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PRELIMINARY REPORT #2

Tavera-Bao Seismic Network
Dominican Republic

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1. INTRODUCTION

After the installation of the Tavera-Bao seismic network, five months have elapsed. This report is to review the performance of the network and analyse the data returned to the Marine Science Institute. The data from December 13,1979 to April 15, 1980 was analysed before this report was prepared.

The data revealed some of the important features of the seismic activity in central Dominican Republic. However, the data analysed is still scanty, and conclusions resulting from microearthquake monitoring should be regarded as preliminary and be subject to later revision when more data is implemented in the future.

2. HISTORICAL SEISMICITY

2-1. Earthquakes Located by Felt Reports; 1564-1910

From the records of earthquakes felt by the populus and the reports of damage accompanying the events, it is possible to construct a map showing the locations of earthquake-damaged areas for time periods prior to instrumental locations of earthquakes. Many of the historical reports for earthquakes within Hispaniola are summarized by Taber (1922), and it is from this summary that the map of Figure 1A was constructed (with frequent reference to the original works cited by Taber). This map indicates the areas known to have experienced intensities IX-X (modified Mercalli scale), as judged from the reports, during the period 1564-1910. Frequently, researchers will associate the areas of such high intensities with the area of actual rupture during the earthquake (e.g., Kelleher, 1973), and a correlation of these intensities with rupture area can be shown to exist, in general, for recent earthquakes. In the Dominican Republic, however, the record-keeping population was not widely enough distributed to permit an accurate picture of the high-intensity isoseismals, which can be seen to cluster about the population center of the times.

The map in Figure 1A is, then, a realistic view of what population centers were severly damaged during large earthquakes in the last few centuries, but should not be taken as a map of the actual earthquake distribution during that time. At best, it indicates that large portions of Hispaniola have been visited recurringly by earthquake destruction. Specifically, in the past few centuries, northern and southwestern Haiti have been repeatedly struck by damaging events, and the northwestern and southeastern parts of the Dominican Republic are frequently damaged by earthquakes. The apparent absence of large events in, say, the northeastern Dominican Republic may be more an effect of the sparse population there in historic times, rather than an absence of earthquakes. Indeed, in the next paragraph we will see that events located remotely from population centers can give rise to large intensities (estimated from damage reports) far from the epicenter itself, with no reported damage coming from the epicentral area.

2-2. Comparison of Felt Reports With Instrumentally-determined Epicenters; 1911 and 1916

It is instructive to compare the locations of felt reports, and the earthquake locations as determined by those reports, with instrumentally-determined epicenters. The 1911 and 1916 events shown in Figure 1A were reported by Taber (1922), and his estimates for the epicentral locations of those events are marked (by x's). Gutenburg and Richter (1956) subsequently located those two events instrumentally, and their locations are shown in Figure 1B. Taber's estimate for the 1911 event, in the interior of the country, is off by only 60 km, but the 1916 event, felt in Santo Domingo, was located by Taber over 150 km west of its actual location in the Mona Passage. It is likely that many of the events reported felt in the southern part of the country had their origin in the Mona Passage or well offshore to the south. Another event in 1916, located by Gutenburg and Richter (1956) off the northern coast of the Dominican Republic, was not mentioned by Taber (1922).

2-3. Large Earthquakes Located Instrumentally; 1911-1945

Many earthquakes with magnitudes over 5.5 were located by instrumental observations from 1911 through 1945; the epicentral locations with a probable error of about 50 km, are shown in Figure 1B. The activity is largely located in the Mona Passage and along the northeastern coast of the country.

2-4. Large Earthquakes; 1946-1953

The period 1946 through 1953 was especially active for seismicity in the Dominican Republic, and the improved capabilities of the worldwide seismograph network permits location of the aftershocks of major events, thus outlining the area of rupture. The mainshock-aftershock sequences have been relocated by Kelleher (1973) and Sykes and Ewing (1965).

The 1946 earthquake (M=8.1) was followed by an aftershock sequence covering about 175 km x 75 km. The mainshock-aftershock pattern and the isoseismals found by Scherer and Bodle (1948) are shown in Figure 1C. In 1948 (M=7.3) and 1953 (M=6.9) events with aftershock areas occurred within and to the northwest of the 1946 rupture area (see Figure 1D).

2-5. Recent Seismicity and Focal Mechanisms From Observations of the World-wide Network; 1950-1978

Events from 1950 through February 1963 (except the 1953 sequence of Figure 1D) as located by Sykes and Ewing (1965) and from March 1963 through September 1978 as located by the U. S. Geological Survey and its predecessors, are shown in Figure 1E, along with focal mechanism determinations for four of the events (from Molnar and Sykes, 1969, and Kafka and Weidner, 1978). Only the reasonably well-located events are shown in this figure, which also differentiates between the shallow- and deep-focus events.

The shallow-focus seismicity is concentrated in two areas of the Dominican Republic: The northeastern coastline and mountainous areas, and in the south, especially in the western half of the country. The deep-focus seismicity is concentrated along a zone trending NW-SE in the southeastern part of the country. The focal mechanisms for the shallow-focus events demonstrate thrusting; in the seismic zone along the northeastern coast the thrusting is in a NE-SW direction (although the mechanism is poorly constrained), and offshore near the southern seismic zone, the thrusting is in a N-S direction. The focal mechanisms for the deep-focus events are typical of such events in subduction zones, where the seismicity does not extend to great depths. The tension axes are nearly vertical, suggesting that the subducted lithosphere, in which they presumably occur, is also nearly vertical.

3. OPERATION OF THE TAVERA-BAO SEISMOGRAPH NETWORK

The Tavera-Bao Seismograph network started its operation on December 13, 1979. During the past 4 month period (December 13, 1979 through April 15, 1980 the Computerized Seismic Monitoring System (COSMOS) has been operating successfully over 80 per cent of the recording time and has registered approximately 600 earthquakes including 73 events generated by the explosions.

Figure 2 shows the down times of COSMOS and the remote stations.

Of six main disruptions of recording experienced in the past 4 months, three occurred in December, 1979. The cause of these disruptions were attributed to an intentional stop for the purpose of calibrating the system, running out of recording paper and malfunction of the time mark system. Two disruptions in February and March, 1980, were results of the failure of the Versatec Printer/Plotter power supply system. The latter was caused by a direct hit of lightning which struck the central recording station on March 7. On both occasions, the repairs were made by Ing. Jose Sanchez under consultation with the University of Texas by telephone. Ample spare parts to support such an emergency repair will be provided in the near future.

Malfunction of the remote stations were reported on six occasions. The causes of malfunction include low battery voltage (before the solar panels were installed), damaged geophone cable, damaged PA/VCO and damaged transmitter/receiver. The last two are usually the most popular causes for malfunctioning of the remote stations. The average down time for each malfunction is 21.2 days and probably some effort to shorten the down time should be taken in the future.

4. EPICENTER DETERMINATION

The data covering the period from December 13, 1979 through April 15, 1980 was returned to the Marine Science Institute, University of Texas, for detailed analysis.

During this 4-month period, the Tavera-Bao seismograph network detected approximately 5 events/day (588 events total), of which 389 epicenters were located. Table 1 shows the listing of all the events detected by the network.

This section describes the procedure deployed in our epicenter determination. The computer program has several restrictions on its capability to determine the epicenters, and one has to be aware of these limitations when utilizing the results for more detailed analysis:

4-1. Dependency on the Crustal Model

A computer program for epicenter determination, DREPC 1, has been developed for the Tavera-Bao seismograph network. This program, similar to other epicenter programs, requires an assumed crustal model to calculate an epicenter, and the resulting foci are, in general, dependent on the assumed crustal model. This dependency of computed epicenter on the crustal model is typically illustrated in Figure 3. In the figure, two different epicenters calculated from different crustal models are shown. All the events exhibited in this figure are generated from explosions and their shot points are indicated by stars (★) and labeled I through VII. Of the two different symbols for epicenters, open circle indicates the epicenter calculated from the crustal model A, and closed circle indicates one from the crustal model B. The corresponding pair is connected by a solid line to show the correlation. Two crustal models, A and B, are shown in Tables 2A and 2B.

The model B, that has lower velocity at shallow depths, is more adequate for the Tavera-Bao network than model A since the closed circles distribute much closer to the actual shot points.

Even the model B is not the final model. There still remains approximately 1 km of systematic offset between the shot points and the closed circles. Usually starting from an assumed crustal model, we gradually improve the model to make it fit better to various data.

Explosions, especially with well-documented locations and accurately measured shot times, are useful to improve the crustal model.

When a sufficient amount of earthquake data is accummulated, we will deploy a technique called "joint hypocenter and velocity determination". By this method, both velocity structure and a large number of foci can be determined simultaneously. However, this requires extensive data set and sophisticated data handling technique in addition to a vast amount of computer time.

4-2. Dependency on the Distribution of Stations

The precision of the epicenter determination is also affected by the distribution of the stations. For instance, if the stations are distributed on a straight line, we are unable to determine an accurate epicenter. Practically, if two of the stations located at opposite sides (such as stations 4 and 6 or 5 and 7) fail to function simultaneously, the rest of the stations are distributed approximately on a straight line and the epicenter determined from these data is not by any means trustworthy. There is a rather complicated pattern of error distribution according to the distribution of the stations (Flinn, 1965). Initially, the location of the remote stations for the Tavera-

Table 2A. Crustal Structure used in epicenter determination (MODEL A)

No.	Vp (km/sec)	Vs (km/sec)	Thickness (km)
1	5.10	2.94	8.20
2	6.20	3.58	12.90
3	6.60	3.81	22.30
4	7.90	4.57	16.60
5	8.15	4.71	

Table 2B. Modified Crustal Structure used in epicenter determination (MODEL B)

No.	Vp (km/sec)	Vs (km/sec)	Thickness (km)
1	4.00	2.24	3.20
2	5.70	3.20	5.00
3	6.20	3.58	12.90
4	6.60	3.81	22.30
5	7.90	4.57	16.60
6	8.15	4.71	- -

Bao network was selected so that requirements of optimum distribution were fulfilled. If some of the stations fail to operate, however, the error distribution alters from the original pattern and special care must be taken to evaluate the precision of the epicenter determination.

Flinn, E. A. "Confidence Regions and Error Determinations for Seismic Event Location", Rev. of Geophysics, 3: (1965), 157.

4-3. Distant Earthquakes

If an earthquake occurs at greater distance, compared with the size of the network, the epicenter determination usually bears a large error. This is similar to tri-angulating a distant object from a short base line. Similar conditions emerge for deep-focus earthquakes if the spread of the network is not sufficiently large as compared to the depth of the events. In addition, predominance of a low-frequency component characterizes that the onset of the first arrival of a distant earthquake will be gradual and indistinguishable. In most of the cases, the readings of the first arrivals are far less accurate for distant earthquakes than those from near-by earthquakes which is characterized by a high-frequency component.

4-4. Other Factors Affecting the Precision of Epicenter Determination

When an earthquake occurs, the strain energy accumulated in the earth is rapidly converted to kinetic energy and released as seismic waves. The radiation of kinetic energy, however, is not uniform in all directions. Because of this directive nature, there is a direction for which a P-wave is almost invisible yet an S-wave is very strong, and vice versa. If a station is located along this nodal line for a P-wave, there is a tendency to misinterpret the S-wave as the first arrival, and the resulting epicenter determination is erroneous.

4-5. Restriction Within the Computer Program

Within the epicenter program (DREPC 1), the following procedure is adopted: The program comptes the coordinate of the source (x_o, y_o and z_o) and the origin time (t_o). If only 4 readings are available, the program calculates all four parameters but no error estimate is available. For more than 5 readings, the least-square fitting method is adopted. In this process, a different weighing factor is assigned for the readings of P-waves and those of S-waves. In this program, S-wave is assigned only 1/3 of the weight because the timing precision for S-wave reading is far laess than those of P-waves.

If only 3 readings are available, or if a negative depth is obtained during the iteration process, the depth is automatically assigned at 5 km and fixed at this value thereafter.

If the displacement of the source coordinate is diverging on each iteration step, and reached to overflow the eigen value function, the iteration process is discontinued and calculated coordinates (longitude, latitude) are equated to zero.

In conclusion, the precision of the epicenter determination is affected by various factors described above. Therefore, the results of epicenter determination should be carefully weighed before applying to further analysis. It is suggested that any earthquake within the following categories should be considered to have a large error.

a. The standard deviation of the eigen-value function (s) is greated than 0.5 or the standard deviation for the coordinate (DX, DY, DZ) is sufficiently large.

b. The displacement of the source coordinate has diverged during the iteration process (Longitude and Latitude are equated to zero for these events.

c. The quality factor (IQ) is greater than 4 except for the explosion events (IQ is assigned as 7).

d. Depth information is not reliable for the events fixed at 5 km.

5. LIMITATION OF AUTOMATIC EPICENTER DETERMINATION PROGRAM

The Computerized Seismic Monitoring System (COSMOS), deployed in the Tavera-Bao Seismograph Network as a key element of the central recording system, has a feature of automatic epicenter determination.

This automatic epicenter program gives prompt solution for the epicenter determination, and is a powerful tool to monitor the seismic activity that may occur near the dam site, such as water-induced earthquakes. Since some of such earthquakes proved to be severe enough to threaten the safety of the dam, the real-time epicenter determination is highly desireable.

However, this highly automated feature is still in the cradle of the experimental stage. In addition, there are some limitations resulting from the nature of automatic data processing. Therefore, one has to be aware of the following restrictions for utilizing the automatic COSMOS epicenter determination.

a) Because of the nature of real-time processing, the computer-selected P-arrival time is always 0.1 to 0.2 seconds behind the actual arrival time. As a result of this time lag, the calculated epicenter may have been shifted up to 2 km from the foci determined by the reading provided by a skilled person.

b) For an event with slow and gradual onsets, the computer fails to identify the onset at the correct place and select the reading with relatively greater error (up to 0.5 to 1 second). If such a large error in the reading is involved, the resulting epicenter is erroneous. A great portion of distant earthquakes usually fall into this category.

c) The COSMOS is unable to identify the arrival of S-waves. S-wave arrival is a key for a better determination for distant or deep focus earthquakes.

Table 3 shows the comparision of the foci determined by COSMOS automatic program and the conventional, eye-ball analysis. Of 92 events compared, only 22 events (in class AA and A) are sufficiently close to each other. The majority of these events are generated by the explosions, for which the onset of P-arrivals is usually large and sharp. On the other hand, the number of events in class C and D, that are considered to be erroneous determination, amounts to 66, three times as many as the number of the events in the classes AA and A combined. Most of these events are either events that occured at greater distances and/or those registered with small and gradual onset. At least one misidentified reading, which is responsible for large error, was involved in the automatic epicenter determination. Therefore, the results from the automatic epicenter determination should be regarded as a preliminary effort. If these preliminary results are to be utilized for more detailed analysis, it is necessary to determine whether any errors are involved in the identification of the onset.

Table 3. Comparison of epicenters determined by COSMOS program and the conventional method

Class	* Error km	No. of events	No. of events that include misidentified onset by COSMOS
AA	less than 2 km	7	
A	2 km E 10 km	15	
B	10 km E 20 km	4	1
C	20 km E 50 km	21	19
D	More than 50 km	45	45

* Error indicates the difference between two epicenter determinations.

6. REGIONAL DISTRIBUTION OF EARTHQUAKES

Distribution of earthquakes in central Dominican Republic is illustrated in Figure 4. This figure includes the events recorded by the Tavera-Bao network during the period of December 13, 1979 through April 15, 1980, but the events with large errors (as described in Section 4) are omitted from this figure.

An X represents an event shallower than 60 km and an open square indicates an earthquake deeper than or equal to 60 km. The size of the symbol is approximately proportional to the magnitude of the earthquake.

6-1. Shallow Seismicity

In this figure, the most extensive activity of shallow earthquakes can be observed approximately along the meridian of 70° 40' (located near Puerto Plata, not shown in this figure). This activity is oriented NNW-SSE and extended 40 km long. At the southern end, this trend bends sharply towards the west.

A scattered seismicity, roughly oriented WNW-ESE distributes along the northern shore of the Dominican Republic between 69° 30' and 71° 30'. This weakly defined zone includes the activity near Puerto Plata described above. With the exception of one event located north of Samara, the earthquakes in this seismic zone are shallow. As described in section 8, the composite fault plane solution supports left lateral strike-slip mechanism. These observations are in agreement with the nature of transform movement of

Caribbean-North American plate boundary. This active zone, although highly scattered, is expected to constitute a segment of the circum Caribbean Seismic belt.

Most of the destructive earthquakes occured in the Dominican Republic during 1920 through 1945 (Figures 1B, 1C and 1D) and were distributed along this plate boundary. The activity along this seismic zone is believed to be the highest in the Dominican Republic.

Within a weakly defined seismic zone along the plate boundary, there seems to be small localized trends directing north to northeast. This trend is typically exhibited by the activity near Puerto Plata (Fig. 4) and the two aftershock zones following the 1948 and 1953 earthquakes (Fig. 1-D).

Another active zone of shallow earthquakes lies along the eastern terminus of Cordillera Central between La Vegas and Bonao. This zone extends southeast of the Tavera dam site to south of Las Lagunas with orientation of NW - SE, and approximately parallel to a metamorphic belt which includes some of the most active mining areas near Hatillo. Intermediate depth earthquakes up to 110 km deep are also associated with this active zone.

Additional linear trend of shallow earthquakes, oriented WNW - ESE is running south of station 6 and 7. In historic times, an earthquake which occured in 1911 may be related to one of these active zones (Figures 1A and 1B).

6.2 Deep Seismicity

In Figure 4, two active zones of intermediate depth to deep-focus earthquakes are exhibited. The open squares signify the events deeper than or equal to 60 km. The former is located in eastern Dominican Republic (near the meridian 69^0 30') and oriented NW - SW. The latter is located near Bonao as discussed in the previous section.

The presence of the former deep seismicity zone is rather well known (e.g., Sykes and Ewing, 1965; Molnar and Sykes, 1969). Although there are contradictory understandings on the nature of this seismic zone, it is generally understood that this zone is continuing with the activity that runs south of Puerto Rico and delineates a small subplate that includes eastern Dominican Republic and Puerto Rico. It is still disputed whether this zone is

The distribution of the Tavera-Bao network is not sufficient to study the nature of this seismic zone. However, the Alto-Yuna network, to be installed in early August, 1980, will provide some coverage in this area, and we hope that the nature of this zone will be better understood when the Alto Yuna network starts to provide new data.

The distribution of earthquakes near La Vega and Bonao has never been clearly defined by any of the previous studies based on the World Wide Standardized Seismograph Network. Some of the natures of this seismic zone will be discussed in the next section.

Sykes, L. R., and Ewing, M., 1965. "The seismicity of the Caribbean region": Jour. Geophys. Res. V.70, no. 20, P. 5065-5074.

Molnar, P., and Sykes, L. R., 1969. "Tectonics of the Caribbean and Middle America regions from focal mechanisms and seismicity": Geol. Soc. America Bull., V. 80, no.9, P. 1639-1684.

7. DISTRIBUTION OF EARTHQUAKES LOCATED NEAR TAVERA-BAO PROJECT

7-1. Explosion Earthquakes

Figure 5 shows the distribution of 47 events located near the Tavera-Bao Project site. These events were listed in Table 4. Of 47 events located, 45 events exhibited upward ground motions to all the directions and this purely compressional source mechanism supports the conclusion that these events were originated from explosions. These events are indicated by plus (+) signs in Figure 5. Sixty-four percent (64%) of these events are located within 1 km of the explosion sites (indicated by solid circle). Sixteen explosion events that show a relatively larger error (greater than 1 km) have, in general, been located based on the small number of P-arrivals. Especially, locations show larger error when Station 2 was not operating.

In Table 4, these explosion events were classified in three categories, as follows:

a) Events attributed to explosions and verified by the explosion log provided by CDE (indicated by an asterisk *)

b) Events attributed to explosions, but with calculated origin time offset by more than 10 minutes when checked with the CDE log (with double asterisk **).

c) Events possibly attributed to explosions, but not reported at all in CDE explosion log (with triple asterisk ***)

To ascertain that these events were actually originated by explosions, it is urged that the explosion log be examined and that the events with double and triple asterisks be verified.

Table 4. Events located near Tavera-Bao Hydroelectric Project, including 45 explosions and 2 possible earthquakes

	File No.	Yr.	M D	H M	NP	NS	IQ	Mag	T₀	X₀	Y₀	Z₀	S
**	9	79	1216	1850	5	1	7	3	-1.62	-4.46	-0.17	5.00	0.18
*	38	79	1219	1344	5	1	7	6	1.36	-6.16	-0.40	2.43	0.16
***	47	79	1221	1527	5	2	7	4	-1.00	-4.70	0.09	5.00	0.25
X	69	79	1225	739	4	0	5	13	-2.41	-0.88	-4.05	12.11	0.00
*	103	80	111	1305	4	1	7	6	0.08	-6.07	-0.51	3.01	0.08
*	126	80	116	1355	5	2	7	16	-1.19	-4.64	-0.78	2.39	0.23
*	129	80	116	1920	5	1	7	21	1.28	-4.63	-0.92	2.38	0.19
*	139	80	117	1942	4	1	7	13	0.67	-6.37	0.01	2.72	0.19
*	147	80	118	1851	4	1	7	11	-0.18	-5.88	-0.82	3.20	0.06
*	150	80	118	2051	4	1	7	9	-0.30	-4.06	-1.51	2.77	0.06
*	153	80	119	1458	5	1	7	9	-0.29	-4.38	-1.94	2.07	0.30
*	159	80	122	1521	5	1	7	11	-1.07	-4.32	-0.94	2.64	0.09
*	162	80	123	1349	4	1	7	3	-3.53	-3.44	-1.67	5.40	0.02
*	164	80	123	1537	3	1	7	8	-0.72	-2.66	-3.48	6.25	0.00
*	173	80	124	1931	4	1	7	8	2.10	-3.60	-2.25	4.11	0.04
*	179	80	125	1316	4	1	7	11	-1.36	-6.49	1.01	5.00	0.25
*	213	80	129	1502	5	1	7	13	3.39	-6.80	-0.17	1.77	0.31
**	217	80	130	1350	5	1	7	6	1.49	-6.44	-1.15	2.94	0.29
***	222	80	130	1941	5	2	7	16	2.16	-4.36	-0.80	5.00	0.25
*	236	80	201	1352	4	2	7	13	-0.72	-4.90	1.50	5.00	0.16
*	252	80	204	1312	3	2	7	12	1.72	-6.18	-0.56	3.41	0.07
*	258	80	205	1336	4	1	7	10	2.67	-7.62	1.83	0.97	0.01
*	266	80	206	1312	4	1	7	9	3.45	-6.43	0.24	2.23	0.02
*	281	80	208	1214	3	2	7	3	-0.70	-4.66	-3.99	5.00	0.27
**	290	80	209	1358	3	2	7	8	-0.06	-8.13	2.03	2.12	0.09
*	343	80	213	1448	2	1	7	4	1.03	-4.55	-2.14	5.00	0.13
**	354	80	214	1310	2	1	7	7	1.51	-7.49	-4.10	5.00	0.47
***	359	80	214	1710	2	1	7	6	0.39	-5.32	-0.54	5.00	0.00
***	369	80	215	1347	4	1	7	11	-0.57	-6.76	0.39	2.39	0.01
*	383	80	222	1431	3	1	7	15	0.73	-5.69	-0.66	6.88	0.00
*	385	80	223	1407	5	1	7	13	0.62	-5.93	-2.93	2.94	0.42
***	407	80	227	1459	3	1	7	10	-0.83	-4.22	-2.95	6.74	0.00
***	414	80	228	1346	3	1	7	12	-0.11	-6.65	-1.70	6.15	0.00
***	415	80	228	1531	3	0	7	5	3.40	-4.85	-0.91	5.00	0.00
***	419	80	229	1323	5	1	7	13	-1.10	-6.40	-0.62	2.73	0.05
X	421	80	229	1517	2	1	5	8	1.49	-4.25	-2.13	5.00	0.05
*	423	80	301	1330	5	1	7	13	3.42	-6.43	-0.59	2.47	0.07
*	428	80	302	1353	5	1	7	21	-1.14	-4.94	-0.65	2.70	0.15
*	433	80	304	1309	5	1	7	15	3.31	-6.56	-0.57	2.59	0.10
*	442	80	307	1553	4	1	7	5	0.06	-6.21	-0.72	2.94	0.05
**	451	80	327	1418	5	1	7	9	2.37	-6.11	-0.79	3.00	0.19
*	456	80	328	1343	5	0	7	16	1.28	-6.56	-0.84	3.08	0.22
***	469	80	331	1555	3	2	7	13	-1.41	-5.85	1.60	5.00	0.35
*	527	80	408	1556	4	1	7	0	3.08	-4.96	-1.15	3.08	0.05
***	528	80	408	1600	5	1	7	3	1.03	-6.69	-0.63	2.93	0.15
*	537	80	410	1421	5	2	7	0	0.91	-6.94	-0.61	1.98	0.18
*	543	80	411	2040	3	0	7	4	0.22	-4.33	-2.01	5.00	0.00

* Events attributed to explosions, verified by the CDE explosion log.

** Events attributed to explosions, but the reported shot time is off by more than 10 minutes.

*** Events attributed to explosions, but not reported in the CDE explosion log.

X Reported earthquakes.

7-2. Distribution of Local Earthquakes in the Vicinity of the Tavera-Bao Hydroelectric Project

During the past four month period, two local events were located near the Tavera-Bao project area and are illustrated by an "x" symbol in Figure 5 (also see Table 4). One is located in the Tavera Reservoir (File No. 69) and the other is distributed along the channel between two reservoirs (File No. 421). The magnitudes (body wave magnitude) of these events were estimated at 1.3 and 0.8 respectively. However, these events were located with a small number of readings and the quality number (ranging 1 through 5, 1 being the most accurate reading) were assigned to be 5 for both events. Therefore, these epicenters are not necessarily accurate and have been eliminated from Figure 4. However, these two events discussed here suggest that the NW - SE trend of the activity observed south of La Vegas (Figure 4) may extend through the Tavera-Bao project area. Although the seismicity level along this zone has been low in the past couple of decades (Figure 1E), the earthquake reported in 1911 (Figure 1B) was probably located along this zone. While it is still too early to determine whether the Tavera-Fault is active or not, the direction of a relative slip along a fault can be predicted from the study of fault plane solution discussed in section 8

The composite fault plane solution of the shallow events in this region demonstrates a combination of strike-slip and thrusting movement (Figure 6A). This result indicates the following:

a) East-West orientation of one of the fault plane solutions is in general agreement with those of major local fault systems (including the Tavera Fault). Along this orientation, dominate component of the slip is left lateral strike-slip movement (northside block moves westward).

b) Another fault plane (with north-south trend and 40° dip) suggests possible thrust component. Combined with the strike-slip component, this thrust will provide uplift to the northern side.

7-3. Preliminary Consideration for Seismic Risk in Conjunction With the Tavera-Bao Project

It is premature to carry out an estimation of the seismic risk associated with the Tavera-Bao Project, since this problem should be discussed after the data from the network has been accumulated to the extent that some statistical treatment is made possible.

However, the preliminary study included in this text revealed some of the active zones to which our effort of seismic monitoring should be directed.

The most extensive activity in this region is, as discussed in section 6, along the northern coast of Hispaniola associated with the plate boundary. After the 1946, 1948 and 1953 earthquakes (Figures 1C and 1C), the area north of the Samana Penninsula experienced relative quiescence and may be ready for a moderatly destructive earthquake. However, a major earthquake with magnitude 8.0 and greater, as experienced in 1946, is highly unlikely since the energy consumed in the 1946 earthquake will take at least several decades to be restored. However, the zone running west of 70° 30', where no major earthquake has been reported, may be one of the possible candidates for major earthquakes. Such an earthquake will generate the ground movement with the intensity up to IX in modified mercalli scale at the dam site.

The NW-SE oriented activity south of La Vegas is the one we need to watch carefully. There are two features our seismic program should pay special attention to. The first is whether this linear trend is extended through the Tavera-Bao area or not. We have no answer for this question at this time. The second is the association of shallow and deep seismicity in this zone. If the shallow activity continues to interconnect with the deep one, the fracture may extend completely through the brittle crust and permit an earthquake of large magnitude. If this is the case, this zone comprises a serious risk to the Alto Yuna project as well.

The problem of whether a water-induced earthquake will occur at the time of impounding the reservoir or not is quite difficult to conjecture. Two events discussed in section 7-2 may imply the water-induced earthquake associated with the Tavera reservoir or associated with the Tavera Fault.

Based on the circumstances described above, we feel that a prolonged seismic monitoring is highly desirable for the Tavera-Bao project.

8. COMPOSITE FOCAL MECHANISM SOLUTION (CFMS)

8-1. Shallow Seismicity

The current station coverage in the Dominican Republic is insufficient for the construction of focal mechanism (or fault plane) solutions for individual events; however, it is possible to combine the arrivals from many events within a given tectonic regime and construct a single composite focal mechanism solution (CFMS). Figure 6A shows an upper-hemisphere equal-area projection of all the reliable first motions for 16 shallow-focus events; Figure 6B shows the locations of the events used.

The CFMS demonstrates that the earthquakes are a combination thrusting and strike-slip mechanism. This is consistent with the expected motion, given the relative motions between the North American and Caribbean plates, and the geographic location of the Dominican Republic along the boundary between the two plates. On either side of Hispaniola the Caribbean-North American plate boundary is oriented east-west, and the sense of motion is purely strike-slip. But the boundary east of Hispaniola is further south than that west of the island. In order to connect these two portions of the plate boundary, the intervening section must be oriented NNW-SSE, but still possessing an east-west relative motion. The result is a section of the plate boundary, situated in the northern Dominican Republic, which is of mixed thrusting and strike-slip motion, as evidenced by the seismicity and focal mechanism.

The plate boundary here appears to be somewhat complex. The great earthquake of 1946 demonstrated that the northeast coastal areas comprise the major portion of the boundary, but the seismicity found by the Tavera-Bao network shows that parallel or sub-parallel motion takes place in the interior of the island. The apparent linear trend of seismicity, generally following the trends of the mountain ranges and valleys, suggest that this interior motion occurs primarily along two major systems near the Tavera site. The zone to the north of Tavera may roughly parallel the coastline, and may be an extension of the major boundary as defined by the 1946, 1948 and 1953 events. The zone to the south of Tavera appears to trend NW-SE, and is likely to represent a stronger component of thrusting than the northern zone, although this cannot be resolved from the present observations.

8-2. Deep Seismicity

The station coverage for the zone of deep crustal or mantle seismicity is insufficient to provide a reliable CFMS. The events for which an attempt at computing a CFMS was made are shown in Figure 6C, along with a possible mechanism. However, the mechanism for the shallow-focus events may also satisfactorily explain the observations. The only certainty is that one nodal plane must strike roughly ESE-WNW to SE-NW.

9. CONCLUSION

9-1. The Tavera-Bao seismograph network was operated successfully for the past four months. The network has recorded earthquakes at the rate of 5 events a day.

9-2. The historic earthquakes from 1564 through 1916 indicated that a number of destructive earthquakes were reported in southern and western Dominican Republic. The instrumentally located earthquakes since 1911, however, are demonstrating higher seismicity in northeastern Dominican Republic. The largest earthquakes ever experienced in the Dominican Republic were located southeast of Samana with magnitude of 8.2 in 1946. An estimated ground movement of intensity VII in the twelve class modified mercalli scale may have been experienced in the Tavera project site.

9-3. Preliminary epicenter determination of earthquakes indicated the following seismically active trends:

a) Shallow scattered seismic zone oriented approximately east-west along the northern coast of Hispaniola. This activity is associated with the boundary between North American-Caribbean plates and comprises the most active seismic belt in the region.

b) Deep seismicity oriented NW-SE near 69^{0} 30' meridian.

9-3. (cont'd)

c) Activity oriented NW-SE near La Vegas - Bonao area. Both shallow and deep seismicity are associated with this zone, and this zone needs to be monitored carefully by the CDE network.

d) Weakly defined activity south of stations 6 and 7 with orientation of NWW-SEE.

9-4. Of 47 events located ~~near~~ the Tavera-Bao project area, 45 events were considered to be originated from explosions. Two events, however, with magnitude 1.3 and 0.8 respectively, were located in the immediate vicinity of the Tavera reservoir. For estimating the activity level of the Tavera Fault, continued monitoring is needed.

9-5. The composite fault plane solutions of the shallow earthquakes demonstrates a combination of strike-slip and thrust motion. It is expected that a rupture associated with an earthquake will show predominant left lateral strike-slip and upheaval of the northwestern quadrangle.

10. RECOMMENDATION

10-1. The operation of the Tavera-Bao network by the CDE personnel has been carried out satisfactorily. One procedure to be improved in the future operation is maintenance of the remote stations. In the past, the average down time (the time between the start of malfunction and the completion of repair) was 21.2 days. With careful inspection of the data on a daily basis, the trouble should be identified swiftly and the repairs of the station should be carried out immediately after the trouble is identified.

10-2. In the past, it was experienced that the explosion log (CDE) apparently did not cover the entire recording period and we suspect that some of the events were missing; or perhaps, some of them may have been lost in shipment. It is recommended that the explosion log should be air mailed directly to Dr. Matumoto and another log should be attached to the the COSMOS data package as back-up.

10-3. An additional station should be operated, at least for several weeks, near the explosion site to assist the study of crustal model. With the approval of CDE, the University of Texas is planning to establish a station near the explosion site in early August, 1980, without any additional expense.

10-4. To improve the accuracy of epicenter determination, the coordinate of remote stations, especially, those of stations 1, 2, and 3 should be measured by a staff surveyor of CDE. Currently, the error involved in station coordinates will reach up to 200 meters. Therefore, a re-survey of the locations within an error of 10 meters will still improve the accuracy of epicenter determination.

10-5. The output of the automatic epicenter determination program should be utilized with care. As described in section 5, there are several limitations of capability in the program and the results are, sometimes, erroneous.

10-6. Since the seismicity in the immediate vicinity of the Tavera-Bao project is a very serious matter, all the events reported in Table 4 (especially those with double and triple asterisks) should be compared with the CDE explosion log and be verified.

10-7. A report came on July 10 that only a couple of boxes of recording paper were left. As a consequence, the paper was depleted and we were forced to suspend seismic monitoring temporarily. Long before completely depleting the recording paper and other expendable supplies, it should be reported to Dr. Matumoto with a sufficient lead time. At least 2 months lead time is desirable.

Table 1. List of earthquakes recorded by the Tavera-Bao Seismograph Network

December 13, 1979 - April 15, 1980

Column	Abbreviation	Description
1	NO	Identification number
2	YR	Year
3	M D	Month and Day
4	H M	Hour and minutes, G.M.T. (to calculate local time, subtract 4 hours)
5	S	Second of origin time, a decimal point should be assumed between 2nd and 3rd digit
6	NP	Number of P-arrival reading
7	NS	Number of S-arrival reading
8	IQ	Quality number, ranging 1 through 5, 1 being the most accurate reading. 6 indicates a distant earthquake and 7 is an event generated by explosion.
9	ITR	Number of iterations carried out during the epicenter
10	MAG	Magnitude x 10; magnitude is calculated based on the duration time
11	LONG	Longitude of epicenter (in degree)
12	LAT	Latitude of epicenter (in degree)
13	X	Distance measured from the central station (eastward positive)
14	Y	Distance measured from the central station (northward positive)
15	DEPTH	Depth; if a negative depth is obtained during the iteration process, the epicenter program automatically fixes the depth at 5.0 km and X, Y are calculated.
16	DX	Standard error for X (in km)
17	DY	Standard error for Y (in km)
18	DZ	Standard error for Z (in km)
19	S	Standard error for origin time (in sec.)

```
DR EQFIL
 NO   Y[illegible]M D  H M   S    NP  NS  IQ ITR  MAG      LONG     [illegible]      X        Y     DEPTH     DX       DY       DZ        S
                                                          (DEG)      (DEG)     (KM)     (KM)     (KM)     (KM)     (KM)     (KM)
  1   79 1213 1136 3858    2   2   4   2   1.1      0.000      0.000      9.6    -25.0      5.0   1310.0   1310.0      0.0     10.60
  2   79 1213 1327 3192    2   2   7  10   0.1      0.000      0.000     -3.2    -19.8    149.3   1310.0   1310.0      0.0     31.08
  3   79 1213 1329 2272    5   2   4  10   1.8    -69.346     18.981    147.9    -36.4    169.5     21.7     25.5     18.5      0.44
  4   79 1214 1451 4948    2   1   5   1   0.6      0.000      0.000      9.6    -25.0      5.0      0.0      0.0      0.0      9.84
  5   79 1216  728 1750    3   0   6  10   1.3    -70.758     19.166     -6.7    -15.9      5.0      0.0      0.0      0.0      0.00
  6   79 1216 1254 3157    5   0   6  10   2.2    -70.948     19.193    -27.6    -13.0     16.2      5.5      1.9     10.1      0.19
  7   79 1216 1840  469    5   2   4  10   1.8    -69.996     19.274     76.6     -3.9     18.9      5.1      2.8      3.2      0.24
  8   79 1216    0    0    0   0   5   0   0.0      0.000      0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
  9   79 1216 1850 4438    5   1   7  10   0.3    -70.737     19.309     -4.5     -0.2      5.0      0.7      0.8      0.0      0.18
 10   79 1216    0    0    0   0   5   0   0.0      0.000      0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 11   79 1216 2108 3435    2   1   4  10   1.1    -70.109     19.269     64.3     -4.5      5.0      0.1      0.0      0.0      0.00
 12   79 1216 2122    4    4   2   3  10   2.1    -69.949     19.280     81.9     -3.3     28.6      2.0      1.6      3.6      0.08
 13   79 1217  307 2397    3   1   5  10   0.9    -70.496     19.593     21.9     31.3      5.0      1.0      4.5      0.0      0.18
 14   79 1217  339 4614    4   1   4  10   2.1    -69.399     18.555    142.0    -83.5     64.8     36.4    104.2    259.1      0.27
 15   79 1217  430  970    2   2   5  10  -0.3    -70.754     19.084     -6.3    -25.0      5.0     19.4     27.3      0.0      1.55
 16   79 1217  614 5347    3   0   6  10   2.5    -70.996     19.514    -32.8     22.6      5.0      0.1      0.2      0.0      0.00
 17   79 1217  653 5338    4   2   3  10   0.3    -70.685     19.483      1.2     19.2     28.2      2.4      4.6      4.6      0.17
 18   79 1217  701 1101    5   1   3  10   2.2    -70.805     18.221    -11.9   -120.5     33.5      6.8      8.8     35.7      0.25
 19   79 1217 1102 1909    5   0   6  10   2.5    -70.930     18.929    -25.6    -42.1     31.9      2.2      3.5      7.2      0.05
 20   79 1217 2139 3510    4   2   4   5   0.9      0.000      0.000    130.2   -140.7    125.3    192.3    260.7    198.1      6.84
 21   79 1217 2253 4215    3   2   4  10   0.0    -70.245     19.263     49.4     -5.2      5.0      5.9      3.1      0.0      0.29
 22   79 1218    0    0    0   0   5   0   0.0      0.000      0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 23   79 1218  136 1246    3   1   5  10   1.3    -70.667     19.562      3.2     27.8     35.9      0.1      0.2      0.2      0.00
 24   79 1218  448 1894    3   1   4  10   1.1    -70.104     19.291     64.9     -2.1    109.3      0.3      0.3      0.2      0.00
 25   79 1218    0    0    0   0   5   0   0.0      0.000      0.000      0.0      0.0      0.0      0.0      0.0      0.0  [illegible]
 26   79 1218 1042 4499    2   1   5  10   1.1    -71.286     19.542    -64.6     25.6      5.0     11.2      7.0      0.0      0.34
 27   79 1218    0    0    0   0   6   0   0.0      0.000      0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 28   79 1218    0    0    0   0   5   0   0.0      0.000      0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 29   79 1218 1313 4852    6   2   1  10   0.5    -70.687     19.605      1.0     32.6     25.4      1.9      3.4      5.4      0.26
 30   79 1218 1445 3000    3   0   6   5   1.3      0.000      0.000   1310.0   1310.0      5.0   1310.0   1310.0      0.0     57.14
 31   79 1218 1445 5110    3   2   7  10   0.3    -70.674     19.207      2.4    -11.4      5.0      2.9      1.9      0.0      0.31
 32   79 1218 1642 1786    3   1   5  10   1.5    -70.463     21.107     25.6    198.8      5.0     66.7     51.9      0.0      1.52
 33   79 1218 2228 1005    5   2   2  10   0.6    -70.516     19.012     19.7    -33.0     77.9      5.5      7.9      8.0      0.32
 34   79 1219   46 2329    6   2   2  10   0.9    -70.444     18.985     27.6    -36.0     82.4      4.9      7.2      6.6      0.29
 35   79 1219  643 4456    5   0   6  10   2.5    -70.788     19.036    -10.0    -30.3     33.1      3.0      8.2     28.9      0.28
 36   79 1219    0    0    0   0   5   0   0.0      0.000      0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 37   79 1219 1020 1250    5   1   3  10   0.7    -70.407     19.292     31.6     -2.1     57.1     18.2     13.5     16.3      0.54
 38   79 1219 1344 1136    5   1   7  10   0.6    -70.753     19.307     -6.2     -0.4      2.4      0.5      0.5      0.5      0.16
 39   79 1219 1511 3781    4   1   7  10   0.9      0.000      0.000     -6.6     -5.0      2.6     32.9     65.8     50.2      2.01
 40   79 1219 1554 4108    4   1   4  10   0.6    -70.684     19.539      1.4     25.3     38.5      2.1      3.5      3.3      0.08
 41   79 1219 2011 4000    4   0   5   2   1.8      0.000      0.000   1310.0   1310.0   1310.0   1310.0   1310.0   1310.0    177.33
 42   79 1220    0    0    0   0   6   0   0.0      0.000      0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 43   79 1221    0    0    0   0   6   0   0.0      0.000      0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 44   79 1221    0    0    0   0   5   0   0.0      0.000      0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 45   79 1221  726 5400    5   2   3  10   1.1    -70.761     19.596     -7.1     31.6     20.5      3.0      5.6      2.2      0.75
 46   79 1221 1142 5900    4   1   4  10   1.3    -70.420     19.052     30.3    -28.6     80.5     10.0     11.1      9.8      0.13
 47   79 1221 1527 1900    5   2   7  10   0.4    -70.739     19.311     -4.7      0.1      5.0      0.9      1.1      0.0      0.25
 48   79 1221    0    0    0   0   6   0   0.0      0.000      0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 49   79 1222    0    0    0   0   6   0   0.0      0.000      0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 50   79 1222  302 1907    5   1   4  10   1.6    -69.372     18.529    145.0    -86.4     38.4     36.4    130.4   1310.0      0.76
```

NO	[illegible]	M D	H M	S	NP	NS	IQ	ITR	MAG	LONG (DEG)	[illegible] (DEG)	X (KM)	Y (KM)	DEPTH (KM)	DX (KM)	DY (KM)	DZ (KM)	S
51	79	1222	559	5172	3	3	4	10	0.2	-70.590	19.146	11.7	-18.1	19.8	0.1	0.1	0.1	0.00
52	79	1222	700	1201	4	1	4	10	1.3	-70.230	20.021	51.0	78.6	50.3	18.0	20.1	58.3	0.24
53	79	1222	800	1650	4	1	4	10	1.3	-70.725	19.741	-3.2	47.7	50.5	9.9	12.6	18.9	0.27
54	79	1222	1004	2225	3	1	5	10	2.2	0.000	0.000	183.4	-85.8	5.0	270.6	313.4	0.0	5.43
55	79	1222	1654	184	6	1	2	10	1.5	0.000	0.000	111.6	-18.1	58.4	81.2	68.7	93.7	2.40
56	79	1222	1659	4078	4	1	4	10	2.3	-70.148	19.707	60.0	43.9	19.3	12.7	14.4	7.6	0.31
57	79	1222	1823	5663	5	2	2	10	2.3	0.000	0.000	19.4	113.2	5.0	48.0	64.3	0.0	3.19
58	79	1222	2252	3412	3	1	4	10	0.3	-70.708	19.556	-1.2	27.2	68.8	0.9	0.9	0.6	0.01
59	79	1223	240	3602	5	2	3	10	2.3	-70.388	19.004	33.7	-33.8	92.0	8.3	8.1	5.9	0.24
60	79	1223	449	294	5	1	5	7	3.3	-68.307	19.453	261.6	15.8	63.3	88.5	188.8	267.7	0.62
61	79	1223	0	0	0	0	6	0	2.2	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
62	79	1223	1118	2875	6	1	2	10	2.3	-70.457	19.112	26.2	-21.9	28.4	1.6	2.3	3.5	0.17
63	79	1223	1119	4129	4	1	4	10	2.3	-70.531	19.137	18.1	-19.1	27.7	5.2	2.6	5.1	0.19
64	79	1223	1154	4145	5	1	3	10	3.1	-69.728	19.450	106.0	15.4	142.1	31.7	23.7	32.1	0.80
65	79	1223	1613	2124	4	1	4	10	2.3	-70.831	19.238	-14.7	-8.0	15.1	0.6	1.6	2.6	0.12
66	79	1224	2300	3696	4	1	4	10	1.1	-71.073	19.644	-41.2	36.9	50.6	7.5	15.6	25.6	0.32
67	79	1225	404	2873	5	1	5	10	2.3	-67.413	18.412	359.5	-99.3	284.3	22.0	26.7	25.9	0.15
68	79	1225	0	0	0	0	6	0	2.2	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
69	79	1225	739	4759	4	0	5	10	1.3	-70.704	19.273	-0.9	-4.0	12.1	0.1	0.1	0.1	0.00
70	79	1225	1311	5508	6	1	2	10	3.2	-71.390	19.221	-76.0	-9.8	62.7	11.7	9.6	8.2	0.36
71	79	1225	0	0	0	0	5	0	2.2	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
72	79	1225	1852	3341	5	1	3	10	0.3	-70.485	19.013	23.1	†32.8	84.4	6.0	10.2	10.1	0.31
73	79	1226	235	323	6	3	1	10	1.3	-70.663	19.637	3.6	36.1	5.0	6.2	14.0	0.0	1.16
74	79	1226	258	227	5	1	3	10	2.3	-70.902	19.475	-22.5	18.2	34.1	2.9	6.7	6.1	0.19
75	79	1226	627	5545	5	0	4	5	1.3	0.000	0.000	157.0	-105.9	2.8	1310.0	1310.0	1310.0	10.32
76	79	1226	928	4208	3	1	5	10	2.3	-70.229	18.689	51.2	-68.6	5.0	8.2	9.6	0.0	0.36
77	79	1226	1242	483	2	1	5	10	2.3	-70.265	19.271	47.2	-4.4	5.0	1.6	0.7	0.0	0.05
78	79	1226	1422	2816	4	1	4	10	2.3	-70.599	19.678	10.6	40.7	53.8	11.4	15.3	15.0	0.26
79	79	1226	1654	2181	4	1	4	10	0.3	-70.549	19.647	16.1	37.2	60.8	5.6	8.3	6.0	0.12
80	79	1226	1716	1445	6	1	2	10	1.3	-70.698	19.660	-0.2	38.7	24.9	1.9	5.1	6.2	0.24
81	79	1226	0	0	0	0	5	0	2.2	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
82	79	1226	1900	3388	3	1	5	10	2.3	-70.274	18.943	46.2	-40.6	28.5	0.1	0.2	0.2	0.00
83	79	1226	0	0	0	0	6	0	0.2	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
84	79	1226	2100	3264	2	1	5	10	0.3	-71.168	18.797	-51.6	-56.7	5.0	17.9	24.1	0.0	0.67
85	79	1226	2200	2661	4	1	4	10	0.3	-71.422	18.514	-79.4	-88.1	5.0	5.4	5.7	0.0	0.14
86	79	1226	0	0	0	0	6	0	2.2	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
87	79	1226	0	0	0	0	6	0	0.2	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
88	79	1226	2302	2339	3	1	4	10	1.1	0.000	0.000	102.1	-69.0	5.0	140.4	92.9	0.0	4.61
89	79	1227	1443	1210	3	2	4	2	1.3	0.000	0.000	-548.9	1310.0	1310.0	1310.0	1310.0	1310.0	830.35
90	79	1227	1500	3767	3	1	5	10	2.3	-70.360	19.834	36.8	57.9	5.0	9.4	12.9	0.0	0.39
91	79	1227	1501	3332	5	2	2	10	1.1	-70.217	18.935	52.5	-41.5	20.5	4.3	5.7	3.4	0.29
92	79	1227	2022	4296	4	1	4	10	2.1	-70.147	20.004	60.1	76.8	107.5	23.3	47.2	24.8	0.30
93	79	1227	2222	2122	6	1	2	10	1.3	-69.924	19.184	84.6	-13.9	5.0	21.7	11.0	0.0	0.84
94	79	1228	218	3409	5	1	3	10	3.1	-70.139	19.242	61.1	-7.5	20.9	5.8	2.7	1.7	0.19
95	79	1228	247	1614	5	0	5	10	2.1	-69.618	18.815	118.0	-54.8	122.0	116.5	63.4	115.5	0.34
96	80	108	0	0	0	0	5	0	2.2	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
97	80	109	111	3476	3	2	5	10	2.1	-70.780	19.388	-9.1	8.6	5.0	2.3	8.6	0.0	0.46
98	80	110	0	0	0	0	5	0	0.2	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
99	80	110	1107	5592	5	2	2	10	1.3	-70.432	19.101	29.0	-23.2	34.7	8.7	5.3	6.3	0.36
100	80	110	0	0	0	0	5	0	2.2	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00

NO	Y	M D	H M	S	NP	NS	IQ	ITR	MAG	LONG (DEG)	[illegible] (DEG)	X (KM)	Y (KM)	DEPTH (KM)	DX (KM)	DY (KM)	DZ (KM)	S
101	80	110	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
102	80	111	1154	5026	3	1	5	10	1.5	-71.047	19.454	-38.4	15.9	32.4	0.4	0.4	0.5	0.00
103	80	111	1305	2008	4	1	7	10	0.6	-70.752	19.306	-6.1	-0.5	3.0	0.3	0.5	0.4	0.08
104	80	111	1510	5274	2	1	5	10	2.7	-68.768	18.510	211.2	-88.5	5.0	12.8	28.1	0.0	0.07
105	80	111	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
106	80	111	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
107	80	112	2132	3705	3	1	5	5	2.2	0.000	0.000	-110.7	-121.7	52.4	422.8	229.7	778.2	2.65
108	80	112	2325	1202	3	1	4	10	1.1	-70.602	18.931	10.3	-41.9	63.6	1.0	1.1	0.7	0.01
109	80	113	16	3500	2	1	5	10	1.6	-64.064	22.848	726.2	391.3	5.0	46.7	84.6	0.0	0.08
110	80	113	649	1971	3	2	4	10	0.8	-71.015	19.182	-34.8	-14.2	12.9	0.8	1.0	3.0	0.03
111	80	113	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
112	80	113	1745	3781	5	0	4	10	3.7	-70.476	19.118	24.1	-21.3	37.6	8.9	2.1	10.7	0.07
113	80	113	2136	1267	4	1	4	10	0.9	-70.744	19.087	-5.2	-24.7	21.0	1.3	1.5	5.0	0.13
114	80	114	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
115	80	115	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
116	80	115	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
117	80	115	1607	1979	4	1	4	5	2.7	0.000	0.000	271.0	10.6	98.3	1310.0	1310.0	1310.0	36.71
118	80	116	323	562	4	0	4	10	3.3	-70.960	19.329	-28.9	2.1	5.0	5.5	7.9	0.0	0.29
119	80	116	358	1912	4	0	6	10	4.2	-70.502	19.310	21.3	0.0	28.1	0.7	0.5	0.6	0.00
120	80	116	412	3738	3	0	5	10	2.9	-70.710	19.158	-1.5	-16.8	5.0	0.1	0.1	0.0	0.00
121	80	116	0	0	0	0	7	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
122	80	116	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
123	80	116	1025	3530	3	1	5	10	3.5	-69.719	18.130	107.0	-130.5	5.0	66.3	47.5	0.0	1.25
124	80	116	1035	2298	3	1	5	10	3.3	-70.250	19.259	48.8	-5.7	63.0	0.8	1.2	0.6	0.01
125	80	116	1343	1190	4	0	5	10	3.3	-70.670	19.196	2.9	-12.7	21.6	0.1	0.1	0.2	[illegible]
126	80	116	1355	1381	5	2	7	10	1.6	-70.739	19.303	-4.6	-0.8	2.4	0.7	0.8	0.8	0.23
127	80	116	1414	1209	5	2	2	10	1.3	-70.687	19.752	1.1	48.9	36.4	3.1	5.2	5.6	0.18
128	80	116	1555	1543	4	0	5	10	3.8	-70.868	18.941	-18.8	-40.8	226.2	5.1	16.3	165.6	0.04
129	80	116	1920	628	5	1	7	10	2.1	-70.739	19.302	-4.6	-0.9	2.4	0.5	0.7	0.7	0.19
130	80	116	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
131	80	117	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
132	80	117	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
133	80	117	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
134	80	117	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
135	80	117	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
136	80	117	1259	2704	5	1	3	10	2.3	-70.420	19.610	30.2	33.2	36.7	5.2	6.5	7.4	0.22
137	80	117	1307	5293	3	1	5	6	1.8	-70.534	19.805	17.7	54.7	12.2	78.4	127.8	310.1	0.67
138	80	117	1857	633	4	2	4	6	1.3	-70.059	18.874	69.7	-48.3	6.7	21.3	21.5	89.8	0.76
139	80	117	1942	3567	4	1	7	10	1.3	-70.755	19.310	-6.4	0.0	2.7	0.7	1.2	0.6	0.19
140	80	117	2144	3037	3	1	5	10	1.1	-70.400	19.147	32.5	-18.0	62.2	0.9	3.6	1.5	0.01
141	80	118	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
142	80	118	326	3226	3	2	4	10	1.6	-70.537	19.787	17.4	52.7	20.6	5.3	7.4	4.0	0.32
143	80	118	518	5472	4	1	4	10	1.6	-70.623	19.579	8.0	29.7	36.3	1.8	2.8	2.5	0.06
144	80	118	752	1977	4	0	4	6	3.4	-70.697	19.144	-0.0	-18.3	4.6	2.4	3.2	7.2	0.11
145	80	118	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
146	80	118	1230	5253	3	1	5	10	0.2	-70.490	19.670	22.6	39.8	55.7	0.4	0.5	0.5	0.01
147	80	118	1851	3482	4	1	7	7	1.1	-70.750	19.303	-5.9	-0.8	3.2	0.3	0.3	1.6	0.06
148	80	118	1926	682	5	0	6	10	0.3	-70.836	19.210	-15.3	-11.0	60.0	2.6	4.1	23.3	0.13
149	80	118	2014	895	3	1	5	10	1.8	-70.061	20.100	69.5	87.4	5.0	30.6	22.7	0.0	0.56
150	80	118	2051	4470	4	1	7	10	0.9	-70.733	19.297	-4.1	-1.5	2.8	0.4	0.6	0.4	0.06

DR EQFILE

NO	[illegible]	M D	H M	S	NP	NS	IQ	ITR	MAG	LONG (DEG)	[illegible] (DEG)	X (KM)	Y (KM)	DEPTH (KM)	DX (KM)	DY (KM)	DZ (KM)	S
151	80	118	2102	371	3	2	4	10	0.3	-70.730	19.156	-3.7	-17.0	13.9	2.7	2.8	8.9	0.19
152	80	119	714	5772	4	0	5	10	3.3	-70.779	19.279	-9.1	-3.4	29.5	0.1	0.1	0.2	0.00
153	80	119	1458	4971	5	1	7	10	0.9	-70.736	19.293	-4.4	-1.9	2.1	1.1	1.4	1.4	0.38
154	80	120	45	5331	4	1	4	10	1.6	-70.708	19.120	-1.3	-21.1	10.2	5.8	3.9	22.3	0.45
155	80	120	747	5407	5	0	6	10	3.7	-70.829	19.114	-14.5	-21.7	25.9	0.1	0.2	1.0	0.01
156	80	120	848	505	5	0	3	10	1.5	-70.619	19.082	8.5	-25.2	48.3	9.5	4.3	20.1	0.16
157	80	120	1303	33	4	2	3	10	1.3	-70.498	19.457	21.8	16.2	46.6	19.6	12.9	21.3	0.49
158	80	121	1502	5020	2	1	5	1	1.6	0.000	0.000	-8.1	4.8	5.0	0.0	0.0	0.0	19.91
159	80	122	1520	5893	5	1	7	10	1.1	-70.736	19.302	-4.3	-0.9	2.6	0.3	0.4	0.3	0.09
160	80	123	515	503	5	1	3	10	0.9	-70.399	19.059	32.6	-27.8	113.5	6.8	7.5	6.2	0.17
161	80	123	843	3575	4	0	7	10	0.9	-70.633	18.653	6.9	-72.7	4.1	30.1	86.4	0.0	0.23
162	80	123	1349	5147	4	1	7	10	0.3	-70.728	19.295	-3.4	-1.7	5.4	0.2	0.1	0.4	0.02
163	80	123	1437	616	4	0	4	10	1.3	-70.640	19.080	6.2	-25.5	19.5	0.4	0.3	0.9	0.01
164	80	123	1537	3428	3	1	7	10	0.8	-70.721	19.279	-2.7	-3.5	6.3	0.0	0.0	0.0	0.00
165	80	123	1539	131	4	1	4	10	0.9	-70.534	19.074	17.8	-26.1	40.6	3.3	2.7	3.8	0.13
166	80	123	1856	5998	6	2	2	10	1.5	-70.341	19.089	38.9	-24.5	30.3	16.6	19.0	24.9	1.28
167	80	123	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
168	80	124	348	2908	5	0	4	5	2.1	-69.885	19.159	88.8	-16.7	8.8	1028.8	60.8	497.9	1.65
169	80	124	558	2394	5	1	3	10	1.8	-69.392	18.594	142.8	-79.2	65.6	13.5	14.6	33.1	0.26
170	80	124	800	1719	3	1	5	10	0.3	-70.299	19.301	43.5	-1.0	7.0	49.8	10.8	20.6	0.17
171	80	124	1021	1913	3	0	5	10	3.4	-70.703	19.167	-0.7	-15.8	5.0	0.0	0.0	0.0	0.00
172	80	124	1442	4589	3	1	5	9	2.4	0.000	0.000	-301.6	+84.8	5.0	1310.0	1310.0	0.0	11.22
173	80	124	1931	210	4	1	7	10	0.8	-70.729	19.290	-3.6	-2.2	4.1	0.3	0.3	0.8	0.04
174	80	125	251	2000	5	0	6	10	2.5	-81.507	19.704	-1183.7	43.6	1265.0	1310.0	42.1	1310.0	0.11
175	80	125	454	3543	4	0	6	10	2.5	-70.596	18.953	11.0	-39.5	146.2	1.2	16.6	35.9	[illegible]
176	80	125	515	2329	6	1	2	10	1.8	-70.270	19.213	46.7	-10.8	38.0	20.8	10.2	22.7	0.91
177	80	125	845	264	5	2	2	10	1.8	-70.618	19.738	8.5	47.3	21.7	2.3	3.1	11.1	0.17
178	80	125	930	233	5	2	2	10	2.1	-70.445	18.994	27.5	-35.0	82.6	4.7	7.2	6.4	0.27
179	80	125	1316	364	4	1	7	10	1.1	-70.756	19.319	-6.5	1.0	5.0	1.0	2.4	0.0	0.25
180	80	125	1317	4608	4	1	4	10	0.5	-70.819	19.205	-13.4	-11.6	24.2	0.4	1.0	2.3	0.05
181	80	126	1337	1427	5	2	2	10	1.7	-70.667	19.818	3.2	56.2	33.3	1.5	2.9	4.5	0.19
182	80	126	1637	4885	4	1	5	10	0.8	-70.630	19.661	7.2	38.8	25.1	0.7	2.0	3.3	0.11
183	80	126	1749	5166	6	3	6	10	0.6	-70.378	18.827	34.9	-53.4	79.8	5.7	7.5	6.3	0.34
184	80	126	1900	4990	5	1	3	10	0.6	-70.264	18.983	47.3	-36.2	19.6	2.5	3.0	1.4	0.12
185	80	126	1901	2484	3	0	7	10	0.6	-70.775	19.374	-8.6	7.1	5.0	0.1	0.2	0.0	0.00
186	80	126	0	0	0	0	4	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
187	80	126	1909	322	4	1	4	8	0.3	0.000	0.000	-29.2	16.3	4.1	22.6	9.2	30.3	2.00
188	80	126	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
189	80	126	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
190	80	127	44	5360	5	1	3	10	0.0	-70.164	19.594	58.3	31.4	19.6	7.3	4.5	2.1	0.27
191	80	127	0	0	0	0	6	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
192	80	127	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
193	80	127	424	2593	5	2	2	10	0.5	-71.128	19.136	-47.2	-19.2	79.0	3.8	4.8	4.5	0.20
194	80	127	442	2427	4	1	4	10	0.0	-70.364	19.487	36.4	19.5	30.1	4.3	2.1	6.3	0.18
195	80	127	449	5293	4	1	4	9	2.4	-70.292	20.045	44.3	81.3	21.1	1.5	2.8	8.3	0.08
196	80	127	526	3376	5	1	3	10	1.1	-70.992	20.165	-32.4	94.5	17.3	2.1	4.7	1.9	0.14
197	80	127	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
198	80	127	805	3380	5	1	3	10	0.8	-70.416	19.215	30.7	-10.6	28.0	11.1	10.4	23.3	1.05
199	80	127	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
200	80	127	1105	4271	4	0	3	6	3.1	-71.646	20.540	-104.0	136.0	5.0	19.8	27.7	0.0	0.56

NO	[illegible]	M D	H M	S	NP	NS	IQ	ITR	MAG	LONG (DEG)	[illegible]T (DEG)	X (KM)	Y (KM)	DEPTH (KM)	DX (KM)	DY (KM)	DZ (KM)	S
201	80	127	1327	4714	3	0	7	9	1.1	-70.723	19.280	-2.9	-3.4	5.0	6.8	16.0	0.0	0.58
202	80	127	1630	3757	4	2	3	10	1.0	-70.537	18.938	17.5	-41.2	14.8	3.8	3.1	4.4	0.19
203	80	127	1650	2725	3	0	6	10	3.8	-70.151	19.662	59.7	38.9	5.0	2.6	1.3	0.0	0.03
204	80	127	1955	5828	3	1	5	10	1.5	-70.399	20.057	32.6	82.6	27.9	0.2	0.5	1.1	0.01
205	80	127	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
206	80	128	321	3460	5	2	2	10	2.3	-69.665	18.756	112.9	-61.3	87.6	6.1	5.0	7.8	0.19
207	80	128	2159	1696	4	1	4	10	1.3	-70.230	18.956	51.1	-39.1	26.0	4.3	5.6	11.4	0.22
208	80	129	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
209	80	129	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
210	80	129	913	3835	3	1	5	10	0.9	-70.786	19.590	-9.8	30.9	13.3	0.0	0.1	0.1	0.00
211	80	129	1031	1338	2	1	6	1	2.5	0.000	0.000	-17.1	35.9	5.0	0.0	0.0	0.0	5.97
212	80	129	1221	251	6	0	2	10	2.8	-69.020	18.709	183.6	-66.5	161.8	159.9	64.3	129.8	0.21
213	80	129	1502	4835	5	1	7	10	1.3	-70.759	19.309	-6.8	-0.2	1.8	1.1	1.1	1.3	0.31
214	80	129	1615	166	4	1	4	10	0.3	-70.607	19.627	9.8	35.0	14.0	1.5	3.6	16.0	0.29
215	80	130	42	1571	3	0	6	10	2.5	-70.904	19.426	-22.7	12.8	5.0	0.0	0.0	0.0	0.00
216	80	130	315	388	5	2	2	10	0.8	-70.316	19.640	41.6	36.5	16.1	5.1	3.1	6.9	0.26
217	80	130	1350	5149	5	1	7	10	0.6	-70.755	19.300	-6.4	-1.2	2.9	1.1	1.2	1.2	0.29
218	80	130	1509	508	6	1	2	10	0.9	-70.820	19.123	-13.5	-20.7	53.8	0.6	0.8	1.1	0.05
219	80	130	1725	3000	3	0	5	3	2.1	0.000	0.000	1310.0	1310.0	5.0	1310.0	1310.0	0.0	95.79
220	80	130	1831	2440	6	3	2	10	1.5	-69.809	19.199	97.1	-12.3	98.4	6.0	4.9	4.9	0.22
221	80	130	1854	3928	5	0	3	10	3.7	-71.396	19.454	-76.6	16.0	84.8	30.5	5.6	32.7	0.23
222	80	130	1941	4716	5	2	7	10	1.6	-70.736	19.303	-4.4	-0.8	5.0	0.9	1.0	0.0	0.25
223	80	130	2142	5230	4	2	3	10	1.6	-70.577	19.744	13.1	48.0	44.6	18.5	28.5	61.5	1.65
224	80	130	741	5203	4	2	3	10	1.5	-71.037	19.762	-37.3	49.9	20.2	5.0	5.9	10.0	0.32
225	80	131	825	497	3	0	6	10	2.1	-70.843	19.473	-16.1	18.0	5.0	0.3	0.1	0.0	[illegible]
226	80	131	927	2261	5	2	2	10	1.1	-70.679	19.816	1.9	55.9	30.0	1.2	2.3	3.4	0.15
227	80	131	1036	4540	3	1	5	10	1.1	-70.303	19.767	43.1	50.5	87.9	0.6	2.0	1.0	0.00
228	80	131	1421	5272	4	1	4	10	1.6	-70.273	19.984	46.4	74.5	25.7	7.1	7.8	22.2	0.33
229	80	131	1723	3346	6	1	2	10	2.2	-69.649	19.514	114.6	22.5	28.3	10.7	6.2	25.3	0.35
230	80	201	0	0	0	0	6	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
231	80	201	337	4053	6	1	2	5	2.1	-69.971	19.503	79.4	21.3	1.8	16.6	7.7	52.4	0.64
232	80	201	501	3070	2	1	5	1	0.3	0.000	0.000	-17.1	35.9	5.0	0.0	0.0	0.0	11.20
233	80	201	725	5299	3	1	5	10	1.6	-70.752	19.650	-6.1	37.6	5.0	0.9	2.2	0.0	0.12
234	80	201	1053	2268	2	1	5	10	1.5	-70.257	19.888	48.1	63.9	5.0	5.4	3.8	0.0	0.03
235	80	201	1335	2890	3	0	5	10	2.7	-70.727	19.426	-3.3	12.9	5.0	0.1	0.0	0.0	0.00
236	80	201	1351	5928	4	2	7	10	1.3	-70.741	19.324	-4.9	1.5	5.0	0.6	1.5	0.0	0.16
237	80	201	1616	3583	3	1	5	10	0.3	-70.432	19.793	29.0	53.4	25.5	0.1	0.2	0.2	0.00
238	80	201	1745	1000	6	0	6	10	2.5	-70.793	22.101	-10.5	308.7	749.0	36.1	507.8	1233.4	0.23
239	80	201	1938	2402	3	0	5	10	0.8	-70.122	19.821	62.9	56.5	5.0	0.8	0.5	0.0	0.00
240	80	202	41	4697	3	0	5	10	1.6	-71.044	18.659	-38.1	-72.0	5.0	0.2	0.4	0.0	0.00
241	80	202	545	2704	6	0	2	10	3.0	-71.055	20.185	-39.3	96.8	19.6	10.6	22.1	3.7	0.21
242	80	202	927	1553	2	1	5	1	0.3	0.000	0.000	35.4	17.4	5.0	0.0	0.0	0.0	5.02
243	80	202	1025	3284	5	0	4	10	1.8	-70.552	20.241	15.8	103.0	8.0	4.5	34.6	0.0	0.27
244	80	202	1526	1938	4	2	3	10	1.8	-71.252	19.639	-60.8	36.4	32.4	5.0	3.4	8.4	0.24
245	80	202	1550	2000	4	0	4	3	1.1	0.000	0.000	927.7	-802.2	1310.0	1310.0	1310.0	1310.0	33.74
246	80	202	1919	4000	3	0	6	3	2.5	0.000	0.000	1310.0	1310.0	5.0	1310.0	1310.0	0.3	64.85
247	80	203	155	4534	5	2	3	10	1.5	-70.236	19.956	50.3	71.5	39.1	3.4	4.7	1.3	0.11
248	80	203	1254	3169	5	1	4	10	2.2	-70.318	19.145	41.4	-18.2	35.3	15.5	14.4	23.2	0.78
249	80	204	102	1019	3	0	6	10	4.2	-70.900	19.347	-22.3	4.1	5.0	0.0	0.1	0.0	0.00
250	80	204	495	1043	3	1	5	10	1.1	-71.501	19.797	-88.1	53.9	40.4	1.7	1.4	0.5	0.05

NO	YR	D	H M	S	NP	NS	IQ	ITR	MAG	LONG (DEG)	LAT (DEG)	X (KM)	Y (KM)	DEPTH (KM)	DX (KM)	DY (KM)	DZ (KM)	S
251	80	204	642	513	3	1	4	10	2.8	-70.363	19.021	36.5	-32.0	42.9	6.2	12.5	13.5	0.33
252	80	204	1312	5672	3	2	7	5	1.2	-70.753	19.305	-6.2	-0.6	3.4	5.9	16.5	19.8	0.07
253	80	204	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
254	80	204	1646	3981	4	1	4	10	1.7	-70.765	20.683	-7.5	151.9	5.0	25.2	18.4	0.0	0.60
255	80	204	2316	4313	2	1	5	10	0.9	-70.378	19.062	34.8	-27.5	5.0	0.0	0.1	0.0	0.00
256	80	205	412	2575	4	1	4	7	1.9	-70.945	19.774	-27.2	51.3	20.7	6.1	8.9	7.4	0.32
257	80	205	623	2342	5	1	4	10	2.1	-69.100	18.883	174.7	-47.2	154.7	14.3	17.3	14.7	0.25
258	80	205	1336	3767	4	1	7	10	1.0	-70.766	19.327	-7.6	1.8	1.0	0.1	0.1	0.1	0.01
259	80	205	0	0	0	0	7	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
260	80	205	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
261	80	206	341	4486	4	1	4	10	0.6	-70.243	19.001	49.6	-34.2	118.2	12.2	15.7	9.2	0.27
262	80	206	905	3385	2	1	5	10	0.6	-70.624	19.729	7.9	46.3	5.0	0.3	0.2	0.0	0.00
263	80	206	1026	3220	3	1	4	10	2.7	-70.484	18.642	23.3	-73.9	40.5	1.1	0.8	0.6	0.01
264	80	206	0	0	0	0	6	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
265	80	206	1140	5500	4	0	4	5	1.4	0.000	0.000	1310.0	510.0	1310.0	1310.0	1310.0	1310.0	3.13
266	80	206	1312	4345	4	1	7	10	0.9	-70.755	19.312	-6.4	0.2	2.2	0.1	0.2	0.1	0.02
267	80	206	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
268	80	206	1542	3897	2	2	5	3	0.1	0.000	0.000	1310.0	1310.0	1310.0	1310.0	1310.0	1310.0	1310.00
269	80	206	1900	3167	2	1	5	1	0.3	0.000	0.000	9.6	-25.0	5.0	0.0	0.0	0.0	12.35
270	80	206	2349	2128	6	1	2	10	3.7	-70.434	19.157	28.8	-17.0	41.9	5.9	5.3	10.4	0.40
271	80	207	156	1521	4	2	3	10	1.3	-71.022	19.778	-35.7	51.7	5.9	11.5	12.6	40.9	0.67
272	80	207	304	2614	5	1	3	10	1.3	-70.756	19.791	-6.5	53.1	23.9	1.4	3.5	2.6	0.14
273	80	207	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
274	80	207	1642	3854	5	1	3	10	1.6	-71.072	19.894	-41.1	64.5	5.0	15.2	27.1	0.0	0.97
275	80	207	2030	5718	3	2	3	10	0.8	0.000	0.000	-8.8	58.6	5.0	21.0	48.7	0.0	[illegible]
276	80	207	2103	486	4	1	4	10	1.6	-69.966	19.329	80.0	2.0	88.4	2.2	2.4	2.6	0.07
277	80	207	2130	2042	3	1	7	10	0.6	-70.733	19.252	-4.0	-6.4	3.8	0.0	0.0	0.1	0.00
278	80	208	438	3814	3	2	4	6	1.3	0.000	0.000	95.6	40.3	38.8	437.9	380.8	100.6	5.13
279	80	208	442	1287	3	1	4	10	0.9	-70.462	19.923	25.6	67.7	5.0	12.3	28.5	0.0	1.08
280	80	208	550	1931	5	3	2	10	0.9	-70.653	19.199	4.7	-12.3	26.8	0.6	0.8	1.3	0.11
281	80	208	1214	2930	3	2	7	10	0.3	-70.739	19.274	-4.7	-4.0	5.0	3.1	5.7	0.0	0.27
282	80	208	1630	116	3	1	4	10	1.3	0.000	0.000	812.7	1310.0	5.0	1310.0	1310.0	0.0	436.63
283	80	208	1739	1739	4	1	3	10	1.3	-71.025	19.711	-36.0	44.4	14.6	0.1	0.1	0.2	0.00
284	80	208	1802	2288	2	1	5	10	1.3	-71.659	19.629	-105.4	35.2	5.0	2.9	5.6	0.0	0.09
285	80	208	2041	1891	5	0	6	10	4.7	-71.935	19.622	-135.6	34.5	5.0	268.1	52.7	0.0	0.20
286	80	209	515	3422	4	1	4	10	1.8	-71.115	18.694	-45.9	-68.2	39.3	0.6	1.1	0.4	0.02
287	80	209	831	5707	3	1	5	10	1.3	0.000	0.000	54.7	71.2	23.6	165.0	132.7	0.0	4.80
288	80	209	957	4211	3	1	5	10	0.9	-70.688	19.847	1.0	59.4	37.1	11.2	20.1	0.0	0.55
289	80	209	1250	3925	3	1	5	10	1.8	-70.730	19.862	-3.6	61.0	24.7	0.5	0.2	0.5	0.00
290	80	209	1358	994	3	2	7	10	0.8	-70.771	19.329	-8.1	2.0	2.1	1.1	1.3	0.5	0.09
291	80	209	2009	2665	6	1	3	10	2.1	-69.686	19.028	110.6	-31.2	91.0	7.9	6.0	6.8	0.20
292	80	210	5	2337	6	2	2	10	2.2	-69.670	18.986	112.4	-35.8	90.2	7.7	6.1	7.9	0.25
293	80	210	125	5000	4	0	5	3	2.5	0.000	0.000	1310.0	1298.6	1310.0	1310.0	1310.0	1310.0	30.43
294	80	210	136	1115	4	1	6	7	2.7	0.000	0.000	282.9	50.8	61.9	1310.0	1310.0	1310.0	7.32
295	80	210	244	3489	2	1	5	10	0.6	-70.979	18.963	-31.0	-38.4	5.0	1.4	2.1	0.0	0.08
296	80	210	334	5674	6	1	2	10	3.5	-70.715	19.837	-2.0	58.2	23.1	1.2	3.1	3.3	0.14
297	80	210	349	4918	4	1	4	10	1.3	-70.653	19.863	4.1	61.1	5.0	7.0	12.7	0.0	0.44
298	80	210	410	1707	3	1	5	5	1.1	-70.637	19.807	6.5	55.0	0.4	19.4	33.1	32.2	1.00
299	80	210	421	325	6	1	2	10	1.6	-70.727	19.908	-3.3	66.1	28.7	1.6	4.1	4.4	0.17
300	80	210	444	2408	6	2	2	10	1.3	-70.664	19.815	3.6	55.8	24.9	1.0	2.2	3.1	0.13

NO	[illegible]	D	H M	S	NP	NS	IQ	ITR	MAG	LONG (DEG)	[illegible] (DEG)	X (KM)	Y (KM)	DEPTH (KM)	DX (KM)	DY (KM)	DZ (KM)	S
301	80	210	446	3268	3	1	5	10	1.3	-70.702	19.835	-0.6	58.0	20.4	0.1	0.1	0.0	0.00
302	80	210	458	1080	4	2	3	10	0.9	-70.669	19.812	2.9	55.6	29.4	4.1	4.1	4.0	0.19
303	80	210	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
304	80	210	637	3128	4	1	4	10	1.3	-70.729	19.844	-3.5	59.0	30.0	11.1	13.7	11.7	0.48
305	80	210	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
306	80	210	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
307	80	210	940	1135	2	1	5	1	1.1	0.000	0.000	-17.1	35.9	5.0	0.0	0.0	0.0	6.91
308	80	210	941	3041	4	1	4	10	1.3	-70.745	19.864	-5.4	61.2	25.7	1.9	3.1	1.8	0.09
309	80	210	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
310	80	211	449	5631	3	3	4	10	1.9	-69.648	19.315	114.8	0.5	142.4	42.5	113.4	37.1	0.29
311	80	211	910	3385	5	2	4	10	1.0	-70.452	19.628	26.7	35.1	28.6	1.6	1.7	3.4	0.14
312	80	211	1544	4500	4	0	6	8	1.1	-75.512	32.986	-527.3	1310.0	1310.0	1310.0	1310.0	1310.0	0.62
313	80	211	1613	4278	4	1	4	10	1.1	-70.617	19.980	8.6	74.1	20.9	6.5	24.0	32.9	0.70
314	80	211	807	4875	6	2	2	10	1.9	-70.165	19.640	58.1	36.5	19.7	5.9	3.5	2.3	0.30
315	80	211	2000	5641	2	2	5	10	1.5	-70.248	19.026	49.1	-31.4	5.0	1.6	2.9	0.0	0.11
316	80	211	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
317	80	212	144	1400	6	1	2	10	1.2	-70.720	19.834	-2.6	57.9	19.7	3.6	9.0	13.9	0.47
318	80	212	235	5542	5	2	4	10	1.8	-70.130	19.586	62.0	30.5	8.5	8.9	5.4	71.8	0.38
319	80	212	256	320	2	1	5	10	0.0	-70.799	19.094	-11.2	-23.9	5.0	0.1	0.3	0.0	0.00
320	80	212	344	2835	3	0	6	10	2.5	-70.857	19.923	-17.6	67.8	5.0	0.5	10.0	0.0	0.02
321	80	212	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
322	80	212	515	500	5	0	4	10	2.9	-65.185	17.828	603.4	-163.9	479.8	1310.0	1310.0	1310.0	0.47
323	80	212	519	5549	3	0	6	10	2.1	-70.892	19.420	-21.5	12.2	5.0	0.1	0.5	0.0	0.01
324	80	212	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
325	80	212	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
326	80	212	856	1781	2	1	6	10	1.2	-70.438	19.309	28.3	-0.1	5.0	0.0	0.0	0.0	0.00
327	80	212	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
328	80	212	1339	435	3	1	7	10	0.9	-70.733	19.252	-4.0	-6.4	4.2	0.0	0.0	0.0	0.00
329	80	212	1418	1424	4	1	4	10	0.3	-70.399	18.916	32.5	-43.6	87.6	3.2	4.2	3.9	0.11
330	80	212	1436	567	3	0	4	10	2.0	-70.496	19.438	21.9	14.2	5.0	0.0	0.0	0.0	0.00
331	80	212	1518	397	5	0	4	10	2.0	-70.729	19.817	-3.5	56.1	26.2	1.7	6.5	5.8	0.16
332	80	212	1644	2746	6	3	4	10	1.6	0.000	0.000	32.0	11.5	3.1	59.8	45.5	102.6	3.42
333	80	212	1823	4367	3	0	6	10	2.7	-71.109	20.123	-45.2	89.9	5.0	4.1	7.2	0.0	0.05
334	80	212	1842	2093	5	3	3	10	1.5	-70.232	18.943	50.9	-40.6	19.0	2.1	2.6	7.3	0.16
335	80	213	0	0	0	0	6	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
336	80	213	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
337	80	213	248	1209	4	2	3	10	0.0	-70.622	19.197	8.1	-12.5	28.2	1.4	1.0	1.9	0.09
338	80	213	317	1531	4	1	4	10	0.4	-70.764	19.887	-7.4	63.9	22.8	0.2	0.6	0.4	0.02
339	80	213	414	5601	6	1	2	10	2.7	-70.695	19.779	0.1	51.8	18.3	1.2	4.7	6.3	0.20
340	80	213	638	4433	4	1	4	10	1.6	-70.748	19.832	-5.7	57.8	18.1	2.7	7.8	6.4	0.28
341	80	213	944	5696	5	0	4	8	2.0	-70.774	19.960	-8.5	71.9	43.3	31.6	90.4	91.7	0.33
342	80	213	1118	4500	3	0	6	3	2.5	0.000	0.000	1310.0	1310.0	5.0	1310.0	1310.0	0.0	173.47
343	80	213	1448	3603	2	1	7	5	-0.4	-70.738	19.291	-4.5	-2.1	5.0	7.6	14.8	0.0	0.13
344	80	213	1730	3917	6	2	2	10	0.6	-70.715	19.625	-2.0	34.8	23.9	0.9	1.2	2.4	0.12
345	80	213	0	0	0	0	6	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
346	80	214	111	3628	6	0	3	10	4.7	-69.850	19.029	92.7	-31.1	79.0	45.1	15.5	33.4	0.23
347	80	214	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
348	80	214	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
349	80	214	544	4	3	1	5	10	-0.4	-70.726	19.584	-3.2	30.3	27.1	0.2	0.1	0.2	0.00
350	80	214	850	4790	3	2	4	10	1.3	0.000	0.000	557.7	256.6	30.3	1310.0	1310.0	0.0	85.80

NO	[illegible]	M D	H M	S	NP	NS	IQ	ITR	MAG	LONG (DEG)	[illegible]T (DEG)	X (KM)	Y (KM)	DEPTH (KM)	DX (KM)	DY (KM)	DZ (KM)	S
351	80	214	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
352	80	214	1109	1730	6	2	2	10	0.3	-70.471	19.635	24.7	35.9	21.5	1.7	1.9	3.6	0.15
353	80	214	1215	2919	2	2	5	10	0.9	0.000	0.000	371.3	17.7	663.3	1310.0	1310.0	0.0	139.27
354	80	214	1310	151	2	1	7	6	0.7	-70.765	19.273	-7.5	-4.1	5.0	15.7	17.7	0.0	0.47
355	80	214	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
356	80	214	1543	1344	3	1	5	8	2.1	-70.396	20.310	32.9	110.6	18.8	14.3	33.3	13.0	0.73
357	80	214	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
358	80	214	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
359	80	214	1710	539	2	1	7	10	0.6	-70.745	19.305	-5.3	-0.5	5.0	0.1	0.2	0.0	0.00
360	80	214	1714	2659	6	0	3	8	4.4	-70.112	19.428	64.0	13.1	40.2	7.3	2.9	1.7	0.24
361	80	215	18	3847	3	2	4	10	0.6	-70.694	19.660	0.3	38.7	24.5	2.3	2.3	2.6	0.12
362	80	215	339	4778	3	2	4	10	-0.3	-70.432	19.155	29.0	-17.2	37.7	1.3	1.3	1.0	0.04
363	80	215	342	1073	6	0	3	7	1.8	-69.772	19.396	101.1	9.5	39.9	31.7	5.9	2.6	0.37
364	80	215	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
365	80	215	527	4817	6	1	3	9	2.7	-71.534	20.071	-91.7	84.2	43.8	7.8	5.1	35.2	0.26
366	80	215	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
367	80	215	739	4553	6	1	3	10	3.5	-69.538	18.880	126.9	-47.6	103.2	6.9	6.0	6.6	0.17
368	80	215	1232	4346	3	2	2	10	0.0	-70.765	19.245	-7.6	-7.2	5.0	7.4	10.8	0.0	0.84
369	80	215	1347	5443	4	1	7	10	1.1	-70.758	19.314	-6.8	0.4	2.4	0.1	0.1	0.1	0.01
370	80	215	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
371	80	215	1511	3835	5	0	4	10	2.8	-69.394	18.974	142.6	-37.1	20.8	127.8	38.7	0.0	0.33
372	80	215	1555	2822	2	1	5	5	0.0	-70.742	19.281	-5.0	-3.2	5.0	20.7	41.3	0.0	1.26
373	80	215	2106	4497	5	1	4	10	1.8	-70.423	18.738	29.9	-63.3	44.1	6.2	12.8	8.2	0.39
374	80	215	2200	2201	2	1	5	1	0.0	0.000	0.000	-17.1	35.9	5.0	0.0	0.0	0.0	3.73
375	80	221	1513	5530	3	0	6	10	0.7	-70.967	19.364	-29.6	5.9	5.0	0.2	0.3	0.0	0.00
376	80	221	1851	1775	3	1	7	10	0.6	-70.720	19.257	-2.5	-5.8	2.8	0.1	0.2	0.1	0.00
377	80	221	2024	2165	5	2	3	10	2.0	-69.563	18.937	124.1	-41.3	106.4	4.6	4.2	5.4	0.13
378	80	221	2343	3930	5	0	3	10	2.2	-70.224	19.237	51.7	-8.1	52.0	8.1	2.8	7.8	0.10
379	80	222	121	2492	6	1	2	10	1.3	-70.511	19.133	20.3	-19.6	28.9	1.0	1.4	2.1	0.12
380	80	222	0	0	0	0	6	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
381	80	222	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
382	80	222	1022	5773	5	3	2	10	1.8	-70.252	18.869	48.6	-48.8	88.4	5.7	8.0	6.9	0.28
383	80	222	1431	3572	3	1	7	10	1.5	-70.748	19.304	-5.7	-0.7	6.9	0.0	0.0	0.0	0.00
384	80	222	2213	4123	5	3	3	10	1.8	-70.339	18.683	39.1	-69.4	34.3	5.8	5.3	7.4	0.22
385	80	223	1407	3562	5	1	7	10	1.3	-70.751	19.284	-5.9	-2.9	2.9	1.6	1.8	1.4	0.42
386	80	223	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
387	80	224	436	2794	2	1	5	10	1.8	-70.053	19.374	70.4	7.1	5.0	0.4	0.3	0.0	0.01
388	80	224	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
389	80	224	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
390	80	224	0	0	0	0	0	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
391	80	224	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
392	80	224	1701	5755	3	0	5	10	0.3	-69.329	18.750	149.8	-62.0	5.0	30.3	12.2	0.0	0.21
393	80	224	1749	5280	4	1	4	10	0.6	-70.404	19.546	32.1	26.1	26.5	1.2	2.2	2.2	0.08
394	80	224	1911	519	5	4	2	10	0.3	-70.517	19.071	19.6	-26.4	38.3	1.9	1.8	1.9	0.13
395	80	224	1938	1628	5	1	3	10	1.6	-69.279	19.286	155.2	-2.6	5.0	7.7	7.0	0.0	0.25
396	80	225	115	1671	6	1	2	10	1.3	-70.716	19.952	-2.1	71.0	29.9	2.0	4.9	5.5	0.20
397	80	225	849	4118	2	1	5	1	0.0	0.000	0.000	-17.1	35.9	5.0	0.0	0.0	0.0	7.36
398	80	225	1007	1007	4	1	4	10	1.6	-70.048	18.336	71.0	-107.8	36.9	9.1	7.3	1.9	0.18
399	80	225	1036	3338	3	0	6	10	2.5	-70.779	19.303	-9.0	-0.8	5.0	0.1	0.0	0.0	0.00
400	80	225	1047	3147	3	1	5	10	0.9	-70.514	19.653	20.0	37.9	5.0	9.4	19.9	0.0	1.44

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DR EQFILE
 NO       M D   H M   S    NP  NS  IQ ITR  MAG     LONG        T       X       Y    DEPTH     DX      DY      DZ       S
                                                   (DEG)    (DEG)    (KM)    (KM)   (KM)    (KM)    (KM)    (KM)
 401  80  225     0    0    0   0   5   0  0.0    0.000    0.000     0.0     0.0    0.0     0.0     0.0     0.0    0.00
 402  80  225     0    0    0   0   5   0  0.0    0.000    0.000     0.0     0.0    0.0     0.0     0.0     0.0    0.00
 403  80  225     0    0    0   0   5   0  0.0    0.000    0.000     0.0     0.0    0.0     0.0     0.0     0.0    0.00
 404  80  225     0    0    0   0   5   0  0.0    0.000    0.000     0.0     0.0    0.0     0.0     0.0     0.0    0.00
 405  80  226   440 4253    6   1   2  10  1.8  -71.239   19.875   -59.4    62.4   25.4     4.6     5.3     9.7    0.20
 406  80  227  1114 2899    5   0   3  10  1.3  -70.716   19.899    -2.2    65.1   25.2     1.0     4.8     3.4    0.08
 407  80  227  1459 2917    3   1   7  10  1.0  -70.735   19.283    -4.2    -2.9    6.7     0.0     0.0     0.0    0.00
 408  80  227  1509 3324    3   1   5  10  0.9  -70.754   19.870    -6.3    61.9   25.3     0.1     0.2     0.1    0.00
 409  80  227  2030 2344    7   1   2  10  1.6  -70.714   19.945    -2.0    70.3   29.5     2.5     6.1     6.5    0.25
 410  80  228    46 3195    5   1   4   6  2.8  -72.923   19.244  -243.8    -7.3   40.8    68.8    60.4   144.5    1.16
 411  80  228     0    0    0   0   5   0  0.0    0.000    0.000     0.0     0.0    0.0     0.0     0.0     0.0    0.00
 412  80  228   212 2121    5   2   2   5  1.3  -70.958   20.178   -28.7    95.9   13.5     5.8     8.0    15.6    0.36
 413  80  228   759 1424    6   1   2  10  0.0  -70.509   19.037    20.5   -30.2   72.4     4.6     7.5     9.2    0.29
 414  80  228  1346 4489    3   1   7  10  1.2  -70.757   19.295    -6.6    -1.7    6.1     0.0     0.0     0.0    0.00
 415  80  228  1531 2340    3   0   7  10 -0.5  -70.741   19.302    -4.9    -0.9    5.0     0.0     0.0     0.0    0.00
 416  80  228  2002 5933    2   2   5   2  0.3    0.000    0.000   -17.1    35.9    5.0  1310.0  1310.0     0.0    4.92
 417  80  228     0    0    0   0   5   0  0.0    0.000    0.000     0.0     0.0    0.0     0.0     0.0     0.0    0.00
 418  80  228  2228 3635    2   2   5   2  0.0  -70.608   19.084     9.6   -25.0    5.0  1310.0  1310.0     0.0    1.91
 419  80  229  1322 5890    5   1   7  10  1.3  -70.755   19.305    -6.4    -0.6    2.7     0.2     0.2     0.2    0.05
 420  80  229     0    0    0   0   5   0  0.0    0.000    0.000     0.0     0.0    0.0     0.0     0.0     0.0    0.00
 421  80  229  1517 2149    2   1   5  10  0.8  -70.735   19.291    -4.3    -2.1    5.0     4.3     8.6     0.0    0.05
 422  80  301   800 4481    5   1   5  10  0.9  -70.224   19.796    51.8    53.8   31.9     4.8     5.1     5.8    0.20
 423  80  301  1330 4842    5   1   7  10  1.3  -70.755   19.305    -6.4    -0.6    2.5     0.2     0.2     0.3    0.07
 424  80  301  1712 2069    5   2   4  10  0.9  -69.873   19.192    90.1   -13.0   86.6     7.2     7.7     6.4    0.25
 425  80  301  2053 4837    4   2   3   5  0.9  -70.730   18.496    -3.6   -90.1   15.8    49.6    14.4    19.5    0.57
 426  80  302   503 2746    6   1   3  10  1.6  -69.347   18.601   147.7   -78.4   70.0    23.7    21.9    44.7    0.54
 427  80  302   633 5626    3   0   5   5  2.2  -70.941   18.958   -26.8   -38.9    5.0     6.5    36.9     0.0    0.41
 428  80  302  1353 1386    5   1   7  10  2.1  -70.742   19.304    -4.9    -0.7    2.7     0.4     0.5     0.5    0.15
 429  80  302  1930 2315    5   2   2  10  0.0  -70.826   19.584   -14.2    30.3   26.7     3.1     3.0     5.2    0.24
 430  80  302  2234 5132    5   1   4   6  0.9  -69.759   19.400   102.6     9.9   11.5    17.4    14.5    13.1    0.60
 431  80  303   319  450    5   3   3  10  1.6  -69.822   18.922    95.7   -42.9  104.9     4.4     5.8     5.5    0.16
 432  80  303  1033  436    6   2   2  10  0.0  -70.671   19.688     2.8    41.8   27.6     1.8     1.9     3.1    0.15
 433  80  304  1309 5331    5   1   7  10  1.5  -70.756   19.305    -6.6    -0.6    2.6     0.3     0.3     0.3    0.10
 434  80  304     0    0    0   0   5   0  0.0    0.000    0.000     0.0     0.0    0.0     0.0     0.0     0.0    0.00
 435  80  304  2106  786    7   1   2  10  1.3  -69.839   19.259    93.9    -5.6   16.0    14.8     6.5     5.9    0.46
 436  80  304  2138 3235    5   1   4   6  1.8  -71.786   18.450  -119.3   -95.1   54.4    21.1    22.2    35.1    0.42
 437  80  305  1122   70    5   2   3  10  0.9  -70.461   18.853    25.8   -50.6   98.0     7.2     8.8     7.4    0.29
 438  80  305  1253 1996    6   0   3   7  1.8  -69.079   19.535   177.1    24.9    5.4    22.3     9.3     8.1    0.24
 439  80  305  1443 2573    4   1   4  10  1.1  -70.681   19.920     1.7    67.5   20.5     5.6    12.3     6.5    0.31
 440  80  305  2204 2173    6   1   3  10  1.1  -71.454   19.977   -82.9    73.7   31.9     6.7     6.0    15.7    0.23
 441  80  306   450 4291    3   3   4  10  0.6  -70.564   19.034    14.5   -30.5   40.2     3.5     2.2     1.5    0.08
 442  80  307  1553 2006    4   1   7  10  0.5  -70.753   19.304    -6.2    -0.7    2.9     0.2     0.2     0.2    0.05
 443  80  307  1602 5481    4   1   4  10  1.6  -68.870   18.745   200.0   -62.5  196.1    33.6    44.8    38.9    0.58
 444  80  326   213 5847    3   0   6  10  3.1  -70.743   19.433    -5.1    13.6    5.0     0.0     0.0     0.0    0.00
 445  80  326   706 1500    4   0   5  10  3.0  -58.057   18.661  1310.0   -71.8 1310.0  1310.0   280.3  1310.0    0.10
 446  80  326  1354  373    4   1   4  10  1.3  -70.675   19.854     2.4    60.1   34.8     0.9     2.2     1.8    0.18
 447  80  326  1355 4660    3   1   7  10  1.6  -70.745   19.356    -5.3     5.1    9.3     0.2     0.1     0.0    0.00
 448  80  326     0    0    0   0   6   0  0.0    0.000    0.000     0.0     0.0    0.0     0.0     0.0     0.0    0.00
 449  80  326  2051 4634    5   1   3  10  5.6  -69.470   19.405   134.3    10.5   57.7    15.9    11.9    15.3    0.30
 450  80  327  1340 2694    5   0   3  10  1.5  -70.755   19.642    -6.4    36.7   27.4    12.8    22.9    32.9    0.43
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 DR EQFILE
 NO    [illegible] M D   H M   S     NP  NS  IQ ITR  MAG    LONG      [illegible]T      X        Y     DEPTH     DX       DY       DZ       S
                                                        (DEG)      (DEG)     (KM)     (KM)    (KM)     (KM)     (KM)     (KM)
 451   80  327 1418 1737    5   1   7  10   0.9   -70.752    19.303     -6.1     -0.8      3.0      0.8      0.6      0.6      0.19
 452   80  327 1555 4045    3   1   5  10   1.8   -70.246    18.942     49.2    -40.7     32.7      0.1      0.1      0.4      0.00
 453   80  327 1740  883    5   1   3  10   0.6   -70.435    18.926     28.6    -42.5     82.9      7.2     12.0     11.2      0.38
 454   80  327 2051 5640    3   1   5   3   1.3     0.000     0.000   1310.0   1310.0   1310.0   1310.0   1310.0   1310.0   1282.91
 455   80  328   22  952    4   0   5  10   1.1   -70.430    19.614     29.2     33.7      5.0      1.4      1.8      0.0      0.15
 456   80  328 1343  128    5   0   7  10   1.6   -70.756    19.303     -6.6     -0.8      3.1      0.9      1.0      0.9      0.22
 457   80  328    0    0    0   0   5   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 458   80  328 1744 2017    4   0   4  10   0.8   -70.652    18.899      4.8    -45.5     68.8      0.8      1.0      0.9      0.03
 459   80  328 2338 5636    6   1   3  10   0.8   -70.383    19.473     34.3     18.0      5.6      9.7      6.5      8.1      0.90
 460   80  329 1244 1617    5   2   4  10   0.9   -70.626    19.080      7.6    -25.4     31.4      1.0      1.6      2.0      0.13
 461   80  329 1532 3094    5   0   3  10   0.8   -70.572    19.176     13.6    -14.8     31.1      1.3      2.0      3.8      0.17
 462   80  329 1658 4197    4   1   5  10   2.8   -68.890    18.863    197.8    -49.5    149.4     14.0     18.3     19.4      0.27
 463   80  329    0    0    0   0   5   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 464   80  329    0    0    0   0   5   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 465   80  330  358 3000    4   0   6   5   1.1   -73.169   -73.169   -270.7   1310.0   1310.0   1310.0   1310.0   1310.0      1.93
 466   80  330 1420  126    3   1   7  10   1.1   -70.754    19.309     -6.3     -0.2      5.0     21.6     41.1      0.0      1.03
 467   80  331  321 1571    4   1   3  10   0.8   -69.850    19.158     92.7    -16.9     95.4     17.1     10.8     17.2      0.31
 468   80  331    0    0    0   0   6   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 469   80  331 1555  858    3   2   7  10   1.3   -70.750    19.325     -5.9      1.6      5.0      3.0      7.4      0.0      0.35
 470   80  331    0    0    0   0   5   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 471   80  401  226 1938    2   1   5   1   1.3     0.000     0.000    -30.8     -8.5      5.0      0.0      0.0      0.0     31.50
 472   80  401    0    0    0   0   5   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 473   80  401  654  844    5   3   3  10   0.9   -70.470    19.697     24.7     42.8     27.0      1.8      2.4      4.1      0.18
 474   80  401    0    0    0   0   5   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 475   80  401    0    0    0   0   5   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 476   80  401 1247 4493    4   1   4  10   0.9   -71.339    19.719    -70.3     45.2     34.4      7.5      5.7     10.9      0.35
 477   80  401 1932 4296    7   1   2  10   0.8   -70.676    19.851      2.3     59.9     30.2      1.6      4.3      5.4      0.19
 478   80  401    0    0    0   0   5   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 479   80  401    0    0    0   0   5   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 480   80  401 2304 5637    7   2   1  10   0.3   -70.578    19.717     12.9     44.9     27.7      0.9      1.6      3.1      0.13
 481   80  402    0    0    0   0   5   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 482   80  402  101 2798    2   1   5  10  -0.5   -70.788    19.071    -10.0    -26.4      5.0      0.7      1.1      0.0      0.04
 483   80  402  836 2376    2   1   5   1   0.3     0.000     0.000     35.4     17.4      5.0      0.0      0.0      0.0      5.90
 484   80  402 1138 5151    5   1   4  10   0.9     0.000     0.000     86.5     14.4     38.0     69.3     44.8     60.7      2.24
 485   80  403  256  440    3   0   5  10   1.6   -70.481    19.304     23.6     -0.6      5.0      0.0      0.1      0.0      0.00
 486   80  403 1543 4470    6   1   3  10   0.9   -70.736    19.654     -4.3     38.0     26.7      1.3      2.2      4.0      0.19
 487   80  403 1608 4490    4   1   4  10   1.3   -70.286    19.150     44.9    -17.7     93.9      9.8     10.8      8.7      0.25
 488   80  403 1703 4482    3   0   6  10   2.5   -70.869    19.439    -18.9     14.2      5.0      0.0      0.0      0.0      0.00
 489   80  403 1810 1125    3   1   5   6   0.9   -70.147    18.921     60.1    -43.0      6.3     20.5     21.9    116.4      1.03
 490   80  403    0    0    0   0   5   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 491   80  403 2111 2948    2   1   5   1   0.8     0.000     0.000      0.0      0.0      5.0      0.0      0.0      0.0     19.53
 492   80  403    0    0    0   0   5   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 493   80  404   15 3068    7   2   2  10   3.3   -70.090    18.073     66.4   -136.8    245.2     27.1     28.0     25.5      0.61
 494   80  404  101 2500    5   0   4   5   2.6   109.701    -3.466   1310.0   1310.0   1310.0   1310.0   1310.0   1310.0      0.67
 495   80  404  129 2541    2   1   5   1   0.9     0.000     0.000    -17.1     35.9      5.0      0.0      0.0      0.0     16.16
 496   80  404  352 4161    6   2   2  10   1.3   -70.718    19.657     -2.4     38.3     27.4      1.3      1.9      3.7      0.19
 497   80  404    0    0    0   0   6   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
 498   80  404  827 2933    5   1   4   6   1.3   -70.298    20.056     43.6     82.5     13.4     12.9     16.7      7.3      0.62
 499   80  404  842 3058    7   2   1  10   0.9   -70.396    18.827     32.9    -53.4     99.7      4.3      5.7      4.9      0.22
 500   80  404    0    0    0   0   5   0   0.0     0.000     0.000      0.0      0.0      0.0      0.0      0.0      0.0      0.00
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NO	Y	M D	H M	S	NP	NS	IQ	ITR	MAG	LONG (DEG)	(DEG)	X (KM)	Y (KM)	DEPTH (KM)	DX (KM)	DY (KM)	DZ (KM)	E
501	80	404	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
502	80	404	1339	884	5	1	4	5	1.3	-70.774	20.587	-8.5	141.2	52.5	29.4	42.5	56.0	1.17
503	80	405	140	3503	2	1	5	1	1.1	0.000	0.000	-17.1	35.9	5.0	0.0	0.0	0.0	19.51
504	80	405	1331	3151	4	1	4	10	0.6	-70.738	19.883	-4.6	63.3	30.2	10.5	4.3	9.0	0.15
505	80	405	1535	2458	4	1	4	10	0.6	-70.512	18.649	20.2	-73.1	110.1	13.3	7.5	3.1	0.09
506	80	405	1627	3462	6	1	2	10	1.0	-71.276	19.178	-63.5	-14.6	56.2	13.7	8.1	13.8	0.50
507	80	405	1901	3005	3	1	5	10	0.6	-70.691	19.787	0.6	52.7	22.9	0.1	0.1	0.1	0.06
508	80	405	2010	461	5	1	3	10	0.9	-70.916	19.023	-24.1	-31.8	5.0	1.2	1.7	0.0	0.13
509	80	405	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
510	80	406	412	3268	3	0	6	10	2.2	-70.687	19.140	1.1	-18.9	5.0	0.1	0.1	0.0	0.00
511	80	406	653	5294	5	1	3	10	1.6	-70.737	19.882	-4.5	63.3	29.7	6.7	10.5	10.2	0.35
512	80	406	942	5584	6	1	2	10	0.7	-70.690	19.832	0.7	57.7	24.5	3.2	4.8	4.8	0.18
513	80	406	1026	5638	6	1	2	10	1.0	-70.646	19.900	5.5	65.3	30.9	9.6	12.2	14.4	0.48
514	80	406	1514	1177	3	3	4	10	-0.3	-70.708	19.174	-1.2	-15.1	18.1	1.4	1.7	2.9	0.11
515	80	406	1607	2831	5	2	3	3	1.1	0.000	0.000	1220.8	284.0	1310.0	1310.0	1310.0	1310.0	546.53
516	80	406	1743	3475	5	2	3	10	1.2	-70.261	19.480	47.6	18.8	23.0	6.3	2.9	18.3	0.27
517	80	406	2124	4613	4	3	3	10	-0.5	-70.853	19.021	-17.2	-32.0	5.0	2.2	3.6	0.0	0.36
518	80	406	0	0	0	0	6	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
519	80	407	126	2869	6	1	3	10	3.1	-68.424	18.990	248.8	-35.4	182.0	37.9	25.2	43.5	0.39
520	80	407	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
521	80	407	439	5915	3	1	5	10	0.9	-69.239	19.245	159.6	-7.2	5.0	12.6	12.4	0.0	0.46
522	80	407	405	4093	5	1	4	10	2.8	-68.928	18.269	193.6	-115.2	94.0	22.8	23.8	46.4	0.28
523	80	407	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
524	80	407	716	4138	2	1	5	1	0.5	0.000	0.000	-7.5	-3.9	5.0	0.0	0.0	0.0	2.73
525	80	407	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
526	80	408	49	5574	2	1	5	1	0.6	0.000	0.000	9.6	-25.0	5.0	0.0	0.0	0.0	17.56
527	80	408	1556	5808	4	1	7	10	0.0	-70.742	19.300	-5.0	-1.2	3.9	0.2	0.2	0.8	0.03
528	80	408	1600	603	5	1	7	10	0.3	-70.757	19.304	-6.7	-0.6	2.9	0.6	0.5	0.5	0.15
529	80	408	1607	1673	4	2	3	10	0.3	-70.649	19.762	5.2	50.0	29.9	2.6	2.5	2.6	0.12
530	80	408	1732	470	2	1	5	1	1.8	0.000	0.000	-30.8	-8.5	5.0	0.0	0.0	0.0	44.45
531	80	408	1800	1607	4	1	4	10	0.9	-70.250	18.959	48.9	-38.8	18.6	10.4	0.0	16.6	0.34
532	80	408	1810	3057	2	1	5	1	0.9	0.000	0.000	-17.1	35.9	5.0	0.0	0.0	0.0	7.80
533	80	408	1917	5897	5	1	4	10	-0.1	-70.695	19.146	0.1	-18.1	6.6	1.2	0.6	8.1	0.12
534	80	408	1940	1935	6	1	2	10	0.3	-70.763	19.778	-7.3	51.8	24.6	5.0	8.4	5.3	0.31
535	80	408	2039	5480	6	1	2	10	0.2	-70.730	18.977	-3.7	-36.9	30.0	4.0	6.0	6.4	0.36
536	80	410	1322	4924	3	0	5	10	0.5	-70.793	18.926	-10.6	-42.4	5.0	0.0	0.1	0.0	0.00
537	80	410	1421	91	5	2	7	10	0.0	-70.760	19.305	-6.9	-0.6	2.0	0.6	0.6	0.6	0.18
538	80	410	1440	3100	3	0	5	10	0.9	-70.745	19.410	-5.3	11.0	5.0	0.0	0.0	0.0	0.00
539	80	410	1456	1417	4	1	4	10	0.7	-71.439	18.466	-81.4	-93.3	5.0	12.1	13.8	0.0	0.33
540	80	411	215	5039	4	2	4	10	1.1	-70.022	18.344	73.9	-106.8	5.0	4.3	3.0	0.0	0.11
541	80	411	414	4387	2	1	5	1	0.6	0.000	0.000	-17.1	35.9	5.0	0.0	0.0	0.0	7.12
542	80	411	1011	2939	2	1	5	1	0.9	0.000	0.000	-17.1	35.9	5.0	0.0	0.0	0.0	7.19
543	80	411	2040	5022	3	0	7	10	-0.4	-70.736	19.292	-4.3	-2.0	5.0	0.0	0.0	0.0	0.00
544	80	411	0	0	0	0	5	0	0.0	0.000	0.000	0.0	0.0	0.0	0.0	0.0	0.0	0.00
545	80	412	23	500	7	0	3	6	2.8	0.000	0.000	1310.0	1310.0	1310.0	1310.0	1310.0	1310.0	2.51
546	80	412	0	0	3	1	5	10	0.9	-71.101	19.660	-44.3	38.7	23.6	0.1	0.1	0.2	0.00
547	80	412	34	4380	3	1	5	10	0.7	-71.055	19.583	-39.3	30.2	5.0	1.0	0.5	0.0	0.05
548	80	412	41	1683	4	2	3	10	1.0	-71.090	19.637	-43.1	36.2	23.9	2.4	2.5	4.3	0.15
549	80	412	123	3235	4	1	4	10	2.8	-71.059	19.620	-39.7	34.2	23.4	4.2	4.6	9.0	0.13
550	80	412	216	3982	4	1	4	10	1.8	-71.106	19.607	-44.9	32.8	5.0	17.2	11.8	0.0	0.95

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DP EQFILE
 NO  [illegible] M D   H M   S    NP  NS  IQ ITR  MAG    LONG     [illegible]T      X       Y     DEPTH     DX      DY      DZ       S
                                                    (DEG)      (DEG)   (KM)    (KM)    (KM)     (KM)    (KM)    (KM)
 551  80  412  320  338    2   1   5   1   0.6    0.000     0.000   -30.8    -8.5     5.0     0.0     0.0     0.0    6.79
 552  80  412  350 3235    4   2   4  10   0.4  -71.055    19.611   -39.2    33.3    28.4     2.0     1.8     3.4    0.12
 553  80  412  539 5368    4   1   4  10   0.9  -71.072    19.624   -41.1    34.7    17.7     6.3     6.5    17.5    0.38
 554  80  412 1104 2835    4   1   4  10   1.3  -71.037    19.447   -37.3    15.1    49.8     5.8    12.1     8.2    0.20
 555  80  412 1111 3093    3   1   4  10   1.1  -70.996    19.437   -32.8    14.0    45.0     0.1     0.2     0.3    0.00
 556  80  412 1502 2134    3   1   5  10   0.9  -71.040    19.575   -37.6    29.3     5.0     6.1     3.6     0.0    0.34
 557  80  412 1836 5123    2   1   5   1   1.1  -70.853    19.634   -17.1    35.9     5.0     0.0     0.0     0.0    1.27
 558  80  413    0    0    0   0   5   0   0.0    0.000     0.000     0.0     0.0     0.0     0.0     0.0     0.0    0.00
 559  80  413 1433 2233    5   2   4  10   1.0  -71.075    19.586   -41.5    30.5    18.2     3.7     3.0    10.8    0.28
 560  80  413 1445  983    3   1   4  10   1.8  -70.420    18.636    30.3   -74.6     5.0    58.5    42.6     0.0    0.79
 561  80  414    0    0    0   0   5   0   0.0    0.000     0.000     0.0     0.0     0.0     0.0     0.0     0.0    0.00
 562  80  414    0    0    0   0   5   0   0.0    0.000     0.000     0.0     0.0     0.0     0.0     0.0     0.0    0.00
 563  80  414  607 3284    3   1   5  10   1.1  -69.959    19.014    80.8   -32.7     5.0    25.2    17.9     0.0    0.73
 564  80  414  655 5544    5   1   4  10   2.5  -68.290    19.465   263.5    17.1   101.7    63.9    41.3   195.7    0.61
 565  80  414 1357 1927    4   0   7  10   1.3  -70.654    19.278     4.6    -3.5     6.6     0.0     0.0     0.0    0.00
 566  80  415  557 2306    2   1   5   1   0.9    0.000     0.000   -17.1    35.9     5.0     0.0     0.0     0.0    6.50
 567  80  415 1047 4167    4   0   4  10   2.5  -70.584    19.161    12.2   -16.5    20.1     0.1     0.0     0.1    0.00
 568  80  415    0    0    2   1   5  10   0.9  -70.910    19.042   -23.4   -29.7     5.0     0.1     0.3     0.0    0.00
 569  80  415 1404 1881    2   1   5  10   1.1  -70.920    19.896   -24.5    64.8     5.0     0.8     0.3     0.0    0.01
 570  80  415 1710  119    3   1   5  10  -0.5  -70.645    19.337     5.6     3.0    19.1     0.1     0.2     0.1    0.00
 571  80  415 1726   48    3   0   5  10   2.5  -70.783    19.597    -9.5    31.7     5.0     0.2     0.1     0.0    0.01
 572  80  415 1800 2249    3   0   5  10   2.5  -70.709    19.639    -1.3    36.4     5.0     0.1     0.2     0.0    0.00
 573  80  416  108  475    4   1   5  10   1.8  -69.653    19.411   114.2    11.1    70.6     6.9     3.9    11.2    0.13
 574  80  416  427 4142    3   2   4  10   0.6  -70.573    19.536    13.5    25.0    20.8     3.4     1.2     4.2    0.13
 575  80  416  540 3449    2   1   5   1   0.0    0.000     0.000   -17.1    35.9     5.0     0.0     0.0     0.0    8.57
 576  80  416    0    0    0   0   5   0   0.0    0.000     0.000     0.0     0.0     0.0     0.0     0.0     0.0    0.00
 577  80  416  659 4633    2   1   5   1  -0.1    0.000     0.000   -17.1    35.9     5.0     0.0     0.0     0.0    6.42
 578  80  416    0    0    0   0   5   0   0.0    0.000     0.000     0.0     0.0     0.0     0.0     0.0     0.0    0.00
 579  80  416 1237 5080    3   0   6  10   2.0  -70.884    19.435   -20.5    13.8     5.0     0.0     0.0     0.0    0.00
 580  80  416 1238 1122    5   0   6  10   3.0  -70.701    20.443    -0.5   125.3   405.6    29.7   187.1   600.8    0.23
 581  80  416 1424 3982    5   1   7  10   0.3  -70.756    19.304    -6.5    -0.7     2.6     0.4     0.4     0.4    0.13
 582  80  416 1913  222    2   1   5   1   0.5    0.000     0.000   -17.1    35.9     5.0     0.0     0.0     0.0    5.07
 583  80  416    0    0    0   0   6   0   0.0    0.000     0.000     0.0     0.0     0.0     0.0     0.0     0.0    0.00
 584  80  417    0    0    0   0   5   0   0.0    0.000     0.000     0.0     0.0     0.0     0.0     0.0     0.0    0.00
 585  80  417  511 1000    5   0   4   6   2.1  -51.852    86.036  1310.0  1310.0  1310.0  1310.0  1310.0  1310.0    1.11
 586  80  417 1101  306    2   1   5  10   1.9    0.000     0.000   -11.6    -5.8     5.0    17.5    95.5     0.0    2.28
 587  80  422 1429 3329    4   1   7  10   0.0  -70.738    19.299    -4.5    -1.3     2.4     0.5     0.5     0.6    0.14
 588  80  422 1628 3122    3   1   7  10   0.1  -70.762    19.296    -7.2    -1.5     5.1     0.0     0.0     0.0    0.00
 589  80  422 1756  252    3   1   4  10   1.5  -71.592    18.232   -98.0  -119.3     5.0    36.7    31.2     0.0    0.97
 590  80  423    7 4361    5   2   2   9   0.8  -70.856    19.670   -17.5    39.7     8.8     4.2     9.0    40.2    0.37
 591  80  423    0    0    0   0   5   0   0.0    0.000     0.000     0.0     0.0     0.0     0.0     0.0     0.0    0.00
 592  80  423 1214 3500    4   0   6   4   2.0    0.000     0.000  1310.0  1310.0  1310.0  1310.0  1310.0  1310.0    2.07
 593  80  423 1635 2785    3   0   6  10   2.0  -71.285    19.505   -64.5    21.6     5.0     0.3     0.1     0.0    0.00
 594  80  423    0    0    0   0   7   0   0.0    0.000     0.000     0.0     0.0     0.0     0.0     0.0     0.0    0.00
 595  80  423 1740 5293    3   1   5  10   1.2    0.000     0.000  -196.2    -1.7     5.0   144.7   135.7     0.0    4.51
 596  80  423 1947 1065    4   1   5  10   0.6  -70.191    19.573    55.3    29.1    11.2     7.5     3.3     5.5    0.24
 597  80  423    0    0    0   0   5   0   0.0    0.000     0.000     0.0     0.0     0.0     0.0     0.0     0.0    0.00
 598  80  424  203 5058    3   0   6  10   2.0  -71.024    19.458   -35.8    16.3     5.0     0.0     0.0     0.0    0.00
 599  80  424    0    0    0   0   5   0   0.0    0.000     0.000     0.0     0.0     0.0     0.0     0.0     0.0    0.00
 600  80  424    0    0    0   0   5   0   0.0    0.000     0.000     0.0     0.0     0.0     0.0     0.0     0.0    0.00
```

Correction and Addendum to
PRELIMINARY REPORT #2
Tavera-Bao Seismic Network
Dominican Republic

July 20, 1980

Corrections:

2-1 (Page 2, line 13) and 2-4 (Page 4, line 11)

Kelleher (1973) should be read as Kelleher *et al.*, (1973)

2-2 (Page 3, line 15)

Gutenburg and Richter (1956) should be read as Gutenburg and Richter (1954)

2-4 (Page 4, line 14)

Scherer and Bodle (1948) should be read as Lynch and Bodle (1948)

9-2 (Page 25, line 12)

Intensity VII should be read as Intensity IX

Addendum:

References for section 2 (Historical Seismicity)

Gutenburg, B. and C. F. Richter (1954), Seismicity of the Earth and Associated Phenomena, Princeton University Press, Princeton, N.J. pp. 210

Kafka, A. L. and D. J. Weidner (1978), A focal mechanism of a small intra-Caribbean plate earthquake as determined from Rayleigh waves, Earthquake Notes, 49, p. 21-29

Kelleher, J., L. Sykes, and J. Oliver (1973), Possible criteria for predicting earthquake locations and their application to major plate boundaries of the Pacific and the Caribbean, Jl Geophys. Res., 78, p. 2547-2585.

Lynch, J. and R. Bodle (1948), The Dominican earthquakes of August, 1946, Bull. Seism. Soc. Am., 38, p. 1-17.

Molnar, P. and L. Sykes (1969), Tectonics of the Caribbean and Middle America regions from focal mechanisms and seismicity, Geol. Soc. Am. Bull., 80, p. 1639-1684

Sykes, L. and M. Ewing (1965), The seismicity of the Caribbean region, Jl. Geophys. Res., 70, p. 5065-5074.

TABLE 2. Instrumentally-located earthquakes, magnitude greater than 3.0

SOURCE[1]	YEAR	MO	DAY	TIME(UT)	LATITUDE	LONGITUDE	DEPTH	MAG(Mb)	MAG(MS)[2]
G-R	1911	10	6	10:16:12.0	19.000	-70.500	-0		7.00PAS
G-R	1916	11	30	13:18: 0.0	20.000	-70.000	-0		6.75PAS
G-R	1926	3	24	5:41:21.0	19.500	-69.500	-0		5.60PAS
G-R	1933	7	21	7:29: 5.0	19.000	-68.500	100		5.75PAS
G-R	1942	7	5	23:16:10.0	19.500	-70.000	50		5.60PAS
G-R	1943	8	15	0:13:15.0	19.000	-68.250	-0		5.60PAS
G-R	1945	1	22	7:47:53.0	19.500	-70.500	-0		6.00PAS
G-R	1946	8	4	17:51: 5.0	19.250	-69.000	-0		8.10PAS(3)
G-R	1946	8	8	13:28:28.0	19.500	-69.500	25A		7.90PAS "
G-R	1946	10	4	14:45:26.0	18.750	-68.500	50		7.00PAS "
G-R	1948	4	21	20:22: 2.0	19.250	-69.250	40		7.30PAS(4)
SYK	1950	8	13	16:43:25.2	19.590	-70.030	43		4.90PAL
SYK	1951	8	20	8:55:51.9	19.320	-69.390	66		3.50PAL
SYK	1951	9	21	4:22:11.8	19.490	-70.190	52		4.30PAL
SYK	1952	12	14	10:38:39.8	19.000	-68.990	0		4.40PAL
CGS	1953	5	31	19:58:35.0	20.000	-70.500	33		6.75PAS(5)
SYK	1953	6	1	20:33:33.8	19.770	-70.270	0		3.70PAL "
SYK	1953	6	2	22:15:54.0	19.640	-70.150	0		4.50PAL "
SYK	1953	6	5	18:15:50.1	19.710	-70.470	0		3.70PAL "
SYK	1953	6	7	12:23:59.4	19.910	-70.060	16		5.30PAL "
SYK	1954	4	25	9:56:27.9	19.500	-69.280	0		3.50PAL
SYK	1954	7	22	22:29: 9.4	20.000	-70.010	66		4.20PAL
SYK	1954	9	25	19:22:24.9	19.740	-69.610	68		3.70PAL
SYK	1954	11	8	2:15:26.5	19.770	-71.240	13		3.80PAL
SYK	1954	12	4	18:10:24.2	19.560	-69.410	1		4.10PAL
SYK	1955	9	3	5:23:15.4	19.460	-69.440	54		4.40PAL
SYK	1956	3	13	1:40:34.1	19.990	-70.080	0		3.90PAL
SYK	1956	8	1	20:28:31.8	19.040	-71.040	28		4.20PAL
SYK	1959	12	19	13:46:21.9	19.580	-71.580	24		4.10PAL
SYK	1960	9	14	1:53:21.3	19.660	-70.170	0		4.40PAL
CGS	1961	6	1	10: 2:42.0	19.300	-69.300	21		4.38PAL
CGS	1961	8	19	14:52:29.7	18.000	-68.800	100		5.50BRK
CGS	1961	11	16	8:19:54.1	18.500	-68.800	152		6.00PAS
CGS	1962	1	8	1: 0:22.7	18.400	-70.400	32		6.50PAS
CGS	1963	2	22	21:14: 2.3	18.100	-71.400	17	5.50MB	
CGS	1963	3	13	10:39:20.1	19.500	-69.500	49	4.10MB	
CGS	1963	6	18	13: 9:34.6	18.300	-71.000	33	4.00MB	
CGS	1963	11	28	2:44:36.3	19.100	-69.400	48	4.30MB	
CGS	1963	11	28	3:18:59.7	19.100	-69.500	33	4.10MB	
CGS	1964	1	18	22:36:17.6	18.800	-69.400	95	5.30MB	
CGS	1964	4	25	21:29:30.4	19.800	-71.200	35	4.30MB	
CGS	1964	5	31	10:30:25.0	19.200	-69.400	83	5.00MB	
CGS	1964	8	3	1:48:23.3	19.800	-70.700	7	5.20MB	
CGS	1964	8	24	8:31: 5.8	18.400	-68.800	179	4.60MB	
CGS	1964	10	9	11:27:57.0	18.400	-68.900	178	4.30MB	
CGS	1964	10	18	7: 7:31.8	19.400	-68.700	33	4.30MB	
CGS	1964	11	5	8:47: 6.0	18.200	-68.400	183	4.80MB	
CGS	1964	12	22	8: 1:12.6	18.400	-68.800	115	5.60MB	6.00PAS
CGS	1965	1	1	10: 2:49.8	19.600	-68.500	33	4.50MB	
CGS	1965	1	10	8:18:17.6	18.500	-68.300	143	4.20MB	
CGS	1965	5	21	7:23:29.3	19.700	-71.600	33	4.20MB	
CGS	1965	6	3	10:57: 8.5	18.500	-70.300	27	5.30MB	5.13BRK
CGS	1965	6	10	20:53:41.5	18.900	-70.100	63	3.70MB	
CGS	1965	6	16	14:12:39.8	18.100	-68.700	116	4.20MB	
CGS	1965	6	30	9:59:34.9	18.500	-68.700	122	4.70MB	
CGS	1965	11	7	4:43:51.1	18.600	-71.800	35	4.10MB	
CGS	1965	12	10	3:46: 4.3	18.500	-69.000	145	4.70MB	
CGS	1966	4	1	1:37:28.1	18.600	-69.300	140	3.90MB	
CGS	1966	4	16	11:31:59.2	19.000	-70.500	27	4.90MB	
CGS	1966	5	2	23:39: 7.6	19.000	-69.300	142	3.70MB	
CGS	1966	6	10	5:34:18.9	19.900	-70.400	11	3.80MB	

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CGS  1966  6 17  1:14: 2.2   18.500  -68.800 110   4.60MB
CGS  1966  6 20  6: 8:20.6   18.000  -68.500  60   4.20MB
CGS  1966 11 20  7:25:56.4   18.200  -68.400  96   4.70MB
CGS  1966 12  7 23:54:35.6   18.300  -68.500 139   5.00MB
CGS  1967  3 16 22:59: 9.2   19.512  -69.968  33N  4.00MB
CGS  1967  4 19 21:57: 4.5   18.608  -69.685 103D  5.10MB
CGS  1967  5  6 14: 0:39.3   19.258  -69.964  23D  5.30MB
CGS  1967  5 11 13:54:  .2   19.314  -69.745  33N  4.20MB
CGS  1967  5 13 18:36:13.9   18.510  -69.786 103   4.60MB
CGS  1967  5 17 11:19:35.0   19.635  -69.874  18   4.50MB
CGS  1967  8 15  3:23:52.3   19.200  -68.500  39   4.90MB
CGS  1967 10  4  1:53:19.7   19.300  -70.000  19   4.30MB
CGS  1967 11  6 18:11:50.5   18.500  -70.100  33   4.00MB
USE  1968  5  2  5:29:38.2   18.800  -69.600   0D  5.80MB
CGS  1968  7 24  8:22:28.5   19.706  -70.103  27   4.50MB
CGS  1968 10  9 13:28:22.9   18.872  -69.786 143   4.40MB
CGS  1968 10 16  1:55:32.7   19.152  -69.838  36   5.20MB
CGS  1969  1  8  7:22:45.5   18.237  -70.839  41   4.00MB
CGS  1969  2 15 11:17: 9.6   19.744  -71.374  33N  4.30MB
CGS  1969 10 27 19:37:38.5   18.420  -68.764 176   4.40MB
CGS  1969 10 30 21:41:55.2   18.533  -68.693 145   4.00MB
CGS  1970  2 14 21: 3:43.2   19.424  -69.013 117   4.40MB
CGS  1970  3 22 10:14:34.2   18.252  -68.656  58   4.20MB
CGS  1970  7  5  4:19:35.1   19.091  -68.400  33N  4.60MB
CGS  1970  7  5  6:10:35.0   19.027  -68.428  33N  4.60MB
CGS  1970  9  1 23:11:39.0   19.422  -69.208  33N  3.80MB
NOS  1971  2  2  0:56:45.5   18.196  -68.393 102   4.80MB
NOS  1971  2  2  1:47:44.0   18.171  -68.441  93   3.80MB
NOS  1971  6 11 12:56: 4.3   17.966  -69.778  57   6.10MB  6.50PAS
NOS  1971  6 11 16:23:36.8   18.027  -69.728  53   4.90MB
NOS  1971  6 11 19:27: 7.2   18.036  -69.822  43   4.10MB
NOS  1971  6 13 10:14:49.9   17.920  -69.740  54   4.60MB
NOS  1971  6 15 19:51:24.6   17.990  -69.736  61   4.70MB
ERL  1971  9  4  6:59:10.1   19.979  -70.187  33N  4.70MB
ERL  1971  9 13  4:18: 1.9   17.931  -69.731  48   5.70MB  5.40BRK
ERL  1972  2 23  7:30:49.2   18.236  -68.795  73   4.50MB
ERL  1972  3  7  2:41:46.6   18.469  -71.519  33N  4.20MB
ERL  1972  6  7  6:16: 9.8   19.282  -69.600  33N  4.30MB
ERL  1972  9 18  5:36:53.3   19.539  -70.120  13   4.80MB
ERL  1972  9 19  1:36:52.4   19.536  -70.148  33N  5.80MB  5.70PAS
ERL  1972  9 20 19:14:13.4   19.665  -70.123  33N  4.90MB
ERL  1972  9 26  3:35:49.5   19.642  -69.972  44   4.60MB
ERL  1972  9 30 20:33:23.3   19.569  -69.878  55   4.30MB
ERL  1972 11 10 18:47:15.1   19.487  -70.093  33N  4.00MB
ERL  1973  6  2 20: 7:30.5   19.581  -70.610  40   5.20MB
GS   1973 11  2 15:14:47.1   19.508  -69.620  30   4.90MB
GS   1974  1 18 16:52:43.1   18.791  -69.370  82D  5.30MB
GS   1974  2 14  7:49:40.3   19.737  -69.953   7   5.10MB
GS   1974  2 20 16:11:26.8   19.583  -70.021  18   4.90MB
GS   1974  3 18  7:57:58.6   18.374  -68.486 137   4.00MB
GS   1974  4 22  6: 7:24.4   18.820  -70.375 112   4.50MB
GS   1974  5  9  9:33:21.4   18.225  -68.360  29   4.90MB
GS   1975  3 15 16:39:26.9   18.991  -69.355  64   4.60MB
GS   1975  3 18  4:19:39.7   19.207  -69.855  39   4.70MB
GS   1975  4 10 11:16: 5.3   18.466  -70.405  33N  4.50MB
GS   1975  5 21 23:58:35.5   19.810  -70.472  33N  4.50MB
GS   1975  8 13  5: 7:17.6   19.633  -70.526  33N  4.70MB
GS   1975  9 14  3:42: 9.0   18.604  -69.062  95   4.70MB
GS   1975 10 31 22:58:47.4   18.983  -69.701 137   3.80MB
GS   1976  6 15  0:33:49.3   18.863  -69.068 111   4.70MB
GS   1976  7  2 12:38:12.9   19.808  -70.937  57   5.00MB
GS   1976 12 31 16:32:50.3   18.267  -68.858  85   5.10MB
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GS	1977	2	5	15:42:44.3	19.6[illegible]2	-70.181	33N	5.00MB
GS	1977	5	31	10:47:29.0	19.374	-69.501	53	4.90MB
GS	1977	6	6	6:38:46.1	19.3[illegible]7	-69.484	49	4.90MB
GS	1977	6	26	10:15:39.0	19.343	-69.310	35	4.70MB
GS	1977	6	26	13:21:13.2	19.4[illegible]1	-69.213	33N	4.80MB
GS	1977	9	3	15:33:43.4	18.3[illegible]9	-71.153	50	4.50MB
GS	1977	9	8	8: 3:54.1	18.439	-68.889	128	4.90MB
GS	1977	10	17	6:30:52.1	18.363	-70.257	58	4.70MB
GS	1977	12	3	12:35:38.2	19.134	-69.599	81	5.00MB
GS	1978	6	5	22:11:19.5	19.837	-70.622	33N	4.60MB
GS	1978	7	21	3:58:26.1	19.613	-70.121	33N	4.70MB

NOTES: (1) SOURCE:

G-R	(Gutenburg and Richter, 1956)
SYK	(Sykes, and Ewing, 1965)
CGS	(Coast and Geodetic Survey)
GS	(US Geological Survey)
USE	(US Earthquakes)
NOS	(National Ocean Survey)
ERL	(Environmental Research Labs)

(2) MS magnitude sources:

PAS	(Pasadena)
PAL	(Palisades)
BRK	(Berkely)

(3) Aftershock sequence for this event relocated by Kelleher (1973): see following page.

(4) Aftershock sequence for this event relocated by Kelleher (1973): see following page.

(5) Aftershock sequence for this event relocated by Sykes and Ewing (1965): see following page.

TABLE 3. List of Earthquakes in 1946, 1948 and 1953

Date	Time, h m s	Latitude	Longitude	N	Q	Standard Error	Magnitude
1946							
Aug. 1	17 51 04.4	18.92	68.94	104	A	2.0	8.1
Aug. 4	18 33 46.5	19.18	69.29	23	B	1.8	
Aug. 1	20 53 35.8	19.49	70.26	40	B	1.6	
Aug. 4	21 49 41.6	19.56	69.21	16	B	1.6	
Aug. 5	02 41 59.8	19.63	69.37	11	B	1.9	
Aug. 5	03 37 37.2	18.41	69.44	13	B	2.0	
Aug. 5	05 41 38.2	19.73	69.27	10	B	1.5	
Aug. 5	12 33 13.6	18.99	68.75	21	B	2.5	
Aug. 5	20 09 01.4	19.44	69.34	17	A	1.8	
Aug. 6	05 57 22.8	19.12	69.08	21	A	2.0	
Aug. 7	18 26 24.9	19.30	69.37	29	A	1.6	
Aug. 7	19 21 30.0	19.57	70.16	25	B	2.2	
Aug. 8	13 28 29.5	19.71	69.51	100	A	2.2	7.6
Aug. 8	17 24 04.9	19.42	69.44	53	A	2.1	
Aug. 8	14 28 39.7	19.55	69.06	15	B	2.4	
Aug. 9	08 25 39.7	19.50	69.26	28	A	1.6	
Aug. 9	20 06 41.7	19.22	68.54	50	A	1.9	
Aug. 9	20 53 19.6	19.79	69.10	16	A	1.3	
Aug. 10	02 10 26.0	19.45	69.33	33	A	1.4	
Aug. 10	09 00 22.0	19.45	69.27	31	A	1.6	
Aug. 10	11 45 47.9	19.49	69.45	31	A	1.6	
Aug. 11	13 12 36.9	19.24	68.48	12	B	1.8	
Aug. 11	03 41 07.8	19.22	68.83	15	B	1.1	
Aug. 12	09 31 55.6	19.38	70.00	12	A	1.5	
Aug. 14	00 56 00.8	19.46	69.27	11	B	1.6	
Aug. 17	04 44 46.6	19.27	68.73	14	B	0.5	
Aug. 17	11 19 47.1	19.16	68.89	12	B	2.0	
Aug. 18	17 09 28.7	19.23	68.83	10	A	1.4	
Aug. 19	04 03 13.9	19.30	69.07	14	B	2.0	
Aug. 19	05 40 48.2	19.34	69.64	19	A	1.7	
Aug. 20	12 49 24.2	19.15	69.01	15	B	1.4	
Aug. 21	18 59 27.4	19.06	69.11	12	B	1.8	
Aug. 21	19 17 42.0	19.33	69.28	88	A	1.7	
Aug. 24	14 18 18.1	19.52	69.79	38	A	1.8	
Sep. 6	21 59 15.0	19.25	69.75	15	B	2.1	
Sep. 12	17 39 40.6	19.77	70.15	40	A	1.8	
Sep. 15	16 10 19.0	18.57	68.99	19	B	0.7	
Sep. 19	02 01 49.6	19.36	69.20	10	B	2.7	
Sep. 19	06 57 02.0	20.09	70.01	22	A	1.4	
Sep. 20	17 35 59.0	19.55	69.11	17	B	1.4	
Sep. 25	10 05 39.8	19.82	70.07	58	A	1.7	
Sep. 25	14 57 55.0	19.63	68.59	30	A	1.8	
Oct. 4	14 45 23.6	18.68	68.77	79	A	2.3	7.0
1948							
Apr. 21	20 22 02.9	19.26	69.50	98	A	2.7	7.3
Apr. 21	20 59 12.2	19.20	69.74	35	A	2.2	
Apr. 21	21 26 21.8	19.37	69.30	17	B	1.3	
Apr. 21	22 02 34.7	18.98	69.66	25	A	2.0	
Apr. 22	13 09 07.1	19.50	69.59	36	A	2.0	
Apr. 23	11 50 18.5	19.42	69.49	55	A	1.9	
Apr. 22	01 00 03	19.19	69.63	90	A	2.6	

1953

MAY 31	19 58 35.4	19.68	70.40	2.14	141	00	A	6.9
MAY 31	20 56 17.5	19.86	70.20	1.60	52	2	A	
JUN 01	06 15 48.5	19.59	67.97	0.93	7	38	B	
JUN 01	06 49 01.4	19.70	70.13	0.97	6	00	B	
JUN 01	20 33 33.8	19.77	70.27	0.79	8	03	B	3.7
JUN 02	14 06 00.3	19.94	70.15	1.20	8	00	B	
JUN 02	22 15 54.0	19.64	70.15	2.26	41	00	A	4.5
JUN 05	18 15 53.1	19.71	70.47	1.77	16	00	B	3.7
JUN 07	12 23 59.4	19.91	70.06	1.96	65	16	A	5.5
JUN 11	17 44 08.0	20.91	69.94	0.56	7	03	B	3.7
JUN 15	16 26 07.7	19.18	67.32	3.58	7	00	C	3.9
JUN 21	08 39 27.5	20.27	70.07	1.29	6	03	B	
JUN 25	21 49 08.2	11.14	62.43	1.12	37	124	A	
JUN 28	15 24 57.5	19.97	70.05	0.46	6	03	B	
AUG 19	08 21 15.2	14.97	61.27	1.42	17	144	A	
AUG 21	13 31 37.7	19.04	67.65	1.76	40	00	B	4.6
SEP 27	06 05 25.3	13.49	57.91	1.31	87	00	A	5.9
SEP 29	06 39 43.5	17.06	72.65	3.81	8	00	C	
OCT 14	00 51 40.7	19.50	70.24	2.43	8	03	B	
OCT 19	10 25 15.4	19.55	65.57	2.07	28	03	A	4.6
OCT 20	10 30 11.1	19.76	70.11	1.52	17	00	A	
DEC 25	02 19 34.9	18.44	62.02	1.67	15	00	A	