

SITREPS for April 1958Little America

IGY NR 78 Sitrep NR 15 - Aurora; Aurora displays occurred eight out of nine clear nights in April. No preferential alignment of the auroral arcs to any meridian has been noted. The time at which the maximum activity has occurred has been random. The all sky camera recorded displays. A ten second exposure is sufficient to give good images of faint auroras and stars of the third magnitude. Both the patrol spectographs are operating automatically during dark hours. Both aligned along geomagnetic meridian. One spectograph is using 103 A-F film while in the other infra-red film is being used. Visual observations are being taken on the hour from 0400 M to 1700 M by volunteer auroral observers supplementing night time observation. For this purpose a new dome has been mounted in the tower. USWB personnel are taking observations from 0400M to 1000 M and 10 Navy and 3 IGY personnel are covering period from 1100 to 1700M. Geomagnetism; Detailed magnetic survey obtained between Little America and Mile 160 on the Byrd Station Trail between March 25 and April 10. Observatory work routine with the exception of a change in the Z Base line resulting in necessary releveling of the variometer. Better temperature control obtained in variations building by piling snow around it. The H base line control has been maintained within 10 gammas, Z within 40 gammas and the Declination within 0.5 Min. No further trouble experienced with the rapid run drive gears. Ionosphere; C-4 operated over 97 % of the total time during the month. All non operation due to machine failure or corrective maintenance. Minor modifications carried out which have prevented reoccurrence of failures. In general records show very little blackout conditions this month in comparison with the summer months. Absorption has been less for the last half of the month. Normal night conditions observed with the exception of the occurrence of much A type sporadic and some E layer traces near local midnight. Critical frequencies as high as 14 megs recorded during the middle and later part of month occurring about 1800 M. Similar peak of critical frequencies appeared around 0600M for the week beginning the middle of the month. Seismology and Gravity; A three component study was completed of seismic waves to five kms. Obtained 8 additional seismic stations for thickness and water depth in the Little America area. Glaciology; Average snow accumulation for period late March to Late April 19 cms for 96 stakes, the largest monthly accumulation noted to date. Strain gages located in shallow pit for study of densification of snow and firn. Traverse Operation; The Ross Ice Shelf Traverse completed April 10 with 16 day trip to Mile 160 on the Byrd Station Trail. 9 major stations made at 10 mile intervals. The observations included 9 long seismic refractions, 13 seismic stations for ice thickness and water depth, 48 gravity and magnetic stations, three pit studies, density and temperature studies in 8 ten meter holes and one 15 meter hole. 1958 - 59 Traverse; 25 boxes of food packed ready for the 1958 59 traverse. Tentative location and elevation studies have been completed and data analysis started for seismic velocities from long range refractions and 10 meter temperature corrections for the 1957-58 traverse. Meteorology; The sun made its last appearance on the 24th (23rd GMT). The horizontal incidence pyrheliometers, illuminometers, and normal incidence pyrheliometers have been secured for the winter. An unbacked total thermometer has been secured on the site just behind the instrument shelter and

the thermohm which was buried several inches under the snow during the summer has been placed on the snow surface to give an additional check on the snow surface temperatures. This month was marred by an unfortunate accident to Domenic Guarcello, who slipped and fell from the roof of the inflation shelter, sustaining a fracture of a minor bone. Guarcello has now returned to work although still confined to indoors activity. Several power failures occurred during the month, but emergency generator prevented interruption of data recording for more than a few minutes. The highest radiosonde flight reached 27,124 meters on the 4th of the month at 1200Z. Tiles were laid on the observers work area improving its appearance considerably. On the 9th an unusual lunar halo display was observed including two halos mock moons, upper and lower tangent arcs, circumzenithal arc and parhelic circle. Weather Central: Operations have been normal. Research activity has remained on the same level as last month. A class in synoptic meteorology has been added to the Little America College with Mr. Gray as instructor. Each of the foreign representatives have made one or more contacts with the other Antarctic Stations. The data supply is fairly good. The following numbers indicate percentage received from the indicated stations: Norway Base 83; Amundsen Scott 94; Halley Bay 26; Ellsworth 97; Byrd 100; Little America 100; Davis Base 95; Soviet Bases 80; Wilkes 99; McMurdo 95; Hallett 94; Mawson 99; French Stations 95; Port Stanley 54.

Byrd Station

Byrd Nr. 25 Status Report April - Meteorology: Renodling of the Met office has continued. Radiometers prepared for operation. ^{the} Apply has been secured for the dark period. The conditioning box has only been used in preparing raob balloons obtaining better heights and less breakage while filling rather than the boiling and then filling method. Excpet for these points the program has been routine. Glaciology: The angles of the movement stakes have been measured. Surface area measurements of snows maximum relief show 40 cms on 14 April with wind NNE 15 to 20 knots with average temperature minus 42 Deg C after period of light winds and moderate precipitation. Higher winds reduced relief of area. Accumulation recored was 5.2 water equivalant 1.61 cms. Geomagnetism: Operations have been primarily normal. Calmer magentic conditions than for previous periods have been recorded. Heater system in the variations building completely renovated, with relocation of heaters and thermostats and additional glass heater. The building is now equipped with two 600 watt and two 1000 watt units. The average temperature is minus 2.3 Deg C, with outside temperatures varying 50 Degs., with inside change less tha 3 Degs. A new control and storage ^{was} building built adjacent variations building. The seismic operation has followed normal pattern, with interference factors considerably less. 77 quakes recorded during this period. Slightly less than 100% seismic and Geomagnetism records taken. Seismology (Traverse); Log plotting mountains seen on traverse completed. Shots were completed at deep hole with geophone at 10 meter intervals between 30 and 310 meters depth. It is intended to shot upper part again with closer spacing of geophone. Bad AC pickup greatly reduced by recording the differential ^{output} resistance. Geophone held in hole by flexible plastic legs. Ionosphere; Generally quiet conditions were reported with only mildly disturbed days on the 16th and 17th. The data loss has beensmall and was caused by a faulty camera gear resulting in improper movement of film. A noticeable SWF occurred at 102200Z through 110100Z and was probably associated with the +2 flare of 102103Z. With sunset on the 17th F1 and Reg were no longer apparent.

Radio Noise: Operation of project normal, The noise levels seem to be close to those predicted. Interesting diurnal variations were found March for 5, 10 and 20 mcs. Whistler Project: The whistler project is now in operation. VLF emissions seem to be scarce in this latitude. A tuned VLF recorder will be in operation soon. Aurora: The last double dome was mounted. The 60 cycle generator failed, but was back in service after defective component was replaced. Program continues in routine manner.

South Pole Station

IGY Nr. 405 Sit Rep for April - Star and refraction observations were continued through the month. Aurora: All sky camera and visual observations commenced April 13. Due to excessive reflections from the interior of the dome discontinued use of arc lights on the all sky camera and reduced voltage on the remaining lights. All bright auroras have occurred between 2000-2400Z. The normal fifteen minute observation period changed to include these hours. Seven IGY/USN volunteers making a 24 hour visual observation program possible. Repairs caused the spectrograph to be inoperative for 8 days. Geomagnetism: Records were lost from March 27 to April 7 due to operator error. Otherwise operation normal for duration of month. Ionosphere: Operation normal for month. Some E layer echoes were received as late as April 29. This usually occurred between 1500 and 2000Z. Much less sporadic E received in April than in previous months. Auroral and Geomagnetic data being plotted with ionospheric data for easier correlation. F-2 critical frequencies were higher than for March but preponderance of spread echoes made distinction between Z, O, X and obliques difficult. Seismology: 221 disturbances reported in April; 36 confirmed earthquakes reported in March. The increased building vibration noted on the paper records eliminated by the construction of a new pier similar to that previously constructed for the film recorder. The vertical component records for the month are 98% complete, 25% of the horizontal component records lost due to equipment malfunction and operator error. Micrometeorology: Recorded 121 wind profiles during the month with measurements taken on all 30 days. Low winds again characterised month with maximum hourly eight meter speed of 9.7 meters per second on the 22nd. Two periods during month, one on the 3-4 and the other on 22 April, with the eight meter height 2 to 3 degrees F. colder than surface, wind profiles swung to left. With customary 3-6 degree F. inversion from surface to 8 meters the profiles were logarithmic to 2 meters and then swung sharply to the right. Logarithmic profiles obtained with cups at 3 cm, minimum height possible with cups. Temperature and heat flow measurements recorded for 90% of the month. Largest inversion of season from surface to 8 meters was recorded to be 26.5 Degrees F., on April 19 with 19 Degree F. of this inversion being between 4 and 8 meters. Glaciology: Monthly accumulation recorded to be 2.1 cm. Accumulation since January 15 is 12.7 cm. The water equivalent measured at 3.5 to 4.0 compared with the annual average of 6 cm. 208 Horizontal cores completed for density studies covering between 7.6 and 25 meters of depth. General: New Jamesway with ships store and library completed. Weekly medical, scientific and educational lectures continued. A new generator is on the line and a total of .075 in has been removed from the side of the commutator armature with home made rig devised from bench vice blocks, wood drill press stand turned up with screwdriver staples etc. Maximum voltage fluctuation now one volt. Due oil usage of the old generator must run new generator three fifths of the time to have enough lube oil to last out the year. Find QM clothing most suitable for all purpose use except face hands and feet. Meteorology: The average monthly temperature was -16.7 Deg C.

The lowest temperature for the month was -48.8 Deg. C on April 22. The highest rawinsonde flight was 21,912 meters. In ID troposphere general cooling continues with only slight undulations due to advection. Lower troposphere continues to cool with little change in height. In stratosphere general cooling continues with largest changes at higher levels. The complete lack of undulations suggests radiation dominant cause of stratospheric temperature changes.

Hallett Station

IGY NR 85, Sit Rep NR 17 - Aurora: Aurora recorded every clear night, those being the 1,2,13,14, 16,17,18,20,21,26,29. Spectrograms show strong oxygen and faint hydrogen alpha and beta lines. The centers of ascending arcs observed in all quadrants except in the southwest. Slight red coloration seen 141602Z. Otherwise all Aurora greenish-white in color. Ionosphere: There was one period of total absorption recorded from 102200Z to 110030Z followed by high absorption for the next 24 hours. Persistent line type sporadic layer at 100 km has been encountered during the later part of the month. The equipment is performing well apart from intensity variations in the scope which defy all efforts to eradicate and which make density control of ionograms impossible. Geomagnetism: No great magnetic activity was observed this month. The simplex clock has been giving some trouble mainly due to deterioration of return spring of operative solenoid. Seismology: Eleven earthquakes recorded sufficiently well for phase identification have been reported out of the total of twenty nine. Damping on Willmore short period seismometer had been reduced giving improvement in sensitivity to local shocks and para phases. New microseisms have been observed having periods of one to two minutes in addition to the usual six seconds period type. Meteorology: The use of the late model AMT 4D radiosonde equipment towards the end of the month boosted morale of meteorological personnel. The dehydration system is successfully keeping water out of the balloons. Balloon conditioning box being constructed will replace boiling water treatment. A burst height check after installation dehydration further indication of success. Snow stakes placed in representative area. Routine soil temperature observations at 10 cm and 50 cm have been taken since April 20 at six hourly intervals. An opening in the galley permits heat to enter the Rawin Dome lessening the thickening of the lubricants. The radiometer has been removed for calibration check, cleaning, and revery of wind frayed wires. Lead shielded cable laid from exposed site to recorder. The vents of the motor half of the instrument case covered to halt snow infiltration. The location of the fuel storage dump and the unused rolling stock adversely affect accuracy of the sunshine switch and pyrhelimeters as the sun's elevation decreases. Highest radiosonde flight on the 21 st reached 18 mb at 26,399 meters after installation of dehydrator. The average height of 52 Raobs was 17,283 meters.

ELLSWORTH STATION

IGY NR 120 April Sit Rep - Meteorology: Problems with upper air program continue. Inflation shelter doors must now be dug out by hand. While losing only three reobs due to wind, other difficulties are being experienced with the GMD-1A Equipment. 4 more 3c23 thyratons gone making 7 lost since January and only four left. In effort to remedy situation three ducts from jet heater have been installed in the dome to augment the two electric heaters in use. Radiation equipment has been secured for the winter. Extreme ice crystalization was experienced on radiometer sensing plate dur-

ing warm frontal pass on April 27 during which the temperature rose from -58 Deg F to -27 Deg F in one half hour. Ionosphere: Operation routine for the month. One day's records were lost due to the jamming of the camera. The frequency standard at the station has broken down and precise timing has become impossible. Difficulty is also being experienced in maintaining constant temperature in the Amesway during periods of changing wind velocity. The newly painted tubes for the cosmic ray equipment seem to be producing a dependable pulse. Aurora: Auroras were seen on 19 nights flaming and red bordered for the first time. Voluntary observer program with three observers on duty for two hours each began April 16. All sky camera was on the frequency standard April 19, but with insufficient power to handle the clocks, it was only putting out 90 cycles. While rewiring the clocks, the leads on the coil of the C-3 broke. The coil was replaced with one from a commercial clock. Thereafter both the 24 hour numeral clocks jammed again and were repaired. The spare 1000 volt power supply for the spectrograph was repaired. Examination of the spectrograms reveals usual lines and righter hands. Alfa lines are faintly visible in longer exposures. Sodium enhancement has been noted in the twilight spectra. Two hours meteor observations gives average of $\frac{1}{2}$ meteor per hour. It has been discovered that the domes frost below -40 Deg F during periods of wind. Glaciology: Operation routine for the month.

Wilkes Station

IGY Nr 295, Wilkes Station April Sit Rep - Reports of most disciplines influenced by severe storm of 24 - 25 April. During the storm there was a seven hour period in which the winds averaged 85 miles per hour with gusts to 133 mph. Aurora and Meteorology were the only disciplines to suffer interruption because of storm. Seismology: Microseismic activity during storms of the 4th, 5th, 8th, 12th, 15th, 16th, 22th, 23rd, was recorded. The deep barometric low of April 25 was followed by intense microseisms. The vertical component is in full operation. The galvanometers of the horizontal are being readjusted. Geomagnetism: Operation was normal until April 24 when high winds produced small fluctuations on records due to vibration of the building. There was no interruption of operations during the storm. Following this period it was necessary to stop operations to repair variation building by replacing fallen panel clips and securing roof to beams with copper wire. A part of the tunnel which contains the lamp and current meters was blown away. All the meters however are still operational. An orientation test will be made because system received several abrupt shocks from the wind. There was no damage done to the instruments. Aurora: More than 75% of the nights during the month were cloudy. On 7 clear nights auroral forms were recorded. Nearly all auroras observed are rayed arcs or rayed bands with random orientation to date. The storm of the 24th blew pibal dome off of the tower wrecking it. The plastic domes remained intact. The tower had eight inches of snow on the floor. The spectrograph was filled with snow and moderate damage from the severe shaking occurred. The integrator was replaced and the Applegate needed repair. Water was siphoned from the bottom of the cabinet. The all sky camera was unharmed. All equipment was operating normally three days later. Glaciology: The survey of the trail to Site 2 has been completed, with 60 positions taken and fixed. Heights were determined for the first 10 miles by theodolite and subtends far beyond this point by a leap frog method of altimetry. The system will be tied into

starshots at site 2 and will provide a necessary control for gravity survey and accumulation studies. During most of April 2 glaciologists were at Site 2, but high winds hampered outside work. At the station additional movement and accumulation stakes were set out. Work has been concluded on super imposed ice, ice structures and raised beaches on Clark Island. Communications: Radio skedules with Site 2 now maintained with good signal strength since revamping the equipment has been completed. The storm blew down the verticle whip antenna on the garage but it is now again in operation. One antenna mast bent over ten feet from the top. The satellite tracking antenna was completed demolished by the storm. It is possible that six or seven of the eleven observations on the satellite were valid. A direct correlation with auroral displays was noted on the satellite receiver. A high frequency field intensity propagation project has been initiated. Oceanography: On April 19 tide gauge which had been in operation since April 10 was wrecked by ice and the installation has been secured until spring. The damage was done by tidal currents moving ice then 6 inches thick, breaking off vertical fibre plastic pipe. The recorder was salvaged in good order. On April 19 both Vincennes and Newcomb Bays has ten tenths of ice covering for the first time this season. The big storm blew this all out to sea again. There has been open water in all directions since. The time lapse camera is now in operation mounted in a plastic dome, pending installation of plastic dome in place of damaged pibal. Survey Work: A half mile base line was re-measured and tied into existing system. Observations indicate that the seaward movement of the Cape Folger Glacier slowed down by the lower temperature. Cosmic Rays: Equipment temporarily out of operation due to electronic failure. Ionosphere: C-4 has been repaired and is operating satisfactorily for 8 hours. Then an 3 E 29 type tube failed. It was discovered that there was no replacement available. Effort is now being made to alter circuit to use other type tubes. Meteorology: The average monthly temperature was -7.3 Deg C. The average height of 33 radiosonde flights was 25,086 meters. General: Repairs to main base and janesway huts completed. The temporary camp is still in bad shape with two Jamesway Huts completely demolished including the radio hut. Calm weather since the storm has facilitated repairs.

General IGY News

Special IGY News Message - Oceanography: Scientists at Woods Hole Oceanographic Institute are analyzing extensive data on deep currents of the Caribbean Sea and the Atlantic Ocean brought back from a two month cruise by the research vessel Crawford. The information collected on the Crawford when considered in the light of other IGY data will shed important light on the circulation of the Atlantic Ocean and particularly upon the age of the Deep Caribbean water. The six man scientific party on board the ship headed by oceanographer William G. Metcalf obtained more than 2000 deep temperature measurements and an equal number of water samples which were analyzed for salinity, oxygen content and other chemical constituents. The samples were obtained from the surface down to depths as great as 23,000 feet while the ship occupied its stations. In addition some 357 temperature measurements from the surface to a depth of 900 feet were obtained while the ship was underway. Detailed examination of the observations and comparison with similar data obtained 30 years ago by the Institute's research vessel R. V. Atlantis, will help to reveal how old the water is in the enclosed Caribbean basin. Important are the depths of the sills in the passage between the

Caribbean islands through which the deep Atlantic water cannot enter under present day climatic conditions. Using the recently developed Woods Hole precision echosounder recorder, the Crawford determined that the windward passage between Cuba and Haiti has a sill depth of 5,046 feet. This passage and the Anegada passage in the Virgin Islands are the deepest sills leading to the Caribbean and prevent the exchange between the colder Atlantic water and the deep Caribbean water. The echosounder was constantly in use and obtained accurate bottom profiles along the entire track of the Crawford. Ranging from Bermuda to the Virgin Islands thence to Venezuela and then from Columbia to Haiti, Jamaica to Central America the trip was completed with a return to Cuba and a final leg to Panama. The observations made on the South Atlantic cruise of the Crawford would normally take almost two years to work up in the laboratory. However, within three months of the finish of the cruise the reports were completed and sent to the IGY data centers. This was made possible through the development of the Woods Hole shipborne scaling meter and the Woods Hole precision echosounder. Even more important, however, was the extra work of seven scientists on board the ship. To date in Woods Hole IGY deep current program more than 7,000 deep temperature and water samples have been taken as well as some 3,760 shallow temperatures down to 900 feet and bottom profiles along the track of the ships. Through the combined efforts of the British National Institute of Oceanography and the Woods Hole Oceanographic Institute, a counter current under the gulf stream was chartered last year. Eight crossings of the Central Atlantic Ocean with some 140 deep stations completed enroute were made by the ships of the two institutions.

In a recent Ham contact with Ice Island T-3 in the Arctic Ocean it was reported that the Navy will continue the support of this station which was installed for the IGY by the Air Force and which has been supported by them to date.

In a recent message it was announced that there will be a meeting of the international IGY committee (CSAGI) in Moscow in August. The message reported that one of the agenda items will be the future location of the IGY Weather Central now at Little America.

MAY SITREPS

Little America

Sitrep Nr 16, 5 May 1958 * AURORA. Aurora observation each of 17 clear days in May. Auroras with red borders seen only in afternoons. Auroras occur most frequently in north and east quads. Spectrograms show foll: Alfa OI lines, NG bonds of nitrogen every night, Bravo twilight enhancement of both oxygen nebular lines and sodium, Charlie first positive bonds of nitrogen only when bright type bravo aurora is present, rare, Delta hydrogen alpha lines frequently in north and sometimes over entire sky, Echo strong sodium during entire night on some days. Meteor radar experiment discontinued because of interference from base transmitters and lack of time. Scanning spectrometer inoperative at present because of instability in circuits that appeared after first week of operation. Demands of regular auroral observational program allows little time for instrument repair. GEOMAG. Magnetic conditions for the month of May generally quiet with exception of sporadic disturbances occurring mainly during times of auroral activity. Temperature in std variometer room maintained within one degree C. H base line values re calculated back as far as Jan with new results indicating that base line has been maintained within 5 gammas for last 5 months. Recalculation of Z line started. Readings obtained with transit magnetometer in good agreement with values obtained from magnetograms. GLAC. Data analysis. Completed 10 meter temperature studies Ross Ice Shelf data. Low temp of -29°C found near center of shelf with highs of -23°C at Little America and Liv Glacier. Completed study of density averages 3 to 10 meters from traverse sta ice cores. Low average density of .42 found near site of lowest temperatures, highest .52 near Liv Glacier except for 2 values of .54 in crevassed areas. SEIS. Data analysis. Completed least square solution of velocity values from all Ross Ice Shelf long refractions; from first break times all reflection records. Maximum velocity 3800 m/sec indicated at about 1 km distance and 85 m depth. Completed study uphole times from 10 meter holes. Anomalous high uphole times found in zone in center of shelf where 10 meter temperature low and low ice densities indicated. Started study of ice thicknesses. TRAVERSE OPERATION. New seismic and mess Snocats readied for next summer traverse. Southwind preheaters and Leece Neville alternators installed. Frames reinforced. Overhead exhaust system constructed. Snow melter unit installed in mess Snocat. METEOROLOGY. Wooden railing erected around roof of hydrogen inflation shelter. Instrument shelter and ceiling light projector dug out and placed back on snow surface near original location. Highest radiosonde flight reached 28200 meters at 0000Z on the 13th. To conserve sodium hydroxide radiosonde balloon releases limited to one charge of hydrogen per scheduled release except when schedule for 12 hrs earlier not successful for any reason. Shattered jewelled bearing in thermograph clock caused interruption of thermograph record. Attempting to get replacement clockworks to operate in low temperature. WEATHER CENTRAL. Operations normal. Research continues with data search and compilation on following topics: Monthly means, objective forecasting, tropopause, synoptic situation studies. Data reception (also retransmitted NLA weather broadcasts) read station, percent sfc data received, percent upper air data received: Mawson collective: Norway 93 89 King Baudoin 90 90 Davis 97 89 Mawson 99 95; Mirny collective: Mirny 90 82 Pioneerskaya 90 XX Komsomolskaya 94 XX Oasis 91 84 Vostok 91 81 Sovietskaya 90 87; Port Stanley collective group 45 52 except Halley Bay 19 24; Deception group 90 87, Gonzales Videla approx 90 XX McMurdo collective: Amundsen Scott 96 100 Ellsworth 94 100 Wilkes 97 82 McMurdo 98 98 Hallett 98 97 Durville 94 100 Camp Charcot approx 94 XX Byrd 98 100. New Zealand and Australia collectives approx 97 97 except Macquarie 98 33. South Africa received occasionally with improvement end of month. Time lag varies from less than hour to 24 hrs.

Time lag responsible one upper air analysis missed and approx 30 % all analyses restricted in area. King Baudoin data report based from 111800Z date comm first established. IONOSPHERE. 98 % coverage of data this month. Records continue to show data similar to that during the latter half of April with F2 layer critical frequency peaking near 1800 hrs Mike. On May 4, 5, 25 second peak in F2 critical appeared at 1200 Mike, not noticed previously this season. Second peak in critical frequency observed near 0500 Mike last month no longer noticeable. Early morning hours showing an increasing amount of obsr E layer criticals. C-4 operating at or above normal performance level.

Byrd Station

May Status Report, 7 June 1958* SEISMOGRAPH. All instruments in satisfactory condition. Some interference result high winds and snow static. 67 discernable quakes reported. Quake report from Pole, Wilkes and Hallett received and appreciated. Aided observer pick out phases. GEOMAG. Building addition to variations completed. Eqpt in process being moved. Tunnel escape hatch completed. Constant pier shift requires releveling std variometers and adjustment recording traces. Sole remaining galvanometer fiber broke again during observations. Replacement being attempted. Systems recording well. Magnetically calm month. AUPORA. Program running smoothly. Due to undependable operation 60 cycle frequency std eliminated. Attempting to use IBM master clock and other timing mechanism used in ionosphere discipline. Aurora observed almost every clear night. No meteor obs made. IONOSPHERE. Normal operations during month. Less than 1 % loss of data. Marked change F2 criticals relative time of day apparent as month progressed. During first portions values highest middle day. Last part F2 values highest near midnight. Overall F2 medians showed double peak 2100 M and 1100 M with former spreading over number of hours. Radio noise recordings continue regular basis. Malfunctioning eqpt cause some loss. Diurnal variations still noted with noise dip 1000 M. Avg running close to March and April. VLF project: recording of pulses best NBS on 15.5 kc now being made daily basis. No whistler mode echos noted to date. Whistler recorder functioning satisfactorily. Few whistlers noted. Inspection of data awaiting construction playback eqpt. METEOROLOGY. Ceiling light rewired. Instrument shelter dug out and placed on sfc again. Drifting snow completely blocked doors of inflation shelter for 2 days with strong winds making overhead releases impossible. Winds breaking balloon accounted for all 11 missed raobs. Winds reached 30 kts or more on 19 days, 40 kts or more on 10 days, Avg temp 1 to 10 -20.1 C, 11 to 20 -28.3 C, 21 to 31 -35.7 C. TRAVERSE SEIS. Compressional wave velocity measured deep hole. Velocity at depth appears slightly higher than for horizontal travelling wave. Measurement with geophone horizontal in hole, casing hit horizontal with sledge shows wave velocity abt 2800 m/sec, believed alternate contraction dilation of hole. Shear wave obscured. Reduction traverse data continues. GLACIOLOGY. All routine readings of thermohms, accumulation poles, pit deformation and accumulation densities completed. Sfc study made after each major change in wind condition. Accumulation 14.9 cm snow with water equiv of 4.8 cm. Heavy accumulation month higher than any month during the last winter season. Progressive sfc topographic maps with a 4 cm contour interval show snow cover maintains high and lows during last 2 months.

Pole Station

May Sitrep. 2 June 1958* Continued star and refraction observations through the month. Refraction study based on Journal of the Institute of Navigation, Vol 3, Nr 5, Sept 1952 p 169, coupled with collection of related met data. AURORA. Bright aurora display observed on 17 nights. For 7 had red lower borders. Blowing snow obscured bright display for approx 12 hrs during month. All records improved by changing from D-76 to D-19 developer. Though arc lights turned off to reduce reflections off dome, silhouette of bulbs records on film. Spectrograph down for 8 days undergoing repairs. Now in operation continuously for 16 days without trouble. Am optimistic. MICROMET. Ran wind profiles on 29 days during the month. 58 wind counter system broke down end of April. 57 wind

counter system used throughout month of May and served highly satisfactorily. Large portion of month with wind over 8 m/sec. Roughness parameter less than 0.4 mm with soft sastrugi covering area. Temperature gradient studies continuous during month except during periods of heavy drifting. Many long, broad, smooth 20-30 cm high sastrugi passed in succession through micromet site from 9 to 25 May. Total accumulation at mast since mid-Dec of 38 cm. Reset subsfc thermocouples and heat flow transducers for fifth time this season on 28th. Several periods with rapid temperature changes, with largest occurring on 8th when temperature dropped 10° F in 3 minutes. GEOMAGNETISM. Operation normal. IONOSPHERE. Operation normal. C-3 adjusted so rapid line voltage fluctuations no longer affect the ionograms. E layer echoes still being recorded. Oblique echoes continue to make accurate scaling of F2 critical freq difficult. Plan to begin tape recording at atmospherics early in June. SEISMOLOGY. At least 68 confirmed quakes in April. 250 disturbances reported during May of which several were of type not previously seen here this year, characterized by sharp onset and short period; possibly ice quakes. Installed thermostat in cabinet of paper recorder. GLACIOLOGY. Month accumulation 1.3 cm. Between May 11 and May 23 lost 1.5 cm. Estimate 15% sfc still summer crust. Sastrugi migration made accumulation stakes values to oscillate between plus 20 and minus 20 cm. Compaction eqpt set at 10 to 13 meters depth in pit, and 17 to 23 m depth. Filtering slowly underway in dust free chamber. GENERAL Capt. Chemeyers USN advised Dr Houk that positive growth found at 91 ft in snow mine. More details to follow. Above normal fuel consumption during month due comparative high winds. It is felt that unavoidable voltage fluctuations motivated undetermined inaccuracies in the production of some scientific data. Met section using variac attempting maintenance of optimum voltage and monitoring line. Health and morale excellent.

Hallett Station

Sitrep Nr 18, 3 June 1958* AURORA. Aurora seen on all clear nights, total 24. Majority of activity this month centered on geomagnetic meridian. This was not so during equinoxial months March and April. Second half month shows nights aurora divided into 2 or 3 displays with regular first commencing at dusk and lasting about 2 hrs. Automatic eqpt has given some trouble but few records lost. Navy built covered stairway from science bldg to aurora tower. Safety and comfort much appreciated. IONOSPHERE. F region spread has reduced number of full weight values. This appears to be due to decrease in absorption permitting weaker signals to be recorded and also that /A/ higher frequency obliques are now recorded as strongly as lower /B/ the component is now much stronger than the θ near the critical. Occurrence of night E is being noted for possible correlation with overhead aurora arcs. Few equipment troubles with exception of variations in scope intensity which have caused the loss of more than a days records. GEOMAGNETISM. Program running smooth. No major activity during month. One set of absolute observations made. SEISMOLOGY. 40 earthquakes were recorded out of which 26 were reported. Long period instruments considerably disturbed by microseisms of period 90 to 120 seconds which have been almost continuous during mo. Most data therefore taken from Wilmore which is recording P phases well. Ground movement of period 17 to 20 minutes repeat minutes has been recorded on E-W seismometer. METEOROLOGY. Routine observations continue. Cause of sporadic radio meter record malfunction found and remedied. Wind storm 29 and 30 disorientated 10 meter wind direction transmitter. Repairs underway. Pyrheliometers secured 19th and brought indoors. Peak gust 60 kts from S on 29. Avg height 56 radio-sondings 20120 meters. Increase due to efforts aerographers and other support personnel. Bay completely frozen over. Sun last seen on 14th. GENERAL. Morale excellent. Relations between NZ and US personnel both sci and support are first class. Appreciate magnificent cooperation of support personnel.

Wilkes Station

May Sitrep. 2 June 1958* SEISMOLOGY. All components operative since 19 May. Tunnel to seismic shelter completed 27 May. Microseisms strong on 1,5,8,9,10, 13,14,15,16,18,19,20,21,28 and 30 May. AURORA. Aurora observations 4 of 7 clear nights. Spectrograms show spectra on clear and cloudy nights, even during snow storms. Better results obtained by developing 103AF film 10 minutes at 66 F. Emulsion remains in better condition. Lights on all sky camera have been placed for half degrees of geomag lat. Calculations based on coordinates for south geomagnetic pole supplied by Oliver. Winds to 92 kts earlier in month made second beginning of snow from tower necessary. New trap door in roof opened also snow blew up shaft. Spectrograph remained in operation. Airglow spectrum obtained during storm. Dean Denison tried auroral photos on Superanschrome using ASA 300 for film speed and 1½ minute exposure time. Results not satisfactory. Cloudy nights seriously hampering height program. IONOSPHERE. C-4 placed in operation 17 May. Operation normal and function satisfactorily since then. Increase in sporadic E activity during last half of May. On 21 May fine display auroral type sporadic E between 1900 and 2000 Local. Strat layer height 115 km at 1.2 mc, increased in height to 170 km at 5 mc and became diffused with F layer. Partial blanketing occurred in 3.2 to 5.3 mc. Obs auroral activity showed 2 RA at 120 km in north sky, color green. During this auroral display high freq field strength intensity prop rec monitoring WWV at 15 mc indicated rapid fluctuations in field strength of both H and V components of received wave. Prov WWV did not return to normal until 1 hr after display. No magnetic activity evident. COSMIC RAYS. Eqpt repaired and in operating condition by Dean Denison and Don Edman. Trouble with power supplies and scaling circuits eliminated. 6AS6 in coincidence circuit of printout one triggered with coincidence in two trays instead of three causing apparent increase in count. Scalar test board being constructed. Two cosmic ray storms obs during week of 12 and 19. Intensity increased greater than 100 %. Intense aurora occurred during first storm. Clouds prevented sky obs during second. Second storm occurred following a large solar flare. Dean Denison has assumed responsibility for cosmic ray program. Data are transmitted on weekly basis. METEOROLOGY. Mid-May storm brought period of strong winds with max gusts 106 mph and temperatures above freezing for 5 days, causing building to leak. Similar occurrence in May last year though not as bad. Avg temp 16-17 F, high 40 F, low -11 F. Avg wind 16.8 mph. Total snowfall 21.6 in, total rainfall .25 in. Days clear 4, partly cloudy 26. GEOMAGNETISM. All operations normal. GLACIOLOGY. John Hollin and Casey Cronk spent month at satellite sta making firn density studies, completing series of star shots for geog location and surveying movement stake network. Bad weather and vehicle trouble hindering program. At base flags were erected for topographic survey, geological field work and periodic temperature-ablation measurements continued. Ole Ommundsen and Bill Allison left on 1 May in Snorat for satellite sta with new spring for Snocat. OCEANOGRAPHY. Ice in Vincennes and Newcomb Bay and coves continues to form and blow out with every high wind. Present ice has been in place for 1 wk. Now ten tenths with more solid ice pack 1 mile out. Ice north of Clark Is solid around islands and thick enough for Snorat. SURVEY WORK. Advantage taken of clear day to obtain distance of Cape Folger from obs point in camp using angles from 2 pts 3914 ft apart. Distance is 8.63 nm. Avg obs daily seaweed movement Cape Folger since March is .7 ft. Max occurred between 25 March and 2 April and was 1.4 ft. GENERAL. Seminars given as follows: Father Birkenhauer, applications of seismology; Borrello, geomag obs; Robertson, geology of Windmill IS. Comfortable sleeping temps easily maintained in BOQ. Thermostat reduced to 60 nights. Seals more abundant. Back country snow sfc greatly improved. Ice too rough and cracked for skating. Skiing resumed but limited to small narrow areas. Hiking still enjoyed during short daylight hours. Dogs are taken on ski runs or out of camp for exercise. Morale high. Looking forward to mid winter days.

Ellsworth Station

May Sitrep. 2 June 1958* GENERAL, Completion of first month of darkness finds scientific program operating very well. Men in excellent health and in good spirit, enjoying experience. AURORA. Auroras seen 23 nights with major activity in low south. Peak activity from 2200 to 2300Z. No dome frost to -68 F with light winds. Morse tank dropped and broken. Using tray developing for spectro and Stineman tank for Tri-X and magneto with better results. All sky camera 1 roll film bad when solenoid stuck holding shutter open. Repaired by placing masking tape in gap. 3 rolls no matrix light due to lack of position pins base of new K-100. Pins from Al nails made. Spectrograph. Minute time now pulsed by ionosphere clock. MAGNETOGRAPH. Unable to get satisfactory results since source lamp replaced. COSMIC RAY. Operation satisfactory. Painted GM tubes dependable. Timing corrected by installation Veeber Root meter in photo box triggered by ionosphere recorder. IONOSPHERE. With Semperebon and Reed this most difficult program operation remains merely routine. METEOROLOGY. Most lost soundings due continual high wind release problems and excess number defective R/S units. Also many bad humidity elements. Rest of program normal. GLACIOLOGY. Net accumulation winter sea ice 10.0 in, total now 70.0 in. Net snow accumulation for month 1.5 cm. Constructed vestibule at top of deep pit for eqpt and tools. Built ramp from top of pit for hauling snow from pit. Began snow tunnel from 10 m level in pit. Installed new cable to bring electricity from station to pit. Measured distance between strain pins, took temperature and density along walls to bottom of pit. Continued sastrugi studies. Wind erosion appears more significant than deposition in shaping sastrugi. Dug monthly 2 m pit. Dug out and assembled 2 1/2 ton sled for construction of traverse wannigan. Hoffman busy tuning and modifying Snocats, welding reinforcements to frames, installing lower tow hitches to lessen drag on vehicles

May Weather Averages

	LAS	Byrd	Pole	Hallett	Wilkes	Ellsworth
Ave Temp, °C	-29.4	-28.3	-57.0	-23.0	-8.5	-34.7
Highest Temp, °C	-3.3	-11.1	-46.1	-8.8	+4.4	-12.2
Lowest Temp, °C	-47.2	-54.8	-67.9	-33.9	-23.9	-55.6
Prev Wind Direction	SE	NNE		SW	E	S
Ave Wind Speed, knots	14.9	19.6	15.8	6.9	14.6	9.6
Max Wind Speed, mph	56	68	33	60	58	38
Nr. Clear Days	10	5	22	18	4	15
Nr. Partly Cloudy Days	8	11	8	5	1	11
Nr. Cloudy Days	13	15	1	8	26	5