



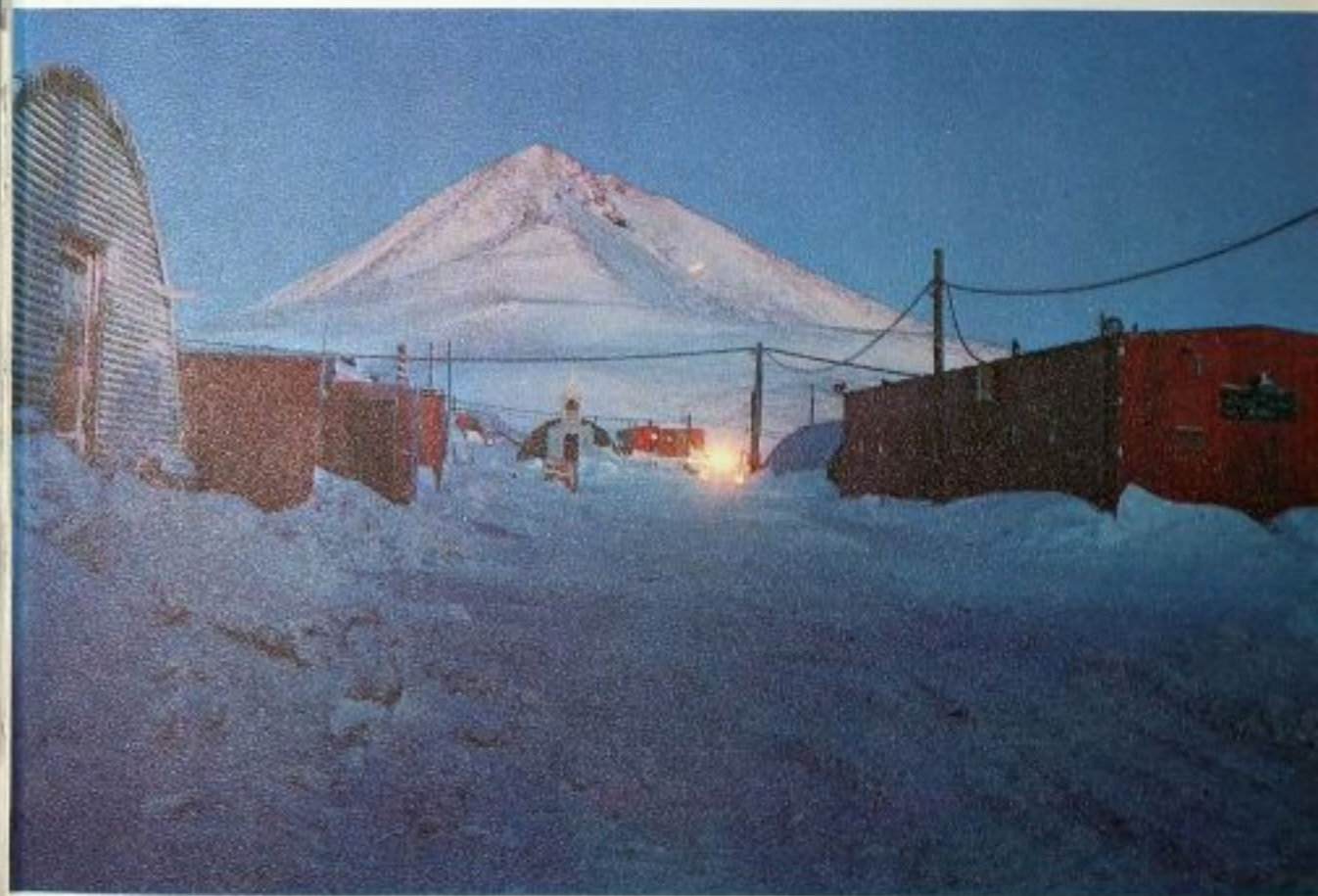


. . . At the bottom of the world lies

a continent of 6,000,000 square miles



**... an area of spectacular beauty.
Here man has constructed**



half a hundred outposts.



**amidst natural
wonders**



of which we still know little.



Here, the ships

and the planes





**and heavy equipment of
Operation Deep Freeze support America's
scientific program.**



**And even as the smoke rises from
the buried buildings of a
present station . . .**



**a new station for the future is carved
from the Antarctic icecap.**



the mission of task force 43

At the conclusion of the International Geophysical Year (July 1957 - Dec 1958) it was evident that the U.S. scientific programs had barely scratched the surface of the vast amount of knowledge yet to be gained from Antarctica. With this in mind President Eisenhower authorized the establishment of the United States Antarctic Research Program, which would continue and, in most areas, intensify the scientific endeavors in the Antarctic for an indefinite period.

The Navy's role in Antarctica during Deep Freeze 61 has been to continue logistic support for the scientific undertakings, including the supply and maintenance of the Naval Air Facility at McMurdo Sound, South Pole Station, Byrd Station, and the jointly operated U.S. - New Zealand Hallett station as well as temporary facilities required by the scientists. In addition the installation of a new communications system, the foundation work for a nuclear power plant and the first portion of constructing a new, undersnow, Byrd Station were undertaken.

An additional mission was to penetrate to the Bellingshausen Sea coast with the icebreakers USS Glacier and USS Burton Island in order to obtain oceanographic, cartographic, and geographical data, and to support the summer scientific program there.



Admiral and Mrs. Tyree entering Christchurch International Airport. Mrs. Tyree arrived in New Zealand in September.

REAR ADMIRAL DAVID M. TYREE
United States Navy
Commander, Naval Support Force, Antarctica
and Antarctic Projects Officer

During his second year as Operation Deep Freeze Commander, Rear Admiral David M. Tyree traveled over 25,000 miles to view the wide-spread activities of his command.

Leaving Washington, D.C., in September 1960, the Admiral flew to Christchurch, N.Z. After establishing advance headquarters for the operation there, Admiral Tyree also traveled to several other N.Z. cities. Among them were Wellington and Dunedin where he delivered addresses about U.S. efforts in Antarctica.

After a three-day weather delay, the first plane of Deep Freeze 61 summer support season landed at McMurdo Sound on the morning of October 4. First to disembark was Admiral Tyree, who was heartily greeted by the wintering-over party of Deep Freeze 60.

During the next few months he visited the three other U.S. stations - South Pole, Byrd and Hallett - as well as New Zealand's Scott Base. He traveled by plane, ship, weasel, Sno-Cat and helicopter. Twice during the season he journeyed to New Zealand for planning conferences.

When the summer support season ended Admiral Tyree returned to Washington to begin preparation for Deep Freeze 62. After his two seasons in Antarctica, Admiral Tyree was sure that the position of Deep Freeze Commander called for a traveling man.



Admiral Tyree greets Brig Gen Andrew B. Cannon, commander of the MATS 63rd Troop Carrier Wing.



At Byrd Station traverse engineer George Widich points out damage on a station traxcavator.

Guests and pressmen are briefed on Deep Freeze operations in the McMurdo Sound wardroom.



highlights of deep freeze 61

JULY

- 7 The President of the United States signed the Antarctic Medal Bill.
- 27 First flight of personnel and cargo departed Quonset Point, Rhode Island, for Christchurch.

AUGUST

- 4 Navy accepted first C-130BL aircraft.
- 9 Icestrip runway construction begun.
- 10 U.S. Senate gave advice and consent to ratification of Antarctic Treaty.
- 16 First NAF, McMurdo Sound, aircraft flight of Deep Freeze 61.

SEPTEMBER

- 9 USS Wilhoite (DER-397) changed operational control to Task Force 43 and departed Pearl Harbor for Dunedin (arrived 22 September).
- 10 Rear Admiral D.M. Tyree, USN, departed Washington for Christchurch (arrived 15 September).
- 12 1960 orientation session of the U.S. Antarctic Research Program convened at Skyland, Virginia.
- 18 First Navy C-130 departed Quonset Point for Christchurch (arrived 21 September); Detachments AirDevRon Six at Quonset Point and Christchurch activated.
- 23 Sunrise at Amundsen-Scott South Pole Station.
- 26 Wilhoite departed Dunedin for Ocean Station, (arrived on station 29 September after stop at Campbell Island).

OCTOBER

- 4 RTV arrived at McMurdo from Christchurch with Admiral Tyree and staff; flight delayed to this date from 30 September by poor weather and storm conditions at McMurdo.

- 11 NAAF Little Rockford activated; Joseph Nemeth, CM2, in charge.
- 15 C-133 aircraft arrived Christchurch with Peter Snowmillers.
- 18 USS Glacier (AGB-4) changed operational control to Task Force 43.
- 20 USS Staten Island (AGB-5) changed operational control to Task Force 43.
- 25 USCGC EastWind (WAGB-279) changed operational control to Task Force 43.
- 28 USS Edisto (AGB-2) changed operational control to Task Force 43.
- 30 Navy C-130 makes first flight to South Pole for Deep Freeze 61.
- 31 Air drop operations begin at South Pole.

NOVEMBER

- 2 Navy C-130 makes first flight to Byrd for Deep Freeze 61.
- 3 NAAF Beardmore activated.
- 9 USNS Private John R. Towle (TAK-240) changed operational control to Task Force 43.
- 10 New site selected for Byrd Station 6.1 miles from present camp.
- 12 132-hour communications blackout between Deep Freeze stations begins (ended Oct 18).
- 14 Commander Griffith Evans, Jr., USNR, relieved Commander Bernard G. Fold, USN, as Commanding Officer of Edisto; Ellsworth Highland Traverse (Dr. Charles Bentley, leader) departed Byrd Station.
- 15 Commander J. J. Brosnahan relieved Commander L.W. Bertoglio as Commander, Antarctic Support



On November 15 Cdr J.J. Brosnahan relieved Cdr Lloyd Bertoglio as Commander Antarctic Support Activities.



Deep Freeze Open House in October at Christchurch International Airport drew thousands of New Zealanders. Star of the show was this C-133 Cargomaster, the largest U.S. cargo plane.

- Activities and Commanding Officer, Naval Air Facility, McMurdo Sound.
- 23 USNS Albatross (TAOF-81) changed operational control to Task Force 43.

DECEMBER

- 1 Final USAF C-124 arrived Christchurch; Deep Freeze 61 mission completed. Begin return to CONUS.
- 8 Byrd-Pole Tractor Train (TG 43.4, Major Antero Havola, USA, leader) departed Byrd Station for South Pole.
- 10 McMurdo-Pole Traverse, (Dr. Albert P. Crary, leader) departed NAF McMurdo Sound for South Pole.
- 12 Excavation begun on New Byrd Station
- 13 USNS Greenville Victory (TAK-237) changed operational control to Task Force 43.

JANUARY

- 3 USS Arneb (AKA-56) changed operational control to Task Force 43.
- 11 Byrd-Pole Tractor Train (Task Group 43.4) arrives South Pole.

FEBRUARY

- 1 Fire destroyed two buildings at NAF McMurdo. Total loss estimated at \$225,000.

On December 10 an eight-man scientific traverse left McMurdo for the South Pole. They arrived 63 days later and were returned to McMurdo by Hercules.

- 5 Glacier and Staten Island rendezvous and enter Bellingshausen Sea.
- 11 Ellsworth Highland Traverse completed evacuated 13 Feb.
- 12 McMurdo-Pole Traverse arrives at South Pole. C-130 evacuated party from Little Rockford; station closed.
- 17 Last flight of season departed South Pole. Party evacuated from Beardmore; station closed.
- 21 Air operations completed for Deep Freeze 61 with arrival of last flight from McMurdo at Christchurch.

MARCH

- 5 Naval Air Facility, McMurdo Sound, placed in winter status; REP, COMNAVSUPFOR ANTARCTICA, McMurdo, disestablished.
- 10 Bellingshausen Sea Expedition 1961 complete; CTU 43.1.2 detaches Staten Island for oceanographic survey operations; Glacier proceeds to Palmer Peninsula area.
- 11 Resupply of Hallett ended.
- 16 Arneb arrived Port Lyttleton
- 17 Edisto arrived Port Lyttleton
- 21 Eastwind arrived Sydney
- 14 First birth at South Pole: "Pandora" (hamster) produces twins.

A Navy Constellation, equipped with special scientific gear as a part of "Operation Magnet," crashed near the McMurdo runway in late October. Several men were injured but there were no fatalities.





Left to right: Interior of an ice crevasse. Two Adelle penguins at the Cape Royds rookery. Giant berg anchored in the sea ice of Hallett Bay.

antarctica

Antarctica, scene of Operation Deep Freeze, is a land mass almost twice as large as the United States. Having an average altitude of 6000 feet, it is the world's highest continent. This height is caused by the ice and snow that have accumulated over many thousands of years. The interior of the Antarctic is covered by this icecap, called the Antarctic Plateau.

Scientists believe that 85% of the world's ice is here. In places the icecap is more than two miles thick. Its great weight causes ice to be pushed out toward the edges of the continent in the form of glaciers. At the coastline the ice continues outward in the form of ice shelves such as the giant Ross Ice Shelf, which is the size of Texas. Portions of these shelves continually break off to become icebergs.

An interesting feature of Antarctica is its mountains. Numerous mountain ranges exist on the continent, with peaks in excess of 15,000 feet. Mountain systems also lie in the interior, covered with snow and showing only the tips of the highest mountains. Several volcanos have already been reported, but only Mt. Erebus on Ross Island appears to be in a constant state of activity.

Antarctica is noted for the fierceness of its weather. Blizzards develop with amazing rapidity and may last for days. It is regarded as the coldest area on earth. The lowest temperature recorded any-

where was minus 126 degrees reported by the Russian scientists at the Vostok station in 1960. Americans at the South Pole recorded 110 below zero in September 1959.

Compared with the rest of the world, Antarctica is a lifeless continent. No trees, flowers or higher animals are to be found. Moss, lichen and a few insects have been collected, but only along the coastal regions is there an appreciable amount of life. Antarctic waters are rich in sea life; plankton, fishes, seals and penguins ring the continent.

Penguins have become the symbol of Antarctica. The Emperor, usually three feet high and weighing about 80 pounds, presents a facade of dignity. In contrast the Adelle is known as the clown of Antarctica. About half the size of their cousins, they are curious, playful and have no fear of men.

Some persons confuse the Arctic and Antarctic regions. In addition to being at opposite ends of the globe there are other important differences. The Antarctic is a continent surrounded by water; the Arctic is an ocean surrounded by land. The South Pole rests on a polar plateau of about 10,000 feet altitude; the North Pole is in the middle of a sea about 10,000 feet deep. More than a million people live beyond the Arctic Circle, as well as numerous animals, plants and insects. Beyond the Antarctic Circle no man can live without outside supplies; only a few living things exist.



Left to right: Queen Alexandra Mountains rise above the Ross Ice shelf. A Weddell seal up for fresh air in McMurdo Sound. Biologists collect water samples for the study of microscopic life from a fresh water lake in Taylor Dry Valley.



An early sketch of Antarctica, made by American naval officer Charles Wilkes, between 1838 and 1840. He is generally accepted as the first man to prove Antarctica was a continent.



history of antarctic exploration

Modern history of Antarctica begins with Captain James Cook of the British Navy. Between 1772 and 1775 Captain Cook sailed completely around the continent, but never sighted land. Cook's reports of abundant seals and whales provided a fresh incentive for commercial mariners; sealers and whalers invaded Antarctic waters during the period of 1820 and 1900.

It is difficult to say who first sighted the continent. It is clear that American and British explorers did so within a short time of each other in 1820 and 1821. An American Naval officer, Charles Wilkes, is generally accepted as having proved the existence of the continent in 1838-40.

Interior of Scott's hut at Cape Evans. From this camp his party left on their fatal trek to the South Pole.



Perhaps the most important expedition of the 19th century was that of Captain James Ross of the British Navy. In two ships especially strengthened to resist the ice, the *Terror* and *Erebus*, he headed for the part of the continent south of New Zealand. In this area Ross sailed as far south as any man had ever done, and as far south as it is possible to go by sea.

From 1890 interest in Antarctica increased, created by both commercial hopes and the search for scientific knowledge. The most dramatic event of this period was reaching the South Pole. After several depot laying trips Norwegian Roald Amundsen began his run in October 1911, leaving from near the present site of Little America. On December 14, 1911, Amundsen reached the exact bottom of the world. Little scientific work was accomplished, but the preparations and execution were a master plan of organization and efficiency.

At almost the same time Captain Robert Scott left Ross Island for the Pole. At the foot of the Beardmore Glacier the dogteams were sent back and the reduced party set out to man-haul across the plateau. For the final dash to the Pole Scott selected four companions. On January 12, 1912, they reached their goal, only to find that Amundsen had been there first. On the return trip all five perished.

In October 1915 the ship of Sir Ernest Shackleton became ice-beset in the Weddell Sea, was crushed and abandoned. The party of 28 camped and drifted on an ice floe until it broke up. Taking to three small boats, they drifted to Elephant Island in the South Shetlands. From here Shackleton, with five others, sailed in an open whaleboat 800 miles to South Georgia. The group on Elephant Island was rescued in August 1916.

The most famous Antarctic explorer that the U.S. has produced is Rear Admiral Richard E. Byrd. He was greatly interested in scientific research and is also responsible for arousing American public interest in Antarctica.

The first Byrd Antarctic Expedition in 1928-30, is best remembered by most people for the 19-hour flight over the South Pole on November 29, 1929. Probably more important were the geographical and scientific discoveries. Basing at Little America on the edge of the Ross Ice Shelf, Byrd showed how effectively the airplane could be used for exploration. In 1933 Byrd's second expedition established Little America II at the same site.

Byrd's third, and probably his most productive expedition, lasted from 1939 to 1941. Little America III was constructed a few miles from the earlier bases. A comprehensive scientific program was conducted and 900 miles of new coastline were discovered.



Richard E. Byrd

In the summer of 1946-47 the Navy sent Operation Highjump to the Antarctic. The expedition was primarily a photographic mission and operated in three task groups. Another objective was to test equipment and train men under polar conditions. It involved 13 ships and over 4,000 men. Little America IV, a tent city, was established near the other Little Americas.

To support the scientific activities of the International Geophysical Year (July 1957 to December 1958) in Antarctica, Deep Freeze operations were begun. The ships of Deep Freeze I left Norfolk, Va., in November 1955. They established the McMurdo and Little America V stations, began a trail from Little America V to Marie Byrd Land and planned the construction of five other IGY stations. When summer operations ended 166 officers and men, all volunteers, stayed behind to winter over.

In October 1956 Deep Freeze II began. The year's most widely publicized event was the establishment of the South Pole Station. The first landing at the South Pole was made on October 28, 1956. Rear Admiral George J. Dufek, Deep Freeze Commander, became the first man to set foot there since Scott's party in 1912.



Hut built by British expedition led by Shackleton in 1908 still stands at Cape Royds.

Material to build the Pole Station was air dropped. A trail party from Little America V carried the supplies for Byrd Station. Ellsworth Station was built with support from ships, as were Wilkes and Hallett Stations.

During this same time eleven other nations were setting up IGY stations. When Deep Freeze III began in November 1957 this world-wide event was under way.

A major news event was the Hillary-Fuchs Trans-Antarctic Traverse, the first land crossing of the continent. Sir Vivian Fuchs's group left the Weddell Sea in November 1957. Traveling by way of the South Pole they reached New Zealand's Scott Base on Ross Island on March 2, 1958. Sir Edmund Hillary laid supply caches for the traverse from Scott Base to the Pole.

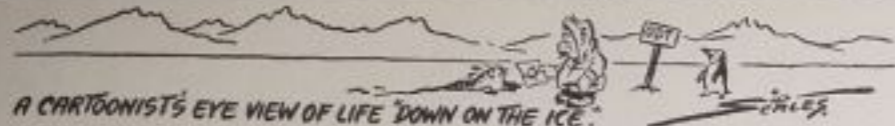
As the IGY neared its end, the decision was made to continue America's scientific program at Pole, Byrd, Hallett and McMurdo. Ellsworth Station was loaned to Argentina and Wilkes to Australia, with American scientists participating at both stations. Little America V was placed on a stand-by status.

As the IGY ended, American scientific efforts in Antarctica became a long range program, with Deep Freeze 61 filling its role of logistical support.

Operation Highjump in 1947 established Little America IV, a temporary tent city later carried to sea as part of an iceberg. This shot shows storm damage to the tents.



WHAT'S IT LIKE IN ANTARCTICA?



A CARTOONIST'S EYE VIEW OF LIFE "DOWN ON THE ICE."



MURDO CITY, LIKE MANY OTHERS, HAS STREETS, POWER POLES, LITTER, AN INTERNATIONAL AIRPORT, A TRAFFIC PROBLEM, AND LOOKS RIPE FOR PARKING METERS AND TROLLEY BUSES



SEALS MOVE ACROSS THE ICE WITH A LABORIOUS, HORIZONTAL MARILYN MONROE TYPE OF MOVEMENT



WHY CAN'T WE HAVE EXTRA-PULLER TRACKS FROM 3" — WHICH MUST MAKE THEM QUITE ENVIROUS OF THE MANOEUVRABLE WERSEL



THERE IS NO FLORA IN ANTARCTICA EXCEPT WIND ROSES, CULTIVATED BY THE MET. DEPT.



BUT WHAT DOES GROW LUXURIANTLY, ARE BEARDS, WHICH



ARE CULTIVATED BY ALL RANKS INTO MAGNIFICENT BLOOMS OF R-O-F-E STANDARD (*Red Old Fashioned Explorer)



GRUNA ABOUNDS HOWEVER — ADLIE PENGUINS GROUP THEMSELVES LIKE POLITICIANS AT A CONVENTION.



THIS IS THE EMPEROR PENGUIN (Type, admiratum, americanus)

HEADLINE EVENTS OF DEEP FREEZE 61

First Antarctic Nuclear Power Plant Underway

Antarctica's first nuclear power plant is beginning to take shape half-way up a hill overlooking the Naval Air Facility at McMurdo Sound. Site preparation was carried out during the summer season and plant construction will begin in Deep Freeze 62.

Prefabricated at The Martin Company's plant in Baltimore, Md., in a series of 30-foot "modules," the reactor system is designed so that it can be put together by Navy Seabees within 60 days after arrival at the site and readied for full power generation only 15 days later.

The Atomic Energy Commission has designated the plant PM-3A—"P" for "portable" and "M" for "medium power range." The "3" indicates that it is the third in an AEC series, and the final letter "A" means that it will be a field plant rather than a prototype.

A technical publication has described PM-3A as "the first power reactor that will be making a profit." Because of high transportation costs, diesel oil in a remote area like the Antarctic is



more expensive than the nuclear fuel required to produce the same amount of electricity. It would take millions of gallons of fuel oil to equal the power output of the PM-3A core.

Energy from more than 730 three-foot tubes of half-inch diameter which make up the PM-3A core will be released in the form of heat. Water under pressure in a closed circuit will transfer the heat to a secondary system, producing steam which will drive a turbine-generator to produce electricity.

Only a small percentage of the heat produced by PM-3A will be used in its original form — just enough to keep the power plant buildings warm and to melt snow for the plant's water supply. Some "make-up water" will be needed to replace normal



steam plant losses, and the rest of the water will be for the personal use of the operating crew.

Oil stoves in the galleys will give way to electrical ones; and if a projected second reactor is added during the following season, all buildings at McMurdo Sound can be heated electrically. The half-mile distance from the reactor site to the main camp area would make it impractical to pipe steam.

The replacement of oil stoves — and, eventually, the oil-fired space heaters — at the chief U.S. Scientific base in the Antarctic will mean more than an increase in comfort. It will be a reassuring safety measure, since the danger of fire has always been a special threat in an area where sub-zero temperatures make normal firefighting procedures impossible.



SEABEES BUILD UNDERSNOW CAMP

High on the Antarctic ice cap, 600 miles from the South Pole, the United States Navy is building an undersnow station of the future. This scientific camp will replace Byrd Station, now being crushed by a five year accumulation of ice and snow.

"New" Byrd is being constructed by Seabees of the Navy's Operation Deep Freeze, commanded by Rear Admiral David M. Tyree. "When finished, this station will bring a new concept to our inland station activities in Antarctica," Admiral Tyree states. "In it we have tried to put our best ideas and use the lessons we have learned since Deep Freeze began."

The site for new Byrd was chosen by the National Science Foundation, which administers our scientific program through the U.S. Antarctic Research Program (USARP). The location is six miles from the old station. This insures uncontaminated snow needed for tunnel construction and scientific studies.

Partial occupation is scheduled for Deep Freeze 62 and completion during Deep Freeze 63. By 1965 a proposed nuclear power plant would begin generating electricity.

Branching from one main tunnel will be seven side tunnels, all beneath the surface of the mile-high ice cap. Inside the tunnels three quarters buildings will house Navy support personnel and scientists. In addition, there will be buildings for recreation, administration and hospital, dining room and kitchen, garage, workshops and communications. For scientific work there will be structures for the study of meteorology, geomagnetism, radio noise and a glaciology lab. Above the snow will be an aurora dome building, a shelter for the inflation and releasing of weather balloons and a radar dome for tracking them.

Key pieces of equipment in the tunneling operation are two trench cutting machines made in Switzerland by the Konrad Peter Company and called Snow-Millers. These highly specialized units cut through snow and ice to carve open trenches. Two revolving cutting drums, mounted on the front, open a swath four feet deep and nine feet wide. The snow is carried up and outward through two upright chutes.

Officer in Charge of construction at "new" Byrd is Ltjg Dave deVico, Civil Engineering Corps, of Gloucester, Mass. With him are 65 men, mostly Seabees. Many were requested by deVico, based upon previous associations and knowledge of the problems at the new station. Ten were sent to Greenland to gain experience at Cap Century, a

similar undersnow project built by the U.S. Army. deVico also spent two weeks at the Greenland camp before heading to Antarctica.

The first 13 men into Byrd arrived on Thanksgiving Day, 1960. On the flat, snow plain they found two wanigans - large sled-mounted boxes - brought from "old" Byrd. One was for sleeping, the other for cooking and eating. Also on hand were one bulldozer and a "Snocat."

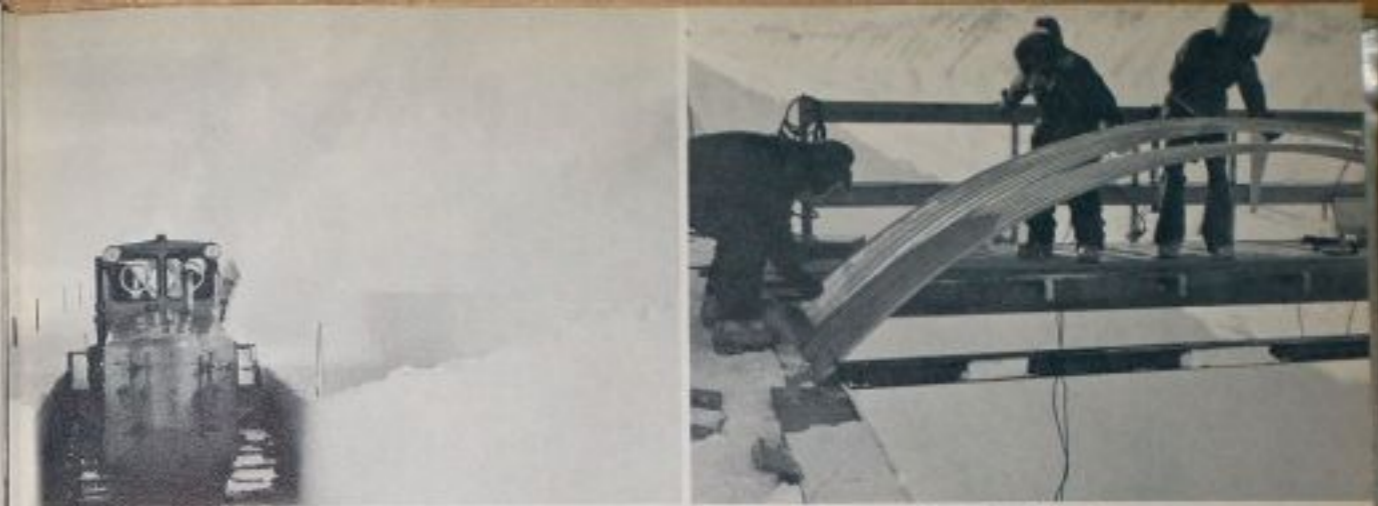
The Seabees immediately began work on what deVico proudly calls "the longest Jamesway in the world." Inside the 424 foot long hut are a garage, several shops, a sick bay, quarters for the 65 men, galley, chow hall, storage space, a small store and a recreation room.

Old Byrd Station, six miles away, is a dramatic contrast to the high, blue-white tunnels of the new station. Byrd was built in 1956 for the International Geophysical Year. (July 1957 to December 1958). The eleven buildings, originally built on the surface, are now buried by five years accumulation of snow. All have shoring to reinforce the roofs against the 8 to 18 feet of snow and ice above.

Lt Donald Walk, of the Navy Medical Corps, is military leader of the station for Deep Freeze 61. In spite of the tons of snow and breaking beams overhead, Dr. Walk is not worried about a sudden collapse. "We have learned that the cave-ins do not happen suddenly," he said. "The crushing is relentless, but slow. It occurs inch by inch and we can usually locate the trouble spots in time to brace them. We have not had, and do not expect, a sudden collapse in any building."

From the old Byrd Station many lessons have been learned that will make the new station far better adapted to Antarctica.

1. Buildings cannot support, or even touch, the surrounding snow. Observing this lesson will eliminate the major crushing and melt problems.
2. Operating in inland stations on air-transported diesel fuel for power and heat is an extremely costly procedure. New Byrd is slated for a nuclear power plant, the second to be built in Antarctica. This will generate 1000 kilowatts of electric power for lighting, heating and all other uses.
3. Surface structures cause heavy drifting. Except for three towers on stilts, the entire camp will be under the surface and cause no drifting.
4. Large quantities of waste and water cannot be drained underneath a building. Drains will carry water to areas not supporting any building. The heat of wastes will create a self-perpetuating melt pit in the ice cap.



Peter Snow Miller carves a trench in the Antarctic ice cap. This is roofed with steel arches.



The arched roof creates a snow tunnel. For wider work a special construction bridge is used. The finished work will contain buildings. Improvement over "old" Byrd Station tunnel is apparent.



HERCULEAN JOB PERFORMED BY C-130



First Navy Hercules to arrive in Antarctica is refueled at Williams Field.

Three "Grasshoppers"

Deep Freeze 61 brought the first Navy use of C-130 Hercules in Antarctica, a program which met with unprecedented success. During the first month of operation in Antarctica the ski-equipped planes turned in a "simply fantastic" performance, Rear Admiral David M. Tyree, Deep Freeze Commander, declared.

So amazing was this performance that the job assignment was increased from 400 to 1600 tons of cargo to be airlifted to inland stations. During one four day period of excellent weather the Hercules flew 20 missions to Byrd and South Pole stations, lifting a total of 302.6 tons of supplies and equipment.

In addition to being the largest aircraft ever to land at these two stations, the Hercules has set new records for short turn around times at these stations. The planes ability to lower its rear cargo ramp to sled-bed or snow level has been a great advantage in high speed loading and unloading operations.

Two of these Air Development Squadron Six "Herks" made the longest logistical flight ever undertaken in Antarctica. They flew a 3024 mile round trip from McMurdo to the Walker Mountains near the Eight Coast with 10,000 pounds of cargo and personnel for the establishment of a geological field camp.

Oct. 25, 1960...On the snow-crueted, southwestern edge of Ross Ice Shelf, a 280 pound "grasshopper" is hard at work for the Navy. The "grasshopper," a portable, automatic weather station, is one of six stations that are being installed during Deep Freeze 61.

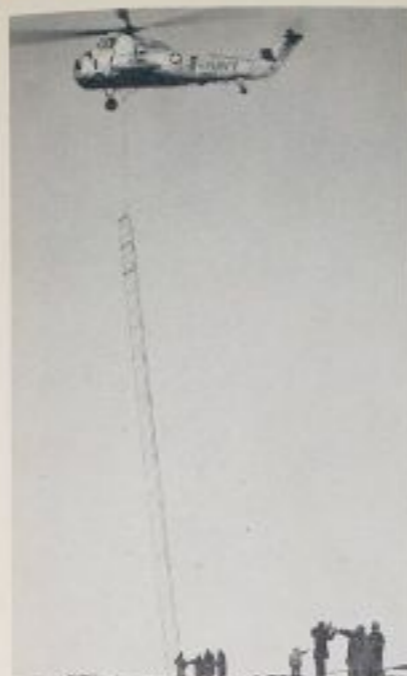
At intervals from 3 to 6 hours, the "grasshoppers" broadcast temperature, barometric pressure, wind speed, and wind direction.

The first "grasshopper" of the 61 season was installed on the Ross Ice Shelf halfway between McMurdo and the U.S. facility at Little Rockford. The second went in at the foot of the Beardmore Glacier, a third was located in Victoria Land.

Ski-planes and helicopters of the Navy's VX-6 provide the airlift for the installation of these stations. Sites for three new Ice Stations, automatic weather stations, dubbed "pinball machines," are Little America and on center of Ross Ice Shelf. One will be kept at McMurdo as a spare.

The "grasshopper" is battery-powered, and its mechanism is governed by a clock which turns the station on at a preset time. The machinery then selects the information to be transmitted, the transmitter is activated, and the station delivers its broadcast.

The station identifies itself, and then it tells the air temperature, the wind direction, the wind



Helicopter lifts 110 foot tower to an antenna site.

HUGE DEEP FREEZE COMM INSTALLATION STARTED

A major rebuilding and modernization program for the vital Deep Freeze Antarctic communications system began in the summer support season of Deep Freeze 61.

Rear Admiral David M. Tyree considers the two year, \$1,800,000, communications improvement program to be of the utmost importance.

Present Deep Freeze communications facilities and equipment were installed 4 to 5 years ago for U.S. participation in Antarctic research during the IGY. Today the Deep Freeze program has grown to such proportions that the communications equipment carried over from the IGY is no longer adequate.

Deep Freeze utilizes a communications network running from the U. S. through Australia, New Zealand, and the six million square mile Antarctic Continent. From the main Antarctic communications center at McMurdo, vocal, radio, teletype, facsimile and continuous wave - dot - dash - systems provide chain of contact for the inland stations, McMurdo, and the outside world.

The three outlying U.S. scientific stations are in continuous contact with McMurdo. Weather and scientific information is transmitted with request and replies concerning personnel and supplies.

The Navy's Indman 14 was assigned the job of installing the communications network. From Hawaii came 30 communications workers to perform the job.

Improvement of the air to ground, ground to air circuits were first to be tackled in the communications rebuilding program. More powerful transmitters, more efficient directional antennas, and better receiving equipment were installed, first at McMurdo, Christchurch, and on board the ocean picket ship, and then at the inland stations. On the overwater flights, communications with the aircraft through the New Zealand Civil Aeronautics Administration will be backed up with the installation of single sideband radio equipment on the ground and in the aircraft.

New navigational aids and automatic aircraft homing devices will aid aircraft in their flying of missions through Antarctic weather. The ground control approach (GCA) radar, now used as a foul weather landing aid by aircraft on the ice runway at McMurdo, will eventually be installed at the inland stations. A direct teletype circuit will be put through from McMurdo to Christchurch, eliminating the present requirement for several landwire relays in New Zealand.

By March of 1962, the Deep Freeze unit at Christchurch and U.S. stations in Antarctica will have new navigational aids, new buildings and more modern sending and receiving equipment.



Aid Weather Program

speed, and the barometric pressure. Present "grasshoppers" are capable of transmitting 400 miles for 2 to 3 months and up to 5 months with doubled battery power.

The new "pinball machine" Ice Stations are more accurate and reliable. The station is mounted on a six foot sled designed for land transportation. The Ice Station transmits over 800 miles for three months. Its more sophisticated mechanism will allow aerologists to activate the machine and receive weather broadcasts at anytime, rather than being restricted to pre-set schedules.



Standing: Farrest Dawling, geophysics, University of Wisconsin; Meredith Radford, CS1; Walter Davis, CMC; Major Antero Havola, USA; CWO George Fowler, USA; Edward Martens, RMCA. Kneeling: Marving Madlin, CM3; James Douglas, CMA2; S.F. Mahan, RM2; Willard Cunningham, CMH2; Henry Rosenthal, aurora, Arctic Institute of North America.

BYRD - SOUTH POLE OVERLAND TREK TRAVELS 800 MILES, 33 DAYS TO GOAL

Jan. 16, 1961...An overland tractor train successfully completed an 800 mile trek from Byrd Station to the South Pole today, after 33 days on the trail.

Led by Major Antero Havola, U.S. Army, the train delivered two 38 ton D-8 tractors to the U.S. South Pole Station. The powerful tractors will be used in maintaining a snow landing strip, assisting in station construction, and in retrieving air-delivered cargo.

The train, manned by 11 men, consisted of two D-8 tractors, two sled-mounted wannigan huts, three 20 ton sleds, one 10 ton sled, and two tracked weasel vehicles. One of the weasels, bearing navigator and trail blazer Chief Warrant Officer George W. Fowler, U.S. Army, led the procession. Ranging approximately one mile ahead of the rest of the equipment, Fowler was responsible for finding and marking a safe and accurate route for the train.

The traverse created two Antarctic "firsts." The party was the first American team to travel overland to the South Pole over an unexplored route. The tractors were the heaviest pieces of mobile equipment yet to arrive overland at the Pole.

Only three days of bad weather were experienced on the trip. The rest of the time temperatures ranged from about minus ten degrees to plus five degrees. The lowest temperature was minus thirty-three degrees.

Crevasses caused trouble on only one occasion. The two tractors with sleds in tow and the leader's weasel found themselves between two heavily crevassed areas, with no apparent means of exit.

At the request of Major Havola, a VX-8 Dakota scouted the area ahead. This information was radioed back to the party on the ground. The party moved ahead for about 10 to 14 hours each day and traveled at an average "speed" of better than three miles an hour.

Thus, these eleven became the first Americans ever to make an oversnow traverse to the Pole, and the fifth party ever to accomplish it.

Moving over an Antarctic area never touched by man, the limbering train traveled across Marie Byrd Land to the eastern end of the Horlick Mountains. Here, trail operations boss Havola turned his equipment to the south and climbed from 6,500 feet to 9,000 feet along a gradual upgrade to the South Polar Plateau.

Fowler took navigation sights three times a day and marked the semi-permanent trail with 12 foot, flagged bamboo poles at 1,000 foot intervals. In the future this trail could be used by other trains and for the possible transfer of construction machinery to the South Pole Station.



Rear Admiral B. W. Hogan, Chief of the Bureau of Medicine; Rear Admiral G. A. Rosso, Chief of Chaplains; T. M. Marrah, State Senator from Greenville, South Carolina, and Rear Admiral H. A. Kara, Director of Coast and Geodetic Survey arrive at Christchurch for flight to Antarctica.

visitors to deep freeze 61

Over 100 military men, reporters and other special visitors viewed operations of Deep Freeze. Some investigated special aspects of the operation related to their fields. Others were on hand to grasp the overall mission. From the newsmen a steady flow of newspaper stories, magazine articles, radio and TV programs told the story of the Navy in Antarctica to the nation.



Congressman Leo W. O'Brien of New York talks with Dick Jennings of NBC Monitor aboard Hercules enroute to South Pole.

Captain Jack Eady welcomes Vice Admiral James A. Hirschfield, Deputy Commandant of the United States Coast Guard, to McMurdo Sound.



H. H. Murray, ADC, of VX-6, shows the interior of a Hercules to Francis H. Russell, U.S. Ambassador to New Zealand; Cdr Chester Knowles, U.S. Embassy Naval Attache, and Blake Lanum, United States Information Agency.



Admiral Tyree greets Philip G. Law, Director of the Antarctic Division, Australian Department of External Affairs, after weasel ride from airstrip to McMurdo camp.



IN THE SUMMER, WHEN THE TEMPERATURE SOARS INTO THE MINUS TENS, M'MURDO HAS ITS TOURISTS.



Congressman Robert W. Hemphill of South Carolina and newspaperman Voit Gilmore, Southern Pines, North Carolina, check over map of Antarctica.



Sir Charles Wright of Canada and Father Brosnan, Catholic priest from New Zealand, look over stove and frying pan in wood hut built by explorer Shackleton in 1908. Sir Charles was a member of Scott's British Antarctic Expedition in 1911.



**staff personnel
task force 43**



Captain Edwin McDonald, Deputy Commander Naval Support Force Antarctica, on bridge of U.S.S. Edisto.



Above: Major James Foster, USMC, assistant air operations officer; Cdr Robert Thurman, assistant chief of staff for operations and plans, and Lt Col Merle Dawson, USA, special advisor on cold weather operations, at Little America V. Right: Major Antero Havala, USA, trail operations officer, and CWO George Fowler, USA, led an 800 mile tractor train from Byrd Station to the South Pole. Below: Larry Rummage, QMC, and Cdr John Goodwin, air operations officer.



operations and plans



Lcdr Leray Justman, ship operations officer.



Captain Jack Eady, Chief of Staff, is greeted by Cdr Frank Kimberling, Officer in Charge of Advance Headquarters.





Above: Lcdr Douglas Madison, Flag Lieutenant and Aide. Right: Deep Freeze visitor Rear Admiral D. W. Hagan is greeted by Lcdr James Corley, staff legal officer.



Captain Herbert Whitney, CEC, supervised site preparation for the McMurdo nuclear power plant.



Captain William Lanterman headed Deep Freeze weather program for the third year.



USARP atmospheric physicist John Brown receives a briefing from Lcdr Richard Dow.



aerology



Lcdr A. T. Buckmaster and William Horner, AG1, read McMurdo temperature.



Ltjg Glen Drummond at McMurdo weather office.

Left: Lt Ralph Fartenberry, MC, joined Task Force 43 after wintering over in Deep Freeze 60. Center: Lt Jack Potter, MC, at work in McMurdo sick bay. Right: Harvey Martin, HMC, in Christchurch dispensary.



Richard Dempsey, AG2, and Chief Aerographers Mate Robert McFetti with aerial ice reconnaissance chart.



Al Bennett, AG2, and Ed Dressler, AG1, check chart of ice in McMurdo Sound area.



logistics



Cdr John Haskell, assistant chief of staff for logistics, shows two young New Zealanders around Deep Freeze headquarters at Christchurch.



Lcdr Daniel Donahue and Lcdr Charles Paul.



Above: Lcdr David Feinman talks with Leonid Kauperov, Soviet exchange scientist. Left: Lcdr John E. Lynch, Jr. and purchasing clerk Jearl Echols.



Cdr Viggo Kiasterud, new assistant chief of staff for logistics, and Lt Harold Kellogg at work on advance plans for Deep Freeze 62.

Below: Lt Tom Monaghan, assistant staff logistics officer, and Lt Ed Anglin, officer in charge of Cargo Handling Battalion One.



Ltjg Darrell Maurer instructs New Zealand worker on Christchurch construction project.



Robert Lake, SK1, and Frank Band, SK1, do some spare time repairs.



Jack Dalton, SK1, and Donald Petemell, DKCA, go over purchasing forms.



Lcdr James Hahn with painting of Hercules over Ross Sea.



Capt Arthur H. Ashton, Deep Freeze Public Information Officer.

public information



Above: Nathan Joyner, JO3, at Christchurch PIO office. Left: Ltjg Steve Schmidt makes radio tape with Glacier helicopter pilot. Below: Gary Garnett, JOSN, and Jack Schelin, JO3, at work in McMurdo Pressheim.



Above right: Ltjg Denis Cliff interviews Lt Vic Young, officer in charge of snow compaction team. Above left: CWO Gerald Pagano, USA, and Leo Loftus, JOC, prepare to enter weasel. Right: NBC television team assembles their camera equipment on the McMurdo airstrip.





Above: Cdr James McShane, administration officer, in Christchurch conference room. Left: Sam Little, PNC, looks over orders with Donald Mills, YN2.



administration



Right: James Henderson YN2, shows Deep Freeze key ring to Wilfred Bell, SK2. Below left: John Silva, SN, helps out in PIO office. Below right: Martice Wise, ET2, and William Kilmer, PNSN, in McMurdo staff office.



Lcdr Robert E. McCloskey checks out morning traffic.



Raymond Foster, YN1, and Larry A. Thorstenson, YN1, look on as H.B. Moore, YNC, explains the routing system.

rep washington



Jim Cummins, YNSN, and Robert Britt, SN, look on as Oscar Brown, SN, demonstrates the use of a thermofax machine.



Travis Thompson, RM2, Robert L. Webb, RM1, and Bill Diamond, RMSN.

William A. Thompson, SP5, USA, and John B. Wheeler, YN3.

Ernest J. Malboeuf, YN3.

Otha L. Smith, AK2.



photography



Cdr Wilson Cremenwett, photo officer, steps off Super Constellation upon return from Antarctica.

Above right: CWO Max Diegleman in Christchurch photo lab. Kennard Johnson, PH3, washes print. Below: Representing the photographer's constant battle with Antarctica, three men climb Observation Hill to take a panoramic shot of the surrounding area.



Above: Burrill Dreifke, PH2, adjusts lens on aerial photo enlarger. Wearing Antarctic parka is Tom Taylor, PH2. Above right: Jack Leonard, PH1, shoots movies during McMurdo snowstorm. Right: Milton King, PH2, in Christchurch supply room.



communications



Ens Richard Page and Ens Harvey Strine on voice circuit.



Cdr Richard Cross, communications officer, in McMurdo comm center.



Chester Traczyk, ETCS; Charles Ryan, RM3, and Thomas Williams, RMC, at teletype.

Rudolph Littleton, RM1, checks message form prepared by Arthur Ellison, RM2.



William Lowe, RMCA, talks by single sideband to McMurdo.

Ltjg Ray Shannon and Ltjg Peter Lettenberger at Christchurch communications office.



CWOC. D. Ransdell, Ens Vern Rochelle and John O'Neill, ETSN, look through electronic parts catalog.



E.L. Parker, Jr., RMC, at Christchurch receiving tower.



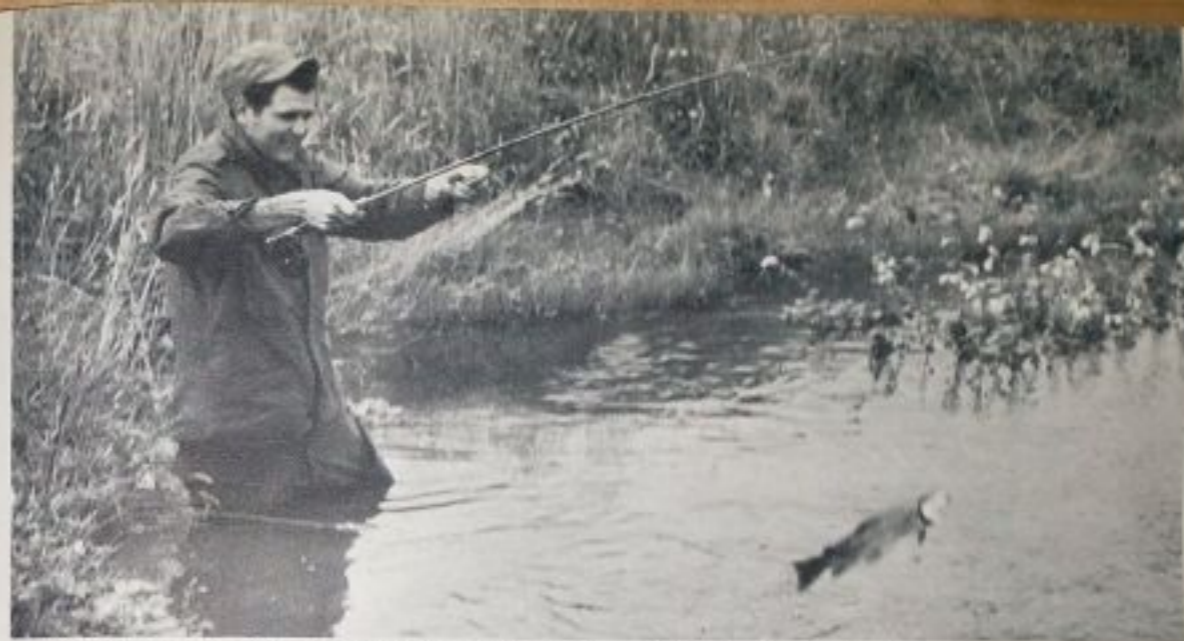
Dennis O'Leary, RM2, and Leonard Maskin, RM3, with punched tapes used for transmitting messages.

Top: Everett Suchland, RM3, at teletype. Center: Wayne Amas, RM2, talks to McMurdo. Bottom: Frederick Rainville Jr., RM3, sends out a message.



(Standing): Dallas Oglesby, RM2; Alvin Bowers, ETN3; (kneeling) N.P. Faltz, ET1, and Harry Hicock, ET2, with single sideband equipment.

Thomas Molineux, RM2, and Howard Gable, RM1, in sideband room.



Richard S. Meyer, CS1, takes advantage of excellent trout fishing in New Zealand.

Miss Terry Perkins, switchboard operator at the Advance Headquarters Building, Christchurch, N.Z.



Edward Kingen, BMC; Robert F. Henry, PHC, and Chester Siegers, CSC, celebrate their advancement in rating. Bernardino Pascua, TN; Mariano Cabestante, TN, and Agripino Ebitner, TN, listen to music during their off hours at NAF McMurdo Sound.



Miss Patricia Oldfield, typist, at work in the Public Information Office in Christchurch.



Senior Chief Yeoman Andy Demnisky in flag office at Christchurch.



Nick Reynolds and Bob Shane of the Kingston Trio receive penguin key chains from Commander Frank Kimberling, Officer in Charge of the Advance Headquarters.



Captain J. A. Eady, presents Brevenido R. Librojo with an advancement in rating certificate which promotes him to store-keeper third class.

Edward P. Koester, PC3, and William L. Simmons, PCC, sorting the mail at Christchurch office.

Esteron Isabelo, TN; Alva Manuel, TN, and Pascua Bernardino, TN, serve chow in the Commissioned Officers Mess at Christchurch.

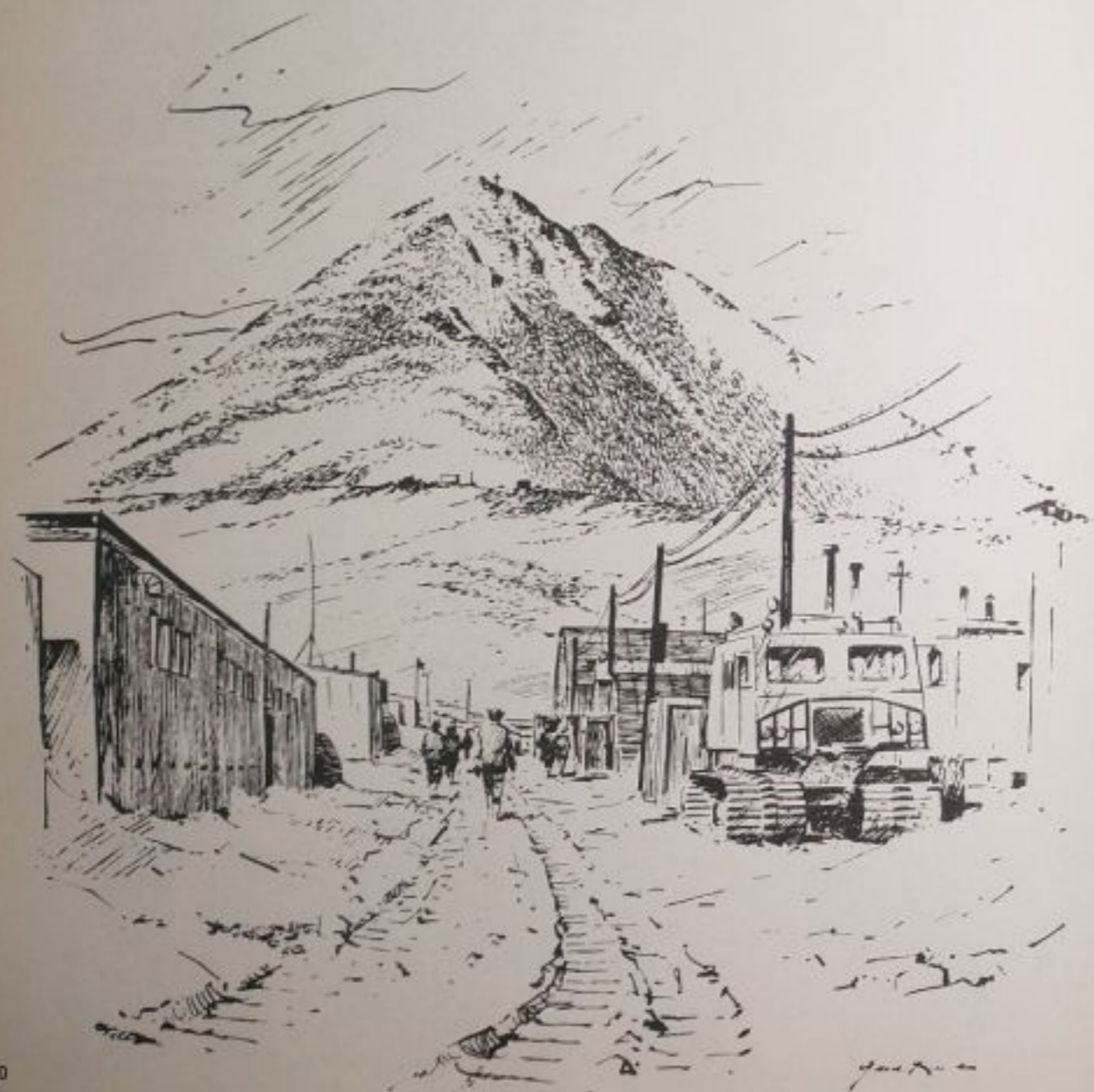


Mrs. Taker of the Canterbury Dachshund Club, Christchurch, with "Danna Mia" an eight month old dachshund pup. The pup was donated to the men of NAF McMurdo Sound by Mr. F. J. C. Dann, Jr., also of Christchurch.



Maori dancers perform at the enlisted mens' club at Christchurch.

antarctic support activities



the mission of antarctic support activities

Get it Done!

Pack it, stack it, load it, ship it. Then build it, drive it, live in it or baby it. Keep it operating in support of America's scientific program in Antarctica.

Antarctic Support Activities breaks down into two major groups - wintering over and summer support.

A hardy band of two hundred or so spends each Antarctic winter night providing base support at the four American stations. They build, operate, repair, maintain, cook, doctor, and generally see to it that each station's scientific program can be carried out.

The Commander, Antarctic Support Activities,

operates from McMurdo Sound. He is responsible to Commander U. S. Navy Support Force Antarctica, for all phases of the support function on the ice during the winter months. This includes the re-ordering of supplies and equipment for the next year.

Back at the CB Center in Davisville, R.I., summer support personnel and the newly forming wintering over element train, study and work to get ready for the opening of the operating season in October.

ASA is a mixture of Seabee and general service Navymen, welded into a unit which has a giant job to do - and does it.

Cdr Lloyd Bertoglio, Radm David M. Tyree and Cdr J. J. Brosnahan at change of command.

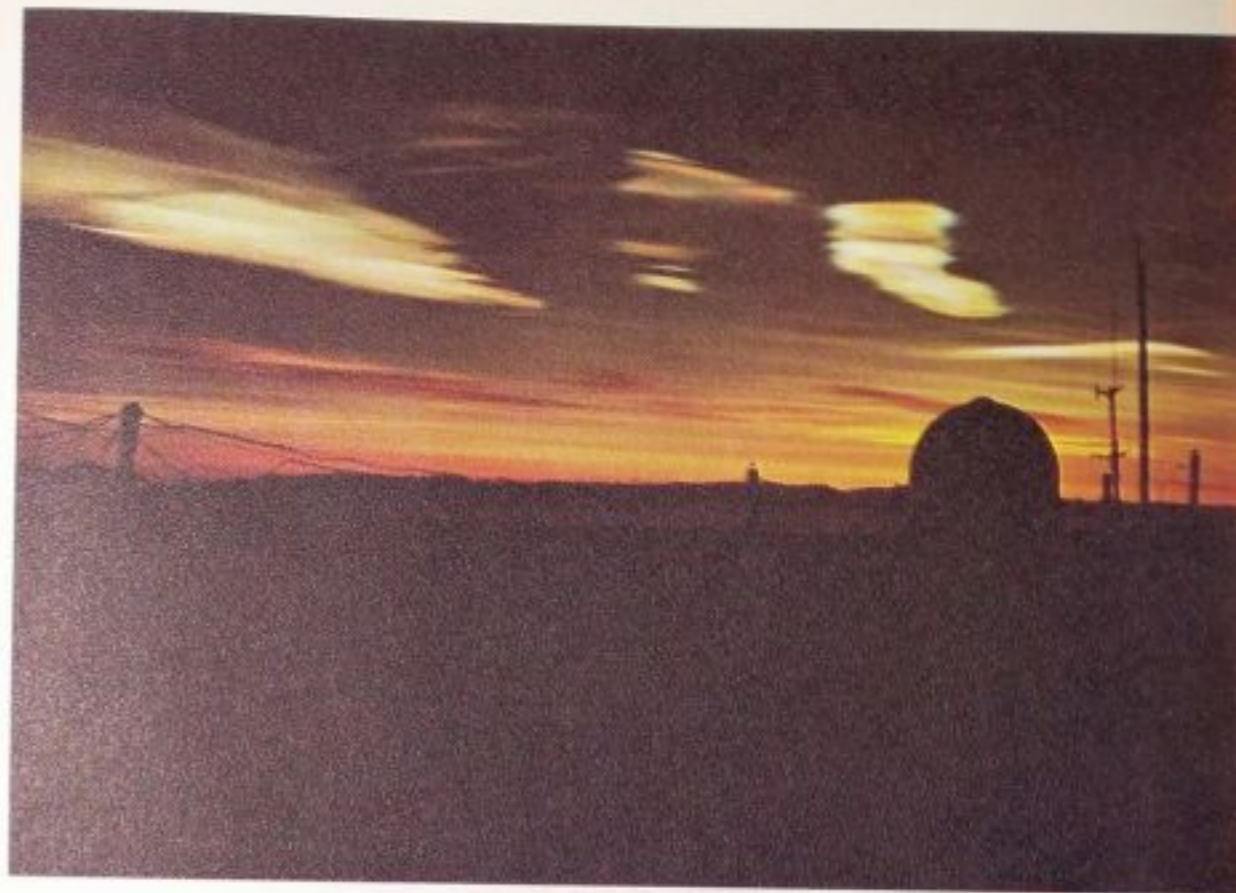




Commander James J. Brosnahan, Commander Antarctic Support Activities; Commanding Officer Naval Air Facility, McMurdo Sound; and leader of the Navy wintering over party during Operation Deep Freeze 61.



Lieutenant Commander Cornelius B. De La Vergne, Deputy Commander Antarctic Support Activities and Executive Officer Naval Air Facility, McMurdo Sound.



antarctic
support activities
personnel



Cdr James J. Brosnahan, Commanding Officer, and Lcdr C. B. De La Vergne, Executive Officer, look approvingly at the new sign on Nimitz Hall.



Gilbert J. J. Hawkins CMCS, chief master-at-arms at NAF McMurdo Sound, gives instructions to Cyril J. Brothwaite BURCN.



Daniel A. Gallagher, YNC, reviews the personnel records of the officers and men of ASA.



John H. Farman, CMCA, is reenlisted by Cdr J. J. Brosnahan.



(Left to right): Stephen L. Kostielney, PN3; Jerold B. Jones, YN3; Anderson N. McMinn, PN2, and Frederick N. Sou, PN2, processing transfer orders.

Charles C. Williams, EO1, standing JOOD watch.



Stephen L. Kostielney, PN3, operating switchboard at NAF McMurdo Sound.



P. A. Remillard, PCC, and T.E. Cook, PC2, gaze at the pile of mail bags which could not be sent out because of the grounding of Deep Freeze 61 aircraft due to a magnetic storm.

air operations and aerology

The most exciting and critical moments during Deep Freeze 61 were found in the GCA control room at Williams Field, where pilots were released and landed under some of the Antarctic's most severe conditions. A high state of readiness was required by all the personnel to meet the ever flexible schedule of air traffic. Included under this broad scope were the crash crew, fuel handlers, McMurdo radio operators, GCA controllers and electronic technicians. In no less respect was the mammoth job of moving snow clear of runways for preparation of arriving aircraft. A tribute to runway maintenance is seen by the successful efforts of maintaining a serviceable runway through the weeks of the greatest ice deterioration. Another Antarctic first!

Meteorology works hand in hand with Operations in issuing area and terminal forecasts to ships and pilots, as well as providing enroute weather forecasts for flights to Byrd, Pole, Hallett, Beardmore, Little Rockford, Christchurch and the many areas covered by photography flights and scientific parties. It maintains a continuing program of twice daily rawinsondes of the upper air, obtaining data on temperature, humidity, and wind speed and direction to altitudes over 100,000 feet, along with making surface synoptic observations hourly.

Lawrence I. Van Loan, AG2, James M. Romano, AG1, and Paul A. Heifner, AG3, check and align the large rawinsonde antenna.



Lt William H. Keith, meteorological officer, analyzes a weather map prior to making the daily forecast.



Lt Cleland V. McBurney and Aron C. Hart, ACCS, use GCA scope to locate incoming aircraft.



Gary E. Signor, AGAN, makes entries on a weather chart while Roger S. Smith, AG2, and Elmer H. Smith, AG1, check Antarctic weather conditions.



Robert R. Allen, ACT1, controls aircraft traffic from Williams Field GCA Tower.

Above: Cecil R. Hall, ACT2, and Audie J. Mulkey, AC1, keep in contact with aircraft flying Antarctic missions from NAF McMurdo.

Right: Members of the crash crew, A. S. Tache, CN, and V.S. Adams, CN, stand by, on the ice runway at Williams Field.



communications



Joseph L. Proctor, RM1, and Rodney C. Roberts, RM2, working in the communications building.



Lt Robert D. Brown, communications officer, checks incoming messages.

The Communications Department of Antarctic Support Activities at NAF McMurdo Sound, together with its tributaries at each American station, comprises the nerve center of Operation Deep Freeze. Each day, twenty four hours a day, messages are received on the circuits. A scientist needs information, supplies vital to the successful operation are requisitioned, a doctor wishes to consult a colleague, a field party reports important findings, ship schedules and aircraft movements flow through the Communications Center to allow the coordination of the success-

ful assault on the world's most unknown continent. Contact is maintained with expeditions of other nations, exchanging vital weather and scientific information. The link with the outside world is maintained through the Naval Communications Station, Balboa, Canal Zone, and Civil Aeronautics Authority, Musick Point, Auckland, New Zealand. Radiomen man the circuits, and electronics technicians keep the equipment in top shape, working smoothly together to maintain an efficient end to the Naval Communications System in the frozen wastes of the Antarctic.

Larry L. Johnson, RM3, and Ernest Norrie, RMSN, working in the communications building.



Helicopter helps raise a 110-foot rhombic communications tower.

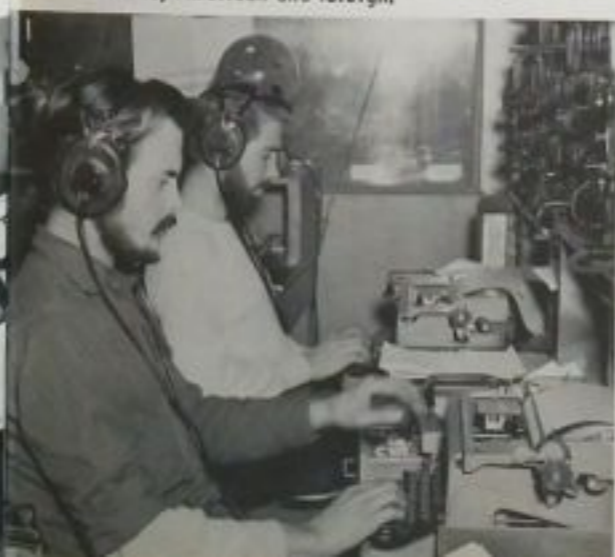
Left: Doyle R. Cox, RM3, tunes in a radio receiver while F. Steadman, RM1, copies an incoming message.



Daniel A. Gallagher, YNC, picks up daily messages from Donald C. Drum, RMCA, while Gwen A. Thompson, RMCA, types incoming messages.



Charles A. Powell, RM2, and Robert L. Samuel, RM2, receiving messages from other Antarctic stations, American and foreign.



James B. Walker, RM2, talks to Christchurch over single side band while James A. Howell, TERM1, prepares to transmit a weather chart on the facsimile machine.





The home of KC4USV

ham shack

One of the greatest morale boosters to the men at McMurdo was the ham station KC4USV. Operated the entire year by volunteers, this ham station maintained schedules with a large number of ham operators throughout the United States, allowing the men of Deep Freeze 61 to talk with their wives, children, parents, and loved ones throughout the year - the only means of personal communications during the winter months of no mail.

Radio operator Martin C. Smith, RM1, instructs "Rival," his Antarctic husky, about the proper use of the ham gear.



CWO Gerald Pagano speaks to his parents with the help of radio operator Arthur G. DuFour, CE1.



electronics

The men in electronics are few, but on them depends the maintenance of electronic equipment necessary for the successful operation of communications and operations. The small amount of time that equipment was inoperative throughout the year attests to their skill.

Lt R. D. Brown and P.R. Wick, ET2, working on the Navy's first "pinball" automatic weather station



Williams Field GCA radar antennas.



Roy J. Whatley RM2; Paul R. Wick, ET2, and James L. Hawthorne, ET1, trouble shooting in the electronic repair shop.



Towle cargo is placed on sleds for transportation to McMurdo.



Lt Louis K. Bruyneel, supply officer, checks over requests for supplies from outlying stations.



Ltjg Steven C. Lamphear, disbursing officer, makes a final money count after payday.

supply

Back in Davisville, supply ordered, received, and packed what seemed like a mountain of supplies and provisions. In a period of a few short months these were to be unloaded from ships and planes, unpacked and placed into use. They hoped nothing had been forgotten, because for ASA resupply is a onetime shot. The storekeepers - what a versatile lot they

proved to be - there was hardly a job they could or did not perform. The "Goodies" in the ship's store kept the operator really busy to keep up with the demand.

Hey there! Yes, disbursing was ready to provide top service at most any time, whether day or night.

Keeping everyone in clean clothes was no small task, but the laundry came through in fine style.

While in many cases it is said that man "eats to live." Just the opposite was true here at McMurdo, for the men "lived to eat" - a fitting tribute to the job done by the cooks.



Donald L. Archibald, SK2, cuts a stencil of the weekly menu in the supply office.

George L. Draffin, DK2; Benjamin McElroy, DK2, and Juanito G. Mosulit, DK2, discuss a correction on the payroll.



Lewis A. Mills, SK2, purchases a camera from the ship's store at NAF McMurdo. Behind counter are Benjamin McElroy, DK2, and Bill D. Waldridge, SH1.



Richard C. Hadley, SK2; James F. Pitts, SK2, and Lowell R. Huff, SK2, stack barrels of aviation gasoline outside one of the cargo supply buildings.



C.D. A. McCoy, SK1, and L.A. Guffy, SK3, utilize every available space for new supplies.

Frank Houser, SKSN, and R.C. Hadley, SK2, stow gear on warehouse shelves.

Ceek R. Tillman, SH1, in the midst of washing some of the 650 pounds of clothing processed daily at the laundry at NAF McMurdo.



Morris Maudal, SK3; Louis Mills, SK2, and W.A. Robinson, SK3, unpack some of the supplies that will sustain the operation over the long winter.



Daniel L. Eacret, CMACN, and Clifford G. Goulin, BULCN, preparing noon meal.



James Nicholson, CS2, looks quite satisfied with his work.



Charles J. Pavlischak, CS1, prepares fish for the Friday noon meal.

mc murdo galley



Richard Schieren, CN, and Delbert L. Means, UTWCN, keep up the supply of clean utensils during the rush hours.



William F. Thompson, CS1, takes freshly baked bread from oven.



M.S. Massaro, CS2, working at his specialty.



Monroe L. Clark, HM1, assisting Lt Lowell T. York, MC, with a minor operation.

Shannon J. Braddock, HM3, and Paul D. Buckley, HM3, pack first aid kits to be used on scientific trail parties.



Left: Gerald H. Rociot, DT2 cleans the teeth of a patient at NAF McMurdo. Right: Lt Thomas M. Allensworth, MC, gives a patient a through check up.



medical and dental

The wintering over medical department personnel includes the Medical Officer (a Naval Flight Surgeon), the Dental Officer, and two hospital corpsmen. During the summer this group was augmented by two additional corpsmen, who served as part of the crash crew at Williams Field, and a dental technician.

In addition to medical care of naval and civilian personnel at NAF McMurdo and Scott Base, veterinary service for the dog teams at Scott Base is provided.

Complete dental care including prosthetics is provided.

In the early part of the season the medical facilities at McMurdo, Pole and Byrd were inspected by the then Chief of the Bureau of Medicine and Surgery, RADM Bartholomew W. Hogan, MC, USN.



Navy CB steelworkers place a steel arch into place as they construct YX-6's hangar.

public works



Archie E. Johnson, BUC, Lt Horace B. Jones and Lt Charles W. Gates plan construction of McMurdo Bowling Alley.



CWO Philip A. Wagenschur chats with Jack W. Cousins, MR1, in the machine shop.



Douglas J. Marvy, SV3, and Thomas B. Nelson, CN, complete a layout drawing of NAF McMurdo Sound.



Robert H. Clary, EM1; Carl D. Melton, CEW3; Jerry E. Harrington, EM2, and Melvin E. Lash, EM1, keep up the power supply at NAF McMurdo.



Charles T. Jones, UTP2, and Darrel Gregory, UTCN, repair water heater.



John P. Hauser, EOH3, offers a warming cup of coffee to Gene R. DeLong, EOH3.



Lt Horace B. Jones congratulates Franklin E. Ford, CMH2, upon his receiving a medal of commendation award.



Robert V. Priest, EON3, wipes snow from the window of a pettibone tractor.



Nella A. Bambini, UT1, and Joseph L. Sutorus, UTP2, repair a jet heater.



Edgar C. Williams, CEC, instructs Arthur R. Kibler, CN, and Joseph L. Fitzpatrick, CES3.

Thomas R. Nelson, CMA2; Leo E. Barlow, CMH3; and Emmett C. Guest, SCMH3; take a break while working on a D-4 tractor.



Kimball J. Cox, CMA3, and Donald W. Fellows, CMH3, learn from Charlie A. Parker, CMA2, the reason this D-4 broke down.





A new 250,000 gallon fuel tank being constructed at NAF McMurdo Sound.



Larry L. Pease, BUL2; Allen W. Kruger, BUH2, and Larry L. Ely, BU3, put in a new ceiling on one of the storage buildings.



Robert D. Brown, BUL3, Raymond L. Smith, CN, and David R. Snyder, CN, repair a tail gate of a twenty ton sled.



Jerry Bogle, BUL1, repairs a door handle in shop area.



Charles Elmore Jr., EON2, receives instructions from Thomas L. Gibbon, EOCA.

Frederick E. Kleinwaechter, EON3; William J. Underwood, EON3, and Thomas M. Johnson, EON3, prepare to start up a D-8 Caterpillar at the beginning of the day's work.



Arthur G. DuFour, CE1, and Wayne J. McCarthy, CEW1, repair an electric motor.



Maynard K. Everett, BUH3, and Lionel W. Morrisette, BULCN, sawing a floor plank to size.





The men at Williams Field live in Jamesway type huts shown here during construction.



James W. Lee, CN; William J. Underwood, EON3; Joseph L. Sutorus, UTP2, and James R. French, EOH2, stacking empty fuel drums.



Carl E. Churchwell, SW1, puts up metal siding on a new hangar. Assisting him is Carl Hinson, SWE2.

Richard M. Klinger, CMH3; Terry W. Padgett, CMA3, and Clyde R. Burkett, CMA3, do their best to put this D-4 back on the road.



Franklin E. Ford, CMH2, passes a wrench to John C. Donner, CN, while working on a D-5 tractor-cavator.



Above: At Williams Field two giant Hercules await loading of cargo for delivery to inland stations. Left: Snow for the water supply at McMurdo is hauled 24 hours a day from a nearby hillside and dumped into the melter.





Mr. Gene Klebe from Bristol, Maine, sponsored by Navy Art cooperation and liason committee, preparing a series of sketches showing the Navy's role in Deep Freeze 61.



Some of the men at McMurdo Sound requested sheet music through the New York Herald Tribune. Here they are in the lobby of their hut with a small part of it sent them by readers. L/R W.E. Steadman, RM1; R.D. Peruchetti, EN1; C.V. Pavilachak, CS1; J.L. Hawthorne, ET1; V.W. Gerken, SF1, and J.M. Romano, AG1.

James H. Ankrom, CMH2, presents the keys of new weasel that he helped reconstruct to Cdr James J. Brosnahan.

Below: Ltjg Steven C. Lamphear, disbursing officer, holds the cake given him by his fellow officers in honor of his promotion from Ensign. Enjoying the occasion are Lt C. V. Mcburney, Lt H.B. Jones and Lt T.M. Allen-sworth.



Left: Marco Billante, PH2, and Jerald B. Jones, YN3, took time out for fun and produced "Willie Kool."

A surprise birthday party for K.E. Mietner, EON2, was held in sickbay. On hand were A.E. Johnson, BUC, (also celebrating his birthday) Cdr J.J. Brosnahan, and Lcdr C.B. De La Vergne.





Lt Gene Andress, chaplain, and Donald L. Archibald, SK2, select a recording to play on the hi-fi set at NAF McMurdo.

chapel

Everyone who comes to McMurdo is impressed with the serenity of the chapel "Our Lady of the Snows." In it are held services for all denominations, with Protestant Sunday services being held by Chaplain Andress. Visiting Catholic priests conduct Mass, while rosary services are conducted by the Catholic lay leader.

In it is found the fine high-fidelity music center where personnel can listen to a wide variety of music.

Interior of Chapel. Rev. Edward J. Brosnahan, Roman Catholic priest from New Zealand, is conducting services.



outlying stations



Gene Andress



byrd station



Lt Donald R. Walk, MC, O-in-C of Byrd Station also is post-master and manager of the ship's store.

There's always time for a coffee break - R.J. O'Neil, UTP2; J. M. Paar, CMI; D.M. Young, EOH3; E.E. Sweatt, CEP3, and J. Vito, ET2.

Byrd Station was built during Deep Freeze II. In its fifth year it has begun to show the strain of the tons of snow that has accumulated on its roofs. Though the station was designed to accommodate only 25 persons, at times its population has exceeded 80. Byrd Station will move in future Deep Freeze Operations to "new" Byrd, commenced during the 1960-61 summer operations.

C-130 and C-124 flights have air-freighted thousands of tons of supplies to Byrd in support of its scientific programs. The first American land traverse to reach the Pole arrived at that base 34 days after having departed from Byrd.

S. Kidani, Indman 14; Charles A. Kirby, RMCA, and K. Nishimura, Indman 14, check out a new transmitter at Byrd Station.



Ice and snow accumulations are removed from the tunnels with the use of sleds.



Byrd Station's new sick bay.

Lt D.R. Walk, M.S. Massaro, CS2, and R.E. Griffith, CS1, watch R.J. O'Neil, UTP2, cut his birthday cake.

Charles H. Kirby, RMC, receives a message at communications.





Above: Mail call—probably the biggest morale factor in the Antarctic.

Right top: Dr. Walk inquires about the radiosonde equipment operated by two weather bureau meteorologists.

Right bottom: D. M. Young, EOH3, and J. Vito, ET3, haul supplies through one of the tunnels at Byrd Station.

Below: Time for rest and relaxation at the Christmas Eve bingo game.



new byrd



Above: George A. Lewis, BUR 3; Warren W. Brown, BUL3, and Joe L. Crawford, BUL3, scrape loose snow from tunnel walls to keep them smooth.

New Byrd Station work was started on Thanksgiving Day when 12 men and the officer-in-charge arrived by VX-6 C-130. Growing quickly to a full strength of 65 men, the new Byrd summer support detachment finished three major tasks: completion of their Jamesway construction camp, assembly of two Peter snow milling machines flown from Switzerland and completion of five major tunnels of the new undersnow camp.

The tunnels, which will eventually house an entire station, are each 300 feet long, almost 30 deep and vary in width up to 40 feet wide. All are covered with steel arches and fitted with escape ventilation shafts. Buildings will be erected inside the tunnels. A nuclear power plant is scheduled in the future.

The "longest Jamesway in the world" is 428 feet long. It houses shops, storage and living spaces for new Byrd construction crew.



Ltjg David deVicq, CEC, O-in-C of new Byrd construction, discusses excavation of a tunnel with Emilio A. Delson, EO2.





The men who performed the construction at new Byrd Station.



Fred S. Crumbliss, CMA3; Jerry E. Butler, CMH2, and David E. Williams, EOC, repair the clutch from a disabled snow cat.



Jerry Vanderberg, HM2, bandages the injured finger of William J. Franlich, EOH3.

scenes of new byrd construction



Above: Gary S. Lichtenberger, BUL3; Jerome S. Becmer CN, and Warren E. Brown, BUL3, prepare wall studs for the undersnow buildings at new Byrd.



Right: Ronald J. Poniewaz, BUR3, and Robert J. Niedermayer, BUL3, open one of the passageways which connect the large tunnels.

Charles W. Dawkins, CN; Billy L. Talbert, BUL3; Dudley W. Maxfield, BUL3, and Ronald J. Poniewaz, BU2, assemble wondor arch forms which cover the tunnels of new Byrd.





Lt P. K. Swartz, MC, OinC of Pole enjoys a meal with Robert J. Boll, ET2.

Life at the station at the bottom of the world depends on the supplies flown into it by the planes of VX-6 and the Air Force during the summer operating season. Again during Deep Freeze 61 supplies were dropped by parachute from Air Force C-124s and delivered by huge ski equipped C-130s of VX-6. This year over seven hundred tons of supplies were delivered by airplane. Because of the high altitude of this station and extreme cold, the physical job of hauling, unpacking, and storing such an amount of material presented an exhausting work load on the limited number of men, but the job was done in record time.

One of the exciting events of the year was the arrival of the tractor train led by Army Major Antero Havola, 34 days after his departure from Byrd.

The Navy wintering over crew at Pole station: L/R(back row) Lt P. K. Swartz, MC; John L. Wellings, UT1; James W. Brown, CE1; Lawrence W. Glover, BU1; Charles N. Wegner, CS1; Joseph R. Cornely, RMC. (front row) James B.B. Jones, RM2; Jose M. Gomel, CMH2; James C. Peterson, EON3; and Robert J. Boll, ET2.



south pole station



E.S. Palaszewski, BU1, and J. R. Wardensk, BULCN, relaxing in the ham shack.

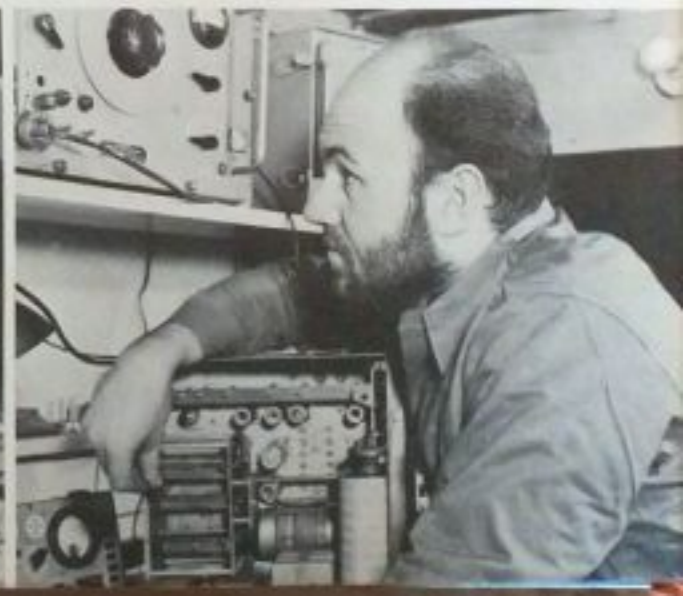


The men at Pole station live beneath 10-15 ft. of ice and snow. Each compartment is connected by one or more tunnels.

Charles Wegner, CS1, carves roast turkey for Christmas dinner.



Robert J. Boll, ET2, performs maintenance on a radio receiver.





C-130 Hercules aircraft are the main source of supply for Pole Station.

Right: John Wellings, BU1, ascends from an underground tunnel to surface. Below: James B. Jones, RM2, and Joseph R. Cornely, RMC, are in contact with radio stations all over the world.



Gary Signor, AGAN, checks wind velocity and direction at Beardmore.



Little Rockford is visited by Chaplain Andress and Lt Keith, ASA meteorological officer. L/R: Lt Gene Andress, chaplain; Larry Johnson, RM3; Larry Van Loan, AG2; A. Ewert, CMA2; Roger Smith, AG2; Robert Costa, AG2; Charles Lauter, ET2; C. M. Eakle, AG2; Elmer Smith, AG1, and Lt William Keith.

Cdr Manson Krebs watches Thomas Badger, RM2, send local weather report to McMurdo.



beardmore and little rockford

The Auxiliary Air Facilities Little Rockford, located at mile 240 of the Army-Navy Drive and Beardmore, at the foot of the mighty Beardmore Glacier, have the primary responsibility of providing three hourly-surface weather observations and upper air and wind soundings. Little Rockford takes two rawinsondes daily and Beardmore two pibals daily.

Little Rockford, the larger of the two with six men, consists of a group of four wigwags and a radome protecting its weather radar.

Beardmore consists of a Jamesway designed to house three men, but the season saw as many as 15 Navy and USARP personnel using its facilities.



Joseph H. Dudding Jr., CMA3, takes his turn as duty cook at Beardmore.



hallett station

Hallett Station, a joint US-NZ site, lies at the foot of a spectacular range of mountains approximately 1700 miles south of New Zealand and 450 miles north of McMurdo. Cape Hallett is a penguin rookery; the human activity hasn't disturbed these natives of the Antarctic from their summer home.

Due to its northern location, aircraft landings on the ice of this bay are only possible in October and November before the ice goes out. Ships supply the base later in the season.



George Allen, ET1



Jack Cummings, RM2



Dan Dougherty, AG2



Pat Lee, EM2



Reday Krieger, AG2



Chuck Rogers, AG3



Lt Joseph A. Kelly, MC, officer in charge, standing beside newly built trough that is collecting water from a melting glacier at the rate of 30 gallons a minute.



A Navy helicopter from Staten Island leaving Hallett.



Adam Sosnowski, UT1



Dale Sheldon, RM1



air development

squadron six (vx-6)



VX6 Hercules cargo being unloaded at McMurdo airstrip.

Air Force Globemaster disgorges Air Devron Six helicopter flown from U.S.





CDR LLOYD E. NEWCOMER
Executive Officer



RADM Moore, COMFAIR/Quonset,
holds annual administration in-
spection.



CAPT WILLIAM MUNSON
Commanding Officer



Below: Lt Garret M. Dyer, center,
inspects survival gear with mem-
bers of Deep Freeze 61 Det Alpha
at Quonset. From left are Lt
Samuel W. Clayman; Jacque T.
Bailey, AMSC; Lcdr Lewis E.
Helms, Officer in Charge; and Lt
Donald W. Roo, Jr.



Detachment VX-6 Quonset during squadron's deployment. From left James J. Curtis, AT2; Edwin M. Garnsey, AK2; Wayne D. Adams, PH3; Gerard P. O'Hara, SN; Robert L. Wood, AT1; John E. Buckley, SN; John E. Vivian, AK1; Donald C. Legere, YN1; Phillip L. Edwards, DT2; Gerald J. Cronin, ADR1; Jerry W. Austin, ADR1; Floyd W. Price, PN2; and Wilbert Dearing, ADR3; Seated: William H. Rozell, ADJC; Lcdr Robert L. Rice, Officer in Charge; Lcdr Albert Cappazoli (DC); and Ltjg Walter L. Loanam.



Artist Gene Klebe's sketch of Capt Munson



Gerald L. Barrie, SH2, explains a survival tent during a Quonset display



Cdr Elbert B. Binkley



Above: Gerald R. Livermore, YN3, and David N. Taellner, YNSN, start the paper work required to get the squadron south.

Left: John Vivian, AK1, Arthur L. Roberts, AKC, and Dale A. Wooten, AK2, are absorbed in ordering supplies.



Lcdr Robert L. Rice, Oinc Det Quonset.

Lcdr Lou Helms, Oinc Det McMurdo



Capt Maurice A. LeBas, USMC.





Filling rubber life to test for leaks, Richard R. Spaulding, PR2, grabs the attention of William E. Padgett, AT1, and David A. Chmielicki, AE2, as Wilbert Dearing Jr., ADR3, lends an assist.



Ground handlers prepare to launch a balloon for a skyhook aerial retriever test at Quonset. Neptune retrieving gear snags the line. In real use end of line holds 2 harnesses to pick up a man.



Andrew N. Halsemer, USMC, is almost lost in the port engine of an R4D-8.



John D. Mitchell, ADC, works on a helicopter with an assist from a civilian worker.



VX-6ers between classes at Marietta: Anthony A. Pautenis, ADC; Ltjg Loonam; Richard Rupp, AM1, and Ken Marriam, AM1. Three Aviation Storekeepers unidentified.

At Lockheed, Marietta, VX-6 men attend a number of courses on the C-130BL. From left are Edward J. Cavanaugh, AEC; Herman A. Schaepe, AEC; George Kovach, AE1; Charles L. Burton, AE1; John J. Eanetta, AE1; David A. Chielecke, AE2; Dennis C. Beutler, AE2; Charles R. Richards, AE1; and Robert L. Miller, AE2.

Kenneth R. Starr, Jr., AT2, and Ray W. Shepard, AT2, find plenty of work to be done before deployment.

VX-6 men attend a power plant course at Marietta.





Lcdr Albert A. Capozzoli, DC, VX-6 Dental Officer, gives William Bentley, AD3, a novocain shot while Phillip L. Edwards, DT2, stands by.



Arnold E. Tilley, PH2, checking in with Lt Andrew Pardue, VX-6 flight surgeon.

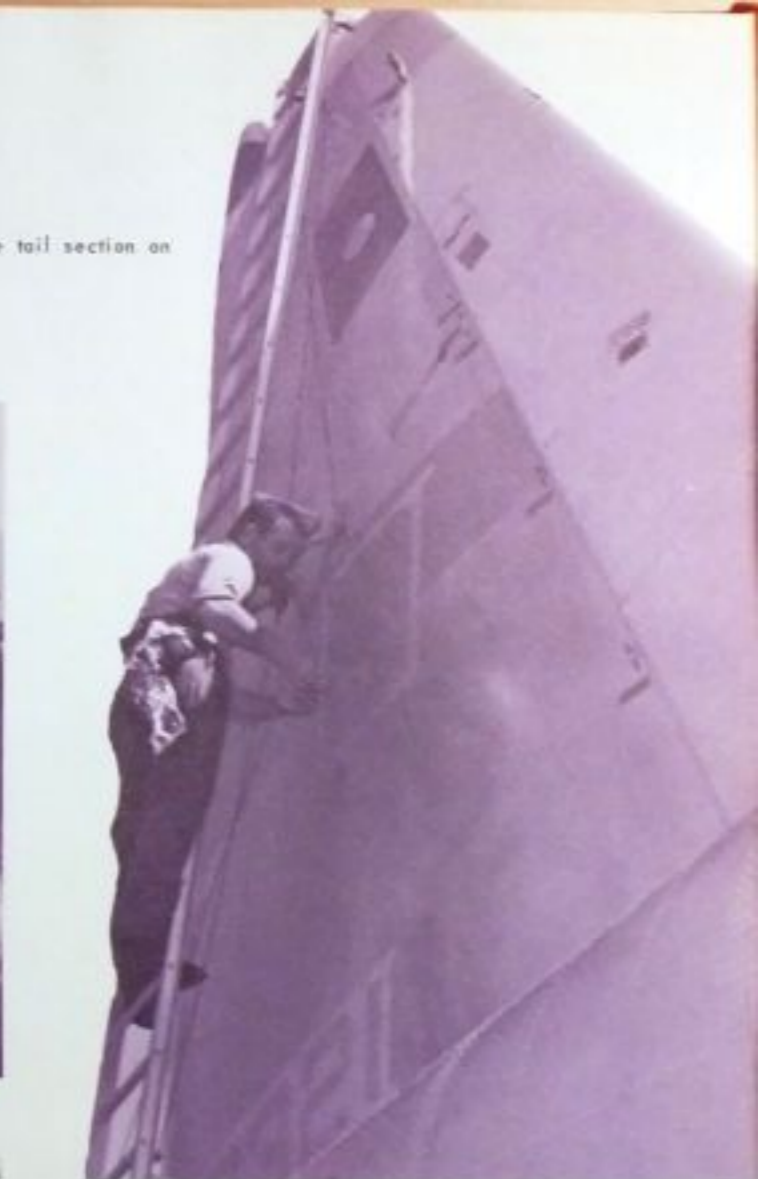


John D. Reimer, PHCA; Lt Mack Wright, Lt James Cornwell and William MacDonald of the U.S. Coast and Geodetic survey check over photomapping assignments.

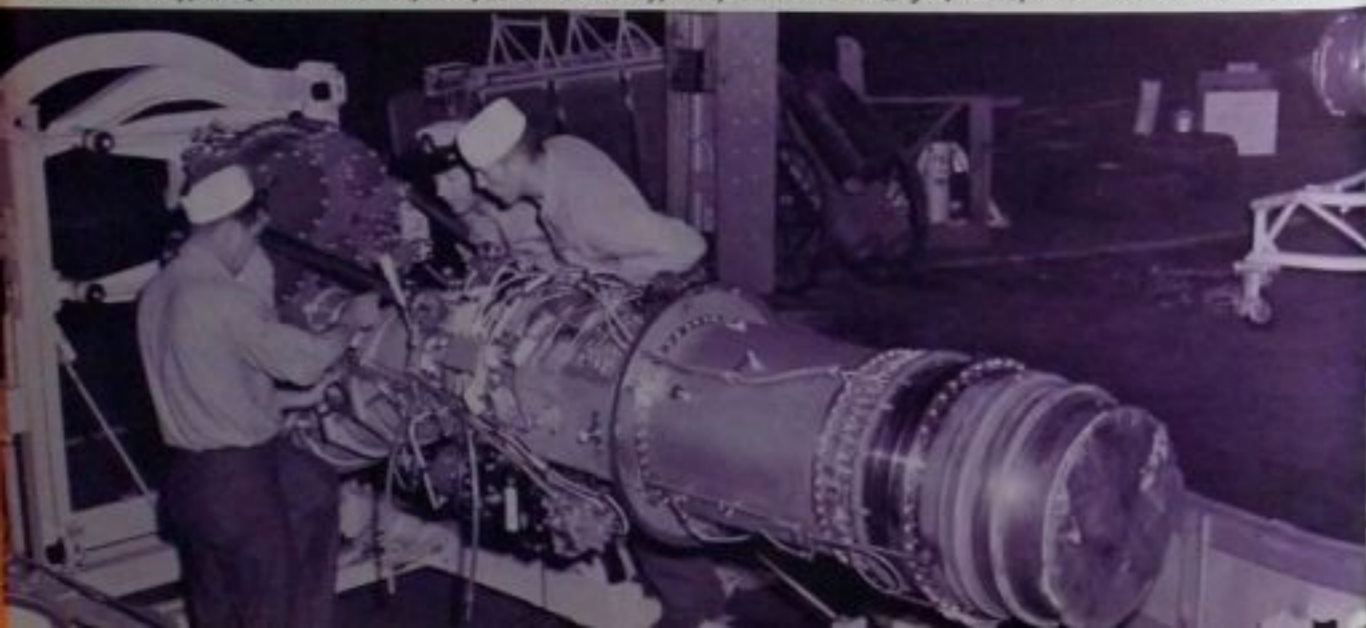


Joseph J. Arno, AMS3, masking off the tail section on one of the C-130 aircraft.

Murdo Woods, AD1, and Frank C. Becton, AD1, pull an engine check on a R4D.



Francis McNally, AD2; Thad M. Smith, AD2; Andrew L. Barry, AD3; and Hobart H. Enges, ADCS; check over a C-130 engine.



Charles W. Munch, AN, works on a display sign.



John W. Hendry, AM1, of the quality control department, packs aircraft check sheets prior to deployment.



VX-6 Planes and Men Log Record Year

Arrival of the first of the C-130s at Quonset in August gave VX-6 a tangible demonstration that deployment of the squadron planes and men was imminent.

At the acceptance ceremony were RADM Benjamin Moore, COMFAIR QUONSET; RADM David M. Tyree, Mr. William Riecke, General Manager of Lockheed, and hundreds of dependents and other visitors.

With three hauling cargo on the ice and one operating as a test plane, the Hercules racked up some impressive figures. From the end of October to Feb. 21 when they left McMurdo, they airlifted over 1,700 tons of cargo and men to South Pole and Byrd Stations. The Herks flew the longest logistics flight in the history of Antarctic operations - a 1,400-mile dash from McMurdo to remote Eights Coast and back - and flew later in the Antarctic season than ever before.

The most spectacular figures, tonnage and cube-wise, were racked up by the Hercules. However, the

Skytrains, Neptunes, Otters, helicopters and the Constellation all filled vital roles in this year's operation. The wide variety of planes in VX-6 makes possible the execution of a wide range of assignments.

A major mission of the R4Ds was medium range support of scientific traverse parties, frequently assisted by the Neptunes from Byrd Station and the helos from McMurdo.

Primary jobs of the Neptunes continued to be SAR and aerial photomapping. This photography was also required for scientific studies.

The Skytrains worked heavily out of Byrd Station, supporting a number of scientific field parties, notably in the Eights Coast area and the Horlick Mountains. Helicopters hustled in the McMurdo area supporting scientific parties and making logistic runs.

The Super Constellation took on a new role this season when a "bug trap" was installed, supporting

the entomological program. Its primary mission was the ferrying of passengers and cargo from the U.S. to New Zealand, and on to the ice, and back.

The Skymaster's major missions were launched in New Zealand. Mail and personnel runs there took up most of the season. During the first months of operating, the R5D also flew to McMurdo and made cargo hauling flights to Hallett Station.

The statistics below show the number of flights flown by the Navy in its support of science.

R7V Super Constellation. VX-6 flew one of this type aircraft in Deep Freeze 61. During this season, it made 14 turnaround flights between Christchurch and McMurdo. It flew 5 turnaround flights between the U.S. and Christchurch. It flew 1044 passengers and lifted 270 tons of cargo, between Christchurch and McMurdo.

R5D-3 Skymaster. One of this type was flown. It logged numerous flights in the New Zealand area, carrying passengers, cargo and mail. On the ice, the Skymaster was utilized on the Hallett run until the bay ice there made further flights unsafe.

P2V-7 Neptune. Three were used, based at McMurdo and Byrd. SAR standby assured Navy and Air Force aircraft quick assistance flying to and within the continent. In all, P2Vs made 53 flights in Antarctica. Photomapping was highly successful this season primarily due to Neptunes. They successfully mapped 100,000 square miles of the continent.

R4D-8 Skytrain, R4D-5 Skytrain. Three -8s were used, and one -5. They operated out of McMurdo.

RADM Moore, Mr. Riecke of Lockheed and RADM Tyree at acceptance of first Navy Hercules.



Byrd and Beardmore, supporting field parties and conducting an airborne traverse, totalling 100 flights. During the season, they logged 460 passenger miles and lifted 495 tons of cargo.

UC-1 Otter. Five were assigned Deep Freeze 61 and were used to haul passengers and cargo, including husky dogs, to various points within range of McMurdo. They were also used for jumps by the VX-6 Para-Rescue team while on the ice. In 84 flights the Otters carried 227 passengers and airlifted 19.5 tons of cargo.

HUS-1A helicopter. Four were assigned. They carried 1416 passengers during 320 flights and were



Visitors to VX-6 tour Hercules during open house.

given such unique assignments as planting automatic weather stations and erecting power antennas.

At the end of the summer operating season most men of VX-6 returned to Quonset Point. Detachment Alpha remained on the ice to winter over and prepare for the first flights of Deep Freeze 62. Before any planes break the winter isolation local flights will be taking place. Soon after the first plane arrives in October 1961 Detachment Alfa will return to the U.S.



Stanley G. Crowley, PR3, spins a tale of adventure as visiting children study one of his pictures of the Antarctic.

Little girl and big boot. Daughter Maryann is dwarfed and impressed by the size of thermal boots held by MSgt Art DeBolt, USMC, during an Open House.



Operations Yeoman Clifford H. Wilson, Jr., YN2, types out one of the many reports that department files before, during and after each deployment.



Some remaining plankowner in YX-6 for Deep Freeze 61, Richard Goodell, AK1, checks stock in a squadron storeroom.

A medical check-off list on each officer and man in the squadron who will deploy is studied by Herman D. Harris, HMCS.

Newly appointed to Lieutenant, junior grade, H. F. Buchberger receives shoulder boards from Capt Munson.





Above: Aerial cameras and magazines are inspected by R. E. Woods, PH3, and J. D. Reimer, PH1.



Left: A trimetrogon aerial camera mount in a P2V is worked on by Woods and Reimer before the cameras are installed.

The air route south is pointed out by Capt Munson during a discussion with Cdr Newcomer.



Crew of the R5D at Quonset. Standing: Harry N. Williams, PH2; Lt Charles F. Bird, Capt Richard M. Johnson, USMC; LtCdr Ralph R. Caruthers, Michael B. Griffin, GYSGT USMC; Fred W. Streitenberger, SSgt, USMC. Front row: Ralph W. Saukka, AT2; Murdo Wood, AD1; Robert H. Weyrauch, AM1; Frank C. Becton, AD1, and H.L. Herles, AE3.





A Hercules takes to the air.



P2V '437 revs up for launching.



Hercules is loaded at Quonset



Lcdr Fred Bates, supply officer.



Cargo is loaded for transport to Antarctic stations.



Capt Maurice LeBas, Joseph T. Jackson, AD1; Lt Little D. Player, and Lt James Cornwell group near a parked P2V.



E. J. McCracken, AD1, at fuel panel of '321.



from the u.s.a.'s newest state, vx-6 flies on to the staging site of new zealand





Christchurch International Airport viewed toward the west.

Crew of the R7V: Standing: Lt Edward W. Oehlbeck; MSgt Billy M. Baker, USMC, Ltjg John W. Hilt, Robert Davis, AD2; Harry J. Matthews, AT2; George E. McFatrige, AD1; Willie L. Cole, ADC, and Lcdr Darold L. Reckling. Front: Jack B. Mitts, AE2; GySgt Charles P. Jewell, USMC; Earl D. Rudder, AD2; Jack H. Tankersley, AM1; Glenn Stevens, ADC, and James W. Garwood, AM1.



Crew of P2V '439. From Left: William W. Chastain, AM1; Arnold E. Tilley, Ph2; George D. Connor, AD1; Clarence C. Allen, AT2; Larry E. McKee, SSgt, USMC; Robert C. Daley, AD1; Jack C. Shaffer, AE1; Lt E. J. Stetz and Lt David J. Finn.

Crew of the '320. Front: Harold J. Bracken, AD1; Thomas E. Harpring, AT2; Richard Rupp, AM1; MSgt. Arthur O. DeBolt, USMC; James C. Eblen, AD1; Thomas H. Dunn, AE2; MSgt Harry S. Brown, USMC; William E. Padgett, AT1; John Conroy, ABC, and Albert Vicari, ADC. Back: S. Golightly Jr., Lockheed Rep.; Hobart H. Enges, ADCS; Ltjg Irving J. Morrison, Capt Les Darbyshire, USMC; Maj Edgar A. Pitman, USMC; Capt William Munson, Lcdr Robert C. Carew, Lt Earl H. Unger, Cdr Mansen Krebs and Lcdr Louis L. Helms.





Cdr Eugene Forsht, Cdr Martin D. Greenwell and Cdr John D. Richardson are greeted at Christchurch by Lcdr Ralph Coruthers.

Lt Mack Wright's "boondockers" grab the attention of Amadeo C. Villanueva, AK2, and Frank Daugherty, AKC, while MSgt William H. Clark, USMC, in the background, tries on a pair of trousers.



Cdr Lloyd E. Newcomer surveys a pair of trousers, while Ltjg Jerry R. Chambers marks a check-off sheet.



Survival gear is checked by Gerald L. Barrie, SH2, at Christchurch and loaded aboard each of the departing aircraft. Here he works on a portable transceiver.



With the influx of personnel at Christchurch, berthing spaces become crowded. Here two YX-6ers assemble lockers to be installed in the barracks area at Harewood. Vintage cars were a common sight.



John A. McMillan, PHAN, measures a shot during a game of lawn bowls at the Christchurch Bowling club.

New Zealand National Airlines Corporation mechanic and Kenneth A. Kellett, AE1, install insect trap on R7V.





Cooks and stewards at Christchurch line up behind a food-laden table. From left are John J. Morrison, CS2; Rodolfo O. Sevillano, TN; Harry Robinson, SD2; Edwin E. Fain CS2; William O. Brown, CS2; Cecil F. Fontecha, SD3; Richard S. Meyers, CS2, and Chester W. Segers, CSC.

JATO thrusts R5D Skymaster into the air for McMurdo.



Cdr Newcomer does some last-minute paper work before launching for the ice as Capt Richard Johnson, USMC, and Lt Donald Moxley look on.



Navigator GySgt Jewell does some pre-flight calculations.



Crew of the '319 congregates for a pre-flight photo. In the fore are Albert E. Benoit, AD1; Howard H. Murray, ADC, and William E. Padgett, AT1. Standing are GySgt Winfred C. Naxon, USMC; Owen N. Dotson, ADC; Robert L. Allison, AB1; Dennis C. Beutler, AE2; Robert B. Shirk, AM1, and Malcolm E. MacLeod, AD1. Standing in the open hatch is George H. Storbel, AE2.



On the ice, Cdr Krebs studies the beauty of an ice cave near Scott Base.



Edward J. O'Neil, HM2, leads passengers onto Connie for flight to McMurdo.



P2V lands at Hallett Station



Para-rescue team with guest jumper. From left, David T. Hutchinson, PRCS; Wadsworth Likely, N.Y. Herald Tribune; Jerome C. Jones, PRC; Ltjg Jerry R. Chambers, Gerald L. Barrie, SH2.

Diverted to Hallett on fly-in, crewman Edward Siegal, AE1, right, shares coffee with station personnel and Lt Del Player, second from left.



P2V crew: Walter R. Nydegger, AD1; Jesse D. Adams, AT2; SSgt John F. Weaver, USMC, Joseph T. Jackson, AD1; Lt James Cornwell, Lt Dal Player, William J. Schobert, Jr., AE1; Arnold E. Tilley, PH2, and Russell L. Symmonds, AM1.

At avionics test bench are Maurice S. Perez, Jr., ATN2; Manuel S. Leon, AT2; Luther D. Woodward, AT2, and Quinn Olsen, ATC.



At McMurdo, Capt Munson cuts a cake honoring VX-6's seventh anniversary and offers a slice to Cdr Greenwell.



In the AE shop are Herman A. Schaepe, AECS; James C. Causey, Jr., AEM3, and Ronald W. Sappenfield, AE2.



In the galley, James H. Nicholson, CS2, shows RADM Russo how soup is made; Chaplain Andress watches from left.

Mail from home is hauled to Admin for sorting by John D. Sullivan, AJ3; Marrian C. Smith, RM1; William W. Chastain, AM1 and James E. Hallenbeck, AKA.



Crew of C130 '319. Back row: David G. Boleen, AB1; Robert L. Allison, AB1; Albert E. Benoit, AD1; Owen N. Dotson, ADC; Howard H. Murray, ADC; Charles L. Burton, AE1; Malcolm E. MacLeod, AD1; Marvin L. Shaffer, AT2; and George H. Starbel, AE2. Front row: Joe E. McKinnis, AT2; Lcdr Dean D. Abbott, Lt Ronald F. Carlson; Cdr Lloyd E. Newcomer, Lt Thomas S. Hale, Winfred C. Naxon, GySgt, USMC, and Kennard N. Nagel, AM1.



Installing new shelves in supply warehouse, Robert F. Protzman, AKA, saws wood held by Amadeo C. Villianueva, AK2, as Frank Epler, SKC, supervises.

Transportation problems at McMurdo are partially solved by Gary J. Guyette, AMSAN, and Gene D. Loper, AM1, as they work on a Sno-Cat.



Crew of C-130 '320. Front row: John F. Conroy, ABC; William D. Carr, SSgt, USMC; Arthur O. DeBalt, MSgt, USMC; Capt Leslie L. Darbyshire, USMC; Capt Richard M. Johnson, USMC; Loretto Lupo, AM1; Thomas H. Dunn, AE2, and Harold J. Bracken, AD1. Back row unidentified.





Lt. Andrew M. Pardue, MC, in Antarctic gear.

Front row: Charles Holt, AN; Charles Hester, AN; Gordon Weeks, AN.
Back row: Louis E. Haiser, CSI; Gary J. Guyette, AN; Douglas J. Fell, AN, and Dominador L. Erenoa, TN, on the McMurdo mess deck.



Crew of C-130 '321. Back row: David A. Chmielecki, AE2; Ray W. Shepard, AT2; Robert L. Parry, AD1; Howard Hoffman, AD1; Thomas E. Southwick, Jr., GySgt, USMC; Kenneth R. Starr, AT2; Andrew N. Holzemer, GySgt, USMC; Lt. Garland M. Renegar. Front row: George Kovach, AE1; Adrian D. Behrens, AM1; Emmett J. McCracken, AD1; Lt. Robert C. Carew, Lt. Earl H. Unger, and Lt. Donald E. Moxley.



L/R William H. Clark, MSgt, USMC; Winfred C. Noxon, GySgt, USMC; Vernon R. Burnell, MSgt, USMC; Arthur O. DeBolt, MSgt, USMC; Capt. William H. Munson, William D. Carr Jr., SSgt, USMC; Fred W. Streitenberger, SSgt, USMC; Andrew N. Holzemer, GySgt, USMC; and John F. Weaver, SSgt, USMC, at the Marine Corps birthday party at NAF McMurdo.

Reference manual is checked by James B. Washburn, AD2.



Lead shot is chopped by Stanley Sapinsky, Jr., AMS3, and Joseph J. Anno, AMS.





Crew of P2V '436. Front row: Earl W. Traugott, AE2; Harry N. Williams, PH2; James L. Gray, AD2; Donald E. Ward, AD2. Back row: James M. Pearson, AM1; unidentified; Lt Brian L. Simpson, Lt Harold L. Van Dusen, William D. Carr, Jr., Ssgt, USMC.

P2V is dug out after snowstorm.



Helicopter with field party unloads near cravasse on Ross Ice Shelf.

Oil drum for scientific group is handled by Vernon M. Leslie, AD2, and Mahlon P. Bradford, ADR2.



L/R Gerard R. Kessens, PH1, Lt Donald W. Roe, Jr., Mahlon P. Bradford, ADR2; Lt John A. Hickey, Capt Thomas E. Morrow, USMC; Vernon M. Leslie, AD2, and Capt D.L. Bridge, RNZA, Scott Base leader.





R4D in flight



Standing in front of R4D-219 upon its arrival at Byrd Station are A.N. Holzemer, GySgt, USMC; F. A. Long, ADC, and Capt Joseph Lisicky, USMC. These men compose the VX-6 maintenance crew that was flown into the central Horlick Mountains to repair and fly out another R4D.



Capt Joseph Walker, USMC, eagerly reads letter from home.

J.K. Leskey, AD2; H.S. Brown, MSgt, USMC; R. F. Martin, AT2; Lt George Janulis and Lt Robert H. Farrington, crew of the first plane to land at Eight's Coast, Antarctica.



Wally Herbert, surveyor, guiding as other members of New Zealand's Geological and Survey Expedition push a dog sled filled with air-delivered supplies. The expedition worked on the Nimrod Glacier, Britannia Mountain Range.



Fred W. Streitberger, SSgt, USMC; Capt Joe G. Walker, USMC; James L. Leskey, AD2; William H. Clark, MSgt, USMC, and Ltjg Kenneth O. Honderich, plane crew members who flew an R4D with wheels down from Byrd Station to McMurdo Sound.



George D. Conner, AD1, and George H. Strobel AE2, preparing meal while on a flight in a R4D-B.



At a semi-serious ceremony in the YX-6 hanger a homemade "medal" is presented to Capt Thomas E. Morrow, USMC, by leading chief Joseph Mihalcik, AECM, for piloting out a UC-1 Otter from a crevassed area of the Ross Ice Shelf. Also "awarded" are David C. Friend, AD2, and Vernon M. Leslie, AD2, for their work in recovery of the plane.

Front row: John F. Arnold III, AD3; James W. McClelland, PN3; Jerry E. Trull, AD3. Back row: Ronald D. Cavicchi, YN2; Marrion C. Smith, RM1; Lawrence G. Adams, SN; David C. Friend, AD2.



C-130 digests parts of Peter Snow Miller for transportation to new Byrd Station site.

Front row: Donald H. Warren, AN; Larry D. Bennett, AN; Gerald L. Barrie, SH2. Back row: James L. McCreary, AN; Eichard B. Allbee, AN; Ray E. Lippka, AN; Richard C. Genung, AN; Bruce I. Raymond, AN. They are the cargo handling crew at Williams Field.





Fire destroys VX-6 parachute loft and avionics shop.



Above: Donald W. Richards, PR3, and Noble L. Cheeks, AT1, look at records found after para-loft and avionics fire.



Vernon M. Leslie, AD2, and Joseph H. Latshaw, AMS2, connect electrical connections on the starboard wing before permanently affixing it to the fuselage of an Otter.

John C. Mowrey, AB2; Daniel J. Lundstrum, AB3; Thomas L. Moody, ABC; Samuel D. Underwood, AB2; Edwin J. Connors, A03, line handling crew.



Six weeks after Antarctica had begun its winter isolation a mercy flight brought two VX-6 Hercules from Quonset Point, R.I., to Christchurch, N.Z. One then flew on to Byrd Station to pick up ailing Russian scientist Leonid Kuperov, while the other stood by in Christchurch. The total distance flown the rescue was just under 13,000 miles.

Request for the evacuation of the scientist was made by Lt Joseph R. Walk, MC, USN, medical officer of Byrd Station, after diagnosing a duodenal ulcer. Kuperov was working side by side with his American

colleagues when the symptoms developed. Although he was not in any immediate danger, the Navy did not consider it wise for him to spend the winter in the Antarctic.

The mercy flight, may prove to be one of the most significant flights in Deep Freeze history. It proved that lack of daylight and adverse weather do not preclude flying. The C-130, piloted by Commander Lloyd E. Newcomer successfully broke Antarctica's winter isolation for the first time.

Mercy flight plane crew. Back row: Capt William H. Munson, Cdr Lloyd E. Newcomer, Henry S. Brown, MSgt, USMC; Charles L. Burton, AE1; George Kovach, AE1; Robert L. Parry, AD1; Howard Hoffman, AD1; Frank Kazukaitsis, PHC; W.D. Smith, Lockheed rep; John E. Beiszer, AD1; Lt Don L. Angier. Front row: Howard H. Murray, ADC; Adrian D. Behrens, AM1; Franklin J. Daugherty, AM1; Kenneth R. Starr, AT2; Fred W. Streitenberger, SSgt, USMC; and Joe E. McKinnis, AT2. In door of plane: Capt Richard M. Johnson. Not in picture: Lcdr J. W. Corley, Ltjg Glen N. Drummond, Jr., Lt Jack W. Potter, William K. Harner, AG1, and Cdr P. Lewis, CNO representative.





the air force in antarctica

For the sixth consecutive year MATSmen of the Air Force and Navy-MATS successfully completed the re-supply operation of the scientific stations in the Antarctic.

This is not an ordinary job. An unpredictable climate is always a threat to fliers. Limited communications and navigational aids increase the problem of navigation. The small number of alternate runways available for emergencies makes this operation a hazardous one.

For three weeks in early October, MATS C-124 Globemasters of the 9th Troop Carrier Squadron were grounded at Christchurch by some of the worst weather in recorded Antarctic history.

Late in October the storms ended and a crash flying program was started. Three additional C-124s from Donaldson AFB were ordered to join the airlift task force in New Zealand.

On October 31st the first 740 mile round trip was flown to airdrop supplies to the South Pole scientific station.

On November 12 a severe electrical storm wiped out radio communications in a vast area surrounding McMurdo. All aircraft were grounded again. For seven days nothing moved over the 2200 mile route between Christchurch and McMurdo.

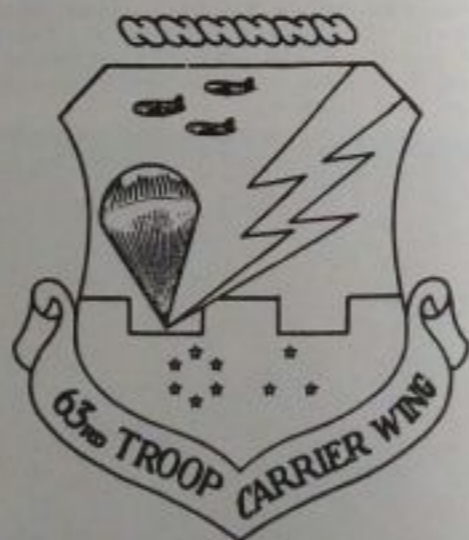
The storm ended in November 19, and the air delivery program moved into high gear. All deliveries and air drops had to be made before the middle of December when the ice runway at McMurdo would no longer support the bulky Globemasters.

Both maintenance and flying personnel worked on a round-the-clock basis to meet the schedule. On December 5th the last mission was flown and the Air Force's role in Operation Deepfreeze 61 ended.

This was the second consecutive year the 9th Troop Carrier Squadron of the 63rd Troop Carrier Wing at Donaldson AFB, S.C., had been selected for Deepfreeze.

Included in this operation were men from other MATS units which were Air Rescue Service, Air Weather Service, Airways and Air Communications Service and 1710th USAF Hospital. The initial complement of 327 men and seven Globemasters was later augmented by three C-124s and 80 men.

During the mission 84 flights operated from Christchurch, N.Z., to McMurdo carrying 881 tons of cargo and personnel. A total of 68 drops were completed with 1091 tons airdropped. The recovery rate was 99 percent. Total flying time was 3736 hours.



Brig Gen Andrew B. Cannon, Commander, 63rd Troop Carrier Wing.



LtCol Fay B. Frost, Commander, 9th Troop Carrier Squadron.

Giant Globemaster dwarfs private plane at Christchurch airport.



new zealand



1/Lt Luke S. Smith, United Fund Project Officer, hangs a poster in the Christchurch orderly room.



SSgt Willis P. Hipps and TSgt Mack C. Honeycutt observe N.Z. custom of carrying baby carriages on special racks at front of buses.



All arriving MATS men exchanged dollars for pounds at the Christchurch International Airport. Pictured here are Maj Leland S. Bearskin, 1/Lt Merritt B. Pound, 1/Lt Dale L. Young and TSgt Frank R. Conrad.



During a tour of the Christchurch facilities the United States Ambassador to New Zealand, Mr. F. H. Russell, pauses with LtCol Michael Zinkovich and Capt P. J. DeLange of the RNZAF.



Airman Lawrence Holmes and Master Sergeant George McNamara examine a small rabbit which strayed into the Aerial Port hangar at Christchurch.



Master Sergeant Walter Gearhart boards a C-124 during the mission.



Waiting for news from home, MATS airmen arrive for mail call.



Airman William Greeson and Robert Green prepare stabilized drop units at Christchurch.



Working on the first flight plan to the ice are Major Hershel Harrell, Major Jerry Mitchell, Captain Vernon Cooper, Major James Roesel and Captain Glenn DeMunck.



A MATS SC-54 escorts a Constellation to Christchurch after it developed engine trouble. Two Rescuemasters were assigned to the Task Unit.



Like a monster from science fiction, a C-124 opens its "mouth" to receive equipment for the ice.



Major Jerry Mitchell and Sergeant Charles Jackson confer in the operations shack at Christchurch.



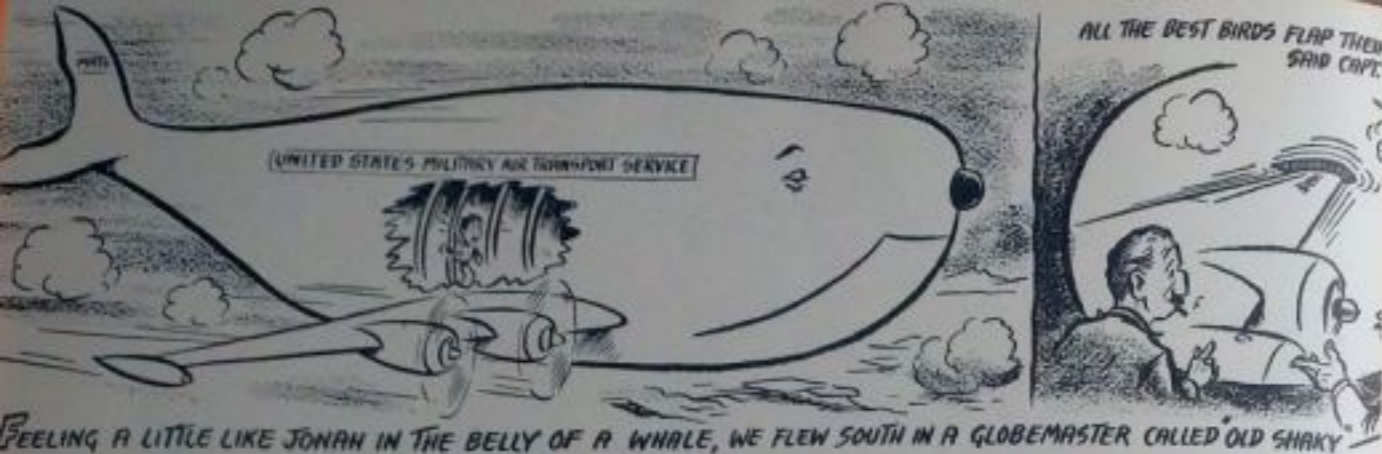
Working the GCA equipment at Christchurch are Sergeants Adolph Cable, Romolo Garza, Leo Grondin, Mack Honeycutt, and Airman Clayton Palmer.



Major Larry Uebel and Captain Banfield greet South Carolina State Senator P. Bradley Marrah at Christchurch.



Sergeants Wade Howe and John Lindstrom make a last minute inspection of landing gear before the long flight to McMurdo.



FEELING A LITTLE LIKE JONAH IN THE BELLY OF A WHALE, WE FLEW SOUTH IN A GLOBEMASTER CALLED OLD SHARKY

ALL THE BEST BIRDS FLAP THEIR SAID CAPE.



AS THE COLDER LATITUDES WERE REACHED, ANTARCTIC CLOTHING WAS PROGRESSIVELY CLIMBED INTO UNTIL WE EMERGED ON THE ICE

A SHAPELESS BUNDLE!



Captain Gordon Leppert, MATS navigator on a flight to the ice.

Flight Engineer Sergeant Kenneth Williams at the control panel on a flight to McMurdo.



MSgt John Dyson and SSgt Pearson Vaughn, Jr. check aircraft maintenance forms.

Williams Field area showing building complex and Globemaster ready for loading.





Radio operators Airmen Charles Bessett and Joseph Boulay examine new radio equipment.



Making a movie were second SSgt Joseph Corbitt, SMSgt J. C. Good, SSgt Daniel Casey, and Airman Robert Hooper from the 1365th Photo Squadron of MATS APC5.



Loadmaster Airman Keith VanNatter checks the tie down equipment on a flight to McMurdo.



TSgt John Manning is greeted at the McMurdo Chapel by Chaplain Gene Address as Maj Jerry Mitchell looks on.



Left: Task Unit Information Officer, 2nd Lt William Corbett at McMurdo



Above: Maj James Cartwright, Capt Charles Paluso and 1st Lt Gerald Kline wait at McMurdo for clear weather to begin airdrops.



Left: Maintenance men work on a C-124 in sub zero temperatures. Above: Captain Robert Briscoe pilots a C-124 to McMurdo.



The climax of the mission arrives when the aircraft drops its heavy load on target.

Fuel drums are webbed together in units of four for air dropping.



ships



Wilhoite steaming up Dunedin Harbor Channel

uss wilhoite (der 397)

During Operation Deepfreeze 61 Wilhoite, a radar-equipped destroyer escort, operated from Dunedin, New Zealand, patrolling ocean station at Latitude 60 degrees South, Longitude 170 degrees East in support of the flights between Deepfreeze Headquarters at Christchurch and NAF McMurdo Sound.

Wilhoite's mission on station was threefold: (1) to provide the aircraft with navigation aid and weather information; (2) to act as a communications relay station when necessary; and (3) to serve as a search and rescue ship in case of emergency. In addition, she was directed to collect oceanographic and hydrographic data whenever possible.

After installing special electronic equipment, loading spare parts, and overhauling existing equipments, Wilhoite joined TF 45 on September 8, 1960. During the operation she successfully completed six patrols, one of which was predominately an oceanographic survey. She returned to Hawaii via Tahiti in March 1961.



Lcdr C.H. Willis, Commanding and Lt H. P. Schonenberg, executive officer.

Three days after departing Pearl Harbor for Dunedin, Wilhoite crossed the equator and some 160 pollywogs became Shellbacks with appropriate ceremony. Also, enroute two newly appointed CPO's donned their "hats" for the first time. On 28 September Wilhoite arrived in Dunedin, a city of 100,000 people, who gave the crew a heartwarming, waving, cheering welcome as the ship steamed up the fjord-like channel. This display of friendship was typical of the New Zealanders when the ship made subsequent stops at Dunedin to replenish, refuel and relax. Four days later, Wilhoite departed for her first ocean station patrol.



Aloha Pearl



Above: Royal family presides over equator fête.
Below: New CPO's are initiated.



Above: A Pollywog is prepared for the initiation.
Below: First line over, Dunedin, N.Z.



First boat over at Campbell Island.



Combat Information Center plots positions of aircraft flying towards Antarctica.



Edgar Massey, AG2, and John Mertz, AG2, prepare to launch weather balloon.



Anchoring at Auckland Islands approximately 600 miles southwest of Dunedin.

Wilhoite arrived at ocean station 60°S 170°E on September 30 after making the first of several stops at Campbell Island to off-load equipment and disembark personnel. Enroute, an iceberg 250 feet long and 150 feet high was encountered. The initial patrol lasted 20 days with only 29 aircraft passing overhead because of unfavorable terminal weather at McMurdo. Wilhoite made a 45-hour refueling stop at Dunedin, resuming station on 22 October.

In spite of communications difficulties and more unfavorable McMurdo weather, 155 planes passed over the ship on her 37-day second patrol, completing two thirds of the turn-around logistic flights.

Wilhoite returned to Dunedin between November 24 and 29 to replenish while USCGC Eastwind (WAGB 279) relieved her on station. The logistic

air lift was completed early in the third patrol enabling embarked New Zealand oceanographer Don York to obtain an unofficial record of 1495 separate observations including fathometer bottom soundings, surface salinity and temperature observations, deep water salinity samples and temperature readings, bathythermograph observations, and bottom dredging samples.

During this patrol Wilhoite visited Campbell, MacQuarie, and Auckland Islands.

On January 5, 1961, after a 16-day Christmas holiday in Dunedin, Wilhoite was underway on her fourth patrol with orders to visit Hobart, Tasmania, and Sydney, Australia. She was on station before and after visiting the Australian ports.

Campbell Island meteorologists push cart loaded with supplies delivered by Wilhoite up to storage huts.



Don York and Lt H. P. Schonenberg with bull seal on Auckland Island.



David Hassel, SO1, assists Don York of the N.Z. oceanographic institute in making a bottle drop.

Lcdr Willis goes aboard at Auckland North Island.





Ship engineers at work on generators.



Wardroom members enjoying meal at 60°S.



American and English officer on bridge.

Wilhoite enters harbor of Sidney, Australia, against backdrop of famous bridge.



Since her commissioning in 1947 Edisto has become a well-seasoned icebreaking veteran of both polar regions. Prior to the present operation the Edisto has been to the Antarctic three times, and a penguin rookery has been named Edisto Acres. The ship has been several times to the Eastern Arctic where she is one of the two ships to have gone to lat. 82°N. The most recent Antarctic trip of the Edisto was Operation Deep Freeze IV, in support of the United States.

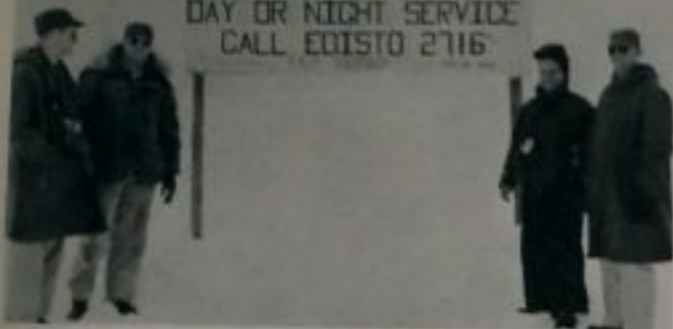
On December 7, 1959, Commander Griffith C. Evans Jr. assumed command of the icebreaker USS Burton Island (AGB1). While he was captain the ship participated in the first successful penetration of Bellingshausen Sea during Deepfreeze 60. On November 14, 1960, Commander Evans became Commanding Officer of Edisto.

uss edisto (agb 2)



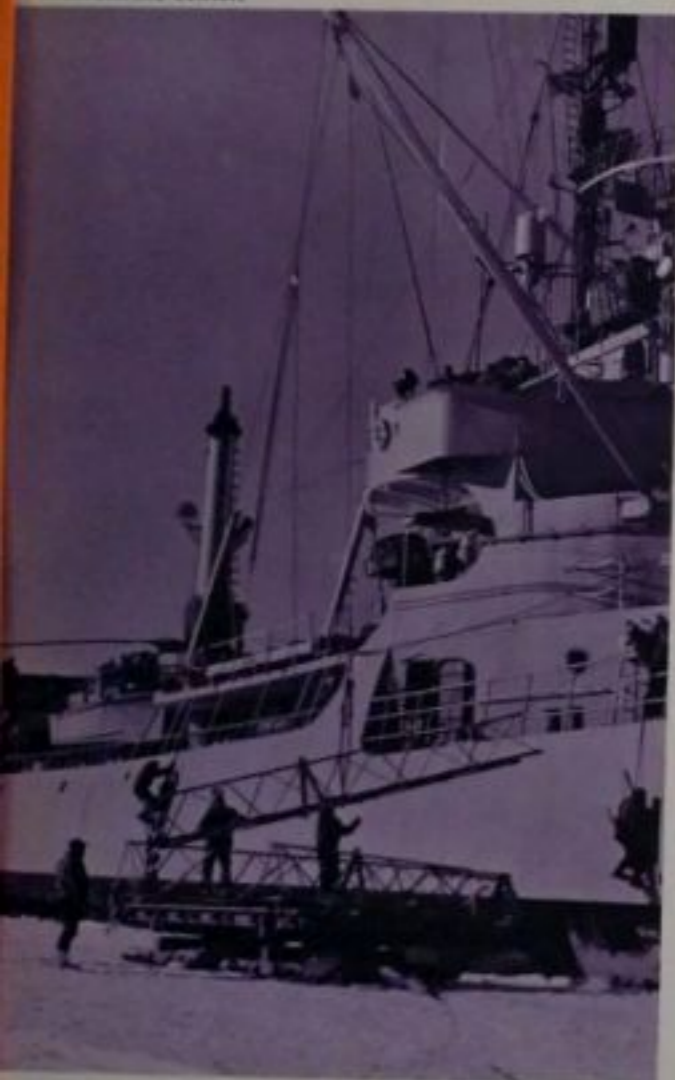
CDR GRIFFITH C. EVANS, JR.
Commanding Officer

UPPER MCMURDO SOUND
TUG AND BARGE CO.
DAY OR NIGHT SERVICE
CALL EDISTO 2716



It pays to advertise. Lt Bryson, MC; CWO Deming, Martin SN, and CWO Brown.

Radio antennas are lowered onto sleds for McMurdo communications center.



Shortly before arriving at McMurdo Sound Edisto was joined by the USNS J. R. Towle and just south of Franklin Island Edisto began the work of breaking ice. During the next week Edisto and the USCGC Eastwind slowly broke the channel leading into NAF McMurdo. As soon as the ice was cleared out of one section the Towle was moved progressively closer to the station during these operations involving towing and pushing Edisto became known as the "Upper McMurdo Sound Tug and Barge Co.". Upon the departure of Eastwind for New Zealand Edisto remained as the only icebreaker in the Ross Sea area. Among her many jobs the one which seemed to be most pleasant was supplying the New Zealand supply ship HMNZS Endeavour with fuel and water. Soon a cultural exchange program was blooming; the crew of the Endeavour coming aboard Edisto to watch movies and get haircuts and the Edisto's crew becoming acquainted with the atmosphere of British Naval tradition aboard the New Zealand ship.

Early in February Edisto encountered a change in scene when the ship sailed for Kainan Bay and Little America V. The purpose of the mission was to backload material from the now deactivated Little America station to McMurdo. Upon arrival it became apparent that the problem was to be somewhat greater than anticipated for the barrier had changed considerably over the previous year and was now too high to permit loading directly from the ice to the ship.



Deck cargo carried from New Zealand is unloaded at McMurdo.



Helicopter from Hutran 4 picking up cargo for transportation from Little America to Edisto.

Fortunately an icebreaker carries two helicopters and between them, in threatening weather, they carried many tons of cargo and personnel between the camp and the ship.

The job over, Edisto returned to McMurdo to resume her duties as "Station Ship." In late February we set a course for New Zealand by way of several oceanographic stations and Cape Hallett where she helped to evacuate some of the summer personnel. Then the long trip back to Boston.



Edisto crewmen stacking mattresses at Little America in preparation for air lift.



The HMNZS Endeavour alongside Edisto



Pollywags waiting to pay homage to King Neptune in equator crossing ceremony.



Brown, JO2; Luttrull, SN, and Nelson, AG1, sort mail in ship's office.



Ballew, SN; Bowman, SN, and Wright, SN, dig hole for placing a "deadman."

New Year's Eve in the Ross Sea. Left: Officer quartet of CWO Deming, Ltjg Charles Keeler, Ltjg Al Rachap and Ens Phillip Lawver sing "We were sailing along McMurdo Bay..." Right: Guitarists Haines, EM2, and Mollands, SN; play while Janusch, SN, and Ballard, CS3, lead crew in song session.



edisto's crew, and

some friends!



CWO Deming and Weddell seal on ice next to ship.



Treacherous killer whale comes up for air in channel cut by Edisto.



Quattronani, DC1, makes friends with an Emperor penguin.

Adelie penguins look like youngsters at dancing school.





uscgc eastwind (wagb 279)



Captain Joseph W. Naab, Jr., USCG, Commanding Officer.

A search for a downed jet and the saving of a seriously ill tanker crewman at sea started off Operation Deepfreeze 61 for the USCGC Eastwind just two days after she left her homeport of Boston.

Spending 30 hours on the search and rescue missions off the coast of the Carolinas, the 269-foot white cutter then headed for the Panama Canal, where cameras snapped away as if everyone aboard was on a pleasure cruise.

Just a few days later, though, pleasure turned to consternation for the unfortunate pollywogs who had never before been across the equator. King Neptune and his trusty shellbacks demanded the full penalty, and there were many shorn heads.

Thanksgiving was spent on Ocean Station 60 South, just prior to the Eastwind's arrival in New Zealand. Once in New Zealand everyone enjoyed the warm hospitality of the Kiwis, but after a week of wrestling with pounds, shillings, and pence, the icebreaker was off again for McMurdo Sound, her decks piled high with vital cargo.

Finally, in the calm stretches of ice, the cargo was unloaded, and the serious work of icebreaking began.



Telephone poles for NAF McMurdo unloaded by Eastwind's crew in McMurdo sound.

Christmastime and New Year's were celebrated by the annual Penguin Bowl football game, and boor Antarctica - served literally on ice. The Airedales brought a visiting Emperor aboard, and again cameras clicked as the big bird inspected the ship.

Supporting science to the fullest, the Eastwind sent balloons aloft, dropped instruments to collect data on the ocean bottom, and even flew huge nets from the flag halyards trying to catch insects for a USARP scientist.

Perhaps the most interesting scientific project was the landing of two scientists at historic Cape Adare, site of the first land wintering-over party in Antarctica. The two men were going to spend three weeks studying over half a million penguins.

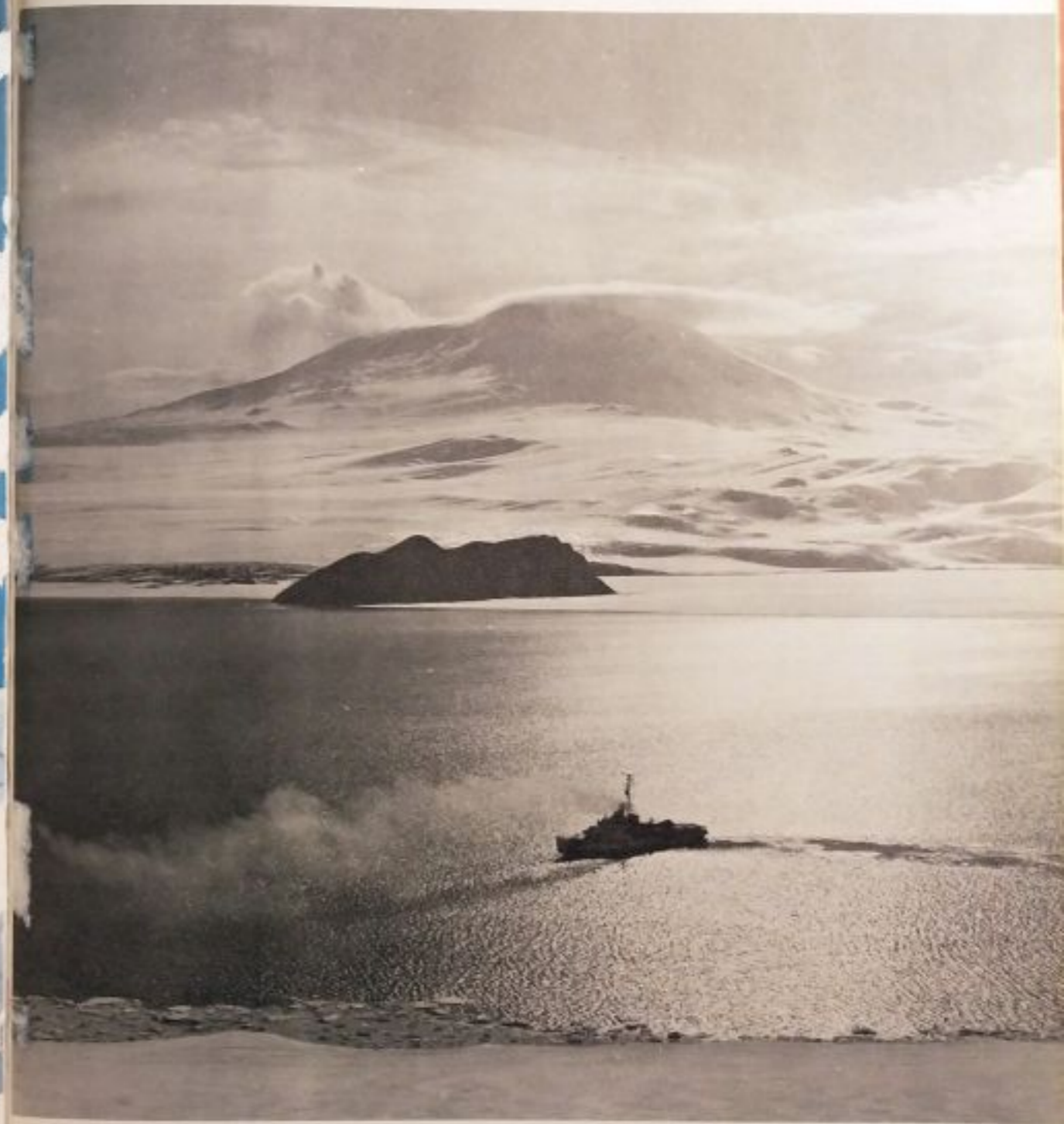
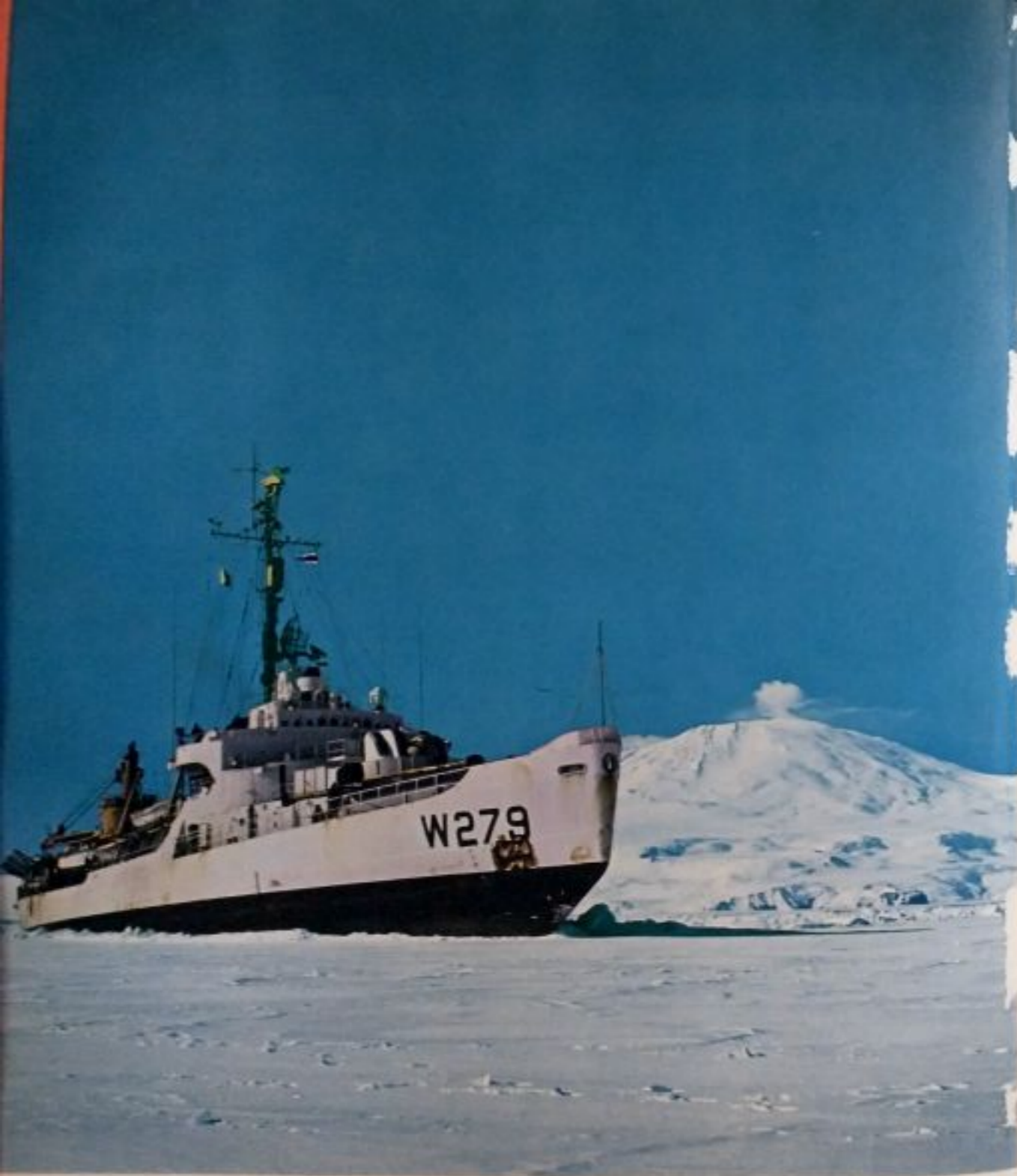
After flying the men and their equipment in, the Eastwind headed north to Wellington for rest, recreation, and reprovisioning. On the way back to McMurdo Sound the icebreaker picked up the scientists, and sent a work party into Cape Adare to repair the historic huts used by past wintering-over parties. The scientists were taken back to their home base at Hallett, and the Eastwind returned to McMurdo Sound.



Commander Keith Low, USCG, Eastwind's executive officer.

Lt David E. Musselman, USN, Senior Naval Aviator.







Cargo bound for Hallett Station is hooked on to helo by crewmembers of HU-4.

While at McMurdo, the icebreaker sent a work party to the South Pole Station. Seven men, including Captain Joseph W. Naab, Jr., made the trip in a C-130.

Setting sail for Hallett Station, the Eastwind unloaded cargo there and then led Arneb through the heavy pack ice to McMurdo Sound.

The cutter returned to Hallett and left from there for Australia. Then, it would be around the world via the Suez Canal, Mediterranean ports and Boston. The Coast Guard Cutter Eastwind was to become the first icebreaker in history to transit the globe on this route.



Deck cargo is offloaded onto McMurdo Sound bay ice for inland stations.



The Coast Guard's annual Penguin Bowl football game, played on the ice at Christmas time.



Scientists Brian Reid (left) and Colin Bailey waiting at Cape Adare campsite for landing craft to pick them up after finishing three weeks' study of penguins here. Eastwind's crew repaired historic hut in background.



The USS Staten Island plows through heavy sea ice in the Antarctic during Operation Deep Freeze '61.

uss staten island (agb 5)



Commander Wesley L. Larson
Commanding Officer

The Staten Island departed Seattle, Washington, on October 13, and headed south for her third Operation Deep Freeze.

She arrived in Portland, Australia, in November. There she represented the United States and Portland, Maine, at the opening of the town's new harbor facilities.

After a short visit to Melbourne, Australia, the Staten Island steamed to Port Lyttelton. From there the Staten Island entered the Ross Sea to undertake oceanographic work in mid-December. Several oceanographers from the U.S. Navy Hydrographic Office and the University of Texas aboard carried out the project.

Late in January the Staten Island made a rendezvous with USS Glacier. The two icebreakers then proceeded to the Bellingshausen Sea for one of the most challenging missions of Deep Freeze '61, the penetration of the sea's rugged ice pack to the coast of Antarctica. On this trip into unexplored territory the two icebreakers carried scientists representing the fields of oceanography, ornithology, seismology, geology and other geographical sciences.

At the completion of this mission the Staten Island returned to the United States by way of the West Coast of South America.



Top left: A Pollywog gets his hair trimmed by Shellbacks during initiation ceremonies upon crossing the equator on November 3, 1960. Above: Cdr W. L. Larsen, Staten Island captain, presents a cleat from the cruiser USS Portland to members of the town council of Portland, Australia. Top right: Willard Lansberry, SN, paints identifying number on ship's landing boat. Below left: Joel Bachman, SA, and Frank Glapa, SN, lower a bathythermograph to record ocean temperatures. Below right: James Culbertson, AD1, and Steven Chadrow, AD3, repair an engine used in one of the two helicopters aboard the Staten Island.



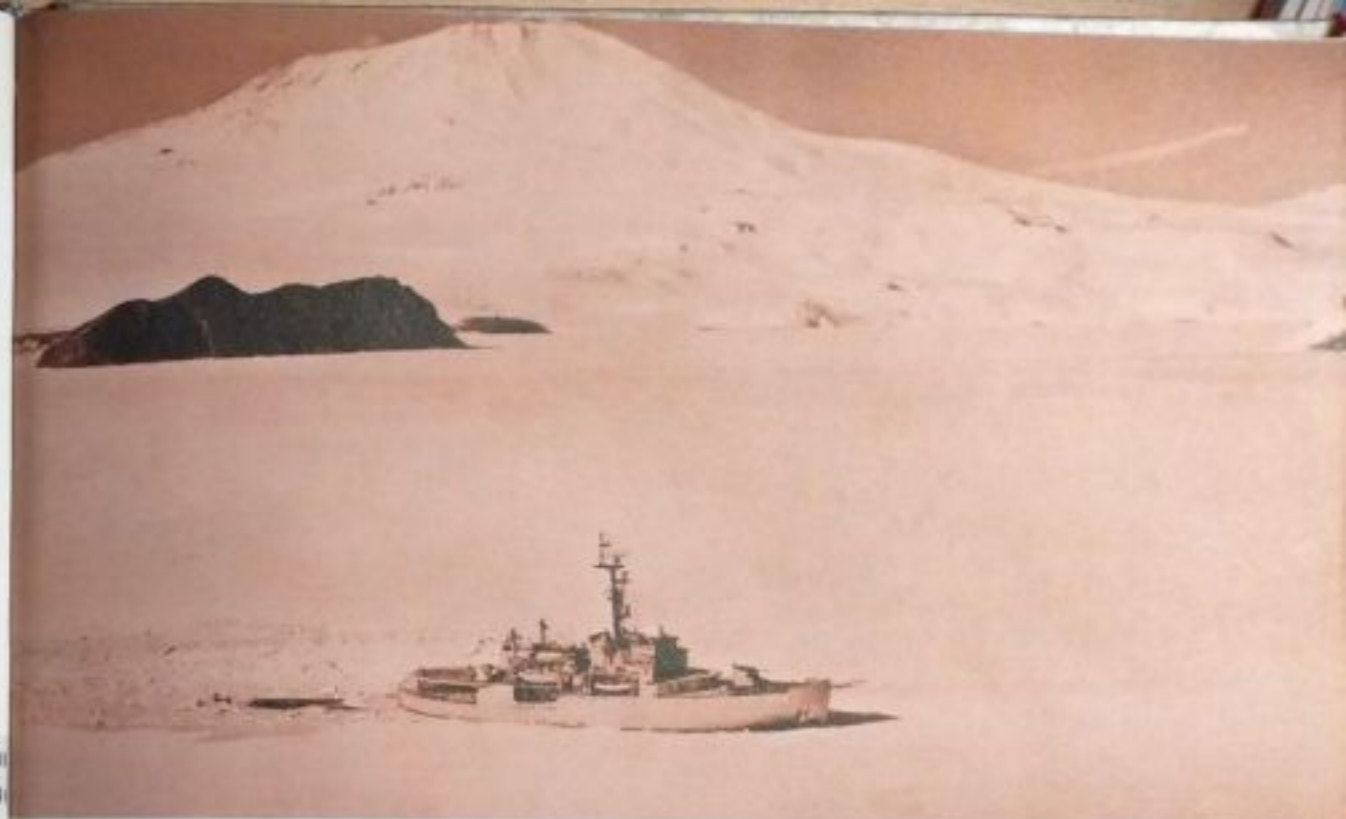


An all-hands party celebrates Christmas on board Staten Island in the Ross Sea.

Christmas on the Staten Island



Above left: Ralph Cook, SN, ices cake for Christmas Eve party. Above right: James Geter, CS3, prepares turkeys for traditional meal. Below: Evening cake and punch. Left: Ens Jack Kjeldgaard plays the piano for caroling.



Mount Erebus stands 13,200 feet high in the background as Glacier breaks channel in McMurdo Sound.

USS Glacier (AGB 4)

On this, her sixth Deep Freeze cruise, Glacier once again showed her ability in the support of logistics, science, and exploration in the Antarctic. The largest, most powerful icebreaker in the free world, she departed homeport Boston on October 13...passed through the Panama Canal on the 23rd, and, after "Crossing the Line" on the 31st, paid a visit to Pago Pago in American Samoa, November 11-15. The ship reached Port Lyttelton, New Zealand on November 21, spending a week there loading cargo. On November 28 she headed south into the ice.

The "Mighty G" earned her name as she broke a 21-mile channel through McMurdo Sound. She returned to New Zealand after Christmas for repairs and spent most of January in Wellington.

On January 29 Glacier headed the Bellingshausen Sea Expedition of 1961 to Antarctica's unexplored Eights Coast. After six weeks in the heavy pack ice she made her way to Palmer Peninsula, stopping by the South Shetland Islands in mid-March, then going east to the South Sandwich Islands. She headed home by way of Montevideo, Uruguay; Rio de Janeiro, Brazil, and San Juan, Puerto Rico.



Cdr Phillip W. Porter, Jr.
Commanding Officer



The 8,600 ton Glacier in Wellington, N.Z., drydock. Each propeller is 17½ feet in diameter, blades were broken in McMurdo Sound in December.

Ship's helicopter returns after a reconnaissance flight over the ice.



Admiral Tyree presents Navy Unit Commendation to Glacier for work in Deep Freeze 60.



Staten Island and Glacier in Bellingshausen Sea.



Neptunus Rex and his court inspect lowly polliwogs on the Equator.

The ship cleans up after a three day snowstorm in the Bellingshausen Sea.

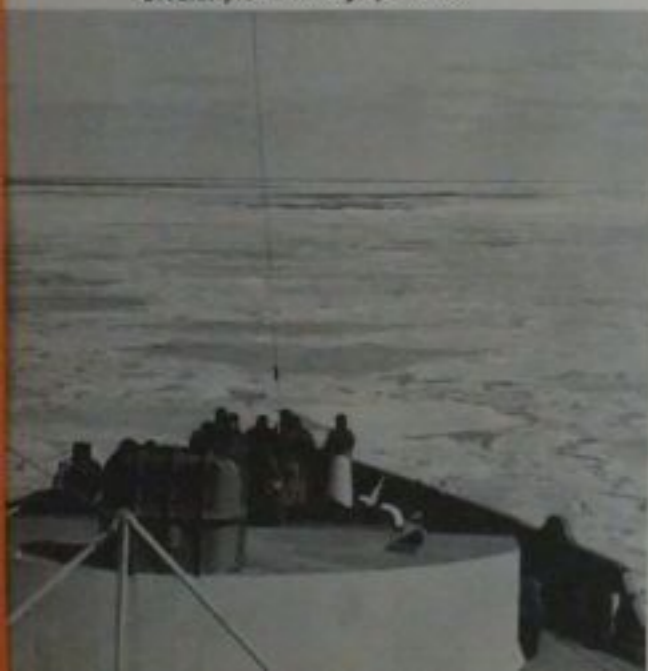




staten island and glacier explore

Late in January 1961, the icebreakers USS Glacier and USS Staten Island headed south from New Zealand bound for Antarctic exploration. The ships, forming Task Unit 43.1.2 under the direction of Task Force 43's Deputy Commander, Captain Edwin A. McDonald, had as their objective the penetration and examination of the Bellingshausen Sea.

Glacier plows through pack ice.



Staten Island, with Commander Wesley L. Larson, Commanding Officer, refitted and departed Port Lyttelton, N.Z. on January 18th. Steaming for over a week, Staten Island arrived at the northern edge of the pack ice above the Thurston Peninsula and continued her marine geophysics program conducting oceanographic surveys.

Meanwhile, Glacier, commanded by Commander Philip W. Porter Jr., had completed her Wellington, N.Z. drydock work, receiving a new set of propellers for the difficult work ahead. On January 29th, Glacier, with Captain McDonald aboard, topped off her fuel tanks, whistled farewell to the New Zealanders who had come to see her off, and set a southeasterly course for the 3,000 mile voyage.

On February 5th the two icebreakers met and headed south into the pack. For over a day the ships battered their way south through the 150 miles of ice. Helicopters were launched from the ships' stern platforms and used in ice reconnaissance flights to search out leads.

With progress halted, the round-bulled ships would back off and then charge the obstructing ice, their inclined bows riding up and crushing the floes under the immense weight. Cracks, first a flowing blue, then black with bubbling sea water, appeared in the yielding pack. Endless chunks of gray-green sea ice churned to the surface revealing rust colored bottoms of frozen plankton as the ships pushed ahead.



bellingshausen sea

By the morning of Feb. 7, the ships had reached open coastal waters along the Thurston Peninsula and steamed eastward rounding the peninsula and moving south into the Bellingshausen Sea. The ships moved on through broad, blue channels in the heavy coastal ice bordered to the north by tubular icebergs, to the south by an unnamed ice shelf pushing out from the Eights Coast.

That afternoon the icebreakers tied up alongside each other and a conference was called by Captain MacDonald with the ship's captains, executive officers and scientists. It was decided that with the favorable weather and ice, the expedition would continue as far east as possible through the Bellingshausen.

For the remainder of the week the expedition devoted its efforts to learning as much as possible about the Eights Coast region. On board Staten Island, scientists completed 18 oceanographic stations. These stations brought Staten Island's total to 79 for the Deep Freeze 61 season, well above the record of any other icebreaker in Antarctic waters.

Surveying and geology field parties were flown ashore from Glacier by helicopter. By taking measurements of the sun, the surveying teams were able to accurately fix the position of distinguishable landmarks which would be used in the future as ground control points in serial photomapping of the region. Rock samples were brought back to be

used in the study of the region's geological composition. Aboard both ships, the ranges and bearings from radar returns delineating the shape of the snow-covered coastline were recorded and incorporated in preliminary charting.

Captain Edwin A. McDonald, USN, the expedition's leader.



Each year the United States Department of State invites member nations of the Antarctic Treaty to send a representative to observe the Navy's Operation Deep Freeze. Four such observers were embarked with the expedition: Dr. Brian B. Roberts of Great Britain, Commander C.J.F. Netterberg of the South African Navy, Lieutenant Colonel Hernan Danyau, a Chilean army staff officer, and Lieutenant Nestor Lopez Ambrosioni of the Argentine Navy.

On February 10th, one of the helicopter-borne field parties came upon the recently abandoned camp of a University of Minneapolis geological party, located at the foot of the Jones Mountains some 60 miles south of the ships. The geologists had since flown back to McMurdo, but on the following day a University of Wisconsin overland



Captain McDonald makes the decision. The expedition will push east into the Bellingshausen Sea.

On the afternoon of Feb. 12 a four man shore party was flown inland 35 miles to obtain a final mapping control point from an isolated rock outcropping. That evening, snow-driven winds that were to rise to hurricane force of over 100 miles an hour struck both the ships and the field party. The men ashore were hit first with winds so strong that they snapped the handles off ice-ax anchors and made the erecting of a tent impossible. Led by Dr. Roberts, the British observer, the four men made their way to the most sheltered part of the outcropping and built a crude stone windbreak.

Aboard the icebreakers the expedition could only wait as the buffeting winds and snows made rescue impossible. By the morning of the 15th, the men of the shore party were suffering from cramps having been so long in their bitter-cold confined positions. The winds had not permitted them to light a stove, and they had had no food or water as their rations had long since frozen solid. The party unsuccessfully tried to erect a tent, weakened and with gloves frozen hard, they had been forced to crawl back into their shelter. An hour later helicopters arrived at the outcropping, toughed down on the icy hillside in 35 knot winds, recovered the party, and returned them safely to the ships.

The following day the helicopters were launched again to recover scientific equipment still remaining at the inland field camp. Six and one half miles from the expedition, excessive smoke was spotted coming from Staten Island's HRS-3 Sikorsky aircraft. The pilots began their descent from 3,000 feet aiming for an ice-capped island, but 20 feet above the sur-

face an engine cylinder head burst and the craft dropped to the ice. No one was injured, but damage to the machine was so severe that it had to be abandoned.

With work completed in the Eights Coast region of the Bellingshausen Sea, Captain McDonald directed the ships to return as they had entered along the northern coast of the Thurston Peninsula. However, storm-driven ice had closed in behind the expedition, and the pack proved quite heavy to the west. The 24,000 horsepower Glacier and the 10,000 horsepower Staten Island turned to the north pushing their blunt bows into the hummocked icefields that lay before them.

There the expedition saw great icefloes 15 to 30 feet thick stretching to the horizon. Between the floes there was not water but a thick, churned mixture of snow and broken ice - slush and brash. The thickness of the pack presented problem enough, but the snow was an added curse. Snow softened the impact of the icebreakers charging hulls, dissipating energy before it could be exerted on the ice.

The pack, countless tons of floating sea ice encircling the Antarctic continent, is in constant flux. Winds, currents and coastal tides are ever at work from above and beneath altering and reconfiguring the shifting, white mass. At one moment the pack

will appear as an area of floes each separated from the next by leads of open water. With a change in the winds the floes may close, and if the same winds persist, the edges of the ice jam together and are forced, grinding and cracking upwards, into pressure ridges. These ridges remain as hummocks on the surface until once again new forces alter the face of the pack.



H. Reed Stevens, University of Texas oceanographer, prepares to analyze sample of seawater.

For 15 days the expedition fought its way through the pack. When pressure worked on the floes, the ships were forced to remain motionless, drifting slowly with the pack. When the pressure eased, they inched ahead, twisting along a 150 mile zig-zag route to the north, the west, and then the south again until on March 2nd the ships steamed into open waters off the Thurston Peninsula.

The icebreakers now moved 10 miles apart while Staten Island collected additional oceanographic data, and Glacier continued its photographing of the Thurston Peninsula. On March 4th the ships found themselves confronted with more bad weather, and the pack soon closed tight around them again.

Aboard both ships many members of the 544 man expedition began to apprehend the possibility that they might be destined to spend the winter night locked in the isolation of Antarctic ice - perhaps the pack was already too strong? On both ships one could hear plans being dreamily concocted for rescue or resupply operations should the ships be unable to free themselves.



The days of ice-bound isolation are broken by ham radio calls to friends and relatives thousands of miles to the north in the United States. Here E. J. Weichert, PN1, talks while Gary Nelson, RM2, looks on.

traverse which had departed Byrd Station three months earlier, terminated its journey at the U. of Minn. camp.

On February 11th, Glacier joined Staten Island at 72°28'S, 90°42'W - the expedition's easternmost point of penetration. Behind the ships now lay 90 miles of newly explored coastline. Helicopter reconnaissance flights showed an impenetrable barrier of landfast ice extending to the eastern horizon.

A cylinder for collecting water samples is lowered from Staten Island.





Geologist Avery Drake greets stately Emperor penguin during Bellingshausen Sea Expedition.

Frisky Adelle penguins cavort in front of cargo ship Arneb.



Early on the morning of March 7th, a mile-wide lead appeared to the north beyond the 500 yards of solid ice confining Glacier. It was decided that Glacier must attempt to punch her way through the 25 foot thick ice to take advantage of the open water before a new shift in the pack could close the lead.

Hour after hour Glacier backed and rammed against the ice floe which could have been crossed on foot in five minutes time. Ever so slowly the big ship narrowed the distance. By two in the afternoon, radar showed that the ice was closing and with it, the open water disappearing. A six man party with 1,500 pounds of explosives was placed on the ice by helicopter. Holes were bored and the charges dropped through and suspended 25 feet beneath the undersurface of the ice. With a push of the plunger and detonation, the white surface heaved, a plume of snow shot skyward and then settled a discolored gray with little change apparent in the pack. This procedure was repeated three times before the men returned to the ship.

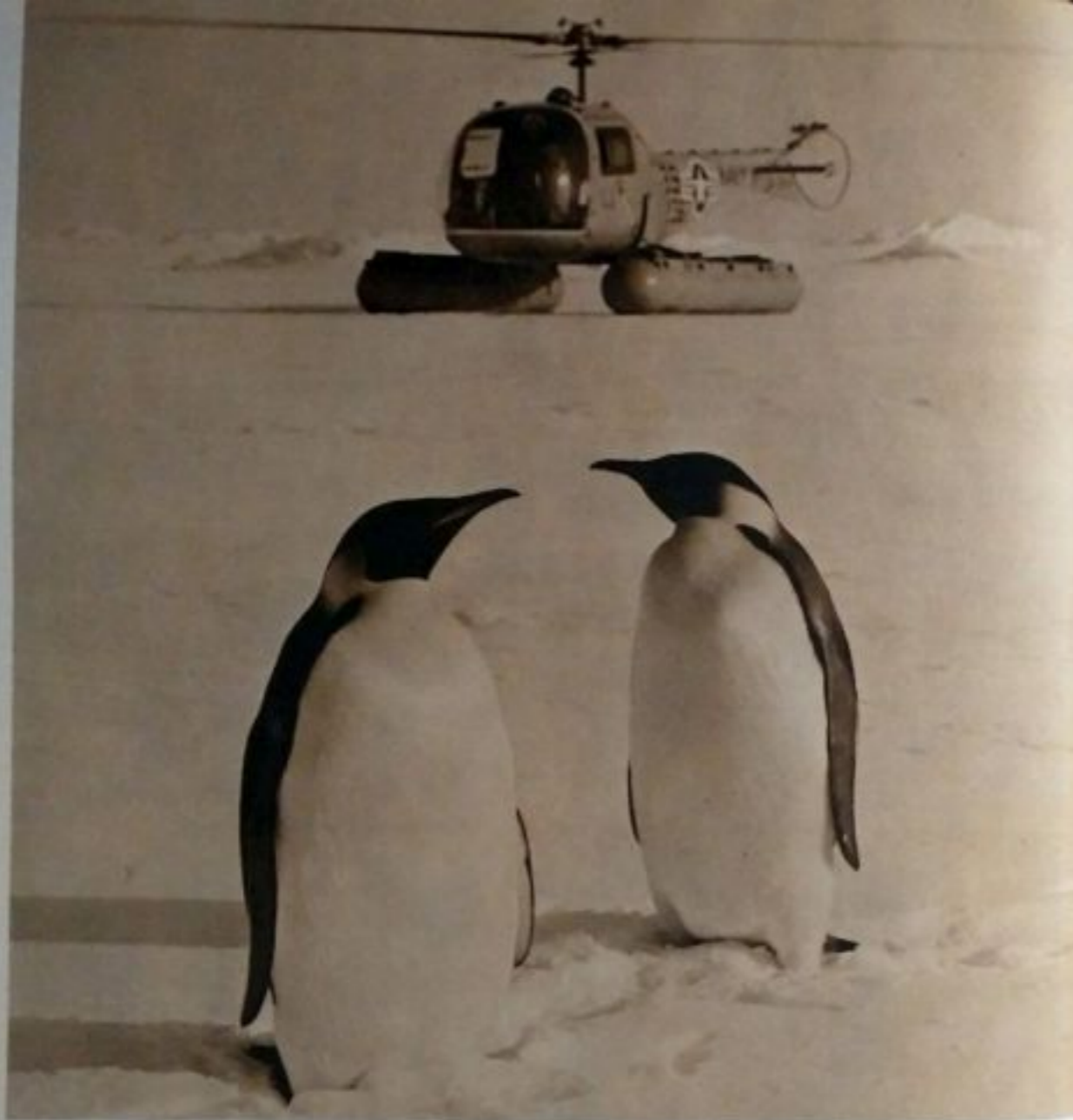
By sunset, Glacier had worked her way to the area of the explosives and was within 100 yards of the lead which had now narrowed to a band 900 yards wide. The big ship charged, rode high on the floe, and then for the first time in 12 hours continued forward pushing the broken ice aside and entering the open water. The explosives had done their job - Glacier was steaming free.



In the aloft conning tower 90 feet above the waterline, Glacier OODs control both rudder and engines as the icebreaker rams her way through the pack.

Staten Island men bury wooden "dead man" to anchor ship to ice.





Staten Island lay 10 miles to the southeast hemmed in by floes. By 2030, the ships lights were visible to Glacier approaching through the drifting ice. Throughout the night the beams of carbon-arc search-lamps played over the pressure-twisted ice and the two ships worked against the ice. By the following morning the last of the floe had been broken, Staten Island was free, and the expedition was steaming westward.

Two days later a good route was discovered and followed northward through the 150 miles of Antarctic pack. The icebreakers were once again in open seas, and the 1961 Bellingshausen Sea Expedition had come to a successful conclusion. The two ships parted company bound for new assignments.

**uss
arneb
(aka 56)**



Capt James L. Hunnicutt
Commanding Officer

The USS Arneb, an attack cargo ship, is a veteran of six Operation Deep Freezes. Her role in Operation Deep Freeze '61, as it has been in the past, is that of logistic support. Loaded in Davisville, R.I., she carries equipment and provisions necessary to sustain the scientific stations at McMurdo Sound and Cape Hallett. Replenishment of Hallett Station is unique to the Arneb as she carries landing craft by which Hallett is resupplied over the beaches.



The Arneb loads a mammoth D-8 bulldozer, with snowblade, at Davisville, Rhode Island.



Musical sailors entertain Panamanian school teachers, guests of the Arneb during the transit of the Panama Canal.



As the Arneb crosses the equator King Neptune and his royal court come aboard to mete out royal justice to the Pollywogs.



The Arneb departs for the Antarctic from Port Lyttelton, N.Z.



The ship digs out from a severe storm encountered off Cape Hallett, in the Ross Sea.



The USCGC Eastwind breaks a path to the mooring site for the Arneb.



Deck hands from the Arneb chop holes in the ice for the "dead men," buried timbers, to which the ship will secure her lines.



When the ice shelf unexpectedly broke up the Arneb went alongside the ice floes to retrieve sleds and cargo. After unloading at McMurdo the Arneb sailed for Cape Hallett to resupply the scientific station there.



Once moored the holds are opened and the hatch crews off load the cargo to waiting sleds.



The volcanic beaches of Cape Hallett require the use of LCM landing craft for cargo operations. The LCM comes alongside and is loaded with cargo.



After a short run to the beach the cargo is discharged on the ice littered shores.

Shortly before the Arneb departs Hallett for Port Lyttelton, and LCM makes a last run to the Eastwind for the traditional movie swap. Hallett Station is in the background.





usns greenville victory t-ak 237

The civilian manned "Greenville Vic" is a veteran of both Arctic and Antarctic operations. She was the first MSTS ship to participate in Deep Freeze activities. This is her fourth year of participation in Deep Freeze.

With 15 officers and 39 men, the ship left New York on December 13 and proceeded to Davisville, Rhode Island, to load cargo. She left there on Christmas Eve and sailed southward, with stops at Balboa, C.Z., and Port Lyttleton, N.Z. The vessel arrived at NAF McMurdo on January 24 and tied up against the sea ice for unloading operations.

After backloading material for return to the U.S. and New Zealand, the "Vic" departed on February 5. She carried 76 passengers to New Zealand. The ship returned to her home port of Brooklyn in March.



Alfred P. Nielsen
Master



Giant reels of cable are unloaded onto a sled at McMurdo.

A standby generator is unloaded for the McMurdo camp.



msts alatna (t-aog-81)

Chief Engineer Egil Malsom plans days work with Karsten A. Larsen, 3rd assistant engineer, and Frank G. Pagen, Chief electrician.



Even P. Purdy Jr., oiler; Roland F. Woodill, oiler and Harry Strool, pumpman, in the engine room.



Peter Gentile
Master

Stephan Fary, able seaman; Michael J. Marsle, ordinary seaman; Robert Morris, able seaman, and Alfonso P. Ortiro, ordinary seaman, prepare to move fuel hose to lower deck.



John C. Hamilton, utility man, and able seaman Charles Connally look over pay check amounts while purser, R.E. Donlan prepares for payday.



Radio officer Stan Kotte, 2nd officer Henry Kelley and 3rd officer Robert E. Bowker look over chart of McMurdo Sound channel.



Rudolph A. Schulte, able seaman; Clowde F. Toney, able seaman, and 1st officer Elmore Genthner on the bridge.

John B. Farrell, oiler; Arthur E. Cox, wiper, and Jecories Williams, wiper, painting overhead pipes in the engine room.



Joseph G. Petronic, boatswain John W. Tillett, ordinary seaman, and George S. Forbes, pumpman, hook up fuel hose.



Juan R. Marquez, messman; Chief Steward Robert S. Wood and Gerlad M. Beegan, messman, checking wardroom menu.

Paul R. Russell, cook-baker; Jean T. Cerge, galleyman, and Joseph F. Hall, chief cook, in the galley.



**msts
private
john r.
towle
tak 240**



At her berth on bay ice of McMurdo Sound, the Towle unloads cargo for scientific bases in Antarctica. Tractor-pulled sleds transport these supplies approximately eight miles to McMurdo.

The USNS Towle was the first ship of the Navy's Military Sea Transport Service to reach Antarctic waters this season. The 12,450 ton, ice-strengthened cargo vessel traveled to Antarctic waters for her fourth tour.

Towle first arrived in Antarctic waters in Deep Freeze II, and was the first cargo ship to complete her mission that year. She returned the following year to resupply McMurdo, Scott Base and Hallett Station in Deep Freeze III (1957-58), but was absent from Antarctic waters in Deep Freeze IV.

Towle returned last season, arriving at McMurdo in mid-January. From her mast she flew the two-star pennant of Rear Admiral Tyree, who had boarded in New Zealand for the trip south. In her holds were 6,900 measurement tons of cargo.

Towle has sailed from Polar Sea to Polar Sea. Since her departure from Antarctica last season she has resupplied DEW Line sites in the Arctic regions and has been to Korea, Japan and other Far Eastern ports.

The civil service manned vessel returned to the United States after unloading and backloading.



Thomas W. Malone
Master



Cargo being off-loaded from Towle for NAF McMurdo Sound.



USCGC Eastwind leads Towle through thick ice pack.



**united states
antarctic
research program**

The United States Antarctic Research Program (USARP) is coordinated and administered by the National Science Foundation. USARP came into being on January 1, 1959 as the successor to the U.S. antarctic research work of the International Geophysical Year, which terminated at the end of 1958.

USARP's role is to formulate and implement the broadest and most probing scientific investigations possible within the budgetary and logistic limitations established by the government. This research ranges from analyzing atmospheric phenomena to sounding the depth of the ice cap by seismic explosions, from observing native flora and fauna to studying the continent's underlying rock structure. In increasing their knowledge of the biological and physical characteristics of the Antarctic, USARP scientists cooperate with scientists of other nations

also working in and around the world's most menacing, yet challenging, continent.

USARP's program of investigations is prepared with the advice and guidance of international and national committees of eminent scientist and polar specialists. A large number of qualified researchers assist by reviewing projects and rendering opinions on their scientific worth.

USARP is pledged to a dynamic and progressive program, altering its emphasis with changes in scientific interest and the appearance of new research problems. It expects to keep pace with the increasing awareness among American scientists of the unparalleled opportunity presented to them for investigations of unique problems in the virtually unexploited south polar area.



Left to right: Dr. Thomas O. Jones, Director, United States Antarctic Research Program; Dr. Albert P. Crary, Chief Scientist, U.S. Antarctic Research Program; George R. Toney, Antarctic USARP Representative; Edward E. Goodale, New Zealand USARP Representative; Richard J. Litell, USARP Public Information Officer; Wayne B. Hughes, Assistant Antarctic USARP Representative; Robert O. Derrick, Assistant New Zealand USARP Representative; Peter H. Wood, Assistant New Zealand USARP Representative and Kendall N. Moulton, Field Assistant to the Antarctic Program Director.

science highlights

During the science program for 1960-61, the National Science Foundation awarded more than 50 grants in support of Antarctic research in 12 different scientific disciplines - aurora, biology, cosmic rays, geodesy and cartography, geology, geomagnetism, geophysical and glaciological traverses, glaciology, ionospheric physics, meteorology, oceanography and station seismology. More than 20 scientists from at least 14 other nations participated.

In November, well over 50 partially decomposed fish remains were found on the shelf ice near the Dailey Islands, not far from McMurdo. Discovered by David G. Darby, with Dr. Charles Swinbank's glaciological field party, and later examined and collected by Dr. Donald E. Wohlschlag of Stanford University, the fish were later determined by carbon-14 dating technique to be roughly 1,100 years old. The great age of the fish would indicate that they had been frozen in at the bottom of the ice and gradually worked their way toward the surface as the surface ice melted and new ice was formed at the bottom.

On November 27, Dr. Olav Liestol, glaciologist from the Norwegian Polar Institute in Oslo, became

the first Norwegian since Amundsen to set foot at the South Pole. Dr. Liestol was in the Antarctic as an exchange scientist and spent several weeks with various field parties.

Two Adelle penguins, banded at Wilkes Station and flown to McMurdo in December 1959, found their way back to Wilkes almost a year later. This was the first experimentally controlled evidence of a penguin migration over a large distance - close to 2,400 miles - and indicated a strong desire to return to a specific nesting area.

During December and January a series of balloon launchings carrying instruments designed to measure stratospheric water vapor attained altitudes well in excess of 100,000 feet. The first balloon, 15 feet in diameter and carrying an 8½ pound payload, reached a record 120,000 feet - probably higher than any previous balloon of comparable size and function ever released in the Antarctic. The launchings were made by John A. Brown and Emmett J. Pybus of the U.S. Army Ballistic Research Laboratories.

Right: Dr. Phillip Law, Director of the Antarctic Division, Australian Department of External Affairs briefs scientists in the biology laboratory at McMurdo on the Australian Antarctic program. Below: Dr. Duncan Stewart, Mr. William A. Radlinski, Mr. Fred D. White, National Science Foundation, Dr. Mackenzie Lamb, and Mr. William A. Briese-meister - all guests of the National Science Foundation - are greeted at Christchurch International Airport - are greeted at Christchurch International Airport by Eddie Goodale, New Zealand USARP Rep.



Blue-eyed shags on Brabant Island in the DeGerlache Straits



Top: Mr. Briesemeister, and Drs. Lamb and Steward studying marine specimens in the bio lab. Bottom left: Dr. Lamb conducting a science seminar. Bottom right: Dr. J. Wallace Joyce, Head, NSF's Office of Special International Programs (under which USARP falls); Eddie Goodale, and Rear Admiral H. Arnold Karo, Director of the U.S. Coast and Geodetic Survey.

Living insects and mites were found in late December at an elevation of 8,000 feet above sea level about 90 miles from McMurdo. This was believed to be the highest altitude at which insect life had ever been encountered in the Antarctic. The specimens were discovered by Keith A. J. Wise, a new Zealander working for the Bernice P. Bishop Museum in Honolulu, Hawaii. Several beds of good-quality coal and a log of petrified wood 17 feet long were discovered not far from the insect find by John J. Mulligan of the U.S. Bureau of Mines.

Coal and petrified wood were also discovered in the Horlick Mountains by a geological party from Ohio State University. This group also encountered tillite, one of the geological "missing links" in the Antarctic Continent.

One of the most unique of experiments carried

on in the Antarctic during Deep Freeze 61 was the one testing the influence of the earth's rotation on the "biological clocks" of plants and animals. Dr. Karl C. Hamner of the UCLA, assisted by Drs. Gir Raj Sirohi and Takashi Hoshizaki, determined through experiments on hamsters, fruit flies, bean plants and fungi at the South Pole and at McMurdo that modifying the influence of the earth's rotation had no detectable effect on the inner metabolic rhythms of these organisms.

In late January, a biological team from the University of Kansas encountered lake water of surprisingly high temperature in the dry valley region of Victoria Land. Lake Vanda was found to contain bottom water of 46 degrees Fahrenheit. A few days later, it was ascertained that Lake Bonney had bottom water as warm as 71 degrees. The



Top: Dr. Donald E. Wohlschlag and David G. Darby stand beside some of the 1100-year-old fish remains discovered by Darby near the easternmost of the Dailey Islands. Bottom: Karl E. Ricker assists University of Kansas biologists in drilling through the ice cover of Lake Bonney.



findings were startling in view of the facts that the average annual temperature of the area is well below freezing and the ice cover of the two lakes is in all probability permanent. Exactly what causes the bottom water of these two lakes to be so warm, has not been determined, but it seems probable that the water may be warmed as a result of a high geothermal gradient in the area, resulting in a higher than normal flow of heat from the ground.

One of the most heartwarming of the season's highlights was the return to the Antarctic of Sir Charles S. Wright, one of the surviving members of Sir Robert Falcon Scott's expedition 50 years ago. Sir Charles, accompanied by Donald J. Evans, returned to the Antarctic as a working scientist, carrying out ionospheric physics investigations at Byrd Station.

On February 12 a University of Wisconsin traverse party headed by Dr. Albert P. Crary, Chief Scientist of USARP pulled into the scientific station at the South Pole. He and his seven companions covered the 1450 miles from McMurdo Sound to the South Pole in 64 days. The traverse party carried out seismic, gravity and altimetric measurements designed to ascertain the elevation and thickness of the Antarctic icecap and the nature of the subglacial rock surface.



Bruce L. Wing examines the head of one of the Dailey Island fish remains.

Two days prior to Dr. Crary's arrival at the Pole, the other University of Wisconsin overland traverse party arrived at its destination in the Eights Coast region of Ellsworth Highland, after having travelled nearly 1,400 miles for 88 days. This group was headed by Dr. Charles R. Bentley, already a veteran of three Antarctic traverses.

Other highlights of the year's scientific program were the visits of distinguished scientists and science administrators. Among these were Dr. Duncan Stewart, world authority on the petrology of Antarctic rocks from Carleton College; Dr. Mackenzie Lamb, Director of the Farlow Herbarium at Harvard University and an expert on lichens; William A. Briesemeister of the American Geographical Society; Dr. Philip Law, Director of the Antarctic Division of the Australian Department of External Affairs; Dr. Edwin I. Robertson, Director of the Geophysics Division of D.S.I.R., and Mr. Geoffrey W. Markham, Superintendent of the Antarctic Division of D.S.I.R.



Remains of a fish body found on the ice near the Dailey Islands.

Russian glaciologist Sveneld Evteev and biologist Jack Littlepage.



Donald Evans, Sir Charles Wright and Dick Litell examine old provisions at Cape Royds left over from the British Antarctic Expedition of 1907.



Sir Charles Wright and Leslie B. Quartermain, New Zealander in charge of restoration of historic huts in the Ross Sea area, examine Pointing's darkroom at Scott's old hut at Cape Evans.





geology

Geological research during the 1960-61 season fell into two general categories, one involving the investigations of the older rocks to determine their stratigraphy, age, origin, mineralogy and structure; the other chiefly concerned with the glaciation of Antarctica.

An NSF grant to Ohio State University Research Foundation supported a project in the Central and Western Horlick Ranges, where William E. Long, Larry L. Lackey, George A. Doumani and Dr. John H. Mercer studied the general geology of the area. Their investigations revealed the existence of coal beds, 24-foot tree stems, and tillite, one of the geological "missing links" in the Antarctic Continent. Dr. Samuel Terves, principal investigator of the OSU project, carried out parallel research in the McMurdo area.

Also undertaking research in the Horlicks under NSF support were six investigators from the U.S. Geological Survey. The party included John M. Aaron, Bjorn G. Andersen, Peter F. Bormel, Dr. Arthur B. Ford, David H. Green and Harold A. Hubbard.

Another grant enabled Dr. Campbell Craddock, Thomas W. Bastien, Dr. Raymond C. Bonnabeau, Thomas P. Miller, Robert H. Rutford, Paul G. Schmidt, John F. Spletstoesser and Gerald F. Webers to carry out investigations in the vicinity of the Eights Coast, the Victoria Dry Valley and Cape Crozier. Also along was Joe M. Anderson, a topographical engineer from the U.S. Geological Survey.



Top: William E. Long in one of the motorized toboggans used by his party. Center: Piece of petrified log found by OSU party in the Horlicks. Bottom: Larry L. Lackey, William E. Long, George A. Doumani and Dr. John H. Mercer enjoy Christmas dinner at their campsite in the Horlicks.



Two investigators from the University of Wisconsin - Martin Halpert and David A. Link - studied the geology of the Palmer Peninsula in hopes of gaining information that would shed light on the part played by western Antarctica as a link between the eastern and western Pacific orogenic systems, which, in turn, would contribute toward an evaluation of the theory of continental drift.

Two other University of Wisconsin geologists spent the summer and winter seasons at McMurdo studying the patterned-ground formations of the area. They were Thomas E. Berg and James G. Sullivan.

A second NSF grant to the U.S. Geological Survey supported a project of geological reconnaissance along the Walgreen Coast. Avery A. Drake accompanied the USS Glacier during its January probe into the Amundsen Sea and worked in as many places along the coast as possible with the support of helicopters from the ship.

Dr. Edward J. Zeller and Luciano B. Ronca of the University of Kansas continued research on the thermoluminescence of Antarctic rocks. These studies enable them to determine how long antarctic rocks have been cold, and thereby to fix the geologic time of the last glaciation of the portion of the Antarctic from which samples were obtained.

A party from Tufts University also continued work during the 1960-61 summer that was begun in earlier seasons. Under the leadership of Dr. Robert L. Nichols; George H. Denton, Parker E. Calkin, Dr. Harold W. Borns, Ellory F. Schempp and Roger A. Hart undertook geomorphological field operations in the Wright, Victoria, and Gran Mountain Dry Valleys.

John J. Mulligan from the U.S. Bureau of Mines conducted investigations into methods of sampling and studying mineral occurrences and deposits in the Antarctic. Mulligan discovered several beds of good-quality coal near the head of the Mackay Glacier.



Dr. John H. Mercer, George A. Doumani and William E. Long during field work in the Horlick mountains.



George A. Doumani points to a long log of petrified wood discovered by the Ohio State University geology party in the Horlicks.

Camp Ohio, main campsite of OSU geological party.





C-130 lands at Eights Coast after flight from McMurdo with members of U. of Minnesota party.

Right: Joe M. Anderson, topographic engineer from the U.S. Geological Survey, and Thomas P. Miller, of the University of Minnesota, aboard a C-130 on their way from McMurdo to Eights Coast.

Below: U. of Minnesota party at Eights Coast. Top row, left to right: Dr. Raymond C. Bonnabeau, Paul G. Schmidt, Thomas P. Miller, John F. Splettaesser and Joe M. Anderson. Bottom row: Robert H. Ruffard, Dr. Campbell Craddock, Gerald F. Webers and Thomas W. Bastien.



Dr. Colin Bull radioing to Scott Base.



Drs. Dick Blank and Colin Bull of Victoria University, Wellington, setting up gravimeter.



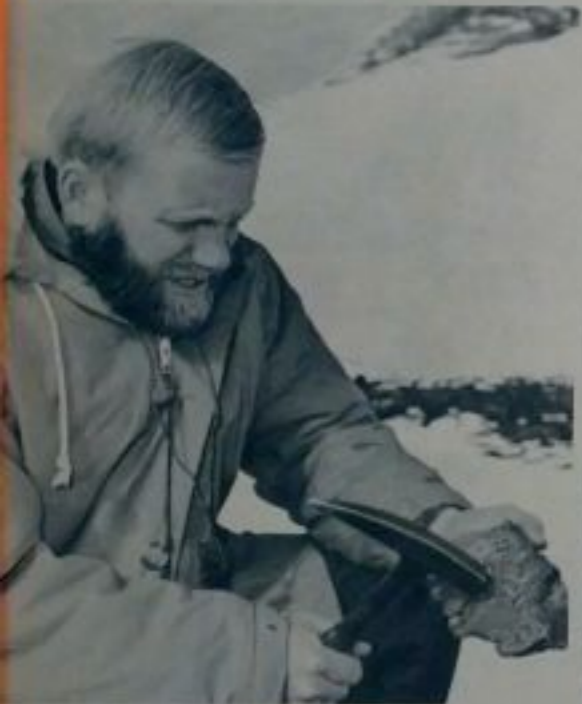
James G. Sullivan, University of Wisconsin, excavating an ice wedge.

Thomas E. Berg and James G. Sullivan pointing to ice wedge.





John J. Mulligan, U.S. Bureau of Mines.



Parker E. Calkin, geologist with Tufts University party, examines rock sample.



Dr. Edward J. Zeller and Luciano B. Ronca from the University of Kansas working with electronic apparatus in their studies of the thermoluminescence of antarctic rocks.



Members of Tufts University geological party making a cache in the Wright Dry Valley.

biology

NSF grants supported biological research both on and around the Antarctic Continent during the 1960-61 seasons. At NAF-McMurdo and the South Pole Station, Dr. Karl C. Hamner from the University of California at Los Angeles carried out experiments aimed at determining the influence of the earth's rotation on the inner metabolic rhythms of plants and animals. Working with bean plants, hamsters, fungi and fruit flies, Dr. Hamner and his assistants, Drs. Takashi Hoshizaki and Girraj S. Sirohi, were unable to detect any effect on so-called "biological clocks" originating from any attempt to alter the normal influence of the earth's rotation.

In another project, Dr. George H. Meyer from the University of Texas conducted a year-long study of bacteria, fungi and other microscopic life found in the air, soil, snow and melt-water pools of the Antarctic. Dr. Meyer was Station Scientific Leader at McMurdo during the winter.

Four investigators from the Bernice P. Bishop Museum in Honolulu, Hawaii, continued a program started the previous year that aimed at the trapping and study of airborne organisms over and around the Antarctic Continent. Josef Sedlacek and Keith A.J. Wise worked in the McMurdo area, aboard the Navy Super Constellation and aboard several Navy ships, while Robin E. and Thomas S. Leech carried out their studies in the Palmer Peninsula area as members of the Chilean Antarctic Expedition.

At Hallett Station Donald S. Douglas from Duke University completed his second summer of study into the salt and water metabolism of the Adelie penguin. One important finding of Douglas' research was the fact that a newly hatched Adelie chick has a well developed salt-secreting gland that is functional at the time of hatching. The young penguins are thus able to consume food and water high in salt content, yet rid their bodies of excess salt.

A grant to Stanford University for ecological and physiological studies of McMurdo Sound marine animals supported the research at McMurdo of Dr. Donald E. Wohlschlag, John H. Dearborn, Jack L. Littlepage, John S. Pearce and Bruce L. Wing. Dr. Wohlschlag and Wing spent the summer studying the metabolism (by measuring oxygen consumption) of area fish in specially designed cold water tanks. The Stanford study was a continuation of work begun the previous year, but included new research into marine invertebrate ecology and physiology. Karl E. Ricker, laboratory technician; Dearborn, Littlepage and Pearce wintered over at McMurdo.

Biological investigations of the fresh water lakes in the vicinity of McMurdo Sound were carried out by a three-man team from the University of Kansas



Josef Sedlacek, entomologist with the Bishop Museum in Hawaii, sets up insect nets during a snowstorm at McMurdo Sound.

- Dr. Rufus H. Thompson, Dr. Kenneth B. Armitage and Hugh B. House. In studying the water and plankton in ice-covered Lake Vanda, the Kansas scientists found that the bottom water was an unusually warm 71 degrees Fahrenheit.

A grant to the Virginia Fisheries Laboratory provided for a continuation of a study of certain parasites of antarctic vertebrates and invertebrates. Earlier work had been done at McMurdo during the 1959-60 summer.

The remaining two NSF grants in support of the biological sciences were made for work undertaken in the United States. William M. Smith, who had spent the previous summer in Antarctica, received a grant for analysis of data concerning the selection and performance of antarctic personnel. Richard Lee Penney from the University of Wisconsin, who wintered over at Wilkes Station two years in succession studying the orientation and sexual behavior of the Adelie penguin, received another grant to aid him in analyzing the data he amassed.



USARP biology lab at McMurdo with Observation Hill in background.

Bruce Wing and Dr. Donald E. Wohlschlag adjust hoisting framework with which to pull large fish traps through a hole in sea ice.



Dr. George Meyer, microbiologist from University of Texas.

Jack L. Littlepage examines a sample of seawater for micro-organisms and plankton.



Jack Littlepage lowers plankton net.

Jack L. Littlepage and Karl E. Ricker at site of discovery of old fish remains near the Dailey Islands.





Above: Hugh B. House, University of Kansas, checks plankton net in small fresh-water lake. Left: Dr. Rufus H. Thompson, Hugh B. House, and Dr. Kenneth B. Armitage, all of University of Kansas, taking fresh-water samples at Cape Evans. Below: Keith A.J. Wise, New Zealand entomologist with the Bishop Museum in Honolulu, at Mt. Gran camp site.



Above: Donald S. Douglas, Duke University, injects saline solution into penguin and will collect salty secretion given off by nasal gland shortly afterward. Left: Dr. Takashi Hoshizaki, UCLA, with bean plants used in biological clock study. Below: Dr. Karl C. Hamner, UCLA, looks at activity record of hamsters in exercise wheels.





traverses

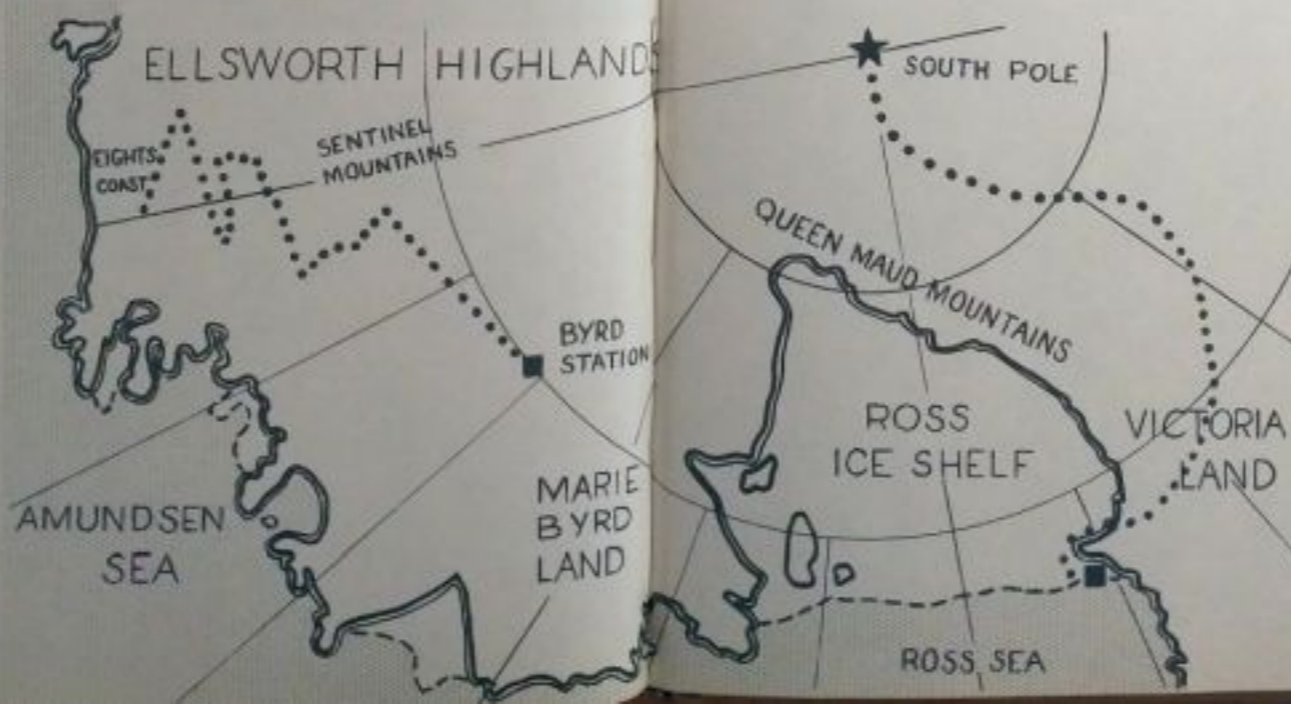
Nearly 3,000 miles of Antarctic land were covered by University of Wisconsin overland traverse parties during the 1960-61 summer season. Dr. Albert P. Crary, Chief Scientist of USARE, led an 8-man party from McMurdo Sound to the South Pole, while Wisconsin's Dr. Charles R. Bentley headed a party of six from Byrd Station to the Eights Coast region of Ellsworth Highland.

In reaching the Pole in early February, Dr. Crary became the first American to have led a traverse from the coast to the Pole and one of the few men ever to have set foot at both of the earth's geographic poles. His party became the seventh one ever to have reached the Pole overland, the fifth to have reached it from the periphery of the continent.

Both treks - Crary's covering 1,450 miles and taking 64 days, and Bentley's covering close to 1,400 miles and taking 88 days - were part of a program which also included an airlifted traverse between the Kohler Mountain Range and the Hudson Mountains.

Top: One of three sno-cats leaving McMurdo for the South Pole. Center: Mario B. Giovinetto and Dr. Albert P. Crary confer shortly after their arrival at the Pole. Bottom: Pole Traverse Party about to leave McMurdo. Top row: Mario Giovinetto, Dr. Albert P. Crary, Svoneld A. Evteev, and Jack C. Zahn. Front row: Ardo X. Meyer, Edwin S. Robinson, Ralph E. Ash and Jack B. Long.

U.S. ANTARCTIC RESEARCH PROGRAM



Accompanying Dr. Crary were Mario B. Giovinetto and Jack C. Zahn, glaciologists from Ohio State University; Edwin S. Robinson, geophysicist from the University of Wisconsin; Svoneld A. Evteev, Russian glaciologist from the Academy of Sciences in Moscow; Ardo X. Meyer, geomagnetician from the U.S. Coast and Geodetic Survey, and Jack B. Long and Ralph E. Ash, traverse engineers from the University of Wisconsin.

The other members of Dr. Bentley's team were Perry E. Parks, geophysicist from the University of Wisconsin; Hironu Shimizu and John R. T. Milholm, glaciologists from Ohio State University; Herbert Meyers, geomagnetician from the U.S. Coast and Geodetic Survey, and George Widich, traverse engineer from the University of Wisconsin. William Feyerherm from the U.S. Weather Bureau accompanied the party for the first three weeks.

Conducting the airborne traverse were John C. Behrendt, Thomas S. Laudon and Richard J. Wold. Forrest L. Dowling and Henry Rosenthal from AINA accompanied the Navy trail party from Byrd to Pole Stations. Hugh F. Bennett carried out geophysical research at Byrd and Pole Stations.



Top: Three sno-cats leave McMurdo for the South Pole. Center: Vehicles leave Byrd Station on the Ellsworth Highland Traverse. Below: Members of Ellsworth Highland Traverse Party. Standing: Hironu Shimizu, Dr. Charles R. Bentley, George Widich, John R. T. Milholm and Perry E. Parks. Kneeling: Herbert Meyers and William Feyerherm.





Henry Rosenthal doing glacial work on Byrd-Pole Tractor Train.



Richard J. Wald checks magnetic instrument on flight over Kohler Mountains.



Ardo X. Meyer with mail and coffee after arrival at Pole.

Pole Traverse Party, the day after their arrival at Pole



Bellinghousen Sea Traverse vehicles poised at Byrd Station, prior to a three month scientific traverse to the Bellinghousen Sea area.



Thomas S. Laudon and Robert H. Rutford check K-20 camera aboard C-130.



Farrest L. Dowling setting up geophysical gear on Byrd to Pole Tractor Trek.

Jack E. Long swaps his mittens for mail on arrival at South Pole.



Thomas J. Laudon and John C. Behrendt shoot photos of Kohler Mountains.



glaciology

The Ross Ice Shelf, Byrd and Pole Stations, and the traverse routes in Ellsworth Highland and Victoria Land were the areas of glaciological investigation during Deep Freeze 61.

An NSF grant to the University of Michigan enabled Dr. Charles W. M. Swithinbank and his party to continue his investigations of the largest unbroken mass of floating ice in the world - the Ross Ice Shelf. His party was made up of John Tuck, Jr., David G. Darby, Norwegian exchange scientist Dr. Olav Liestol, and Thomas E. Taylor from the U.S. Geological Survey.

A grant to the University of Ohio placed two glaciologists on each of the two traverse parties organized by the University of Wisconsin. Mario B. Giovinetto and Jack C. Zahn accompanied Dr. Cray to the South Pole, while Hironu Shimizu and John R.T. Molholm accompanied Dr. Bentley on the traverse from Byrd Station to Camp Minnesota at Eight Coast.

Dr. Olav Liestol, exchange scientist from the Norwegian Polar Institute, moves in for a close look at the Wilson Piedmont Glacier at Marble Point.



Rene O. Ramseier from the U.S. Army Corps of Engineers, SIPRE, and Anthony J. Gow, Arctic Institute of North America, undertook investigations into the strengths of various types of snow at very low temperatures at Byrd and Pole Stations. Their findings aided military and civilian planners in determining the practicability of rebuilding the South Pole Station in tunnels beneath the snow surface.

Mount Union College received an NSF grant for the conduct of a three-month study at the cold-room facilities of the University of Michigan of thin ice sections collected from a deformed area of the north-western end of the Ross Ice Shelf during the summer of 1958-59.

The glaciological program for the year was also highlighted by the studies carried out at McMurdo by Sveneld A. Evtsev, Russian exchange scientist from the Academy of Science in Moscow, who spent the winter of 1960 at McMurdo and accompanied the traverse to the South Pole the following summer.



Above: Sveneld Evtsev examines inside of crevasse near Scott Base. Left: Hironu Shimizu, Glaciologist, Ohio State University, arrives at McMurdo. Below left: James B. Burnham, ionospheric physicist from the National Bureau of Standards, checks closure gauges in the 90 foot snow mine at the Pole. Below right: Members of University of Michigan Party studying the Ross Ice Shelf - John Tuck Jr., Dr. Charles W.M. Swithinbank, David C. Darby, and Thomas E. Taylor from USGS.





George R. Staeffler and Leslie S. Robinson with tellurometer.

Two NSF-supported projects in Antarctic mapping were carried out during the 1960-61 season - one in the United States and one in the Antarctic.

A grant to the American Geographical Society provided for the revision of its present base map of Antarctica and the preparation of a new map with improved type and format. Preparation was at a scale of 1:3,000,000 and publication at a scale of 1:5,000,000, in three colors - black, grey and blue. The new map is in four quadrants, oriented with Greenwich 0° longitude at the top of the map, and includes many of the islands to the north and north-east of Palmer Peninsula.

Six topographic engineers and a photogrammetrist spent the summer season in New Zealand and Antarctica under an NSF grant to the U.S. Geological Survey. This project included photogrammetric compilation of maps for multi-color reproduction of the Horlick Mountains and Executive Committee Range, and mono-color maps of the McMurdo Sound area. It also comprised a photo revision of the Thurston Peninsula area and field operations to establish ground control in the areas of the Bellingshausen-Amundsen Sea, additional points in the Horlicks, the mountains west of the Ross Ice Shelf, and the Taylor and Wright Dry Valleys of Victoria Land.

In addition, provisions were made to continue the service of the Antarctic map and aerial photography library in Washington, D.C., to train personnel for future expanded mapping programs, and to complete three maps of the Wilkes Land coast, photography of which was obtained in 1946-47 on Operation Highjump.

geodesy and cartography

The USGS topographic engineers involved were Joe M. Anderson, Peter F. Bermal, Joel H. Langhofer, Leslie B. Robison, George R. Staeffler and Thomas E. Taylor. The photogrammetrist was William R. MacDonald. The aerial photography basic to the project was accomplished by U.S. Navy Air Development Squadron Six.

Peter F. Bermal determines station location with theodolite.



oceanography

Personnel included Richard H. Evans, Lloyd W. Wilson and Donald D. Roberts aboard the Staten Island; Larry K. Lopley and J.Q. Tierney (USARP Representative on the Amundsen Sea Expedition) aboard the Glacier, and J.C. Franco aboard the Edisto.

A grant to the University of Texas supported studies on the significance of bacteria and organic carbon concentrations in the organic cycle of Antarctic waters, performed on the Staten Island by H. Reed Stevens.

Oceanographic data compiled during the IGY from South Atlantic and Antarctic waters were assembled and studied in the U.S. with the aid of the third NSF grant within the oceanographic discipline. This work was performed by the Texas A. & M. Research Foundation.

In addition, shore-based oceanographic research at McMurdo, made possible by an NSF grant to the Hydrographic Office from the previous season, continued throughout the summer of 1960-61. This study was carried out by Dr. Willis L. Tressler. He was assisted by Audun "Ole" Ommundsen of AINA.

Three NSF grants supported oceanographic research in the Antarctic during the summer of 1960-61. A grant to the U.S. Navy Hydrographic Office provided for ship-based studies of Antarctic waters.



Dr. Willis L. Tressler, hydrographic office, makes record of water samples from McMurdo Sound.



Biologist Willis Tressler, investigating the sea bottom, built a hut around the ice hole he made, and had to share it with a seal.

Richard H. Evans, hydrographic office, tests salinity - measuring apparatus aboard Staten Island.



"Ole" Ommundsen clears entrance to hut that covers 10 foot hole through ice of McMurdo Sound.



H. Reed Stevens, Jr., University of Texas, checks gear used aboard the Staten Island.



meteorology

NSF support to basic research in the meteorological sciences in Antarctica during the 1960-61 season amounted to five separate grants - three to the U.S. Weather Bureau, and one each to the Scripps Institution of Oceanography and the U.S. Army Ballistic Research Laboratories at Aberdeen Proving Grounds.

The largest grant went to the Weather Bureau for the conduct of synoptic meteorological programs at Byrd, Ellsworth, Hallett, Pole and Wilkes Stations. These programs included standard surface observation, upper-air soundings and surface radiation measurements at all five stations; upper-air radiation measurements at Byrd, Pole and Hallett Stations, and total and surface ozone determinations and airborne radioactivity measurements at the South Pole Station.

Data obtained through this project were made available to the International Antarctic Analysis Center in Melbourne, Australia; the Antarctic Weather Central Office of Meteorological Research of the U.S. Weather Bureau; the U.S. Navy, and other nations carrying out research and supply missions in the Antarctic.

Personnel involved in this project were: Travis L. Baker, Norman S. Bones, Carl J. Garczynski, Martin Goehigian and Thomas J. Holmes at Byrd

U.S. Weather Bureau personnel at South Pole Station. Top: Ronald E. Witalis, Center; Jack Steagall, bottom; Clarence D. McKenny. Below: Gordon A. Cartwright, weather bureau's coordinator of international meteorological programs.

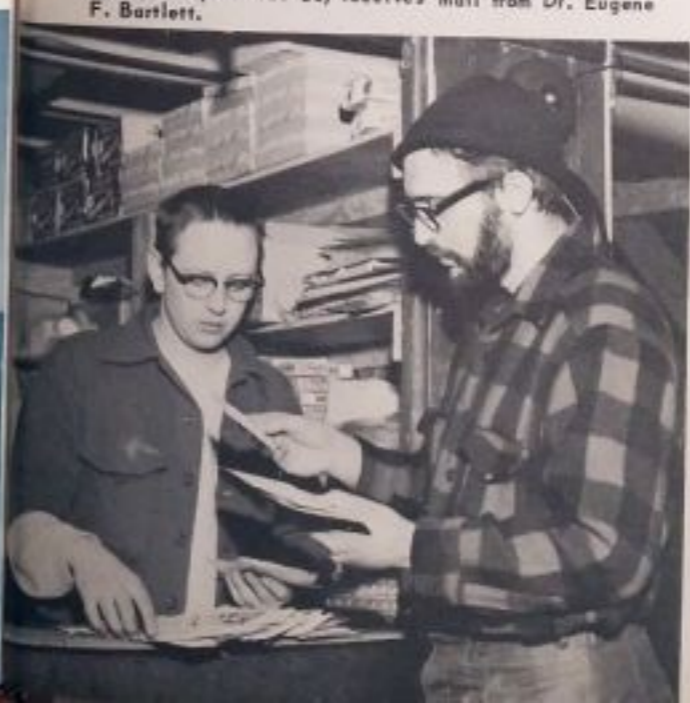
Station; Douglas W. Beaudoin, L. David Drury and Larry R. Seaquist at Ellsworth Station; Joseph E. Dessent, Larry W. Engberg and Robert W. Titus at Hallett Station; Hank J. Eckins, Ben W. Harlin, Clarence D. McKenny, Wesley R. Morris, Jack Steagall, Raymond L. Whitney and Ronald E. Witalis at Pole Station, and John E. Breckinridge, Edward C. Harrigan and George R. Hemphill at Wilkes Station.

The other two grants to the Weather Bureau provided for analysis in the States of data on the physical properties of the atmosphere, ocean and ice in and around Antarctica as well as for U.S. participation in the International Antarctic Analysis Center.

The grant to the U.S. Army Ballistic Research Laboratories supported a study of the vortical distribution of water vapor above the Antarctic Continent. The measurements, made with balloon-borne dew-point hygrometers at altitudes in excess of 100,000 feet, were the first stratospheric water-vapor measurements made in the Antarctic and possibly in the Southern Hemisphere.

The grant to the Scripps Institution allowed Mr. Witalis to study the abundance of carbon dioxide in the atmosphere in Antarctica.

Top: Larry W. Engberg, weather man at Hallett, standing near Observation Hill. Center: Ben W. Harlin, station scientific leader at Pole Station, making adjustments on ozone detector. Below right: Hank J. Eckins operating GMD-1A, which picks up radiosonde pulses. Below left: Luis Aldaz (right), station scientific leader at Byrd during Deep Freeze 60, receives mail from Dr. Eugene F. Bartlett.





John A. Brown and Emmett J. Pybus prepare high altitude dew point hygrometer for balloon launching.

Helium inflated balloon about to be taken out of the building and released.



Emmett J. Pybus readies instrument package prior to launch.



Balloon and instrument package ascending.

aurora

An NSF grant to the Arctic Institute of North America supported a continued program of auroral observations at Byrd, Ellsworth, Hallett, Pole and Wilkes Stations, and provided necessary expendable supplies for the U.S. equipment operated at New Zealand's Scott Base. The program was designed to furnish basic information about the aurora, a mysterious phenomenon that occurs in both the northern and southern hemispheres and which continues to elude solution. Detailed data about the morphology, direction, movement and color of auroral displays were obtained through combined use of continuous photographic records with all-sky cameras and periodic visual observations.

David L. Sylvester, AINA auroral observer at Pole Station during the 1961 winter, tends bean plants left behind by summer botanical personnel.



Henry M. Morozumi, South Pole auroral observer from AINA who wintered over during 1959-60.

AINA personnel were located as follows: Pole Station, David L. Sylvester; Byrd Station, Lawrence J. Victor; Ellsworth Station, William C. Holt; and Hallett Station, Thomas B. Ballard. U.S. equipment at Wilkes Station and Scott Base was operated by Australian and New Zealand personnel, respectively.

NSF also made three other grants for antarctic auroral research. Two of these also went to the AINA and one to the Air Force Cambridge Research Center. All three were for reduction of data gathered during earlier work in the Antarctic under NSF support.



Leonid Kuperov, Russian exchange scientist from the Arctic and Antarctic Institute in Leningrad who was to carry out atmospheric research at Byrd Station, visits with the seals at Scott Base. He was flown out of Byrd in April with a stomach ailment.

ionospheric physics

James B. Burnham of the National Bureau of Standards checking intricate component of his C-3 ionospheric instrument at Pole Station.



The USARP ionospheric physics program aims at developing a greater understanding of the layers of electrically charged air in the upper atmosphere known as the ionosphere. The ionosphere is of prime importance in the transmission of radio waves by reflection from the ionized layers.

During the 1960-61 season, the National Bureau of Standards continued vertical-incidence soundings at Byrd, Ellsworth, Hallett, Pole and Wilkes Stations under an NSF grant. Apparatus at Ellsworth, Hallett and Wilkes Stations was operated by Argentine, New Zealand and Australian physicists, respectively. The equipment at Byrd Station was run by Gordon W. Angus, at Pole by James B. Burnham.

Two grants were made to Stanford University. One, carried out by Keith E. Marks, Dale R. Reed, Oliver C. Morse and Neil Brice, provided for the conduct of an airlifted survey along a series of sites in Marie Byrd Land, the Ross Ice Shelf and Victoria Land. Transported from site to site by ski-equipped R4D aircraft, the four men determined the geomagnetic latitude control of Very Low Frequency and Extra Low Frequency phenomena along the line.

The other Stanford project continued the VLF observations at Byrd and Pole Stations and provided for the initiation of observations at Hallett Station. Personnel included Keith E. Marks, Sir Charles S. Wright and Donald J. Evans at Byrd Station and James Burnham at the Pole.

cosmic rays

For the 1960-61 research year, William W. Fairchild of the Bartol Foundation of the Franklin Institute of Philadelphia relieved Hugo A. C. Neuberg, the previous field investigator from Bartol, for a continuation of a study at NAF McMurdo of the time variations of low-energy primary cosmic rays. The study will provide data fundamental to the understanding of important aspects of the broad fields of astrophysics and geophysics. Utilization of data collected at this station and from a similar station at Thule, Greenland, permits the continued study of diurnal variations and detailed comparison between the phase and amplitude of data from the two stations. A cosmic-ray-recording meson monitor was installed at McMurdo early in 1961.

Another NSF grant - this one to the University of Maryland - provided for the installation and operation for one year of a meson monitor at Hallett Station. A meson monitor uses a large scintillator, is completely automatic and requires only the change of film and charts. Apparatuses of this construction are most applicable to study near the South Magnetic Pole because they have high counting rates. This affords good accuracy in studying time variations of cosmic ray intensity. The equipment at Hallett will be operated by the U.S. auroral observer stationed there - Thomas M. Ballard.



The cosmic ray building with Observation Hill in the background.

William W. Fairchild and Hugo A.C. Neuberg at the neutron monitor in the cosmic ray laboratory.



Hugo A. C. Neuberg showing Sir Charles S. Wright the recorded data from the neutron monitor.



geomagnetism and station seismology

The U.S. Coast and Geodetic Survey received two NSF grants for the 1960-61 season. One provided for the continuation of the four magnetic observatories at Byrd, Hallett, Pole and Wilkes Stations that have been in operation since 1956. Information gained from this study will contribute to the accuracy of world magnetic charts, from which both nautical and aeronautical navigational data are derived. Personnel at Hallett and Wilkes Stations were provided by New Zealand and Australia, respectively, with the U.S. furnishing the necessary equipment. John T. Lamping was the field investigator at the South Pole Station, while David M. Perkins was the investigator at Byrd Station.

A second grant allowed the USCGS to place one man with each of the two scientific overland traverses undertaken by the University of Wisconsin - one in Ellsworth Highland and the other on the Victoria Land plateau. This project began an effort to supplement the magnetic records from the more permanent U.S. facilities in Antarctica with data taken at field stations. Each of the traverse geomagneticians, Arlo K. Meyer and Herbert Meyers, made precise magnetic measurements at selected sites along the traverse routes.

Lamping and Perkins also carried out seismological observations at their respective stations under another NSF grant to the USCGC, this one for the support of Antarctic seismological observa-



Seismograph from Byrd.

tions, which provide data that can help delineate the continental and oceanic structure of Antarctica. Part of the U.S. contribution to the international seismological station network in and around Antarctica is to record earthquakes occurring in all areas of the world.

Other NSF seismology grants included one to the California Institute of Technology for a year's operation of the seismograph station at Wilkes Station, another in Columbia University for the conduct of the station seismology program at Hallett Station, and another to Caltech for the operation, upkeep, and replacement of the South American earth strain stations at Nana, Peru, and Santiago, Chile.



John T. Lamping at his desk in the science building at Pole Station.



John T. Lamping with magnetometer.



George Toney and Sir Charles Wright single out a landmark in the Wright Dry Valley (named for Sir Charles)



Roland D. Paine, Jr., NSF Press Officer, briefs VIPS and reporters on the role of USARP in the Antarctic.

Bruce Wing, Dr. Takashi Hoshizaki and Dr. "Curly" Wehlschlag at a Christmas Eve party in the biology lab.



foreign observers

Since the beginning of Operation Deep Freeze in 1955, the United States has invited observers from other nations to participate in the many activities aboard the ships, aircraft, and bases of the U.S. Antarctic operations.

During the summer season of Deep Freeze 61 the following observers, representing eight different nations, were able to make an on the spot study of the United States' scientific exploration and examination of Antarctica.

From:

Argentina — Lt. Nestor Lopez Ambrosioni, Argentine Navy

Australia — Wing Commander Warwick Addison, RAAF
Captain M.P. Bamman, Quantas Airlines

Belgium — Mr. Jean Paul Van Bellinghen, Deputy Economic counselor, Belgium Embassy, Washington, D.C.

Brazil — Mr. Rubens J. Villela, staff member of oceanographic institute, University of Sao Paulo.

Chile — LtCol Hernan Danyau, Chilean Army.

France — Dr. Andre de Cayeux, professor of geology, University of Paris.

South Africa — Cdr Charles J. F. Netterberg, South African Navy

United Kingdom — Dr. Brian B. Roberts, Polar Desk, British Foreign Office; Senior Research Fellow, Scott Polar Research Institute.

Dr. Brian B. Roberts (left) at work with traverse leader Dr. Charles R. Bentley on Eights Coast of Bellingshausen Sea.



LtCol Hernan Danyau, Chilean Army, aboard one of USS Staten Island's helos.



Cdr C. J. F. Netterberg, South Africa, (left) with Lt Nestor Lopez Ambrosioni, of Argentina, aboard Glacier.

roster of personnel participating in deep freeze 61

task force 43 staff

officers

Capt A. H. Ashton
Lcdr A. T. Buckmaster
Ltjg A. D. Clift
Lcdr J. W. Corley
Cdr W. R. Cronenwett
Cdr R. E. Cross
CWO M.E. Diegleman
Lcdr D. F. Donahue
Lcdr R.Y. Dow

Ltjg G. N. Drummond
Capt J. A. Eady
Ltjg P. R. Fallone, Jr.
Lcdr D. M. Feinman
Maj J. H. Foster, USMC
Cdr J. T. Goodwin
Lcdr J. S. Hahn
Cdr J. W. Haskell
Maj A. Havola, USA

Lcdr L. G. Justman
Lt H. D. Kellogg
Cdr F. E. Kimberling
Cdr V. H. Kiosterud
Capt W. S. Lanterman
Ltjg P. J. Lettenberger
Lcdr J. E. Lynch
Lcdr R.E. McCloskey
Capt E. A. McDonald

Cdr J. "G" McShane
Lcdr D. W. Madison
Lt W. T. Monaghan
CWO G. Pagano, USA
Ens R. G. Page III
Lcdr C. Paul
Lcdr J. C. Peeler
Lt J. W. Potter
CWO C. D. Ransdell

Ens V.H. Rochelle
Capt L. N. Saunders
Ltjg S. Schmidt
Ltjg R. D. Shannon
Lt W. Stearns
Ens H. E. Strine
Cdr R. K. Thurman
Radm D.M. Tyree

enlisted men

W. K. Amos, RM2
J. F. Bishop, RM3
F. R. Bond, SK1
A. A. Bowers, ETN3
R.J. Britt, GM3
D. Brown, SN
R.N. Costa, AG2
J.W. Cummins, YNSN
G.W. Custer, BM2
R.R. Del Rosario, TN
A. Demisky, YNCM
W.C. Diamond, RMSN
W.N. Dinucci, PHAN
J.T. Dooling, RM2
B.L. Dreifke, PH2
C. M. Eakle, AG2
I.B. Esteron, TN
H.L. Gable, RM1
L.W. Haskin, RM3

J.L. Henderson, YN2
R.F. Henry, PHCA
H. N. Hicoock, ET2
J.M. Hogan, YN2
R.O. James, AGC
E.H. Johns, YNCA
K.W. Johnson, PHG3
H.N. King, Jr. PH2
D.J. Peterneil, DKC
O.L. Smith, AK2
W.A. Thompson, SP/5, USA
T.W. Thompson, RM2
L.A. Thorstenson, YN1
C.J. Traczyk, ETCS
D.C. Weaver, AG2
J.B. Wheeler, Jr., YN3
M.T. Kirkland, RM1
E.P. Koester, PC3

W.A. Kolmer, PN3
G.A. Kretzschmar, Jr. TE(RM)1
J.W. Leonard, PH1
S. Little, PNC
R. Littleton, RM1
L.G. Loftus, JOC3
W.E. Lowe, RMCA
W.H. Luethje, PH3
E.J. Malboeuf, Jr., YN3
H.E. Martin, HMC
D.L. Mills, YN2
T.S. Molineux, RM2
H.B. Moore, YNCA
D.W. Norris, DK1
T. O'Brien, PH2
D.E. Oglesby, RM2
J.J. O'Neill, Jr., ETNSN
E.L. Parker, Jr., RMC

F.L. Rainville, RM3
R.C. Roberts, RM2
L.A. Rummage, QMCS
R.E. Rutan, SK3
C.F. Ryan, RM3
J.E. Sampson, SD3
J.A. Schelin, JO3
J.C. Silva, SN
W.L. Simmons, PCC

DAVISVILLE DET

M.M. Alva, TN
M.D. Cabrestante, TN
G.J. Concors, SKG2
V. Cooke, SD1
A. Cunningham, SDCA
J.D. Dalton, SK1

C.B. Dela Rosa, TN
E.A. Dressler, AG1
A. L. Ebittner, TN
B. Espiritu, SK1
N.P. Foltz, ET1
J.R. Hawkins, JOSA
R.G. Hoppe, PHCS
W.K. Horner, Jr., AG1
H.B. Jackson, SK2
L.D.S. Javier, SK3
A.J. Kalogeros, Jr., SK1
J.B. Martin, AK1
L.E. Ochsner, SKC
B.A. Pascua, TN
O.H. Quilatan, TN
R.O. Sevilano, TN
T.J. Taylor, PH3
V.L. Turner, SD3

antarctic support activities

mc murdo officers wintering over

Cdr J. J. Brosnahan
Lcdr C. B. De La Vergne
Lt T.M. Allensworth, Jr., DC

Lt G. B. Andress, CHC
Lt R. D. Brown

Lt L. K. Bruyneel, SC
Lt H. B. Jones, CEC

Lt W. H. Keith
Ltjg S. C. Lamphear, SC

Lt C. V. McBurney
Lt L. T. York, MC
CWO (W-2) P. A. Wagenschnur

mc murdo enlisted wintering over

J. Aker, EN3
R.R. Allen, AC1
E.E. Allshouse, EON3
J.H. Ankrom, CMH2
D. L. Archibald, SK2
W.R. Attell, Jr., CSCA
T.H. Badger, RM2(P1)
L.E. Barlow, CMH3
A.J. Barney, ENC
W.M. Beaumont, AC1
W.T. Beckett, UTCA
A.A. Brown, EON3
J.D. Bogle, BU1
W.A. Boyd, SF1
S.J. Braddock, HM3
E.L. Callahan, CN
D.M. Campbell, ABH2
R.W. Champ, CMH2
M.L. Clark, HM1
R.H. Clart, EM1
W.E. Cleveland, SWF3
T.E. Cook, PC2
J.W. Cousins, MR1(P1)
D.R. Cox, RM3

J.C. Donner, CN
D.R. Drumm, BMCA(P2)
R.L. Eberth, ETCS
F.W. Frantz, DC2
D.A. Gallagher, YNC
V.W. Gerken, Jr., SF1
L.W. Glover, BU1
D.F. Gregory, CN
E.C. Guest, CMH3
L.A. Guffey, III, SK3
R.C. Hadley, SK2
J.L. Hannah, CECA
A.C. Hart, ACCS
G.J.J. Hawkins, CMCS
J.L. Hawthorne, ET1
P.A. Heifner, AG3(P1)
J.D. Henderson, E01
G.J. Henry, ABFC
J.L. Hopkins, RM2
R.E. Hopkins, RM3
F.E. Houser, SN
J.A. Howell, TE(RM)1
F.R. Jess, EOCA(P1)
E.F. Johnson, Jr., ET1

H. Johnson, SN
L.L. Johnson, RM3
W.L. Johnson, EN1
T.M. Johnston, EON2
C.T. Jones, UTP2
F.E. Kleinwaechter, EON3
S.L. Kostielney, PN3
A.W. Kruger, BUH2
M.E. Lash, EM1
J.W. Lee, CN
D.J. Marvy, SV3
M.S. Massaro, CS2
E.H. Maxfield, EN3
C.D.A. McCoy, SK1
B.Q. McElroy, DK2
A.N. McMinn, Jr., PN2
C.D. Melton, CEW3
R.B. Nelson, CN
J.H. Nicholson, CS2
E. Norie, RMSN
B.C. Pape, CN
J.M. Parr, CM1
R.D. Peruchiti, EN1
J.F. Pitts, Jr. SK2

C.A. Powell, RM2(P1)
J.L. Proctor, RM1(P1)
H.J. Robicheau, E01
J.M. Romano, AG1
R.L. Samuel, RM2(P1)
J.B. Saxon, Jr. PH2
D.C. Shane, ETC
G.E. Signor, AGAN
E.A. Singer, RM3
J.R. Skero, CS1
E.H. Smith, AG1
R.E. Smith, AG2
W.F. Steadman, RM1
J.J. Tenzycki, SK2
O.A. Thompson, RMCA (P1)
W.F. Thompson, CS1
C.R. Tillman, SH1
W.J. Underwood, EON3
L.I. Van Loan, AG2
W.T. Waggoner, EON2
R.D. Wagner, RM3(P1)
J.B. Walker, RM2
A.P. Warner, BULCN
J.L. Wellings, UT1

R.J. Whatley, RM2(P1)
J.C. Wasson, CN
P.R. Wick, ET2
K.R. Wilson, EON2
F.S. Winterer, RM2(P1)
B.D. Wooldridge, SH1
D.M. Young, EDH3



byrd station wintering over

Lt D. R. Walk, MC
W. Berry, RM2

G.B. Gierloff, BU1
F.E. Ford, CMH2

R.E. Griffith, CS1
C.H. Kirby, RMCA

R.J. O'Neil, UTP2(P1)
E.E. Sweatt, CEP3

J. Vito, ET3
R.R. Mickler, EON3

hallett station wintering over

Lt J. A. Kelly, MC
C.A. Lauter, Jr., ET2(P2)
J.W. Cummings, RM2 (P1)

R.B. Krieger, AG2
P.R. Lee, EM2(P1)

T.R. Nelson, CMA2
C.D. Rogers, AG3

C.J. Pavlischak, CS1
D.M. Sheldon, RM1

A.S. Sosnowski, UT1
D.F. Dougherty, AG2(P1)

pole station wintering over

Lt P.K. Swartz, Jr. MC
R. J. Boli, ET2

J.W. Brown, CE1
J.R. Cornely, RMCA(P2)

J.M. Gomez, CMH2
J.B.B. Jones, RM2

E.S. Palaszewski, BU1
J.C. Peterson, EON3

C.B. Walker, UTA3
C.N. Wegner, CS1

mc murdo summer support

Li C.W. Gates, Jr.
J.D. Adams, CN
B.J. Artzer, SWF2
P.G. Bair, EON3
N.A. Bambini, UT1
E.R. Barkham, EONCN
M.A. Bass, Jr., CN
E.H. Beck, Jr., SWFCP
D.E. Benson, BUL3
W.W. Bell, SK2
J.C. Betz, SWF2
J.M. Black, CEW2
I.E. Bonney, UT1
P. Borkowski, UTP2
C.J. Brathwaite, CN
R.E. Britton, CE1
R.D.R. Brown, BUL3
J.A. Burke, SWF2
C.R. Burkett, CMA3
P.D. Buckley, HM3
H.B. Cann, BUL3
W.J. Chapleau, BUL2
J.C. Chumbley, EOH2
C.E. Churchwell, SW1
K.J. Cox, CMA3
F.M. Crandall, EOI
D.L. DeLong, EOH3
G.R. DeLong, EONCN
B.L. Denton, SWF2
F.A. Deroo, CN
A.J. Desonia, CN
J.W. Dever, EOH2
V. Di Giuseppe, SWCA
G.L. Draffan, DK2

J.H. Dudding, Jr., EOHCN
A.G. Dufour, CE1
D.L. Eacret, CN
K.F. Edwards, CN
C. Elmore, Jr., EON2
L.L. Ely, BUL3
M.K. Everett, BUH3
A.H. Ewart, Jr., CMA2
D.W. Fellows, CMH3
E. Ferreira, CEW3
W.E. Fink, BUL3
H.W. Fischer, BUR3
J.L. Fitzpatrick, CES3
R.E. Fowler, UTA2
H.L. Freeland, EON3
J.R. French, EOH2
C.D. Frieze, EOH3
R.D. Gabbert, EOH3
C.O. Gaulin, CN
E.W. Gertz, CN
T.L. Gibbon, EOCA
F.L. Gooden, SWF2
J.P. Gudmunson, BU3
C.R. Hall, ACT2
G.A. Hall, CMA2
R.P. Hardwin, CMA3
J.P. Hauser, EOH3
E. Hill, Jr., SWE2
F. Hill, EOH3
E.C. Hinson, SWE2
R.W. Hofus, BUL3
W.L. Hopkins, BUL3
R.E. Hubbell, EOI
L.R. Huff, SK2

M.W. Hughes, CEW3
M.H. Ireland, CEW3
A.E. Johnson, BUC
J.L. Johnson, SK3
J.B. Jones, YN3
G.J. Kelly, CS3
A.R. Kibler, CN
R.M. Klinger, CMH3
R.M. Lambert, SWF3
H.A. Lammel, CEW3
C.J. Mamo, CP
M.F. Maudal, SK3
L.E. Matter, CEW2
M.L. May, CE1
L. Mayfield, EON3
J.K. McCall, CN
W.J. McCarthy, CEW3
A.L. McGehee, EOI
D.L. Means, UTW3
K.A. Mietzner, EON2
L.A. Mills, SK2
J.W. Morrisette, BUL3
A.J. Mulkey, AC1
D.L. Nelson, SK2
R.W. Nelson, BU1
L.L. Noland, UTPCN
D.J. O'Shea, SWE2
T.W. Padgett, CMA3
F.R. Paessun, SWCA
C.A. Parker, CMA2
R.A. Parker, EON2
L.L. Pease, BUL2
D.G. Peterson, CN
M.L. Post, SV2



R.V. Priest, EON3
G.H. Racicot, DT2
J.E. Raffin, SW1
E.A. Ray, RM1
P.A. Remillard, PCC
D.R. Robinson, CN
W.A. Robison, SK3
J.L. Roger, UTP3
R.N. Schmierer, CN
R.G. Scoggins, HM1
F.M. Simpson, BU1
R.L. Smith, CN
R.E. Smith, CS2
C.L. Snider, EON3
D.R. Snyder, CN
F.L.G.N., Sou, PN2
C.O. Spillman, BUL1
E. Stacey, CEP3
J.T. Stroub, SV3
J.L. Sutorus, UTP2
A.J. Synowicz, Jr., UTA2
A.D. Tache, CN
W.C. Taylor, BUR2
F.L. Tenry, UTB2
H.D. Thomas, CN
E.F. Truax, RM3
K.A. Veillette, UTPCN
A.E. Walkington, UTP2
J. R. Wardensky, CN
B.W. Watson, CES2
J.R. White, EON2
C.C. Williams, EOI
E.C. Williams, CECA

new byrd

Ltjg D.C. De Vico
K.L. Allison, CS3
H.J. Anable, EOI
E.D. Barnes, Jr., UTA3
J.S. Becmer, CN
J.M. Birmingham, EON2
W.E. Brown, BUL3
G.E. Butler, CMA2
H.E. Cabey, EOH3
F.A. Carr, CN
A.R. Cleland, EOI

T.V. Chapman, CN
W.E. Cleveland, SWE3
I.F. Copp, BUC
J.L. Crawford, BUL3
F.S. Crumbliss, CMA3
D.L. Cullen, BU1
A.E. D'Aquino, EOH3
C.W. Dawkins, CN
E.A. DeLeon, EON2
V. DeMaio, CN
T.L. Durham, UTP2

W.J. Franolich, EOH3
J.W. Funk, CMH3
R.J. Graham, Jr., CN
D.L. Hebert, CN
J.J. Hughes, Jr., SVC
C.E. Jackson, CN
J.E. Jones, CM1
R.J. Kissel, CN
E.E. Lee, CEP2
J.D. Lecik, CN
G.A. Lewis, III, BUR3

G.S. Lichtenberger, BUL3
W.J. Lorch, CEP3
F.J. Luttrio, CN
T.J. Lyden, CN
D.A. Maxfield, BUL3
F.F. Michel, Jr., SV3
W.R. Moore, Jr., BUC
J.F. Mumm, CEP3
R.J. Niedermayer, BUL3
D.L. Nordskog, UTP3
R.W. Norwood, BU1

J.H. Perkins, UT1
R.J. Poniewaz, BUR2
R.W. Post, EOC
E.B. Scheele, SWE2
R.E. Smith, CS2
M.R. St. Pierre, UTP3
B.L. Talbert, BUL3
J. Vandenberg, HM2
D.L. Wilcoxon, CMA3
D.E. Williams, EOCA
R.J. Wrigley, EOH2

air development squadron six (vx-6)

officers

Capt W. H. Munson
Cdr L. E. Newcomer
Cdr M.D. Greenwell
Lcdr D.D. Abbott
Lt D.L. Angier
Lcdr F.A. Bates
Cdr E.B. Binkley
Lt C.F. Bird
Ltjg H.F. Buchberger
Lcdr A.A. Capozzoli
Lcdr R.C. Carew
Lt R.F. Carlson
Lcdr R.R. Caruthers
Ltjg J. R. Chambers
Ltjg E.A. Christoffersen

Lt J.W. Cornwell
Capt L.L. Darbyshire, USMC
Lcdr E.D. Dryfoose
Lt G. M. Dyer
Lt R.H. Farrington
Lt D.J. Finn, Jr.
Cdr E.R. Forstht
Lt T.S. Hale
Lt H.B. Haskell
Lt J.A. Hickey
Ltjg J.W. Hill
Ltjg K.O. Honderich
Ltjg W.D. Hughes
Lt G. Janulis

Capt R.M. Johnson, USMC
Cdr M. Krebs
Capt M.A. Lebas, USMC
Capt J.F. Lisicky, USMC
Lt A.A. Littrell
Ltjg W.L. Loomam, Jr.
Ltjg I.J. Morrison
Capt T.E. Morrow, USMC
Lt D.F. Moxley
Lt E.W. Oehlbeck
Lt A.M. Pardue
Maj E.D. Pitman, USMC
Lcdr E.A. Potter
Lcdr D.L. Reckling

Lt G.M. Renegar
Lcdr R.L. Rice
Cdr J.D. Richardson
Lt B.L. Simpson, Jr.
Lt S.R. Snyder
Lt E.J. Stelz
Lt E.H. Unger
Lt H.L. Van Dusen
Capt J.G. Walker, USMC
Ltjg J.W. Weeks
Lt M. Wright
Det. Alpha
Lcdr L.L. Helms
Lt S.W. Clayman
Lt D.W. Roe, Jr.

LtCol F.B. Frost
Maj L.S. Bearskin
Maj D.O. Blackmon
Maj J.W. Cartwright
Maj J.H. Frank
Maj W. J. Gallarda
Maj H.L. Harrell
Maj J. Mitchell, Jr.
Maj J. E. Roesel
Maj L. F. Uebel
Capt C.E. Abbott
Capt H.L. Arnett, Jr.
Capt N.A. Arsenault

Msgt W.R. Adamsen
Msgt J.R. Barrineau
Msgt M.L. Beaty
Smsgt G.W. Boyer
Msgt F.J. Broadley
Msgt L. Caywood

A.A. Nielsen, ADCS
O.N. Dotson, Jr., ADC
J.H. Bratina, ADC
J.P. Budoff, ADC
Q.W. Christie, ADC
W.L. Cole, ADC
J.D. Mitchell, ADC
A.A. Pautenis, ADC
G. Stevens, ADC
A. Vicari, ADC
E.F. Graham, ADJC
F.A. Long, Jr., ADJC
H.H. Murray, ADJC
F.C. Becton, ADRI
J.E. Beiszer, ADRI
H.J. Bracken, ADRI
B.L. Chase, ADRI
G.D. Connor, ADRI
G.J. Cronin, ADRI
R.C. Daley, ADRI
J.C. Eblen, ADRI
C.C. Frazier, ADRI
J.T. Jackson, ADRI
S. Koszick, ADRI
M.E. MacLeod, ADRI
R.W. McCracken, ADRI
G. McFadrigue, ADRI
C.D. Steele, ADRI
M.J. Wood, ADRI
R.A. Zinser, ADRI
A.E. Benoit, ADJ1
H. Hoffman, ADJ1
W.R. Nydegger, ADJ1
R.L. Parry, ADJ1
E.L. Quinn, ADJ1
M.P. Bradford, ADR2
L. Brown, ADR2
R.H. Cosman, ADR2
R. Davis, ADR2
J.L. Gray, ADR2
R.A. Kramer, ADR2
E.D. Rudder, Jr., ADR2
T.M. Smith, ADR2
R.E. Wallace, ADR2
D.E. Ward, ADR2
J.B. Washburn, ADR2
D.C. Friend, ADJ2
A.L. Barry, Jr., ADR3
W.D. Bentley, ADR3
L. Campbell, ADR3
W. Dearing, Jr., ADR3
C.L. English, Jr., ADR3
N.A. Heaney, ADR3
G.A. Sanchez, ADR3
G.C. Smith, ADR3
R.A. Whitesell, ADR3
J.F. Arnold, ADJ3

E.L. Kingen, BMI
T.C. Caines, RM1
M.C. Smith, Jr., RM1
D.C. Legere, YN1
R. Perez, YN1
R.D. Cavicchi, YN2
D.L. Spencer, YN2
C.H. Wilson, Jr., YN2
G.R. Livermore, YN3
D.N. Toellner, YNSA
J.P. Cunningham, PNC
F.W. Price, PN2
D.A. Rock, PN2
R.J. Schick, PN2
A.O. Bartlett, PN3
J.W. McClelland, PN3
C.F. Epler, Jr., SKC
J.W. Walker, DK1
P.M. Brown, DK2
J.G. Masullit, DK2
C.W. Segers, CSC
L.F. Kaiser, CS1
C.W. Nichols, SD2
O. Pascual, SD2
H. Robinson, SD2
C.F. Fontecha, SD3
R.C. Caslib, TN
N.P. Chan, TN
D.L. Ereneau, TN
D.C. Monroy, TN
W.O. Brown, CS2
E.E. Fain, CS2
A.J. Jones, CS2
J.H. Nicholson, CS2
J.E. Adams, CS3
F.H. McDaniel, CS3
G.L. Barrie, SH2
J.H. MacDonald, Jr., JOC
L.G. Adams, SN
J.E. Buckley, SN
A.A. Edelin, Jr., SN
G.P. O'Hara, SN
H.H. Enges, ADCS

air force task unit officers

Capt R. J. Briscoe
Capt A.J. Brueckner, Jr.
Capt R.W. Burtner
Capt V.R. Cooper
Capt G.C. Demunck
Capt J.J. Douches, Jr.
Capt J.R. Gannon
Capt J. E. Hagler
Capt L.R. Hileman
Capt G.O. Hubbart
Capt J.L. Huston
Capt L.A. Joos
Capt H.E. Jordan

Msgt J.A. Chitty
Msgt B. Combs
Msgt R.H. Cook
Msgt J.L. Dyson
Msgt W.J. Gearhart
Smsgt J.C. Good

enlisted men

D.D. Day, ADJ3
L.G. Hammer, ADJ3
R.A. McClinton, Jr., ADJ3
J.E. Trull, ADJ3
D.P. Campbell, ATC
H.Q. Olsen, ATC
N.L. Cheeks, AT1
J.B. Goodlin, AT1
P.W. Gregor, AT1
C.A. Hock, AT1
A.L. Lishness, AT1
W.E. Padgett, AT1
J.P. Parker, AT1
R.L. Pfeifer, AT1
L.R. Sharpe, AT1
D.R. Snyder, AT1
R.L. Wood, AT1
C.C. Allen, AT2
J.J. Curtis, AT2
T.E. Harpring, AT2
M.S. Leon, AT2
R.E. Martin, AT2
H.J. Matthews, AT2
J.D. McKinnis, AT2
M.S. Perez, Jr., AT2
R.W. Saukko, AT2
M.L. Shaffer, AT2
R.W. Shepard, AT2
K.R. Starr, Jr., AT2
R.C. Straube, AT2
L.P. Woodard, AT2
J.D. Adams, Jr., AT3
F. Langbein, AT3
E.J. Connors, Jr., A03
B. Fratus, A03
J.L. Moody, ABEC
J.F. Conroy, ABHC
F.W. Whitney, ABHC
N.T. McCrimmon, AB1
R.L. Allison, ABH1
D.G. Boleen, ABH1
D.J. Guy, ABF2
J.C. Mowrey, ABF2
C.K. Long, ABH2
C.E. Thomas, Jr., ABH2
S.D. Underwood, ABH2
D.J. Lundstrom, ABH3
J. Mihalcik, AECM
H.A. Schaepe, AECS
E.J. Cavanaugh, AEC
G.R. McKeon, AEC
C.L. Burton, AE1
J.J. Eanetta, AE1
K.A. Kellett, AE1
G. Kovach, AE1
D.J. Patrick, AE1
C.R. Richards, AE1
W.J. Schobert, Jr., AE1
J.C. Shaffer, AE1
E. Siegel, AE1

D.C. Beutler, AE2
D.A. Chmielecki, AE2
R. Goodell, AK1
J.M. Fairbanks, AE2
T.A. Fusco, AE2
J.B. Mitts, AE2
R.W. Sappenfield, AE2
G.H. Strobel, AE2
E.M. Traugott, AE2
J.C. Causey, Jr., AE3
H.L. Herles, AE3
J.T. Bailey, AMC
D.L. Cain, AMH1
G.A. Carpenter, AMC
K.N. Nagel, AMH1
C.J. Nichols, AMC
R. Rupp, AMC
R.H. Weyrauch, AMH1
J.M. Bearden, AMH1
A.D. Behrens, AM1
W.W. Chastain, AM1
F.J. Daugherty, AM1
A.T. Folts, AM1
J.W. Garwood, AM1
J.W. Hendry, AM1
A.R. Hodgkins, AM1
L. Lubo, Jr., AM1
R.B. Shirk, AM1
G.F. Stokely, AM1
R.L. Symmonds, AM1
J.H. Tankersley, AM1
M.E. Wilkerson, AM1
G.D. Loper, AMS1
J.J. Amo, AMS2
J.H. Latshaw, AMS2
S. Sapinski, AMS2
M.F. Flowers, AMH2
R.L. McGowin, AMH2
J.D. Leake, AME2
T.F. Borral, AMS3
K.E. Brewster, AMS3
D.E. Kirkland, AMH3
W.C. Suerth, AMH3
G.J. Guyette, AMSAN
D.J. Fell, AMHAN
J.L. McCreary, AMHAN
D.T. Hutchinson, PRCS
J.C. Jones, PRC
J.L. Cramer, PR1
A.N. Edwards, PR1
R.W. Bashaw, PR2
M.R. Bishop, PR2
M.D. Holland, PR2
R. Spaulding, PR2
S.G. Crowley, PR3
D.W. Richards, PR3
D. MacDowell, AG2
D.J. Rheume, AG2
F. Daugherty, AKC
A.L. Roberts, AKC

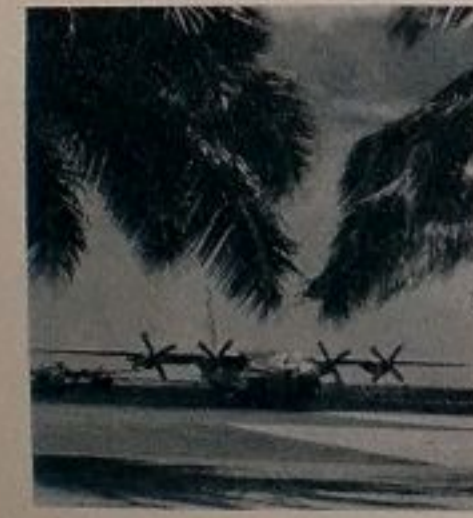
D.J. Schmidt, AKC
C.E. George, AK1
T.H. Dunn, AE2
K.A. Johnson, AK1
D.E. Lewis, AK1
I. Matthews, AK1
J.E. Vivian, AK1
G.G. Bell, AK2
E.M. Gamsey, AK2
E.E. King, Jr., AK2
G.A. Palzer, AK2
A.F. Soley, Jr., AK2
A.C. Villanueva, AK2
D.A. Wooten, AK2
M. Zuniga, AK2
W.D. Adams, AK3
M.R. Janicot, AK3
J.D. Sullivan, AK3
J.E. Hallenbeck, AKAN
R.F. Protzman, AKAN
F. Kazukaitis, PHC
J.D. Reimer, PHC
B.M. Andersen, PH1
A.T. Folts, AM1
L.V. Cookson, Jr., PH1
G.R. Kessens, PH1
L.R. Mathis, Jr., PH1
E.B. Barfield, PH2
M.J. Billante, PH2
W.L. Lewandoski, PH2
L.D. Sayen, PH2
A.E. Tilley, PH2
H.N. Williams, PH2
E.D. Foote, PH3
G.R. Johnson, PH3
P.D. Paxton, PH3
M.J. Perez, PH3
R.E. Woods, Jr., PH3
J.A. McMillen, Jr., PHAN
R.B. Allbee, AN
T.S. Behlmann, AN
L.D. Bennett, AN
M.R. Booska, AN
M.E. Busch, AN
E.H. DeCamp, AN
R.C. Genung, AN
C.A. Hester, AN
C. Holt, AN
J.D. Jackson, AN
D.O. Knapp, AN
R.E. Lippka, AN
C.W. Munch, AN
B.J. Raymond, AN
T.D. Vanetta, AN
D.H. Warren, AN
G. Weeks, AN
H.D. Harris, HMCS
W.A. Fleet, HMC
P.T. Leak, HMC
E.J. O'Neil, HM2
P.L. Edwards, DT2

enlisted men

Msgt D.C. Hawkins
Msgt H.E. Henderson
Msgt J.F. Lindstrom
Msgt W.B. Lynch, Jr.
Msgt G.D. McNamara
Msgt D. Olsen

Msgt J.D. Owens
Msgt G.W. Perry
Msgt L.W. Samuelson
Msgt J.B. Smith
Smsgt M.A. Stout
Msgt E.J. Wright

Msgt M.B. Wright
Tsgt M. Akui
Tsgt G.B. Beaudry
Tsgt J.A. Brightwell
Tsgt M.E. Chase
Tsgt J. Collins, Jr.



Tsgt F.R. Conard
Tsgt J.F. Conway
Tsgt L.A. Couture
Tsgt L.L. Crocker, Jr.
Tsgt T.W. Duncan
Tsgt M. Garza
Tsgt A.L. Gray
Tsgt L.P. Groudin
Tsgt W.J. Harkins
Tsgt J.B. Hipps
Tsgt M.C. Honeycutt
Tsgt R.H. Huffman
Tsgt C.W. Jackson
Tsgt J.C. Jarrard
Tsgt R.C. Kofalk
Tsgt C.A. Kramer
Tsgt J.J. Langdon
Tsgt B.G. Lanter
Tsgt E.E. Lauer
Tsgt H.G. Lee
Tsgt W.J. Majetic
Tsgt A. Manning
Tsgt J.R. Manning
Tsgt C.J. Mathews
Tsgt J.E. McDaniel
Tsgt R.J. Morris
Tsgt J.J. Nesei
Tsgt D.H. Partington
Tsgt D.W. Peterson
Tsgt K.W. Poteet
Tsgt H.P. Quinn
Tsgt T.H. Rhyne
Tsgt G.E. Seeley
Tsgt W.B. Tummiere
Tsgt A. Werlinger
Tsgt H.E. Willett
Tsgt K.T. Williams
Tsgt J.C. Wood
Tsgt E.J. Youngsma
Ssgt C.W. Allen
Ssgt E.D. Alphin
Ssgt R.A. Barley
Ssgt M.L. Baskins
Ssgt R.J. Bigford
Ssgt F.W. Botham, Jr.
Ssgt A.L. Brown
Ssgt C.W. Browning
Ssgt B.R. Buchanan
Ssgt T. Burkaski, Jr.
Ssgt A.Q. Cable
Ssgt L. Cannon
Ssgt R.L. Cantrell
Ssgt D.E. Casey
Ssgt H.E. Clark
Ssgt J.E. Clayton
Ssgt B.W. Cole
Ssgt R.R. Cole
Ssgt H.E. Colman
Ssgt J.A. Corbitt
Ssgt M.L. Crowe, Jr.
Ssgt R.A. Davis
Ssgt R.E. Day
Ssgt J.L. Deese
Ssgt H.L. Diwelbiss
Ssgt R.M. Dows
Ssgt R.W. Drapeau
Ssgt S.F. Dudek

Ssgt E.K. Edwards
Ssgt J.S. Fastnacht
Ssgt C.T. Featherstone
Ssgt B.R. Fisher
Ssgt J.W. Flowers
Ssgt O.E. Gaede
Ssgt D.C. Gallitzin
Ssgt W.R. Gardner
Ssgt R.R. Garza
Ssgt D.A. Genens
Ssgt O.D. Goodner
Ssgt C.L. Goodwin
Ssgt R.J. Green
Ssgt P.W. Griggs
Ssgt J.S. Guinn
Ssgt J.F. Hamill
Ssgt W.L. Hammond, Jr.
Ssgt J.R. Hamner
Ssgt J.D. Haney
Ssgt L.R. Harmon
Ssgt D.H. Herlufson
Ssgt R.H. Herman
Ssgt W.P. Hipps
Ssgt V.W. Hood
Ssgt C.W. Hoggood
Ssgt J.W. Howard
Ssgt R.T. Jenkins
Ssgt C.L. Johnson
Ssgt T.A. Johnson
Ssgt G.W. Kelley
Ssgt B.R. Kirby
Ssgt L.H. Krause
Ssgt G.J. Ladoceour
Ssgt E.T. Landrum
Ssgt B.R. Logan
Ssgt B.L. Long
Ssgt O.R. Long
Ssgt H.D. Lorenz
Ssgt G.D. Lucas
Ssgt J.R. Mace
Ssgt B.F. Marlar
Ssgt R.K. Matthews
Ssgt D.G. McGill
Ssgt R.E. McGirr
Ssgt D.D. Meadows
Ssgt M.H. Newman
Ssgt J. D. O'Bryan
Ssgt B.E. Overman
Ssgt D.E. Parks
Ssgt A.D. Payette
Ssgt S. C. Pimes
Ssgt C.H. Pittman
Ssgt T.W. Pressley
Ssgt J.H. Pritchard
Ssgt L.W. Pursley, Jr.
Ssgt R.G. Pyle
Ssgt C.L. Roberts
Ssgt D.C. Rutherford
Ssgt J.J. Ryan
Ssgt R.B. Sacra
Ssgt J.W. Sammons
Ssgt W.T. Sauve
Ssgt A.H. Sharpe
Ssgt R.J. Shiley
Ssgt M.E. Shoener
Ssgt I.C. Smith
Ssgt J.D. Smith

Ssgt C. Stiffler
Ssgt G.D. Stine
Ssgt J.A. Styles
Ssgt C.W. Thompson
Ssgt S. Tichi, Jr.
Ssgt P.S. Vaughn, Jr.
Ssgt G.F. Vivarttas
Ssgt T. Watkins, Sr.
Ssgt E. Werzinsky
Ssgt T.W. Whalen
Ssgt J.C. Williams
Ssgt F.D. Williams
A/1C R.D. Alexander
A/1C S.F. Angele
A/1C M.T. Ashley, Jr.
A/1C C.T. Banken, Jr.
A/1C C.W. Besselt
A/1C J.J. Bouoay
A/1C T.H. Bourne
A/1C H.J. Bryant
A/1C T.E. Bryant
A/1C J.H. Buckingham
A/1C L.L. Bunton
A/1C J.W. Burleson
A/1C H.M. Butler
A/1C W.A. Caron
A/1C C.D. Carpenter
A/1C M.W. Cash
A/1C R.E. Cook
A/1C T.G. Cox
A/1C J.E. Crabtree
A/1C F. J. Daugherty
A/1C A. Dickens
A/1C C.L. Donaldson
A/1C C.D. Eubank
A/1C C.N. Eubanks
A/1C R.C. Euscher
A/1C B.C. Evans
A/1C B.B. Farley
A/1C H.A. Farley
A/1C T.H. Faulkner
A/1C J.T. Flanagan
A/1C W.M. Frye
A/1C R.A. Gaffin
A/1C M.D. Garber
A/1C C.R. Garst
A/1C J.T. Gibson
A/1C W.T. Giffin
A/1C D.L. Grant
A/1C W.P. Grindstaff
A/1C T.W. Haney
A/1C C.C. Hart
A/1C M.E. Higgins
A/1C M.E. Holden
A/1C B.G. Holt
A/1C R.W. Hooper, Sr.
A/1C E.F. Huskey
A/1C R.E. Jared
A/1C C.F. Johnson
A/1C J.N. Johnson
A/1C M.J. Klecki
A/1C B.J. Long
A/1C R.H. Lovelady
A/1C B.H. Martin
A/1C J.B. McCormick, Jr.
A/1C P. E. McCurdy
A/1C T.M. McDonald

A/1C J.M. McIntyre
A/1C V.A. Mennella
A/1C J.E. Miley
A/1C D.F. Miller
A/1C W.J. Nasiatka
A/1C R.A. Nelson
A/1C R.J. Ott
A/1C C.L. Palmer
A/1C H.D. Parramore
A/1C J.D. Peyton
A/1C J.D. Roush
A/1C C.L. Propst
A/1C F.A. Puckett
A/1C A.A. Sandoval
A/1C W.B. Sawyer
A/1C R.S. Schreiner
A/1C R.L. Scott
A/1C R.R. Shields
A/1C A.D. Simpson
A/1C J.E. Slater
A/1C B.H. Solomon
A/1C D.L. Styles, Jr.
A/1C K.M. Van Natter
A/1C M.O. Watson, Jr.
A/1C J.F. Watts
A/1C J.H. Williams
A/1C C. Witt
A/1C M.W. Wolfe
A/1C H. Woods
A/2C J.A. Abbomavage
A/2C H.M. Adams
A/2C R.L. Allen
A/2C A.B. Atwood
A/2C R.C. Banks
A/2C R.W. Bell
A/2C T.L. Boatner
A/2C P.A. Brandenburg
A/2C L.G. Brewer
A/2C J.T. Broome
A/2C K.G. Brubaker
A/2C B.H. Bruce
A/2C N.L. Burke, Jr.
A/2C J.C. Burris
A/2C E.B. Campbell
A/2C R.M. Candiano
A/2C J.W. Crawford
A/2C A. Davidson
A/2C R.D. Davis
A/2C J.J. Delaney
A/2C R.E. Derix
A/2C T.J. Dixon
A/2C J.R. Doak
A/2C G.C. Eddy
A/2C R.F. Foreman
A/2C P.R. Friend
A/2C P.L. Gallagher
A/2C E.J. Galligan
A/2C L. George, Jr.
A/2C C.E. Glentz
A/2C J.L. Green
A/2C W.F. Greeson
A/2C C.S. Gregory
A/2C C.G. Grife
A/2C R.J. Hall
A/2C R. Hartzell
A/2C T.E. Hazen



A/2C G.F. Henderson
A/2C L.K. Holmes
A/2C L.I. Hoyt, Jr.
A/2C R.L. Johnson
A/2C J. Kancz, Jr.
A/2C J.D. Keenum
A/2C C.E. Kelly
A/2C R.L. Kiser
A/2C D.L. Kroh
A/2C L. Lafleur, Jr.
A/2C W.L. Lallithan
A/2C L. Larsen
A/2C R.G. Lebedin
A/2C O.B. Lowry
A/2C J. Martins, Jr.
A/2C J. T. McClure
A/2C D.H. Meader
A/2C R.C. Millican
A/2C C. Moore, Jr.
A/2C D.E. Morris
A/2C W.F. O'Brien
A/2C R.N. Owens
A/2C J.L. Rivere
A/2C L.M. Rice
A/2C L.L. Rollins
A/2C L.C. Sessions
A/2C C.L. Shouse
A/2C J.M. Smallwood
A/2C W.H. Stames
A/2C D.W. Stewart
A/2C J.E. Stone
A/2C H.W. Taylor
A/2C J.S. Taylor
A/2C J.D. Tipton
A/2C J.W. Walker
A/2C J.A. Welle
A/2C R.L. Westfall
A/2C G.L. Wright
A/2C G.U. Wright
A/3C G.R. Anderson
A/3C H. J. Bliss, Jr.
A/3C R. Carpenter
A/3C H.T. Chinn
A/3C E.D. Cox, Jr.
A/3C R. Cox
A/3C H.F. Ellis
A/3C J.S. Frene
A/3C F.C. Livermore
A/3C B.T. McAdams
A/3C R.D. Montross
A/3C R.E. Nichols
A/3C R.C. Piner
A/3C W.L. Teutsch
A/3C D.G. Torbush
A/3C E.W. Dyson, Jr.

Ens A.E. Walton
Ens T.M. Crow
Ens J.A. Lasky

R.R. Gliddon, FN
T. Gordon, SO1
K.E. Graham, SN
K.B. Greene, BM2
F.W. Greer, HMCA
D.R. Hassel, SO1
M.J. Hayes, BT3
S.L. Hazlewood, SN
D.G. Heavilin, RD3
E.E. Henry, TN
D.L. Hester, PN3
L.H. Hill, EN2
R.C. Hirsch, RD2

D.J. Hlaca, SH3
T.R. Hoeling, YN3
J.A. Horton, GM3
F. Ingmire, FTASN
J.T. Ivester, SN
R.D. James, FTM3
C.P. Jarvis, CS3
O.M. Jennings, SA
K.N. Jensen, ETRSN
R.A. Jensen, SM2
M. Johnson, SA
G.E. King, SA
D.W. Kitch, S3
H.T. Klaus, PNC(P1)
M.J. Knight, FN
J.D. Kotalis, EN1
P.C. Linder, SN
A.G. Lovett, SM2
E.J. Majerle, FTM3
G.S. Malinag, TN
J.E. Martz, AG2(P1)
E.L. Massey, AG2
D.B. Mathews, EN2
W. McElfish, SN
C.R. McFadden, RD3

Cdr G.C. Evans, Jr.
Lcdr T.F. Gerecke
Lt W.H. Goforth, Jr.
Lt J.V. Ransey

C.M. Abenes, SK3
M.C. Adamo, BT3
R.J. Albert, Jr., BT3
D.L. Anderson, SN
R.G. Austin, SFM2
J.A. Babauta, SD1
L.J. Ballard, CS3
C.R. Ballew, SN
M.J. Balis, Jr., FN
J.E. Bibik, FN
R.C. Boiles, FR
H.E. Bowman, SN
L.W. Bowman, SN
P.J. Boyle, SN
P.M. Breslin, FN
C.C. Brewer, QM1
F.J. Brissette, GM3
J.L. Brockman, IC3
H.C. Brown, SN
L.R. Brown, JO2
D.K. Burke, DT2
R.J. Burns, FN
P.E. Carney, ICFN
D.G. Castleberry, ET1
M.A. Cirignano, EN1
D.R. Colsch, EN3
L.G. Cooper, CS3
R.I. Crane, ET2
J.D. Cravey, SFP3
J.O. Curtis, ENCA
T.B. Damian, TN
J.A. Daniels, SN
S.L. Davis, CSSN
M.J. Deegan, QMSN
K.H. Devlin, SH2
P.M. Dewey, SFMFN
V. Domoretzky, BM2
R.M. Donado, TN
G.L. Downs, SN
C.A. Edwards, SN
G.D. Edwards, Jr., EN3
J.W. Edwards, AGAN
L.J. Elvove, RMSN
A. English, Jr., BT3

Capt J.W. Naab, Jr.
Cdr K. Low
Lcdr E.W. Dorr
Lt R. O. Haughey

D.L. McFee, SKSN
P.H. McFarvey, ETR3
B.G. Mefford, RM2
G.L. Miller, SN
J.E. Monarch, AG2
E.R. Moore, FN
O.L. Nees, RD3
A.D. Nelson, Jr., SA
B.J. Nelson, FR
C.N. Nielsen, ETCS
H.L. Noble, EN2
G.C. Noon, SN
T.A. O'Brien, RD2(P1)
D.E. Orr, FN
A.P. Osborne, FN
J.P. Papandreu, RDSN
K.R. Parrotte, BM2
R.D. Parson, FN
J.M. Payton, FA
J. Peoples, Jr., YNSN
J.L. Perry, TM3
R.G. Priebe, MR2
G.R. Pugh, DC2
T.G. Ransom, ETR3
R.D. Rice, FA

Ltjg A.R. Morris
Ltjg W.H. Richardson
Ltjg P.A. Kirby
Ltjg A. Rachap

F.F. Eskridge, EM1
D. Estrada, BMCA
M.R. Fairbanks, SK3
L.E. Farrey, SA
D.W. Ferraro, DKSN
E. Fettinger, SN
J.W. Fichtinger, QM2
L.A. Furchner, BM3
W.F. Gallant, SN
R.A. Geddes, RD3
J.A. Gill, YN1
D.J. Golden, SN
G.F. Granakis, SN
G.K. Grassby, SN
W.R. Graves, Jr., BM2
J.A. Green, SN
J.J. Griffin, III, FN
J.R. Griffiths, FN
G.G. Gustavson, EN2
J.L. Hall, SN
V.R. Haines, EM2
E.P. Harrington, Jr., SN
L.W. Hartley, Jr., FN
R.F. Haumann, SN
R.B. Hernandez, TN
J.J. Herrmann, FA
R.P. Higgins, II, SA
H.A. Homioz, SA
C.M. Hooper, SN
E.B. Hose, Jr., FT2
A. House, CS1
G.W. Huffman, SN
H.A. Hunter, SN
M.E. Ingram, PH2
A.L. Jackson, RD1
A.E. Jackson, RMI
C.A. Jamison, FN
G.A. Janusch, SKSN
J.M. Jensen, SA
E. Jerry, SM3
L.E. Johnston, SN
T.B. Jones, FA
R.C. Kalher, FN
E.A. Keeler, SA



N.W. Robertson, SA
C.A. Roberts, RMI
J.D. Rohde, RMSN
W.L. Rollins, EMFA
J.W. Roscoe, CS2
F.L. Ruiz, CS1
C.C. Salas, EM2
C.V. Schneider, RD3
G.L. Schreck, EM1(P1)
A.J. Scott, Jr., EN2
W.T. Scrimsher, SOGSN
E.F. Scullion, GM2
D.G. Shriver, RD3
D.L. Shuck, SN
J.M. Simpson, BM3
A.L. Sims, EN2
R.E. Sircy, FA
F.T. Smith, DK3
H.F. Sokol, SKCA
D.S. Southern, EN1
R.M. Spaulding, SO3
D.D. Stansberry, ETRSN
R.H. Stames, RD3
W.D. Sterling, RD1

Ltjg P.R. Sawyer
Ltjg C.M. Zabler
CWO J.W. Brown
CWO P.L. Wells

J.D. Kelley, SN
V.O. Kelley, SN
D.K. Kenning, ETR3
G.K. Khoranoff, FN
M.J. Klish, FA
R.H. Koski, YN3
M.G. Laganic, SN
M.A. Ladieu, SA
T.J. Lahey, SK2
K.H. Lane, SN
L.E. Lattin, SN
W.J. Lautzenheiser, RDSN
G.F. Lea, HMC
R.A. Lebeau, FN
D.H. Leng, SN
J.W. Lewis, SMSN
G.W. Logan, EN1
T.G. Lucas, SK3
I.D. Luttrill, FN
R. Magnotti, RDSN
R.J. Mallett, BM3
R.L. Mallman, FN
H. Markowski, EM3
H.T. Marshall, PN2
A. Martin, SN
J.J. Martin, FN
G.W. Maul, SA
J. Maxie, Jr., SHL3
L.T. Mayo, BMSN
F.A. McBride, EMCA
C.E. McDuffee, FN
J.G. McKelvey, FA
E.H. McMahan, ENFN
W.R. McMinn, RMSN

Ens W.B. Hewitt
Ens J.A. Klein
Ens W.H. Low
Ens R.S. Bates

J.L. Steward, FN
E.C. Strickland, RDSN
J.L. Suffield, SHSN
R.C. Sukeforth, RM2
D.J. Sullivan, FN
R.W. Taylor, FA
S.A. Taylor, EM2
L.D. Thom, SN
L.B. Tisler, ENFA
J.L. Tschirgi, RM3
E.K. Tucker, SK3
T.F. Tyler, SN
D.E. Warner, RD2
J.L. Weaver, IC2
R.G. Welsh, RD3
W.L. Whittaker, FA
W.M. Wilcox, FT1
A.S. Williams, RMC(P1)
B. Williams, SFP2
E.E. Williams, SK2
I. Williams, CS2
W. Wilson, GMC
R.A. Wittig, EN1
D. Zier, QM1



WO R.L. Deming
Lt C.T. Arnold, DC
Lt G.H. Bryson, MC
Ltjg A.W. Waldrep, SC

Lt J.A. Broughton
Ltjg E.F. Goetz
Ens V.A. Przybyszewski
Ens D.G. Higgins

D.B. McPherson, RM3
T.L. McPherson, EN3
J.D. McPherson, FA
R.D. Miller, FN
A. Mitchell, Jr., SH3
D.C. Moore, FN
P. Mularchuk, Jr., EM3
T.O. Murphy, ENFN
J.E. Nelson, AG1
D.L. Neville, RMSN
C.A. Nogan, SD2
B.E. Nolin, SN
R. Page, EM3
T.W. Pancake, SN
D.W. Parker, AG1
K.M. Parker, SFM2
D.W. Pierce, FA
W.E. Pierce, SA
R.L. Pollard, RD3
J.L. Quattromani, Jr., DC1
N. Rappi, SN
W.A. Ramsey, GM3
P.L. Ransel, QM3
L. Redden, SD3
J.J. Reidy, SN
R.M. Remack, FN
G.W. Remey, EN2
J.G. Repic, FN
C.L. Richards, EN3
E.M. Rioux, SN
E.M. Rizk, SA
R.A. Roberts, FA
E.A. Robertson, RM3
E.S. Robinson, SF1
D.B. Robinson, FN
M.J. Rothschild, Jr., RDSN
K.G. Rubadou, SN
G.V. Rudolph, TN
G.J. Saner, EM1
R.P. Schermann, EN3
S.S. Sell, FA
W.E. Sellers, SHL3
E.A. Shapira, SA
W.T. Shoener, AG3

S.J. Slubowski, GM1
C.R. Smith, FN
E. Smith, SN
G.D. Smith, ETR3
J.L. Squire, FN
A.A. Steilling, FN
J.W. Steins, EN2
T.O. Stewart, SFMFN
D.C. St John, SA
J.E. Stock, TE(RM)3
S.R. Stone, FN
C. Stutts, EMFN
R. Page, EM3
T.W. Pancake, SN
D.W. Parker, AG1
K.M. Parker, SFM2
D.W. Pierce, FA
W.E. Pierce, SA
R.L. Pollard, RD3
J.L. Quattromani, Jr., DC1
N. Rappi, SN
W.A. Ramsey, GM3
P.L. Ransel, QM3
L. Redden, SD3
J.J. Reidy, SN
R.M. Remack, FN
G.W. Remey, EN2
J.G. Repic, FN
C.L. Richards, EN3
E.M. Rioux, SN
E.M. Rizk, SA
R.A. Roberts, FA
E.A. Robertson, RM3
E.S. Robinson, SF1
D.B. Robinson, FN
M.J. Rothschild, Jr., RDSN
K.G. Rubadou, SN
G.V. Rudolph, TN
G.J. Saner, EM1
R.P. Schermann, EN3
S.S. Sell, FA
W.E. Sellers, SHL3
E.A. Shapira, SA
W.T. Shoener, AG3

Sas D.R. Herr, USPHS
Sads J.A. McTaggart, USPHS
Lt D.E. Musselman, USNR
Ltjg T.H. Ballard, USNR
Ltjg J.H. Long, USNR

uss wilhoite (der-397)

officers

Lcdr C.H. Willis
Lt H.P. Schonenberg
Lt R.M. Sullivan, MC

Ltjg A.E. Bass
Ltjg J.M. Wyatt, SC

Ltjg R.B. Hackenberg
Ltjg R.H. Fuller
Ltjg J.E. Bowers

Ltjg D.C. Young, Jr.
Ens J.E. Fleming

enlisted men

J.R. Ades, RDCA(P2)
T.W. Allmon, Jr., ENCA
A.T. Anderson, EN2
H.T. Anderson, EN3
E.K. Antinson, EN2
B.C. Applebee, AG2
G.M. Avera, YN3
M.A. Bagdonas, SN
R.M. Bantay, TA
J.S. Barnett, SN
G.A. Barrera, FA
G.W. Bauch, SN
L.N. Bertrand, SN

D.G. Bettin, SN
T.E. Bevis, EN3
J.A. Bogdan, FN
J.E. Booth, ENFA
H.A. Broadway, SFP2
C.F. Brown, GM2
J.M. Brown, EN3
R.D. Brown, QM3
E.G. Bunker, RD3
M.C. Cappon, SOG3
B.P. Carney, SOG3
G.A. Carpenter, EN2
R.L. Caron, RMSA

W.L. Case, FN
J.W. Champ, CSCS
R.H. Chmara, RMSN
P.R. Churchill, FA
J.E. Cochran, SN
J.A. Colley, GM3
E.L. Conner, FN
P.F. Cook, BM3
R.G. Crafton, FA
D.D. Currier, EM3
J.E. Daneke, SOGSN
G.A. Demarais, RMSN
G.R. Dougher, Jr., RM3

J.M. Duncan, SA
R.W. Elder, RM3
R.L. Ellis, ETRSN
W.D. Ellis, CS1
H.M. Evans, SOGSN
W.J. Falk, CS3
M.E. Farber, FA
W.E. Finch, SN
C.A. Findley, EN3
B.M. Fooks, SN
C.J. Fowler, RDSN
F.S. Fuller, FN
R.E. Gastil, EN3

Ens A.E. Walton
Ens T.M. Crow
Ens J.A. Lasky

uss edisto (agb-2)

officers

enlisted men

uscgc eastwind (wagb-279)

officers

Lt W.D. Markle, Jr.
Ltjg E.J. Lecourt, Jr.
Ens J.D. Sipes
Ens J.W. Coste

Ens W.C. Park, III
Ens A.H. Bleich
Chspck R.L. Barnett
Mach W.A. Roderfeld

enlisted men

R.L. Adams, SD2
K.F. Allen, SA
F.M. Aromin, TN
E.J. Balland, SA
D.G. Barnes, FA
R.A. Bellafatto, RM2
J.K. Betha, BM1
R.W. Bird, FNEN
E.A. Blackburn, EMC
R. Blanchard, SN
I.L. Boswell, Jr., SA
C.B. Boutilier, BM3
J.N. Bradford, RMC
O.W. Brannan, BMC
J.E. Behling, SN
D.J. Bressman, CSC
P.R. Brouillette, Jr., SA
T.G. Burley, SN
S. Busko, SA
R.L. Callahan, FA
J.J. Canfield, RM2
J.L. Capone, SA
K.E. Chandler, Jr., FNEM
K.W. Clark, FA
J.R. Clarke, SD2
J.G. Clough, CS3
J.T. Combest, SN
N.C. Conejero, SA
L.F. Conley, FA
F.C. Cordero, TNSD
A.H. Couture, FN
A.E. Cole, Jr., SN
H.C. Cray, FNEN
T.J. Cox, Jr., SN
R.J. Crane, Jr., SA
R.E. Crawford, SN
D.E. Crocker, EM3
W.H. Crocker, Jr., SA
H.L. Cross, SN
R.L. Cross, SN

uss staten island (agb-5)

officers

Cdr W. L. Larson
Lcdr P.J. Hoffman
Lt J.F. Campbell
Lt R.L. Carrothers

Lt L.C. Gore
Lt B.R. Levinthal
Lt W.B. McFarland

Ltjg W.L. Fluke
Ltjg R.N. Franks
Ltjg J.C. Thorpe

enlisted men

J.A. Boyce, FA
W.V. Brandt, SN
C.F. Braxley, Jr., EN3
E.L. Brewer, BMSN
W.P. Brown, FA
J.T. Brown, SA
D.E. Bryner, AG3
M.L. Bryan, RM2
B.C. Buscombe, SN
L.W. Carr, OSCA
P.J. Chaffee, RMSN
C.E. Chassey, FN
I. Cohen, EMFN
R. Cook, SN
E.E. Connett, Jr., SA
B.J. Crawford, RM3
L.A. Cubero, SH3
J.D. Culbertson, AD1
J.L. Davis, RMSN
M.S. Davenport, QM3
R.L. Dean, FA
P.F. Demarmels, SN
C.H. Delsing, EN3
D.G. Dewitt, SA
C.L. Dossey, FN
J.L. Doty, SA
R.J. Doty, YN1
L.B. Douglass, RMSN
R.S. Douglass, SA
N.J. Dunaway, SN
J.T. Durand, AD3
M.P. Ender, SN
R.E. Ernst, AG2
R.G. Fielder, SN
H.E. Fish, DK3
C.G. Fisher, FN
D.J. Fitzgerald, FN
L.L. Ford, SN
J.W. Frost, FN

G. Garcia, SN
A.B. Garrett, RMC
F.L. Glapa, SN
R.W. Godfrey, FA
C.L. Green, EN3
J.R. Greer, SA
R.E. Grove, RM1
L.R. Hadley, SA
E.E. Hansen, SA
W.J. Harrington, FN
E.N. Harris, AD1
C.E. Haugen, EMFN
D.S. Hay, CWO4
G.W. Heald, Jr., SF2
L.J. Henderson, FT1
D.K. Holloman, ENC
W.E. Houk, IC1
L.F. Jeter, SN
L.M. Jordy, RMSN
L.H. Jordy, EM3
S. Kawaha, Jr., SA
R.W. Keebler, FA
C.T. Kelly, BM2
J.E. Kiniry, SA
G.A. Koegel, SA
C.E. Koernerick, SN
J.W. Kramer, FN
R.C. Krause, AG2
R.R. Larson, GM3
L.E. Layton, DT2
J.W. Leadford, SA
J.N. Long, FA
W.G. Lonsberry, SN
R.E. Loomis, BM3
W.J. McCarthy, FA
R.D. McClain, BM2
J.R. McConnell, HM2
J.W. McGarr, AM3
W.S. McGhee, RDSN

P.B. Miles, SN
T.C. Miller, SN
J.C. Miller, EN3
W.F. Miozza, EM2
F.E. Moir, SN
T. Montgomery, Jr., EN3
W.L. Moore, BT2-P1
R.E. Morin, EN3
R.B. Morris, SNCS
N.T. Motley, SN
R.L. Mulhern, FA
R.E. Murphy, SN
R.C. Murray, RD3
L.A. Murray, FA
A.J. Natividad, TN
R.G. Neal, SA
G.A. Nieto, T.N.
R.F. Oberle, RM3
W.P. Oubre, SN
T.E. Osborne, SNGM
P.F. King, QM2
L.A. Parissi, Jr., RD2
G.P. Piste, SN
G.O. Price, RM3
R.L. Pugh, AGC(AC)
A.B. Pulley, EM3
K.B. Pyles, SA
J.J. Quakemeyer, SA
D.E. Ray, YN3
R.C. Rarick, SNAG
D.R. Raymond, GM2
R.H. Rogers, RM2
D.H. Rouse, BM3
M.W. Schassburger, FA
H.V. Schweikert, SA
R.M. Stephens, SN
P.E. Shanklin, YNC
R.J. Shea, EN3
P.R. Sheldon, RM1
J.L. Simons, SA

A.J.L. Smith, EN3
A.O. Smith, SA
C.L. Smith, HM3
R.I. Smith, EN1
P.M. Snow, EM1
J.M. Snyder, SA
J. A. Spritzer, EMCM
M.A. Spornauer, SN
R. Steadman, FNEN
J.F. Stefaniak, EN1
J.P. Sullivan, Jr., CS2
R.S. Sunderlin, SN
N.V. Swanson, EN2
W.A. Swansburg, ETC
D.L. Tennent, SK3
T.J. Triplett, SN
D.R. Ulanday, TN
J.F. Waitkevitch, FNEM
J.A. Wakefield, EN2
T.J. Walsh, Jr., SN
L. Weaver, EN1
H.H. Welch, Jr., HMCS
T.E. White, EM3
B.L. Wilson, GM3
T.O. Wiltsie, FN
D.A. Wolters, GM1
F.J. Yaeger, FT1
R.F. Zehnung, EN3
A.D. Ziomek, SK2
R.J. Davis, QMCA-P1
T.J. Faulkner, AD2
H.H. Kleckley, AM3
R.P. Mahn, AN
V.M. Minet, ATS3
W.E. Parmlay, AM2
J.F. Prince, AD3
H.E. Prichard, AN
J.A. Ramsey, AD2
A.F. White, AE2
M. Capola, CSC

Ens L.J. Mancy
Ens F.R. Power
Ens A.K. Walters, Jr.

Ltjg R.A. Schmaeiock
Ens P.J. Epperly
Ens J.R. Kjeldgaard

L.D. Sheppard, AGAN
N.G. Shields, BM2
R.L. Skelton, SH1
D.J. Smith, SN
E.W. Smith, FA
F.T. Smith, RM3
R.B. Sparks, SA
H.J. Steinback, SA
R.L. Stone, SA
O.E. Suttle, EN2
W.R. Swain, SN
J.W. Tapp, QMC
R.L. Taylor, FA
J.W. Thompson, SN
R.D. Tipping, AD3
D.J. Tyson, SA
E.J. Valerio, SH2
B.J. Wallace, SK3
J.L. Wasson, SA
K.D. Webb, SN
G.G. Weber, SA
J.M. Weber, SN
E.J. Weichert, PN1
G.L. White, SN
R.D. Wicklund, SF1
J.W. Wilburn, FA
J. Williams, Jr., SH3
R.W. Willis, JO3
O.D. Wilson, SA
G.R. Wohlk, SN
D.D. Wolfe, Jr., RDSN
G.C. Wood, AG3
D.L. Wright, RD3
B.Z. Womac, FN
E.D. Wylie, FN
R.D. Yearwood, EN3
W.H. Young, Jr., FN
N.V. Zagainoff, SKSN
J.H. Zercher, Jr., ETSN

uss glacier (agb-4)

officers

Cdr P.W. Porter, Jr.
Lcdr M.J. Winton
Lt R.R. Hatch
Lt J.W. Savage, Jr., DC
Lt S.P. Filewicz, MC

Lt C.S. Sayers
Ltjg T.H. Vollmer
Ltjg F. Petinos
Ltjg G.E. Mott, III
Ltjg P.A. Hutchinson

Ltjg D.J. Calder
Ltjg D.E. Price
Ltjg D.S. Mathewson, SC
Ltjg B.G. Koether

Ltjg R.W. Klementz
Ltjg P.G. Smith
Ltjg S.A. DeRuggiero
Ens J.F. McCarthy, SC

Ens R.E. Colbum
WO S.L. Dean
WO K.W. Fritsche
WO R.L. Johnson

enlisted men

G.R. Agee, SD2
B.R. Allen, TE(RM) 2
G.K. Apple, SA
R.E. Amazeen, BM3
H.W. Babbitt, SN
N.J. Balcaen, RM2
T.O. Balliew, FA
R.E. Bartgis, IC3
B.C. Barto, SA
G.A. Barto, SA
J.B. Basa, TN
H.E. Baublitz, RM3-P1
E.J. Benner, FN
W.T. Benton, BM2
H.K. Berry, SN
E.W. Bielefeld, EMC
G.A. Billings, CSSN
J.P. Bleclie, AG1
E.L. Blossom, SN
J.W. Bohlen, FA
D.J. Bourgoin, AG2
W.E. Boyd, RDSA
J.W. Bowlin, QMSN
W.A. Bradley, SN
R.L. Brown, SH3
S. Brown, SN
W.S. Brown, SN
R.A. Buchbinder, SA
J.E. Buesgens, SN
K.W. Bunosky, FA
D.W. Burkland, FA
B.J. Busby, SN
R.W. Bushee, SN
F.J. Businsky, FA
M.J. Cahill, SA
J.J. Cain, SN
M.E. Canzoneri, FN
O.E. Carlin, CS3
D.C. Carpenter, ICFN
R.E. Carter SFPFN
C.T. Caveny, SA
R.E. Chad, EM2
P.J. Chesser, HM2
D.R. Claycomb, SN
M.L. Coeur, QM1
R. Coleman, HM3
R.C. Collins, DK3
W. Connor, SD3
W.C. Coon, FA
C.F. Cordima, FN
R.R. Corres, TN
D.E. Cota, EN3
R.D. Craudell, FA
F.C. Daniels, EN1
D.L. Damell, RD2-P1
C.S. Davis, BM2-P1
C.C. Denno, SA
R.E. Doan, SA
J. Dorman, SD3
S.D. Driver, FA
B.W. Duncan, FN

E.T. Eck, RM2
R.I. Edwards, JO2
D.E. Ellis, FN
J.N. Erwin, FA
W. Evers, SA
C.M. Einhellig, SHSN
A.C. Fajardo, TN
F.L. Farmer, SF1
R.L. Faust, ETN3
J.E. Fitzgerald, SN
D.G. Flint, SN
D.F. Flynn, FN
T.E. Flynn, SN
R.H. Frank, SN
J.V. Frazier, PH2
A.K. Friedel, FA
R.A. Fulkerson, FN
H.R. Fyock, EN3
T.M. Gaede, SA
E.H. Gagnon, SA
D. Gale, SA
A.F. Garcia, SKSN
A.G. Geitz, SN
T.A. Gilbert, SK3
C.M. Gilligan, EM3
A.M. Gilson, FN
T.H. Glass, FN
D.E. Gmyrek, FN
E.J. Gotreaux, EN2
G.D. Greene, GM3
S.A. Greene, SN
R.F. Gridley, GM3
G.L. Gudim, FN
F.C. Hackworth, BMSN
S.H. Hallahan, SA
T. Hamernick, EM3
B.E. Hardy, SA
M.K. Harjes, SA
L. Harjes, SN
A. Harris, SD2-P1
F.E. Hart, QM2-P1
D.L. Hauth, MR3
E.N. Henry, BM1
K.W. Heuer, SN
G.S. Hilburn, SN
W.F. Hitt, EN1
K.R. Holder, FN
B. Holton, TE(RM)C
W.J. Hookey, SA
P.C. Hopper, FN
F.J. Hoyt, SN
J.L. Hunter, SN
G.R. Hurd, SN
J.A. Johnson, EN3
F.B. Johnson, ET2
K.S. Johnson, SN
R.J. Jones, EN3
T.M. Jones, EM3
J. Jordan, BMSN
R.J. Jung, EN2
F.W. Kalman, QMSN

J.J. Katalenas, RM2-P1
P.S. Kelly, GMB
L.D. King, DCFN
C.E. Kline, RM3
J.T. Koval, FT1
L. Krupinski, GM2
C.C. LaGrange, SA
P.A. Lambert, QM1
J.L. Land, SR
J.A. Lange, FN
C.B. Larson, GMSN
B.R. Larue, FA
C.L. Lathrop, EM3
D.F. Lauthenbach, SA
B.L. Lease, BMSN
J.E. Lee, TN
A.B. Lents, SN

W.G. Nolan, RD1
G.H. Norris, FN
R.E. Norris, BT3
A.F. Olsen, FN
E.J. O'Neil, SN
A.L. Ormiston, SN
K.S. Otzen, SN
L.K. Overstreet, SN
A.W. Owens, MR3
D.L. Owens, FN
R.H. Peters, RD3
E.K. Pellish, ETRSN
R.L. Peters, FA
A. Pettaway, SH3
D.F. Pierson, SN
W.H. Pierson, CSCA
G.M. Powers, MR3
C.R. Pratt, SN

G.R. Sendejo, TN
R.V. Serafini, SN
L.V. Simpson, EN3
J.J. Skocik, FA
K.E. Slawson, SF1
R.H. Smith, EM1
S.J. Smith, FA
H.W. Smitherman, FN
G.L. Snelling, EMFN
R.A. Snyder, SN
M.L. Stover, SN
D.E. Strickland, EN3
C.F. Sullivan, EMFN
R.J. Sullivan, BM2
W.B. Timmerman, FN
J.C. Varley, YN1
C.D. Wagoner, SN
G.D. Wagoner, SA
J.R. Watnes, FA
J.W. Wells, BMC
L.E. Wells, AK2
R.W. Wenzelow, SN
D.L. West, SA
T.L. Westcott, SA
W.C. Whisman, SK3
B. White, SD3
C.M. White, AGAN
D.W. White, EM3
B.E. Whitman, EM2
G.L. Wilke, SN
M.L. Wilkins, QMSN
J.W. Willard, Jr., SN
R.R. Willard, EN2
M.C. Wirth, FN
Z. Woiculewicz, RM1-P1
J.H. Woolums, EN3
W.V. Wroblewski, FN
D.L. Wyrick, EMFN
M.L. Zaher, EN1
R.O. Zimmerman, RMSN
G.W. Zoppo, SA
J.F. Zuber, EN1
E.W. Callender, FA
D.J. Carter, SK1



T.E. Lillis, EN3
T.L. Lockrout, FN
J.C. Lyons, PN3
E.A. Maitland, EM2-P1
W.C. Marsh, SN
P.M. Martin, SN
C.A. Mason, SH3
W.P. Matikonis, DC2
C.A. McConnell, ENC
P. McCormack, SA
C.J. McManus, FN
H.J. Millett, GMSN
R.L. Moder, EM3
S.E. Mooney, SFMB
J.H. Moore, SN
R.E. Morlock, RM3-P1
J.E. Morrison, SN
R.A. Muth, SN
R.E. Myers, FA

E.P. Prodigalidad, SD3
A.J. Puzar, HMCA
H.D. Quinby, SN
E.J. Rall, FA
W.F. Randall, CSSN
G.F. Readence, EMFN
T.G. Reed, EN3
M.M. Renn, SA
R.A. Reymann, SN
F.L. Richards, SA
M.A. Richie, EN3
J.V. Riles, YN2
L.E. Rutkowski, ENCA
R.L. Saam, EN3
D.D. Sampson, DT3
G.A. Sands, SN
R.W. Sangwin, SH2
J.P. Sarmiento, TN
R.P. Schwartz, FN

HU-4
M.C. Thomas, AMC
A.H. Delaney, AD2
T.J. Baranski, AD2
W.D. Schrack, AE2
L.R. Williams, AT2
L.C. Days, AD3
R.T. Devore, ADJAN
L.F. Becker, AMSAN
BT TEAM
E. Edwards, SN
N.J. Pruitt, SN
T.E. Reid, SN
A.C. Wade, SN
L. Morris, QMCA PI

uss arneb (aka-56)

officers

Cdr J.E. Ingram
Lcdr B.F. Grott
Lt J.L. Head

Ltjg R.W. Breslin
Ltjg D.E. Dodson
Ltjg N.S. Gaines

Ltjg C.J. Peterson
Ens R.N. Bohlin
Ens W.F. Bonsel

enlisted men

D.L. Aldrich, SM3
A.F. Aliff, BM3
H.S. Anderson, FN
L.R. Bagos, SD
D.E. Bailey, HM2
S.E. Baldwin, RD2
L.M. Barnard, BT3
E. Barnett, BMC
R.A. Barr, RD3
F.W. Baumack, SN

K.L. Beamer, QMSN
J.R. Bebout, SA
P.J. Behan, Jr., SN
L.T. Belcastro, FN
L.F. Bevere, YNSN
R.G. Biscocho, SD
J.L. Bishop, SN
J.R. Black, FA
J.N. Black, SN
V.R. Boris, GM2

R.L. Brys, MM3
D.R. Buckendorf, FTSN
R.E. Burke, FN
F.P. Burtout, RM3
W.G. Bushman, SK3
E.E. Butcher, BM3
J.E. Craig, FA
E.F. Cichon, SN
D.N. Chichester, RMSN
D.E. Civiello, FN

Ens D.S. Blanch
Ens E.W. Evans
CWO J.L. Evans
CWO L.A. Brown

M.V. Clapsaddle, YNSN
 J.W. Cole, QMSA
 J.R. Compton, GM2
 H.E. Cook, YN3
 M.A. Cooper, IC2
 R.D. Courton, BTFN
 J.G. Covell, SN
 V.L. Craig, MM3
 R.J. Curry, FN
 P.T. Cuevas, SD3
 J.J. Dackweiler, SK2
 J.A. Darring, SN
 D.F. Davies, BTFN
 L.V. Day, Jr., RMSN
 R.L. Dennis, YNSN
 G.R. Distin, IC3
 T. Dorsey, Jr., BM2
 R.J. Doyle, SK3
 B.D. Duncan, EMFN
 D.P. Earp, EMFN
 R.M. Eason, EMCS
 C. Ecal, SD3
 C.J. Edwards, Jr., SK2
 H.O. Elliott, Jr., FN
 D.E. Erickson, SN
 V.L. Fairley, RD2
 C.O. Farley, Jr., BMSN
 J.R. Farley, EMSN
 J.E. Feerst, SN
 D.L. Fields, CS2
 A.L. Fischer, QM3
 A.L. Fletcher, FN
 J.C. Folsom, BM3
 J.R. Fonte, SH2
 J.L. Fore, FN
 R.D. Fox, YN1
 T. Gacki, FT1
 W.J. Gansert, Jr., HM3
 F.H. Garcia, FN
 L.D. Gardner, MM3
 J.D. Gaston, EN2
 P.H. Goebel, RM2
 W.L. Gommer, EM3
 R.G. Graham, SH1
 C.E. Grant, CS3
 A.V. Guthrie, IC1
 P.M. Guy, SA

J.F. Hall
 W.C. Hamilton, Jr., GM3
 R.L. Hanshaw, FA
 D.E. Hardin, SF2
 W.C. Hargreaves, SN
 C.J. Harris, SD3
 D.E. Hatch, IC2
 D.A. Hedman, SMSN
 R. Hempsted, SN
 J.C. Hennessy, RMSN
 D.J. Hicks, RMSN
 T.J. Hill, BM2
 F.V. Hogan, Jr., SA
 D.N. Holmes, ENC
 C.D. Hopson, SDSN
 K. Holt, RMSN
 W.W. Horn, SM3
 L. Houston, RMSN
 N.S. Hudak, FA
 B.J. Hughes, EM2
 D.R. Hutchison, QM3
 R.E. Huskey, SN
 G.F. Hyde, BM3
 H. Ivory, SD3
 E.H. James, CSSN
 J.W. Jeffries, Jr., SN
 W. Jenkins, BMSN
 G.B. Jones, Jr., BT3
 R.O. Jones, SD2
 R.W. Jones, QM1
 H.T. Jordan, BT1
 C.N. Kaplan, SN
 J.G. Kappler, Jr., CS3
 K.C. Kelly, RD2
 R.C. Kemp, DC3
 P. Kish, FN
 D.W. Koabel, SN
 G.L. Kramer, BT3
 W.J. Kuepper, MMFN
 A.B. Lacson, SD
 N.H. Lahue, SN
 B.R. Lambert, SH3
 R.G. Lamangen, SD
 E.H. LeClaire, BM2
 E.W. Leiby, RM3
 R.K. Leyendecker, FN
 R.A. Lindeman, FN

D.E. Long, RD1
 L.B. McClain, SK2
 G.R. McDade, HMC
 H.E. Masdon, MM1
 G.L. McDonald, MS1
 L.R. McFarland, FN
 J.M. McGraw, FN
 J.P. McGuirk, RM3
 J.E. McNeilly, SMSN
 D.A. McQuaig, CSSN
 E.K. McVey, EM3
 C.I. Magee, CS3
 J.L. Manning, Jr., EN3
 J.L. Martin, BT1
 W.C. Martin, BMSN
 D.C. Martinson, MMFA
 H.C. Matzen, Jr., MMC
 T.J. Masseth, PH2
 J.L. Mathis, CS3
 S.E. Mayberry, SN
 B.J. Melton, EN2
 G.H. Miller, CS1
 J.F. Miller, Jr., SA
 M.D. Miller, Jr., HM2
 L.P. Minacapelli, SN
 J.A. Mancinelli, SKC
 L.E. Mancinelli, SN
 W.J. Mock, SH2
 J.A. Moffitt, SK3
 B.J. Monchak, SF1
 D.L. Morgan, BM3
 T.N. Morgan, SN
 S.L. Morrison, CS3
 K.E. Morton, RM2
 J.N. Mulkey, EN3
 G.R. Murphy, RM1
 T.D. Neaves, BM3
 T.J. Nugent, SN
 L.J. Nuss, MM3
 R.N. O'Sullivan, RD3
 E.P. Owens, DC1
 J.G. Pacis, SK3
 P.B. Pagliaro, DKSA
 P.F. Palmer, SA
 L.G. Parham, MM1
 R.A. Parr, MMFN
 D.D. Parrish, MM3

J.V. Patterson, FN
 J.P. Peralta, SD
 R.H. Peterson, RM3
 F.L. Phillips, YNSN
 G. Phillips, RM3
 J.L. Phillips, GMSN
 J.F. Piscione, RMSN
 A.J. Piliute, FA
 A.B. Poole, Sr., MM2
 R.L. Potts, RM3
 R.A. Powell, SA
 E.S. Ragan, SM2
 G.L. Randall, MM2
 F.M. Reed, FN
 L.J. Reo, BM3
 L.E. Reynolds, SN
 J.P. Richard, RMSA
 J.W. Richardson, BM3
 A.W. Ringwald, SK2
 S. Robertson, SD
 D.P. Rogan, DKSN
 M.J. Rodish, SN
 D.E. Rougeux, RM1
 R. Rudel, SN
 L.J. Ryder, YN3
 G.J. Salay, QM3
 A.J. Saunders, PN2
 R.B. Savage, SN
 R.W. Savard, FN
 M.M. Schlarbaum, SA
 J.E. Sayer, SA
 H.R. Schnacker, BM3
 S.W. Schreiner, EN2
 T. Segovia, Jr., SN
 M. Sepitko, MM3
 G.A. Shaberly, SMSN
 J.W. Shasteen, SA
 L. Sheam, MM3
 F.E. Sherman, SH3
 M.T. Sherman, RMC
 R.G. Shick, BM2
 V.R. Shoemaker, FN
 A.C. Signorini, SN
 B.L. Skerlec, ET3
 J.M. Smith, BM1
 R.A. Parr, MMFN
 J.W. Spargur, BMSN

S.K. Stasko, ENFN
 J.L. Steiger, RM3
 C.C. Steinkraus, SA
 R. Sims, SD3
 C. Stevens, BM2
 R.J. Stevens, SA
 C.W. Stewart, YN3
 D.B. Stewart, RD3
 V.D. Strickland, SN
 F.W. Strong, SM2
 D.P. Sweet, RDSN
 L.E. Taylor, Jr., BM1
 O.J. Taylor, Jr., FN
 D.S. Thompson, SN
 B.W. Thost, DC3
 M.A. Uherick, FN
 F.P. Umili, SDSA
 W.E. Valentine, YNSN
 D.W. Vincent, CS2
 H.P. Waclaw, ET1
 R.M. Wagner, JO3
 R.L. Walden, SN
 H.C. Walker, MR1
 B.C. Walls, RDSN
 R.W. Walls, EN3
 J.F. Waters, SK2
 M.A. Watkins, RMSN
 W.C. Watts, SH2
 R.E. Watson, FN
 P.H. West, Jr., EN1
 D.P. Weyer, FA
 J.L. Whitaker, MM3
 C.O. Wilkerson, FN
 J.C. Williams, FN
 E.G. Wilmoth, DC3
 J.L. Wilson, EN2
 J.N. Win'e, BM1
 E.K. Winchell, MM3
 C.W. Wolff, SMC
 D.W. Wolfe, SF3
 J.K. Wood, RD3
 D.L. Wooten, SN
 R.M. Wright, RD3
 R.J. Whited, QMC
 J.S. Williams, SF3
 F. Zimkewicz, BM2

u.s. antarctic research program

wintering over

Byrd Station

G.W. Angus, Iono. Physics
 T.L. Baker, Met
 N.S. Benes, Met.
 C.J. Garczynski, Met.
 M. Goorhigian, Met
 T.J. Holmes, Met.
 L. Kouperov, Iono. Physics
 K.E. Marks, Iono. Physics
 D.M. Perkins, Geomag.
 H. Shimizu, Glaciology
 L.J. Victor, Aurora

Ellsworth Station

D.W. Beaudoin, Met.
 L.D. Drury, Met.
 W.C. Holt, Aurora
 L.R. Sequist, Met.

Hallett Station

T.B. Ballard, Aurora
 J.E. Dessent, Met.
 L.W. Engberg, Met.
 R.W. Titus, Met.

NAF McMurdo

T.E. Berg, Geology
 J.H. Dearborn, Biology
 W.W. Fairchild, Cosmic Rays
 L. Jacobs, Biology
 L.W. Kreiling, Trav.Eng.
 J.L. Littlepage, Biology
 G.H. Meyer, Biology
 J.S. Pearce, Biology
 K.E. Ricker, Biology
 J.G. Sullivan, Geology

Pole Station

J.B. Burnham, Iono. Physics
 H.J. Eckins, Met.
 B.W. Harlin, Met.
 J.T. Lamping, Geomag.
 C.D. McKenny, Met.
 W.R. Morris, Met.
 J. Steagall, Met.
 D.W. Sylvester, Aurora
 R.L. Whitney, Met.
 R.E. Witalis, Met.

Mirny Observer

C. S. Giltmor, Iono. Physics

Wilkes Station

J.E. Breckinridge, Met.
 E.C. Harrigan, Met.
 G.R. Hemphill, Met.
 W.Y. Saunders, Biology
 W. S. Wilson, Biology

summer personnel

Byrd Station

J.C. Behrendt, Explor. Geophy.
 C.R. Bentley, Explor. Geophy.
 N.M. Brice, VLF Program
 P.H. West, Jr., EN1
 D.P. Weyer, FA
 J.L. Whitaker, MM3
 C.O. Wilkerson, FN
 J.C. Williams, FN
 E.G. Wilmoth, DC3
 J.L. Wilson, EN2
 J.N. Win'e, BM1
 E.K. Winchell, MM3
 C.W. Wolff, SMC
 D.W. Wolfe, SF3
 J.K. Wood, RD3
 D.L. Wooten, SN
 R.M. Wright, RD3
 R.J. Whited, QMC
 J.S. Williams, SF3
 F. Zimkewicz, BM2

Hallett Station

D.S. Douglas, Biology
 K. Maeda, Cosmic Rays
 W.J. Maher, Biology

Horlick Mountains

J.M. Aaron, Geology
 B.G. Andersen, Geology
 P.F. Bernel, Topo. Eng.
 G.A. Doumani, Geology
 A.B. Ford, Geology
 D.H. Green, Geology
 H.A. Hubbard, Geology
 L.A. Lackey, Geology
 W.E. Long, Geology
 J.H. Mercer, Geology
 S.B. Treves, Geology

Chilean Antarctic Expedition

J.O. Annestad, Geomag.
 M. Halpern, Geology
 R.E. Leech, Biology
 T.S. Leech, Biology
 D.E. Wohlschlag, Biology
 J.C. Zahn, Glaciology
 E.J. Zeller, Geology

NAF McMurdo

K.B. Armitage, Biology
 R.E. Ash, Trav. Eng.
 H.F. Bennett, Explor. Geophy.
 H.W. Boms, Geology
 J.A. Brown, Meteorology
 P.E. Calkin, Geology
 A.P. Crary, Explor. Geophy.
 G.H. Denton, Geology
 M.B. Giovinetto, Glaciology
 K.C. Hammer, Biology
 R.A. Hart, Geology
 T. Hoshizaki, Biology
 H.B. House, Biology
 A.X. Meyer, Geomag.
 J.J. Mulligan, Geology
 R.L. Nichols, Geology
 M.A. Pomerantz, Cosmic Rays
 E.J. Pybus, Meteorology
 L.B. Robison, Topo. Eng.
 L.B. Ronca, Geology
 E.F. Schempp, Geology

Ross Ice Shelf Studies

D.G. Darby, Glaciology
 O. Liestol, Glaciology
 C.W.M. Swithinbank, Glaciology
 T.E. Taylor, Topo. Eng.
 J. Tuck, Jr., Glaciology
 W.A. Briesemeister, Geography
 G.D. Cartwright Met.
 R.P. Goldthwait, Geology
 J.W. Joyce, Natl. Sci. Found.

New Zealand

W.R. MacDonald, Photogrammetry

Pole Station

A.J. Gow, Glaciology
 R.O. Ramseier, Glaciology

E.E. Ferguson, Iono. Physics

I. M. Lamb, Biology
 W.A. Radlinski, Geodesy
 J. Sedlacek, Biology
 D. Stewart, Geology
 F.D. White, Atmos. Phy.
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