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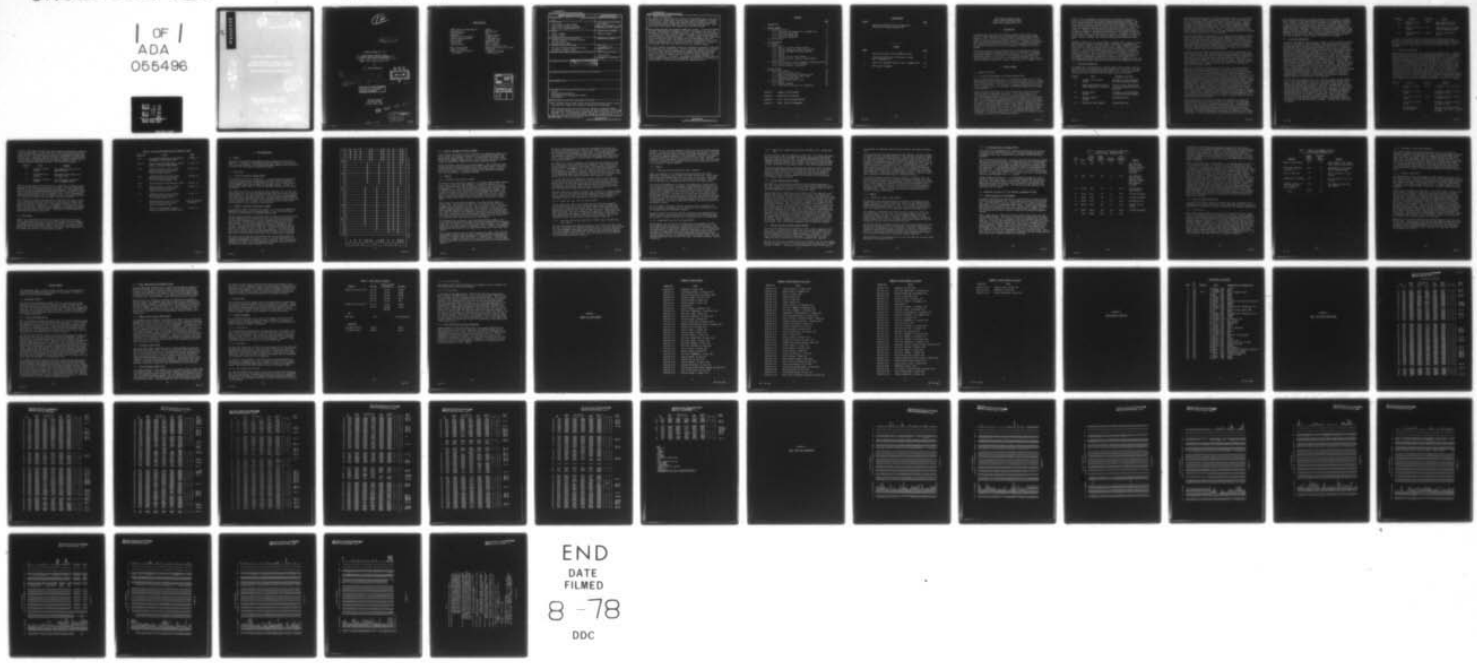

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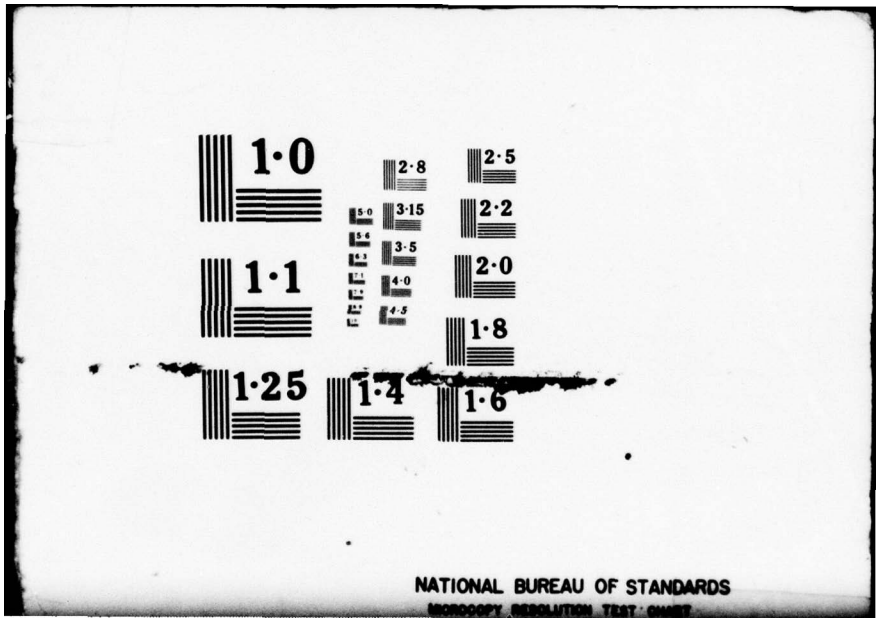
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TECHNICAL REPORT NO. 77-8

FINAL REPORT, PROJECT T/4703
SPECIAL DATA COLLECTION SYSTEMS

AUGUST 1973 THROUGH OCTOBER 1977

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TECHNICAL REPORT NO. 77-8

(6) FINAL REPORT, PROJECT T/4703
SPECIAL DATA COLLECTION SYSTEMS
August 1973 through October 1977

by

(10) John R. Sherwin

(9) Final rept. Aug 73-Oct 77

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TELEDYNE GEOTECH
3401 Shiloh Road
Garland, Texas 75041

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IDENTIFICATION

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ARPA Order Nos.	2551 and 2897
Program Code No.	6F10
Contractor	Teledyne Geotech
Effective Date of Contract	1 August 1973
Contract Expiration Date	30 September 1977
Date of Report	22 December 1977
Contract No.	F08606-74-C-0013
Program Manager	John R. Sherwin (214) 271-2561, ext. 265
Short Title of Work	Special Data Collection Systems
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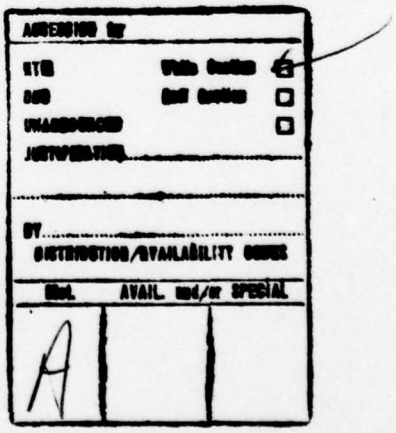
Contract Period Covered by this Report	1 August 1973 through 31 October 1977



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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

Work performed under Project T/4703, Special Data Collection Systems, during the period for 1 August 1973 through 31 October 1977 is described.

Under the primary data collection task five portable seismograph systems were routinely operated at ten sites during the period from early 1975 through September 1977. Three additional systems were placed in operation in May and June 1977, and also remained operational through the contract period. →(over)

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20. ABSTRACT (Continued)

The systems were operational for a total of 157 team months and all data were forwarded to the Seismic Data Analysis Center (SDAC) in Alexandria, Virginia for processing. Event reports were prepared under the program as requested by the Project Officer through April 1976; 104 reports were prepared. After April 1976, event reports were prepared under the SDAC contract.

Three special projects were completed under the program. In the first study, the Model 36000 Borehole Seismometer (KS-36000) was modified and tested for operation in boreholes up to 3000 meters deep. The modified unit was operated at a Wyoming site along a shallow borehole KS-36000 in order to determine the effects of depth on long-period signals. In another study, various techniques for detecting tunnels were investigated and field measurements were made. Finally, a study was made to determine the cause of unexplained noise on the KS-36000 instrument and to develop techniques for eliminating it. Details of these studies and results are reported in special technical reports.

The eleven portable seismograph systems were modified as necessary to meet the requirements of the various tasks. Digital recording capability was included for five systems with the development of a digital data acquisition system. By the end of the contract period, filter/amplifier systems were built for operation of three KS-36000 systems in place of the normal complement of surface seismometers. In general, the portable seismograph systems along with other equipment assigned to the program have continued to be a versatile and reliable means of collecting seismic data for research purposes.

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* * * * * * * *

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FINAL REPORT, PROJECT T/4703
SPECIAL DATA COLLECTION SYSTEMS
August 1973 through October 1977

1. INTRODUCTION

The Special Data Collection System (SDCS) program, Project T/4703 is an extension of work begun under the Long Range Seismic Measurements (LRSM) program in 1960. The work is directed primarily toward collection of high quality seismic data for the development of seismic techniques necessary to detect and identify underground nuclear explosions. In addition, the program also involves related special studies such as instrumentation development and special field studies utilizing the equipment and capabilities of the program.

This report describes the work performed under the SDCS program during the period from August 1973 through October 1977 and is submitted in accordance with Sequence A005 of the Contract Data Requirements List as amended under Modification P00005, 2 January 1975. This research was supported by the Advanced Research Projects Agency of the Department of Defense and was monitored by AFTAC/VSC, Alexandria, Virginia, under Contract No. F08606-74-C-0013.

2. PROGRAM SUMMARY

2.1 PROJECT ACTIVITIES

2.1.1 Activities from August 1973 through December 1974

Project T/4703 began in August 1973. The program's primary task was a short-term deployment of the eleven SDCS units for an unspecified event; the systems were to be maintained in readiness in Garland until notification was received from the Project Office. In addition, the program included a special study task to evaluate and test the new Model 36000 Borehole Seismometer (KS-36000) in deep boreholes.

During the period from August 1973 through March 1974, work on the primary task was limited to equipment maintenance. On the deep borehole study, the KS-36000 was modified as necessary to assure proper operation in the high temperature-high pressure environment of boreholes up to 3000 meters deep. Also, SDCS and other equipment necessary to operate at the deep borehole site near Pinedale, Wyoming (PI2WY) was tested and prepared for shipment. The overall plan of this PI2WY operation was to compare the operation of a KS-36000 in a shallow borehole (45 meters deep) with the specially configured system at several depths from 45 meters to 3000 meters. Operational characteristics of the modified system in the as yet untested environment of the deep borehole (water fill, high temperature and high pressure) were to be determined. The primary plan, however, was to determine the effects of depth on signals and noise in the long-period passband.

In April 1974, an amendment to the contract was received, extending the primary task through June 1975 under the same arrangements as before. Meanwhile, equipment for the deep borehole experiment was shipped to PI2WY and set-up began. Operation continued without the deep borehole KS-36000 until August 1974 when modification and final testing were completed. A restriction in the deep borehole prevented setting the KS holelock below 1350 meters (4400 ft). Therefore, the deep hole instrument data were obtained from 300 and 900 meter depths in the water-filled portion of the borehole and from 90 and 180 meter depths in the dry portion of the hole. Operations at PI2WY were discontinued on 2 January 1975, and all equipment was returned to Garland. A report covering instrument tests and data processing was submitted in March 1975.

Meanwhile, another special study was begun in December 1974 in order to investigate methods for detecting shallow tunnels. Techniques investigated were active seismic, magnetic, and radioactive decay of radon. Theoretical studies showed that there was insufficient radon in newly excavated rock to detect at distances. A brief field program was conducted from Geotech's Alexandria office to evaluate the first two methods using railroad tunnels in Ohio and Colorado as targets. These tests showed that only the magnetic detector was even marginally successful in detecting tunnels. A field demonstration of the magnetic technique was conducted at an overseas site in April 1975. A final report describing field tests and conclusions was submitted in June 1975, and a supplemental report covering the overseas test was submitted in July 1975.

2.1.2 Activities During 1975

In November 1974, notification was received from the Project Office that five SDCS units were to be deployed on a semi-permanent basis from early 1975 until June 1975 with an extension through March 1976 likely. Sites to be occupied had been previously used under earlier programs and were as follows:

Team No.	Site	Equipment to be Used
56	Franklin, West Virginia (FN-WV)	KS-36000 in existing borehole with SDCS recording equipment.
57	Cumberland Plateau Observatory (CPO), McMinneville, Tennessee	Station vertical short-period array plus standard SDCS instrumentation.
58	Houlton, Maine (HN-ME)	KS-36000 in existing borehole with SDCS recording equipment.
59	Red Lake, Ontario (RK-ON)	Standard SDCS unit.
60	Whitehorse, Yukon (WH2YK)	Standard SDCS unit.

Data from these stations were to be processed using facilities at the Seismic Data Analysis Center (SDAC) in Alexandria, Virginia. Also, the SDCS systems were to be upgraded by the addition of digital recording systems. Preparations for the deployment (permits for sites, leasing of vehicles, equipment checkout, etc.) began in December and the first three teams (HN-ME, RK-ON, and WH2YK) left Garland in January 1975. The system for CPO left in early February and the FN-WV system left in March. A helper was assigned to each team to complete the extra work due to the semi-permanent nature of the stations and for safety reasons due to the cold weather.

Both HN-ME and WH2YK were operational by late February; HN-ME began operations with a standard surface installation pending completion of a borehole. The RK-ON site became operational in March after a delay in receiving the small diesel generators; CPO also became operational in March. Set up of the FN-WV site was delayed due to several problems, such as late approval to re-enter the plugged deep borehole and borehole-produced noise when the KS-36000 was installed. Routine operation at FN-WV began in late May with the KS-36000 in a shallow (10 meter deep), water-filled borehole.

Data quality from all teams was generally poor for about a month after each site became operational but improved significantly as operators gained experience. Quality control (QC) checks of the field magnetic tapes in Garland were routinely used to detect operational problems; operators were notified of these problems and suggestions for correction were given. After QC, all data were shipped to the SDAC for storage and later processing. The SDAC group was given responsibility to produce detailed event reports using SDCS data as directed by the Project Office.

While routine operations continued at the five sites, work on the digital recording system began in May 1975 with the selection of the Kinemetrics Model DDS-1103 Digital Recording System. Five of these systems were ordered and work began in Garland to design and build the necessary equipment to interface the digital system with the SDCS units. After resolving some initial difficulties with the DDS-1103, the first system was placed in operation at CPO in early November 1975, followed by installations during December at FN-WV, HN-ME, and WH2YK. The system scheduled for the RK-ON site was used by Geotech engineers and by the manufacturer to investigate an intermittent problem in the dual memory. After several tests, the system was installed at RK-ON in March 1976, even though a satisfactory solution to the problem had not been determined. The problem continued to cause the intermittent loss of data until the memories were replaced by newly designed units beginning in December 1976. The systems, as modified, operated with only isolated problems throughout the remainder of the contract period. To complete the development work, an operation and maintenance manual for the digital recording system was written, printed and sent to system users.

Routine operations at the five sites continued throughout the design and installation phase of the digital systems. In June 1975, the operational portion of the contract was extended through March 1976. During November 1975, a borehole (40 meters deep) was drilled and cased on the HN-ME site and the problem with the deep borehole casing at FN-WV was corrected by cementing. The HN-ME KS-36000 system was placed in operation in December, resulting in a decided improvement of data quality as compared to the surface installation. A similar improvement was achieved when the KS-36000 at FN-WV

was moved from the shallow (10 meters) borehole to the deep hole at 60 meters depth. Addition of the digital recorder resulted in no significant problems to the operators, except that digital tapes had to be changed daily, requiring a visit to the site seven days a week. Operating procedures using the new equipment were quickly developed and digital recording was incorporated into normal operations. Meanwhile, routine data processing and preparation of event reports continued at the SDAC. In addition, software and other procedures were developed to use the digital data as soon as it became available. The computer facilities at SDAC were also used in troubleshooting the various problems in the field system and a routine digital QC procedure was developed.

2.1.3 Activities During 1976

In January 1976, approval was received to conduct a study of convection-induced noise on the KS-36000 in shallow boreholes. The purpose of the study was to determine the cause or causes of the long-period (60 to 200 sec) noise which was sometimes seen on the high-gain KS horizontal data traces. In addition, methods of eliminating the noise from the data were to be developed if possible. The study was conducted using a KS-36000 in the 60 meter deep borehole at the Garland facility from March through mid-June 1976. A special report on the study and results was prepared and submitted in late June. The study showed that the noise generally termed "convection noise" could be due to atmospheric pressure changes acting either on the seismometer directly if the borehole was unsealed or on the earth's surface if the borehole was well sealed. (The sealed borehole reduced atmospheric effects significantly.) The characteristic noise could also be produced by nearby heavy truck traffic. When these sources of noise were eliminated, KS traces continued to show occasional periods of noise. Although none of the tests were able to detect convection activity directly, the remaining noise is thought to be due to minute temperature changes in the KS-36000 support members which in turn are caused by air (or water) circulations due to convection. Techniques were developed to insulate or otherwise protect the holelock and instrument base from these temperature changes, but were not tested due to time constraints.

In April 1976, the operation of the five sites was extended through December 1976. At this time responsibility for all SDCS data processing was transferred to the SDAC contract. Operations continued at these original sites through July 1976 when the stations at FN-WV, CPO, and WH2YK were closed for relocation; RK-ON and HN-ME remained in operation. The FN-WV and CPO stations were rolled up and transported to Garland to be reconfigured as necessary to operate short-period surface instrumentation only. The WH2YK equipment was transported directly to the Nevada Test Site (NTS) near Las Vegas, Nevada, and was joined later by the other two SDCS units. These systems were to collect data for an experiment to determine whether teleseismic signals detected on the NTS exhibited anomalies similar to those signals generated by explosions on the NTS and detected elsewhere. The SDCS units were set up as follows:

Team No.	New Site	Old Site	Remarks
56	Nevada Test Site (NT-NV)	FN-WV	Pahute Mesa, Area 20 on Timber Mountain Caldera
57	Nevada Test Site 2 (NT2NV)	CPO	Pahute Mesa, Area 19, edge of Timber Mountain Caldera
60	Oak Spring Butte 2 (OB2NV)	WH2YK	Granite, Climax Stock, Area 15.

In general, set-up of the three sites was completed quickly and without difficulty. Personnel at NTS were extremely helpful in providing assistance for site selection, power hookup, and access to the various areas. The NT-NV and OB2NV sites were operational by late August and NT2NV started in early September.

2.1.4 Activities During 1977

Routine operation of the five sites continued and plans were made to terminate the field program in December. All equipment was scheduled to be returned to Garland to be maintained in storage through September 1977. In mid-December, the field operation was extended through September 1977. The SDCS units remained in continuous operation until April when the NT-NV and NT2NV stations were moved from Pahute Mesa to Yucca Flat in Areas 3 and 7 of the NTS. In addition to the standard three-component short-period instrumentation, single vertical component outriggers were installed with each unit to form a four-element linear array in Yucca Flat. The purpose of this installation was to collect data near sites with known signal anomalies. It was recognized at the time that the Yucca Flat Sites would be very noisy due to a lack of competent bedrock for seismometer emplacement and also due to the great amount of cultural activity in the area such as heavy equipment movements and drilling. An outrigger was also added to complement the OB2NV site. The new sites and all outriggers were in routine operation by mid-April. Sites are as follows:

Team No.	New Site	Old Site	Remarks
56	Yucca Flat, Nevada (YF-NV)	NT-NV	3-component, east end, Area 3
-	Yucca Flat 2, Nevada (YF2NV)	-	Outrigger, 1 km west of YF-NV, recorded at YF-NV
57	Yucca Flat 4, Nevada (YF4NV)	NT2NV	3-component, approx 3 km west of YF-NV, Area 7
-	Yucca Flat 3, Nevada (YF3NV)	-	Outrigger, 2 km west of YF-NV, recorded at YF4NV
-	Oak Springs Butte 3, Nevada (OB3NV)	-	Outrigger, 1 km NNE of OB2NV, granite, Climax Stock, recorded at OB2NV

In April, three additional SDCS units were prepared for deployment as directed by the Project Office. The new units were to be located near the detonation points of devices off the NTS as an extension of the magnitude anomaly study using NTS sites. The teams departed Garland in mid-May and were operational by early June. Commercial power was not readily available at these new sites so system power was supplied using thermoelectric generators (TEGs); the systems recorded on FM analog tape only. The sites are as follows:

Team No.	Site	Remarks
51	Faultless, Nevada (FA-NV)	Near Tonopah, Nevada, site of FAULTLESS event.
52	Tatum Dome, Miss. (TQ-MS)	Near Purvis, Mississippi, site of SALMON event.
53	Gasbuggy, New Mexico (GB-NM)	Near Farmington, New Mexico; site of GASBUGGY event.

Addition of the three new teams resulted in a requirement to produce visual playouts to facilitate data processing at the SDAC. A suitable reproduction facility was set up at Garland using existing equipment. The playouts were made on a specially modified high-speed Develocorder (16-mm film) at a twenty-times real-time playback of the field magnetic tape. The film presentation compressed the short-period data as compared to normal, real-time operation, but resolution was adequate for preliminary analysis at the SDAC.

At the end of the contract operating period, eight SDCS units were in operation. Notification had been received earlier from the Project Office that operations would be continued under a new contract; however, several sites were to be relocated. Therefore, on 30 September 1977, operations at YF-NV, YF4NV, and FA-NV were terminated and the equipment was prepared for shipment to the new sites under the new contract. Operations at HN-ME, RK-ON, and OB2NV continued without interruption.

2.2 PUBLICATIONS

Table 1 is a chronological listing of the major technical and operations reports published as a result of activities under this contract. Appendix 1 is a summary of the Event Reports published by the SDAC as a result of data processing completed under this contract. The reader is referred to these publications for details of the operations and results (where applicable) of the primary data collection task and special studies.

Table 1. Publications under Contract F08606-74-C-0013

Report No.	Title	Date
75-2	Deep Borehole Operation of the Borehole Seismometer System, Model 36000	15 March 75
AL-75-1	Tunnel Location by Magnetometer, Active Seismic, and Radon Decay Methods	18 June 75
75-5	Semiannual Report, Project T/4703, Special Data Collection Systems, January through June 1975	30 June 75
76-3	Semiannual Report, Project T/4703, Special Data Collection Systems, July 1975 through December 1975	30 March 76
76-6	Shallow Borehole Convection Noise Study	30 June 76
76-8	Semiannual Report, Project T/4703, Special Data Collection System, January through June 1976	30 July 76
77-1	Semiannual Report, Project T/4703, Special Data Collection System, July through December 1976	31 Jan. 77
77-7	Semiannual Report, Project T/4703, Special Data Collection System, January through June 1976	(awaiting approval to release)
--	Operation and Maintenance Manual, Digital Recording System, Model 43419	02 Aug. 77

3. FIELD OPERATIONS

3.1 GENERAL

During the report period, seven SDCS units were operational in the field. Figure 1 is a summary of the operational dates for each of the units and the sites that were occupied. The following paragraphs summarize the team activity at each of the sites during the operational period.

3.2 FIELD SITES

3.2.1 Team 51, Faultless, Nevada (FA-NV)

The team arrived on site on 26 May 1977. A site was selected and permission to occupy the location was coordinated by the Project Office through the Property Management Office, Nevada Operations Office of the Energy Research and Development Administration (ERDA) in Las Vegas, Nevada. The site is located about 1050 m (3400 ft) NW of the FAULTLESS detonation surface ground zero (SGZ).

Site installation and set-up calibrations were completed on 03 June 1977 and routine operations were conducted from that date until the site was closed on 30 September 1977. The data requirement at FA-NV was for the analog magnetic tape recording of short-period data only. No major problems were encountered during the operational period and the minor problems which included low thermoelectric generator (TEG) voltages, tape capstan motor failures and timing system instability were corrected as they occurred.

3.2.2 Team 52, Tatum Dome, Mississippi (TQ-MS)

On 12 May 1977, Team 52 arrived in the general area of Projects DRIBBLE and MIRACLE PLAY conducted in the Tatum Salt Dome. A site was selected about 520 meters (1700 ft) SSW of the SALMON detonation SGZ.

Routine analog recording of short-period data was begun on 20 May 1977 following the completion of site installation and set-up calibration procedures. The system remained operational in this configuration at the end of this report period. Thirteen days of magnetic tape recording were lost due to bearing failure in three nonstandard capstan motors of FM magnetic tape recorder. The tape system was changed to a standard configuration and has operated satisfactorily since 16 June 1977. There were no other major malfunctions at TQ-MS but there were many minor problems. There were several noisy tape system gear boxes, continuing amplifier drift, and a continuing problem with variable power outputs from the two thermoelectric generators.

The noise level at Tatum Dome is high due to the lack of good bedrock for seismometer emplacement, the number of trees in the area and activities of lumbering and geophysical exploration crews in the area. Heavy rains during September 1977, added to the site problems by hindering site access due to destroyed bridges and almost impassable dirt roads.

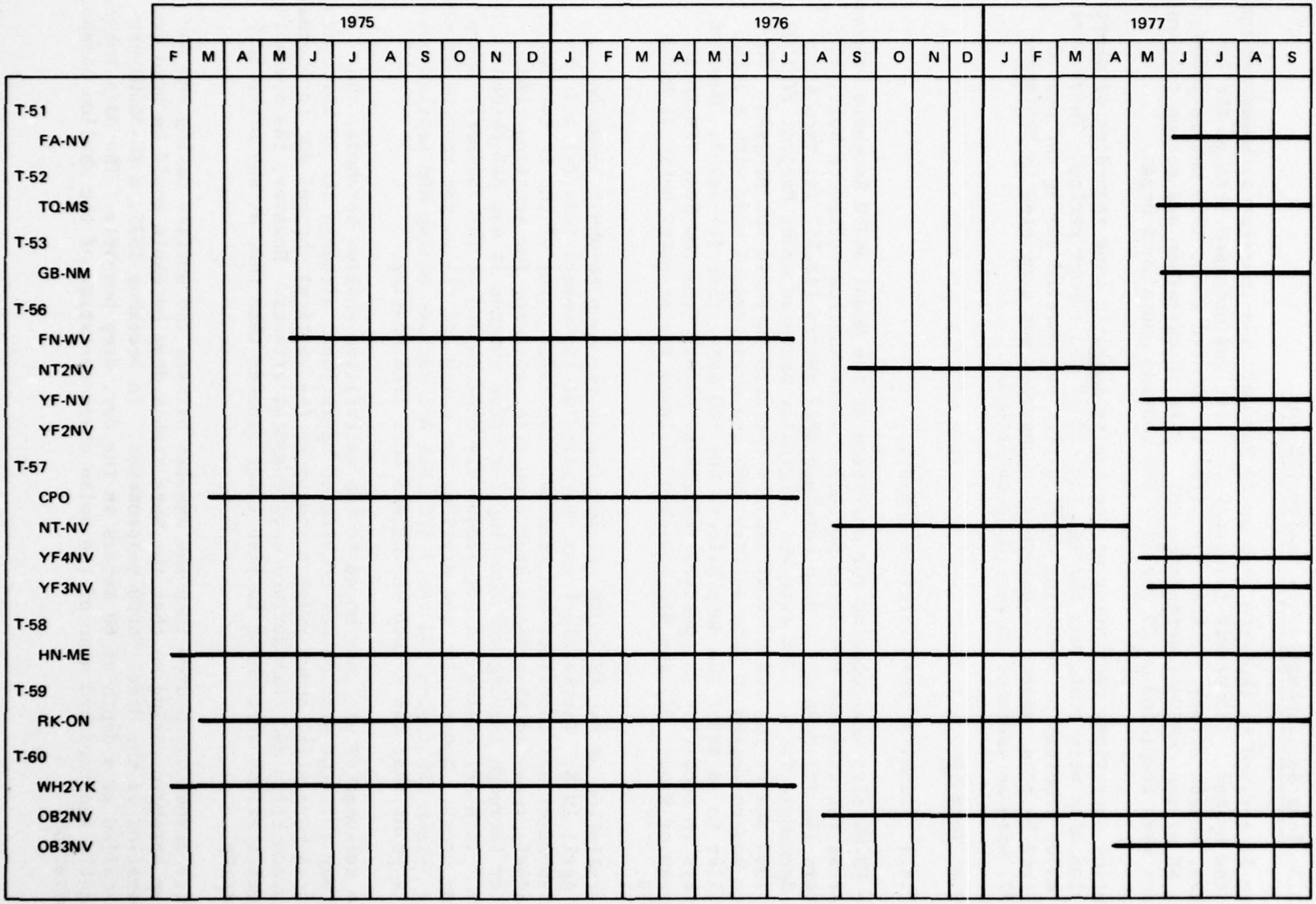

Figure 1. Operational periods of sites occupied from February 1975 through September 1977

3.2.3 Team 53, Gasbuggy, New Mexico (GB-NM)

Team 53 arrived in the site area on 23 May 1977 and immediately began set-up of the system. The permit to occupy the site was obtained through the Las Vegas, Nevada office of ERDA. The site is located about 1900 meters (6300 ft) NW of the GASBUGGY detonation SGZ. Site installation and set-up calibrations were completed on 29 May 1977 and routine operations began.

Routine operations consisting of the analog magnetic tape recording of short-period data were continued through the end of the report period. There were no major problems or operating difficulties encountered during the period covered by this report. A personnel changeover was completed in September 1977, with no decrease in recording efficiency.

3.2.4 Team 56

3.2.4.1 Franklin, West Virginia (FN-WV)

The FN-WV site was selected for operation of the Model 36000 Borehole Seismometer as the site has two cased boreholes - one shallow reference hole, 15 meters (50 ft) deep and a deep borehole 3827 meters (12,557 ft) deep known as Sponaugle No. 1. The site was originally occupied under Project VT/1139 in 1964 and at the end of that project the deep borehole was plugged. The site was re-leased in late January 1975 and arrangements made with a local driller to re-enter the deep hole to the 160 meter (525 ft) level. However, delays in receiving an approved redrilling permit from the West Virginia Bureau of Mines, Oil and Gas Division, delayed the re-entry until 31 March 1975.

Installation of the KS-36000 seismometer in the deep borehole began on 10 April 1975. The holelock was installed at 150 meters (494 ft) and the seismometer was installed and leveled. The noise level of the LP horizontal channels remained abnormally high even after allowing for settling time. After thorough testing and checking for noise sources it was determined that the 7-inch API casing was not adequately constrained at the 150-meter operating depth. Apparently, the drilling mud which had filled the annulus between the 7-inch API casing and the 9-5/8 inch API surface casing had settled out to a point that the 7-inch casing was left free-hanging.

The seismometer was then moved to the waterfilled shallow borehole. On 27 May 1977 the station was considered operational although the LP horizontal traces were still about twice as noisy as the vertical channel due to thermally induced tilts and near surface environmental effects. However, the operating magnifications were three to five times greater than that at any other SDCS station.

Later cement was poured into the annulus between the surface casing and the deep borehole casing so that the more stable deep borehole could be used for operation of the Model 36000 seismometer. In December 1975, a KS-36000 was installed at a depth of 60 meters in the dry, deep borehole. The data subsequently recorded had none of the noise characteristics of the shallow borehole operation.

The digital recording system was installed in December 1975 but was not placed in routine operation until February 1976 when the controller drawer was returned from the manufacturer after repair. The system continued to have occasional alternate memory problems until May when a Kinemetrics representative visited the site and observed the problem under field conditions. A replacement memory operated properly throughout the remainder of the operations at FN-WV.

On 21 March 1975, the KS seismometer was removed from the borehole so that the orientation of the holelock could be determined. (The orientation for the KS seismometer had been estimated when it was originally installed in December 1975.) The Humphrey, Inc., Gyrosurveyor Probe System which had been delivered to the contract was used. While it was out of the hole, the KS seismometer was modified to reduce the short-period signal level by 14 dB at the instrument output to provide better control of the SP recording levels. Routine operations with proper orientation were resumed on 22 March.

On 15 June 1976 the KS was damaged by lightning in spite of the lightning protection devices which were utilized. The unit was replaced on 23 June but the SP and LP data from the new system soon became intermittently noisy and unusable. The unit was removed from the borehole and the inner case helium pressure was reduced. When installed, the unit functioned properly until the conclusion of operations at 2100Z, 28 July 1976.

This SDCS system was returned to Garland to be returned to a standard configuration. The site lease and deep borehole operations permit remained active until 4 February 1977 when the lease was terminated and the borehole was replugged according to the regulations of the State of West Virginia.

3.2.4.2 Nevada Test Site, Area 19, Nevada (NT2NV)

In late August 1976, Team 56 was reconfigured to record three-component surface short-period data in both analog and digital modes, and was moved onto location on the Nevada Test Site (NTS). The site on Pahute Mesa was prepared and arrangements were made with USGS for use of a small trailer to house the system. The site installation was completed on 10 September 1976, when routine operations began. Operations at NT2NV were routine with no major malfunctions in either the analog or digital systems. The site was closed on 01 April 1977 and moved to another location on the NTS.

3.2.4.3 Yucca Flat (YF-NV) and Yucca Flat 2 (YF2NV), Area 3, Nevada Test Site, Nevada

The Team 56 equipment from NT2NV was moved on site at YF-NV on 01 April 1977 and site installation was completed on 10 April 1977. The YF-NV site consisted of a three-component short-period system and the YF2NV site was a single SP vertical instrument located 880 meters (2900 ft) west of the YF-NV location as an "outrigger" of the YF-NV site. Data from both sites were recorded on the YF-NV analog and digital recorders.

Operations at this site were relatively trouble free with only minor equipment problems. The long data cable between the outrigger and the prime site picked up noise caused by the operation of many mobile radio transmitters in the area. The absence of competent bedrock for the seismometers resulted in low magnifications and relatively high levels of cultural activity (heavy equipment movements and drilling) caused extended periods of noisy data. The site operations were terminated on 30 September and the system was removed from the NTS to be relocated in western Colorado.

3.2.5 Team 57

3.2.5.1 Cumberland Plateau Observatory (CPO), Tennessee

Team 57 was operated at the Cumberland Plateau Observatory (CPO) near McMinnville, Tennessee, from 14 March 1975 until 28 July 1976. CPO has been operational since December 1962, and at the time of the arrival of the SDCS unit in February 1975, the USGS was responsible for operations. SDCS operations at CPO were fully coordinated with the USGS by the Project Office.

The existing instrumentation at CPO was a 19-element short-period vertical array with two SP horizontal instruments (Johnson-Matheson seismometers) and a three-component LP system. The SDCS recording initially consisted of the vertical array summation and the two short period horizontals instead of the standard SDCS seismometers; after retrofit of the LP vaults, SDCS LP instrumentation was utilized. The operation of the CPO was a cooperative effort between USGS personnel and Geotech until October 1975 when the USGS staff was transferred. The SDCS operator continued to maintain operations of both SDCS and CPO equipment as well as telemetering equipment that had been installed in September 1975, for Virginia Polytechnic Institute and State University in Blacksburg, Virginia.

The first digital recording system was installed at CPO in November 1975. The unit operated satisfactorily until operations were terminated with only minor modification and maintenance required.

Departure from CPO in late July 1976 was coordinated with USGS personnel in Golden, Colorado, and responsibility for the facility was returned to them. The system was returned to Garland for reconfiguration prior to redeployment.

3.2.5.2 Nevada Test Site, Area 20, Nevada (NT-NV)

During August 1976, the Team 57 instrumentation was configured to record three-component short-period data in both digital and analog formats. The system was checked in Garland and transported to the NTS. Site installation was completed on 25 August 1976. Commercial power and a trailer to house the recording instruments were provided by other organizations on the NTS. No problems were encountered in analog recording and only problems with the alternate memory circuits were encountered with the digital system. The site remained operational until 01 April 1977 when it was moved to another location on the NTS.

3.2.5.3 Yucca Flat 3 (YF3NV) and Yucca Flat 4 (YF4NV), Area 7, Nevada Test Site

The site on Yucca Flat was occupied on 01 April 1977. The trailer and equipment were moved on site, instrument set-up and calibrations performed and operations began on 10 April 1977. The YF4NV instrumentation was a three-component short-period system and the YF3NV site was a SP vertical outrigger located 1100 meters (3600 ft) east of YF4NV. Data from both locations were recorded in both digital and analog formats at the YF4NV recording location.

The major operational problems encountered were with the digital recording system, including memory failures and tape skew problems. As at the other Yucca Flat sites, the noise level was high due to the lack of competent bedrock and cultural activity. Site operations were discontinued on 30 September 1977 and a site was prepared for relocation to the Gold Meadows area on Rainier Mesa at the NTS.

3.2.6 Team 58, Houlton, Maine (HN-ME)

The HN-ME site is the location occupied for the RIO BLANCO experiment in May 1973. This alternate location to the original site was obtained because the original HN-ME site could not be leased. The location change was not of sufficient magnitude to warrant a site designator change.

Routine operations at HN-ME began on 20 February 1975 after many delays and problems due to heavy snows and extremely cold weather. The wooden vaults used in 1973 were again utilized as the snow, cold and frozen ground prevented new vault installation. A site retrofit was not performed because the original HN-ME site was to be leased later in order to utilize the borehole that was originally drilled for the vertical strain seismometer test program in 1969 under Project VT/8704. When it became evident that a satisfactory lease for the original site was not possible due to litigation, a 40 meter borehole was drilled and cased at the operational site. The Model 36000 seismometer was placed into operation on 11 December 1975 and an immediate marked improvement was noted in LP data quality. The SP data quality was not significantly improved except during windy periods because background noise is primarily due to the close proximity to the ocean. On 15 March 1976, the Model 36000 was removed from the borehole so that the orientation of the holelock could be checked. While the KS was out of the borehole it was modified to lower the SP signal level. Operations at the site were continuing at the end of the contract. This site has been remarkably free of operational problems.

3.2.7 Team 59, Red Lake, Ontario, Canada (RK-ON)

The site at Red Lake has been occupied for several previous operations starting in 1963. From June 1963 to August 1970, the site was an LRSM van site, generator powered and with the vaults installed in a log bunker. The site was re-occupied in 1971 for the CANNIKAN experiment and again in 1973 for Project RIO BLANCO by portable system teams. Although this site lacks commercial power, excellent data have been recorded at this location.

The site set-up for this experiment began on 03 February 1975 when the standard portable system arrived on site. Site operations did not begin until 10 March 1975 due to delays in receiving the power generators, delays in delivery of

the equipment and generator shelters and the extreme cold weather and heavy snow.

Site operations have been continuous since that time with only short periods of outage time due to equipment failure or site retrofit. During the summer of 1975, the log bunker was replaced with a smaller concrete block structure. The change was necessary as the log structure was rotted and was close to collapse. The generator operation has been exceptionally successful with few outages that could not be repaired on site. In approximately 2-1/2 years of continuous operation, there were only four instances when the generator repair could not be completed on site. Most of the outage time other than that caused by generator failure has been due to the difficulty in getting replacement parts to Red Lake. A Canadian postal strike in late 1975 caused severe problems in completing data and resupply shipments. Routine air shipments to Red Lake from Garland require a minimum of ten days.

The DDS-1103 digital recording system was installed on 09 March 1976. The installation was delayed as the system was being used to conduct laboratory tests to support the four operating systems. Digital recording was lost from 08 to 30 July 1976 due to a failure of a 400 kHz crystal and again from 27 October to 13 November 1976 due to a failure of the 5-volt power supply in the Pertec tape recorder. The data loss was due to the unavailability of replacement parts. Analog recording continued uninterrupted during the periods of digital system failure.

3.2.8 Team 60

3.2.7.1 Whitehorse, Yukon, Canada (WH2YK)

The Whitehorse site had been occupied by an LRSM van from October 1966 to October 1969 and was occupied by portable systems for the CANNIKAN and RIO BLANCO experiments in 1971 and 1973. This site is a bunker location with tank vaults and commercial power available. The portable system arrived on site on 05 February 1975 and site operations began on 18 February 1975.

Site operation at Whitehorse continued relatively trouble free until the site closed down on 28 July 1976. The only major problem was the lack of consistent reception of radio time signals from WWV, WWVH or any other accurate time signal broadcast. The most satisfactory method of using time signal broadcasts was to try the reception several times during the day, by returning to the site after routine operating hours.

The DDS-1103 digital recording system was installed during December 1975 with routine data recording starting on 19 December. During the installation, a miswiring by the manufacturer was discovered and corrected. High background caused by a nearby radio frequency transmitter also had to be corrected. A filter was designed and installed and ground loops eliminated which reduced the noise level to below that of the normal seismic background.

Routine operations were maintained until 28 July 1976 when the site was closed and moved to the Nevada Test Site.

3.2.7.2 Oak Springs Butte 2, Nevada (OB2NV)

On 09 August 1976 arrangements were completed with NTS personnel allowing operations on the test site and with U. S. Geological Survey personnel to use three of their idle recording trailers to house the SDCS recording equipment.

The site was fully operational on 16 August 1976 with both analog and digital short-period records being made. Site operations have continued throughout the report period with some changes in operational status. In April 1977, a short-period vertical outrigger instrument was added and designated OB3NV. This new location is approximately 850 meters (2800 ft) north-northwest of the OB2NV site. In May 1977, NTS personnel initiated an investigation of the possible use of the PILEDRIVER location as an underground waste disposal facility. A large blower and the shaft elevator were operated causing exceptionally high background on all data channels.

Analog recording continued virtually uninterrupted throughout the report period with only minor outages caused by power failures and tape drive malfunctions. The digital data recording system, however, was plagued with memory malfunctions from October 1976 until April 1977 when the unit was repaired by Kinemetrics personnel. The digital system has operated satisfactorily since the repair.

3.3 OPERATIONAL RELIABILITY OF THE PORTABLE SEISMOGRAPH SYSTEMS

3.3.1 Failure Analysis of the Equipment

An analysis was made of the operations at eight SDCS units during the period from June through September 1977, to determine the reliability of the equipment. For each station, the total outage time due to equipment failure was determined in terms of seismograph channel-hours. The particular component which failed was also noted in each case. Failures in the digital recording system were not included nor were a few outages caused by operator error. The following tables show the analysis of the data by team and by equipment category.

Table 2 shows that all teams were on the air 96.6 percent of the time from June through September. This level of reliability is significant for several reasons. First, each unit is operated by only one technician (the three NTS teams [56, 57 and 60] were operated by two men) and sites are generally remote with home-to-site distances ranging from 9 to 75 miles, averaging 45 miles. Second, operators at Teams 51 and 52 were inexperienced in field work at the beginning of June. Another significant factor is that the portable system was designed in 1964; the first six units were built in 1965 and the last five were built in 1967 with some modification to the original design. Therefore, many of the electronic components are obsolete, have many operating hours, and are difficult to maintain under field conditions.

Table 2. Operational reliability of SDCS units by team, June - September 1977

Team No.	Site	Total Channel Hours	Outage Channel Hours	Outages Percent	Full Operation Percent	Remarks
51	FA-NV	7560	261	3.5	96.5	Full operation began 12 June; two-week training period prior to this time not included.
52	TQ-MS	7560	539	7.1	92.9	Full operation began 12 June; two week training period prior to this time not included.
53	GB-NM	8316	144	1.7	98.3	Full operations began 29 May.
56	YF-NV	11424	216	1.9	98.1	Includes outrigger.
57	YF4NV	11424	652	5.7	94.3	Includes outrigger.
58	HN-ME	17136	60	0.4	99.6	KS-36000 system.
59	RK-ON	17136	870	5.1	94.9	Complete SP & LP system.
60	OB2NV	11424	412	3.6	96.4	Includes outrigger.
	Total	91980	3154	3.4	96.6	

The TQ-MS site had the highest percentage of outage due to two factors: inexperience of the operator and continuing problems with the thermoelectric generators used to power the equipment. A majority of the outages at RK-ON were due to lightning damage to the solid-state amplifiers; the normal complement of spare units was inadequate for this major failure. At YF4NV, the major problem was also unavailability of a spare amplifier for the outrigger instrument. The site with lowest outage was HN-ME where the KS-36000 system is operated.

Table 3 shows that failure of the magnetic tape recorders resulted in 39% of the total outage reported. Failures in this unit are especially serious because up to six channel hours of data are lost for each hour the system is inoperative. More detailed analysis of the failures shows that the capstan drive motor caused more than one-third of all recorder-related outages. The solid-state amplifiers were the second highest cause of outage. However, at least half of these failures were due to unavoidable lightning damage as previously mentioned. Perhaps more significant than those items shown in table 3 are those not shown. The Model 19000 Timing System with its discrete transistor logic circuitry accounted for only eight channel hours of outage for the entire period. Also, there were no failures in either the SP (Model 18300) or the 2-kg LP (Models SL-210 and SL-220) seismometers. Another unexpectedly reliable piece of equipment is the diesel motor-generator used at RK-ON; two of these units have been operating alternately since RK-ON became operational in March 1975 and are continuing to perform with little major maintenance. Most notable is the operating history of the KS-36000 at HN-ME (S/N X001); this unit has been in continuous operation since December 1975 (over 15,000 hours) with one interruption to orient the holelock and modify the electronics.

3.3.2 Action to Improve Reliability

The analysis of failures pointed out several areas where improvement could be achieved without major difficulty. Major categories are closer supervision, improvement of seismometer installation techniques, and equipment improvements.

3.3.2.1 Supervision

Many of the routine problems in the field can be corrected by closer supervision of the operators and the data which they produce. The most important tool is a detailed quality control (QC) check of the tapes and documentation from each team. The QC procedures were relaxed somewhat during 1977 due to budgetary constraints; however, it is clear that future cost reduction should be made elsewhere. Another area is more thorough training of new operators. This can be done by having the new operator participate for some time in the QC process in Garland in order to learn proper operating and reporting techniques. Also, on-site training periods should be lengthened, with close supervision by support personnel. Finally, regular supervisory field trips should be made to all sites, whether the operator is experienced or not. All these procedures have been adopted for the follow-on program.

Table 3. Analysis of equipment failures, June through September 1977

Component	Outage Channel Hours	Percentage Total Outage	Remarks
Magnetic Tape Recorder	1227	39	Approximately 1/3 of outage due to capstan motor failure.
Solid State Amplifier, SP and LP	910	29	Approximately 1/2 of outage due to lightning damage.
Photocell Amplifier	275	9	Used for teams 51, 52, and 53 only.
Thermoelectric Generator	206	6	Used for teams 51, 52, and 53 only.
Flooding, moisture in data circuits and misc. problems	536	17	Not complete outage; data questionable.
Total	3154	100	

3.3.2.2 Seismometer Installation Techniques

The original concept of portable operations was to set up as quickly as possible, record for about one month, and then return the equipment to Garland. Toward this objective, seismometers were normally installed in small wooden vaults just below the surface. When the extended-type operation began in 1975, surface site emplacement techniques were not changed; however, existing bunker sites were used if available. While these techniques were adequate for most cases, site operations could be improved by installing better vaults. It is estimated that the outages due to flooding and moisture shown in table 3 could be reduced by about one-half. Also, a deeper vault would provide better quality data because the instruments would be more protected from wind noise.

3.3.2.3 Equipment Improvements

The HN-ME operation using the KS-36000 instrument indicates that this instrument should be used at any station which is to be on-site long enough to justify its installation cost. Operations in shallow-holes in Garland and at Franklin, West Virginia (10 meters or less depth) indicate a significant improvement in data quality over normal surface installations. It might be possible to dig a shallow (5 to 10 meter) borehole at low cost using power company auger-type equipment.

Another obvious candidate for improvement is the tape recorder. Analog recording is likely to continue for some time to provide a reasonably reliable back-up for present digital recorders and those which will become available in the future. The Model 19429 recorders have been improved somewhat since the SDCS units were purchased, particularly in updating the FM electronics. However, the reliability experienced with the present discrete electronics does not justify their replacement. There have been no significant design improvements in the mechanical portions of the system which were responsible for the most of the outages. A major mechanical redesign is not feasible and therefore improved operations must be achieved by implementing more thorough maintenance procedures. Capstan motor failures were drastically reduced by use of better lubrication and by using approved installation techniques for the bearings. Improved methods of lubricating the gearbox and periodic inspections should reduce failures in this subassembly. Finally, each team should be furnished a more complete inventory of spare parts.

Outages due to solid-state amplifiers were increased because spare units were not available. The operation of the three NTS outriggers utilized three spare SP units from the unused HN-ME system and only four additional units were available to replace lightning damaged units at two sites. The termination of operations at two outrigger sites in September will probably eliminate this problem in the future.

4. GARLAND SUPPORT

The engineering support and field support functions in Garland supported several routine projects during the course of the contract. These are discussed in the following paragraphs.

4.1 ENGINEERING SUPPORT

The function of the engineering support task is to provide all necessary technical assistance to assure reliable and continuous operation of the SDCS units and to develop improved equipment as required. Much of the effort under this task was directed toward routine repair of defective equipment and maintenance of an adequate spare parts inventory. However, some effort was also directed toward equipment improvements and other tasks as described in the following paragraphs.

4.1.1 Digital Recording System

Work to incorporate a digital recording system into the SDCS equipment complement began in early 1975 and was divided into four phases. First, a performance specification was developed for a specially modified recording system manufactured by Kinemetrics, Inc.; second, equipment was designed and built to provide the interface between the SDCS unit and the Kinemetrics System, Model DDS-1103. The third phase was assembly and testing and the fourth was installation of the completed units at five field sites.

The order for five DDS-1103 systems with special modifications was placed in May 1975 and the first two systems were delivered in September. During the interim period, the design and prototype testing were completed for the Interface Unit, Geotech P/N 42052. When the first two systems were delivered, they were immediately placed into operation to test the various prototype modules of the Interface Unit. At this time, several problems were discovered in the DDS-1103 system which required troubleshooting and correction by the vendor. Many of the difficulties were related to the special circuit modifications required for this program. One particularly troublesome problem was an intermittent failure in the shift register memory which was aggravated by the relatively slow sampling rate (20 sps) used for the SDCS units. This problem was noted occasionally during system tests and also during the installation phase from November 1975 through March 1976.

The installation of the system was relatively trouble free and operation of the system was quickly incorporated into the routine at FN-WV, CPO, HN-ME, RK-ON, and WH2YK. Minor operational problems in the DDS-1103 were resolved with the assistance of Kinemetrics but the memory problems continued. Several of the dual 2048 x 8 bit units were replaced under warranty, but the problem was not satisfactorily resolved until a unit of newer design was installed in one of the systems in December 1976. When proper operation of this new unit was verified, memories of three of the four remaining systems were replaced; the RK-ON system continued to operate properly with the old unit. At the end of the contract, all five systems were operating properly.

4.1.2 Model 36000 Borehole Seismometer System

The Model 36000 (KS) systems were successfully used during the contract at PI2WY, FN-WV, HN-ME, and at Garland. Three of the systems are presently assigned to this program. During the contract period, there were several instances where maintenance was required, such as repair of damage caused by shipping (early in the program) or by lightning (at PI2WY and at FN-WV). For the most part, operations were routine once the system was installed.

Modifications to the system were developed as needed for the operations. Technical Report 75-2 thoroughly describes the modifications developed for the deep borehole operation. Another modification was made to the operating systems at HN-ME and FN-WV during March 1976. This modification involved a few circuit changes to reduce the level of the higher frequency data above 1 Hz by 14 dB while maintaining the higher gain in the LP passband. The modification successfully resolved the operational problem of excessive SP channel gains.

4.1.3 Magnetic Tape Recorder, Model 19429

The FM magnetic tape recorders are operated at all SDCS sites; at those sites equipped with digital recorders, the analog units are the secondary recorders. Problems with the electronic sections have been minimal, despite the fact that the circuitry consists of obsolete, discrete components. As previously noted, the majority of problems with this unit are mechanical. When field units began to experience repeated failures in the capstan motors, a study was made to determine the cause. These tests showed that the normally inefficient hysteresis-synchronous motors were operating at temperatures high enough to cause failure of the lubricants being used. Also, it was discovered that the bearings were being installed improperly. Subsequently, bearings were lubricated with a high-temperature lubricant and improper installation techniques were corrected. At the close of the contract, the experienced failure rate had been significantly reduced.

4.1.4 Helicorder, Model 12400

One of the particularly troublesome pieces of SDCS equipment has been the small Helicorder, Model 12400. The unit was designed in 1964 specifically for use in low-power applications. The mechanical sections have given good service, but the electronics sections required considerable maintenance. This continuing maintenance to the two printed circuit cards caused card damage and made maintenance even more difficult. During this program, the electronic circuitry was updated and simplified. After completion of bench testing, new printed circuit cards were manufactured and three units were modified. Operational reliability and maintainability was much improved.

4.1.5 Battery Charger, Model 21160

Like other components of the portable system, the Battery Charger, Model 21160, was designed in 1964. It was specifically designed to charge the silver-zinc and silver-cadmium batteries of the system. The units were modified several times as system requirements changed. The last modification was for use with the inexpensive lead-acid automotive batteries which have shown to be satisfactory in most cases. Long term operations under this program showed that

the chargers needed further modifications to prevent overcharging of the batteries. Several alternative circuits were considered, but the problem was resolved when it was found that readily available commercial chargers would satisfy the requirements at a fraction of the cost to modify the old units. By the end of the contract period, six SDCS units had been outfitted with commercial chargers and battery problems were significantly reduced.

4.2 FIELD SUPPORT

The function of the field support task is the supervision and support given to the field operators to assure continuous operation of all units. During this contract, activity under this task was continuous and generally routine. Work done included preparation and analysis of the data quality control reports and all activities related to selection of new SDCS sites as well as routine telephone contact with all operators at least once per week.

4.2.1 Support Equipment

One of the major functions of this task is the support and control of the various vehicles and other related equipment assigned to the program as discussed in the following paragraphs. Table 4 shows the present status of support equipment assigned to the program.

4.2.1.1 Recording Van

Only one Recording Van, Model 8513, remained assigned to the program. This unit has been on a standby status at the Garland, Texas, plant since June 1975. The van had been on loan to Contract C-0052 and recorded data at the McKinney, Texas, location. The van has been declared surplus to program requirements and is in the process of being disposed of. Appendix 2 shows the date and disposition of the 40 vans of the LRSM program.

4.2.1.2 Generators

The two diesel generators at RK-ON have provided power for station operations throughout the report period. Both units have required repair work but the major portion of the repair has been confined to the generator while the engines have continued to operate satisfactorily. When the severe climatic conditions, remote location and the amount of operating time are considered, the reliability of these units is exceptional.

At the start of this program a 3 kW Kohler gasoline fueled generator was available as an emergency power unit. However, the unit was not reliable and required considerable repair and retrofit to restore it to operational status. The unit was declared surplus and sold to the highest bidder.

4.2.1.3 Two and One-half Ton Truck

The 1966 Ford, Model F-800 truck was used to move the Model 8513 recording van. The unit was kept on standby in Garland and as long as the requirement to move the van existed, it was economical to keep the unit in readiness. The unit was sold in November 1976 when the possible requirement to move the van was removed.

Table 4. SDCS support equipment

Vehicles	Unit No.	Approx. Mileage (9-30-77)	Location
Pickup 3/4 ton Ford 1975	011-110	55,057	GB-NM
	011-111	69,675	RK-ON
	011-112	44,993	HN-ME
	011-113	101,135	GL-TX
	011-114	85,225	NTS
Pickup 3/4 ton Ford 1977	011-115	19,084	TQ-MS
	011-116	16,319	RB-CO
		391,488	
Van			
Model 8513	208		Geotech/Garland
Generators			
3 kW ONAN (diesel)	897069		RK-ON
3 kW ONAN (diesel)	897078		RK-ON

4.2.1.4 Utility Trailer

The Krueger utility trailer assigned to the program was sold in November 1976 when the possibility for use was removed.

4.2.1.5 Pickup Trucks

At the start of the report period, eleven 3/4 ton Chevrolet pickup trucks were assigned to the SDCS contract. Six of the units in poor condition were sold in January 1975 per instructions from the Project Office. Five new 1975 Ford units were leased in December 1975 to be used for the long-term field operation. The remaining units (four 1967 and one 1968 Chevrolet models) were retained during 1976 for possible use in a short-term deployment of the remaining SDCS teams. These vehicles were sold in November 1976 when the possibility of a deployment diminished and the operational condition of the older vehicles became more questionable. Finally, two new 1977 3/4-ton Ford pickups were leased in May 1977 when additional SDCS teams were deployed. At the close of the contract, six Ford units were in the field (four 1975 and two 1977 models) and the remaining 1975 Ford was being returned to Garland with the Team 51 equipment. This vehicle is scheduled for sale in the near future. All trucks have the beds enclosed by camper shells. Most of the campers were in good condition but those installed on units operating in rough country were showing signs of wear.

4.2.2 Field Team History and Site Information

Another function of the field support task is the regular updating of the Field Team History and the Site Information listings which began with the LRSM program in the early 1960s. The Field Team History list primarily shows information pertaining to the operational dates for each site. The Site Information list gives particulars of the individual sites such as the geographical coordinates, elevation, distance from the Nevada Test Site and orientation azimuths of the horizontal seismometers. The latest Field Team History listing is included as Appendix 3 and the Site Information list is included as Appendix 4 to this report.

APPENDIX 1

SUMMARY OF EVENT REPORTS

SUMMARY OF EVENT REPORTS

Report No.	Title
SDCS-ER-75-1	Kamchatka, 06 April 1975
SDCS-ER-75-2	Northeastern China, 25 February 1975
SDCS-ER-75-3	North Atlantic Ocean, 26 February 1975
SDCS-ER-75-4	NTS Event "OBAR", 30 April 1975
SDCS-ER-75-5	Western Kazakh, 25 April 1975
SDCS-ER-75-6	Eastern Kazakh, 27 April 1975
SDCS-ER-75-7	Confidential
SDCS-ER-75-8	Eastern Kazakh, 20 February 1975
SDCS-ER-75-9	NTS Event "TOPGALLANT", 28 February 1975
SDCS-ER-75-10	NTS Event "TYBO", 14 May 1975
SDCS-ER-75-11	NTS Event "CABRILLO", 07 March 1975
SDCS-ER-75-12	Eastern Kazakh, 11 March 1975
SDCS-ER-75-13	Central Kazakh SSR, 28 February 1975
SDCS-ER-75-14	Afghanistan-USSR Border Region, 03 March 1975
SDCS-ER-75-15	Southern Iran, 07 March 1975
SDCS-ER-75-16	Kurile Islands, 23 March 1975
SDCS-ER-75-17	Eastern Idaho, 28 March 1975
SDCS-ER-75-18	NTS Event "MAST", 19 June 1975
SDCS-ER-75-19	NTS Event "DINING CAR", 05 April 1975
SDCS-ER-75-20	NTS Event "EDAM", 24 April 1975
SDCS-ER-75-21	NTS Event "MIZZEN", 02 June 1975
SDCS-ER-75-22	NTS Event "STILTON", 03 June 1975
SDCS-ER-75-23	Kurile Islands, 23 March 1975
SDCS-ER-75-24	Eastern Kazakh, 08 June 1975
SDCS-ER-75-25	NTS Event "CAMEMBERT", 26 June 1975
SDCS-ER-75-26	Eastern Kazakh, 30 June 1975
SDCS-ER-75-27	Tadzhik SSR, 09 April 1975
SDCS-ER-75-28	Eastern Kashmire, 28 April 1975
SDCS-ER-75-29	Southern California, 01 June 1975
SDCS-ER-75-30	Yellowstone National Park, Wyoming, 30 June 1975
SDCS-ER-75-31	Gulf of California, 08 July 1975
SDCS-ER-75-32	Eastern Kazakh, 07 August 1975

SUMMARY OF EVENT REPORTS (continued)

Report No.	Title
SDCS-ER-75-33	Central Siberia, 12 August 1975
SDCS-ER-75-34	Novaya Zemlya, 23 August 1975
SDCS-ER-75-35	Mexico, 23 April 1975
SDCS-ER-75-36	Japan, 04 May 1975
SDCS-ER-75-37	Mexico, 04 May 1975
SDCS-ER-75-38	Japan, 06 May 1975
SDCS-ER-75-39	Central Siberia, 29 September 1975
SDCS-ER-75-40	NTS Event "MARSH", 06 September 1975
SDCS-ER-75-41	NTS Event "KASSERI", 28 October 1975
SDCS-ER-75-42	Komandorsky Islands Regions, 15 August 1975
SDCS-ER-75-43	Mexico-Guatemala Region, 22 August 1975
SDCS-ER-75-44	Near East Coast of Eastern Russia, 16 May 1975
SDCS-ER-75-45	Southern Sinkiang Province, 27 October 1975
SDCS-ER-75-46	Unimak Island Region, 16 May 1975
SDCS-ER-75-47	Northern Colombia, 23 June 1975
SDCS-ER-75-48	Eastern Kazakh, 05 October 1975
SDCS-ER-75-49	Central Mid-Atlantic, 07 October 1975
SDCS-ER-75-50	Peru, 16 August 1975
SDCS-ER-75-51	Novaya Zemlya, 18 October 1975
SDCS-ER-75-52	Northern California, 01 August 1975
SDCS-ER-75-53	Kashmir-Tibet Border Region, 19 May 1975
SDCS-ER-75-54	Central America, 15 July 1975
SDCS-ER-75-55	Novaya Zemlya, 21 October 1975
SDCS-ER-75-56	Kurile Islands, 19 May 1975
SDCS-ER-75-57	Puerto Rico Region, 17 June 1975
SDCS-ER-75-58	Gulf of Alaska, 25 May 1975
SDCS-ER-75-59	North Atlantic Ocean, 26 May 1975
SDCS-ER-75-60	Near Coast of Venezuela, 08 June 1975
SDCS-ER-75-61	Gulf of California, 14 June 1976
SDCS-ER-75-62	Peru-Bolivia Border Region, 12 July 1975
SDCS-ER-75-63	Baja California, 28 July 1975
SDCS-ER-75-64	Peru-Ecuador Border, 06 June 1975
SDCS-ER-75-65	Near Coast of Northern California, 07 June 1975

SUMMARY OF EVENT REPORTS (continued)

Report No.	Title
SDCS-ER-75-66	Minnesota, 09 July 1975
SDCS-ER-75-67	NTS Event "HUSKY PUP", 24 October 1975
SDCS-ER-75-68	Eastern Kazakh SSR, 25 December 1975
SDCS-ER-75-69	Turkey, 06 September 1975
SDCS-ER-75-70	Eastern Kazakh, 29 October 1975
SDCS-ER-75-71	NTS Event "INLET", 20 November 1975
SDCS-ER-75-72	Confidential
SDCS-ER-75-73	NTS Event "LEYDEN", 26 November 1975
SDCS-ER-75-74	Hawaiian Islands, 29 November 1975
SDCS-ER-75-75	Vancouver Island Region, 11 December 1975
SDCS-ER-75-77	NTS Event "CHIBERTA", 20 December 1975
SDCS-ER-75-78	Greece, 21 December 1975
SDCS-ER-76-79	NTS Event "MUENSTER", 03 January 1976
SDCS-ER-76-80	Peru, 05 January 1976
SDCS-ER-76-81	Off Coast of Oregon, 10 January 1976
SDCS-ER-76-82	Eastern Kazakh SSR, 15 January 1976
SDCS-ER-76-83	Guatamala, 04 February 1976
SDCS-ER-76-84	NTS Event "KEELSON", 04 February 1976
SDCS-ER-76-85	NTS Event "ESROM", 04 February 1976
SDCS-ER-76-86	NTS Event "FONTINA", 12 February 1976
SDCS-ER-76-87	NTS Event "CHESHIRE", 14 February 1976
SDCS-ER-76-88	Andreanof Islands, Aleutian Islands, 08 March 1976
SDCS-ER-76-89	NTS Event "ESTUARY", 09 March 1976
SDCS-ER-76-90	NTS Event "COLBY", 14 March 1976
SDCS-ER-76-92	NTS Event "STRAIT", 17 March 1976
SDCS-ER-76-93	Eastern Kazakh SSR, 20 March 1976
SDCS-ER-76-94	Northern Sinkiang Province, China, 20 March 1976
SDCS-ER-76-96	North Atlantic Ridge, 28 March 1976
SDCS-ER-76-97	North Atlantic Ocean, 31 March 1976
SDCS-ER-76-98	UZBEK SSR, 08 April 1976
SDCS-ER-76-99	Fox Islands, Aleutian Islands, 12 April 1976
SDCS-ER-76-100	Eastern Kazakh SSR, 21 April 1976
SDCS-ER-76-101	Eastern Kazakh SSR, 21 April 1976

SUMMARY OF EVENT REPORTS (continued)

Report No.	Title
SDCS-ER-76-102	Northern Italy, 06 May 1976
SDCS-ER-76-103	UZBEK SSR, 17 May 1976
SDCS-ER-76-104	Eastern Kazakh SSR, 19 May 1976

APPENDIX 2

DISPOSITION OF LRSM VANS

DISPOSITION OF LRSM VANS

Team	Van No.	Location	Date	Disposition or Transferred to
1	212		03 January 1966	T/6058
2	215		15 December 1964	USGS
3	208	GL-TX	November 1977	Sold to highest bidder
4	203		09 April 1965	AFTAC
5	233		09 April 1965	AFTAC
6	225		15 December 1964	USGS
7	237		03 January 1966	T/6058
8	232		25 August 1971	University of California (Berkeley)
9	207		02 February 1965	USC&GS
10	224		09 April 1965	AFTAC
11	214		19 December 1969	AF Weapons Lab, Albuquerque, N.M.
12	220		30 December 1964	USGS
13	213		22 July 1969	Canadian Transpt Agent (DOT)
14	209		09 April 1965	AFTAC
15	229		22 December 1969	AF Weapons Lab, Albuquerque, N.M.
16	236		06 December 1968	USC&GS
17	234		03 January 1966	T/6058
18	235		06 September 1966	Destroyed by fire
19	230		15 February 1965	OSR (La Paz)
20	216		01 April 1965	OSR (Norway)
21	226		23 November 1968	USC&GS
22	227		07 January 1965	USGS
23	228		17 January 1966	Corps of Engineers
24	202		30 November 1965	WFO
25	221		03 January 1966	T/6058
26	204		25 November 1965	WFO
27	205		10 December 1969	AFOSR (U. of Washington)
28	206		11 March 1974	SMU
29	201		30 November 1964	T/5003
30	223		23 August 1971	Develco, Inc.
31	231		31 December 1965	VT/5051 (to C-0121 to USGS)
32	239		17 March 1964	Destroyed by fire
33	211		23 November 1968	USC&GS
34	217		02 March 1965	OSR (Germany)
35	210		25 August 1971	University of California (Berkeley)
36	219		29 March 1974	University of Alaska
37	240		11 January 1968	Destroyed by accident
38	222		June 1969	C-0121 (to USGS)
39	238		31 January 1966	AFCRL
40	218		22 March 1966	USC&GS

APPENDIX 3

LRSM - SDCS FIELD TEAM HISTORY

LRSM - SDCS FIELD TEAM HISTORY

	TEAM	ARRIVAL DATE	OPERATIONAL DATE SP	OPERATIONAL DATE LP	SITE CLOSED	DEPARTURE DATE	T	S	P	I	SPEC OP STATUS
30	-AOMA	17JUN65	02JUL65	11JUL65	31AUG65	09SEP65	V	T	Y	S	
55	AA-IS	07JUL67	12JUL67	*******	08SEP67	13SEP67	T	T	N	G	PORT SYS
50	AC-IS	26JUN67	05JUL67	06JUL67	10SEP67	11SEP67	T	T	N	G	PORT SYS
40	AD-IS	23JUN64	24JUL64	05AUG64	22MAR66	*******	V	T	Y	L	
40	AD-IS	TRANSFD	TO	USCGS	ON	22MAR66					
50	AE-NC	09DEC66	16DEC66	16DEC66	20DEC66	21DEC66	T	T	N	G	PORT SYS
52	AE-NC	14JAN68	19JAN68	19JAN68	19JAN68	19JAN68	V	T	N	G	PORT SYS
32	AI-NB	29OCT62	07NOV62	*******	12DEC62	17DEC62	T	T	N	L	
22	AK-OK	11JUN62	17JUN62	*******	28JUN62	30JUN62	T	T	N	L	
22	AL-OK	01JUL62	04JUL62	*******	11JUL62	12JUL62	T	T	Y	L	
40	AM-OK	17NOV61	08DEC61	09DEC61	20DEC61	24DEC61	V	T	Y	L	
30	AN-MA	060CT64	16NOV64	02DEC64	11JUN65	17JUN65	V	P	Y	S	16NOV64DW
16	AP-OK	20SEP63	25SEP63	02OCT63	31DEC63	05JAN64	V	T	Y	S	25SEP63DW
16	AP-OK	20APR65	05MAY65	*******	19SEP65	23SEP65	V	T	Y	S	05MAY65DW
39	AP-OK	25NOV65	09DEC65	*******	13JAN66	17JAN66	V	T	Y	S	DW
39	AP-OK	TRANSFD	TO	AFCRL	31JAN66						
10	AR-WS	30MAY62	06JUN62	*******	05OCT62	07OCT62	T	T	N	*	
51	AS-PA	17AUG69	26AUG69	26AUG69	10OCT69	11OCT69	T	T	Y	G	PORT SYS
37	AT-NV	31DEC61	15JAN62	*******	14MAY62	19MAY62	M	P	Y	L	
07	AT-NV	03APR63	23APR63	23APR63	12JUL63	22JUL63	M	T	Y	S	
60	AT-NV	08APR68	13APR68	13APR68	26APR68	26APR68	V	T	N	G	PORT SYS
51	AX-AL	01DEC65	03DEC65	11DEC65	13DEC65	14DEC65	T	T	N	G	PORT SYS
21	AX2AL	07MAR66	24MAR66	24MAR66	16JAN67	28JAN67	V	P	Y	L	
51	AX2AL	12JAN68	19JAN68	19JAN68	19JAN68	19JAN68	V	T	N	G	PORT SYS
21	AY-SD	12JUL62	14JUL62	14JUL62	05OCT62	08OCT62	T	T	N	L	
32	AZ-TX	19JUL63	28AUG63	28AUG63	06MAR64	*******	V	T	N	L	
26	BA-WS	060CT62	11OCT62	*******	27OCT62	31OCT62	T	T	Y	L	
24	BB-PA	10AUG62	16AUG62	*******	05OCT62	06OCT62	T	T	Y	L	
28	BD-PA	14DEC62	22DEC62	*******	21MAR63	24MAR63	T	T	Y	L	
15	BE-FL	12SEP65	07OCT65	17OCT65	16JAN67	23JAN67	V	T	Y	S	
54	BE-FL	12JAN68	17JAN68	17JAN68	19JAN68	20JAN68	V	T	N	G	PORT SYS
54	BE-FL	15AUG69	21AUG69	21AUG69	10OCT69	11OCT69	T	T	Y	G	PORT SYS
54	BE-FL	17SEP71	23SEP71	23SEP71	09NOV71	10NOV71	T	T	N	G	PORT SYS
54	BE-FL	30APR73	07MAY73	07MAY73	22MAY73	23MAY73	T	T	N	G	PORT SYS
34	BF-CL	22DEC61	08JAN62	08JAN62	23APR62	25APR62	V	T	Y	L	
32	BF-CL	05APR63	19APR63	*******	09JUL63	16JUL63	V	T	N	L	
34	BF-CL	07OCT61	28OCT61	28OCT61	06NOV61	09NOV61	V	T	Y	L	
58	BF-CL	09APR68	15APR68	15APR68	26APR68	29APR68	V	T	N	G	PORT SYS
18	BG-ME	21OCT61	04NOV61	04NOV61	01AUG62	08AUG62	V	P	Y	S	
53	BH-YK	08OCT65	16OCT65	16OCT65	15NOV65	16NOV65	T	T	N	G	PORT SYS
50	BH-YK	13AUG68	20AUG68	20AUG68	09SEP68	10SEP68	V	T	N	G	PORT SYS
19	BI-VA	30OCT62	07NOV62	12NOV62	12DEC62	17DEC62	T	T	Y	L	
24	BK-AR	02JUL62	06JUL62	*******	11JUL62	12JUL62	T	T	N	L	
22	BK-AR	03FEB63	12FEB63	02APR63	10APR63	12APR63	V	T	Y	L	
15	BL-WV	04NOV61	13DEC61	13DEC61	23JUL65	03AUG65	V	P	Y	S	
50	BL-WV	26MAY66	31MAY66	31MAY66	03JUN66	03JUN66	V	T	N	G	PORT SYS
07	BM-TX	27DEC61	20JAN62	20JAN62	15FEB62	18FEB62	V	T	Y	S	
53	BO-AL	01DEC65	02DEC65	07DEC65	13DEC65	14DEC65	T	T	N	G	PORT SYS
37	BP-CL	03APR63	16APR63	16APR63	18JUL63	25JUL63	V	T	N	L	
50	BP-CL	26AUG66	27AUG66	*******	09SEP66	10SEP66	V	T	N	G	PORT SYS
53	BP-CL	08APR68	13APR68	13APR68	26APR68	28APR68	V	T	N	G	PORT SYS
55	BP-CL	15AUG69	29AUG69	29AUG69	10OCT69	11OCT69	T	T	N	G	PORT SYS
59	BP-CL	29APR73	08MAY73	08MAY73	22MAY73	23MAY73	T	T	N	G	PORT SYS
53	BQ-AK	29JUN67	06JUL67	*******	10SEP67	11SEP67	T	T	Y	G	PORT SYS
24	BR-PA	17DEC62	30DEC62	17APR63	23JUL65	03AUG65	V	P	Y	L	
16	BS-MA	13OCT67	28OCT67	28OCT67	10DEC67	14DEC67	V	P	Y	S	
03	BU-QB	20JUL62	24JUL62	*******	05OCT62	07OCT62	T	T	N	S	
28	BV-PA	01NOV62	08NOV62	*******	12DEC62	14DEC62	T	T	Y	L	
28	BX-UT	21JUL63	08AUG63	31AUG63	18MAR64	21MAR64	V	T	N	L	
59	BY-IO	15AUG69	28AUG69	26AUG69	10OCT69	11OCT69	T	T	N	G	PORT SYS
55	CC-WA	28OCT67	08NOV67	08NOV67	29JUL68	30JUL68	M	T	Y	G	PORT SYS
05	CE-WA	09OCT62	15OCT62	*******	27OCT62	02NOV62	T	T	N	S	
26	CF-WS	31OCT62	04NOV62	*******	12DEC62	17DEC62	T	T	Y	L	
19	CG-VA	27MAY62	01JUN62	*******	28JUN62	30JUN62	T	T	Y	L	
26	CG-VA	27MAY65	10JUN65	15JUN65	23JUL65	30JUL65	V	T	Y	L	
51	CH-MT	04OCT65	22OCT65	22OCT65	09NOV65	12NOV65	T	T	N	G	PORT SYS

	TEAM	ARRIVAL DATE	OPERATIONAL DATE SP	OPERATIONAL DATE LP	SITE CLOSED	DEPARTURE DATE	T	S	P	I	SPEC OP STATUS
54	CH-MT	15DEC66	SETUP	INCOMP	20DEC66	22DEC66	T	T	N	G	PORT SYS
19	CI-VA	09OCT62	15OCT62	*******	27OCT62	30OCT62	T	T	N	L	
37	CK-BC	19JUL62	22JUL62	*******	05OCT62	08OCT62	T	T	N	L	
55	CL-ID	21MAY66	23MAY66	*******	24MAY66	24MAY66	M	T	N	G	PORT SYS
26	CN-WS	08MAY62	10MAY62	*******	28JUN62	01JUL62	V	T	Y	L	
21	CO-SD	30JUN62	06JUL62	*******	11JUL62	12JUL62	T	T	Y	L	
33	CP-CL	14SEP61	10OCT61	10OCT61	01MAR64	05MAR64	V	P	Y	L	
	CP-CL	07OCT65	26OCT65	26OCT65	13NOV65	17NOV65	V	T	Y	S	
55	CP-CL	23FEB66	26FEB66	01MAR66	12MAR66	13MAR66	V	T	N	G	PORT SYS
16	CP-CL	10JUL67	01AUG67	01AUG67	06AUG67	09AUG67	V	P	Y	S	
51	CP-CL	07APR68	18APR68	18APR68	26APR68	28APR68	V	T	N	G	PORT SYS
57	CPO	09FEB75	14MAR75	14MAR75	28JUL76	31JUL76	V	P	Y	J-G	PORT SYS
54	CQ-NV	27OCT67	01NOV67	01NOV67	10DEC67	11DEC67	M	T	N	G	PORT SYS
37	CR-NB	14OCT65	26OCT65	01NOV65	14OCT66	21OCT66	V	T	Y	L	
53	CR2NB	14AUG69	22AUG69	22AUG69	10OCT69	11OCT69	T	T	Y	G	PORT SYS
60	CR2NB	17SEP71	26SEP71	26SEP71	09NOV71	10NOV71	T	T	Y	G	PORT SYS
53	CR2NB	29APR73	05MAY73	05MAY73	22MAY73	23MAY73	T	T	Y	G	PORT SYS
27	CS-TN	21DEC62	01JAN63	*******	21MAR63	26MAR63	T	T	Y	L	
22	CT-OK	12JUL62	14JUL62	*******	05OCT62	06OCT62	T	T	Y	L	
07	CU-NV	24JUL63	09SEP63	10SEP63	09MAR64	13MAR64	V	T	N	S	
27	CV-TN	12JUL62	15JUL62	*******	05OCT62	06OCT62	V	T	Y	L	
07	CV-TN	17NOV61	25NOV61	25NOV61	20DEC61	22DEC61	V	T	Y	S	
27	CW-AR	15NOV61	10DEC61	*******	16DEC61	26DEC61	V	T	Y	L	
24	CW-AR	08MAY62	09MAY62	*******	09JUN62	10JUN62	V	T	Y	L	
32	CY-WY	30JUN62	06JUL62	*******	11JUL62	12JUL62	T	T	N	L	
17	DH-NY	20OCT61	28OCT61	13NOV61	15NOV65	18NOV65	V	P	Y	S	
17	DH-NY	TRANSFD	TO	T/6058	03JAN66						
55	DH-NY	26MAY66	31MAY66	31MAY66	03JUN66	03JUN66	V	T	N	G	PORT SYS
50	DI-MA	20MAY66	23MAY66	*******	24MAY66	24MAY66	V	T	N	G	PORT SYS
21	DL-SD	18DEC62	28DEC62	*******	21MAR63	24MAR63	T	T	N	L	
28	DP-NY	02JUL62	07JUL62	*******	17JUL62	20JUL62	T	T	N	L	
12	DR-CO	11SEP61	01OCT61	17OCT61	30DEC64	*******	V	P	Y	S	
12	DR-CO	TRANSFD	TO	USGS	ON	30DEC64					
27	DU-OK	24JUL63	14AUG63	10SEP63	09MAR64	12MAR64	V	T	Y	L	
31	DV-CL	29DEC61	20JAN62	*******	23APR62	28APR62	M	T	N	L	
08	EB-MT	28JUN63	06AUG63	06AUG63	12AUG64	17AUG64	V	T	Y	S	
50	ED-MI	01DEC65	02DEC65	08DEC65	13DEC65	14DEC65	T	T	N	G	PORT SYS
27	EF-TX	27DEC61	25JAN62	*******	03MAY62	05MAY62	V	T	Y	L	
23	EK-NV	24OCT63	11NOV63	07DEC63	02NOV64	09NOV64	V	T	N	L	11JAN64DW
37	EL-WA	21MAY62	28MAY62	*******	28JUN62	30JUN62	T	T	N	L	
50	EM-KA	13SEP65	14SEP65	*******	16SEP65	17SEP65	T	T	N	G	PORT SYS
52	EN-MO	12SEP65	15SEP65	*******	16SEP65	17SEP65	V	T	Y	G	PORT SYS
21	EN-MO	14OCT65	25OCT65	11NOV65	25FEB66	03MAR66	V	T	Y	L	
56	EO2TX	12MAR68	15MAR68	*******	26MAR68	26MAR68	V	T	N	G	PORT SYS
26	EP-TX	27DEC61	15JAN62	*******	04MAY62	05MAY62	V	T	Y	L	
50	ER300	THROUGH	ER304	03JUL66	THROUGH	29JUL66	T	T	N	G	EARLYRISE
50	ER306	THROUGH	ER319	03JUL66	THROUGH	29JUL66	T	T	N	G	EARLYRISE
**	ER201	THROUGH	ER242	03JUL66	THROUGH	29JUL66	T	T	N	G	EARLYRISE
54	ER120	THROUGH	ER101	04JUL66	THROUGH	29JUL66	T	T	N	G	EARLYRISE
03	ES-ON	31OCT62	12NOV62	*******	07DEC62	10DEC62	T	T	N	S	
09	EU-AL	21JUN63	02JUL63	19AUG63	22OCT64	24OCT64	V	T	Y	S	
09	EU-AL	TRANSFD	TO	USCGS	ON	02FEB65					
38	EU2AL	26OCT66	12NOV66	12NOV66	16JAN67	31JAN67	V	P	Y	S	
58	EU2AL	14AUG69	27AUG69	27AUG69	10OCT69	11OCT69	T	T	Y	G	PORT SYS
23	EW-IS	14JUN63	28JUN63	17JUL63	13SEP63	24SEP63	B	T	N	L	28JUN63DW
05	EY-NV	05APR63	21APR63	*******	10JUN63	16JUN63	V	T	N	S	
54	EY-NV	15APR68	19APR68	19APR68	26APR68	27APR68	V	T	N	G	PORT SYS
50	EY2NV	24FEB66	01MAR66	*******	12MAR66	13MAR66	V	T	N	G	PORT SYS
51	FA-NV	28MAY77	03JUN77	*******	30SEP77	30SEP77	T	T	N	G	PORT SYS
36	FB-AK	05AUG68	03SEP68	10OCT68	10OCT69	01MAY70	V	T	Y	S	ALPA TX
36	FB2AK	01MAY70	*******	09JUN70	14JUN71	*******	V	T	N	-	ALPA TX
36	FB2AK	TRANSFD	TO	UNIV	ALASKA						
53	FH-PM	06NOV66	14NOV66	14NOV66	20DEC66	22DEC66	T	T	N	G	PORT SYS
36	FK-CO	04OCT66	17NOV66	17NOV66	26JUN67	06JUL67	V	T	Y	L	SILO
26	FL-BC	12SEP65	22OCT65	22OCT65	15NOV65	19NOV65	V	T	N	L	
26	FL-BC	TRANSFD	TO	WFO	ON	25NOV65					
51	FL-BC	21AUG68	30AUG68	30AUG68	09SEP68	10SEP68	V	T	N	G	PORT SYS
02	FM-UT	12SEP61	07OCT61	*******	10JUN63	14JUN63	V	P	Y	S	
52	FM-UT	22FEB66	02MAR66	02MAR66	12MAR66	13MAR66	V	T	N	G	PORT SYS

	TEAM	ARRIVAL DATE	OPERATIONAL DATE SP	OPERATIONAL DATE LP	SITE CLOSED	DEPARTURE DATE	T	S	P	I	SPEC OP STATUS
39	FN-WV	17APR64	04MAY64	*******	28AUG64	01SEP64	V	T	Y	S	23MAY64DW
39	FN-WV	14MAY65	03JUN65	27OCT65	12NOV65	19NOV65	V	T	Y	S	03JUN65DW
56	FN-WV	24MAR75	27MAY75	27MAY75	28JUL76	16AUG76	W	P	Y	K-S	PORT SYS
16	FO-TX	22MAY64	21JUN64	*******	12APR65	19APR65	V	T	Y	S	30JUN64DW
05	FR-MA	24JUN63	07JUL63	07JUL63	05AUG64	08AUG64	V	T	Y	S	
20	FS-AZ	11SEP61	14OCT61	14OCT61	12MAY63	16MAY63	V	P	N	L	
51	FS-AZ	22FEB66	27FEB66	01MAR66	12MAR66	14MAR66	V	T	N	G	PORT SYS
39	FT-BC	02NOV62	16NOV62	*******	09DEC62	17DEC62	T	T	N	L	
56	GA-TX	08OCT68	16OCT68	18OCT68	23APR69	23APR69	V	T	N	G	PORT SYS
60	GA-TX	11OCT68	*******	25OCT68	23APR69	23APR69	V	T	N	-	PORT SYS
60	GA-TX	07JAN70	23MAR70	13MAR70	11AUG70	11AUG70	V	T	Y	G	PORT SYS
59	GA3TX	01OCT71	01OCT71	*******	10NOV71	10NOV71	T	T	Y	-	PORT SYS
53	GB-NM	27MAY77	29MAY77	*******			T	T	Y	G	PORT SYS
05	GC-WA	03NOV62	08NOV62	*******	12DEC62	03JAN63	T	T	N	S	
19	GD-VA	19JUL62	21JUL62	*******	05OCT62	09OCT62	T	T	Y	L	
37	GE-AZ	29MAR64	09APR64	09APR64	04OCT65	07OCT65	V	T	N	L	
37	GF-NV	25JAN63	08FEB63	*******	29MAR63	02APR63	M	T	N	L	
34	GG-GR	21JUN63	20AUG63	04SEP63	02MAR65	*******	V	T	N	L	20AUG63AR
34	GG-GR	TRANSFD	TO	DSR	ON	02MAR65					
50	GH-MS	14AUG69	22AUG69	22AUG69	10OCT69	11OCT69	T	T	Y	G	PORT SYS
02	GI-MA	25JUN63	17JUL63	14AUG63	05AUG64	08AUG64	V	T	Y	S	
03	GL-TX	07JUN72	*******	*******	*******	04MAY73					STANDBY
03	GL-TX	31AUG70	*******	*******	*******	08JAN71					STANDBY
28	GL-TX	17AUG71		(STANDBY)							
28	GL-TX	TRANSFD	TO	SMU		08MAY74					
56	GL-TX	17JAN68	19JAN68	19JAN68	19JAN68	19JAN68	V	T	N	G	TEST SITE
30	GM-CU	09SEP63	19NOV63	14JAN64	03MAR64	05MAR64	V	T	Y	S	26NOV63DW
09	GN-NM	02JAN62	08JAN62	*******	15FEB62	17FEB62	V	T	N	S	
32	GO-NB	17DEC62	28DEC62	*******	21MAR63	24MAR63	T	T	Y	L	
06	GP-MN	12AUG64	02SEP64	18SEP64	01DEC64	*******	V	T	Y	S	
06	GP-MN	TRANSFD	TO	USGS	ON	15DEC64					
54	GR2TX	16MAY67	19MAY67	19MAY67	23MAY67	23MAY67	T	T	N	G	PORT SYS
55	GR1TX	16MAY67	19MAY67	19MAY67	23MAY67	23MAY67	T	T	N	G	PORT SYS
28	GT-PA	22MAY62	31MAY62	*******	28JUN62	30JUN62	V	T	Y	L	
31	GV-TX	18MAY62	02JUN62	02JUN62	31DEC65	*******	V	P	Y	L	28JUN62DW
31	GV-TX	TRANSFD	TO	VT/5051	ON	31DEC65					
26	GY-MN	02JUL62	05JUL62	*******	11JUL62	12JUL62	T	T	N	L	
57	GZ-OH	17AUG69	23AUG69	23AUG69	10OCT69	11OCT69	T	T	Y	G	PORT SYS
16	HB-OK	23OCT61	09NOV61	*******	10APR63	13APR63	V	T	Y	S	DW
39	HD-PA	03SEP64	25SEP64	24NOV64	25JAN65	02FEB65	V	T	N	S	25SEP64DW
26	HE-TX	02JUL63	25JUL63	*******	16MAR64	20MAR64	V	T	Y	L	09AUG63DW
06	HH-ND	28JUN63	22JUL63	22JUL63	05AUG64	08AUG64	V	T	Y	S	
51	HH2ND	21MAY66	23MAY66	31MAY66	03JUN66	03JUN66	T	T	N	G	PORT SYS
32	HK-WY	12JUL62	17JUL62	*******	05OCT62	08OCT62	T	T	N	L	
01	HL-ID	04OCT61	14OCT61	24OCT61	07MAR64	08MAR64	M	P	Y	L	
01	HL2ID	09MAR64	29MAR64	29MAR64	23JUL65	30JUL65	M	P	Y	L	
01	HL2ID	14SEP65	07OCT65	07OCT65	15NOV65	18NOV65	M	T	Y	L	
01	HL2ID	TRANSFD	TO	T/6058	03JAN66						
38	HL2ID	15JUL67	09AUG67	09AUG67	10DEC67	20DEC67	M	P	Y	S	
57	HL2ID	21AUG68	27AUG68	27AUG68	09SEP68	10SEP68	M	T	N	G	PORT SYS
39	HM-BC	20JUL62	26JUL62	*******	05OCT62	16OCT62	T	T	N	L	
18	HN-ME	09AUG62	22AUG62	23AUG62	06SEP66	*******	V	P	Y	S	
18	HN-ME	TRANSFD	OUT	OF	PROGRAM	06SEP66					
30	HN-ME	30SEP66	21OCT66	25OCT66	04FEB71	10FEB71	V	P	Y	S	
30	HN-ME	TRANSFD	TO	DEVELCO	INC	23AUG71					
55	HN-ME	18SEP71	27SEP71	27SEP71	10NOV71	11NOV71	T	T	Y	G	PORT SYS
55	HN-ME	27APR73	10MAY73	10MAY73	22MAY73	23MAY73	T	T	Y	G	PORT SYS
58	HN-ME	05FEB75	20FEB75	20FEB75	11DEC75	11DEC75	T	P	Y	G	PORT SYS
58	HN-ME	11DEC75	11DEC75	11DEC75			T	P	Y	KS	PORT SYS
21	HR-AZ	19JUN64	10JUL64	10JUL64	04OCT65	07OCT65	V	T	N	L	
32	HS-NB	08MAY62	09MAY62	*******	28JUN62	30JUN62	V	T	Y	L	
26	HT-MN	31JUL62	02AUG62	*******	05OCT62	06OCT62	T	T	N	L	
23	HV-MA	30SEP65	25OCT65	25OCT65	31DEC65	12JAN66	V	T	Y	L	
23	HV-MA	TRANSFD	TO	CORPS	ENGRS	17JAN66					
37	HV-MA	10JUL67	03AUG67	03AUG67	10DEC67	15DEC67	V	P	Y	L	
58	HV-MA	21AUG68	30AUG68	30AUG68	09SEP68	10SEP68	V	T	N	G	PORT SYS
22	HW-IS	24MAY63	24JUL63	07SEP63	22OCT64	07DEC64	V	T	Y	L	24JUL63AR
22	HW-IS	TRANSFD	TO	USGS	ON	07JAN65					
23	HY-MA	09NOV64	30NOV64	30NOV64	19SEP65	28SEP65	V	P	Y	L	16JAN65DW
52	IC-GL	24JUN66	06JUL66	29APR67	28AUG67	02SEP67	T	T	N	G	PORT SYS
22	IK-AR	01NOV62	10NOV62	*******	13DEC62	14DEC62	T	T	Y	L	

	TEAM	ARRIVAL DATE	OPERATIONAL DATE SP	OPERATIONAL DATE LP	SITE CLOSED	DEPARTURE DATE	T	S	P	I	SPEC OP STATUS
29	JE-LA	01FEB64	06FEB64	12FEB64	23NOV64	27NOV64	V	T	Y	L	
29	JE-LA	TRANSFD	TO	T/5003	ON	30NOV64					
37	JE-LA	25OCT66	16NOV66	16NOV66	16JAN67	24JAN67	V	P	Y	L	
09	JN-IS	09MAR62	31MAR62	*******	02AUG62	SEP62	B	T	Y	S	
26	JO-MN	12JUL62	13JUL62	*******	30JUL62	31JUL62	T	T	N	L	
33	JP-AT	13OCT65	23OCT65	23OCT65	14SEP66	23SEP66	V	T	N	L	
56	JP-AT	21AUG68	29AUG68	29AUG68	09SEP68	10SEP68	V	T	N	G	PORT SYS
38	JR-AZ	14MAR64	30MAR64	30MAR64	04OCT65	08OCT65	V	T	Y	L	19JAN65AR
09	JS-TN	17NOV61	11DEC61	*******	19DEC61	22DEC61	V	T	Y	S	
27	JS-TN	07MAY62	10MAY62	*******	28JUN62	02JUL62	V	T	Y	L	
26	JU-TX	20MAR64	04APR64	29APR64	11AUG64	SEP64	V	T	Y	L	06APR64DW
16	KC-MO	24SEP65	17OCT65	27OCT65	16JAN67	22JAN67	V	T	Y	S	
27	KG-AZ	02APR63	19APR63	20APR63	11JUL63	22JUL63	V	T	N	L	
57	KG-AZ	08APR68	10APR68	11APR68	26APR68	27APR68	V	T	N	G	PORT SYS
21	KH-AZ	14MAR64	02APR64	04APR64	18JUN64	19JUN64	V	T	N	L	
21	KM-CL	05APR63	29APR63	29APR63	10JUL63	16JUL63	V	T	N	L	
37	KM-CL	13DEC63	14JAN64	14JAN64	21MAR64	27MAR64	V	T	N	L	
53	KM-CL	22FEB66	25FEB66	25FEB66	12MAR66	13MAR66	V	T	N	G	PORT SYS
50	KM-CL	11APR68	15APR68	15APR68	26APR68	28APR68	B	T	N	G	PORT SYS
11	KN-UT	19NOV61	09DEC61	21DEC61	31OCT69	*******	V	T	N	L	
11	KN-UT	TRANSFD	TO	AFWL	ON	19DEC69					
56	KN-UT	19SEP71	26SEP71	26SEP71	09NOV71	11NOV71	V	T	N	G	PORT SYS
-	KP-NV	06JAN70	23JAN70	(STRAIN)	24APR70	*******	M	T	N	-	PORT STR
-	KP-NV	*******	29AUG70	(STRAIN)	31JUL71	*******	M	T	N	-	PORT STR
-	KP-NV	TRANSFD	TO	UNIV	NEVADA	18OCT71					
55	KV-AT	08OCT65	12OCT65	13OCT65	15NOV65	16NOV65	B	T	N	S	PORT SYS
54	KV-AT	21AUG68	26AUG68	26AUG68	09SEP68	10SEP68					PORT SYS
54	LA-GA	01DEC65	03DEC65	10DEC65	13DEC65	14DEC65	T	T	N	S	PORT SYS
03	LB-NH	11JUN62	14JUN62	*******	28JUN62	01JUL62	T	T	N	S	
25	LC-NM	11SEP61	20SEP61	30SEP61	23JUL65	30JUL65	M	P	Y	L	
25	LC-NM	13SEP65	28SEP65	28SEP65	15NOV65	27NOV65	M	T	Y	L	
25	LC-NM	TRANSFD	TO	T/6058	03JAN66						
15	LC-NM	29JUN67	02AUG67	02AUG67	16JUL69	*******	M	P	Y	S	
15	LC-NM	*******	01SEP69	01SEP69	16SEP69	*******	M	T	Y	S	
15	LC-NM	*******	26SEP69	26SEP69	10OCT69	*******	M	T	Y	S	
15	LC-NM	TRANSFD	TO	AFWL	ON	22DEC69					
15	LC-NM	*******	13MAR70	13MAR70	26MAR70	*******	M	T	Y	S	
59	LC-NM	04MAR70	16MAR70	17MAR70	26MAR70	29MAR70	M	T	N	G	PORT SYS
58	LC-NM	18SEP71	27SEP71	27SEP71	10NOV71	11NOV71	M	T	N	G	PORT SYS
51	LC-NM	29APR73	08MAY73	08MAY73	22MAY73	23MAY73	M	T	Y	G	PORT SYS
55	LD-MS	03NOV66	13NOV66	15NOV66	03DEC66	04DEC66	T	T	N	G	PORT SYS
55	LD-MS	12JAN69	19JAN69	19JAN69	02FEB69	04FEB69	T	T	N	G	PORT SYS
51	LD-MS	09APR70	11APR70	11APR70	22APR70	23APR70	T	T	N	G	PORT SYS
58	LD2MS	12JAN69	18JAN69	18JAN69	02FEB69	03FEB69	T	T	N	G	PORT SYS
58	LD2MS	11APR70	14APR70	14APR70	22APR70	23APR70	T	T	N	G	PORT SYS
51	LD3MS	12JAN69	18JAN69	18JAN69	02FEB69	03FEB69	T	T	N	G	PORT SYS
55	LD3MS	07APR70	09APR70	09APR70	22APR70	23APR70	T	T	N	G	PORT SYS
27	LE-TN	06OCT62	17OCT62	*******	27OCT62	01NOV62	T	T	Y	L	
07	LG-AZ	15MAR64	02APR64	04APR64	04OCT65	07OCT65	V	T	Y	S	
54	LL-MS	08NOV66	14NOV66	14NOV66	03DEC66	04DEC66	T	T	N	G	PORT SYS
50	LL-MS	12JAN69	17JAN69	17JAN69	02FEB69	03FEB69	T	T	N	G	PORT SYS
54	LL-MS	04APR70	09APR70	12APR70	22APR70	23APR70	T	T	N	G	PORT SYS
19	LM-NV	05MAY62	09MAY62	*******	14MAY62	17MAY62	V	T	N	L	
34	LM-NV	11NOV61	25NOV61	30NOV61	20DEC61	21DEC61	V	T	N	L	
51	LN-MA	29OCT67	07NOV67	07NOV67	10DEC67	11DEC67	M	T	N	G	PORT SYS
09	LO-NV	11FEB63	23FEB63	15MAR63	29MAR63	01APR63	T	T	N	S	
28	LP-TX	15NOV61	27NOV61	*******	16MAY62	19MAY62	V	T	Y	L	
14	LS-NH	12AUG63	27SEP63	21OCT63	22MAR65	28MAR65	M	T	Y	S	
14	LS-NH	TRANSFD	TO	AFTAC	ON	09APR65					
51	LS-NH	12DEC66	17DEC66	17DEC66	20DEC66	21DEC66	M	T	Y	G	PORT SYS
53	LS-NH	15JAN68	19JAN68	19JAN68	19JAN68	19JAN68	M	T	N	G	PORT SYS
24	LT-PA	01NOV62	08NOV62	*******	12DEC62	17DEC62	T	T	N	L	
52	LU-MS	12JAN69	16JAN69	17JAN69	02FEB69	03FEB69	T	T	N	G	PORT SYS
53	LU-MS	04APR70	07APR70	07APR70	22APR70	23APR70	T	T	N	G	PORT SYS
29	LV-LA	14JUN63	28JUN63	14AUG63	30JAN64	01FEB64	V	T	Y	L	
52	LY-WA	30OCT67	08NOV67	10NOV67	10DEC67	13DEC67	V	T	N	G	PORT SYS
19	LZ-BV	11JUN63	12SEP63	26OCT63	*******	*******	V	T	N	J	19SEP63AR
19	LZ-BV	TRANSFD	TO	OSR	ON	15FEB65					

	TEAM	ARRIVAL DATE	OPERATIONAL DATE SP	OPERATIONAL DATE LP	SITE CLOSED	DEPARTURE DATE	T	S	P	I	SPEC OP STATUS
51	MB-MS	08NOV66	15NOV66	15NOV66	06DEC66	07DEC66	T	T	N	G	PORT SYS
57	MB-MS	12JAN69	15JAN69	17JAN69	02FEB69	03FEB69	T	T	N	G	PORT SYS
56	MB-MS	04APR70	09APR70	10APR70	22APR70	23APR70	T	T	N	G	PORT SYS
21	MC-SD	08MAY62	09MAY62	*******	28JUN62	30JUN62	V	T	Y	L	
39	ME-BC	04JUL62	07JUL62	*******	17JUL62	19JUL62	T	T	N	L	
26	MF-WS	17DEC62	22DEC62	*******	01APR63	01APR63	T	T	Y	L	
32	MH-NB	08OCT62	15OCT62	*******	27OCT62	29OCT62	T	T	N	L	
03	MKT	04MAY73	*******	23MAY73	31JAN75	14JUN75	B	P	Y	G	SPEC TST
50	ML1CL	20AUG66	22AUG66	*******	26AUG66	26AUG66	T	T	N	G	PORT SYS
51	ML3CL	21AUG66	25AUG66	*******	09SEP66	10SEP66	T	T	N	G	PORT SYS
54	ML4CL	20AUG66	23AUG66	*******	09SEP66	10SEP66	T	T	N	G	PORT SYS
55	ML2CL	21AUG66	24AUG66	*******	09SEP66	10SEP66	T	T	N	G	PORT SYS
23	ML-NM	04NOV61	15DEC61	*******	16FEB62	17FEB62	M	T	Y	S	
14	MM-TN	15OCT61	17DEC61	*******	01APR63	08APR63	V	P	Y	S	
35	MN-NV	12SEP61	19SEP61	10OCT61	15JAN69	02FEB69	M	P	Y	L	
33	MO-ID	27SEP66	17NOV66	17NOV66	26JUN67	02JUL67	V	T	Y	L	SILO
13	MP-AR	02OCT61	20NOV61	20NOV61	03JUN63	04JUN63	V	P	Y	S	
24	MR-PA	06OCT62	11OCT62	*******	27OCT62	31OCT62	T	T	Y	L	
28	MS-PA	20JUL62	24JUL62	*******	27JUL62	29JUL62	T	T	N	L	
05	MU-WA	18SEP62	26SEP62	*******	05OCT62	09OCT62	T	T	N	S	
36	MV-CL	06OCT61	22OCT61	18OCT61	10MAR64	14MAR64	V	P	Y	L	
54	MV-CL	23FEB66	01MAR66	01MAR66	12MAR66	13MAR66	V	T	N	G	PORT SYS
03	MW-ON	08OCT62	11OCT62	*******	27OCT62	29OCT62	T	T	Y	S	
27	MX-TN	01NOV62	14NOV62	27NOV62	12DEC62	19DEC62	T	T	Y	L	
24	MY-AR	12JUL62	16JUL62	*******	03AUG62	07AUG62	T	T	Y	L	
22	MZ-AR	14DEC62	20DEC62	30JAN63	31JAN63	02FEB63	T	T	Y	L	
09	ND-CL	02APR63	17APR63	17APR63	07JUN63	12JUN63	M	T	N	S	
56	ND-CL	07APR68	11APR68	11APR68	26APR68	27APR68	M	T	N	G	PORT SYS
10	NG-WS	20OCT61	19NOV61	*******	26MAY62	29MAY62	V	P	Y	S	
10	NG-WS	07OCT62	13OCT62	*******	14JUN63	21JUN63	V	P	Y	S	AR
28	NL-AZ	21MAR64	31MAR64	31MAR64	25JAN65	28JAN65	V	T	N	L	
28	NL2AZ	28JAN65	10FEB65	24FEB65	04OCT65	07OCT65	V	T	Y	L	
13	NP-NT	27JUN63	11JUL63	23AUG63	10JUL70	DISPOSED	T	T	N	J	22JUL70
57	NT-NV	23AUG76	26AUG76	*******	01APR77	01APR77	T	T	Y	G	PORT SYS
56	NT2NV	04SEP76	10SEP76	*******	01APR77	01APR77	T	T	Y	G	PORT SYS
05	OA-IS	17MAR62	30MAR62	*******	03AUG62	10AUG62	B	T	Y	S	
09	OA-IS	22SEP62	29SEP62	*******	05NOV62	01DEC62	B	T	Y	S	
-	OB-NV	18FEB70	27FEB70	(STRAIN)	05MAY70	*******	M	T	N	-	PORT STR
-	OB-NV	*******	25AUG70	(STRAIN)	31JUL71	*******	M	T	N	-	PORT STR
-	OB-NV	TRANSFD	TO	UNIV	NEVADA	18OCT71					
60	OB2NV	12AUG76	16AUG76	*******			T	T	Y	G	
60	OB3NV	11APR77	20APR77	*******							SPZ OUTRIG
20	OO-NW	18JUN63	13AUG63	23OCT63	01APR65	*******	V	T	N	L	13AUG63AR
20	OO-NW	TRANSFD	TO	OSR	ON	01APR65					
16	OR-FL	24APR63	14MAY63	*******	15SEP63	18SEP63	V	T	N	S	14MAY63DW
27	PB-TN	02JUL62	06JUL62	*******	11JUL62	12JUL62	T	T	Y	L	
50	PC-MS	08NOV66	12NOV66	12NOV66	06DEC66	07DEC66	T	T	N	G	PORT SYS
54	PC-MS	12JAN69	15JAN69	15JAN69	02FEB69	03FEB69	T	T	N	G	PORT SYS
52	PC-MS	04APR70	10APR70	10APR70	22APR70	23APR70	T	T	N	G	PORT SYS
37	PD-BC	02JUL62	06JUL62	*******	17JUL62	18JUL62	T	T	N	L	
19	PE-WV	01JUL62	06JUL62	*******	17JUL62	18JUL62	T	T	Y	L	
03	PF-MI	13DEC62	03JAN63	*******	17JUN63	17JUN63	T	T	Y	S	
37	PG-BC	21NOV62	07DEC62	*******	07DEC62	18DEC62	T	T	N	L	
28	PG-BC	15OCT65	26OCT65	01NOV65	11SEP68	*******	V	T	N	L	
28	PG2BC	23SEP68	05OCT68	05OCT68	17AUG70	28AUG70	B	T	N	S	
52	PG2BC	15SEP71	25SEP71	25SEP71	09NOV71	12NOV71	B	T	Y	G	PORT SYS
58	PG2BC	29APR73	04MAY73	04MAY73	22MAY73	23MAY73	B	T	Y	G	PORT SYS
35	PH-NV	11AUG69	15SEP69	(ACCMTR)	10OCT69	*******	T	T	N	-	JORUM ARC
8	PH2NV	11AUG69	15SEP69	(ACCMTR)	10OCT69	*******	T	T	N	-	JORUM ARC
35	PH3NV	27FEB70	18MAR70	(ACCMTR)	07APR70	*******	T	T	N	-	HNDLY ARC
35	PH3NV	TRANSFD	TO	UNIV	CALIF	25AUG71					
8	PH4NV	27FEB70	18MAR70	(ACCMTR)	07APR70	*******	T	T	N	-	HNDLY ARC
08	PH4NV	TRANSFD	TO	UNIV	CALIF	25AUG71					
33	PH-WA	14OCT67	08NOV67	08NOV67	10DEC67	14DEC67	V	P	Y	L	
16	PI-WY	09JAN64	22JAN64	11MAR64	29APR64	15MAY64	V	T	Y	S	21JAN64DW
39	PI2WY	09FEB65	01MAR65	*******	26APR65	03MAY65	V	T	Y	S	27FEB65DW
60	PJ-PA	15AUG69	29AUG69	29AUG69	10OCT69	11OCT69	T	T	N	G	PORT SYS
39	PK-OR	24MAY62	06JUN62	*******	28JUN62	02JUL62	T	T	N	L	

	TEAM	ARRIVAL DATE	OPERATIONAL DATE SP	OPERATIONAL DATE LP	SITE CLOSED	DEPARTURE DATE	T	S	P	I	SPEC OP STATUS
04	PM-WY	03OCT61	25NOV61	25NOV61	10JUL63	17JUL63	V	P	Y	S	
37	PO-TX	15NOV61	09DEC61	*******	20DEC61	21DEC61	V	T	Y	L	
53	PQ-ID	29OCT67	07NOV67	07NOV67	10DEC67	11DEC67	B	T	N	G	PORT SYS
07	PR-IS	10MAR62	06APR62	*******	03AUG62	*******	B	T	N	S	
07	PR-IS	*******	30SEP62	*******	04NOV62	01DEC62	B	T	N	S	
40	PT-OR	04JAN62	26JAN62	26JAN62	29JUL63	06AUG63	V	T	Y	L	
50	PU-MS	25FEB65	26FEB65	01MAR65	03MAR65	04MAR65	T	T	N	S	PORT SYS
24	PV-AR	10JUN62	15JUN62	*******	28JUN62	30JUN62	T	T	Y	L	
51	PW-IL	29JUN66	29JUN66	*******	30JUN66	30JUN66	T	T	N	G	PORT SYS
53	PY1AZ	18JAN67	*******	26JAN67	06APR67	11APR67	T	T	N	G	PORT SYS
51	PY2AZ	18JAN67	*******	27JAN67	06APR67	11APR67	T	T	N	G	PORT SYS
50	PY3AZ	18JAN67	*******	27JAN67	06APR67	11APR67	T	T	N	G	PORT SYS
54	PY4AZ	18JAN67	*******	01FEB67	06APR67	11APR67	T	T	N	G	PORT SYS
55	PY5AZ	18JAN67	*******	01FEB67	06APR67	11APR67	T	T	N	G	PORT SYS
39	PZ-PR	12AUG63	10SEP63	11JAN64	13MAR64	19MAR64	V	T	Y	S	10SEP63D
-	QM-NV	20JAN70	25JAN70	(STRAIN)	24APR70	*******	M	T	N	-	PORT STR
-	QM-NV	*******	30AUG70	(STRAIN)	31JUL71	*******	M	T	N	-	PORT STR
-	QM-NV	TRANSFD	TO	UNIV	CALIF	25AUG71					
39	QN-BC	16OCT62	26OCT62	*******	27OCT62	01NOV62	T	T	N	L	
36	RG-SD	14OCT65	25OCT65	07NOV65	26SEP66	01OCT66	V	T	Y	L	
-	RH-NV	15DEC69	29DEC69	(STRAIN)	01MAY70	*******	M	T	N	-	PORT STR
-	RH-NV	*******	31AUG70	(STRAIN)	31JUL71	*******	M	T	N	-	PORT STR
-	RH-NV	TRANSFD	TO	UNIV	NEVADA	18OCT71					
28	RH-NV	31AUG70		(STANDBY)							VAN
28	RH-NV	09FEB71	21APR71	21APR71	02AUG71	13AUG71	V	T	N	S	SPEC TST
53	RI-MS	12JAN69	14JAN69	18JAN69	02FEB69	03FEB69	T	T	N	G	PORT SYS
50	RI-MS	13APR70	16APR70	16APR70	22APR70	23APR70	T	T	N	G	PORT SYS
03	RK-ON	21JUN63	12JUL63	17JUL63	17AUG70	26AUG70	V&B	T	N	S	
53	RK-ON	17SEP71	24SEP71	24SEP71	09NOV71	10NOV71	B	T	N	G	PORT SYS
57	RK-ON	30APR73	08MAY73	08MAY73	22MAY73	23MAY73	B	T	N	G	PORT SYS
59	RK-ON	03FEB75	10MAR75	10MAR75			B	P	N	G	PORT SYS
26	RL-WS	01APR63	10APR63	*******	13MAY63	15MAY63	T	T	Y	L	
19	RN-WV	19DEC62	31DEC62	12MAR63	16MAY63	18MAY63	T	T	Y	L	
55	RS-KY	01DEC65	03DEC65	11DEC65	13DEC65	14DEC65	T	T	N	S	PORT SYS
05	RT-NM	18NOV61	04DEC61	*******	15FEB62	08MAR62	V	T	Y	S	
04	RT-NM	18JUL63	14AUG63	14AUG63	22MAR65	27MAR65	V	T	Y	S	
04	RT-NM	TRANSFD	TO	AFTAC	ON	09APR65					
10	RY-ND	24JUN63	22JUL63	22JUL63	22MAR65	28MAR65	V	T	Y	S	
10	RY-ND	TRANSFD	TO	AFTAC	ON	09APR65					
54	RY-ND	21MAY66	23MAY66	29MAY66	03JUN66	03JUN66	V	T	N	G	PORT SYS
55	SA4TX	14APR67	17APR67	*******	08MAY67	08MAY67	T	T	N	G	PORT SYS
50	SA2TX	14APR67	16APR67	*******	16MAY67	16MAY67	T	T	N	G	PORT SYS
55	SA2TX	09MAY67	09MAY67	*******	15MAY67	16MAY67	T	T	N	G	PORT SYS
50	SA4TX	16MAY67	18MAY67	18MAY67	23MAY67	23MAY67	T	T	N	G	PORT SYS
08	SE-MN	20OCT61	24JAN62	*******	19JUN63	25JUN63	V	P	Y	S	
21	SF-AZ	04NOV61	03DEC61	*******	03MAY62	05MAY62	V	T	Y	L	
36	SG-AZ	17MAR64	06APR64	09APR64	04OCT65	08OCT65	V	T	N	L	
28	SH-PA	06OCT62	11OCT62	*******	27OCT62	31OCT62	T	T	Y	L	
27	SI-BC	15OCT65	25OCT65	07NOV65	14OCT66	22OCT66	V	T	Y	L	
60	SI-BC	21AUG68	26AUG68	29AUG68	09SEP68	10SEP68	V	T	N	G	PORT SYS
30	SJ-TX	05OCT61	11NOV61	*******	08JUL63	11JUL63	V	P	Y	S	
07	SJ-TX	13OCT65	26OCT65	11NOV65	15NOV65	18NOV65	V	T	Y	S	
07	SJ-TX	TRANSFD	TO	T/6058	03JAN66						
21	SJ-TX	28JUN67	03AUG67	03AUG67	18SEP67	19SEP67	V	P	Y	L	
50	SJ-TX	12JAN68	16JAN68	16JAN68	19JAN68	19JAN68	V	T	N	G	PORT SYS
52	SJ-TX	15AUG69	21AUG69	21AUG69	10OCT69	11OCT69	V	T	N	G	PORT SYS
57	SJ-TX	17SEP71	23SEP71	23SEP71	09NOV71	12NOV71	V	T	N	G	PORT SYS
60	SJ-TX	01MAY73	08MAY73	08MAY73	22MAY73	23MAY73	T	T	N	G	PORT SYS
21	SK-TX	22JUL63	19AUG63	19AUG63	06MAR64	08MAR64	V	T	Y	L	
32	SM-TX	16NOV61	06DEC61	*******	20DEC61	24DEC61	V	T	Y	L	
33	SN-AZ	07MAR64	29MAR64	29MAR64	04OCT65	06OCT65	V	T	N	L	
03	SO-QB	04JUL62	06JUL62	*******	17JUL62	19JUL62	T	T	N	S	
54	SP-IS	28JUN67	02JUL67	*******	10SEP67	13SEP67	T	T	N	G	PORT SYS
51	SQ-IS	05JUL67	14JUL67	*******	10SEP67	12SEP67	V	T	N	G	PORT SYS
39	SR-OR	02MAR63	19MAR63	*******	03JUN63	07JUN63	T	T	N	L	
29	SS-TX	02OCT61	19OCT61	15OCT61	11JUN63	12JUN63	V	P	Y	L	

	TEAM	ARRIVAL DATE	OPERATIONAL DATE SP	OPERATIONAL DATE LP	SITE CLOSED	DEPARTURE DATE	T	S	P	I	SPEC OP STATUS
07	ST-NV	19JAN63	30JAN63	15MAR63	29MAR63	01APR63	T	T	N	S	
51	ST1TX	14APR67	15APR67	19MAY67	23MAY67	23MAY67	T	T	N	G	PORT SYS
53	ST2TX	14APR67	16APR67	19MAY67	23MAY67	23MAY67	T	T	N	G	PORT SYS
54	ST4TX	14APR67	16APR67	*******	16MAY67	16MAY67	T	T	N	G	PORT SYS
50	SU-VA	18JUN65	19JUN65	05JUL65	23JUL65	23JUL65	T	T	N	S	PORT SYS
22	SV-AZ	04NOV61	25NOV61	22DEC61	03MAY62	05MAY62	V	T	N	L	
08	SV2QB	25AUG64	20SEP64	20SEP64	23JUL65	02AUG65	V	T	Y	S	20SEP64AR
08	SV3QB	15SEP65	13OCT65	13OCT65	09SEP68	13SEP68	V	T	Y	S	
30	SW-MA	13SEP65	16OCT65	16OCT65	13SEP66	20SEP66	V	T	Y	S	
21	SX-SD	29OCT62	09NOV62	14NOV62	12DEC62	18DEC62	T	T	Y	L	
21	SY-SD	09OCT62	12OCT62	*******	27OCT62	29OCT62	T	T	Y	L	
09	SZ-NV	19DEC62	05JAN63	*******	08FEB63	11FEB63	T	T	N	S	
24	TC-NM	06NOV61	20DEC61	20DEC61	03MAY62	05MAY62	V	T	Y	L	
37	TD-NM	02AUG63	22AUG63	26OCT63	26NOV63	09DEC63	V	T	N	L	
52	TE-GL	28SEP65	12OCT65	12OCT65	15NOV65	17NOV65	T	T	N	P	PORT SYS
55	TE-GL	11DEC66	18DEC66	18DEC66	20DEC66	24DEC66	B	T	Y	G	PORT SYS
34	TF-CL	26APR62	23MAY62	23MAY62	12MAY63	15MAY63	V	P	Y	L	
-	TF-CL	07OCT65	24OCT65	24OCT65	13NOV65	30NOV65	V	T	Y	S	
23	TG-IS	10APR62	30APR62	*******	04AUG62	*******	V	T	N	S	
23	TG-IS	*******	30SEP62	*******	04NOV62	01DEC62	V	T	N	S	
-	TI-NV	05JAN70	07JAN70	(STRAIN)	24APR70	*******	T	T	N	-	PORT STR
-	TI-NV	*******	27AUG70	(STRAIN)	31JUL71	*******	T	T	N	-	PORT STR
-	TI-NV	TRANSFD	TO	UNIV	NEVADA	18OCT71					
40	TK-WA	08AUG63	21AUG63	30AUG63	17MAY64	23MAY64	V	T	Y	L	
21	TL-WY	09OCT67	08NOV67	08NOV67	10DEC67	20DEC67	V	P	Y	S	
32	TN-CL	02JAN62	01FEB62	*******	03MAY62	04MAY62	M	T	Y	L	
39	TO-OK	15NOV61	20NOV61	*******	18DEC61	24DEC61	V	T	Y	L	
22	TO-OK	07MAY62	09MAY62	*******	09JUN62	10JUN62	V	T	Y	L	
31	TP-NV	13NOV61	06DEC61	*******	16DEC61	29DEC61	V	T	N	L	
52	TQ-MS	13MAY77	03JUN77	*******			T	T	N	G	PORT SYS
26	TS-ND	10SEP64	02OCT64	*******	14MAY65	21MAY65	V	T	Y	L	02OCT64DW
28	TU-PA	29JUL62	02AUG62	*******	05OCT62	06OCT62	T	T	Y	L	
39	UK-OR	09JAN63	08FEB63	*******	01MAR63	02MAR63	T	T	N	L	
03	VN-UT	03OCT61	20OCT61	*******	01JUN62	03JUN62	V	T	Y	S	
05	VO-IO	17AUG64	01SEP64	18SEP64	22MAR65	31MAR65	V	T	Y	S	
05	VO-IO	TRANSFD	TO	AFTAC	ON	09APR65					
39	VT-OR	02JAN62	16JAN62	*******	21MAY62	24MAY62	V	T	Y	L	
22	WA-OK	08OCT62	17OCT62	*******	27OCT62	30OCT62	T	T	Y	L	
02	WF-MN	14AUG64	30AUG64	17SEP64	24NOV64	03DEC64	V	T	Y	S	
03	WF-MN	TRANSFD	TO	USGS	ON	15DEC64					
54	WH-YK	07OCT65	21OCT65	21OCT65	15NOV65	16NOV65	T	T	N	S	PORT SYS
27	WH2YK	27OCT66	24NOV66	24NOV66	11SEP68	*******	V	P	Y	L	
27	WH2YK	*******	23SEP68	23SEP68	10OCT69	16OCT69	B	P	Y	L	
27	WH2YK	TRANSFD	TO	AFOSR	U.WASH.	ON		10DEC69			
51	WH2YK	17SEP71	26SEP71	26SEP71	09NOV71	10NOV71	B	T	N	G	PORT SYS
56	WH2YK	29APR73	09MAY73	09MAY73	22MAY73	23MAY73	B	T	N	G	PORT SYS
60	WH2YK	05FEB75	18FEB75	18FEB75	28JUL76	02AUG76	B	P	Y	G	PORT SYS
38	WI-NV	07OCT61	10DEC61	10DEC61	03MAR64	11MAR64	M	P	Y	L	
37	WK-BC	09OCT62	17OCT62	*******	27OCT62	05NOV62	T	T	N	L	
24	WL-YK	13SEP65	16OCT65	16OCT65	15NOV65	22NOV65	V	T	N	L	
24	WL-YK	TRANSFD	TO	WFO	ON	30NOV65					
53	WL-YK	21AUG68	29AUG68	29AUG68	11SEP68	11SEP68	V	T	N	G	PORT SYS
19	WM-AZ	04NOV61	12DEC61	12DEC61	03MAY62	04MAY62	V	T	N	L	
06	WN-SD	19OCT61	08DEC61	*******	19JUN63	26JUN63	V	P	Y	S	
30	WN-SD	11MAY64	07JUN64	27JUN64	01OCT64	09OCT64	V	P	Y	S	07JUN64DW
38	WN-SD	14OCT65	25OCT65	10NOV65	14OCT66	20OCT66	V	T	Y	L	
36	WN-SD	08JUL67	03AUG67	03AUG67	10DEC67	23JAN68	V	P	Y	L	
27	WO-AZ	13MAR64	01APR64	01APR64	04OCT65	07OCT65	V	T	N	L	17JAN65AR
03	WP-TX	08JAN71	*******	18MAR71	31MAY72	07JUN72	V	P	Y	*	TRIAX TST
56	WQ-IL	18AUG69	23AUG69	23AUG69	10OCT69	13OCT69	T	T	Y	G	PORT SYS
50	WQ-IL	28APR73	07MAY73	07MAY73	22MAY73	23MAY73	T	T	Y	G	PORT SYS
26	WR-AR	16NOV61	05DEC61	*******	16DEC61	26DEC61	V	T	Y	L	
50	WS-AT	08OCT65	14OCT65	13OCT65	15NOV65	16NOV65	T	T	N	S	PORT SYS
55	WS-AT	20AUG68	22AUG68	24AUG68	09SEP68	10SEP68	V	T	N	G	PORT SYS

	TEAM	ARRIVAL DATE	OPERATIONAL DATE SP	OPERATIONAL DATE LP	SITE CLOSED	DEPARTURE DATE	T	S	P	I	SPEC OP STATUS
14	WT-TN	09APR63	12APR63	*******	31JUL63	06AUG63	T	T	Y	S	
28	WW-UT	03APR63	16APR63	16APR63	15JUL63	20JUL63	V	T	N	L	
59	WW-UT	08APR68	23APR68	23APR68	26APR68	27APR68	V	T	N	G	PORT SYS
50	WZ-NV	02NOV67	07NOV67	07NOV67	10DEC67	11DEC67	M	T	N	G	PORT SYS
05	YA-WA	04JAN63	29JAN63	*******	29MAR63	02APR63	T	T	N	S	
56	YF-NV	01APR77	09APR77	*******	30SEP77	30SEP77	T	T	Y	G	PORT SYS
56	YF2NV	11APR77	20APR77	*******	30SEP77	30SEP77					SPZ OUTRIG
56	YF3NV	11APR77	20APR77	*******	30SEP77	30SEP77					SPZ OUTRIG
56	YF4NV	01APR77	09APR77	*******	30SEP77	30SEP77	T	T	Y	G	PORT SYS
-	YM-NV	15JAN70	20JAN70	(STRAIN)	24APR70	*******	T	T	N	-	PORT STR
-	YM-NV	*******	26AUG70	(STRAIN)	31JUL71	*******	T	T	N	-	PORT STR
-	YM-NV	TRANSFD	TO	UNIV	NEVADA	18OCT71					
-	YR-CL	11OCT65	25OCT65	25OCT65	13NOV65	16NOV65	V	T	Y	S	
33	YR-CL	06JUL67	01AUG67	01AUG67	06OCT67	12OCT67	V	P	Y	L	
59	YR-CL	21AUG68	30AUG68	30AUG68	09SEP68	10SEP68	V	T	N	G	PORT SYS

LEGEND
T-TYPE OF SITE
  M-MINE
  V-VAULT
  T-TEMPORARY
  B-BUNKER
S-STATUS
  P-PERMANENT
  T-TEMPORARY
P-AVAILABILITY OF COMMERCIAL POWER
  Y-YES
  N-NO
I-TYPE OF SEISMOMETER INSTALLATION
  L-LARGE BENIOFF
  S-SMALL BENIOFF
  J-JOHNSON-MATHESON
  *-LARGE VERTICALS, SMALL HORIZONTALS
  G-GEOTECH
  KS-MODEL 36000
**ODD-NUMBERED SITES (201, 203, ETC.) WERE OCCUPIED BY TEAM 51.
  EVEN-NUMBERED SITES (202, 204, ETC.) WERE OCCUPIED BY TEAM 55.

APPENDIX 4

LRSM - SDCS SITE INFORMATION

LRSM SITE INFORMATION

SITE	SITE DESIGNATOR		AZIMUTHS		DEC	SITE COORDINATES						DISTANCE	KM	ELEV	T	P	I
78	ACADEMY	AY-SD	070	160	11E	43	31	40	099	06	30	14.481	1610	610	T	N	L
216	ADAK ISLAND	AD-IS	000	090	09E	51	52	30	176	40	45	44.264	4922	61	V	Y	L
354	ALBEMARLE	AE-NC	104	194	03W	35	26	01	080	03	35	29.070	3232	183	T	N	PS
354	ALBEMARLE *	AE-NC	107	197	03W	35	26	01	080	03	35	28.923	3216	183	T	N	PS
251	ALEXANDER CITY	AX-AL	109	198	02E	32	50	08	086	10	35	24.919	2771	183	T	N	PS
258	ALEXANDER CITY	AX2AL	139	228	02E	32	46	38	086	07	48	24.974	2777	213	V	Y	L
258	ALEXANDER CITY *	AX2AL	112	202	02E	32	46	38	086	07	48	25.053	2786	213	T	Y	PS
115	ALLIANCE	AI-NB	068	158	14E	42	07	58	103	16	35	11.119	1236	1311	T	N	L
391	ALTOONA	AS-PA	096	186	07W	40	43	59	078	31	26	29.392	3268	469	T	Y	PS
188	AMARILLO	AZ-TX	103	193	12E	35	25	48	101	55	50	11.647	1295	988	V	N	L
143	AMBOY	AB-WV	097	197	05W	39	19	50	079	34	01	28.725	3194	914	T	Y	N
363	AMCHITKA	AC-IS	000	090	06E	51	23	22	179	20	33	46.783	5202	61	T	N	PS
220	ANGELA (+ARY)	AN-MA	042	132	15E	46	45	08	106	05	30	12.155	1352	907	V	Y	S+DH+HS
57	ANTLERS	AL-OK	105	195	09E	34	21	29	095	36	45	16.944	1884	213	T	Y	L
169	APACHE	AP-OK	104	194	09E	34	49	59	098	26	09	14.571	1620	427	V	Y	S+DH
47	ARDMORE *	AM-OK	074	164	10E	34	02	52	097	24	41	5.699	0634	274	V	Y	L
157	ARGONNE	AO-WS	077	167	01E	45	36	24	088	57	01	22.027	2449	518	T	Y	N
367	ATKA	AA-IS	000	090	10E	52	12	42	174	12	13	42.714	4750	6	T	N	PS
63	ATOKA	AK-OK	106	196	09E	34	22	06	096	03	26	16.586	1844	183	T	N	L
67	AUGUSTA	AG-ME	095	185	18W	44	22	22	069	39	46	35.573	3956	152	T	Y	N
61	AURORA (ARY)	AR-WS	063	153	00	45	41	48	088	08	32	22.600	2513	381	T	N	L
37	AUSTIN	AT-NV	343	073	17E	39	28	53	117	04	26	2.395	0266	1981	M	Y	L+S+PS
34	BAKERSFIELD	BF-CL	234	324	16E	35	38	53	118	51	27	2.635	0293	567	V	Y	L+PS
65	BALD KNOB (+ARY)	BK-AR	102	192	08E	35	21	24	091	38	42	19.872	2210	122	T	Y	L
110	BALDWIN	BA-MS	075	165	04E	44	53	58	092	16	20	19.580	2177	335	T	Y	L
28	BALMORHEA	BM-TX	125	215	12E	30	55	35	103	51	18	11.984	1333	1067	V	Y	S
18	BANGOR	BG-ME	095	185	19W	44	38	04	069	13	17	35.866	3988	183	V	Y	S
79	BATES	BT-OR	344	074	19E	44	37	28	118	46	16	7.684	0854	1372	T	N	N
15	BECKLEY	BL-WV	100	190	03W	37	47	56	081	18	36	27.598	3069	610	V	Y	S+PS
135	BEDFORD	BD-PA	096	186	06W	40	08	00	078	30	28	29.438	3273	366	T	Y	L
233	BELLEVIEW *	BE-FL	140	230	01E	28	54	19	082	03	52	73.053	8123	21	V	Y	S
233	BELLEVIEW *	BE-FL	140	230	01E	28	54	19	082	03	52	73.082	8126	21	T	Y	PS
233	BELLEVIEW *	BE-FL	118	208	01E	28	54	19	082	03	52	29.856	3320	21	T	Y	PS
233	BELLEVIEW	BE-FL	115	205	01E	28	54	19	082	03	52	29.659	3298	21	T	Y	PS
233	BELLEVIEW *	BE≠FL	123	213	01E	28	54	19	082	03	52	23.986	2667	21	T	Y	PS
132	BELLEVILLE	BV-PA	096	186	07W	40	41	04	077	37	24	30.050	3341	244	T	Y	L
139	BERLIN (+ARY)	BR-PA	097	187	05W	39	55	27	078	50	41	29.205	3247	665	V	Y	L
364	BETHEL	BQ-AK	000	090	19E	60	46	44	161	53	01	37.048	4120	46	T	N	PS
130	BIG STONE GAP	BI-VA	101	191	01W	36	50	45	082	42	25	26.671	2966	549	T	Y	L
369	BILLINGS *	BS-MA	351	081	17E	45	43	56	108	53	32	9.130	1015	1219	V	Y	S
162	BISHOP	BP-CL	274	004	16E	37	21	36	118	41	25	1.994	0222	2317	V	N	L+PS
162	BISHOP *	BP-CL	110	200	16E	37	21	36	118	41	25	.646	0072	2317	T	N	PS
162	BISHOP *	BP-CL	252	342	16E	37	21	36	118	41	25	8.489	0944	2317	T	N	PS
198	BLANDING	BX-UT	088	178	14E	37	33	48	109	26	05	5.402	0601	1707	V	N	L
68	BLEWETT	BW-WA	341	071	21E	47	22	49	120	39	12	10.708	1191	884	T	N	N
393	BLOOMFIELD	BY-IO	087	177	06E	40	46	09	092	27	09	18.757	2086	259	T	N	PS
116	BLOOMSBURG	BB-PA	096	186	09W	41	10	56	076	33	07	30.807	3426	305	T	Y	L
253	BREWTON	BO-AL	112	202	04E	31	10	11	086	51	35	24.946	2774	76	T	N	PS
145	BUCKHANNON	BZ-WV	098	188	04W	38	47	54	080	20	58	28.193	3135	457	T	Y	N
101	BUCKINGHAM	BU-QB	089	179	14W	45	46	03	075	32	25	31.367	3488	183	T	N	S
249	BURWASH LANDING *	BH-YK	085	175	30E	61	22	14	139	08	29	24.682	2745	861	T	N	PS

LRSM SITE INFORMATION

SITE	SITE DESIGNATOR		AZIMUTHS		DEC	SITE COORDINATES						DISTANCE	KM	ELEV	T	P	I
249	BURNASM LANDING *	BH-YK	085	175	30E	61	22	14	139	08	29	25.277	2811	861	T	N	PS
94	CACHE CREEK	CK-BC	343	073	24E	50	49	31	121	19	40	14.123	1570	518	T	N	L
372	CALIENTE *	CQ-NV	273	003	16E	37	54	15	114	28	15	5.924	0659	1804	M	N	PS
33	CAMPO	CP-CL	182	272	15E	32	43	44	116	22	16	4.446	0494	1189	V	Y	L+PS
33	CAMPO *	CP-CL	132	222	15E	32	43	44	116	22	16	49.668	5523	1189	V	Y	S
33	CAMPO *	CP-CL	131	221	15E	32	43	44	116	22	16	50.158	5577	1189	V	Y	S
133	CARYVILLE	CA-TN	102	192	00	36	08	40	084	11	23	25.639	2851	305	T	Y	N
371	CASCADE TUNNEL *	CC-WA	289	019	22E	47	46	09	121	05	01	15.089	1678	1036	M	Y	PS
52	CENTERVILLE	CV-TN	102	192	03E	35	46	12	087	23	04	23.180	2578	183	V	Y	L
52	CENTERVILLE *	CV-TN	080	170	03E	35	46	12	087	23	04	14.110	1569	183	V	Y	S
259	CHALLIS *	CL-ID	069	159	19E	44	29	28	114	20	30	9.896	1100	2256	T	N	PS
71	CHEYENNE	CY-WY	068	158	14E	41	25	00	104	51	36	9.752	1084	1920	T	N	L
245	CHURCHILL *	CH-MT	121	211	03E	58	36	25	093	49	00	47.029	5229	38	T	N	PS
69	CLAYTON	CT-OK	105	195	09E	34	29	17	095	07	38	17.297	1923	305	T	Y	L
111	CLINTWOOD	CI-VA	100	190	02W	37	11	37	082	24	57	26.835	2984	549	T	N	L
149	CODY	CZ-NB	069	159	12E	42	52	30	101	14	30	12.791	1422	975	T	Y	N
128	COLFAX	CF-WS	075	165	04E	45	05	39	091	45	59	19.976	2221	366	T	Y	L
76	COLOME	CO-SD	070	160	11E	43	17	12	099	40	13	14.013	1558	640	T	Y	L
75	CONCRETE	CE-WA	338	068	22E	48	31	21	121	41	14	12.022	1337	274	T	N	S
49	CONWAY	CW-AR	103	193	06E	35	08	08	091	58	40	19.655	2186	152	V	Y	L
49	CONWAY *	CW-AR	077	167	06E	35	08	08	091	58	40	10.309	1146	152	V	Y	L
9	CORNELL	CN-WS	076	166	04E	45	11	34	091	07	41	20.438	2273	320	V	Y	S
148	CRAIGSVILLE	CX-WV	099	189	03W	38	19	23	080	38	25	29.037	3118	732	T	Y	N
84	CRANE	KR-OR	343	073	19E	43	25	03	118	30	44	5.473	0720	1402	T	N	N
241	CRETE *	CR-NB	131	221	10E	40	39	52	096	51	15	56.201	6249	442	V	Y	L
338	CRETE	CR2NB	083	173	09E	40	38	12	096	50	54	15.453	1718	418	T	Y	PS
388	CRETE *	CR2NB	132	222	09E	40	38	12	096	50	54	56.252	6255	418	T	Y	PS
388	CRETE *	CR2NB	086	176	09E	40	38	12	096	50	54	8.796	0978	418	T	Y	PS
123	CROSSVILLE	CS-TN	102	192	01E	35	48	55	085	09	34	24.939	2773	579	T	Y	L
60	CUMBERLAND GAP	CG-VA	101	191	00	36	37	35	083	15	36	26.277	2922	396	V	Y	L
406	CUMBERLND PLT OBS	CP-SO	000	090	02E	35	35	41	085	34	14	24.625	2738	574	V	Y	PS+JMVARY
196	CURRANT	CU-NV	022	112	16E	38	40	38	115	27	18	1.604	0178	1646	V	N	S
31	DEATH VALLEY	DV-CL	177	267	15E	35	50	00	116	06	06	1.349	0150	792	M	N	L
17	DELHI	DH-NY	095	185	11W	42	14	39	074	53	19	31.949	3553	652	V	Y	S+PS
119	DELL RAPIDS	DL-SD	072	162	09E	43	49	58	096	46	24	16.182	1799	488	T	N	L
90	DEPOSIT	DP-NY	095	185	11W	42	05	18	075	27	08	31.545	3508	579	T	N	L
260	DILLON *	DI-MA	069	159	18E	45	10	25	112	26	52	11.405	1268	1859	T	N	PS
255	DRY RIDGE	DY-KY	097	187	000	38	38	59	084	38	36	24.880	2767	259	T	N	N
12	DURANGO	DR-CO	090	180	15E	37	27	53	107	47	00	6.713	0747	2225	V	Y	S
181	DURANT	DU-OK	107	197	09E	34	02	11	096	13	04	16.550	1840	198	V	Y	L
27	EAGLE FLAT	EF-TX	126	216	12E	31	10	35	105	07	48	10.949	1217	1433	V	Y	L
338	EARLY RISE *	ER101	UP	UP	07W	47	55	47	083	08	11	3.933	0437	457	T	N	PS
338	EARLY RISE *	ER101	327	057	07W	47	55	47	083	08	11	13.254	1474	457	T	N	PS
334	EARLY RISE *	ER102	UP	UP	07W	48	06	07	082	36	13	4.311	0479	457	T	N	PS
330	EARLY RISE *	ER103	UP	UP	08W	48	13	35	082	10	10	4.605	0512	305	T	N	PS
326	EARLY RISE *	ER104	UP	UP	09W	48	20	16	081	45	15	4.896	0544	396	T	N	PS
322	EARLY RISE *	ER105	UP	UP	09W	48	29	16	081	16	14	5.235	0582	305	T	N	PS
318	EARLY RISE *	ER106	UP	UP	10W	48	32	18	080	46	05	5.569	0619	274	T	N	PS
314	EARLY RISE *	ER107	UP	UP	10W	48	32	19	080	16	39	5.891	0655	305	T	N	PS
310	EARLY RISE *	ER108	UP	UP	11W	48	32	00	079	51	51	6.167	0686	457	T	N	PS
306	EARLY RISE *	ER109	UP	UP	12W	48	47	51	079	21	26	6.527	0726	290	T	N	PS

LRSM SITE INFORMATION

SITE	SITE DESIGNATOR		AZIMUTHS		DEC	SITE COORDINATES		DISTANCE	KM	ELEV	T	P	I
301	EARLY RISE *	ER110	UP	UP	13W	48 51 49	078 51 49	6.867	0764	305	T	N	PS
297	EARLY RISE *	ER111	UP	UP	13W	48 37 21	078 18 38	7.199	0801	305	T	N	PS
293	EARLY RISE *	ER112	UP	UP	14W	48 41 47	077 54 14	7.477	0831	320	T	N	PS
289	EARLY RISE *(ARY)	ER113	UP	UP	15W	48 50 10	077 25 13	7.808	0868	290	T	N	PS
286	EARLY RISE *	ER114	UP	UP	16W	49 07 10	077 00 24	8.113	0902	305	T	N	PS
282	EARLY RISE *	ER115	UP	UP	17W	49 22 52	076 32 16	8.446	0939	305	T	N	PS
278	EARLY RISE *	ER116	UP	UP	18W	49 35 29	076 01 36	8.802	0979	305	T	N	PS
274	EARLY RISE *	ER117	UP	UP	19W	49 49 25	075 36 00	9.115	1014	305	T	N	PS
271	EARLY RISE *	ER118	UP	UP	19W	49 49 14	075 07 41	9.416	1047	381	T	N	PS
267	EARLY RISE *	ER119	UP	UP	19W	49 47 26	074 38 17	9.731	1082	381	T	N	PS
263	EARLY RISE *	ER120	UP	UP	20W	49 55 29	074 15 30	9.963	1108	396	T	N	PS
264	EARLY RISE *	ER201	UP	UP	19W	49 35 41	074 16 38	9.909	1102	381	T	N	PS
265	EARLY RISE *	ER202	UP	UP	19W	49 21 12	074 02 17	10.041	1117	46	T	N	PS
268	EARLY RISE *	ER203	UP	UP	19W	49 11 09	073 40 18	10.299	1145	381	T	N	PS
269	EARLY RISE *	ER204	UP	UP	19W	49 02 24	073 21 48	10.494	1167	381	T	N	PS
272	EARLY RISE *	ER205	UP	UP	19W	48 52 29	072 56 01	10.767	1197	351	T	N	PS
275	EARLY RISE *	ER207	UP	UP	19W	48 33 23	072 20 44	11.157	1241	123	T	N	PS
276	EARLY RISE *	ER208	UP	UP	19W	48 24 35	071 58 36	11.407	1268	137	T	N	PS
279	EARLY RISE *	ER209	UP	UP	20W	48 29 08	071 36 14	11.649	1295	168	T	N	PS
280	EARLY RISE *	ER210	UP	UP	20W	48 20 41	071 08 47	11.959	1330	152	T	N	PS
283	EARLY RISE *	ER211	UP	UP	20W	48 16 33	070 47 52	12.199	1356	274	T	N	PS
284	EARLY RISE *	ER212	UP	UP	21W	48 10 21	070 17 35	12.543	1395	183	T	N	PS
287	EARLY RISE *	ER213	UP	UP	21W	48 00 54	070 04 22	12.706	1413	244	T	N	PS
290	EARLY RISE *	ER215	UP	UP	21W	47 48 16	069 25 23	13.158	1463	152	T	N	PS
291	EARLY RISE *	ER216	UP	UP	21W	47 37 38	069 00 35	13.456	1496	290	T	N	PS
294	EARLY RISE *	ER217	UP	UP	22W	47 29 11	068 39 48	13.706	1524	366	T	N	PS
295	EARLY RISE *	ER218	UP	UP	22W	47 24 17	068 20 30	13.934	1549	175	T	N	PS
298	EARLY RISE *	ER219	UP	UP	22W	47 13 05	067 55 00	14.245	1584	183	T	N	PS
299	EARLY RISE *	ER220	UP	UP	22W	47 01 03	067 43 40	14.405	1602	173	T	N	PS
302	EARLY RISE *	ER221	UP	UP	22W	46 54 44	067 21 53	14.676	1632	213	T	N	PS
303	EARLY RISE *	ER222	UP	UP	23W	46 52 50	066 58 34	14.943	1662	442	T	N	PS
307	EARLY RISE *	ER223	UP	UP	23W	46 48 48	066 36 48	15.192	1689	396	T	N	PS
306	EARLY RISE *	ER224	UP	UP	23W	46 35 32	066 13 56	15.493	1723	122	T	N	PS
311	EARLY RISE *	ER225	UP	UP	23W	46 32 18	065 50 47	15.770	1753	31	T	N	PS
312	EARLY RISE *	ER226	UP	UP	23W	46 20 13	065 35 42	15.933	1777	46	T	N	PS
315	EARLY RISE *(ARY)	ER227	UP	UP	23W	46 11 46	065 09 45	16.304	1813	61	T	N	PS
316	EARLY RISE *	ER228	UP	UP	23W	46 08 51	064 54 21	16.489	1833	152	T	N	PS
319	EARLY RISE *	ER229	UP	UP	24W	46 00 54	064 31 16	16.761	1866	76	T	N	PS
320	EARLY RISE *	ER230	UP	UP	24W	45 58 07	064 10 27	17.027	1893	46	T	N	PS
323	EARLY RISE *	ER231	UP	UP	24W	45 52 00	063 49 11	17.297	1923	15	T	N	PS
324	EARLY RISE *	ER232	UP	UP	24W	45 44 56	063 26 55	17.578	1955	31	T	N	PS
327	EARLY RISE *	ER234	UP	UP	24W	45 35 32	062 42 53	18.115	2014	76	T	N	PS
328	EARLY RISE *	ER235	UP	UP	24W	45 35 55	062 18 02	18.393	2045	61	T	N	PS
331	EARLY RISE *	ER236	UP	UP	24W	45 34 56	061 54 16	18.661	2075	15	T	N	PS
332	EARLY RISE *	ER237	UP	UP	25W	45 37 35	061 33 30	18.883	2100	46	T	N	PS
335	EARLY RISE *	ER238	UP	UP	25W	45 37 26	061 13 12	19.121	2126	23	T	N	PS
336	EARLY RISE *	ER239	UP	UP	25W	45 39 42	060 50 21	19.369	2154	15	T	N	PS
339	EARLY RISE *	ER241	UP	UP	26W	46 01 41	060 12 22	19.688	2189	76	T	N	PS
339	EARLY RISE *	ER241	053	143	26W	46 01 41	060 12 22	14.347	1595	76	T	N	PS
340	EARLY RISE *	ER242	UP	UP	26W	46 09 38	059 56 12	19.836	2206	15	T	N	PS
340	EARLY RISE *	ER242	053	143	26W	46 09 38	059 56 12	14.617	1625	15	T	N	PS

LRSM SITE INFORMATION

SITE	SITE DESIGNATOR		AZIMUTHS		DEC	SITE COORDINATES						DISTANCE	KM	ELEV	T	P	I
266	EARLY RISE *	ER300	UP	UP	05W	40	27	42	080	10	50	9.459	1052	287	T	N	PS
270	EARLY RISE *	ER301	UP	UP	05W	40	17	13	079	56	58	9.727	1082	311	T	N	PS
273	EARLY RISE *	ER302	UP	UP	05W	40	04	42	079	46	13	9.975	1109	317	T	N	PS
277	EARLY RISE *	ER303	UP	UP	05W	39	52	31	079	31	50	10.253	1140	616	T	N	PS
281	EARLY RISE *	ER304	UP	UP	05W	39	41	45	079	15	49	10.518	1169	823	T	N	PS
285	EARLY RISE *	ER306	UP	UP	06W	39	15	10	078	54	43	11.038	1227	290	T	N	PS
288	EARLY RISE *	ER307	UP	UP	06W	39	02	01	078	39	11	11.326	1259	457	T	N	PS
292	EARLY RISE *	ER308	UP	UP	06W	38	49	47	078	26	08	11.600	1290	270	T	N	PS
296	EARLY RISE *	ER309	UP	UP	06W	38	37	20	078	13	54	11.860	1319	232	T	N	PS
300	EARLY RISE *	ER310	UP	UP	06W	38	22	35	078	03	20	12.135	1349	122	T	N	PS
304	EARLY RISE *	ER311	UP	UP	06W	38	09	52	077	48	50	12.424	1382	128	T	N	PS
309	EARLY RISE *	ER312	UP	UP	06W	37	57	28	077	35	36	12.686	1411	67	T	N	PS
313	EARLY RISE *	ER313	UP	UP	06W	37	44	17	077	25	51	12.946	1439	64	T	N	PS
317	EARLY RISE *	ER314	UP	UP	06W	37	31	29	077	11	09	13.232	1471	37	T	N	PS
321	EARLY RISE *	ER315	UP	UP	06W	37	17	47	076	57	55	13.516	1503	18	T	N	PS
325	EARLY RISE *	ER316	UP	UP	06W	37	05	18	076	45	18	13.787	1533	24	T	N	PS
329	EARLY RISE *	ER317	UP	UP	06W	36	52	52	076	34	55	14.037	1561	18	T	N	PS
333	EARLY RISE *	ER318	UP	UP	06W	36	38	08	076	21	34	14.334	1594	3	T	N	PS
337	EARLY RISE *	ER319	UP	UP	06W	36	23	27	076	09	51	14.634	1627	6	T	N	PS
337	EARLY RISE *	ER319	272	092	06W	36	23	27	076	09	51	1.494	0166	6	T	N	PS
195	EAST BRAINTREE	EB-MT	058	148	07E	49	37	40	095	37	20	19.372	2154	312	V	Y	S
256	EDGEWOOD	ED-MI	087	177	03W	43	15	20	084	24	41	24.924	2771	213	T	N	PS
26	EL PASO	EP-TX	125	215	13E	31	55	58	105	58	00	9.929	1104	1615	V	Y	L
58	ELLENSBURG	EL-WA	339	059	21E	46	55	27	120	43	48	10.298	1145	975	T	N	L
235	ELLSINORE *	EN-MO	099	189	05E	36	52	58	090	35	44	12.986	1444	152	V	Y	PS
235	ELLSINORE *	EN-MO	135	225	05E	36	52	58	090	35	44	62.349	6933	152	V	Y	L
377	ELMO	EO2TX	111	201	09E	32	38	53	096	09	31	17.044	1895	158	T	N	PS
168	ELY	EY-NV	018	108	17E	39	24	36	115	18	46	2.330	0259	2012	V	N	S+PS
257	ELY	EY2NV	017	107	17E	39	25	53	115	19	04	2.350	0261	2012	T	N	PS
238	EMPORIA *	EM-KA	091	181	09E	38	31	29	096	28	22	17.517	1948	411	T	N	PS
180	ENIWETOK	EW-IS	234	324	06E	11	23	50	162	22	31	76.414	8497	3	B	Y	L+DH
108	ESPANOLA	ES-ON	083	173	07W	46	19	08	081	47	34	27.066	3010	274	T	N	S
173	EUREKA	EK-NV	011	101	17E	39	12	32	115	42	37	2.059	0229	1951	V	N	L+DH
175	EUTAW	EU-AL	109	199	05E	32	46	45	087	52	26	23.581	2622	43	V	Y	S
348	EUTAW *	EU2AL	041	131	04E	32	47	47	087	53	05	2.184	0243	43	V	Y	S
348	EUTAW	EU2AL	109	199	04E	32	47	47	087	53	05	23.567	2620	43	T	Y	PS
378	FAIRBANKS	FB-AK	000	090	28E	64	57	07	148	17	03	33.634	3740	716	V	Y	S+TX
402	FAIRBANKS	FB2AK	000	090	29E	64	54	36	147	26	47	33.335	3707	343	V	N	TX
415	FAULTLESS	FA-NV	000	090	16E	38	38	26	116	13	22	1.559	0173	1920	T	N	PS SPONLY
2	FILLMORE	FM-UT	058	148	17E	39	13	06	112	12	25	3.745	0416	1990	V	Y	S+PS
20	FLAGSTAFF	FS-AZ	119	209	15E	35	04	09	111	18	34	4.485	0499	1890	V	N	L+PS
186	FORSYTH	FR-MA	043	133	15E	46	06	00	106	26	25	11.510	1280	823	V	Y	S
105	FORT MCLEOD	FT-BC	343	073	26E	54	54	49	122	52	56	18.315	2037	914	T	N	L
240	FORT NELSON *	FL-BC	103	193	30E	58	51	38	122	50	11	32.990	3668	655	V	N	L
240	FORT NELSON *	FL-BC	103	193	30E	58	51	38	122	50	11	33.590	3735	655	V	N	PS
353	FORT SHERMAN	FH-PM	136	226	04W	09	21	47	079	57	30	42.866	4767	15	B	N	PS
202	FORT STOCKTON	FO-TX	123	213	11E	30	54	06	102	41	52	12.825	1426	880	V	Y	S+DH
206	FRANKLIN	FN-WV	099	189	04W	38	32	58	079	30	47	28.877	3211	910	V	Y	S+DH
206	FRANKLIN	FN-WV	099	189	04W	38	32	58	079	30	47	28.877	3211	910	T	Y	PS+KS160M
346	FRANKTOWN	FK-CO	079	169	14E	39	35	12	104	27	42	9.524	1059	1803	S	Y	L
16	GALETON	GT-PA	094	184	07W	41	37	54	077	48	40	29.824	3316	610	V	Y	L

LRSM SITE INFORMATION

SITE	SITE DESIGNATOR		AZIMUTHS		DEC	SITE COORDINATES		DISTANCE	KM	ELEV	T	P	I
392	GALION	GZ-OH	093	183	03W	40 39 36	082 47 00	26.160	2909	372	T	Y	PS
41	GARLAND	GL-TX	110	200	09E	32 58 20	096 38 06	16.555	1841	168	V	Y	S+PS
410	GASBUGGY	GB-NM	000	090	14E	36 41 13	107 13 34	7.048	0784	2164	T	N	PS SPONLY
72	GAYLORD	GY-MN	074	164	07E	44 30 17	094 03 17	18.249	2029	305	T	N	L
102	GLACIER PEAK	GC-WA	339	069	22E	48 09 44	121 16 56	11.589	1289	671	T	N	S
187	GLENDIVE	GI-MA	046	136	14E	47 11 34	104 13 10	13.361	1486	732	V	Y	S
211	GLOBE	GE-AZ	131	221	14E	33 46 32	110 31 41	5.742	0638	1475	V	N	L
44	GNOME	GN-NM	119	209	12E	32 15 45	103 51 25	11.278	1254	1036	V	N	S
152	GOLDFIELD	GF-NV	312	042	16E	37 55 03	117 12 06	1.082	0120	1707	M	N	L
74	GORDON	GO-NB	068	158	13E	42 37 58	102 16 26	11.995	1334	1097	T	Y	L
182	GRAFENBERG (ARY)	GG-GR	140	230	02W	49 41 32	011 12 55	81.812	9097	525	V	Y	L
179	GRAND RAPIDS	GD-MN	066	156	05E	47 39 52	093 29 22	19.699	2190	427	V	Y	S
380	GRAND SALINE	GA-TX	000	090	08E	32 39 25	095 42 16	17.399	1935	-86	M	Y	PS
380	GRAND SALINE	GA-TX	111	201	08E	32 39 25	095 42 16	17.399	1935	-86	M	Y	PS
404	GRAND SALINE	GA2TX	000	090	08E	32 39 29	095 42 13	17.399	1935	119	V	Y	PS
405	GRAND SALINE *	GA3TX	135	225	08E	32 39 35	095 42 13	62.401	6939	-94	M	Y	PS+TX
140	GRANTSVILLE	GS-MO	097	187	05E	39 37 08	079 11 00	28.983	3223	762	T	Y	N
57	GRAPEVINE	GV-TX	111	201	09E	32 53 09	096 59 54	16.295	1812	152	V	Y	L+DH
387	GREENVILLE	GH-MS	107	197	06E	33 19 45	091 02 07	20.864	2320	30	T	Y	PS
361	GRIT	GR1TX	119	209	10E	30 46 40	099 23 03	15.335	1705	518	T	N	PS
362	GRIT	GR2TX	119	209	10E	30 47 11	099 24 58	15.307	1702	549	T	N	PS
106	GRUNDY	GD-VA	100	190	02W	37 23 34	081 58 40	27.145	3018	366	T	Y	L
199	GUANTANAMO	GM-CU	125	215	01W	19 58 01	075 05 14	39.622	4406	16	V	Y	S+DH
1	HAILEY (+ARY)	HL-ID	014	104	19E	43 38 50	114 15 02	6.626	0737	1890	M	Y	L
205	HAILEY	HL2ID	013	103	18E	43 33 40	114 25 08	6.514	0724	1829	M	Y	L
205	HAILEY *	HL2ID	304	034	18E	43 33 40	114 25 08	44.135	4908	1829	M	Y	L
205	HAILEY *	HL2ID	124	214	18E	43 33 40	114 25 08	44.657	4966	1829	M	Y	S
205	HAILEY *	HL2ID	304	034	18E	43 33 40	114 25 08	44.718	4972	1829	M	Y	PS
194	HANNAH	HH-ND	054	144	10E	48 56 53	098 41 33	17.327	1927	488	V	Y	S
261	HANNAH *	HH2ND	054	144	10E	48 56 39	098 40 56	21.526	2394	488	T	N	PS
109	HASTINGS	HT-MN	075	165	05E	44 51 10	092 52 40	19.152	2130	274	T	N	L
234	HAVRE *	HV-MA	122	212	18E	48 25 20	109 49 20	44.157	4910	884	V	Y	L
234	HAVRE *	HV-MA	122	212	18E	48 25 20	109 49 20	44.687	4969	884	V	Y	L
234	HAVRE *	HV-MA	122	212	18E	48 25 20	109 49 20	44.755	4977	884	V	Y	PS
171	HAWAII ISLAND ARY	HW-IS	235	325	12E	19 58 49	155 42 20	38.373	4267	705	V	Y	L
95	HAWK SPRINGS	HK-WY	069	158	14E	41 41 45	104 21 25	10.207	1135	1494	T	N	L
5	HAY SPRINGS	HS-NB	068	158	14E	42 25 32	102 42 52	11.615	1292	1158	V	Y	L
215	HEBER	HR-AZ	131	221	14E	34 40 11	110 45 59	5.072	0564	1875	V	N	L
193	HEMPSTEAD	HE-TX	118	208	08E	30 11 59	096 05 31	18.105	2014	67	V	Y	L+DH
42	HOBART *	HB-OK	055	145	11E	35 10 35	098 54 37	5.048	0561	491	V	Y	S+DH
117	HOULTON	HN-ME	093	183	21W	46 09 43	067 59 09	36.626	4073	213	V	Y	S+VST
117	HOULTON *	HN-ME	141	231	21W	46 09 43	067 59 09	66.935	7443	213	T	Y	PS
117	HOULTON *	HN-ME	092	182	21W	46 09 43	067 59 09	30.010	3337	213	T	Y	PS
117	HOULTON	HN-ME	093	183	21W	46 09 43	067 59 09	35.626	4073	213	T	Y	PS+KS 34M
218	HOWARD	HO-PA	095	185	07W	41 59 44	077 35 44	30.040	3340	369	V	N	S+DH
221	HYSHAM (+ARY)	HY-MA	041	131	15E	45 58 22	107 04 54	11.118	1236	975	V	Y	L+DH+HS
305	ICE CAP (ARY)	IC-GL	086	176	49W	77 56 48	039 11 00	51.242	5698	2365	T	N	PS+SH
137	INK	IK-AR	105	195	08E	34 37 10	094 06 09	18.081	2011	305	T	Y	L
160	IONE	IO-NV	319	049	17E	38 31 33	117 38 20	1.759	0196	1737	M	N	N
51	JACKSON	JS-TN	102	192	04E	35 39 20	088 36 46	22.227	2471	152	V	Y	L
51	JACKSON *	JS-TN	079	169	04E	35 39 20	088 36 46	13.106	1457	152	V	Y	S

LRSM SITE INFORMATION

SITE	SITE DESIGNATOR		AZIMUTHS		DEC	SITE COORDINATES						DISTANCE	KM	ELEV	T	P	I
125	JASPER	JA-MN	073	163	08E	43	53	24	096	19	17	16.511	1836	518	T	N	N
243	JASPER *	JP-AT	114	204	24E	52	53	50	118	05	25	37.418	4161	1128	V	N	L
243	JASPER *	JP-AT	114	204	24E	52	53	50	118	05	25	38.018	4227	1128	V	N	PS
203	JENA	JE-LA	112	202	07E	31	47	05	092	00	55	20.629	2294	46	V	Y	L
203	JENA *	JE-LA	286	016	07E	31	47	05	092	00	55	2.186	0243	46	V	Y	L
207	JEROME (+ARY)	JR-AZ	131	221	14E	34	49	32	111	59	25	4.145	0461	1311	V	Y	L
223	JOHNSTON IS.	JN-IS	311	041	09E	16	44	02	169	31	41	51.006	5672	3	B	Y	S
83	JORDAN	JO-MN	074	164	06E	44	42	25	093	30	30	18.680	2077	290	T	N	L
204	JUNO	JU-TX	123	213	10E	30	06	43	101	04	38	14.427	1604	513	V	Y	L+DH
11	KANAB	KN-UT	095	185	15E	37	01	22	112	49	39	2.701	0300	1737	V	N	L
11	KANAB *	KN-UT	130	220	15E	37	01	22	112	49	39	49.098	5459	1737	V	N	PS
237	KANSAS CITY *	KC-MO	133	223	08E	39	21	21	094	40	17	58.321	6485	274	V	Y	S
395	KAWICH PEAK *	KP-NV	APX	356	16E	37	53	51	116	27	33	.598	0067	2134	M	N	HST
247	KEG RIVER *	KV-AT	108	198	28E	56	49	49	117	19	26	36.386	4046	305	T	Y	PS
247	KEG RIVER *	KV-AT	108	198	28E	56	49	49	117	19	26	36.987	4113	305	T	Y	PS
138	KENNEWICK	KE-WA	345	075	21E	46	08	24	119	16	39	9.240	1027	396	T	Y	N
163	KINGMAN	KG-AZ	130	220	15E	35	38	30	113	54	28	2.405	0267	1067	V	N	L+PS
209	KOHLS RANCH	KH-AZ	131	221	14E	34	29	00	111	02	03	4.987	0554	2286	V	N	L
165	KRAMER	KM-CL	280	290	15E	34	52	52	117	15	24	2.451	0273	853	V	N	L+PS
131	LA FOLLETTE	LF-TN	101	191	00	36	28	11	083	49	43	25.859	2875	366	T	Y	N
177	LA PAZ (ARY)	LZ-BV	141	231	02E	16	15	31	068	28	47	59.594	7738	3993	V	N	J
53	LA PRYOR *	LP-TX	131	221	10E	29	10	47	099	40	35	4.739	0527	274	V	Y	L
252	LAFAYETTE	LA-GA	104	194	02E	34	51	26	085	27	00	24.929	2772	610	T	N	PS
54	LAKE MEAD	LM-NV	115	205	15E	36	34	57	114	32	07	1.463	0163	536	V	N	L
54	LAKE MEAD *	LM-NV	293	023	15E	36	34	57	114	32	07	9.808	1091	536	V	N	L
95	LAKE WENATCHEE	LW-WA	340	070	22E	47	50	44	120	54	06	11.203	1246	762	T	N	N
25	LAS CRUCES	LC-NM	124	214	13E	32	24	08	106	35	58	9.222	1025	1585	M	Y	L
25	LAS CRUCES *	LC-NM	133	223	13E	32	24	08	106	35	58	55.951	6221	1585	M	Y	L
25	LAS CRUCES *	LC-NM	133	223	13E	32	24	08	106	35	58	56.461	6278	1585	M	Y	S
25	LAS CRUCES	LC-NM	133	223	13E	32	24	08	106	35	58	9.222	1025	1585	M	Y	S+PS
25	LAS CRUCES *	LC-NM	133	223	13E	32	24	08	106	35	58	55.992	6226	1585	M	Y	PS
25	LAS CRUCES *	LC#NM	170	260	13E	32	24	08	106	35	58	7.177	0798	1585	M	Y	PS
349	LAUREL *	LL-MS	018	108	05E	31	43	17	089	21	21	.606	0067	91	T	N	PS
62	LEBANON	LB-NH	094	184	14W	43	37	15	072	16	32	33.753	3753	274	T	N	S
112	LEWISBURG	LE-TN	102	192	03E	35	38	05	086	46	02	23.700	2635	213	T	Y	L
134	LEWISTOWN	LT-PA	096	186	07W	40	20	21	078	04	00	29.751	3308	396	T	N	L
374	LEWISTOWN *	LN-MA	333	063	18E	47	12	43	109	08	56	10.620	1181	1448	M	N	PS
159	LIBERTY	LI-NV	322	052	16E	38	18	22	117	17	30	1.416	0157	1829	T	N	N
176	LIDDIEVILLE	LV-LA	111	201	07E	32	08	10	091	52	30	20.612	2292	15	V	Y	L
200	LISBON	LS-NH	094	184	16W	44	14	18	071	55	21	33.965	3777	287	M	Y	S+PS
200	LISBON *	LS-NH	096	186	16W	44	14	18	071	55	21	33.361	3710	287	T	Y	PS
214	LONG VALLEY	LG-AZ	131	221	14E	34	24	28	111	32	45	4.688	0521	1768	V	Y	S
156	LOVELOCK	LO-NV	322	052	18E	39	56	07	118	50	22	3.440	0382	1280	T	N	S
347	LUCEDALE *	LD-MS	108	198	05E	30	57	00	088	53	00	.620	0069	70	T	N	PS
382	LUCEDALE *	LD2MS	108	198	04E	30	51	10	088	32	26	.930	0103	79	T	N	PS
384	LUCEDALE *	LD3MS	136	226	05E	30	39	58	089	02	37	.656	0073	46	T	N	PS
383	LUMBERTON *	LU-MS	111	201	05E	31	02	20	089	14	20	.302	0034	91	T	N	PS
383	LUMBERTON *	LU-MS	110	200	05E	31	02	20	089	14	20	.302	0034	91	T	N	PS
375	LYNDEN *	LY-WA	292	022	17E	48	38	51	122	12	10	16.234	1805	122	V	N	PS
121	MANCHESTER	MX-TN	103	193	03E	35	33	01	086	16	12	24.114	2681	305	T	Y	L
82	MARKED TREE	MK-AR	102	192	05E	35	33	32	090	15	55	20.930	2327	61	T	Y	N

LRSM SITE INFORMATION

SITE	SITE DESIGNATOR		AZIMUTHS		DEC	SITE COORDINATES			DISTANCE	KM	ELEV	T	P	I
36	MARYSVILLE	MV-CL	295	025	17E	39 12 47		121 17 35	4.495	0500	183	V	Y	L+PS
107	MATTAWA	MW-ON	086	176	10W	46 16 31		078 34 18	29.283	3256	244	T	Y	S
351	MCCOMB *	MB-MS	288	018	06E	31 20 34		090 17 11	.645	0072	122	T	N	PS
66	MCCRORY	MY-AR	103	193	06E	35 21 04		091 04 47	20.325	2260	61	T	Y	L
14	MCMINNVILLE	MM-TN	103	193	02E	35 33 52		085 35 20	24.652	2741	391	V	Y	S
142	MEDFORD	MF-WS	076	166	03E	45 20 51		090 35 23	20.845	2318	412	T	Y	L
92	MERRITT	ME-BC	344	074	23E	50 06 21		120 39 56	13.313	1480	1067	T	N	L
126	MIDDLEBURG	MR-PA	095	186	08W	40 48 53		077 10 32	30.375	3378	213	T	Y	L
35	MINA	MN-NV	308	038	17E	38 26 10		118 08 53	1.986	0221	1524	M	Y	L
7	MITCHELL	MC-SD	071	161	09E	43 39 16		097 55 10	15.337	1705	366	V	Y	S
96	MITCHELL	MH-NB	068	158	14E	41 53 20		103 53 30	10.602	1179	1311	T	N	L
23	MOGOLLON	ML-NM	124	214	14E	33 24 53		108 50 11	7.097	0789	1646	M	Y	S
343	MONO LAKE *	ML1CL	110	200	17E	37 52 50		118 50 58	.146	0016	2512	T	N	PS
344	MONO LAKE *	ML2CL	302	032	17E	38 04 50		119 14 39	.225	0025	2987	T	N	PS
341	MONO LAKE *	ML3CL	160	250	17E	37 32 58		118 48 55	.433	0048	2512	T	N	PS
342	MONO LAKE *	ML4CL	312	042	17E	38 18 21		119 33 13	.555	0062	2195	T	N	PS
97	MONTROSE	MS-PA	095	185	10W	41 45 40		075 47 51	31.317	3482	457	T	N	L
191	MOULD BAY (ARY)	NP-NT	356	086	65E	76 15 08		119 22 19	39.193	4358	59	T	N	J
141	MOUNT IDA	MZ-AR	105	195	08E	34 33 31		093 39 28	18.451	2052	213	T	Y	L
345	MOUNTAIN HOME	MO-ID	359	089	18E	43 04 19		115 15 56	5.882	0654	792	S	Y	L
70	MT. BAKER	MU-WA	338	068	23E	48 55 00		121 54 37	12.443	1384	732	T	N	S
13	MTN. PINE	MP-AR	105	195	07E	34 36 06		093 08 45	18.849	2096	183	V	Y	S
212	NAZLINI	NL-AZ	131	221	14E	35 54 05		109 34 10	5.490	0610	1768	V	N	L
226	NAZLINI	NL2AZ	131	221	14E	35 48 25		109 37 43	5.469	0608	1920	V	Y	L
167	NEEDLES	ND-CL	169	259	15E	34 35 57		115 33 05	2.632	0293	366	M	N	S+PS
408	NEV TEST SITE	NT-NV	000	090	16E	37 16 33		116 25 06	0	0000	1987	T	Y	PS SPONLY
409	NEV TEST SITE	NT2NV	000	090	16E	37 15 12		116 17 09	0	0000	2185	T	Y	PS SPONLY
10	NIAGARA (+ARY)	NG-WS	078	168	01E	45 45 27		088 08 57	22.608	2514	396	V	Y	S
153	NIOBRARA RIVER	NR-NB	068	159	13E	42 49 11		101 42 04	12.456	1385	975	T	Y	N
178	NORTH BRANCH	NB-MN	073	163	05E	45 31 58		092 50 51	19.364	2153	259	V	Y	N
222	OAHU, ISLAND	OA-IS	357	087	09E	21 27 27		157 59 47	39.331	4373	183	B	Y	S
399	OAK SPR. BUTTE *	OB-NV	APX	081	16E	37 14 09		116 03 09	.390	0043	1731	M	N	HST
407	OAK SPRINGS BUTTE	OB2NV	000	090	16E	37 13 31		116 03 28	0	0000	1542	T	Y	PS SPONLY
410	OAK SPRINGS BUTTE	OB3NV	NO	HRZ	16E	37 13 57		116 03 15	0	0000	1609	T	N	PS OUTRIG
98	100 MILE HOUSE	HM-BC	343	073	24E	51 39 18		121 28 32	14.945	1662	1128	T	N	L
170	ORLANDO	OR-FL	116	206	01E	28 28 01		081 13 17	30.515	3393	20	V	N	S+DH
185	OSLO (ARY)	OO-NW	138	228	02W	61 03 17		010 51 58	73.049	8123	555	V	Y	L
385	PAHUTE MESA ARY *	PH-NV	VAN						-0		-0			
386	PAHUTE MESA ARY *	PH2NV	VAN						-0		-0			
	JORUM (PH2NV)	1	182	272	16E	37 14 32		116 27 52	.072	0008	1908	T	N	AC
	JORUM (PH2NV)	2	208	298	16E	37 14 58		116 30 16	.073	0008	1899	T	N	AC
	JORUM (PH2NV)	3	227	317	16E	37 15 55		116 31 38	.072	0008	1832	T	N	AC
	JORUM (PH-NV)	4	257	347	16E	37 17 54		116 32 53	.072	0008	1792	T	N	AC
	JORUM (PH-NV)	5	280	010	16E	37 19 36		116 32 58	.072	0008	1695	T	N	AC
	JORUM (PH-NV)	6	303	033	16E	37 21 10		116 32 13	.072	0008	1615	T	N	AC
400	PAHUTE MESA ARY *	PH3NV	VAN						-0		-0			
401	PAHUTE MESA ARY *	PH4NV	VAN						-0		-0			
	HANDLEY (UC-BRK)	1	003	093	16E	37 22 21		116 31 43	.071	0008	1603	T	N	AC
	HANDLEY (UC-BRK)	2	025	115	16E	37 22 00		116 29 44	.072	0008	1658	T	N	AC
	HANDLEY (USGS)	3	048	138	16E	37 20 56		116 27 59	.072	0008	1695	T	N	AC
	HANDLEY (PH3NV)	4	077	167	16E	37 18 59		116 26 46	.072	0008	1890	T	N	AC

LRSM SITE INFORMATION

SITE	SITE DESIGNATOR		AZIMUTHS		DEC	SITE COORDINATES			DISTANCE	KM	ELEV	T	P	I
	HANDLEY (PH3NV)	5	103	193	16E	37	17	04	116 26 46	.072	0008	1951	T	N	AC
	HANDLEY (PH4NV)	6	128	218	16E	37	15	20	116 27 49	.072	0008	1917	T	N	AC
	HANDLEY (PH4NV)	7	154	244	16E	37	14	09	116 29 40	.072	0008	1893	T	N	AC
	HANDLEY (PH4NV)	8	180	270	16E	37	13	42	116 32 03	.072	0008	1841	T	N	AC
224	PALMYRA IS.	PR-IS	000	090	10E	05	53	17	162 05 39	52.099	5793	3	B	N	S
73	PARSONS	PB-TN	102	192	04E	35	44	10	088 08 10	22.589	2512	122	T	Y	L
355	PAYSON (ARY)	PY-AZ	000	090	14E	34	15	15	111 19 37	4.925	0548	1516	V	N	PS
40	PENDLETON	PT-OR	346	076	22E	45	36	40	118 53 02	8.658	0963	411	V	Y	L
64	PERRYVILLE	PV-AR	104	194	07E	34	55	46	092 40 12	19.150	2129	213	T	Y	L
147	PHILIPPI	PX-WV	098	188	05W	39	04	34	079 54 40	28.493	3168	518	T	Y	N
352	PICAYUNE *	PC-MS	197	287	05E	30	33	21	089 46 57	.612	0068	12	T	N	PS
146	PICKFORD	PF-MI	081	171	04W	46	05	16	084 27 39	25.199	2802	259	T	Y	S
59	PILOT ROCK	PK-OR	345	075	20E	45	19	03	118 54 33	8.379	0932	1036	T	N	L
80	PINE CREEK	PN-OR	344	074	19E	43	44	35	118 34 38	6.798	0756	1250	T	N	N
201	PINEDALE	PI-WY	046	136	16E	42	27	10	109 32 55	7.340	0816	2170	V	Y	S+DH
227	PINEDALE	PI2WY	045	135	16E	42	46	02	109 33 43	7.553	0840	2195	B	Y	S+DH
227	PINEDALE	PI2WY	000	090	16E	42	46	02	109 33 43	7.553	0840	2195	B	Y	S+KS
89	PINEVILLE	PE-WV	100	190	02W	37	36	53	081 39 55	27.351	3041	427	T	Y	L
120	PIPESTONE	PP-MN	072	162	06E	44	04	39	096 09 03	16.685	1855	533	T	Y	N
4	POLE MTN.	PM-WY	068	158	15E	41	12	27	105 21 39	9.324	1037	2469	V	Y	S
370	POMEROY *	PH-WA	318	148	20E	46	19	25	117 19 41	12.253	1362	945	V	Y	L
197	PONCE	PZ-PR	124	214	07W	17	58	12	066 25 04	47.517	5284	5	V	Y	S+DH
262	PONTIAC	PW-IL	UP	UP	03E	40	54	58	088 35 07	21.731	2416	210	T	N	PS
45	POST *	PO-TX	061	151	10E	33	28	32	101 21 44	2.429	0270	914	V	Y	L
390	POTTSTOWN	PJ-PA	097	187	09W	40	16	58	075 35 01	31.509	3504	91	T	N	PS
373	PRESTON *	PQ-ID	309	039	17E	42	13	41	111 42 57	6.547	0728	1554	T	N	PS
103	PRINCE GEORGE	PG-BC	343	073	25E	53	59	50	122 31 23	17.375	1932	914	T	N	L
103	PRINCE GEORGE *	PG-BC	110	200	25E	53	59	50	122 31 23	34.547	3841	914	V	N	L
379	PRINCE GEORGE *	PG2BC	110	200	25E	53	59	28	122 30 44	34.355	3842	747	B	Y	S
379	PRINCE GEORGE *	PG2BC	110	200	25E	53	59	28	122 30 44	34.582	3845	747	B	Y	PS
379	PRINCE GEORGE *	PG2BC	320	050	25E	53	59	28	122 30 44	17.466	1942	747	B	Y	PS
91	PRINCETON	PD-BC	344	074	23E	49	23	32	120 28 35	12.592	1400	914	T	N	L
228	PURVIS	PU-MS	113	203	05E	31	09	07	089 32 56	22.818	2537	91	T	N	PS
397	QUARTZITE MTN. *	QM-NV	APX	020	16E	37	33	47	116 19 04	.313	0035	1878	M	N	HST
100	QUESNEL	QN-BC	342	072	25E	52	57	25	122 23 45	16.358	1819	610	T	N	L
150	RAINELLE	RN-WV	099	189	03W	38	04	35	080 50 54	27.913	3104	853	T	Y	L
55	RATON	RT-NM	096	186	13E	36	43	46	104 21 37	9.489	1055	1951	V	Y	S
55	RATON *	RT-NM	355	095	13E	36	43	46	104 21 37	4.473	0497	1951	V	Y	S
394	RAWHIDE MTN. *	RH-NV	APX	325	16E	38	13	36	116 22 53	.932	0104	1768	M	N	HST
394	RAWHIDE MTN.	RH-NV	000	090	16E	38	13	36	116 22 53	1.052	0117	1768	V	N	S
189	RED LAKE	RK-ON	058	148	06E	50	50	20	093 40 20	21.076	2344	366	B	N	S
189	RED LAKE *	RK-ON	127	217	06E	50	50	20	093 40 20	51.497	5726	366	B	N	PS
189	REDLAKE *	RK2ON	048	138	06E	50	50	20	093 40 20	15.277	1699	366	B	N	PS
239	REDIG *	RG-SD	127	217	14E	45	12	59	103 32 05	49.529	5507	945	V	Y	L
144	RIB LAKE	RL-WS	077	167	03E	45	18	29	090 05 55	21.172	2354	472	T	Y	L
381	RICHTON *	RI-MS	085	175	05E	31	11	52	088 51 03	.619	0069	37	T	N	PS
254	RUSSELL SPRINGS	RS-KY	100	190	01E	37	11	55	084 52 06	24.906	2769	274	T	N	PS
190	RYDER	RY-ND	050	140	12E	48	05	50	101 29 40	15.335	1705	640	V	Y	S+PS
118	SALEM	SX-SD	072	162	09E	43	52	29	097 15 00	15.867	1764	488	T	Y	L
359	SAN ANGELO	SA2TX	UP	UP	10E	31	33	00	100 54 27	13.820	1537	732	T	N	PS
360	SAN ANGELO	SA4TX	118	208	11E	31	49	29	101 25 35	13.301	1479	792	T	N	PS

LRSM SITE INFORMATION

SITE	SITE DESIGNATOR		AZIMUTHS		DEC	SITE COORDINATES		DISTANCE	KM	ELEV	T	P	I
30	SAN JOSE	SJ-TX	127	217	09E	27 36 43	098 18 46	17.843	1984	114	V	Y	S+PS
30	SAN JOSE *	SJ-TX	137	227	09E	27 36 43	098 18 46	64.406	7162	114	V	Y	S
30	SAN JOSE *	SJ-TX	136	226	09E	27 36 43	098 18 46	64.920	7219	114	V	Y	L
30	SAN JOSE *	SJ-TX	131	221	09E	27 36 43	098 18 46	18.558	2064	114	T	Y	PS
30	SAN JOSE *	SJ-TX	137	227	09E	27 36 43	098 18 46	64.445	7166	114	T	Y	PS
30	SAN JOSE *	SJ#TX	148	328	09E	27 36 43	098 18 46	14.414	1603	114	T	Y	PS
29	SANDERSON (+ARY)	SS-TX	125	215	11E	30 01 17	102 19 41	13.582	1510	732	V	Y	L
136	SAULT STE. MARIE	SL-ON	080	170	04W	46 38 14	084 21 02	25.368	2821	335	T	N	N
217	SCHEFFERVILLE ARY	SV2QB	083	173	32W	54 48 54	066 45 31	37.693	4191	594	V	Y	S
231	SCHEFFERVILLE *	SV3QB	139	229	32W	54 48 39	066 45 00	60.781	6759	579	V	Y	S
229	SCHUYLER	SU-VA	101	191	03E	37 45 35	078 43 36	29.621	3294	165	T	N	PS
210	SELIGMAN	SG-AZ	131	221	14E	35 38 27	113 15 39	2.826	0314	1676	V	N	L
81	SENECA	SA-OR	344	074	19E	44 09 20	118 39 45	7.212	0802	1524	T	N	N
46	SEYMOUR *	SM-TX	071	161	10E	33 40 56	099 11 23	4.177	0464	396	V	Y	L
124	SHAMOKIN	SH-PA	096	186	09W	41 00 49	076 54 49	33.552	3397	183	T	Y	L
183	SHAMROCK	SK-TX	104	194	11E	35 04 58	100 21 50	12.975	1443	671	V	Y	L
366	SHEMYA	SQ-IS	000	090	03E	52 43 37	174 06 33	49.740	5531	61	T	N	PS
154	SHOAL	SZ-NV	319	049	17E	39 12 13	118 22 48	2.649	0295	1606	T	N	S
8	SLEEPY EYE	SE-MN	073	163	07E	44 24 51	094 39 55	17.804	1980	244	V	Y	S
242	SMITHERS *	SI-BC	107	197	27E	54 47 18	127 04 17	31.773	3533	579	V	Y	L
242	SMITHERS *	SI-BC	107	197	27E	54 47 18	127 04 17	32.373	3600	579	V	Y	PS
21	SNOWFLAKE	SF-AZ	122	212	14E	34 26 19	110 30 52	5.370	0597	1981	V	Y	L
93	SOREL	SO-QB	091	181	17W	45 45 18	072 15 18	33.667	3744	152	T	N	S
166	SPARTA (ARY)	SR-OR	000	090	20E	44 56 25	117 25 40	7.805	0868	1341	T	N	L+S
22	SPRINGERVILLE	SV-AZ	120	210	14E	34 10 32	109 08 49	6.477	0720	2134	V	N	L
365	ST PAUL	SP-IS	000	090	13E	57 09 15	170 13 05	40.512	4505	10	T	N	PS
104	STICKNEY	SY-SD	071	161	10E	43 36 20	098 29 30	14.929	1660	488	T	Y	L
158	STILLWATER	ST-NV	320	050	17E	39 26 17	118 34 48	2.928	0326	1219	T	N	S
356	STREETER	ST1TX	119	209	10E	30 45 08	099 21 20	15.369	1709	518	T	N	PS
357	STREETER	ST2TX	119	209	10E	30 47 32	099 26 52	15.280	1699	579	T	N	PS
358	STREETER	ST4TX	UP	UP	10E	31 09 48	100 03 40	14.640	1628	640	T	N	PS
230	SUBARRAY AO (ARY)	-AOMA	042	132	16E	46 41 19	106 13 20	12.048	1340	897	V	Y	S+HS
213	SUNFLOWER	SN-AZ	131	221	14E	33 51 49	111 41 34	4.947	0550	884	V	N	L
161	SUTCLIFFE	SC-NV	314	044	18E	39 52 26	119 38 27	3.808	0423	1341	T	N	N
232	SWEETGRASS *	SW-MA	121	211	19E	48 58 08	111 57 46	42.661	4744	1113	V	Y	S
24	T OR C	TC-NM	122	212	13E	33 11 03	107 27 42	8.190	0911	1524	V	Y	L
56	TAFT	TF-CL	235	325	16E	35 09 49	119 58 03	3.654	0406	793	V	Y	L
56	TAFT *	TF-CL	130	220	16E	35 09 49	119 58 03	45.820	5095	793	V	Y	S
417	TATUM DOME	TQ-MS	000	090	06E	31 07 58	089 34 16	22.642	2518	130	T	N	PS SPONLY
368	THERMOPOLIS *	TL-WY	354	084	16E	43 23 30	108 05 17	6.869	0764	1615	V	Y	L
244	THULE *	TE-GL	125	215	76W	76 29 50	064 36 20	45.378	5046	213	B	Y	PS
244	THULE	TE-GL	057	147	76W	76 29 50	068 36 20	44.645	4964	213	B	Y	PS
43	TIPPIPAH *	TP-NV	292	022	16E	37 12 01	116 13 34	11.296	1256	2256	V	N	L
48	TISHOMINGO	TO-OK	105	196	09E	34 21 23	096 34 05	15.183	1799	259	V	Y	L
48	TISHOMINGO *	TO-OK	073	163	09E	34 21 23	096 34 05	6.456	0718	259	V	Y	L
398	TOLICHA PEAK *	TI-NV	APX	267	16E	37 17 07	116 52 01	.266	0030	1524	T	N	HST
155	TOMAHAWK	TM-WS	077	167	02E	45 29 31	089 30 11	21.623	2404	488	T	Y	N
184	TONASKET	TK-WA	347	077	22E	48 47 38	119 35 16	11.865	1319	549	V	Y	L
225	TONGAREVA IS.	TG-IS	184	274	11E	09 03 36	158 02 08	60.422	6719	3	V	N	S
122	TRACY	TY-MN	073	163	08E	44 20 45	095 31 11	17.198	1912	351	T	N	N
192	TRES PIEDRAS	TD-NM	097	187	13E	36 39 20	106 10 18	8.051	0895	2926	V	N	L

LRSM SITE INFORMATION

SITE	SITE DESIGNATOR		AZIMUTHS		DEC	SITE COORDINATES			DISTANCE	KM	ELEV	T	P	I
219	TROTTERS	TS-ND	048	138	14E	47 06 25	103 40 23		13.573	1509	816	V	Y	L+DH+SH
151	TROUT LAKE	TT-MI	080	170	04W	46 12 35	085 10 04		24.735	2750	259	T	N	N
114	TUNKHANNOCK	TU-PA	095	185	10W	41 34 17	076 08 12		31.081	3456	366	T	Y	L
32	29 PALMS	TN-CL	176	266	15E	34 11 54	115 57 00		2.985	0332	533	M	Y	L
68	UKIAH	UK-OR	345	075	20E	45 05 35	118 53 55		8.160	0907	1311	T	N	L
39	VENATOR	VT-OR	343	073	20E	43 06 49	118 24 53		6.162	0685	1341	V	Y	L
3	VERNAL	VN-UT	059	149	16E	40 30 31	109 34 45		6.142	0683	1768	V	Y	S
172	VINTON	VO-IO	083	173	05E	42 13 30	092 07 37		19.171	2132	274	V	Y	S
164	WAH WAH MTS.	WW-UT	058	148	16E	38 30 50	113 35 20		2.457	0273	1829	V	N	L+PS
50	WALNUT RIDGE *	WR-AR	074	164	06E	36 03 30	091 13 19		11.136	1238	122	V	Y	L
376	WARM SPRINGS	WZ-NV	260	350	17E	38 03 46	116 26 23		7.486	0832	2073	M	N	PS
129	WARTBURG	WT-TN	102	192	01E	36 06 35	084 45 28		25.196	2802	427	T	Y	L
250	WATERWAYS *	WS-AT	113	203	24E	56 39 34	111 16 07		39.560	4399	366	T	N	PS
250	WATERWAYS *	WS-AT	113	203	24E	56 39 34	111 16 07		40.160	4466	366	T	N	PS
393	WATSEKA	WQ-IL	090	180	02E	40 51 56	087 35 11		22.364	2487	198	T	Y	PS
393	WATSEKA *	WQ-IL	092	182	02E	40 51 56	087 35 11		15.833	1761	198	T	Y	PS
113	WATSON	WA-OK	105	195	08E	34 26 30	094 29 28		17.816	1981	305	T	Y	L
236	WATSON LAKE *	WL-YK	097	187	32E	60 07 00	128 45 52		29.796	3313	716	V	N	L
236	WATSON LAKE *	WL-YK	097	187	32E	60 07 00	128 45 52		30.394	3380	716	V	N	PS
248	WHITEHORSE *	WH-YK	090	180	31E	60 44 03	135 08 57		26.599	2958	762	T	N	PS
350	WHITEHORSE	WH2YK	325	055	31E	60 41 41	134 58 02		26.370	2932	853	B	Y	S
350	WHITEHORSE *	WH2YK	091	181	31E	60 41 41	134 58 02		26.705	2969	853	B	Y	PS
350	WHITEHORSE *	WH2YK	325	055	31E	60 41 41	134 58 02		26.966	2998	853	B	N	PS
19	WILLIAMS	WM-AZ	120	210	15E	35 25 04	112 12 54		3.669	0408	1920	V	N	L
99	WILLIAMS LAKE	WK-BC	343	073	24E	52 10 43	121 58 54		15.539	1728	975	T	N	L
403	WILLS POINT	WP-TX	000	090	09E	32 36 25	095 53 10		17.273	1921	161	V	Y	S+TX
127	WINDOM	WD-MN	074	164	07E	44 06 58	095 09 18		17.383	1933	381	T	Y	N
38	WINNEMUCCA	WI-NV	346	076	18E	41 21 02	117 27 30		4.275	0475	1524	M	Y	L
6	WINNER	WN-SD	069	159	12E	43 15 08	100 11 46		13.641	1517	792	V	Y	S+DH
6	WINNER *	WN-SD	129	219	12E	43 15 08	100 11 46		52.628	5852	792	V	Y	L
6	WINNER *	WN-SD	129	219	12E	43 15 08	100 11 46		53.158	5911	792	V	Y	L
208	WINSLOW (+ARY)	WO-AZ	131	221	14E	34 52 53	110 37 15		5.071	0564	1585	V	N	L
174	WYKOFF	WF-MN	078	168	05E	43 48 05	092 22 23		19.255	2141	381	V	Y	S
77	WYNNE	WY-AR	102	192	06E	35 36 44	090 42 25		20.567	2287	122	T	Y	N
86	YAKIMA	YA-WA	342	072	21E	46 30 00	119 55 12		9.713	1080	610	T	N	S
246	YREKA *	YR-CL	125	215	19E	41 38 07	122 45 14		40.148	4464	914	V	Y	S
246	YREKA *	YR-CL	124	214	19E	41 38 07	122 45 14		40.655	4521	914	V	Y	L
246	YREKA *	YR-CL	125	215	19E	41 38 07	122 45 14		40.707	4526	914	V	Y	PS
411	YUCCA FLAT NTS	YF-NV	000	090	16E	37 04 06	116 00 07		0	0000	1271	T	Y	PS SPONLY
412	YUCCA FLAT NTS	YF2NV	NO	HRZ	16E	37 04 10	116 00 44		0	0000	1260	T	N	PS OUTRIG
413	YUCCA FLAT NTS	YF3NV	NO	HRZ	16E	37 04 22	116 01 27		0	0000	1254	T	N	PS OUTRIG
414	YUCCA FLAT NTS	YF4NV	000	090	16E	37 04 29	116 02 12		0	0000	1244	T	Y	PS SPONLY
396	YUCCA MTN. *	YM-NV	APX	183	16E	36 55 53	116 33 15		.369	0041	1341	T	N	HST

TOTAL SITES SELECTED 417

LEGEND

SITE NUMBERS AFTER 55 RELATE TO ORIGINAL PERMIT DATE SEQUENCE.

SITE DESIGNATION - A MAP NAME NEAR THE SITE WITH A FIVE-CHARACTER STATION CODE. (ARY) INDICATES ARRAY SITE. (+ARY) INDICATES ARRAY INSTRUMENTATION ADDED TO ORIGINAL SITE. DATA GIVEN FOR ARRAY SITES ARE GENERALLY FOR THE CROSS OR CENTER POINT. PH-NV AND PH2NV VAN SITES SUPPORTED ACCELEROMETER ARC FOR JORUM EVENT, AND INDIVIDUAL ARC STATIONS ARE REPORTED. PH3NV AND PH4NV VAN SITES SUPPORTED ACCELEROMETER ARC FOR HANDLEY EVENT, AND INDIVIDUAL ARC STATIONS ARE REPORTED.

AZIMUTHS - STATION AZIMUTHS IN DEGREES ARE FOR ON-SITE RADIAL AND TRANSVERSE HORIZONTAL SEISMOMETER ORIENTATION. EARTH MOTION TOWARDS THESE DIRECTIONS RESULTS IN MAXIMUM POSITIVE RECORD TRACES. WITH THE EXCEPTION OF SOME SITES OCCUPIED FOR SPECIAL PROGRAMS, ORIENTATION IS GENERALLY FOR NEVADA TEST SITE EVENTS. NTS COORDINATES USED FOR AZIMUTH AND DISTANCE COMPUTATIONS ARE 37.183 DEGREES N. LAT. AND 116.200 DEGREES W. LONG. AZIMUTHS FOR HORIZONTAL STRAINMETERS ARE APPROXIMATE, AND ARE NOT NECESSARILY IN-LINE-RADIAL FROM EVENT.

SITE DUPLICATION - INDICATES REORIENTATION OF SEISMOMETERS, OR REOCCUPATION WITH OTHER TYPE SEISMOMETERS/SENSORS.

DECLINATION - THE MAGNETIC DECLINATION OF THE COMPASS IN DEGREES AT THE SITE, EAST OR WEST OF TRUE NORTH.

SITE COORDINATES - GEOGRAPHIC COORDINATES IN DEGREES, MINUTES, AND SECONDS OF LATITUDE AND LONGITUDE. GENERALLY TAKEN FROM MAP PLOTS WITH PLUS OR MINUS 20 SECONDS MAXIMUM ERROR.

DISTANCES - DISTANCES ARE GIVEN IN GREAT CIRCLE DEGREES AND KILOMETERS TO THE EVENT. DEGREE DISTANCE DECIMALS ARE NOT ROUNDED-OFF. KILOMETER DISTANCES ARE CORRECTED TO THE NEAREST KILOMETER.

ASTERISKS - IF A SITE NAME IS FOLLOWED BY AN ASTERISK, DISTANCES ARE TO A SPECIAL EVENT. OTHERWISE, DISTANCES ARE TO THE NEVADA TEST SITE.

ELEVATIONS - ELEVATIONS ARE GIVEN IN METERS ABOVE OR BELOW MEAN SEA LEVEL.

T - TYPE OF SURFACE SEISMOMETER PROTECTION EMPLOYED AT SITE.

M = MINE	V = VAULT
T = TEMPORARY (HUT, ROOFED-EXCAVATION, STRAIN TRENCH, ETC.)	
B = BUNKER	S = MISSILE SILO

P - AVAILABILITY OF COMMERCIAL POWER.

Y = YES	N = NO

I - PRIMARY SENSOR INSTRUMENTATION INSTALLED.

N = NEVER OCCUPIED	L = LARGE BENIOFF	S = SMALL BENIOFF
PS = PORTABLE SYSTEM	DH = GEOTECH DEEP HOLE	SH = GEOTECH SHALLOW HOLE
HS = HALL SEARS	AC = ACCELEROMETER	J = JOHNSON MATHESON
VST = VERTICAL STRAIN	HST = HORIZONTAL STRAIN	TX = GEOTECH TRIAXIAL
KS = MODEL 36000 (KS) SEIS	OUTRIG = OUTRIGGER SITE, VERT ONLY	

SEPTEMBER 1977