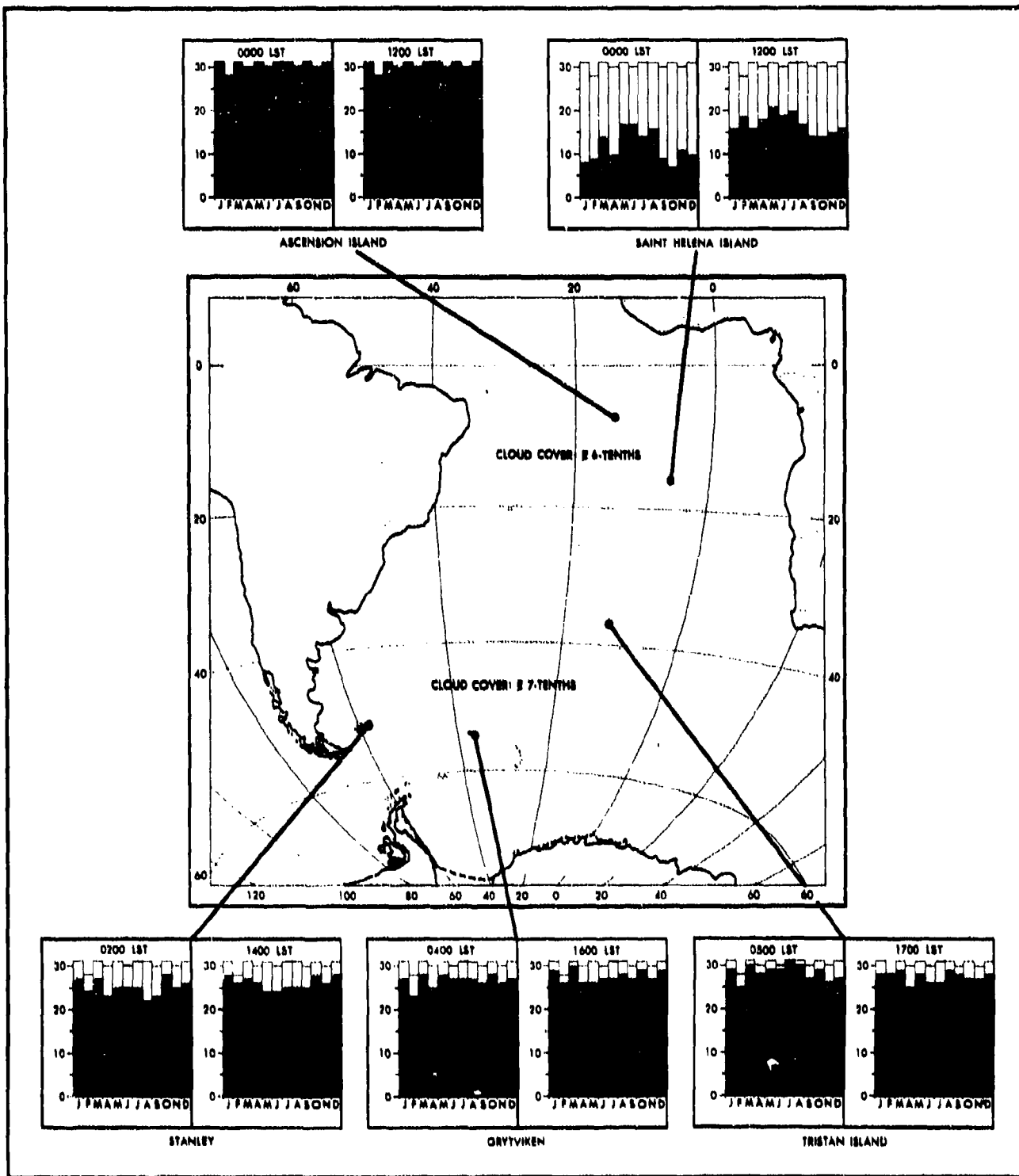


FIGURE 23-8. MEAN NUMBER OF DAYS WITH CEILING \leq 1,000 FEET AND VISIBILITY \geq 2 1/2 MILES AT SPECIFIED HOURS. (For tabular data see Figure 23-30.)

stations with a high incidence of low clouds which might envelop the station.

Tristan Island records visibilities of 6 miles or more over 85% of the time annually. In all seasons, visibilities less than 6 miles occur most frequently during the afternoon. The Falkland Islands and South Georgia have similar visibility data. Both locations have the highest frequency of visibilities less than 6 miles occurring during the winter season, with small variations during the remainder of the year; annual values range generally between 15% and 20%, whereas monthly values during winter may be as high as 25%. These frequencies are considered to be reasonably applicable to the South Sandwich Islands and Bouvet Island; visibilities probably worsen in

the southern South Sandwich Islands, as indicated by the data for the South Orkney and South Shetland Islands.

C. COMBINED CEILING AND VISIBILITY — For many air-to-ground operations, particularly landings and takeoffs, the distribution and frequency of certain ceiling and visibility criteria are significant. Computed frequencies of one set of values often used to delineate the boundary between favorable and unfavorable conditions are given in Figures 23-8 and 23-20. In these figures, ceilings refer to conditions with cloud cover equal to or greater than 6-tenths at Ascension Island and Saint Helena Island and with cloud cover equal to or greater than 7-tenths at all other stations.

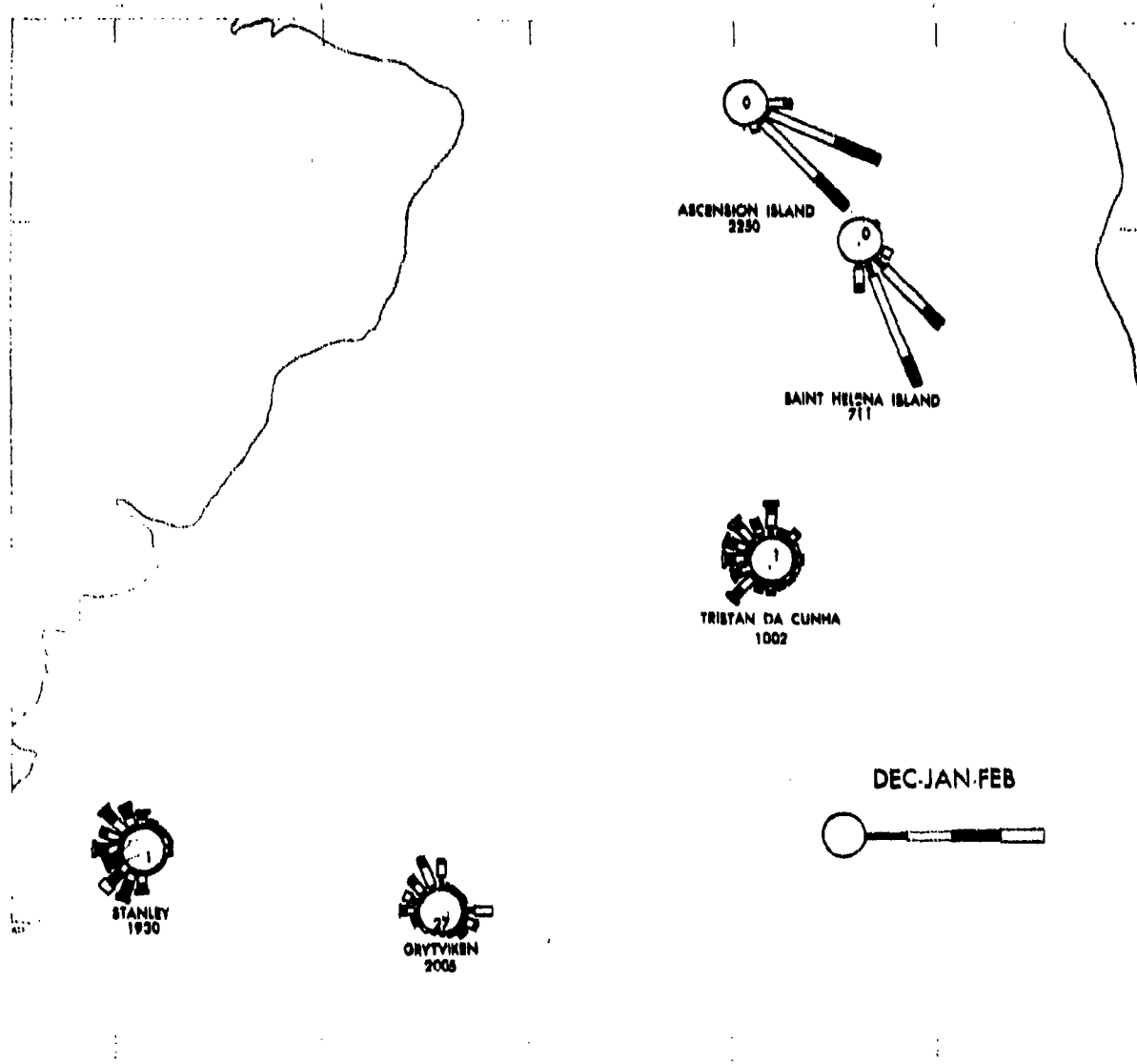


FIGURE 23-9. SURFACE WIND ROSES, DECEMBER-FEBRUARY

The data indicate that all islands of the Area except Saint Helena have ceilings equal to or greater than 1,000 feet and visibility equal to or greater than 2½ miles more than 80% of the time annually, with Ascension Island approaching 100% of the time. Very little variability is noted both diurnally and seasonally. Saint Helena, on the other hand, has conditions below the criteria approximately 50% of the time, with improved conditions most likely to occur during the early afternoon. Conditions at the South Sandwich Islands and Bouvet Island are probably comparable to those of Tristan Island and South Georgia, where ceilings 1,000 feet or greater and visibilities 2½ miles or greater are recorded approximately 90% of the time.

d. SURFACE WINDS — The variation of surface wind is illustrated by the wind roses in FIGURES 23-9 and 23-10. The South Atlantic high-pressure cell with its counterclockwise windflow determines the overall seasonal surface wind regime in this part of the world (FIGURES 23-1 and 23-2). Diurnally, little change is noted in velocities; the steadiness results from the fact that the South Atlantic Islands are relatively small, so that the diurnal change in temperature has very little effect on the windflow. At specific locations on any of the islands, it is necessary to be cognizant of the rugged terrain and its local influence on wind velocities and gustiness. At Grytviken, South Georgia, for example, the wind data are seldom entirely representative of the surface

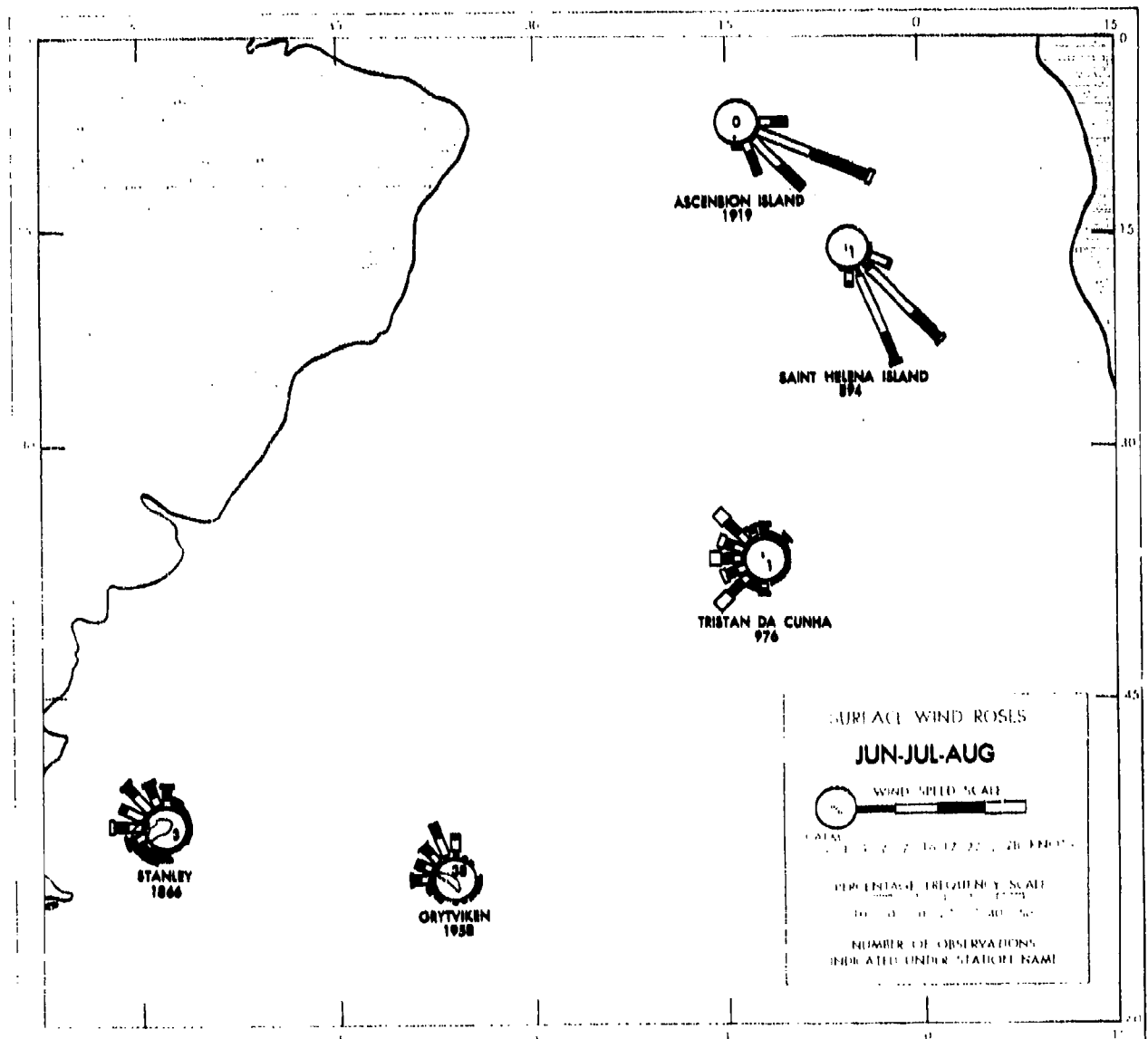


FIGURE 23-10. SURFACE WIND ROSES, JUNE-AUGUST

winds over the island. Here the observation site is sheltered, and therefore an excessive number of calms is recorded in all seasons.

Winds of gale force (28 knots or more) rarely occur in the vicinity of Ascension and Saint Helena Islands. The Tristan da Cunha Group experiences gale-force winds between 15% and 20% of the time in winter but only rarely in summer. Winds of this force are generally from a westerly direction. Of all the islands in the Area, the Falkland Islands experience the greatest frequency of gale-force winds annually. They are, for the most part, from the west, their frequency averaging generally 5% to 10% in summer and between 15% and 20% in winter. South Georgia has gale winds 5% to 10% of the time during the summer and slightly greater than 10% of the time during the winter, generally from the west to northwest. The South Sandwich Islands and Bouvet Island experience gale winds to an extent comparable to that at South Georgia.

3. Ground surface operations

a. TEMPERATURE — Because the South Atlantic Islands are scattered over such a vast ocean area, extending from within 10 degrees of the Equator to within 10 degrees of the Antarctic Circle, the temperature in these islands varies more than any other climatic element. Temperature data, means and extremes, are presented in graphic form in FIGURE 23-11 and in tabular form in FIGURES 23-21 through 23-23.

Ascension Island, with a mean annual temperature of near 80° F., has the warmest temperature regime of any of the islands in the Area, and displays little seasonal variability. Extreme temperatures recorded on Ascension are a maximum of 95° F. and a minimum of 65° F. Mean daily maximum and minimum temperatures are highest in March and April and lowest in September. The range between monthly values is remarkably low, 6 Fahrenheit degrees for mean maximums and 4 degrees for mean minimums. Temperatures are about 15 to 20 Fahrenheit degrees cooler at Saint Helena Island than at Ascension, but they show almost the same seasonal and diurnal variations. Part of the differences in temperature at these

NOTE Ground surface operations are defined as those operations taking place primarily at or very near the earth's surface. The meteorological elements discussed in this Subsection are those which are of primary importance to such operations as movement of troops and vehicles, selection of clothing and equipment, storage of supplies, and maintenance of armament and equipment. Some meteorological elements which may also have an effect upon this type of operation are discussed in Subsections B, 1 and B, 2.

two islands is due to the differences in the elevation of the observation sites, near sea level at Ascension and above 2,000 feet at Saint Helena, and part is due to differences in latitude between the two islands. Saint Helena's mean daily maximum and minimum temperatures are highest in March and lowest about September. Recorded extremes vary from 82° to 50° F.

Tristan Island has never recorded freezing temperatures at its observation site; however, at higher elevations on the island snow is on the ground during most of the winter. Recorded temperature extremes are 75° and 38° F. at the observing station near the coast. The mean daily maximum and minimum temperatures are highest in February and lowest in August or September. Mean daily maximums range about 12 Fahrenheit degrees and minimums about 11 degrees from warmest to coldest month.

The Falkland Islands have experienced freezing temperatures in all months of the year. An extreme temperature as low as 12° F. has been observed. The all-time record high temperature of 76° F. occurred in January. Both mean daily maximum temperatures and mean daily minimums are highest in January and lowest in July.

South Georgia has about 4 to 10 Fahrenheit degrees lower mean temperatures than the Falkland Islands. Highest mean daily maximum and minimum temperatures occur in February and lowest values during the winter. The extreme temperatures at South Georgia range from 84° F. in March to -3° F. in August. The extreme maximum temperatures appear to be too high to be representative, especially the February and March record, in comparison with those at other stations with about the same latitude and exposure; they probably result from local foehn wind conditions. The observation site at Grytviken, because of its sheltered location, influences both wind velocities and minimum temperatures. A higher percentage of low wind speeds are recorded, and during periods of calm winds, lower than representative minimum temperatures are recorded. It is probable that high elevations have temperatures below -10° F.

b. RELATIVE HUMIDITY — Summarized relative humidity data are presented in FIGURES 23-12 and 23-24. As with all small islands, relative humidity values are fairly conservative, showing only small diurnal and seasonal variations. Values over a particular island at a given time are most greatly influenced by differences in elevation.

At Ascension Island, relative humidity is noticeably lower than at other islands in the Area. Here, the annual values average slightly over 65%

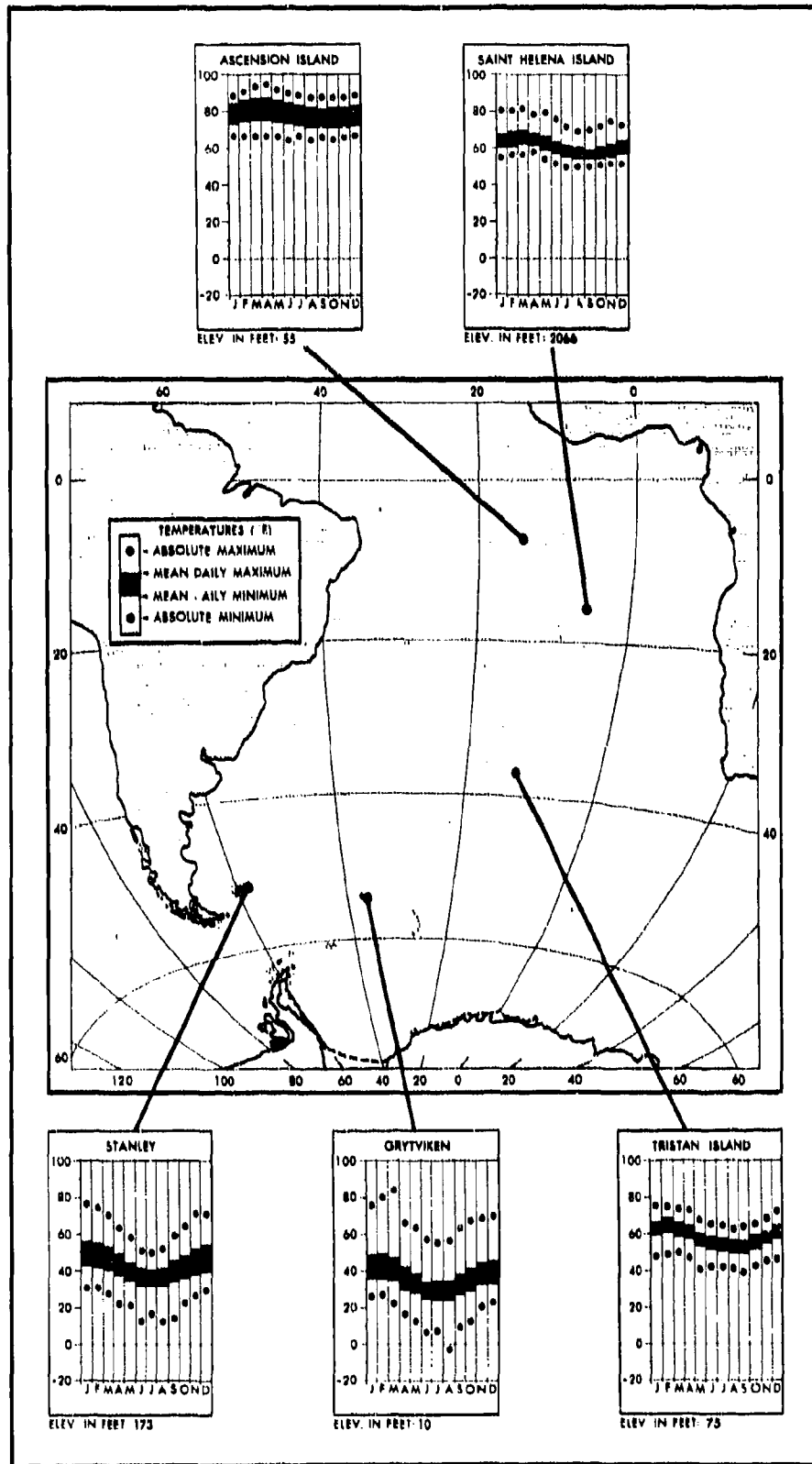


FIGURE 23-11. TEMPERATURES (°F.). (For tabular data see FIGURES 23-22 and 23-23.)

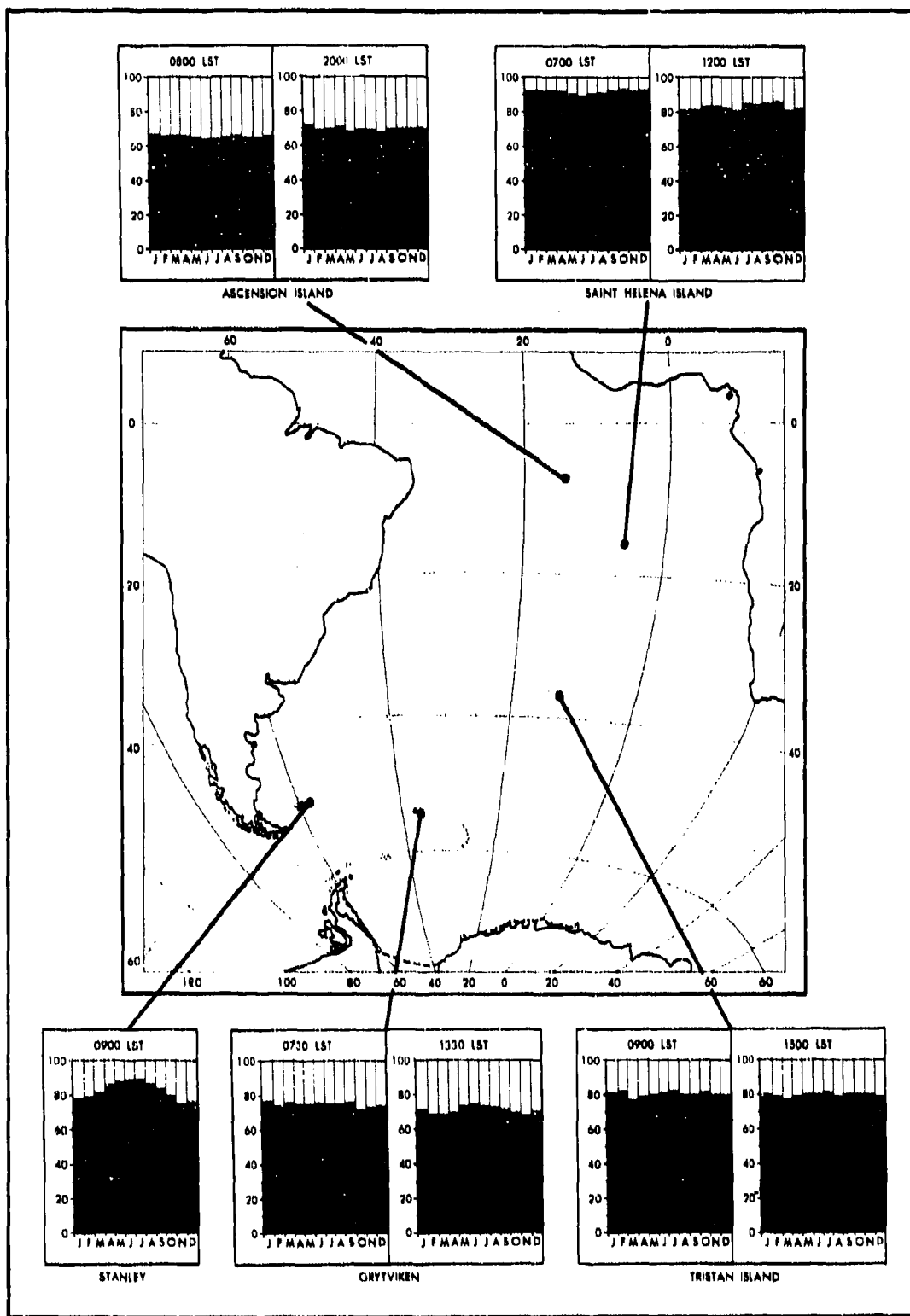


FIGURE 23-12. MEAN RELATIVE HUMIDITY (%) AT SPECIFIED HOURS. (For tabular data see Figure 23-24.)

during the early morning hours and a little over 70% during the late afternoon, with the mean monthly values ranging within about 2% of the annual. On the other hand, Saint Helena Island records the highest relative humidity of any island in the Area. This is partly due to the fact that the observations were taken at a high elevation, often near or in the base of clouds. Average annual values of relative humidity at Saint Helena range from about 92% during the early morning to slightly under 85% at noon, with very little seasonal variation.

Relative humidity at Tristan Island averages close to 80% at both the midmorning and mid-afternoon observations during all months of the year. The Falkland Islands data, based on only one observation time daily (0900 LST), show relative humidity values in the high 80's in winter and in the high 70's in summer. Observations taken twice daily, at 0730 and 1330 LST, indicate that relative humidity at South Georgia averages in the low and middle 70's throughout most of the year, with only small diurnal and seasonal variations.

c. PRECIPITATION — Data reflecting precipitation regimes over the South Atlantic Islands are presented in graphic form in FIGURES 23-13 and 23-14 and in tabular form in FIGURES 23-25 through 23-29. Precipitation over the Area varies from a low of 5.2 inches annually at Ascension Island to a high of 66.1 inches annually at Tristan Island.

Precipitation at Ascension Island is not only less in amount than at the other islands but also occurs least frequently (30 days per year). The variations in precipitation amount and frequency at this island are closely related to the seasonal oscillation of the ICZ; both amount and frequency reach a slight maximum in April, the month when the ICZ is most active over the island. Excessive precipitation, that is, large amounts of precipitation occurring in a relatively short period of time, is usually not common in this NIS Area. The largest amount ever reported in the Area in a 24-hour period, a total of 8.3 inches, occurred on Ascension Island in April.

Saint Helena Island receives precipitation on an average of about 155 days a year, with annual totals averaging about 32 inches. Average monthly rainfall amounts range from slightly over 1 inch in November to over 4 inches in March and July.

Tristan Island receives more precipitation than any other island in the Area. Over 66 inches of precipitation occur at this island annually, with monthly amounts varying from a low of 3.5 inches in January and February to a high of almost 8.0

inches in September; a secondary maximum near 7.0 inches occurs in May. Tristan Island also records precipitation on more days than any other island in the Area. At the observing station, near the coast, precipitation occurs on an average of 185 days a year. Although seasonal variation is generally small, there is a tendency for a maximum frequency to occur in winter and a minimum in summer. Snow data for this island are not available; however, indications are that snow frequently occurs at high elevations in winter but seldom, if ever, occurs near the coast.

The Falkland Islands receive an average of a little over 26 inches of precipitation, mostly in the form of rain, each year, with monthly amounts varying from about 1.5 inches in September and October to a maximum of about 3.0 inches in December and January. Precipitation occurs on an average of about 160 days a year, with no pronounced seasonal variation. Snow is sometimes recorded during the months April through October; however, the maximum frequency occurs during the winter months (June through August), averaging only 3 days or less per month. Normally, there is no persistent snow cover. Hail is occasionally observed over these islands, with a tendency toward a maximum frequency of occurrence in September through November.

Grytviken, South Georgia, receives an average of about 55 inches of precipitation each year. Average monthly amounts range from about 3 inches in October to 6 inches in July. Since the observation site at Grytviken is sheltered by the mountains to the west, the precipitation regime at this station may not be necessarily representative of other parts of the island. At the observing station, precipitation occurs on about 155 days a year, with only a slight tendency toward a maximum in winter. Snow is generally plentiful on South Georgia. Snowfall at Grytviken usually occurs every month of the year, averaging over 65 days annually and reaching a maximum frequency of occurrence in winter. During this season the general vicinity of the station is completely snow covered, and drifts form to a depth of about 5 feet. At higher elevations a permanent snow cover is evident the year round, especially in the vicinity of the deep glacier-filled valleys separating the high mountain peaks.

Meteorological data for the South Sandwich Islands and Bouvet Island are not available. However, one may assume that the precipitation regime at these islands is similar in many respects to that of South Georgia. The descriptive material available suggests somewhat less annual totals at the South Sandwich Islands, with an increase in days with snow. It is probable that

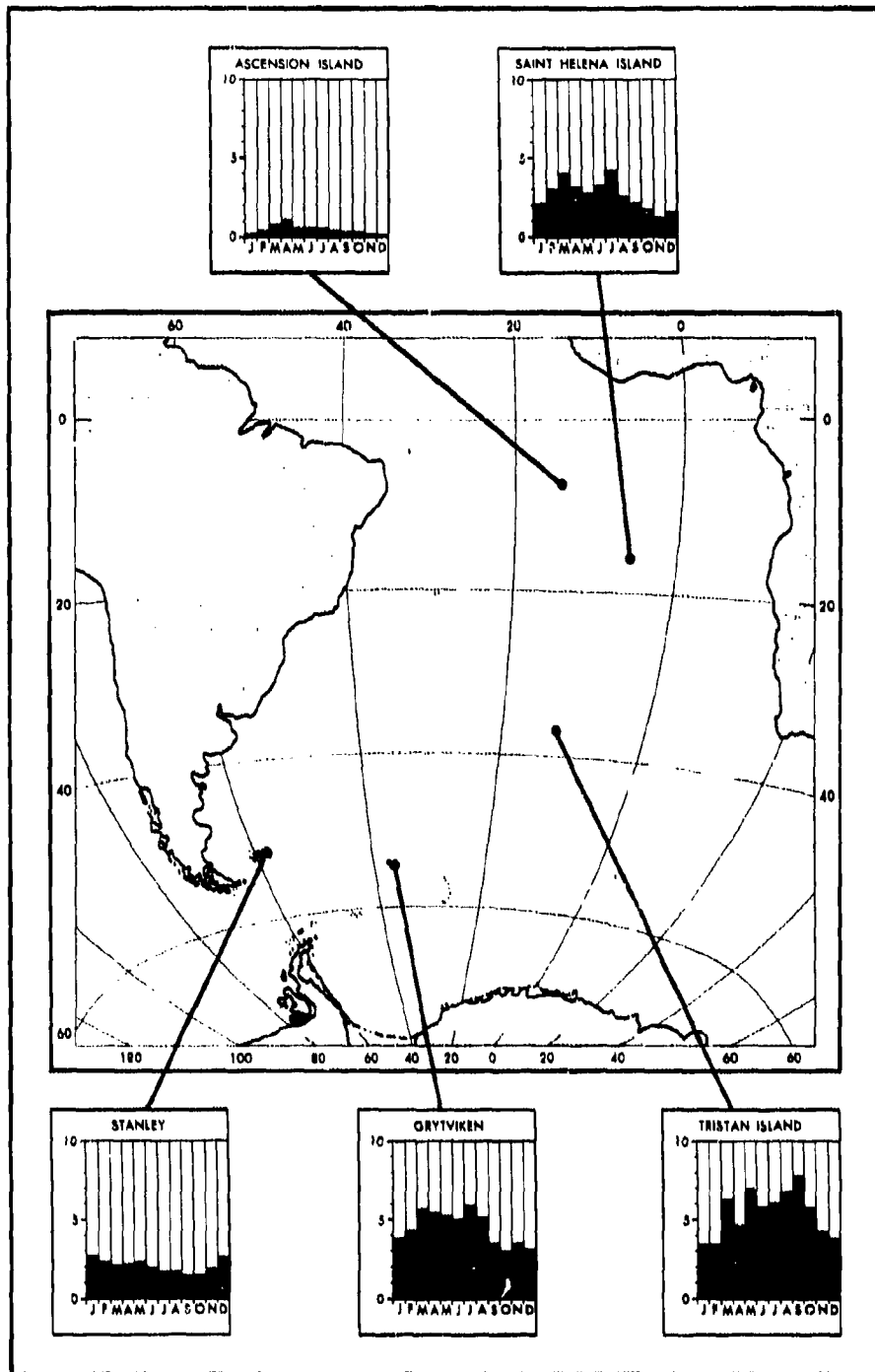


FIGURE 23-13. MEAN PRECIPITATION (INCHES). (For tabular data see Figure 23-25.)

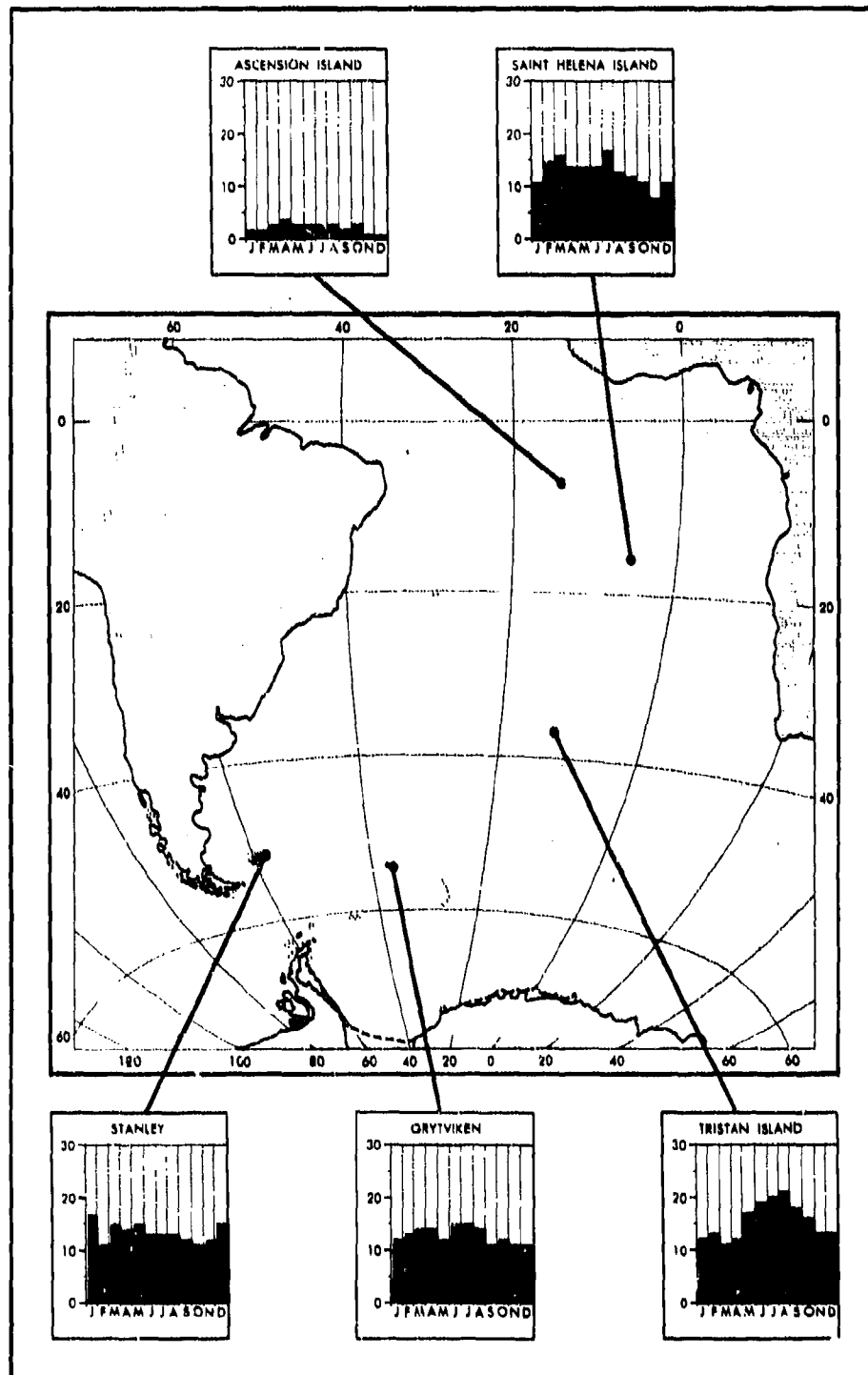


FIGURE 23-14. MEAN NUMBER OF DAYS WITH PRECIPITATION >0.04 INCH. (For tabular data see Figure 23-27.)

days with precipitation are somewhat higher on Bouvet Island because of increased cyclonic activity.

d. OVERALL EFFECT OF SURFACE WEATHER ON CLOTHING, STORAGE, AND SHELTER

(1) Clothing

(a) MAJOR INFLUENCES — Temperature, varying with a wide range of latitude, is the most important climatic factor affecting clothing requirements throughout the South Atlantic Islands. No seasonal changes in clothing are required except on the isolated mountain peaks of Tristan Island and South Georgia.

(b) REGIONAL REQUIREMENTS — The islands of this Area are under three climatic regimes: Ascension Island is influenced by the tropical regime, Saint Helena Island and the Tristan da Cunha Group by the temperate regime, and Falkland Islands, South Georgia, South Sandwich Islands, and Bouvet Island by the subpolar regime. There are distinctive clothing requirements prescribed for each of these climatic regimes. The warm-weather clothing assembly is required for the tropical regime. The cool-weather clothing assembly is sufficient for the temperate regime, except that the cold-weather assembly is required on the slopes of Tristan Island's volcanic peak from 3,000 to 5,000 feet in winter and above 5,000 feet the year round. The cold-weather clothing assembly is sufficient for the subpolar regime, except that the ultra-cold-weather assembly is required on the slopes of Mount Paget on South Georgia Island from 6,000 to 8,000 feet during the winter and above 8,000 feet the year round.

These clothing requirements are based upon clothing assemblies that have been prescribed for worldwide military use depending upon the occurrence of mean monthly temperatures as follows:

CLOTHING ASSEMBLY	MEAN MONTHLY TEMPERATURES
Warm-weather	Above 68° F.
Cool-weather	50° to 68° F.
Cold-weather	14° to 50° F.
Ultra-cold-weather	Below 14° F.

Appropriate service regulations list the exact nomenclature and the basis for issue of various components of these clothing assemblies. For planning purposes, however, the clothing assembly components are described in general terms. Also listed are special items which are necessary because of varying climatic factors.

The warm-weather assembly is a cotton outfit (visored cap, shirt, trousers, and underwear). It also includes leather combat boots and a poncho. A woolen blanket is adequate sleeping equipment for use with this assembly.

The cool-weather assembly supplements the warm-weather clothing assembly with a hooded water-repellent wind-resistant coat. Two woolen blankets or a lightweight sleeping bag are adequate sleeping equipment for use with this assembly.

The cold-weather clothing assembly consists of a wool shirt, wool trousers, wool-and-cotton underwear, and insulated rubber boots. A coat liner is added to the coat used with the cool-weather assembly. A cotton field cap or a field cap with wool pile lining is worn, depending on the degree of coldness. Woolen glove inserts or woolen mitten inserts, worn with the appropriate leather shells, are also components of the cold-weather assembly. A mountain-type sleeping bag (down- and feather-filled) with a water-repellent case is adequate sleeping equipment for use with this assembly.

The ultra-cold-weather clothing assembly uses the same inner insulating garments as the cold-weather clothing assembly, except for the substitution of a trouser liner in lieu of the wool trousers. The outer garments consist of an additional pair of cotton water-repellent wind-resistant trousers with a trouser liner, a parka with liner, and Arctic-type mittens. Boots with additional insulated layers are substituted for the insulated boots used with the cold-weather assembly. An Arctic-type sleeping bag, consisting of down- and feather-filled bags with a water-repellent case, is substituted for the mountain-type sleeping bag.

(c) EXCEPTIONS AND ADDITIONS FOR INDIVIDUALS IN A PROTECTED ENVIRONMENT — The clothing assemblies just described are based on the assumption that the individuals wearing them will be living in the open 24 hours a day. Clothing requirements at permanent installations may be modified; for example, a raincoat may be more practical than a poncho, and blankets may take the place of sleeping bags.

(d) SPECIAL REQUIREMENTS — Low temperatures, high humidities, and sunglare are the factors creating special requirements for the Area. Clothing attrition will be increased in the region under the influence of the tropical regime, where high humidities associated with high temperatures cause rapid deterioration of untreated cloth and leather items. Tinted glasses and chap sticks are effective protection against sunglare reflected off snow and wind effects characteristic of the subpolar regime. Sunburn cream is desirable for use on Ascension Island throughout the year. No special protection is required against insects and reptiles in the South Atlantic Islands.

(2) *Storage* — Temperature, humidity, precipitation, and winds are the main environmental factors to be considered for the protection of stored items in this NIS Area. Heated warehouses, tents, or shelters are required throughout the year on the islands south of 45°S. for the protection of those items that may be damaged by freezing temperatures or by alternate freezing and thawing conditions. On Ascension Island, adequate ventilation, in and between stored items, is necessary to control corrosion and mildew. Throughout the Area, storage has to be protected against light to moderately heavy precipitation. Particular care is required against heavy precipitation during the autumn and winter months in the Tristan da Cunha Group and on South Georgia. Storage must be secured against the moderate to strong westerly winds that predominate during all seasons in the Tristan da Cunha Group and on all the islands under the influence of the subpolar regime. Drifting snow on South Georgia, and also possibly on the South Sandwich Islands, may cover storage items; special marking precautions are required on these islands. Protection is needed against the widespread depredation by rats on the islands of Ascension and Saint Helena.

(3) *Shelter* — Shelter is needed the year round in this NIS Area as protection against extremes of temperature, precipitation, and winds. Protection is required against the sun's rays wherever the tropical regime dominates, against below-freezing temperatures wherever the subpolar regime dominates, and against light to moderately heavy precipitation and moderate to strong winds in all of the Area.

Tents similar to those developed by the U.S. Army for Temperate Zone operations would provide adequate protection on the islands north of 45°S., and tentage similar to the U.S. Army hexagonal or Arctic tent would provide adequate protection on the islands south of this latitude. Tents should be fastened securely in the Tristan da Cunha Group and in all of the islands south of this group to withstand the strong westerly winds during all seasons.

4. Amphibious operations

The South Atlantic Islands located south of about 35°S. latitude are predominantly within the stormy belt of the westerlies and are subject to definite operational limitations throughout most of the year. Only the islands of Ascension and Saint Helena have favorable conditions most of the time. Unfavorable sea and swell conditions, cloudiness, precipitation, low temperatures, and sea ice would at times seriously hinder amphibious

operations at the other islands in this NIS Area. Amphibious operations may be conducted among the Tristan da Cunha Group, the Falkland Islands, South Georgia, and Bouvet Island during the entire year, although often with considerable difficulty. On the other hand, at the South Sandwich Islands amphibious operations would be hazardous most of the year. The Southern Hemisphere summer (December through February) offers the most favorable conditions and winter (June through August) the least favorable for conducting amphibious operations.

a. *ASCENSION ISLAND AND SAINT HELENA ISLAND* — Although Ascension and Saint Helena are over 700 miles apart, the influence of weather on amphibious operations at these islands is quite similar. Both of these islands are under the influence of the southeasterlies of the permanent South Atlantic anticyclone. The surface winds are between south and east over 90% of the time. The islands are too small to be affected by land or sea breezes. The mean wind speed is about 12 knots, and gales are rare. Sea and swell conditions (seas less than 3 feet and swell less than 6 feet) favorable for conducting amphibious operations occur about 58% and 75% of the time, respectively, with little seasonal difference.

The mean cloud amount is about 5-tenths at Ascension and slightly higher at Saint Helena; maximum cloud cover over both islands is recorded during August through December. Precipitation occurs generally less than 10% of the time at Ascension and a little more frequently at Saint Helena. Good visibility is predominant; visibility less than 2½ miles is recorded in less than 5% of the observations. The mean annual temperature is in the middle 70's at Ascension and in the low 70's at Saint Helena. There is little variation in sea-water temperature throughout the year; the average is near 76° F. at Ascension and 74° F. at Saint Helena. Relative humidity along the coast averages near 70% at both islands.

b. *TRISTAN DA CUNHA GROUP* — This small group of islands is located south of the center of the permanent anticyclone. Westerly winds are predominant. The mean wind speed is about 17

NOTE Amphibious operations are defined as those operations involving the movement of troops and equipment onto a beach and the associated protective measures. The meteorological elements discussed in this Subsection are those which are of primary importance to such operations as helicopter troop transport, waterborne troop and cargo landing, underwater demolition, air support, and naval gunfire support. Further discussion of some of the elements may be found in the Subsections on Air, Air-ground, and Ground Surface Operations.

knots. Gales are rare in summer; however, they occur about 15% to 20% of the time during the winter season. With unlimited fetch and a moderately strong mean wind speed, moderate to rough sea and swell conditions predominate. Slight seas (less than 3 feet) and low swell (less than 6 feet) are observed about 33% of the time. The most favorable period for slight sea and low swell is during the summer season.

The cloud amount varies little throughout the year, averaging between 60% and 65% cloud cover in most months. Light showers account for most of the precipitation, which occurs on an average of 20% to 25% of the time. Visibility is usually good; however, about 5% to 10% of the time visibility is less than 2½ miles due to precipitation and occasionally fog. The air temperature is influenced greatly by the sea-water temperature; both average near 55° F. in winter and almost 65° F. in summer.

c. FALKLAND ISLANDS — Westerly winds are predominant in the vicinity of the Falkland Islands with winds from the remaining directions about evenly distributed. The mean wind speed is about 17 knots. Gale-force winds occur generally less than 10% of the time during summer and from 15% to 20% of the time during winter. Sudden squalls may occur at any time, but they are less frequent at night than during the day. The summer season has the largest percentage of sea and swell conditions favorable for amphibious operations. Annually, slight seas (less than 3 feet) and low swell (less than 6 feet) occur 45% and 37% of the time, respectively.

The mean annual cloud amount is about 6-tenths. The cloud cover varies little throughout the year; however, increased cloudiness usually accompanies northerly winds. Precipitation occurs about 20% of the time during most months of the year. About one-third of all precipitation is in the form of snow. Snowfall is heaviest from June through September; however, it is observed during all months. Thunderstorms are rare. Visibility less than 2½ miles is observed about 10% to 15% of the time, and occurs least frequently during the summer. Dense fog occurs about 4% of the time and is most common in July. There is no month in which the air temperature has not fallen below the freezing point. The annual average air temperature is about 44° F., and the sea temperature averages near 43° F. The mean relative humidity averages a little over 80% for the year, with a slight maximum occurring during the winter.

Sea ice is rare in the vicinity of the Falkland Islands. During severe winters, the pack ice of the Antarctic has surrounded the islands; how-

ever, this ice can usually be penetrated by reinforced vessels. Icebergs are observed occasionally.

d. SOUTH GEORGIA — South Georgia is exposed to strong westerly winds blowing over a cold, ice-bearing sea. The predominant wind direction is between west and northwest. The mean wind speed is 12 knots. Calms are observed about 20% of the time. The winds are frequently squally, and at times warm foehn winds flow down the mountains along the north coast with great violence. Gales occur about 10% of the time, with maximum frequency occurring during the winter. Slight sea (less than 3 feet) and low swell (less than 6 feet) are observed 39% and 23% of the time, respectively. The summer season has the highest percentage of slight sea and low swell.

The average annual cloud cover is near 7-tenths, with a tendency for maximum cloudiness to occur in December and January. Precipitation occurs about 48% of the time; however, the amount is not excessive. The south coast is usually snow-covered the entire year. Along the north coast, snow is observed during all months; however, the warm foehn winds sometimes prevent its accumulation, even in winter. Dense fog occurs about 10% of the time, occurring most frequently from November through March. Visibility less than 2½ miles is observed about 30% of the time. The mean daily temperatures range from the high 20's to the low 40's, with the extremes ranging from -3° to 84° F. The mean sea-water temperature is 35° F. Relative humidity averages between 70% and 75%.

Only during severe winters does the Antarctic pack ice extend as far north as South Georgia. Large quantities of ice in the bays along the south coast hinder amphibious operations a great part of the year.

e. SOUTH SANDWICH ISLANDS — Few marine observations are available in the vicinity of these islands from May through September. Observations during the other 7 months indicate that the predominant wind direction is westerly. The mean wind speed is about 16 knots. When the sea is ice free, sea and swell conditions (sea less than 3 feet, swell less than 6 feet) are favorable for amphibious operations about 33% of the time.

Indications are that the meteorological conditions in the vicinity of the South Sandwich Islands are generally similar to those of South Georgia, with a possibility of a little more cloudiness and of temperatures a few degrees cooler.

Ice begins to form on the sea around the southern islands of the South Sandwich Islands in early June, and by mid-July the group is completely enclosed by ice. This condition continues until October, when the pack ice begins to recede south-

ward. By the first of January, the ice has usually disappeared around the northern islands. All the islands are normally ice free by the end of January.

f. **BOUVET ISLAND** — In the vicinity of Bouvet Island the winds are predominantly westerly. The mean wind speed is about 15 knots. The highest seasonal mean wind speed is observed in winter. Sea and swell conditions (seas less than 3 feet, swells less than 6 feet) favorable for conducting amphibious operations occur about 33% of the time. The summer season has the highest percentage of favorable sea and swell conditions. Although very few meteorological data are available for this island, indications are that the climate is cold and dismal with an average annual temperature of about 32° F. The sea-water temperature also averages about 32° F. Sea ice normally does not form; however, during severe winters, Bouvet Island may be encompassed by pack ice for several months.

C. Meteorological facilities and organization (as of March 1960)

1. Ascension Island

Little information is available concerning the history and organization of the weather service of Ascension Island. Observations taken during the years 1854 to 1865 and 1899 to 1935 have been compiled by the Meteorological Office, Air Ministry, London. Between September 1942 and May 1947, upper-air data and surface observations were obtained under the direction of the United States Army Air Corps. From September 1957 to date, under the auspices of the United States, upper-air data and surface observations have been obtained. Rawinsonde releases are scheduled on a basis of 2 a day, while surface observations are taken every 3 hours. Also at the present time under the direction of the United Kingdom, synoptic surface observations are taken at 0600, 1200, and 1800 GMT daily, and upper-air pilot balloon soundings are taken at 0600 and 1800 GMT daily.

2. Saint Helena Island

Practically no information is available concerning the history and organization of the weather service on Saint Helena Island. Surface observations taken during the years 1853 to 1862 and 1893 to 1924 have been made available by the Meteorological Office, Air Ministry, London. Under the direction of the United Kingdom, surface synoptic observations are now taken daily at 0000, 0600, 1200, and 1800 GMT. No upper-air observations are taken.

3. Tristan da Cunha Group

The Tristan da Cunha weather service was established in 1941 by the Meteorological Section of the Union of South Africa Air Force and in 1946 was transferred to the Weather Bureau, Department of Transport. Presently on Tristan Island, surface synoptic observations are taken at 0000, 0600, 0900, 1500, and 1800 GMT, with hourly observations taken at 0600 through 1400 local time. Upper-air pilot balloon soundings are taken when conditions permit. Monthly climatological means are transmitted. Total radiation and duration of sunshine are compiled into bulletins. During the whaling season, reports from this island are included in the collective messages of whaling ship reports transmitted from South Africa.

4. Falkland Islands and South Georgia

Although weather observations (mostly precipitation, temperature, and relative humidity) have been taken during various periods since 1874, there is little information regarding the weather service responsible for these observations. However, the British Meteorological Office has summarized and published many of these observational data.

The Falkland Islands and Dependencies Meteorological Service had its origin a little over 10 years ago when bases were first established at Port Lockroy (64°50'S., 63°31'W.) and Deception Island. In 1950, a single Meteorological Service was established as an integral part of the Falkland Islands Dependencies Survey, with headquarters at Stanley, Falkland Islands.

The Chief Meteorological Officer is directly responsible to the Governor for the technical efficiency of the service and seeks advice, as required, from the Director of the Meteorological Office, London. The general functions of the Service are 1) to provide forecasting services for the whaling fleets operating in the waters of the Falkland Islands and Dependencies; 2) to prepare local weather forecasts in the Falkland Islands for the general public, for shipping, and for the Government Air Service; 3) to supervise meteorological observations in the Falkland Islands and Dependencies and to broadcast this information in the form of collective synoptic messages; 4) to collect and publish climatic data; and 5) to sponsor limited investigations into the meteorology of the Falkland Islands and Dependencies region.

Full synoptic observations are taken at Stanley, Falkland Islands, and at Grytviken, South Georgia, at 3-hourly intervals, and pilot balloon ascents are made when possible. Additional observations are made at Fox Bay, Pebble Island

Westpoint Island, and Darwin, all located in the Falkland Islands, by part-time observers and are invaluable for briefing the local air service. Observations made at these four stations are made with sufficient regularity to form the basis for monthly and annual climatological summaries. In addition, synoptic reports are received from ships registered in the Falkland Islands, visiting British ships, fleet auxiliaries, and seasonal whaling vessels. Upper-air data from various stations are collected at Stanley, Falkland Islands. Radiosonde observations taken at Stanley are sponsored by the British Air Ministry.

Local forecasts for the Falkland Islands are broadcast daily at 1515 and 2115 GMT for the benefit of the farmers and the general public. On request, information is supplied to the Government Air Service and ships operating in the general vicinity. During the whaling season, forecast bulletins are issued from Stanley for the whaling fleets at 0200, 1500, and 2100 GMT.

Three forecasts a day, at 0215, 1515, and 2115 GMT, are provided for South Georgia and the ocean area south of 50°S. latitude between 10° and 40°W. longitude.

A continuing shortage of experienced staff personnel throughout the Service has been reported. This problem has been minimized, to a degree, by recruiting untrained personnel and training them in London, England, or Stanley, Falkland Islands. Senior duties at each station are carried out by experienced meteorological assistants. Each station has assigned to it at least one observer who

has been approved by the British Meteorological Office.

Weather service facilities do not exist on the South Sandwich Islands or Bouvet Island.

D. Climatic data tables

The data presented in tabular form with a period of record of 5 years or more are considered to be quite reliable and representative for the observation site. The length of record of temperature, precipitation, and relative humidity at most stations in this NIS Area is sufficient to show representative means and extremes. As more cloud, visibility, and wind data are made available in the future, the statistical conclusions may change slightly; however, the change at these island stations should not be as great as might occur at continental stations. Data for the South Shetland and South Orkney Islands, located just south of the Area boundary, have been included to facilitate a comparison. Upper-air data are limited; however, the data for the two stations where radiosonde observations are taken are considered reliable and representative.

A map of station locations (Figure 23-30), with an accompanying list giving latitude, longitude, and elevation of stations mentioned in Subsections A, B, and D, appears at the end of this Section.

The annual values in some tables may be slightly different from the sums or means of the monthly values because of the rounding-off of fractions.

FIGURE 23-15. MEAN NUMBER OF DAYS WITH VARIOUS CLOUD AMOUNTS AT SPECIFIED HOURS

ISLAND AND STATION	HOUR (LST)	CLOUD AMOUNTS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC	
Ascension Island.....	0000	< 1/10	2	1	2	0	0	0	1	0	0	0	0	0	0	7	
		1/10 through 5/10	15	17	20	18	20	20	17	14	7	5	5	12	170	7	
		> 5/10	14	10	9	12	11	10	13	17	23	20	25	19	189	7	
	1200	< 1/10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
		1/10 through 5/10	10	14	17	13	12	10	17	12	5	5	3	0	133	7	
		> 5/10	21	14	14	17	19	14	14	19	25	20	27	22	232	7	
Saint Helena Island..	0000	< 1/10	0	0	0	0	0	0	1	0	0	0	0	0	1	3	
		1/10 through 5/10	0	0	0	3	3	2	2	1	0	0	1	1	19	3	
		> 5/10	31	28	25	27	28	28	28	30	30	31	20	30	345	3	
	1200	< 1/10	0	0	0	1	0	0	0	0	0	0	0	0	1	3	
		1/10 through 5/10	1	1	2	2	3	4	2	1	1	1	1	1	20	3	
		> 5/10	30	27	29	27	28	29	29	30	29	30	29	30	344	3	
Tristan da Cunha Group: Tristan Island.....	0500	< 1/10	3	1	2	1	0	2	2	1	1	1	2	2	18	4	
		1/10 through 5/10	0	5	4	0	7	8	7	0	3	7	0	5	70	4	
		> 5/10	22	22	25	23	24	20	22	24	20	23	22	24	277	4	
	1700	< 1/10	3	1	2	2	1	0	2	1	1	1	3	1	18	4	
		1/10 through 5/10	0	0	7	5	0	0	4	3	4	0	7	0	60	4	
		> 5/10	22	21	22	23	24	24	24	25	27	25	24	20	24	281	4

See footnote at end of table.

FIGURE 23-15 (Continued)

ISLAND AND STATION	HOOR (LST)	CLOUD AMOUNTS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC	
Falkland Islands:																	
Darwin	0800	0- $\frac{1}{8}$	0	2	5	1	3	2	3	4	3	4	3	0	30	5	
		$\frac{1}{8}$ through $\frac{1}{4}$	0	5	0	7	8	8	8	8	5	7	8	0	0	63	5
		$\frac{1}{4}$ through $\frac{1}{2}$	22	21	20	22	20	20	20	22	20	19	21	25	25	252	5
Fox Bay.....	0800	0- $\frac{1}{8}$	3	0	7	0	3	2	3	5	7	8	7	4	01	5	
		$\frac{1}{8}$ through $\frac{1}{4}$	10	8	0	7	7	8	8	8	8	8	8	8	8	04	5
		$\frac{1}{4}$ through $\frac{1}{2}$	18	14	18	17	21	20	20	18	15	15	15	10	23	210	5
Stanley.....	0200	0- $\frac{1}{8}$	4	0	0	7	0	7	7	0	5	10	0	4	77	5	
		$\frac{1}{8}$ through $\frac{1}{4}$	4	4	5	4	4	4	5	4	7	4	5	4	54	5	
		$\frac{1}{4}$ through $\frac{1}{2}$	23	18	17	10	21	10	10	21	18	17	10	23	234	5	
	1400	0- $\frac{1}{8}$	2	2	3	3	3	2	4	3	2	3	4	1	32	5	
		$\frac{1}{8}$ through $\frac{1}{4}$	5	4	7	5	5	4	5	3	5	7	5	0	01	5	
		$\frac{1}{4}$ through $\frac{1}{2}$	24	22	21	22	23	24	22	25	23	21	21	24	272	5	
South Georgia:																	
Grytviken.....	0400	0- $\frac{1}{8}$	4	5	0	7	8	0	0	10	0	8	5	4	87	5	
		$\frac{1}{8}$ through $\frac{1}{4}$	4	5	0	5	4	4	3	0	4	0	7	4	58	5	
		$\frac{1}{4}$ through $\frac{1}{2}$	23	18	10	18	10	17	10	15	17	17	18	23	220	5	
	1000	0- $\frac{1}{8}$	1	3	4	4	4	3	5	7	5	5	4	2	47	5	
		$\frac{1}{8}$ through $\frac{1}{4}$	4	0	4	4	5	5	4	4	4	5	5	4	54	5	
		$\frac{1}{4}$ through $\frac{1}{2}$	20	10	23	22	22	22	22	20	21	21	21	25	264	5	
South Orkney Islands*:																	
Signy Island.....	0300	0- $\frac{1}{8}$	1	1	1	1	4	0	7	0	5	2	0	0	34	5	
		$\frac{1}{8}$ through $\frac{1}{4}$	2	3	1	2	3	2	4	4	5	3	3	1	33	5	
		$\frac{1}{4}$ through $\frac{1}{2}$	28	24	20	27	24	22	20	21	20	20	27	30	208	5	
	1500	0- $\frac{1}{8}$	1	0	1	1	3	4	4	4	3	1	0	0	22	5	
		$\frac{1}{8}$ through $\frac{1}{4}$	1	3	2	3	2	1	4	3	3	2	2	3	20	5	
		$\frac{1}{4}$ through $\frac{1}{2}$	20	25	28	20	20	25	23	24	24	28	28	28	314	5	
South Shetland Islands*:																	
Admiralty Bay.....	0200	0- $\frac{1}{8}$	1	1	2	2	4	4	5	0	4	1	2	2	34	5	
		$\frac{1}{8}$ through $\frac{1}{4}$	3	4	3	5	4	5	4	3	5	3	2	3	44	5	
		$\frac{1}{4}$ through $\frac{1}{2}$	27	23	20	23	23	21	22	22	21	27	20	20	287	5	
	1400	0- $\frac{1}{8}$	0	1	2	1	2	2	2	5	4	1	2	1	23	5	
		$\frac{1}{8}$ through $\frac{1}{4}$	5	4	3	2	3	3	3	3	3	3	2	5	30	5	
		$\frac{1}{4}$ through $\frac{1}{2}$	20	23	20	27	20	25	20	23	23	27	20	25	303	5	
Deception Island.....	0200	0- $\frac{1}{8}$	1	2	3	3	3	5	5	0	4	1	1	2	30	5	
		$\frac{1}{8}$ through $\frac{1}{4}$	3	3	3	4	4	5	5	3	3	3	3	4	43	5	
		$\frac{1}{4}$ through $\frac{1}{2}$	27	23	25	23	24	20	21	22	23	27	20	25	286	5	
	1400	0- $\frac{1}{8}$	1	1	1	1	1	2	2	2	3	2	1	3	20	5	
		$\frac{1}{8}$ through $\frac{1}{4}$	4	3	3	3	3	1	2	3	2	3	3	3	33	5	
		$\frac{1}{4}$ through $\frac{1}{2}$	20	24	27	20	27	27	27	27	20	25	20	25	312	5	

* Near but outside N18 04 Area.

FIGURE 23-16. MEAN UPPER-AIR TEMPERATURES (° C.) AT STANDARD PRESSURE SURFACES

ISLAND AND STATION	PRES- SURE SUR- FACE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC
Ascension Island*	milli- bars														
	200	-54			-53			-53			-55			-54	na
	300	-33			-32			-33			-33			-33	
	500	-7			-7			-6			-8			-7	
	700	8			8			0			8			8	
	850	15			15			12			14			14	
Falkland Islands: Stanley	00	-50	-52	-54	-57	-61	-62	-62	-63	-61	-57	-53	-51	-57	5
	100	-50	-52	-53	-55	-57	-59	-59	-61	-59	-57	-52	-51	-50	
	150	-49	-51	-52	-54	-57	-58	-58	-59	-58	-57	-53	-51	-54	
	200	-51	-51	-52	-54	-57	-59	-58	-60	-59	-58	-54	-52	-50	
	300	-47	-49	-47	-48	-52	-53	-53	-53	-54	-52	-50	-48	-51	
	400	-34	-32	-34	-36	-38	-40	-41	-41	-41	-39	-37	-35	-37	
	500	-23	-21	-23	-24	-27	-29	-29	-29	-30	-27	-26	-24	-26	
	700	-8	-6	-8	-8	-11	-12	-13	-13	-13	-11	-10	-8	-10	
	850	0	2	1	0	-2	-4	-4	-4	-4	-1	-1	0	-2	

na Data not available.

* Data for season appear under midseason month.

FIGURE 23-17. MEAN HEIGHTS (10' FEET) OF STANDARD PRESSURE SURFACES

ISLAND AND STATION	PRES- SURE SUR- FACE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC
Ascension Island*	milli- bars														
	200	4050			4060			4060			4050			4055	na
	300	3100			3170			3180			3170			3170	
	500	1950			1940			1940			1940			1942	
	700	1030			1030			1030			1030			1030	
	850	500			500			500			500			500	
Falkland Islands: Stanley	100	5280	5301	5278	5240	5187	5159	5140	5138	5153	5198	5232	5203	5216	5
	150	4416	4430	4419	4398	4345	4322	4309	4308	4315	4348	4371	4400	4300	
	200	3708	3820	3807	3793	3748	3729	3715	3718	3721	3751	3763	3789	3763	
	300	2931	2958	2930	2936	2901	2892	2877	2882	2884	2908	2909	2930	2912	
	400	2299	2311	2298	2299	2273	2266	2254	2257	2262	2280	2270	2292	2280	
	500	1760	1783	1773	1778	1757	1755	1744	1748	1752	1765	1758	1770	1762	
	700	934	944	939	948	935	938	929	934	939	943	935	940	938	
		850	431	438	430	445	437	443	435	439	440	445	435	437	439

na Data not available.

* Data for season appear under midseason month.

FIGURE 23-18. PERCENTAGE FREQUENCY OF SPECIFIED CEILING (CLOUD COVER \geq 6/10 OR \geq 7/10) RANGES AT SPECIFIED HOURS

ISLAND AND STATION	HOUR (LST)	CLOUD COVER	RANGE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRN REC		
Ascension Island.....	0000	VI $\frac{1}{10}$	feet																
			< 5,000	47	31	27	30	31	30	38	51	72	83	81	58	49	49	5	
			< 3,000	20	18	23	24	23	18	23	30	41	44	30	20	28	28		
			< 1,000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1200	VI $\frac{1}{10}$	< 5,000	59	35	32	37	42	39	33	47	80	78	82	65	52	52	5	
			< 3,000	26	14	20	28	32	25	16	17	20	36	27	23	24	24		
			< 1,000	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	
			< 500	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	Saint Helena Island.....	0000	VI $\frac{1}{10}$	< 5,000	98	100	77	90	88	91	91	97	98	97	96	90	94	90	2
				< 3,000	98	100	77	88	86	91	91	97	98	97	96	90	90	93	
				< 1,000	74	66	53	66	45	43	55	48	70	75	62	68	60	60	
				< 500	21	21	19	19	11	8	18	22	34	43	22	18	21	21	
1200		VI $\frac{1}{10}$	< 5,000	93	96	91	87	87	84	94	95	95	96	97	95	92	92	2	
			< 3,000	93	66	91	87	87	81	92	95	95	96	97	95	91	91		
			< 1,000	40	32	48	41	31	35	34	46	54	53	50	47	43	43		
			< 500	8	14	16	7	6	9	9	13	10	10	14	8	12	12		
Tristan da Cunha Group: Tristan Island.....		0500	VI $\frac{1}{10}$	< 4,021	32	42	33	30	36	38	28	35	51	32	35	37	30	30	5
				< 3,281	20	24	20	17	0	0	8	13	12	8	17	24	14	14	
				< 984	3	10	1	5	0	1	1	1	2	0	0	7	3	3	
				< 650	2	0	0	0	0	1	1	2	0	6	8	2	2	2	
	1700	VI $\frac{1}{10}$	< 4,021	25	27	25	43	30	47	45	55	46	31	30	33	37	37	5	
			< 3,281	10	7	11	24	9	13	16	15	7	5	10	22	12	12		
			< 984	6	0	0	11	3	9	8	2	0	4	4	6	4	4		
			< 650	6	0	0	5	3	9	8	0	0	4	4	2	3	3		
	Falkland Islands: Darwin.....	0800	VI $\frac{1}{10}$	< 4,021	43	38	32	51	44	42	46	41	40	20	45	54	42	5	
				< 3,281	37	33	20	44	40	42	43	40	45	20	41	51	30	30	
				< 984	10	15	14	20	20	24	19	19	17	10	23	17	18	18	
				< 650	7	13	0	11	18	18	12	15	15	5	13	7	12	12	
Fox Bay.....		0800	VI $\frac{1}{10}$	< 4,021	51	30	30	40	62	61	57	51	36	34	34	40	47	5	
				< 3,281	40	34	30	42	58	53	53	47	36	31	33	47	42	42	
				< 984	20	16	18	26	34	35	32	34	22	14	16	26	25	25	
				< 650	9	9	11	20	20	23	23	24	12	7	9	13	15	15	
Stanley.....		0200	VI $\frac{1}{10}$	< 4,021	46	39	35	46	45	45	45	48	45	27	30	47	42	5	
				< 3,281	41	35	31	43	44	34	42	47	42	20	34	39	38	38	
				< 984	12	13	13	24	19	16	10	25	21	8	18	14	17	17	
				< 650	7	7	7	14	13	9	11	18	15	4	13	10	11	11	
	1400	VI $\frac{1}{10}$	< 4,021	42	38	34	40	44	40	42	40	42	28	30	44	40	5		
			< 3,281	40	34	31	38	41	43	40	42	37	26	20	41	36	36		
			< 984	9	7	12	13	21	18	10	16	15	9	13	9	13	13		
			< 650	0	3	7	10	15	9	15	12	16	5	7	6	9	9		
	South Georgia: Grytviken.....	0400	VI $\frac{1}{10}$	< 4,021	44	43	40	48	46	39	48	41	45	44	53	47	45	5	
				< 3,281	37	30	28	37	38	35	40	30	42	30	48	36	37	37	
				< 984	11	12	8	11	8	7	9	11	10	6	12	10	10	10	
				< 650	5	6	6	8	5	5	5	8	8	5	8	4	6	6	
1600		VI $\frac{1}{10}$	< 4,021	48	40	41	45	44	42	46	43	40	39	39	51	42	5		
			< 3,281	32	21	26	36	34	37	38	33	30	31	29	30	31	31		
			< 984	6	6	3	11	9	9	8	6	7	4	9	6	7	7		
			< 650	3	3	1	5	7	6	5	4	4	3	5	3	4	4		
South Orkney Islands:* Signy Island.....		0300	VI $\frac{1}{10}$	< 4,021	81	77	81	81	67	64	57	57	50	68	75	73	68	5	
				< 3,281	72	72	77	77	64	61	55	50	56	67	70	70	66	66	
				< 984	27	25	25	28	31	24	23	28	25	25	24	30	27	27	
				< 650	11	17	10	16	18	12	13	16	12	13	13	18	14	14	
	1500	VI $\frac{1}{10}$	< 4,021	61	66	80	60	59	59	57	55	64	64	62	67	62	62	5	
			< 3,281	59	62	75	52	54	57	53	53	58	60	53	58	58	58		
			< 984	25	27	21	20	27	31	29	25	27	16	24	19	24	24		
			< 650	12	13	13	13	18	18	18	14	15	6	15	11	14	14		

See footnote at end of table.

FIGURE 23-18 (Continued)

ISLAND AND STATION	HOUR (LST)	CLOUD COVER	RANGE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC		
South Shetland Islands: Admiralty Bay.....	0200	VH 3/4	feet																
			<4,021	65	64	64	64	63	54	59	59	54	60	60	67	62	62	5	
			<3,281	56	57	59	61	58	50	55	54	51	65	57	63	57			
			<084	7	15	13	10	18	14	14	13	12	15	18	8	13			
			<050	4	4	5	7	10	11	9	6	5	6	5	2	6			
			<4,021	50	51	40	59	50	56	49	54	53	58	48	47	50	50	5	
	1400	VH 3/4	<3,281	39	42	34	52	49	54	47	49	52	53	43	41	46			
			<084	8	12	13	16	10	18	15	10	14	18	13	4	12			
			<050	3	4	4	7	6	11	7	8	4	10	8	1	6			
			<4,021	61	67	67	70	67	59	55	62	65	72	60	61	65	65	5	
			<3,281	55	65	64	66	62	50	55	60	64	70	65	50	61			
			<084	23	35	34	34	33	34	35	36	41	34	30	25	34			
Deception Island.....	0200	VH 3/4	<050	13	14	17	17	10	17	20	10	23	17	21	13	17			
			<4,021	51	60	66	68	66	70	65	60	68	65	59	50	62	62	5	
			<3,281	47	64	57	64	63	69	63	55	59	57	44	58				
			<084	22	30	34	40	36	38	29	32	34	36	34	19	32			
			<050	8	17	18	10	10	10	17	19	17	19	17	10	11	16		
			<4,021	61	67	67	70	67	59	55	62	65	72	60	61	65	65	5	
	1400	VH 3/4	<3,281	55	65	64	66	62	50	55	60	64	70	65	50	61			
			<084	23	35	34	34	33	34	35	36	41	34	30	25	34			
			<050	13	14	17	17	10	17	20	10	23	17	21	13	17			
			<4,021	51	60	66	68	66	70	65	60	68	65	59	50	62	62	5	
			<3,281	47	64	57	64	63	69	63	55	59	57	44	58				
			<084	22	30	34	40	36	38	29	32	34	36	34	19	32			

* Near but outside NIS 64 Area.

FIGURE 23-19. PERCENTAGE FREQUENCY OF SPECIFIED VISIBILITY RANGES AT SPECIFIED HOURS

ISLAND AND STATION	HOUR (LST)	RANGE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC		
Ascension Island..	0000	miles																
		<1/2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
		<1	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
		<2 1/2	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
		<5	0	0	3	0	0	0	1	0	3	3	1	0	1			
		<10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
	1200	VH 3/4	<1	0	0	0	0	0	0	0	0	0	0	0	0	0		
			<2 1/2	0	0	0	0	0	0	0	1	0	3	3	1	0	1	
			<5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			<10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
			<20	1	1	2	0	1	0	2	4	3	2	2	2	2	2	
			<50	13	13	15	12	3	5	10	10	21	27	14	5	13	13	5
Saint Helena Is- land.	0000	<1	10	17	17	17	6	10	17	22	21	27	19	5	16			
		<2 1/2	24	25	19	20	11	10	21	25	22	37	21	13	21			
		<5	30	25	24	22	11	12	20	30	37	50	31	27	27			
		<10	3	9	13	3	3	7	8	13	8	11	7	6	8			
		<20	6	9	15	3	4	9	9	15	11	16	9	8	9			
		<50	8	11	15	3	5	10	9	23	12	21	12	8	11			
	1200	VH 3/4	<10	13	13	21	8	11	11	15	28	23	37	20	14	18		
			<20	13	13	21	8	11	11	15	28	23	37	20	14	18		
			<50	13	13	21	8	11	11	15	28	23	37	20	14	18		
			<100	13	13	21	8	11	11	15	28	23	37	20	14	18		
			<200	13	13	21	8	11	11	15	28	23	37	20	14	18		
			<500	13	13	21	8	11	11	15	28	23	37	20	14	18		
Tristan da Cunha Group: Tristan Island...	0500	<1/2	0	0	0	0	0	0	0	2	2	2	4	2	1	5		
		<1 1/4	0	1	2	0	0	0	0	2	0	2	5	4	2			
		<2 1/2	1	4	5	4	7	2	1	3	8	5	9	9	5			
		<5	5	5	7	8	10	5	9	7	13	11	15	15	9			
		<10	2	0	2	2	0	0	0	2	1	1	1	4	1			
		<20	6	0	5	4	2	1	5	2	4	5	1	5	3			
	1700	VH 3/4	<10	10	0	5	7	11	7	13	7	7	11	9	7	8		
			<20	14	7	12	18	27	14	22	15	13	22	17	17	16		
			<50	14	7	12	18	27	14	22	15	13	22	17	17	16		
			<100	14	7	12	18	27	14	22	15	13	22	17	17	16		
			<200	14	7	12	18	27	14	22	15	13	22	17	17	16		
			<500	14	7	12	18	27	14	22	15	13	22	17	17	16		

See footnote at end of table.

FIGURE 23-10 (Continued)

ISLAND AND STATION	HOUR (LST)	RANGE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YR# REC
			<i>miles</i>													
Falkland Islands: Darwin.....	0800	< 1/8	2	1	0	2	4	2	3	1	2	2	2	3	2	5
		< 1 1/4	4	2	1	2	8	5	10	1	5	2	5	3	4	4
		< 2 1/2	5	5	4	4	8	10	12	8	11	6	6	3	7	7
		< 0	13	20	16	17	10	31	24	17	26	12	18	13	10	10
Fox Bay.....	0800	< 1/8	1	0	1	2	4	2	2	3	1	0	0	0	1	5
		< 1 1/4	1	1	1	2	5	4	4	7	3	1	1	1	2	5
		< 2 1/2	2	2	1	3	6	7	4	9	4	1	3	1	4	5
		< 0	3	5	2	5	9	11	13	16	6	3	3	3	7	7
Stanley.....	0200	< 1/8	2	2	1	5	1	4	2	3	3	1	5	0	2	5
		< 1 1/4	3	2	1	6	2	7	3	8	6	2	5	0	4	5
		< 2 1/2	3	3	1	7	5	8	5	10	9	3	6	1	5	5
		< 0	12	13	12	21	22	19	20	29	21	8	18	9	17	17
	1400	< 1/8	0	0	0	5	2	1	1	3	1	1	1	1	1	5
		< 1 1/4	1	1	3	6	3	4	7	3	2	1	1	3	3	5
		< 2 1/2	3	1	5	7	10	7	8	11	6	4	3	4	6	6
		< 0	10	12	11	16	23	23	25	21	17	8	10	9	15	15
South Georgia: Grytviken.....	0400	< 1/8	1	3	1	3	3	2	1	3	4	3	6	1	3	5
		< 1 1/4	4	8	5	7	7	4	6	6	8	5	8	4	6	6
		< 2 1/2	5	12	7	9	9	8	9	9	11	6	9	5	8	8
		< 0	10	20	16	17	20	20	23	27	20	10	22	21	22	22
	1600	< 1/8	0	1	0	2	4	2	5	2	2	7	0	0	2	5
		< 1 1/4	1	3	0	3	6	3	7	5	6	10	2	0	4	5
		< 2 1/2	1	4	1	4	10	5	9	7	7	11	4	1	5	5
		< 0	11	12	12	16	21	18	21	17	13	21	14	11	16	16
South Orkney Is- lands:* Signy Island... .	0300	< 1/8	2	1	2	2	5	9	1	1	4	2	1	2	3	5
		< 1 1/4	5	4	2	3	11	15	7	7	8	5	4	9	7	5
		< 2 1/2	9	6	5	11	14	17	14	15	11	7	7	13	11	11
		< 0	24	24	21	32	34	35	32	37	32	29	19	27	28	28
	1500	< 1/8	1	1	3	1	7	5	4	2	3	2	2	1	3	5
		< 1 1/4	5	6	8	5	16	11	17	10	6	4	8	7	8	5
		< 2 1/2	7	8	11	8	21	16	22	12	10	6	13	8	12	12
		< 0	10	10	21	22	35	35	31	25	25	17	21	16	24	24
South Shetland Is- lands:* Admiralty Bay..	0200	< 1/8	2	2	5	3	7	8	9	6	5	4	3	2	5	5
		< 1 1/4	3	5	7	5	11	14	16	11	9	8	4	3	8	5
		< 2 1/2	6	7	10	8	17	17	24	16	12	17	8	4	12	12
		< 0	22	30	30	32	40	42	42	38	33	30	27	15	32	32
	1400	< 1/8	0	0	4	4	7	8	7	6	7	7	1	0	4	5
		< 1 1/4	2	2	5	6	11	17	14	15	10	11	3	1	8	5
		< 2 1/2	5	5	8	12	21	22	21	20	17	17	7	2	13	12
		< 0	17	18	24	27	38	45	41	35	34	35	23	10	20	20
Deception Is- land.	0200	< 1/8	4	1	1	3	7	12	9	6	9	6	5	1	5	5
		< 1 1/4	7	4	5	7	13	16	16	11	17	11	9	5	10	5
		< 2 1/2	9	11	12	14	18	23	22	21	25	18	14	8	10	10
		< 0	21	31	33	38	35	43	43	44	40	42	32	20	30	30
	1400	< 1/8	1	1	4	2	7	10	11	5	5	9	3	1	5	5
		< 1 1/4	5	5	10	8	8	17	17	14	8	13	7	2	9	5
		< 2 1/2	9	9	18	13	13	20	20	10	11	17	9	4	14	14
		< 0	19	15	30	10	20	42	43	35	33	38	25	18	20	20

* Near but outside NIS 64 Area.

FIGURE 23-20. MEAN NUMBER OF DAYS WITH CEILING (CLOUD COVER $\geq 1/8$ OR $\geq 3/8$) $\geq 1,000$ FEET AND VISIBILITY $\leq 2 1/2$ MILES AT SPECIFIED HOURS

ISLAND AND STATION	HOUR (LST)	CLOUD COVER	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC
Ascension Island...	0000	VII $\frac{1}{8}$	31	28	31	30	31	30	31	31	30	31	30	31	305	6
	1200	VII $\frac{1}{8}$	31	28	31	30	31	30	31	31	30	31	30	31	305	6
Saint Helena Island.	0000	VII $\frac{1}{8}$	8	9	14	10	17	17	14	16	9	7	11	10	142	2
	1200	VII $\frac{1}{8}$	16	19	10	18	21	19	20	17	14	14	15	16	206	2
Tristan da Cunha Group:																
Tristan Island...	0500	VII $\frac{1}{8}$	20	25	30	28	29	20	31	30	27	29	26	27	340	3
	1700	VII $\frac{1}{8}$	28	28	29	25	28	26	20	20	28	27	27	28	320	3
Falkland Islands:																
Darwin.....	0800	VII $\frac{1}{8}$	26	23	20	22	25	22	24	25	24	27	23	25	292	5
Fox Bay.....	0800	VII $\frac{1}{8}$	25	23	25	22	20	19	21	21	23	27	25	23	274	5
Stanley.....	0200	VII $\frac{1}{8}$	27	24	27	23	25	25	25	22	23	28	25	20	300	5
	1400	VII $\frac{1}{8}$	28	26	27	26	24	24	25	25	25	28	26	28	312	5
South Georgia:																
Grytviken.....	0400	VII $\frac{1}{8}$	27	23	28	25	28	27	27	27	26	28	26	27	319	5
	1000	VII $\frac{1}{8}$	20	26	30	26	26	27	27	28	27	29	27	29	331	5
South Orkney Islands:*																
Signy Islands....	0300	VII $\frac{1}{8}$	23	21	23	21	20	23	23	21	22	23	23	19	262	5
	1500	VII $\frac{1}{8}$	23	20	24	24	22	20	21	22	22	26	26	25	275	5
South Shetland Islands:*																
Admiralty Bay..	0200	VII $\frac{1}{8}$	28	23	26	26	23	24	23	24	25	24	24	28	298	5
	1400	VII $\frac{1}{8}$	27	24	26	24	24	21	23	23	23	23	25	29	292	5
Deception Island.	2000	VII $\frac{1}{8}$	24	17	19	19	19	18	18	15	15	18	18	23	227	5
	1400	VII $\frac{1}{8}$	24	19	19	17	19	17	19	20	19	19	19	25	230	5

* Near but outside NIS 64 Area.

FIGURE 23-21. MEAN DAILY TEMPERATURE (°F.)

ISLAND AND STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC
Ascension Island.....	79	80	81	81	80	79	78	77	79	77	77	79	79	30
Saint Helena Island.....	64	65	66	65	63	60	58	58	57	58	59	61	61	30
Tristan da Cunha Group:														
Tristan Island.....	63	64	62	60	59	54	53	53	53	55	57	61	57	5
Falkland Islands:														
Stanley.....	40	48	47	43	39	36	36	36	39	42	42	40	42	25
South Georgia:														
Grytviken.....	41	42	40	32	28	28	28	32	32	34	38	30	32	23
South Orkney Islands:*														
Laurie Island.....	32	32	31	26	19	12	11	12	19	25	28	31	23	48
South Shetland Islands:*														
Admiralty Bay.....	35	35	32	30	24	20	20	20	25	28	32	33	28	5
Deception Island.....	34	34	32	37	23	18	16	17	21	27	28	33	27	8

* Near but outside NIS 64 Area.

FIGURE 23-22. MEAN DAILY MAXIMUM AND MINIMUM TEMPERATURES (°F.)

ISLAND AND STATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC
Ascension Island.....	Max	85	87	88	88	87	85	84	83	82	83	83	84	85	20
	Min	73	74	75	75	74	73	72	71	71	71	71	72	73	30
Saint Helena Island.....	Max	68	70	70	69	67	64	62	61	60	61	63	65	65	30
	Min	60	61	62	61	59	57	55	54	54	54	55	57	57	30
Tristan da Cunha Group: Tristan Island.....	Max	66	68	66	64	60	58	57	56	56	56	61	64	61	5
	Min	50	60	58	57	53	51	50	49	49	51	54	57	54	5
Falkland Islands: Stanley.....	Max	56	55	53	49	44	41	40	41	45	48	52	54	48	25
	Min	42	41	40	37	34	31	31	31	33	35	37	39	36	25
South Georgia: Grytviken.....	Max	48	49	47	42	38	33	34	34	38	41	44	45	41	24
	Min	35	35	34	29	27	24	23	23	26	28	32	32	29	23
South Orkney Islands:* Laurie Islands.....	Max	35	35	35	31	25	21	20	21	20	30	32	34	31	48
	Min	29	29	27	21	13	5	4	5	12	19	24	28	19	48
South Shetland Islands:* Admiralty Bay.....	Max	38	38	36	33	28	24	24	24	29	31	35	39	31	5
	Min	32	32	29	27	20	15	15	16	21	24	29	30	24	5
Deception Island.....	Max	37	37	35	31	27	23	21	22	26	31	32	36	30	8
	Min	31	31	29	24	19	14	11	12	17	23	25	30	22	8

* Near but outside N18 04 Area.

FIGURE 23-23. ABSOLUTE MAXIMUM AND MINIMUM TEMPERATURES (°F.)

ISLAND AND STATION		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC
Ascension Island.....	Max	80	81	84	85	82	80	80	88	88	88	88	89	85	30
	Min	67	67	67	67	67	65	67	65	66	65	66	67	65	30
Saint Helena Island.....	Max	81	81	82	79	80	76	72	69	70	72	75	73	82	30
	Min	55	57	57	58	54	52	50	50	50	51	52	52	50	30
Tristan da Cunha Group: Tristan Island.....	Max	75	74	73	72	67	65	64	62	64	65	68	72	75	5
	Min	47	48	49	49	49	41	41	40	38	41	44	45	38	5
Falkland Islands: Stanley.....	Max	76	74	70	63	58	51	50	52	59	64	71	71	76	25
	Min	30	30	27	21	20	12	10	12	13	22	20	29	12	25
South Georgia: Grytviken.....	Max	75	80	84	80	63	57	55	56	63	67	68	69	84	23
	Min	25	26	21	16	12	6	7	-3	9	12	20	22	-3	23
South Orkney Islands:* Laurie Islands.....	Max	54	48	51	46	49	43	46	47	44	48	48	49	54	48
	Min	19	14	5	-25	25	-37	-34	-40	-27	-24	-5	8	-40	48
South Shetland Islands:* Admiralty Bay.....	Max	48	48	50	46	41	39	39	39	41	39	45	52	52	5
	Min	23	19	14	5	-4	-20	11	20	-13	7	16	23	-26	5
Deception Island.....	Max	51	48	46	47	42	39	40	41	39	45	42	45	51	8
	Min	19	20	12	2	6	-16	13	-18	-10	2	7	18	18	8

* Near but outside N18 04 Area.

FIGURE 23-24. MEAN RELATIVE HUMIDITY (%) AT SPECIFIED HOURS

ISLAND AND STATION	HOUR (LST)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC
Ascension Island.....	0800	68	67	67	67	66	65	65	66	67	66	66	67	66	19
	2000	73	70	71	72	69	70	70	69	71	71	71	71	71	19
Saint Helena Island.....	0700	93	93	93	93	91	90	91	92	93	94	93	94	92	10
	1200	82	82	84	84	83	82	80	85	86	87	82	83	84	10
Tristan da Cunha Group:															
Tristan Island.....	0000	81	82	77	79	80	81	82	80	80	81	80	80	80	5
	1500	80	79	77	79	80	80	81	79	80	80	80	79	79	5
Falkland Islands:															
Stanley.....	0000	78	79	82	80	88	80	80	87	84	80	75	77	83	20
South Georgia:															
Grytviken.....	0730	77	74	76	75	75	76	75	76	76	72	73	74	75	9
	1330	72	69	69	70	74	75	74	73	72	70	69	71	71	9
South Orkney Islands:*															
Laurie Island.....	0600	88	88	90	90	93	94	93	94	93	91	91	89	91	7
	1200	85	85	86	87	91	93	93	94	92	89	89	89	89	7
South Shetland Islands:*															
Admiralty Bay.....	0200	87	87	88	87	83	84	84	86	87	87	87	85	86	5
	1400	80	83	84	85	83	85	84	84	84	85	84	80	84	5
Deception Island.....	0800	85	86	89	88	84	90	88	87	89	87	85	85	87	8
	1400	81	83	85	86	83	87	87	87	88	85	82	83	85	8

* Near but outside NIS 64 Area.

FIGURE 23-25. MEAN PRECIPITATION (INCHES)

ISLAND AND STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC	
Ascension Island.....	0.2	0.4	0.7	1.1	0.5	0.5	0.5	0.4	0.3	0.3	0.2	0.1	5.2	45	
Saint Helena Island.....	2.1	3.1	4.2	3.1	2.8	3.2	4.3	2.6	2.2	1.7	1.2	1.6	32.1	30	
Tristan da Cunha Group:															
Tristan Island.....	3.5	3.5	6.4	4.7	7.1	5.9	6.1	6.0	7.9	5.8	4.3	4.0	60.1	5	
Falkland Islands:															
Stanley.....	2.8	2.4	2.3	2.4	2.5	2.2	1.9	1.9	1.6	1.6	2.0	2.8	20.4	30	
South Georgia:															
Grytviken.....	3.0	4.4	5.8	5.5	5.4	5.2	6.0	5.3	3.7	3.1	3.7	3.3	55.3	41	
South Orkney Islands:*															
Laurie Island.....	1.4	1.5	1.9	1.6	1.2	1.0	1.3	1.3	1.1	1.1	1.3	1.0	15.7	46	
South Shetland Islands:*															
Deception Island.....	2.3	2.1	2.7	2.0	0.2	0.3	0.6	1.0	0.9	4.3	3.8	2.0	22.2	2	

* Near but outside NIS 64 Area.

FIGURE 23-26. MAXIMUM 24-HOUR PRECIPITATION (INCHES)

ISLAND AND STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC	
Ascension Island.....	0.2	1.6	1.8	8.3	1.5	1.6	1.6	0.4	0.3	0.2	0.1	0.2	8.3	30	
Saint Helena Island.....	1.3	1.3	1.6	1.9	1.8	1.5	1.3	1.3	0.7	0.5	0.4	0.7	1.9	30	
Tristan da Cunha Group:															
Tristan Island.....	1.3	1.4	3.0	1.7	2.7	1.8	1.8	1.0	5.7	1.0	1.0	1.1	5.7	5	
Falkland Islands:															
Stanley.....	1.2	1.7	1.1	1.0	1.5	1.1	1.2	1.0	0.5	0.8	1.4	1.6	1.7	21	
South Georgia:															
Grytviken.....	3.8	3.5	4.0	4.4	2.2	5.0	3.7	3.8	3.2	2.5	2.5	2.6	5.0	23	
South Orkney Islands:*															
Laurie Island.....	0.0	1.2	0.0	1.2	1.1	1.0	1.7	1.5	1.3	1.1	1.4	1.3	1.7	44	
South Shetland Islands:*															
Deception Island.....	1.2	0.7	1.3	0.0	0.2	0.1	0.3	0.4	0.3	1.4	3.5	0.8	3.5	2	

* Near but outside NIS 64 Area.

FIGURE 23-27. MEAN NUMBER OF DAYS WITH PRECIPITATION >0.04 INCH

ISLAND AND STATION	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC
Ascension Island.....	2	2	3	4	3	3	3	3	2	3	1	1	30	30
Saint Helena Island.....	11	15	16	14	14	14	17	13	12	11	8	11	150	21
Tristan da Cunha Group:														
Tristan Island.....	12	13	11	12	17	10	20	21	18	16	13	13	185	5
Falkland Islands:														
Stanley.....	17	12	15	14	15	13	13	13	12	11	12	15	102	15
South Georgia:														
Grytviken.....	12	13	14	14	12	15	15	14	11	12	11	11	154	13
South Orkney Islands:*														
Laurie Island.....	8	9	11	11	9	8	9	9	9	8	9	7	107	44
South Shetland Islands:*														
Deception Island.....	11	10	11	10	1	2	3	5	7	9	8	8	85	2

* Near but outside NIS 64 Area.

FIGURE 23-28. MEAN NUMBER OF DAYS WITH SNOW AT SPECIFIED HOURS

ISLAND AND STATION	HOUR (LST)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC
Falkland Islands:															
Darwin.....	0800	0	0	0	1	1	2	2	0	2	1	0	0	9	5
Fox Bay.....	0800	0	0	0	0	0	1	1	1	0	0	0	0	3	5
Stanley.....	0200	0	0	0	0	1	2	1	3	0	0	0	0	7	5
	1400	0	0	0	0	2	2	2	3	1	1	0	0	11	5
South Georgia:															
Grytviken.....	0400	4	3	4	3	8	7	10	8	7	4	4	6	68	5
	1000	4	1	3	4	9	7	9	6	7	5	5	5	65	5
South Orkney Islands:*															
Signy Island.....	0300	0	5	8	6	8	9	9	7	7	8	7	6	86	5
	1500	0	4	7	4	8	7	9	7	9	7	7	5	80	5
South Shetland Islands:*															
Admiralty Bay.....	0200	5	4	8	7	9	9	11	10	9	13	7	4	90	5
	1400	6	4	7	7	11	11	11	9	9	10	6	3	94	5
Deception Island.....	0200	3	4	6	7	7	8	8	6	7	9	6	4	75	5
	1400	4	5	6	6	6	6	8	8	7	10	6	3	78	5

* Near but outside NIS 64 Area.

FIGURE 23-29. MEAN NUMBER OF DAYS WITH HAIL AT SPECIFIED HOURS

ISLAND AND STATION	HOUR (LST)	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	YRS REC
Falkland Islands:															
Darwin.....	0800	1	0	0	0	1	0	0	0	1	1	1	0	5	5
Fox Bay.....	0800	1	0	0	0	1	0	0	0	1	1	1	0	5	5
Stanley.....	0200	0	0	0	0	0	0	0	0	0	0	1	0	1	5
	1400	0	0	0	0	0	0	0	0	1	1	0	0	2	5
South Georgia:															
Grytviken.....	0400	0	0	0	0	0	0	1	0	0	0	0	0	1	5
	1000	0	1	0	0	1	0	1	0	0	1	1	1	6	5

E. Comments on principal sources

1. Evaluation

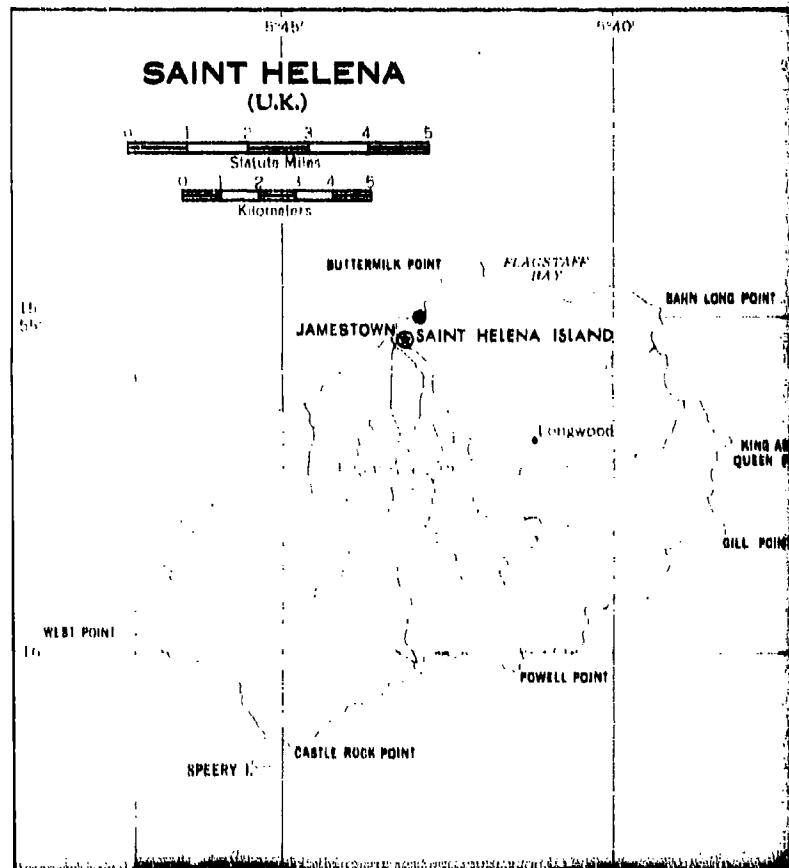
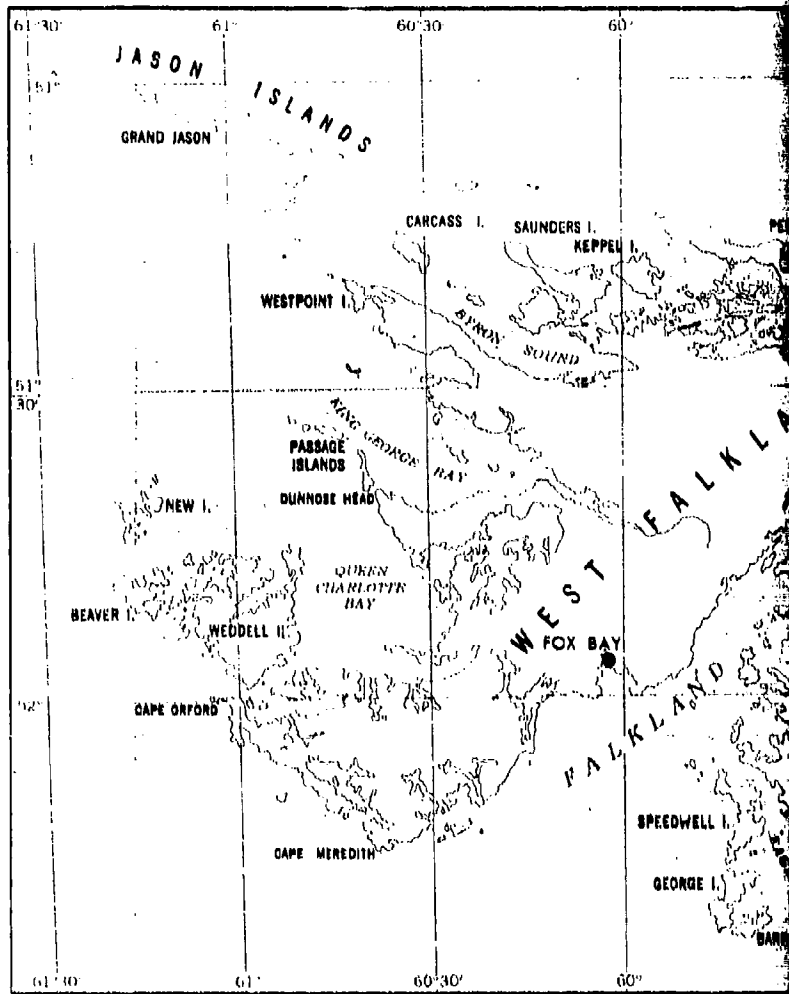
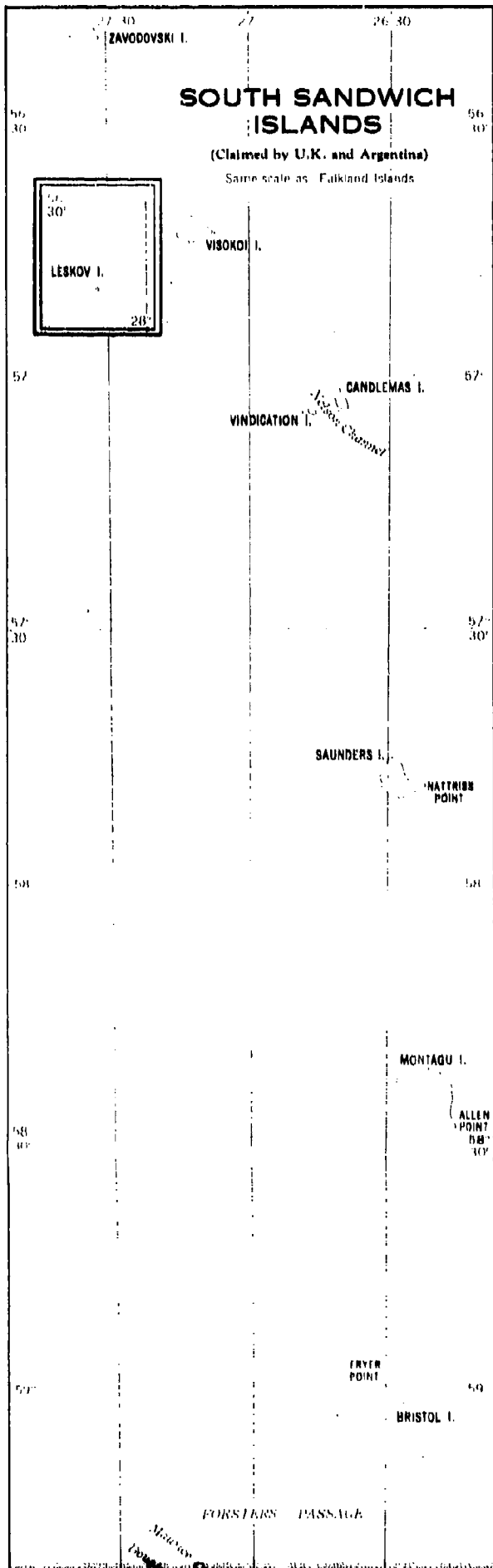
Weather observations made in this NIS Area are generally of adequate quality; however, the coverage is limited. Climatic data are available for most of the larger islands in the Area, but usually there is only one observation station on each island. Much of the tabular material was taken from climatological data published in *Sources 2, 6, and 7* and from machine tabulations made by the Data Control Division, Air Weather Service, Asheville, N.C. *Sources 6 and 7* also contain rather extensive discussions concerning the meteorology of the subpolar islands of the South Atlantic. The remainder of the sources were particularly valuable as general background material.

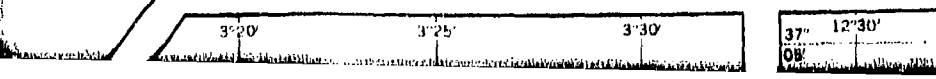
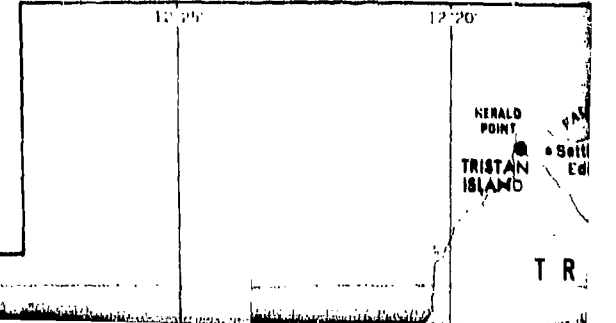
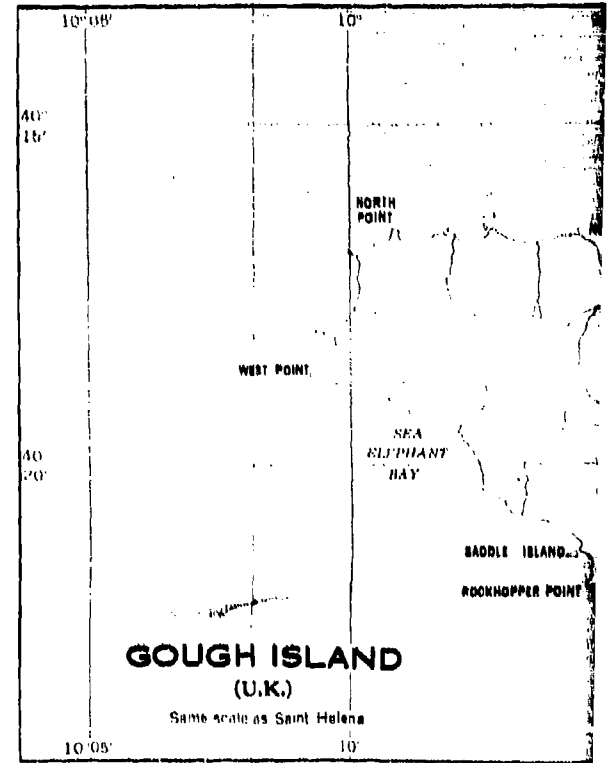
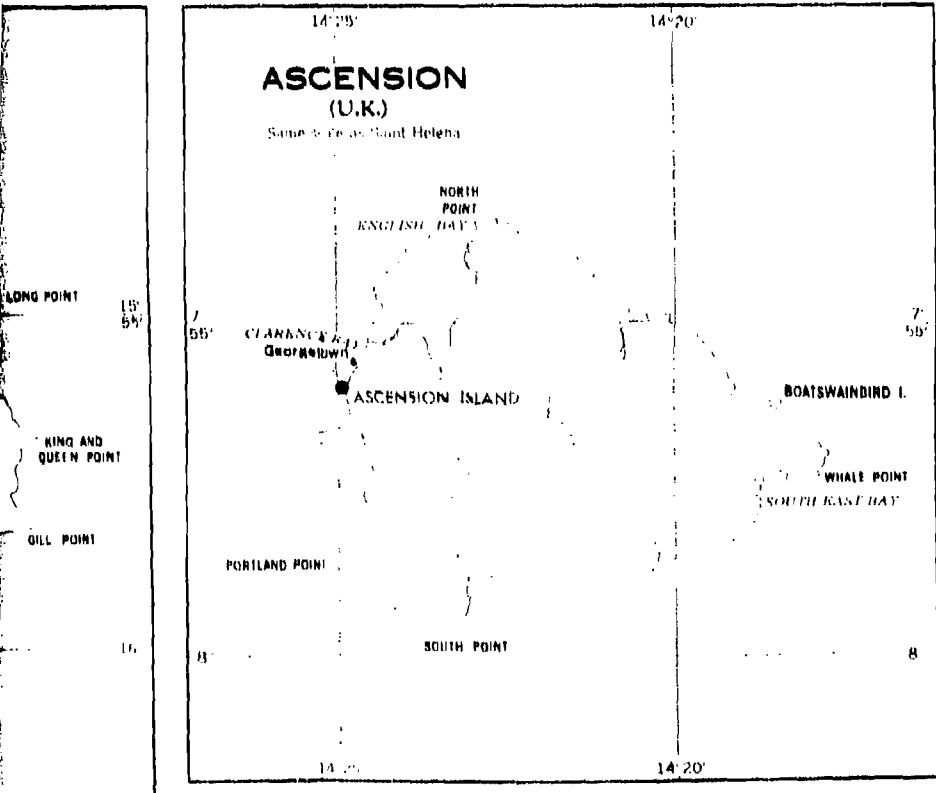
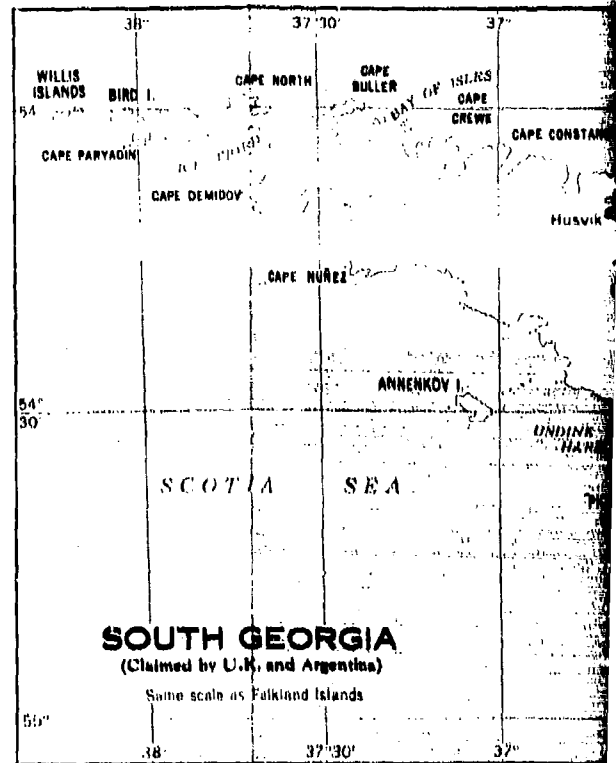
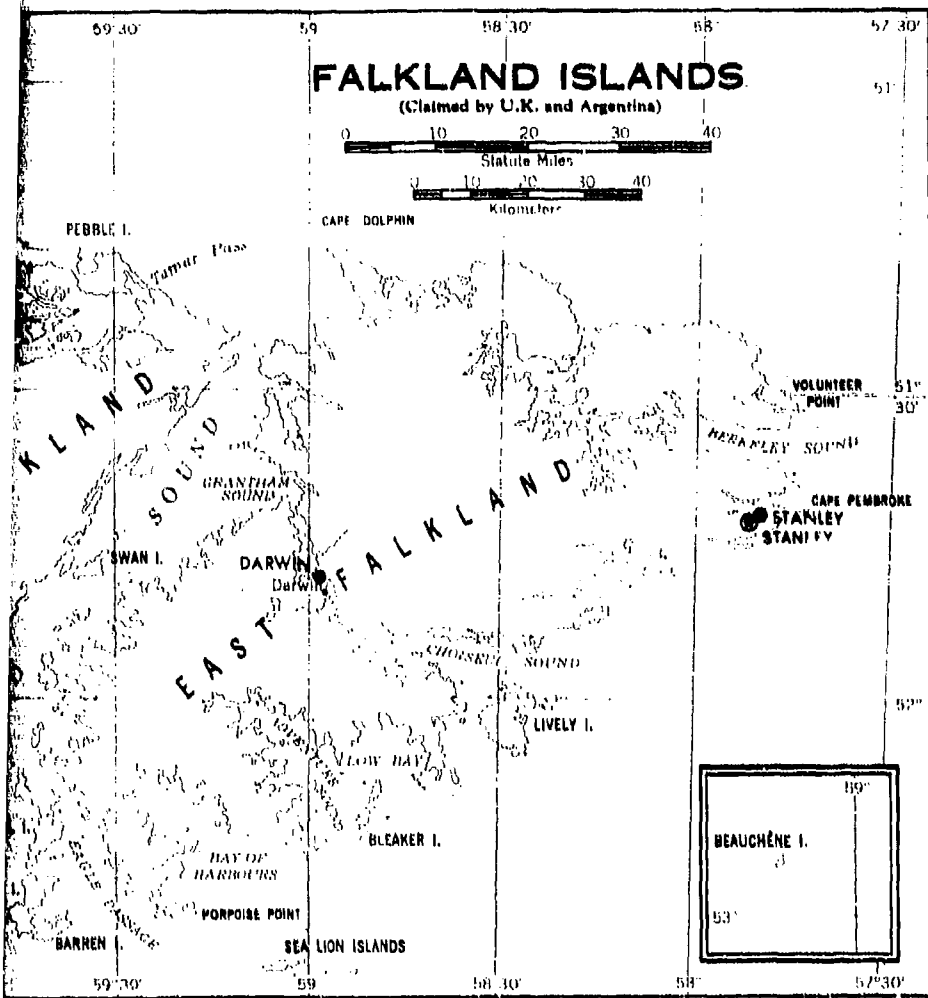
The major deficiencies encountered in preparing this Section were the lack of data pertaining to aircraft operations and the lack of sufficient upper-air data coverage.

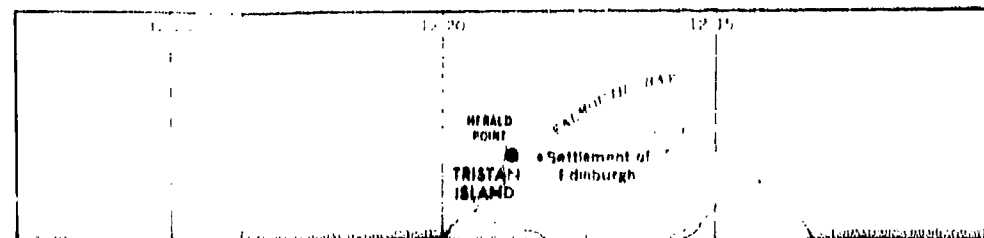
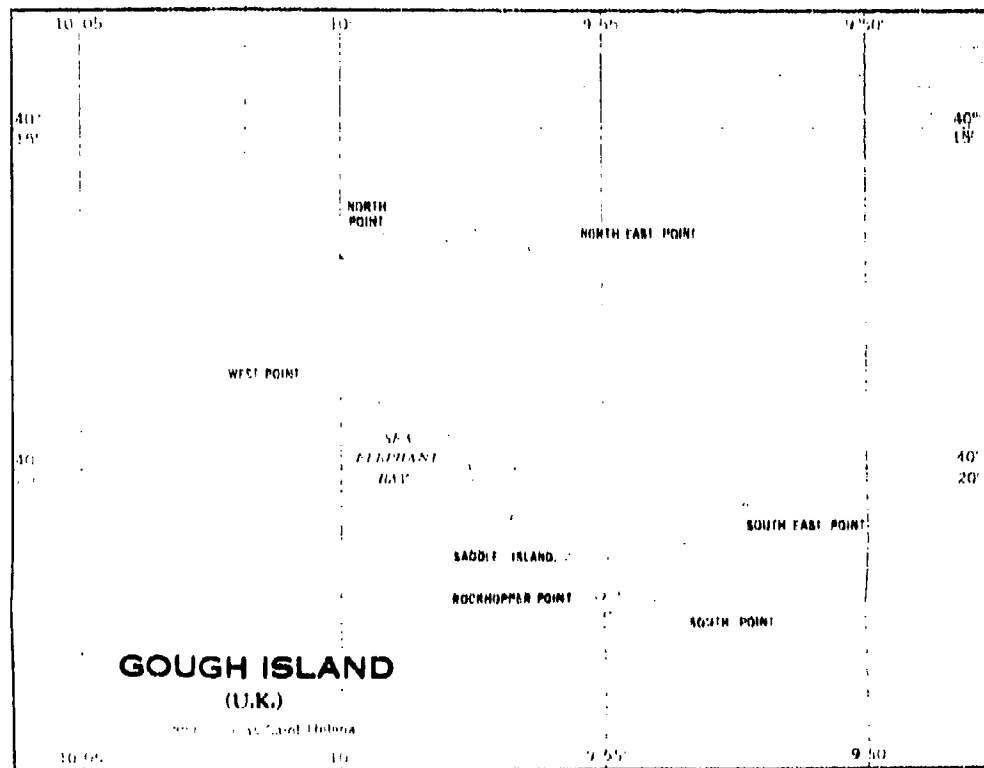
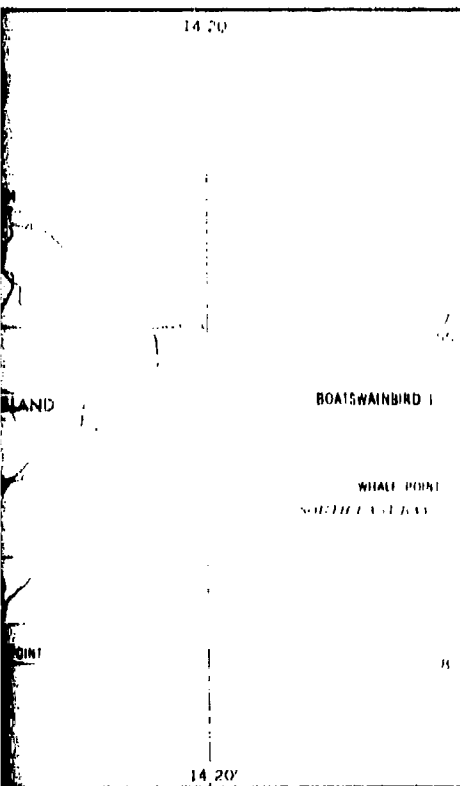
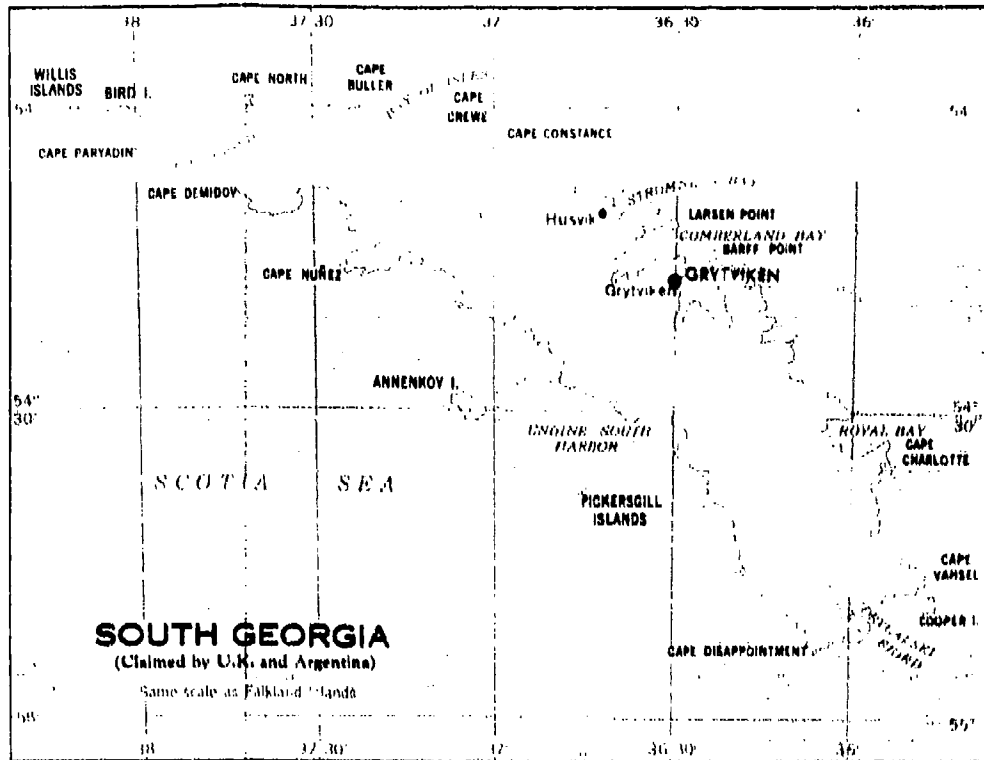
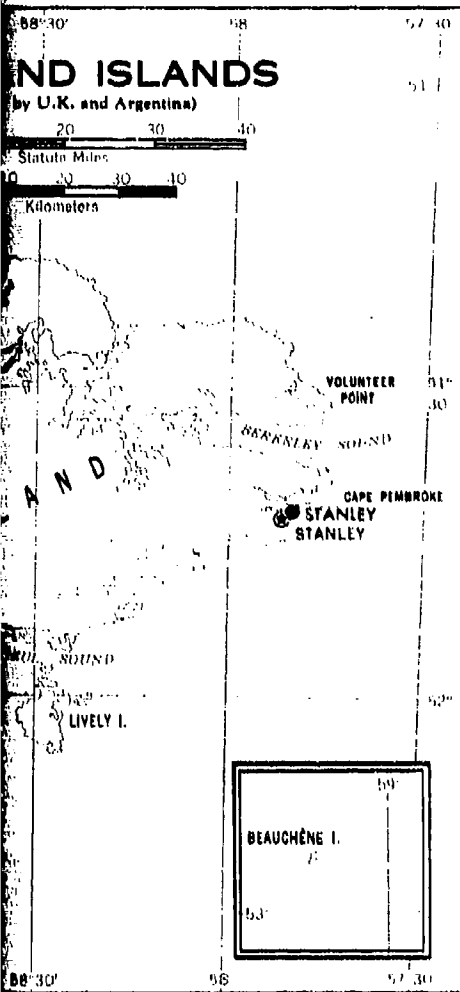
2. List of sources

1. GREAT BRITAIN, HYDROGRAPHIC OFFICE. *Africa Pilot*, Pt. II, ed. 9. London, 1939.
2. GREAT BRITAIN, METEOROLOGICAL OFFICE. *Tables of Temperature, Relative Humidity and Precipitation for the World*, Pt. II and IV. London, 1958.
3. ———. *Upper Air Data*, Pt. I. Stanley, Falkland Islands. London, 1957.
4. ———. *Upper Air Temperature Over the World*. Geophysical Memoirs No. 101. London, 1958.
5. GREAT BRITAIN, METEOROLOGICAL RESEARCH COMMITTEE. *Seasonal Charts of the Mean Height of the Tropopause*. M.R.P. No. 334. London, 1947.
6. PEPPER, J. *Meteorology of the Falkland Islands and Dependencies, 1944-1950*. London, 1954.
7. SOUTH AFRICA, WEATHER BUREAU, DEPARTMENT OF TRANSPORT. *Meteorology of the Antarctic*. Pretoria, 1957.
8. U.S., NAVY HYDROGRAPHIC OFFICE. *Oceanographic Atlas of the Polar Seas*. H.O. Pub. No. 705, Pt. I, Antarctic. Washington, 1957.
9. ———. *Sailing Directions for the Antarctic*, Ed. 1. H.O. Pub. No. 138. Washington, 1943.
10. ———. *Sailing Directions for South America*, Vol. 2, ed. 5. H.O. Pub. No. 173. Washington, 1952.
11. ———. *Sailing Directions for the Southwest Coast of Africa*, Ed. 4. H.O. Pub. No. 105. Washington, 1951.
12. U.S., OFFICE OF CHIEF OF NAVAL OPERATIONS. *Marine Climatic Atlas of the World*, Vol. 4. South Atlantic Ocean. NAVAER 50-1C-531. Washington, 1958.

UNCLASSIFIED



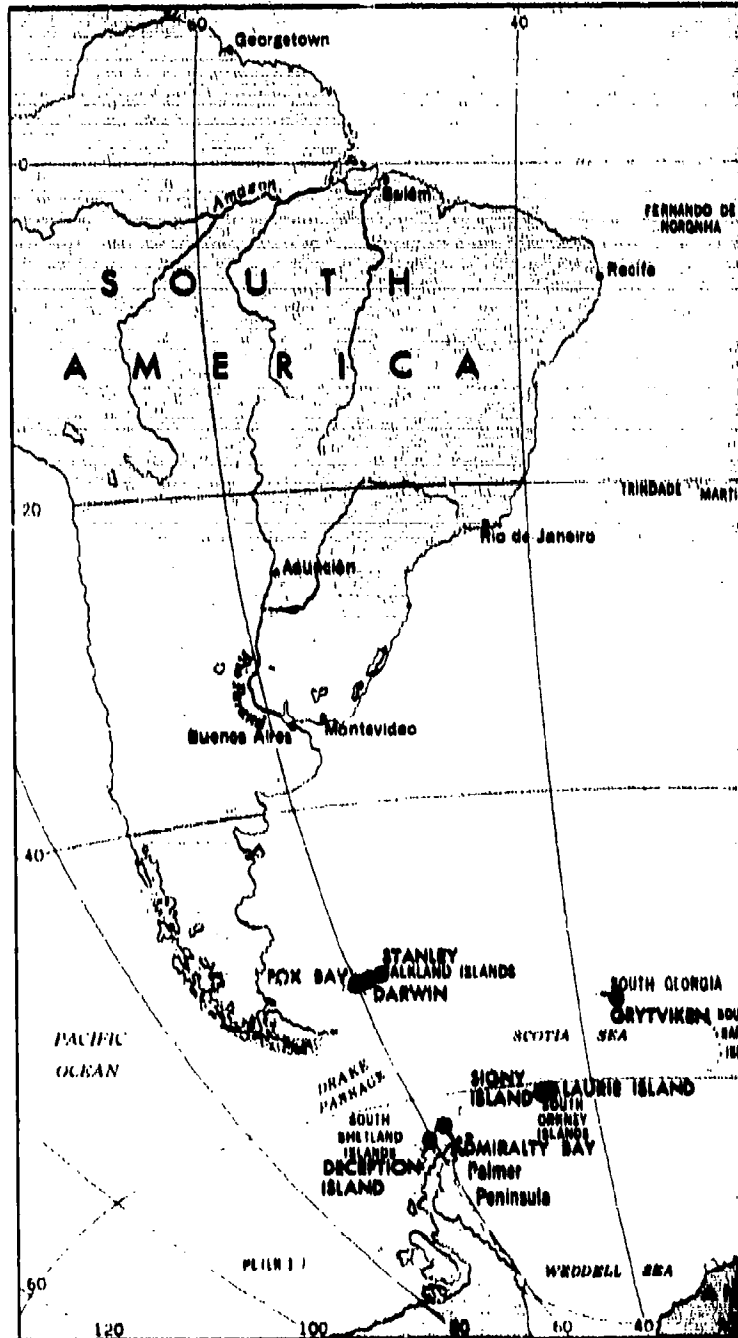
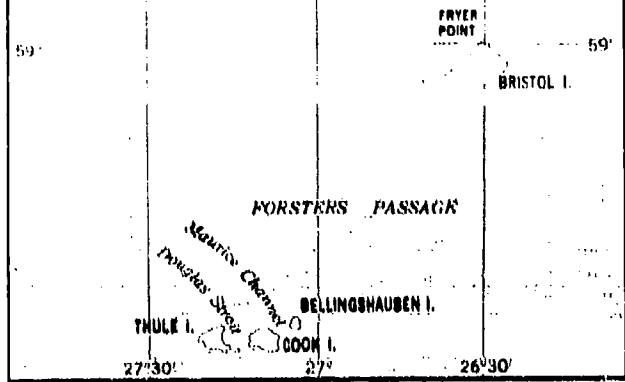




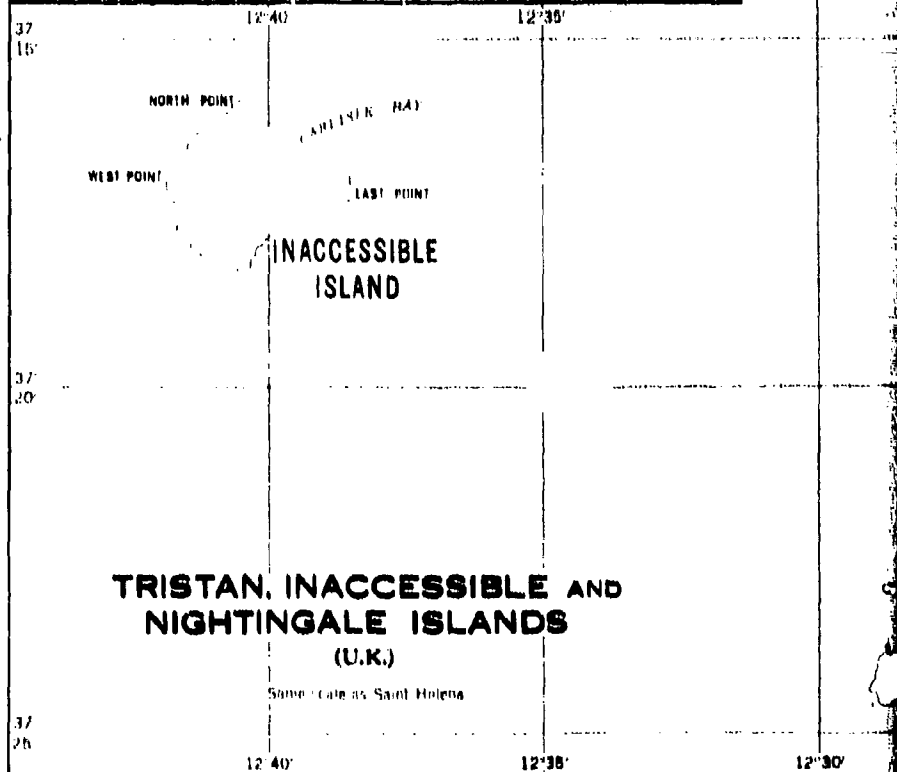
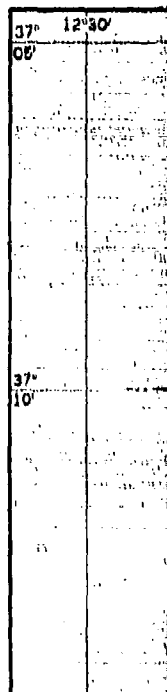
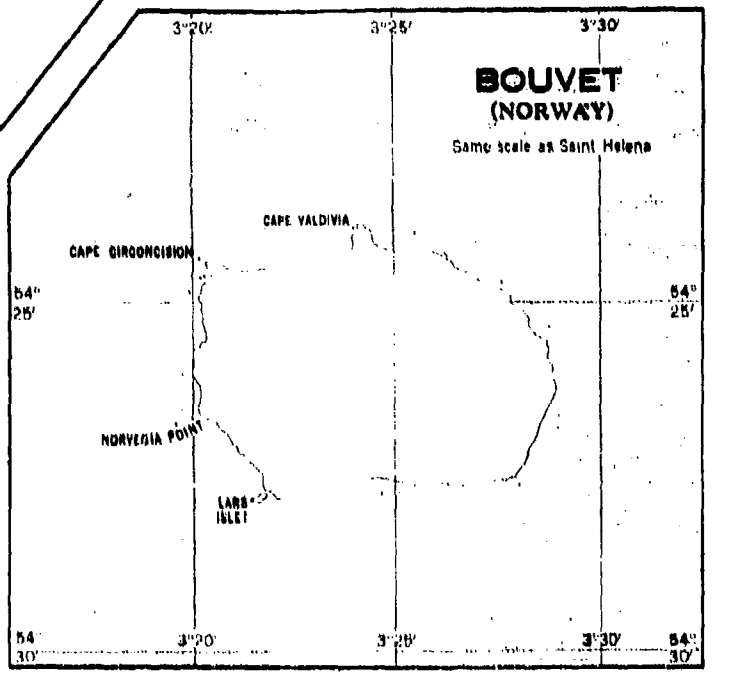
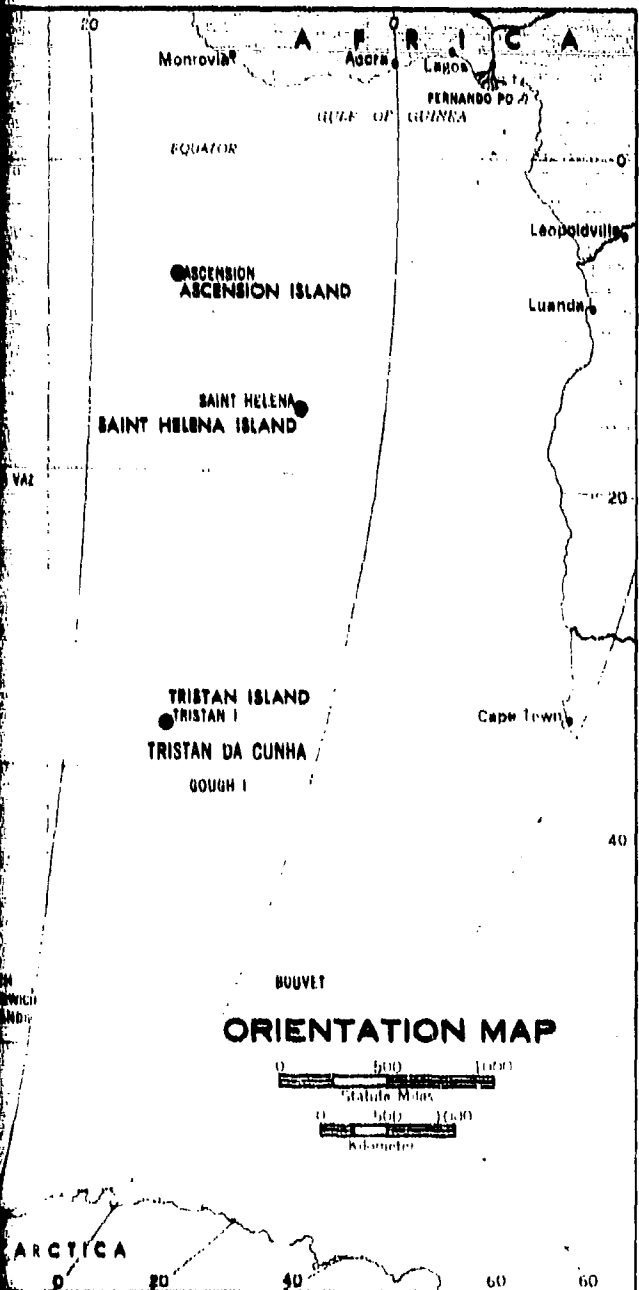
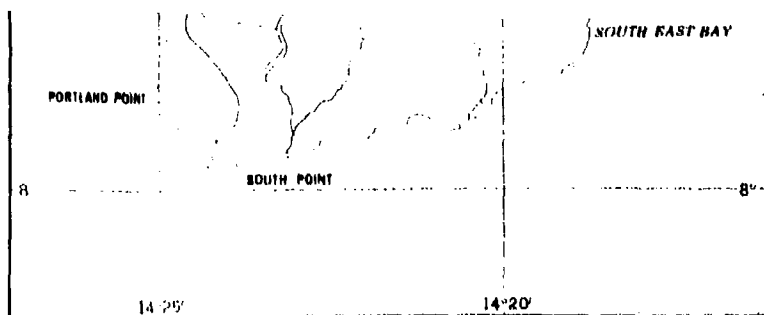
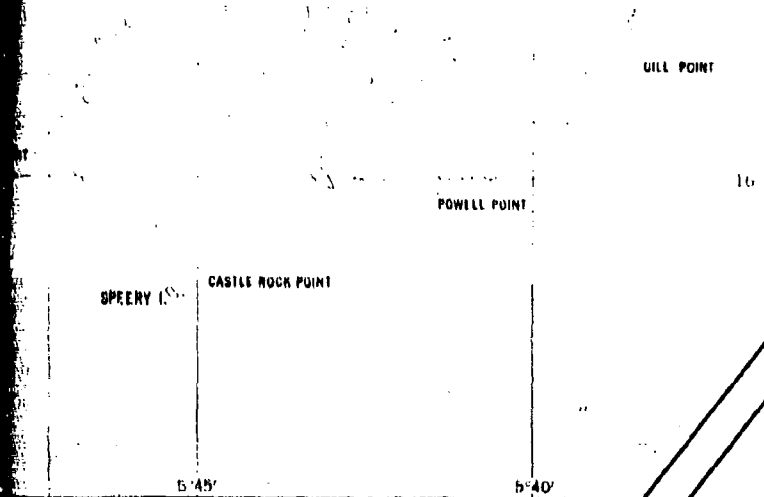
LIST OF STATIONS

ISLAND AND STATION	LATI- TITUDE*	LONGI- TITUDE*	ELEVA- TION
	" S.	" W.	feet
Ascension Island.....	7 56	14 25	55
Saint Helena Island.....	15 55	5 43	2,000
Tristan da Cunha Group:			
Tristan Island.....	37 03	12 10	75
Falkland Islands:			
Darwin.....	51 50	58 58	13
Fox Bay.....	51 57	60 03	45
Stanley.....	51 41	57 52	173
South Georgia:			
Grytviken.....	54 17	30 31	10
South Orkney Islands:**			
Laurie Island.....	60 42	41 35	30
Signy Island.....	60 43	45 36	72
South Shetland Islands:**			
Admiralty Bay.....	62 03	58 24	58
Deception Island.....	62 50	60 34	26

- * Coordinates give locations of weather stations and do not necessarily coincide with those for populated places.
- ** Near but outside NIS 64 Area.

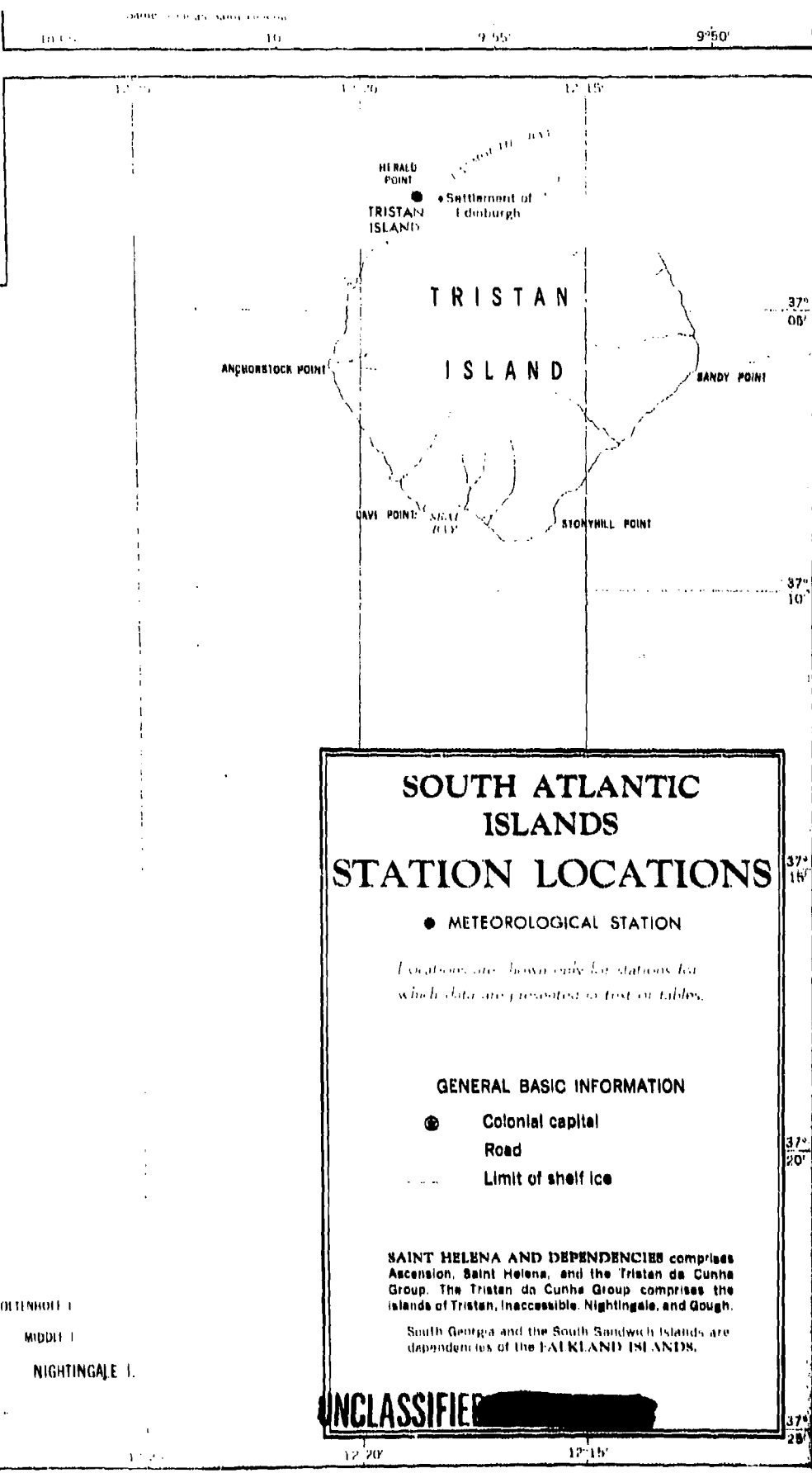
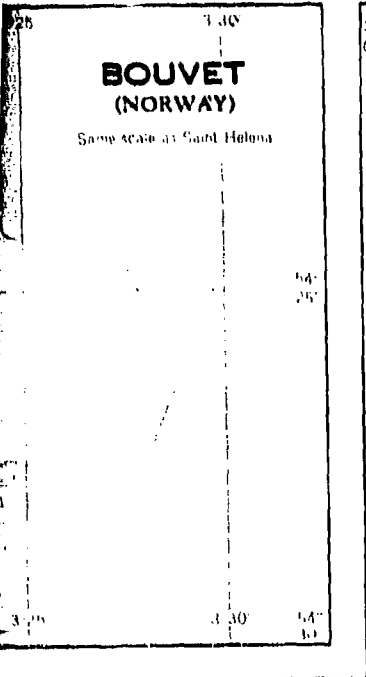
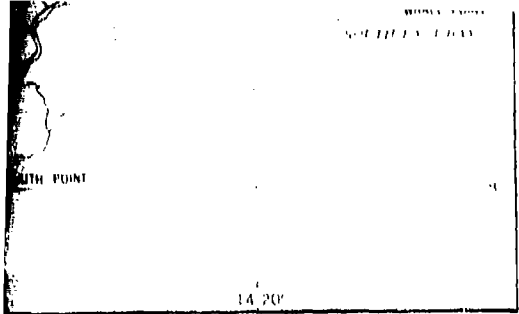


H



5

NOT RECOMMENDED TO FOREIGN NATIONALS



SOUTH ATLANTIC ISLANDS
STATION LOCATIONS

● METEOROLOGICAL STATION

Locations are shown only for stations for which data are presented in text or tables.

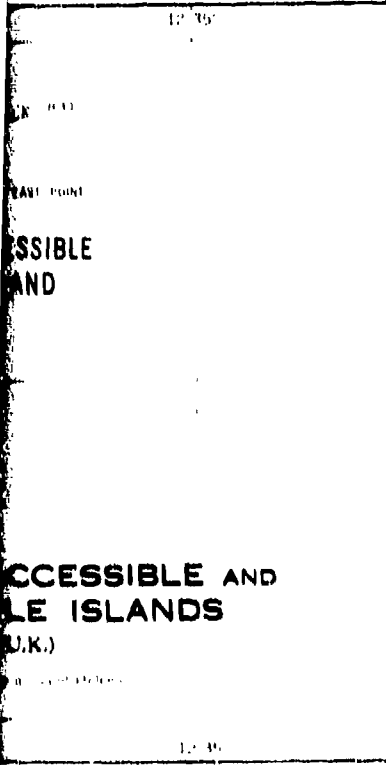
GENERAL BASIC INFORMATION

⊙ Colonial capital
— Road
--- Limit of shelf ice

SAINT HELENA AND DEPENDENCIES comprises Ascension, Saint Helena, and the Tristan da Cunha Group. The Tristan da Cunha Group comprises the islands of Tristan, Inaccessible, Nightingale, and Gough.

South Georgia and the South Sandwich Islands are dependencies of the **FALKLAND ISLANDS**.

UNCLASSIFIED



ACCESSIBLE AND INACCESSIBLE ISLANDS (U.K.)

STOUTENHOFF I.
MIDDLE I.
NIGHTINGALE I.

This publication, issued separately for flexibility in production and use, is one of the integral components in the National Intelligence Survey of comprehensive basic intelligence on this NIS Area.

The standard NIS is divided into the following nine Chapters: I Brief; II Military Geography; III Transportation and Telecommunications; IV Sociological; V Political; VI Economic; VII Scientific; VIII Armed Forces; IX Map and Chart Appraisal.

When appropriate, Chapter discussion is amplified by more detailed treatment in one or more of the following Supplements: I Ports and Naval Facilities; II Coasts and Landing Beaches; III Telecommunications; IV Urban Areas; V Petroleum; VI Communism.

The Section, covering a major subtopic, is the NIS basic unit of production and subsequent maintenance. Each Section is individually classified, indicates the Intelligence Agency primarily responsible for the preparation of the Section, and carries the date on which the responsible Agency approved the material for NIS publication. Sections may be combined and issued as a consolidated element, and may be supplemented by Annexes on special subareas.

The standard NIS includes a Gazetteer of geographic names approved by the United States Board on Geographic Names (issued as a separate volume), and a consolidated biographical reference work, Key Personalities.

World sea areas, in terms of major ocean basins, are treated in the NIS on Marine Climate and Oceanography; each ocean basin subdivision is treated in a Part, consisting of three sections, which is the unit of production and is analogous to a standard NIS Chapter. The NIS program also includes separate publications on special subjects, e.g., International Communism, which are issued as appropriate.

NIS Areas which have been segmented or combined to reflect fundamental political developments are designated by capital letter suffixes. Certain large NIS units are issued in parts, which are identified by Roman numeral suffixes.

Sections are to be bound or filed in topical sequence rather than according to the sequence of dissemination. NIS maintenance units supersede previously dated editions on the same topics. The basic inter-relationships between the topical components which make each NIS an integrated and comprehensive survey are summarized in the NIS Correlation Guide.

The nature and scope of the NIS program, the allocation of NIS production responsibilities, the delineation of NIS Areas, and the outline guides for topical units are set forth in the NIS Standard Instructions. A convenient summary of the NIS Standard Instructions, designed particularly for NIS users, is available in the NIS Reference Guide which may be requested through official channels.

The NIS is published and disseminated by the Central Intelligence Agency. Components of the Departments of State, Army, Navy, and Air Force should request additional copies from the Intelligence Agencies of these Departments. Other government agencies desiring published units of the NIS should make supported request for them through official channels to the Central Intelligence Agency.



Declassification Instructions For This National Intelligence Survey Volume

Country: **South Atlantic Islands**

Report Title: **Weather and Climate**

NIS Series Number: **64**

Publication Date: **01-May-60**

Chapter Number: **2**

Total Pages: **50**

Section Number: **23**

**THIS VOLUME IN ITS ENTIRETY HAS BEEN
DECLASSIFIED AND APPROVED FOR RELEASE
TO THE PUBLIC**

----- DECLASSIFIED -----

Reviewed by CIA Under E.O. 12958 Sec. 3.4
Date: 08-Aug-98 CIA DOC ID: NIS 273 - 1
APPROVED FOR RELEASE