OBSERVATION OF GALACTIC AND SOLAR COSMIC RAYS FROM OCTOBER 13, 1959 TO FEBRUARY 17, 1961 WITH EXPLORER VII (Satellite 1959 Iota)*

by

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ABSTRACT

This paper gives a comprehensive summary of cosmic-ray intensity observations at high latitudes over North America and over Australia in the altitude range 550 to 1100 km by means of Geiger tubes in Explorer VII (Earth satellite 1959 Iota). The time period covered is October 13, 1959 to February 17, 1961. Of special interest are the observational data on some ~~ten~~ 20 solar cosmic-ray events including major events of early April 1960, early September 1960, and of mid-November 1960. Detailed study of the latitude dependence of solar cosmic ray intensity will be presented in a later companion paper.

The following is a brief tabular summary of the solar cosmic ray events observed by Explorer VII during the period October 13, 1959 to February 17, 1961:

Dates	Approximate Absolute Peak Intensity of Protons having E > 30 Mev [(particles cm^2 sec$)^{-1}$]
November 9, 1959	10
November 30 - December 2, 1959	0.3
January 11-14, 1960	2
March 18-20, 1960	0.3
April 1-2, 1960	210
April 5-6, 1960	> 5
April 28-29, 1960	32
April 29-30, 1960	18

Dates		Approximate Absolute Peak Intensity of Protons having E > 30 Mev [particles cm^2 sec)$^{-1}$]
May 4,	1960	40*
May 5,	1960	11
May 6,	1960	13
May 7,	1960	25
May 13-14,	1960	50
May 18,	1960	0.8
May 26,	1960	0.8
June 1-2,	1960	5
June 4,	1960	1.3
August 12-16,	1960	2
September 3-9,	1960	250
November 12-14,	1960	12,000 to 46,000
November 15-19,	1960	11,000
November 20-26,	1960	1,800

* Primary peak not observed with Explorer VII.

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The ephemerides of Explorer VII were prepared by the Space Control Center of the Goddard Space Flight Center of the National Aeronautics and Space Administration. For these data and for telemetry data from the world-wide network of N.A.S.A. stations, I am indebted to arrangements by Mr. Herman E. LaGow of N.A.S.A. Additional telemetry data of importance were obtained by a station at Ottawa, Canada, through the courtesy of Dr. C. M. Hines.

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I. INTRODUCTION

The IGY composite satellite Explorer VII (1959 Iota), launched on October 13, 1959, included an instrument prepared by this department [Ludwig and Whelpley, 1960] for comprehensive study of (a) the lower parts of the inner and outer radiation belts, (b) the primary cosmic-ray intensity near the earth, and (c) the arrival of solar cosmic rays. Table I summarizes the properties of the two Geiger tube detectors in this instrument [Van Allen and Lin, 1960].

This paper reports the solar cosmic ray intensity at high latitudes, both north and south, measured by Explorer VII during the period October 13, 1959 to February 17, 1961. All data of the present report were derived from receptions at Iowa City, Iowa, and Ottawa, Canada, and at the NASA stations at Blossom Point, Maryland, and Woomera, Australia.

II. METHOD OF ANALYZING DATA

The method of analyzing data used in this paper is similar to that previously reported [Van Allen and Lin, 1960].

It has been found meanwhile by examination of counting rate data under high intensity conditions during the November 1960 solar cosmic ray events and during passages through the inner radiation zone that the apparent counting rate of the 112 G.M. tube saturated at a considerably lower value than that found by Ludwig and Whelpley [1960] in pre-flight calibrations. The apparent counting rate of the 302 tube also saturated at a lower value. Since the 302 tube has a considerably smaller geometric factor than that of the 112 and since the additional shielding of the 112 has little effect in absorbing the radiation encountered in the lower edge of the inner zone near the equator it was possible to construct an approximate curve of apparent rate vs true rate of the 112 by using in-flight data.

This curve was then checked and refined by an extended study of the characteristics of the spare flight unit of the Explorer VII apparatus. The significant variables were found to be the supply voltage to the amplifiers, pulse formers and scaler (nominal value 6.5 volts), and separately the high voltage supply for the G.M. tube (nominal value 700 volts). The following are sample results:

Circuit Voltage	High Voltage	Saturation Counting Rate of 112 Tube
4.05 volts	630 volts	305 counts/sec
5.35	630	385
5.20	640	515
6.00	700	930

Full characteristic curves of apparent vs true counting were run for each of the above conditions to correspond to various flight conditions (Figure 1).

An additional check on the validity of this procedure was that the laboratory value of the saturation counting rate of the 302 automatically agreed (approximately) with its flight value for the same supply voltage conditions in the laboratory tests that mark the saturation rate of the 112 do so.

The saturation counting rate of the 112 G.M. tube as observed during passages through the inner zone showed a systematic dependence on local time with a maximum at 08:00 local time, a minimum at 19:00 local time, and a maximum-to-minimum excursion of 60 counts/sec out of a total value of about 400 counts/sec. This effect is presumably due to a combination of the effects of the state of charge of the batteries and the temperature.

It is felt that a reasonable level of confidence can be placed in the revised curves (Figure 1) of the relation of apparent counting rate to true counting as obtained by the above method.

Most of the data of the present paper required no dead-time correction and are, therefore, independent of the above discussion. Only the high counting rate data of the early April 1960 and mid-November 1960 events are significantly affected. Previously published absolute intensities for the April 1, 1960 event are corrected herein (see pertinent section of Chapter III).

The data of the present paper are those obtained when the satellite was at or near the highest dip latitude which it reached (orbital inclination 50.4° to equatorial plane). In this way there are obtained counting rates having the smallest possible contribution from trapped particles in the outer zone. This contribution is further subtracted in order to obtain the net counting rate due to penetrating particles (i.e., cosmic rays, in contrast to the soft radiation of the outer zone) by the following technique:

(a) A large body of observations of the counting rates of the 112, N_{112}, and of the counting rate of the 302, N_{302}, were assembled for quiescent (non-solar event) conditions and for the highest available dip latitudes.

(b) To any extent necessary these data were corrected for dead time to yield the respective true counting rates N^*_{112} and N^*_{302}. (For data shown in Figure 2, the dead time corrections were trivial.)

(c) Then a plot was made of N^*_{112} vs N^*_{302} (Figure 2). From this plot it is seen that N^*_{112} is a linear function of N^*_{302} and that at $N^*_{302} \rightarrow$ zero, N^*_{112} approaches 14.3 counts/second. Since the ratio of geometric factors (Table I) for penetrating particles (e.g. ordinary cosmic rays) is 13.3 an $N^*_{112} = 14.3$ corresponds to $N^*_{302} = 1.08$. Hence, the intercept at $N^*_{302} = 0$ is taken as the pure cosmic ray rate of the 112 tube. The equation of the curve of Figure 2 is

$$N^*_{112} = 14.3 + 0.119\, N^*_{302}$$

or

$$\left(\frac{N^*_{112} - 14.3}{N^*_{302}} \right) = 0.119 .$$

This ratio is similar to that usually observed in the soft radiation region of the outer zone, thus further supporting the belief that Figure 2 can be used reliably in subtracting the contribution of soft radiation to the rate of the 112. It is, of course, evident from the latitude dependence of the counting rates of the two tubes that the time-varying outer boundary of the outer radiation zone is the principal cause of the variation of counting rates at high latitudes. The use of Figure 2 makes it possible to considerably increase the sensitivity for the reliable detection of solar cosmic rays. When N^*_{302} is less than, say 100 counts/sec, one can clearly detect an intensity of solar cosmic rays as low as 2 particles $(cm^2 \ sec)^{-1}$ (having energies greater than 30 Mev (for protons)). It is probable that one could improve this detection capability by an order of magnitude with a satellite passing over the polar caps.

Two examples of the use of Figure 2 follow:

In the pass which covered from 0720 to 0736 UT on November 18, 1959, the position of observation was chosen at 0729.5 UT (Figure 3 and Table II). N_{302}, the apparent counting rate of the 302 Geiger tube, is 17 counts/sec and N_{112}, the apparent counting rate of the 112 Geiger tube, at the same time is 16 counts/sec. From the curve of apparent counting via true counting rate for the 112 Geiger tube (Figure 1), one finds the true counting rate N^*_{112}, corresponding to $N_{112} = 16$ is also 16. This is shown in Table II. By Figure 2 and the above discussion, the estimated contribution of soft trapped radiation in the outer edge of the outer zone to the counting rate of the 112 is $\Delta N^*_{112} = 0.119 \ N^*_{302} = 2$ counts/sec. The net true counting rate due to cosmic radiation is taken to be

$$N^{**}_{112} = N^*_{112} - \Delta N^*_{112} = 14.0 \pm 1.0 \text{ counts/sec.}$$

On 17 June 1960 in the pass which covered from 0542 to 0557 UT, the time of observation was chosen at 0551 UT (Figure 4 and Table II) at which $N_{302} = 60$ and $N_{112} = 20$ from which N_{112}^{**} can be inferred as about 13 ± 1.5. The error was estimated from (a) the fluctuation of N_{112} near the vicinity of the observation position, and (b) how large the correction term ΔN_{112}^{*} was. During large solar cosmic ray events there is an important (or perhaps dominant) contribution to N_{302}^{*} due to penetrating particles in addition to normal cosmic rays. Fortunately in such cases there is usually an accompanying depletion of the outer zone (cf. Van Allen and Lin, 1960) such that the correction for trapped radiation may be negligible. In solar cosmic ray events for intermediate size (say 20 times normal C.R. intensity) the final value of N_{112}^{**} is determined by a two stage iteration process -- i.e., by first using Figure 2 to find ΔN_{112}^{*}, then taking $(N_{112}^{*} - \Delta N_{112}^{*})$ and the relative geometric factors of the 112 and 302 to estimate the penetrating contribution to N_{302}^{*}, then using Figure 2 again to get an improved ΔN_{112}^{*} and thereby an improved N_{112}^{**}.

III. OBSERVATIONAL DATA AND DISCUSSION

A. Normal Cosmic Ray Intensity.

During the period of observation the average net counting rate N^{**}_{112} due to galactic cosmic rays as observed at the highest latitudes over North America and Australia by Explorer VII was about 14.5 counts/sec (cf. Table II). This rate corresponds to an omnidirectional intensity at the altitudes of observation

$$J_o = 2.0 \text{ particles } (\text{cm}^2 \text{ sec})^{-1} .$$

It is, of course, well known that such a measurement cannot be taken to represent the interplanetary cosmic ray intensity for the following reasons:

(a) the solid earth blocks a substantial fraction of 4π steradians.

(b) the magnetic influence of the earth may not be negligible even at these high latitudes.

(c) there is doubtless a contribution due to cosmic ray secondaries produced in the atmosphere (cosmic ray albedo).

B. November 9, 1959 Event (Table II).

The first case during the observation period of Explorer VII that N^{**}_{112} exceeded 20 counts/sec was on November 9, 1959 at about

1051 UT during the pass which covered the period 1042 UT to 1058 UT. N_{112}^{**} was 30 $\pm$ 5 counts/sec. During the following pass which covered the period 1230 UT to 1240 UT on the same day, the counting rate curves of both the 112 and the 302 exhibited concatenated bumps in the high latitude portion of their counting rate vs time curves in the region where both curves usually exhibit valleys. The bumps were narrower in time extent than for usual solar cosmic ray cases (and therefore corresponded to a high latitude threshold). At the highest value of latitude, N_{302}^{*} = 107 and N_{112}^{*} = 90. The resulting N_{112}^{**} = 85 $\pm$ 9 counts/sec. Hence the radiation being detected was considerably harder than typical outer zone radiation <u>but</u> considerably softer than that in a typical solar cosmic ray event.

After subtracting the contribution from cosmic rays, a net intensity of 10 $(cm^2\ sec)^{-1}$ is found from the 112 data at the highest latitude at 1234.7 UT, on the assumption that the particles being counter are directly-penetrating ones (e.g. protons of E $>$ 30 Mev) and are not non-penetrating electrons which are being detected via their bremsstrahlung. The latitude dependence leaves little doubt that the primary radiation must consist of charged particles.

Other interesting aspects of this event are that no associated geomagnetic disturbance was reported and that no plausibly responsible solar disturbance has been identified.

C. November 30 - December 2, 1959 (Table II).

On November 30, 1959 a flare of importance 3 was observed at Sacramento Peak beginning at 1722 UT and ending at 1904 UT at the location N08 E06 [Compilations of Solar-Geophysical Data]. Explorer VII data showed an increased counting rate of about 10% ~ 20% above normal cosmic ray intensity in early December 1; a similar increase was also observed during late December 1 and early December 2. The intensity had returned to normal by early December 3.

D. January 11-14, 1960 Event (Figure 11, Table II).

At 2040 UT on January 11, 1960 the beginning of a solar flare of importance 3 at the location N23 E03 was observed at Lockheed Observatory [Compilations of Solar-Geophysical Data]. The flare ended at 2355 UT.

Explorer VII showed that at the middle of January 10, N_{112}^{**} was 14 (which is the normal cosmic ray value), and at the middle of January 11, which is before the solar flare was observed, N_{112}^{**} was about 17, an increase of about 20% above normal. At about the middle of January 12, N_{112}^{**} was 27, corresponding to an excess particle intensity of 2 $(cm^2\ sec)^{-1}$. Thereafter, the intensity decreased gradually, and was back to normal by about the middle of January 15. This small increase in intensity and long decay time were supposed to be due to the location of the flare on the sun, according to the model of sun-earth magnetic field suggested by Obayashi and Hakura [1960].

E. March 18-20, 1960 (Table II).

An increased N_{112}^{**} of about 10% ~ 20% above the normal cosmic ray value was observed from Explorer VII data. The increase, which does appear to be significant, has not been identified with any other phenomena.

F. April 1-2, 1960 and April 5, 1960 (Figure 12, Table II).

A full report on these events has been given previously by Van Allen and Lin [1960] including the report of a 24% Forbush decrease during the early morning of April 1.

An improved estimate of the maximum intensity on April 1 has been made with the help of the set of laboratory curves (Chapter II and Figure 1) of apparent rate vs true rate of the 112. The choice among the family of curves to be used was made by finding the flight saturation value of the 112 in nearby inner zone passes at a similar local time. The saturation value adopted was 340 counts/sec.

The resulting value of N_{112}^{**} at about 1023 UT on April 1 was 1600 counts/sec. This yields

$$J_o = 220 \pm 30 \ (\text{cm}^2 \ \text{sec})^{-1}$$

for the omnidirectional intensity of solar protons of energy greater than 30 Mev. At the same time the counting rate of the 302 yields

$$J_o = 210 \pm 20 \ (cm^2 \ sec)^{-1}$$

of protons of energy greater than 18 Mev. The combination of these two results indicates that the spectrum was not rising appreciably between 30 and 18 Mev and hence invalidates the earlier spectral remark of Van Allen and Lin [pp. 3001 top of column 2, 1960].

The peak intensity of the April 5-6 event was not observed by Explorer VII. At about 1000 UT on April 5 the omnidirectional intensity of protons of $E > 30$ Mev was 5 $(cm^2 \ sec)^{-1}$.

G. April 28-30, 1960 (Figure 13, Table II).

Three important flares were observed during this period. The first occurred at about 0130 UT on April 28 (Hawaii Observatory), the location of the flare being S05 E34. The satellite data show a slight increase from normal cosmic ray intensity at about 0323 UT. Then there were no data until 1920 UT (Figure 5), but from the observed time history of the event (Figure 13), it appears that the peak of this event was not observed with Explorer VII. The proton omnidirectional intensity with $E > 30$ Mev at 1920 UT was about 32 $(cm^2 \ sec)^{-1}$. The intensity decreased monotonically with time to about 03 UT on April 29. The increased counting rates shown in Figure 13 during late April 29 and early April 30 were presumably due to flares beginning at 0107 and ending at 0230 at N12 W20, and also beginning at 0612 and ending at 0822 on April 29 at the location of N15, W20 (observed at Lockheed and Capri S respectively) /Compilations of Solar-Geophysical Data/.

H. May 4-8, 1960 (Figure 13, Table II).

On May 4 polar cap absorption began at 1044 UT /Leinbach/. The flare which was apparently responsible for this event began before 1020 UT on the west limb of the sun, and was observed at Thule, Greenland.

The event at around 1100 UT was of very short time duration and was not observed by Explorer VII due to the absence of a suitable pass during the event. Explorer VII data show an increased N_{112}^{**} at 1516 UT and at the following pass at about 1700 UT the omnidirectional intensity was about 16.5 $(cm^2\ sec)^{-1}$ which was about 8.3 times normal cosmic ray intensity. Balloon observations by Winckler, Mosley, and May /1961/ were obtained at the same time (1700 UT) the excess ionization rate at 6 g/cm^2 atmospheric depth was about 25% above the normal galactic cosmic-ray background ionization rate at that altitude. Explorer VII data show peak intensity for this later event on May 4 during the pass covering 1837 to 1848 UT (Figure 6). The omnidirectional intensity for protons with $E > 30$ Mev was about 40 $(cm^2\ sec)^{-1}$. The next and subsequent passes show a steady decrease of intensity up to about 0040 UT on May 5. Then there were no data until about 1450 UT on the same day. The balloon observations showed the decay of the event from 1700 on May 4 to 0200 UT on May 5. Thus the peak intensity shown by Explorer VII at 1830 might not correspond to the maximum intensity of the May 4 event; the maximum intensity apparently occurred between 1700 UT and 1830 UT. There is a striking level of general agreement between the satellite and balloon measurements on the time history of the event. From the 112 the omnidirectional intensity of protons with $E > 30$ Mev was about 40 $(cm^2\ sec)^{-1}$ at 1842; and from the 302, the omnidirectional intensity with $E > 18$ Mev was about 52 $(cm^2\ sec)^{-1}$.

A thorough study of the spectrum of solar protons (and of solar alpha particles) during a balloon exposure of nuclear emulsions in the period 1700 UT May 4 to 0200 UT May 5 has been reported by Biswas and Freier [1961]. The average differential number energy spectrum $dN/dE = \text{const}\ E^{-(1.0 \pm 0.3)}$ was found for $250 \leq E \leq 1000$ Mev for protons.

Between 0040 and 1430 UT May 5 there were no satellite observations. N^{**}_{112} was about 35 at 1452 UT on May 5 and increased with time. At 1819 UT there was an apparently maximum value of $N^{**}_{112} = 77$, corresponding to an omnidirectional intensity of 9 $(cm^2\ sec)^{-1}$, after subtraction of the galactic cosmic ray background. On May 6, at about 1844, Explorer VII reported another value of N_{112}^{**} equal to about 110 counts/sec, which corresponds to about 15 particles $(cm^2 \ sec)^{-1}$. After subtracting the cosmic ray background of 2 it gives the proton flux of about 13 $(cm^2 \ sec)^{-1}$. On May 6 a flare of importance 3+ was reported at Sacramento Peak beginning at 1404 UT at S10 E08 [Compilations of Solar-Geophysical Data]. This flare was also observed at several other stations and is presumed to be the cause of the May 6 solar cosmic ray event [see Leinbach, 1960].

On May 7 no flare with importance more than 1 was observed. However, Explorer VII data show an increase of intensity and at about 2100 UT the peak value of N_{112}^{*} was 195, corresponding to 27 $(cm^2 \ sec)^{-1}$ absolute omnidirectional intensity. After subtracting the cosmic ray background of 2 $(cm^2 \ sec)^{-1}$ the solar proton intensity was 25 $(cm^2 \ sec)^{-1}$. The intensity decreased thereafter and returned to normal by about 20 UT on May 8.

I. <u>May 13-14, 1960 (Figure 13, Table II)</u>.

The next increased intensity was observed on May 13. The flare which was supposed to be responsible for this event was observed by several observatories [Compilations of the Solar-Geophysical Data] at about 0522 UT and of importance 3+ at the location of approximately N30 W64. Unfortunately the first pertinent data from Explorer VII were not received until 1330 from the Woomera station, which showed an N_{112}^{**} of 58. The next pass showed the highest observed value of

N^{**}_{112}, namely 370, corresponding to a proton intensity of 50 $(cm^2\ sec)^{-1}$ at 1512 UT. This result was confirmed by the Woomera station which also showed the decline of intensity during the next pass covering the time 1652 to 1705 UT (Figure 7). The pass over North America at about 2112 showed that N^{**}_{112} was 25 but at this time the subsatellite point was at 75.5 degrees dip angle, compared to the previous pass over North America at about 1927 with dip angle of 78.3 degrees. Hence the rapidity of time decay was probably less than would appear at first glance. The value of N^{**}_{112} was back to the normal value of about 14.5 counts/sec sometime before 1600 UT of May 15.

J. May 18 and May 26, 1960 (Figure 14, Table II).

On May 18 after 1200 UT an increase of about 40% above the normal intensity was observed by Explorer VII. About the same amount of increase was observed around 12 UT on May 26.

K. June 1, 2 and 4, 1960 (Figure 14, Table II).

On June 1 a flare of importance 3+ was observed at Capri S Observatory, starting at 0824 UT and ending at 1340 UT at the location of about N28 E46 [Compilations of Solar-Geophysical Data]. A slightly increased intensity N^{**}_{112} = 18 was observed by Explorer VII at 1021 UT, about two hours later than the beginning of the flare. The pass previous to 1021 showed normal intensity. Thus the solar protons began arriving at the earth sometime before 1020 UT. The highest value of N_{112}^{**} during the event was 51 counts/sec at 1205 UT, corresponding to a solar proton intensity of 5 $(cm^2\ sec)^{-1}$ with E > 30 Mev. During the middle of June 2 N_{112}^{**} was 22 counts/sec, corresponding to a solar proton intensity of about 1 $(cm^2\ sec)^{-1}$. By 1120 UT on June 3 N_{112}^{**} had returned to its normal value.

Again at 0900 to 1230 UT on June 4, N_{112}^{**} was high, being about 21 counts/sec, and by about the same time on June 5, N_{112}^{**} was normal.

L. August 12-16, 1960 (Figure 15, Table II).

On August 12, 1960 at 1924 UT a flare of importance 3+ was observed at Hawaii at the location of N22 E27. The flare ended at 2042 UT. Explorer VII had only one pertinent set of observations, at about 1240 UT on August 12. N_{112}^{**} was 29 counts/sec, corresponding to a solar proton intensity of 2 $(cm^2\ sec)^{-1}$. On August 13 during 0850 to 1220, the intensity was 1.3 $(cm^2\ sec)^{-1}$ and on the following day, during 0820 to 1010 UT, 0.8 $(cm^2\ sec)^{-1}$. On August 15, about 1130 UT, the excess intensity was slightly higher than 0.8 $(cm^2\ sec)^{-1}$. On August 16 N_{112}^{**} was about 15% to 20% above normal. On the following day N_{112}^{**} was back to the normal intensity.

M. September 3-9, 1960 (Figure 16, Table II).

One of the most interesting series of observations was made during this period. On September 2, two flares of importance 3 were observed without being accompanied by Type IV radio emission, and on September 3 a flare of importance 3 began at 0040 at N17 E90. This latter flare was accompanied by Type IV radio emission and is presumed to have been responsible for the emission of the observed particles. Balloon observations were made at Minneapolis /Bhavsar, Mosley, and May, Phys. Rev. Letters 1961/ on September 3. Rocket observations were also made /Davis, Fichtel, Guss, and Ogilvie, Phys. Rev. Letters 1961/. Unfortunately, there were no simultaneous data from Explorer VII for direct comparison with their results.

During three passes at 0037, 0221, and 2322 UT, on September 3, N_{112}^{**} was 12 ± 2, 10 ± 3, and 1000 counts/sec, respectively. Therefore the time at which solar protons arrived near the earth was after 0221 and before 2322 UT. From our data the peak intensity was observed at 0155 and 0337 on September 4 (Figure 8). N_{112}^{**} was about 1800 counts/sec, which corresponds to a solar proton flux of 250 $(cm^2\ sec)^{-1}$ with $E > 30$ Mev. A very interesting feature of this event is its very slow decay. If one assumes that the peak intensity observed by Explorer VII was the maximum intensity of this event, then the time width of this event at half-intensity exceeds eight hours, being much longer than that of the April 1 event.

N. <u>November 12-28, 1960 (Figure 17, Table II)</u>.

At 2300 UT of November 12, the peak intensity of N_{112}^{**} observed by Explorer VII was between 85,000 to 330,000 counts/sec (Figure 10). There were two passes earlier than 2330 UT. Their N_{112}^{**} were 16,000 ± 5,000 and 32,000 ± 10,000 at 2101 UT (Figure 9) and at 2245 UT respectively.

The ground observation of November 12 and November 15 events were reported by Steljes, Carmichael, and McCracken [1961].

On November 12, the two distant peaks of the neutron monitor data (about 1600 UT and 2000 UT) were very well explained by the model they used. According to their observational results and explanation, both counting rate enhancements on November 12 were due to cosmic-ray production in the large flare which started at 1320 UT on November 12.

When we compare the peak intensity of Explorer VII at 2330 UT to the second peak of the neutron monitor data, the peak of Explorer VII data lagged behind by about 3 1/2 hours. Since the detection of neutrons on the ground implies arrival of high energy particles, the lower energy particles lagged behind the high energy particles.

At 2330 UT on November 12 the proton (plus α-particle) intensity was between 12,000 and 45,000 $(cm^2\ sec)^{-1}$. The upper limit of the peak intensity was determined by the 302 Geiger tube, since the 112 Geiger tube was driven far beyond its saturation value, namely into a portion of its calibration curve which involved substantial uncertainty. For the November event, apparent fluctuations of N_{112}^{**} in Figure 17 are in large part due to differences in the latitudes of observation. The successive entries do not provide a homogeneous series of observations from which the detailed time history of the intensity can be simply determined.

For geographic latitudes north of about 48° N at 1000 km altitude over the polar caps it is of interest to note the time-integrated omnidirectional intensity.

$$\int_{12\ \text{Nov.}}^{16\ \text{Nov.}} J_o dt \sim 2 \times 10^9/\text{cm}^2 .$$

This result /J. A. Van Allen, Private Communication/ may be compared to the one year integral of galactic cosmic ray intensity in interplanetary space /Van Allen and Frank, 1959/

$$\int_{\text{One Year}} (J_o)_{c.r.} dt = 6 \times 10^7/\text{cm}^2 .$$

The intensity enhancement on late November 20 and early November 21 (Figure 17) observed by Explorer VII was apparently due to the flare started at 2055 $\pm$ 10 UT on November 20 at a solar longitude some 120° N of the center of the solar disk, which was predicted by Carmichael, Steljes, Rose, and Wilson [Phys. Rev. Letters, 1961]. Their postulate was strongly supported by Covington and Harvey [Phys. Rev. Letters, 1961].

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TABLE I

Properties of SUI Detectors in Explorer VII

Detector	ϵG_o *	Absorbers over 70% of Solid Angle		Approximate Detection Thresholds		
				Proton	Electron,+ extrapolated range	X Rays, 5% transmission
Anton type 112 Geiger Tube Scaling Factor: 128	7.2 cm^2	Stainless steel	0.040 g/cm^2	30 Mev	2.5 Mev	80 kev
		Al	0.26			
		Pb	1.15			
		Mg	0.14			
Anton type 302 Geiger Tube Scaling Factor: 2048	0.54	Stainless steel	0.40	18	1.1	30
		Mg	0.14			

* Counting rate of tube for penetrating particles is equal to ϵG_o times omnidirectional intensity J_o.

\+ For nonpenetrating electrons, sample experimental values of ratio of omnidirectional intensity to counting rate of 302 tube are: 10^{13} at 14 kev; 10^{12} at 17 kev; 10^{11} at 20 kev; 10^{10} at 26 kev; 10^9 at 34 kev; 10^8 at 45 kev; 10^7 at 70 kev; 2×10^6 at 105 kev. (L. A. Frank, private communication, April 1960. Experimental values obtained by electron bombardment of an arrangement similar to SUI package in Explorer VII.)

TABLE II

SUMMARY OF OBSERVATIONS

N_{302} - apparent counting rate (= true counting rate if $N_{302} < 1000$ counts/sec) of 302 Geiger tube

N_{112} - apparent counting rate of 112 Geiger tube

N^*_{112} - true counting rate of 112 Geiger tube

N^{**}_{112} - corrected rate of 112 penetrating component

Year	Month	Day	Hr.	Min.	Geographic Position of Observation Long.	Lat.	Alt. (km)	N_{302}	N_{112}	N^*_{112}	N^{**}_{112}
1959	Oct.	13	18	22.5	+118.4	-50.5	1056.0	20	16.0	16.0	13.5 ± 1.5
			20	56.0	-80.7	+49.1	639.6	45	19.0	19.0	13.5 ± 2.0
	Oct.	18	15	35.5	-67.3	+47.8	560.7	44	18.0	18.0	13.0 ± 2.0
			17	20.0	-72.4	+50.5	571.6	20	16.0	16.0	13.5 ± 1.0
			19	03.5	-88.2	+50.3	580.9	19	15.5	15.5	13.5 ± 1.5
	Oct.	19	15	12.0	-70.6	+46.9	560.8	100	26.0	26.0	14.0 ± 3.0
	Oct.	20	14	50.0	-68.8	+48.2	561.9	130	28.5	28.5	13.0 ± 4.0
	Oct.	21	17	06.0	+105.3	-50.4	1097.6	24	18.5	18.5	15.5 ± 1.5

1959	Oct.	22	15	50.5	-75.9	+50.5	560.5	6	15.0	15.0	14.5± 1.0
			17	34.5	-85.9	+50.3	564.6	34	18.0	18.0	14.0± 1.5
			19	17.5	-101.9	+49.2	570.9	110	28.0	28.0	15.0± 3.0
	Oct.	23	16	21.0	+105.5	-50.4	1103.8	5	14.0	14.0	14.0± 1.0
	Oct.	24	12	34.0	+147.2	-50.4	1104.6	5	14.5	14.5	14.0± 1.0
			16	00.0	+112.9	-49.8	1102.8	5	14.0	14.0	13.5± 1.0
	Oct.	25	13	52.0	+118.0	-50.2	1100.6	4	13.5	13.5	13.5± 1.0
			14	42.4	-80.8	+49.5	568.1	27	18.0	18.0	15.0± 1.5
			16	28.0	-79.6	+49.8	560.9	25	17.5	17.5	15.0± 1.5
	Oct.	26	14	21.0	-73.1	+50.3	566.6	15	16.0	16.0	14.5± 1.5
			16	05.0	-83.1	+50.2	560.7	55	21.0	21.0	14.5± 1.5
	Oct.	27	15	42.5	-86.6	+50.5	563.3	22	18.0	18.0	14.5± 1.5
	Oct.	28	13	35.0	-79.8	+49.5	583.3	28	19.5	19.5	16.0± 1.5
	Oct.	29	13	13.5	-77.5	+49.6	587.8	30	18.0	18.0	14.5± 1.0
	Oct.	30	11	08.5	-58.9	+48.3	606.5	67	20.0	20.0	12.0± 3.0
			12	51.0	-75.3	+49.8	592.2	19	16.0	16.0	14.0± 1.0
	Oct.	31	12	29.5	-72.9	+50.0	596.8	22	15.5	15.5	13.0± 1.5
			14	16.0	-66.6	+48.1	564.1	22	18.0	18.0	15.0± 2.0
	Nov.	1	12	07.0	-70.5	+50.2	601.7	9	14.0	14.0	13.0± 1.0
			13	50.0	-86.3	+50.5	587.9	14	14.5	14.5	13.0± 2.0
			15	34.0	-96.7	+49.1	571.2	33	20.0	20.0	16.0± 2.0
	Nov.	2	10	02.0	-52.0	+49.3	623.7	95	28.0	28.0	17.0± 3.0
			11	44.3	-73.6	+49.9	616.6	30	17.0	17.0	13.5± 2.0

1959	Nov.	2	13	27.3	-89.6	+50.5	600.5	29	16.0	16.0	12.5± 2.0
	Nov.	3	11	22.5	-71.2	+50.1	622.4	82	23.0	23.0	13.0± 2.0
	Nov.	4	12	43.7	-84.5	+50.5	610.5	70	24.0	24.0	15.5± 2.0
	Nov.	5	12	22.0	-76.3	+50.0	605.3	140	27.0	27.0	11.0± 4.0
	Nov.	6	11	07.0	+114.7	-50.2	1038.5	23	16.5	16.5	14.0± 1.0
	Nov.	7	11	35.0	-87.9	+50.4	649.9	73	24.0	24.0	15.0± 2.0
	Nov.	8	08	39.0	+132.5	-50.5	994.8	104	24.0	24.0	12.0± 3.0
			14	35.5	-139.5	+50.4	665.0	16	17.0	17.0	15.0± 2.0
	Nov.	9	10	51.0	-82.5	+50.5	663.1	140	42.0	47.0	30.0± 5.0
			12	34.7	-94.8	+49.3	633.1	107	70.0	90.0	85.0± 9.0
	Nov.	10	08	45.3	-69.2	+49.9	708.4	155	27.5	28.0	10.0± 5.0
			10	28.5	-85.4	+50.5	683.9	100	22.0	22.0	10.0± 5.0
	Nov.	11	11	48.0	-104.2	+50.4	682.2	56	20.0	20.0	13.0± 3.0
			13	27.0	-142.3	+50.2	716.1	14	15.0	15.0	13.5± 1.5
	Nov.	12	06	22.5	-25.6	+50.3	689.7	8	14.0	14.0	13.0± 1.5
			09	43.9	-79.8	+50.4	699.0	120	24.5	24.5	12.0± 3.0
			11	27.3	-95.9	+49.8	675.0	120	27.0	28.0	14.0± 3.0
	Nov.	13	07	37.5	-71.5	+49.4	763.3	110	26.0	28.0	15.0± 3.0
			09	21.5	-82.5	+50.5	721.4	25	17.5	17.5	14.5± 1.5
	Nov.	14	07	15.5	-68.7	+49.7	771.3	15	15.0	15.0	13.5± 1.0
			08	58.5	-85.0	+50.4	744.5	32	16.0	16.0	13.0± 1.0
			10	42.3	-95.8	+49.9	703.2	66	21.0	21.0	13.5± 1.5
	Nov.	15	06	53.0	-65.8	+50.0	779.3	33	19.0	19.0	15.0± 1.5

1959	Nov.	15	08	36.5	-82.1	+50.5	752.2	13	17.0	17.0	15.0 ± 1.5
	Nov.	16	06	30.0	-68.1	+49.6	803.6	54	24.5	24.5	14.5 ± 1.5
			08	14.0	-79.2	+50.5	759.9	33	21.0	21.0	17.0 ± 2.0
	Nov.	17	06	07.5	-70.3	+49.3	827.9	56	20.0	20.0	14.0 ± 1.0
			07	51.7	-81.6	+50.5	783.9	13	16.0	16.0	14.5 ± 2.0
	Nov.	18	05	45.0	-67.4	+49.6	835.8	46	20.5	20.5	15.0 ± 1.0
			07	29.5	-78.6	+50.5	791.6	17	16.0	16.0	14.0 ± 1.0
			09	12.5	-95.0	+50.0	763.7	58	22.0	22.0	15.0 ± 1.5
	Nov.	19	05	23.0	-64.5	+49.8	842.8	48	20.0	20.0	14.0 ± 1.0
			07	07.0	-75.6	+50.4	798.8	17	17.0	17.0	15.0 ± 1.5
	Nov.	20	05	00.0	-66.5	+49.5	866.6	75	22.5	22.5	13.5 ± 1.5
			06	44.0	-77.9	+50.4	822.8	14	17.0	17.0	15.0 ± 2.0
			08	28.0	-89.0	+49.4	778.5	62	23.0	23.0	15.5 ± 2.0
	Nov.	21	04	38.0	-63.5	+49.8	874.0	92	24.0	24.0	13.0 ± 3.0
			06	21.0	-80.0	+50.4	846.8	16	16.0	16.0	14.0 ± 1.0
			08	05.5	-91.2	+49.7	802.4	64	21.0	21.0	14.0 ± 1.5
	Nov.	22	04	15.0	-65.4	+49.5	897.3	5	14.5	14.5	14.0 ± 1.5
			05	56.5	-92.3	+49.4	902.3	6	13.0	13.0	12.5 ± 1.0
			07	42.0	-93.3	+50.0	826.5	4	13.5	13.5	13.0 ± 2.0
	Nov.	23	02	09.8	-45.2	+48.5	930.0	56	19.5	19.5	13.0 ± 1.5
			03	50.0	-76.7	+47.2	949.2	4	13.0	13.0	12.5 ± 1.0
			05	34.0	-89.2	+49.7	909.4	4	13.5	13.5	13.0 ± 1.5

1959	Nov.	23	09	02.5	-112.1	+49.2	822.4	87	23.5	24.0	13.0 ± 2.0
	Nov.	24	03	30.0	-64.2	+49.6	927.0	18	17.0	17.0	15.0 ± 1.0
			05	14.0	-75.7	+50.4	885.1	6	14.5	14.5	14.0 ± 1.0
			06	57.0	-92.3	+50.0	857.6	16	17.0	17.0	15.0 ± 1.0
	Nov.	25	03	07.5	-65.9	+49.2	948.2	40	21.5	21.5	15.5 ± 1.0
			04	51.5	-77.7	+50.4	908.0	8	15.0	15.0	14.0 ± 1.0
			06	35.0	-89.1	+49.7	864.8	21	18.0	18.0	15.5 ± 1.5
	Nov.	26	02	45.0	-62.7	+49.7	952.4	10	14.5	14.5	14.0 ± 2.0
			04	28.0	-79.5	+50.4	928.0	4	13.5	13.5	13.0 ± 1.5
			06	12.0	-91.0	+50.1	886.5	10	13.5	13.5	12.5 ± 1.5
	Nov.	27	02	22.0	-64.4	+49.3	972.1	21	16.5	16.5	14.5 ± 1.5
			04	05.0	-81.3	+50.3	948.9	4	12.5	12.5	12.0 ± 1.0
			05	49.4	-92.8	+50.3	908.9	10	14.5	14.5	13.5 ± 1.0
	Nov.	28	02	00.0	-61.1	+49.7	977.9	3	13.0	13.0	13.0 ± 1.5
			03	43.5	-78.0	+50.5	955.0	2	13.0	13.0	13.0 ± 1.5
			07	09.5	-111.4	+49.6	904.6	15	15.0	15.0	13.0 ± 1.5
	Nov.	29	00	45.0	+132.9	-49.8	662.6	2	15.0	15.0	15.0 ± 1.0
			01	37.0	-62.7	+49.4	996.0	4	14.0	14.0	13.5 ± 1.0
			03	21.0	-74.6	+50.5	960.9	2	13.0	13.0	13.0 ± 1.5
			05	04.0	-91.3	+50.2	936.6	4	14.5	14.5	14.0 ± 1.5
			22	43.0	-168.6	-50.5	1674.6	5	16.5	16.5	16.0 ± 1.0
	Nov.	30	00	26.0	+152.6	-50.3	697.8	5	16.5	16.5	16.0 ± 1.0

1959	Nov.	30	01	15.5	-59.3	+49.8	1001.3	19	23.0	23.0	19.5 $\pm$ 3.0
			02	06.0	+120.0	-50.5	679.6	6	16.0	16.0	15.5 $\pm$ 1.5
			02	58.5	-76.2	+50.5	980.0	5	15.0	15.0	14.5 $\pm$ 1.0
			03	51.0	+114.5	-48.6	732.3	7	18.0	18.0	17.0 $\pm$ 1.5
			04	41.3	-93.0	+50.4	957.0	11	18.0	18.0	17.0 $\pm$ 1.0
	Dec.	1	00	52.0	-60.8	+49.6	1017.7	7	18.5	18.0	17.5 $\pm$ 1.5
			02	35.0	-77.8	+50.4	998.0	4	17.5	17.5	17.0 $\pm$ 1.5
			03	28.0	-112.5	-49.1	711.3	10	18.0	18.0	17.0 $\pm$ 1.5
			04	18.5	-94.6	+50.5	976.4	3	15.5	15.5	15.5 $\pm$ 1.0
			21	54.0	+148.1	-47.5	608.4	9	20.0	20.0	19.0 $\pm$ 1.5
			23	36.0	+126.2	-48.4	614.9	5	19.0	19.0	18.5 $\pm$ 1.5
	Dec.	2	00	29.0	-62.2	+49.3	1032.6	18	23.0	23.0	21.0 $\pm$ 2.0
			02	12.5	-79.4	+50.2	1014.7	5	17.5	17.5	17.0 $\pm$ 1.0
			03	57.0	-86.1	+49.9	968.1	10	17.5	17.5	16.5 $\pm$ 2.5
	Dec.	3	00	07.0	-58.7	+49.7	1038.8	55	22.0	22.0	15.5 $\pm$ 1.0
			01	50.0	-75.7	+50.5	1021.9	10	13.0	13.0	12.0 $\pm$ 2.0
			03	34.3	-87.5	+50.1	990.2	35	19.0	19.0	15.0 $\pm$ 2.0
			21	10.0	+154.0	-48.7	600.3	28	18.0	18.0	14.5 $\pm$ 1.0
			22	52.0	+122.3	-49.4	606.1	13	14.0	14.0	12.5 $\pm$ 1.5
			23	43.9	-60.0	+49.5	1051.2	45	16.5	16.5	11.0 $\pm$ 1.0
	Dec.	4	01	27.5	-77.1	+50.4	1036.0	6	12.5	12.5	12.0 $\pm$ 1.5

1959	Dec.	4	03	11.0	-89.0	+50.3	1007.0	3	11.0	11.0	11.0 ± 1.0
			23	21.0	-61.3	+49.2	1062.1	66	20.0	20.0	12.0 ± 2.0
	Dec.	5	01	05.0	-73.5	+50.5	1039.8	9	14.0	14.0	13.0 ± 1.0
			02	48.5	-90.4	+50.4	1022.6	12	14.5	14.5	13.5 ± 1.0
			22	59.0	-57.8	+49.6	1065.0	20	15.0	15.0	12.5 ± 1.5
	Dec.	6	00	43.0	-69.9	+50.6	1043.2	3	11.5	11.5	11.5 ± 1.5
			02	26.5	-83.4	+50.0	1021.0	3	11.5	11.5	11.5 ± 1.0
	Dec.	7	00	20.0	-71.2	+50.5	1055.3	4	14.0	14.0	13.5 ± 1.0
			02	03.0	-88.1	+50.4	1040.4	3	13.0	13.0	13.0 ± 1.0
			23	57.0	-72.5	+50.5	1065.7	8	15.0	15.0	14.0 ± 1.0
	Dec.	8	01	41.0	-84.5	+50.1	1043.8	11	16.5	16.5	15.0 ± 1.0
			23	35.0	-68.8	+50.6	1068.2	10	15.0	15.0	14.0 ± 1.0
	Dec.	9	01	18.0	-85.8	+50.3	1055.6	10	16.5	16.5	15.5 ± 1.0
			23	11.6	-75.0	+50.3	1081.5	15	16.5	16.5	14.5 ± 1.5
	Dec.	10	00	55.0	-87.0	+50.4	1066.0	33	17.0	17.0	13.0 ± 1.0
			22	49.0	-71.3	+50.5	1083.2	22	16.5	16.5	14.0 ± 1.5
	Dec.	11	00	32.5	-85.8	+50.4	1071.6	23	19.0	19.0	16.0 ± 1.5
			20	42.5	-57.6	+48.1	1092.0	75	26.0	26.0	15.0 ± 2.0
			22	26.0	-72.5	+50.4	1088.0	14	16.5	16.5	14.5 ± 2.0
	Dec.	12	00	10.2	-84.5	+50.3	1076.6	24	18.0	18.0	15.0 ± 2.0
			22	04.0	-68.7	+50.5	1089.2	3	13.0	13.0	13.0 ± 1.0
			23	46.5	-90.6	+50.6	1087.0	3	13.0	13.0	13.0 ± 1.0

1959	Dec.	13	23	24.0	-86.9	+50.5	1088.3	4	13.0	13.0	13.0 ± 1.0
	Dec.	14	21	19.0	-66.1	+50.6	1092.4	7	14.0	14.0	13.0 ± 1.0
			23	02.0	-83.1	+50.3	1089.2	6	14.0	14.0	13.5 ± 1.0
	Dec.	15	22	38.0	-89.1	+50.6	1093.0	22	16.0	16.0	13.5 ± 1.0
	Dec.	16	19	42.5	+121.2	-50.3	573.0	10	13.0	13.0	12.0 ± 1.0
			20	32.0	-73.2	+50.1	1090.0	48	20.0	20.0	14.0 ± 2.0
			22	17.0	-80.4	+50.2	1092.3	60	19.0	19.0	12.0 ± 2.0
	Dec.	17	20	10.0	-69.4	+50.4	1089.2	80	23.0	23.0	13.0 ± 2.0
			21	54.0	-81.5	+50.3	1093.0	56	20.5	20.5	13.5 ± 2.0
	Dec.	18	19	47.5	-70.5	+50.2	1084.8	90	23.5	23.5	12.0 ± 2.0
			21	31.5	-82.5	+50.4	1092.0	67	19.0	19.0	12.0 ± 3.0
	Dec.	19	16	52.0	+142.0	-49.6	587.5	7	13.0	13.0	12.0 ± 1.5
			19	24.5	-71.5	+50.1	1078.7	21	14.0	14.0	11.0 ± 2.0
	Dec.	20	18	13.0	+129.8	-50.6	580.8	9	14.0	14.0	13.0 ± 1.0
			20	46.0	-79.7	+50.3	1088.3	44	16.5	16.5	11.5 ± 1.0
	Dec.	21	20	23.0	-80.8	+50.4	1083.5	49	18.5	18.5	12.5 ± 2.0
	Dec.	22	20	00.0	-81.8	+50.5	1077.2	90	21.0	21.0	12.0 ± 3.0
	Dec.	23	15	24.0	+156.4	-50.5	596.5	13	14.0	14.0	12.5 ± 1.5
			17	06.0	+135.0	-50.6	591.8	5	13.0	13.0	12.0 ± 1.5
	Dec.	24	15	00.0	+148.8	-50.1	615.6	14	14.0	12.5	12.5 ± 1.5
	Dec.	25	18	52.0	-80.0	+50.5	1057.3	22	16.5	16.5	13.5 ± 1.5

1959	Dec.	26	14	14.0	+145.1	-48.5	643.0	16	15.5	13.5	13.5 ± 1.5
	Dec.	27	15	34.0	+127.2	-50.3	639.8	3	13.0	13.0	13.0 ± 1.0
	Dec.	28	15	11.0	+125.4	-50.1	654.3	13	14.5	14.5	13.0 ± 1.5
	Dec.	29	13	06.8	+150.7	-50.0	666.8	38	18.0	18.0	13.5 ± 1.5
			14	48.0	+123.7	-49.8	670.8	5	12.5	12.5	12.0 ± 1.5
	Dec.	30	14	26.5	+127.4	-50.2	675.0	14	13.5	13.5	12.0 ± 2.0
	Dec.	31	17	32.5	+109.9	-47.8	616.1	15	14.5	14.5	13.0 ± 1.5
1960	Jan.	1	13	41.0	+129.3	-50.3	701.0	15	15.5	15.5	13.5 ± 1.0
	Jan.	2	13	18.0	+127.8	-50.0	720.4	66	18.5	18.5	12.0 ± 2.0
	Jan.	3	14	38.5	+110.2	-50.7	714.1	17	14.0	14.0	12.0 ± 1.5
	Jan.	4	14	16.0	+114.2	-50.7	718.3	4	13.0	13.0	12.5 ± 1.0
	Jan.	5	12	58.0	-64.6	+49.9	873.7	47	17.0	17.0	12.0 ± 2.0
			14	41.3	-81.2	+50.7	901.5	13	15.0	15.0	13.5 ± 1.5
	Jan.	6	12	35.5	-65.8	+49.7	852.6	8	15.5	15.5	14.5 ± 1.5
			14	19.0	-77.1	+50.7	897.2	4	15.0	15.0	14.5 ± 1.5
			16	03.0	-88.6	+49.9	939.1	12	17.0	17.0	15.5 ± 1.5
	Jan.	7	12	12.5	-66.4	+49.4	831.4	18	16.0	16.0	14.0 ± 1.0
			13	57.0	-73.0	+50.7	892.9	8	16.5	16.5	15.5 ± 1.5
	Jan.	8	11	49.8	-62.9	+49.9	827.0	24	17.0	17.0	14.0 ± 1.0
			13	33.0	-79.4	+50.7	855.7	11	16.0	16.0	14.5 ± 1.0
	Jan.	9	11	27.0	-64.1	+49.2	806.0	15	17.5	17.5	15.5 ± 1.5

1960	Jan.	9	13	11.0	-75.2	+50.7	851.4	9	16.0	16.0	15.0 ± 1.0
	Jan.	10	11	04.0	-65.3	+49.4	784.9	13	15.5	15.5	14.0 ± 1.0
			12	48.0	-76.4	+50.7	830.4	3	14.0	14.0	14.0 ± 1.0
			14	30.7	-98.0	+50.7	842.0	12	15.0	15.0	13.5 ± 1.5
	Jan.	11	10	42.0	-61.3	+49.9	780.8	20	20.0	20.0	17.5 ± 2.0
			12	26.5	-72.3	+50.7	826.1	23	20.0	20.0	17.5 ± 2.0
			14	09.5	-88.6	+50.2	854.3	53	22.5	22.5	17.0 ± 2.0
	Jan.	12	10	18.5	-65.0	+49.2	751.9	38	29.0	30.0	25.5 ± 2.0
			12	02.0	-78.8	+50.6	788.4	15	28.5	29.0	27.0 ± 3.0
			13	45.5	-92.4	+50.5	825.3	20	29.0	30.0	27.5 ± 3.0
			15	29.5	-104.0	+48.7	867.0	100	37.0	40.0	28.0 ± 4.0
	Jan.	13	09	56.0	-63.7	+49.4	739.8	34	28.0	29.0	25.0 ± 3.0
			11	40.0	-74.7	+50.7	784.3	33	28.0	29.0	25.0 ± 3.0
			13	23.3	-88.3	+50.2	817.5	44	29.0	30.0	24.5 ± 2.0
			15	04.0	-117.8	+50.6	807.4	55	31.5	33.0	26.0 ± 3.0
	Jan.	14	11	17.0	-75.9	+50.7	763.7	21	19.0	19.0	16.5 ± 1.0
			13	00.4	-92.1	+50.6	791.7	25	20.5	20.5	17.5 ± 2.0
	Jan.	15	09	10.0	-66.2	+48.7	701.0	5	15.0	15.0	14.5 ± 1.0
			10	55.0	-71.7	+50.7	759.7	3	13.5	13.5	13.5 ± 1.0
			12	38.0	-87.9	+50.3	787.5	8	14.0	14.0	13.0 ± 1.5

1960	Jan.	16	08	48.0	-62.2	+49.3	697.6	8	16.0	16.0	15.0 ± 2.0
			10	33.0	-67.6	+50.7	755.7	4	15.0	15.0	14.5 ± 1.0
			12	14.5	-94.5	+50.7	750.8	5	15.2	15.0	14.5 ± 1.0
	Jan.	17	08	25.5	-63.5	+49.0	679.5	10	15.5	15.5	14.5 ± 1.0
			10	09.0	-74.3	+50.7	720.1	4	14.5	14.5	14.0 ± 1.0
			11	52.0	-90.3	+50.6	746.9	8	16.0	16.0	15.0 ± 1.5
	Jan.	18	09	46.0	-75.6	+50.6	701.2	2	12.0	12.0	12.0 ± 1.0
			11	28.0	-97.1	+50.7	771.8	2	12.5	12.5	12.5 ± 1.0
	Jan.	19	07	41.0	-55.5	+50.1	673.1	9	15.5	15.5	14.5 ± 1.5
			09	23.0	-77.0	+50.5	683.1	4	13.0	13.0	12.5 ± 1.0
			11	06.0	-92.9	+50.7	708.2	5	13.5	13.5	13.0 ± 1.0
	Jan.	20	09	01.0	-72.8	+50.7	679.8	7	14.5	14.5	13.5 ± 1.0
			10	44.0	-88.7	+50.6	704.6	7	15.0	15.0	14.0 ± 1.0
	Jan.	21	06	54.0	-63.4	+48.6	628.7	7	15.0	15.0	14.0 ± 1.0
			08	37.5	-79.7	+50.1	649.6	4	13.0	13.0	12.5 ± 1.0
			10	21.5	-90.0	+50.7	686.5	8	13.5	13.5	12.5 ± 1.0
	Jan.	22	08	16.0	-69.9	+50.7	659.8	9	14.0	14.0	13.0 ± 1.0
			09	59.0	-85.7	+50.5	683.1	11	16.0	16.0	14.5 ± 1.5
	Jan.	23	07	53.0	-71.3	+50.7	644.1	15	15.5	15.5	13.5 ± 1.0
			09	36.0	-87.1	+50.6	666.1	18	17.0	17.0	14.5 ± 1.5

1960	Jan.	24	07	30.0	-72.7	+50.6	629.5	33	19.0	19.0	15.0 ± 1.0
			09	13.5	-88.4	+50.7	650.0	42	22.0	22.0	17.0 ± 2.0
	Jan.	25	07	07.0	-74.0	+50.4	616.0	57	23.5	23.5	16.5 ± 2.0
			08	51.0	-84.1	+50.5	647.2	53	22.5	22.5	16.5 ± 2.0
	Jan.	26	06	44.3	-75.4	+50.2	604.1	70	22.5	22.5	14.0 ± 1.5
			08	28.4	-85.5	+50.6	632.5	83	24.0	24.0	14.0 ± 1.5
	Jan.	27	06	22.0	-71.2	+50.5	602.1	120	26.0	26.0	12.0 ± 3.0
			08	05.0	-86.9	+50.7	619.0	80	22.0	22.0	12.5 ± 2.0
	Jan.	28	05	59.0	-72.6	+50.4	591.7	110	26.5	26.5	13.5 ± 3.0
			07	42.7	-88.2	+50.7	606.7	60	22.5	22.5	15.5 ± 2.0
	Jan.	29	04	48.0	+126.7	-50.7	1065.0	50	21.5	21.5	15.5 ± 1.0
	Jan.	30	05	13.0	-75.4	+50.0	575.3	18	16.0	16.0	14.0 ± 1.0
			06	56.5	+57.8	-38.7	1094.6	7	15.7	15.5	14.5 ± 1.0
	Jan.	31	04	51.0	-71.1	+50.4	574.3	33	17.5	17.5	13.5 ± 1.5
			06	34.0	-86.7	+50.7	584.9	17	16.0	16.0	14.0 ± 1.5
	Feb.	1	04	26.5	-83.4	+48.0	568.5	16	16.5	16.5	14.5 ± 1.0
			06	12.0	-82.6	+50.5	586.0	60	19.5	19.5	12.5 ± 1.5
	Feb.	2	04	05.5	-73.9	+49.6	573.0	6	14.0	14.0	13.5 ± 1.5
			05	50.0	-78.2	+50.3	584.7	8	13.5	13.5	12.5 ± 1.5
	Feb.	3	03	43.0	-69.6	+50.0	570.0	4	12.5	12.5	12.5 ± 1.0

1960	Feb.	3	05	26.0	-85.2	+50.5	574.5	7	12.5	12.5	12.0 ± 1.0
	Feb.	4	03	21.0	-65.2	+50.3	569.7	6	14.0	14.0	13.5 ± 1.5
			05	05.0	-75.1	+50.1	577.5	5	12.5	12.5	12.0 ± 1.0
	Feb.	5	02	57.5	-72.1	+49.6	568.9	10	16.5	16.5	15.5 ± 1.0
			04	41.0	-82.0	+50.5	570.6	8	15.0	15.0	14.0 ± 1.0
	Feb.	6	02	34.0	-73.2	+49.4	570.7	4	13.0	13.0	12.5 ± 1.0
			04	18.0	-83.3	+50.5	569.0	5	13.0	13.0	12.5 ± 1.0
			06	01.0	-98.9	+50.0	571.6	8	14.0	14.0	13.0 ± 1.0
	Feb.	7	03	55.0	-84.5	+50.5	568.9	5	13.5	13.5	13.0 ± 1.0
	Feb.	8	03	33.0	-79.9	+50.5	569.0	7	14.5	14.5	14.0 ± 1.0
	Feb.	9	03	10.0	-81.1	+50.5	571.0	6	13.5	13.5	13.0 ± 1.0
	Feb.	10	02	48.0	-76.5	+50.4	571.1	5	14.0	14.0	13.5 ± 1.0
	Feb.	11	02	24.0	-83.3	+50.5	578.4	4	14.5	14.5	14.0 ± 1.5
	Feb.	12	00	18.5	-68.6	+49.6	595.4	16	17.0	17.0	15.0 ± 1.0
			03	45.5	-94.3	+49.9	572.5	21	16.5	16.5	14.0 ± 1.0
	Feb.	13	01	39.0	-79.7	+50.5	585.4	5	15.0	15.0	14.5 ± 1.0
			03	22.0	-95.3	+50.1	576.7	15	18.0	18.0	16.0 ± 1.5
	Feb.	14	01	17.0	-75.0	+50.5	586.3	2	12.5	12.5	12.5 ± 1.0
			02	59.5	-96.3	+50.2	582.2	3	13.0	13.0	13.0 ± 1.0
	Feb.	15	00	54.0	-75.9	+50.6	593.9	5	14.5	14.5	14.0 ± 1.0
			02	37.0	-91.5	+49.8	582.9	14	18.0	18.0	16.0 ± 1.5

1960	Feb.	16	00	30.5	-82.5	+50.4	611.5	9	16.0	16.0	15.0 ± 1.0
			02	14.0	-92.5	+49.9	589.9	12	16.5	16.5	15.0 ± 1.5
	Feb.	17	00	09.0	-72.1	+50.4	593.0	8	15.0	15.0	14.0 ± 1.0
			01	51.5	-93.4	+50.1	587.5	15	16.0	16.0	14.0 ± 1.0
			23	46.0	-73.0	+50.5	602.8	6	13.5	13.5	13.0 ± 2.0
	Feb.	18	01	29.5	-88.7	+49.6	588.4	5	13.5	13.5	13.0 ± 1.0
			22	32.0	+124.7	-50.2	1052.3	18	17.0	17.0	15.0 ± 1.0
	Feb.	19	01	06.0	-89.6	+49.8	597.6	10	16.0	16.0	14.5 ± 1.5
	Feb.	20	00	44.0	-85.0	+49.2	598.6	10	14.0	14.0	13.0 ± 1.0
			20	01.0	+131.3	-49.8	983.5	8	16.0	16.0	15.0 ± 1.0
			21	46.5	+124.5	-50.3	1029.2	14	15.5	15.5	14.0 ± 1.0
	Feb.	21	19	38.5	+131.1	-49.7	967.8	22	18.5	18.5	15.5 ± 1.5
	Feb.	22	19	15.0	+131.0	-49.6	951.5	14	18.0	18.0	16.0 ± 1.5
			20	59.0	+119.3	-50.5	989.6	15	14.0	14.0	12.0 ± 2.0
	Feb.	23	20	37.0	+124.3	-50.4	987.9	27	17.5	17.5	14.5 ± 1.0
	Feb.	24	20	12.0	+113.9	-50.3	943.7	45	18.0	18.0	12.5 ± 2.5
			21	05.0	-78.2	+50.4	700.0	59	22.5	22.5	14.5 ± 1.5
	Feb.	25	20	42.0	-78.8	+50.3	716.9	33	19.0	19.0	15.0 ± 1.5
			21	33.0	+102.3	-50.3	966.7	60	20.0	20.0	13.0 ± 2.0
	Feb.	26	17	44.5	+135.3	-49.8	897.8	125	25.0	25.0	10.0 ± 5.0
			21	12.3	+112.1	-49.3	978.7	32	18.0	18.0	14.0 ± 1.5

1960	Feb.	27	17	21.0	+135.1	-49.7	879.7	5	13.5	13.5	13.0 ± 1.0
			19	57.0	-74.3	+50.5	736.3	19	16.0	16.0	14.0 ± 1.5
	Feb.	28	19	34.0	-74.8	+50.4	754.0	10	15.5	15.5	14.5 ± 1.5
			21	16.0	-96.2	+50.5	743.0	21	16.0	16.0	13.5 ± 1.5
	Feb.	29	20	55.0	-85.8	+50.1	728.4	18	17.0	17.0	15.0 ± 1.5
	Mar.	1	16	12.5	+134.5	-49.4	824.4	14	14.5	14.5	13.0 ± 1.5
	Mar.	2	18	26.0	-70.3	+50.4	789.3	17	16.0	16.0	14.0 ± 2.0
			20	08.0	-91.9	+50.4	777.9	28	18.0	18.0	14.5 ± 2.0
	Mar.	3	18	03.0	-70.6	+50.4	807.2	31	17.5	17.5	14.0 ± 1.0
			19	46.0	-86.8	+50.2	779.4	50	21.0	21.0	15.0 ± 1.5
	Mar.	4	17	40.0	-70.8	+50.4	825.1	36	19.0	19.0	14.5 ± 1.5
			19	23.5	-87.0	+50.3	797.2	75	24.0	24.0	15.0 ± 2.0
	Mar.	5	16	23.0	+117.0	-50.0	783.8	3	13.0	13.0	13.0 ± 1.0
			17	16.5	-76.2	+50.1	859.1	65	22.0	22.0	14.0 ± 1.5
	Mar.	6	14	18.5	+138.4	-49.4	754.8	45	19.5	19.5	14.0 ± 2.0
			16	01.0	+122.1	-50.3	782.5	8	14.0	14.0	13.0 ± 1.5
			18	37.4	-87.3	+50.4	832.8	52	18.5	18.5	12.5 ± 2.0
	Mar.	7	15	38.0	+121.9	-50.3	765.1	14	14.0	14.0	13.0 ± 1.0
			18	12.0	-97.9	+50.2	882.6	130	29.0	31.0	15.0 ± 3.0
	Mar.	8	16	09.0	-65.8	+50.4	879.2	7	15.5	15.5	15.0 ± 1.0
			17	50.5	-92.7	+50.4	883.9	11	15.0	15.0	13.5 ± 1.0

1960	Mar.	9	15	45.0	-71.0	+50.2	911.7	57	18.5	18.5	12.0 ± 2.5
	Mar.	10	15	21.5	-75.9	+49.7	942.6	42	20.5	20.5	15.5 ± 2.0
			17	06.0	-82.1	+50.2	886.0	59	19.5	19.5	12.5 ± 2.0
	Mar.	11	14	59.0	-70.7	+50.2	943.7	75	24.0	24.0	15.0 ± 2.0
			16	42.5	-87.2	+50.4	918.2	50	20.0	20.0	14.0 ± 1.5
			18	26.5	-98.7	+49.3	875.4	130	29.0	29.5	14.0 ± 3.0
	Mar.	12	14	36.0	-70.5	+50.1	958.8	62	22.0	22.0	14.5 ± 1.5
			16	19.5	-87.0	+50.4	934.2	50	21.0	21.0	15.0 ± 1.5
			18	03.0	-98.5	+49.3	892.3	123	29.0	30.0	15.5 ± 3.0
	Mar.	13	14	13.0	-70.2	+50.1	973.4	80	24.0	24.0	14.5 ± 2.0
			15	57.0	-81.7	+50.3	934.9	64	21.0	21.0	13.5 ± 1.5
	Mar.	14	11	15.5	+142.1	-49.3	647.6	78	21.5	21.5	12.5 ± 2.0
			12	58.0	+126.0	-50.3	669.6	12	16.0	16.0	14.5 ± 1.0
	Mar.	15	13	26.5	-74.4	+49.5	1012.1	94	24.0	24.5	13.5 ± 2.0
			15	11.0	-81.1	+50.3	965.0	104	25.0	25.5	12.0 ± 3.0
	Mar.	16	11	20.0	-56.8	+47.9	1050.5	6	14.0	14.0	13.5 ± 1.5
			13	03.0	-74.2	+49.5	1034.6	3	13.5	13.5	13.5 ± 1.5
			14	47.0	-86.1	+50.5	1004.4	3	14.0	14.0	14.0 ± 1.5
	Mar.	17	12	39.0	-78.4	+48.6	1053.5	12	16.5	16.5	14.0 ± 1.5
			14	25.0	-80.6	+50.4	1004.7	8	16.0	16.0	15.0 ± 1.5

1960	Mar.	18	12	17.0	-73.1	+49.4	1054.0	18	19.0	19.0	17.0 ± 2.0
			14	01.5	-85.1	+50.5	1028.0	13	18.0	18.0	16.5 ± 1.5
	Mar.	19	11	54.5	-72.6	+49.4	1062.3	38	21.5	21.5	17.0 ± 1.5
			13	39.0	-79.6	+50.4	1028.1	57	25.0	25.0	18.0 ± 1.5
	Mar.	20	11	31.5	-72.0	+49.4	1069.8	45	24.0	24.0	18.5 ± 2.0
			13	15.5	-84.0	+50.5	1048.2	37	21.5	21.5	17.0 ± 1.5
			14	59.0	-95.8	+49.8	1020.2	55	26.0	26.0	18.5 ± 2.0
	Mar.	21	11	09.0	-66.5	+50.0	1070.0	82	27.0	27.0	17.0 ± 3.0
			12	52.5	-83.4	+50.5	1057.0	70	23.0	23.0	14.5 ± 2.0
	Mar.	22	10	45.0	-70.6	+49.4	1081.9	58	21.5	21.5	14.5 ± 1.5
			12	29.0	-82.7	+50.5	1065.0	56	22.0	23.0	15.5 ± 2.0
	Mar.	23	10	22.5	-69.9	+49.4	1086.6	102	27.5	28.0	16.0 ± 3.0
			12	06.0	-82.0	+50.5	1072.0	65	22.0	22.0	14.0 ± 1.0
			13	50.0	-93.9	+49.8	1050.5	148	31.0	33.0	15.5 ± 3.0
	Mar.	24	09	59.5	-69.1	+49.5	1090.3	117	26.0	26.0	13.0 ± 3.0
			11	43.5	-81.2	+50.5	1078.2	25	16.5	16.5	13.5 ± 1.0
			13	27.0	-93.2	+49.7	1059.0	135	30.0	31.0	15.0 ± 3.0

1960	Mar.	25	09	36.0	-68.3	+49.5	1093.1	28	18.0	18.0	14.5 ± 1.0
			11	20.0	-80.4	+50.5	1083.5	8	15.5	15.5	14.5 ± 1.0
			13	04.0	-92.4	+49.7	1066.6	44	21.0	21.0	15.5 ± 1.5
	Mar.	26	09	13.5	-67.5	+49.5	1095.0	85	25.0	25.0	15.0 ± 2.0
			10	57.0	-79.6	+50.5	1087.8	25	19.0	19.0	16.0 ± 1.5
			12	40.5	-96.5	+50.2	1079.5	80	24.0	24.0	14.5 ± 2.0
	Mar.	27	08	50.0	-66.6	+49.5	1096.0	88	24.5	24.5	14.5 ± 2.0
			10	34.5	-78.7	+50.5	1091.3	40	19.0	19.0	14.5 ± 1.5
			12	18.0	-90.8	+49.7	1079.1	68	22.0	22.0	14.0 ± 1.5
	Mar.	28	08	26.5	-70.4	+48.8	1095.1	111	24.0	24.0	13.0 ± 3.0
			10	11.0	-77.8	+50.5	1093.9	5	14.0	14.0	13.5 ± 1.0
			11	54.5	-94.7	+50.2	1088.6	8	15.5	15.5	14.5 ± 1.0
	Mar.	29	08	03.5	-69.4	+48.9	1093.4	13	14.5	14.5	13.0 ± 1.5
			09	48.0	-76.9	+50.5	1095.6	6	15.0	15.0	14.5 ± 1.5
			11	32.0	-88.6	+49.6	1088.2	27	19.5	19.5	16.0 ± 1.5
	Mar.	30	07	40.0	-68.5	+48.6	1090.9	24	20.0	20.0	17.0 ± 1.5
			09	24.5	-80.8	+50.4	1096.3	9	16.5	16.5	15.5 ± 1.0
			11	08.5	-92.8	+50.1	1094.2	27	21.0	21.0	18.0 ± 2.0
	Mar.	31	07	16.0	-72.1	+48.1	1082.8	5	15.5	15.5	15.0 ± 1.0
			09	02.0	-74.9	+50.5	1096.3	3	16.0	16.0	16.0 ± 1.0

1960	Mar.	31	10	45.3	-91.8	+50.0	1095.7	13	21.0	21.0	19.5 ± 1.0
			12	27.5	-113.7	+49.7	1094.5	13	17.0	17.0	16.0 ± 1.0
	Apr.	1	04	25.5	+163.3	-50.3	569.3	3	11.0	11.0	11.0 ± 1.0
			05	13.0	-39.9	+49.2	1082.0	3	11.5	11.5	11.5 ± 1.0
			06	05.0	+130.7	-49.7	573.7	3	11.5	11.0	11.0 ± 1.0
			06	53.0	-71.1	+48.1	1074.6	3	11.0	11.0	11.0 ± 1.0
			07	50.0	+126.6	-50.2	565.3	3	11.0	11.0	11.0 ± 1.0
			08	38.0	-78.8	+50.4	1091.9	2	11.0	11.0	11.0 ± 0.5
			09	35.0	+121.1	-46.5	570.7	4	25.0	25.0	25.0 ± 7.0
			10	23.0	-86.0	+49.5	1095.2	115	310	1600	1600 ± 200
			12	04.0	-112.6	+49.7	1095.5	30	120	210	210 ± 20
			13	50.0	-117.5	+44.5	1080.9	160	110	180	170 ± 20
	Apr.	2	05	45.0	+148.2	-50.5	567.3	5	23.0	23.0	23.0 ± 2.0
			06	31.0	-65.5	+49.1	1075.3	14	24.0	24.0	22.5 ± 1.0
			07	28.0	+132.6	-49.6	565.1	5	20.5	20.5	20.0 ± 1.0
			08	15.0	-77.7	+50.4	1089.0	10	21.0	21.0	19.5 ± 1.0
			09	59.0	-89.7	+50.1	1095.1	45	24.0	24.0	19.5 ± 1.5
	Apr.	3	07	52.0	-76.6	+50.5	1085.3	3	17.0	17.0	16.5 ± 1.0
			09	36.0	-88.6	+50.0	1093.8	8	15.0	15.0	14.0 ± 1.0
	Apr.	4	05	45.0	-63.3	+49.2	1062.8	42	19.0	19.0	14.0 ± 1.0
			07	29.0	-75.5	+50.5	1080.8	6	13.0	13.0	12.5 ± 1.0

1960	Apr.	4	09	13.0	-87.4	+50.0	1091.6	28	16.5	16.5	13.0 ± 1.0
			10	56.5	-104.7	+48.7	1094.6	100	24.0	24.0	12.0 ± 2.0
	Apr.	5	04	35.0	+143.6	-50.5	582.6	7	14.0	14.0	14.0 ± 1.0
			05	22.0	-62.2	+49.2	1055.5	3	15.0	15.0	15.0 ± 1.0
			07	06.0	-74.3	+50.5	1075.6	7	20.0	20.0	19.0 ± 1.0
			08	49.0	-91.2	+50.3	1084.8	9	45.0	53	52 ± 5.0
			10	32.5	-105.9	+49.0	1092.0	105	45.0	53	45 ± 5.0
	Apr.	6	04	12.0	+144.1	-50.5	588.5	6	33.0	36.0	36.0 ± 2.0
			04	59.0	-61.1	+49.3	1047.5	40	40.0	45.0	40.0 ± 3.0
			06	43.0	-73.2	+50.5	1069.8	23	35.0	38.0	35.0 ± 2.0
			08	26.5	-87.5	+50.1	1082.6	23	34.0	37.0	33.0 ± 2.0
	Apr.	7	04	35.5	-62.5	+49.0	1033.7	36	19.5	19.5	15.0 ± 1.5
			06	20.0	-72.0	+50.5	1063.2	4	15.0	15.0	15.0 ± 1.0
			08	03.5	-88.8	+50.3	1075.0	14	16.5	16.5	15.0 ± 1.0
	Apr.	8	04	12.0	-63.6	+48.6	1018.7	60	19.0	19.0	13.0 ± 2.0
			05	57.0	-70.8	+50.5	1056.0	12	15.0	15.0	14.0 ± 1.0
			07	40.0	-87.6	+50.2	1069.2	11	16.0	16.0	15.0 ± 1.0
	Apr.	9	05	33.0	-74.6	+50.4	1038.6	5	12.5	12.5	12.0 ± 1.0
			07	17.0	-86.4	+50.2	1062.6	5	12.5	12.5	12.0 ± 1.0
	Apr.	10	05	12.0	-63.4	+50.4	1049.1	5	13.0	13.0	12.5 ± 1.0
			06	54.0	-85.2	+50.9.	1055.4	13	13.5	13.5	12.0 ± 1.0

1960	Apr.	11	03	02.0	-64.9	+47.9	972.7	5	13.0	13.0	12.5 ± 1.0
			04	48.0	-67.2	+50.5	1030.7	3	12.5	12.5	12.5 ± 1.0
			06	30.5	-88.9	+50.4	1038.1	5	13.0	13.0	12.5 ± 1.0
	Apr.	12	02	41.0	-54.2	+49.7	988.1	52	19.0	19.0	13.0 ± 1.0
			04	23.0	-76.0	+50.1	997.4	6	13.5	13.5	13.0 ± 1.0
			06	07.0	-87.6	+50.4	1029.1	8	13.1	13.0	12.0 ± 1.0
	Apr.	13	04	01.0	-69.7	+50.5	999.1	17	15.0	15.0	13.0 ± 1.0
			05	42.5	-91.4	+50.5	1007.9	8	14.0	14.0	13.0 ± 1.0
	Apr.	14	03	38.0	-68.5	+50.5	988.0	22	15.5	15.5	13.0 ± 1.5
			05	20.5	-90.1	+50.5	997.3	30	16.5	16.5	13.0 ± 1.0
			07	04.5	-101.9	+49.5	1028.5	128	28.0	28.5	13.5 ± 3.0
	Apr.	15	01	30.0	-60.4	+48.3	922.3	140	29.0	30.0	13.5 ± 2.0
			04	56.5	-94.0	+50.5	972.8	5	14.2	14.2	13.5 ± 1.0
	Apr.	16	02	51.0	-70.8	+50.3	951.6	5	13.0	13.0	12.5 ± 1.0
			04	34.4	-87.3	+50.5	975.9	33	16.5	16.5	12.5 ± 1.5
	Apr.	17	00	45.0	-52.9	+49.4	912.8	100	25.0	25.0	13.0 ± 4.0
			04	12.0	-80.9	+50.2	977.9	20	14.5	14.5	12.5 ± 1.5
	Apr.	18	02	03.5	-78.3	+49.3	895.3	13	13.5	13.5	12.5 ± 1.0
			03	48.0	-84.6	+50.5	952.4	12	14.0	14.0	13.0 ± 1.5
	Apr.	19	01	41.0	-71.9	+50.0	898.2	11	16.0	16.0	14.5 ± 1.0
			03	24.5	-88.3	+50.5	925.2	14	15.0	15.0	13.5 ± 1.0

1960	Apr.	20	01	18.0	-70.5	+50.1	885.2	33	20.0	20.0	16.0 ± 1.0
			02	59.6	-97.2	+50.0	880.8	46	21.0	21.0	15.5 ± 1.5
	Apr.	21	00	54.0	-74.3	+49.6	855.5	62	23.5	23.5	16.0 ± 2.0
			02	39.0	-80.3	+50.4	915.4	68	22.5	22.5	14.5 ± 2.0
	Apr.	22	02	15.0	-84.0	+50.5	887.0	85	24.0	24.0	14.0 ± 2.0
			21	39.0	+148.6	+50.0	802.7	34	21.0	21.0	17.0 ± 2.0
	Apr.	23	01	51.5	-87.8	+50.5	857.8	38	19.0	19.0	14.5 ± 1.0
			23	48.0	-54.3	+50.4	865.5	4	13.5	13.5	13.0 ± 1.0
	Apr.	24	01	26.0	-96.8	+49.7	811.5	4	13.5	13.5	13.0 ± 1.0
			03	10.0	-107.2	+50.5	856.7	4	13.0	13.0	13.0 ± 1.0
			23	21.0	-73.8	+49.3	796.3	4	14.0	14.0	13.5 ± 1.0
	Apr.	25	01	03.5	-95.3	+49.8	798.5	8	14.0	14.0	13.0 ± 1.5
			02	49.5	-95.8	+49.7	876.2	4	13.5	13.5	13.0 ± 1.0
			22	59.5	-67.1	+50.0	790.1	5	13.0	13.0	12.5 ± 1.0
	Apr.	26	00	41.5	-88.6	+50.4	802.2	4	13.5	13.5	13.0 ± 1.5
			02	25.5	-99.4	+50.1	847.3	14	15.0	15.0	13.0 ± 1.0
			22	36.5	-65.6	+50.1	777.5	9	13.5	13.5	12.5 ± 1.0
	Apr.	27	00	19.5	-81.7	+50.5	806.0	13	15.5	15.5	14.0 ± 1.0
			22	10.0	-79.5	+47.7	717.0	10	13.5	13.5	13.5 ± 1.5
			23	55.0	-96.1	+49.5	744.5	4	14.0	14.0	14.0 ± 1.0

1960	Apr.	28	01	38.0	-101.5	+50.4	805.4	2	14.0	14.0	14.0 ± 1.0
			03	23.0	-108.1	+47.6	865.9	5	19.5	19.5	19.0 ± 2.0
			19	20.0	+152.8	-50.0	895.5	22	120	245	245 ± 25
			21	00.0	+121.1	-49.2	915.1	20	104	165	164 ± 16
			21	49.5	-65.3	+49.9	744.7	17	82	115	110 ± 10
			23	32.0	-83.9	+50.5	764.6	12	72	95	94 ± 10
	Apr.	29	01	16.0	-94.6	+49.9	809.2	10	62	77	76 ± 8
			02	59.5	-108.9	+48.0	845.3	85	60	75	66 ± 7
			18	57.0	+154.5	-50.1	907.4	30	45.0	53	50 ± 5
			20	38.0	+127.8	-50.0	911.6	22	66	85	83 ± 15
			21	26.0	-66.4	+49.8	725.1	37	62	77	72 ± 7
			22	21.5	+111.5	-50.5	884.3	35	87	130	130 ± 20
			23	10.0	-76.9	+50.5	768.6	28	64	82	79 ± 10
	Apr.	30	00	52.5	-95.6	+50.0	788.5	52	77	105	99 ± 10
			18	33.3	+151.2	-49.7	934.1	3	15.0	15.0	14.5 ± 1.0
			21	02.0	-70.1	+49.2	698.6	4	12.5	12.5	12.5 ± 1.5
			22	44.0	-91.5	+49.8	709.6	4	13.5	13.5	13.5 ± 1.0
	May	1	00	29.0	-96.6	+50.2	768.3	3	14.0	14.0	14.0 ± 1.0
			18	08.0	+143.5	-48.1	970.8	6	14.5	14.5	14.0 ± 1.0
			19	53.0	+136.6	-50.4	917.3	3	13.5	13.5	13.5 ± 1.0
			20	40.0	-63.2	+49.9	704.1	8	15.0	15.0	14.0 ± 1.0

1960	May	1	22	23.0	-95.3	+49.0	685.5	7	15.0	15.0	14.0 ± 1.0
	May	2	00	08.0	-84.7	+48.6	789.3	15	17.0	17.0	15.5 ± 1.5
			17	47.0	+155.0	-49.8	953.9	10	17.0	17.0	16.0 ± 1.0
			19	28.0	+128.3	-49.7	957.6	6	16.0	16.0	15.0 ± 1.5
			20	15.0	-72.2	+48.4	665.2	11	18.0	18.0	17.0 ± 1.0
			22	00.0	-77.5	+50.4	719.0	12	18.0	18.0	17.0 ± 1.0
			23	43.5	-93.4	+50.0	745.6	16	21.5	21.5	19.5 ± 2.0
	May	3	01	25.0	-114.8	+49.5	757.1	21	21.0	21.0	18.5 ± 2.0
			15	40.0	+169.2	-47.8	999.5	15	19.0	19.0	17.5 ± 1.0
			17	21.0	+142.6	-47.5	1002.7	8	18.0	18.0	17.0 ± 1.0
			19	06.5	+135.3	-50.3	954.0	5	15.5	15.5	15.0 ± 1.0
			20	48.0	+113.7	-50.4	943.6	6	14.5	14.5	14.0 ± 1.0
			21	36.0	-81.3	+50.3	693.3	9	17.5	17.5	16.5 ± 1.5
			23	16.0	-113.5	+49.9	675.4	9	18.0	18.0	17.0 ± 2.0
	May	4	01	01.0	-118.4	+50.0	730.0	14	18.0	18.5	17.0 ± 1.0
			15	16.0	+166.6	-46.9	1019.5	28	39.0	42.0	40.0 ± 5.0
			16	59.2	+149.1	-48.8	999.8	20	84	122	120 ± 12
			18	42.0	+132.2	-50.0	978.0	30	143	300	300 ± 30
			20	25.0	+115.7	-50.4	954.2	45	127	255	250 ± 20
			21	13.0	-79.6	+50.4	682.9	36	102	168	165 ± 20
			22	10.5	+111.6	+48.2	889.3	80	116	210	200 ± 20
			22	55.5	-100.9	+50.4	693.3	60	96	150	145 ± 20

1960	May	5	00	40.0	-106.4	+48.3	749.2	70	43.0	52	48.0 ± 8.0
			14	52.0	+164.2	-46.0	1037.3	85	40.0	45.0	35.0 ± 5.0
			16	36.0	+151.1	-49.0	1008.7	55	44.0	50	44.0 ± 5.0
			18	19.0	+134.2	-50.1	987.6	18	62	78	77 ± 10
			20	01.0	+112.6	-50.3	978.0	10	57	70	70 ± 10
			20	50.0	-77.9	+50.4	672.9	42	53	65	60 ± 5
			22	34.0	-88.3	+49.6	711.7	54	51	62	55 ± 5
	May	6	00	16.0	-109.8	+49.0	772.6	88	37.0	43.0	33.0 ± 5.0
			14	30.0	+170.4	-47.5	1035.1	130	36.0	38.0	23.0 ± 5.0
			16	12.0	+148.4	-48.4	1027.8	20	45.0	53	50 ± 5
			17	56.0	+136.3	-50.2	996.8	20	63	80	80 ± 20
			18	43.5	-63.4	+49.4	635.5	20	80	110	110 ± 10
			20	27.5	-73.5	+50.4	669.9	20	65	85	85 ± 10
			22	11.0	-86.6	+49.5	701.0	10	50	60	60 ± 6
			23	54.0	-103.0	+47.8	726.4	32	43.0	50	45.0 ± 5.0
	May	7	01	33.0	-140.0	+49.8	693.4	33	30.0	33.0	29.0 ± 5.0
			15	49.0	+150.4	-48.6	1035.3	35	66	86	80 ± 20
			17	33.0	+138.4	-50.3	1005.6	34	93	140	135 ± 15
			19	16.0	+121.8	-50.4	983.9	43	102	170	165 ± 17
			20	04.0	-74.5	+50.4	654.1	35	92	150	150 ± 15
			21	01.0	+114.8	-48.0	930.5	55	110	195	195 ± 20

1960	May	7	21	48.0	-84.8	+49.4	690.6	40	98	165	165 ±	15
			23	30.5	-103.9	+48.1	708.1	40	42.0	48.0	45.0 ±	10.0
		8	15	26.0	+152.5	-48.9	1042.3	11	28.0	30.0	29.0 ±	3.0
			17	09.0	+135.5	-50.0	1025.1	4	17.5	17.5	17.0 ±	1.5
			17	57.0	-62.6	+49.4	614.8	7	14.0	14.0	13.0 ±	1.0
			19	41.0	-72.8	+50.4	645.3	2	13.5	13.5	13.5 ±	1.0
			20	37.0	+112.1	-48.7	955.7	10	14.0	14.0	13.0 ±	1.0
			21	24.0	-88.5	+49.9	667.2	4	13.5	13.5	13.0 ±	1.0
	May	9	17	33.0	-66.3	+48.6	599.0	6	15.0	15.0	14.0 ±	1.5
			18	27.0	+111.1	-50.0	1035.2	3	13.5	13.5	13.5 ±	1.0
			19	16.0	-82.2	+50.0	615.3	5	15.0	15.0	14.5 ±	1.0
			21	02.0	-81.4	+49.0	670.8	4	14.0	14.0	13.5 ±	1.5
	May	10	17	10.0	-64.6	+48.8	593.4	12	15.0	15.0	14.0 ±	1.0
			18	53.5	-80.5	+50.1	608.6	6	15.0	15.0	14.0 ±	1.0
	May	11	18	30.0	-78.7	+50.2	602.4	8	15.0	15.0	14.0 ±	1.0
			20	14.0	-88.6	+50.1	629.4	4	14.0	14.0	13.5 ±	1.0
	May	12	18	07.0	-76.9	+50.2	596.6	14	17.5	17.5	15.5 ±	1.0
			19	03.0	+111.0	-49.4	1017.4	6	15.5	15.5	15.0 ±	1.0
			19	50.5	-92.3	+50.4	612.0	14	17.5	17.5	15.5 ±	1.0
	May	13	13	30.0	+158.8	-49.3	1076.7	38	53	63	58 ±	5
			15	12.0	+136.6	-49.8	1072.4	55	155	370	370 ±	40

1960	May	13	16	55.0	+120.2	-50.4	1060.3	60	140	300	300 ± 40
			17	44.0	-75.0	+50.3	591.4	41	120	230	230 ± 25
			18	40.0	+113.2	-49.2	1024.9	45	127	250	250 ± 25
			19	27.2	-90.5	+50.3	605.6	30	97	155	153 ± 15
			21	12.5	-91.1	+45.9	656.2	20	26.0	26.0	25.0 ± 6.0
	May	14	14	50.0	+144.2	-50.3	1070.5	25	24.0	24.0	21.0 ± 2.0
			15	34.6	-75.0	+45.0	564.4	75	28.0	29.0	20.0 ± 3.0
			16	31.0	+117.6	-50.2	1072.2	4	20.5	20.5	20.0 ± 1.0
			18	15.0	+105.8	-50.1	1051.4	12	20.0	20.0	19.0 ± 1.0
			19	04.5	-88.6	+50.2	599.7	33	23.0	23.0	19.0 ± 3.0
	May	15	16	08.0	+120.0	-50.3	1076.3	9	15.0	15.0	14.0 ± 1.0
			16	56.0	-82.5	+49.5	572.0	33	18.0	18.0	14.0 ± 1.0
			18	41.0	-86.7	+50.2	594.2	14	17.5	17.5	15.5 ± 2.0
	May	16	18	17.5	-90.3	+50.3	581.5	30	18.5	18.5	15.0 ± 1.5
	May	17	11	56.5	+158.8	-48.7	1095.5	130	30.0	30.0	15.0 ± 3.0
			14	28.0	-57.3	+49.1	563.5	58	21.0	21.0	14.0 ± 2.5
			16	10.0	-78.6	+49.7	565.4	10	15.5	15.5	14.5 ± 1.0
			17	54.5	-88.3	+50.3	577.4	15	16.5	16.5	14.5 ± 1.0
	May	18	13	15.5	+139.3	-49.5	1095.6	22	27.0	27.0	24.5 ± 2.0
			15	47.0	-76.7	+49.8	563.8	13	21.5	21.5	20.0 ± 1.5
			16	42.0	+110.5	-49.9	1078.7	9	22.0	22.0	21.0 ± 1.0

1960	May	18	17	31.0	-86.4	+50.2	573.8	13	21.0	21.0	19.5 ± 1.5
			19	14.0	-102.0	+49.2	583.8	16	20.5	20.5	18.5 ± 1.0
	May	19	12	52.0	+141.7	-49.7	1096.6	40	22.0	22.0	17.0 ± 2.0
			14	35.0	+120.8	-50.3	1093.5	5	17.0	17.0	16.5 ± 1.0
			15	24.0	-74.8	+50.0	562.7	21	18.5	18.5	16.5 ± 2.0
			16	18.0	+108.1	-50.1	1087.3	7	17.0	17.0	16.5 ± 1.0
			17	08.0	-84.5	+50.1	570.6	20	18.5	18.5	16.5 ± 2.0
	May	20	12	29.0	+144.2	-49.4	1097.2	50	21.0	21.0	15.0 ± 2.0
			14	11.0	+122.5	-50.2	1096.7	6	18.0	18.0	17.0 ± 1.0
			15	55.0	+110.5	-50.0	1089.9	8	16.0	16.0	15.0 ± 1.0
			16	40.0	-110.5	+48.4	563.0	5	16.0	16.0	15.5 ± 1.0
	May	21	12	05.0	+141.9	-49.6	1096.5	50	20.0	20.0	14.0 ± 2.0
			13	48.0	+125.0	-50.3	1097.2	5	15.0	15.0	14.5 ± 1.0
			15	32.0	+113.1	-49.4	1092.1	6	14.5	14.5	14.0 ± 1.0
			16	21.0	-86.2	+50.3	563.5	20	18.0	18.0	15.5 ± 1.0
	May	22	11	42.0	+144.4	-49.8	1095.6	29	18.5	18.5	15.0 ± 1.0
			13	25.0	+127.5	-50.3	1097.4	7	17.0	17.0	16.0 ± 1.0
			14	14.0	-74.5	+49.8	563.5	30	18.0	18.0	14.5 ± 1.0
			15	08.0	+110.7	-50.1	1096.1	9	17.0	17.0	16.0 ± 1.0
			15	58.0	-84.2	+50.2	562.5	48	20.0	20.0	14.5 ± 1.5
	May	23	11	18.5	+142.1	-49.4	1091.3	32	18.5	18.5	14.5 ± 1.0
			13	01.0	+125.2	-50.2	1095.9	6	16.0	16.0	15.0 ± 1.0

1960	May	24	11	46.0	-66.5	+49.5	1056.6	30	17.0	17.0	13.0 ± 1.5
			12	38.0	+127.8	-50.3	1094.6	2	13.0	13.0	13.0 ± 1.0
			13	28.0	-88.4	+49.1	1050.2	14	18.0	18.0	16.5 ± 1.0
			15	12.0	-101.7	+46.1	1022.0	9	15.0	15.0	14.0 ± 1.0
			16	53.0	-106.8	+50.1	562.1	8	15.0	15.0	14.0 ± 1.0
	May	25	13	03.0	-79.4	+48.8	579.2	17	16.5	16.5	14.5 ± 1.0
			14	48.0	-83.7	+50.3	564.1	12	15.5	15.5	14.0 ± 1.5
			16	31.5	-123.4	+44.9	1024.5	27	19.0	19.0	16.0 ± 2.0
	May	26	10	08.0	+145.0	-49.5	1077.6	22	26.0	26.0	23.0 ± 1.5
			11	52.2	+133.1	-50.3	1090.9	3	20.0	20.0	20.0 ± 1.0
			12	42.5	-63.3	+50.2	570.1	32	24.0	24.0	20.0 ± 2.5
			14	25.5	-83.4	+50.3	567.3	18	23.0	23.5	21.5 ± 2.5
	May	27	12	18.0	-69.7	+49.9	581.2	14	17.5	17.5	16.0 ± 1.0
			14	01.0	-85.1	+50.4	571.8	11	17.0	17.0	15.5 ± 1.0
	May	28	11	04.0	+128.5	-50.2	1074.6	8	15.5	15.5	14.5 ± 1.0
			11	55.0	-67.5	+50.0	585.5	24	17.0	17.0	14.0 ± 1.0
			12	49.0	+121.5	-49.5	1092.2	10	15.5	15.5	14.5 ± 1.0
			13	38.0	-83.0	+50.3	574.9	13	16.5	16.5	15.0 ± 1.0
	May	29	08	58.0	+148.0	-49.6	1056.6	10	15.0	15.0	14.0 ± 1.0
			10	40.0	+126.3	-50.0	1062.8	6	14.0	14.0	13.5 ± 1.0
			11	32.0	-65.4	+50.1	590.1	6	14.0	14.0	13.5 ± 1.0
			13	15.0	-80.8	+50.3	578.4	9	14.5	14.5	13.5 ± 1.0

1960	May	30	10	17.0	+129.0	-50.1	1057.8	4	14.0	14.0	13.5 ± 1.0
			11	08.5	-86.7	+49.8	603.7	9	14.5	14.5	13.5 ± 1.0
			12	51.0	-84.2	+50.4	589.3	11	14.5	14.5	13.0 ± 1.0
			14	35.0	-94.1	+49.3	572.1	26	16.5	16.5	13.5 ± 1.0
	May	31	10	45.0	-66.5	+49.9	609.6	31	19.0	19.0	15.0 ± 1.0
			12	28.0	-82.0	+50.4	594.2	18	18.5	18.5	16.5 ± 2.0
	June	1	08	39.0	-48.3	+48.9	631.5	95	24.0	24.5	13.0 ± 3.0
			10	21.0	-69.6	+49.6	623.8	25	21.0	21.0	18.0 ± 2.0
			11	13.0	+112.3	-50.4	1053.8	5	30.0	30.0	30.0 ± 3.0
			12	04.5	-82.4	+50.4	603.0	22	46.0	54	51 ± 4
			13	48.0	-95.1	+49.7	586.2	108	32.0	35.0	30.0 ± 10
	June	2	10	50.0	+115.0	-50.4	1048.7	14	23.0	23.0	21.5 ± 2.0
			11	40.0	-88.5	+50.2	622.5	14	25.0	25.0	23.0 ± 2.0
			13	24.6	-94.8	+49.7	594.6	90	31.0	32.0	21.0 ± 3.0
	June	3	11	18.5	-80.6	+50.4	618.6	80	24.0	24.0	14.0 ± 3.0
			14	45.0	-106.8	+47.4	582.4	6	15.5	15.5	15.0 ± 1.5
	June	4	09	11.0	-68.1	+49.5	655.9	4	20.0	20.0	20.0 ± 1.5
			10	06.0	+130.2	-49.1	1055.0	3	19.0	19.0	19.0 ± 1.5
			10	55.0	-78.2	+50.4	624.7	3	21.0	21.0	21.0 ± 1.5
			12	38.0	-93.7	+49.8	607.6	7	24.0	24.0	23.0 ± 1.5

1960	June	5	08	46.5	-76.1	+47.9	689.9	13	16.0	16.0	14.5 ± 1.0
			09	40.0	+118.3	-50.4	1021.6	3	14.0	14.0	14.0 ± 1.0
			10	32.0	-75.8	+50.4	631.0	7	14.5	14.5	13.5 ± 1.0
			11	25.0	+110.8	-48.0	1055.8	5	14.0	14.0	13.5 ± 1.0
			12	14.5	-96.9	+50.2	623.0	26	16.0	16.0	13.0 ± 2.0
	June	6	08	24.5	-68.6	+49.2	684.6	26	14.0	14.0	11.0 ± 1.5
			09	17.5	+121.1	-50.3	1015.1	15	13.0	13.0	11.5 ± 1.0
			10	07.5	-84.5	+50.2	661.7	7	12.5	12.5	11.5 ± 1.0
			11	00.0	+104.3	-49.4	1033.2	15	13.0	13.0	11.5 ± 1.0
			11	52.0	-89.3	+49.4	618.7	66	20.0	20.0	12.0 ± 2.0
	June	7	08	01.5	-66.2	+49.4	692.9	54	18.0	18.0	11.5 ± 1.5
			09	43.0	-87.5	+49.9	682.7	6	11.5	11.5	11.0 ± 1.0
	June	8	09	21.5	-79.5	+50.4	677.2	40	16.0	16.0	11.0 ± 2.0
			11	05.0	-89.7	+49.7	642.3	91	21.0	21.0	10.0 ± 3.0
	June	9	08	58.0	-77.0	+50.4	685.2	17	13.0	13.0	11.0 ± 1.0
			10	41.0	-92.7	+50.1	661.8	94	21.0	21.0	10.0 ± 3.0
	June	10	08	33.0	-85.4	+49.9	722.3	115	26.0	26.0	13.5 ± 3.0
			11	56.5	-133.4	+50.2	715.1	37	18.0	18.0	13.5 ± 1.5
	June	11	08	11.0	-77.4	+50.4	716.1	112	22.5	23.0	10.0 ± 5.0
			09	54.7	-93.1	+50.2	690.8	138	25.0	25.0	10.0 ± 5.0
	June	12	07	47.0	-80.2	+50.2	740.0	150	27.5	27.5	10.0 ± 5.0
			11	09.5	-133.5	+50.1	747.8	39	16.5	16.5	12.5 ± 3.0

1960	June	13	06	34.0	+130.5	-49.9	936.0	75	20.0	20.0	12.0 ± 2.5
	June	15	05	46.0	+125.9	-50.4	888.6	13	17.0	17.0	15.5 ± 1.0
			06	37.5	-77.5	+50.3	784.2	31	17.0	17.0	13.5 ± 1.5
	June	16	06	14.0	-74.7	+50.4	792.9	40	18.5	18.5	13.5 ± 1.5
			07	57.5	-90.6	+50.3	765.5	100	21.5	21.5	10.0 ± 4.0
	June	17	05	51.0	-71.9	+50.5	801.6	60	20.0	20.0	13.0 ± 2.0
			07	34.0	-87.9	+50.2	773.9	79	22.0	22.0	12.5 ± 2.5
	June	18	05	27.0	-74.4	+50.4	826.1	29	16.0	16.0	12.5 ± 1.0
			07	11.0	-85.1	+50.0	782.4	110	23.0	23.5	10.5 ± 4.0
	June	19	03	21.0	-55.3	+49.7	867.2	71	23.0	23.0	14.5 ± 2.0
			05	04.0	-71.5	+50.5	834.8	5	14.0	14.0	13.5 ± 1.0
	June	20	04	40.0	-73.9	+50.3	859.2	5	13.5	13.5	13.0 ± 1.0
			06	24.0	-84.7	+50.1	815.5	4	12.0	12.0	11.5 ± 1.0
	June	21	04	15.6	-81.3	+49.5	898.3	11	13.5	13.5	12.0 ± 1.5
			06	00.2	-87.1	+50.3	840.1	35	18.0	18.0	14.0 ± 1.5
	June	22	03	53.0	-73.3	+50.2	891.6	5	12.5	12.5	12.0 ± 1.0
			05	37.0	-84.2	+50.2	848.7	8	13.0	13.0	12.0 ± 2.0
	June	23	03	30.0	-70.4	+50.4	899.8	4	13.0	13.0	12.5 ± 1.0
			05	11.0	-97.0	+50.3	903.6	10	14.0	14.0	13.0 ± 2.0
	June	24	03	07.0	-67.4	+50.4	908.0	15	13.5	13.5	12.0 ± 1.0
			04	49.0	-88.9	+50.5	896.7	4	13.0	13.0	12.5 ± 1.0
			06	33.5	-100.0	+49.3	853.7	66	21.0	21.0	13.0 ± 2.0

1960	June	25	04	26.5	-85.9	+50.4	904.9	9	14.5	14.5	13.5 ± 1.0
			06	10.0	-97.2	+49.0	862.0	52	21.5	21.5	15.5 ± 2.0
	June	26	02	18.0	-76.7	+49.6	965.5	7	18.0	18.0	17.0 ± 2.0
			04	03.0	-83.0	+50.3	912.9	3	16.0	16.0	15.5 ± 1.0
	June	27	03	40.0	-80.0	+50.2	921.0	8	15.0	15.0	14.0 ± 1.0
	June	28	01	32.0	-70.8	+50.1	979.6	3	14.0	14.0	13.5 ± 1.0
			03	16.0	-82.1	+50.4	943.0	4	14.0	14.0	13.5 ± 1.0
			22	33.0	+138.0	-48.5	633.8	8	15.5	15.5	14.5 ± 1.5
	June	29	01	08.0	-72.8	+49.8	998.2	12	14.5	14.5	13.5 ± 1.0
			02	52.0	-84.3	+50.5	964.0	13	17.5	17.5	16.0 ± 1.5
			22	12.0	+151.4	-50.2	650.7	26	20.0	20.0	17.0 ± 1.5
	June	30	00	43.0	-79.4	+48.6	1025.3	4	13.5	13.5	13.0 ± 1.5
			02	27.0	-91.4	+50.3	995.9	20	13.0	13.0	11.5 ± 1.0
			04	12.0	-97.8	+49.6	947,3	7	12.5	12.5	11.5 ± 1.0
	July	1	00	22.0	-66.8	+50.2	1010.5	6	13.0	13.0	12.5 ± 1.0
			02	06.0	-78.2	+50.3	977.9	4	12.0	12.0	11.5 ± 1.0
			03	48.5	-99.8	+49.9	968.1	14	13.5	13.5	12.0 ± 1.5
			21	27.0	+162.5	-50.5	650.0	4	15.5	15.5	15.0 ± 1.0
			23	58.5	-68.7	+49.9	1032.6	14	16.5	16.5	14.0 ± 1.0
	July	2	01	42.0	-80.3	+50.4	1002.4	10	16.0	16.0	15.0 ± 1.0
			03	25.0	-96.9	+49.7	980.3	37	21.0	21.0	16.5 ± 1.5

1960	July	2	21	01.0	+148.6	-49.7	606.8	4	15.0	15.0	14.5 ± 1.0
			22	44.0	+133.0	-50.4	624.1	4	15.0	15.0	14.5 ± 1.0
			23	35.0	-65.7	+50.1	1038.0	32	22.0	22.0	18.0 ± 2.0
	July	3	01	18.5	-82.3	+50.5	1020.0	14	18.5	18.5	17.0 ± 1.0
			23	11.0	-67.6	+49.9	1051.8	95	28.0	28.0	17.0 ± 3.0
	July	4	00	54.0	-84.2	+50.5	1036.0	35	20.0	20.0	15.5 ± 1.5
			02	38.5	-95.8	+49.8	1006.1	78	26.0	26.5	17.0 ± 2.5
			22	47.5	-69.3	+49.6	1063.6	97	27.0	27.5	16.0 ± 3.0
	July	5	00	30.5	-86.1	+50.1	1050.1	41	20.0	20.0	15.0 ± 2.0
			02	15.0	-92.8	+49.5	1012.2	126	30.0	31.0	15.0 ± 4.0
	July	6	00	08.0	-78.0	+50.4	1046.0	19	16.0	16.0	14.0 ± 1.0
			01	51.5	-94.7	+49.8	1028.9	76	24.0	24.0	15.0 ± 2.0
			22	00.5	-68.0	+49.6	1076.5	90	26.0	26.0	15.0 ± 3.0
			23	44.0	-79.9	+50.5	1058.8	33	19.0	19.0	15.0 ± 1.0
	July	7	01	28.0	-91.7	+49.5	1034.2	103	31.0	33.0	19.5 ± 5.0
			23	21.0	-76.8	+50.4	1062.8	150	28.0	30.0	13.0 ± 4.0
	July	8	22	56.0	-83.5	+50.3	1078.4	153	28.0	30.0	13.0 ± 5.0
	July	9	22	33.5	-80.4	+50.4	1081.0	130	26.5	28.0	13.0 ± 5.0
	July	10	17	54.0	+153.3	-49.5	567.3	20	17.0	17.0	14.5 ± 1.0
			22	11.0	-72.3	+50.4	1078.7	15	17.5	17.5	15.5 ± 1.0

1960	July	11	19	13.0	+134.9	-50.2	567.9	14	16.0	16.0	14.5 ± 1.0
			21	46.5	-79.0	+50.4	1088.5	12	15.0	15.0	14.5 ± 1.0
	July	12	21	23.0	-75.8	+50.5	1089.8	40	19.5	19.5	14.5 ± 2.0
			23	06.5	-92.5	+50.1	1084.4	103	25.5	26.0	14.0 ± 3.0
	July	13	21	00.0	-72.6	+50.5	1090.8	56	21.0	21.0	14.0 ± 1.0
			22	42.5	-94.3	+50.3	1089.2	170	31.0	32.0	13.0 ± 5.0
	July	14	18	52.5	-62.4	+49.5	1089.3	75	21.0	21.0	12.0 ± 3.0
			20	36.0	-74.4	+50.5	1092.3	17	16.5	16.5	14.5 ± 1.0
			22	20.0	-86.3	+49.7	1087.7	41	17.0	17.0	12.0 ± 3.0
	July	15	18	30.0	-54.5	+50.2	1090.5	5	13.0	13.0	12.5 ± 1.0
			20	13.0	-71.2	+50.5	1092.4	4	12.5	12.5	12.0 ± 1.0
			21	56.0	-87.9	+49.9	1091.1	3	12.5	12.5	12.0 ± 1.0
			23	39.0	-105.0	+48.7	1086.7	5	12.5	12.5	12.0 ± 1.0
	July	16	18	05.0	-60.9	+49.5	1082.7	80	23.0	23.0	14.5 ± 2.5
			19	49.0	-72.9	+50.5	1091.0	9	13.0	13.0	12.0 ± 1.0
			21	33.0	-84.8	+49.7	1091.6	5	13.0	13.0	12.5 ± 2.0
	July	17	21	09.0	-86.5	+50.0	1086.5	150	27.0	30.0	13.0 ± 5.0
	July	19	18	39.0	-68.3	+50.5	1078.9	9	15.0	15.0	14.0 ± 1.0
			20	22.0	-85.0	+50.0	1083.9	27	15.0	15.0	12.0 ± 1.5
	July	20	18	14.0	-75.0	+50.3	1066.5	35	18.0	18.0	14.0 ± 1.5
			19	57.0	-91.6	+50.4	1075.7	58	20.0	20.0	14.5 ± 1.5

1960	July	21	15	19.0	+140.0	-50.0	599.3	18	17.0	17.0	15.0 ± 1.0
			19	34.5	-88.4	+50.3	1073.3	130	30.0	32.0	15.0 ± 3.0
	July	22	14	56.0	+142.9	-50.2	603.3	50	19.0	19.0	13.0 ± 2.0
			17	27.0	-73.5	+50.3	1052.7	170	32.0	34.0	13.0 ± 5.0
	July	23	14	32.0	+140.1	-49.9	616.1	55	20.0	20.0	13.5 ± 2.0
	July	24	14	08.0	+137.5	-49.4	630.9	35	18.0	18.0	14.0 ± 1.0
	July	25	13	45.0	+140.3	-49.7	636.4	42	20.0	20.0	15.0 ± 1.5
	July	26	11	39.0	+159.2	-48.5	662.5	10	16.5	16.5	15.5 ± 1.5
	July	27	14	41.0	+124.9	-50.4	639.6	2	14.0	14.0	14.0 ± 1.5
			17	13.0	-84.0	+50.4	1028.1	76	22.0	22.0	14.0 ± 2.0
	July	28	14	18.0	+127.8	-50.5	645.3	12	15.0	15.0	14.0 ± 1.0
			15	05.0	-74.3	+49.8	979.7	72	18.0	18.0	10.0 ± 4.0
			16	48.5	-90.9	+50.5	1001.2	100	26.0	26.0	14.0 ± 4.0
	July	29	12	12.0	+146.3	-50.0	672.8	6	15.0	15.0	14.5 ± 1.0
			13	54.0	+125.2	-50.4	663.4	4	13.0	13.0	12.5 ± 1.5
			14	42.0	-71.2	+50.1	973.3	20	16.0	16.0	14.0 ± 1.5
			16	26.0	-82.6	+50.4	1006.8	30	18.5	18.5	15.0 ± 1.0
	July	30	11	49.0	+149.3	-50.2	679.5	5	13.0	13.0	12.5 ± 1.5
			13	31.0	+128.1	-50.4	669.8	5	13.5	13.5	13.0 ± 1.5
			14	18.0	-73.0	+49.8	953.1	30	19.0	19.0	15.5 ± 1.5
			16	02.0	-84.5	+50.5	989.1	11	17.0	17.0	15.5 ± 1.0

1960	July	31	11	25.0	+146.7	-49.9	700.0	6	14.0	14.0	13.5 ± 1.0
			13	08.0	+131.0	-50.5	676.3	7	13.0	13.0	12.5 ± 1.0
			13	55.0	-69.9	+50.0	946.1	70	21.0	21.0	13.0 ± 2.0
			14	52.0	+120.9	-49.5	642.4	5	13.0	13.0	12.5 ± 1.0
	Aug.	1	12	44.5	+128.5	-50.4	696.7	9	14.0	14.0	13.0 ± 1.0
			15	15.0	-82.7	+50.5	960.3	7	13.0	13.0	12.5 ± 2.0
	Aug.	2	12	19.0	+120.5	-49.7	738.4	22	14.0	14.0	12.0 ± 2.0
			14	52.0	-79.6	+50.4	953.1	73	25.0	25.0	16.0 ± 2.5
	Aug.	3	11	57.0	+128.8	-50.3	730.9	14	16.0	16.0	14.5 ± 1.0
			14	28.0	-81.6	+50.5	931.1	95	26.0	26.0	13.5 ± 3.0
	Aug.	4	09	51.0	+147.8	-49.7	766.4	140	31.0	33.0	16.5 ± 5.0
			11	34.0	+131.8	-50.4	738.8	45	18.0	18.0	12.5 ± 2.5
			13	17.0	+116.1	-50.3	712.0	15	17.0	17.0	15.0 ± 1.0
	Aug.	5	09	28.0	+150.7	-49.9	774.6	130	32.0	32.0	16.5 ± 4.0
			12	54.0	+119.1	-50.1	719.5	80	23.0	23.0	13.5 ± 3.0
	Aug.	6	12	30.5	+116.6	-50.4	742.8	95	22.0	22.0	11.0 ± 5.0
	Aug.	7	10	23.0	+130.2	-50.2	795.1	54	19.0	19.0	13.0 ± 2.0
			12	07.0	+119.7	-50.2	751.0	25	14.0	14.0	12.0 ± 2.0
			12	54.0	-79.4	+50.5	868.4	113	26.5	26.5	13.0 ± 4.0
	Aug.	8	10	00.0	+133.2	-50.4	803.3	23	17.0	17.0	14.0 ± 1.0
			11	43.0	+117.3	-50.4	774.7	3	14.0	14.0	14.0 ± 1.0

1960	Aug.	8	12	30.5	-81.5	+50.5	844.0	96	24.0	24.0	12.5 ± 3.0
			14	13.0	-97.6	+50.2	872.4	95	26.0	26.	14.5 ± 3.0
	Aug.	9	10	23.5	-67.5	+49.5	790.4	45	18.0	18.0	12.5 ± 2.0
			12	06.5	-83.7	+50.4	819.4	36	17.5	17.5	13.5 ± 1.5
	Aug.	10	09	14.0	+139.5	-50.5	819.6	3	14.5	14.5	14.5 ± 1.0
			10	57.0	+123.5	-50.1	790.7	2	14.0	14.0	14.0 ± 1.5
			11	43.0	-80.6	+50.5	811.6	15	17.5	17.5	15.5 ± 1.5
			13	26.5	-96.6	+50.3	840.0	75	25.0	25.5	16.5 ± 2.0
	Aug.	11	11	20.0	-77.4	+50.5	803.3	45	18.5	18.5	13.5 ± 1.5
			13	03.0	-93.4	+50.1	831.9	80	24.0	24.0	14.5 ± 2.0
	Aug.	12	12	40.0	-90.3	+49.8	823.8	100	37.0	41.0	29.0 ± 5.0
	Aug.	13	08	49.0	-65.9	+49.3	727.2	45	28.0	30.0	25.0 ± 3.0
			10	32.5	-79.2	+50.4	763.0	14	26.0	26.0	24.5 ± 1.5
			12	16.0	-92.4	+50.1	799.5	20	26.0	26.0	23.5 ± 1.5
	Aug.	14	08	25.5	-65.5	+49.2	712.2	80	30.0	32.0	21.0 ± 3.0
			10	10.0	-73.4	+50.5	763.3	23	22.0	22.0	19.0 ± 2.0
	Aug.	15	08	03.0	-59.9	+49.9	712.7	90	30.0	32.0	20.0 ± 3.0
			09	43.5	-89.1	+49.4	701.5	19	24.0	24.0	21.5 ± 1.5
			11	29.0	-91.5	+50.2	767.5	18	25.0	25.0	22.5 ± 1.5
	Aug.	16	09	22.5	-78.0	+50.4	716.9	9	18.0	18.0	17.0 ± 2.0
			11	05.0	-93.7	+50.4	743.9	8	18.0	18.0	17.0 ± 2.0

1960	Aug.	17	06	29.0	+141.2	-50.4	940.5	3	13.5	13.5	13.5 ± 1.0
			10	40.0	-101.5	+50.4	702.1	4	14.0	14.0	13.5 ± 2.0
	Aug.	18	08	37.0	-66.2	+50.3	713.7	11	14.0	14.0	13.0 ± 1.0
			10	19.0	-87.4	+50.0	725.0	8	15.0	15.0	14.0 ± 2.0
	Aug.	19	08	12.0	-74.0	+50.5	678.1	6	15.0	15.0	14.5 ± 1.0
			09	55.0	-89.6	+50.3	703.0	25	17.0	17.0	14.0 ± 1.0
	Aug.	20	09	32.0	-86.4	+50.1	696.2	10	14.0	14.0	13.0 ± 1.0
	Aug.	21	07	26.0	-67.6	+50.5	665.6	5	13.0	13.0	12.5 ± 1.5
			09	08.0	-88.7	+50.3	675.7	23	15.0	15.0	12.0 ± 1.5
	Aug.	22	08	43.0	-96.7	+50.5	644.0	11	16.0	16.0	14.5 ± 1.0
	Aug.	23	08	21.0	-87.9	+50.3	650.6	35	19.0	19.0	15.0 ± 1.5
	Aug.	24	06	16.5	-63.6	+50.4	636.0	90	25.0	25.0	14.0 ± 3.0
			07	59.0	-79.2	+49.6	657.3	23	20.0	20.0	17.0 ± 2.0
	Aug.	25	05	05.0	+136.9	-49.9	1006.4	34	20.0	20.0	16.0 ± 2.0
			07	36.0	-76.1	+49.3	651.4	20	19.0	19.0	16.5 ± 1.0
	Aug.	26	07	13.0	-72.9	+48.9	645.7	20	17.0	17.0	14.5 ± 1.0
			08	55.0	-94.4	+48.0	654.8	10	17.0	17.0	16.0 ± 2.0
	Aug.	27	02	32.5	+140.7	-49.7	1069.1	150	30.0	32.0	14.0 ± 4.0
	Aug.	28	02	08.0	+139.4	-49.4	1077.8	30	19.0	19.0	15.0 ± 1.5
	Aug.	29	05	04.5	+76.4	-46.7	1091.2	20	17.0	17.0	14.5 ± 1.0
	Aug.	30	02	09.0	-62.0	+47.4	564.0	2	12.5	12.5	12.5 ± 2.0
			03	05.0	+129.7	-50.5	1073.1	5	13.5	13.5	13.0 ± 1.0

1960	Aug.	31	02	41.0	+128.1	-50.5	1080.8	25	17.0	17.0	14.0 ± 1.0
	Sept.	1	02	17.0	+126.7	-50.4	1087.2	18	17.5	17.5	15.5 ± 1.5
			03	06.5	-71.9	+49.9	566.1	70	20.0	20.0	12.0 ± 3.0
			04	49.0	-92.9	+50.3	568.5	55	19.0	19.0	12.0 ± 2.0
	Sept.	3	00	37.0	-50.0	+49.2	562.9	40	16.5	16.5	12.0 ± 2.0
			02	21.0	-59.8	+50.5	566.6	63	17.0	17.0	10.0 ± 3.0
			23	22.5	+140.0	-48.6	1090.1	100	285	1000	1000 ± 100
	Sept.	4	01	06.5	+127.7	-50.3	1094.5	76	290	1050	1050 ± 100
			01	55.0	-73.5	+49.5	563.4	100	350	1800	1800 ± 200
			03	37.0	-94.6	+50.0	563.1	125	350	1800	1800 ± 200
			21	17.0	+165.3	-48.3	1089.0	270	182	400	380 ± 40
			23	00.0	+148.0	-49.7	1093.4	160	160	330	320 ± 40
			23	48.5	-59.5	+46.8	571.5	60	182	400	390 ± 40
	Sept.	5	00	42.0	+126.5	-50.1	1094.4	33	150	290	290 ± 30
			01	29.5	-83.6	+47.2	564.8	37	165	340	340 ± 40
			02	26.0	+114.7	-50.5	1092.6	32	150	290	290 ± 30
			03	14.5	-88.6	+50.3	563.2	42	170	360	360 ± 40
			04	12.5	+113.5	-45.9	1068.5	130	135	240	240 ± 30
			22	35.0	+142.3	-48.7	1086.8	45	76	100	100 ± 20
	Sept.	6	01	06.5	-80.6	+47.8	572.5	39	102	145	145 ± 20
			02	52.0	-92.3	+50.5	563.2	16	102	145	145 ± 20

1960	Sept.	6	22	13.0	+150.5	-49.8	1089.1	30	44.0	54	50 ± 10
			23	55.0	+128.9	-50.2	1091.4	30	47.0	57	53 ± 10
	Sept.	7	01	39.0	+117.1	-50.3	1094.0	20	44.0	54	51 ± 5.0
			02	28.5	-81.8	+50.5	563.8	17	48.0	58	55 ± 6.0
			04	10.6	-102.8	+50.3	563.3	40	43.0	53	48.0 ± 5.0
			23	31.0	+127.7	-50.0	1086.7	18	31.0	34.0	31.0 ± 5.0
	Sept.	8	03	47.5	-102.3	+50.4	563.9	90	35.0	39.0	30.0 ± 3.0
			21	25.0	+148.2	-49.3	1076.2	190	40.0	45.0	22.0 ± 3.0
	Sept.	9	03	23.5	-104.7	+50.5	566.8	135	29.0	32.0	16.0 ± 6.0
			20	01.5	+150.4	-49.4	1077.3	80	29.0	30.0	20.0 ± 4.0
			22	44.5	+130.2	-50.1	1078.4	22	20.0	20.0	17.5 ± 2.0
	Sept.	10	03	01.0	-95.6	+50.1	565.2	200	34.0	38.0	14.0 ± 5.0
			20	36.0	+141.5	-47.7	1047.1	95	27.0	27.0	16.0 ± 3.0
	Sept.	11	02	37.0	-97.9	+50.3	569.5	40	18.0	18.0	13.5 ± 1.5
	Sept.	13	01	50.0	-96.6	+50.3	577.9	60	19.0	19.0	12.0 ± 4.0
			22	53.0	+118.8	-50.5	1066.7	10	15.5	15.5	14.0 ± 1.5
	Sept.	14	19	03.0	+151.0	-49.0	1021.3	210	35.0	39.0	14.0 ± 5.0
	Sept.	15	18	38.0	+145.1	-47.6	998.5	65	23.0	23.0	15.0 ± 2.5
			22	10.0	+140.2	-48.1	1081.6	130	29.0	30.0	14.5 ± 4.0
	Sept.	16	18	15.0	+148.6	-48.2	994.0	23	20.0	20.0	17.0 ± 3.0
			21	45.0	+134.7	-49.3	1068.3	35	20.0	20.0	15.5 ± 1.0

1960	Sept.	17	17	51.5	+147.6	-47.8	976.0	40	24.0	24.0	19.0 ± 3.0
			23	01.6	+107.2	-48.7	1056.2	50	20.0	20.0	15.0 ± 3.0
	Sept.	18	20	55.0	+122.8	-50.5	1027.0	20	16.0	16.0	14.0 ± 2.0
	Sept.	19	17	05.0	+154.9	-49.0	966.3	120	27.0	28.0	14.0 ± 4.0
	Sept.	20	20	08.5	+125.7	-50.4	1007.4	13	17.0	17.0	15.5 ± 1.5
	Sept.	21	21	31.5	+126.5	-46.2	1051.3	30	20.0	20.0	16.5 ± 2.0
	Sept.	22	15	57.0	+171.6	-50.4	965.8	75	25.0	25.0	16.0 ± 3.0
	Sept.	23	18	03.5	-68.5	+47.3	755.1	55	22.0	22.0	15.5 ± 2.0
	Sept.	24	22	52.0	-96.7	+48.0	641.4	16	19.0	19.0	17.0 ± 2.0
	Sept.	28	16	04.0	-69.0	+46.8	847.2	130	28.0	29.0	14.5 ± 4.0
	Oct.	6	12	55.5	-61.4	+46.2	964.5	85	23.0	23.0	13.0 ± 4.0
			14	40.0	-69.0	+49.9	910.3	10	15.0	15.0	14.0 ± 2.0
	Oct.	7	15	57.5	-96.3	+49.6	933.3	300	39.0	45.0	10.0 ± 7.0
	Oct.	16	10	42.0	-64.5	+49.4	1045.2	90	23.0	23.0	12.0 ± 3.0
			12	26.0	-76.2	+50.5	1017.2	40	17.0	17.0	12.5 ± 2.0
	Oct.	18	13	22.5	-88.0	+49.9	1008.5	20	17.0	17.0	14.5 ± 1.5
	Oct.	19	11	14.0	-76.7	+50.4	1046.6	17	17.0	17.0	15.0 ± 1.5
			12	59.0	-83.3	+49.4	1010.6	110	26.0	26.0	13.0 ± 5.0
	Oct.	20	10	50.0	-76.9	+50.4	1055.6	30	17.0	17.0	13.5 ± 1.5
			11	44.0	+115.1	-48.7	636.1	20	17.0	17.0	13.5 ± 1.5
			12	34.0	-88.7	+50.1	1032.9	48	20.0	20.0	15.0 ± 2.0

1960	Oct.	21	12	10.0	-88.5	+50.2	1043.5	110	26.0	26.0	13.0	±	4.0
	Oct.	22	11	46.0	-88.6	+50.3	1052.8	120	26.0	26.0	12.0	±	5.0
	Oct.	23	11	24.0	-79.0	+49.3	1046.3	150	26.0	26.0	10.0	±	5.0
	Oct.	25	10	36.5	-78.9	+49.5	1063.0	25	16.0	16.0	13.0	±	2.0
			12	19.0	-96.1	+48.0	1050.4	90	24.0	24.0	13.0	±	3.0
	Oct.	26	04	11.3	+156.4	-48.3	572.4	43	21.0	21.0	16.0	±	2.0
	Nov.	12	21	01.0	+160.7	-45.2	747.8	1,400	280	16,000	16,000	±	5,000
			22	44.6	+146.6	-48.3	713.4	45,000	145	27,000	32,000	±	10,000
			23	30.0	-59.4	+44.4	877.5	10,000	1.0	85,000	85,000	to	330,000
	Nov.	13	01	10.5	-87.6	+43.2	866.0	7,500	12.0	70,000	70,000	±	20,000
			03	56.3	+114.0	-47.2	615.9	10,500	7.0	72,000	72,000	±	20,000
			23	06.7	-56.0	+45.3	872.2		280	13,000	13,000	±	4,000
	Nov.	14	00	48.0	-81.0	+45.5	873.6	3,000	240	16,000	16,000	±	4,800
			02	31.0	-98.4	+47.9	901.6	2,600	220	17,000	17,000	±	5,500
	Nov.	15	00	26.0	-71.6	+47.9	889.0	375	.350	3,900	3,900	±	1,200
			02	06.0	-102.5	+46.6	869.8	460	340	3,800	3,800	±	1,100
			21	30.0	+135.2	-44.3	802.4		5.0	79,000	79,000	±	24,000
			23	59.0	-84.2	+43.7	821.6	10,000	2.0	80,000	80,000	±	40,000
	Nov.	16	01	44.0	-92.6	+48.8	884.2	8,000	16.0	63,000	63,000	±	19,000
			23	37.4	-73.2	+47.3	843.5		320	9,000	9,000	±	2,700

1960	Nov.	17	01	20.8	-88.3	+49.3	881.0	420	330	7,200	7,200 ± 2,200
			03	04.0	-103.3	+50.4	912.1		325	2,100	2,100 ± 200
			23	13.3	-73.1	+46.9	843.6		280	1,150	1,150 ± 200
	Nov.	18	00	57.5	-84.0	+49.8	876.0	350	345	4,000	4,000 ± 1,200
			02	39.5	-105.2	+50.2	888.6	360	255	900	900 ± 90
	Nov.	19	00	33.9	-81.3	+49.9	866.4		205	550	550 ± 55
	Nov.	20	00	09.5	-82.8	+49.7	843.6	550	125	220	220 ± 20
			05	13.5	-156.8	+50.0	849.5		115	190	185 ± 20
			22	02.8	-64.4	+48.4	802.6	530	208	560	560 ± 60
			23	47.5	-71.7	+50.5	860.0	1200	340	4,500	4,500 ± 1,500
	Nov.	21	01	30.5	-64.0	+45.6	960.9		275	13,000	13,000 ± 4,000
			03	12.5	-109.0	+49.9	900.4	600	250	860	860 ± 90
			21	38.0	-67.6	+47.4	773.3	200	145	290	265 ± 27
			23	24.0	-68.5	+50.5	852.0	45	145	290	285 ± 30
	Nov.	22	00	17.0	+98.6	-50.5	783.2	22	95	145	145 ± 15
			01	06.0	-89.6	+50.4	864.6	34	125	220	220 ± 22
			18	47.0	+162.6	-49.6	837.5	25	23	23	20 ± 2
			22	57.5	-81.0	+49.5	794.9	40	58	70	65 ± 7
			23	55.0	+109.8	-50.0	766.9	15	42	47	45 ± 6

1960	Nov.	23	00	42.0	-89.0	+50.4	848.6	35	52	62	58	± 6.0
			18	23.0	+163.3	-49.6	853.5	110	29.0	31.0	24.0	± 3.0
			22	30.0	-79.5	+45.6	722.5	20	40.0	45.0	42.0	± 4.0
	Nov.	24	00	18.0	-88.4	+50.4	832.0	20	28.0	28.0	25.0	± 3.0
			17	58.5	+159.0	-48.8	885.0	50	26.0	26.0	20.0	± 2.0
			23	06.0	+105.9	-50.4	815.2	20	21.0	21.0	18.5	± 2.0
	Nov.	26	18	52.5	+141.7	-49.7	895.9	22	22.0	22.0	19.0	± 2.0
	Nov.	28	18	05.0	+145.9	-50.0	918.3	30	20.0	20.0	16.0	± 2.0
	Nov.	29	21	07.0	+114.6	-50.1	877.9	68	19.0	19.0	11.0	± 3.0
	Nov.	30	22	25.5	+96.7	-49.2	872.4	35	15.0	15.0	11.0	± 2.0
	Dec.	1	15	10.5	+165.1	-48.7	983.6	13	14.0	14.0	13.0	± 1.0
			16	52.0	+143.6	-49.4	973.3	16	14.0	14.0	12.0	± 1.0
			19	21.5	-78.5	+48.7	655.8	16	15.0	15.0	13.0	± 1.0
			21	05.0	-88.8	+50.4	695.0	8	14.0	14.0	13.0	± 1.0
			22	50.0	-93.6	+49.1	752.0	6	13.5	13.5	12.5	± 1.0
	Dec.	2	16	28.0	+144.6	-49.4	985.9	30	18.0	18.0	14.0	± 1.5
			18	55.6	-87.9	+46.1	620.0	75	24.0	24.0	15.0	± 1.5
			19	57.5	+127.2	-48.8	890.1	28	19.0	19.0	15.0	± 1.5
	Dec.	3	16	04.5	+150.6	-50.0	985.5	45	22.0	22.0	16.5	± 2.0
			22	01.0	-97.5	+49.9	707.0	72	26.0	26.0	16.5	± 3.0
	Dec.	4	19	05.0	+109.1	-50.5	977.4	5	14.0	14.0	13.5	± 1.0

1960	Dec.	5	15	16.5	+147.9	-49.5	1019.9	120	27.0	28.0	13.5 ± 3.0
	Dec.	6	14	51.0	+144.4	-48.7	1039.6	27	20.0	20.0	17.0 ± 2.0
			20	04.5	+114.1	-46.6	920.5	15	16.0	16.0	14.0 ± 1.5
	Dec.	7	14	28.0	+150.3	-49.6	1039.2	26	17.0	17.0	14.0 ± 1.5
			17	55.0	+122.5	-50.0	988.0	10	15.0	15.0	14.0 ± 1.5
	Dec.	8	14	04.0	+151.5	-49.6	1047.8	18	17.0	17.0	15.0 ± 1.0
			17	30.0	+118.7	-50.4	1011.6	4	14.0	14.0	14.0 ± 1.0
			19	14.0	+107.1	-48.8	976.4	10	15.0	15.0	14.0 ± 1.5
	Dec.	9	13	40.0	+152.8	-49.6	1055.6	20	15.5	15.5	13.5 ± 1.0
			17	08.5	+129.8	-49.4	998.5	15	14.0	14.0	13.5 ± 1.5
	Dec.	10	13	15.0	+149.4	-49.0	1069.3	54	25.0	25.0	19.0 ± 2.5
			15	45.5	-73.1	+48.2	575.8	31	20.0	20.0	16.0 ± 1.5
	Dec.	11	12	51.0	+150.7	-49.0	1074.8	50	24.0	24.0	18.0 ± 3.0
	Dec.	12	12	25.6	+143.1	-47.2	1086.6	160	32.0	34.0	15.0 ± 4.0
			15	57.0	+138.3	-48.4	1018.6	25	20.0	20.0	17.0 ± 2.0
	Dec.	13	13	48.0	+146.6	-50.5	1062.6	18	16.0	16.0	14.0 ± 1.5
			14	33.5	-71.0	+48.0	564.7	100	26.0	26.0	14.0 ± 4.0
			15	30.0	+125.3	-50.3	1056.5	2	13.0	13.0	13.0 ± 1.0
			17	12.5	+103.9	-49.9	1049.8	10	14.0	14.0	13.0 ± 1.0
	Dec.	14	13	20.0	+128.6	-49.2	1087.3	27	16.0	16.0	13.0 ± 2.0

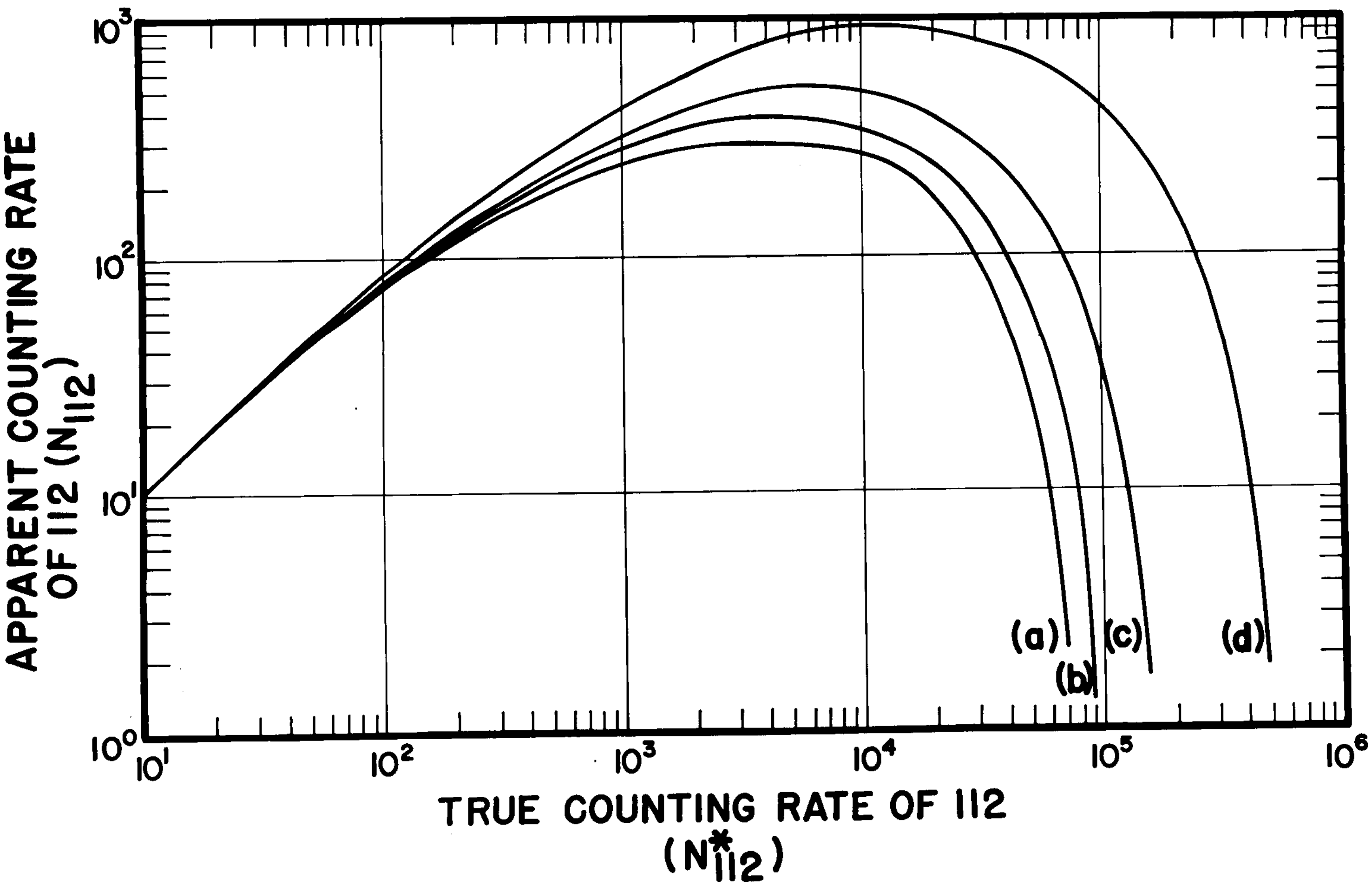
1960	Dec.	15	11	13.5	+147.3	-47.5	1091.0	2	13.0	13.0	13.0 ± 2.0
			12	59.0	+144.6	-50.5	1079.6	3	13.5	13.5	13.5 ± 1.0
			15	28.0	-85.2	+49.7	565.0	11	15.5	15.5	14.0 ± 1.0
			16	25.0	+111.4	-49.1	1056.2	5	13.5	13.5	13.5 ± 1.0
			18	55.5	-109.8	+49.6	588.0	70	21.0	21.0	12.5 ± 3.0
	Dec.	16	10	49.0	+148.7	-47.6	1091.0	3	14.0	14.0	14.0 ± 1.5
			12	34.0	+141.1	-50.3	1087.0	4	14.5	14.5	14.0 ± 1.0
			13	20.5	-73.7	+46.6	562.2	84	25.5	25.5	15.5 ± 2.0
			14	16.0	+119.7	-50.5	1084.0	2	13.0	13.0	13.0 ± 1.0
			15	03.5	-89.9	+48.8	562.0	15	16.5	16.5	15.0 ± 1.0
	Dec.	17	12	57.0	-67.9	+47.9	562.5	70	20.0	20.0	12.0 ± 3.0
			14	40.0	-83.6	+49.7	562.0	24	17.0	17.0	14.0 ± 1.0
			15	35.0	+104.8	-50.2	1080.5	10	14.0	14.0	13.0 ± 2.0
	Dec.	18	01	02.0	+156.1	-48.8	1090.7	20	15.5	15.5	13.0 ± 2.0
			11	45.0	+139.3	-50.0	1091.8	4	14.0	14.0	14.0 ± 1.0
			12	33.5	-67.1	+47.9	564.1	32	19.0	19.0	16.0 ± 1.5
			14	16.5	-82.8	+49.7	562.2	14	17.0	17.0	15.5 ± 1.0
			15	14.0	+120.4	-47.9	1067.9	7	15.0	15.0	14.0 ± 1.5
			16	01.0	-92.2	+50.5	565.7	11	17.0	17.0	16.0 ± 1.0
	Dec.	19	11	19.5	+131.4	-48.8	1088.8	20	17.0	17.0	15.0 ± 1.0
			12	09.3	-66.2	+47.8	566.6	110	28.0	29.0	16.0 ± 3.0

1960	Dec.	19	13	04.0	+124.6	-50.5	1091.2	6	15.0	15.0	14.0 ± 1.5
			13	51.5	-87.4	+48.8	564.6	38	19.0	19.0	14.5 ± 1.5
			14	46.0	+103.0	-50.4	1089.8	5	14.5	14.5	14.0 ± 1.5
			15	36.5	-91.3	+50.5	563.8	17	18.0	18.0	16.0 ± 1.0
	Dec.	20	14	25.0	+118.7	-48.7	1084.1	25	17.0	17.0	14.0 ± 1.0
			15	13.0	-84.9	+50.1	562.0	45	22.0	22.0	16.5 ± 2.0
			16	06.0	+92.4	-48.8	1084.9	35	12.0	12.0	16.5 ± 1.5
	Dec.	21	10	32.0	+139.0	-49.7	1089.0	45	20.0	20.0	14.5 ± 2.0
			13	03.0	-85.8	+48.8	568.4	150	31.0	33.0	15.0 ± 4.0
	Dec.	22	10	08.0	+140.5	-49.8	1086.0	80	24.0	24.0	14.5 ± 2.0
			12	40.5	-79.5	+49.6	568.0	95	25.0	25.0	13.0 ± 3.0
			13	37.0	+121.7	-48.5	1089.9	44	22.0	22.0	17.0 ± 2.0
	Dec.	23	12	17.5	-70.3	+50.3	566.2	200	34.0	38.0	12.0 ± 5.0
			13	10.0	+109.0	-50.3	1093.0	30	17.0	17.0	13.5 ± 2.0
			15	41.5	-111.8	+50.6	562.0	110	29.0	30.0	17.0 ± 4.0
	Dec.	24	09	21.0	+148.4	-50.3	1083.0	200	31.0	33.0	12.0 ± 5.0
	Dec.	26	11	58.0	+113.7	-50.1	1086.3	10	15.0	15.0	14.0 ± 1.5
	Dec.	27	11	35.0	+120.0	-49.6	1086.6	13	14.0	14.0	13.0 ± 1.5
	Dec.	28	07	44.0	+149.7	-50.1	1053.4	14	18.0	18.0	16.5 ± 1.0
			12	00.0	-83.9	+50.5	582.0	25	19.0	19.0	16.0 ± 1.5
			13	44.0	-93.6	+48.9	566.8	60	21.0	21.0	14.0 ± 2.0

1960	Dec.	29	07	20.0	+151.2	-50.2	1045.6	26	21.0	21.0	18.0 ± 1.5
			11	37.0	-77.3	+50.2	581.3	28	20.0	20.0	16.5 ± 1.5
			13	19.5	-98.1	+49.8	576.2	43	23.0	23.0	18.0 ± 3.0
	Dec.	30	11	12.5	-79.2	+50.4	591.5	41	19.0	19.0	14.0 ± 1.5
	Dec.	31	09	56.0	+111.5	-50.5	1044.1	20	16.0	16.0	14.0 ± 1.0
			12	31.5	-96.4	+49.8	588.0	150	29.0	31.0	13.0 ± 4.0
1961	Jan.	1	06	06.6	+145.9	-49.2	994.5	170	30.0	32.0	12.0 ± 5.0
	Jan.	7	07	08.0	+122.0	-50.3	973.0	18	18.0	18.0	16.0 ± 1.0
			08	50.0	+100.7	-50.0	984.0	85	23.0	23.0	13.0 ± 2.0
	Jan.	8	06	45.0	+128.5	-49.9	974.6	10	16.0	16.0	15.0 ± 1.5
			08	25.0	+97.1	-50.4	958.1	10	16.0	16.0	15.0 ± 1.5
	Jan.	9	02	53.5	+152.2	-49.0	877.4	80	23.0	23.0	13.5 ± 3.0
	Jan.	10	05	55.0	+121.2	-50.5	921.0	10	16.5	16.5	15.5 ± 1.5
			07	41.0	+119.3	-47.2	988.0	25	19.0	19.0	16.0 ± 1.0
	Jan.	11	05	33.5	+132.8	-49.7	937.4	14	16.5	16.5	15.0 ± 1.5
	Jan.	12	06	50.0	+107.9	-49.8	921.2	30	19.0	19.0	14.0 ± 1.5
	Jan.	13	06	27.0	+119.0	-48.0	937.7	15	19.0	19.0	17.0 ± 2.5
	Jan.	17	04	50.0	+115.4	-49.4	855.6	15	18.5	18.5	16.5 ± 1.5
	Jan.	18	01	49.5	-64.2	+47.8	911.0	122	26.0	26.0	11.0 ± 4.0
			04	25.0	+111.7	-50.0	826.2	6	19.0	19.0	18.5 ± 2.5

1961	Jan.	19	01	25.5	-62.7	+48.0	923.0	85	24.5	24.5	14.5 ± 2.0
			03	07.5	-84.3	+48.8	911.8	15	18.0	18.0	16.5 ± 1.5
			04	00.0	+107.8	-50.3	796.7	6	18.0	18.0	17.5 ± 2.0
			04	52.0	-90.2	+50.5	853.0	10	18.0	18.0	17.0 ± 1.5
	Jan.	20	01	01.0	-61.3	+48.1	936.0	25	18.0	18.0	15.0 ± 2.0
			02	44.5	-77.9	+49.7	909.8	5	15.0	15.0	14.5 ± 1.0
			04	27.0	-94.0	+50.4	882.6	60	19.0	19.0	12.0 ± 3.0
	Jan.	21	02	21.0	-70.3	+50.2	907.8	30	18.5	18.5	14.5 ± 1.5
			04	04.0	-87.3	+50.5	880.3	70	20.0	20.0	12.0 ± 3.0
	Jan.	22	01	56.0	-74.9	+49.9	934.9	140	27.0	27.0	11.0 ± 5.0
			03	41.0	-80.6	+50.2	877.9	41	20.0	20.0	15.0 ± 1.5
	Jan.	23	01	33.0	-68.3	+50.3	932.9	85	22.0	22.0	12.0 ± 4.0
			02	23.5	+107.7	-50.5	927.9	22	20.0	20.0	17.5 ± 2.5
	Jan.	29	01	41.0	-91.9	+50.5	1087.7	24	20.0	20.0	17.0 ± 2.5
	Feb.	3	02	11.0	-131.8	+50.4	1053.4	80	22.0	22.0	12.5 ± 4.0
	Feb.	4	00	08.0	-96.3	+50.3	1046.5	44	21.0	21.0	16.0 ± 2.0
			22	00.0	-83.1	+50.2	1072.0	5	15.0	15.0	14.5 ± 1.0
			22	56.0	+118.2	-47.2	630.5	10	15.0	15.0	14.0 ± 1.5
			23	43.0	-99.6	+50.5	1060.8	3	15.5	15.5	15.0 ± 1.0
	Feb.	5	01	28.0	-106.5	+48.5	1028.0	7	16.5	16.5	15.5 ± 1.0
			21	36.0	-81.4	+50.2	1080.1	10	16.0	16.0	15.0 ± 1.5

1961	Feb.	5	23	20.0	-92.8	+50.2	1059.0	4	16.0	16.0	15.5 ± 1.0
	Feb.	6	01	04.0	-104.8	+48.4	1026.0	20	21.0	21.0	18.5 ± 1.5
			19	30.0	-58.2	+50.0	1082.4	10	18.0	18.0	17.0 ± 1.5
			21	10.0	-89.2	+49.3	1085.0	8	18.0	18.0	17.0 ± 1.5
			22	58.0	-81.5	+49.0	1050.3	6	17.0	17.0	16.5 ± 1.5
	Feb.	7	00	40.0	-103.1	+48.2	1043.0	36	23.0	23.0	18.5 ± 2.0
			19	06.0	-56.4	+50.0	1084.8	14	19.5	19.5	18.0 ± 1.0
			20	49.0	-72.9	+50.5	1079.0	6	18.0	18.0	17.5 ± 1.0
			22	32.0	-89.3	+50.1	1070.2	10	18.5	18.5	17.5 ± 1.0
	Feb.	8	18	41.0	-59.4	+49.6	1087.5	65	21.0	21.0	13.0 ± 2.0
			20	24.5	-71.1	+50.5	1082.2	45	18.5	18.5	13.0 ± 2.0
	Feb.	9	20	00.0	-74.2	+50.4	1086.6	38	22.0	22.0	17.5 ± 1.5
			21	43.0	-90.6	+50.3	1082.2	50	24.0	24.0	18.0 ± 2.5
	Feb.	11	20	54.0	-91.9	+50.5	1087.7	130	24.0	24.0	10.0 ± 5.0
	Feb.	12	18	47.5	-73.7	+50.3	1086.5	125	25.0	25.0	10.0 ± 5.0
	Feb.	13	16	40.0	-55.4	+49.5	1071.9	50	23.0	23.0	17.0 ± 2.0
	Feb.	14	17	58.0	-75.1	+50.1	[illegible]	[illegible]	21.0	21.0	15.0 ± 2.0
			21	26.0	-98.5	+48.[illegible]	1081.9	140	33.0	35.0	17.0 ± 4.0
	Feb.	15	21	00.0	-106.2	+50.0	1080.0	120	30.0	32.0	17.0 ± 4.0
	Feb.	16	20	37.5	-99.6	+49.3	1080.6	90	30.0	32.0	18.0 ± 4.0
	Feb.	17	18	30.5	-81.2	+50.2	1068.7	62	21.0	21.0	14.0 ± 2.0



APPARENT COUNTING RATE OF 112 (N_{112})
10^0
10^1
10^2
10^3
10^4
10^5
10^6
(a)
(b)
(c)
(d)
TRUE COUNTING RATE OF 112
(N^*_{112})

Figure 1

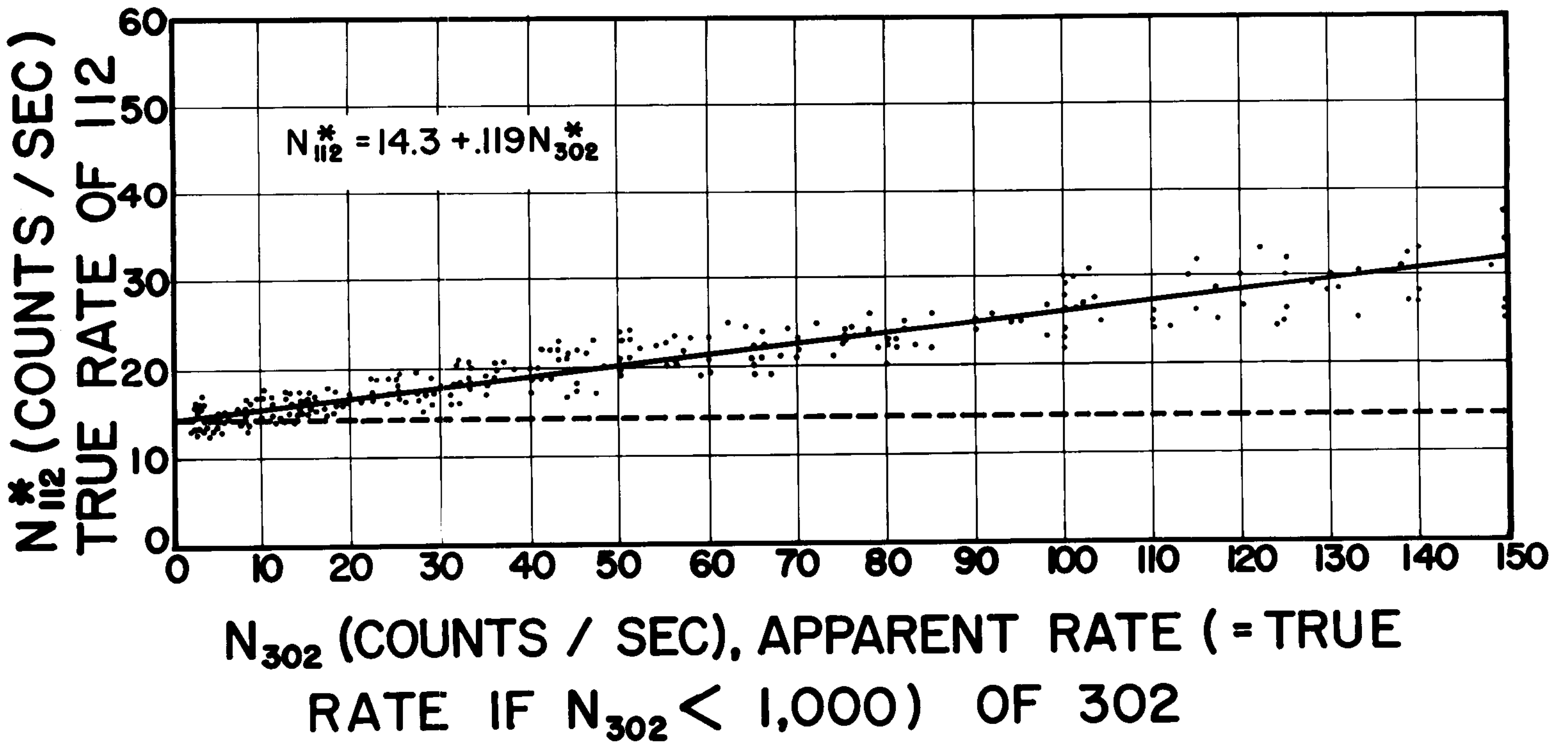

N^*_{112} (COUNTS / SEC)
TRUE RATE OF 112
0
10
20
30
40
50
60
$N^*_{112} = 14.3 + .119 N^*_{302}$
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
N_{302} (COUNTS / SEC), APPARENT RATE (= TRUE RATE IF $N_{302} < 1{,}000$) OF 302

Figure 2

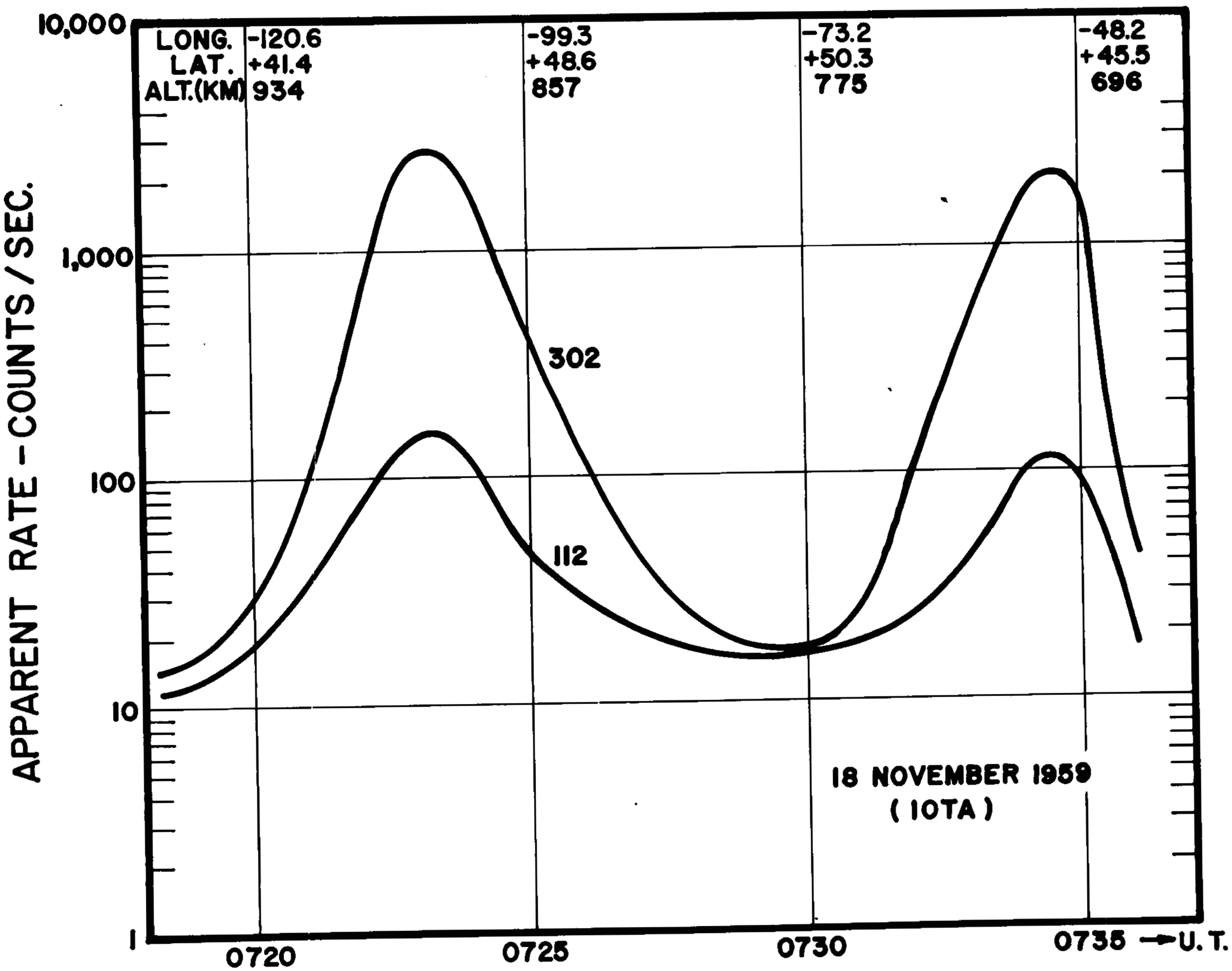
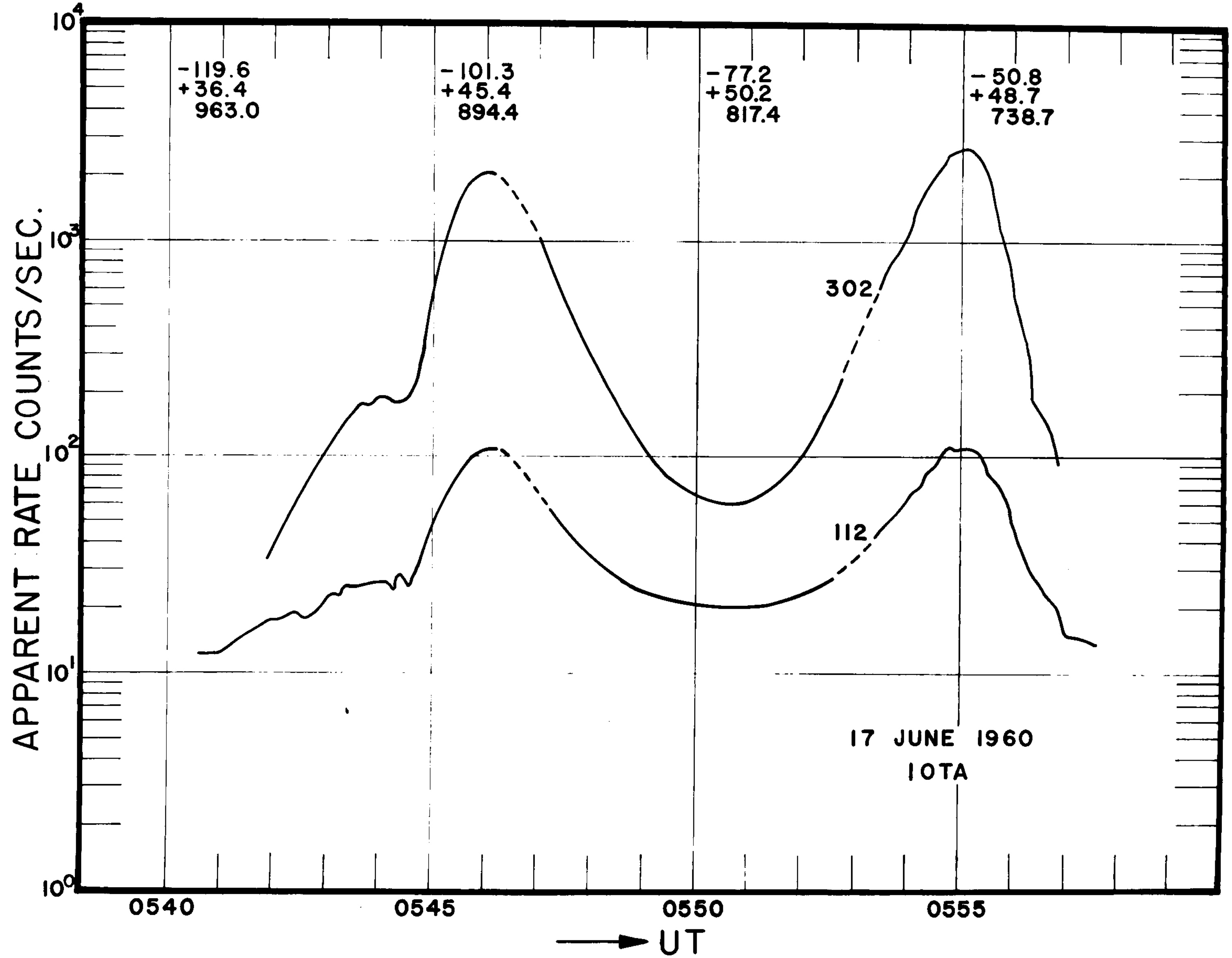

10,000
1,000
100
10
1
APPARENT RATE - COUNTS / SEC.
LONG. -120.6
LAT. +41.4
ALT.(KM) 934
-99.3
+48.6
857
-73.2
+50.3
775
-48.2
+45.5
696
302
112
18 NOVEMBER 1959
(10TA)
0720
0725
0730
0735 → U. T.

Figure 3



APPARENT RATE COUNTS/SEC.
10^4
10^3
10^2
10^1
10^0
-119.6
+36.4
963.0
-101.3
+45.4
894.4
-77.2
+50.2
817.4
-50.8
+48.7
738.7
302
112
17 JUNE 1960
IOTA
0540
0545
0550
0555
UT

Figure 4

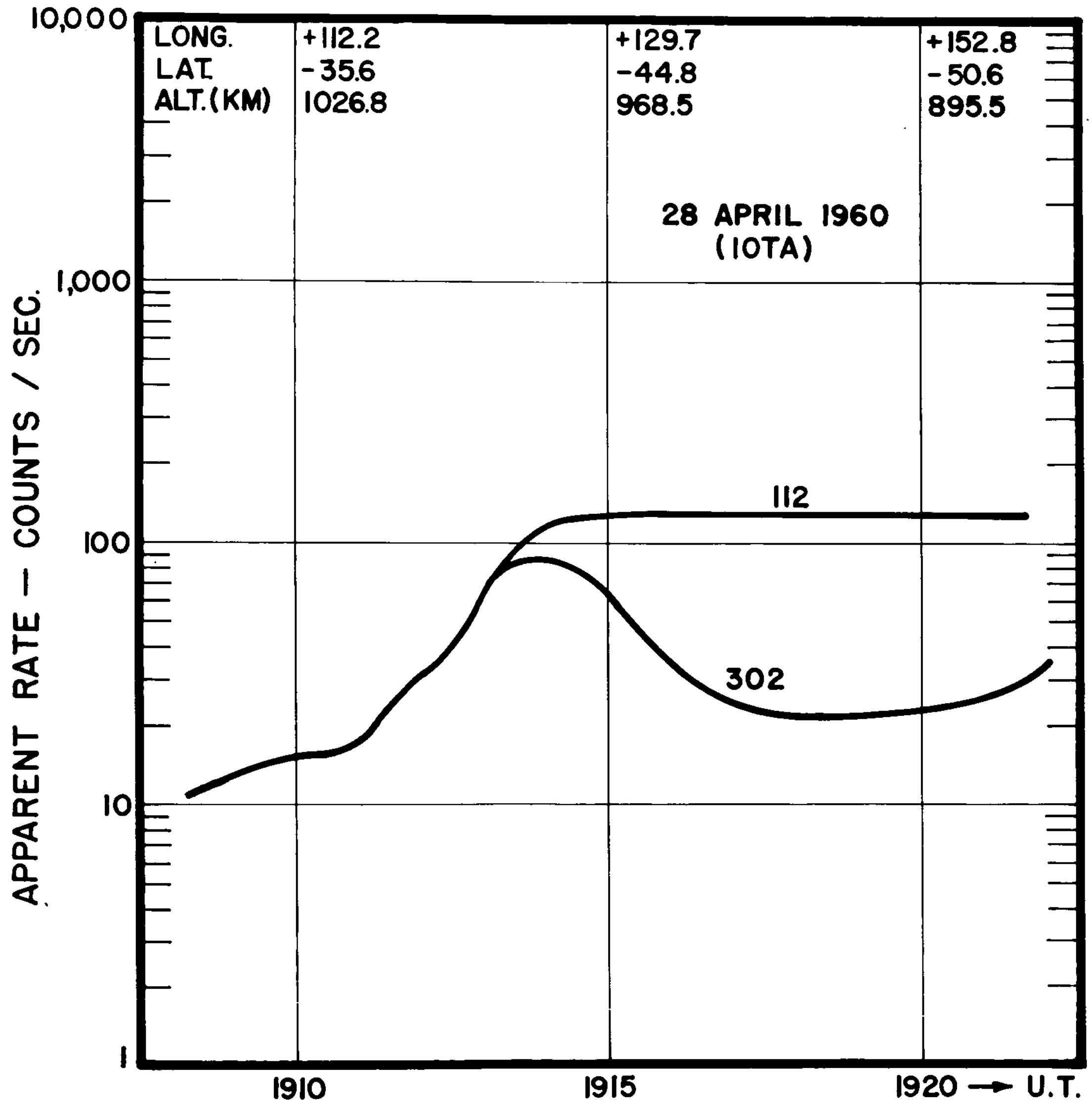
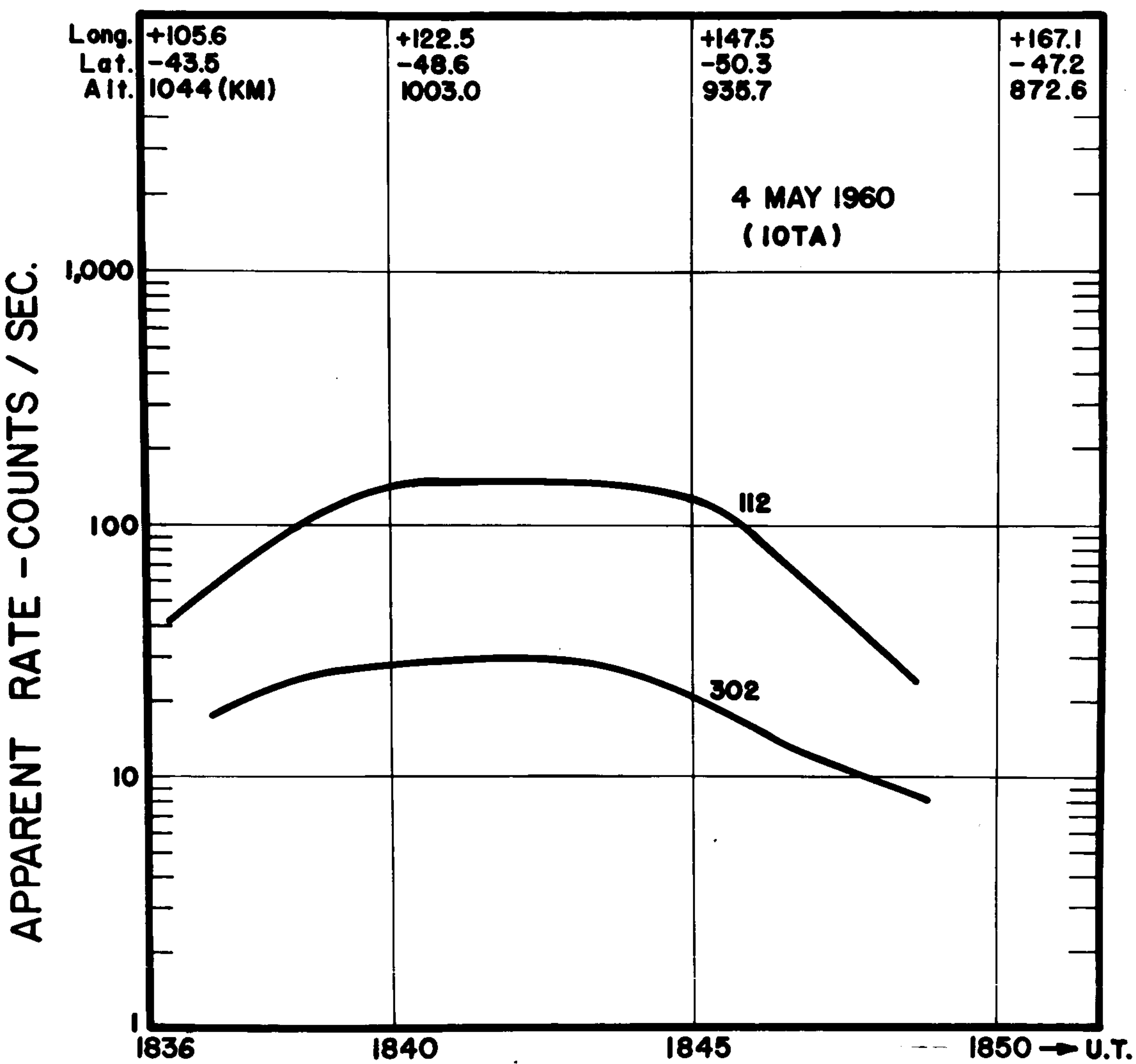

LONG.
LAT.
ALT. (KM)
+112.2
-35.6
1026.8
+129.7
-44.8
968.5
+152.8
-50.6
895.5
28 APRIL 1960
(IOTA)
112
302
10,000
1,000
100
10
1
APPARENT RATE — COUNTS / SEC.
1910
1915
1920 → U.T.

Figure 5



Long.
Lat.
Alt.
+105.6
-43.5
1044 (KM)
+122.5
-48.6
1003.0
+147.5
-50.3
935.7
+167.1
-47.2
872.6
4 MAY 1960
(IOTA)
APPARENT RATE -COUNTS / SEC.
1,000
100
10
1
112
302
1836
1840
1845
1850 → U.T.

Figure 6

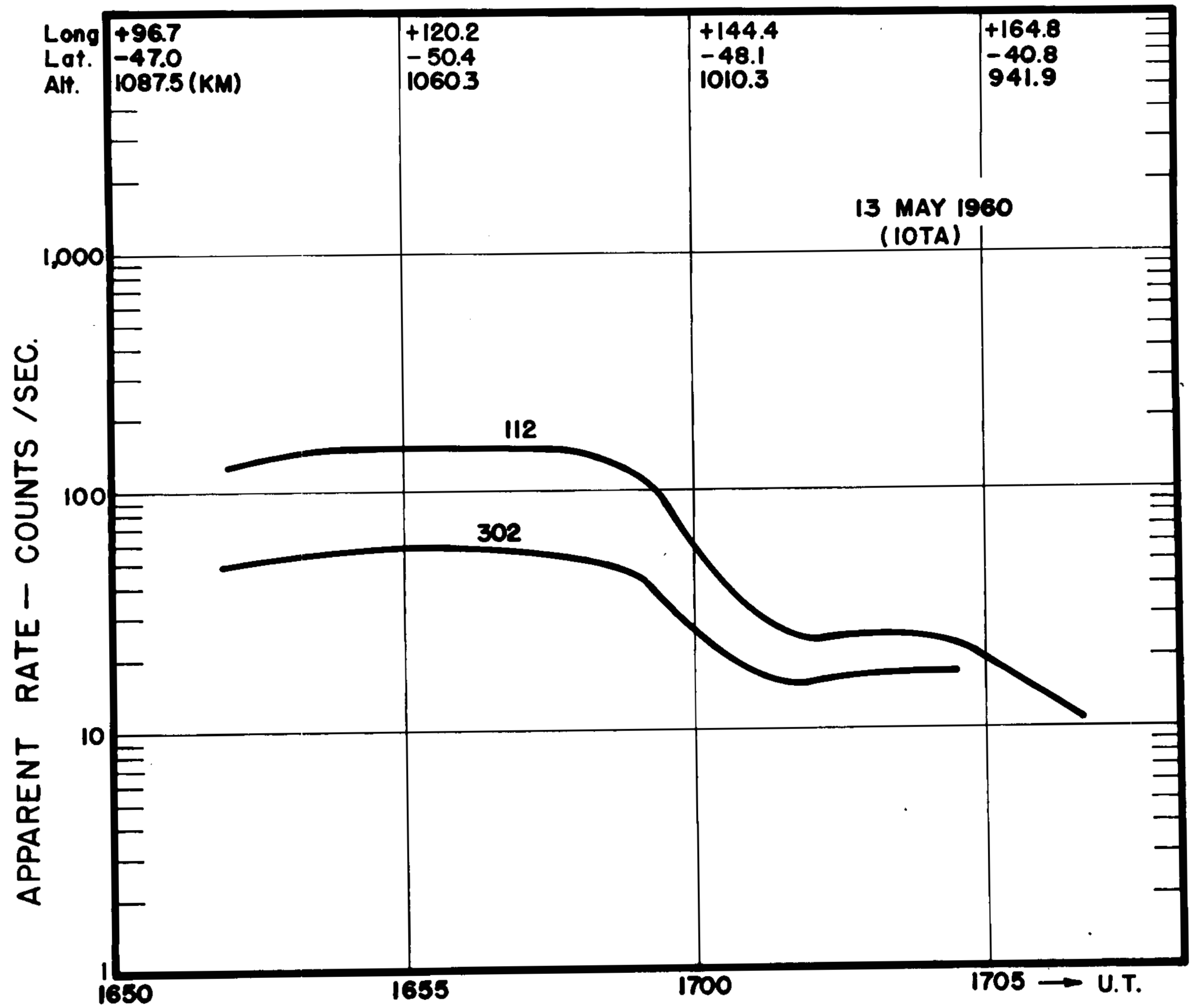
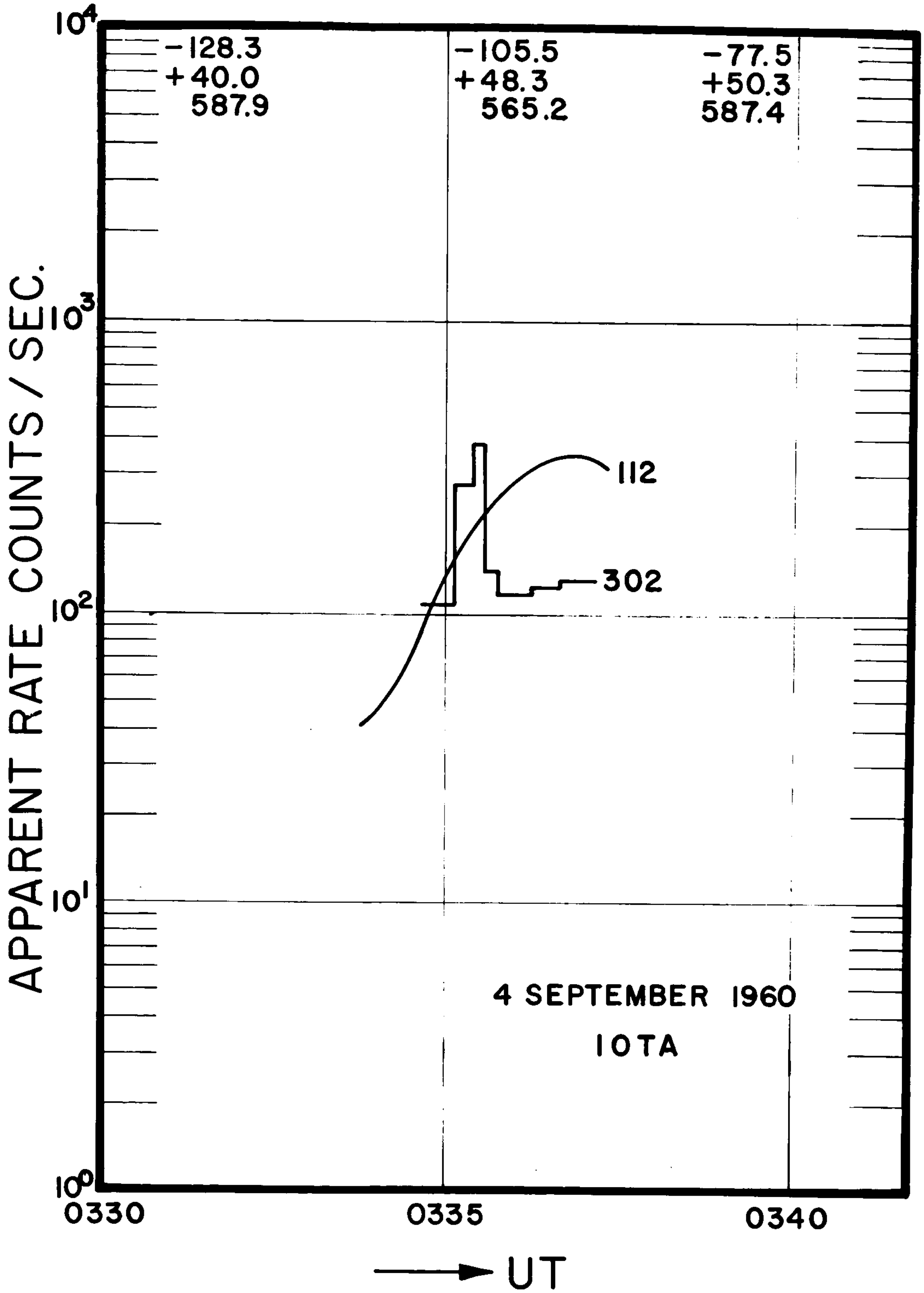

Long
Lat.
Alt.
+96.7
-47.0
1087.5 (KM)
+120.2
- 50.4
1060.3
+144.4
-48.1
1010.3
+164.8
-40.8
941.9
13 MAY 1960
(IOTA)
1,000
100
10
1
112
302
APPARENT RATE — COUNTS /SEC.
1650
1655
1700
1705 → U.T.

Figure 7



10⁴
10³
10²
10¹
10⁰
-128.3
+40.0
587.9
-105.5
+48.3
565.2
-77.5
+50.3
587.4
112
302
4 SEPTEMBER 1960
IOTA
0330
0335
0340
APPARENT RATE COUNTS / SEC.
UT

Figure 8

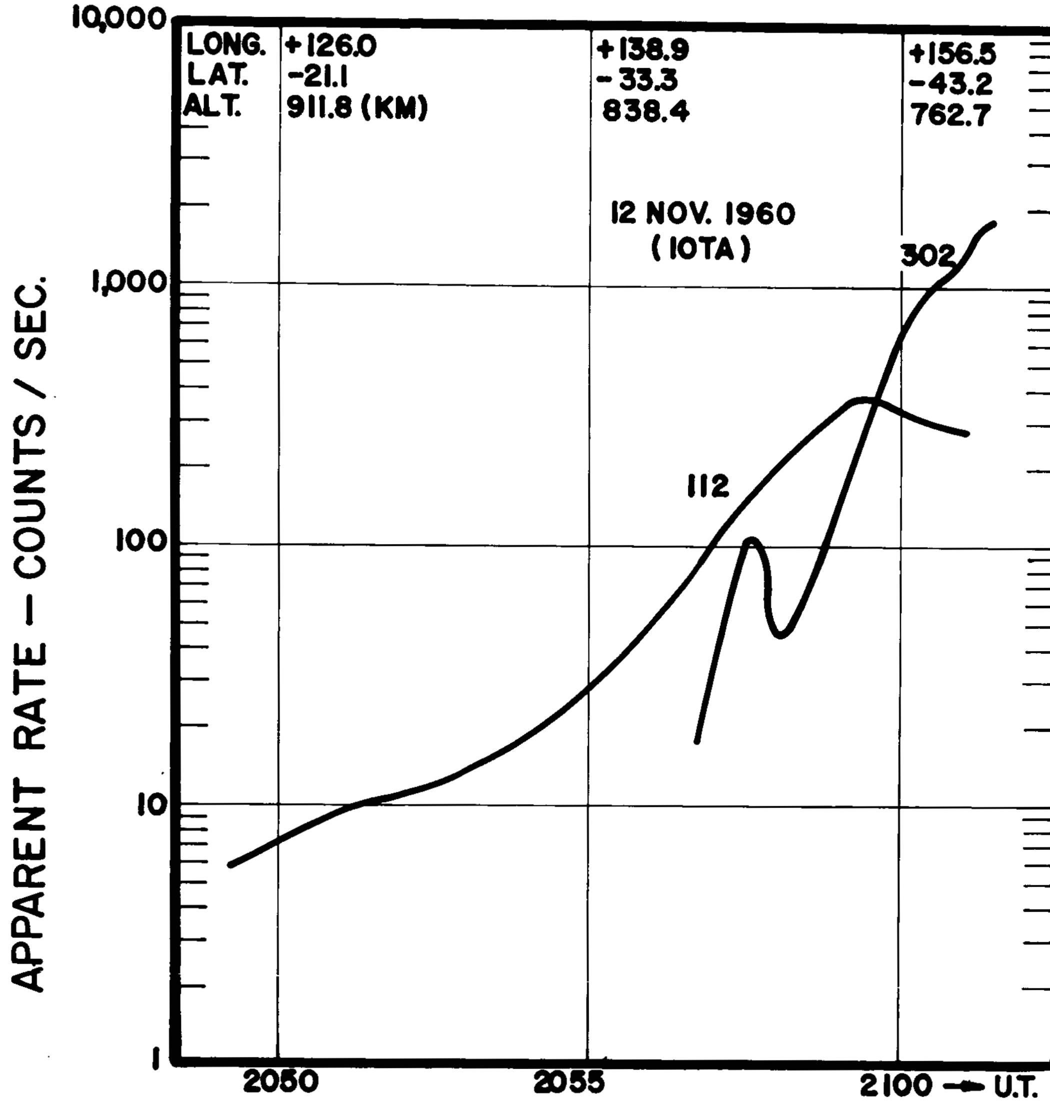

10,000
1,000
100
10
1
APPARENT RATE — COUNTS / SEC.
LONG.
LAT.
ALT.
+126.0
-21.1
911.8 (KM)
+138.9
-33.3
838.4
+156.5
-43.2
762.7
12 NOV. 1960
(IOTA)
302
112
2050
2055
2100 → U.T.

Figure 9

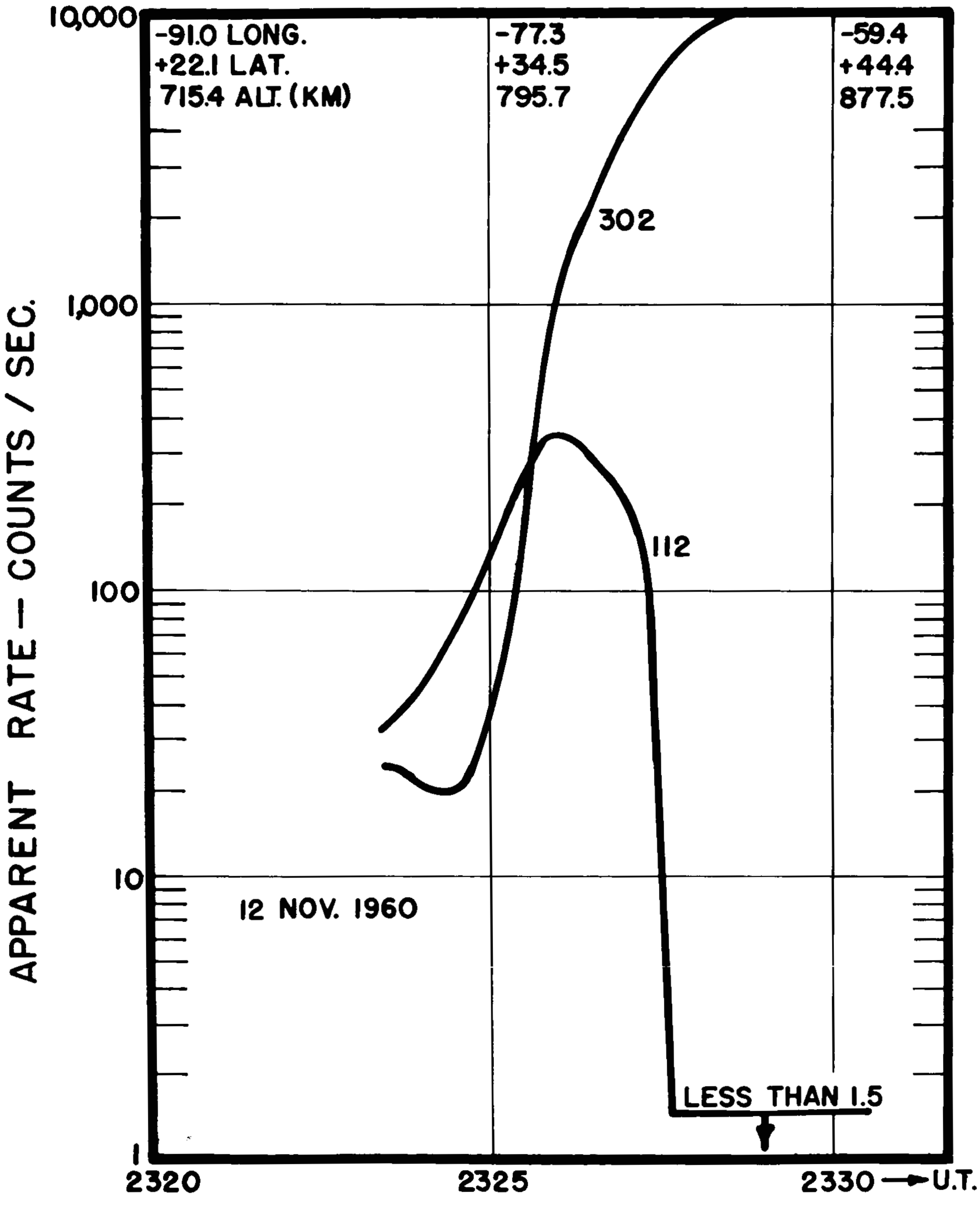

10,000
1,000
100
10
1
APPARENT RATE — COUNTS / SEC.
-91.0 LONG.
+22.1 LAT.
715.4 ALT. (KM)
-77.3
+34.5
795.7
-59.4
+44.4
877.5
302
112
12 NOV. 1960
LESS THAN 1.5
2320
2325
2330 → U.T.

Figure 10

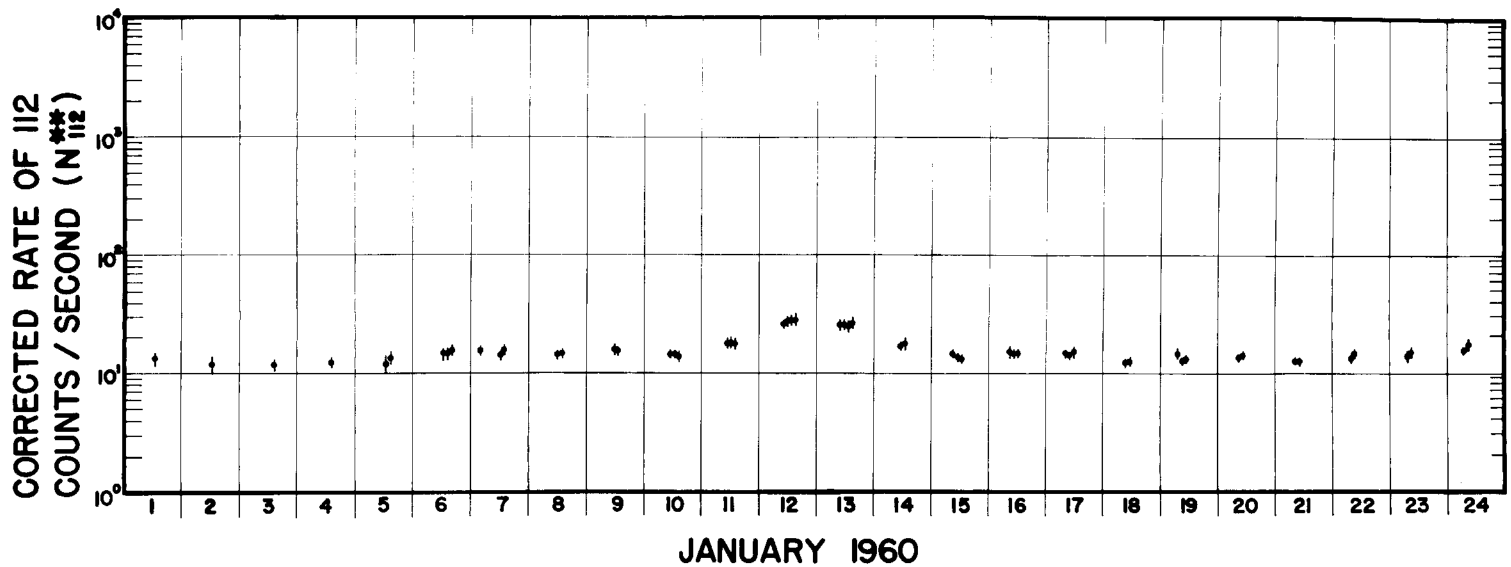

CORRECTED RATE OF 112
COUNTS / SECOND (N^{**}_{112})
10^4
10^3
10^2
10^1
10^0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
JANUARY 1960

Figure 11

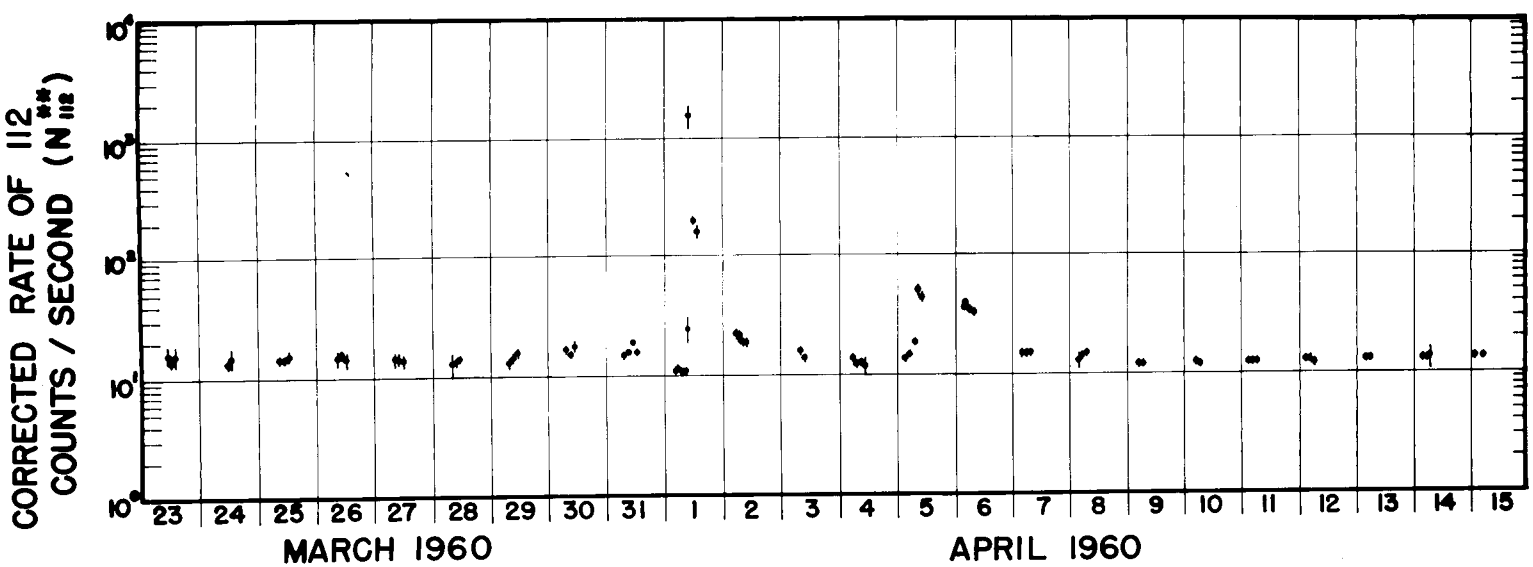

CORRECTED RATE OF 112
COUNTS / SECOND (N^{**}_{112})
10^4
10^3
10^2
10^1
10^0
23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
MARCH 1960
APRIL 1960

Figure 12

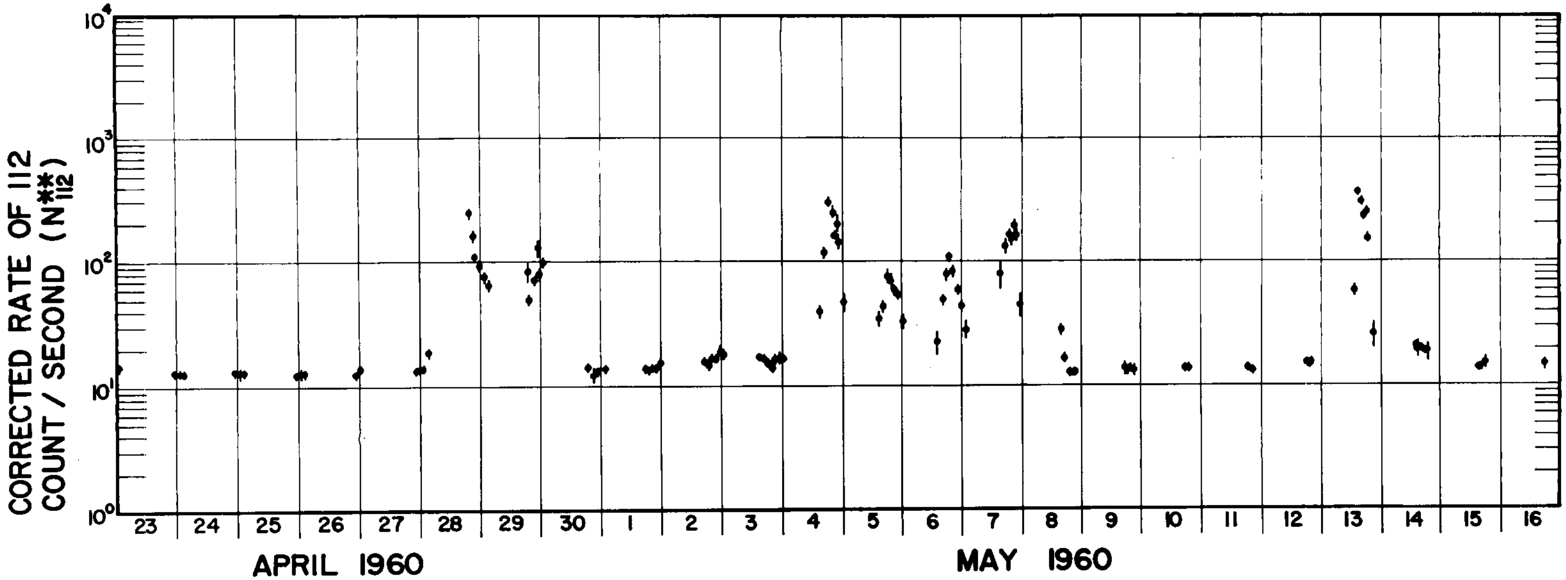


Figure 13

161-19

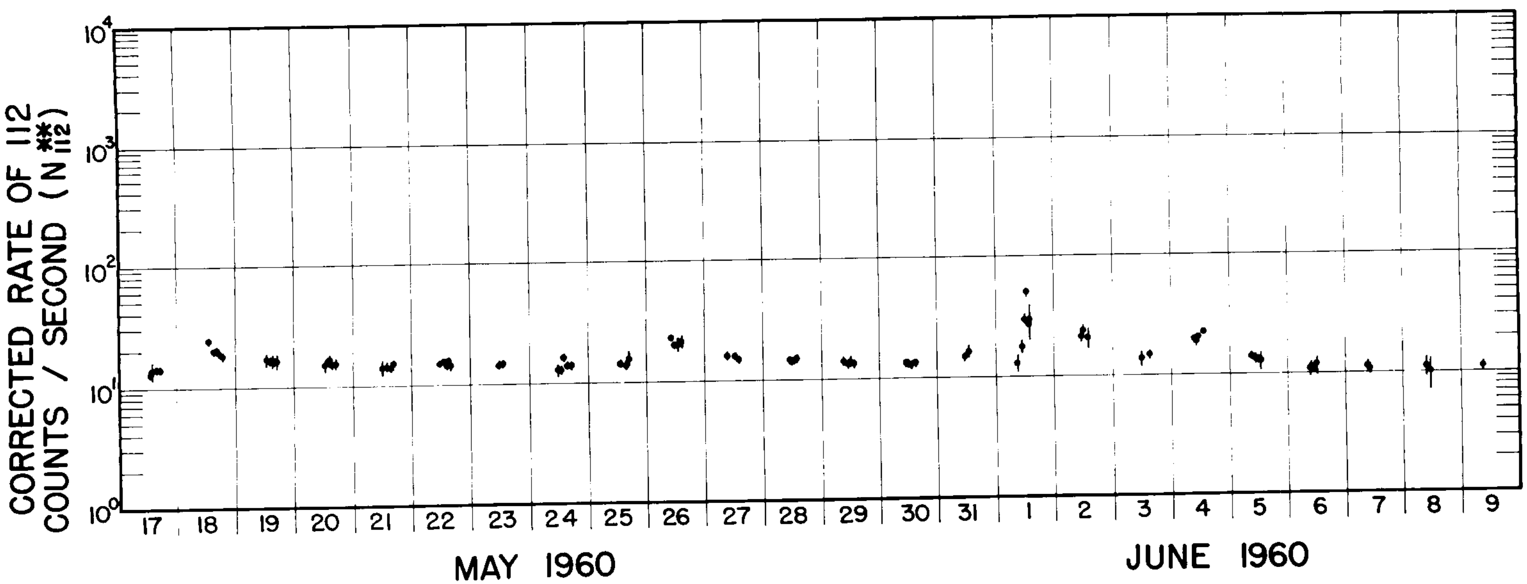

CORRECTED RATE OF 112
COUNTS / SECOND (N^{**}_{112})
10^0
10^1
10^2
10^3
10^4
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
1 2 3 4 5 6 7 8 9
MAY 1960
JUNE 1960

Figure 14

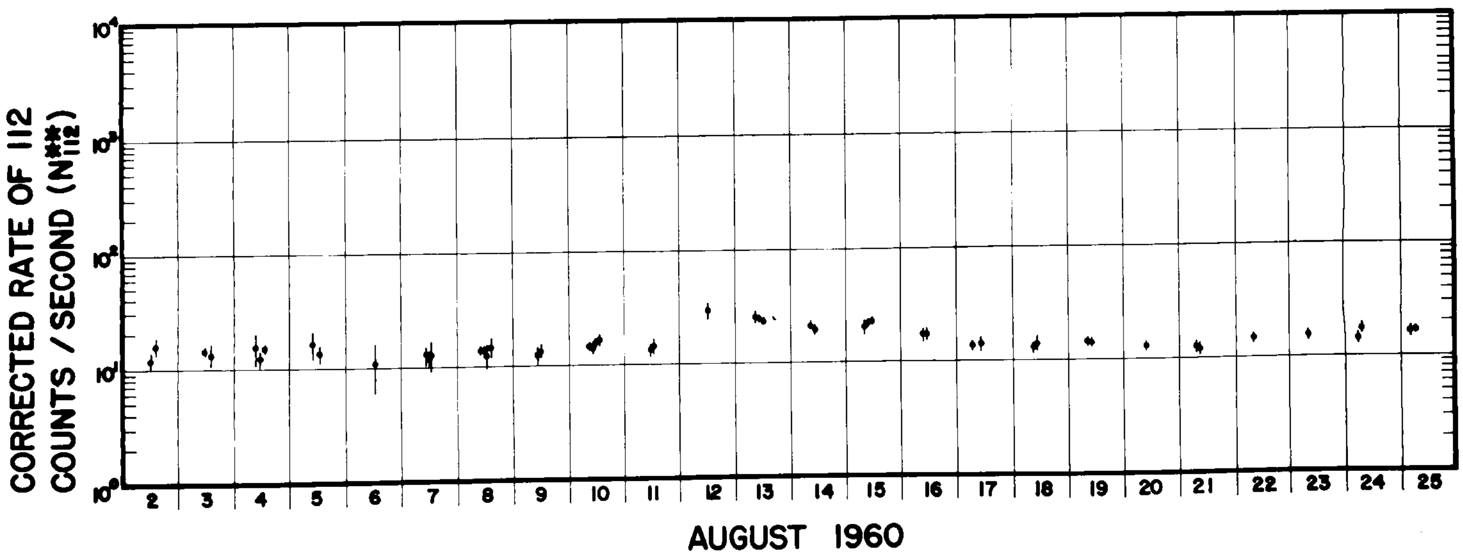

CORRECTED RATE OF 112
COUNTS / SECOND (N^{**}_{112})
10^4
10^3
10^2
10^1
10^0
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
AUGUST 1960

Figure 15

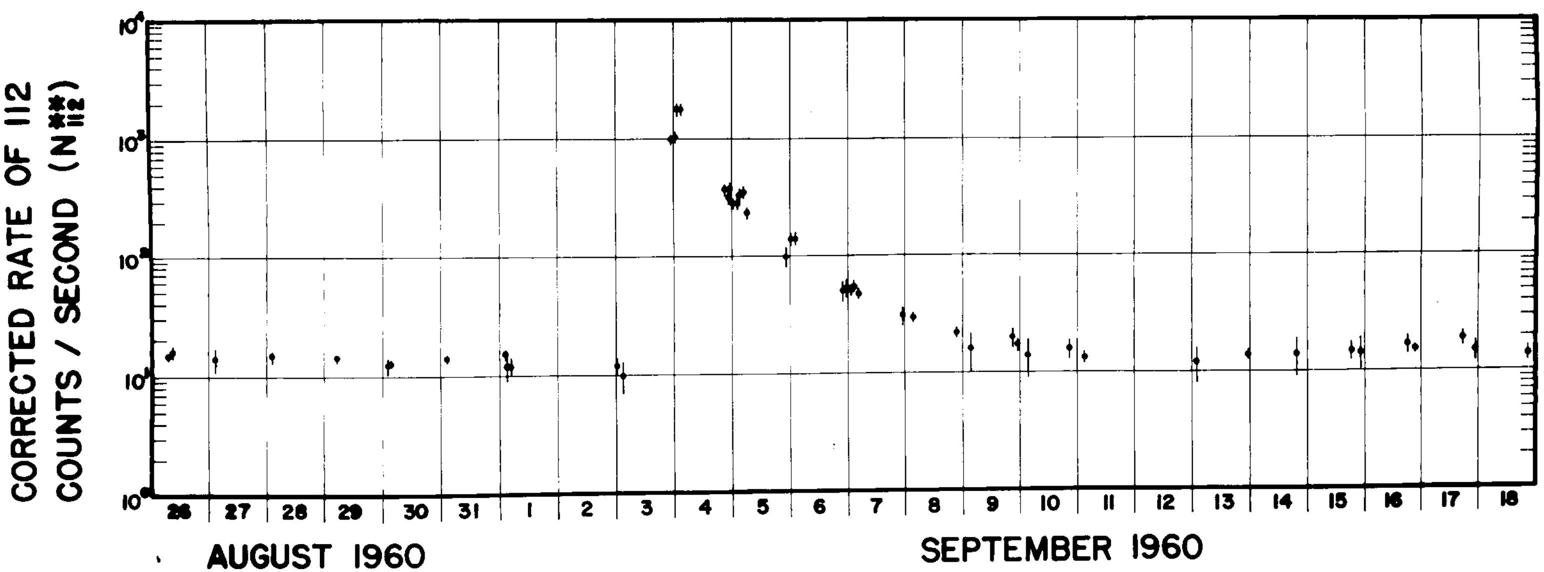

CORRECTED RATE OF 112
COUNTS / SECOND (N^{**}_{112})
10^4
10^3
10^2
10^1
10^0
26
27
28
29
30
31
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
AUGUST 1960
SEPTEMBER 1960

Figure 16

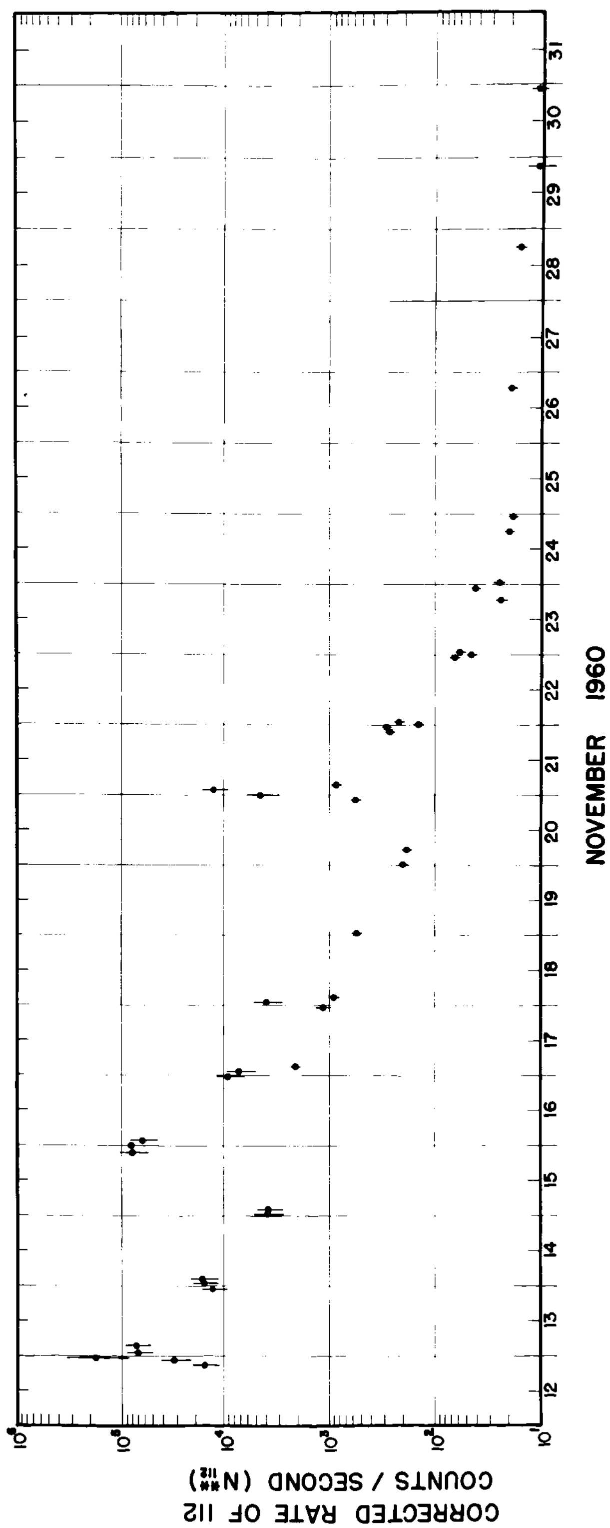


Figure 17