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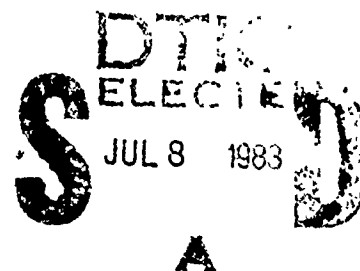
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1978 Diffuse Auroral Boundaries and a Derived Auroral Boundary Index

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28 December 1982



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1978 Diffuse Auroral Boundaries and a Derived Auroral Boundary Index

1. INTRODUCTION

This report has two aims. First, to provide the scientific community a compilation of all equatorward boundaries of the auroral oval as determined from the SSJ/3 data on the DMSP/F2 satellite for the year 1978. Second, to review and extend the knowledge of the systematics of the position of the equatorward boundary with respect to geomagnetic activity and the degree to which the boundary determination can be done by computer. From this we are able to construct a new index of auroral activity.

The first of these aims is motivated by research that has shown the boundary to move in a consistent and systematic manner in response to geomagnetic activity as measured by Kp, the velocity of the solar wind, and the strength of the north-south component of the Interplanetary Magnetic Field.¹⁻⁷ This work has shown that the boundaries can be used as an indirect measure of the strength and orientation of the magnetospheric electric field when the assumption is made that the equatorward boundary maps to the zero energy Alfvén layer in the magnetic equatorial plane. Calculations of the total cross magnetospheric potential drop determined from the average location of the boundaries were found to be in reasonable

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(Due to the large number of references cited above, they will not be listed here.
See References, page 59.)

agreement with measurements of the average cross polar cap potential measured by probes.⁷ Since the location of the boundary appears to reflect large-scale processes taking place in the magnetospheric system, it should provide a valuable tool in the study of geomagnetic phenomena.

The second of these aims is motivated by the need of the Global Weather Central of the Air Force Weather Service for a means of specifying in near real time the global extent of electron precipitation and the level of geomagnetic activity. The present work contributes to fulfilling the need of GWC in three ways. First, the set of boundaries compiled for this report represents a significant portion of the data set used to derive the systematics of the boundary location. Knowledge of these systematics has been used to extrapolate the global position of the boundary based on a single point determination of the boundary made in near real time from DMSP satellite data.⁸ Second, the computer-chosen boundaries and the algorithm used in their selection represent an extension of work previously done for GWC on techniques for automatically determining the location of the boundary in near real time using the raw data from the SSJ/3 sensor on the DMSP satellites.⁹ Lastly, the report shows how the boundary measurements made at different local times can be normalized to magnetic midnight to produce a new index of geomagnetic activity which correlates well with Kp. This new index will be directly available from the DMSP SSJ/4 data.

The report is divided into seven sections, including two appendices. Section 1 describes the instrumentation which provided the data used in this study. Section 2 deals with the format of the data used in the hand determination of the boundaries, the method used in the hand selection of the boundaries and the sources of error or ambiguity in these determinations. Section 3 describes the computer algorithm used to choose the boundaries. Section 4 provides an analysis of the discrepancies between the hand and computer techniques. Section 5 describes the process by which the auroral activity index was produced. Appendix A gives plots of the equivalent midnight boundary from the hand determined data set by month for 1978; the Auroral Boundary Index for one year. Appendix B gives a complete listing of both boundary data sets for 1978.

8. Hardy, D. A., and Holeman, E. (1983) The Global Auroral Boundary Code for the Global Weather Central of the Air Weather Service (to be published).
9. Hardy, D. A., and MacKean, R. (1980) An Algorithm for Determining the Boundary of Auroral Precipitation Using Data from the SSJ/3 Sensor, AFGL-TR-80-0028, AD A084482.

2. INSTRUMENTATION

DMSP/F2, a three-axis stabilized satellite, was launched into a near sun-synchronous, circular orbit at an altitude of 840 km in June 1977. Its orbital period was 101 min; the nominal inclination, 98.75° . At launch the orbit was centered near the 0700-1900 meridian but was subject to a very slow precession toward later local times. Due to the offset between the Earth spin axis and magnetic axis, the orbit had significant diurnal and seasonal variations in the magnetic local time-magnetic latitude frame of reference. Thus, equatorial auroral boundaries could be determined over a wider range of MLT than might be assumed from the restricted geographical local time locations of the orbit. Figure 1 shows the diurnal coverage

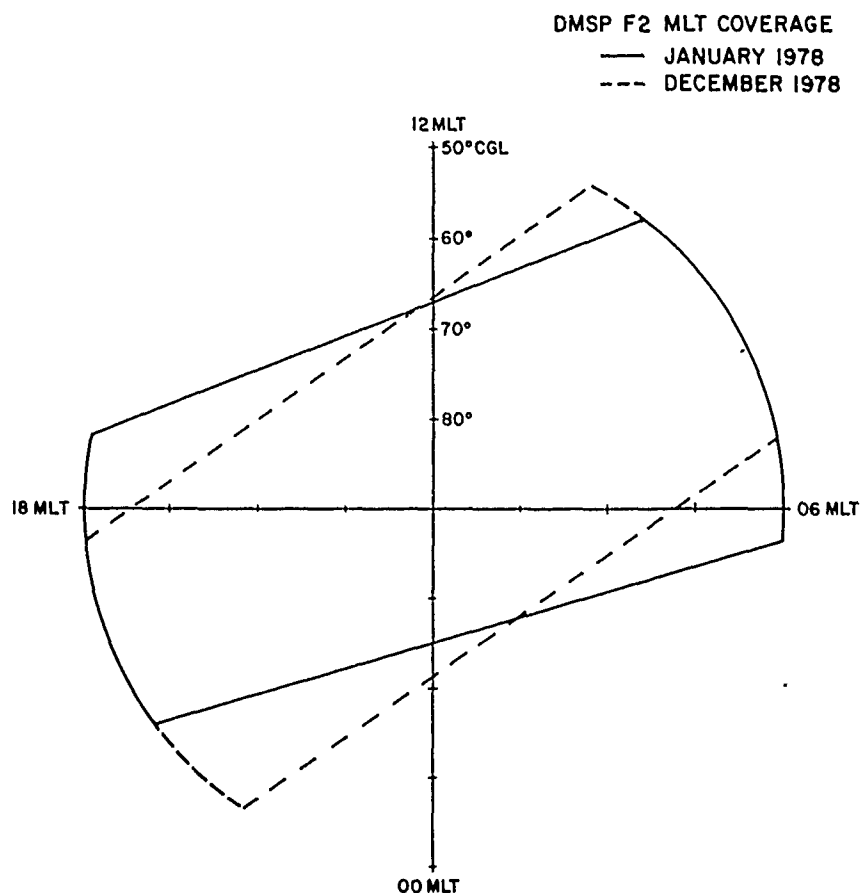


Figure 1. A Polar Plot in Magnetic Local Time—Magnetic Latitude Coordinates Showing the Diurnal Range of the DMSP/F2 Orbits in January 1978 (solid line), and in December 1978 (dashed line)

of DMSP/F2 in magnetic local time and magnetic latitude for January 1978 (solid line), and December 1978 (dashed line). Good coverage exists in the dawn and dusk sectors. Little coverage exists in the noon, post-noon and the midnight, post-midnight sectors. To extend the boundary statistics into these regions data from a later satellite, DMSP/F4, launched in April 1979 was also used. Identical particle detectors were flown on both satellites. It should also be noted that DMSP satellites are operational Air Force satellites. As such, except during periods of down-link transmissions, data are almost always being recorded. In 1980-1982, because of the failure of DMSP/F5 at launch, there is a break in the coverage, but DMSP/F6 was launched in late 1982.

The particle detector on DMSP/F2 consists of two curved plate electrostatic analyzers that measure the fluxes of electrons in 16 energy channels between 50 eV and 20 keV once per second. The apertures of the analyzers always face in the local zenith direction such that at auroral and polar cap latitudes they detect precipitating rather than backscattered and/or trapped electrons. One analyzer covers the energy range from 50 eV to 1 keV with a geometric factor of $4 \times 10^{-4} \text{ cm}^2 \text{ ster}$ and a $\Delta E/E$ of 13 percent. The other analyzer covers the energy range from 1 keV to 20 keV with a geometric factor of $10^{-3} \text{ cm}^2 \text{-ster}$ and a $\Delta E/E$ of 9 percent. The large geometric factors insure that the flux level for electrons in the diffuse aurora is well above the detector's sensitivity. A detailed description of the detector is given by Hardy et al.¹⁰

3. HAND SELECTION OF EQUATORWARD BOUNDARIES

An example of DMSP/F2 electron data, taken from a south polar pass on 18 May 1978, is given in Figure 2. For this pass $K_p = 1+$. Data are plotted as JTOT, the directional integral flux ($\text{cm}^2 \text{-sec-ster})^{-1}$ in the bottom panel; JETOT, the directional energy flux ($\text{keV/cm}^2 \text{-sec-ster}$) in the middle panel; and EAVE, the average energy in keV in the top panel. The scale for EAVE is linear. These quantities are plotted as functions of universal time in seconds of the day, the geographic and corrected geomagnetic latitudes and longitudes, and the magnetic local time of the satellite all projected to an altitude of 110 km.

Several features of the electron precipitation that pertain to the choice of auroral boundaries are illustrated in Figure 2. First, equatorward of the auroral precipitation there is a broad region over which there is a slight rise in JTOT with relatively large values of JETOT and EAVE. In Figure 2 these lie between

10. Hardy, D.A., Gussenhoven, M.S., and Huber, A. (1979) The Precipitating Electron Detectors (SSJ/3) for the Block 5D/Flights 2-5 DMSP Satellites: Calibration and Data Presentation, AFGL-TR-79-0210, AD A083135.

9480-9690 UT and between 10,620-10,800 UT. The increases are due to radiation belt particles that penetrate the detector casing and directly stimulate the channeltrons. Since they have nothing to do with the auroral precipitation, they must be differentiated from the auroral electrons when determining boundaries. Due to the difference in the size of channeltrons used in the two detectors, radiation belt contamination is largely limited to the energy channels of the 1 to 20 keV detector.

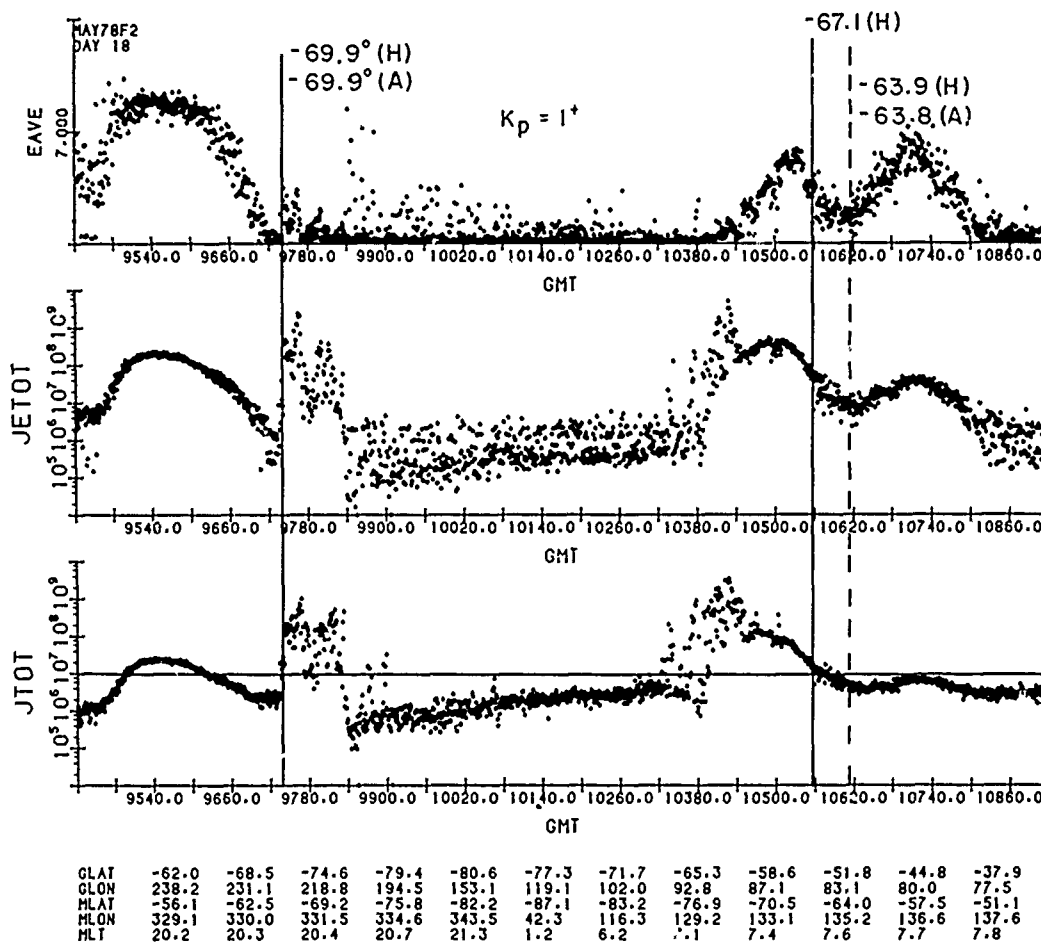


Figure 2. Integral Flux in $(\text{cm}^2\text{-ster-s})^{-1}$ (bottom panel), Energy Flux in $\text{keV} (\text{cm}^2\text{-ster-s})^{-1}$ (middle panel), and Average Energy in keV (top panel) of Precipitating Electrons Measured by the DMSP/F2 Satellite Passing Over the South Pole on 18 May 1978. These values are plotted as functions of universal time (in seconds), geographic and corrected geomagnetic latitudes and longitudes and the magnetic local time of the satellite all projected to an altitude of 100 km. Solid (dashed) vertical lines indicate 10^7 ("better") equatorward boundaries of precipitating auroral electrons chosen by hand (H). Algorithm-chosen boundaries (A) are indicated by a dot-dash line when they differ from the hand boundary by more than 0.3° CGL.

Second, we have found the condition $JTOT > 10^7 \text{ (cm}^2\text{-sec-ster)}^{-1}$, indicated in Figure 2 by the horizontal line (the 10^7 level) provides a useful "zero-order" criterion for selecting the equatorward boundaries of the oval. The solid, vertical lines drawn where the data points rise above the 10^7 level, going in the poleward direction, are referred to as 10^7 boundaries.

Third, the evening equatorward boundary is sharper than its morning side counterpart. On the morning side in Figure 2 JTOT rose from background to $10^7 \text{ (cm}^2\text{-sec-ster)}^{-1}$ over 3.2° latitude, whereas the evening side rise was nearly instantaneous. Generally, gradients in the electron flux with latitude are found near both equatorward boundaries. The gradient never extends more than a few degrees latitude in the evening sector, but can cover as much as 10° on the morning side where it is always perceptibly present. A dashed line on the morning side in Figure 2 is drawn at the point where JTOT rises noticeably above background, to include the flux gradient within the auroral boundary. This is referred to as a "better" boundary.

Because of the nearly instantaneous rise of the data on the evening side, most of the evening boundaries are 10^7 boundaries. Because of flux gradients on the morning side, morning boundaries are generally "better" boundaries. In Appendix B "better" boundaries (or 10^7 boundaries when the two are the same) are listed. This is the set of boundaries which has been used for various statistical studies.

The 10^7 boundary is quite precise, but the criteria used for choosing the "better" boundary are more subjective, and cause some ambiguity. On both morning and evening sides of the oval, the onset of electron precipitation can be obscured in various ways.

In the evening sector the principal ambiguity in choosing boundaries is caused by contamination of the low energy channels of the detector by photoelectrons. Gussenhoven et al⁶ discuss this problem in detail. In these data this contamination shows up as a high equatorward background level which can exceed a level of 0.5×10^7 on the JTOT scale. Although the choice of auroral boundaries is generally clear the ambiguity results from the fact that it is impossible to tell if, and how far, the aurora might extend below the JTOT level produced by the photoelectrons. Clearly, when the background level is close to or above the 10^7 level on the JTOT scale choosing a 10^7 boundary is impossible.

In the morning sector uncertainties in identifying the position of the boundary are more severe. There are three sources of uncertainty: (1) a much more gradual latitudinal onset of precipitation than is found in the evening, (2) overlap between regions of energetic electron precipitation and radiation belt contamination of corresponding energy channels, and (3) the existence of energetic plasma close to but detached from the boundary.

The gradual latitudinal onsets of precipitation with increasing latitude, are called ramps (Figure 2, morningside). Ramps may occur on both morning and evening sides of the north and south poles, but are less frequent and less extensive on the evening side. They occur nearly all the time on the morning side generally producing a lower boundary when compared to the evening side. Ramps cause severe problems in two different ways: (1) when they are combined with a high equatorward background (as discussed in the case of evening boundary ambiguities), and (2) when the morning side gradient extends into regions of radiation belt contamination. Even when not obscured there can be ambiguity in choosing where a gradual ramp begins. In choosing the morning boundaries it is almost always necessary to use changes in the average energy and the energy flux, as well as those in the number flux.

Overlap between the region of energetic electron precipitation in the auroral zone and the region of contamination of energy channels by radiation belt particles is shown in Figure 3, a pass over the south pole on 4 April 1978, for which $K_p = 5-$. On the morning side of the oval one can see that the rise in JTOT, JE1 O1 and EAVE, due to contamination, is contiguous to the region of auroral precipitation. When the radiation belt particles exhibit a characteristically smooth curve an attempt is made to determine the onset of auroral particle precipitation by drawing the boundary at the point where irregularity begins as was done in this example. In this case the morning boundary was drawn at -60.7° MLAT, but choices down to -56.6° (the 10^7 boundary) are defensible giving an uncertainty of 4.1° . However, when the radiation belt and particle signatures are both irregular there is even greater uncertainty in the boundary choice. Because of the sudden onset of auroral electron precipitation on the evening side, radiation belt particle contamination is rarely a problem, as Figure 3 also shows.

At lower K_p , as in Figure 2, radiation belt interference produces no problems since the aurora is contracted enough to leave the radiation belt particles clearly outside the oval. Radiation belt interference is most problematic at moderately high activity levels ($K_p = 3$ to 6). For these activities it is often the case that a clear separation between JTOT levels produced by auroral and radiation belt effects cannot be made. At very high K_p , the problems are again manageable since fluxes are so intense they appear to mask the effect of the radiation belt particles. An example of this type of occurrence is shown in Figure 4, a north pole pass on 28 August 1978, for which $K_p = 8$.

The third effect (detached energetic plasma) can be found in both morning and evening regions and an example is shown in Figure 5. This example shows a north pole pass on 21 January 1978, during a time of magnetospheric quiet ($K_p = 0$). On the evening side there are small regions of energetic electrons near to but detached

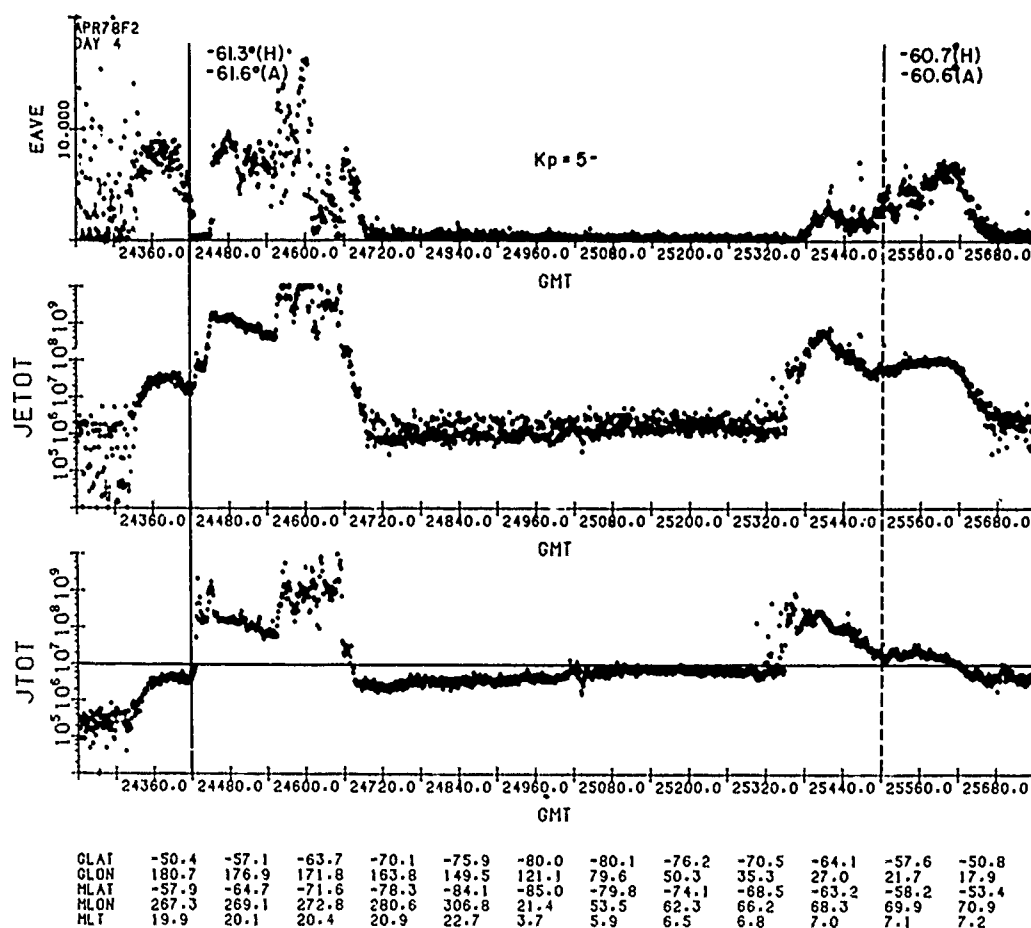


Figure 3. Precipitating Electron Data for a South Pole Pass on 4 April 1978. The format is the same as that in Figure 2

from the more poleward precipitation region. These can occur during active times, as well, and are ignored in selecting the boundaries. Ambiguity may result when these regions are very broad and/or very close to the auroral region. (Note that Figure 5 is also an example of high equatorward background from photoelectrons from the sunlit conjugate hemisphere, as discussed above.)

The final problem encountered in this data set is with those morning south pole equatorward boundaries which fall between 0900-1300 MLT. Electron precipitation patterns in the diffuse auroral region during these local times are observed to vary from a normal diffuse aurora to the complete disappearance of the diffuse aurora within detector sensitivity. In the latter instances only the magnetospheric cusp is encountered. An example of a pass with no dayside diffuse aurora is shown in

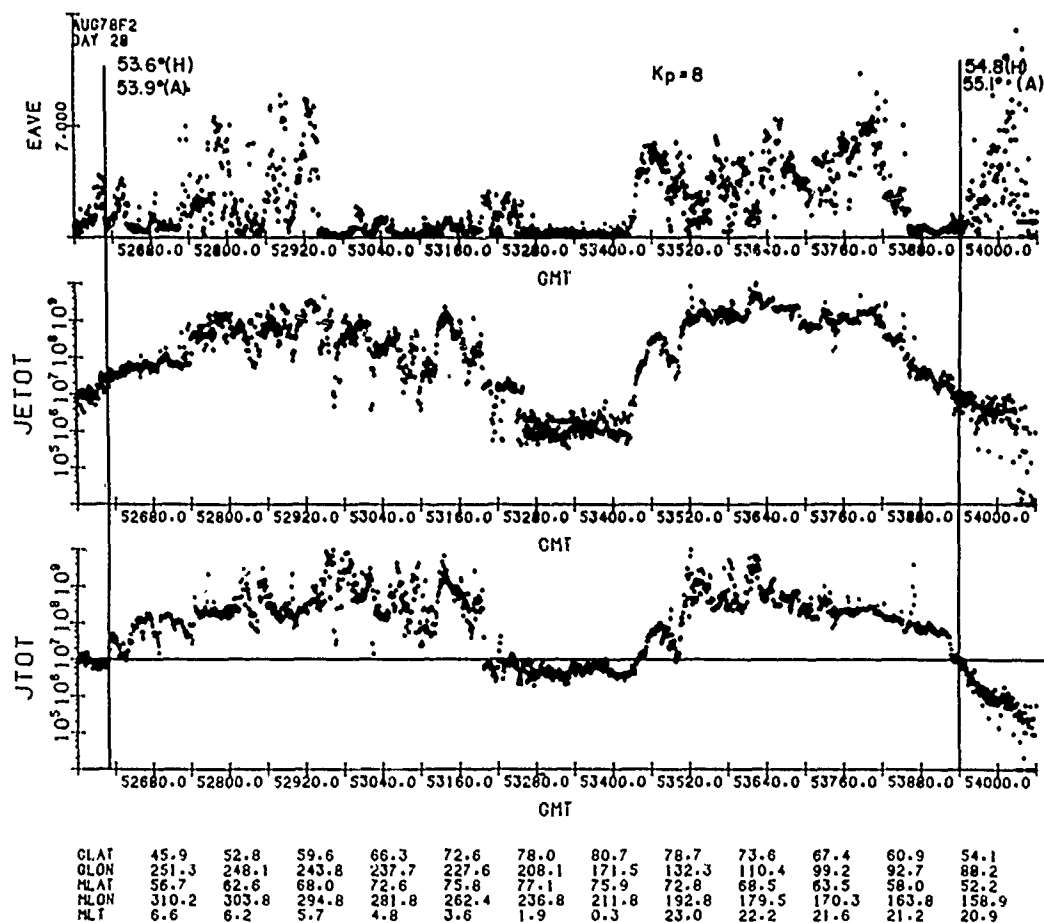


Figure 4. Precipitating Electron Data for a North Pole Pass on 28 August 1978. The format is the same as that in Figure 2

Figure 6, a south pole pass on 12 December 1978, for which $K_p = 2-$. For cases such as these no equatorward boundary is listed. Problems arise when the diffuse aurora is weak and irregular. As may be seen in Figure 1, DMSP/F2 is only in the pre-noon sector for a few passes per day, so any problems with the 1978 data sets should be minimal. The dynamics of the dayside diffuse auroral electron precipitation will be discussed in a forthcoming paper. For the time being, however, listed boundaries between 0900-1300 MLT should be treated judiciously, and we advise referencing the actual data to determine what is being measured in these instances.

The above effects produced greater than 1 degree uncertainty in the equatorial boundary only for a small percentage of the total cases. On the evening side

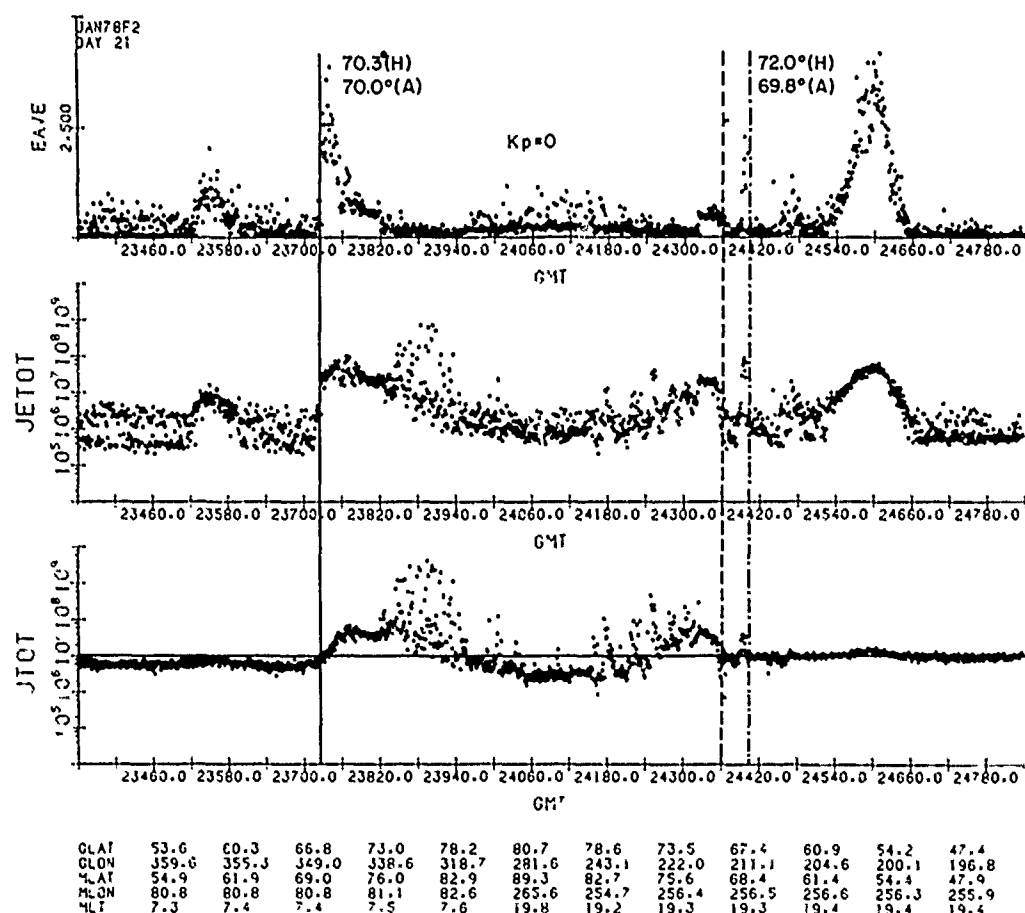


Figure 5. Precipitating Electron Data for a North Pole Pass on 21 January 1978. The format is the same as that in Figure 2

approximately 90 percent of boundaries were determined with no ambiguity; on the morning side, approximately 70 percent. After making more than 20,000 boundary determinations by hand, we feel that a high enough level of consistency has been reached to justify using the hand-chosen boundary set to verify the algorithm which has been developed to select boundaries automatically. In actuality, this verification turned out to be a two way process which has enabled us to decide which of several algorithm tests works best for determining morning and evening auroral boundaries (as discussed in Section 4), and to eliminate from the hand-chosen data set most of the glaring errors. As a result of this cross-verification, we have two data sets in which we have a high level of confidence.

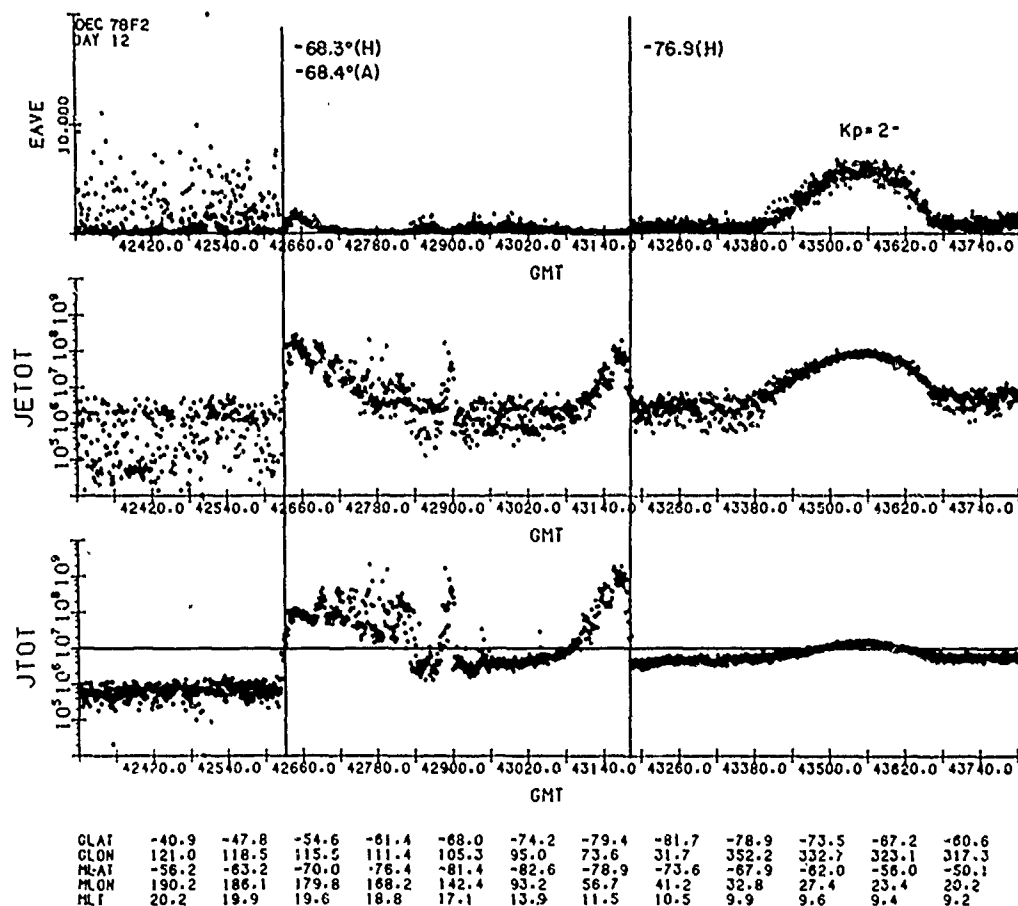


Figure 6. Precipitating Electron Data for a South Pole Pass on 12 December 1978. The format is the same as that in Figure 2

4. COMPUTER ALGORITHM FOR BOUNDARY SELECTION

In devising methods for choosing equatorward auroral boundaries by computer we made use of two factors that we found to be generally applicable in choosing the boundaries by hand; (1) on the evening side the electron precipitation begins (on the equatorward edge proceeding poleward) with increases in the flux at the lowest energies, often resulting in a gradual rise in average energy, and (2) on the morning side the precipitation onset is most reliably seen in the 1-10 keV energy range, resulting in an average energy rise which is rather abrupt. Thus, an increase over background in the energy range < 1 keV will be used to signal the evening boundary, and an increase over background in the keV electrons, used to signal the morning

boundary. The complexity of the tests used reflects the difficulty often encountered in determining that the signal is above background.

Photoelectron contamination is avoided in the low energy particle signal by eliminating counts from the two lowest energy channels. Contamination of the higher energy signal by radiation belt particles is more complex and requires tests that make use of the fact that the low energy detector (channels 9 to 16) has only $\sim 1/10$ the contamination of the high energy detectors (channels 1 to 8), and that the contamination in the high energy detector gives a uniform count signal in all channels.

In this section we will describe the preparation of the data base, the construction of test quantities from the data, and the application of the tests that produced the 1978 set of computer- (algorithm-) chosen equatorward boundaries. The DMSP test data for the SSJ/3 instrument are stored on a series of 6250 BPI tapes, each containing several months of raw data from either the F2 or F4 satellite. The data base is analyzed one month at a time for boundary information. The first step in this procedure is to run program DSFMPEP on a month's data with control parameters set to strip off all data with absolute magnetic latitude greater than 50° . Program STDKC3 then searches this intermediate file for boundary crossings. STDKC3 logically divides the file into quarter orbit segments by successive calls to subroutine SEARCE. For each call to SEARCE, information for up to 300 consecutive 4-sec data records is stored in the matrix ITST for subsequent analysis. For each quarter orbit, SEARCE determines whether the data are occurring in ascending or descending order of absolute geomagnetic latitude as a function of time. If the geomagnetic latitude is decreasing, the data are stored in inverse order beginning in location 300 so that STDKC3 always sees a quarter orbit file in order of increasing geomagnetic latitude.

The ITST matrix is preset to a value of -1. and the relative location in ITST for a particular 4-sec data record is calculated from the elapsed universal time since the beginning of the quarter orbit. Hence, time gaps are automatically embedded as a series of one or more lines of all minus ones. The end of a quarter orbit is defined to be where the data goes from one side of geomagnetic midnight (43,200 secs) to the other for the ascending latitude half of a polar pass and the 50° latitude boundary for the descending magnetic latitude half. The last valid position in the data file is marked for the next call and control returned to STDKC3.

The DMSP raw data file is a series of consecutive data records, each containing a time and ephemeris record and four consecutive 16-channel spectral observations seen by the SSJ/3 instrument. Each spectrum is acquired over approximately one second of elapsed universal time. For statistical purposes these four spectra are added together to form a unit data record and its information stored in one line of ITST. ITST is dimensioned as (300, 18) and the 18 words corresponding to the N'th ITST line are defined as follows:

ITST (N, 1) through ITST (N, 8) are the number of counts in consecutive energy channel pairs 1 + 2, 3 + 4, . . . , 15 + 16 (the channel numbers increase with decreasing energy);

ITST (N, 9): Counts in channel 8 (high energy detector, 985 eV channel);
 ITST (N, 10): Counts in channel 9 (low energy detector, 972 eV channel);
 ITST (N, 11): Universal time;
 ITST (N, 12): Geomagnetic latitude;
 ITST (N, 13): Magnetic local time;
 ITST (N, 14): 110 km latitude;
 ITST (N, 15): 110 km longitude;
 ITST (N, 16): Altitude;
 ITST (N, 17): Geographic latitude;
 ITST (N, 18): Geographic longitude.

STDKC3 analyzes the 300 record ITST quarter orbit file in sequential order until three of six defined pseudo statistical tests are satisfied. When this happens a successful boundary determination has been made. The universal time at which each test was satisfied along with its corresponding magnetic latitude and local time are recorded in the computer boundary file. The six test quantities are defined as follows:

JTST₁: low energy integral count signal omitting the two lowest energy channels.

$$JTST_1 = S_1 \sum_{i=9}^{14} N_i,$$

where N_i is the observed counts in channel i , and

$$S_1 = 0.1 \text{ (scale factor).}$$

JTST₂: 8-4-2-1 weighted (toward high energy) RMS variance of 1st four channel pairs.

$$JTST_2 = \frac{S_2}{\sqrt{1}} \left\{ \frac{1}{w} \sqrt{w \sum_{i=1}^4 w_i I_i^2 - \left(\sum_{i=1}^4 w_i I_i \right)^2} \right\},$$

where

$$w = \sum_{i=1}^4 w_i;$$

$$w_i = \{ 8, 4, 2, 1 \} \text{ weighting factors;}$$

I_i : counts in i 'th channel pair, 1+2, 3+4, and so on;

$$\bar{I} = \frac{\sum_{i=1}^4 w_i I_i}{w} ;$$

$$S_2 = 10 .$$

JTST₃: 1-2-4-8 weighted (toward low energy) rms variance in first four channel pairs. The definition is the same as for JTST₂, but with

$$w_i = \{1, 2, 4, 8\} ;$$

$$S_3 = 10 .$$

JTST₄: difference function between 5.5-20 keV counts and 1-3.5 keV counts.

$$JTST_4 = \frac{S_4 |I_1 + I_2 - I_3 - I_4|}{\sqrt{\max(I_1 + I_2, I_3 + I_4)}}$$

where

$$S_4 = 10 .$$

JTST₅: unweighted rms variance in 1st four channel pairs. The definition is the same as for JTST₂, but with

$$w_i = \{1, 1, 1, 1\} ;$$

$$S_5 = 10 .$$

JTST₆: ratio of counts in channel 8 to those in channel 9.

$$JTST_6 = S_6 \frac{N_8}{N_9} ;$$

$$S_6 = -10 .$$

Tests 2, 3 and 5 are of the form $S\sqrt{I} \sigma_p$ where σ_p is the normalized statistical variance ($\sigma_p = \frac{\sigma}{I}$). It was found empirically that this form gave a more reliable signal than either σ or σ_p alone.

$JTST_1$ is the sum of the counts in the six channels of the SSJ/3 sensor between 110 eV and 1000 eV. On the evening side of the oval counts in this energy range are normally observed first as the satellite passes the auroral oval boundary.⁹ The two lowest channels are excluded since they are often contaminated by conjugate photoelectrons. $JTST_2$ is the weighted rms variance of the four channel pairs in the energy range from 1 to 20 keV. These are the channels that are affected by penetrating particles from the radiation belts. Since these particles directly stimulate the channeltrons each of the eight channels should see the same number of counts within statistics such that the rms variance ($JTST_5$) is small when there is no other signal. If counts from auroral fluxes are present they should be highly non-uniform over this energy range and would act to increase the rms variance. The weighting for $JTST_2$ is toward the highest energy channels. $JTST_3$ is the same as $JTST_2$ except that the weighting is toward the 1 keV end of the range. $JTST_4$ is the absolute difference in the 4-sec sum of counts in the four channels between 5.5 and 20 keV and the four channels between 1 keV and 3.5 keV divided by the square root of whichever of these sums is greater. The idea again is that if auroral counts are present this difference will be larger than if only counts from penetrating particles are present. This test was not used to determine the final boundary but was retained since it is the same as the test developed by Hardy and MacKean for GWC. $JTST_5$ is the same as $JTST_2$ and $JTST_3$ except with no weighting. $JTST_6$ is the ratio of channels 8 to channel 9. Both these channels are at approximately 1 keV but channel 8 should see the effects of penetrating particles and channel 9 should not. Based on the difference in the geometric factors between channel 8 and 9 the ratio should be approximately 3 if both channels were measuring the same flux. If the ratio is much higher than this it means that channel 8 has significant counts due to penetrating electrons.

STDKC3 treats each of these six quantities as an independent statistic with an empirically determined normal, average, or threshold value when the satellite is at latitudes below the auroral boundary. When a statistic is above its threshold value for a sufficiently long time period, the boundary flag for that statistic is turned on. That time period was chosen as one 4-sec interval for $JTST_1$ and three 4-sec intervals for the remaining tests. STDKC3 scans the quarter orbit file from its beginning, setting the flag for each test until flags are on for $JTST_2$, $JTST_5$ and $JTST_6$ at the same time. STDKC3 retains the geomagnetic latitude and magnetic local time at which the flag for each test was set. Once the flags for $JTST_2$, $JTST_5$, and $JTST_6$ are set the boundary is chosen on the morning side of the oval at the point where the flag for $JTST_2$ was set and on the evening side of the oval at the point where $JTST_1$ was set.

Once a signal for a given test is turned on it is possible for its corresponding statistic to return to its threshold level or below. If $JTST_1$ and $JTST_5$ along with either $JTST_2$ or $JTST_3$ are below threshold for two consecutive 4-sec time intervals before the boundary search reaches a normal termination ($JTST_{2, 5, 6}$ on), all signals are turned off and the search resumed. Independent of that $JTST_5$ is turned off if its statistic is below threshold for five consecutive 4-sec time intervals.

The actual thresholds chosen for the six quantities were $T_c = \{12, 18, 16, 30, 18, -50\}$. These were chosen empirically using approximately 500 case histories before the procedure was applied to the entire DMSP data base to construct the final computer boundary file.

Time gaps in the data file had to be dealt with. One and two 4-sec time gaps were ignored since they could cause at most a 8-sec error in the boundary determination. However, if a longer time gap occurred, all flags were turned off. Also, if any of the six signals occurred immediately after a time gap longer than 8 sec, its boundary was flagged as questionable in the computer boundary file. The beginning of a quarter orbit file was logically treated as if it were occurring after a large time gap for the time gap logic. If the data were exhausted before all flags were set, the current status of each was written into the boundary file, and labelled as questionable. Also, the boundary latitudes were examined and labelled questionable if they were above 72° . A record was written for each of the quarter orbit files, and analyzed for completeness with all questionable data flagged.

5. ANALYSIS OF DIFFERENCES BETWEEN HAND-CHOSEN AND ALGORITHM-CHOSEN BOUNDARIES

Two methods of analyzing the hand- and algorithm-chosen sets of boundaries are given in this section. The first method relates each set separately to geomagnetic activity, as measured by Kp, by finding, for each local time sector, a linear relationship between Kp and the boundaries. We then compare the linear relationships of both sets, and the residual scatter found within each set. The second method looks directly at the differences between the two boundary choices, and analyzes the causes of the differences when they are found to be systematic and large.

Relationship of boundary sets to Kp. To relate the boundary sets to Kp, 24 1-hr bins in magnetic local time were created and individual boundaries assigned to a bin based on their MLT. Each boundary was tagged with the value of Kp at the time of the boundary crossing. Within each local time bin a linear regression was performed on the corrected geomagnetic latitudes (λ) of the boundaries vs Kp of the form:

$$\lambda = \alpha + \beta Kp .$$

(1)

Table 1 is a list of the results of the regression for those MLT bins in which there are sufficient data. In the table we give the range of the MLT bin, the number of boundaries in the bin used in the regression, the intercept (α) and the slope (β) of the regression line and the correlation coefficient (cc). The results from the hand-chosen and computer-chosen boundaries are listed separately. Hand-chosen boundaries using both F2 and F4 satellite data between September 1977 and February 1980 were used to obtain the regression equations. Computer-chosen boundaries used F2 satellite data from 1978, with selected values from 1979 and 1980 to complete the midnight sector statistics.

Comparing the regression equations from the hand- and computer-chosen boundaries one notes several systematic differences. On the morning side of the oval (MLT's between 0400 and 1200) the regressions on the hand boundaries give intercepts roughly 1° higher and slopes approximated $0.4^\circ/\text{Kp}$ more negative than the computer-chosen boundaries. On the evening side of the oval (MLT's between 1600 and 2400) the regressions on the hand boundaries give intercepts roughly 0.4° lower and slopes approximately the same as the computer-chosen boundaries results.

These differences reflect the limitations on the computer techniques. We attribute the differences on the morning side to the general problem the computer algorithm has in picking up the onset of morning side ramps and to the fact that this difficulty increases with increasing activity as the ramp region and the region of contamination by penetrating radiation more and more overlap. This problem results in computer boundaries higher than hand boundaries and a difference between the two that increases with activity. This leads to a higher average location for the computer boundaries at high Kp such that the slope of the regression curve is forced down and the intercept lowered. The evening side differences result from the threshold for the computer test being set at a high enough level to ensure that counts due to photoelectrons in the low energy channel would not trigger the test. This conservative approach results in the vast majority of computer boundaries being chosen at higher latitudes than the hand boundaries. Since the onset of precipitation on the evening side is normally abrupt at all levels of activity, on average, the difference between hand- and computer-chosen boundaries is the same resulting in the observed 0.4° offset but the same slopes.

Table 1. Regression Values for $\lambda = \alpha + \beta K_p$

Hand-chosen					Computer-chosen				
	Number	α	β	cc		Number	α	β	cc
04-05	267	67.7	-1.48	-0.57		112	67.4	-1.28	-0.52
05-06	1123	67.8	-1.87	-0.71		865	67.0	-1.57	-0.69
06-07	2462	68.2	-1.90	-0.74		1670	67.2	-1.51	-0.70
07-08	3159	68.9	-1.91	-0.76		1926	68.0	-1.52	-0.72
08-09	2159	69.3	-1.87	-0.73		1045	68.2	-1.45	-0.68
09-10	1178	69.5	-1.69	-0.66		441	68.5	-1.21	-0.62
10-11	864	69.5	-1.41	-0.57		220	69.0	-1.12	-0.60
11-12	513	70.1	-1.25	-0.52		27	67.3	-0.47	-0.37
16-17	204	71.6	-1.28	-0.66		123	72.0	-1.15	-0.63
17-18	526	71.1	-1.31	-0.69		341	72.0	-1.35	-0.75
18-19	997	71.2	-1.74	-0.82		652	71.6	-1.71	-0.80
19-20	2469	70.4	-1.83	-0.82		1537	70.7	-1.85	-0.85
20-21	3309	69.4	-1.89	-0.82		1934	69.8	-1.82	-0.83
21-22	3092	68.6	-1.86	-0.79		1513	69.1	-1.73	-0.81
22-23	1485	67.9	-1.78	-0.77		861	68.4	-1.52	-0.71
23-24	461	67.8	-2.07	-0.81		179	67.7	-1.64	-0.54

We next investigated the degree of scatter in the two data sets from their respective regression equations. This was done by subtracting the appropriate regression equation value from each boundary measurement and determining the frequency distribution of the residuals. In Table 2 are listed the percentages of this residual scatter within $\pm 1^\circ$, $\pm 2^\circ$, $\pm 3^\circ$ of zero for computer- and hand-chosen boundaries for morning and evening sides of the oval, both separately and together.

Table 2. Percentages of Residual Scatter

	Morning Side		Evening Side		Entire Oval	
	Computer	Hand	Computer	Hand	Computer	Hand
$\pm 1^\circ$	36%	30%	44%	40%	40%	36%
$\pm 2^\circ$	64%	56%	75%	70%	68%	65%
$\pm 3^\circ$	82%	76%	90%	86%	86%	82%

The spread in the unaccounted scatter for the computer- and hand-chosen boundaries is comparable, the computer boundary spread being approximately 5% narrower. This reflects a higher consistency in the computer-chosen over the hand-chosen boundaries. It is also the case that for both computer- and hand-chosen boundaries the spread is approximately 10° greater on the morning than on the evening side of the oval. Figures 7 and 8 are plots of the distribution of the residual scatter taken over the entire oval for the hand and computer boundaries, respectively. A bin size of 0.1° is used and the number normalized to 1000 cases. It is clear that the distributions are Gaussian. Based upon this and the results listed in Table 2 one can assign to the distributions a sigma of approximately 2° for both computer- and hand-chosen boundaries.

Direct comparison of hand- and computer-chosen boundaries. Distribution of differences between hand- and computer-chosen boundaries for the evening and morning sides of the oval, both separately and together, are shown in Figures 9 through 11. In addition, in Table 3 we show the percentage of the differences within $\pm 1^\circ$, $\pm 2^\circ$ and $\pm 3^\circ$ of zero for the three cases and a comparison to the earlier work of Hardy and MacKean.⁹

The figures and tables illustrate three points. First, all three distribution are strongly skewed towards negative values for the differences between computer- and hand-chosen boundaries. As discussed above, this arises due to the requirement of the computer algorithm for a clearer signal than that required by eye in order to consistently avoid the effects of background and noise in the selection

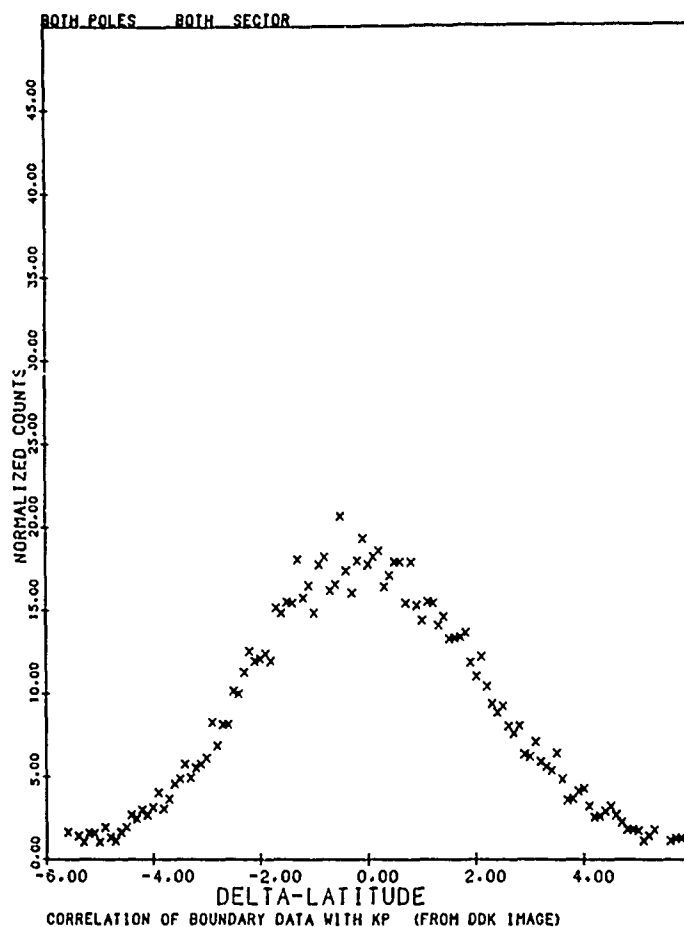


Figure 7. Distribution of the Residual Scatter in the Hand-chosen Boundary Set When Compared to Linear Regression Values Obtained From the Same Set. The distribution is accumulated in 0.1° bins and normalized to 1000 cases

process. Second, the distribution on the evening side of the oval is much narrower than on the morning side reflecting the more abrupt and therefore clearer onset of precipitation on the evening side. Lastly, the results are in very close agreement to those obtained by Hardy and MacKean⁹ which were derived using slightly different statistical tests.

We next analyze the source of differences between hand and computer boundaries that are greater than $\pm 3^\circ$ on the morning side and greater than $\pm 2^\circ$ on the evening side of the oval. The reasons for the larger differences between the hand-chosen and algorithm-chosen boundaries are given in Table 4. Morning and evening

sector discrepancies are listed separately because the number of cases differs. A discussion of these large differences in order of frequency of occurrence is given below.

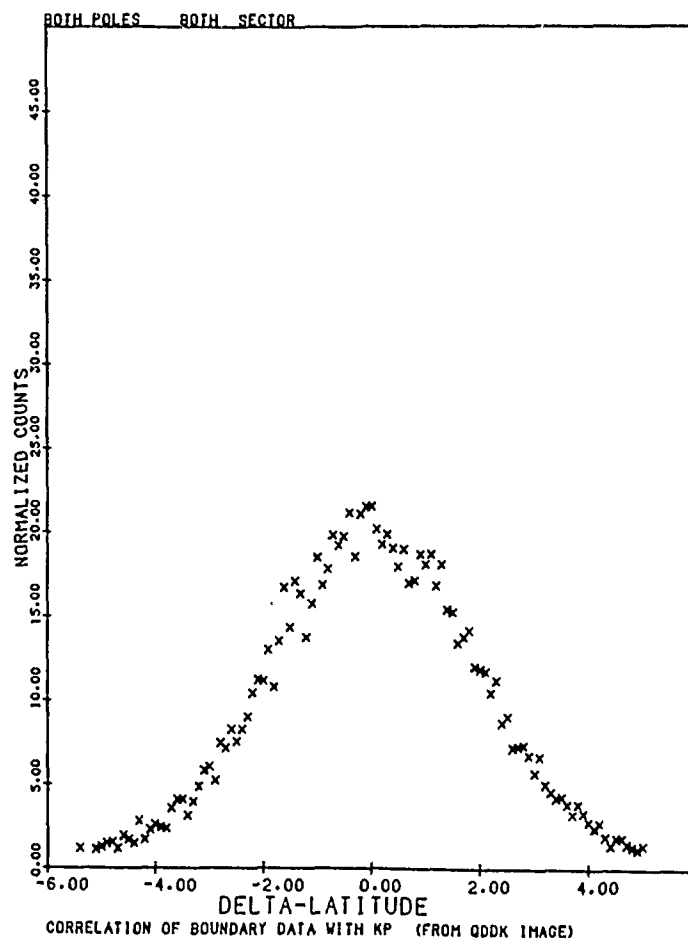


Figure 8. Distribution of the Residual Scatter in the Computer-chosen Boundary Set When Compared to Linear Regression Values Obtained From the Same Set. The distribution is accumulated in 0.1° bins and normalized to 1000 cases

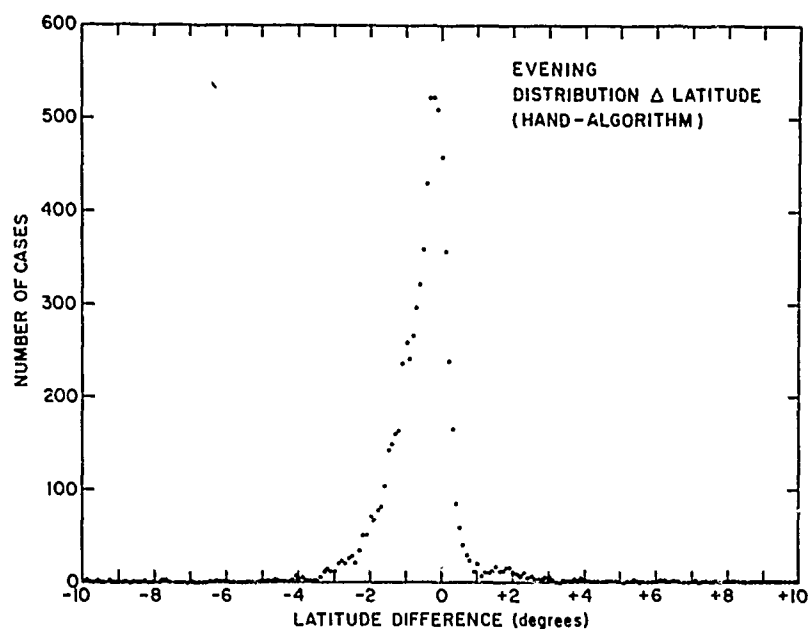


Figure 9. Distribution of the Differences Between Hand- and Computer-Chosen Boundaries ($\lambda_{II} - \lambda_A$) for the Evening Sector. The distribution is accumulated in 0.1° bins

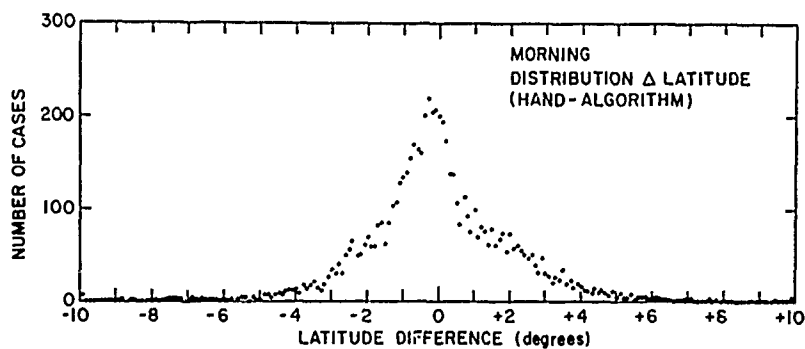


Figure 10. Same as Figure 9, for Morning Sector

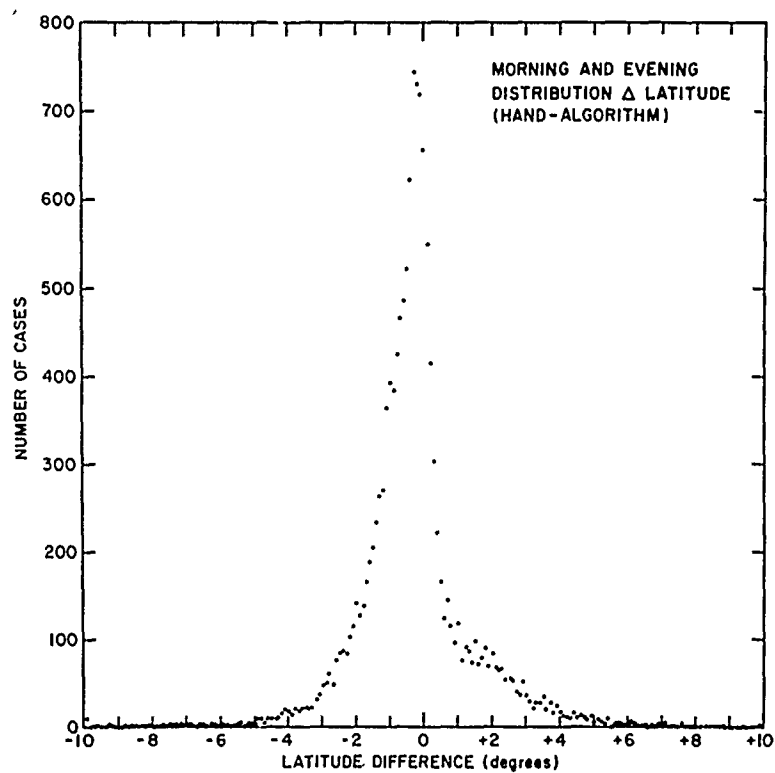


Figure 11. Same as Figure 9, for Evening and Morning Sectors Combined

Table 3. Percentages of Differences

	Evening	Morning	Composite	H-M Evening	H-M Morning
± 1°	74%	50%	63%	80%	50%
± 2°	93%	74%	84%	95%	67%
± 3°	98%	89%	94%	99%	82%

Table 4. Hand- vs Algorithm-Chosen Boundaries

Morning			Evening		
Morning Discrepancies ($> \pm 3^\circ$ CGM)			Evening Discrepancies ($> \pm 2^\circ$ CGM)		
Reason	Number	% of Total Morning Boundaries Discrepancies	Reason	Number	% of Total Evening Boundaries Discrepancies
Radiation Belt Interference	241	3.8 (34.7)	Evening Ramp	303	4.3 (64.3)
Irregularities Equatorward Edge	241	3.8 (34.7)	Irregularities Equatorward Edge	66	0.9 (14.0)
Spurs	71	1.1 (10.2)	Spurs	36	0.5 (7.6)
Magnetic Local Noon Criteria	54	0.8 (7.8)	Radiation Belt Interference	29	0.4 (6.2)
Morning Ramps	28	0.4 (4.0)	Poleward Boundary	18	0.3 (3.8)
Minor Problems	59	0.9 (8.5)	Minor Problems:	19	0.3 (4.0)
1. Ambiguous (34)			1. Ambiguous (12)		
2. Algorithm Failure (13)			2. Algorithm Failure (2)		
3. Poleward Boundary (11)			3. Hand Error (5)		
4. Hand Error (1)					
Total Number of Morning Discrepancies $> \pm 3^\circ$:			Total Number of Evening Discrepancies $> \pm 2^\circ$:		
% of Total Morning Boundaries with $> 3^\circ$ CGM Discrepancy:			% of Total Evening Boundaries with $> 2^\circ$ CGM Discrepancy:		
(6398 Morning Boundaries Measured)			(7030 Evening Boundaries Measured)		
694			471		
10.8%			6.7%		

Evening ramps refer to the gradual onsets of precipitation in the evening sector. They occur in less than half of the passes and usually extend for less than half a degree in CGL. The onset of the evening ramps is chosen as the "better" boundary for the hand-chosen data set, but the algorithm tends not to pick up the onset of these evening ramps making the algorithm boundary closer to the 10^7 level. Referring to Table 4, it is seen that evening ramps account for nearly 2/3 of the $> \pm 2^\circ$ CGL discrepancies. Actually, because in these cases the hand boundary is lower than the computer boundary they fall only in the negative direction. Since evening ramps are generally smaller than 2° , it is possible to deduce that the small regions of gradual onset of precipitation on the evening side are a major cause of the slightly lower hand-chosen evening boundary, and the negative skew seen in Figure 9.

Large irregularities on or near the equatorward edge of both the morning or evening auroral oval occur primarily under three conditions: (a) the occurrence of polar cap absorption events, (b) very low activity, and (c) abrupt changes in the activity. Polar cap absorption events have been, as much as possible, edited out of both data sets because they totally obscure the onset of auroral precipitation. Figure 5 illustrates ambiguous conditions on the evening-side equatorward edge of the aurora. The dashed line is the hand-chosen boundary, the dot-dash line the computer-chosen boundary. As was mentioned in Section 3, spurs are excluded from the hand-chosen data set because they may be produced by the precipitation of trapped electrons from prior activity. The algorithm usually picks the auroral boundary below the spur if it is broad enough, as was the case in this example. The net effect on the evening side of the $> \pm 2^\circ$ irregularities is not significant in the distribution of differences shown in Figure 9, as 30 of the algorithm boundaries were lower and 33 of the hand boundaries were lower. However, this category of discrepancies can account for some of the very large differences between the two data sets.

Irregularities in the equatorward edge of the aurora produce a quite different net effect on the morning side. First, they account for more than half the $> \pm 3^\circ$ CGL discrepancies on the morning side. Second, there is a distinct bias in that for more than 210 of these cases, the computer boundary is lower than the hand boundary. This category, then, accounts for many of the $> + 3^\circ$ CGL differences in the distribution shown in Figure 10.

Radiation belt particles interfere with both morning and evening auroral boundaries. This accounts for ~30 percent of the large discrepancies on the morning side. (On the evening side the problem is minor, 0.4 percent of the large discrepancies, either because the sharp increase due to auroral precipitation is visible through the radiation belt signature or the generally higher latitude of the onset of auroral precipitation on the evening side produces a boundary above the latitude of particle radiation.) Radiation belt particle interference is a major problem in determining

equatorward auroral boundaries both by hand and with the computer and was discussed thoroughly in the previous sections. Although every attempt was made in both data sets to exclude radiation belt particles effects, it was not always successful. The effect is that the hand chosen boundaries in 200 of 270 cases where radiation particle effects are important, are lower than those chosen by the algorithm. On the morning side then, this category of discrepancy accounts for many of the $> -3^\circ$ CGL differences in the distribution shown in Figure 10.

The category labelled Spurs, in Table 4, results from the triggering of the algorithm test too early by regions of enhancement which in these cases are clearly outside the auroral oval. This category accounts for many of the largest differences between the algorithm- and hand-chosen boundaries in the positive direction in Figures 9, 10 and 11. This is an algorithm failure which occurs for about 0.8 percent of the boundaries in the total data set.

The area of the aurora around noon local time is confusing, as was discussed earlier. Whereas, the method used to choose boundaries in this region by hand is fairly clearly defined and consistent, algorithm tests often fail to pick up the irregular conditions of the diffuse aurora. Instead the "cusp" boundary is chosen. An attempt has been made to edit out the algorithm "cusp" boundaries. The cases appear in the listing as the hand-chosen boundaries with no corresponding algorithm boundary. There are also instances in the noon sector where the algorithm chose boundaries which were not evident in the particle data. Because DMSP/F2 is in a dusk-dawn orbit this is not a major problem. If a satellite in a noon-midnight orbit is used to produce future Auroral Boundary Index values, further work on both the algorithm and hand selection of boundaries in the noon sector will be needed.

The remaining categories of large discrepancies between the two data sets are minor problems. The total number of boundaries in these additional cases accounts for less than 1 percent of the total boundary measurements. Morning ramps, which are a major problem in determining boundaries by hand, cause very few large discrepancies between the two data sets unlike their evening counterparts. Briefly, the other minor problems are: Poleward boundaries, the result of the algorithm tests being triggered very late (at or near the poleward edge of the aurora) because the gradient is very smooth; Ambiguous, where the reason for the discrepancy is a combination of two or more categories; Algorithm Failure, where the algorithm is wrong, but the reason is unclear; and Hand Errors, two of which were ephemeris interpolation errors, and the rest recording mistakes.

6. AURORAL BOUNDARY INDEX

A proposed Auroral Boundary Index was constructed in the following manner. First, using values of α and β from Table 1 a predicted Kp, called Kp', was calculated for each measured equatorward auroral boundary, λ_E , based on the relationship of λ and Kp shown in Eq. (1), using the following expression:

$$Kp' \equiv \frac{\lambda_E - \alpha_i}{\beta_i} . \quad (2)$$

Here α_i and β_i are the intercept and slope for the MLT zone in which the boundary was measured.

Second, using the Kp' calculated in Eq. (2), λ_{EM}' , the projection of λ_E to the midnight (23-24) MLT sector, was calculated using the expression:

$$\lambda_{EM}' = \alpha_M + \beta_M Kp' , \quad (3)$$

where α_M and β_M are the intercept and slope for 23-24 MLT zone. The last two columns in computer listing in Appendix B give the values of λ_{EM}' for the hand- and computer-chosen values of λ_E , respectively. Software has been developed to generate monthly plots of Kp', 3 hour averages of Kp' ($\overline{Kp}'$), and λ_{EM}' for both the hand- and algorithm-chosen boundaries. Additionally, the derived quantities are plotted using all points and using morning or evening boundaries separately. A sample set of plots of $\overline{Kp}'$ and λ_{EM}' for March 1978 is shown in Figures 12a-12l.

As the final part of the development of the index we have correlated Kp with $\overline{Kp}'$ for both hand- and algorithm-boundaries. The correlation was done using values of $\overline{Kp}'$ derived from the morning sector boundaries, evening sector boundaries, and all boundaries. Table 5 shows the correlations of Kp vs $\overline{Kp}'$ for each month in 1978. It is clear from Table 5 that correlations are best using only the evening boundaries (average of 0.84, hand and algorithm) and still quite good for the combined morning and evening boundary set (average of 0.84, hand, and 0.82, algorithm). The poorest correlations result when only morning boundaries are used (average of 0.77, hand, and 0.72, algorithm), a reflection of the morning problems. The lowest correlations generally occur in those months where there are very few active periods resulting in a restricted range for the data. Scatter plots of Kp vs of $\overline{Kp}'$ for March 1978, are given in Figures 13a-13f. Straight lines show the results of performing linear regressions on Kp vs $\overline{Kp}'$ and $\overline{Kp}'$ vs Kp.

In order to assess the consistency between the hand-chosen and algorithm-chosen data sets, monthly regressions of $\overline{Kp'}$ derived from the hand-chosen boundaries on $\overline{Kp'}$ derived from the algorithm-chosen boundaries were calculated. The results of these regressions for March 1978 are shown in Figure 14. Average correlation coefficients of $\overline{Kp'}$ (hand) vs $\overline{Kp'}$ (algorithm) are 0.97 for evening values, 0.91 for morning values and 0.96 for combined values.

Table 5. Correlations of Kp vs $\overline{Kp'}$

1979	Algorithm Kp' M/E	Algorithm Kp' Evening	Algorithm Kp' Morning	Hand Kp' M/E	Hand Kp' Evening	Hand Kp' Morning
Jan	0.87	0.86	0.80	0.89	0.86	0.85
Feb	0.74	0.78	0.64	0.77	0.77	0.66
Mar	0.81	0.84	0.73	0.83	0.84	0.75
Apr	0.81	0.83	0.70	0.84	0.84	0.76
May	0.85	0.87	0.77	0.88	0.87	0.84
Jun	0.78	0.81	0.67	0.77	0.80	0.66
Jul	0.76	0.78	0.68	0.79	0.79	0.73
Aug	0.86	0.87	0.83	0.89	0.89	0.83
Sep	0.87	0.89	0.76	0.89	0.90	0.83
Oct	0.78	0.81	0.66	0.80	0.82	0.73
Nov	0.85	0.86	0.74	0.87	0.87	0.81
Dec	0.83	0.84	0.73	0.86	0.86	0.79

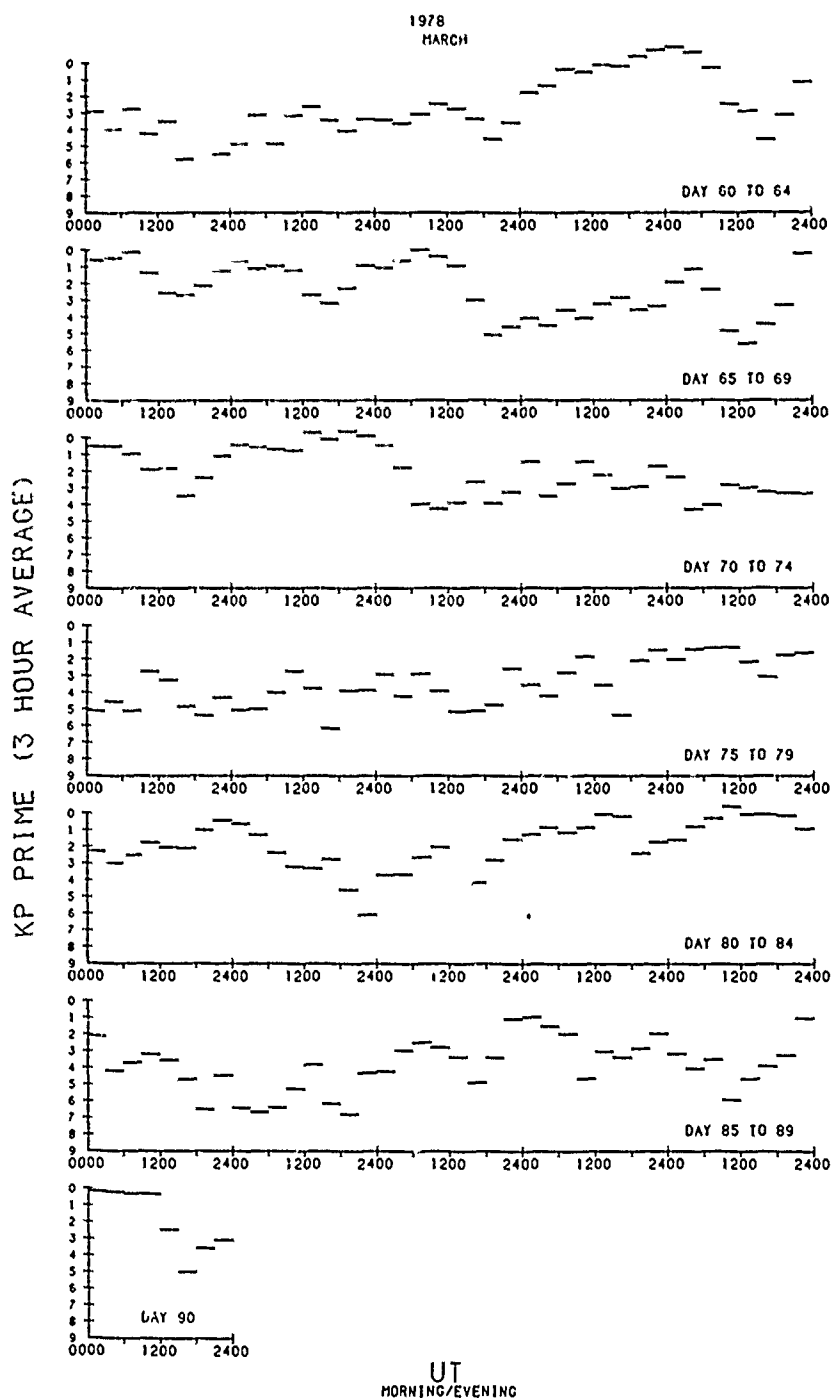


Figure 12a. Three-hour Average of K_p' Calculated From Hand-chosen Morning and Evening Equatorward Auroral Boundaries, Plotted as a Function of Universal Time for March 1978

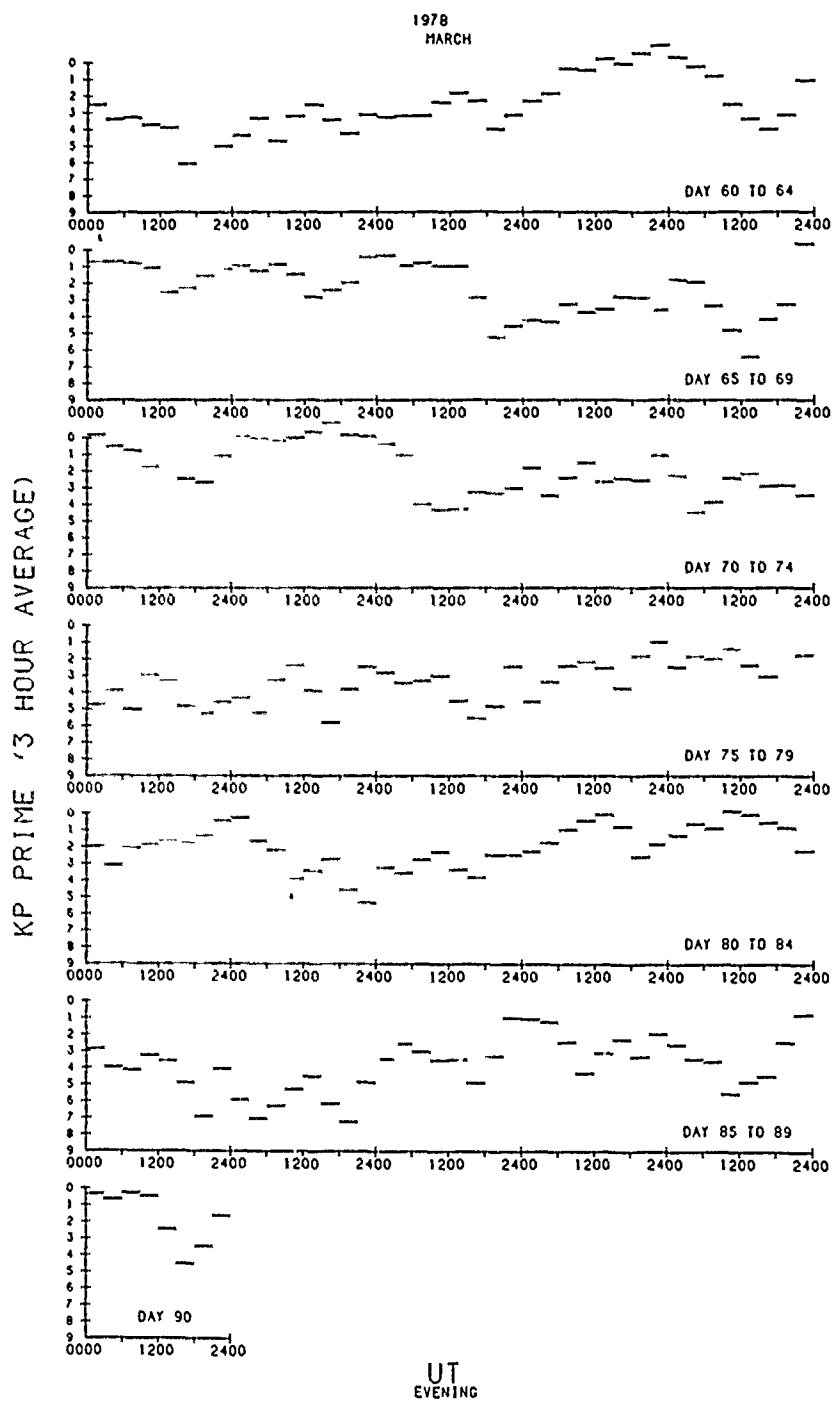


Figure 12b. Same as Figure 12a, Using Only Evening Boundaries

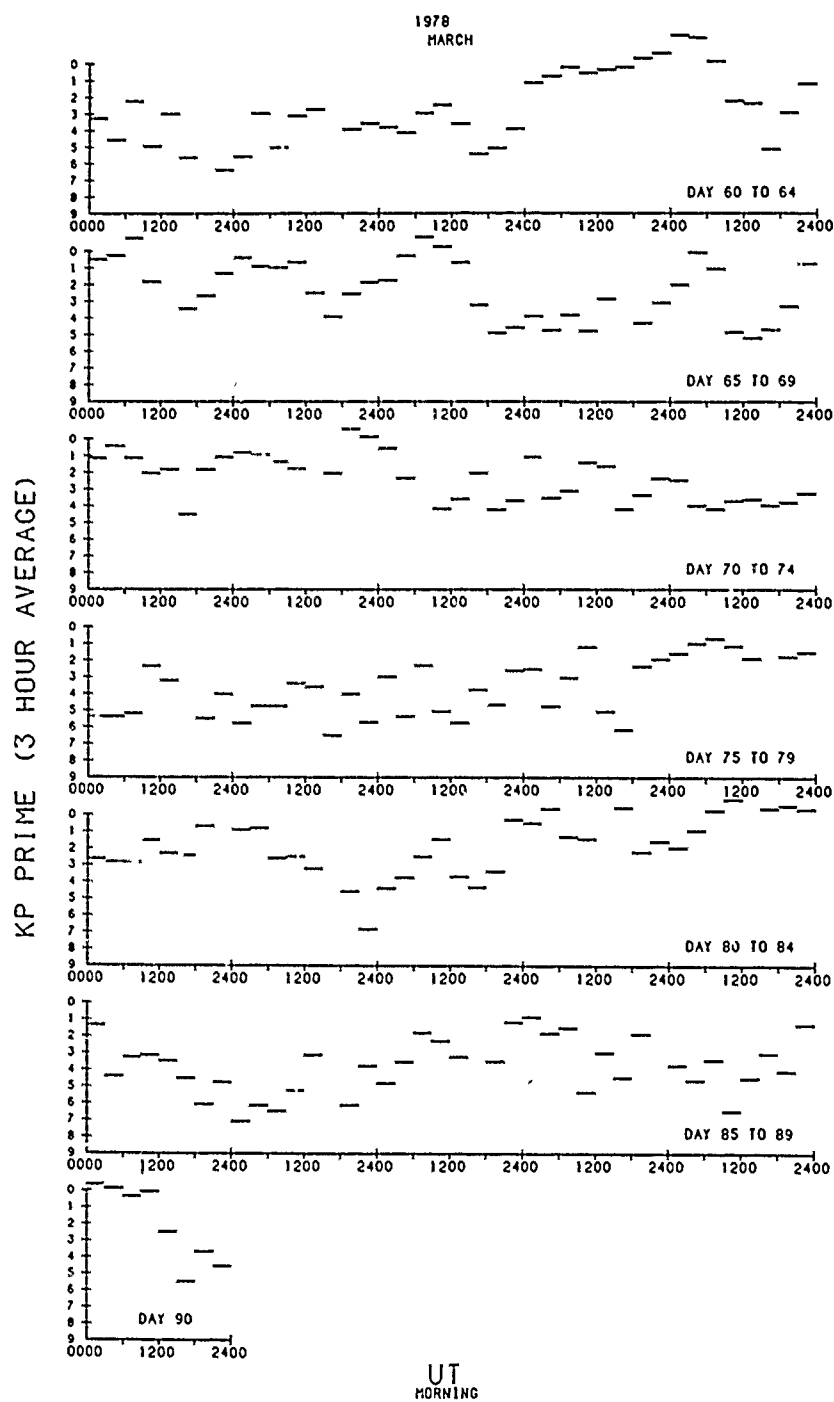


Figure 12c. Same as Figure 12a, Using Only Morning Boundaries

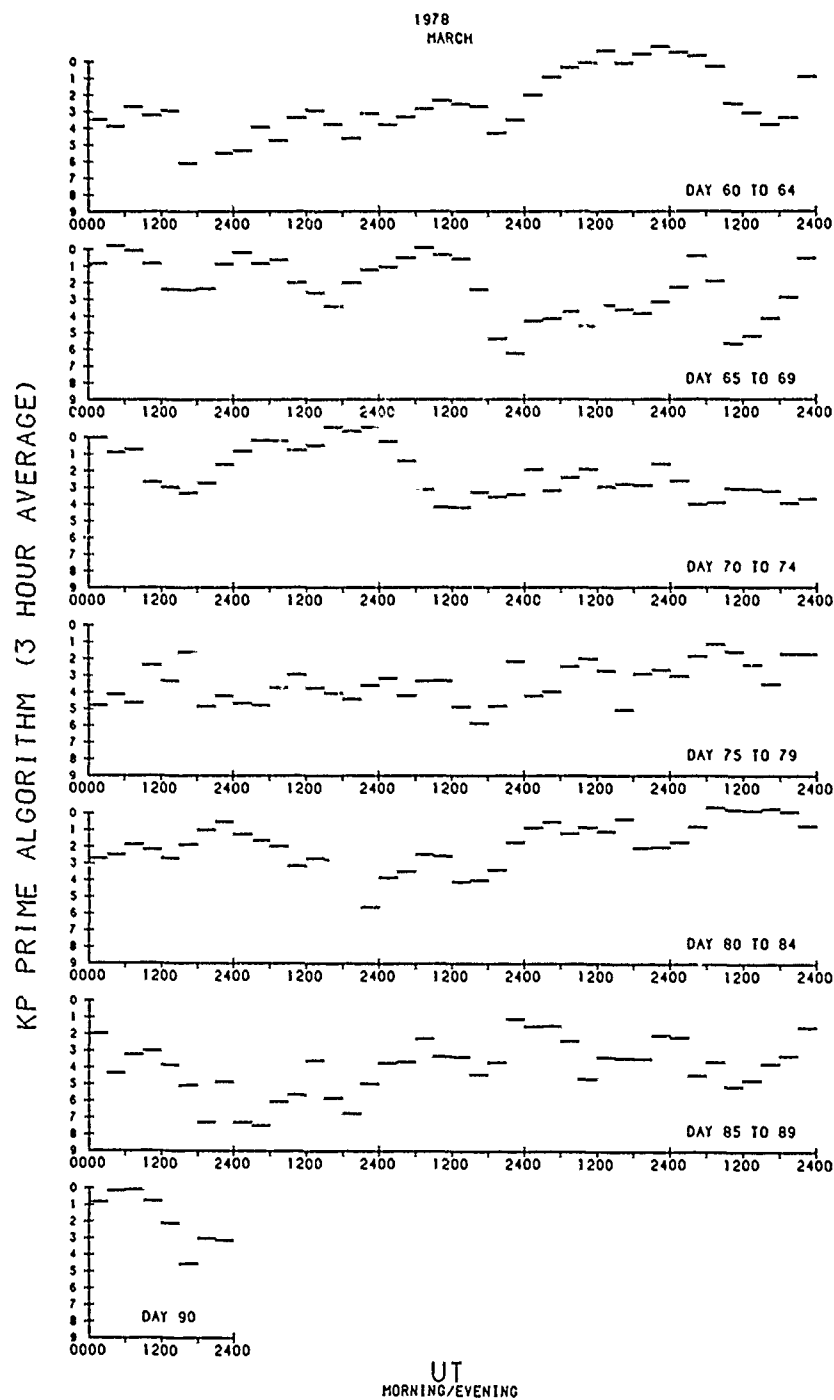


Figure 12d. Three-hour Average of K_p' Calculated From Algorithm-chosen Morning and Evening Equatorward Auroral Boundaries Plotted as a Function of Universal Time for March 1978

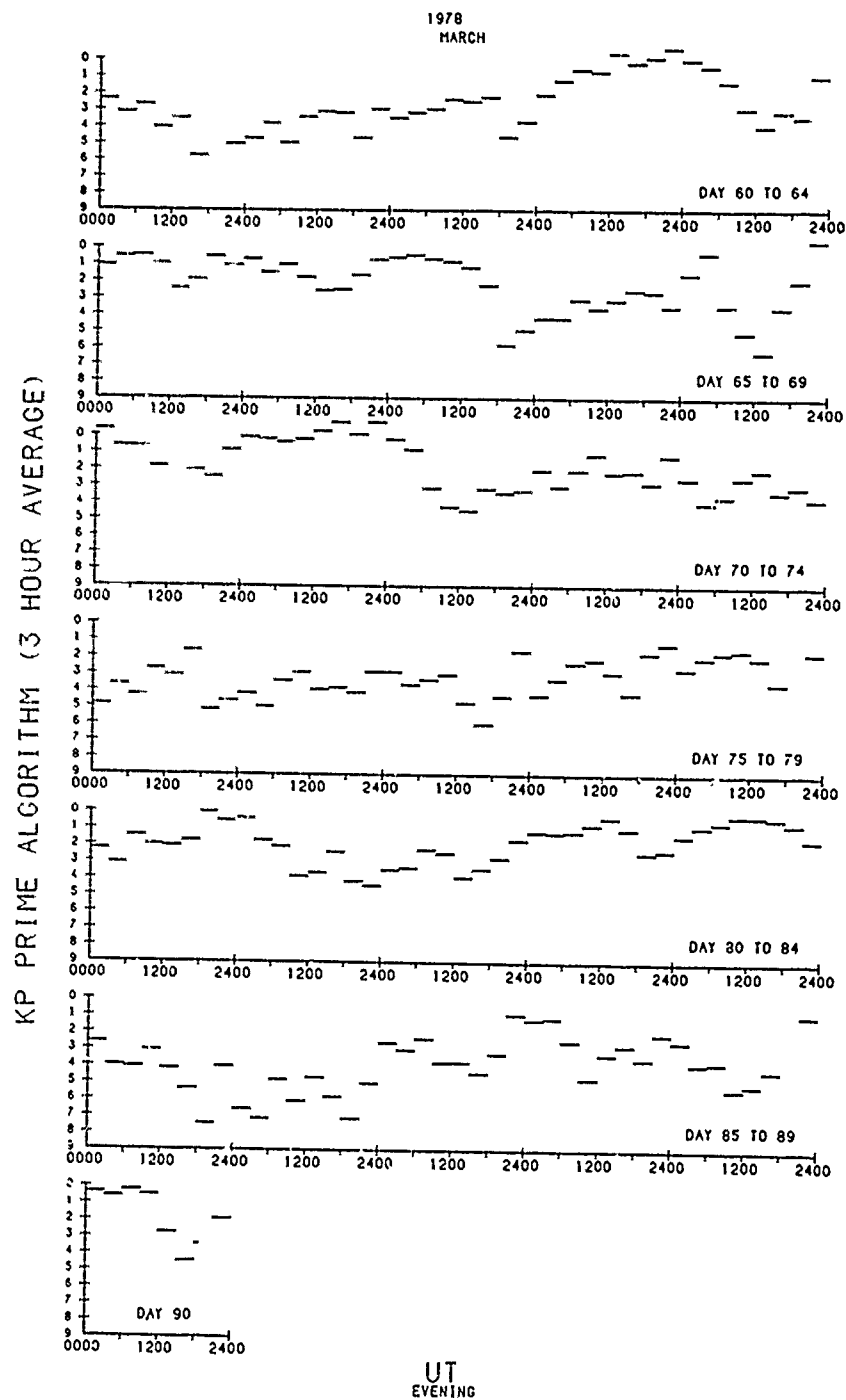


Figure 12e. Same as Figure 12d, Using Only Evening Boundaries

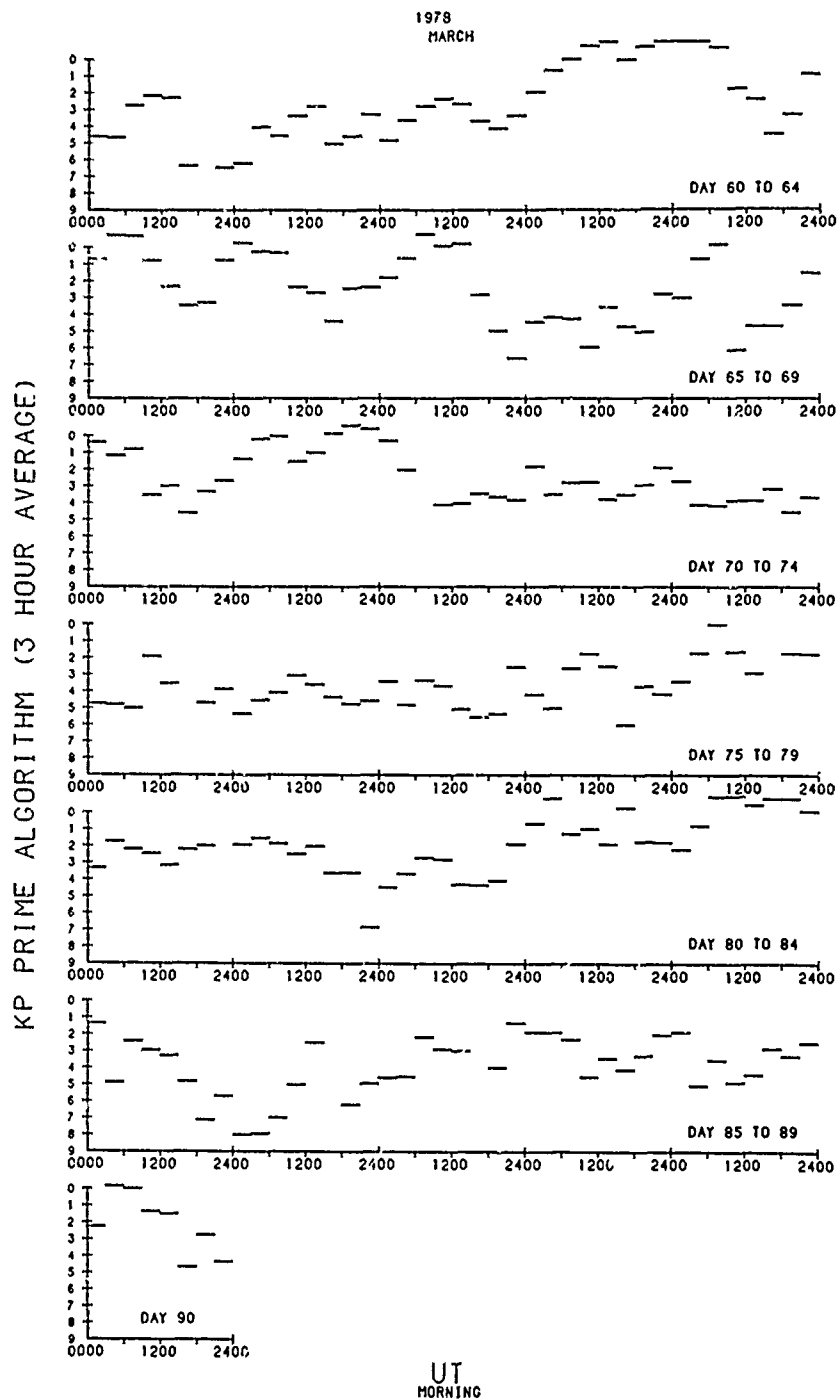


Figure 12f. Same as Figure 12d, Using Only Morning Boundaries

1978
MARCH

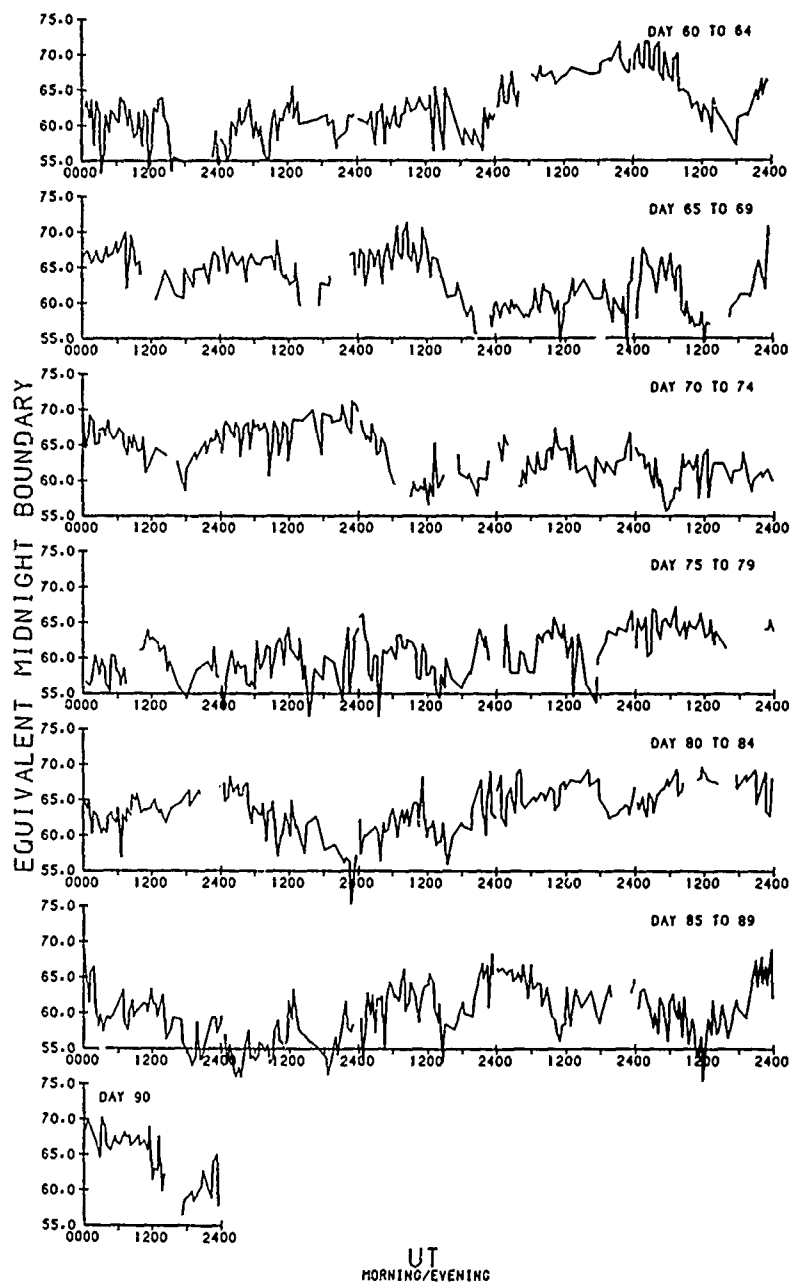


Figure 12g. Equivalent Midnight Boundary Calculated From Hand-chosen Morning and Evening Equatorward Auroral Boundaries, Plotted as a Function of Universal Time for March 1978

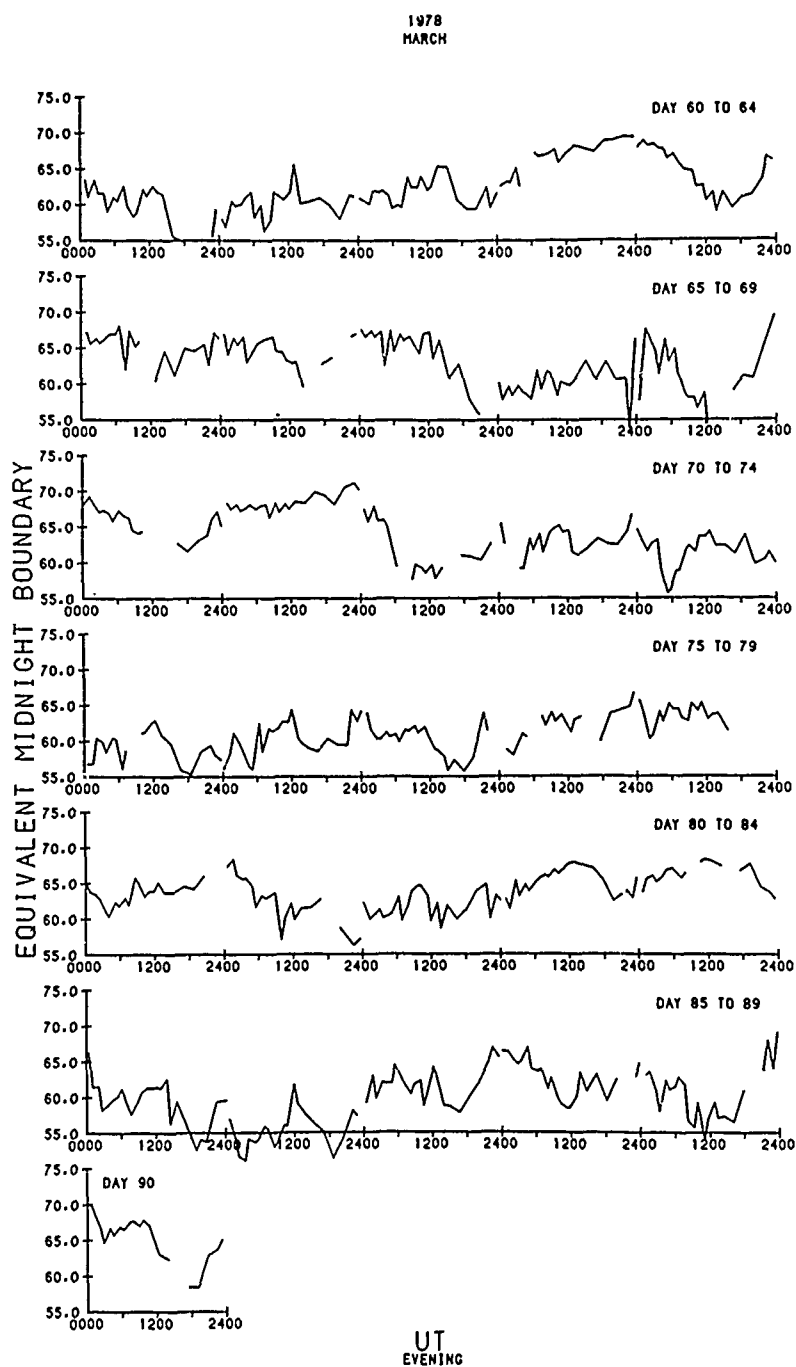


Figure 12h. Same as Figure 12g, Using Only Evening Boundaries

1978
MARCH

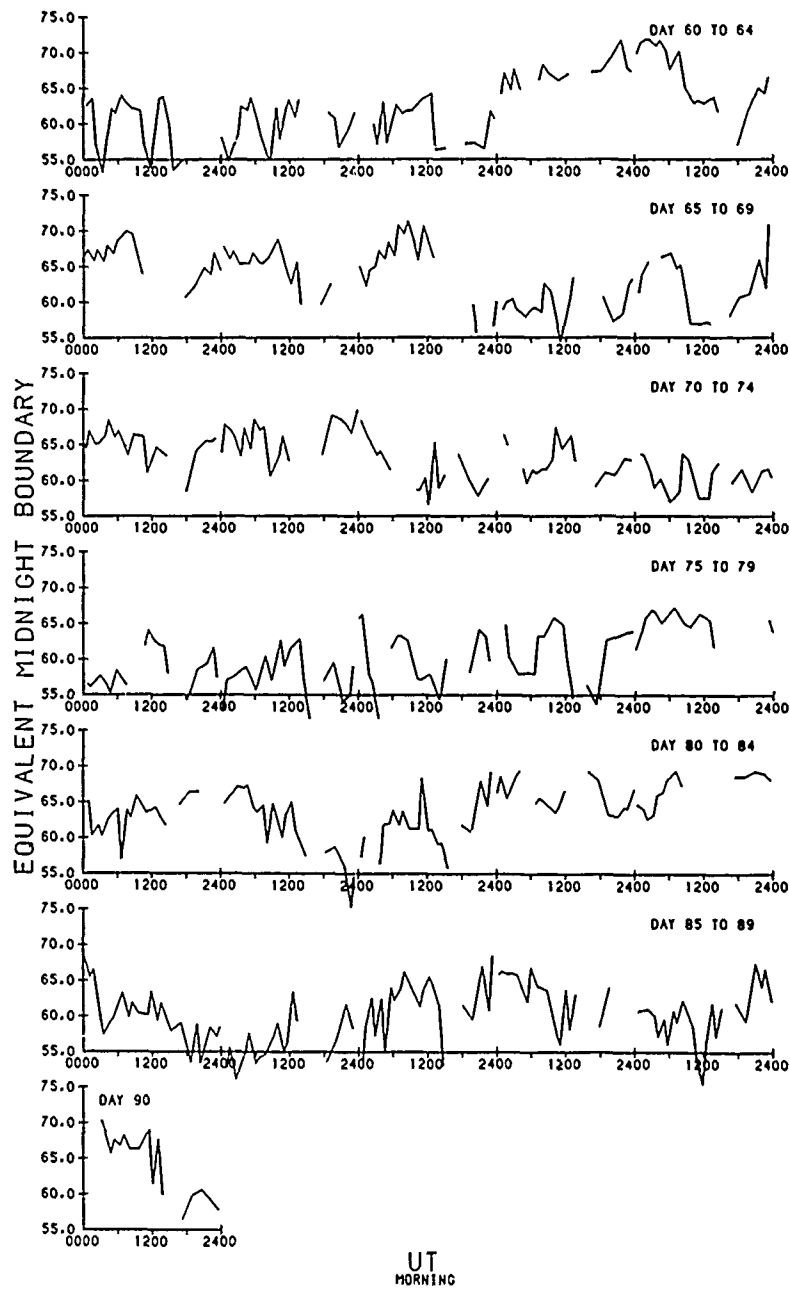


Figure 12i. Same as Figure 12g, Using Only Morning Boundaries

1978
MARCH

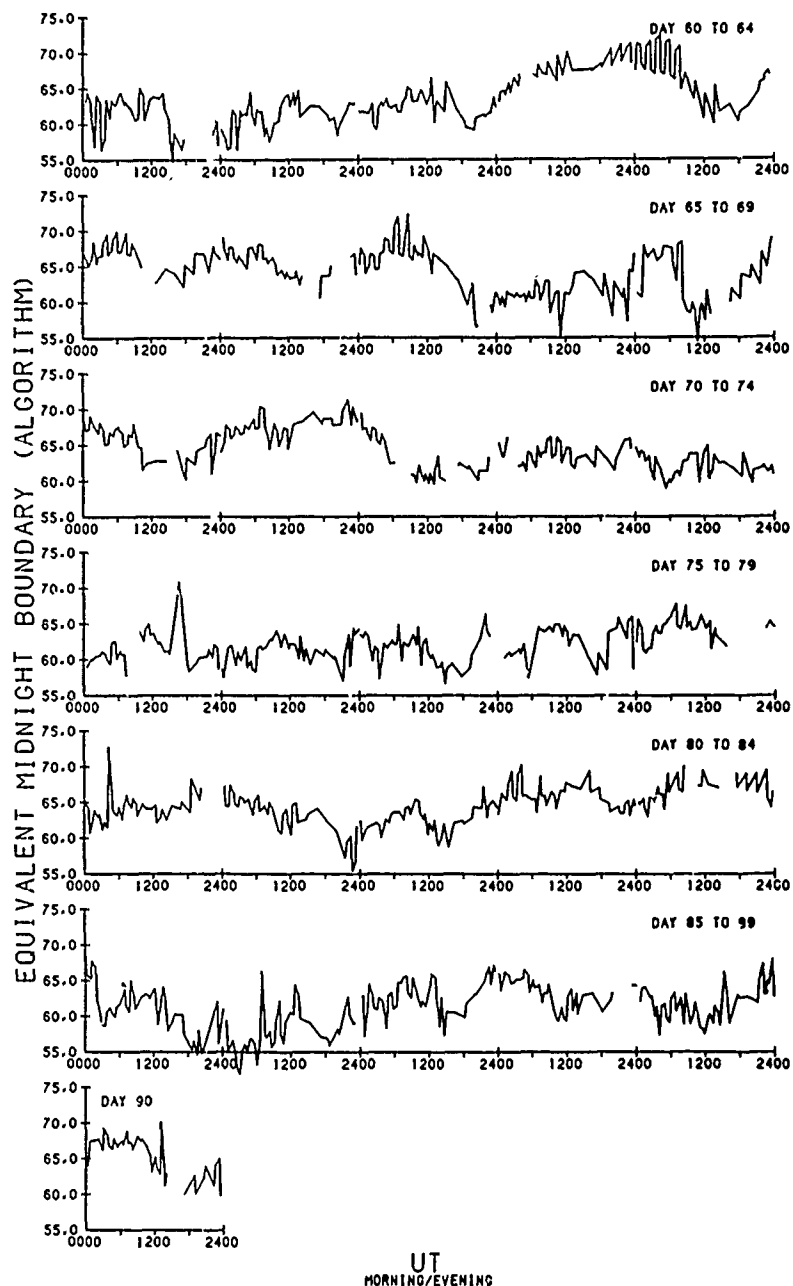


Figure 12j. Equivalent Midnight Boundary Calculated From Algorithm-chosen Morning and Evening Equatorward Auroral Boundaries, Plotted as a Function of Universal Time for March 1978

1978
MARCH

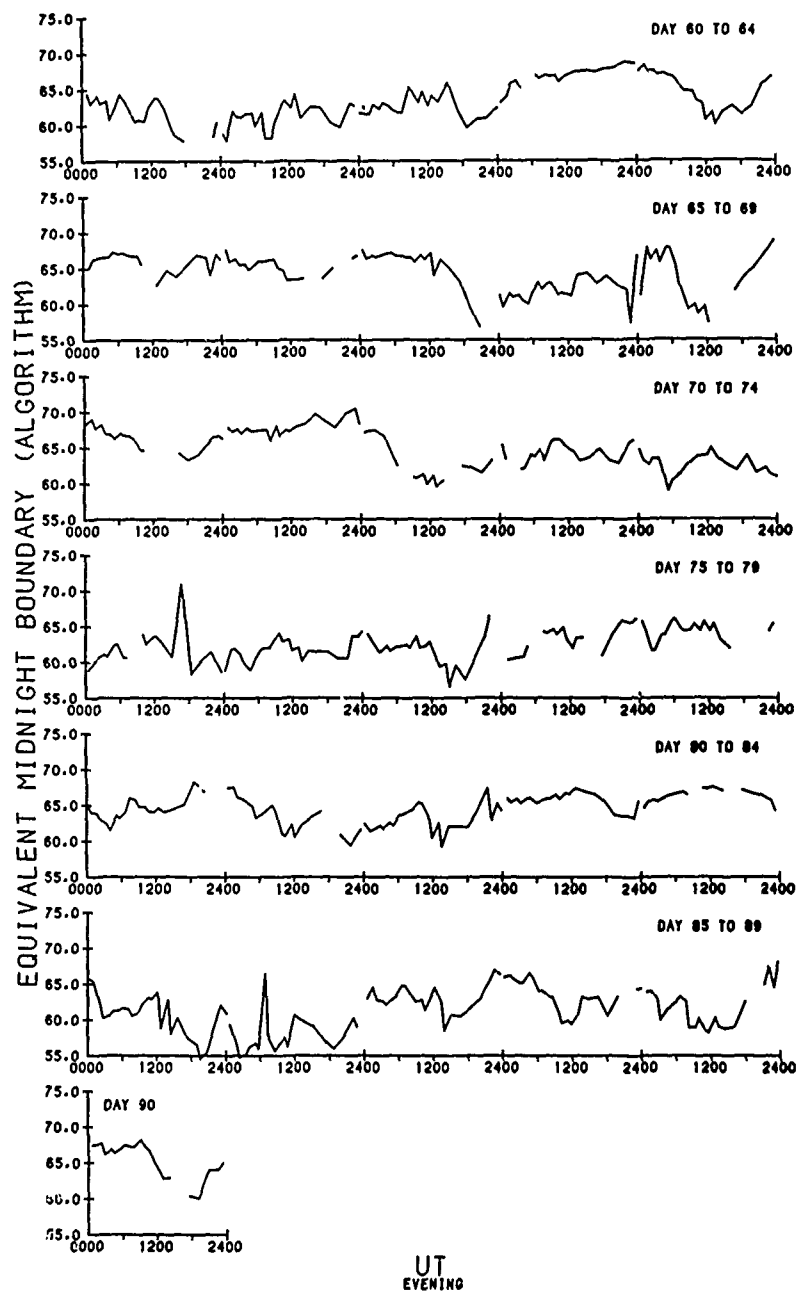


Figure 12k. Same as Figure 12j, Using Only Evening Boundaries

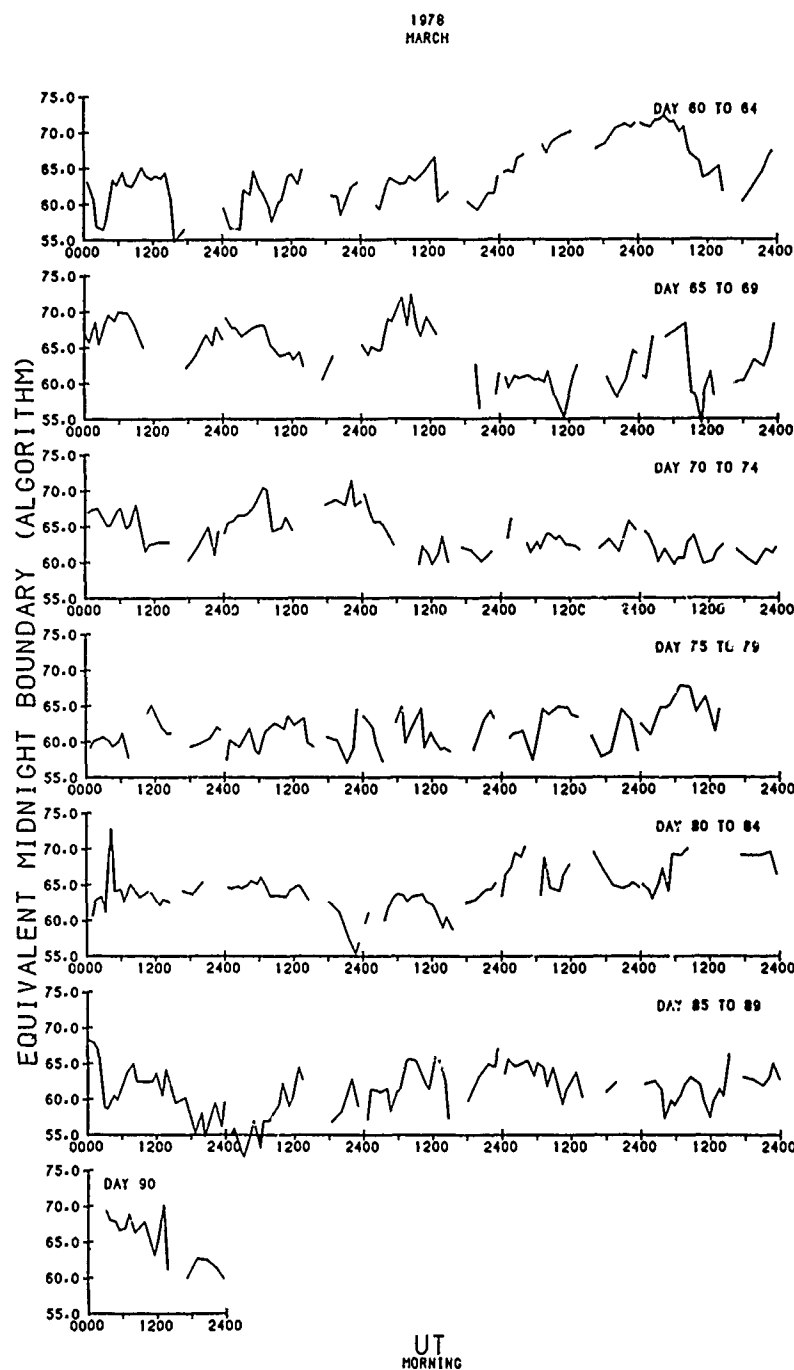


Figure 12l. Same as Figure 12j, Using Only Morning Boundaries

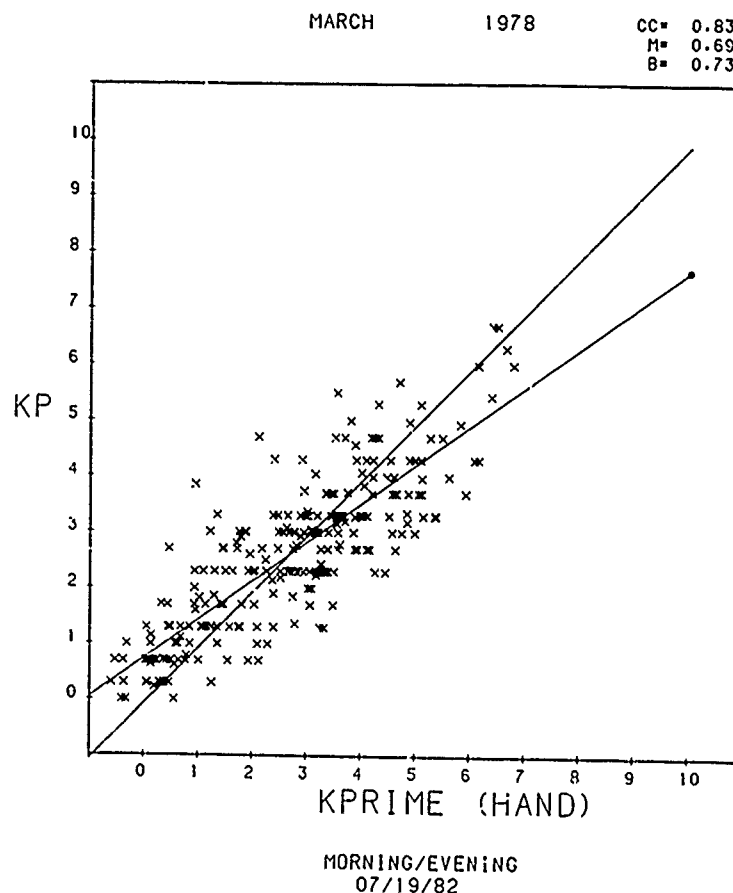
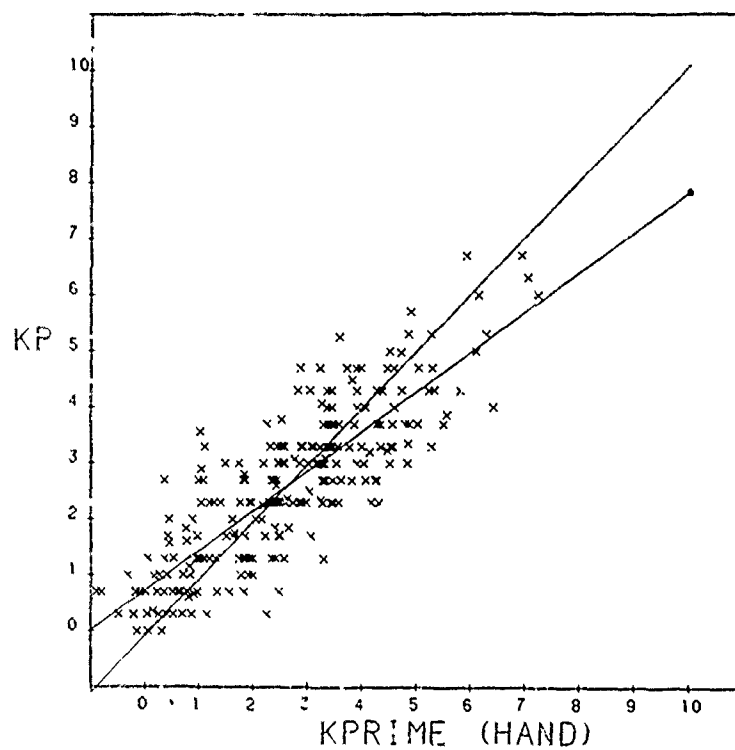


Figure 13a. Scatter Plot of the Values of Kp vs the Corresponding Three-hour Average Value of Kp' (labelled KPRIME) When Kp' is Calculated Using Hand-chosen Morning and Evening Equatorward Auroral Boundaries Obtained in March 1978. The result of performing a linear regression of Kp (Kp') vs Kp' (Kp) is shown by the straight line ending in a dot (not ending in a dot). The correlation coefficient, slope and intercept of the Kp vs Kp' line are shown in the upper right hand corner

MARCH

1978

CC= 0.84
M= 0.71
B= 0.72



EVENING
07/19/82

Figure 13b. Same as Figure 13a, Using Only Values of Kp'
Determined From Evening Boundaries

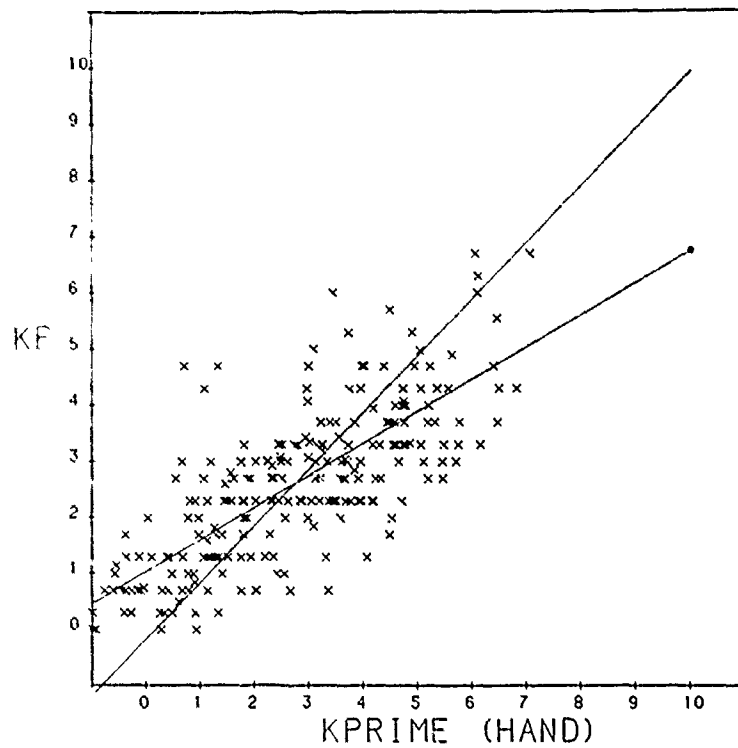
MARCH

1978

CC= 0.75

H= 0.57

B= 1.03



MORNING
07/19/82

Figure 13c. Same as Figure 13a, Using Only Values of Kp' Determined From Morning Boundaries

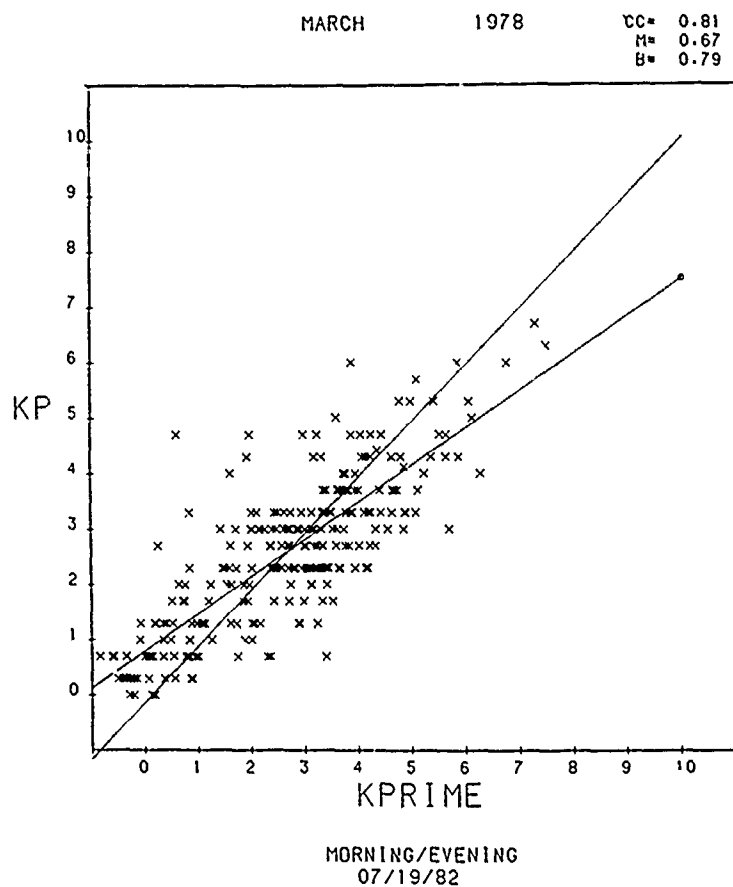
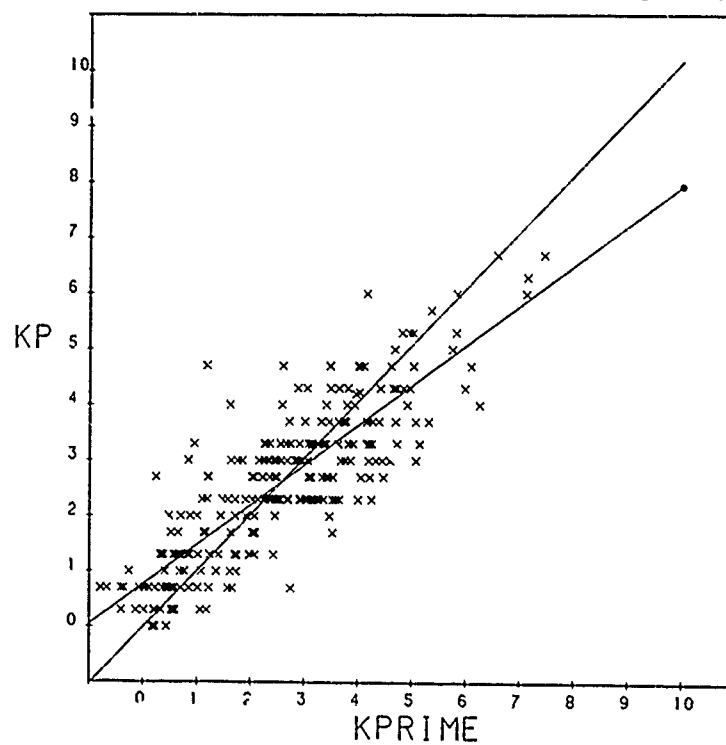


Figure 13d. Scatter Plot of the Values of Kp vs the Corresponding Three-hour Average Value of Kp' (labelled KPRIME) When Kp' is Calculated Using Computer-chosen Morning and Evening Equatorward Auroral Boundaries Obtained in March 1978. The result of performing a linear regression of Kp (Kp') vs Kp' (Kp) is shown by a straight line ending in a dot (not ending in a dot). The correlation coefficient, slope and intercept of the Kp vs Kp' line are shown in the upper right hand corner

MARCH

1978

CC= 0.84
H= 0.72
B= 0.76



EVENING
07/19/82

Figure 13e. Same as Figure 13d, Using Only Values of Kp' Determined From Morning Boundaries

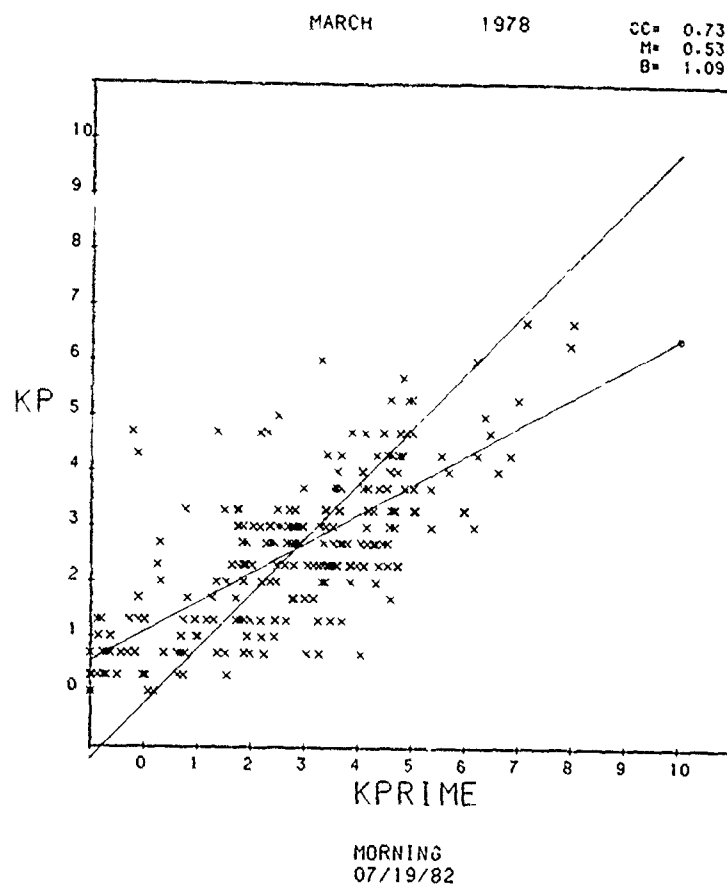


Figure 13f. Same as Figure 13d, Using Only Values of Kp' Determined From Morning Boundaries

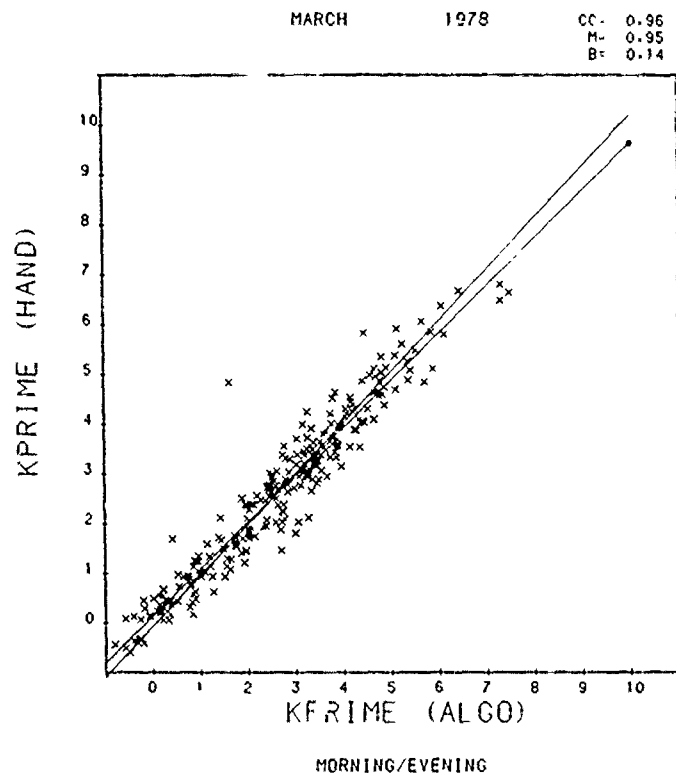


Figure 14. Scatter Plot of the Corresponding Values of Three-hour Averages of Kp' Calculated Using Hand-chosen [labelled KPRIME (HAND)] and Algorithm-chosen [labelled KPRIME (ALGO)] Morning and Evening Equatorward Boundaries Obtained in March 1978. The result of performing a linear regression of Kp' (hand) [Kp' (algorithm)] vs Kp' (algorithm) [Kp' (hand)] is shown by the straight line ending in a dot [not ending in a dot]. The correlation coefficient, slope and intercept of the Kp' (hand) vs Kp' (algorithm) line are shown in the upper right hand corner

7. DISCUSSION

Before making a comparison of the two sets of 1978 auroral equatorward boundaries, those laboriously done by hand and those done by a rather complex computer algorithm, we list the following overall conclusions:

- (a) The boundaries cannot be judged absolutely. There is a margin of ambiguity in all but the most abrupt and clean evening side rises of precipitating electron counts above background. In most cases the margin of ambiguity is small.

(b) The evening boundaries have a much smaller margin of ambiguity than the morning boundaries. Characteristically the morning electron precipitation onset is different from that of the evening, having long ramps and more irregularities. This may well reflect a difference in the dynamics of the plasma sheet at different local times and/or a difference in precipitation mechanisms. The evening boundaries also have higher correlation coefficients than the morning boundaries, when directly related to Kp.

(c) Contamination of the auroral electron signal by radiation belt particles presents the single greatest problem in choosing equatorward boundaries by both methods. Again, this is particularly true on the morning side. To avoid this problem on future DMSP flights additional shielding has been added to the detectors.

Since one of the objects of this study is an assessment of the algorithm developed by Hardy and Holeman⁸ for choosing boundaries we make the following additional conclusions from comparing the two boundary sets:

(d) Both hand- and computer-chosen boundary sets have approximately the same internal consistency. The spread in boundary values from the linear regression values are very similar (Figures 7 and 8).

(e) Although the two sets of boundaries result in different linear regressions (systematically differing slopes and intercepts) they correlate equally well with Kp (Table 1).

(f) The two boundary sets show similar discrepancies between morning and evening boundaries, the latter being more consistent both within and between boundary sets and having high correlation with Kp.

(g) When used as a predictor of Kp (using the three-hour averaged values of Kp') the accuracy of the two sets is indistinguishable when the evening boundaries are used, and is only slightly better for hand-chosen boundaries using morning and combined values (Table 5). This is clearly shown in Figure 14 in which the two predicted values agree with a correlation coefficient of 0.96.

We therefore conclude that the auroral equatorward boundaries selected by the algorithm described here may be used for both scientific and predictive purposes in place of the hand-chosen boundaries. The algorithm was developed and tested for dawn and dusk boundaries and is not applicable in the noon sector.

Finally, we use the auroral equatorward boundaries as a measure of auroral activity by indexing the activity with the boundary measurements. Using the algorithm for choosing boundaries at the site of the down-link data transmission without intermediate processing can give the index in near real time. The most direct index is simply the boundary itself, tagged by both universal and local time. The large offset of the auroral oval in magnetic coordinates toward higher latitudes at noon and lower latitudes at midnight, makes the use of multi-local time values of

the boundary difficult at best, and no doubt misleading to casual users. We therefore choose to scale each boundary to an equivalent midnight boundary by way of the derived $Kp = Kp'$. Kp' is not used as the index for two reasons: (a) the index is derived from boundaries, not from magnetic activity. The source of the index is obscured by using Kp' . (b) The boundary measurements have a finer time resolution, and one more appropriate to substorm activity than the 3-hr Kp interval. A finer Kp' resolution would again add confusion in interpretation.

Another choice remains. The equivalent midnight, λ_{EM}' used for the index can be derived from both morning and evening boundaries, or either morning or evening boundaries. Plots of the combined data (Figure 12g) have better time resolution, but contain a great deal of variation from point to point (oscillating from a morning to an evening equivalent boundary). These variations result either from the poorer quality of morning boundary choices and/or from a real difference in the particle dynamics between the two local time sectors. Because the evening boundary set has fewer and more controllable selection problems, is more internally consistent, and correlates more directly with Kp , we choose the equivalent midnight boundary obtained from the evening sector boundary set (Figure 12h) as the Auroral Boundary Index. To reiterate, the Auroral Boundary Index is the projected midnight equatorward auroral boundary found using an actual evening sector boundary and the statistically determined systematic local time variation of the oval. During periods of good data accumulation there will be one index value each 55 min. The Auroral Boundary Index is presented month by month for 1978 in Appendix A.

References

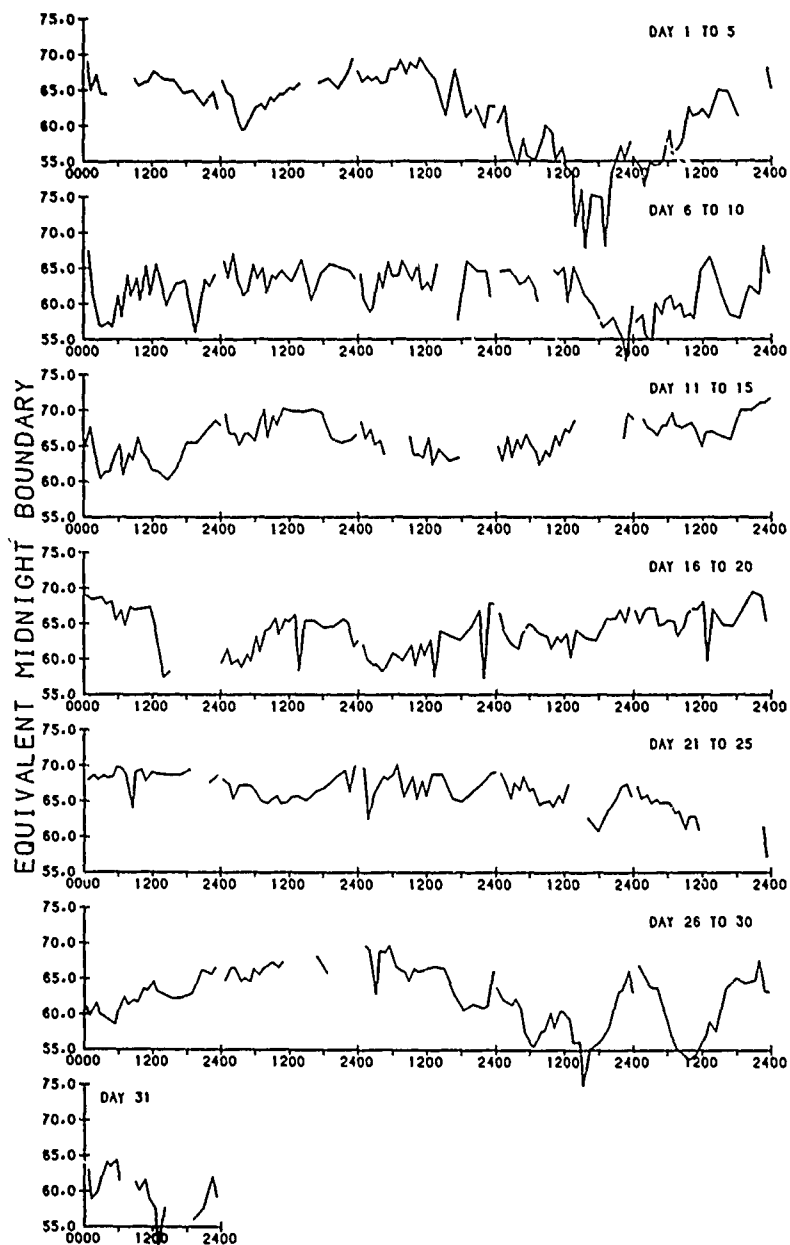
1. Lui, A.T.Y., Anger, C.D., and Akasofu, S.-I. (1975) The equatorward boundary of the diffuse aurora and auroral substorms as seen by the ISIS-2 auroral scanning photometer, J. Geophys. Res. 80:3603.
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3. Kamide, Y., and Winningham, J.D. (1977) A statistical study of the 'instantaneous' nightside auroral oval. The equatorial boundary of electron precipitation as observed by the ISIS 1 and 2 satellites, J. Geophys. Res. 82:5573.
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6. Gussenhoven, M.D., Hardy, D.A., and Burke, W.J. (1981) DMSP/F2 electron observations of equatorward auroral boundaries and their relationship to magnetospheric electric fields, J. Geophys. Res. 86:768.
7. Hardy, D.A., Burke, W.J., Gussenhoven, M.S., Heinemann, N., and Holeman, E. (1981) DMSP/F2 electron observations of equatorward auroral boundaries and their relationship to the solar wind velocity and the north-south component of the interplanetary magnetic field, J. Geophys. Res. 86:9961.
8. Hardy, D.A., and Holeman, E. (1983) The Global Auroral Boundary Code for the Global Weather Central of the Air Weather Service (to be published).
9. Hardy, D.A. and MacKean, R. (1980) An Algorithm for Determining the Boundary of Auroral Precipitation Using Data from the SSJ/3 Sensor, AFGL-TR-80-0028, AD A084482.
10. Hardy, D.A., Gussenhoven, M.S., and Huber, A. (1979) The Precipitating Electron Detectors (SSJ/3) for the Block 5D/Flights 2-5 DMSP Satellites: Calibration and Data Presentation, AFGL-TR-79-0210, AD A083136.

Appendix A

Auroral Boundary Index

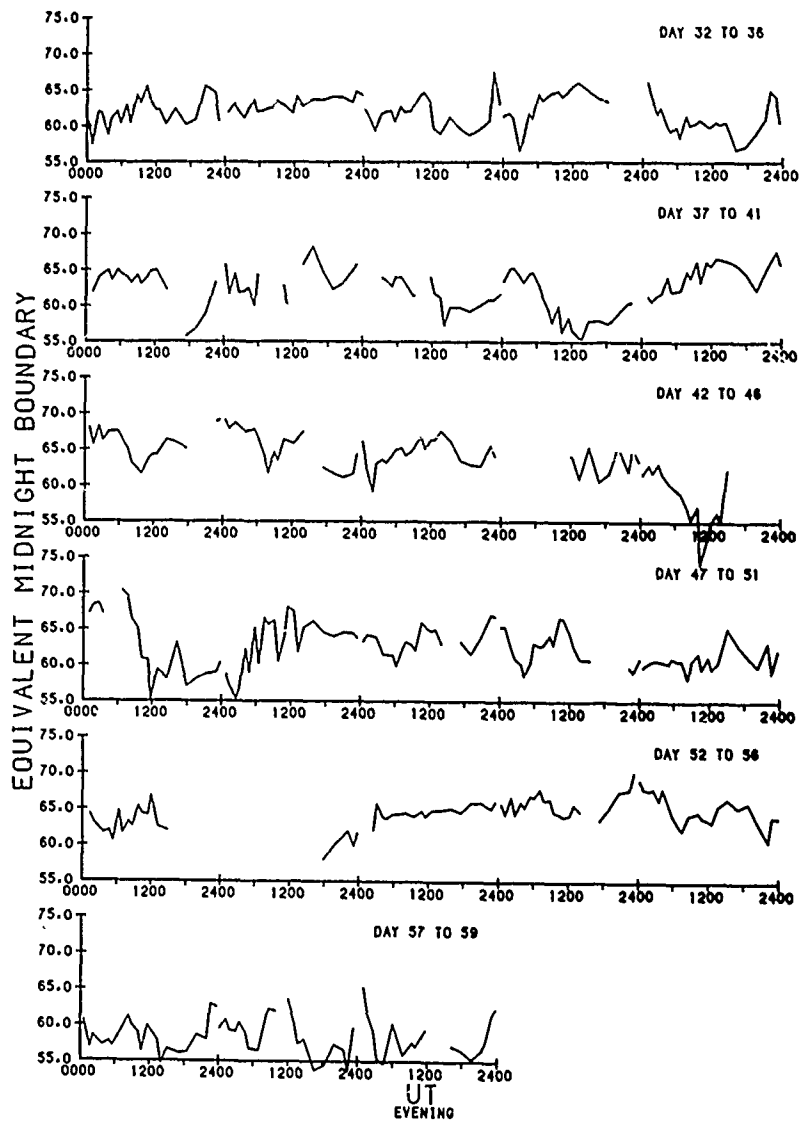
Each value of the Auroral Boundary Index is a projected midnight equatorward auroral boundary found using an actual evening sector boundary and the statistically determined systematic local time variation of the auroral oval. The Index is presented in the following pages as a function of universal time, by month, for 1978.

1978
JANUARY

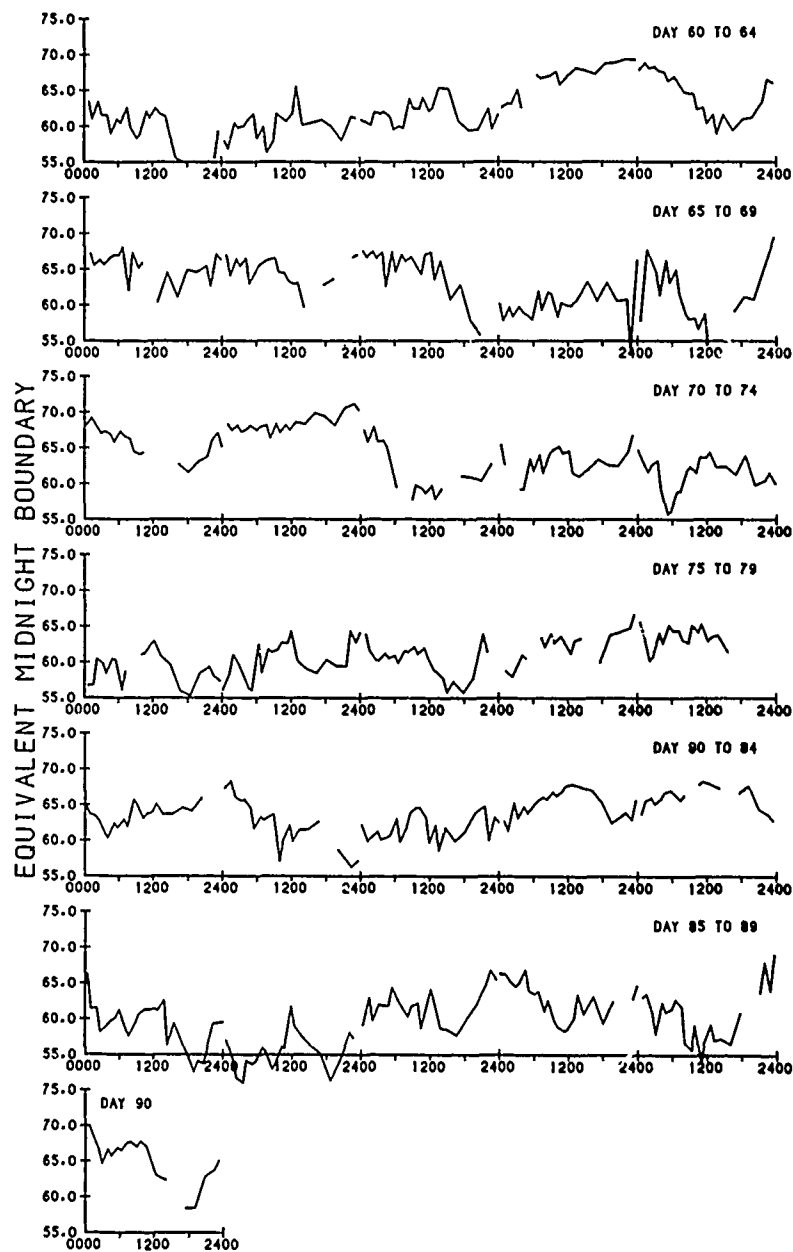


UT
EVENING

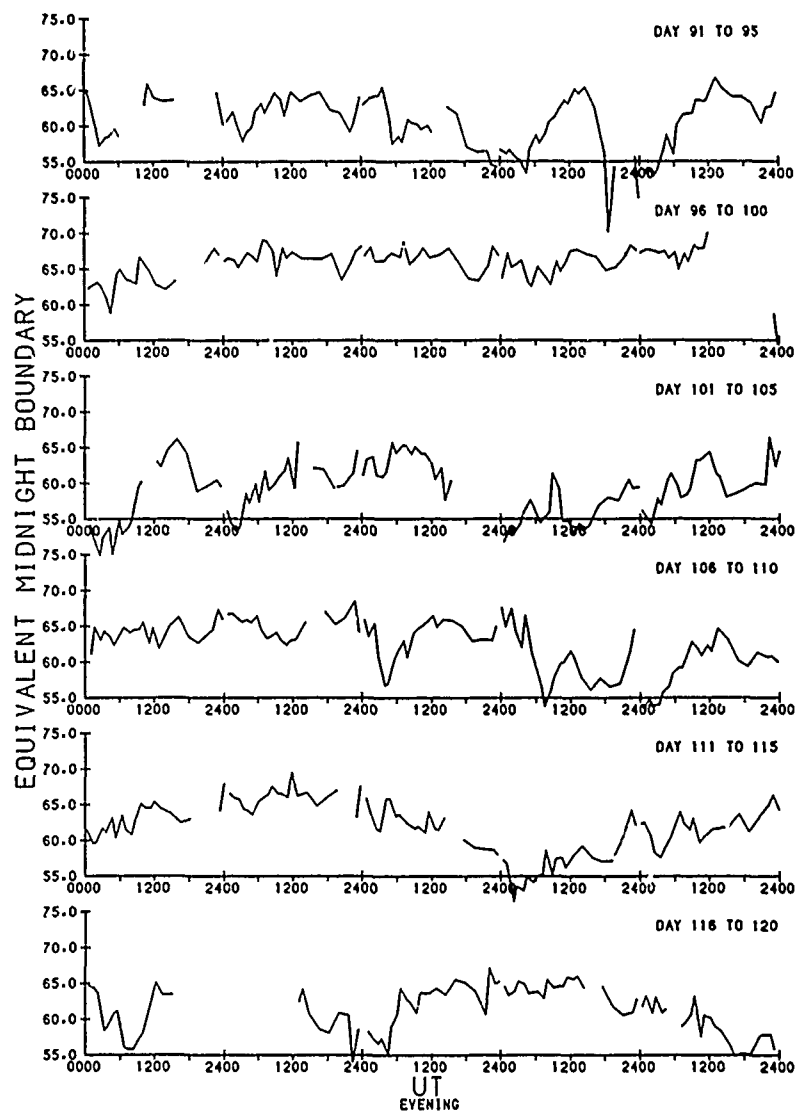
1978
FEBRUARY



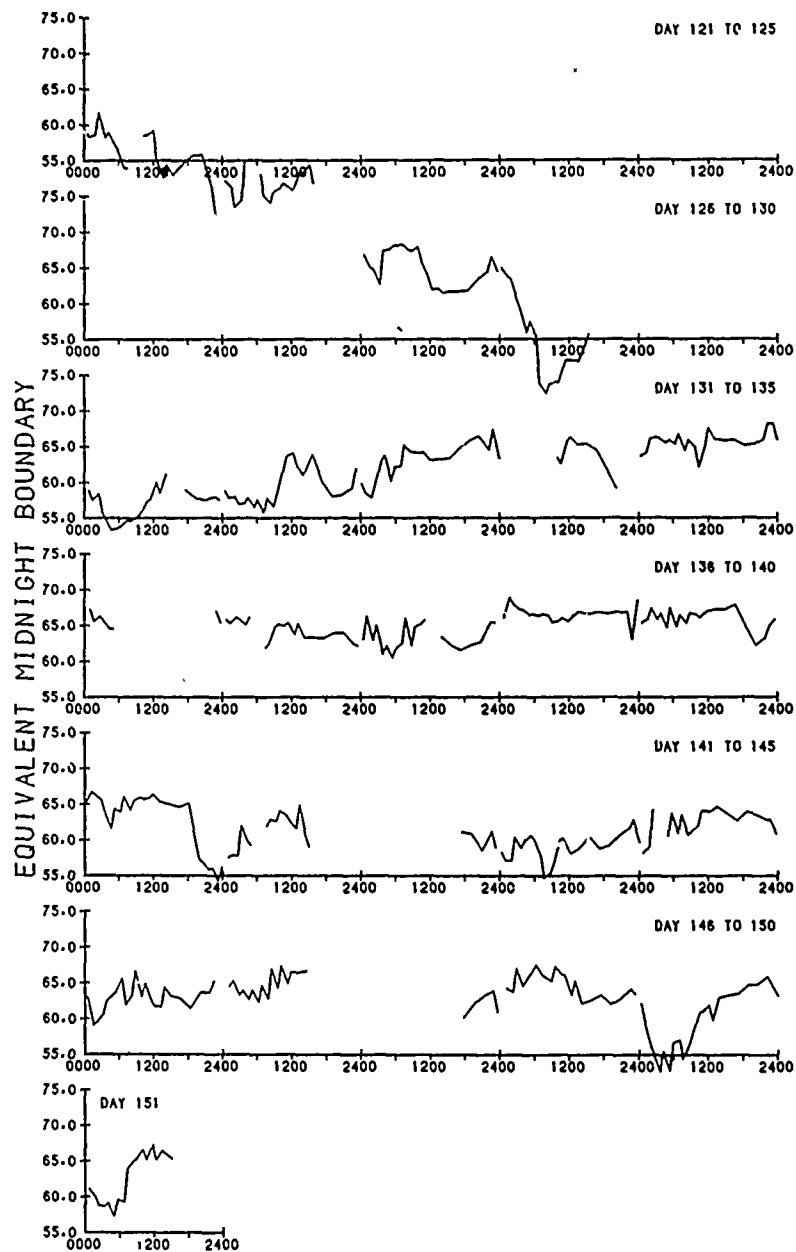
1978
MARCH



1978
APRIL

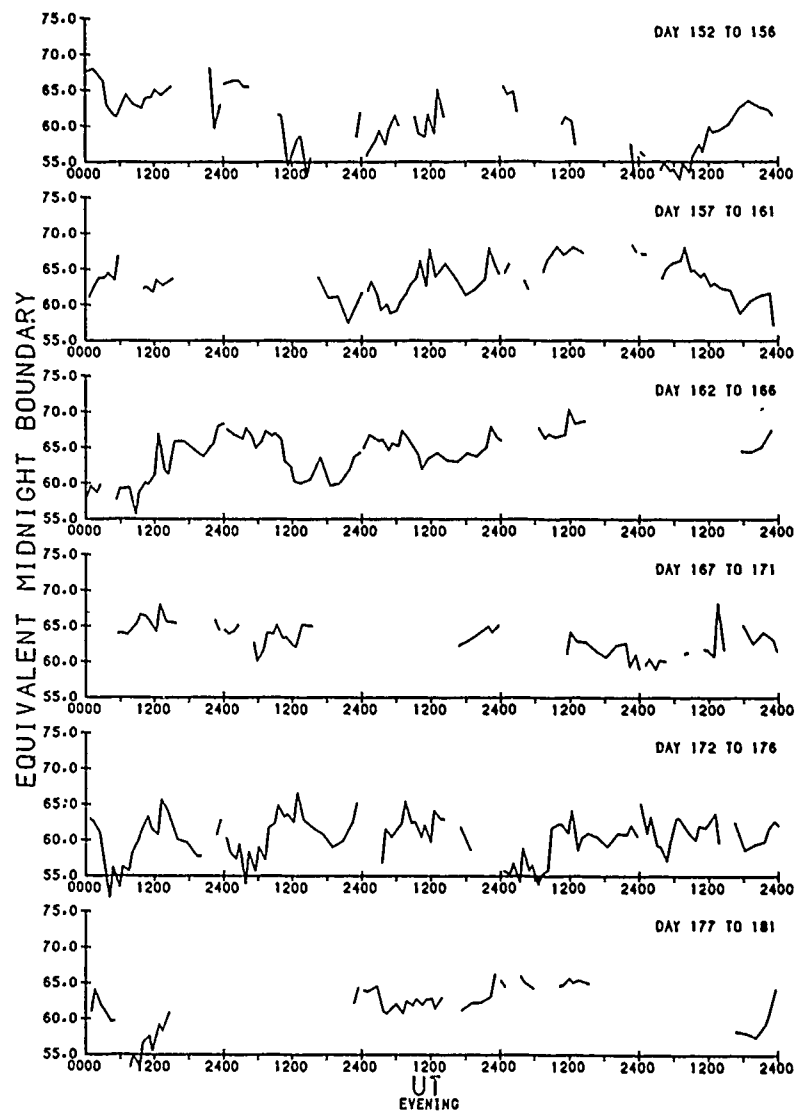


1978
MAY

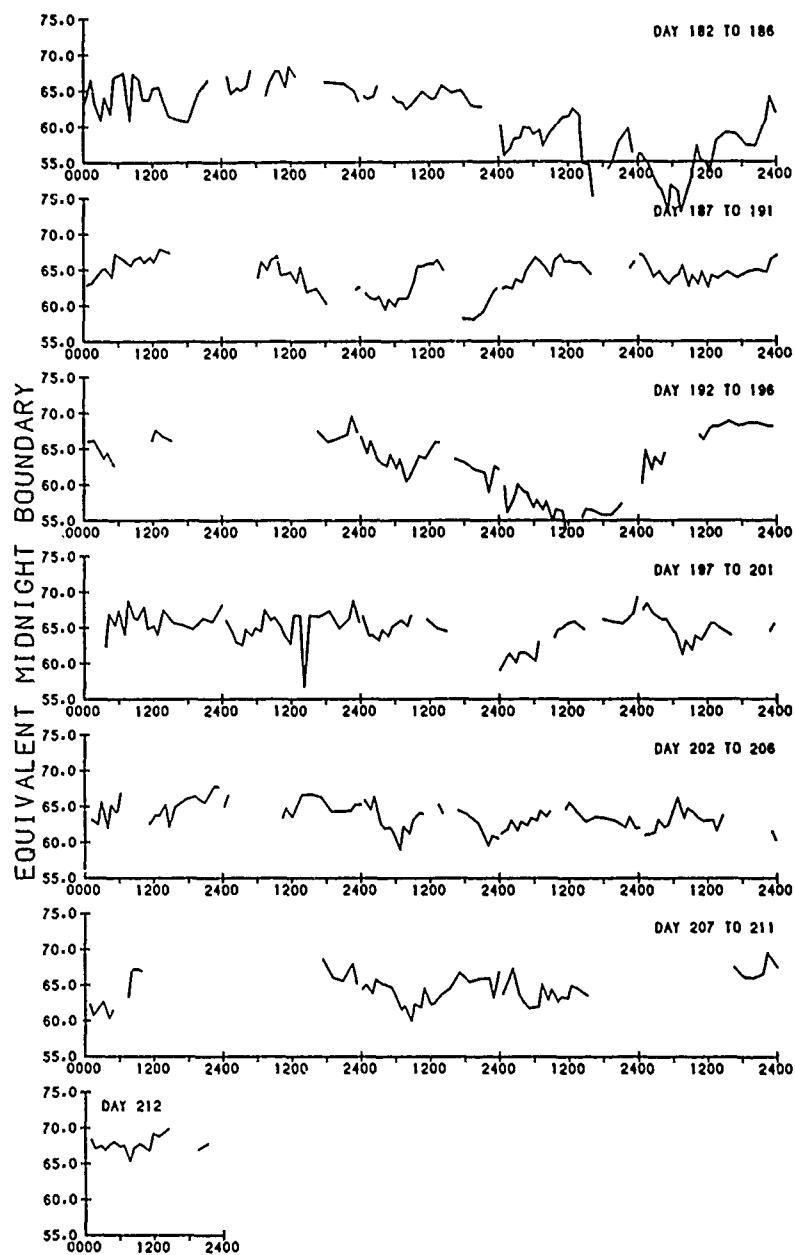


UT
EVENING

1978
JUNE

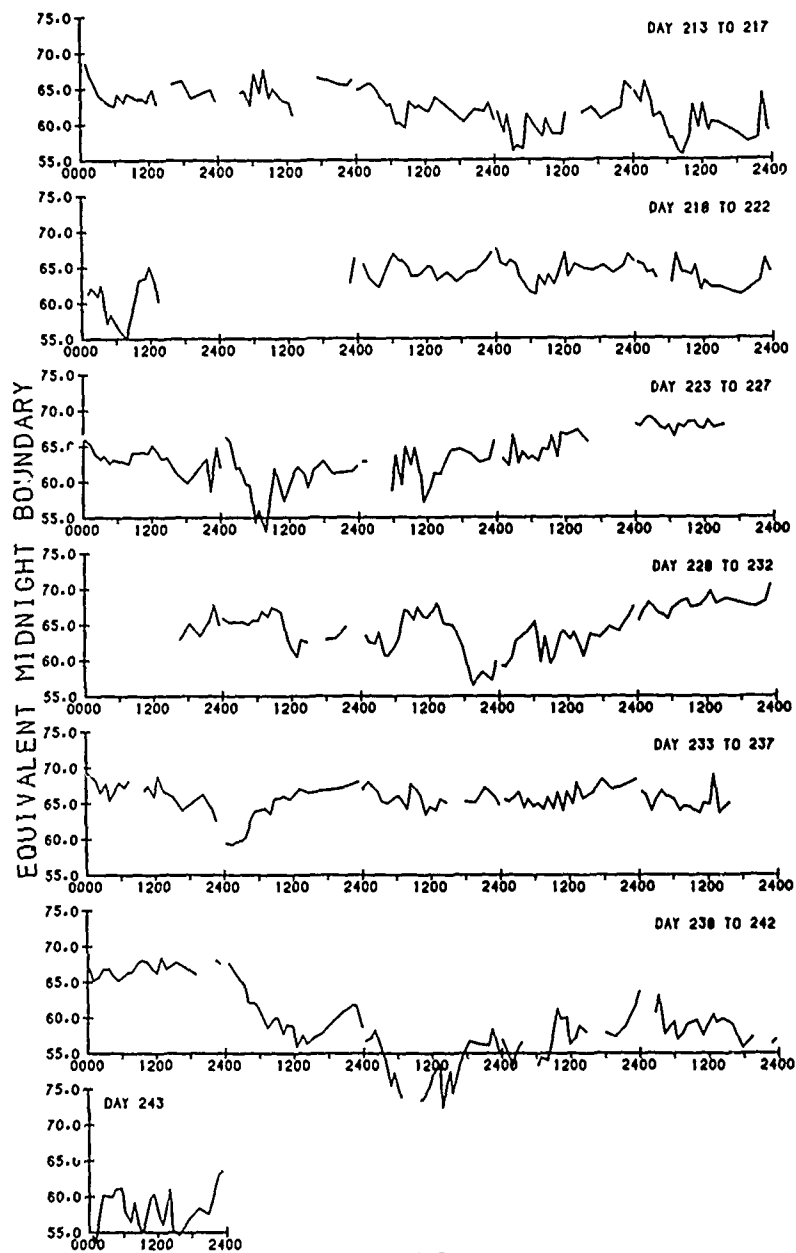


1978
JULY



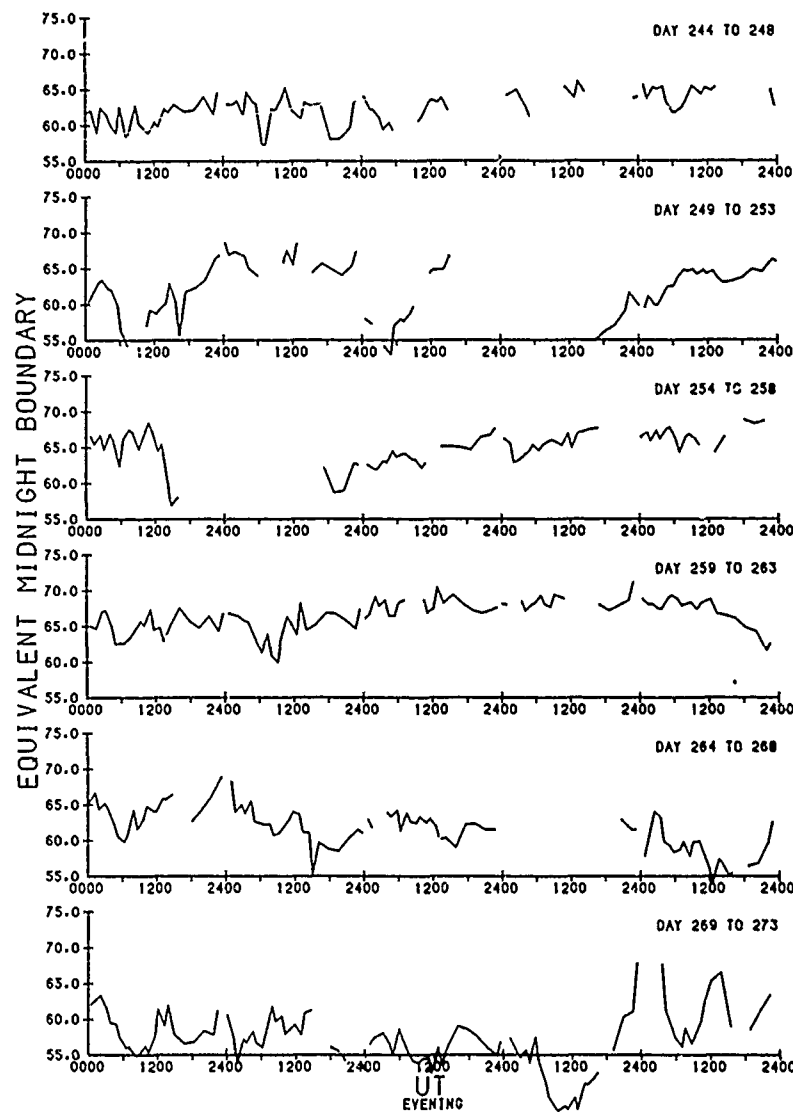
UT
EVENING

1978
AUGUST

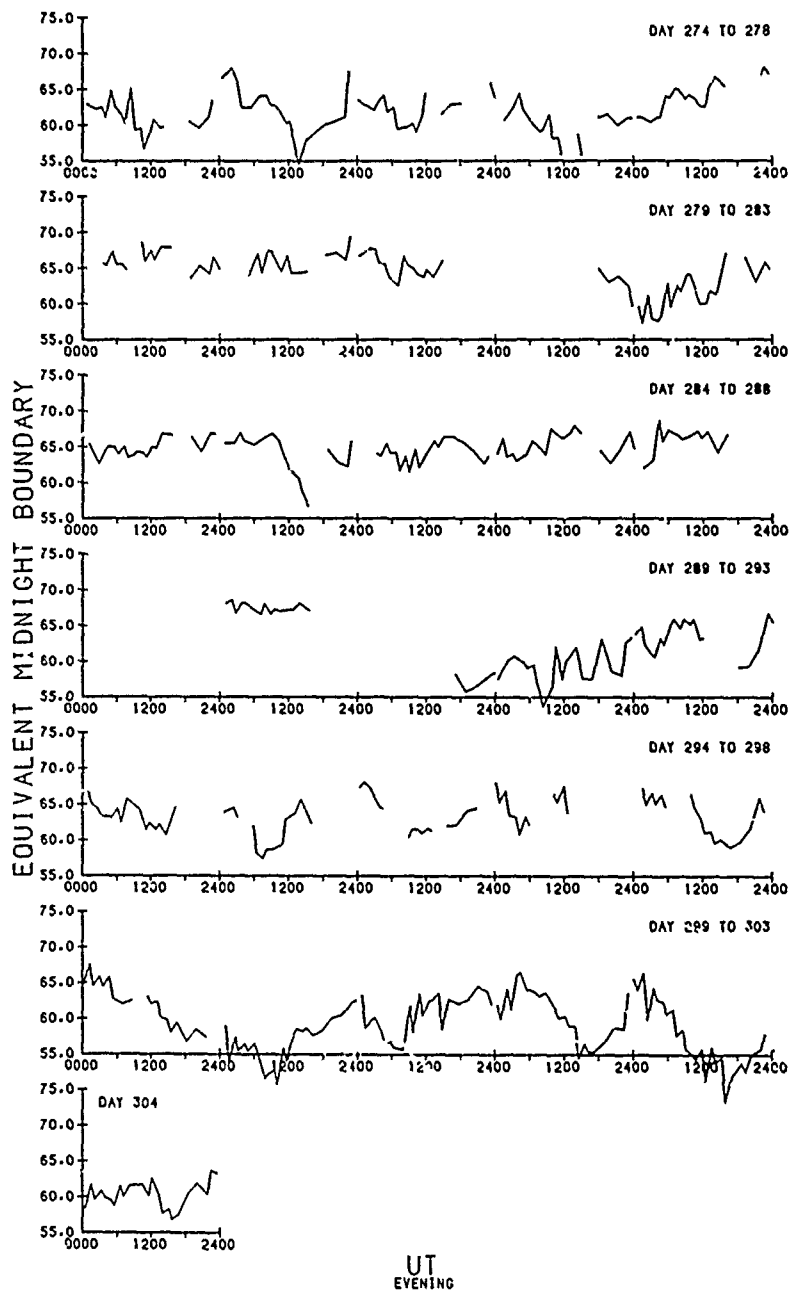


UT
EVENING

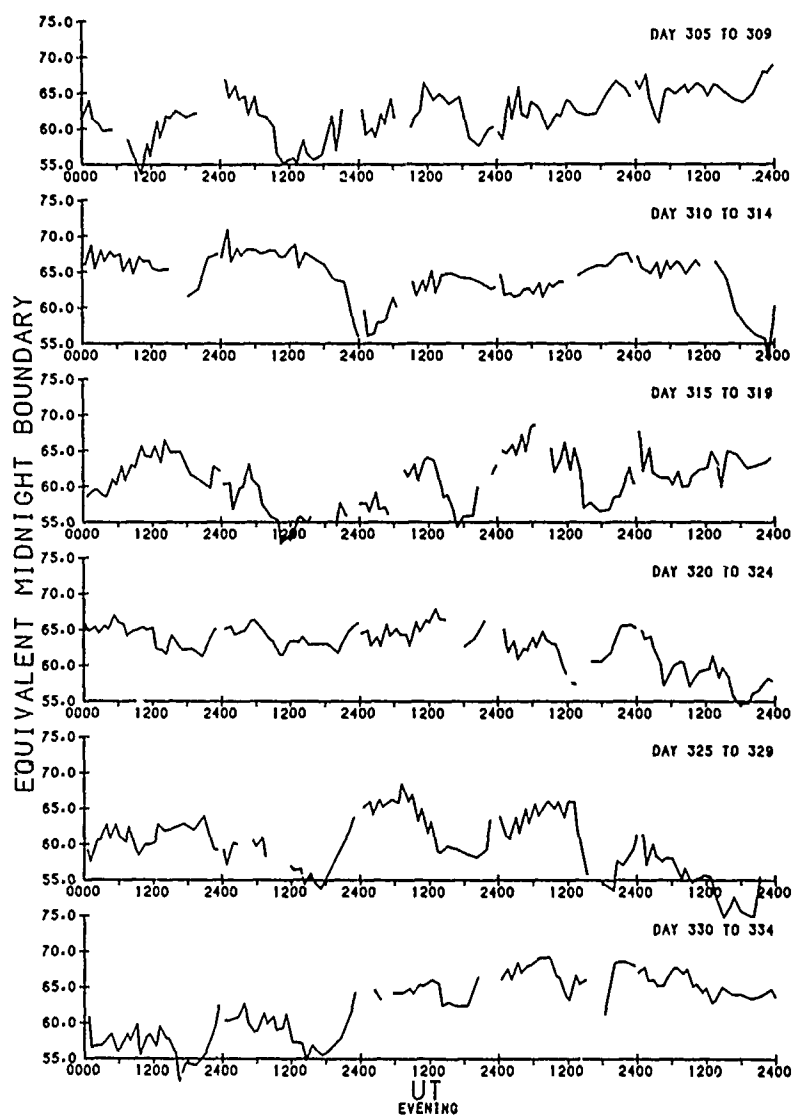
1978
SEPTEMBER



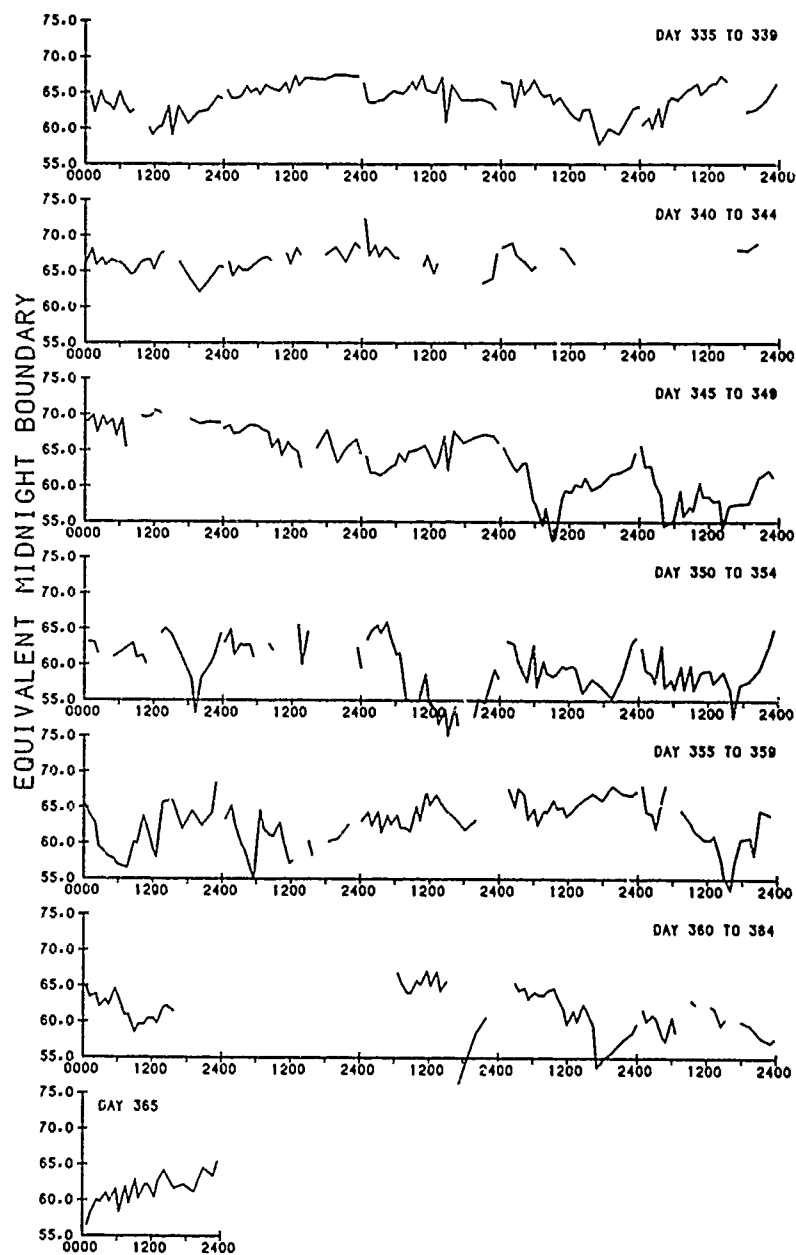
1978
OCTOBER



1978
NOVEMBER



1978
DECEMBER



UT
EVENING

Appendix B

1978 Auroral Boundary Listing

The following computer listing contains equatorward auroral boundary measurements made by hand and computer from DMSP/F2 precipitating electron particle data for the entire year of 1978. There are two sets of vertical columns on a page. A single set reads from left to right.

YR	= 1978
DA	= Julian Day
HDDK/HR, MN, SEC	= Exact universal time at which the hand-chosen boundary was measured.
PO	= Pole
HDDK/LT*	= Exact magnetic local time in hours at which the hand-chosen boundary was measured.
HDDK/LAT*	= Exact corrected geomagnetic latitude at which the hand-chosen boundary was measured.
CDDK/LT*	= Exact magnetic local time in hours at which the computer-chosen boundary was measured.
CDDK/LAT*	= Exact corrected geomagnetic latitude at which the computer-chosen boundary was measured.
DLAT*	= Computer-chosen boundary minus hand-chosen boundary.

MIDNIGHT/LATH* = Projection of the hand-chosen boundary (HDDK/LAT) measured in the given MLT (HDDK/LT) to the corrected geomagnetic latitude at which the boundary would occur in the midnight (23-24) magnetic local time bin, calculated as described in Section 5 of the preceding paper.

MIDNIGHT/LATC* = Same as MIDNIGHT/LATH except using CDDK/LAT and CDDK/LT.

*To read values in these columns correctly, multiply by 10^{-1} .

YR	DA	HDDK	HR	MIN	SEC	PO	HDJX	CDJX	DLAT	MIDNIGHT	LA, LATC	YR	DA	HDDK	HR	MIN	SEC	PO	HDJX	CDJX	DLAT	MIDNIGHT	LA, LATC
78	6	6	0	42	2	N	50	620	5	612	630	78	7	7	0	15	49	S	191	684	30	655	683
78	6	6	0	57	57	N	200	590	1	612	670	78	7	7	0	15	49	S	200	590	29	655	684
78	6	6	1	35	39	S	188	650	13	616	636	78	7	7	6	32	12	S	66	690	-16	687	675
78	6	6	1	51	30	S	65	608	10	597	618	78	7	7	7	11	59	S	76	711	-44	702	663
78	6	6	2	24	0	N	56	626	-5	628	633	78	7	7	7	23	30	S	196	679	7	650	658
78	6	6	2	41	16	N	187	623	-2	571	586	78	7	7	7	58	49	S	196	648	197	651	654
78	6	6	3	14	15	S	191	607	-1	564	587	78	7	7	8	12	7	S	72	597	-3	687	592
78	6	6	3	33	38	S	34	557	23	542	577	78	7	7	8	4	49	N	201	675	15	641	556
78	6	6	4	3	0	N	63	553	15	543	574	78	7	7	9	0	19	S	189	676	7	635	646
78	6	6	4	21	25	N	187	625	2	575	594	78	7	7	9	34	5	S	80	632	11	633	655
78	6	6	4	54	15	S	197	606	7	567	594	78	7	7	10	31	41	N	72	678	-7	666	667
78	6	6	5	11	30	S	65	625	-30	616	636	78	7	7	10	45	50	S	206	665	8	647	655
78	6	6	5	44	35	S	71	577	52	537	622	78	7	7	11	22	18	S	179	637	177	701	640
78	6	6	6	0	59	N	192	645	-2	611	620	78	7	7	11	34	41	S	91	657	15	631	660
78	6	6	6	34	39	S	199	619	3	582	602	78	7	7	12	11	58	S	64	646	-2	639	647
78	6	6	6	51	36	S	64	622	-2	613	623	78	7	7	12	27	55	N	209	651	2	631	636
78	6	6	7	26	45	N	196	670	3	619	632	78	7	7	13	5	29	S	165	689	163	597	8
78	6	6	7	40	43	N	195	655	-17	640	629	78	7	7	13	54	54	N	104	673	115	719	8
78	6	6	8	15	40	S	195	645	10	611	631	78	7	7	14	8	52	N	212	671	53	643	837
78	6	6	8	31	39	S	73	622	17	605	631	78	7	7	14	8	52	N	209	627	209	642	661
78	6	6	9	22	0	N	201	655	-3	635	636	78	7	7	15	52	21	N	44	652	10	605	626
78	6	6	9	56	42	S	189	651	25	605	639	78	7	7	17	21	58	N	50	601	-51	643	605
78	6	6	10	10	58	S	82	655	9	636	656	78	7	7	17	33	9	S	214	654	-19	642	624
78	6	6	10	47	59	S	71	657	6	643	662	78	7	7	18	24	43	S	107	644	88	648	609
78	6	6	11	2	44	N	207	657	-4	654	649	78	7	7	19	4	59	N	44	673	-5	672	633
78	6	6	11	39	0	S	178	670	-23	613	611	78	7	7	19	14	48	N	217	666	13	656	666
78	6	6	12	44	29	S	92	649	18	622	653	78	7	7	20	46	11	N	50	660	-14	658	652
78	6	6	13	22	2	S	211	666	6	655	659	78	7	7	20	57	43	N	217	662	8	651	657
78	6	6	14	12	0	N	167	668	6	633	633	78	7	7	21	52	22	S	88	648	219	670	638
78	6	6	14	26	1	N	52	635	-4	632	637	78	7	7	22	26	10	N	57	617	-6	610	615
78	6	6	16	9	1	N	207	621	51	598	659	78	7	7	22	41	17	N	213	657	6	646	650
78	6	6	17	38	31	N	210	641	30	629	658	78	7	7	23	21	50	S	177	684	22	635	660
78	6	6	17	50	40	N	213	645	-14	614	630	78	7	7	23	36	20	S	76	594	5	574	590
78	6	6	19	18	59	N	54	589	7	612	620	78	8	8	0	6	30	S	58	584	1	574	583
78	6	6	19	34	58	N	209	586	0	560	575	78	8	8	1	18	54	S	202	660	202	660	0
78	6	6	21	1	59	N	55	621	9	615	626	78	8	8	1	18	54	S	186	651	2	605	617
78	6	6	21	15	42	N	215	647	-6	635	630	78	8	8	1	48	17	N	67	558	62	543	620
78	6	6	21	58	1	S	168	683	-1	625	623	78	8	8	2	6	57	N	57	590	4	581	597
78	6	6	22	9	0	S	88	670	-24	653	636	78	8	8	2	41	14	S	189	636	5	588	606
78	6	6	22	43	1	N	58	610	16	603	631	78	8	8	3	0	9	S	190	631	5	593	614
78	6	6	22	58	59	N	211	652	4	540	644	78	8	8	3	46	0	S	63	543	68	527	511
78	7	7	0	41	12	N	201	677	7	659	664	78	8	8	3	46	0	N	186	583	-17	643	629
78	7	7	1	19	14	S	187	677	13	636	652	78	8	8	4	37	9	S	197	655	3	623	634
78	7	7	1	32	47	S	66	665	-39	661	617	78	8	8	5	12	56	N	63	641	-5	633	638
78	7	7	2	8	12	N	54	672	-30	670	648	78	8	8	5	26	0	S	69	659	-11	653	651
78	7	7	2	22	2	N	190	700	3	671	671	78	8	8	6	2	3	N	190	687	-1	659	658
78	7	7	2	59	7	S	192	664	22	633	658	78	8	8	6	16	47	S	200	658	8	639	648
78	7	7	3	17	46	S	59	678	-45	678	627	78	8	8	6	53	18	N	75	679	-12	643	640
78	7	7	3	49	24	N	61	671	-35	666	627	78	8	8	7	43	24	N	195	670	24	635	669
78	7	7	4	3	39	N	186	669	13	611	632	78	8	8	7	43	0	S	71	678	9	640	649
78	7	7	4	38	43	S	198	651	46	618	676	78	8	8	7	55	54	S	198	668	-21	664	650
78	7	7	4	54	0	S	63	642	-36	634	665	78	8	8	8	47	45	N	200	661	9	664	651
78	7	7	5	30	50	N	70	678	70	642	636	78	8	8	9	22	55	S	191	664	11	633	649

YR	DA	HR	MIN	SEC	PO	HDOK	LT	LAT	CDJK	DLAT	MIDNIGHT LATH, LATC	YR	DA	HR	MIN	SEC	PO	HDOK	LT	LAT	CDJK	DLAT	MIDNIGHT LATH, LATC
78	8	9	36	45	S	79	663	79	664	1	650	78	9	21	49	48	N	61	553	58	599	46	537
78	8	10	28	29	S	205	673	205	681	8	655	78	9	22	9	18	N	208	578	209	593	15	551
78	8	11	4	19	S	182	683	180	690	27	620	78	9	22	45	29	S	77	538	178	610	-1	520
78	8	11	16	32	S	92	690	92	695	5	620	78	9	23	3	29	S	59	584	77	542	6	514
78	8	11	55	29	N	64	688	65	665	-3	653	78	9	23	31	48	N	203	619	59	584	13	560
78	8	12	10	48	N	208	650	209	654	4	630	78	9	23	31	16	N	59	571	202	604	-15	596
78	8	12	47	17	S	170	673	168	687	14	618	78	10	0	26	47	S	70	563	184	627	2	545
78	8	13	37	0	N	56	634	56	634	0	629	78	10	0	44	34	S	70	563	184	627	2	545
78	8	13	52	0	N	211	665	211	667	2	655	78	10	1	14	19	N	57	599	57	599	0	591
78	8	17	2	44	N	49	602	49	603	1	573	78	10	1	33	21	N	192	621	192	623	2	584
78	8	17	17	48	N	208	602	210	628	26	577	78	10	2	6	45	S	188	609	188	609	0	555
78	8	18	47	8	N	45	656	48	638	-18	659	78	10	2	24	59	S	63	583	63	583	13	570
78	8	18	57	25	N	218	659	218	672	3	659	78	10	2	55	0	N	58	573	58	598	25	562
78	8	19	49	48	S	107	679	107	679	661	661	78	10	3	14	29	N	186	603	186	599	-4	548
78	8	20	29	33	N	47	673	50	655	-18	672	78	10	3	47	42	S	194	636	192	589	-47	601
78	8	20	40	29	N	217	657	218	664	7	646	78	10	4	4	28	S	63	609	63	607	-2	598
78	8	20	10	20	N	53	653	55	635	-18	650	78	10	4	36	15	N	65	570	65	613	43	556
78	8	22	23	50	N	214	657	214	662	5	646	78	10	4	53	44	N	188	634	188	650	16	585
78	8	23	4	20	S	177	668	175	680	12	610	78	10	5	27	45	S	199	639	199	638	-1	604
78	8	23	17	51	S	79	638	75	638	0	623	78	10	5	44	19	S	67	616	67	616	0	606
78	8	23	50	30	N	57	616	57	612	-4	609	78	10	6	17	34	N	73	587	73	618	31	567
78	9	0	6	20	N	184	684	206	683	0	645	78	10	6	33	37	N	193	645	193	645	0	611
78	9	1	0	58	S	69	597	69	609	22	574	78	10	7	7	29	S	198	628	198	628	-2	592
78	9	1	33	38	N	54	662	56	624	-38	660	78	10	7	23	58	S	70	625	70	643	18	609
78	9	1	48	28	N	192	682	192	682	0	655	78	10	8	0	0	N	78	656	76	646	-10	640
78	9	2	25	40	S	190	676	191	680	4	646	78	10	8	14	29	N	198	635	198	643	8	600
78	9	2	41	0	S	62	613	62	639	26	603	78	10	8	47	41	S	193	619	193	618	-1	582
78	9	3	14	46	N	58	655	58	646	-9	653	78	10	9	3	27	N	202	610	202	612	13	629
78	9	3	29	14	N	186	677	186	684	7	636	78	10	9	56	19	N	202	610	202	612	2	586
78	9	4	5	14	S	196	659	195	657	-2	627	78	10	10	29	1	S	187	629	187	633	4	579
78	9	4	21	0	S	63	620	63	624	4	610	78	10	10	43	58	S	85	647	86	673	26	627
78	9	4	56	21	N	67	629	67	632	-41	668	78	10	11	35	58	N	208	665	207	637	-28	646
78	9	5	9	31	N	189	673	189	683	10	632	78	10	13	17	15	N	212	675	211	669	-6	666
78	9	5	45	10	S	200	658	200	667	9	639	78	10	14	5	58	S	105	650	105	650	0	606
78	9	6	0	15	S	66	641	66	639	-2	633	78	10	14	45	2	N	209	642	209	642	2	621
78	9	6	36	31	N	74	655	74	636	-19	641	78	10	15	0	19	N	208	609	208	611	2	585
78	9	6	50	18	N	194	654	194	654	0	631	78	10	16	43	13	N	208	609	208	611	2	585
78	9	7	24	41	S	198	638	198	638	0	603	78	10	18	10	1	N	52	590	50	600	20	570
78	9	10	11	39	N	204	666	203	627	-39	647	78	10	18	25	19	N	209	604	210	612	8	579
78	9	10	47	40	S	182	681	184	660	-21	641	78	10	19	53	40	N	51	629	52	620	-9	625
78	9	11	0	19	S	87	666	88	668	2	648	78	10	20	6	30	N	214	638	214	640	2	625
78	9	11	52	58	N	209	659	209	665	-4	651	78	10	21	24	31	N	57	608	57	608	1	601
78	9	12	29	29	S	98	663	170	688	25	602	78	10	21	50	0	N	212	628	212	626	-2	613
78	9	12	41	18	S	98	663	97	655	-8	639	78	10	22	31	57	S	83	655	82	628	-4	681
78	9	13	20	19	N	56	655	58	634	-21	653	78	10	22	42	48	S	83	655	82	628	-4	681
78	9	13	34	58	N	211	662	211	665	3	651	78	10	23	15	18	N	59	590	57	619	27	591
78	9	15	17	40	N	209	637	209	639	2	616	78	10	23	32	13	N	208	662	208	662	0	643
78	9	16	45	21	N	49	602	49	601	-1	573	78	11	0	11	40	S	182	686	182	695	8	649
78	9	16	59	59	N	209	621	210	635	14	598	78	11	0	24	4	S	73	680	73	649	-31	668
78	9	18	28	19	N	208	592	209	598	6	566	78	11	1	0	1	N	53	679	55	634	-45	679
78	9	18	42	59	N	208	592	209	598	6	566	78	11	1	32	31	N	199	702	197	687	-15	676
78	9	20	8	44	N	57	564	55	599	33	552	78	11	1	52	1	S	188	683	188	682	-21	643
78	9	20	25	19	N	211	598	211	606	8	580	78	11	2	5	23	S	63	668	63	642	-26	663
78	9	20	25	19	N	211	598	211	606	8	580	78	11	2	40	58	N	56	667	56	653	-14	666

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YR		DA	HR	MIN	SEC	PO	HDDK	LT	LAT	CDCK	DLAT	LATH, LATH	MIDNIGHT	DLAT	LATH, LATH	MIDNIGHT		
78	13	17	20	0	0	N	46	630	45	630	-4	615	620	188	713	2	679	676
78	13	17	32	12	12	N	212	645	214	658	12	633	646	202	696	2	679	676
78	13	21	10	59	59	N	210	632	211	644	12	618	632	74	667	-27	683	663
78	13	22	40	12	12	N	178	672	175	673	1	616	620	193	720	4	696	692
78	13	23	34	50	50	S	76	680	77	626	26	592	619	199	706	1	679	675
78	14	0	5	46	0	N	58	599	57	610	11	591	614	76	687	-15	692	685
78	14	0	23	0	0	N	203	667	202	663	-4	646	645	198	707	5	676	677
78	14	1	0	47	0	S	185	670	185	670	32	628	664	198	707	5	676	677
78	14	1	15	0	0	S	68	647	68	637	-10	640	639	198	707	5	676	677
78	14	1	49	49	0	N	54	671	54	659	-12	670	665	191	705	7	666	682
78	14	2	3	59	0	N	192	691	192	690	-1	663	662	77	678	7	666	682
78	14	2	41	0	0	S	191	685	192	689	24	634	661	77	678	7	666	682
78	14	2	56	0	0	S	61	634	61	659	25	636	661	204	697	-1	682	675
78	14	3	31	13	13	N	59	675	59	670	-5	675	677	180	712	4	673	673
78	14	3	44	23	23	N	186	695	186	695	-1	659	660	91	709	20	674	710
78	14	4	21	24	24	S	197	676	198	688	12	646	660	66	663	-1	648	648
78	14	4	35	30	30	S	62	652	62	650	-2	645	653	208	665	-1	648	648
78	14	5	12	1	1	N	68	670	68	668	-2	665	673	163	722	12	668	680
78	14	5	24	23	23	N	199	702	199	702	0	666	664	98	667	-17	662	653
78	14	6	1	12	12	S	200	672	201	677	5	654	658	57	637	1	632	642
78	14	6	14	55	55	S	66	665	65	662	-30	659	666	212	679	0	670	665
78	14	7	5	34	34	N	75	689	75	659	5	641	650	213	679	11	665	671
78	14	7	40	50	50	S	194	671	194	676	5	641	650	42	662	-7	657	652
78	14	7	55	59	59	S	197	685	197	659	4	623	634	218	688	19	659	674
78	14	8	45	10	10	N	71	638	71	644	6	623	638	44	653	-7	668	663
78	14	9	21	45	45	S	199	674	199	679	-4	642	644	221	691	-7	700	685
78	14	9	36	15	15	S	190	666	190	670	13	635	652	46	676	3	672	679
78	14	10	12	54	54	S	78	640	78	654	14	625	649	233	696	-2	700	690
78	14	10	26	58	58	N	205	682	205	683	1	655	654	47	692	7	689	700
78	14	11	3	51	51	S	180	689	179	697	8	651	649	222	707	2	711	704
78	14	11	16	38	38	S	89	648	88	656	8	628	647	172	699	-37	710	651
78	14	11	54	12	12	N	64	668	65	659	-9	663	662	85	692	11	665	688
78	14	12	9	22	22	N	210	632	210	635	3	673	671	214	719	-2	717	703
78	14	12	27	35	35	S	163	710	162	714	4	658	669	182	725	3	690	686
78	14	12	56	57	57	S	100	665	101	671	5	655	649	72	694	11	671	692
78	14	13	37	16	16	N	52	677	54	660	-17	677	666	53	679	27	649	685
78	14	13	49	35	35	N	214	692	214	691	-1	655	677	196	695	-15	685	666
78	14	17	3	59	59	N	41	668	41	673	5	665	675	190	683	-28	686	656
78	14	17	13	37	37	N	217	682	218	683	1	674	669	62	680	-11	688	686
78	14	22	21	58	58	N	215	671	215	671	0	661	658	55	711	15	698	720
78	14	23	4	48	48	S	172	722	172	720	-2	656	677	188	720	-1	698	680
78	14	23	15	42	42	S	81	666	82	663	17	648	678	197	709	5	678	679
78	14	23	50	6	6	N	55	640	55	639	-1	636	644	57	710	11	701	719
78	14	0	4	13	13	N	209	703	209	702	-1	668	680	65	692	-23	714	699
78	15	0	45	2	2	S	184	711	184	711	-1	668	673	188	713	-2	682	674
78	15	1	46	14	14	N	195	712	195	712	-1	667	683	201	691	18	655	670
78	15	2	25	14	14	S	191	703	191	702	-1	677	673	62	706	-13	704	700
78	15	2	37	36	36	S	60	681	61	670	-11	677	675	73	727	-29	719	696
78	15	3	13	36	36	N	58	658	58	670	12	656	677	192	696	0	669	660
78	15	3	27	10	10	N	187	706	187	710	4	671	672	199	677	11	647	660
78	15	4	3	1	1	S	197	682	197	686	4	664	667	68	696	-2	693	701
78	15	4	18	9	9	S	60	665	59	684	19	659	691	197	701	5	675	676
78	15	4	55	30	30	N	67	687	66	676	-11	683	681	193	697	2	670	670

YR	DA	HR	MIN	SLC	HDJK	PO	LT	LAT	CDJK	DLAT	MIDNIGHT LATH, LATC	DLAT	MIDNIGHT LATH, LATC	CDJK	LT	LAT	DLAT	MIDNIGHT LATH, LATC
78	19	1	16	47	S	186	681	649	186	681	649	186	681	186	681	649	186	681
78	19	1	31	0	S	186	687	650	186	687	650	186	687	186	687	650	186	687
78	19	2	4	49	N	189	659	657	189	659	657	189	659	189	659	657	189	659
78	19	2	20	29	N	189	659	657	189	659	657	189	659	189	659	657	189	659
78	19	2	56	14	S	191	653	651	191	653	651	191	653	191	653	651	191	653
78	19	3	11	46	S	191	653	651	191	653	651	191	653	191	653	651	191	653
78	19	4	1	8	N	186	659	657	186	659	657	186	659	186	659	657	186	659
78	19	4	36	36	S	186	659	657	186	659	657	186	659	186	659	657	186	659
78	19	4	52	53	S	186	659	657	186	659	657	186	659	186	659	657	186	659
78	19	5	26	21	N	190	678	678	190	678	678	190	678	190	678	678	190	678
78	19	5	40	44	N	190	678	678	190	678	678	190	678	190	678	678	190	678
78	19	6	16	38	S	200	667	664	200	667	664	200	667	200	667	664	200	667
78	19	6	31	22	S	200	667	664	200	667	664	200	667	200	667	664	200	667
78	19	7	8	29	N	189	659	657	189	659	657	189	659	189	659	657	189	659
78	19	7	21	20	N	189	659	657	189	659	657	189	659	189	659	657	189	659
78	19	7	56	48	S	186	659	657	186	659	657	186	659	186	659	657	186	659
78	19	8	11	7	S	186	659	657	186	659	657	186	659	186	659	657	186	659
78	19	9	2	35	N	200	667	664	200	667	664	200	667	200	667	664	200	667
78	19	9	37	16	S	189	659	657	189	659	657	189	659	189	659	657	189	659
78	19	9	51	39	S	189	659	657	189	659	657	189	659	189	659	657	189	659
78	19	10	28	1	N	189	659	657	189	659	657	189	659	189	659	657	189	659
78	19	10	43	47	N	205	652	652	205	652	652	205	652	205	652	652	205	652
78	19	11	13	21	S	179	677	677	179	677	677	179	677	179	677	677	179	677
78	19	11	32	47	S	186	659	657	186	659	657	186	659	186	659	657	186	659
78	19	12	25	15	N	209	655	655	209	655	655	209	655	209	655	655	209	655
78	19	12	25	15	N	209	655	655	209	655	655	209	655	209	655	655	209	655
78	19	13	13	33	S	189	659	657	189	659	657	189	659	189	659	657	189	659
78	19	13	51	34	N	189	659	657	189	659	657	189	659	189	659	657	189	659
78	19	14	7	7	N	210	653	653	210	653	653	210	653	210	653	653	210	653
78	19	15	49	16	N	210	653	653	210	653	653	210	653	210	653	653	210	653
78	19	17	18	7	N	210	653	653	210	653	653	210	653	210	653	653	210	653
78	19	17	31	8	N	211	640	640	211	640	640	211	640	211	640	640	211	640
78	19	19	1	59	N	211	640	640	211	640	640	211	640	211	640	640	211	640
78	19	19	12	15	N	217	666	666	217	666	666	217	666	217	666	666	217	666
78	19	20	43	45	N	218	668	668	218	668	668	218	668	218	668	668	218	668
78	19	20	54	51	N	218	668	668	218	668	668	218	668	218	668	668	218	668
78	19	21	49	31	S	189	659	657	189	659	657	189	659	189	659	657	189	659
78	19	22	23	2	N	189	659	657	189	659	657	189	659	189	659	657	189	659
78	19	22	38	27	N	213	663	663	213	663	663	213	663	213	663	663	213	663
78	19	23	19	59	S	175	708	708	175	708	708	175	708	175	708	708	175	708
78	19	23	32	59	S	175	708	708	175	708	708	175	708	175	708	708	175	708
78	20	0	5	47	N	205	685	685	205	685	685	205	685	205	685	685	205	685
78	20	0	21	2	N	205	685	685	205	685	685	205	685	205	685	685	205	685
78	20	1	12	43	S	186	659	657	186	659	657	186	659	186	659	657	186	659
78	20	2	2	32	N	186	659	657	186	659	657	186	659	186	659	657	186	659
78	20	2	40	44	S	192	699	699	192	699	699	192	699	192	699	699	192	699
78	20	3	53	29	S	192	699	699	192	699	699	192	699	192	699	699	192	699
78	20	3	53	29	S	192	699	699	192	699	699	192	699	192	699	699	192	699
78	20	3	42	49	S	187	707	707	187	707	707	187	707	187	707	707	187	707
78	20	4	20	5	S	197	677	677	197	677	677	197	677	197	677	677	197	677
78	20	4	31	16	S	197	677	677	197	677	677	197	677	197	677	677	197	677
78	20	5	11	22	S	197	677	677	197	677	677	197	677	197	677	677	197	677
78	20	5	11	22	S	197	677	677	197	677	677	197	677	197	677	677	197	677

YR	DA	HR	MM	SEC	PO	HDDK	LT	LAT	COOK	DLAT	LATH, LATH	MIDNIGHT	DLAT	LATH, LATH	MIDNIGHT
78	21	9	15	28	S	72	713	77	702	-11	704	701	1	683	677
78	21	9	56	48	N	72	729	73	689	-40	72	687	-12	712	696
78	21	10	7	46	N	204	703	204	695	-14	694	674	3	693	689
78	21	10	45	58	S	180	712	180	716	4	676	677	2	663	661
78	21	10	55	29	S	92	730	88	661	-69	721	553	-16	715	707
78	21	11	49	23	N	210	697	210	694	-3	690	680	-14	692	684
78	21	12	39	12	S	59	676	59	676	-7	691	690	0	699	690
78	21	13	18	58	N	53	683	53	683	2	689	683	26	697	691
78	21	13	31	2	N	214	695	214	697	2	689	683	26	697	691
78	21	15	12	47	N	217	694	217	696	2	687	682	8	691	678
78	21	16	54	35	N	219	694	219	693	-1	687	679	8	707	721
78	21	18	36	38	N	221	693	221	692	-1	694	686	3	660	662
78	21	22	2	34	N	219	685	219	690	5	677	676	3	662	675
78	21	22	45	58	S	171	707	87	709	-1	697	707	-9	685	671
78	21	22	55	40	S	87	710	87	709	-5	687	688	4	680	678
78	21	23	33	25	N	51	686	51	681	0	688	681	0	675	685
78	21	23	45	47	N	210	695	210	695	2	680	677	-29	705	682
78	22	0	26	47	N	132	714	182	716	6	1	44	191	697	688
78	22	0	38	0	S	72	698	72	691	-2	688	689	-4	701	688
78	22	1	14	35	N	53	679	53	677	1	675	673	-2	689	697
78	22	1	28	12	N	197	702	197	702	6	653	668	-28	716	694
78	22	2	6	36	S	189	691	189	697	7	661	678	13	657	669
78	22	2	19	46	S	62	666	62	673	-3	669	674	8	660	667
78	22	2	55	37	N	56	670	56	667	-1	672	668	4	677	690
78	22	3	8	58	N	187	707	187	706	-5	672	665	-1	685	677
78	22	3	47	2	S	196	699	196	694	13	650	674	22	653	674
78	22	4	0	14	S	60	655	60	659	-33	705	679	22	648	684
78	22	4	37	49	N	64	707	65	674	0	672	669	67	708	716
78	22	4	49	11	N	188	707	188	707	3	670	669	4	678	677
78	22	5	26	36	S	201	687	201	690	13	667	691	17	657	671
78	22	5	39	37	S	63	672	63	685	17	668	695	20	658	696
78	22	6	17	44	N	73	680	73	697	3	658	661	3	688	684
78	22	6	29	59	N	192	686	192	689	2	651	655	1	688	682
78	22	7	6	22	S	199	680	199	682	11	686	708	17	654	668
78	22	7	18	59	S	68	689	67	700	-2	693	700	-3	654	655
78	22	7	58	48	N	76	703	76	701	0	647	650	2	649	650
78	22	8	10	48	S	197	677	197	677	-4	652	650	4	640	651
78	22	8	46	47	S	193	681	193	677	-8	668	688	1	662	660
78	22	8	59	36	S	75	680	75	672	0	652	650	4	640	651
78	22	9	37	53	N	202	675	202	676	1	657	657	-11	679	674
78	22	9	51	46	N	184	686	184	687	1	647	650	4	674	679
78	22	10	28	1	S	86	686	86	676	-10	670	670	-26	674	659
78	22	10	40	0	S	207	667	207	667	0	648	649	-5	684	685
78	22	11	33	22	S	171	695	171	697	1	654	649	1	689	683
78	22	12	10	36	S	99	690	99	689	-1	672	683	2	691	678
78	22	12	20	36	S	56	676	56	676	5	670	683	10	652	672
78	22	13	0	49	N	210	668	210	665	-3	658	652	11	669	668
78	22	13	15	0	N	57	671	57	671	-3	658	652	-1	689	681
78	22	14	56	59	N	211	662	213	677	15	670	643	187	709	671
78	22	16	27	59	N	41	671	44	648	-23	670	643	3	678	671
78	22	16	38	18	N	215	673	216	680	7	664	667	7	677	685
78	22	18	9	58	N	45	652	42	659	17	643	670	1	677	685
78	22	18	20	1	N	218	678	219	682	4	669	668	16	654	678
78	22	19	53	14	N	43	687	43	688	1	692	695	-5	676	668

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				HDDK				CDDK				MIDNIGHT				MIDNIGHT			
YR	DA	HR	MIN	SEC	PO	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT
78 41	17 49 15	N	214	664	N	214	664	68	707	24	679	715	68	707	24	679	715	68	707
78 41	17 59 47	N	214	655	N	214	655	53	702	-10	710	715	53	702	-10	710	715	53	702
78 41	19 29 48	N	51	621	N	51	621	193	697	-3	687	679	193	697	-3	687	679	193	697
78 41	19 42 44	N	214	636	N	214	636	60	697	12	694	717	60	697	12	694	717	60	697
78 41	21 11 30	N	55	622	N	55	622	60	676	-33	707	681	60	676	-33	707	681	60	676
78 41	21 24 38	N	217	662	N	217	662	188	710	1	674	672	188	710	1	674	672	188	710
78 41	22 8 49	S	161	729	S	161	729	200	698	0	683	693	200	698	0	683	693	200	698
78 41	22 19 2	S	85	642	S	85	642	61	687	8	676	695	61	687	8	676	695	61	687
78 41	22 54 29	N	53	665	N	53	665	69	688	2	678	676	69	688	2	678	676	69	688
78 41	23 7 13	N	214	685	N	214	685	190	704	1	686	684	190	704	1	686	684	190	704
78 41	23 48 20	S	173	699	S	173	699	201	684	-26	704	686	201	684	-26	704	686	201	684
78 41	24 1 5	S	76	649	S	76	649	65	680	-3	685	690	65	680	-3	685	690	65	680
78 42	0 35 30	N	55	651	N	55	651	74	695	194	672	1	74	695	194	672	1	74	695
78 42	0 50 0	N	203	696	N	203	696	194	672	2	617	628	194	672	2	617	628	194	672
78 42	1 28 47	S	188	694	S	188	694	196	650	44	631	628	196	650	44	631	628	196	650
78 42	1 42 0	S	67	661	S	67	661	70	690	-4	646	646	70	690	-4	646	646	70	690
78 42	2 17 20	N	56	662	N	56	662	198	676	6	635	645	198	676	6	635	645	198	676
78 42	2 31 10	N	191	708	N	191	708	198	676	-36	660	630	198	676	-36	660	630	198	676
78 42	3 8 58	S	194	690	S	194	690	205	685	4	664	665	205	685	4	664	665	205	685
78 42	3 22 0	S	60	673	S	60	673	178	699	551	644	644	178	699	551	644	644	178	699
78 42	3 59 42	N	61	698	N	61	698	87	553	-4	647	653	87	553	-4	647	653	87	553
78 42	4 11 35	N	187	709	N	187	709	64	654	13	658	675	64	654	13	658	675	64	654
78 42	4 49 1	S	200	691	S	200	691	209	676	7	675	676	209	676	7	675	676	209	676
78 42	5 2 58	S	64	644	S	64	644	213	683	-2	625	630	213	683	-2	625	630	213	683
78 42	5 39 59	N	70	680	N	70	680	212	631	8	610	616	212	631	8	610	616	212	631
78 42	5 51 53	N	190	701	N	190	701	51	600	5	603	619	51	600	5	603	619	51	600
78 42	6 28 40	S	200	682	S	200	682	104	670	-5	610	623	104	670	-5	610	623	104	670
78 42	6 42 37	S	67	652	S	67	652	54	651	8	611	623	54	651	8	611	623	54	651
78 42	7 19 44	N	74	652	N	74	652	214	690	-2	625	630	214	690	-2	625	630	214	690
78 42	7 32 58	N	194	679	N	194	679	45	638	11	625	637	45	638	11	625	637	45	638
78 42	8 8 21	S	195	633	S	195	633	212	649	3	617	623	212	649	3	617	623	212	649
78 42	8 22 0	S	71	672	S	71	672	51	608	3	617	623	51	608	3	617	623	51	608
78 42	9 14 29	N	199	654	N	199	654	213	634	5	603	619	213	634	5	603	619	213	634
78 42	9 49 0	S	188	660	S	188	660	104	670	8	611	623	104	670	8	611	623	104	670
78 42	10 2 57	S	79	657	S	79	657	54	610	-5	610	616	54	610	-5	610	616	54	610
78 42	10 40 23	N	71	656	N	71	656	213	626	5	617	625	213	626	5	617	625	213	626
78 42	10 55 43	N	204	654	N	204	654	211	631	14	643	656	211	631	14	643	656	211	631
78 42	11 31 30	S	177	688	S	177	688	175	703	0	572	581	175	703	0	572	581	175	703
78 42	11 42 2	S	95	705	S	95	705	77	591	-10	660	649	77	591	-10	660	649	77	591
78 42	12 21 19	N	63	614	N	63	614	206	678	23	623	651	206	678	23	623	651	206	678
78 42	12 37 1	N	209	662	N	209	662	195	689	40	630	637	195	689	40	630	637	195	689
78 42	13 23 30	S	106	665	S	106	665	191	662	20	602	634	191	662	20	602	634	191	662
78 42	14 3 34	N	54	625	N	54	625	63	612	-9	608	609	63	612	-9	608	609	63	612
78 42	14 18 18	N	212	673	N	212	673	197	663	0	636	638	197	663	0	636	638	197	663
78 42	15 49 31	N	41	680	N	41	680	197	663	6	591	607	41	680	6	591	607	41	680
78 42	16 0 15	N	213	669	N	213	669	197	663	-33	632	638	213	669	-33	632	638	213	669
78 42	17 31 1	N	45	640	N	45	640	64	608	1	642	646	64	608	1	642	646	64	608
78 42	17 42 21	N	215	662	N	215	662	197	663	0	632	638	197	663	0	632	638	197	663
78 42	22 49 18	N	217	695	N	217	695	197	663	6	591	607	217	695	6	591	607	217	695
78 42	23 31 55	S	175	719	S	175	719	197	663	1	642	646	175	719	1	642	646	175	719
78 42	23 42 15	S	81	703	S	81	703	197	663	4	628	638	197	663	4	628	638	197	663
78 43	0 20 0	N	51	694	N	51	694	197	663	1	642	646	197	663	1	642	646	197	663
78 43	0 32 20	N	207	705	N	207	705	200	668	-5	650	645	200	668	-5	650	645	200	668
78 43	1 12 20	S	186	712	S	186	712	66	636	4	628	642	66	636	4	628	642	66	636

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YR	DA	HR	MIN	SEC	PO	HDDK	LT	LAT	CDDK	DLAT	MIDNIGHT	LA-H, L, A, C	YR	DA	HR	MIN	SEC	PO	HDDK	LT	LAT	CDDK	DLAT	MIDNIGHT	LA-H, L, A, C
78	52	5	33	58	S	65	645	65	639	-6	638	641	78	52	5	33	58	S	65	645	65	639	-6	638	641
78	52	6	10	31	N	72	652	72	641	-11	638	635	78	52	6	10	31	N	72	652	72	641	-11	638	635
78	52	6	23	47	N	192	677	192	676	-1	647	650	78	52	6	23	47	N	192	677	192	676	-1	647	650
78	52	6	58	46	S	198	650	198	653	6	617	632	78	52	6	58	46	S	198	650	198	653	6	617	632
78	52	7	13	34	S	67	655	68	633	-22	649	635	78	52	7	13	34	S	67	655	68	633	-22	649	635
78	52	7	50	47	N	75	646	75	643	-3	631	637	78	52	7	50	47	N	75	646	75	643	-3	631	637
78	52	8	4	39	N	196	664	196	670	5	633	644	78	52	8	4	39	N	196	664	196	670	5	633	644
78	52	8	39	21	S	193	658	193	671	13	626	645	78	52	8	39	21	S	193	658	193	671	13	626	645
78	52	9	45	20	N	73	670	73	656	-14	637	651	78	52	9	45	20	N	73	670	73	656	-14	637	651
78	52	10	21	0	S	201	672	201	635	13	654	665	78	52	10	21	0	S	201	672	201	635	13	654	665
78	52	10	33	30	S	185	683	184	695	12	643	657	78	52	10	33	30	S	185	683	184	695	12	643	657
78	52	11	11	21	N	83	678	82	648	-30	661	638	78	52	11	11	21	N	83	678	82	648	-30	661	638
78	52	11	26	58	N	69	645	69	645	10	642	652	78	52	11	26	58	N	69	645	69	645	10	642	652
78	52	12	3	49	S	206	661	206	671	1	669	664	78	52	12	3	49	S	206	661	206	671	1	669	664
78	52	12	14	28	S	171	705	171	709	4	650	661	78	52	12	14	28	S	171	705	171	709	4	650	661
78	52	12	52	55	N	94	672	94	673	1	659	639	78	52	12	52	55	N	94	672	94	673	1	659	639
78	52	13	9	11	N	208	646	209	658	12	625	640	78	52	13	9	11	N	208	646	209	658	12	625	640
78	52	13	56	58	S	101	637	119	712	75	593	613	78	52	13	56	58	S	101	637	119	712	75	593	613
78	52	14	35	11	N	54	610	53	616	6	603	620	78	52	14	35	11	N	54	610	53	616	6	603	620
78	52	14	51	12	N	209	641	210	651	10	620	639	78	52	14	51	12	N	209	641	210	651	10	620	639
78	52	16	16	23	N	208	622	208	622	5	552	571	78	52	16	16	23	N	208	622	208	622	5	552	571
78	52	17	42	45	N	53	564	53	559	8	581	603	78	52	17	42	45	N	53	564	53	559	8	581	603
78	52	17	58	44	N	209	605	210	613	6	571	590	78	52	17	58	44	N	209	605	210	613	6	571	590
78	52	18	48	14	S	54	587	54	587	13	600	612	78	52	18	48	14	S	54	587	54	587	13	600	612
78	52	19	25	42	N	212	616	213	629	14	606	632	78	52	19	25	42	N	212	616	213	629	14	606	632
78	52	21	8	24	N	55	613	54	627	9	613	626	78	52	21	8	24	N	55	613	54	627	9	613	626
78	52	21	23	0	N	214	628	214	637	2	620	623	78	52	21	23	0	N	214	628	214	637	2	620	623
78	52	22	4	6	S	188	680	189	682	8	626	645	78	52	22	4	6	S	188	680	189	682	8	626	645
78	52	22	15	59	S	87	646	87	654	8	626	645	78	52	22	15	59	S	87	646	87	654	8	626	645
78	52	22	50	2	N	58	618	58	615	-3	512	619	78	52	22	50	2	N	58	618	58	615	-3	512	619
78	52	23	6	39	N	209	622	209	621	-1	599	607	78	52	23	6	39	N	209	622	209	621	-1	599	607
78	52	23	41	16	S	181	660	181	657	-3	616	621	78	52	23	41	16	S	181	660	181	657	-3	616	621
78	52	23	58	11	S	77	650	77	636	-14	636	630	78	52	23	58	11	S	77	650	77	636	-14	636	630
78	52	24	30	44	N	59	595	59	596	1	586	599	78	52	24	30	44	N	59	595	59	596	1	586	599
78	52	24	30	0	N	191	654	192	658	14	621	642	78	52	24	30	0	N	191	654	192	658	14	621	642
78	52	3	6	1	S	135	685	134	673	-13	658	647	78	52	3	6	1	S	135	685	134	673	-13	658	647
78	52	3	20	43	S	63	627	64	623	-29	675	653	78	52	3	20	43	S	63	627	64	623	-29	675	653
78	52	4	9	39	N	188	679	189	701	22	639	663	78	52	4	9	39	N	188	679	189	701	22	639	663
78	52	4	45	30	S	199	668	200	660	18	637	656	78	52	4	45	30	S	199	668	200	660	18	637	656
78	52	4	59	13	S	63	672	64	631	-21	647	654	78	52	4	59	13	S	63	672	64	631	-21	647	654
78	52	5	37	1	N	70	672	70	654	-13	660	654	78	52	5	37	1	N	70	672	70	654	-13	660	654
78	52	5	49	57	N	191	673	192	692	19	643	664	78	52	5	49	57	N	191	673	192	692	19	643	664
78	52	6	25	16	S	200	662	200	662	11	643	654	78	52	6	25	16	S	200	662	200	662	11	643	654
78	52	6	39	14	S	66	668	66	659	-9	663	663	78	52	6	39	14	S	66	668	66	659	-9	663	663
78	52	7	18	0	N	75	687	74	658	-49	676	632	78	52	7	18	0	N	75	687	74	658	-49	676	632
78	52	7	30	19	N	194	674	194	686	12	644	658	78	52	7	30	19	N	194	674	194	686	12	644	658
78	52	8	5	47	S	195	675	195	680	5	645	653	78	52	8	5	47	S	195	675	195	680	5	645	653
78	52	8	18	17	S	70	698	71	674	-24	668	671	78	52	8	18	17	S	70	698	71	674	-24	668	671
78	52	9	11	10	N	199	671	199	671	3	641	648	78	52	9	11	10	N	199	671	199	671	3	641	648
78	52	9	46	40	S	188	681	188	682	1	641	645	78	52	9	46	40	S	188	681	188	682	1	641	645
78	52	9	58	55	S	80	691	79	655	-35	676	651	78	52	9	58	55	S	80	691	79	655	-35	676	651

YR	DA	HR	MM	SEC	PO	HDCK	LT	LAT	CDCK	DLAT	MIDNIGHT	DLAT	LAT	CDCK	DLAT	MIDNIGHT	DLAT	LAT	CDCK	DLAT	MIDNIGHT	
78	58	1	21	58	N	197	642	197	642	-1	606	318	78	59	4	8	21	N	189	602	65	560
78	58	2	14	43	S	190	629	191	627	-2	593	606	78	59	4	27	19	N	189	602	65	560
78	58	3	2	59	N	189	639	190	642	3	591	619	78	59	5	49	29	N	189	602	65	560
78	58	4	26	2	N	189	639	190	642	3	591	619	78	59	5	49	29	N	189	602	65	560
78	58	5	15	59	S	198	605	199	619	13	567	599	78	59	6	39	25	S	198	605	68	557
78	58	6	7	6	N	198	605	199	619	13	567	599	78	59	6	39	25	S	198	605	68	557
78	58	7	15	17	S	197	604	197	609	5	565	590	78	59	6	39	25	S	197	604	68	557
78	58	8	3	6	N	193	653	193	653	11	623	641	78	59	6	39	25	S	193	653	68	557
78	58	9	37	46	S	193	653	193	653	11	623	641	78	59	6	39	25	S	193	653	68	557
78	58	10	18	37	S	193	653	193	653	11	623	641	78	59	6	39	25	S	193	653	68	557
78	58	11	25	53	N	174	684	175	682	-2	635	631	78	59	6	39	25	S	174	684	68	557
78	58	12	12	58	S	174	684	175	682	-2	635	631	78	59	6	39	25	S	174	684	68	557
78	58	13	43	30	S	168	652	169	644	-8	574	569	78	59	6	39	25	S	168	652	68	557
78	58	14	32	20	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	15	34	0	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	16	33	59	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	17	58	40	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	18	15	34	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	19	40	51	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	20	22	30	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	21	40	27	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	22	17	41	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	23	4	0	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	24	0	23	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	25	0	15	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	26	0	46	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	27	1	3	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	28	1	40	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	29	1	55	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	30	2	29	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	31	2	46	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	32	18	40	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	33	2	16	N	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	34	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	35	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	36	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	37	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	38	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	39	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	40	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	41	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	42	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	43	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	44	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	45	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	46	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	47	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	48	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	49	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	50	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	51	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	52	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	53	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	54	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	55	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	56	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	57	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	58	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	59	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	60	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	61	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	62	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	63	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	64	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	65	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	66	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	67	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	68	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	69	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	70	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	71	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	72	3	38	S	175	682	175	682	-2	635	631	78	59	6	39	25	S	175	682	68	557
78	58	73	3	38	S	175	682															

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YR		DA	HR	MIN	SEC	PO	HDDK	LT	LAT	CDCK	DLAT	LATH	LATC	MIDNIGHT	DLAT	LATH	LATC	CDCK	LT	LAT	CDCK	DLAT	LATH	LATC	MIDNIGHT
78	62	78	62	22	51	38	S	176	559	173	670	11	596	610	28	676	715	73	715	73	715	28	676	715	
78	62	78	62	23	5	19	S	93	638	82	627	-11	617	615	-1	669	666	192	695	192	695	-1	669	666	
78	62	78	62	23	38	27	N	59	614	59	612	18	607	637	0	662	650	200	680	200	680	0	662	650	
78	62	78	62	23	55	31	N	207	637	207	639	2	616	623	-1	691	700	66	694	66	694	-1	691	700	
78	63	78	63	0	32	41	S	195	658	195	658	0	625	631	-2	701	707	75	708	75	708	-2	701	707	
78	63	78	63	0	46	36	S	74	666	74	666	-7	642	644	-4	647	647	196	673	196	673	-4	647	647	
78	63	78	63	1	22	0	N	56	671	56	671	-30	670	643	10	650	669	193	671	193	671	10	650	669	
78	63	78	63	1	36	58	N	197	603	197	603	3	632	641	0	644	645	201	663	201	663	0	644	645	
78	63	78	63	2	12	58	S	192	682	193	665	23	630	657	5	623	634	186	671	186	671	5	623	634	
78	63	78	63	2	27	36	S	66	654	66	641	-13	647	643	17	628	658	81	648	81	648	17	628	658	
78	63	78	63	3	3	32	N	59	676	59	659	-17	670	663	-5	632	636	82	665	82	665	-5	632	636	
78	63	78	63	3	17	18	N	190	680	191	630	10	651	66	-1	625	629	70	642	70	642	-1	625	629	
78	63	78	63	3	53	2	S	197	658	198	679	21	626	652	-2	604	607	205	645	205	645	-2	604	607	
78	63	78	63	4	7	44	S	64	654	62	664	10	647	668	4	628	641	92	654	92	654	4	628	641	
78	63	78	63	6	31	14	N	192	658	192	658	0	671	669	-5	615	617	208	637	208	637	-5	615	617	
78	63	78	63	7	13	52	S	199	694	199	693	-1	667	665	5	589	600	167	661	166	666	5	589	600	
78	63	78	63	7	27	11	S	68	667	68	677	10	662	683	6	637	652	107	673	107	673	6	637	652	
78	63	78	63	8	17	51	N	75	694	75	674	-20	662	671	-10	617	617	53	623	53	623	-10	617	617	
78	63	78	63	8	17	51	N	196	696	196	699	2	669	672	-3	616	623	107	673	107	673	-3	616	623	
78	63	78	63	8	54	27	S	192	697	192	697	6	670	668	-6	616	616	54	613	54	613	-6	616	616	
78	63	78	63	9	6	53	S	74	692	75	698	4	677	675	-13	643	644	214	627	215	637	-13	643	644	
78	63	78	63	9	58	51	N	202	692	202	699	-3	678	668	10	626	626	54	639	54	639	10	626	626	
78	63	78	63	10	35	29	S	183	695	183	698	3	658	660	-22	635	635	216	689	219	689	-22	635	635	
78	63	78	63	10	47	38	S	85	677	86	698	21	660	695	18	594	626	167	708	168	708	18	594	626	
78	63	78	63	11	40	19	N	208	685	208	686	3	666	668	1	609	615	51	599	51	599	1	609	615	
78	63	78	63	12	28	1	S	98	682	101	706	18	669	700	-3	616	623	107	651	107	651	-3	616	623	
78	63	78	63	13	21	43	N	213	689	213	689	-1	691	674	-10	616	616	52	622	53	619	-10	616	616	
78	63	78	63	15	3	38	N	216	685	216	689	4	677	675	-13	643	644	214	627	215	637	-13	643	644	
78	63	78	63	16	35	46	N	41	673	42	673	6	672	673	22	635	635	54	639	54	639	22	635	635	
78	63	78	63	16	45	31	N	218	681	218	687	6	672	673	15	658	685	167	708	168	708	15	658	685	
78	63	78	63	18	16	30	N	42	674	42	679	5	674	683	-18	674	654	88	660	89	673	-18	674	654	
78	63	78	63	18	27	13	N	221	687	221	685	-2	697	673	2	663	665	54	665	54	665	2	663	665	
78	63	78	63	20	0	58	N	44	688	43	695	-7	693	704	1	660	668	215	681	215	681	1	660	668	
78	63	78	63	20	9	29	N	223	688	222	687	-1	668	680	-7	660	658	182	696	182	696	-7	660	658	
78	63	78	63	21	43	16	N	45	705	46	700	-5	717	710	-23	674	657	78	678	78	678	-23	674	657	
78	63	78	63	21	52	19	N	222	692	222	693	1	692	687	-19	671	650	57	651	57	651	-19	671	650	
78	63	78	63	22	37	13	S	156	734	90	706	-3	673	706	7	652	652	204	688	202	689	7	652	652	
78	63	78	63	22	46	16	S	89	693	50	703	29	674	711	15	658	685	191	691	191	691	15	658	685	
78	63	78	63	23	23	30	N	54	674	50	699	0	692	685	-15	674	654	68	664	69	679	-15	674	654	
78	63	78	63	23	35	38	N	215	699	215	699	0	692	685	-15	674	654	59	648	59	648	-15	674	654	
78	64	78	64	0	17	0	S	183	712	183	712	2	678	675	2	663	665	193	693	193	693	2	663	665	
78	64	78	64	0	27	58	S	77	708	78	712	-1	699	711	3	657	655	197	695	198	694	3	657	655	
78	64	78	64	1	6	20	N	53	710	54	700	-10	713	708	15	657	684	64	663	63	678	15	657	684	
78	64	78	64	1	18	25	N	203	703	203	705	-2	688	683	6	679	696	64	683	64	683	6	679	696	
78	64	78	64	1	57	20	S	192	706	192	704	-2	680	674	3	664	666	190	695	190	695	3	664	666	
78	64	78	64	2	8	36	S	66	719	67	699	-20	718	707	8	669	673	202	694	202	694	8	669	673	
78	64	78	64	2	47	39	N	57	713	58	706	-7	717	714	5	688	687	63	681	63	681	5	688	687	
78	64	78	64	2	59	29	N	192	708	192	704	-4	683	675	5	685	700	72	701	72	701	5	685	700	
78	64	78	64	3	37	30	S	199	703	199	698	-5	677	669	3	672	671	191	697	191	697	3	672	671	
78	64	78	64	3	48	58	S	61	710	61	709	-1	709	717	688	691	201	697	201	697	-5	681	671		
78	64	78	64	4	28	46	N	65	717	66	701	-3	716	723	75	699	700	66	691	75	699	-10	700	697	
78	64	78	64	4	39	58	N	190	701	190	701	0	675	672	7	699	700	195	695	195	695	7	699	700	
78	64	78	64	5	16	44	S	201	690	202	689	9	653	658	44	620	668	195	695	195	695	44	620	668	
78	64	78	64	5	28	59	S	62	704	62	705	1	702	713	-4	673	667	195	700	195	700	-4	673	667	

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YR			DA			HDDK			HDDK			CDCK			MIDNIGHT			MIDNIGHT			CDCK			MIDNIGHT		
YR	DA	HR	MIN	SEC	PO	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT	
78	68	0	47	0	S	188	628	188	631	3	578	596	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	1	3	46	N	73	607	73	616	-9	589	608	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	1	35	31	N	60	609	60	595	-14	598	593	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	1	53	32	N	193	632	196	637	5	597	615	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	2	27	14	S	193	621	193	631	10	584	610	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	2	44	22	S	67	614	67	611	-3	604	611	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	3	16	45	N	62	602	63	607	5	591	606	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	3	34	6	N	190	633	190	634	1	598	612	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	4	7	29	S	198	627	199	627	0	591	606	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	4	25	43	S	67	583	69	611	20	579	611	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	4	57	39	N	69	591	191	620	-1	584	600	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	5	14	35	N	191	621	191	620	11	580	613	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	5	47	13	S	199	617	200	628	4	590	604	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	6	5	13	S	68	605	68	604	4	590	604	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	6	39	0	N	73	610	73	614	4	592	606	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	6	53	59	N	193	652	193	654	2	612	630	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	7	27	37	N	197	643	197	643	14	593	620	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	7	45	0	S	70	604	70	610	6	586	602	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	8	20	15	N	75	641	75	641	-17	626	617	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	8	34	38	N	197	651	197	653	2	618	639	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	9	8	38	S	191	648	192	653	5	615	635	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	9	24	14	N	75	630	74	594	-36	614	635	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	10	17	1	N	202	609	202	627	19	584	612	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	10	49	49	S	184	649	184	651	2	603	615	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	11	6	45	S	81	572	81	572	0	544	601	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	11	39	50	N	69	632	69	632	5	592	612	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	11	58	8	N	206	622	206	627	5	592	612	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	12	32	23	S	174	661	174	661	5	593	611	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	12	45	37	S	94	634	94	636	2	603	611	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	13	23	16	N	58	638	59	620	-18	634	625	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	13	39	39	N	208	631	210	652	21	609	620	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	14	26	14	S	197	651	197	651	2	603	615	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	15	6	38	N	51	635	51	635	10	632	643	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	15	20	53	N	211	645	212	655	18	606	628	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	16	8	50	S	112	639	112	639	18	606	628	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	17	3	31	N	210	621	212	639	-9	606	628	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	18	32	4	N	51	613	52	604	7	631	639	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	18	44	30	N	215	644	216	651	-5	572	600	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	20	13	0	N	57	582	57	577	18	606	628	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	20	27	52	N	214	621	216	630	2	604	628	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	21	54	51	N	59	593	59	602	2	604	628	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	22	10	59	N	213	623	214	639	6	603	618	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	22	48	59	S	179	623	178	634	11	539	572	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	23	3	39	S	84	645	84	654	9	625	645	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	23	37	46	N	58	636	58	635	0	632	641	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	23	52	38	N	211	672	212	680	8	622	647	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	0	30	2	S	187	623	186	649	-12	614	610	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	0	45	58	S	75	630	75	618	-35	636	606	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	1	19	31	N	58	642	60	607	7	677	678	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	1	34	29	N	200	693	201	700	-3	666	662	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	2	12	27	S	193	692	194	690	-3	666	662	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	2	25	59	S	67	661	67	661	0	655	665	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	3	15	58	N	191	675	192	703	28	645	673	78	69	78	69	78	69	78	69	78	69	78	69	78	69
78	68	3	51	15	S	198	647	199	685	38	614	657	78	69	78	69	78	69	78	69	78	69	78	69	78	69

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YR	DA	HDDK	HR	MIN	SEC	FJ	HDDK	LT	LAT	CDDK	DLAT	MIDNIGHT	LATH, LATC	DLAT	LATH, LATC	CDDK	LT	LAT	HDDK	PO	HR	MIN	SEC	DLAT	MIDNIGHT	LATH, LATC	DLAT	LATH, LATC	CDDK	LT	LAT	HDDK	
78	75	11	22	38	N	69	647	69	648	1	640	551	570	15	570	598	57	555	58	N	14	27	59	1	570	598	57	555	58	N	14	27	59
78	75	11	38	30	N	206	646	207	651	5	625	634	16	590	615	208	614	208	N	14	45	59	5	590	615	208	614	208	N	14	45	59	
78	75	12	14	3	S	174	680	174	687	7	629	637	85	518	594	113	645	99	S	15	36	15	7	518	594	113	645	99	S	15	36	15	
78	75	12	26	21	S	94	653	93	652	-1	627	633	16	585	615	210	625	209	S	16	27	50	-1	585	615	210	625	209	S	16	27	50	
78	75	13	4	0	S	61	630	61	631	-9	621	622	22	570	606	52	602	53	S	17	54	37	-9	570	606	52	602	53	S	17	54	37	
78	75	13	20	49	N	208	631	209	641	10	609	625	6	603	615	213	625	212	N	18	5	20	10	603	615	213	625	212	N	18	5	20	
78	75	13	56	44	S	168	662	163	678	16	591	617	5	595	596	105	635	55	S	19	0	30	16	591	617	105	635	55	S	19	0	30	
78	75	14	7	23	S	106	654	104	645	-9	618	611	4	595	602	55	590	55	S	19	37	38	-9	595	602	55	590	55	S	19	37	38	
78	75	14	45	50	N	56	590	55	608	18	581	612	18	570	570	60	574	213	N	21	17	46	18	570	570	60	574	213	N	21	17	46	
78	75	15	3	1	N	209	619	209	621	2	595	607	5	595	606	214	616	61	N	21	34	43	2	595	606	214	616	61	N	21	34	43	
78	75	16	45	50	N	207	586	226	714	128	560	709	171	636	636	171	636	171	N	22	15	33	128	560	709	171	636	636	N	22	15	33	
78	75	18	11	13	N	55	557	53	589	32	544	592	29	550	591	85	606	84	S	22	29	30	32	544	592	85	606	84	S	22	29	30	
78	75	18	27	53	N	209	590	210	592	12	553	611	38	590	591	58	639	194	N	23	0	36	12	553	611	58	639	194	N	23	0	36	
78	75	19	17	40	S	56	594	56	594	0	585	597	6	628	635	61	601	61	S	23	17	5	0	585	597	6	628	635	S	23	17	5	
78	75	19	54	34	N	213	602	214	612	10	585	602	183	639	644	213	647	183	N	23	56	1	10	585	602	183	639	644	N	23	56	1	
78	75	20	9	31	N	59	602	59	601	-1	594	605	-32	657	636	80	674	80	S	0	46	46	-1	594	605	80	674	80	S	0	46	46	
78	75	21	36	23	N	176	610	215	625	15	592	615	60	630	631	183	680	183	N	0	44	21	15	592	615	60	630	631	N	0	44	21	
78	75	21	52	13	N	176	650	175	659	9	582	603	204	656	639	204	656	204	N	0	59	30	9	582	603	204	656	639	N	0	59	30	
78	75	22	31	16	S	86	637	85	632	-5	616	620	6	617	632	192	656	192	S	1	35	40	-5	616	620	6	617	632	S	1	35	40	
78	75	22	44	59	S	66	637	60	616	29	574	616	71	627	620	192	656	192	S	1	52	22	29	574	616	71	627	620	S	1	52	22	
78	75	23	17	17	N	62	587	60	616	-1	574	586	18	568	598	62	581	62	N	2	23	2	-1	574	586	18	568	598	N	2	23	2	
78	75	23	36	8	N	208	599	208	598	9	561	588	194	641	641	194	641	194	N	2	41	26	9	561	588	194	641	641	N	2	41	26	
78	76	0	11	0	S	186	614	186	623	32	528	575	3	518	518	68	640	68	S	3	15	32	32	528	575	3	518	518	S	3	15	32	
78	76	0	29	34	S	76	551	76	551	20	570	602	197	637	637	197	637	197	S	3	35	0	20	570	602	197	637	637	S	3	35	0	
78	76	0	58	39	N	62	583	61	603	10	584	616	191	646	616	191	646	191	N	4	4	56	10	584	616	191	646	616	N	4	4	56	
78	76	1	17	58	N	199	621	200	631	-3	611	619	2	606	615	200	630	2	N	4	21	29	-3	611	619	2	606	615	N	4	21	29	
78	76	1	52	30	S	193	645	193	642	4	578	592	191	646	615	191	646	191	S	4	55	16	4	578	592	191	646	615	S	4	55	16	
78	76	2	40	29	N	62	590	63	594	5	564	589	2	616	628	63	594	2	N	5	46	59	5	564	589	2	616	628	N	5	46	59	
78	76	2	58	39	N	192	631	192	632	4	578	592	191	646	615	191	646	191	N	5	46	59	4	578	592	191	646	615	N	5	46	59	
78	76	3	32	1	S	197	622	197	619	-3	595	599	2	609	622	192	634	2	S	6	1	44	-3	595	599	2	609	622	S	6	1	44	
78	76	3	49	59	S	67	593	67	593	17	530	618	75	607	607	68	640	75	S	6	51	27	17	530	618	75	607	607	S	6	51	27	
78	76	4	22	12	N	67	601	67	618	17	530	618	75	607	607	68	640	75	N	7	28	0	17	530	618	75	607	607	N	7	28	0	
78	76	4	39	39	N	191	603	191	608	5	564	589	195	648	625	195	648	195	N	7	41	58	5	564	589	195	648	625	N	7	41	58	
78	76	5	11	19	S	199	600	200	611	11	560	598	195	648	625	195	648	195	S	8	16	0	11	560	598	195	648	625	S	8	16	0	
78	76	5	30	37	S	69	589	69	589	7	569	587	72	626	619	72	626	72	S	8	31	23	7	569	587	72	626	619	S	8	31	23	
78	76	6	2	19	N	72	577	72	583	16	557	583	10	621	635	200	652	10	N	9	22	59	16	557	583	10	621	635	N	9	22	59	
78	76	6	18	18	N	192	657	192	638	-19	625	616	1	611	621	188	656	1	S	9	57	1	-19	625	616	1	611	621	S	9	57	1	
78	76	6	52	0	S	199	622	199	632	20	585	619	63	573	646	80	655	63	S	10	13	33	20	585	619	63	573	646	S	10	13	33	
78	76	7	9	59	S	69	539	69	539	15	588	614	73	501	592	80	655	73	S	10	46	45	15	588	614	73	501	592	S	10	46	45	
78	76	7	44	15	N	75	621	75	621	4	604	614	205	641	622	205	641	205	N	11	4	19	4	604	614	205	641	622	N	11	4	19	
78	76	7	58	59	N	196	651	196	643	-8	618	620	13	608	629	180	666	13	N	11	38	30	-8	618	620	13	608	629	N	11	38	30	
78	76	8	33	0	S	194	647	194	653	6	614	629	88	625	612	180	666	88	S	11	54	0	6	614	629	88	625	612	S	11	54	0	
78	76	8	50	17	S	194	647	194	653	43	571	626	12	579	602	65	603	12	N	12	28	2	43	571	626	12	579	602	N	12	28	2	
78	76	9	40	13	N	200	639	201	653	19	618	640	206	613	607	171	653	206	N	12	46	59	19	618	640	206	613	607	N	12	46	59	
78	76	10	14	30	S	187	669	187	666	-3	627	629	171	653	607	171	653	171	S	13	21	16	-3	627	629	171	653	607	S	13	21	16	
78	76	10	28	41	S	91	645	80	630	-16	626	618	26	554	589	97	620	26	S	13	35	30	-16	626	618	26	554	589	S	13	35	30	
78	76	11	4	20	N	71	608	71	608	34	590	636	58	589	591	58	589	58	N	14	9	45	34	590	636	58	589	591	N	14	9	45	
78	76	11	21	18	N	206	647	206	647	0	627	636	208	609	596	208	609	208	N	14	29	12	0	627	636	208	609	596	N	14	29	12	
78	76	11	56	59	S	175	639	177	670	-19	643	616	0	558	566	165	642	0	S	15	4	31	-19	643	616	0	558	566	S	15	4	31	
78	76	12	9	39	S	91	643	91	643	2	614	623	107	621	586	209	594	107	S	15	14	31	2	614	623	107	621	586	S	15	14	31	
78	76	13	3	45	N	206	626	208	635	9	604	620	209	594	586</																		

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YR	DA	HR	MIN	SEC	PO	HDDK	LT	LAT	CDDK	LT	LAT	DLAT	MIDNIGHT	LATH, LATH	655
78	80	8	17	15	N	176	643	76	649	76	643	-2	628	644	655
78	80	8	30	28	N	197	686	197	684	197	684	-2	658	687	655
78	80	9	6	24	S	192	679	192	674	192	674	-5	650	679	655
78	80	9	19	48	S	75	671	75	638	75	638	-33	658	637	655
78	80	9	57	27	N	74	643	74	643	74	643	0	658	643	655
78	80	10	12	29	N	202	631	202	666	202	666	15	631	618	655
78	80	10	47	31	S	183	678	184	679	184	679	1	638	642	655
78	80	11	0	58	S	85	654	84	651	84	651	-3	635	640	655
78	80	11	53	38	S	208	659	208	652	208	652	-7	651	627	655
78	80	12	0	23	S	171	694	171	695	171	695	-22	642	642	655
78	80	12	41	25	S	97	666	95	642	95	642	-8	632	639	655
78	80	13	19	58	N	210	649	210	652	210	652	3	637	640	655
78	80	13	35	44	N	107	654	108	655	108	655	1	618	625	655
78	80	14	23	0	S	212	649	213	658	213	658	9	637	646	655
78	80	15	17	31	N	45	654	47	646	47	646	-8	645	641	655
78	80	16	47	39	N	215	657	216	644	216	644	-7	645	641	655
78	80	16	58	38	N	45	667	49	642	49	642	-25	664	656	655
78	80	18	30	45	N	217	653	223	690	223	690	37	664	684	655
78	80	20	12	38	N	49	657	52	647	52	647	-20	664	653	655
78	80	20	23	1	N	220	633	222	677	222	677	14	659	679	655
78	80	23	49	3	N	214	678	214	682	214	682	4	669	668	655
78	80	0	29	21	S	185	708	186	713	186	713	5	673	674	655
78	80	0	41	58	S	77	661	77	651	77	651	-10	648	646	655
78	80	1	16	50	N	59	657	60	642	60	642	-15	655	644	655
78	80	1	30	59	N	203	689	203	695	203	695	-3	683	675	655
78	80	2	22	39	S	195	689	195	690	195	690	1	661	662	655
78	80	2	58	52	N	69	670	69	645	69	645	-25	665	642	655
78	80	3	12	25	N	194	664	194	664	194	664	-34	671	644	655
78	80	3	49	0	S	200	675	200	674	200	674	-2	655	658	655
78	80	4	2	38	S	65	674	65	647	65	647	-1	657	655	655
78	80	4	40	1	N	68	678	68	652	68	652	-26	674	655	655
78	80	4	52	59	N	191	675	191	675	191	675	0	645	643	655
78	80	5	27	51	S	201	638	201	649	201	649	11	617	632	655
78	80	5	43	29	S	67	649	67	648	67	648	-1	642	631	655
78	80	6	19	59	N	73	650	73	665	73	665	15	636	651	655
78	80	6	33	20	N	193	664	193	663	193	663	-	633	638	655
78	80	7	8	28	S	199	660	199	668	199	668	8	628	642	655
78	80	7	23	19	S	68	652	69	643	69	643	-9	645	643	655
78	80	7	59	20	N	156	665	156	670	156	670	30	592	634	655
78	80	8	14	0	N	193	667	193	677	193	677	12	634	650	655
78	80	8	49	0	S	193	667	193	667	193	667	0	636	642	655
78	80	9	3	8	S	74	651	74	641	74	641	-20	648	635	655
78	80	9	56	59	N	201	656	201	625	201	625	29	571	611	655
78	80	10	29	24	S	187	645	187	643	187	643	-3	599	607	655
78	80	10	44	59	S	81	623	82	643	82	643	20	631	642	655
78	80	11	21	1	N	70	646	70	647	70	647	1	631	642	655
78	80	11	37	1	N	205	642	206	638	206	638	-4	621	632	655
78	80	12	11	46	S	177	661	177	651	177	651	0	596	605	655
78	80	12	24	6	S	95	672	95	663	95	663	-9	650	647	655
78	80	13	2	1	N	209	637	209	646	209	646	26	610	639	655
78	80	13	19	0	N	209	637	209	637	209	637	1	614	621	655
78	80	13	56	5	S	163	683	163	683	163	683	1	614	625	655

YR	DA	HR	MM	SEC	PO	HDOK	LT	LAT	CDOK	DLAT	MIDNIGHT LATH, LATIC	DLAT	MIDNIGHT LATH, LATIC	CDOK	LT	LAT	DLAT	MIDNIGHT LATH, LATIC
78	82	21	20	16	N	50	679	58	637	-42	679 642	-42	679 642	58	637	58	-1	655 636
78	82	21	31	13	N	219	655	222	661	22	648 674	-6	640 643	222	661	22	-6	640 643
78	82	22	12	59	S	173	662	172	681	15	601 630	-3	627 635	172	681	15	-3	627 635
78	82	22	25	1	S	91	668	90	651	-7	645 645	-3	660 657	90	651	-7	-3	660 657
78	82	23	2	12	N	53	690	58	646	-44	691 652	9	651 656	58	646	9	9	651 656
78	82	23	15	13	N	214	645	216	665	20	632 652	3	632 652	216	665	20	3	632 652
78	82	23	54	1	N	184	668	184	681	13	626 644	3	659 673	184	681	13	3	659 673
78	83	0	7	0	S	81	680	80	644	-35	664 644	2	659 673	80	644	2	2	659 673
78	83	0	43	30	N	57	685	59	657	-28	686 663	-2	667 682	59	657	-28	-2	667 682
78	83	0	53	10	N	204	647	207	679	32	627 659	-31	665 641	207	679	32	-31	665 641
78	83	1	34	0	S	193	647	193	681	34	614 654	-3	680 692	193	681	34	-3	680 692
78	83	1	48	38	S	72	668	72	678	10	655 675	-3	670 685	72	678	10	-3	670 685
78	83	2	24	24	N	61	672	60	683	16	667 655	-10	694 692	60	683	16	-10	694 692
78	83	2	38	28	N	196	682	196	687	5	653 659	13	653 659	196	687	5	13	653 659
78	83	3	14	45	S	198	663	194	680	-17	687 639	3	663 665	194	680	-17	3	663 665
78	83	3	28	17	S	65	690	66	683	0	693 703	17	674 701	66	683	0	17	674 701
78	83	4	6	21	N	66	696	66	696	0	693 703	0	679 674	66	696	0	0	679 674
78	83	4	18	59	N	191	677	192	687	10	647 659	3	683 673	192	687	10	3	683 673
78	83	4	54	36	S	202	658	203	680	22	639 659	-12	698 686	203	680	22	-12	698 686
78	83	5	8	30	S	65	681	192	681	2	650 654	2	680 678	192	681	2	2	680 678
78	83	5	59	6	N	192	679	201	674	-21	655 655	13	657 659	201	674	-21	13	657 659
78	83	6	34	59	S	501	673	68	634	-21	649 636	3	663 665	68	634	-21	3	663 665
78	83	6	49	21	S	67	655	75	630	-21	656 588	17	674 701	75	630	-21	17	674 701
78	83	7	26	59	N	195	689	195	687	-2	661 659	0	679 674	195	687	-2	0	679 674
78	83	7	39	13	S	196	686	196	687	-11	658 639	2	680 678	196	686	-11	2	680 678
78	83	8	15	29	S	196	686	196	687	-11	658 639	2	680 678	196	686	-11	2	680 678
78	83	8	29	9	N	72	662	72	651	0	668 655	3	667 672	72	651	0	3	667 672
78	83	9	20	5	N	200	685	200	685	0	668 655	3	667 672	200	685	0	3	667 672
78	83	9	56	36	S	187	699	183	697	-2	663 659	-3	693 691	183	697	-2	-3	693 691
78	83	10	10	0	N	72	650	79	647	-3	636 642	16	645 664	79	647	-3	16	645 664
78	83	10	47	14	N	72	658	71	668	10	644 664	-1	690 696	71	668	10	-1	690 696
78	83	11	1	8	N	206	697	206	698	1	670 668	22	636 657	206	697	1	22	636 657
78	83	11	1	8	N	175	710	175	711	1	676 666	11	628 644	175	710	1	11	628 644
78	83	11	28	42	S	93	685	93	686	1	666 679	-25	681 664	93	685	1	-25	681 664
78	83	11	49	30	S	93	685	93	686	1	666 679	-25	681 664	93	685	1	-25	681 664
78	83	12	28	53	N	212	687	212	688	1	679 674	-7	684 683	212	687	1	-7	684 683
78	83	12	42	35	S	101	652	101	652	1	679 674	-7	684 683	101	652	1	-7	684 683
78	83	13	31	41	N	216	683	216	683	0	675 659	-3	664 657	216	683	0	-3	664 657
78	83	14	24	24	N	41	688	41	688	0	695 635	32	615 653	41	688	0	32	615 653
78	83	15	56	36	N	218	679	217	679	0	670 666	-5	665 669	217	679	0	-5	665 669
78	83	16	6	20	N	42	679	44	669	-10	681 670	-1	615 624	44	669	-10	-1	615 624
78	83	17	35	13	N	218	664	218	668	4	654 655	-5	582 603	218	664	4	-5	582 603
78	83	17	48	45	N	51	637	51	643	6	633 647	-11	598 599	51	637	6	-11	598 599
78	83	19	19	53	N	217	638	218	649	11	625 637	2	574 597	218	649	11	2	574 597
78	83	19	31	49	N	55	635	55	635	4	636 644	1	590 606	55	635	4	1	590 606
78	83	21	1	29	N	218	647	218	647	0	635 635	8	595 612	218	647	0	8	595 612
78	83	21	14	12	N	198	692	198	691	-1	639 635	4	591 605	198	691	-1	4	591 605
78	83	21	57	1	S	168	692	168	691	-2	642 649	-6	597 600	168	691	-2	-6	597 600
78	83	22	7	40	S	92	666	92	664	-2	642 649	-2	602 613	92	666	-2	-2	602 613
78	83	22	43	18	N	215	642	215	642	2	641 653	-3	593 616	215	642	2	-3	593 616
78	83	22	57	47	N	181	694	181	694	2	641 653	-3	593 616	181	694	2	-3	593 616
78	83	23	37	48	S	84	684	82	685	-29	668 646	-4	632 637	82	685	-29	-4	632 637
78	83	23	49	38	S	84	684	82	685	-29	668 646	-4	632 637	82	685	-29	-4	632 637
78	83	0	25	0	N	59	650	60	648	-2	647 651	14	586 606	60	648	-2	14	586 606
78	84	0	40	30	N	207	657	208	665	8	637 647	39	599 650	208	665	8	39	599 650

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YR	DA	HDDK	HR	MIN	SEC	PO	HDDK		CDDK		DLAT	MIDNIGHT		YR	DA	HDDK	HR	MIN	SEC	PO	HDDK		CDDK		DLAT	MIDNIGHT	
							LT	LAT	LT	LAT		LT	LAT								LT	LAT	LT	LAT		LT	LAT
78	87	14	41	3	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	87	14	59	59	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	87	16	41	59	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	87	18	10	6	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	87	18	23	18	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	87	19	14	31	S	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	87	20	4	57	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	87	21	35	31	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
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78	87	22	30	0	S	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	87	22	41	58	S	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	87	23	17	30	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	87	23	30	13	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	88	0	10	29	S	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
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78	88	2	54	5	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
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78	88	3	44	34	S	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
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78	88	4	33	46	S	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
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78	88	5	25	42	S	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
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78	88	6	49	56	S	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
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78	88	7	41	58	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	88	7	55	51	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	88	8	30	8	S	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
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78	88	10	27	22	S	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	88	11	0	16	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	88	11	19	14	S	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
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78	88	12	5	48	S	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	88	12	42	6	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
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78	88	13	37	3	S	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
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78	88	16	23	14	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
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78	88	19	35	39	N	56	604	59	571	23	595	532	573	78	88	23	13	35	N	214	642	216	655	14	629	644	
78	88	19	47	29	N	56	604	59	571</																		

YR	DA	HDOY	HR	MM	SEC	PO	HDOY	LT	LAT	COOK	DLAT	MIDNIGHT LATH, LATH	YR	DA	HDOY	HR	MM	SEC	PO	HDOY	LT	LAT	COOK	DLAT	MIDNIGHT LATH, LATH	
78	90	3	9	18		S	66	705	67	687	-18	705	78	91	11	15	32		S	85	636	86	645	10	614	535
78	90	3	47	25		N	85	691	66	676	-15	688	78	91	12	7	29		N	208	655	210	681	22	640	668
78	90	3	58	53		N	193	694	193	693	-4	697	78	91	12	45	28		S	165	716	58	659	-6	641	642
78	90	4	36	39		S	203	675	203	673	8	657	78	91	12	55	22		S	99	665	58	653	10	639	659
78	90	4	50	39		S	66	683	66	673	10	657	78	91	13	34	14		N	58	643	58	653	10	639	659
78	90	5	28	12		N	71	687	72	670	-17	676	78	91	13	49	40		N	211	647	215	698	41	635	674
78	90	5	39	59		S	192	696	192	696	3	689	78	91	14	37	5		N	213	649	214	659	10	637	647
78	90	5	16	45		S	202	682	203	686	14	685	78	91	23	2	0		S	177	691	177	692	1	646	643
78	90	6	30	10		N	67	673	67	665	-8	682	78	91	23	13	42		S	88	674	86	652	-22	657	643
78	90	7	9	0		N	75	693	75	693	-2	682	78	91	23	48	5		N	61	628	62	625	-3	619	626
78	90	7	20	8		N	194	702	194	702	0	676	78	91	23	48	5		N	209	625	210	639	14	602	628
78	90	7	57	24		S	198	703	198	702	-1	677	78	91	23	48	5		S	190	641	190	639	-2	607	611
78	90	8	10	7		S	71	675	71	687	-8	683	78	91	23	48	5		S	190	641	190	628	3	609	621
78	90	8	49	15		N	199	697	200	704	7	670	78	91	23	48	5		N	190	641	190	627	-27	646	627
78	90	9	0	59		N	189	712	189	714	2	678	78	91	23	48	5		N	200	641	201	644	3	620	628
78	90	9	38	13		S	79	676	79	681	5	664	78	91	23	48	5		S	177	691	177	692	1	646	643
78	90	10	42	19		N	205	687	205	686	-1	670	78	91	23	48	5		S	171	606	171	642	36	598	615
78	90	11	19	19		S	179	697	179	700	3	656	78	91	23	48	5		N	193	616	194	620	4	576	600
78	90	11	30	8		S	93	705	87	642	-63	690	78	91	23	48	5		S	200	613	200	619	6	589	605
78	90	12	8	28		N	67	624	66	649	25	615	78	91	23	48	5		S	69	600	69	620	20	589	620
78	90	12	24	57		N	249	651	209	655	4	631	78	91	23	48	5		N	192	634	192	639	7	619	636
78	90	13	1	42		S	169	635	169	686	1	628	78	91	23	48	5		N	192	634	192	639	5	599	617
78	90	13	11	13		S	106	694	108	707	13	677	78	91	23	48	5		N	202	641	202	639	-2	620	623
78	90	13	50	28		N	59	607	59	608	1	639	78	91	23	48	5		S	67	656	74	656	-4	647	651
78	90	14	7	16		N	210	637	211	641	4	623	78	91	23	48	5		N	194	653	194	665	2	632	640
78	90	17	16	13		N	54	576	53	597	21	565	78	91	23	48	5		N	174	653	194	665	14	618	640
78	90	17	31	53		N	211	602	212	614	12	585	78	91	23	48	5		S	199	651	199	665	14	618	640
78	90	18	23	49		N	54	606	53	622	16	598	78	91	23	48	5		S	199	651	199	665	14	618	640
78	90	19	14	0		S	213	602	214	611	9	585	78	91	23	48	5		S	199	651	199	665	14	618	640
78	90	20	4	34		S	167	659	167	659	7	606	78	91	23	48	5		N	197	676	198	693	26	646	673
78	90	20	41	53		N	57	613	57	620	11	628	78	91	23	48	5		S	197	676	198	693	26	646	673
78	90	20	55	13		N	218	641	219	652	12	590	78	91	23	48	5		N	197	676	198	693	26	646	673
78	90	22	22	55		N	62	601	61	613	3	638	78	91	23	48	5		N	203	655	203	679	24	635	659
78	90	22	38	11		N	217	650	218	653	-1	651	78	91	23	48	5		N	203	655	203	679	24	635	659
78	90	23	15	59		S	180	689	180	686	10	574	78	91	23	48	5		S	186	658	186	660	-10	636	635
78	90	23	33	8		S	83	603	83	613	10	574	78	91	23	48	5		S	186	658	186	660	-10	636	635
78	91	0	4	33		S	63	607	62	617	10	595	78	91	23	48	5		N	208	656	208	670	4	647	651
78	91	0	21	13		S	210	661	211	666	7	650	78	91	23	48	5		N	208	656	208	670	4	647	651
78	91	0	58	53		S	191	664	191	664	0	633	78	91	23	48	5		N	210	647	211	658	11	635	612
78	91	1	15	29		S	76	580	76	580	45	560	78	91	23	48	5		N	213	654	215	670	13	642	626
78	91	1	46	30		N	63	618	63	635	17	604	78	91	23	48	5		N	213	654	215	670	13	642	626
78	91	2	4	8		N	198	632	199	632	0	577	78	91	23	48	5		N	215	658	215	655	-29	656	623
78	91	2	37	41		S	197	611	197	612	1	573	78	91	23	48	5		N	215	658	215	655	-29	656	623
78	91	2	56	52		S	71	564	71	566	-42	543	78	91	23	48	5		N	216	636	216	634	-2	622	623
78	91	3	26	46		N	66	580	67	570	-10	567	78	91	23	48	5		N	216	636	216	634	-2	622	623
78	91	3	45	0		N	193	621	193	622	1	564	78	91	23	48	5		N	216	636	216	634	-2	622	623
78	91	4	17	40		S	200	603	200	603	113	589	78	91	23	48	5		N	216	636	216	634	-2	622	623
78	91	4	35	57		S	69	600	69	600	113	589	78	91	23	48	5		N	216	636	216	634	-2	622	623
78	91	5	8	57		N	192	631	192	636	5	595	78	91	23	48	5		N	216	636	216	634	-2	622	623
78	91	5	24	51		S	200	610	200	613	3	586	78	91	23	48	5		N	216	636	216	634	-2	622	623
78	91	5	57	41		S	203	650	204	657	7	630	78	91	23	48	5		N	216	636	216	634	-2	622	623
78	91	10	26	19		S	102	656	102	656	2	654	78	91	23	48	5		N	216	636	216	634	-2	622	623

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YR	DA	HR	MM	SEC	PO	HDDK	LT	LAT	COCK	DLAT	MIDNIGHT	LA-TM-LATC	YR	DA	HR	MM	SEC	PO	HDDK	LT	LAT	COCK	DLAT	MIDNIGHT	LA-TM-LATC
78	97	23	12	12	S	89	669	60	660	-1	651	664	78	97	23	12	12	S	89	669	60	660	-1	651	664
78	97	23	47	34	N	215	661	216	661	0	661	675	78	97	23	47	34	N	215	661	216	661	0	661	675
78	98	0	41	29	S	109	704	159	708	4	668	670	78	98	0	41	29	S	109	704	159	708	4	668	670
78	98	0	54	12	S	79	665	79	663	-2	662	669	78	98	0	54	12	S	79	665	79	663	-2	662	669
78	98	1	29	38	N	61	677	63	641	-36	673	643	78	98	1	29	38	N	61	677	63	641	-36	673	643
78	98	1	43	14	N	205	695	205	639	2	640	677	78	98	1	43	14	N	205	695	205	639	2	640	677
78	98	2	21	28	S	198	389	199	393	10	661	670	78	98	2	21	28	S	198	389	199	393	10	661	670
78	98	2	34	52	S	71	671	72	630	-41	658	673	78	98	2	34	52	S	71	671	72	630	-41	658	673
78	98	3	10	12	N	196	689	196	704	15	661	674	78	98	3	10	12	N	196	689	196	704	15	661	674
78	98	3	24	23	S	203	679	203	636	7	662	666	78	98	3	24	23	S	203	679	203	636	7	662	666
78	98	4	1	19	S	66	690	68	648	-42	637	651	78	98	4	1	19	S	66	690	68	648	-42	637	651
78	98	5	4	19	N	192	699	193	702	3	672	673	78	98	5	4	19	N	192	699	193	702	3	672	673
78	98	5	41	29	S	204	687	204	690	3	670	669	78	98	5	41	29	S	204	687	204	690	3	670	669
78	98	5	55	30	S	67	654	68	628	-26	647	658	78	98	5	55	30	S	67	654	68	628	-26	647	658
78	98	6	32	0	S	74	648	75	675	27	634	672	78	98	6	32	0	S	74	648	75	675	27	634	672
78	98	6	44	41	N	194	694	194	698	4	667	666	78	98	6	44	41	N	194	694	194	698	4	667	666
78	98	7	21	53	S	201	703	201	701	-2	669	679	78	98	7	21	53	S	201	703	201	701	-2	669	679
78	98	7	35	10	S	69	661	69	654	-7	655	668	78	98	7	35	10	S	69	661	69	654	-7	655	668
78	98	8	13	0	N	78	669	76	667	-2	656	663	78	98	8	13	0	N	78	669	76	667	-2	656	663
78	98	8	25	30	N	198	685	198	705	20	657	675	78	98	8	25	30	N	198	685	198	705	20	657	675
78	98	10	6	20	N	203	687	204	700	13	670	678	78	98	10	6	20	N	203	687	204	700	13	670	678
78	98	10	43	38	S	183	713	183	714	1	679	675	78	98	10	43	38	S	183	713	183	714	1	679	675
78	98	10	54	19	S	88	709	86	681	-28	696	676	78	98	10	54	19	S	88	709	86	681	-28	696	676
78	98	11	47	45	N	200	683	210	694	11	656	660	78	98	11	47	45	N	200	683	210	694	11	656	660
78	98	12	24	59	S	174	684	174	684	-46	636	645	78	98	12	24	59	S	174	684	174	684	-46	636	645
78	98	13	15	53	N	58	674	58	667	12	669	676	78	98	13	15	53	N	58	674	58	667	12	669	676
78	98	13	29	30	N	214	678	215	690	0	679	673	78	98	13	29	30	N	214	678	215	690	0	679	673
78	98	15	10	53	N	218	687	218	687	0	679	673	78	98	15	10	53	N	218	687	218	687	0	679	673
78	98	15	42	18	N	47	651	45	671	20	642	673	78	98	15	42	18	N	47	651	45	671	20	642	673
78	98	16	53	22	N	218	689	218	671	2	659	658	78	98	16	53	22	N	218	689	218	671	2	659	658
78	98	18	24	36	N	51	640	51	640	0	636	645	78	98	18	24	36	N	51	640	51	640	0	636	645
78	98	18	36	3	N	218	649	219	652	3	637	640	78	98	18	36	3	N	218	649	219	652	3	637	640
78	98	20	6	6	N	56	626	56	625	-1	620	630	78	98	20	6	6	N	56	626	56	625	-1	620	630
78	98	20	18	30	N	219	646	221	659	13	633	650	78	98	20	18	30	N	219	646	221	659	13	633	650
78	98	21	48	43	N	56	657	58	643	-14	655	649	78	98	21	48	43	N	56	657	58	643	-14	655	649
78	98	22	1	0	N	220	659	231	720	61	655	720	78	98	22	1	0	N	220	659	231	720	61	655	720
78	98	22	44	8	S	173	713	173	713	0	681	659	78	98	22	44	8	S	173	713	173	713	0	681	659
78	98	22	54	29	S	91	679	91	674	-5	658	652	78	98	22	54	29	S	91	679	91	674	-5	658	652
78	98	23	30	39	N	58	669	59	659	-10	668	655	78	98	23	30	39	N	58	669	59	659	-10	668	655
78	98	23	43	48	N	217	678	219	691	13	669	677	78	98	23	43	48	N	217	678	219	691	13	669	677
78	99	0	23	37	S	189	678	188	667	15	638	659	78	99	0	23	37	S	189	678	188	667	15	638	659
78	99	0	35	52	S	82	703	80	634	-69	689	632	78	99	0	35	52	S	82	703	80	634	-69	689	632
78	99	1	12	38	N	60	682	61	671	-11	678	676	78	99	1	12	38	N	60	682	61	671	-11	678	676
78	99	1	26	15	N	207	688	207	691	3	671	670	78	99	1	26	15	N	207	688	207	691	3	671	670
78	99	2	4	14	S	197	681	197	683	8	652	661	78	99	2	4	14	S	197	681	197	683	8	652	661
78	99	2	17	22	S	72	686	73	668	-18	675	683	78	99	2	17	22	S	72	686	73	668	-18	675	683
78	99	2	54	39	N	63	703	64	677	-26	701	660	78	99	2	54	39	N	63	703	64	677	-26	701	660
78	99	3	7	23	N	202	679	203	681	2	662	661	78	99	3	7	23	N	202	679	203	681	2	662	661
78	99	3	44	23	S	67	680	67	680	2	676	666	78	99	3	44	23	S	67	680	67	680	2	676	666
78	99	3	57	43	S	193	663	193	679	16	632	652	78	99	3	57	43	S	193	663	193	679	16	632	652

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YR	DA	HR	MM	SEC	PO	HDDK		MIDNIGHT		YR	DA	HR	MM	SEC	PO	HDDK		MIDNIGHT		YR	DA	HR	MM	SEC	PO	HDDK		MIDNIGHT						
						LT	LAT	DLAT	LATH, LANC							LT	LAT	DLAT	LATH, LANC							LT	LAT	DLAT	LATH, LANC	LT	LAT	DLAT	LATH, LANC	
78	103	2	51	24	S	72	632	-3	616	522	78	104	8	26	11	N	197	599	10	559	590	78	103	2	51	24	S	72	632	-3	616	522		
78	103	3	25	38	N	67	654	-30	647	525	78	104	9	15	0	S	194	647	-6	614	618	78	103	3	25	38	N	67	654	-30	647	525		
78	103	4	15	20	N	195	643	6	609	622	78	104	10	6	44	N	202	616	11	593	612	78	103	4	15	20	N	195	643	6	609	622		
78	103	5	7	6	N	202	638	7	617	629	78	104	11	29	0	N	205	574	205	577	3	547	555	78	103	5	7	6	N	202	638	7	617	629
78	103	6	30	58	N	68	650	-18	643	634	78	104	12	39	0	S	183	586	183	595	9	528	552	78	103	6	30	58	N	68	650	-18	643	634
78	103	7	1	6	N	71	667	2	657	659	78	104	13	9	43	N	206	571	206	575	4	543	556	78	103	7	1	6	N	71	667	2	657	659
78	103	8	15	58	N	153	655	23	642	664	78	104	14	31	42	S	174	620	174	625	1	534	551	78	103	8	15	58	N	153	655	23	642	664
78	103	9	55	58	N	203	661	-35	655	659	78	104	15	13	30	N	207	569	207	573	4	541	554	78	103	9	55	58	N	203	661	-35	655	659
78	103	10	10	30	S	67	651	-32	665	659	78	104	16	34	31	N	210	588	210	592	15	569	585	78	103	10	10	30	S	67	651	-32	665	659
78	103	11	48	36	N	75	695	9	632	682	78	104	17	54	31	N	214	598	214	602	8	580	597	78	103	11	48	36	N	75	695	9	632	682
78	103	12	7	0	S	194	681	-4	653	651	78	104	18	20	0	N	215	594	215	598	-4	576	581	78	103	12	7	0	S	194	681	-4	653	651
78	103	13	7	36	S	71	621	9	604	623	78	104	19	36	2	N	217	620	217	624	-10	565	570	78	103	13	7	36	S	71	621	9	604	623
78	103	14	28	39	N	77	683	-6	671	674	78	104	20	40	30	S	179	657	179	661	2	593	603	78	103	14	28	39	N	77	683	-6	671	674
78	103	15	8	41	N	198	671	14	641	657	78	104	21	55	0	N	212	611	212	615	14	595	615	78	103	15	8	41	N	198	671	14	641	657
78	103	16	16	59	S	192	680	-3	651	650	78	104	22	55	0	S	187	605	187	609	2	581	593	78	103	16	16	59	S	192	680	-3	651	650
78	103	17	31	34	S	76	637	76	640	634	78	104	23	44	30	N	215	594	215	598	-4	576	581	78	103	17	31	34	S	76	637	76	640	634
78	103	18	8	17	N	75	662	-22	649	634	78	104	24	30	1	N	217	620	217	624	-10	565	570	78	103	18	8	17	N	75	662	-22	649	634
78	103	19	10	22	S	204	660	0	641	642	78	104	25	30	1	N	219	657	219	661	2	593	603	78	103	19	10	22	S	204	660	0	641	642
78	103	20	10	58	S	184	681	-1	641	643	78	104	26	30	1	N	220	657	220	661	2	593	603	78	103	20	10	58	S	184	681	-1	641	643
78	103	21	11	35	S	86	654	-31	635	610	78	104	27	30	1	N	221	657	221	661	2	593	603	78	103	21	11	35	S	86	654	-31	635	610
78	103	22	11	48	S	68	657	-14	651	635	78	104	28	30	1	N	222	657	222	661	2	593	603	78	103	22	11	48	S	68	657	-14	651	635
78	103	23	12	4	N	208	650	2	628	633	78	104	29	30	1	N	223	657	223	661	2	593	603	78	103	23	12	4	N	208	650	2	628	633
78	103	24	12	39	S	175	665	172	685	635	78	104	30	30	1	N	224	657	224	661	2	593	603	78	103	24	12	39	S	175	665	172	685	635
78	103	25	12	53	S	95	638	35	639	615	78	104	31	30	1	N	225	657	225	661	2	593	603	78	103	25	12	53	S	95	638	35	639	615
78	103	26	13	30	N	61	624	60	632	615	78	104	32	30	1	N	226	657	226	661	2	593	603	78	103	26	13	30	N	61	624	60	632	615
78	103	27	13	46	N	210	635	3	621	637	78	104	33	30	1	N	227	657	227	661	2	593	603	78	103	27	13	46	N	210	635	3	621	637
78	103	28	14	22	S	168	653	164	671	607	78	104	34	30	1	N	228	657	228	661	2	593	603	78	103	28	14	22	S	168	653	164	671	607
78	103	29	14	32	S	112	670	8	627	695	78	104	35	30	1	N	229	657	229	661	2	593	603	78	103	29	14	32	S	112	670	8	627	695
78	103	30	15	12	N	57	592	55	611	615	78	104	36	30	1	N	230	657	230	661	2	593	603	78	103	30	15	12	N	57	592	55	611	615
78	103	31	15	29	N	211	619	211	617	607	78	104	37	30	1	N	231	657	231	661	2	593	603	78	103	31	15	29	N	211	619	211	617	607
78	103	32	16	55	N	212	510	54	592	595	78	104	38	30	1	N	232	657	232	661	2	593	603	78	103	32	16	55	N	212	510	54	592	595
78	103	33	17	11	N	58	570	56	597	600	78	104	39	30	1	N	233	657	233	661	2	593	603	78	103	33	17	11	N	58	570	56	597	600
78	103	34	18	37	N	192	589	209	579	585	78	104	40	30	1	N	234	657	234	661	2	593	603	78	103	34	18	37	N	192	589	209	579	585
78	104	0	35	29	S	193	563	192	589	585	78	104	41	30	1	N	235	657	235	661	2	593	603	78	103	35	29	S	193	563	192	589	585	
78	104	1	24	29	S	79	544	79	579	572	78	104	42	30	1	N	236	657	236	661	2	593	603	78	103	36	29	S	79	544	79	579	572	
78	104	2	24	29	N	66	560	66	561	563	78	104	43	30	1	N	237	657	237	661	2	593	603	78	103	37	29	N	66	560	66	561	563	
78	104	3	45	38	N	200	566	200	563	563	78	104	44	30	1	N	238	657	238	661	2	593	603	78	103	38	29	N	200	566	200	563	563	
78	104	4	16	16	S	198	573	198	570	570	78	104	45	30	1	N	239	657	239	661	2	593	603	78	103	39	29	N	198	573	198	570	570	
78	104	5	35	18	S	73	602	74	584	585	78	104	46	30	1	N	240	657	240	661	2	593	603	78	103	40	29	N	73	602	74	584	585	
78	104	6	6	14	N	67	585	68	577	574	78	104	47	30	1	N	241	657	241	661	2	593	603	78	103	41	29	N	67	585	68	577	574	
78	104	7	25	40	N	155	585	155	609	609	78	104	48	30	1	N	242	657	242	661	2	593	603	78	103	42	29	N	155	585	155	609	609	
78																																		

YR	DA	HDDK	HR	MIN	SEC	PO	HDDK	LT	LAT	COOK	LT	LAT	DLAT	MIDNIGHT	YR	DA	HDDK	HR	MIN	SEC	PO	HDDK	LT	LAT	COOK	LT	LAT	DLAT	MIDNIGHT									
78	107	23	49	0	N	223	635	224	632	7	925	698	78	109	23	49	0	N	223	635	224	632	7	925	698	78	109	23	49	0	N	223	635	224	632	7	925	698
78	107	23	43	0	S	183	682	131	712	50	642	573	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	107	23	43	0	S	88	681	90	714	33	665	716	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	0	19	48	N	53	697	58	689	19	658	672	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	0	33	5	S	212	688	194	679	12	634	652	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	1	11	5	S	194	667	194	679	12	634	652	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	1	24	19	S	78	690	79	709	19	674	675	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	2	0	31	N	63	678	64	677	5	654	658	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	2	14	52	N	202	672	202	677	5	654	658	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	2	50	18	S	200	620	72	641	13	626	635	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	3	6	24	S	71	671	72	641	13	626	635	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	3	38	40	N	69	573	69	582	13	626	635	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	3	57	19	N	194	606	195	616	10	567	596	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	4	29	19	S	201	593	201	599	3	571	587	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	4	48	27	S	71	586	71	590	4	565	580	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	5	20	18	N	72	594	72	594	0	575	585	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	5	36	30	N	193	639	193	639	0	604	617	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	6	10	30	S	202	635	202	636	0	614	621	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	6	27	9	S	69	624	69	626	2	615	627	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	7	2	0	N	75	628	75	631	-17	612	623	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	7	16	10	N	195	661	195	667	6	629	642	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	7	50	44	S	138	641	138	641	12	607	623	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	8	7	37	S	71	610	71	614	4	592	606	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	8	42	29	N	77	633	77	633	7	617	634	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	8	56	35	N	199	670	199	674	4	640	648	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	9	32	15	S	192	675	192	677	2	645	650	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	9	47	10	S	77	629	78	629	10	613	622	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	10	37	39	N	205	670	205	671	1	532	542	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	11	12	4	S	210	674	210	674	0	665	670	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	12	18	55	N	169	698	169	700	2	649	649	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	13	8	6	S	98	649	99	658	9	622	641	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	13	45	45	N	59	627	59	627	10	622	642	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	14	0	50	N	214	659	212	646	-23	659	634	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	14	39	45	S	217	668	217	668	0	658	655	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	15	42	35	N	50	636	50	641	5	632	646	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	17	13	0	N	218	661	219	665	4	650	652	78	109	23	38	28	N	196	653	156	573	20	620	647	78	109	23	38	28	N	196	653	156	573	20	620	647
78	108	17	24	39	N	54	627	55	626	-1	622	631	78	109	23	38	28	N	196	653	156																	

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YR	DA	HDDK	HR	MIN	SEC	PO	HDDK		COOK		OLAT	LATH, LANC	YR	DA	HDDK	HR	MIN	SEC	PO	HDDK		COOK		OLAT	LATH, LANC	YR	DA	HDDK	HR	MIN	SEC	PO	HDDK		COOK		OLAT	LATH, LANC																	
							LT	LAT	LT	LAT										LT	LAT	LT	LAT										LT	LAT	LT	LAT			LT	LAT	LT	LAT													
78	120	22	13	48	N	65	599	65	599	0	588	538	78	122	78	122	2	59	23	N	197	547	27	524	563	78	120	22	13	48	N	65	599	65	599	0	588	538	78	122	78	122	2	59	23	N	197	547	27	524	563				
78	120	22	30	59	N	216	597	216	597	-1	579	587	78	122	78	122	3	21	32	N	197	558	16	495	545	78	120	23	7	54	S	186	612	186	612	3	559	581	78	122	78	122	4	10	59	S	201	577	4	550	571				
78	120	23	7	54	S	186	612	186	612	3	559	581	78	122	78	122	4	10	59	S	201	577	4	550	571	78	120	23	25	0	S	86	574	86	574	4	10	59	S	201	577	4	550	571											
78	120	23	25	0	S	86	574	86	574	4	10	59	78	122	78	122	4	10	59	S	201	577	4	550	571	78	120	23	25	0	S	86	574	86	574	4	10	59	S	201	577	4	550	571											
78	121	0	13	59	S	212	603	212	603	13	592	612	78	122	78	122	6	41	29	N	194	572	36	549	597	78	121	0	13	59	S	212	603	212	603	13	592	612	78	122	78	122	6	41	29	N	194	572	36	549	597				
78	121	0	49	0	S	195	820	195	820	25	622	622	78	122	78	122	6	41	29	N	194	572	36	549	597	78	121	0	49	0	S	195	820	195	820	25	622	622	78	122	78	122	6	41	29	N	194	572	36	549	597				
78	121	0	49	0	S	195	820	195	820	25	622	622	78	122	78	122	6	41	29	N	194	572	36	549	597	78	121	0	49	0	S	195	820	195	820	25	622	622	78	122	78	122	6	41	29	N	194	572	36	549	597				
78	121	1	37	29	N	67	620	67	620	27	610	650	78	122	78	122	7	10	29	S	193	548	7	502	542	78	121	1	37	29	N	67	620	67	620	27	610	650	78	122	78	122	7	10	29	S	193	548	7	502	542				
78	121	1	37	29	N	67	620	67	620	27	610	650	78	122	78	122	7	10	29	S	193	548	7	502	542	78	121	1	37	29	N	67	620	67	620	27	610	650	78	122	78	122	7	10	29	S	193	548	7	502	542				
78	121	1	56	1	N	203	610	204	640	30	586	624	78	122	78	122	8	1	47	N	197	538	12	501	524	78	121	1	56	1	N	203	610	204	640	30	586	624	78	122	78	122	8	1	47	N	197	538	12	501	524				
78	121	2	40	5	S	201	638	201	641	3	617	625	78	122	78	122	8	22	30	S	195	553	15	450	540	78	121	2	40	5	S	201	638	201	641	3	617	625	78	122	78	122	8	22	30	S	195	553	15	450	540				
78	121	2	40	5	S	201	638	201	641	3	617	625	78	122	78	122	8	22	30	S	195	553	15	450	540	78	121	2	40	5	S	201	638	201	641	3	617	625	78	122	78	122	8	22	30	S	195	553	15	450	540				
78	121	3	18	45	N	69	613	68	656	43	603	660	78	122	78	122	9	42	4	N	201	542	11	512	546	78	121	3	18	45	N	69	613	68	656	43	603	660	78	122	78	122	9	42	4	N	201	542	11	512	546				
78	121	3	18	45	N	69	613	68	656	43	603	660	78	122	78	122	9	42	4	N	201	542	11	512	546	78	121	3	18	45	N	69	613	68	656	43	603	660	78	122	78	122	9	42	4	N	201	542	11	512	546				
78	121	4	9	20	S	203	613	203	616	3	569	603	78	122	78	122	10	32	15	S	190	563	191	562	-1	519	548	78	121	4	9	20	S	203	613	203	616	3	569	603	78	122	78	122	10	32	15	S	190	563	191	562	-1	519	548
78	121	4	9	20	S	203	613	203	616	3	569	603	78	122	78	122	10	32	15	S	190	563	191	562	-1	519	548	78	121	4	9	20	S	203	613	203	616	3	569	603	78	122	78	122	10	32	15	S	190	563	191	562	-1	519	548
78	121	4	27	59	N	72	580	72	586	6	560	576	78	122	78	122	11	23	41	N	73	580	202	546	546	78	121	4	27	59	N	72	580	72	586	6	560	576	78	122	78	122	11	23	41	N	73	580	202	546	546				
78	121	4	27	59	N	72	580	72	586	6	560	576	78	122	78	122	11	23	41	N	73	580	202	546	546	78	121	4	27	59	N	72	580	72	586	6	560	576	78	122	78	122	11	23	41	N	73	580	202	546	546				
78	121	5	16	45	N	194	609	194	608	-1	571	589	78	122	78	122	11	44	50	N	185	569	185	569	2	508	539	78	121	5	16	45	N	194	609	194	608	-1	571	589	78	122	78	122	11	44	50	N	185	569	185	569	2	508	539
78	121	5	16	45	N	194	609	194	608	-1	571	589	78	122	78	122	11	44	50	N	185	569	185	569	2	508	539	78	121	5	16	45	N	194	609	194	608	-1	571	589	78	122	78	122	11	44	50	N	185	569	185	569	2	508	539
78	121	6	8	12	S	71	580	71	589	9	560	579	78	122	78	122	12	32	2	S	90	593	90	599	6	553	561	78	121	6	8	12	S	71	580	71	589	9	560	579	78	122	78	122	12	32	2	S	90	593	90	599	6	553	561
78	121	6	8	12	S	71	580	71	589	9	560	579	78	122	78	122	12	32	2	S	90	593	90	599	6	553	561	78	121	6	8	12	S	71	580	71	589	9	560	579	78	122	78	122	12	32	2	S	90	593	90	599	6	553	561
78	121	6	39	58	N	75	583	75	603	18	565	594	78	122	78	122	13	4	30	N	206	562	207	577	15	533	552	78	121	6	39	58	N	75	583	75	603	18	565	594	78	122	78	122	13	4	30	N	206	562	207	577	15	533	552
78	121	6	39	58	N	75	583	75	603	18	565	594	78	122	78	122	13	4	30	N	206	562	207	577	15	533	552	78	121	6	39	58	N	75	583	75	603	18	565	594	78	122	78	122	13	4	30	N	206	562	207	577	15	533	552
78	121	6	57	45	S	198	582	198	589	7	540	572	78	122	78	122	13	26	28	S	176	618	175	622	4	531	558	78	121	6	57	45	S	198	582	198	589	7	540	572	78	122	78	122	13	26	28	S	176	618	175	622	4	531	558
78	121	7	28	25	N	203	603	203	610	1	585	597	78	122	78	122	14	15	19	S	96	542	98	572	28	493	524	78	121	7	28	25	N	203	603	203	610	1	585	597	78	122	78	122	14	15	19	S	96	542	98	572	28	493	524
78	121	10	18	39	N	187	634	187	642	8	585	607	78	122	78	122	14	47	40	N	61	557	60	584	27	542	581	78	121	10	18	39	N	187	634	187	642	8	585	607	78	122	78	122	14	47	40	N	61	557	60	584	27	542	581
78	121	10	18	39	N	187	634	187	642	8	585	607	78	122	78	122	14	47	40	N	61	557	60	584	27	542	581	78	121	10	18	39	N	187	634	187	642	8	585	607	78	122	78	122	14	47	40	N	61	557	60	584	27	542	581
78	121	11	8	46	S	82	577	82	602	25	550	586	78	122	78	122	15	41	30	S	101	546	171	615	5	544	566	78	121	11	8	46	S	82	577	82	602	25	550	586	78	122	78	122	15	41	30	S	101	546	171	615	5	544	566
78	121	11	40	58	N	71	585	71	592	7	565	582	78	122	78	122	15	41	30	S	101	546	171	615	5	544	566	78	121	11	40	58	N	71	585	71	592	7	565	582	78	122	78	122	15	41	30	S	101	546	171	615	5	544	566
78	121	12	0	0	N	207	615	207	620	5	591	606	78	122	78	122	15	49	17	N	5																																		

YR	DA	HR	MM	SEC	PO	HDOX	LT	LAT	CDOX	DLAT	MIDNIGHT	LATH	LATC
78	132	0	27	49	N	212	603	212	617	12	588	607	78 133
78	132	1	2	14	S	197	616	197	616	11	572	586	78 133
78	132	1	15	45	S	81	588	82	588	10	572	586	78 133
78	132	1	49	19	N	69	619	69	619	45	553	619	78 133
78	132	2	5	38	N	203	604	203	606	2	579	594	78 133
78	132	2	42	0	S	202	595	202	601	6	570	589	78 133
78	132	2	59	21	S	75	629	75	629	7	612	629	78 133
78	132	3	32	58	N	70	640	70	647	7	625	642	78 133
78	132	3	49	59	N	197	609	197	608	-1	571	589	78 133
78	132	4	22	19	S	203	603	203	602	-1	578	590	78 133
78	132	4	39	47	S	71	621	71	624	3	604	617	78 133
78	132	5	14	40	N	72	659	72	652	-1	645	653	78 133
78	132	5	30	14	N	194	604	194	606	2	565	587	78 133
78	132	6	2	14	S	201	600	201	599	-1	575	587	78 133
78	132	6	20	59	S	70	591	70	591	3	572	620	78 133
78	132	6	54	23	N	75	624	75	627	3	608	620	78 133
78	132	7	10	39	N	195	596	195	615	17	558	595	78 133
78	132	7	42	46	S	198	615	198	622	7	577	602	78 133
78	132	8	0	30	S	71	603	71	610	7	585	602	78 133
78	132	8	35	48	N	77	661	77	661	-36	648	618	78 133
78	132	8	51	5	N	199	605	199	618	13	566	598	78 133
78	132	9	23	23	S	193	619	193	619	0	582	599	78 133
78	132	9	39	13	S	77	644	77	644	-12	629	625	78 133
78	132	10	16	11	N	75	667	75	667	62	622	622	78 133
78	132	10	31	21	N	204	634	204	634	619	619	619	78 133
78	132	11	6	12	S	184	680	184	680	3	636	643	78 133
78	132	11	19	3	S	88	667	88	667	-31	649	625	78 133
78	132	11	57	13	N	67	675	67	675	-34	670	643	78 133
78	132	12	11	59	N	209	660	209	663	3	641	645	78 133
78	132	12	48	32	S	174	676	174	674	-2	623	621	78 133
78	132	13	0	14	S	99	659	98	655	-4	634	627	78 133
78	132	13	37	0	N	63	600	63	596	-4	589	594	78 133
78	132	13	55	0	N	210	625	211	626	1	610	615	78 133
78	132	14	41	46	S	110	651	110	651	601	601	601	78 133
78	132	15	20	42	N	57	610	57	610	614	614	614	78 133
78	132	15	35	45	N	215	651	217	661	10	639	649	78 133
78	132	17	4	26	N	54	617	54	616	-1	610	620	78 133
78	132	17	18	44	N	215	617	217	640	23	601	626	78 133
78	132	18	45	19	N	61	563	60	586	25	548	586	78 133
78	132	19	1	22	N	217	598	219	617	19	580	607	78 133
78	132	20	26	58	N	65	552	63	588	36	536	566	78 133
78	132	20	43	49	N	218	500	219	610	10	592	600	78 133
78	132	22	9	58	N	66	599	65	605	6	558	604	78 133
78	132	22	26	41	N	213	509	220	629	20	592	618	78 133
78	132	23	5	46	S	184	662	184	665	3	619	629	78 133
78	132	23	51	41	N	91	645	90	621	-25	619	591	78 133
78	132	23	51	41	N	214	614	215	625	11	598	615	78 133
78	132	23	51	41	N	196	622	196	625	-2	585	600	78 133
78	133	1	3	21	S	82	559	83	613	54	530	559	78 133
78	133	1	31	24	N	71	555	70	592	37	543	582	78 133
78	133	1	52	30	N	205	603	205	618	15	578	604	78 133
78	133	2	25	41	S	202	619	202	617	-1	595	603	78 133
78	133	2	43	58	S	77	573	76	611	38	552	552	78 133

YR DA		HCDK		HDCX		CDDK		MIDNIGHT		MIDNIGHT	
YR	DA	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT
78	135	15	0 42	215	664	217	672	64	681	64	681
78	134	16	42 45	218	656	218	656	215	681	215	681
78	134	18	11 51	219	632	219	632	199	683	199	683
78	134	18	25 29	219	632	219	632	199	683	199	683
78	134	19	53 58	219	632	219	632	199	683	199	683
78	134	20	8 37	219	632	219	632	199	683	199	683
78	134	21	35 16	219	632	219	632	199	683	199	683
78	134	22	35 16	219	632	219	632	199	683	199	683
78	134	23	35 16	219	632	219	632	199	683	199	683
78	135	0	12 29	219	632	219	632	199	683	199	683
78	135	0	26 30	219	632	219	632	199	683	199	683
78	135	1	0 12	219	632	219	632	199	683	199	683
78	135	1	16 21	219	632	219	632	199	683	199	683
78	135	2	7 59	219	632	219	632	199	683	199	683
78	135	2	42 28	219	632	219	632	199	683	199	683
78	135	3	33 39	219	632	219	632	199	683	199	683
78	135	3	47 42	219	632	219	632	199	683	199	683
78	135	4	23 36	219	632	219	632	199	683	199	683
78	135	5	13 36	219	632	219	632	199	683	199	683
78	135	5	27 22	219	632	219	632	199	683	199	683
78	135	6	17 10	219	632	219	632	199	683	199	683
78	135	6	55 44	219	632	219	632	199	683	199	683
78	135	7	6 18	219	632	219	632	199	683	199	683
78	135	7	45 58	219	632	219	632	199	683	199	683
78	135	8	34 0	219	632	219	632	199	683	199	683
78	135	8	46 7	219	632	219	632	199	683	199	683
78	135	9	38 47	219	632	219	632	199	683	199	683
78	135	10	14 9	219	632	219	632	199	683	199	683
78	135	10	27 4	219	632	219	632	199	683	199	683
78	135	11	6 0	219	632	219	632	199	683	199	683
78	135	11	20 0	219	632	219	632	199	683	199	683
78	135	11	57 18	219	632	219	632	199	683	199	683
78	135	12	8 1	219	632	219	632	199	683	199	683
78	135	12	46 59	219	632	219	632	199	683	199	683
78	135	13	1 25	219	632	219	632	199	683	199	683
78	135	14	28 57	219	632	219	632	199	683	199	683
78	135	14	42 15	219	632	219	632	199	683	199	683
78	135	16	24 59	219	632	219	632	199	683	199	683
78	135	17	55 51	219	632	219	632	199	683	199	683
78	135	18	7 13	219	632	219	632	199	683	199	683
78	135	19	38 13	219	632	219	632	199	683	199	683
78	135	19	49 25	219	632	219	632	199	683	199	683
78	135	21	20 30	219	632	219	632	199	683	199	683
78	135	21	31 59	219	632	219	632	199	683	199	683
78	135	22	16 14	219	632	219	632	199	683	199	683
78	135	22	26 16	219	632	219	632	199	683	199	683
78	135	23	2 13	219	632	219	632	199	683	199	683
78	135	23	14 39	219	632	219	632	199	683	199	683
78	135	23	56 16	219	632	219	632	199	683	199	683
78	136	0	8 20	219	632	219	632	199	683	199	683

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YR	DA	HDDK	HR	MIN	SEC	PO	HDDK	CCD	DLAT	MIDNIGHT	YR	CA	HR	MIN	SEC	PO	HDDK	CCD	DLAT	MIDNIGHT	YR	CA	HR	MIN	SEC	PO	HDDK	CCD	DLAT	MIDNIGHT															
78 151	13 29 52	N	213	574	214	676	2	665	663	78 153	3 40 57	S	72	674	72	668	-6	662	664	78 151	14 17 53	N	213	574	214	676	2	665	663	78 153	3 40 57	S	72	674	72	668	-6	662	664						
78 151	14 17 53	N	213	574	214	676	2	665	663	78 153	4 18 0	N	196	684	196	684	-3	673	678	78 151	15 12 0	N	217	664	218	675	1	654	662	78 153	4 18 0	N	196	684	196	684	-3	673	678						
78 151	15 12 0	N	217	664	218	675	1	654	662	78 153	5 21 29	S	68	657	68	652	0	655	655	78 151	16 12 0	N	217	664	218	675	1	654	662	78 153	5 21 29	S	68	657	68	652	0	655	655						
78 151	16 12 0	N	217	664	218	675	1	654	662	78 153	6 33 46	S	9 33 46	10 7 36	S	190	650	2	616	628	78 151	17 12 0	N	217	664	218	675	1	654	662	78 153	6 33 46	S	9 33 46	10 7 36	S	190	650	2	616	628				
78 152	0 24 35	S	88	698	87	654	-44	684	645	78 153	10 7 36	S	190	650	2	616	628	78 152	0 35 54	S	88	698	87	654	-44	684	645	78 153	10 7 36	S	190	650	2	616	628	78 152	0 35 54	S	88	698	87	654	-44	684	645
78 152	0 35 54	S	88	698	87	654	-44	684	645	78 153	10 7 36	S	190	650	2	616	628	78 152	1 12 38	N	213	588	202	690	0	678	688	78 153	10 7 36	S	190	650	2	616	628	78 152	1 12 38	N	213	588	202	690	0	678	688
78 152	1 12 38	N	213	588	202	690	0	678	688	78 153	10 7 36	S	190	650	2	616	628	78 152	1 23 29	N	213	588	202	690	0	678	688	78 153	10 7 36	S	190	650	2	616	628	78 152	1 23 29	N	213	588	202	690	0	678	688
78 152	1 23 29	N	213	588	202	690	0	678	688	78 153	10 7 36	S	190	650	2	616	628	78 152	2 4 46	S	202	620	78 691	0	674	669	78 153	10 7 36	S	190	650	2	616	628	78 152	2 4 46	S	202	620	78 691	0	674	669		
78 152	2 4 46	S	202	620	78 691	0	674	669	78 153	10 7 36	S	190	650	2	616	628	78 152	2 17 12	S	78	691	0	674	669	78 153	10 7 36	S	190	650	2	616	628	78 152	2 17 12	S	78	691	0	674	669					
78 152	2 17 12	S	78	691	0	674	669	78 153	10 7 36	S	190	650	2	616	628	78 152	2 53 45	N	69	675	69	680	5	670	686	78 153	10 7 36	S	190	650	2	616	628	78 152	2 53 45	N	69	675	69	680	5	670	686		
78 152	2 53 45	N	69	675	69	680	5	670	686	78 153	10 7 36	S	190	650	2	616	628	78 152	3 7 58	N	202	680	202	682	2	663	662	78 153	10 7 36	S	190	650	2	616	628	78 152	3 7 58	N	202	680	202	682	2	663	662
78 152	3 7 58	N	202	680	202	682	2	663	662	78 153	10 7 36	S	190	650	2	616	628	78 152	3 43 47	S	205	650	205	652	-2	630	635	78 153	10 7 36	S	190	650	2	616	628	78 152	3 43 47	S	205	650	205	652	-2	630	635
78 152	3 43 47	S	205	650	205	652	-2	630	635	78 153	10 7 36	S	190	650	2	616	628	78 152	3 57 58	S	71	673	72	644	-29	661	638	78 153	10 7 36	S	190	650	2	616	628	78 152	3 57 58	S	71	673	72	644	-29	661	638
78 152	3 57 58	S	71	673	72	644	-29	661	638	78 153	10 7 36	S	190	650	2	616	628	78 152	4 33 48	N	71	640	71	649	9	625	644	78 153	10 7 36	S	190	650	2	616	628	78 152	4 33 48	N	71	640	71	649	9	625	644
78 152	4 33 48	N	71	640	71	649	9	625	644	78 153	10 7 36	S	190	650	2	616	628	78 152	4 49 6	N	195	650	195	661	11	617	636	78 153	10 7 36	S	190	650	2	616	628	78 152	4 49 6	N	195	650	195	661	11	617	636
78 152	4 49 6	N	195	650	195	661	11	617	636	78 153	10 7 36	S	190	650	2	616	628	78 152	5 23 20	S	203	635	204	653	18	613	635	78 153	10 7 36	S	190	650	2	616	628	78 152	5 23 20	S	203	635	204	653	18	613	635
78 152	5 23 20	S	203	635	204	653	18	613	635	78 153	10 7 36	S	190	650	2	616	628	78 152	5 39 58	S	70	616	69	627	11	599	628	78 153	10 7 36	S	190	650	2	616	628	78 152	5 39 58	S	70	616	69	627	11	599	628
78 152	5 39 58	S	70	616	69	627	11	599	628	78 153	10 7 36	S	190	650	2	616	628	78 152	7 4 8	S	201	663	201	669	-4	644	641	78 153	10 7 36	S	190	650	2	616	628	78 152	7 4 8	S	201	663	201	669	-4	644	641
78 152	7 4 8	S	201	663	201	669	-4	644	641	78 153	10 7 36	S	190	650	2	616	628	78 152	7 19 20	S	69	633	70	622	-5	625	621	78 153	10 7 36	S	190	650	2	616	628	78 152	7 19 20	S	69	633	70	622	-5	625	621
78 152	7 19 20	S	69	633	70	622	-5	625	621	78 153	10 7 36	S	190	650	2	616	628	78 152	7 55 43	N	79	658	76	654	-4	644	649	78 153	10 7 36	S	190	650	2	616	628	78 152	7 55 43	N	79	658	76	654	-4	644	649
78 152	7 55 43	N	79	658	76	654	-4	644	649	78 153	10 7 36	S	190	650	2	616	628	78 152	8 9 19	N	197	663	197	666	3	632	624	78 153	10 7 36	S	190	650	2	616	628	78 152	8 9 19	N	197	663	197	666	3	632	624
78 152	8 9 19	N	197	663	197	666	3	632	624	78 153	10 7 36	S	190	650	2	616	628	78 152	8 44 19	S	74	629	74	625	-2	629	624	78 153	10 7 36	S	190	650	2	616	628	78 152	8 44 19	S	74	629	74	625	-2	629	624
78 152	8 44 19	S	74	629	74	625	-2	629	624	78 153	10 7 36	S	190	650	2	616	628	78 152	8 59 32	S	196	651	196	653	-4	613	618	78 153	10 7 36	S	190	650	2	616	628	78 152	8 59 32	S	196	651	196	653	-4	613	618
78 152	8 59 32	S	196	651	196	653	-4	613	618	78 153	10 7 36	S	190	650	2	616	628	78 152	9 35 40	N	76	649	76	638	-11	635	632	78 153	10 7 36	S	190	650	2	616	628	78 152	9 35 40	N	76	649	76	638	-11	635	632
78 152	9 35 40	N	76	649	76	638	-11	635	632	78 153	10 7 36	S	190	650	2	616	628	78 152	9 50 41	N	202	646	202	654	6	625	637	78 153	10 7 36	S	190	650	2	616	628	78 152	9 50 41	N	202	646	202	654	6	625	637
78 152	9 50 41	N	202	646	202	654	6	625	637	78 153	10 7 36	S	190	650	2	616	628	78 152	10 25 40	N	188	679	188	680	1	539	643	78 153	10 7 36	S	190	650	2	616	628	78 152	10 25 40	N	188	679	188	680	1	539	643
78 152	10 25 40	N	188	679	188	680	1	539	643	78 153	10 7 36	S	190	650	2	616	628	78 152	10 39 23	S	82	647	82	647	23	617	651	78 153	10 7 36	S	190	650	2	616	628	78 152	10 39 23	S	82	647	82	647	23	617	651
78 152	10 39 23	S	82	647	82	647	23	617	651	78 153	10 7 36	S	190	650	2	616	628	78 152	11 15 30	N	72	633	72	656	23	617	651	78 153	10 7 36	S	190	650	2	616	628	78 152	11 15 30	N	72	633	72	656	23	617	651
78 152	11 15 30	N	72	633	72	656	23	617	651	78 153	10 7 36	S	190	650	2	616	628	78 152	11 31 30	N	207	660	207	670	10	641	651	78 153	10 7 36	S	190	650	2	616	628	78 152	11 31 30	N	207	660	207	670	10	641	651
78 152	11 31 30	N	207	660	207	670	10	641	651	78 153	10 7 36	S	190	650	2	616	628	78 152	12 7 59	S	176	694	176	695	2	651	649	78 153	10 7 36	S	190	650	2	616	628	78 152	12 7 59	S	176	694	176	695	2	651	649
78 152	12 7 59	S	176	694	176	695	2	651	649	78 153	10 7 36	S	190	650	2	616	628	78 152	12 20 7	S	92	649	92	649	0	622	636	78 153	10 7 36	S	190	650	2	616	628	78 152	12 20 7	S	92	649	92	649	0	622	636
78 152	12 20 7	S	92	649	92	649	0	622	636	78 153	10 7 36	S	190	650	2	616	628	78 152	12 55 45	N	85	625	85	625	8	616	635	78 153	10 7 36	S	190	650	2	616	628	78 152	12 55 45	N	85	625	85	625	8	616	635
78 152	12 55 45	N	85	625	85	625	8	616	635	78 153	10 7 36	S	190	650	2	616	628	78 1																											

YR	DA	HR	MIN	SEC	PO	HDDK	LT	LAT	COCK	DLAT	MIDNIGHT	LT	LAT	COCK	DLAT	MIDNIGHT	
78	154	15	9	16	S	65	674	109	624	-47	590	65	674	109	624	3	594
78	155	0	20	35	N	217	665	413	669	4	655	217	665	413	669	4	632
78	155	0	35	1	S	198	674	198	675	-36	653	198	674	198	675	4	602
78	155	1	12	59	S	83	670	83	674	-36	653	83	670	83	674	11	634
78	155	2	2	19	N	67	682	206	662	-21	673	67	682	206	662	21	623
78	155	2	17	0	N	205	666	204	642	-4	647	205	666	204	642	-33	639
78	155	3	7	25	S	75	656	75	650	-6	642	75	656	75	650	22	635
78	155	5	22	39	N	72	619	72	621	15	602	72	619	72	621	9	627
78	155	5	38	24	N	194	641	193	655	15	607	194	641	193	655	2	657
78	155	10	24	20	N	75	635	75	623	-12	619	75	635	75	623	3	622
78	155	10	40	54	S	203	626	204	641	15	604	203	626	204	641	4	615
78	155	11	14	44	S	184	657	184	659	2	613	184	657	184	659	-21	735
78	155	11	29	0	S	86	638	86	638	0	617	86	638	86	638	0	634
78	155	12	4	21	N	69	612	69	618	6	602	69	612	69	618	5	611
78	155	12	22	25	N	207	628	208	632	4	506	207	628	208	632	-2	599
78	155	12	56	35	S	177	643	176	651	6	574	177	643	176	651	0	601
78	155	13	11	32	S	93	594	93	594	29	554	93	594	93	594	2	637
78	155	15	29	28	N	58	556	56	622	26	597	58	556	56	622	16	635
78	155	22	18	9	N	69	569	69	562	13	605	69	569	69	562	3	637
78	155	22	36	42	N	219	592	215	593	-7	585	219	592	215	593	-14	635
78	155	23	12	24	N	189	598	189	594	6	533	189	598	189	594	3	639
78	155	23	31	20	S	97	531	88	591	30	499	97	531	88	591	-2	645
78	155	0	1	18	N	69	620	71	580	-40	610	69	620	71	580	-17	653
78	156	0	20	29	S	192	593	193	592	-7	559	192	593	193	592	16	635
78	156	0	53	38	S	84	587	84	576	29	561	84	587	84	576	-1	668
78	156	1	11	31	S	72	584	72	573	19	532	72	584	72	573	-5	649
78	156	3	43	0	N	199	581	198	585	4	539	199	581	198	585	10	623
78	156	4	13	31	S	203	576	203	576	0	549	203	576	203	576	0	626
78	156	5	4	7	N	72	573	72	574	1	552	72	573	72	574	-12	635
78	156	5	23	11	N	194	579	194	596	17	537	194	579	194	596	3	618
78	156	5	53	20	S	200	568	201	574	6	540	200	568	201	574	1	635
78	156	6	13	30	N	71	576	70	598	22	556	71	576	70	598	-19	616
78	156	6	45	26	N	75	590	75	595	5	571	75	590	75	595	8	580
78	156	7	3	39	N	194	569	194	608	39	525	194	569	194	608	88	628
78	156	7	34	3	S	198	589	198	592	0	548	198	589	198	592	2	628
78	156	7	52	40	S	71	593	71	591	-2	574	71	593	71	591	15	637
78	156	8	26	15	N	77	603	77	614	11	585	77	603	77	614	3	625
78	156	8	43	59	N	198	578	198	596	18	535	198	578	198	596	2	637
78	156	9	14	43	S	194	597	194	599	2	557	194	597	194	599	3	625
78	156	9	33	29	S	75	576	75	566	20	556	75	576	75	566	2	637
78	156	10	5	22	N	76	570	76	598	28	545	76	570	76	598	2	637
78	156	10	24	30	N	202	599	202	607	8	574	202	599	202	607	9	592
78	156	10	56	17	S	188	616	197	622	6	564	188	616	197	622	25	610
78	156	11	13	57	S	81	574	83	605	31	546	81	574	83	605	1	545
78	156	11	46	23	N	71	589	71	607	18	570	71	589	71	607	14	612
78	156	12	5	18	N	207	622	207	628	6	559	207	622	207	628	26	556
78	156	12	39	29	S	177	656	177	660	4	591	177	656	177	660	32	575
78	156	12	53	29	S	92	617	93	619	2	582	92	617	93	619	31	546
78	156	13	29	14	N	63	615	62	635	20	605	63	615	62	635	4	593

YR	DA	HDDK	HR	MIN	SEC	PO	HDDK	LT	LAT	CDOK	DLAT	MIDNIGHT	DLAT	LAT	LATC
78 158	23	26	22	N	219	621	220	627	6	605	618	6	605	618	618
78 158	0	3	45	S	192	650	192	649	-1	617	626	-1	617	626	626
78 159	0	18	54	S	87	614	88	623	9	591	610	9	591	610	610
78 159	0	51	36	N	69	635	68	643	8	627	646	8	627	646	646
78 159	1	8	55	N	212	634	213	648	14	620	636	14	620	636	636
78 159	2	33	23	S	201	653	201	648	-5	633	631	-5	633	631	631
78 159	2	33	23	S	81	603	81	622	19	578	609	19	578	609	609
78 159	2	50	14	N	70	643	70	638	-4	638	633	-4	638	633	633
78 159	3	23	40	S	202	635	202	638	3	613	622	3	613	622	622
78 159	3	40	35	S	204	616	204	624	8	593	610	8	593	610	610
78 159	4	13	30	S	74	620	74	620	10	603	623	10	603	623	623
78 159	4	30	30	N	71	605	71	620	15	587	612	15	587	612	612
78 159	5	3	34	S	195	636	195	646	10	601	623	10	601	623	623
78 159	5	55	35	S	203	612	203	614	2	588	601	2	588	601	601
78 159	6	10	50	N	73	641	69	639	-1	626	634	-1	626	634	634
78 159	7	2	42	S	193	638	193	631	3	592	610	3	592	610	610
78 159	7	35	29	S	201	625	201	647	21	604	631	21	604	631	631
78 159	7	50	34	N	71	617	70	610	39	550	602	39	550	602	602
78 159	8	25	6	N	76	617	76	626	9	600	619	9	600	619	619
78 159	8	29	38	S	196	650	196	677	27	617	650	27	617	650	650
78 159	9	16	44	S	197	651	197	671	12	627	645	12	627	645	645
78 159	9	31	7	S	72	651	72	636	-15	637	630	-15	637	630	630
78 159	10	6	53	N	200	658	201	667	9	638	649	9	638	649	649
78 159	10	18	9	N	189	698	189	705	7	661	667	7	661	667	667
78 159	10	57	29	N	82	707	79	636	-71	693	530	-71	693	530	530
78 159	11	12	39	N	72	689	72	675	6	656	672	6	656	672	672
78 159	11	48	58	N	205	647	205	674	27	627	655	27	627	655	655
78 159	11	59	16	S	175	711	175	719	8	678	676	8	678	676	676
78 159	12	38	59	S	94	694	90	647	-47	677	626	-47	677	626	626
78 159	12	54	7	N	63	675	62	686	11	670	692	11	670	692	692
78 159	14	21	7	N	210	651	212	683	32	639	669	32	639	669	669
78 159	14	35	12	N	57	652	56	655	3	649	661	3	649	661	661
78 159	16	3	50	N	216	668	217	677	9	658	664	9	658	664	664
78 159	16	17	39	N	54	628	55	613	-10	623	622	-10	623	622	622
78 159	17	45	49	N	217	650	217	656	16	638	644	16	638	644	644
78 159	18	0	14	N	58	594	57	612	18	585	616	18	585	616	616
78 159	19	28	0	N	219	623	219	633	5	613	622	5	613	622	622
78 159	19	42	16	N	62	586	60	615	29	573	615	29	573	615	615
78 159	21	11	11	N	222	631	222	635	4	622	624	4	622	624	624
78 159	21	24	31	N	62	629	62	625	-4	626	626	-4	626	626	626
78 159	22	7	59	N	224	643	225	654	11	636	645	11	636	645	645
78 159	22	18	4	S	170	712	171	711	-1	680	656	-1	680	656	656
78 159	22	53	42	S	98	649	98	656	-7	622	538	-7	622	538	538
78 159	23	7	12	N	63	658	63	644	-14	652	647	-14	652	647	647
78 159	23	47	38	S	224	661	225	672	21	657	664	21	657	664	664
78 159	23	58	43	S	189	683	187	705	22	643	657	22	643	657	657
78 159	0	35	18	S	93	707	91	678	-25	693	668	-25	693	668	668
78 160	0	50	41	N	66	661	67	654	-7	655	658	-7	655	658	658
78 160	1	28	20	S	215	657	218	659	32	646	675	32	646	675	675
78 160	1	41	24	S	199	685	199	700	15	657	671	15	657	671	671
78 160	3	58	24	S	82	671	82	664	-7	654	656	-7	654	656	656
78 160	3	58	24	N	70	672	70	675	3	660	672	3	660	672	672

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YR	DA	HR	MM	SEC	PO	HODX	LT	LAT	COXK	DLAT	LATH, LATIC	YR	DA	HR	MM	SEC	PO	HODX	LT	LAT	COXK	DLAT	LATH, LATIC	YR	DA	HR	MM	SEC	PO	HODX	LT	LAT	COXK	DLAT	LATH, LATIC
78	174	0	12	32	N	217	623	197	629	197	629	78	175	0	12	32	N	217	623	197	629	197	629	78	175	0	12	32	N	217	623	197	629	197	629
78	174	0	49	3	S	196	560	197	629	197	629	78	175	0	49	3	S	196	560	197	629	197	629	78	175	0	49	3	S	196	560	197	629	197	629
78	174	1	3	47	S	85	633	197	629	197	629	78	175	1	3	47	S	85	633	197	629	197	629	78	175	1	3	47	S	85	633	197	629	197	629
78	174	3	17	59	N	71	617	197	629	197	629	78	175	3	17	59	N	71	617	197	629	197	629	78	175	3	17	59	N	71	617	197	629	197	629
78	174	3	35	59	N	199	608	197	629	197	629	78	175	3	35	59	N	199	608	197	629	197	629	78	175	3	35	59	N	199	608	197	629	197	629
78	174	4	9	0	S	204	637	197	629	197	629	78	175	4	9	0	S	204	637	197	629	197	629	78	175	4	9	0	S	204	637	197	629	197	629
78	174	4	25	25	S	72	620	197	629	197	629	78	175	4	25	25	S	72	620	197	629	197	629	78	175	4	25	25	S	72	620	197	629	197	629
78	174	5	0	40	N	72	665	197	629	197	629	78	175	5	0	40	N	72	665	197	629	197	629	78	175	5	0	40	N	72	665	197	629	197	629
78	174	5	15	15	N	194	639	197	629	197	629	78	175	5	15	15	N	194	639	197	629	197	629	78	175	5	15	15	N	194	639	197	629	197	629
78	174	6	3	53	S	67	663	197	629	197	629	78	175	6	3	53	S	67	663	197	629	197	629	78	175	6	3	53	S	67	663	197	629	197	629
78	174	6	41	49	N	74	678	197	629	197	629	78	175	6	41	49	N	74	678	197	629	197	629	78	175	6	41	49	N	74	678	197	629	197	629
78	174	6	54	58	N	134	556	197	629	197	629	78	175	6	54	58	N	134	556	197	629	197	629	78	175	6	54	58	N	134	556	197	629	197	629
78	174	7	30	0	S	200	672	197	629	197	629	78	175	7	30	0	S	200	672	197	629	197	629	78	175	7	30	0	S	200	672	197	629	197	629
78	174	7	43	57	S	69	680	197	629	197	629	78	175	7	43	57	S	69	680	197	629	197	629	78	175	7	43	57	S	69	680	197	629	197	629
78	174	8	22	35	N	76	681	197	629	197	629	78	175	8	22	35	N	76	681	197	629	197	629	78	175	8	22	35	N	76	681	197	629	197	629
78	174	8	35	30	N	197	686	197	629	197	629	78	175	8	35	30	N	197	686	197	629	197	629	78	175	8	35	30	N	197	686	197	629	197	629
78	174	9	9	58	S	194	688	197	629	197	629	78	175	9	9	58	S	194	688	197	629	197	629	78	175	9	9	58	S	194	688	197	629	197	629
78	174	10	0	19	S	74	603	197	629	197	629	78	175	10	0	19	S	74	603	197	629	197	629	78	175	10	0	19	S	74	603	197	629	197	629
78	174	10	17	1	N	202	627	197	629	197	629	78	175	10	17	1	N	202	627	197	629	197	629	78	175	10	17	1	N	202	627	197	629	197	629
78	174	10	51	8	S	186	664	197	629	197	629	78	175	10	51	8	S	186	664	197	629	197	629	78	175	10	51	8	S	186	664	197	629	197	629
78	174	11	8	0	S	80	562	197	629	197	629	78	175	11	8	0	S	80	562	197	629	197	629	78	175	11	8	0	S	80	562	197	629	197	629
78	174	11	40	0	N	72	584	197	629	197	629	78	175	11	40	0	N	72	584	197	629	197	629	78	175	11	40	0	N	72	584	197	629	197	629
78	174	11	59	0	N	206	521	197	629	197	629	78	175	11	59	0	N	206	521	197	629	197	629	78	175	11	59	0	N	206	521	197	629	197	629
78	174	12	33	58	S	174	688	197	629	197	629	78	175	12	33	58	S	174	688	197	629	197	629	78	175	12	33	58	S	174	688	197	629	197	629
78	174	12	46	45	S	92	628	197	629	197	629	78	175	12	46	45	S	92	628	197	629	197	629	78	175	12	46	45	S	92	628	197	629	197	629
78	174	13	22	57	N	63	618	197	629	197	629	78	175	13	22	57	N	63	618	197	629	197	629	78	175	13	22	57	N	63	618	197	629	197	629
78	174	13	40	0	N	211	643	197	629	197	629	78	175	13	40	0	N	211	643	197	629	197	629	78	175	13	40	0	N	211	643	197	629	197	629
78	174	14	27	20	S	106	643	197	629	197	629	78	175	14	27	20	S	106	643	197	629	197	629	78	175	14	27	20	S	106	643	197	629	197	629
78	174	16	49	0	N	57	597	197	629	197	629	78	175	16	49	0	N	57	597	197	629	197	629	78	175	16	49	0	N	57	597	197	629	197	629
78	174	17	3	53	N	216	632	197	629	197	629	78	175	17	3	53	N	216	632	197	629	197	629	78	175	17	3	53	N	216	632	197	629	197	629
78	174	18	31	29	N	60	584	197	629	197	629	78	175	18	31	29	N	60	584	197	629	197	629	78	175	18	31	29	N	60	584	197	629	197	629
78	174	18	46	43	N	218	604	197	629	197	629	78	175	18	46	43	N	218	604	197	629	197	629	78	175	18	46	43	N	218	604	197	629	197	629
78	174	20	13	0	N	65	565	197	629	197	629	78	175	20	13	0	N	65	565	197	629	197	629	78	175	20	13	0	N	65	565	197	629	197	629
78	174	23	36	57	N	70	597	197	629	197	629	78	175	23	36	57	N	70	597	197	629	197	629	78	175	23	36	57	N	70	597	197	629	197	629
78	174	23	55	55	N	216	594	197	629	197	629	78	175	23	55	55	N	216	594	197	629	197	629	78	175	23	55	55	N	216	594	197	629	197	629
78	175	0	29	59	S	196	597	197	629	197	629	78	175	0	29	59	S	196	597	197	629	197	629	78	175	0	29	59	S	196	597	197	629	197	629
78	175	0	48	22	S	85	569	197	629	197	629	78	175	0	48	22	S	85	569	197	629	197	629	78	175	0	48	22	S	85	569	197	629	197	629
78	175	1	18	19	N	71	582	197	629	197	629	78	175	1	18	19	N	71	582	197	629	197	629	78	175	1	18	19	N	71	582	197	629	197	629
78	175	1	38	55	S	207	580	197	629	197	629	78	175	1	38	55	S	207	580	197	629	197	629	78	175	1	38	55	S	207	580	197	629	197	629
78	175	2	10	26	S	202	593	197	629	197	629	78	175	2	10	26	S	202	593	197	629	197	629	78	175	2	10	26	S	202	593	197	629	197	629
78	175	3	0	30	N	71	610	197	629	197	629	78	175	3	0	30	N	71	610	197	629	197	629	78	175	3	0	30	N	71	610	197	629	197	629
78	175	3	18	36	N	139	584	197	629	197	629	78	175	3	18	36	N	139	584	197	629	197	629	78	175	3	18	36	N	139	584	197	629	197	629
78	175	3	51	12	S	204	612	197	629	197	629	78	175	3	51	12	S	204	612	197	629	197	629	78	175	3	51	12	S	204	612	197	629	197	629
78	175	4	7	24	S	72	649	197	629	197	629	78	175	4	7	24	S	72	649	197	629	197	629	78	175	4	7	24	S	72	649	197	629	197	629
78	175	4	42	21	N	71	628	197	629	197	629	78	175	4	42	21	N	71	628	197	629	197	629	78	175	4	42	21	N	71	628	197	629	197	629
78	175	4	59																																

HDDK			COCK			MIDNIGHT			HDDK			COCK			MIDNIGHT		
YR	DA	HR NN SEC	PO	LT	LAT	YR	DA	HR NN SEC	PO	LT	LAT	YR	DA	HR NN SEC	PO	LT	LAT
78	185	20 27 28	N	62	611	78	185	20 27 28	N	62	611	78	185	20 27 28	N	62	611
78	185	20 42 24	N	219	595	78	185	20 42 24	N	219	595	78	185	20 42 24	N	219	595
78	185	22 9 9	N	65	616	78	185	22 9 9	N	65	616	78	185	22 9 9	N	65	616
78	185	22 25 0	N	220	509	78	185	22 25 0	N	220	509	78	185	22 25 0	N	220	509
78	185	23 2 24	S	187	616	78	185	23 2 24	S	187	616	78	185	23 2 24	S	187	616
78	185	23 19 36	S	90	536	78	185	23 19 36	S	90	536	78	185	23 19 36	S	90	536
78	185	23 48 48	N	214	580	78	185	23 48 48	N	214	580	78	185	23 48 48	N	214	580
78	186	0 9 30	N	197	599	78	186	0 9 30	N	197	599	78	186	0 9 30	N	197	599
78	186	0 42 48	S	84	519	78	186	0 42 48	S	84	519	78	186	0 42 48	S	84	519
78	186	1 29 59	N	72	554	78	186	1 29 59	N	72	554	78	186	1 29 59	N	72	554
78	186	1 51 58	N	205	573	78	186	1 51 58	N	205	573	78	186	1 51 58	N	205	573
78	186	2 22 15	S	202	564	78	186	2 22 15	S	202	564	78	186	2 22 15	S	202	564
78	186	2 42 29	S	79	567	78	186	2 42 29	S	79	567	78	186	2 42 29	S	79	567
78	186	3 11 45	N	198	560	78	186	3 11 45	N	198	560	78	186	3 11 45	N	198	560
78	186	3 33 0	N	202	543	78	186	3 33 0	N	202	543	78	186	3 33 0	N	202	543
78	186	4 1 45	S	74	548	78	186	4 1 45	S	74	548	78	186	4 1 45	S	74	548
78	186	4 23 37	S	72	545	78	186	4 23 37	S	72	545	78	186	4 23 37	S	72	545
78	186	4 52 45	N	194	531	78	186	4 52 45	N	194	531	78	186	4 52 45	N	194	531
78	186	5 14 0	S	200	548	78	186	5 14 0	S	200	548	78	186	5 14 0	S	200	548
78	186	5 42 0	S	72	533	78	186	5 42 0	S	72	533	78	186	5 42 0	S	72	533
78	186	6 4 38	N	74	571	78	186	6 4 38	N	74	571	78	186	6 4 38	N	74	571
78	186	6 34 15	N	194	555	78	186	6 34 15	N	194	555	78	186	6 34 15	N	194	555
78	186	6 53 28	N	198	529	78	186	6 53 28	N	198	529	78	186	6 53 28	N	198	529
78	186	7 21 35	S	198	523	78	186	7 21 35	S	198	523	78	186	7 21 35	S	198	523
78	186	7 45 10	S	72	523	78	186	7 45 10	S	72	523	78	186	7 45 10	S	72	523
78	186	8 14 36	N	76	553	78	186	8 14 36	N	76	553	78	186	8 14 36	N	76	553
78	186	8 33 59	N	197	556	78	186	8 33 59	N	197	556	78	186	8 33 59	N	197	556
78	186	9 3 3	S	195	567	78	186	9 3 3	S	195	567	78	186	9 3 3	S	195	567
78	186	9 24 20	S	73	538	78	186	9 24 20	S	73	538	78	186	9 24 20	S	73	538
78	186	9 55 2	N	76	570	78	186	9 55 2	N	76	570	78	186	9 55 2	N	76	570
78	186	10 13 48	N	201	598	78	186	10 13 48	N	201	598	78	186	10 13 48	N	201	598
78	186	10 45 5	S	189	608	78	186	10 45 5	S	189	608	78	186	10 45 5	S	189	608
78	186	11 4 25	S	79	540	78	186	11 4 25	S	79	540	78	186	11 4 25	S	79	540
78	186	11 36 13	N	72	599	78	186	11 36 13	N	72	599	78	186	11 36 13	N	72	599
78	186	11 56 7	N	204	575	78	186	11 56 7	N	204	575	78	186	11 56 7	N	204	575
78	186	12 26 20	S	183	593	78	186	12 26 20	S	183	593	78	186	12 26 20	S	183	593
78	186	12 42 49	S	91	613	78	186	12 42 49	S	91	613	78	186	12 42 49	S	91	613
78	186	13 16 37	N	66	560	78	186	13 16 37	N	66	560	78	186	13 16 37	N	66	560
78	186	13 35 59	N	208	604	78	186	13 35 59	N	208	604	78	186	13 35 59	N	208	604
78	186	14 11 35	S	170	660	78	186	14 11 35	S	170	660	78	186	14 11 35	S	170	660
78	186	14 24 2	S	102	617	78	186	14 24 2	S	102	617	78	186	14 24 2	S	102	617
78	186	14 59 30	N	62	554	78	186	14 59 30	N	62	554	78	186	14 59 30	N	62	554
78	186	15 18 36	N	211	608	78	186	15 18 36	N	211	608	78	186	15 18 36	N	211	608
78	186	15 55 20	S	154	651	78	186	15 55 20	S	154	651	78	186	15 55 20	S	154	651
78	186	16 6 34	S	109	609	78	186	16 6 34	S	109	609	78	186	16 6 34	S	109	609
78	186	16 42 37	N	60	545	78	186	16 42 37	N	60	545	78	186	16 42 37	N	60	545
78	186	17 0 21	N	214	606	78	186	17 0 21	N	214	606	78	186	17 0 21	N	214	606
78	186	18 26 31	N	61	568	78	186	18 26 31	N	61	568	78	186	18 26 31	N	61	568
78	186	18 42 39	N	217	592	78	186	18 42 39	N	217	592	78	186	18 42 39	N	217	592
78	186	19 33 27	S	109	625	78	186	19 33 27	S	109	625	78	186	19 33 27	S	109	625
78	186	20 8 58	N	64	575	78	186	20 8 58	N	64	575	78	186	20 8 58	N	64	575
78	186	20 25 0	N	219	591	78	186	20 25 0	N	219	591	78	186	20 25 0	N	219	591
78	186	21 51 30	N	65	604	78	186	21 51 30	N	65	604	78	186	21 51 30	N	65	604

YR	DA	HDDK HR	MN	SEC	PO	HDDK LT	LAT	CODK LT	LAT	MIDNIGHT LAT	LAT	DA	YR
78	191	2	39	58	S	203	659	203	667	8	640	649	78
78	191	2	54	40	S	76	656	76	657	1	642	652	78
78	191	3	29	43	S	70	651	70	651	3	634	646	78
78	191	3	44	30	S	199	677	199	688	11	647	660	78
78	191	4	20	8	S	205	659	205	654	-5	640	637	78
78	191	4	34	52	S	70	653	70	659	6	639	654	78
78	191	5	10	35	N	72	642	72	652	10	637	647	78
78	191	5	25	7	N	194	661	194	674	13	635	648	78
78	191	6	0	1	S	203	657	204	664	7	637	646	78
78	191	6	14	40	S	68	657	58	647	-10	631	650	78
78	191	6	52	7	N	75	666	75	650	-16	653	645	78
78	191	7	4	58	N	194	674	194	687	13	644	659	78
78	191	7	40	30	S	200	674	200	675	1	656	656	78
78	191	7	54	0	S	59	674	70	649	-25	659	644	78
78	191	8	32	46	N	77	674	77	673	-1	652	669	78
78	191	8	46	0	N	198	658	198	661	3	656	636	78
78	191	9	20	49	S	194	672	194	671	-1	642	645	78
78	191	9	35	19	S	76	643	76	647	4	638	642	78
78	191	10	11	53	N	76	639	76	644	6	623	638	78
78	191	10	27	13	N	203	650	203	661	1	630	643	78
78	191	11	2	18	S	185	686	184	697	11	647	659	78
78	191	11	15	54	S	94	642	55	657	15	642	646	78
78	191	11	52	21	N	70	635	69	654	29	619	668	78
78	191	12	8	45	N	208	646	209	654	28	635	655	78
78	191	12	44	36	S	173	688	172	700	12	642	653	78
78	191	12	57	2	S	94	636	93	646	10	606	624	78
78	191	13	33	33	N	63	611	63	621	10	601	622	78
78	191	13	50	21	N	212	650	213	660	10	638	648	78
78	191	15	16	39	N	58	606	56	628	22	593	633	78
78	191	15	31	49	N	216	658	217	662	4	617	650	78
78	191	17	0	15	N	56	608	55	618	10	601	622	78
78	191	17	13	52	N	219	650	220	658	8	638	649	78
78	191	18	43	31	N	57	619	57	622	3	613	627	78
78	191	18	55	40	N	223	652	226	669	17	647	661	78
78	191	20	26	6	N	59	637	58	647	10	623	653	78
78	191	20	37	53	N	225	655	227	666	11	653	658	78
78	191	22	7	52	N	62	643	61	660	17	636	664	78
78	191	22	21	3	N	224	652	225	658	6	647	649	78
78	191	23	2	56	S	180	700	180	701	1	654	663	78
78	191	23	15	9	S	93	635	94	648	13	605	627	78
78	191	23	49	43	N	65	654	66	651	-3	647	654	78
78	191	0	3	47	N	222	672	221	669	-4	640	660	78
78	192	0	43	15	S	194	688	194	689	1	650	661	78
78	192	0	56	30	S	66	657	66	665	8	638	658	78
78	192	1	30	59	N	68	647	63	650	3	640	653	78
78	192	1	46	52	N	211	671	211	672	1	651	659	78
78	192	2	23	35	S	203	683	203	683	1	663	663	78
78	192	2	38	5	S	78	638	78	642	4	633	636	78
78	192	3	12	23	N	70	646	70	644	-2	631	638	78
78	192	3	28	0	N	200	656	200	674	18	636	655	78
78	192	4	3	12	S	205	663	203	672	9	644	653	78
78	192	4	18	0	S	71	649	71	655	6	635	650	78
78	192	4	53	54	N	71	357	72	645	-12	643	639	78
78	192	5	8	8	N	194	659	194	666	27	627	658	78

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YR	DA	HR	MN	SEC	PO	HDDK	LT	LAT	COCK	DLAT	MIDNIGHT	DLAT	LATH, LATH	COCK	LT	LAT	COCK	DLAT	MIDNIGHT
78 217	78 217	5 33	27	0	S	71	607	72 609	2	582	601	197	590	197	590	197	590	197	590
78 217	78 217	6 23	0	N	N	74	613	75 616	3	598	608	199	610	199	610	199	610	199	610
78 217	78 217	6 55	15	0	S	201	605	202 605	0	581	593	78	592	78	592	78	592	78	592
78 217	78 217	7 14	0	S	S	201	605	202 605	0	581	593	78	592	78	592	78	592	78	592
78 217	78 217	7 47	11	N	N	77	598	77 622	24	576	615	193	663	201	640	193	663	201	640
78 217	78 217	8 35	14	N	N	197	599	197 600	1	559	582	80	607	193	663	80	607	193	663
78 217	78 217	8 54	53	S	S	74	568	74 582	14	547	572	74	591	80	607	74	591	80	607
78 217	78 217	9 26	29	N	N	78	565	78 582	29	544	585	182	689	182	689	182	689	182	689
78 217	78 217	9 44	30	N	N	202	607	202 607	22	583	614	90	653	202	607	90	653	202	607
78 217	78 217	10 17	38	S	S	191	658	192 659	1	528	634	62	647	68	645	62	647	68	645
78 217	78 217	10 34	1	N	N	80	599	81 622	23	574	609	210	641	210	641	210	641	210	641
78 217	78 217	11 8	7	S	S	75	615	75 624	8	539	617	175	663	173	677	175	663	173	677
78 217	78 217	11 25	29	N	N	206	618	206 621	6	535	610	100	643	100	643	100	643	100	643
78 217	78 217	11 59	30	S	S	182	669	183 665	-4	627	629	63	638	63	638	63	638	63	638
78 217	78 217	12 14	45	S	S	88	598	89 618	20	573	604	222	636	222	636	222	636	222	636
78 217	78 217	12 47	58	N	N	69	576	70 583	7	562	590	182	699	182	699	182	699	182	699
78 217	78 217	13 7	20	N	N	209	614	210 612	2	530	612	93	665	93	665	93	665	93	665
78 217	78 217	13 42	5	S	S	173	563	173 667	4	602	613	64	667	66	652	64	667	66	652
78 217	78 217	13 56	19	S	S	97	589	100 624	35	548	580	195	682	196	692	195	682	196	692
78 217	78 217	14 30	46	N	N	63	578	61 607	29	565	606	85	688	84	683	85	688	84	683
78 217	78 217	14 49	5	N	N	212	617	212 621	4	601	611	67	671	66	674	67	671	66	674
78 217	78 217	16 13	43	N	N	60	564	58 593	29	549	595	207	654	208	673	207	654	208	673
78 217	78 217	16 31	1	N	N	213	610	215 625	15	593	615	69	684	70	654	69	684	70	654
78 217	78 217	17 57	40	N	N	59	583	58 597	15	585	607	199	654	199	654	199	654	199	654
78 217	78 217	18 13	1	N	N	216	602	218 617	15	585	607	206	662	206	662	206	662	206	662
78 217	78 217	19 40	28	N	N	61	594	60 611	21	582	615	73	697	73	697	73	697	73	697
78 217	78 217	19 55	25	N	N	218	593	219 603	10	575	594	195	686	195	686	195	686	195	686
78 217	78 217	21 21	44	N	N	65	580	64 604	24	567	603	206	695	207	701	206	695	207	701
78 217	78 217	21 37	59	N	N	219	598	220 613	15	580	601	67	696	70	647	67	696	70	647
78 217	78 217	22 19	0	S	S	174	608	175 683	-5	632	632	77	697	76	654	77	697	76	654
78 217	78 217	22 32	39	S	S	92	576	93 594	10	532	554	196	687	196	687	196	687	196	687
78 217	78 217	23 4	30	N	N	66	621	66 627	6	612	628	202	677	202	677	202	677	202	677
78 217	78 217	23 21	4	N	N	218	607	189 666	18	590	629	71	676	72	641	71	676	72	641
78 217	78 217	23 59	4	S	S	88	609	89 637	23	585	626	200	668	200	668	200	668	200	668
78 218	78 218	0 13	59	N	N	66	651	68 627	-24	644	628	155	658	155	658	155	658	155	658
78 218	78 218	0 47	4	N	N	212	628	213 630	2	613	619	200	668	200	668	200	668	200	668
78 218	78 218	1 31	31	N	N	189	653	189 653	0	620	629	77	654	77	654	77	654	77	654
78 218	78 218	1 39	19	S	S	81	655	81 635	-24	640	644	205	657	205	657	205	657	205	657
78 218	78 218	1 53	59	N	N	67	682	69 641	-41	578	643	187	682	187	682	187	682	187	682
78 218	78 218	2 29	36	N	N	203	631	204 649	18	609	632	88	675	87	654	88	675	87	654
78 218	78 218	3 19	24	S	S	204	645	204 646	1	624	630	71	641	71	641	71	641	71	641
78 218	78 218	3 36	5	S	S	75	610	71 623	32	572	616	210	662	210	662	210	662	210	662
78 218	78 218	4 7	59	N	N	72	591	131 627	17	572	606	174	693	174	693	174	693	174	693
78 218	78 218	4 25	59	N	N	197	510	197 510	23	584	616	100	678	97	648	100	678	97	648
78 218	78 218	4 58	18	S	S	204	508	205 631	23	584	616	63	639	63	639	63	639	63	639
78 218	78 218	5 16	57	S	S	72	592	72 603	11	573	626	213	644	222	722	213	644	222	722
78 218	78 218	5 50	22	N	N	74	633	74 633	626	601	601	113	670	110	649	113	670	110	649
78 218	78 218	6 5	48	N	N	195	621	195 621	-2	561	575	60	589	58	615	60	589	58	615
78 218	78 218	6 37	38	S	S	201	587	202 585	-2	561	575	217	654	217	654	217	654	217	654
78 218	78 218	6 57	15	S	S	72	537	72 537	26	551	589	55	599	55	599	55	599	55	599
78 218	78 218	7 29	20	N	N	77	572	77 598	26	551	589	16	615	16	615	16	615	16	615

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YR	DA	HR	MN	SEC	PO	HDDK	LT	LAT	COOK	DLAT	LATH	LATC	MIDNIGHT	DLAT	LATH	LATC
78	236	3	13	36	S	205	682	-1	656	662	2	655	656	2	655	656
78	236	3	27	17	S	74	665	1	652	676	6	653	668	6	653	668
78	236	4	3	25	N	71	679	2	652	676	14	662	686	14	662	686
78	236	4	17	2	N	199	674	2	652	650	5	640	549	5	640	549
78	236	4	53	24	N	207	670	-4	652	651	5	646	652	5	646	652
78	236	5	7	37	S	71	657	-24	652	672	11	677	697	11	677	697
78	236	5	45	0	N	75	659	-23	652	672	15	677	696	15	677	696
78	236	5	57	8	N	196	675	12	650	660	16	645	660	16	645	660
78	236	6	35	7	S	206	668	655	655	655	15	641	652	15	641	652
78	236	6	46	46	S	70	677	1	653	633	14	636	660	14	636	660
78	236	7	25	29	N	196	694	8	652	662	3	636	641	3	636	641
78	236	7	37	30	N	202	676	-5	650	653	1	651	652	1	651	652
78	236	8	13	23	S	74	672	-22	653	620	26	615	636	26	615	636
78	236	8	26	59	N	80	685	15	653	656	6	649	653	6	649	653
78	236	9	5	11	N	202	662	-6	656	659	2	691	678	2	691	678
78	236	9	18	27	N	195	693	-21	676	663	14	618	645	14	618	645
78	236	10	5	39	S	82	691	5	652	662	6	617	634	6	617	634
78	236	10	45	14	N	76	665	12	650	653	10	637	647	10	637	647
78	236	10	59	36	N	209	659	-1	656	653	8	618	637	8	618	637
78	236	11	35	58	S	184	702	11	677	704	9	650	662	9	650	662
78	236	11	47	12	S	94	684	6	674	690	-2	674	681	-2	674	681
78	236	12	26	32	N	69	678	11	650	659	4	659	657	4	659	657
78	236	12	41	0	N	213	561	5	680	680	6	652	659	6	652	659
78	236	13	19	26	S	169	717	-1	672	677	18	671	690	18	671	690
78	236	13	28	2	S	107	691	2	652	654	-18	675	665	-18	675	665
78	236	14	8	4	N	62	649	2	657	656	5	657	667	5	657	667
78	236	14	22	28	N	217	657	-1	658	656	3	668	668	3	668	668
78	236	15	51	43	N	54	650	13	655	674	-18	656	646	-18	656	646
78	236	16	4	10	N	220	668	7	651	656	-45	694	646	-45	694	646
78	236	16	4	10	N	53	645	-1	684	676	3	688	688	3	688	688
78	236	17	34	52	N	226	684	-1	655	680	-1	659	657	-1	659	657
78	236	17	45	17	N	52	673	12	655	674	0	643	652	0	643	652
78	236	19	17	57	N	228	661	9	670	674	-6	668	671	-6	668	671
78	236	19	27	47	N	51	697	14	673	667	11	652	654	11	652	654
78	236	21	0	34	N	228	675	0	673	667	11	652	654	11	652	654
78	236	21	10	9	N	55	703	2	650	676	207	658	1549	207	658	1549
78	236	22	42	32	N	227	683	2	650	676	71	648	1544	71	648	1544
78	236	22	53	6	N	182	719	14	652	714	-13	678	673	-13	678	673
78	236	23	36	34	S	96	712	2	652	680	18	663	670	18	663	670
78	236	23	46	40	S	62	692	0	683	699	205	699	677	205	699	677
78	236	0	23	53	N	219	681	6	656	666	5	680	697	5	680	697
78	236	1	15	16	S	196	689	0	661	661	201	715	692	201	715	692
78	236	1	26	40	S	84	705	14	676	703	9	680	692	9	680	692
78	236	2	4	59	N	66	682	17	650	657	198	715	692	198	715	692
78	236	2	19	4	N	207	659	25	653	663	9	680	684	9	680	684
78	236	2	56	10	S	204	672	9	653	662	-31	663	638	-31	663	638
78	236	3	10	51	S	76	644	-3	653	662	-34	678	646	-34	678	646
78	236	3	45	50	N	70	663	4	663	665	207	703	681	207	703	681
78	236	3	59	36	N	200	595	6	663	665	188	714	675	188	714	675
78	236	4	36	30	N	208	579	6	663	665	87	650	643	87	650	643
78	236	4	50	59	S	72	644	8	663	678	74	648	648	74	648	648
78	236	5	27	13	N	75	660	1	668	678	213	685	671	213	685	671
78	236	5	39	45	N	156	625	-1	659	657	174	718	684	174	718	684

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YR	DA	HDDK	HR	KN	SEC	PG	HDDK	LT	LAT	CODE	DLAT	MIDNIGHT	LATH	LATC	DLAT	MIDNIGHT	LATH	LATC
78	255	20 47	20	47	47	N	221	603	221	610	-5	590	592	670	0	670	580	680
78	255	22 15	22	15	48	N	224	635	224	638	-3	635	639	670	-1	670	645	645
78	255	22 29	22	29	36	N	183	668	183	670	-2	626	633	670	-8	670	644	644
78	255	23 10	23	10	24	S	95	652	94	632	-15	626	633	670	-20	670	644	644
78	255	23 22	23	22	57	S	95	652	94	632	-15	626	633	670	-20	670	644	644
78	255	23 57	23	57	27	N	66	649	68	624	-25	642	625	670	-1	670	645	645
78	255	0 50	0	50	54	N	194	658	194	656	-2	626	632	670	-1	670	645	645
78	255	1 30	1	30	30	S	85	600	85	617	-17	575	603	670	-2	670	645	645
78	255	1 39	1	39	15	N	67	656	70	606	-50	575	603	670	-2	670	645	645
78	255	1 55	1	55	35	N	208	641	202	643	-2	620	627	670	-4	670	645	645
78	255	2 30	2	30	52	S	202	640	202	643	-2	620	627	670	-4	670	645	645
78	255	2 45	2	45	59	S	78	655	78	632	-23	619	625	670	0	670	645	645
78	255	3 15	3	15	57	N	71	635	71	631	-4	619	624	670	6	670	645	645
78	255	3 36	3	36	14	N	201	651	202	651	10	623	643	670	1	670	645	645
78	255	4 11	4	11	19	S	207	649	208	661	12	629	643	670	1	670	645	645
78	255	4 27	4	27	20	S	75	621	75	633	-12	634	626	670	0	670	645	645
78	255	5 16	5	16	16	N	76	638	76	625	-12	623	618	670	0	670	645	645
78	255	5 15	5	15	43	N	193	675	193	677	2	645	650	670	0	670	645	645
78	255	5 51	5	51	30	S	209	656	209	656	0	636	639	670	12	670	645	645
78	255	6 6	6	6	6	S	73	657	74	641	-16	643	635	670	2	670	645	645
78	255	6 43	6	43	1	N	80	669	80	647	-22	651	637	670	2	670	645	645
78	255	6 55	6	55	59	N	199	671	200	668	-3	641	649	670	2	670	645	645
78	255	7 31	7	31	35	S	206	660	206	660	0	641	642	670	2	670	645	645
78	255	7 46	7	46	10	S	75	654	76	628	-25	640	621	670	2	670	645	645
78	255	8 23	8	23	38	N	82	674	82	656	-18	657	647	670	2	670	645	645
78	255	8 26	8	26	58	N	203	653	202	654	11	633	646	670	2	670	645	645
78	255	9 11	9	11	38	S	201	653	201	655	2	633	638	670	2	670	645	645
78	255	9 26	9	26	30	S	80	649	80	639	-10	629	628	670	58	670	645	645
78	255	10 18	10	18	12	N	208	642	209	728	86	621	704	670	222	670	645	645
78	255	10 52	10	52	44	S	194	660	194	666	6	628	641	670	224	670	645	645
78	255	11 6	11	6	44	S	89	656	90	684	28	637	776	670	53	670	645	645
78	255	13 26	13	26	0	N	66	671	69	644	-27	666	647	670	64	670	645	645
78	255	13 40	13	40	30	N	219	682	219	682	20	651	668	670	226	670	645	645
78	255	14 28	14	28	59	S	111	648	111	648	0	659	677	670	226	670	645	645
78	255	15 9	15	9	17	N	57	670	57	670	0	669	677	670	226	670	645	645
78	255	15 22	15	22	29	N	220	656	221	671	15	651	663	670	226	670	645	645
78	255	16 51	16	51	38	N	55	638	55	641	3	634	646	670	226	670	645	645
78	255	17 4	17	4	15	N	221	655	222	663	8	650	655	670	226	670	645	645
78	255	18 33	18	33	55	N	58	619	58	625	6	613	630	670	226	670	645	645
78	255	18 45	18	45	13	N	224	652	225	659	7	647	650	670	226	670	645	645
78	255	20 16	20	16	30	N	60	633	59	640	7	625	645	670	226	670	645	645
78	255	20 27	20	27	53	N	228	667	228	669	2	654	661	670	226	670	645	645
78	255	21 58	21	58	59	N	61	658	62	652	-6	652	655	670	226	670	645	645
78	255	22 10	22	10	39	N	229	670	228	671	1	668	663	670	226	670	645	645
78	255	22 54	22	54	39	S	175	710	176	712	-2	676	667	670	226	670	645	645
78	255	23 3	23	3	56	S	101	699	96	646	-53	684	624	670	226	670	645	645
78	255	23 41	23	41	22	N	62	681	62	681	0	681	671	670	226	670	645	645
78	255	23 53	23	53	50	N	191	690	224	678	671	671	671	670	226	670	645	645
78	255	0 34	0	34	39	S	89	691	191	689	-1	662	661	670	226	670	645	645
78	255	0 46	0	46	26	S	89	691	89	691	-3	679	687	670	226	670	645	645
78	255	1 22	1	22	59	N	64	685	64	687	2	681	693	670	226	670	645	645
78	255	1 37	1	37	21	N	212	665	212	666	1	655	653	670	226	670	645	645
78	255	2 13	2	13	59	S	201	649	201	651	2	629	634	670	226	670	645	645
78	255	2 27	2	27	40	S	79	693	79	670	-23	682	666	670	226	670	645	645

YR	DA	HODK	HR	MIN	SEC	PO	HODK	LT	LAT	COCK	LT	LAT	OLAT	MIDNIGHT	LAT	LATC	YR	DA	HODK	HR	MIN	SEC	PO	HODK	LT	LAT	COCK	LT	LAT	OLAT	MIDNIGHT	LAT	LATC
78	258	8	51	57		S	78	652	78	661	78	661	-5	642	657	673	78	259	16	11	16	N	78	652	78	661	78	661	-5	642	657	673	
78	258	9	30	15		N	82	645	83	671	83	671	-2	680	664	666	78	259	17	42	56	N	82	645	83	671	83	671	-2	680	664	666	
78	258	9	42	37		N	206	679	206	681	206	681	4	654	655	656	78	259	17	53	40	N	224	661	224	661	224	661	4	654	655	656	
78	258	10	18	49		S	196	683	196	687	196	687	-19	676	655	652	78	259	19	24	16	N	58	633	58	633	58	633	17	628	636	636	
78	258	10	31	12		S	87	691	87	691	87	691	6	648	655	652	78	259	22	5	30	N	225	653	225	653	225	653	8	648	652	652	
78	258	12	50	40		N	71	661	71	669	71	669	8	643	650	652	78	259	21	18	0	N	228	667	228	667	228	667	-10	638	637	637	
78	258	13	6	2		N	216	655	216	663	216	663	8	643	650	652	78	259	22	47	54	N	55	643	55	643	55	643	11	636	638	638	
78	258	13	45	14		S	63	646	63	640	63	640	-6	639	642	642	78	259	23	1	56	N	224	649	224	649	224	649	10	643	650	650	
78	258	14	32	57		N	220	668	222	682	222	682	14	643	645	645	78	259	23	43	28	S	184	703	184	703	184	703	0	667	655	655	
78	258	14	47	16		N	51	679	55	650	55	650	-29	675	656	656	78	259	23	55	13	S	92	653	92	653	92	653	4	633	646	646	
78	258	16	17	59		N	52	664	49	685	49	685	21	663	651	651	78	259	0	29	39	S	66	650	66	650	66	650	0	643	646	646	
78	258	18	0	32		N	229	689	229	689	229	689	1	688	682	682	78	259	0	44	19	N	213	677	213	677	213	677	8	668	678	678	
78	258	18	10	1		N	52	684	49	688	49	688	14	685	682	682	78	259	1	23	46	S	66	680	66	680	66	680	-20	676	664	664	
78	258	19	43	33		N	52	684	49	688	49	688	5	683	688	688	78	259	2	12	13	N	208	681	208	681	208	681	4	654	665	665	
78	258	19	52	16		N	230	683	23	688	23	688	0	705	710	710	78	259	2	26	27	S	205	677	205	677	205	677	2	659	659	659	
78	258	21	25	59		N	52	702	57	705	57	705	2	687	689	689	78	259	3	3	46	S	76	677	76	677	76	677	-23	667	651	651	
78	258	21	34	43		N	231	687	226	677	226	677	9	710	738	738	78	259	4	57	24	N	201	673	201	673	201	673	3	655	657	657	
78	258	23	7	42		N	188	651	188	651	188	651	3	657	671	671	78	259	4	57	24	S	73	669	73	669	73	669	40	656	708	708	
78	258	24	0	18		S	95	721	95	720	95	720	12	649	659	659	78	259	5	24	23	N	199	656	199	656	199	656	-5	664	667	667	
78	259	0	47	29		N	215	660	215	672	215	672	9	643	652	652	78	259	6	13	35	N	205	631	205	631	205	631	8	613	627	627	
78	259	1	2	32		N	198	676	198	685	198	685	-5	646	651	651	78	259	7	28	11	N	91	623	91	623	91	623	9	601	620	620	
78	259	1	40	29		S	81	664	81	659	81	659	3	643	646	646	78	259	8	17	59	S	76	650	76	650	76	650	-11	657	655	655	
78	259	2	23	29		N	68	654	69	643	69	643	-7	643	646	646	78	259	8	55	24	N	83	674	83	674	83	674	1	599	609	609	
78	259	2	43	32		N	206	687	207	689	207	689	2	671	668	668	78	259	9	43	48	S	199	663	199	663	199	663	3	632	641	641	
78	259	3	21	13		S	206	682	206	688	206	688	0	671	668	668	78	259	9	57	48	S	83	662	83	662	83	662	2	644	656	656	
78	259	3	34	35		S	75	665	76	645	76	645	-20	652	639	639	78	259	10	35	19	N	210	673	210	673	210	673	-9	646	646	646	
78	259	4	10	55		S	72	684	73	655	73	655	1	650	650	650	78	259	10	49	19	N	190	684	190	684	190	684	22	555	663	663	
78	259	4	24	39		N	200	688	200	689	200	689	2	650	650	650	78	259	11	38	46	S	92	652	92	652	92	652	1	625	634	634	
78	259	4	59	59		S	209	646	209	684	209	684	8	625	637	637	78	259	12	16	12	N	74	670	74	670	74	670	-9	657	657	657	
78	259	5	14	35		S	73	636	73	651	73	651	-5	653	637	637	78	259	12	31	28	N	214	650	214	650	214	650	21	638	658	658	
78	259	6	39	58		S	208	641	208	648	208	648	1	627	631	631	78	259	13	9	8	N	174	714	174	714	174	714	5	683	676	676	
78	259	6	55	13		S	74	646	82	648	82	648	7	620	638	638	78	259	13	58	14	N	104	657	104	657	104	657	-2	622	625	625	
78	259	7	31	16		N	81	641	82	648	82	648	12	635	649	649	78	259	14	12	59	N	218	655	218	655	218	655	26	645	675	675	
78	259	7	45	25		N	201	655	201	667	201	667	9	643	652	652	78	259	15	41	24	N	57	652	57	652	57	652	12	649	671	671	
78	259	8	20	28		S	234	662	235	671	235	671	2	675	668	668	78	259	15	41	24	N	57	652	57	652	57	652	12	649	671	671	
78	259	8	34	23		S	77	669	83	652	83	652	2	675	668	668	78	259	16	1	59	N	218	655	218	655	218	655	26	645	675	675	
78	259	9	12	59		N	83	650	206	677	206	677	2	657	658	658	78	259	16	1	59	N	218	655	218	655	218	655	26	645	675	675	
78	259	9	25	30		N	205	675	199	679	199	679	-1	651	652	652	78	259	17	54	41	N	221	652	221	652	221	652	12	649	671	671	
78	259	10	1	31		S	198	680	199	679	199	679	2	657	658	658	78	259	17	54	41	N	221	652	221	652	221	652	12	649	671	671	
78	259	10	14	33		S	85	675	85	657	85	657	-18	658	648	648	78	259	18	9	9	N	53	669	53	669	53	669	-1	668	663	663	
78	259	10	53	19		N	80	693	81	663	81	663	-30	678	655	655	78	259	19	17	53	N	227	670	227	670	227	670	8	664	680	680	
78	259	11	6	18		N	211	682	212	682	212	682	0	672	668	668	78	259	20	49	51	N	227	662	227	662	227	662	1	658	655	655	
78	259	11	42	58		S	188	684	188	685	188	685	5	645	651	651	78	259	21	0	36	N	59	686	59	686	59	686	1	687	695	695	
78	259	11	55	43		S	54	660	95	664	95	664	4	635	649	649	78	259	22	32	13	N	59	686	59	686	59	686	1	687	695	695	
78	259	12	34	19		N	71	693	73	661	73	661	-32	682	657	657	78	259	22	32	13	N	59	686	59	686	59	686	1	687	695	695	
78	259	12	48	31		N	215	659	217	683	217	683	1	648	659	659	78	259	23	1	57	N	227	662	227	662	227	662	1	687	695	695	
78	259	13	25	25		S	178	680	178	681	178	681	3	676	671	671	78	259	23	1	57	N	227	662	227	662	227	662	1	687	695	695	
78	259	13	35	1		S	112	700	113	703	113	703	9	676	671	671	78	259	23	1	57	N	227	662	227	662	227	662	1	687	695	695	
78	259	14	15	57		N	63	664	62	673	62	673	23	648	675	675	78	259	23	1	57	N	227	662	227	662	227	662	1	687	695	695	
78	259	14	30	15		N	219	659	222	682	222	682	7	684	698	698	78	259	23	1	57	N	227	662	227	662							

HDDK	HR	MN	SEC	PO	HDDK		LT	LAT	DLAT	LATH, LATH	MIDNIGHT	YR	DA	HDDK		HR	MN	SEC	PO	HDDK		LT	LAT	DLAT	LATH, LATH	MIDNIGHT
					LT	LAT								LT	LAT					LT	LAT					
78 263	78 263	11 38	0	N	214	693	N	214	693	215	702	9	686	215	702	9	686	215	702	9	686	215	702	3	664	662
78 263	78 263	12 16	29	S	181	720	S	181	720	181	723	3	688	181	723	3	688	181	723	3	688	181	723	10	647	666
78 263	78 263	12 26	3	S	103	704	S	103	704	103	702	-2	691	103	702	-2	691	103	702	-2	691	103	702	-1	647	655
78 263	78 263	13 6	9	N	69	680	N	69	680	69	679	-1	676	69	679	-1	676	69	679	-1	676	69	679	8	627	633
78 263	78 263	13 19	59	N	219	677	N	219	677	221	701	24	668	221	701	24	668	221	701	24	668	221	701	4	630	644
78 263	78 263	14 48	39	N	60	664	N	60	664	61	651	-13	658	61	651	-13	658	61	651	-13	658	61	651	20	643	661
78 263	78 263	15 2	4	N	221	668	N	221	668	225	693	25	665	225	693	25	665	225	693	25	665	225	693	2	628	640
78 263	78 263	16 32	27	N	49	688	N	49	688	49	629	1	693	49	629	1	693	49	629	1	693	49	629	18	662	683
78 263	78 263	16 44	1	N	222	664	N	222	664	227	689	25	661	227	689	25	661	227	689	25	661	227	689	-44	693	651
78 263	78 263	18 15	27	N	48	685	N	48	685	46	689	11	693	46	689	11	693	46	689	11	693	46	689	7	682	700
78 263	78 263	18 26	12	N	224	653	N	224	653	227	676	23	648	227	676	23	648	227	676	23	648	227	676	1	681	676
78 263	78 263	19 58	24	N	52	684	N	52	684	53	683	-1	685	53	683	-1	685	53	683	-1	685	53	683	8	640	651
78 263	78 263	20 8	30	N	225	649	N	225	649	226	650	-6	650	226	650	-6	650	226	650	-6	650	226	650	3	686	701
78 263	78 263	21 38	59	N	61	656	N	61	656	62	650	0	616	62	650	0	616	62	650	0	616	62	650	12	689	712
78 263	78 263	21 52	8	N	223	626	N	223	626	224	626	0	616	224	626	0	616	224	626	0	616	224	626	2	650	651
78 263	78 263	22 53	44	S	178	678	S	178	678	177	687	9	626	177	687	9	626	177	687	9	626	177	687	14	637	652
78 263	78 263	22 45	0	S	99	659	S	99	659	101	677	18	634	101	677	18	634	101	677	18	634	101	677	20	643	674
78 263	78 263	23 19	56	N			N			66	641		654	66	641		654	66	641		654	66	641	-7	661	662
78 263	78 263	23 34	15	N	190	682	N	190	682	224	680		653	224	680		653	224	680		653	224	680	3	655	657
78 263	78 263	0 14	40	S	39	639	S	39	639	89	635	1	653	89	635	1	653	89	635	1	653	89	635	10	627	645
78 263	78 263	0 28	0	S	65	674	S	65	674	65	668	-4	618	65	668	-4	618	65	674	-4	618	65	668	17	622	648
78 263	78 263	1 2	39	N	215	675	N	215	675	215	679	3	667	215	679	3	667	215	675	3	667	215	679	5	632	647
78 263	78 263	1 16	55	S	199	673	S	199	673	199	677	4	643	199	677	4	643	199	673	4	643	199	677	11	622	637
78 263	78 263	2 9	1	S	80	653	S	80	653	80	667	14	634	80	667	14	634	80	653	14	634	80	667	4	607	618
78 263	78 263	2 43	44	N	68	655	N	68	655	68	669	4	659	68	669	4	659	68	655	4	659	68	669	22	618	653
78 263	78 263	2 58	47	N	205	670	N	205	670	205	672	2	652	205	672	2	652	205	670	2	652	205	672	6	611	
78 263	78 263	3 34	58	S	206	662	S	206	662	206	663	1	643	206	663	1	643	206	670	1	643	206	663	11	622	637
78 263	78 263	3 48	54	S	75	673	S	75	673	75	677	4	661	75	677	4	661	75	673	4	661	75	677	4	607	618
78 263	78 263	4 24	37	N	74	653	N	74	653	74	656	3	639	74	656	3	639	74	653	3	639	74	656	1	641	651
78 263	78 263	4 40	1	N	200	642	N	200	642	200	639	-3	621	200	639	-3	621	200	642	-3	621	200	639	22	618	653
78 263	78 263	5 13	59	S	209	628	S	209	628	209	627	-1	606	209	627	-1	606	209	628	-1	606	209	627	6	611	
78 263	78 263	5 30	40	S	76	621	S	76	621	76	621	0	604	76	621	0	604	76	621	0	604	76	621	199	667	642
78 263	78 263	6 4	30	N	79	615	N	79	615	80	632	17	598	80	632	17	598	79	615	17	598	80	632	85	574	568
78 263	78 263	6 20	43	N	200	621	N	200	621	200	630	9	598	200	630	9	598	200	621	9	598	200	630	25	630	655
78 263	78 263	6 54	0	S	208	629	S	208	629	208	635	6	607	208	635	6	607	208	629	6	607	208	635	6	640	650
78 263	78 263	7 10	34	S	76	624	S	76	624	83	623	26	572	83	623	26	572	76	624	26	572	83	623	3	640	653
78 263	78 263	7 44	38	N	82	597	N	82	597	202	661	0	642	202	661	0	642	82	597	0	642	202	661	-7	629	631
78 263	78 263	7 59	53	N	204	637	N	204	637	204	668	31	616	204	668	31	616	204	637	31	616	204	668	2	629	631
78 263	78 263	8 34	22	S	204	637	S	204	637	79	649	8	625	79	649	8	625	204	637	8	625	79	649	2	629	631
78 263	78 263	8 49	59	S	79	649	S	79	649	84	656	-3	640	84	656	-3	640	79	649	-3	640	84	656	2	629	631
78 263	78 263	9 26	40	N	93	559	N	93	559	94	566	-3	640	94	566	-3	640	93	559	13	54	93	559	8	627	645
78 263	78 263	9 40	55	N	207	650	N	207	650	207	671	21	630	207	671	21	630	207	650	21	630	207	671	-4	619	625
78 263	78 263	10 16	6	S	197	677	S	197	677	197	677	0	617	197	677	0	617	197	650	0	617	197	677	2	610	616
78 263	78 263	10 28	59	S	87	680	S	87	680	86	637	-3	664	86	637	-3	664	87	680	-3	664	86	637	3	553	574
78 263	78 263	11 7	20	N	80	673	N	80	673	80	672	-1	656	80	672	-1	656	80	673	-1	656	80	672	4	604	618
78 263	78 263	11 22	0	N	212	653	N	212	653	213	664	11	641	213	664	11	641	212	653	11	641	213	664	1	597	604
78 263	78 263	11 57	41	S	198	680	S	198	680	188	682	2	640	188	682	2	640	198	680	2	640	188	682	15	572	599
78 263	78 263	12 9	41	S	98	579	S	98	579	98	680	-1	658	98	680	-1	658	98	680	-1	658	98	680	8	588	603
78 263	78 263	12 48	59	N	70	688	N	70	688	71	677	-11	677	71	677	-11	677	70	688	-11	677	71	677	4	597	612
78 263	78 263	13 41	14	S	217	668	S	217	668	217	668	0	658	217	668	0	658	217	668	0	658	217	668	11	585	598
78 263	78 263	13 50	49	S	173	698	S	173	698	191	650	-48	557	191	650	-48	557	173	698	-48	557	191	650	-4	619	625
78 263	78 263	14 31	3	S	110	672	S	110	672	111	673	3	630	111	673	3	630	110	672	3	630	111	673	13	602	616
78 263	78 263			N	62	667	N	62	667	61	675	3	661	61	675	3	661	62	667	3	661	61	675		602	616

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YR	DA	HR	MM	SEC	FO	HDDK	LT	LAT	COO	LT	LAT	DLAT	MIDNIGHT LAT, L, L, C	YR	DA	HR	MM	SEC	FO	HDDK	LT	LAT	COO	LT	LAT	DLAT	MIDNIGHT LAT, L, L, C
78	273	22	9	29	N	59	681	87	619	62	631	619	634	78	273	22	9	29	N	59	681	87	619	62	631	619	634
78	273	22	21	25	N	225	641	87	619	62	631	619	634	78	273	22	21	25	N	225	641	87	619	62	631	619	634
78	273	23	4	33	S	176	721	103	709	0	699	705	694	78	273	23	4	33	S	176	721	103	709	0	699	705	694
78	273	23	13	7	N	103	709	72	565	57	626	533	623	78	273	23	13	7	N	103	709	72	565	57	626	533	623
78	273	23	50	13	N	65	662	193	661	15	620	530	620	78	273	23	50	13	N	65	662	193	661	15	620	530	620
78	274	0	43	15	S	193	661	86	641	46	602	530	602	78	274	0	43	15	S	193	661	86	641	46	602	530	602
78	274	0	57	26	S	86	641	59	602	46	602	530	602	78	274	0	57	26	S	86	641	59	602	46	602	530	602
78	274	1	31	25	N	57	654	214	701	35	734	683	734	78	274	1	31	25	N	57	654	214	701	35	734	683	734
78	274	1	44	30	N	218	736	201	664	20	623	645	623	78	274	1	44	30	N	218	736	201	664	20	623	645	623
78	274	2	23	17	S	201	644	79	589	78	634	579	634	78	274	2	23	17	S	201	644	79	589	78	634	579	634
78	274	2	37	49	S	78	667	71	551	9	637	337	637	78	274	2	37	49	S	78	667	71	551	9	637	337	637
78	274	3	12	46	N	71	651	203	643	5	625	634	625	78	274	3	12	46	N	71	651	203	643	5	625	634	625
78	274	3	26	51	N	203	646	208	640	7	611	624	611	78	274	3	26	51	N	203	646	208	640	7	611	624	611
78	274	4	3	11	N	208	633	208	633	7	611	624	611	78	274	4	3	11	N	208	633	208	633	7	611	624	611
78	274	4	18	57	S	77	652	77	652	20	626	614	626	78	274	4	18	57	S	77	652	77	652	20	626	614	626
78	274	4	54	0	N	77	652	77	652	20	626	614	626	78	274	4	54	0	N	77	652	77	652	20	626	614	626
78	274	5	8	25	N	201	667	201	658	9	648	640	648	78	274	5	8	25	N	201	667	201	658	9	648	640	648
78	274	5	43	23	S	211	640	211	651	11	627	539	627	78	274	5	43	23	S	211	640	211	651	11	627	539	627
78	274	5	58	8	S	75	654	76	636	26	651	630	651	78	274	5	58	8	S	75	654	76	636	26	651	630	651
78	274	6	35	1	N	82	657	82	641	18	639	630	639	78	274	6	35	1	N	82	657	82	641	18	639	630	639
78	274	6	49	23	N	202	636	202	633	7	614	627	614	78	274	6	49	23	N	202	636	202	633	7	614	627	614
78	274	7	22	53	S	208	625	208	623	3	609	599	609	78	274	7	22	53	S	208	625	208	623	3	609	599	609
78	274	7	36	29	S	77	653	77	653	6	639	594	639	78	274	7	36	29	S	77	653	77	653	6	639	594	639
78	274	8	15	39	N	84	661	84	651	10	643	624	643	78	274	8	15	39	N	84	661	84	651	10	643	624	643
78	274	8	28	56	N	204	670	205	639	31	652	623	652	78	274	8	28	56	N	204	670	205	639	31	652	623	652
78	274	9	3	0	S	204	617	204	636	19	594	621	594	78	274	9	3	0	S	204	617	204	636	19	594	621	594
78	274	9	17	59	S	62	670	62	622	48	653	603	653	78	274	9	17	59	S	62	670	62	622	48	653	603	653
78	274	9	56	0	N	84	566	85	647	19	648	637	648	78	274	9	56	0	N	84	566	85	647	19	648	637	648
78	274	10	11	19	N	209	618	209	618	0	595	604	595	78	274	10	11	19	N	209	618	209	618	0	595	604	595
78	274	10	43	28	S	198	605	198	620	15	566	600	566	78	274	10	43	28	S	198	605	198	620	15	566	600	566
78	274	10	59	9	S	90	650	91	667	17	623	553	623	78	274	10	59	9	S	90	650	91	667	17	623	553	623
78	274	11	35	59	N	80	654	80	653	4	635	650	635	78	274	11	35	59	N	80	654	80	653	4	635	650	635
78	274	11	53	0	N	213	609	214	626	18	591	615	591	78	274	11	53	0	N	213	609	214	626	18	591	615	591
78	274	12	26	28	S	189	633	189	653	10	608	627	608	78	274	12	26	28	S	189	633	189	653	10	608	627	608
78	274	12	40	58	S	98	620	103	675	56	586	656	586	78	274	12	40	58	S	98	620	103	675	56	586	656	586
78	274	13	16	39	N	72	629	72	629	6	613	631	613	78	274	13	16	39	N	72	629	72	629	6	613	631	613
78	274	13	34	38	N	216	613	217	627	14	597	616	597	78	274	13	34	38	N	216	613	217	627	14	597	616	597
78	274	14	5	1	S	181	645	176	645	31	598	624	598	78	274	14	5	1	S	181	645	176	645	31	598	624	598
78	274	14	22	30	N	107	612	114	664	52	556	625	556	78	274	14	22	30	N	107	612	114	664	52	556	625	556
78	274	14	59	30	N	217	615	217	615	0	605	605	605	78	274	14	59	30	N	217	615	217	615	0	605	605	605
78	274	15	16	22	N	57	640	58	630	9	605	614	605	78	274	15	16	22	N	57	640	58	630	9	605	614	605
78	274	15	39	48	N	221	616	222	625	9	605	614	605	78	274	15	39	48	N	221	616	222	625	9	605	614	605
78	274	20	8	18	N	62	621	62	625	4	612	625	612	78	274	20	8	18	N	62	621	62	625	4	612	625	612
78	274	20	22	15	N	222	639	223	617	8	597	605	597	78	274	20	22	15	N	222	639	223	617	8	597	605	597
78	274	21	49	18	N	68	602	66	622	20	551	613	551	78	274	21	49	18	N	68	602	66	622	20	551	613	551
78	274	22	4	38	N	224	622	224	626	4	612	615	612	78	274	22	4	38	N	224	622	224	626	4	612	615	612
78	274	22	45	36	S	180	675	180	675	4	634	642	634	78	274	22	45	36	S	180	675	180	675	4	634	642	634
78	274	22	56	59	S	99	665	100	670	5	641	648	641	78	274	22	56	59	S	99	665	100	670	5	641	648	641
78	274	23	31	0	N	69	610	67	636	26	600	628	600	78	274	23	31	0	N	69	610	67	636	26	600	628	600
78	275	0	27	0	S	190	693	190	697	4	656	568	656	78	275	0	27	0	S	190	693	190	697	4	656	568	656
78	275	0	39	36	S	88	656	87	623	33	572	610	572	78	275	0	39	36	S	88	656	87	623	33	572	610	572
78	275	1	12	2	N	70	597	69	616	19	578	616	578	78	275	1	12	2	N	70	597	69	616	19	578	616	578
78	275	2	7	41	S	200	695	200	686	10	560	566	560	78	275	2	7	41	S	200	695	200	686	10	560	566	560

YR	DA	HR	MM	SEC	PO	HDDK	LT	LAT	COOK	DLAT	MIDNIGHT	DLAT	MIDNIGHT	DLAT	MIDNIGHT	DLAT	MIDNIGHT
YR	DA	HR	MM	SEC	PO	HDDK	LT	LAT	COOK	DLAT	MIDNIGHT	DLAT	MIDNIGHT	DLAT	MIDNIGHT	DLAT	MIDNIGHT
78	284	0	2	1	N	56	554	66	650	-4	617	559	559	559	559	559	559
78	285	0	55	48	S	193	684	192	651	-7	635	641	641	641	641	641	641
78	285	1	44	22	N	65	677	85	675	-11	610	689	689	689	689	689	689
78	285	2	36	0	S	202	673	202	681	-25	610	689	689	689	689	689	689
78	285	2	50	4	S	78	654	78	652	-2	640	647	647	647	647	647	647
78	285	3	24	36	N	72	644	72	647	-3	629	642	642	642	642	642	642
78	285	3	39	38	N	204	685	204	685	-1	609	685	685	685	685	685	685
78	285	4	16	3	S	210	668	210	668	-16	658	650	650	650	650	650	650
78	285	4	29	46	S	76	671	77	655	-16	658	650	650	650	650	650	650
78	285	5	55	53	S	213	663	213	663	-4	652	654	654	654	654	654	654
78	285	6	9	57	S	76	663	77	654	-9	650	649	649	649	649	649	649
78	285	6	48	0	N	84	691	84	686	-5	676	681	681	681	681	681	681
78	285	7	0	3	N	203	665	211	675	-4	661	662	662	662	662	662	662
78	285	7	36	5	S	210	671	78	666	-4	657	662	662	662	662	662	662
78	285	7	49	37	S	78	670	78	666	-4	657	662	662	662	662	662	662
78	285	8	28	2	N	86	675	96	678	-2	659	672	672	672	672	672	672
78	285	8	40	34	N	206	682	206	684	-1	666	684	684	684	684	684	684
78	285	9	16	43	S	205	685	205	681	-4	668	681	681	681	681	681	681
78	285	9	30	0	S	84	685	84	684	-1	647	685	685	685	685	685	685
78	285	10	9	5	N	85	704	85	679	-25	690	673	673	673	673	673	673
78	285	10	21	54	N	211	667	212	669	-2	657	656	656	656	656	656	656
78	285	10	57	14	S	197	674	3	641	-3	641	648	648	648	648	648	648
78	285	11	5	0	S	95	710	92	676	-34	696	655	655	655	655	655	655
78	285	11	48	59	N	79	685	79	693	-7	675	691	691	691	691	691	691
78	285	12	4	17	S	216	633	216	633	0	619	622	622	622	622	622	622
78	285	12	38	50	S	188	663	188	663	0	619	622	622	622	622	622	622
78	285	12	50	2	S	108	699	108	699	-11	618	616	616	616	616	616	616
78	285	13	28	57	N	72	634	73	623	-11	618	616	616	616	616	616	616
78	285	13	46	28	N	218	621	218	625	-4	606	615	615	615	615	615	615
78	285	14	21	32	S	179	654	181	642	-12	588	607	607	607	607	607	607
78	285	15	12	6	N	64	633	64	633	0	625	635	635	635	635	635	635
78	285	15	29	31	N	216	585	216	591	-5	567	592	592	592	592	592	592
78	285	16	38	58	N	58	639	61	616	-23	635	616	616	616	616	616	616
78	285	18	50	40	N	226	651	226	652	1	645	643	643	643	643	643	643
78	285	20	21	25	N	60	650	59	659	9	643	665	665	665	665	665	665
78	285	20	33	28	N	226	636	227	641	5	628	631	631	631	631	631	631
78	285	22	2	35	N	66	637	69	598	-39	629	597	597	597	597	597	597
78	285	22	16	34	N	225	631	226	639	8	622	639	639	639	639	639	639
78	285	22	58	11	S	180	694	179	700	-24	644	620	620	620	620	620	620
78	285	23	9	0	S	99	667	97	643	-24	644	620	620	620	620	620	620
78	285	23	43	29	N	69	622	68	631	9	613	632	632	632	632	632	632
78	285	0	37	44	S	193	656	193	660	4	624	635	635	635	635	635	635
78	286	0	52	26	S	67	626	87	651	25	604	642	642	642	642	642	642
78	286	1	26	12	N	67	655	68	643	-12	649	646	646	646	646	646	646
78	286	2	18	8	S	201	650	201	650	9	519	638	638	638	638	638	638
78	286	3	16	53	N	71	635	71	644	9	519	638	638	638	638	638	638
78	286	3	23	13	S	204	660	204	664	-4	641	646	646	646	646	646	646
78	286	3	58	34	S	209	656	209	653	-3	636	656	656	656	656	656	656
78	286	4	13	37	S	77	641	77	644	3	626	638	638	638	638	638	638
78	286	4	48	33	N	78	646	78	652	6	631	647	647	647	647	647	647
78	286	5	3	9	N	202	672	202	650	-22	654	653	653	653	653	653	653
78	286	5	33	28	S	212	653	213	664	11	641	651	651	651	651	651	651
78	286	5	53	39	S	77	641	77	641	626	626	626	626	626	626	626	626

YR	DA	HR	MM	SEC	PO	HDDK	LT	LAT	CDCK	DLAT	LATH, LATH	MIDNIGHT	YR	DA	HR	MM	SEC	PO	HDDK	LT	LAT	CDCK	DLAT	LATH, LATH	MIDNIGHT
78	292	3	3	11	N	72	608	71	619	11	590	611	78	293	5	32	54	S	77	662	79	632	-30	649	625
78	292	3	21	16	N	203	630	203	634	4	608	619	78	293	6	10	30	N	83	684	83	676	-8	668	670
78	292	2	54	47	S	208	626	208	631	5	604	616	78	293	6	23	23	N	203	669	203	665	16	651	665
78	292	4	10	59	S	78	634	78	639	5	618	619	78	293	6	58	52	S	213	669	213	670	1	659	657
78	292	4	45	25	N	78	636	78	626	-10	621	619	78	293	7	13	34	S	79	642	86	655	-8	645	646
78	292	5	1	48	N	203	621	203	625	4	588	611	78	293	7	50	26	N	86	663	206	631	-34	646	616
78	292	5	34	15	S	78	647	212	619	11	591	609	78	293	8	3	48	N	208	677	208	671	-6	659	652
78	292	5	50	34	S	78	647	212	619	11	591	609	78	293	8	3	48	N	208	677	208	671	-6	659	652
78	292	6	25	30	N	83	606	204	620	11	592	603	78	293	8	39	12	S	82	679	82	647	-32	663	637
78	292	6	42	0	N	204	618	204	620	2	595	606	78	293	9	31	8	N	87	676	87	660	-16	659	652
78	292	7	13	44	S	210	589	75	705	122	570	592	78	293	9	44	26	N	210	652	210	670	8	651	657
78	292	7	32	54	S	80	586	75	705	122	570	592	78	293	10	19	49	S	201	677	201	673	-4	659	654
78	292	8	5	30	N	86	586	206	615	32	570	604	78	293	10	32	25	S	90	681	91	680	-1	661	670
78	292	8	23	53	N	206	585	206	574	5	571	565	78	293	11	17	58	N	83	695	84	672	-23	680	665
78	292	8	53	31	S	206	572	206	572	0	574	565	78	293	11	23	18	N	215	644	215	644	5	631	637
78	292	9	12	24	S	83	597	93	620	23	572	607	78	293	12	0	52	S	193	664	192	673	9	633	647
78	292	9	47	23	N	87	645	211	613	13	525	581	78	293	12	13	31	S	101	674	68	625	-24	642	626
78	292	10	4	11	N	210	585	211	590	5	566	581	78	293	14	34	18	N	66	649	221	644	7	629	634
78	292	10	36	10	S	200	642	201	613	-29	621	600	78	293	14	49	33	N	220	637	221	632	-22	651	634
78	292	10	50	55	S	91	648	90	623	-25	623	593	78	293	16	18	10	N	58	654	61	632	-22	651	634
78	292	11	26	43	N	84	616	24	604	-12	623	593	78	293	18	0	20	N	60	625	58	639	14	616	644
78	292	11	15	18	N	215	594	215	619	24	576	608	78	293	18	14	32	N	220	605	221	612	7	592	600
78	292	12	17	28	S	193	635	193	644	2	600	621	78	293	19	41	57	N	64	601	63	618	17	590	618
78	292	12	30	40	S	103	677	104	685	8	652	670	78	293	19	56	33	N	223	606	224	618	12	593	606
78	292	13	7	25	N	77	600	76	607	7	592	599	78	293	21	25	33	N	226	654	68	606	-48	647	605
78	292	13	25	27	N	219	640	627	607	7	592	599	78	293	21	38	28	N	226	654	68	606	-48	647	605
78	292	14	1	9	S	181	663	178	677	14	620	625	78	293	23	7	52	N	63	676	65	662	-14	671	666
78	292	14	52	27	N	63	650	58	608	-52	654	597	78	293	23	20	6	N	237	670	238	678	8	668	671
78	292	15	8	57	N	217	594	218	604	10	576	595	78	293	23	20	6	N	237	670	238	678	8	668	671
78	292	16	35	51	N	57	652	62	613	-39	649	613	78	294	0	13	12	S	93	673	91	647	-26	651	626
78	292	16	50	36	N	218	594	219	612	18	576	592	78	294	0	49	31	N	64	680	66	655	-25	676	659
78	292	18	18	22	N	58	636	60	625	-11	632	626	78	294	1	3	19	N	217	675	218	680	4	667	657
78	292	18	30	46	N	224	639	224	634	-5	631	623	78	294	1	41	41	S	197	680	197	681	1	651	654
78	292	20	0	53	N	61	643	24	606	-37	636	605	78	294	2	31	31	S	82	672	82	672	0	655	665
78	292	20	14	16	N	223	600	224	613	13	555	601	78	294	2	31	31	N	66	686	68	671	-25	693	676
78	292	21	41	10	N	68	602	69	597	-5	591	595	78	294	2	45	46	N	208	662	206	666	4	643	648
78	292	21	57	15	N	223	595	223	600	5	590	597	78	294	3	21	15	S	206	653	206	663	10	633	645
78	292	22	37	25	S	179	678	179	678	0	626	626	78	294	3	35	44	S	77	663	78	653	-20	650	637
78	292	22	48	13	S	192	672	192	666	-6	644	642	78	294	4	11	55	N	75	672	75	677	5	660	674
78	292	23	22	41	N	70	606	70	615	7	588	605	78	294	4	26	36	N	203	652	203	656	4	632	639
78	292	23	39	0	N	223	541	223	648	10	638	538	78	294	5	1	3	S	212	644	212	648	4	631	636
78	293	0	17	56	S	191	569	190	579	-40	638	552	78	294	5	15	13	S	78	650	78	650	0	636	645
78	293	0	30	31	S	91	579	93	539	-23	652	628	78	294	5	52	29	N	82	659	82	587	-71	639	659
78	293	1	6	10	N	56	561	58	639	-23	655	640	78	294	6	6	21	N	202	663	203	664	1	644	648
78	293	1	21	32	N	214	659	214	664	5	648	651	78	294	6	40	51	S	212	638	213	658	20	625	646
78	293	1	58	11	N	199	656	199	663	7	624	538	78	294	6	56	28	N	79	642	79	642	-25	633	620
78	293	2	12	46	S	81	650	81	650	-1	632	641	78	294	7	23	6	N	86	657	86	632	-25	633	620
78	293	2	47	28	N	69	657	69	654	-3	651	650	78	294	7	46	19	S	205	684	205	684	9	657	664
78	293	3	3	58	N	204	633	204	637	4	611	621	78	294	8	21	52	N	209	672	209	670	-2	654	651
78	293	3	37	41	S	207	628	207	628	0	606	613	78	294	8	35	44	S	81	661	81	661	-10	659	659
78	293	3	53	1	N	77	659	76	606	-5	645	597	78	294	9	13	59	N	27	676	87	666	-10	659	659
78	293	4	29	4	N	76	667	77	657	-	654	652	78	294	9	27	15	N	209	665	210	664	-1	646	651
78	293	4	43	43	S	203	653	203	643	-10	633	627	78	294	10	2	6	S	203	662	203	663	1	643	645
78	293	5	17	59	S	212	637	212	641	4	623	630	78	294	10	15	25	S	89	675	89	682	3	663	677

HDDK			CODK			MIDNIGHT			HDDK			CODK			MIDNIGHT			
YR	DA	HR MN SEC	PO	LT	LAT	YR	DA	HR MN SEC	PO	LT	LAT	YR	DA	HR MN SEC	PO	LT	LAT	
78 300	12 29 45	81 556	N	81	556	78 301	17 36 3	N	222	630	223	635	5	621	624	5	621	624
78 300	12 49 29	217 594	N	217	594	78 301	19 5 57	N	58	650	59	648	-2	647	654	-2	647	654
78 300	13 21 29	190 622	S	190	622	78 301	19 17 45	N	225	635	225	636	-21	627	625	-21	627	625
78 300	13 36 59	104 609	S	104	609	78 301	20 59 31	N	61	659	630	660	9	645	660	9	645	660
78 300	14 31 8	218 600	N	218	600	78 301	22 42 47	N	229	651	240	657	-34	661	634	-34	661	634
78 300	15 5 11	180 635	S	180	635	78 301	22 42 47	N	64	666	67	632	7	638	643	7	638	643
78 300	15 17 39	115 624	S	115	624	78 301	23 23 10	S	186	664	186	665	1	621	629	1	621	629
78 300	15 55 1	64 613	N	64	613	78 301	23 34 49	S	99	689	99	689	-12	671	686	-12	671	686
78 300	16 13 1	218 595	N	218	595	78 301	23 34 49	S	68	634	69	620	-14	626	620	-14	626	620
78 300	17 40 15	59 633	N	59	633	78 302	0 10 19	N	68	634	69	620	3	619	625	3	619	625
78 300	17 54 34	220 598	N	220	598	78 302	0 26 45	S	218	633	218	633	6	609	618	6	609	618
78 300	19 22 59	60 637	N	60	637	78 302	1 3 5	S	195	635	195	641	-35	632	602	-35	632	602
78 300	19 36 1	223 613	N	223	613	78 302	1 18 0	S	85	651	84	616	3	585	606	3	585	606
78 300	21 5 38	62 659	N	62	659	78 302	1 50 45	N	70	604	69	607	-4	642	640	-4	642	640
78 300	21 18 23	225 616	N	225	616	78 302	2 8 19	N	209	661	209	661	-6	613	625	-6	613	625
78 300	22 45 27	67 640	N	67	640	78 302	2 43 36	S	202	641	202	641	-22	649	634	-22	649	634
78 300	23 1 0	225 632	S	225	632	78 302	2 58 39	S	78	662	79	640	-37	649	618	-37	649	618
78 300	23 40 35	187 668	S	187	668	78 302	3 48 44	N	72	662	73	625	3	662	662	3	662	662
78 300	23 53 45	93 645	S	93	645	78 302	4 28 0	S	212	675	211	664	-11	657	651	-11	657	651
78 301	0 27 39	68 633	N	68	633	78 302	4 38 34	S	77	670	81	552	-115	649	530	-115	649	530
78 301	0 44 1	217 623	N	217	623	78 302	5 15 30	N	80	667	80	667	6	641	648	6	641	648
78 301	1 20 0	197 623	S	197	623	78 302	5 29 30	N	204	660	204	660	-3	641	638	-3	641	638
78 301	1 35 10	84 658	S	84	658	78 302	6 4 17	S	214	653	214	650	-14	656	651	-14	656	651
78 301	2 9 28	68 641	N	68	641	78 302	6 20 0	N	85	629	85	629	5	636	643	5	636	643
78 301	2 27 0	206 521	N	206	521	78 302	6 56 27	N	205	656	205	656	2	631	634	2	631	634
78 301	3 0 29	204 624	S	204	624	78 302	7 9 45	S	211	644	211	644	-16	657	650	-16	657	650
78 301	3 16 43	78 634	S	78	634	78 302	7 58 15	S	80	674	80	658	-14	640	635	-14	640	635
78 301	3 50 39	74 634	N	74	634	78 302	8 36 30	N	88	659	88	645	2	635	640	2	635	640
78 301	4 8 0	203 608	S	203	608	78 302	8 50 16	N	208	656	208	656	2	630	635	2	630	635
78 301	4 39 26	210 591	S	210	591	78 302	9 24 30	S	206	650	206	650	-9	632	632	-9	632	632
78 301	4 56 49	78 637	S	78	637	78 302	9 39 15	S	86	551	86	542	8	601	617	8	601	617
78 301	5 31 0	81 607	N	81	607	78 302	10 32 0	N	213	628	213	633	5	584	599	5	584	599
78 301	5 46 31	204 594	N	204	594	78 302	11 4 43	S	200	624	200	632	12	605	612	12	605	612
78 301	6 19 17	211 580	S	211	580	78 302	11 20 15	S	94	636	94	637	3	603	612	3	603	612
78 301	6 38 15	81 600	S	81	600	78 302	12 13 43	N	83	624	83	636	15	590	618	15	590	618
78 301	7 12 36	205 597	N	205	597	78 302	12 46 29	S	192	636	191	641	24	590	631	24	590	631
78 301	7 28 39	209 589	S	209	589	78 302	13 1 9	S	103	635	105	659	5	584	599	5	584	599
78 301	7 59 28	81 650	S	81	650	78 302	13 36 59	N	75	602	75	607	12	589	608	12	589	608
78 301	8 16 17	88 661	N	88	661	78 302	14 28 18	S	187	600	183	631	31	545	596	31	545	596
78 301	8 53 44	209 639	N	209	639	78 302	14 43 21	S	110	611	110	611	69	579	576	69	579	576
78 301	9 8 1	205 606	S	205	606	78 302	15 19 13	N	69	577	69	577	2	564	576	2	564	576
78 301	9 40 33	87 650	S	87	650	78 302	15 38 30	N	217	585	218	595	10	556	586	10	556	586
78 301	9 56 30	214 648	N	214	648	78 302	16 12 1	S	180	608	180	610	2	554	576	2	554	576
78 301	10 48 44	198 654	S	198	654	78 302	17 20 30	N	218	575	218	584	9	554	576	9	554	576
78 301	11 22 31	94 622	S	94	622	78 302	18 45 14	N	66	561	65	576	15	546	573	15	546	573
78 301	11 38 0	80 651	S	80	651	78 302	19 1 59	N	220	594	221	595	11	568	581	11	568	581
78 301	12 14 12	218 638	N	218	638	78 302	20 27 38	N	69	566	67	594	28	552	592	28	552	592
78 301	12 30 30	186 669	S	186	669	78 302	22 6 23	N	224	602	224	602	28	557	557	28	557	557
78 301	13 5 29	208 665	S	208	665	78 302	22 26 44	N	223	600	227	641	41	586	631	41	586	631
78 301	13 17 23	142 643	N	142	643													
78 301	14 12 6	178 652	S	178	652													
78 301	14 48 9	165 665	S	165	665													
78 301	15 37 19	222 642	N	222	642													
78 301	15 54 5	221 636	N	221	636													

	VR	DA	HDDK	HR	MN	SEC	PO	HDDK	LT	LAT	CDCK	DLAT	MIDNIGHT	LATH.	LATC	MIDNIGHT
	78 302	78 302	183	6	19	0	S	183	677	636	640	0	636	640	0	636
	78 302	78 302	96	638	38	0	S	96	638	562	614	38	562	614	38	562
	78 302	78 302	69	619	0	0	S	69	619	619	619	0	619	619	0	619
	78 302	78 302	222	656	-2	0	N	222	656	656	656	-2	656	656	-2	656
	78 303	78 303	193	671	0	0	N	193	671	671	671	0	671	671	0	671
	78 303	78 303	212	674	0	0	N	212	674	674	674	0	674	674	0	674
	78 303	78 303	201	622	0	0	S	201	622	622	622	0	622	622	0	622
	78 303	78 303	201	625	3	0	S	201	625	625	625	3	625	625	3	625
	78 303	78 303	79	660	0	0	S	79	660	660	660	0	660	660	0	660
	78 303	78 303	72	621	0	0	N	72	621	621	621	0	621	621	0	621
	78 303	78 303	204	663	0	0	N	204	663	663	663	0	663	663	0	663
	78 303	78 303	204	645	0	0	N	204	645	645	645	0	645	645	0	645
	78 303	78 303	210	648	0	0	N	210	648	648	648	0	648	648	0	648
	78 303	78 303	78	634	-13	0	S	78	634	634	634	-13	634	634	-13	634
	78 303	78 303	79	628	0	0	N	79	628	628	628	0	628	628	0	628
	78 303	78 303	203	644	0	0	N	203	644	644	644	0	644	644	0	644
	78 303	78 303	213	622	0	0	N	213	622	622	622	0	622	622	0	622
	78 303	78 303	77	636	72	0	S	77	636	636	636	72	636	636	72	636
	78 303	78 303	84	604	0	0	N	84	604	604	604	0	604	604	0	604
	78 303	78 303	205	635	0	0	N	205	635	635	635	0	635	635	0	635
	78 303	78 303	211	635	0	0	N	211	635	635	635	0	635	635	0	635
	78 303	78 303	81	595	0	0	N	81	595	595	595	0	595	595	0	595
	78 303	78 303	87	603	0	0	N	87	603	603	603	0	603	603	0	603
	78 303	78 303	208	609	0	0	N	208	609	609	609	0	609	609	0	609
	78 303	78 303	207	585	0	0	S	207	585	585	585	0	585	585	0	585
	78 303	78 303	34	581	0	0	S	34	581	581	581	0	581	581	0	581
	78 303	78 303	212	571	0	0	N	212	571	571	571	0	571	571	0	571
	78 303	78 303	202	571	0	0	N	202	571	571	571	0	571	571	0	571
	78 303	78 303	90	578	0	0	S	90	578	578	578	0	578	578	0	578
	78 303	78 303	85	584	0	0	N	85	584	584	584	0	584	584	0	584
	78 303	78 303	215	578	0	0	N	215	578	578	578	0	578	578	0	578
	78 303	78 303	197	559	0	0	S	197	559	559	559	0	559	559	0	559
	78 303	78 303	79	593	0	0	N	79	593	593	593	0	593	593	0	593
	78 303	78 303	217	580	0	0	N	217	580	580	580	0	580	580	0	580
	78 303	78 303	190	592	0	0	N	190	592	592	592	0	592	592	0	592
	78 303	78 303	114	597	0	0	N	114	597	597	597	0	597	597	0	597
	78 303	78 303	72	548	0	0	N	72	548	548	548	0	548	548	0	548
	78 303	78 303	217	574	6	0	N	217	574	574	574	6	574	574	6	574
	78 303	78 303	189	550	1	0	N	189	550	550	550	1	550	550	1	550
	78 303	78 303	67	554	0	0	N	67	554	554	554	0	554	554	0	554
	78 303	78 303	216	559	15	0	N	216	559	559	559	15	559	559	15	559
	78 303	78 303	66	557	0	0	N	66	557	557	557	0	557	557	0	557
	78 303	78 303	219	566	6	0	N	219	566	566	566	6	566	566	6	566
	78 303	78 303	169	626	11	0	N	169	626	626	626	11	626	626	11	626
	78 303	78 303	68	562	5	0	N	68	562	562	562	5	562	562	5	562
	78 303	78 303	221	575	6	0	N	221	575	575	575	6	575	575	6	575
	78 303	78 303	21	570	4	0	N	21	570	570	570	4	570	570	4	570
	78 303	78 303	223	593	17	0	N	223	593	593	593	17	593	593	17	593
	78 303	78 303	165	629	0	0	N	165	629	629	629	0	629	629	0	629
	78 303	78 303	94	570	0	0	N	94	570	570	570	0	570	570	0	570
	78 303	78 303	71	593	10	0	N	71	593	593	593	10	593	593	10	593
	78 303	78 303	420	616	604	0	N	420	616	616	616	604	616	616	604	616
	78 304	78 304	193	629	6	0	N	193	629	629	629	6	629	629	6	629

YR	DA	HR	MN	SEC	PO	HDCK	LT	LAT	CDCK	DLAT	"MIDNIGHT"	LATH.	LATC	CDCK	LT	LAT	DLAT	"MIDNIGHT"	LATH.	LATC
78 305	4 20 35	N	77	577	77	562	-15	597	550	597	550	612	614	88	677	88	677	-28	660	639
78 305	4 26 52	N	77	577	203	626	6	596	611	596	611	612	614	210	524	210	524	6	602	614
78 305	5 11 38	S	212	615	212	621	6	596	611	596	611	612	614	205	593	205	593	20	567	600
78 305	5 28 30	S	79	628	79	628	22	592	577	592	577	612	614	89	661	89	661	8	634	553
78 305	6 1 36	N	83	572	83	594	22	592	577	592	577	612	614	214	590	214	590	19	550	581
78 305	7 1 36	N	83	572	83	594	22	592	577	592	577	612	614	199	590	199	590	5	555	582
78 305	7 7 36	N	83	572	83	594	22	592	577	592	577	612	614	97	635	97	635	-34	646	610
78 305	7 43 46	N	87	622	87	612	-10	599	598	599	598	612	614	81	615	81	615	44	544	510
78 305	7 59 46	N	207	608	207	608	1	594	596	594	596	612	614	217	597	217	597	8	559	579
78 305	8 31 15	S	208	597	208	605	8	592	593	592	593	610	610	193	592	193	592	0	551	575
78 305	8 49 0	S	83	613	83	613	10	599	610	599	610	610	610	107	639	107	639	-12	613	602
78 305	9 41 22	N	211	578	211	578	14	597	570	597	570	610	610	72	604	72	604	-11	587	595
78 305	10 10 59	S	204	565	204	579	14	597	569	597	569	610	610	218	602	218	602	-3	585	590
78 305	10 30 52	S	88	586	88	630	64	597	618	597	618	610	610	181	633	181	633	14	567	586
78 305	11 2 59	N	87	584	87	621	37	597	582	597	582	610	610	55	605	55	605	20	573	585
78 305	11 22 5	N	215	597	215	598	1	579	589	579	589	610	610	218	577	218	577	16	558	584
78 305	11 52 12	S	198	601	198	605	4	591	587	591	587	610	610	64	583	64	583	11	558	580
78 305	12 9 1	S	93	638	93	621	-17	608	591	608	591	610	610	220	602	220	602	18	584	599
78 305	12 44 59	N	79	621	79	626	5	604	615	604	615	610	610	62	620	62	620	2	608	620
78 305	13 2 48	N	219	626	219	626	0	611	615	611	615	610	610	225	627	225	627	-2	618	614
78 305	13 26 29	S	107	636	107	636	17	598	587	598	587	610	610	166	656	166	656	7	570	586
78 305	13 49 36	S	110	639	110	639	-20	592	587	592	587	610	610	119	684	119	684	7	605	606
78 305	14 27 29	N	69	624	69	624	4	603	625	603	625	610	610	67	625	67	625	-10	616	615
78 305	14 44 33	N	220	627	220	627	11	619	628	619	628	610	610	226	625	226	625	-8	625	615
78 305	15 21 41	S	171	671	171	679	8	615	619	615	619	610	610	66	648	66	648	-12	654	651
78 305	16 26 1	N	222	634	222	646	12	626	636	626	636	610	610	227	655	227	655			
78 305	17 55 17	N	58	644	58	644	16	616	632	616	632	610	610	188	651	188	651			
78 305	18 5 1	N	223	626	223	642	16	616	632	616	632	610	610	97	689	97	689			
78 305	19 37 23	N	51	634	51	639	5	626	641	626	641	610	610	68	635	68	635	-13	642	638
78 305	19 49 52	N	226	631	226	639	8	632	629	632	629	610	610	217	639	217	639	2	626	630
78 305	21 18 55	N	66	626	66	626		627	627	627	627	610	610	196	641	196	641	7	591	612
78 305	21 32 28	N	70	620	70	620	-22	620	599	620	599	610	610	84	643	84	643	-5	624	628
78 305	23 0 26	N	68	625	68	625		619	619	619	619	610	610	58	648	58	648	13	627	651
78 305	23 14 44	N	226	656	226	656	647	668	668	668	668	610	610	206	623	206	623	7	600	615
78 305	23 56 5	S	186	703	186	703	668	668	668	668	668	610	610	203	621	203	621	9	588	607
78 305	0 5 37	S	53	663	53	663	-33	662	550	662	550	610	610	78	634	78	634	35	618	666
78 305	0 42 46	N	66	652	66	652	-45	665	599	665	599	610	610	78	634	78	634	-18	619	609
78 305	0 57 23	N	218	677	218	677	4	668	666	668	666	610	610	203	642	203	642	-6	621	621
78 305	1 35 44	S	197	674	197	683	9	644	656	644	656	610	610	211	622	211	622	-9	607	620
78 305	1 48 37	S	83	689	83	689	-70	660	658	660	658	610	610	78	645	78	645	19	634	652
78 305	2 39 31	N	207	678	207	678	0	660	658	660	658	610	610	81	653	81	653	4	642	647
78 305	3 15 43	S	205	690	205	690	8	651	649	651	649	610	610	204	665	204	665	4	642	647
78 305	3 30 32	S	78	643	78	643	4	654	647	654	647	610	610	214	647	214	647	17	616	635
78 305	4 6 33	N	75	661	75	661	-20	659	657	659	657	610	610	86	700	86	700	-9	696	697
78 305	4 20 35	N	205	684	205	684	8	645	653	645	653	610	610	205	684	205	684			
78 305	4 54 59	S	212	633	212	647	14	619	635	619	635	610	610	211	632	211	632	-24	651	635
78 305	5 10 37	N	78	649	78	649	1	635	645	635	645	610	610	81	669	81	669	-13	649	645
78 305	5 47 21	N	92	675	92	675	9	632	672	632	672	610	610	209	625	209	625	14	602	623
78 305	6 0 43	N	204	694	204	694	-12	645	635	645	635	610	610	206	641	206	641	6	613	625
78 305	6 35 0	S	213	634	213	636	2	620	625	620	625	610	610	87	651	87	651	18	615	625
78 305	6 50 4	N	79	681	79	681	-6	647	651	647	651	610	610	214	639	214	639	9	626	636
78 305	7 27 45	N	97	685	97	685		647	651	647	651	610	610	214	639	214	639			
78 305	7 41 27	N	206	647	206	647	17	627	635	627	635	610	610	98	636	98	636			
78 305	8 14 59	S	210	630	210	630	7	620	636	620	636	610	610	215	639	215	639			
78 305	8 30 47	S	82	541	82	648	7	620	636	620	636	610	610	215	639	215	639			

HDDK										CDDK			MIDNIGHT			HDDK			CDDK			MIDNIGHT									
YR	DA	HR	MM	SEC	PO	LT	LAT	DLAT	LATH, LATC	YR	DA	HR	MM	SEC	PO	LT	LAT	DLAT	LATH, LATC	YR	DA	HR	MM	SEC	PO	LT	LAT	DLAT	LATH, LATC		
78	307	11	20	56	S	196	690	-2	662	78	308	15	33	54	N	221	628	221	637	9	619	78	307	11	20	56	S	196	690	-2	662
78	307	11	32	44	S	96	688	-22	669	78	308	17	2	32	N	57	652	60	634	-18	649	78	307	12	11	23	N	81	657	-13	638
78	307	12	11	23	N	81	657	-13	638	78	308	17	15	31	N	222	630	224	644	14	621	78	307	12	26	42	N	219	660	20	649
78	307	12	26	42	N	219	660	20	649	78	308	18	45	57	N	56	666	60	635	-31	665	78	307	13	2	43	S	186	680	28	640
78	307	13	2	43	S	186	680	28	640	78	308	18	56	32	N	227	652	228	662	10	647	78	307	13	13	59	S	109	675	-23	649
78	307	13	13	59	S	109	675	-23	649	78	308	20	39	14	N	58	672	63	637	-35	671	78	307	13	53	23	N	70	656	12	649
78	307	13	53	23	N	70	656	12	649	78	308	20	39	14	N	58	672	63	637	-35	671	78	307	14	8	37	N	222	654	22	643
78	307	14	8	37	N	222	654	22	643	78	308	22	9	57	N	52	676	66	646	-30	671	78	307	15	50	51	N	222	641	22	643
78	307	15	50	51	N	222	641	22	643	78	308	23	3	30	S	182	684	182	687	8	645	78	307	17	32	14	N	225	650	37	554
78	307	17	32	14	N	225	650	37	554	78	308	23	13	41	S	103	701	101	684	-17	687	78	307	19	0	1	N	56	668	15	587
78	307	19	0	1	N	56	668	15	587	78	308	23	50	34	N	66	653	66	657	4	646	78	307	19	15	51	N	222	601	22	616
78	307	19	15	51	N	222	601	22	616	78	309	0	4	21	N	224	668	224	673	5	655	78	307	20	41	55	N	70	561	-3	539
78	307	20	41	55	N	70	561	-3	539	78	309	0	44	14	S	192	684	192	685	2	655	78	307	20	58	39	N	223	591	-6	576
78	307	20	58	39	N	223	591	-6	576	78	309	0	57	15	S	87	660	87	661	1	641	78	307	22	25	28	N	68	523	70	597
78	307	22	25	28	N	68	523	70	597	78	309	1	47	0	N	213	683	213	681	-2	675	78	307	22	40	53	N	224	611	224	612
78	307	22	40	53	N	224	611	224	612	78	309	2	24	8	S	201	662	201	664	-2	643	78	307	23	19	35	S	187	643	96	652
78	307	23	19	35	S	187	643	96	652	78	309	2	38	1	S	79	674	79	649	-25	662	78	307	23	33	1	S	96	648	86	652
78	307	23	33	1	S	96	648	86	652	78	309	3	13	19	N	71	647	71	625	-21	632	78	307	23	33	1	S	96	648	86	652
78	307	23	33	1	S	96	648	86	652	78	309	3	29	39	N	204	639	204	641	2	618	78	308	0	7	30	N	67	640	67	641
78	308	0	7	30	N	67	640	67	641	78	309	4	3	25	S	209	630	209	629	-1	608	78	308	0	24	23	N	217	511	217	511
78	308	0	24	23	N	217	511	217	511	78	309	4	3	25	S	209	630	209	629	-1	608	78	308	0	39	38	S	195	622	195	636
78	308	0	39	38	S	195	622	195	636	78	309	4	19	58	S	79	624	79	631	-29	644	78	308	1	15	22	S	95	636	85	647
78	308	1	15	22	S	95	636	85	647	78	309	4	54	54	S	79	658	79	629	-29	644	78	308	1	50	25	N	65	678	65	621
78	308	1	50	25	N	65	678	65	621	78	309	5	9	0	N	204	671	204	654	-17	653	78	308	2	5	10	N	209	663	208	639
78	308	2	5	10	N	209	663	208	639	78	309	5	44	29	S	215	666	214	643	-23	656	78	308	2	40	33	S	202	635	202	640
78	308	2	40	33	S	202	635	202	640	78	309	5	44	29	S	215	666	214	643	-23	656	78	308	2	55	21	S	78	672	78	671
78	308	2	55	21	S	78	672	78	671	78	309	6	35	48	S	95	659	85	636	-13	645	78	308	2	55	21	S	78	672	78	671
78	308	2	55	21	S	78	672	78	671	78	309	6	35	48	S	95	659	85	636	-13	645	78	308	3	30	32	N	72	642	73	605
78	308	3	30	32	N	72	642	73	605	78	309	6	45	15	N	205	667	205	680	-13	640	78	308	3	45	48	N	204	676	204	668
78	308	3	45	48	N	204	676	204	668	78	309	7	24	21	S	90	650	80	652	2	630	78	308	4	20	44	S	210	634	211	654
78	308	4	20	44	S	210	634	211	654	78	309	7	24	21	S	90	650	80	652	2	630	78	308	4	36	0	S	78	658	78	611
78	308	4	36	0	S	78	658	78	611	78	309	8	16	0	N	28	648	88	650	2	628	78	308	5	11	20	N	80	629	80	629
78	308	5	11	20	N	80	629	80	629	78	309	8	29	21	N	28	678	208	681	3	660	78	308	5	27	10	N	204	635	204	663
78	308	5	27	10	N	204	635	204	663	78	309	9	4	41	S	88	658	88	659	11	650	78	308	6	1	8	S	214	649	214	650
78	308	6	1	8	S	214	649	214	650	78	309	9	17	23	S	85	692	85	649	-49	684	78	308	6	15	31	N	78	669	78	643
78	308	6	15	31	N	78	669	78	643	78	309	10	10	23	S	85	692	85	649	-49	684	78	308	6	53	20	N	86	668	86	640
78	308	6	53	20	N	86	668	86	640	78	309	10	45	47	S	200	680	201	673	-5	663	78	308	7	5	53	N	205	651	205	653
78	308	7	5	53	N	205	651	205	653	78	309	10	57	29	S	96	709	94	685	-26	695	78	308	7	40	48	S	211	538	212	639
78	308	7	40	48	S	211	538	212	639	78	309	11	37	30	N	83	680	84	665	-15	664	78	308	8	33	18	N	58	662	58	645
78	308	8	33	18	N	58	662	58	645	78	309	11	51	41	N	83	680	84	665	-15	664	78	308	8	55	16	S	81	647	81	640
78	308	8	55	16	S	81	647	81	640	78	309	12	27	21	N	83	680	84	665	-15	664	78	308	8	33	18	N	58	662	58	645
78	308	8	33	18	N	58	662	58	645	78	309	12	27	21	N	83	680	84	665	-15	664	78	308	8	48	11	N	209	522	209	628
78	308	8	48	11	N	209	522	209	628	78	309	12	38	36	S	107	696	106	683	-13	679	78	308	9	20	49	S	207	628	207	625
78	308	9	20	49	S	207	628	207	625	78	309	13	17	41	N	75	642	74	658	16	627	78	308	9	26	23	S	86	647	86	640
78	308	9	26	23	S	86	647	86	640	78	309	13	17	41	N	75	642	74	658	16	627	78	308	9	36	23	S	86	647	86	640
78	308	9	36	23	S	86	647	86	640	78	309	14	11	32	N	222	665	222	666	1	662	78	308	10	28	47	N	210	634	210	638
78	308	10	28	47	N	210	634	210	638	78	309	14	11	32	N	222	665	222	666	1	662	78	308	10	28	47	N	210	634	210	638
78	308	10	28	47	N	210	634	210	638	78	309	15	15	14	S	93	665	93	665	-13	634	78	308	11	16	14	S	93	665	93	665
78	308	11	16	14	S	93	665	93	665	78	309	15	15	14	S	93	665	93	665	-13	634	78	308	11	53	29	N	83	639	82	652
78	308	11	53	29	N	83	639	82	652	78	309	16	57	26	N	24	647	24	652	5	651	78	308	12	9	36	N	218	651	219	659
78	308	12	9	36	N	218	651	219	659	78	309	16	57	26	N	24	647	24	652	5	651	78	308	12	44	59	S	188	677	189	580
78	308	12	44	59	S	188	677	189	580	78	309	18	39	21	N	235	643	235	643	-35	661	78	308	12	44	59	S	188	677	189	580
78	308	12	44	59	S	188	677																								

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YR	DA	HR	MIN	SEC	PO	HDOK	LT	LAT	HDOK	LT	LAT	HDOK	LT	LAT	CDOK	LT	LAT	DLAT	MIDNIGHT	LATH, LATC
78 326	23 41 18	23	41	18	N	65	660	65	660	65	660	65	660	65	660	65	660	-10	656	647
78 326	23 54 49	23	54	49	N	65	660	65	660	65	660	65	660	65	660	65	660	-12	637	629
78 326	0 34 40	0	34	40	S	190	681	190	680	190	680	190	680	190	680	190	680	10	616	631
78 327	0 47 0	0	47	0	S	190	686	190	686	190	686	190	686	190	686	190	686	72	667	599
78 327	1 22 28	1	22	28	N	66	651	66	651	66	651	66	651	66	651	66	651	-1	652	660
78 327	1 37 40	1	37	40	N	213	670	213	672	213	672	213	672	213	672	213	672	1	630	653
78 327	2 15 0	2	15	0	S	199	672	199	672	199	672	199	672	199	672	199	672	23	630	653
78 327	2 29 40	2	29	40	S	79	640	79	640	79	640	79	640	79	640	79	640	-21	632	618
78 327	3 4 14	3	4	14	N	69	660	69	661	69	661	69	661	69	661	69	661	9	656	663
78 327	3 18 51	3	18	51	N	205	680	205	680	205	680	205	680	205	680	205	680	32	640	670
78 327	3 55 13	3	55	13	S	208	671	208	672	208	672	208	672	208	672	208	672	-3	663	665
78 327	4 9 21	4	9	21	S	77	664	77	664	77	664	77	664	77	664	77	664	2	676	689
78 327	4 45 47	4	45	47	N	78	670	78	670	78	670	78	670	78	670	78	670	12	654	684
78 327	4 59 21	4	59	21	N	204	677	204	677	204	677	204	677	204	677	204	677	8	660	665
78 327	5 35 15	5	35	15	S	215	672	215	672	215	672	215	672	215	672	215	672	-18	676	667
78 327	5 50 16	5	50	16	S	80	637	80	637	80	637	80	637	80	637	80	637	-24	693	678
78 327	6 26 14	6	26	14	N	85	655	85	655	85	655	85	655	85	655	85	655	5	650	653
78 327	6 39 30	6	39	30	N	205	676	205	676	205	676	205	676	205	676	205	676	3	659	660
78 327	7 15 45	7	15	45	S	215	692	215	692	215	692	215	692	215	692	215	692	28	609	653
78 327	7 28 52	7	28	52	S	80	672	80	672	80	672	80	672	80	672	80	672	-44	653	613
78 327	8 7 30	8	7	30	N	89	679	89	679	89	679	89	679	89	679	89	679	-2	638	636
78 327	8 19 48	8	19	48	N	208	679	208	679	208	679	208	679	208	679	208	679	8	660	667
78 327	8 55 30	8	55	30	S	210	679	210	679	210	679	210	679	210	679	210	679	-46	668	612
78 327	9 9 8	9	9	8	S	85	666	85	666	85	666	85	666	85	666	85	666	21	619	651
78 327	10 1 30	10	1	30	N	213	645	213	645	213	645	213	645	213	645	213	645	-20	659	633
78 327	10 35 51	10	35	51	S	202	668	202	668	202	668	202	668	202	668	202	668	6	620	632
78 327	10 49 45	10	49	45	S	93	660	93	660	93	660	93	660	93	660	93	660	13	623	705
78 327	11 28 0	11	28	0	N	85	677	85	677	85	677	85	677	85	677	85	677	6	599	615
78 327	11 43 12	11	43	12	N	217	630	217	630	217	630	217	630	217	630	217	630	4	579	592
78 327	12 17 13	12	17	13	S	194	663	194	663	194	663	194	663	194	663	194	663	1	559	579
78 327	12 29 12	12	29	12	S	106	695	106	695	106	695	106	695	106	695	106	695	-37	593	563
78 327	13 7 29	13	7	29	N	78	624	77	646	77	646	77	646	77	646	77	646	6	546	565
78 327	13 25 40	13	25	40	N	218	607	219	612	219	612	219	612	219	612	219	612	7	558	575
78 327	13 58 54	13	58	54	S	195	637	195	637	195	637	195	637	195	637	195	637	6	536	548
78 327	14 10 40	14	10	40	S	116	677	117	666	117	666	117	666	117	666	117	666	1	577	589
78 327	14 49 17	14	49	17	N	70	596	71	578	71	578	71	578	71	578	71	578	8	530	548
78 327	15 7 15	15	7	15	N	219	614	221	637	221	637	221	637	221	637	221	637	7	571	580
78 327	15 49 12	15	49	12	N	220	602	221	619	221	619	221	619	221	619	221	619	22	576	517
78 327	16 15 50	16	15	50	N	64	565	62	603	62	603	62	603	62	603	62	603	6	593	600
78 327	18 31 6	18	31	6	N	221	600	222	612	222	612	222	612	222	612	222	612	-3	613	618
78 327	19 58 10	19	58	10	N	66	587	65	606	65	606	65	606	65	606	65	606	-61	622	570
78 327	20 13 20	20	13	20	N	223	595	224	607	224	607	224	607	224	607	224	607	1	591	602
78 327	21 39 12	21	39	12	N	71	565	70	583	70	583	70	583	70	583	70	583	0	613	618
78 327	21 55 42	21	55	42	N	225	566	226	620	226	620	226	620	226	620	226	620	24	581	617
78 327	22 36 39	22	36	39	S	178	683	178	683	178	683	178	683	178	683	178	683	-1	610	619
78 327	22 47 41	22	47	41	S	102	660	98	612	98	612	98	612	98	612	98	612	0	572	591
78 327	23 22 0	23	22	0	N	70	608	69	621	69	621	69	621	69	621	69	621	24	601	594
78 327	23 38 0	23	38	0	N	222	601	222	601	222	601	222	601	222	601	222	601	-17	601	594
78 328	0 16 59	0	16	59	S	190	669	189	679	189	679	189	679	189	679	189	679	2	584	597
78 328	0 36 30	0	36	30	S	90	651	89	634	89	634	89	634	89	634	89	634	42	554	595
78 328	1 3 53	1	3	53	N	68	620	68	624	68	624	68	624	68	624	68	624	11	574	595
78 328	1 21 31	1	21	31	N	212	627	212	633	212	633	212	633	212	633	212	633	8	576	596
78 328	1 56 47	1	56	47	S	198	642	198	642	198	642	198	642	198	642	198	642	203	609	
78 328	2 12 3	2	12	3	S	80	649	80	649	80	649	80	649	80	649	80	649			

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		HDDK		CDDK		MIDNIGHT		HDDK		CDDK		MIDNIGHT	
YR	DA	HR	MN	SEC	PO	LT	LAT	LT	LAT	LT	LAT	LT	LAT
78 331	8 38 20	N	89	664	3	646	660	78 332	11 56 4	N	219	668	2 558 657
78 331	8 52 26	N	209	631	-3	628	613	78 332	12 32 33	S	189	697	8 660 667
78 331	9 24 59	S	207	614	208	626	612	78 332	12 44 36	S	104	658	5 624 637
78 331	9 41 28	S	87	637	87	641	630	78 332	13 23 21	N	73	672	-17 660 650
78 331	10 33 58	S	214	610	214	620	610	78 332	13 37 55	N	232	659	5 655 656
78 331	11 6 25	S	201	634	201	643	627	78 332	14 14 55	S	179	677	18 624 647
78 331	11 21 53	S	94	635	96	667	627	78 332	15 3 32	N	222	642	5 668 632
78 331	11 58 42	S	83	656	83	665	653	78 332	15 20 31	N	222	636	4 623 625
78 331	12 16 0	S	218	620	218	620	610	78 332	17 2 27	N	222	632	-56 682 627
78 331	12 48 28	S	192	645	66	563	644	78 332	18 33 40	N	224	633	83 625 716
78 331	13 37 59	N	77	583	4	571	585	78 332	18 44 12	N	239	716	-58 688 630
78 331	13 57 58	N	218	590	218	594	576	78 332	20 15 54	N	231	664	4 664 669
78 331	14 29 44	S	187	623	186	610	625	78 332	20 50 52	N	231	664	2 561 662
78 331	14 43 21	S	115	650	8	594	625	78 332	0 31 59	S	189	698	-2 598 710
78 331	15 21 16	N	68	600	10	578	599	78 332	0 42 59	S	91	711	-9 668 668
78 331	15 39 47	N	218	598	10	569	599	78 332	1 19 59	N	64	673	0 676 670
78 331	16 14 53	S	173	648	10	563	589	78 332	1 33 48	N	214	684	9 561 569
78 331	16 26 26	S	119	623	549	583	583	78 332	2 12 17	S	198	689	-28 669 648
78 331	17 21 52	N	218	575	17	554	593	78 332	2 25 14	S	79	681	-21 670 658
78 331	18 43 9	N	63	599	28	565	593	78 332	3 1 29	N	68	675	-3 685 675
78 331	19 3 24	N	222	610	11	597	579	78 332	3 14 59	N	205	700	9 670 675
78 331	20 29 25	N	69	571	18	579	600	78 332	3 52 32	S	208	687	77 653
78 331	20 45 20	N	223	594	-45	636	589	78 332	4 5 36	S	76	682	-24 565 648
78 331	22 13 21	N	66	643	-1	616	614	78 332	4 42 45	N	204	696	7 680 681
78 331	22 27 5	S	226	626	226	625	614	78 332	4 55 32	N	216	696	5 681 680
78 331	23 7 59	S	182	682	160	701	608	78 332	5 32 35	S	216	696	85 673
78 331	23 20 51	S	95	626	96	634	612	78 332	5 46 0	S	78	668	1 591 585
78 331	23 53 11	N	70	597	69	613	612	78 332	6 25 0	N	85	724	-22 680 662
78 332	0 9 7	S	223	664	-21	651	633	78 332	6 35 33	N	205	701	-23 698 684
78 332	0 49 0	S	191	690	60	679	624	78 332	7 12 43	S	216	699	-6 691 681
78 332	1 2 32	S	86	641	-60	679	624	78 332	7 25 0	S	79	691	-4 692 681
78 332	1 37 47	S	67	623	18	646	653	78 332	8 5 9	N	89	711	-18 700 692
78 332	2 28 47	S	200	655	2	621	632	78 332	8 15 45	S	210	699	-5 695 685
78 332	2 43 52	S	78	638	-2	635	642	78 332	9 4 18	S	84	713	-5 718 724
78 332	3 17 59	N	70	649	6	633	641	78 332	9 45 58	N	89	729	3 567 655
78 332	3 33 40	S	203	653	203	659	637	78 332	9 57 19	N	213	676	-2 664 659
78 332	4 8 40	S	209	654	-20	642	630	78 332	10 32 57	S	203	679	-15 710 706
78 332	4 23 35	S	77	656	-9	643	643	78 332	10 44 29	S	94	706	-3 639 638
78 332	4 59 28	N	79	657	8	642	650	78 332	11 39 13	N	218	651	9 696 715
78 332	5 13 41	N	215	654	-27	642	617	78 332	12 13 58	S	194	654	1 652 662
78 332	5 48 38	S	79	656	-15	644	656	78 332	12 25 34	S	107	707	-18 668 643
78 332	6 3 33	S	86	650	26	665	657	78 332	13 5 33	N	76	665	14 654 665
78 332	6 40 59	N	206	657	13	642	654	78 332	13 20 3	S	222	670	1 661 657
78 332	6 53 58	S	214	654	-8	650	652	78 332	13 57 57	N	177	696	-14 661 626
78 332	7 28 35	S	80	668	5	648	654	78 332	14 48 28	N	224	665	7 613 619
78 332	7 42 59	S	89	671	-4	648	652	78 332	15 2 1	N	58	639	-44 692 650
78 332	8 21 7	N	209	667	10	642	652	78 332	15 14 18	N	223	630	0 685 629
78 332	8 34 4	N	209	661	-8	644	649	78 332	16 14 18	N	223	630	-19 690 675
78 332	9 8 58	S	86	662	-3	654	649	78 332	17 2 0	N	53	691	
78 332	9 23 17	S	214	664	15	652	665	78 332	17 58 34	N	234	685	
78 332	10 15 0	S	201	670	7	650	677	78 332	20 52 53	S	163	685	
78 332	10 50 0	S	94	656	-1	656	677	78 332	21 40 9	N	62	670	
78 332	11 3 57	N	84	684									
78 332	11 42 14	N	84	684									

YR	DA	HR	MM	SEC	PO	HDCK	LT	LAT	CLUTX	DLAT	MIDNIGHT	CLUTX	DLAT	MIDNIGHT	YR	DA	HR	MM	SEC	PO	HDCK	LT	LAT	CLUTX	DLAT	MIDNIGHT
78	333	2	49	16	N	234	686	235	689	3	636	689	3	636	78	333	7	35	9	N	203	652	77	652	-1	639
78	333	23	21	21	N	228	681	229	690	9	680	681	9	680	78	333	4	22	23	N	203	652	77	652	7	632
78	333	23	32	49	S	186	706	186	706	1	671	706	1	671	78	333	4	56	45	S	212	639	74	651	8	626
78	334	0	14	56	S	95	724	93	713	-23	714	692	-23	692	78	333	5	12	33	S	79	644	203	639	8	626
78	334	0	24	59	S	61	695	64	676	-15	692	673	-15	673	78	333	5	47	15	N	83	617	83	635	18	629
78	334	1	3	23	N	217	686	217	686	1	613	673	1	613	78	333	6	2	1	N	204	670	204	647	3	652
78	334	1	16	2	S	197	688	197	687	-1	660	659	-1	660	78	333	6	32	59	S	214	670	215	655	6	638
78	334	1	54	56	S	80	699	80	692	-7	685	682	-7	685	78	333	6	52	0	S	80	657	80	655	-1	638
78	334	2	4	22	N	66	685	67	675	-10	681	680	-10	681	78	333	7	29	26	N	88	667	88	663	2	643
78	334	2	44	22	N	205	678	206	684	6	660	660	6	660	78	333	7	42	1	S	211	639	207	645	3	621
78	334	2	58	15	S	334	45	334	45	-1	652	650	-1	652	78	333	8	16	44	S	211	639	211	637	-2	626
78	334	3	34	45	S	206	670	206	669	-1	652	650	-1	652	78	333	8	16	44	S	211	639	211	637	-2	626
78	334	3	49	23	S	77	670	75	656	-23	672	651	-23	672	78	333	11	37	57	S	199	627	199	627	-4	600
78	334	3	49	23	S	77	670	75	656	-23	672	651	-23	672	78	333	11	37	57	S	199	627	199	627	-4	600
78	334	4	39	0	N	203	671	203	673	3	654	654	3	654	78	333	11	5	59	S	199	627	199	627	-4	600
78	334	5	14	53	S	214	673	214	676	3	654	653	3	654	78	333	12	46	59	N	218	618	218	618	9	602
78	334	5	28	14	S	77	684	84	651	-50	687	642	-50	687	78	333	13	20	42	S	188	649	188	649	7	603
78	334	6	7	0	N	84	701	84	698	5	677	677	5	677	78	333	13	33	20	S	188	649	188	649	7	603
78	334	6	18	31	N	205	693	205	698	5	677	677	5	677	78	333	14	28	2	N	121	639	220	634	-5	631
78	334	6	55	9	S	216	685	216	694	9	677	680	9	677	78	333	14	28	2	N	121	639	220	634	-5	631
78	334	7	7	59	S	79	686	80	671	-25	675	653	-25	675	78	333	15	4	23	S	177	656	174	670	14	591
78	334	7	7	59	S	79	686	80	671	-25	675	653	-25	675	78	333	15	4	23	S	177	656	174	670	14	591
78	334	7	47	52	N	88	712	88	696	-16	699	681	-16	699	78	333	16	9	47	N	222	639	222	639	3	631
78	334	7	47	52	N	88	712	88	696	-16	699	681	-16	699	78	333	16	9	47	N	222	639	222	639	3	631
78	334	7	58	56	N	207	685	207	682	-4	663	662	-4	663	78	333	17	32	23	N	60	624	60	624	0	615
78	334	8	35	8	S	211	682	211	686	-2	672	672	-2	672	78	333	17	32	23	N	60	624	60	624	0	615
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78	334	8	47	20	S	83	705	83	698	-17	691	684	-17	691	78	333	19	22	0	N	59	651	60	636	-15	648
78	334	8	47	20	S	83	705	83	698	-17	691	684	-17	691	78	333	19	22	0	N	59	651	60	636	-15	648
78	334	9	28	14	N	89	712	89	707	-5	691	705	-5	691	78	333	21	3	39	N	225	632	225	632	0	623
78	334	9	40	20	N	212	682	212	684	2	651	651	2	651	78	333	21	3	39	N	225	632	225	632	0	623
78	334	10	15	21	S	204	673	204	675	2	655	655	2	655	78	333	22	15	59	N	227	634	228	641	7	626
78	334	10	15	21	S	204	673	204	675	2	655	655	2	655	78	333	22	15	59	N	227	634	228	641	7	626
78	334	10	27	21	S	93	716	93	722	14	704	727	14	704	78	333	22	48	28	N	227	634	228	641	7	626
78	334	11	7	54	N	86	692	86	692	-14	677	672	-14	677	78	333	23	58	35	S	185	682	184	687	8	645
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78	334	11	21	39	S	217	654	217	650	5	642	642	5	642	78	333	23	51	27	S	96	674	94	649	-25	652
78	334	11	21	39	S	217	654	217	650	5	642	642	5	642	78	333	23	51	27	S	96	674	94	649	-25	652
78	334	11	56	51	S	195	673	195	679	1	643	642	1	643	78	333	24	25	25	S	67	639	67	630	-9	631
78	334	11	56	51	S	195	673	195	679	1	643	642	1	643	78	333	24	25	25	S	67	639	67	630	-9	631
78	334	12	9	19	S	102	677	102	684	7	652	658	7	652	78	333	24	25	25	S	67	639	67	630	-9	631
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78	334	13	3	47	S	220	635	220	639	3	626	623	3	626	78	333	24	25	25	S	67	639	67	630	-9	631
78	334	13	3	47	S	220	635	220	639	3	626	623	3	626	78	333	24	25	25	S	67	639	67	630	-9	631
78	334	13	39	14	S	183	674	183	679	-2	649	656	-2	649	78	333	24	25	25	S	67	639	67	630	-9	631
78	334	14	30	13	N	67	655	67	653	-2	649	656	-2	649	78	333	24	25	25	S	67	639	67	630	-9	631
78	334	14	44	50	N	222	655	221	642	-13	650	632	-13	650	78	333	24	25	25	S	67	639	67	630	-9	631
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78	334	16	26	52	N	223	647	224	642	-6	641	641	-6	641	78	333	24	25	25	S	67	639	67	630	-9	631
78	334	16	26	52	N	223	647	224	642	-6	641	641	-6	641	78	333	24	25	25	S	67	639	67	630	-9	631
78	334	17	57	9	N	57	651	60	628	-23	648	629	-23	648	78	333	24	25	25	S	67	639	67	630	-9	631
78	334	17	57	9	N	57	651	60	628	-23	648	629	-23	648	78	333	24	25	25	S	67	639	67	630	-9	631
78	334	18	8	45	N	225	645	225	650	4	640	641	4	640	78	333	24	25	25	S	67	639	67	630	-9	631
78	334	18	8	45	N	225	645																			

YR		DA		HR MN SEC		PO		HDDK		CDDK		MIDNIGHT		MIDNIGHT		CDDK		HDDK		MIDNIGHT		MIDNIGHT	
YR	DA	HR	MN	SEC	PO	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT	LT	LAT
78	336	10	46	18	N	216	674	216	673	216	673	216	673	216	673	216	673	216	673	216	673	216	673
78	336	11	22	0	S	198	679	198	682	198	682	198	682	198	682	198	682	198	682	198	682	198	682
78	336	11	34	14	S	99	693	99	688	99	688	99	688	99	688	99	688	99	688	99	688	99	688
78	336	12	13	55	N	221	676	221	676	221	676	221	676	221	676	221	676	221	676	221	676	221	676
78	336	12	27	31	N	184	697	184	697	184	697	184	697	184	697	184	697	184	697	184	697	184	697
78	336	13	4	43	S	109	680	109	680	109	680	109	680	109	680	109	680	109	680	109	680	109	680
78	336	13	12	25	S	223	673	223	673	223	673	223	673	223	673	223	673	223	673	223	673	223	673
78	336	14	9	12	N	223	673	223	673	223	673	223	673	223	673	223	673	223	673	223	673	223	673
78	336	15	50	59	N	226	672	226	672	226	672	226	672	226	672	226	672	226	672	226	672	226	672
78	336	17	22	17	N	55	666	55	666	55	666	55	666	55	666	55	666	55	666	55	666	55	666
78	336	17	32	46	N	227	671	227	671	227	671	227	671	227	671	227	671	227	671	227	671	227	671
78	336	19	5	3	N	55	668	55	668	55	668	55	668	55	668	55	668	55	668	55	668	55	668
78	336	19	14	29	N	231	675	231	675	231	675	231	675	231	675	231	675	231	675	231	675	231	675
78	336	20	47	37	N	57	685	57	685	57	685	57	685	57	685	57	685	57	685	57	685	57	685
78	336	20	56	47	N	233	675	233	675	233	675	233	675	233	675	233	675	233	675	233	675	233	675
78	336	22	28	26	N	63	685	63	685	63	685	63	685	63	685	63	685	63	685	63	685	63	685
78	336	22	39	47	N	230	673	230	673	230	673	230	673	230	673	230	673	230	673	230	673	230	673
78	336	23	23	10	S	190	708	190	708	190	708	190	708	190	708	190	708	190	708	190	708	190	708
78	336	23	33	15	S	99	692	99	692	99	692	99	692	99	692	99	692	99	692	99	692	99	692
78	337	0	10	31	N	62	681	62	681	62	681	62	681	62	681	62	681	62	681	62	681	62	681
78	337	0	23	31	N	221	667	221	667	221	667	221	667	221	667	221	667	221	667	221	667	221	667
78	337	1	2	33	S	193	680	193	680	193	680	193	680	193	680	193	680	193	680	193	680	193	680
78	337	1	15	55	S	85	675	85	675	85	675	85	675	85	675	85	675	85	675	85	675	85	675
78	337	1	50	47	N	66	648	66	648	66	648	66	648	66	648	66	648	66	648	66	648	66	648
78	337	2	6	41	N	204	656	204	656	204	656	204	656	204	656	204	656	204	656	204	656	204	656
78	337	2	42	45	S	201	658	201	658	201	658	201	658	201	658	201	658	201	658	201	658	201	658
78	337	2	57	30	S	77	657	77	657	77	657	77	657	77	657	77	657	77	657	77	657	77	657
78	337	3	32	0	N	71	641	71	641	71	641	71	641	71	641	71	641	71	641	71	641	71	641
78	337	3	47	37	N	203	660	203	660	203	660	203	660	203	660	203	660	203	660	203	660	203	660
78	337	4	22	54	S	210	657	210	657	210	657	210	657	210	657	210	657	210	657	210	657	210	657
78	337	4	38	23	S	78	637	78	637	78	637	78	637	78	637	78	637	78	637	78	637	78	637
78	337	5	13	9	N	80	639	80	639	80	639	80	639	80	639	80	639	80	639	80	639	80	639
78	337	5	27	31	N	204	671	204	671	204	671	204	671	204	671	204	671	204	671	204	671	204	671
78	337	6	3	0	S	215	662	215	662	215	662	215	662	215	662	215	662	215	662	215	662	215	662
78	337	6	18	9	S	80	644	80	644	80	644	80	644	80	644	80	644	80	644	80	644	80	644
78	337	6	54	17	N	86	649	86	649	86	649	86	649	86	649	86	649	86	649	86	649	86	649
78	337	7	7	47	N	206	668	206	668	206	668	206	668	206	668	206	668	206	668	206	668	206	668
78	337	7	43	0	S	213	664	213	664	213	664	213	664	213	664	213	664	213	664	213	664	213	664
78	337	7	57	39	S	81	655	81	655	81	655	81	655	81	655	81	655	81	655	81	655	81	655
78	337	8	35	14	N	89	665	89	665	89	665	89	665	89	665	89	665	89	665	89	665	89	665
78	337	8	47	48	N	209	683	209	683	209	683	209	683	209	683	209	683	209	683	209	683	209	683
78	337	9	23	30	S	208	673	208	673	208	673	208	673	208	673	208	673	208	673	208	673	208	673
78	337	9	27	36	S	87	659	87	659	87	659	87	659	87	659	87	659	87	659	87	659	87	659
78	337	10	28	39	N	215	683	215	683	215	683	215	683	215	683	215	683	215	683	215	683	215	683
78	337	11	4	22	S	200	673	200	673	200	673	200	673	200	673	200	673	200	673	200	673	200	673
78	337	11	18	35	S	94	644	94	644	94	644	94	644	94	644	94	644	94	644	94	644	94	644
78	337	11	56	21	N	83	681	83	681	83	681	83	681	83	681	83	681	83	681	83	681	83	681
78	337	12	10	32	N	219	662	219	662	219	662	219	662	219	662	219	662	219	662	219	662	219	662
78	337	12	46	44	S	188	689	188	689	188	689	188	689	188	689	188	689	188	689	188	689	188	689
78	337	12	58	25	S	105	671	105	671	105	671	105	671	105	671	105	671	105	671	105	671	105	671
78	337	13	51	40	N	223	674	223	674	223	674	223	674	223	674	223	674	223	674	223	674	223	674
78	337	13	58	33	S	181	654	181	654	181	654	181	654	181	654	181	654	181	654	181	654	181	654
78	337	15	33	48	N	224	664	224	664	224	664	224	664	224	664	224	664	224	664	224	664	224	664
78	337	17	4	43	N	54	671	54	671	54	671	54	671	54	671	54	671	54	671	54	671	54	671

YR	DA	HR	MIN	SEC	PO	HDDK	LT	LAT	CDCK	LT	LAT	DLAT	MIDNIGHT	LT	LAT	CDCK	LT	LAT	DLAT	MIDNIGHT
78	338	23	48	59	N	222	632	222	630	630	630	2	630	630	630	222	630	630	2	630
78	339	0	27	0	S	191	640	191	640	640	640	12	640	640	640	191	640	640	12	640
78	339	0	41	51	S	88	643	88	643	643	643	11	643	643	643	88	643	643	11	643
78	339	1	14	43	N	68	617	66	636	636	636	19	607	636	636	66	636	636	19	607
78	339	1	32	25	N	210	629	211	638	638	638	9	615	637	637	211	638	638	9	615
78	339	2	7	30	S	193	635	198	642	642	642	7	630	639	639	198	642	642	7	630
78	339	2	23	25	N	79	637	79	642	642	642	5	622	636	636	79	642	642	5	622
78	339	3	55	49	N	69	632	69	623	623	623	-10	625	624	624	69	623	623	-10	625
78	339	3	13	19	N	203	648	203	643	643	643	-5	628	627	627	203	643	643	-5	628
78	339	3	47	30	S	206	625	206	626	626	626	11	602	621	621	206	625	625	11	602
78	339	4	3	52	S	77	639	78	644	644	644	-35	624	595	595	78	644	644	-35	624
78	339	4	38	0	N	77	628	77	631	631	631	3	612	624	624	77	628	628	3	612
78	339	4	53	29	N	203	658	203	650	650	650	-6	635	633	633	203	658	658	-6	635
78	339	5	28	25	S	214	655	214	659	659	659	4	643	647	647	214	655	655	4	643
78	339	5	44	38	S	80	620	84	622	622	622	15	593	609	609	84	622	622	15	593
78	339	6	33	31	N	205	659	205	672	672	672	12	640	653	653	205	659	659	12	640
78	339	7	8	40	S	81	648	81	651	651	651	3	628	642	642	81	648	648	3	628
78	339	7	23	32	S	88	633	88	638	638	638	6	612	627	627	88	633	633	6	612
78	339	7	59	47	N	208	672	208	678	678	678	6	654	658	658	208	672	672	6	654
78	339	8	13	29	S	210	666	210	667	667	667	1	656	654	654	210	666	666	1	656
78	339	8	48	46	S	84	660	84	660	660	660	0	641	652	652	84	660	660	0	641
78	339	9	3	4	S	84	660	84	660	660	660	0	641	652	652	84	660	660	0	641
78	339	9	54	11	N	213	672	213	671	671	671	-1	662	658	658	213	672	672	-1	662
78	339	10	29	23	S	203	665	203	669	669	669	3	647	650	650	203	665	665	3	647
78	339	10	43	0	S	92	673	92	671	671	671	-2	651	658	658	92	673	673	-2	651
78	339	11	21	18	N	85	668	85	668	668	668	0	650	661	661	85	668	668	0	650
78	339	11	35	29	N	213	666	213	666	666	666	0	656	653	653	213	666	666	0	656
78	339	12	11	31	S	192	699	192	692	692	692	3	661	664	664	192	699	699	3	661
78	339	12	22	7	S	107	716	105	694	694	694	-22	705	683	683	105	694	694	-22	705
78	339	13	2	57	N	75	684	76	671	671	671	11	664	671	671	76	671	671	11	664
78	339	13	16	57	N	221	667	222	678	678	678	7	673	671	671	222	667	667	7	673
78	339	13	55	17	S	174	708	173	715	715	715	-23	680	665	665	173	715	715	-23	680
78	339	14	45	50	N	62	684	65	661	661	661	11	666	673	673	65	661	661	11	666
78	339	14	58	33	N	224	669	225	680	680	680	4	672	684	684	225	669	669	4	672
78	339	18	11	57	N	56	673	55	677	677	677	8	623	630	630	55	677	677	8	623
78	339	18	23	26	N	222	632	223	640	640	640	-7	646	649	649	223	632	632	-7	646
78	339	19	53	34	N	61	653	62	646	646	646	-6	627	631	631	62	646	646	-6	627
78	339	20	5	23	N	235	635	226	641	641	641	-21	668	655	655	226	635	635	-21	668
78	339	21	36	3	N	63	673	65	652	652	652	5	640	652	652	65	652	652	5	640
78	339	21	47	37	N	227	646	228	651	651	651	8	597	615	615	228	646	646	8	597
78	339	23	15	31	N	70	614	70	622	622	622	-1	662	656	656	70	614	614	-1	662
78	339	23	30	11	N	225	665	225	664	664	664	16	664	677	677	225	665	665	16	664
78	340	0	11	24	S	188	700	187	716	716	716	-54	685	636	636	187	716	716	-54	685
78	340	0	59	37	N	84	682	89	646	646	646	0	626	636	636	89	646	646	0	626
78	340	1	12	38	N	216	689	216	692	692	692	13	681	678	678	216	689	689	13	681
78	340	1	51	43	S	198	687	197	703	703	703	-61	702	645	645	197	703	703	-61	702
78	340	2	3	47	S	79	711	79	650	650	650	-48	659	619	619	79	711	711	-48	659
78	340	2	40	33	N	205	695	204	682	682	682	-3	668	662	662	204	695	695	-3	668
78	340	2	54	45	S	207	682	207	682	682	682	6	653	662	662	207	682	682	6	653
78	340	3	31	48	S	75	666	76	665	665	665	-29	683	661	661	76	666	666	-29	683
78	340	3	45	41	N	76	694	76	665	665	665	-29	683	661	661	76	694	694	-29	683
78	340	4	22	29	N	76	694	76	665	665	665	-29	683	661	661	76	694	694	-29	683

YR	DA	HR	MIN	SEC	PO	HOOK	LT	LAT	COCK	DLAT	MIDNIGHT	YR	DA	HR	MIN	SEC	PO	HOOK	LT	LAT	COCK	DLAT	MIDNIGHT	
78	341	11	48	11	S	99	697	57	685	-24	680 66	78	343	4	20	12	S	4	20	12	211	672	0	662 659
78	341	12	41	29	N	230	683	220	685	2	683 678	78	343	4	35	5	S	76	639	76	647	8	624 642	
78	341	13	19	16	N	183	708	181	717	9	673 672	78	343	5	10	0	N	80	647	80	646	-1	627 636	
78	341	13	28	14	S	114	716	117	729	12	703 668	78	343	5	24	11	N	202	670	202	675	5	652 656	
78	341	17	36	59	N	54	683	54	682	-1	684 689	78	343	5	59	58	S	217	667	216	665	-2	657 652	
78	341	17	45	54	N	226	675	227	679	4	673 672	78	343	6	13	57	S	77	669	87	653	-30	665 644	
78	341	19	20	0	N	53	694	54	691	-3	696 699	78	343	10	25	8	N	87	683	212	699	-1	682 675	
78	341	19	23	28	N	231	684	230	679	-5	684 679	78	343	11	1	43	S	201	697	201	698	1	681 677	
78	341	21	1	8	N	61	674	61	676	2	669 681	78	343	11	14	7	S	94	681	94	679	-2	661 669	
78	341	22	43	1	N	229	666	232	685	20	663 686	78	343	11	53	17	N	84	650	84	650	4	669 668	
78	341	22	43	1	N	63	682	65	672	-10	678 677	78	343	12	6	44	N	218	670	218	670	12	661 672	
78	341	22	53	39	N	230	690	230	691	1	690 691	78	343	12	43	33	S	189	692	189	692	7	704 700	
78	341	23	37	20	S	153	716	153	716	0	683 677	78	343	12	53	43	S	109	713	108	706	-7	658 653	
78	341	23	46	48	S	99	718	96	694	-24	706 689	78	343	12	53	43	N	232	652	222	662	0	639 704	
78	342	0	24	30	N	64	682	64	687	5	676 693	78	343	16	44	18	N	52	697	53	696	-1	680 674	
78	342	0	35	4	N	224	719	221	696	-20	723 692	78	343	16	54	8	N	226	681	226	681	-16	678 668	
78	342	1	17	29	S	194	689	194	703	4	672 673	78	343	18	26	32	N	54	678	57	682	1	679 674	
78	342	1	29	5	S	83	705	82	671	-38	696 684	78	343	18	36	2	N	228	630	228	630	-22	672 654	
78	342	2	6	49	N	54	706	55	688	-18	704 695	78	343	20	8	35	N	59	673	61	651	-3	689 686	
78	342	2	19	19	N	208	702	208	703	1	687 681	78	343	20	17	45	N	232	689	232	689	6	690 689	
78	342	2	57	41	S	204	687	204	692	5	687 671	78	343	23	43	19	N	188	722	187	723	-13	671 668	
78	342	3	11	5	S	75	670	75	677	7	657 674	78	343	0	26	18	S	83	687	88	674	-7	693 693	
78	342	3	47	50	N	72	693	72	697	-1	698 695	78	343	1	14	8	N	63	696	64	689	5	699 695	
78	342	4	37	55	S	214	688	214	687	-1	688 673	78	343	2	6	18	S	198	701	198	711	10	675 691	
78	342	4	51	38	S	76	657	76	657	11	670 694	78	343	2	19	0	S	78	677	67	695	1	665 703	
78	342	5	28	31	N	82	685	82	685	-1	669 665	78	343	2	55	29	N	67	695	204	715	3	698 692	
78	342	5	40	58	N	202	686	217	676	-2	669 663	78	343	3	8	5	S	204	712	209	699	-13	655 691	
78	342	6	30	39	S	73	727	73	727	43	659 728	78	343	3	46	39	S	209	700	77	683	22	654 697	
78	342	7	10	1	N	89	711	89	710	-1	698 708	78	343	4	36	18	N	74	687	73	693	12	671 688	
78	342	10	43	11	N	214	668	214	660	-3	673 655	78	343	4	42	41	S	201	708	201	711	3	693 688	
78	342	11	18	53	S	200	689	200	686	-3	673 655	78	343	5	26	0	S	216	679	217	690	11	670 675	
78	342	11	31	12	N	96	688	96	685	-20	680 669	78	343	5	39	45	S	76	665	35	678	-7	669 672	
78	342	12	10	47	N	82	695	83	675	10	647 655	78	343	6	17	19	N	85	695	202	709	0	694 686	
78	342	12	24	51	N	218	656	218	668	6	650 665	78	343	7	5	28	N	203	709	217	695	30	655 691	
78	342	13	1	10	S	187	697	186	703	9	646 665	78	343	9	39	19	S	216	665	217	695	-13	655 691	
78	342	13	12	34	S	106	673	107	682	-4	659 664	78	343	9	50	1	N	90	721	90	728	5	698 694	
78	342	15	47	43	N	223	671	223	672	-4	659 664	78	343	10	27	19	S	204	710	204	707	-3	696 695	
78	342	20	54	47	N	226	641	226	642	-3	634 632	78	343	10	38	29	S	91	712	92	715	3	698 691	
78	342	22	24	27	N	36	651	37	648	15	641 653	78	343	11	31	2	N	217	704	217	705	-8	706 689	
78	342	22	37	31	N	226	647	227	662	15	641 653	78	343	12	9	25	S	190	729	191	721	1	702 695	
78	342	23	19	46	S	181	709	180	719	10	674 680	78	343	13	12	32	S	106	729	222	701	1	702 695	
78	342	23	29	46	S	99	699	95	659	-40	683 642	78	343	13	51	34	S	53	684	178	703	-4	685 687	
78	343	0	5	57	N	27	653	27	657	4	646 661	78	343	13	51	34	S	53	684	178	703	-4	685 687	
78	343	0	19	35	N	222	684	222	680	-6	634 684	78	343	18	9	7	N	53	684	178	703	-4	685 687	
78	343	1	0	33	S	192	711	193	705	-6	686 675	78	343	18	18	0	N	52	704	51	707	3	693 694	
78	343	1	12	21	S	85	635	85	635	-36	669 680	78	343	19	52	15	N	52	704	51	707	3	693 694	
78	343	1	48	57	N	64	694	67	658	-2	690 681	78	343	20	30	15	N	231	687	232	652	5	687 692	
78	343	2	40	30	S	202	690	202	693	-3	674 672	78	343	21	34	5	N	56	707	55	711	4	710 720	
78	343	2	53	20	S	75	686	76	643	-43	675 637	78	343	21	42	43	N	232	690	233	693	3	690 693	
78	343	3	43	36	S	202	683	202	681	-2	666 661													

				MIDNIGHT			
				LT	LAT	LAT	DLAT
				LT	LAT	LAT	DLAT
YR	DA	HR	MIN	DLAT	LAT	LAT	DLAT
78	348	8	45	-13	522	617	7
78	348	9	2	16	524	560	7
78	348	9	31	16	528	562	2
78	348	9	50	-4	577	582	0
78	348	10	24	1	587	588	13
78	348	10	41	6	582	597	-17
78	348	10	57	5	594	608	5
78	348	11	13	-34	600	558	12
78	348	11	29	5	584	599	542
78	348	12	4	5	592	605	581
78	348	12	23	6	592	605	555
78	348	12	55	2	602	617	581
78	348	13	11	-7	536	552	588
78	348	13	19	28	573	612	593
78	348	13	45	6	600	612	593
78	348	14	4	10	612	627	593
78	348	14	22	21	643	576	593
78	348	14	52	4	610	625	593
78	348	15	30	4	595	605	593
78	348	15	46	-9	602	602	593
78	348	17	13	9	606	601	593
78	348	17	28	-14	606	601	593
78	348	19	9	10	616	625	593
78	348	20	39	-9	634	625	593
78	348	20	51	3	620	621	593
78	348	22	20	-18	626	616	593
78	348	22	34	1	628	627	593
78	348	23	15	6	646	593	593
78	348	23	26	-2	696	699	593
78	348	0	1	23	598	634	593
78	348	0	15	-5	556	643	593
78	348	0	55	14	628	643	593
78	348	1	9	-9	633	623	593
78	348	1	44	1	640	591	593
78	348	2	0	4	628	635	593
78	348	2	35	-2	606	616	593
78	348	3	51	9	613	632	593
78	348	3	24	-3	609	615	593
78	348	3	42	1	587	599	593
78	348	4	13	9	544	571	593
78	348	4	33	-1	572	580	593
78	348	5	4	3	550	570	593
78	348	5	23	7	552	572	593
78	348	5	53	13	568	592	593
78	348	6	13	26	579	619	593
78	348	6	46	-16	594	599	593
78	348	7	2	21	559	591	593
78	348	7	31	19	575	605	593
78	348	7	53	31	571	615	593
78	348	8	26	4	572	599	593
78	348	9	43	13	566	592	593
78	348	9	14	22	552	585	593
78	348	9	34	-8	605	602	593
78	348	10	23	19	596	614	593
78	348	10	56	19	596	614	593

YR	DA	HR	MIN	SEC	PO	HDDK	LT	LAT	CDDK	LT	LAT	MIDNIGHT	LT	LAT	CDDK	LT	LAT	MIDNIGHT
78	350	20	17	31	N	222	595	222	600	222	600	531	587	222	600	222	600	531
78	350	21	44	39	N	224	604	224	607	224	607	533	586	224	607	224	607	533
78	350	22	40	36	S	178	672	179	670	179	670	532	585	179	670	179	670	532
78	350	22	53	25	S	97	623	97	630	97	630	530	582	97	630	97	630	530
78	350	23	26	34	N	67	619	69	598	69	598	529	577	69	598	69	598	529
78	350	23	41	41	N	222	649	222	648	222	648	533	581	222	648	222	648	533
78	351	0	21	28	S	188	673	183	680	183	680	532	580	183	680	183	680	532
78	351	0	34	59	S	86	650	86	650	86	650	530	582	86	650	86	650	530
78	351	1	8	14	N	66	625	66	629	66	629	531	583	66	629	66	629	531
78	351	1	24	33	N	212	660	212	661	212	661	533	584	212	661	212	661	533
78	351	2	1	19	S	196	647	196	656	196	656	532	583	196	656	196	656	532
78	351	2	16	0	S	78	664	78	670	78	670	531	582	78	670	78	670	531
78	351	2	50	59	N	66	661	68	610	68	610	533	584	68	610	68	610	533
78	351	3	6	33	N	202	649	202	650	202	650	532	583	202	650	202	650	532
78	351	3	41	37	S	204	637	204	638	204	638	531	582	204	638	204	638	531
78	351	3	57	41	S	76	627	75	627	75	627	530	581	75	627	75	627	530
78	351	4	31	50	N	75	648	74	648	74	648	531	582	74	648	74	648	531
78	351	4	47	0	N	201	648	201	649	201	649	532	583	201	649	201	649	532
78	351	5	21	0	S	211	626	211	631	211	631	531	582	211	631	211	631	531
78	351	5	37	39	S	78	631	78	640	78	640	532	583	78	640	78	640	532
78	351	6	14	7	N	63	692	63	646	63	646	533	584	63	646	63	646	533
78	351	7	16	52	S	79	651	80	632	80	632	532	583	80	632	80	632	532
78	351	7	53	30	N	87	648	87	647	87	647	531	582	87	647	87	647	531
78	351	8	7	23	N	207	649	207	651	207	651	532	583	207	651	207	651	532
78	351	8	41	31	S	209	642	209	649	209	649	533	584	209	649	209	649	533
78	351	8	58	4	S	83	618	83	639	83	639	532	583	83	639	83	639	532
78	351	13	10	25	N	220	659	225	719	225	719	533	584	225	719	225	719	533
78	351	13	45	59	S	185	647	179	686	179	686	532	583	179	686	179	686	532
78	351	13	57	48	S	142	676	113	684	113	684	531	582	113	684	113	684	531
78	351	14	28	1	N	65	659	65	659	65	659	530	581	65	659	65	659	530
78	351	14	52	29	N	221	651	222	664	222	664	532	583	222	664	222	664	532
78	351	18	5	27	N	52	672	58	628	58	628	531	582	58	628	58	628	531
78	351	18	16	3	N	224	648	225	658	225	658	532	583	225	658	225	658	532
78	351	23	24	29	N	222	632	222	634	222	634	531	582	222	634	222	634	531
78	351	0	3	8	S	182	643	186	657	186	657	532	583	186	657	186	657	532
78	352	0	16	5	S	92	693	91	670	91	670	533	584	91	670	91	670	533
78	352	0	51	28	N	65	645	65	644	65	644	532	583	65	644	65	644	532
78	352	1	7	16	N	213	648	213	652	213	652	531	582	213	652	213	652	531
78	352	1	44	54	S	194	676	194	676	194	676	530	581	194	676	194	676	530
78	352	1	59	25	S	79	637	79	654	79	654	531	582	79	654	79	654	531
78	352	2	32	38	N	66	636	66	636	66	636	530	581	66	636	66	636	530
78	352	2	48	25	N	204	673	204	678	204	678	532	583	204	678	204	678	532
78	352	3	24	51	S	203	663	203	673	203	673	531	582	203	673	203	673	531
78	352	3	40	42	S	76	618	74	659	74	659	532	583	74	659	74	659	532
78	352	4	13	34	N	73	621	73	635	73	635	531	582	73	635	73	635	531
78	352	4	28	54	N	201	677	201	677	201	677	530	581	201	677	201	677	530
78	352	5	4	34	S	211	652	211	657	211	657	531	582	211	657	211	657	531
78	352	5	20	47	S	78	621	78	631	78	631	530	581	78	631	78	631	530
78	352	5	56	30	N	82	593	82	593	82	593	531	582	82	593	82	593	531
78	352	6	10	11	N	203	636	203	639	203	639	532	583	203	639	203	639	532
78	352	6	43	51	S	212	631	212	630	212	630	531	582	212	630	212	630	531
78	352	6	59	59	S	79	642	78	665	78	665	532	583	78	665	78	665	532
78	352	7	36	8	N	87	647	87	660	87	660	531	582	87	660	87	660	531

YR	DA	HR	MIN	SEC	PO	HDOK	LT	LAT	LOOK	LT	LAT	DLAT	MIDNIGHT	LA-T-H-LATC	YR	DA	HR	MIN	SEC	PO	HDOK	LT	LAT	DLAT	MIDNIGHT	LA-T-H-LATC	YR	DA	HR	MIN	SEC	PO	HDOK	LT	LAT	LOOK	LT	LAT	DLAT	MIDNIGHT	LA-T-H-LATC	YR	DA	HR	MIN	SEC	PO	HDOK	LT	LAT	DLAT	MIDNIGHT	LA-T-H-LATC	
78	353	9	46	31	S	203	611	205	622	11	587	608	11	587	608	78	353	12	51	43	S	194	613	194	616	3	575	596	78	353	12	51	43	S	194	613	194	616	3	575	596	78	353	12	51	43	S	194	613	194	616	3	575	596
78	353	10	3	35	S	87	623	87	623	22	601	635	22	601	635	78	353	13	7	21	S	102	631	102	634	13	584	609	78	353	13	7	21	S	102	631	102	634	13	584	609	78	353	13	7	21	S	102	631	102	634	13	584	609
78	353	10	38	37	N	214	615	214	621	6	599	611	6	599	611	78	353	13	41	27	N	76	550	75	551	31	586	591	78	353	13	41	27	N	76	550	75	551	31	586	591	78	353	13	41	27	N	76	550	75	551	31	586	591
78	353	10	55	22	S	199	631	198	643	12	595	620	12	595	620	78	353	14	35	28	S	182	633	182	635	32	578	614	78	353	14	35	28	S	182	633	182	635	32	578	614	78	353	14	35	28	S	182	633	182	635	32	578	614
78	353	11	28	6	S	95	633	95	643	10	602	620	10	602	620	78	353	14	48	58	N	224	607	224	609	2	594	596	78	353	14	48	58	N	224	607	224	609	2	594	596	78	353	14	48	58	N	224	607	224	609	2	594	596
78	353	11	43	44	S	82	601	81	615	14	575	601	14	575	601	78	353	15	25	0	N	113	646	113	648	-3	590	600	78	353	15	25	0	N	113	646	113	648	-3	590	600	78	353	15	25	0	N	113	646	113	648	-3	590	600
78	353	12	18	31	N	217	615	217	620	5	594	610	5	594	610	78	353	15	44	0	N	216	595	216	597	23	585	624	78	353	15	44	0	N	216	595	216	597	23	585	624	78	353	15	44	0	N	216	595	216	597	23	585	624
78	353	12	36	55	N	190	630	189	640	10	594	610	10	594	610	78	353	16	16	35	N	183	595	181	602	17	527	568	78	353	16	16	35	N	183	595	181	602	17	527	568	78	353	16	16	35	N	183	595	181	602	17	527	568
78	353	13	10	0	S	105	620	105	625	45	612	651	45	612	651	78	353	16	35	2	N	218	591	219	600	9	572	591	78	353	16	35	2	N	218	591	219	600	9	572	591	78	353	16	35	2	N	218	591	219	600	9	572	591
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78	353	16	1	4	N	217	598	218	610	12	580	600	12	580	600	78	353	21	30	47	N	226	637	224	621	16	629	609	78	353	21	30	47	N	226	637	224	621	16	629	609	78	353	21	30	47	N	226	637	224	621	16	629	609
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78	353	23	29	38	S	193	578	183	681	3	633	644	3	633	644	78	353	26	32	9	S	199	631	198	648	10	595	618	78	353	26	32	9	S	199	631	198	648	10	595	618	78	353	26	32	9	S	199	631	198	648	10	595	618
78	353	23	41	36	S	96	667	96	666	-1	644	651	-1	644	651	78	353	26	32	9	S	199	631	198	648	10	595	618	78	353	26	32	9	S	199	631	198	648	10	595	618	78	353	26	32	9	S	199	631	198	648	10	595	618
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78	354	0	32	6	N	217	636	217	640	4	622	629	4	622	629	78	354	27	48	23	S	77	632	77	636	4	615	630	78	354	0	32	6	N	217	636	217	640	4	622	629	78	354	0	32	6	N	217	636	217	640	4	622	629
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78	354	1	24	48	S	93	628	93	628	-11	606	569	-11	606	569	78	354	28	1	4	N	217	598	218																														

YR	DA	HR	MIN	SEC	PO	HDDK	LT	LAT	CDXX	PLAT	LATH,LATC	YR	DA	HR	MIN	SEC	PO	HDDK	LT	LAT	CDXX	PLAT	LATH,LATC
78	355	16	53	32	N	57	629	56	656	6	650	78	357	1	21	12	N	213	655	213	658	3	643
78	355	17	6	35	N	21	629	23	635	6	622	78	357	1	58	20	S	195	657	196	659	2	625
78	355	18	35	2	N	61	611	59	623	12	621	78	357	2	12	45	S	79	661	79	664	-7	648
78	355	18	47	35	N	225	651	224	636	-15	625	78	357	2	45	30	N	68	601	68	597	-4	590
78	355	20	19	0	N	58	652	62	635	-27	637	78	357	3	2	45	N	203	653	203	649	-14	644
78	355	20	30	22	N	226	633	226	638	5	628	78	357	3	38	3	S	204	637	204	644	7	616
78	355	22	1	55	N	57	695	65	639	-50	637	78	357	3	55	21	S	77	597	74	643	-19	578
78	355	22	12	35	N	227	648	228	652	4	643	78	357	4	28	52	N	74	662	202	662	4	639
78	355	22	17	15	N	174	715	173	723	8	641	78	357	4	43	24	N	202	658	202	662	4	639
78	355	23	5	44	S	102	681	100	666	-15	637	78	357	5	18	10	S	211	640	212	657	17	627
78	355	23	42	29	N	63	671	69	609	-62	656	78	357	5	34	21	S	78	632	78	632	17	627
78	355	23	55	0	N	189	675	224	674	8	666	78	357	6	9	58	N	83	656	83	662	-4	648
78	356	0	35	35	S	87	659	86	637	-22	646	78	357	6	23	29	N	204	659	204	656	-3	640
78	356	1	23	44	N	63	665	66	624	-41	629	78	357	6	57	59	S	213	636	213	644	8	622
78	356	1	38	36	N	211	663	212	672	9	625	78	357	7	13	5	S	79	665	79	661	-4	652
78	356	2	15	40	S	197	658	197	662	4	626	78	357	7	50	24	N	87	658	87	651	-7	639
78	356	2	30	19	S	78	655	78	674	19	641	78	357	8	4	15	S	210	642	237	643	1	621
78	356	3	21	22	N	201	622	201	631	9	637	78	357	8	37	55	S	207	631	210	644	13	617
78	356	3	54	39	S	205	616	205	617	9	637	78	357	8	53	28	S	83	654	83	656	2	635
78	356	4	11	11	S	76	607	76	620	-13	621	78	357	9	44	20	N	211	652	211	674	12	651
78	356	4	44	36	N	202	589	202	615	13	612	78	357	10	19	3	S	204	652	203	667	15	632
78	356	5	2	36	N	210	570	211	612	26	603	78	357	10	33	16	S	90	669	90	656	-13	646
78	356	5	33	15	S	210	570	211	612	42	602	78	357	11	12	7	N	85	698	86	655	-33	684
78	356	5	53	58	S	81	557	81	557	49	602	78	357	11	24	49	N	217	681	217	680	-1	672
78	356	6	25	38	N	84	606	84	606	33	602	78	357	12	1	16	S	194	683	193	692	9	654
78	356	6	40	35	N	204	665	204	665	-13	646	78	357	12	13	13	S	102	689	100	674	-15	669
78	356	7	15	11	S	213	635	213	636	1	621	78	357	12	53	8	N	75	697	77	562	-35	697
78	356	7	30	0	S	79	673	83	647	-25	661	78	357	13	6	34	N	221	670	220	668	-2	688
78	356	8	7	39	N	89	656	83	659	3	637	78	357	13	44	33	S	178	599	176	707	8	659
78	356	8	21	48	N	208	633	208	638	5	611	78	357	13	53	31	S	116	698	111	669	-29	673
78	356	8	55	14	S	209	632	209	634	2	610	78	357	14	49	0	N	221	652	222	659	7	647
78	356	9	5	54	S	94	676	84	654	-24	659	78	357	16	31	4	N	221	642	222	644	2	635
78	356	10	2	19	N	212	642	212	634	-6	629	78	357	18	0	19	N	58	632	60	612	-20	637
78	356	10	35	45	S	203	628	203	639	11	606	78	357	18	13	18	N	222	628	222	631	3	619
78	356	10	50	48	S	92	662	91	656	-6	632	78	357	19	44	7	N	56	658	56	640	-28	667
78	356	11	26	30	N	66	601	30	625	24	612	78	357	19	54	52	N	226	640	226	640	0	633
78	356	11	45	11	N	216	550	216	613	23	571	78	357	21	25	4	N	63	645	63	645	681	560
78	356	12	19	43	S	196	614	196	618	4	576	78	357	21	36	12	N	60	635	232	704	-29	681
78	356	12	32	2	S	100	647	106	707	60	608	78	357	23	18	3	N	193	713	183	718	5	679
78	356	12	7	9	N	79	580	78	613	24	570	78	357	23	44	4	S	93	688	93	680	-8	665
78	356	13	7	47	N	218	618	219	624	5	602	78	357	24	12	48	S	93	623	95	649	26	614
78	356	15	44	6	S	174	651	171	655	14	593	78	358	0	12	48	N	194	702	193	707	5	676
78	356	18	16	22	N	63	585	59	622	37	572	78	358	1	42	24	S	81	686	81	689	2	670
78	356	18	31	19	N	221	614	221	613	-1	622	78	358	1	54	35	S	81	687	85	665	-22	693
78	356	19	58	58	N	65	589	63	600	19	577	78	358	2	30	59	N	205	570	205	677	7	652
78	356	20	13	15	N	224	619	225	627	9	607	78	358	2	45	7	N	205	570	205	677	7	652
78	356	21	43	0	N	62	658	64	642	-16	632	78	358	3	22	31	S	203	633	203	701	-8	677
78	356	21	55	20	N	225	634	226	636	2	625	78	358	3	35	39	S	75	674	75	664	-10	632
78	356	23	22	59	N	68	615	223	629	11	635	78	358	4	11	50	N	72	674	72	678	4	682
78	356	23	38	7	N	188	673	187	692	19	632	78	358	4	25	20	N	211	647	212	678	11	688
78	357	0	18	11	S	89	642	89	651	-11	634	78	358	5	1	11	S	211	647	212	678	31	685
78	357	1	5	39	N	65	649	67	623	-26	624	78	358	5	16	2	S	76	664	75	694	30	651

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