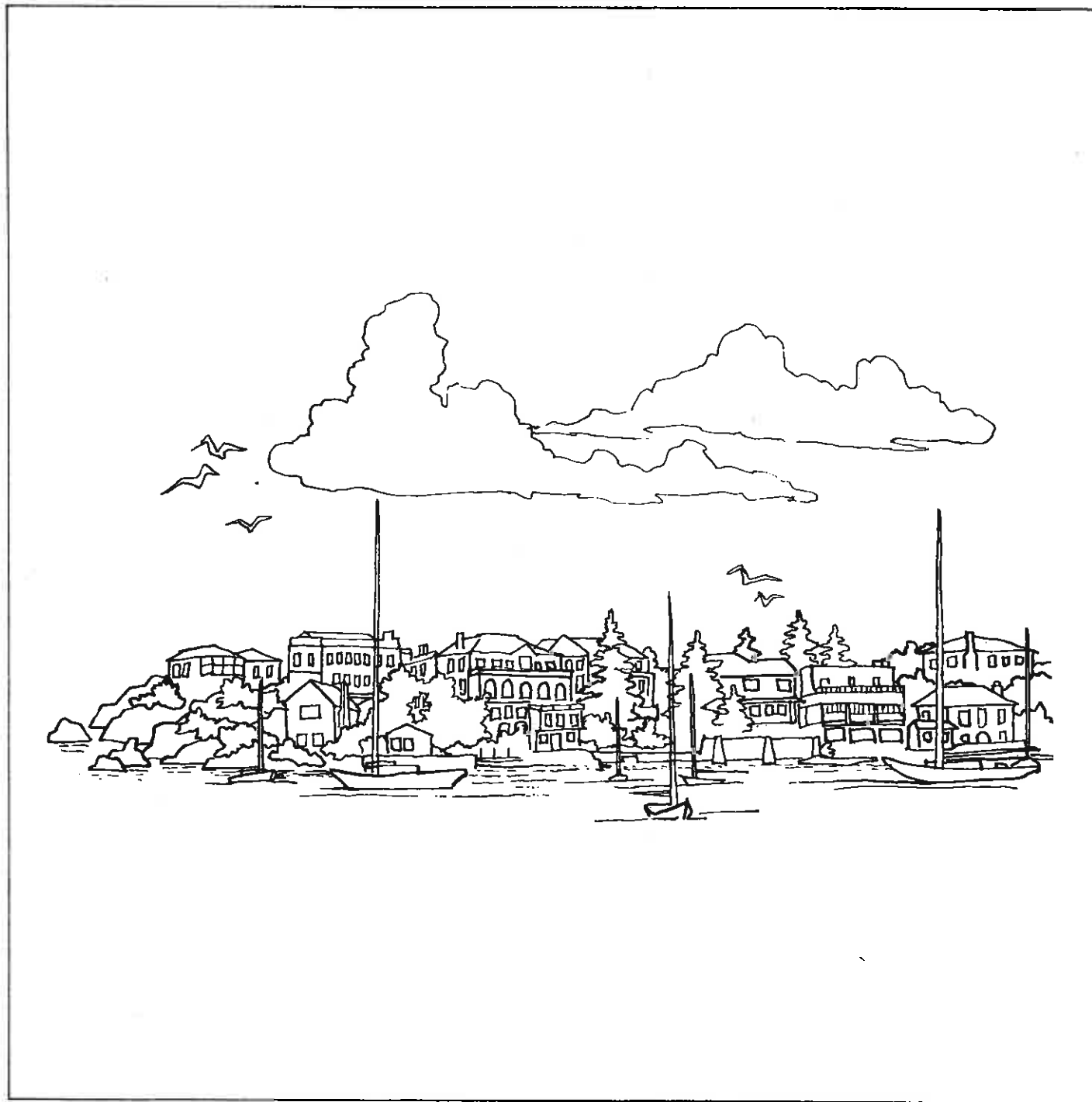


The Bermuda Story



**Field Engineering
Corporation**

THE BERMUDA STORY

Some useful facts and figures for personnel
proceeding to the Spaceflight Tracking and
Data Networks station at Bermuda.

prepared by

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Revised May 1973

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Cooper's Island

THE BERMUDA STORY

I. THE STATION

A. Primary Mission and Brief History of Station

The mission support requirements of the Bermuda Spaceflight Tracking and Data Networks (STDN) station are five-fold and include:

1. Support of NASA manned space flights (Apollo and Skylab).
2. Support of the lunar Particles and Fields Subsatellite (P&FS) and the ALSEP experimental packages left on the moon by Apollo astronauts.
3. Support of NASA and DOD launches from Cape Kennedy.
4. Support of NASA launches from Wallops Island, Virginia.
5. Support of miscellaneous satellites in earth orbit.

This station is one in a worldwide network of approximately 20 NASA tracking stations. The main objective of the station is the gathering of tracking and scientific data from all NASA spacecraft, satellites, and planetary probes.

Personnel presently assigned to the station number approximately 145 people; slightly more than half are employed in technical capacities, whereas the remainder provide the necessary support functions required at a self-contained tracking station of this size. Bendix draws upon local sources of manpower to supplement the employees relocated from the United States.

The unique geographical location of the Bermuda station enables it to supply tracking data for launches both from Cape Kennedy and from Wallops Island, Virginia, during the critical portions of powered flight. This was an important consideration in the original selection of this site for Project Mercury. It continues to be an important consideration today.

The tracking station in Bermuda was originally provided as one of the 18 worldwide Manned Space Flight Network tracking stations to support Project Mercury. Construction and installation of the station began in early 1960. Following the installation, checkout, and testing phases, the station became



Original Project Mercury "T&C" Building

officially operational for the launching of the Mercury Atlas 4 mission in September 1961. The station continued to support Project Mercury through the manned orbital Mercury missions in 1962, ending with the 1-day orbital flight of Astronaut Cooper in May 1963.

As Project Mercury drew to a successful conclusion, the station began preparations for Project Gemini. All of the highly successful Gemini program flights were supported by the Bermuda station. And in 1965, preparations began in earnest for the support of Project Apollo. A 30-foot, unified S-band tracking system, a more sophisticated C-band tracker, and increased computer capability were added at this time. The station has since participated in all of the Apollo flights.

Although primarily a Manned Space Flight Network support station, it is frequently called upon to support unmanned scientific launches conducted by NASA, as well as orbital and translunar/transplanetary coast support for scientific spacecraft.

Early in 1962, the station was called upon to support reentry experiments being launched aboard Scout vehicles from NASA's Wallops Island station. Bermuda serves as a down-range instrumentation facility to record telemetry data, to provide tracking data, and to coordinate communications with ships and aircraft operating in the down-range recovery area. In conjunction with the reentry experiments, meteorological rockets have been launched

from Cooper's Island to obtain air-density and temperature data at altitudes up to approximately 60 nautical miles. The Bermuda station also provides range safety support for Scout vehicles launched from Wallops Island. This type of support continues today and provides the station with the same challenges as were encountered in 1962.

B. Brief Description of Site Layout

The Bermuda tracking station is located on the U.S. Naval Air Station at Cooper's Island on the southeastern-most tip of Bermuda. Although known as Cooper's Island, it is actually a peninsula extending from the parish of St. George.

The land for the U.S. Naval Air Station was leased by the U.S. Government from the U.K. Government in 1941. As a result of being on a Naval Air Station, access to and from the tracking station is through the air station security gates.

The land on which the tracking station lies has been consigned from the U.S. Navy to the NASA.

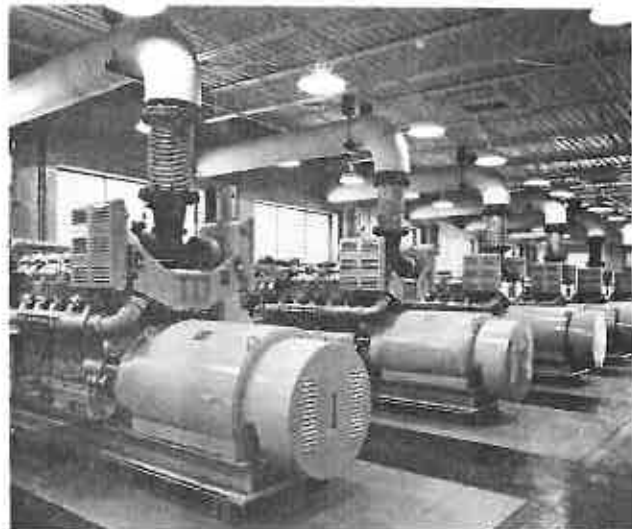
The tracking station consists of five main buildings, including the administration building which houses the unified S-band system equipment, the T&C building which houses all the telemetry, computer, command, and communications equipment as well as the station logistics (spare parts) inventory, the radar building which houses the FPQ-6 and FPS-16 radars and the VHF acquisition systems, the station powerplant building, and the station facilities workshop building. Each of these buildings has its own self-contained air-conditioning and humidity control units. Also the station generates and distributes all of its own 60-Hertz power for utilities and electronic equipment.



Administration Building and the Unified S-Band Antenna



FPS-16 & FPQ-6 Acquisition Aid Antennas



The Station's Power Plant

C. Major Operational Systems

The important role played by the Bermuda station in tracking and data acquisition is made possible by the sophisticated instrumentation installed by the NASA at the Cooper's Island complex. This instrumentation includes: a unified S-band system with a 30-foot parabolic antenna; an FPQ-6, C-band radar system with a 30-foot parabolic antenna; an FPS-16, C-band radar system with a 12-foot parabolic antenna; a VHF/USB, 30-foot parabolic telemetry tracking antenna; three VHF acquisition aid tracking systems; a flexible, general purpose telemetry, PCM, and computer system for telemetry and command use; computing systems for designation, tracking analysis, and impact prediction; a UHF command system; a complex VHF/UHF voice communications system; and a ground communications system including teletype, high-speed data, and telephone equipment.

Other subsystems include a command destruct system that finds real-time use on many of the launches from Cape Kennedy, extremely accurate timing systems, an ASTAM station testing and monitoring system, and a precision measuring equipment laboratory which maintains and calibrates sophisticated test equipment.

The extremely corrosive environment at the Bermuda station has provided at least one useful application. In the spring of 1969, a Corrosion Evaluation

Test Area (Project CETA) was established at the station by GSFC. The corrosive effects of salt-laden air and high humidity are measured and evaluated on various types of metals and finishes subjected to long-term exposure. The Project CETA area presently contains approximately 1,000 samples.

D. Station Management Policies

The normal working hours at the station are from 8 a. m. to 4:45 p. m. , with 45 minutes for lunch. However, due to the many activities supported, actual working hours tend to be erratic. It is not unusual to work two or three different shifts in one week. However, attempts are made to maintain the normal daytime shift whenever possible.

The Bermuda station is on a compensatory time-off policy for all overtime hours worked. No pay is received for overtime hours worked; instead, all overtime hours are credited to the employee's compensatory time account. Employees receive an hour off for each overtime hour worked. Compensatory time may be accrued to a total not to exceed 160 hours; and, in addition, all compensatory time hours must be taken within 6 months of the date earned. The scheduling of compensatory time off is at the discretion of the employee; however, the M&O supervisor must approve all compensatory time off so as not to compromise the station's operational support requirements.

There is no station cafeteria. However, station employees are allowed to eat meals at any of the three military clubs on the naval station.

E. Miscellaneous Information

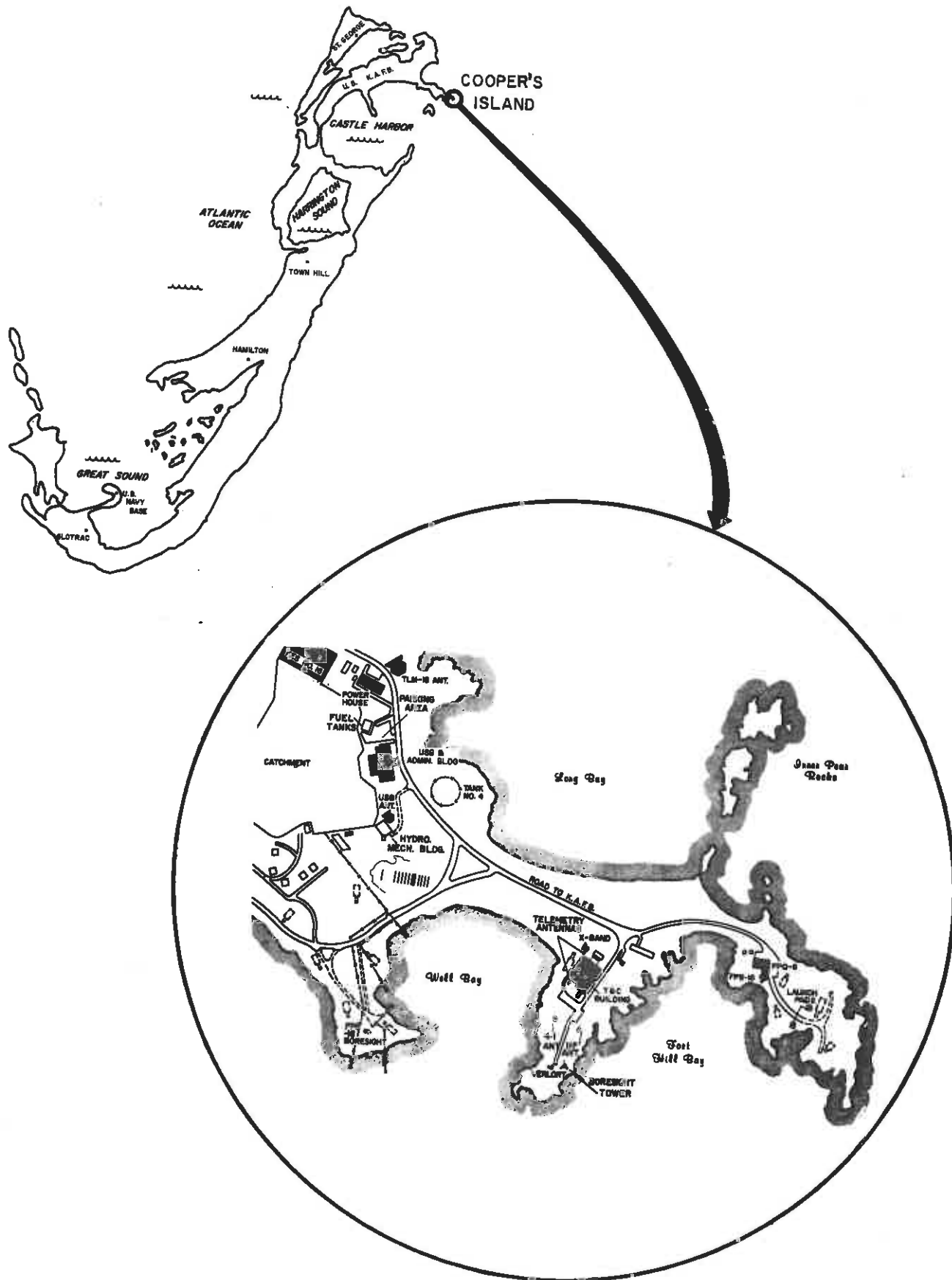
Bendix employees, including those retired from the U.S. military, do not have purchasing privileges at the U.S. base commissary, BX, and Class VI outlets in Bermuda. This is the result of an agreement between the U.S. and U.K. Governments.

II. BACKGROUND INFORMATION ON STATION LOCALE

A. Geographic Description

1. Location and Size

Bermuda is an archipelago located 760 statute miles southeast of New York City and 660 statute miles due east and on the same latitude as



Bermuda

Cape Hatteras, North Carolina. Many consider Bermuda as part of the West Indies, but this is far from true, as it lies 700 miles north of the most northerly Caribbean Islands. The exact location of Bermuda is 32 degrees, 19 minutes north latitude and 64 degrees, 49 minutes west longitude. The archipelago consists of seven islands and some 150 islets; however, since the islands are close together and joined by bridges, they are collectively termed the "Island" of Bermuda. The total land area of Bermuda is about 21 square miles, 23 miles in length and, on the average, less than a mile in width. The island is divided into nine districts called parishes.

2. Terrain and Topography

The terrain is very hilly, but there are no mountains as such. Also, no rivers, streams, lakes, or other fresh water formations exist on the island. The north shore of the island is characterized by wind-carved cliffs, while the south shore is abundant with long beaches and small coves.

Bermuda is actually the top of an extinct volcano which rises some 15,000 feet from the bed of the Atlantic Ocean. Deep waters encompass it on all sides; the long-dead crater has become a circle of coral reefs sheltering the shallow waters around the beaches of Bermuda. Coral formations, irregular in shape and size, surround the island, outcrop on the beaches, and control the contour of the surface on the mainland. A level plot of ground is rare in the islands. While touring the islands,



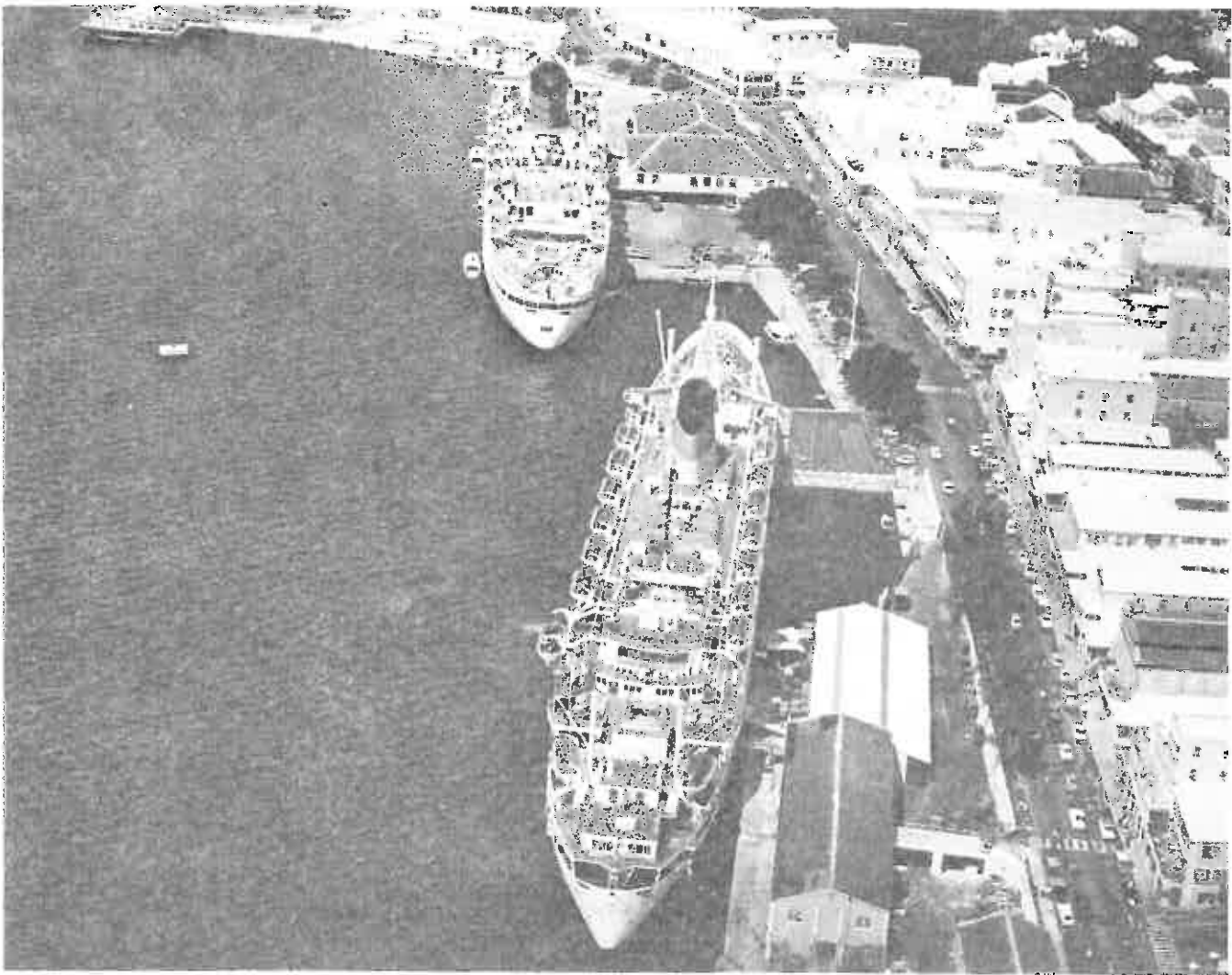
The Highest Spot in Bermuda, Gibbs Hill



The Pink Sandy Beach of Horseshoe Bay

one is continually encountering hills and turns. Foundations for roadways and homes are cut out of solid coral and volcanic rock.

Most of the land area of Bermuda is covered with verdant subtropical plants and shrubs, an abundance of colorful flowers throughout the year, and a variety of impressive trees and bushes, including palms, pines, mangroves, poincianas, and oleanders. It is estimated that over 1,500 varieties of flowers, bushes, and trees from all parts of the world bloom at one time or another during the year. The famous Bermuda cedar trees, which for centuries dominated the landscape and were the colony's pride, were afflicted by a blight in the early 1940's; and by 1944, more than 90 percent of them were dead. The Bermuda Government has been carrying out a long-range program of removal and reforestation.



Hamilton, Bermuda's Capital City

3. Climate

Bermuda's comfortable climate is considered by Bermudians as one of the most pleasant in the world. Though far north of the tropical latitudes, Bermuda has a mild, frost-free, but extremely humid climate with an annual mean temperature of 70.7 degrees. The seasonal range of temperature is as follows: spring, 62 to 71 degrees; summer, 74 to 88 degrees; autumn, 70 to 75 degrees; and winter, 50 to 64 degrees.

The Gulf Stream is mainly responsible for Bermuda's weather being better than other countries at 32 degrees north latitude. The broad belt of warm water flowing between Bermuda and the North American mainland is a barrier to the extreme cold of winter, and the midocean location prevents excessive heat in summer. However, it should be noted that although it never reaches freezing temperatures in Bermuda, due to the high humidity and resultant dampness, the winters are uncomfortable. The high humidity, frequent rains, and high winds, along with 50 to 55 degree temperatures, result in a very low comfort index. The months of January to May are "bad" months, and blankets and heating in the homes are absolutely essential during this period. Electric blankets and home heaters to combat the dampness are used by almost all station personnel.

The late spring weather is unpredictable but pleasant; whereas the summer weather, from June through September, is usually perfect. The late autumn weather is again unpredictable, but in the main, very pleasant.

Rainfall is distributed evenly throughout the year, the heaviest rains occurring from January through mid-April. During this time, a raincoat or other suitable apparel should be within reach when going out of doors. The average yearly rainfall is 58.13 inches; the average relative humidity is 80.4 percent.

September is the stormy season when hurricanes which originate in the Caribbean work their way north. However, it is very unusual for a hurricane to actually strike Bermuda; and usually there is little or no damage done when one strikes the colony.



A Gleaming White Roof to Catch Rainwater, in a Typical Bermuda Scene

Incidentally, Bermuda is a tourist resort that really looks forward to rain since it depends on rainfall for its water supply. The roofs of Bermuda houses are designed to catch and funnel the rain into storage tanks or cisterns. This supply must serve all household needs during dry periods. Conservation of water must always be foremost in the mind of the housewife; purchased water is expensive (e. g. \$15 per 1,000 gallons).

B. History of Area

Bermuda was discovered in 1503 by a Spanish mariner, Juan de Bermudez; but due to treacherous surrounding reefs, no attempt was made to settle. In 1609, some 150 British colonists sailing for Virginia under the command of Admiral Sir George Somers became separated from the rest of their fleet during a storm and ran aground on Bermuda's reefs. The flagship of this supply fleet was the Sea Venture. Two small pinnaces, the Deliverance and the Patience were built from the wreckage of the Sea Venture and from native Bermuda cedar. These two vessels departed for Virginia and arrived in Jamestown on May 23, 1610, with supplies for the needy settlers of Virginia. Admiral Somers returned to Bermuda to collect food, but died in Bermuda shortly after arrival. The crew's description of the previously uninhabited Bermuda, or "Somers' Island" as it also became known, aroused great interest in England. In 1612, the King granted the Virginia Company an extension of its charter to include the islands. Later that year some 60 colonists settled on the eastern-most island and founded the town of St. George, the

oldest English-speaking continuous settlement in the Western Hemisphere. This was 8 years before the Pilgrims landed on Plymouth Rock. In 1614, the Bermuda Company (British) was also granted a charter to colonize Bermuda. The islands have remained under continuous British rule since 1612. Hamilton was founded in 1790 to provide a centrally located port. In 1815, the seat of government was moved from St. George to Hamilton. Until 1900, the colony remained an outpost of the 17th century British civilization.

In the early 1900's, it became a popular attraction of wealthy American, British, and Canadian tourists. The protective tariff act enacted by the U.S. in 1930 cut off Bermuda's once thriving agricultural export trade and spurred the colony to develop its tourist industry, which has since become its principal economic asset.

The population of Bermuda (1970 census) is 67,000. This includes approximately 57,000 Bermudians and 10,000 other residents. Approximately 38,000 are black and 19,000 are white. The blacks are mainly of African descent. The first black people were brought to Bermuda from the West Indies as servants, laborers, and slaves around 1616. The white people are mainly of British descent. There is also a small minority of Portugese from the Azores, and their descendants. Bermudians in general enjoy a reputation for being pleasant, friendly, and hospitable people.

In addition to the above, there are approximately 3,000 American personnel and their dependents assigned to the United States base. About 13,500 other Americans registered with the United States Consulate General reside on the



Tourists Exploring King's Square by Cycle

island all or part of each year. Bermuda's cosmopolitan atmosphere is enhanced by the hundreds of Germans, Austrians, Swiss, French, and Italians employed in the colony's hotels and guest houses.

C. Present Form of Government

Bermuda has had representative government since 1620, and its Parliament is the oldest in the Commonwealth outside the British Isles. It is a self-governing British colony and is autonomous in its internal affairs. Under a new constitution, effective June 8, 1968, the Governor, appointed by the Queen, is responsible for external affairs, defense, internal security, and the police. All other executive functions of government rest with the Government Leader (equivalent to Prime Minister) and on 12 named members of the Executive Council, who are also members of the House of Assembly as elected representatives of the majority party in that House. There are four other appointive officials in the executive branch--the Chief Secretary, the Attorney General, the Financial Secretary, and the Secretary to the Executive Council. The Legislative Branch consists of a Legislative Council (the upper house) composed of 11 members, five appointed at the discretion of the Governor, four by the Government Leader, and two by the Opposition Leader, and a House of Assembly with 40 members. Bermuda is divided into 20 electoral districts, from each of which there are two members elected to the house. The Judiciary is composed of a Chief and a Puisne Judge appointed by the Governor.

There is a two-party system in Bermuda. In the June 7, 1972, general election, the incumbent United Bermuda Party (UBP) had 30 members elected to the House of Assembly while the opposition Progressive Labour Party (PLP) had 10 members elected.

D. Local Industries

Most Bermudians owe their livelihood, directly or indirectly, to the tourist industry. This has continued to boom over the past 12 years. Tourism has grown at a rate of 12 percent per year over the past 3 years, in the face of the mild recession in the United States, to over 400,000 visitors including cruise ship passengers. In 1971, the tourists, 81 percent of whom were Americans, contributed an estimated \$65 million to the economy. Another



Front Street Shopping Center in Bermuda's Capital City

source of jobs and foreign exchange earnings is the local expenditure of the United States military base, which has been contributing roughly \$10 million per year through contracts to local firms, salaries to local employees, rental payments for nearly a thousand off-base housing units, and other expenditures.

Another source of income is the continually growing number of exempted companies who have set up headquarters in Bermuda (over 2,000 presently). The exempted companies are offshore corporations and partnerships which are exempted from the stringent laws of Bermudian ownership. These companies engage in many types of business, particularly shipping and insurance, and there are a growing number of investment companies.

Bermuda has no heavy and only a few light manufacturing industries. Fishing and agriculture produce only a small fraction of Bermuda's needs.

III. LIVING ACCOMMODATIONS AND COMMODITIES

A. Housing

1. Temporary

The availability of temporary housing is good. Many landlords and rental agencies have apartments and homes designed for the tourist trade, and

short-term rentals are nearly always available at tourist prices. It is usually necessary to move into a local hotel, cottage, or guest house for a temporary period until suitable permanent accommodations are found. The average prices that the new arrival should expect to pay for temporary quarters are as follows:

Single employee	\$15 to \$30/day (no meals)
Employee plus family	\$35 to \$70/day (no meals) (depending on family size)

2. Permanent

The cost of renting houses or apartments in Bermuda is extremely high. The following is a typical range of monthly rentals (furnished or unfurnished) as of May 1972:

One bedroom	\$175 to \$250
Two bedroom	\$250 to \$400
Three bedroom	\$300 to \$650
Four bedroom	\$400 to \$1000

There is an extreme scarcity of all permanent housing. The only possible exceptions to this are homes that rent for more than \$500 per month. Upon initial assignment, the employee should be prepared to pay the higher rent for possibly a number of months until cheaper accommodations can be found. There is very little price difference between a well-furnished house or apartment and an unfurnished house or apartment. Whereas, one can expect to pay a high price for living quarters, one cannot generally expect equivalent U.S. standards except in rare cases. Most of the houses available for rental at reasonable rates are older homes, i. e., in the 30- to 50-year age bracket. While many accommodations are advertised as furnished, the furnishings are generally not very new or even up to date.

Houses for rent are usually found through real estate agents or from advertisements in the daily paper. Most homes are leased through agents for 1, 2, or 3 years or on a 30-day basis, i. e.; either party can terminate the agreement in 30 days. These agreements usually state that the tenant is responsible for the inside of the house; the landlord is responsible for the outside of the house.

Because of the scarcity of permanent housing and the difficulty in obtaining housing at a reasonable rent (it takes 1 to 2 months for most station personnel to find permanent quarters and get settled), it is suggested that married employees with families initially come to Bermuda without their families. The employee can survey the housing situation, perhaps get some leads on rental possibilities, and then determine when his family should come to Bermuda.

B. Utilities

The homes in Bermuda have no central heating. When temperatures drop to the chilly 50's, heat must be provided by a fireplace (price of wood is exorbitant), gas heaters, or electric heaters. Heating by electricity is very expensive. However, the cost of utilities in Bermuda is not grossly out of line with U.S. costs. A list of average utility costs is as follows:

Telephone - \$9.35/month (70 calls allowed with rental, each additional call is 6 ¢)

Electricity - \$30 to \$55/month

Bottled gas (heating/cooking) - \$17/cylinder

Water (when required) - \$15.40 per 1,000 gallons

The electrical power provided in Bermuda is standard 60 Hertz, 120 volts; and no special adapters are required for U.S. appliances.

C. Food

The cost of feeding a family in Bermuda is extremely high, and in most cases is more than 50 percent higher than in Washington, D.C. Most food is imported from the United States, Canada, or England, with substantial imports from Australia and New Zealand.

Frozen and unfrozen American or Canadian meats are available, but are very expensive. Lower quality, lower priced frozen meats from Australia and New Zealand are available. The availability of local meat is so low that it is essentially nonexistent.

Fresh vegetables and fruits are very expensive. Fresh vegetables are imported from September through April. During the rest of the year, several locally grown vegetables are available. Price and availability are not what one would expect for a climate that can produce five crops a year. As a result of the high cost of land and the extensive development, the amount of local farming decreases every year.

Local fish is excellent, but availability and prices are not what one would expect from an island in the middle of the Atlantic Ocean. The best fish is bought directly from the local fishermen, but it is not always available. The average price for fresh fish is \$1.25 per pound.

Bermuda stores carry many well-known brand name canned goods, dairy products, and staples. The variety and availability are good but do not quite compare with that in U.S. supermarkets.

The following is a list of typical prices:

(Note: All prices are quoted in U.S. currency.)

Meats

Hamburger, unfrozen, U.S.	\$1.94/lb
Rump roast, unfrozen, U.S.	\$2.46/lb
Sirloin roast, unfrozen, U.S.	\$3.62/lb
Loin lamb chops, unfrozen, U.S.	\$2.31/lb
Rib chops, unfrozen, U.S.	\$2.32/lb
Leg of lamb, unfrozen, U.S.	\$1.91/lb
Strip steak, frozen, N.Z.	\$2.19/lb
Hamburger, frozen, N.Z.	\$1.07/lb
Chicken	\$3.57/5-lb box
Bacon, U.S.	\$1.31 to \$1.51/lb
Bacon, Danish	\$1.14 to \$1.30/lb
Bologna	\$1.30/lb
Boiled ham	\$1.65/lb
Hot dogs	\$.95/pkg of 12

Groceries

Butter, Ireland	\$.81/lb
Eggs	\$1.17/doz

Milk, fresh	\$.55/qt
Milk, filled	\$.36/qt
Bread, white	\$.49/loaf
Coffee, Sanka	\$1.73/lb - ground \$5.28/lb - instant
Sugar, Domino	\$.87/5-lb bag
Oranges, local	\$1.59/doz
Grapefruit, local	\$.26 ea
Apples, Washington Red Delicious	\$.29 ea
Apples, Winesap	\$.27/lb
Tomatoes, fresh, local	\$.93/lb
Lettuce, fresh, local	\$.80/head
Beans, fresh, local	\$.63/lb
Green beans, frozen, Birdseye	\$.45/9 oz
Peas, frozen, Birdseye	\$.38/10 oz
Asparagus, frozen, Birdseye	\$1.05/10 oz
Campbell soups	\$.27 to \$.35/can
Peanut butter, Skippy	\$1.44/28 oz

Laundry Products

Cheer, box	\$.64/20 oz
Tide, box	\$.64/20 oz
Ajax, box	\$.59/20 oz
Fab, box	\$.59/20 oz
Tide, giant box	\$2.53/5 lb, 4 oz
Clorox	\$1.82/gal
Comet cleanser	\$.42 large
Lestoil	\$2.20/1/2 gal

Miscellaneous

Gasoline, high-test	\$.65/Imp gal
Gasoline, regular	\$.59/Imp gal
Newspapers -	
N. Y. Times, daily/Sunday	\$.55/\$1.10
Bermuda, local, daily	\$.13
Time magazine	\$.55

The cost of most other major categories is also higher than in the U. S. These categories include furniture and other household goods, clothes, children's toys, tools, hardware, etc.

Items that are generally less expensive in Bermuda than in the U. S. are cameras, British woolen goods, perfume, and English bone china.

The main reasons why prices are so much higher in Bermuda than in the United States are; import duties on food range from 6 to 27.5 percent, all import items have significant transportation charges, and most local businesses deal in lower volumes than U. S. merchants.

D. Laundry and Drycleaning

There are a few self-service laundromats in Bermuda and several drycleaning establishments. The service is fairly good; however, the prices are above those generally charged in the United States.

Man's suit, clean and pressed	\$2.20
Shirt laundered and ironed	\$.82
Woman's dress cleaned	\$2.20
Self-service (wash and dry)	\$1.25 per load

E. Household Furnishings and Housewares

All the normal household furnishings and housewares commonly available in the United States are available in Bermuda. However, the prices of these goods are much higher than in the United States. There is a reasonably brisk market in used furniture.

F. Cosmetics and Toiletries

All the normal cosmetics and toiletry items commonly available in the United States are available in Bermuda. However, again, the prices of these articles tend to be much greater than normally charged in the U. S.

G. Domestic Help

Through the years there has been an increasing shortage of domestic help in Bermuda. Because the demand greatly exceeds the supply, most servants are not ardent workers; and the amount of work accomplished is not usually satisfactory. In addition, the wages of domestic help have increased to the present level of \$12 to \$24 per day. Very few live-in servants are available.

IV. COMMUNITY FACILITIES

A. Religious Services

One can usually find the church of his choice in Bermuda without difficulty. Because Bermuda is an English colony, the Church of England is the most well represented, but Roman Catholic and Protestant churches are convenient to all locations on the island. Protestant denominations include Methodist, Presbyterian, Baptist, Seventh Day Adventist, African Methodist Episcopal, and Lutheran.

No Jewish synagogues exist in Bermuda, but lay services are held once a month at the Naval Air Station. In addition, the U.S. Navy provides ordained rabbis from the U.S. for the Jewish holy days.

Other churches include a Mormon society and a Christian Science society.

B. Educational Facilities for Dependents and/or Adults

The Roger B. Chaffee School is a fully accredited, 12-year, grammar and high school located on the U.S. Naval Air Station, and operated by the U.S. Department of Defense. Schooling is free for children of military and civil service personnel. U.S. contractor personnel may send their children to this school for a fee.

The fees have steadily increased and amounted to \$864 for the school year 1971 to 1972. Presently, Bendix reimburses the schooling up to \$864 per child. Free transportation is provided to and from this school from anywhere on the island. Most of the station personnel send their children to this school.

There are three private schools in Bermuda. One is an all-girls school, one is an all-boys school, and one is a Roman Catholic coeducational school. The standard of education at these schools is good. The first two schools are patterned after the British school system, whereas the last school is patterned after the North American school system. The fees are approximately \$810 per year at the first two schools and \$330 per year at the Catholic school. Transportation is not provided, but the public bus system is adequate. School uniforms are required at all three schools.

The Bermuda Government schools are generally of lower standard than U.S. public schools. Most are patterned after the British school system, and a number of teachers and headmasters are brought over from Great Britain. Schooling is free at all Bermuda Government schools, but it is not always possible to obtain admission to a particular school because of local zoning laws and crowded conditions. Transportation is not provided, but the public bus system is adequate.

The University of Maryland extension service conducts college-level courses at the U.S. Naval Air Station. Classes meet two nights a week for 3 hours during the 8-week semester. The college conducts five semesters a year, but the curriculum offered is very limited. The fees for the extension courses are based on a fee/credit hour.

The Bermuda Government announced in May 1972, the formation of the Bermuda College which will be made up of three major colleges. These three colleges will teach in the following three disciplines: academic, hotels/tourism, and technical trades. The academic college is expected to provide education that is generally equivalent to the first year of U.S. universities.

C. Health and Sanitation

There are no prevalent diseases in Bermuda, and there is no cause for concern about living in a semitropical climate. However, the dampness and humidity can affect those troubled with respiratory ailments.

There is one large, government-controlled hospital, King Edward VII, that approaches modern standards. Medical costs are generally equivalent to those in the United States. The all-inclusive charge for semiprivate accommodations in the King Edward VII hospital is \$74 a day. In addition to the hospital, there is an adequate number of doctors in private practice. The cost per visit is approximately \$9. District nurses, available in all the parishes, handle such cases as colds, baby care, and vaccinations. Shots, such as polio, tetanus, smallpox, cholera, and others, are given free to children at the Bermuda Health Center. There is a scarcity of specialists in Bermuda, which often necessitates a return trip to the States for specialist treatment.

Dental facilities are quite good and are again at costs comparable to those in the United States. Dentures are easily made, and there is very little waiting for delivery.

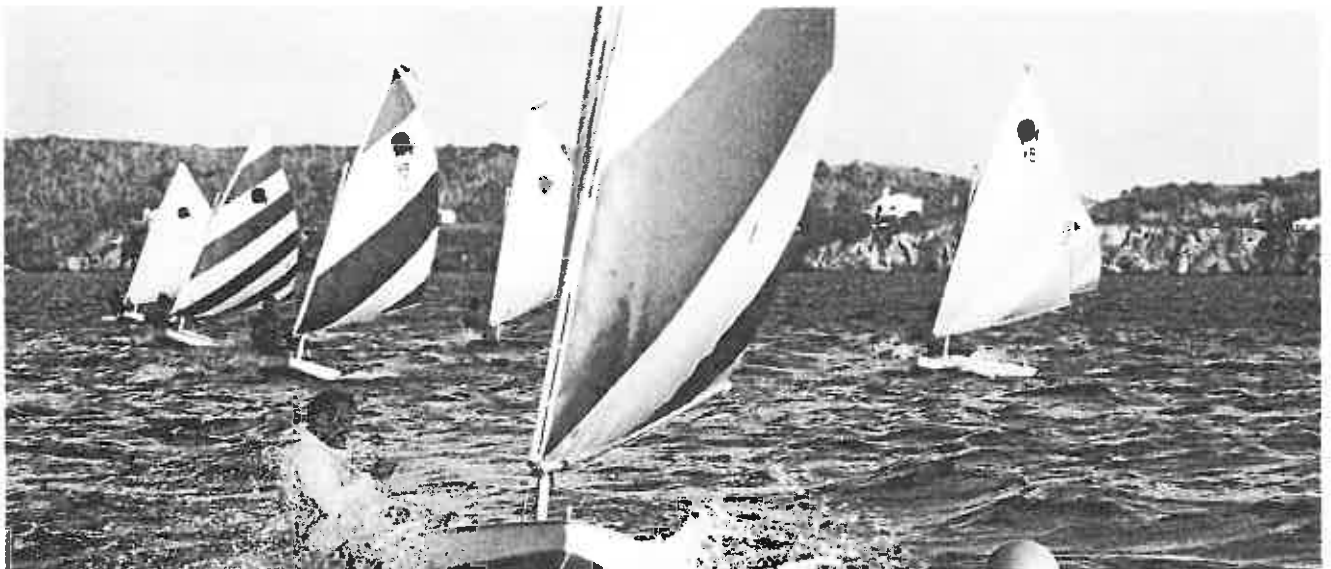
D. Recreation and Entertainment

Station personnel in Bermuda have a wide range of sporting activities from which to choose. Regardless of taste, the island offers a sport or hobby that is sure to satisfy almost everyone.

Bowling — The island has a tenpin bowling facility. League bowling is fast and furious and many station people find competition and relaxation in the fast-growing sport. Open bowling is not always possible because of popularity of league bowling and the limited number of bowling lanes available.

Sailing — Those who like to sail will find the ideal spot in Bermuda. Several station personnel own sailboats and derive many hours of pleasure from the sport. If you have never sailed before, you are in for many thrills. A few wet outings and close calls with submerged coral reefs will convince you that this is no sport for the timid.

Tennis — It is said that tennis came to America via Bermuda in 1873. The oldest tennis court in the Western Hemisphere is located in Paget parish. Tennis is very popular in Bermuda; and, because of the fine weather, it is played throughout the year. Tennis enthusiasts include quite a few station personnel. Even though tennis is popular, there is only one public court in Bermuda, in addition to the one located on the Naval Air Station.



Sunfish Sailing

Skindiving — Skindiving with a snorkel, face mask, and flippers is an inexpensive hobby. There is much entertainment in the partially submerged coral reef gardens that encompass the island. Brilliantly colored underwater vegetation and fish, ranging in size from several inches to several feet, abound in the waters. The colors and shapes are magnificent. Skindiving with aqualungs, however, is a sport requiring skill and knowledge.

Membership in the Bermuda Reef Roamers Diving Club, on the U.S. Naval Air Station, is open to all station personnel. The club provides professional diving instruction and air tanks and regulators, in addition to countless hours of fun and exploration for the diving enthusiast.

Golf — The weather is excellent for golf throughout most of the year, and many people take advantage of the nine well-laid-out courses on the island. The toughest test of par to the low handicap golfer is the Port Royal Golf Course, one of the best courses on Bermuda.



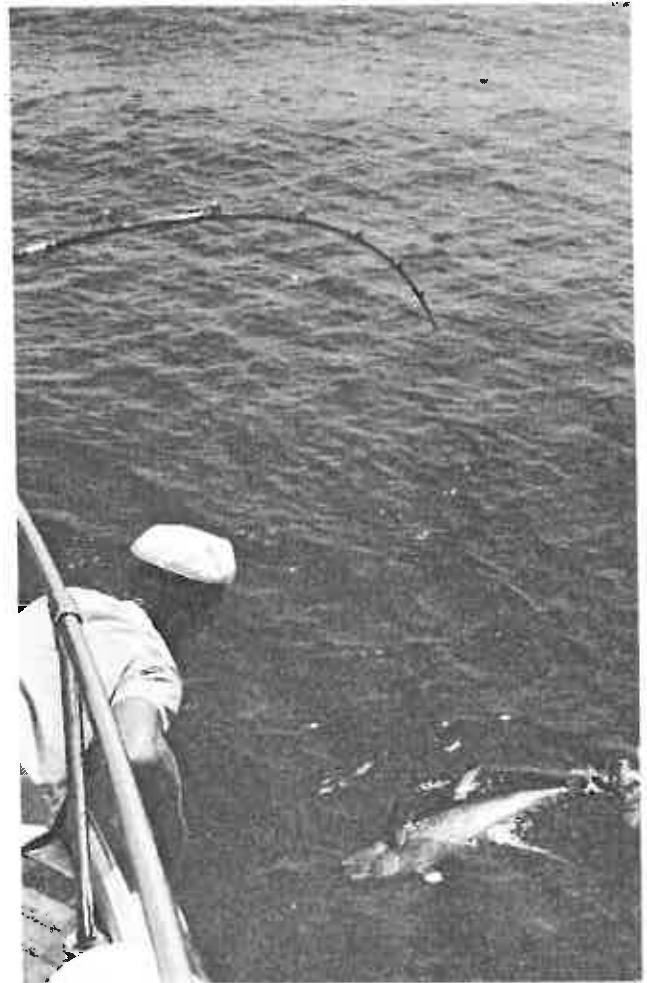
Mid-Atlantic Golf

Fishing — A wide variety of game fish, including white and blue marlin, dolphin, wahoo, and bonefish, are native to Bermuda waters. Many hours of pleasant relaxation may be had in fishing from the shore, reefs, or deep sea. A number of rather large fish have been caught by station personnel while deep sea fishing, which tends to be quite expensive because of the high cost of charter boat rentals.

Cultural Arts — While the cultural arts are few in comparison with other larger countries, there are several "little theatre" groups, a good musical and dramatic society, art society, small philharmonic society, garden clubs, historical societies, and four motion picture theaters. There are periodic musical concerts and some theatrical productions presented by visiting artists during the year. There is also an excellent public library in Hamilton, with branches in Somerset and St. George.



Game Fish Tournament



Bringing One In

Bermuda does not have what one would consider to be a nightclub atmosphere. However, the 10 major hotels and a few nightclubs do provide live entertainment. Since the entertainment is usually local, it is not long before one has seen all the shows. Two disadvantages of night life in Bermuda are the high cost of alcoholic beverages and the early closing hours. The early closing hours are in keeping with Bermuda's intention to remain a quiet, peaceful, restful vacation resort.

In addition to the above, Bermuda has its share of quaint British-type pubs and many fine restaurants.

Recreation and entertainment for children in Bermuda is adequate. There are little league baseball and football leagues operating on the U.S. Navy base. Children of Bendix employees are eligible to participate in these activities. In addition, sailing and tennis activities are conducted on the base in the summer.

Swimming and Beach Picnics — Bermuda boasts many fine beaches, and swimming is enjoyed by all station personnel and their dependents. Beach picnics are in abundance since the hot, humid summer drives many of the inhabitants to the beaches where the water temperature reaches into the 80's during the summer months.

E. Shopping Facilities

The city of Hamilton has many smart shops and fashionable department stores. The goods sold in these establishments are of high quality and originate from all over the world. However, the goods come predominately from Great Britian. British woolens, men's and women's suits, sweaters, jackets, etc., are in abundance at reasonable prices. Other moderately priced items include camera and photography equipment and perfumes. With the exception of the above items, most goods in Bermuda are generally much higher in price than in the United States.

In addition to the main shopping area in Hamilton, there are numerous branch stores and quaint shops throughout the island and in all the major hotels.

F. Emergency Assistance

Emergency assistance of all types is available in Bermuda. The King Edward VII hospital has ambulances on call for any medical emergency or accident. In addition, there is a private, nonprofit ambulance service available.

There are three fire stations in Bermuda; one is the main fire station in the city of Hamilton; the other two are smaller stations on the east and west ends of the island. The firefighting service and capability is very high for such a small island. In addition to the Bermuda Fire Department, the U.S. Naval Air Station maintains two excellent fire stations which assist in local fires when the need arises.

Police assistance can be obtained by calling the police emergency number at any time of night or day. The Bermuda police force is generally a very efficient, friendly force.

Assistance in matters involving your rights as a U.S. citizen residing abroad or as a resident of Bermuda can be obtained at the U.S. Consulate in Hamilton. You will find the consulate staff to be helpful in these matters.

V. COMMUNICATIONS

A. Telephone

Telephone communications between the station and the United States are good. Long distance calls to and from all parts of the world are possible. The station telephone numbers are 3-1142, and 3-8111, ext. 6221 or 5134. Telephone service extends throughout the island. There is sometimes a wait involved in having a telephone installed in your home, but usually one can have a phone within 2 months.

In an emergency, personnel stationed at Bermuda may be contacted by families, relatives, or others. Call Columbia, Maryland, Area Code 301, 730-3700, and ask for the Manned Space Flight Program Manager. Describe the emergency to him and he will alert the Bermuda individual through the facilities of the network.

Long distance rates for Bermuda are given below:

	<u>Station to Station</u>		<u>Person to Person</u>	
	Three Minute Call	Each Additional Minute	Three Minute Call	Each Additional Minute
U.S.A. (reversed charges and credit cards apply)				
Eastern states	\$5.00	\$1.65	\$6.60	\$1.65
Middle states	\$6.05	\$2.00	\$8.25	\$2.00
Western states	\$7.30	\$2.40	\$9.90	\$2.40

B. Telegraph

Commercial telegraph cables may be sent to the station or one's local home address. Delivery time on commercial cables is approximately 1 day. Cable and Wireless Limited, a private communications company working in conjunction with the Bermuda post office, handles all outside communications.

C. Postal Service

Mail service to and from the United States is good. On the average, delivery of airmail to and from the East Coast is made in 3 days. Delivery time for packages mailed from the East Coast is about 1 week. The station mailing address is:

NASA Box 7015
FPO New York 09560

In addition to the FPO mailing address, any resident may mail packages or letters into and out of Bermuda through the local Bermuda post office. In this case, the local home address should be used.

D. Radio

Bermuda has three AM radio stations and two FM stations. At night, some East Coast U.S. stations come in with fair clarity on ordinary longwave radio sets. Those with shortwave sets can readily pick up U.S. and other

foreign broadcasts at any hour. The Bermuda radio stations generally provide the same type of programming as U.S. stations.

E. Television

There are two TV transmitting stations in Bermuda. The TV programs shown are mostly American reruns, usually delayed 1 week or more, with few live programs. All live programs are local since no TV transmission capability exists from the United States via cable or satellite. Daily programming begins in the midafternoon and continues to midnight. Both stations do transmit a number of programs in color.

F. Newspapers and Magazines

Bermuda has one daily newspaper, the Royal Gazette, and three weekend papers, the Mid-Ocean News, the Bermuda Sun, and the Bermuda Recorder. While all the newspapers concern themselves mainly with local events, they have wire service coverage of leading U.S. and other foreign news stories via UPI, AP, and Reuters.

In addition to local newspapers, U.S. newspapers are air mailed in to Bermuda every day. For instance, the New York Times and the Boston Globe are available the "same" afternoon in Bermuda. In addition to U.S. papers, British, Canadian, and European papers are available a day or so after they are published.

Most U.S. magazines including Time, Newsweek, Ladies Home Journal, etc., are available in many Bermuda stores a few days after they are available in the United States.

VI. TRANSPORTATION

Transportation for the newly hired in Bermuda is a problem. Motorbikes may be rented or purchased by any visitor or resident without requiring an operator's license or driving examination. The cost of renting one of these motorbikes is approximately \$33 per week for the first week and \$28 per week after that.

Motorcycles and motor scooters are not available for rental but are available for purchase. These vehicles require licensing and a driving examination prior to putting them on the road.

There are no car rental agencies on the island, as it is illegal to rent cars. In order for a person to drive a car in Bermuda, he must pass a driving test and have his car inspected and registered. There are several new car agencies on the island, and the cost of new cars is slightly higher than the equivalent priced car in the United States.

There are used cars available, usually from rotating U.S. base personnel; but, again, the cost of these cars is higher than their equivalent in the U.S. After purchasing a used car, the owner must pass a driving test and have his car inspected and registered.

Only one car is allowed per family in Bermuda. The dimensions and horsepower of privately owned automobiles are limited by Bermuda law, and thus most American cars are not permitted. Foreign car costs range from \$1,700 to \$3,300. In addition, the cost of registering an automobile is high. For example, a Volkswagen owner pays an annual registration fee of \$121. However, Bendix reimburses the employee for registration fees in excess of \$20, which is the fee paid in the state of Maryland.

Insurance is compulsory, and the rates depend upon driver age, driving record, and value of car. For example, the insurance premium for a married man, 25 years old, with an 8-year clean driving record, and driving a new Volkswagen valued at \$2,800 would be:

Comprehensive (\$100 deductible)	- \$240/per annum
Third Party	- \$90/per annum

This premium could be as much as 200 percent higher if the insured does not have a clean driving record.

Driving in Bermuda is on the left-hand side of the road. The maximum speed limit, on and off base, is 20 mph, except for posted 15-mph areas.

Public buses are available in Bermuda but are not suitable for transportation to and from the NASA station because of the irregular service and inadequate schedules. Moreover, the fares are higher than equivalent U.S. fares.

Taxi service is available but very expensive for use as transportation to and from work.

To summarize the transportation situation, the new arrival will probably have to rent a motorbike, at least for a month or more in Bermuda, until he purchases a new or used car, a motorcycle, or a motor scooter. Because of the frequent rain showers and the relatively dangerous aspects of two-wheeled transportation, good foul-weather gear and a sturdy helmet are necessities.

Bermuda has a fairly good network of paved roads. However, most are hilly and curved, thus not conducive to fast driving. Service stations of both Shell and Exxon products are available throughout the island. Mechanical repair service is available in four local garages with qualified mechanics, and also in some service stations. The cost of labor for automobile repair services varies from \$9 to \$12 per hour. In addition, the cost of replacement parts is very high - about 50 percent above the equivalent price in the United States.

In addition to the public bus service mentioned above, there is a ferry service available to residents of the central and western parishes. This service operates in the Great Sound and Hamilton harbor.

Daily flights aboard three carriers connect Bermuda with the Eastern seaboard cities of Baltimore, Washington, Philadelphia, New York, Newark, and Boston. Also, at various times during each week, flights arrive and depart for London, Nassau, and other foreign cities.

VII. CURRENCY AND BANKING

In February 1970, Bermuda converted from the pound sterling system to the dollar sterling system. The Bermuda dollar is tied to the British pound at a fixed exchange rate of \$2.40 Bermudian to the pound. Since the official devaluation of the U.S. dollar on December 18, 1971, the center point value of the U.S. dollar is \$2.61 with respect to the U.K. pound. This makes the U.S. dollar worth 8.57 percent less than the Bermuda dollar. This percentage can vary ± 2.25 percent either way. Recently, the discount has averaged 9.5 percent. All of this means that prices of goods marked in Bermuda dollars (per Bermuda law) must be increased by 8 to 10 percent when paying in U.S. dollars. The Bermuda Government issues its own banknotes in denominations of \$50, \$20, \$10, \$5, and \$1. The Bermuda coins, which are similar in size and shape to U.S. coins, are issued in 50¢, 25¢, 10¢, 5¢, and 1¢ pieces.

All Bermuda business houses and stores accept American dollars, although at the discounted rate explained above.

There are four banking houses on the island, all of which accommodate any American wishing to establish savings or checking accounts in U.S. dollars or Bermuda dollars. Most of the station personnel have U.S. dollar accounts at the local banks. In addition, many of the station personnel maintain U.S. bank checking accounts. Checks can be deposited to a local Bermuda or U.S. dollar account and drawn on a stateside bank. Some station personnel maintain Bermuda dollar accounts at the local banks. When drawing money from a local U.S. dollar account, part may be drawn in Bermuda dollars and part in U.S. dollars.

U.S. travelers checks are accepted everywhere in Bermuda. In addition, the local banks issue travelers checks in either U.S. or Canadian dollars or British pounds.

The representative for American Express in Bermuda is the Bank of Bermuda Limited.

Money orders can be transmitted to U.S. banks from any of the four local banks. Incoming money orders from Western Union are similarly received at any one of the local banks.

Loans by Americans from the Bermuda banks are extremely difficult to obtain. The only general exception to this is for the purchase of an automobile from a local car dealer.

VIII. CUSTOMS REGULATIONS AND SHIPPING

A. Personal Effects

Personal effects and clothing owned at the time of your assignment to Bermuda may enter duty free, but are not to be resold here without the payment of duty. The station will assist in preparing the necessary forms for customs exemption.

A wharfage fee is charged on all incoming goods at a rate of 1 percent of the declared value, in addition to freight handling charges.

When shipping customs-exempt goods from the States, mark shipping crates or boxes with your name, "used personal effects," and "customs exempt." A shipping document listing the contents should be attached to the crates. Air freight shipments should not show an FPO address - these shipments should be addressed:

NASA Station
Naval Air Station
Bermuda
M/F: Name
Call 3-1142 upon arrival

Care should be taken with regard to containerization of a shipment. There is a difference between domestic and overseas packaging. There have been cases where a shipment had to be repackaged on the East Coast prior to shipment to Bermuda.

B. Household Effects

The same rules and procedures for personal effects above apply. Household effects include furniture, stereo equipment, rugs, white goods, etc.

There is one cautionary note about furnishings. Bermuda's climate has a deleterious effect on furniture. Veneer woods tend to warp, metals corrode, and fabrics mildew. These factors should be kept in mind when considering the shipment of high quality furnishings to Bermuda.

C. Firearms

Bermuda laws are extremely strict with regard to the importation and possession of firearms. Neither firearms nor ammunition may be possessed without a license from the Bermuda Commissioner of Police, and the only weapons normally permitted for U.S. personnel are for target shooting. Application for the importation of firearms must be made to the Bermuda Police Commissioner prior to their entry. Importing of firearms or ammunition by BFEC personnel is discouraged by station management, unless the employee intends to participate in a local gun club. There is no hunting of any kind in Bermuda.

D. Automobiles

Bermuda's laws virtually forbid the importation of used cars. A motor vehicle may be imported only if it was purchased new within 6 months of importation and conforms to all of Bermuda's regulations concerning size and horsepower. If you have any questions concerning a car you want to import, please contact the Bermuda station administrative assistant.

E. Pets

All dogs and cats imported into Bermuda require the same type of immunization certificates by registered veterinarians as required for importation to the U.S. The island is free of rabies, and no quarantine is necessary if pets arrive from other rabies-free countries and if immunization records are in order. Those intending to bring pets into the colony should contact the airline on which they are to travel and request the information necessary for the importation of pets.

There are some exotic pets in Bermuda; however, permission to import them must be obtained from the Bermuda Department of Agriculture and Fisheries prior to importation.

IX. CLOTHING/GROOMING

Since you are not coming to the island as a tourist, be conservative. The same clothing you would use in the United States during spring, summer, and late fall is advisable. The nights are very cool and damp during January, February, March, and April. Warm sweaters, jackets, and fall coats are necessary.

During the summer, bermuda shorts are worn for all occasions. An all-season raincoat is a necessity. Summer clothes include sports jackets, sports shirts, bermuda shorts and slacks for men, casual dresses, blouses, bermuda shorts and slacks for women. Mostly cottons are worn. Evening clothes can be of one's own taste; there are numerous places, if the budget permits, where they can be worn.

Clothing prices in Bermuda are generally higher than stateside prices. Some good quality English merchandise is available.

X. CONDUCT

You are subject to local law and custom as you would be in any country. Bermuda laws are generally similar to the normal laws in force in the United States. The atmosphere is generally quiet and more reserved than the average United States resort area. Loud and unusual dress or behavior is no more appreciated here than it would be in your home town. You are expected to conduct yourself in a manner befitting your association with Bendix and the National Aeronautics and Space Administration. Maintaining a creditable image at an overseas location is not only important, it is mandatory. Disorderly conduct, nonpayment of debts, and slovenly appearance will not be tolerated. The station M&O supervisor is charged with the responsibility of maintaining an awareness of the conduct of all employees in an overseas location. Instances of misconduct brought to the M&O's attention can result in the removal of the employee from the overseas location.

XI. WHAT TO DO UPON ARRIVAL

Normally, all new arrivals are met by a station representative, whether arriving by plane or boat. Arrangements for temporary housing for new arrivals are handled by the station.

If you are not met at the terminal, contact the NASA station by phone at 3-1142. The normal station working hours are 8 a.m. to 4:45 p.m., but watchmen are on duty 24 hours a day; and the home telephone number of the M&O supervisor or the administrative assistant may be obtained by calling the NASA station.

Prior to departing from Columbia, you may desire additional information or details about Bermuda which are not covered in this booklet. We invite you to call the Bermuda M&O supervisor or his administrative assistant via SCAMA phone for answers to your questions.