

# Solar Bulletin

THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS— SOLAR DIVISION

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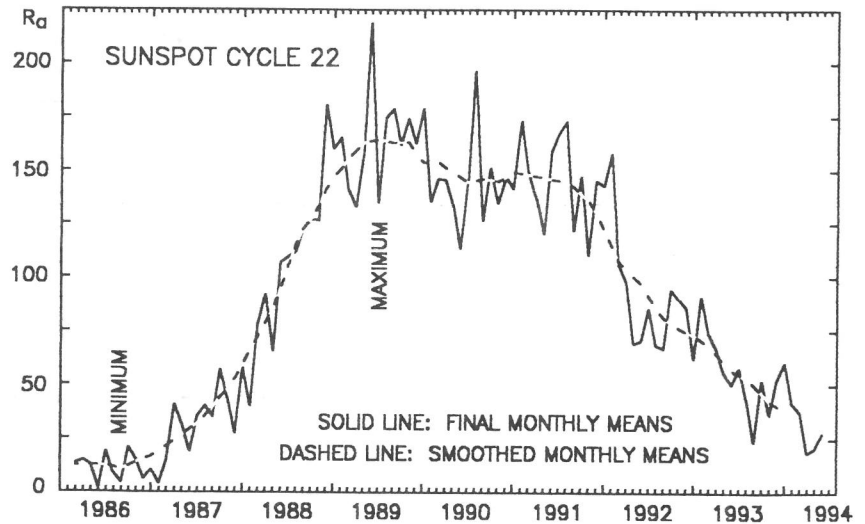
June 1994

## American Relative Sunspot Numbers for June

|     |    | R <sub>a</sub> Final |    |     |    |
|-----|----|----------------------|----|-----|----|
| 1)  | 0  | 11)                  | 56 | 21) | 12 |
| 2)  | 0  | 12)                  | 53 | 22) | 16 |
| 3)  | 0  | 13)                  | 46 | 23) | 24 |
| 4)  | 0  | 14)                  | 58 | 24) | 34 |
| 5)  | 0  | 15)                  | 54 | 25) | 25 |
|     |    |                      |    |     |    |
| 6)  | 7  | 16)                  | 51 | 26) | 14 |
| 7)  | 22 | 17)                  | 42 | 27) | 12 |
| 8)  | 43 | 18)                  | 36 | 28) | 14 |
| 9)  | 44 | 19)                  | 32 | 29) | 23 |
| 10) | 50 | 20)                  | 16 | 30) | 27 |

Mean: 27.0

Number of reports: 100



**June Summary:** Solar activity was low and very low during most of June. The Sun continued to be spotless until the 6th when a small type-B sunspot group - NOAA/USAF Region 7729 (S16, L273, BXO) - emerged in the SW Hemisphere and promptly produced a class C2/1F flare, the first to reach class C status since mid-May. The geomagnetic field experienced periods of storm level conditions at the first of the month, and the > 2 MeV electron fluence again climbed into the high range (E + 09); both due to the return of the coronal hole which has been geoeffective each month since January.

A fairly large (18-degree) filament disappeared from the central disk area on the 12th, accompanied by a long-duration class B flare. The geomagnetic field was at storm levels during the first few days of the second week due to coronal hole effects, then subsided to a quiet or unsettled level. The > 2 MeV electron fluence declined to moderate (E + 08) on the 10th, and remained there for several days.

Activity continued to be very low during the third week. The geomagnetic field experienced a minor disturbance around midday on the 19th, but otherwise was quiet to active. The > 2 MeV electron fluence dropped to near normal (E + 07), then rose to moderate at the end of the period.

The remainder of June was quiet until late on the 30th when NOAA/USAF Region 7742 (S08, L230, DAO) produced the first class M flare (M2.5/1B) to be recorded since February. Region 7742 also spawned two class C flares earlier on the 30th. Otherwise, a C2 flare occurred on the 24th, and an eruptive prominence was spotted on the NE limb on the 29th. Some fluctuations of the > 2 MeV fluence and a few instances of storm conditions occurred as a result of the return of the recurrent coronal hole which has plagued the geomagnetic field for six months, but the hole has apparently closed somewhat and was far less effective this rotation. Sunspot activity was low, and centered mainly in the Sun's Southern Hemisphere. The smoothed-mean American Relative Sunspot Number for December 1993 fell to 39.5.

The mean estimated American Relative Sunspot Number for 1-13 July is 43. July began with solar activity in the low and very low range. The level temporarily increased to moderate on the 7th after NOAA/USAF Region 7746 (N11, L155, CAI) spawned the month's first - and so far only - class M flare (M1.3\1N). Other events of interest during the period included a filament which disappeared on the 1st, and two which lifted-off on the 2nd/3rd. Minor to major geomagnetic storm conditions linked to a coronal hole occurred during the first three days, then declined to quiet or unsettled. The > 2 MeV electron fluence was mostly moderate (E + 08) at the beginning of July, dropping to normal (E + 07) thereafter.

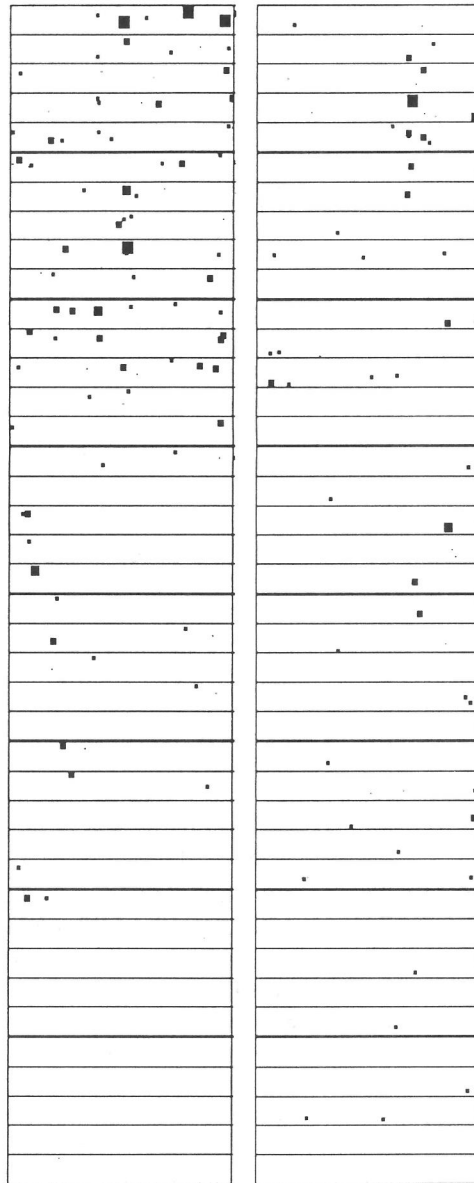
[A portion of the above information was obtained from SELDADS]

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Note: Network contributors are urged to submit their reports via these media whenever possible.

## Determining Solar Active Longitudes



The diagrams shown above are called 'stack-plots' of solar active regions. They are useful when determining active longitudes which rotate at close to the Carrington rate, or at distinctive non-Carrington rates.

Each small panel consists of a slice of the Sun, either from -40 to 0 degrees for the southern plots (left), or from 0 to +40 degrees for the northern plots. The location (in Carrington longitude) of the flare-productive regions is coded as black squares with the size of the square indicative of the total X-ray flare production (class M and X) of the region. Subsequent Carrington rotations are stacked below each other to see the changes from rotation to rotation.

The two plots shown above - CR1840 through CR1877 - demonstrate the rapid decay of activity in the Southern Hemisphere as compared with the North. It will be seen that a large number of regions appear at the top of the southern plot and very few at the bottom. The Northern Hemisphere shows a good rate of fall-off, but is far less steep, with some activity persisting at least until CR1877. (Dr. Richard Thompson of the *IPS Radio and Space Services* in New South Wales, Australia, generously provided the plots and remarks.)

### Sudden Ionospheric Disturbances (SES) Recorded During May 1994

Records were received from A9,40,50,59,61,62,63,65,66,67,68,69,70,71,72,73,74,75,76,77,78,80,81,82,83,84

| Day | Max  | Imp | Def | Day | Max  | Imp | Def | Day | Max  | Imp | Def | Day | Max  | Imp | Def |
|-----|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|
| 1   | 1720 | 1-  | 4   | 12  | 0554 | 1-  | 5   | 14  | 0010 | 1-  | 4   | 17  | 0003 | 1-  | 4   |
| 7   | 1258 | 1-  | 4   | 12  | 1232 | 1-  | 4   | 15  | 1728 | 1-  | 4   | 18  | 1343 | 1-  | 4   |
| 7   | 1441 | 1-  | 4   | 12  | 1245 | 1-  | 5   | 16  | 1256 | 1-  | 4   | 18  | 1403 | 1-  | 4   |
| 11  | 1743 | 1-  | 4   | 12  | 1503 | 1   | 5   | 16  | 2208 | 1-  | 5   | 18  | 1836 | 1-  | 5   |
| 12  | 0525 | 1-  | 5   | 13  | 1209 | 1-  | 4   | 16  | 2333 | 1-  | 4   | 22  | 0811 | 1-  | 5   |

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 Frequencies recorded (kHz): 16.8; 18.3; 19.6; 21.4; 23.4; 24.0; 24.8; 28.5; 30.6; 48.5; 51.6; 73.6; 77.15