

# 目 录

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1988, 6-7

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DAILY RELATIVE SUNSPOT NUMBERS AND SUNSPOT AREAS

JUNE 1988

| Relative-Numbers |    |    |    |     |      |       |       |       |        | Sunspot Areas |      |      |      |     |      |      |      |      |      | Photographic |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------------------|----|----|----|-----|------|-------|-------|-------|--------|---------------|------|------|------|-----|------|------|------|------|------|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Day Gro.         |    |    |    |     | N.H. |       |       |       |        | S.H.          |      |      |      |     | Sum  |      |      |      |      | N.H.         |      |      |      |      | S.H. |      |      |      |      | Sum  |      |      |      |      |      |      |      |      |      |      |      |      |      |
| Drawing          |    |    |    |     | S.H. |       |       |       |        | Sum           |      |      |      |     | S.H. |      |      |      |      | Sum          |      |      |      |      | S.H. |      |      |      |      | Sum  |      |      |      |      |      |      |      |      |      |      |      |      |      |
| 1                | 6  | 51 | 31 | 82  | 568  | 224   | 792   | 861   | 258    | 1119          | 1205 | 451  | 754  | 629 | 688  | 1317 | 1880 | 1159 | 721  | 958          | 721  | 1679 | 1317 | 1880 | 1159 | 721  | 958  | 721  | 1679 | 1317 | 1880 | 1159 | 721  | 958  | 721  | 1679 | 1317 |      |      |      |      |      |      |
| 2                | 6  | 59 | 28 | 87  | 623  | 307   | 930   | 754   | 451    | 1205          | 1880 | 1159 | 721  | 958 | 721  | 1679 | 1317 | 1880 | 1159 | 721          | 958  | 721  | 1679 | 1317 | 1880 | 1159 | 721  | 958  | 721  | 1679 | 1317 | 1880 | 1159 | 721  | 958  | 721  | 1679 | 1317 |      |      |      |      |      |
| 3                | 6  | 62 | 26 | 88  | 654  | 497   | 1151  | 754   | 451    | 1205          | 1880 | 1159 | 721  | 958 | 721  | 1679 | 1317 | 1880 | 1159 | 721          | 958  | 721  | 1679 | 1317 | 1880 | 1159 | 721  | 958  | 721  | 1679 | 1317 | 1880 | 1159 | 721  | 958  | 721  | 1679 | 1317 |      |      |      |      |      |
| 4                | 7  | 79 | 29 | 108 | 524  | 315   | 839   | 958   | 721    | 1679          | 1317 | 1880 | 1159 | 721 | 958  | 721  | 1679 | 1317 | 1880 | 1159         | 721  | 958  | 721  | 1679 | 1317 | 1880 | 1159 | 721  | 958  | 721  | 1679 | 1317 | 1880 | 1159 | 721  | 958  | 721  | 1679 | 1317 |      |      |      |      |
| 5                | 6  | 64 | 29 | 93  | 457  | 234   | 691   | 629   | 688    | 1317          | 1880 | 1159 | 721  | 958 | 721  | 1679 | 1317 | 1880 | 1159 | 721          | 958  | 721  | 1679 | 1317 | 1880 | 1159 | 721  | 958  | 721  | 1679 | 1317 | 1880 | 1159 | 721  | 958  | 721  | 1679 | 1317 |      |      |      |      |      |
| 6                | 8  | 77 | 53 | 130 | 428  | 615   | 1043  | 671   | 1212   | 1883          | 2290 | 1437 | 853  | 920 | 1000 | 484  | 1484 | 2290 | 1437 | 853          | 920  | 1000 | 484  | 1484 | 2290 | 1437 | 853  | 920  | 1000 | 484  | 1484 | 2290 | 1437 | 853  | 920  | 1000 | 484  | 1484 |      |      |      |      |      |
| 7                | 9  | 69 | 73 | 142 | 473  | 942   | 1415  | 853   | 1437   | 2290          | 1484 | 1628 | 1628 | 920 | 1000 | 484  | 1484 | 2290 | 1437 | 853          | 920  | 1000 | 484  | 1484 | 2290 | 1437 | 853  | 920  | 1000 | 484  | 1484 | 2290 | 1437 | 853  | 920  | 1000 | 484  | 1484 |      |      |      |      |      |
| 8                | 9  | 71 | 72 | 143 | 566  | 1019  | 1585  | 853   | 1437   | 2290          | 1484 | 1628 | 1628 | 920 | 1000 | 484  | 1484 | 2290 | 1437 | 853          | 920  | 1000 | 484  | 1484 | 2290 | 1437 | 853  | 920  | 1000 | 484  | 1484 | 2290 | 1437 | 853  | 920  | 1000 | 484  | 1484 |      |      |      |      |      |
| 9                | 9  | 83 | 87 | 170 | 711  | 729   | 1440  | 853   | 1437   | 2290          | 1484 | 1628 | 1628 | 920 | 1000 | 484  | 1484 | 2290 | 1437 | 853          | 920  | 1000 | 484  | 1484 | 2290 | 1437 | 853  | 920  | 1000 | 484  | 1484 | 2290 | 1437 | 853  | 920  | 1000 | 484  | 1484 |      |      |      |      |      |
| 10               | 9  | 70 | 81 | 151 | 766  | 677   | 1443  | 1000  | 484    | 1484          | 2290 | 1484 | 1628 | 920 | 1000 | 484  | 1484 | 2290 | 1437 | 853          | 920  | 1000 | 484  | 1484 | 2290 | 1437 | 853  | 920  | 1000 | 484  | 1484 | 2290 | 1437 | 853  | 920  | 1000 | 484  | 1484 |      |      |      |      |      |
| 11               | 8  | 51 | 65 | 116 | 574  | 177   | 751   | 882   | 84     | 966           | 577  | 382  | 966  | 882 | 84   | 966  | 577  | 382  | 966  | 882          | 84   | 966  | 577  | 382  | 966  | 882  | 84   | 966  | 577  | 382  | 966  | 882  | 84   | 966  | 577  | 382  | 966  | 882  | 84   | 966  |      |      |      |
| 12               | 7  | 48 | 54 | 102 | 325  | 123   | 448   | 399   | 178    | 577           | 966  | 577  | 382  | 399 | 178  | 577  | 966  | 577  | 382  | 399          | 178  | 577  | 966  | 577  | 382  | 399  | 178  | 577  | 966  | 577  | 382  | 399  | 178  | 577  | 966  | 577  | 382  | 399  | 178  | 577  | 966  |      |      |
| 13               | 4  | 22 | 32 | 54  | 231  | 84    | 315   | 118   | 264    | 382           | 966  | 577  | 382  | 118 | 264  | 382  | 966  | 577  | 382  | 118          | 264  | 382  | 966  | 577  | 382  | 118  | 264  | 382  | 966  | 577  | 382  | 966  | 577  | 382  | 966  | 577  | 382  | 966  | 577  | 382  | 966  |      |      |
| 14               | 3  | 22 | 11 | 33  | 233  | 38    | 271   | 118   | 264    | 382           | 966  | 577  | 382  | 118 | 264  | 382  | 966  | 577  | 382  | 118          | 264  | 382  | 966  | 577  | 382  | 118  | 264  | 382  | 966  | 577  | 382  | 966  | 577  | 382  | 966  | 577  | 382  | 966  | 577  | 382  | 966  |      |      |
| 15               | 5  | 26 | 25 | 51  | 303  | 452   | 755   | 118   | 264    | 382           | 966  | 577  | 382  | 118 | 264  | 382  | 966  | 577  | 382  | 118          | 264  | 382  | 966  | 577  | 382  | 118  | 264  | 382  | 966  | 577  | 382  | 966  | 577  | 382  | 966  | 577  | 382  | 966  | 577  | 382  | 966  |      |      |
| 16               | 7  | 42 | 41 | 83  | 315  | 486   | 801   | 561   | 539    | 1100          | 867  | 946  | 869  | 561 | 539  | 1100 | 867  | 946  | 869  | 561          | 539  | 1100 | 867  | 946  | 869  | 561  | 539  | 1100 | 867  | 946  | 869  | 561  | 539  | 1100 | 867  | 946  | 869  | 561  | 539  | 1100 | 867  | 946  | 869  |
| 17               | 8  | 60 | 37 | 97  | 238  | 473   | 801   | 561   | 539    | 1100          | 867  | 946  | 869  | 561 | 539  | 1100 | 867  | 946  | 869  | 561          | 539  | 1100 | 867  | 946  | 869  | 561  | 539  | 1100 | 867  | 946  | 869  | 561  | 539  | 1100 | 867  | 946  | 869  | 561  | 539  | 1100 | 867  | 946  | 869  |
| 18               | 5  | 51 | 16 | 67  | 272  | 382   | 711   | 304   | 642    | 946           | 869  | 946  | 869  | 304 | 642  | 946  | 869  | 946  | 869  | 304          | 642  | 946  | 869  | 946  | 869  | 946  | 869  | 304  | 642  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  |      |
| 19               | 5  | 28 | 49 | 77  | 169  | 483   | 652   | 193   | 676    | 869           | 946  | 869  | 946  | 193 | 676  | 869  | 946  | 869  | 946  | 193          | 676  | 869  | 946  | 869  | 946  | 193  | 676  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  |
| 20               | 6  | 28 | 49 | 77  | 169  | 483   | 652   | 193   | 676    | 869           | 946  | 869  | 946  | 193 | 676  | 869  | 946  | 869  | 946  | 193          | 676  | 869  | 946  | 869  | 946  | 193  | 676  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  |
| 21               | 6  | 23 | 54 | 77  | 154  | 526   | 680   | 193   | 676    | 869           | 946  | 869  | 946  | 193 | 676  | 869  | 946  | 869  | 946  | 193          | 676  | 869  | 946  | 869  | 946  | 193  | 676  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  |
| 22               | 6  | 25 | 75 | 100 | 299  | 540   | 839   | 193   | 676    | 869           | 946  | 869  | 946  | 193 | 676  | 869  | 946  | 869  | 946  | 193          | 676  | 869  | 946  | 869  | 946  | 193  | 676  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  |
| 23               | 8  | 26 | 76 | 102 | 277  | 851   | 1128  | 193   | 676    | 869           | 946  | 869  | 946  | 193 | 676  | 869  | 946  | 869  | 946  | 193          | 676  | 869  | 946  | 869  | 946  | 193  | 676  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  |
| 24               | 7  | 18 | 66 | 84  | 240  | 1247  | 1487  | 193   | 676    | 869           | 946  | 869  | 946  | 193 | 676  | 869  | 946  | 869  | 946  | 193          | 676  | 869  | 946  | 869  | 946  | 193  | 676  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  | 869  | 946  |
| 25               | 10 | 31 | 77 | 108 | 214  | 1458  | 1672  | 287   | 1494   | 1781          | 1781 | 1781 | 1781 | 287 | 1494 | 1781 | 1781 | 1781 | 1781 | 287          | 1494 | 1781 | 1781 | 1781 | 1781 | 287  | 1494 | 1781 | 1781 | 1781 | 1781 | 1781 | 1781 | 1781 | 1781 | 1781 | 1781 | 1781 | 1781 | 1781 | 1781 | 1781 | 1781 |
| 26               | 10 | 40 | 59 | 99  | 328  | 2707  | 3035  | 161   | 2848   | 3009          | 3009 | 3009 | 3009 | 161 | 2848 | 3009 | 3009 | 3009 | 3009 | 161          | 2848 | 3009 | 3009 | 3009 | 3009 | 161  | 2848 | 3009 | 3009 | 3009 | 3009 | 3009 | 3009 | 3009 | 3009 | 3009 | 3009 | 3009 | 3009 | 3009 | 3009 | 3009 | 3009 |
| 27               | 7  | 35 | 51 | 86  | 336  | 2307  | 2643  | 431   | 2329   | 2760          | 2760 | 2760 | 2760 | 431 | 2329 | 2760 | 2760 | 2760 | 2760 | 431          | 2329 | 2760 | 2760 | 2760 | 2760 | 431  | 2329 | 2760 | 2760 | 2760 | 2760 | 2760 | 2760 | 2760 | 2760 | 2760 | 2760 | 2760 | 2760 | 2760 | 2760 | 2760 |      |
| 28               | 9  | 49 | 67 | 116 | 412  | 2526  | 2938  | 526   | 1216   | 1742          | 1742 | 1742 | 1742 | 526 | 1216 | 1742 | 1742 | 1742 | 1742 | 526          | 1216 | 1742 | 1742 | 1742 | 1742 | 526  | 1216 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 |      |
| 29               | 6  | 52 | 81 | 133 | 426  | 2726  | 3152  | 526   | 1216   | 1742          | 1742 | 1742 | 1742 | 526 | 1216 | 1742 | 1742 | 1742 | 1742 | 526          | 1216 | 1742 | 1742 | 1742 | 1742 | 526  | 1216 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 |      |
| 30               | 6  | 46 | 93 | 139 | 440  | 2401  | 2841  | 526   | 1216   | 1742          | 1742 | 1742 | 1742 | 526 | 1216 | 1742 | 1742 | 1742 | 1742 | 526          | 1216 | 1742 | 1742 | 1742 | 1742 | 526  | 1216 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 | 1742 |      |
| Mean             |    |    |    |     | 53.0 | 100.6 | 398.5 | 880.9 | 1279.4 |               |      |      |      |     |      |      |      |      |      |              |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |

DAILY RELATIVE SUNSPOT NUMBERS AND SUNSPOT AREAS

JULY 1988

| Sunspot Areas    |   |    |     |     |               |      |      |      |      |      |      |    |   |    |      |      |       |       |        |        |      |      |
|------------------|---|----|-----|-----|---------------|------|------|------|------|------|------|----|---|----|------|------|-------|-------|--------|--------|------|------|
| Drawing          |   |    |     |     | Photographic  |      |      |      |      | Sum  |      |    |   |    |      |      |       |       |        |        |      |      |
| N.H.             |   |    |     |     | S.H.          |      |      |      |      | N.H. |      |    |   |    | S.H. |      |       |       |        |        |      |      |
| Relative-Numbers |   |    |     |     | Sunspot Areas |      |      |      |      | Sum  |      |    |   |    | Sum  |      |       |       |        |        |      |      |
| Day Gro.         |   |    |     |     | N.H.          |      |      |      |      | S.H. |      |    |   |    | Sum  |      |       |       |        |        |      |      |
| 1                | 6 | 67 | 74  | 141 | 563           | 2456 | 3019 | 3093 | 327  | 3409 | 3736 | 2  | 4 | 61 | 82   | 143  | 615   | 2478  | 3093   | 327    | 3409 | 3736 |
| 2                | 4 | 61 | 82  | 143 | 615           | 2478 | 3093 | 2958 | 946  | 2343 | 3289 | 3  | 4 | 60 | 76   | 136  | 636   | 2322  | 2958   | 946    | 2343 | 3289 |
| 4                | 4 | 86 | 88  | 174 | 901           | 2421 | 3322 |      |      |      | 3045 | 4  | 4 | 86 | 88   | 174  | 901   | 2421  | 3322   |        |      | 3045 |
| 5                | 5 | 48 | 65  | 113 | 753           | 1959 | 2712 |      |      |      |      | 5  | 5 | 48 | 65   | 113  | 753   | 1959  | 2712   |        |      |      |
| 6                | 5 | 42 | 43  | 85  | 685           | 1798 | 2483 | 892  | 1640 | 2532 |      | 6  | 5 | 42 | 43   | 85   | 685   | 1798  | 2483   | 892    | 1640 | 2532 |
| 7                | 7 | 46 | 38  | 84  | 956           | 1376 | 2332 | 819  | 0    | 819  |      | 7  | 7 | 46 | 38   | 84   | 956   | 1376  | 2332   | 819    | 0    | 819  |
| 8                | 8 | 66 | 22  | 88  | 791           | 910  | 1701 | 888  | 0    | 888  |      | 8  | 8 | 66 | 22   | 88   | 791   | 910   | 1701   | 888    | 0    | 888  |
| 9                | 7 | 76 | 7   | 83  | 746           | 3    | 749  | 862  | 0    | 862  |      | 9  | 7 | 76 | 7    | 83   | 746   | 3     | 749    | 862    | 0    | 862  |
| 10               | 6 | 69 | 14  | 83  | 720           | 4    | 724  |      |      |      |      | 10 | 6 | 69 | 14   | 83   | 720   | 4     | 724    |        |      |      |
| 11               | 7 | 78 | 16  | 94  | 492           | 88   | 580  | 933  | 139  | 1072 |      | 11 | 7 | 78 | 16   | 94   | 492   | 88    | 580    | 933    | 139  | 1072 |
| 12               | 8 | 82 | 26  | 108 | 576           | 537  | 1113 | 853  | 978  | 1831 |      | 12 | 8 | 82 | 26   | 108  | 576   | 537   | 1113   | 853    | 978  | 1831 |
| 13               | 8 | 84 | 36  | 120 | 514           | 912  | 1426 | 933  | 1347 | 2280 |      | 13 | 8 | 84 | 36   | 120  | 514   | 912   | 1426   | 933    | 1347 | 2280 |
| 14               | 7 | 78 | 35  | 113 | 343           | 1128 | 1471 | 646  | 1632 | 2278 |      | 14 | 7 | 78 | 35   | 113  | 343   | 1128  | 1471   | 646    | 1632 | 2278 |
| 15               | 5 | 58 | 51  | 109 | 178           | 1266 | 1444 |      |      |      |      | 15 | 5 | 58 | 51   | 109  | 178   | 1266  | 1444   |        |      |      |
| 16               | 6 | 48 | 72  | 120 | 99            | 1250 | 1349 | 214  | 1778 | 1992 |      | 16 | 6 | 48 | 72   | 120  | 99    | 1250  | 1349   | 214    | 1778 | 1992 |
| 17               | 7 | 38 | 89  | 127 | 43            | 1194 | 1237 |      |      |      |      | 17 | 7 | 38 | 89   | 127  | 43    | 1194  | 1237   |        |      |      |
| 18               | 9 | 19 | 124 | 143 | 17            | 1199 | 1216 | 83   | 1486 | 1569 |      | 18 | 9 | 19 | 124  | 143  | 17    | 1199  | 1216   | 83     | 1486 | 1569 |
| 19               | 9 | 15 | 129 | 144 | 14            | 1008 | 1022 |      |      |      |      | 19 | 9 | 15 | 129  | 144  | 14    | 1008  | 1022   |        |      |      |
| 20               | 7 | 0  | 91  | 91  | 0             | 945  | 945  |      |      |      |      | 20 | 7 | 0  | 91   | 91   | 0     | 945   | 945    |        |      |      |
| 21               | 9 | 21 | 89  | 110 | 12            | 899  | 911  | 68   | 1017 | 1085 |      | 21 | 9 | 21 | 89   | 110  | 12    | 899   | 911    | 68     | 1017 | 1085 |
| 22               | 8 | 24 | 66  | 90  | 55            | 797  | 852  | 56   | 1210 |      |      | 22 | 8 | 24 | 66   | 90   | 55    | 797   | 852    | 56     | 1210 |      |
| 23               | 7 | 27 | 68  | 95  | 334           | 620  | 954  |      |      |      |      | 23 | 7 | 27 | 68   | 95   | 334   | 620   | 954    |        |      |      |
| 24               | 7 | 43 | 54  | 97  | 188           | 373  | 561  |      |      |      |      | 24 | 7 | 43 | 54   | 97   | 188   | 373   | 561    |        |      |      |
| 25               | 7 | 41 | 26  | 67  | 254           | 150  | 404  |      |      |      |      | 25 | 7 | 41 | 26   | 67   | 254   | 150   | 404    |        |      |      |
| 26               | 7 | 37 | 37  | 74  | 270           | 307  | 577  | 227  | 270  | 497  |      | 26 | 7 | 37 | 37   | 74   | 270   | 307   | 577    | 227    | 270  | 497  |
| 27               | 7 | 31 | 55  | 86  | 967           | 664  | 1631 | 728  | 678  | 1406 |      | 27 | 7 | 31 | 55   | 86   | 967   | 664   | 1631   | 728    | 678  | 1406 |
| 28               | 7 | 64 | 37  | 101 | 1349          | 567  | 1916 | 1437 | 566  | 2003 |      | 28 | 7 | 64 | 37   | 101  | 1349  | 567   | 1916   | 1437   | 566  | 2003 |
| 29               |   |    |     |     |               |      |      |      |      |      |      | 29 |   |    |      |      |       |       |        |        |      |      |
| 30               | 5 | 82 | 42  | 124 | 1177          | 431  | 1608 | 1252 | 447  | 1699 |      | 30 | 5 | 82 | 42   | 124  | 1177  | 431   | 1608   | 1252   | 447  | 1699 |
| 31               | 6 | 89 | 33  | 122 | 1653          | 493  | 2146 | 994  | 510  | 1504 |      | 31 | 6 | 89 | 33   | 122  | 1653  | 493   | 2146   | 994    | 510  | 1504 |
| Mean             |   |    |     |     |               |      |      |      |      |      |      |    |   |    | 52.7 | 56.2 | 108.8 | 530.0 | 1018.5 | 1548.5 |      |      |

DAILY SUNSPOT OBSERVATIONS

JUNE 1988

CMP  
Day Group Mo-Day Lat L CMD Type T/R Sd Corre. Area Whole Max See Remarks

|      |     |        |     |     |     |     |      |     |     |     |   |
|------|-----|--------|-----|-----|-----|-----|------|-----|-----|-----|---|
| 1.06 | 132 | 5-28.0 | -24 | 107 | 47W | FAI | 0.76 | 219 | 168 | 110 | 3 |
|      | 138 | 6-4.7  | 19  | 4   | 50E | EAI | 0.79 | 261 | 214 | 72  | 3 |
|      | 139 | 6-5.0  | 26  | 1   | 51E | HXX | 0.83 | 349 | 311 | 311 | 3 |
|      | 140 | 5-30.6 | 38  | 72  | 19W | AXX | 0.68 | 34  | 3   | 3   | 3 |
|      | 141 | 6-6.2  | 26  | 345 | 63E | HRX | 0.91 | 34  | 40  | 40  | 3 |
|      | 142 | 6-7.2  | -21 | 331 | 80E | HRX | 0.99 | 17  | 56  | 42  | 3 |
| 2.05 | 132 |        |     |     | 58W | FAI | 0.87 | 177 | 181 | 151 | 4 |
|      | 138 |        |     |     | 37E | EAI | 0.64 | 395 | 258 | 115 | 4 |
|      | 139 |        |     |     | 38E | HXX | 0.71 | 442 | 315 | 312 | 4 |
|      | 140 |        |     |     | 32W | AXX | 0.74 | 4   | 3   | 3   | 4 |
|      | 141 |        |     |     | 50E | HAX | 0.82 | 55  | 47  | 47  | 4 |
|      | 142 |        |     |     | 71E | DRO | 0.94 | 84  | 126 | 63  | 4 |
| 3.04 | 132 |        |     |     | 71W | DAI | 0.94 | 236 | 352 | 296 | 4 |
|      | 138 |        |     |     | 24E | EAI | 0.49 | 492 | 283 | 114 | 4 |
|      | 139 |        |     |     | 26E | HXX | 0.59 | 538 | 332 | 322 | 4 |
|      | 140 |        |     |     | 45W | AXX | 0.83 | 4   | 4   | 4   | 4 |
|      | 141 |        |     |     | 37E | HAX | 0.70 | 50  | 35  | 32  | 4 |
|      | 142 |        |     |     | 58E | DAO | 0.86 | 147 | 145 | 75  | 4 |
| 4.07 | 132 |        |     |     | 84W | HAX | 0.99 | 34  | 111 | 83  | 4 |
|      | 138 |        |     |     | 10E | EAI | 0.37 | 320 | 172 | 90  | 4 |
|      | 139 |        |     |     | 12E | HXX | 0.47 | 576 | 327 | 317 | 4 |
|      | 140 |        |     |     | 55W | AXX | 0.90 | 4   | 5   | 5   | 4 |
|      | 141 |        |     |     | 24E | BXI | 0.56 | 13  | 8   | 5   | 4 |
|      | 142 |        |     |     | 43E | DAI | 0.72 | 282 | 204 | 159 | 4 |
|      | 143 | 6-1.9  | 13  | 41  | 29W | BXO | 0.52 | 21  | 12  | 5   | 4 |
| 5.08 | 138 |        |     |     | 5W  | EAI | 0.33 | 210 | 112 | 65  | 3 |
|      | 139 |        |     |     | 1W  | HXX | 0.44 | 576 | 320 | 313 | 3 |
|      | 141 |        |     |     | 11E | BXI | 0.57 | 17  | 10  | 5   | 3 |
|      | 142 |        |     |     | 29E | CAI | 0.56 | 240 | 145 | 127 | 3 |
|      | 143 |        |     |     | 43W | BXI | 0.69 | 21  | 15  | 6   | 3 |
|      | 144 | 6-11.1 | -17 | 280 | 78E | CSO | 0.98 | 38  | 89  | 69  | 3 |
| 6.05 | 138 |        |     |     | 18W | CAI | 0.43 | 189 | 105 | 63  | 4 |
|      | 139 |        |     |     | 13W | HXX | 0.48 | 488 | 279 | 276 | 4 |
|      | 141 |        |     |     | 2E  | BXI | 0.44 | 42  | 23  | 5   | 4 |
|      | 142 |        |     |     | 16E | CAI | 0.43 | 294 | 163 | 144 | 4 |
|      | 143 |        |     |     | 57W | CRO | 0.84 | 17  | 15  | 12  | 4 |
|      | 144 |        |     |     | 70E | ESC | 0.94 | 290 | 434 | 195 | 4 |
|      | 145 | 6-4.3  | -25 | 10  | 24W | BXI | 0.55 | 29  | 18  | 3   | 4 |
|      | 146 | 6-8.0  | 31  | 321 | 27E | BXO | 0.66 | 8   | 6   | 3   | 4 |
| 7.15 | 138 |        |     |     | 31W | CAI | 0.60 | 130 | 81  | 50  | 3 |
|      | 139 |        |     |     | 27W | HXX | 0.60 | 526 | 328 | 325 | 3 |
|      | 141 |        |     |     | 12W | CRI | 0.48 | 84  | 48  | 22  | 3 |
|      | 142 |        |     |     | 1E  | CAI | 0.36 | 353 | 189 | 167 | 3 |
|      | 143 |        |     |     | 72W | AXX | 0.95 | 8   | 14  | 7   | 3 |
|      | 144 |        |     |     | 56E | EAC | 0.85 | 673 | 640 | 240 | 3 |
|      | 145 |        |     |     | 40W | CSI | 0.71 | 156 | 111 | 72  | 3 |

## DAILY SUNSPOT OBSERVATIONS

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| Day   | Group | CMP<br>Mo-Day | Lat | L   | CMD | Type | r/R  | Sd  | Corre.<br>Whole | Area<br>Max | See | Remarks |
|-------|-------|---------------|-----|-----|-----|------|------|-----|-----------------|-------------|-----|---------|
| 146   |       |               |     |     | 11E | AXX  | 0.54 | 4   | 2               | 2           | 3   |         |
| 147   |       | 6- 8.7        | -16 | 312 | 20E | AXX  | 0.41 | 4   | 2               | 2           | 3   |         |
| 8.01  | 138   |               |     |     | 41W | CSO  | 0.70 | 101 | 71              | 41          | 4   |         |
|       | 139   |               |     |     | 38W | HHX  | 0.70 | 450 | 316             | 316         | 4   |         |
|       | 141   |               |     |     | 22W | BXI  | 0.55 | 55  | 33              | 5           | 4   |         |
|       | 142   |               |     |     | 11W | CAI  | 0.39 | 336 | 183             | 167         | 4   |         |
|       | 143   |               |     |     | 83W | AXX  | 0.99 | 8   | 28              | 14          | 4   |         |
|       | 144   |               |     |     | 44E | EAC  | 0.72 | 757 | 549             | 186         | 4   |         |
|       | 145   |               |     |     | 50W | DAI  | 0.80 | 336 | 283             | 127         | 4   |         |
|       | 147   |               |     |     | 9E  | AXX  | 0.32 | 8   | 4               | 2           | 4   |         |
|       | 148   | 6-13.8        | 14  | 243 | 80E | HSX  | 0.98 | 50  | 118             | 118         | 4   |         |
| 9.08  | 138   |               |     |     | 51W | DAI  | 0.79 | 160 | 131             | 69          | 3   |         |
|       | 139   |               |     |     | 52W | HHX  | 0.83 | 370 | 330             | 326         | 3   |         |
|       | 141   |               |     |     | 33W | DRI  | 0.67 | 147 | 99              | 54          | 3   |         |
|       | 142   |               |     |     | 24W | CAI  | 0.53 | 294 | 173             | 164         | 3   |         |
|       | 144   |               |     |     | 30E | EAC  | 0.54 | 547 | 325             | 110         | 3   |         |
|       | 145   |               |     |     | 64W | ESI  | 0.91 | 193 | 231             | 90          | 3   |         |
|       | 146   |               |     |     | 12W | BXO  | 0.54 | 8   | 5               | 2           | 3   |         |
|       | 148   |               |     |     | 65E | CSO  | 0.91 | 118 | 141             | 131         | 3   |         |
|       | 149   | 6-11.0        | 24  | 281 | 27E | BXO  | 0.62 | 8   | 5               | 3           | 3   |         |
| 10.03 | 138   |               |     |     | 62W | CAI  | 0.89 | 126 | 136             | 104         | 3   |         |
|       | 139   |               |     |     | 65W | HHX  | 0.92 | 261 | 332             | 332         | 3   |         |
|       | 141   |               |     |     | 45W | DSI  | 0.78 | 139 | 111             | 88          | 3   |         |
|       | 142   |               |     |     | 37W | CAO  | 0.67 | 181 | 121             | 116         | 3   |         |
|       | 144   |               |     |     | 15E | EAC  | 0.37 | 446 | 240             | 118         | 3   |         |
|       | 145   |               |     |     | 76W | ESO  | 0.98 | 135 | 316             | 168         | 3   |         |
|       | 146   |               |     |     | 25W | AXX  | 0.61 | 8   | 5               | 3           | 3   |         |
|       | 148   |               |     |     | 52E | CSI  | 0.80 | 210 | 177             | 149         | 3   |         |
|       | 149   |               |     |     | 15E | BXO  | 0.53 | 8   | 5               | 2           | 3   |         |
| 11.01 | 138   |               |     |     | 72W | CAO  | 0.95 | 55  | 91              | 77          | 3   |         |
|       | 139   |               |     |     | 78W | HHX  | 0.98 | 97  | 227             | 227         | 3   |         |
|       | 141   |               |     |     | 57W | CSO  | 0.87 | 97  | 99              | 95          | 3   |         |
|       | 142   |               |     |     | 48W | CRO  | 0.78 | 29  | 24              | 10          | 3   |         |
|       | 144   |               |     |     | 1E  | EAI  | 0.30 | 265 | 139             | 82          | 3   |         |
|       | 145   |               |     |     | 85W | AXX  | 0.99 | 4   | 14              | 14          | 3   |         |
|       | 146   |               |     |     | 36W | BXO  | 0.71 | 8   | 6               | 3           | 3   |         |
|       | 148   |               |     |     | 39E | CSO  | 0.64 | 231 | 151             | 132         | 3   |         |
| 12.01 | 138   |               |     |     | 86W | AXX  | 0.99 | 4   | 14              | 14          | 3   |         |
|       | 141   |               |     |     | 69W | CSO  | 0.94 | 67  | 101             | 94          | 3   |         |
|       | 142   |               |     |     | 63W | AXX  | 0.91 | 8   | 10              | 5           | 3   |         |
|       | 144   |               |     |     | 12W | EAI  | 0.37 | 210 | 113             | 59          | 3   |         |
|       | 146   |               |     |     | 46W | AXX  | 0.80 | 8   | 7               | 4           | 3   |         |
|       | 148   |               |     |     | 25E | DSI  | 0.47 | 349 | 198             | 160         | 3   |         |
|       | 149   |               |     |     | 14W | BXO  | 0.44 | 8   | 5               | 2           | 3   |         |
| 13.10 | 141   |               |     |     | 84W | AXX  | 0.99 | 8   | 28              | 28          | 2   |         |
|       | 142   |               |     |     | 70W | AXX  | 0.95 | 4   | 7               | 7           | 2   |         |
|       | 144   |               |     |     | 27W | CSI  | 0.53 | 130 | 77              | 52          | 2   |         |

## DAILY SUNSPOT OBSERVATIONS

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| Day   | Group | CMP<br>Mo-Day | Lat | L   | CMD | Type | r/R  | Sd  | Corre.<br>Whole | Area<br>Max | See | Remarks |
|-------|-------|---------------|-----|-----|-----|------|------|-----|-----------------|-------------|-----|---------|
|       | 148   |               |     |     | 10E | DSI  | 0.28 | 391 | 203             | 133         | 2   |         |
| 14.03 | 144   |               |     |     | 40W | CSO  | 0.69 | 55  | 38              | 32          | 3   |         |
|       | 148   |               |     |     | 3W  | DSI  | 0.22 | 400 | 205             | 136         | 3   |         |
|       | 150   | 6-21.2        | 37  | 147 | 86E | HSX  | 0.99 | 8   | 28              | 28          | 3   |         |
| 15.27 | 144   |               |     |     | 57W | CRO  | 0.86 | 17  | 17              | 12          | 2   |         |
|       | 148   |               |     |     | 18W | DSI  | 0.37 | 294 | 158             | 127         | 2   |         |
|       | 150   |               |     |     | 71E | HSX  | 0.97 | 76  | 145             | 145         | 2   |         |
|       | 151   | 6-19.3        | -22 | 171 | 53E | AXX  | 0.83 | 8   | 7               | 4           | 2   |         |
|       | 152   | 6-20.7        | -15 | 153 | 72E | DSI  | 0.95 | 257 | 428             | 302         | 2   |         |
| 16.10 | 144   |               |     |     | 66W | BXO  | 0.92 | 13  | 16              | 11          | 3   |         |
|       | 148   |               |     |     | 29W | DAI  | 0.52 | 261 | 152             | 108         | 3   |         |
|       | 150   |               |     |     | 62E | HSX  | 0.92 | 122 | 155             | 155         | 3   |         |
|       | 151   |               |     |     | 43E | AXX  | 0.74 | 4   | 3               | 3           | 3   |         |
|       | 152   |               |     |     | 60E | DHI  | 0.87 | 450 | 462             | 337         | 3   |         |
|       | 153   | 6-18.1        | -29 | 187 | 27E | AXX  | 0.64 | 8   | 5               | 3           | 3   |         |
|       | 154   | 6-20.0        | 34  | 162 | 51E | BXO  | 0.84 | 8   | 8               | 4           | 3   |         |
| 17.06 | 148   |               |     |     | 41W | CRI  | 0.67 | 126 | 85              | 37          | 3   |         |
|       | 150   |               |     |     | 50E | HSX  | 0.84 | 147 | 135             | 135         | 3   |         |
|       | 152   |               |     |     | 47E | DHI  | 0.75 | 589 | 443             | 383         | 3   |         |
|       | 153   |               |     |     | 14E | AXX  | 0.55 | 8   | 5               | 3           | 3   |         |
|       | 154   |               |     |     | 38E | BXI  | 0.74 | 21  | 16              | 3           | 3   |         |
|       | 155   | 6-11.4        | -33 | 276 | 75W | AXX  | 0.98 | 8   | 20              | 10          | 3   |         |
|       | 156   | 6-17.6        | 25  | 194 | 7E  | AXX  | 0.40 | 4   | 2               | 2           | 3   |         |
|       | 157   | 6-21.8        | -23 | 139 | 62E | AXX  | 0.90 | 4   | 5               | 5           | 3   |         |
| 18.03 | 148   |               |     |     | 53W | CRI  | 0.80 | 93  | 78              | 25          | 3   |         |
|       | 150   |               |     |     | 38E | HSX  | 0.76 | 236 | 181             | 181         | 3   |         |
|       | 152   |               |     |     | 34E | DHI  | 0.61 | 606 | 382             | 345         | 3   |         |
|       | 154   |               |     |     | 25E | BXO  | 0.63 | 17  | 11              | 5           | 3   |         |
|       | 156   |               |     |     | 6W  | AXX  | 0.41 | 4   | 2               | 2           | 3   |         |
| 19.00 |       | Not Available |     |     |     |      |      |     |                 |             |     |         |
| 20.14 | 148   |               |     |     | 84W | AXX  | 0.99 | 8   | 28              | 14          | 3   |         |
|       | 150   |               |     |     | 12E | HAX  | 0.60 | 214 | 134             | 131         | 3   |         |
|       | 152   |               |     |     | 7E  | DHI  | 0.31 | 812 | 427             | 363         | 3   |         |
|       | 154   |               |     |     | 2W  | BXI  | 0.54 | 13  | 7               | 2           | 3   |         |
|       | 158   | 6-23.9        | -25 | 111 | 40E | AXX  | 0.72 | 8   | 6               | 3           | 3   |         |
|       | 159   | 6-24.8        | -21 | 99  | 63E | HSX  | 0.91 | 42  | 50              | 50          | 3   |         |
| 21.12 | 150   |               |     |     | 1E  | HSX  | 0.57 | 231 | 141             | 141         | 4   |         |
|       | 152   |               |     |     | 6W  | DHI  | 0.30 | 862 | 452             | 353         | 4   |         |
|       | 154   |               |     |     | 14W | BXI  | 0.56 | 21  | 13              | 3           | 4   |         |
|       | 158   |               |     |     | 27E | BXO  | 0.60 | 17  | 10              | 3           | 4   |         |
|       | 159   |               |     |     | 49E | HSX  | 0.79 | 71  | 59              | 55          | 4   |         |
|       | 160   | 6-25.9        | -23 | 83  | 60E | AXX  | 0.89 | 4   | 5               | 5           | 4   |         |
| 22.01 | 150   |               |     |     | 11W | HSX  | 0.60 | 227 | 142             | 142         | 4   |         |
|       | 152   |               |     |     | 17W | DKI  | 0.40 | 883 | 482             | 326         | 4   |         |

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| CMP | Day Group | Mo-Day | Lat | L   | CMD  | Type | r/R  | Sd   | Corre. Area | Whole | Max | See Remarks |
|-----|-----------|--------|-----|-----|------|------|------|------|-------------|-------|-----|-------------|
| 154 | 23.26     | 150    | 26W | DAI | 0.64 | 240  | 157  | 91   | 4           | 4     | 4   | 4           |
| 158 |           |        | 19E | BXI | 0.53 | 21   | 12   | 2    | 4           | 4     | 4   | 4           |
| 159 |           |        | 37E | HSX | 0.68 | 63   | 43   | 4    | 4           | 4     | 4   | 4           |
| 160 |           |        | 48E | AXX | 0.79 | 4    | 3    | 3    | 4           | 4     | 4   | 4           |
| 150 | 23.26     | 150    | 26W | HSX | 0.68 | 219  | 149  | 149  | 2           | 2     | 2   | 2           |
| 152 |           |        | 33W | EKC | 0.60 | 1283 | 800  | 525  | 2           | 2     | 2   | 2           |
| 154 |           |        | 41W | DAO | 0.77 | 160  | 125  | 82   | 2           | 2     | 2   | 2           |
| 158 |           |        | 4E  | BXO | 0.44 | 8    | 5    | 2    | 2           | 2     | 2   | 2           |
| 159 |           |        | 21E | CSO | 0.51 | 67   | 39   | 37   | 2           | 2     | 2   | 2           |
| 160 |           |        | 32E | BXO | 0.63 | 8    | 5    | 3    | 2           | 2     | 2   | 2           |
| 161 |           |        | 21W | AXX | 0.40 | 4    | 2    | 2    | 2           | 2     | 2   | 2           |
| 162 |           |        | 33E | AXX | 0.60 | 4    | 3    | 3    | 2           | 2     | 2   | 2           |
| 150 | 24.01     | 150    | 36W | HSX | 0.74 | 168  | 124  | 124  | 4           | 4     | 4   | 4           |
| 152 |           |        | 44W | EKC | 0.74 | 1514 | 1118 | 745  | 4           | 4     | 4   | 4           |
| 154 |           |        | 52W | DSO | 0.85 | 122  | 116  | 80   | 4           | 4     | 4   | 4           |
| 158 |           |        | 2W  | AXX | 0.45 | 4    | 2    | 2    | 4           | 4     | 4   | 4           |
| 159 |           |        | 10E | HRX | 0.43 | 38   | 21   | 21   | 4           | 4     | 4   | 4           |
| 160 |           |        | 20E | BXO | 0.54 | 13   | 7    | 7    | 4           | 4     | 4   | 4           |
| 163 |           |        | 79E | HSX | 0.98 | 42   | 99   | 99   | 4           | 4     | 4   | 4           |
| 150 | 25.08     | 150    | 51W | HSX | 0.84 | 101  | 93   | 93   | 4           | 4     | 4   | 4           |
| 152 |           |        | 58W | EKC | 0.86 | 1081 | 1066 | 714  | 4           | 4     | 4   | 4           |
| 154 |           |        | 64W | DRI | 0.92 | 84   | 107  | 54   | 4           | 4     | 4   | 4           |
| 158 |           |        | 24W | BXI | 0.57 | 13   | 8    | 5    | 4           | 4     | 4   | 4           |
| 159 |           |        | 4W  | AXX | 0.38 | 13   | 7    | 2    | 4           | 4     | 4   | 4           |
| 160 |           |        | 8E  | BXI | 0.44 | 13   | 7    | 2    | 4           | 4     | 4   | 4           |
| 163 |           |        | 64E | HSX | 0.91 | 97   | 115  | 115  | 4           | 4     | 4   | 4           |
| 164 |           |        | 22E | AXX | 0.39 | 8    | 5    | 2    | 4           | 4     | 4   | 4           |
| 165 |           |        | 39E | BXI | 0.64 | 21   | 14   | 8    | 4           | 4     | 4   | 4           |
| 166 |           |        | 84E | HMX | 0.99 | 76   | 250  | 250  | 4           | 4     | 4   | 4           |
| 150 | 26.17     | 150    | 62W | HSX | 0.92 | 88   | 112  | 112  | 2           | 2     | 2   | 2           |
| 152 |           |        | 72W | EKC | 0.97 | 408  | 783  | 541  | 2           | 2     | 2   | 2           |
| 154 |           |        | 75W | CRO | 0.97 | 21   | 40   | 32   | 2           | 2     | 2   | 2           |
| 158 |           |        | 38W | BXO | 0.72 | 8    | 6    | 3    | 2           | 2     | 2   | 2           |
| 160 |           |        | 3W  | AXX | 0.43 | 8    | 5    | 2    | 2           | 2     | 2   | 2           |
| 163 |           |        | 50E | HSX | 0.79 | 126  | 104  | 104  | 2           | 2     | 2   | 2           |
| 165 |           |        | 23E | CRO | 0.43 | 17   | 9    | 7    | 2           | 2     | 2   | 2           |
| 166 |           |        | 75E | FKC | 0.97 | 942  | 1809 | 1777 | 2           | 2     | 2   | 2           |
| 167 |           |        | 85E | AXX | 0.99 | 8    | 28   | 14   | 2           | 2     | 2   | 2           |
| 168 |           |        | 87E | HSX | 0.99 | 42   | 139  | 139  | 2           | 2     | 2   | 2           |
| 150 | 27.36     | 150    | 77W | HSX | 0.98 | 46   | 108  | 108  | 2           | 2     | 2   | 2           |
| 160 |           |        | 23W | BXI | 0.56 | 13   | 8    | 3    | 2           | 2     | 2   | 2           |
| 163 |           |        | 35E | HAX | 0.63 | 181  | 117  | 117  | 2           | 2     | 2   | 2           |
| 165 |           |        | 7E  | AXX | 0.22 | 8    | 4    | 2    | 2           | 2     | 2   | 2           |
| 166 |           |        | 60E | FKC | 0.87 | 2124 | 2182 | 2147 | 2           | 2     | 2   | 2           |
| 167 |           |        | 66E | CRI | 0.92 | 55   | 70   | 43   | 2           | 2     | 2   | 2           |
| 168 |           |        | 73E | HSX | 0.95 | 93   | 154  | 154  | 2           | 2     | 2   | 2           |
| 150 | 28.02     | 150    | 87W | AXX | 0.99 | 13   | 42   | 42   | 3           | 3     | 3   | 3           |

## DAILY SUNSPOT OBSERVATIONS

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| Day   | Group | CMP<br>Mo-Day | Lat | L  | CMD | Type | r/R  | Sd   | Corre.<br>Whole | Area<br>Max | See | Remarks |
|-------|-------|---------------|-----|----|-----|------|------|------|-----------------|-------------|-----|---------|
|       | 159   |               |     |    | 48W | AXX  | 0.80 | 4    | 4               | 4           | 3   |         |
|       | 160   |               |     |    | 33W | BXO  | 0.66 | 25   | 17              | 6           | 3   |         |
|       | 162   |               |     |    | 31W | AXX  | 0.57 | 4    | 3               | 3           | 3   |         |
|       | 163   |               |     |    | 26E | HAX  | 0.53 | 139  | 82              | 79          | 3   |         |
|       | 165   |               |     |    | 1E  | BXI  | 0.21 | 8    | 4               | 2           | 3   |         |
|       | 166   |               |     |    | 50E | FKC  | 0.79 | 2952 | 2423            | 2372        | 3   |         |
|       | 167   |               |     |    | 58E | DAI  | 0.84 | 177  | 162             | 77          | 3   |         |
|       | 168   |               |     |    | 64E | HHX  | 0.91 | 168  | 201             | 201         | 3   |         |
| 29.03 | 160   |               |     |    | 46W | BXO  | 0.78 | 17   | 13              | 7           | 4   |         |
|       | 163   |               |     |    | 12E | CAO  | 0.39 | 164  | 89              | 80          | 4   |         |
|       | 165   |               |     |    | 13W | BXO  | 0.34 | 8    | 4               | 2           | 4   |         |
|       | 166   |               |     |    | 36E | FKC  | 0.67 | 3911 | 2624            | 2460        | 4   |         |
|       | 167   |               |     |    | 43E | EAI  | 0.68 | 324  | 220             | 106         | 4   |         |
|       | 168   |               |     |    | 51E | HHX  | 0.80 | 240  | 202             | 202         | 4   |         |
| 30.05 | 160   |               |     |    | 57W | AXX  | 0.87 | 8    | 9               | 4           | 4   |         |
|       | 163   |               |     |    | 1W  | CAO  | 0.34 | 109  | 58              | 56          | 4   |         |
|       | 166   |               |     |    | 23E | FKC  | 0.52 | 3995 | 2334            | 1661        | 4   |         |
|       | 167   |               |     |    | 28E | EAI  | 0.48 | 421  | 240             | 139         | 4   |         |
|       | 168   |               |     |    | 38E | HHX  | 0.68 | 286  | 195             | 195         | 4   |         |
|       | 169   | 7- 1.5        | 19  | 10 | 18E | BXI  | 0.40 | 8    | 5               | 2           | 4   |         |

## DAILY SUNSPOT OBSERVATIONS

JULY 1988

| Day  | Group | CMP<br>Mo-Day | Lat | L   | CMD | Type | r/R  | Sd   | Corre.<br>Whole | Area<br>Max | See | Remarks |
|------|-------|---------------|-----|-----|-----|------|------|------|-----------------|-------------|-----|---------|
| 1.33 | 163   | 6-30.0        | -17 | 30  | 16W | CAO  | 0.44 | 63   | 35              | 33          | 3   |         |
|      | 166   | 7- 1.9        | -19 | 5   | 7E  | FKC  | 0.39 | 4458 | 2421            | 1935        | 3   |         |
|      | 167   | 7- 2.2        | 13  | 1   | 11E | EKC  | 0.24 | 715  | 368             | 238         | 3   |         |
|      | 168   | 7- 3.0        | 26  | 350 | 22E | HHX  | 0.52 | 320  | 187             | 187         | 3   |         |
|      | 169   | 7- 1.5        | 19  | 10  | 2E  | BXO  | 0.28 | 8    | 4               | 2           | 3   |         |
|      | 170   | 7- 1.4        | 13  | 11  | 1E  | BXO  | 0.18 | 8    | 4               | 2           | 3   |         |
| 2.03 | 163   |               |     |     | 26W | CSO  | 0.53 | 38   | 22              | 17          | 4   | PLAT    |
|      | 166   |               |     |     | 1W  | FKC  | 0.37 | 4567 | 2456            | 1845        | 4   | PLAT    |
|      | 167   |               |     |     | 1E  | EKC  | 0.17 | 736  | 374             | 239         | 4   | PLAT    |
|      | 168   |               |     |     | 13E | HHX  | 0.44 | 433  | 241             | 241         | 4   | PLAT    |
| 3.01 | 163   |               |     |     | 38W | AXX  | 0.67 | 8    | 6               | 3           | 4   | PLAT    |
|      | 166   |               |     |     | 14W | FKC  | 0.43 | 4193 | 2316            | 1875        | 4   | PLAT    |
|      | 167   |               |     |     | 12W | EKC  | 0.26 | 845  | 438             | 294         | 4   | PLAT    |
|      | 168   |               |     |     | 1E  | HSX  | 0.38 | 366  | 198             | 198         | 4   | PLAT    |
| 4.09 | 166   |               |     |     | 31W | FKC  | 0.61 | 3840 | 2421            | 1538        | 4   | PURP    |
|      | 167   |               |     |     | 26W | FKC  | 0.44 | 1236 | 687             | 411         | 4   | PURP    |
|      | 168   |               |     |     | 13W | CSI  | 0.43 | 378  | 209             | 204         | 4   | PURP    |
|      | 171   | 7- 6.3        | 29  | 307 | 30E | BXI  | 0.57 | 8    | 5               | 3           | 4   | PURP    |
| 5.36 | 166   |               |     |     | 45W | FKC  | 0.77 | 2481 | 1945            | 1170        | 3   |         |
|      | 167   |               |     |     | 49W | EH1  | 0.76 | 715  | 549             | 420         | 3   |         |
|      | 168   |               |     |     | 29W | HHX  | 0.59 | 315  | 195             | 192         | 3   |         |
|      | 172   | 7-10.0        | 23  | 257 | 63E | BXI  | 0.90 | 8    | 9               | 5           | 3   |         |
|      | 173   | 7-11.7        | -13 | 235 | 81E | AXX  | 0.99 | 4    | 14              | 14          | 3   |         |
| 6.22 | 166   |               |     |     | 57W | EKC  | 0.86 | 1808 | 1784            | 1203        | 2   |         |
|      | 167   |               |     |     | 60W | EH1  | 0.87 | 442  | 454             | 389         | 2   |         |
|      | 168   |               |     |     | 40W | HSX  | 0.70 | 257  | 180             | 177         | 2   |         |
|      | 172   |               |     |     | 49E | CRO  | 0.78 | 63   | 51              | 40          | 2   |         |
|      | 173   |               |     |     | 71E | BXO  | 0.95 | 8    | 14              | 7           | 2   |         |
| 7.09 | 166   |               |     |     | 68W | EKC  | 0.94 | 913  | 1366            | 384         | 3   |         |
|      | 167   |               |     |     | 73W | EH1  | 0.95 | 269  | 449             | 365         | 3   |         |
|      | 168   |               |     |     | 52W | HAX  | 0.82 | 172  | 149             | 146         | 3   |         |
|      | 172   |               |     |     | 36E | CSO  | 0.63 | 231  | 149             | 136         | 3   |         |
|      | 173   |               |     |     | 57E | BXO  | 0.86 | 8    | 8               | 4           | 3   |         |
|      | 174   | 7- 8.0        | -18 | 284 | 12E | AXX  | 0.41 | 4    | 2               | 2           | 3   |         |
|      | 175   | 7-13.4        | 23  | 212 | 82E | DSO  | 0.99 | 63   | 209             | 139         | 3   |         |
| 8.15 | 166   |               |     |     | 80W | EKC  | 0.99 | 273  | 904             | 529         | 3   |         |
|      | 167   |               |     |     | 86W | DHO  | 0.99 | 42   | 139             | 97          | 3   |         |
|      | 168   |               |     |     | 65W | HAX  | 0.92 | 84   | 107             | 107         | 3   |         |
|      | 171   |               |     |     | 25W | BXO  | 0.57 | 8    | 5               | 3           | 3   |         |
|      | 172   |               |     |     | 23E | DSI  | 0.48 | 513  | 293             | 163         | 3   |         |
|      | 173   |               |     |     | 43E | BXO  | 0.71 | 8    | 6               | 3           | 3   |         |
|      | 175   |               |     |     | 68E | DSO  | 0.92 | 189  | 241             | 123         | 3   |         |
|      | 176   | 7-11.5        | 19  | 237 | 46E | AXX  | 0.74 | 8    | 6               | 6           | 3   |         |
| 9.09 | 168   |               |     |     | 77W | HAX  | 0.98 | 42   | 99              | 99          | 3   |         |

DAILY SUNSPOT OBSERVATIONS

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| CMP |       |        |        |     |     |      |      |      |      | Corre. Area |   | Sd | Whole |  | Max | See Remarks |
|-----|-------|--------|--------|-----|-----|------|------|------|------|-------------|---|----|-------|--|-----|-------------|
| Day | Group | Mo-Day | Lat    | L   | CMD | Type | r/R  |      |      |             |   |    |       |  |     |             |
| 171 |       |        |        |     | 39W | AXX  | 0.70 | 8    | 6    | 3           | 3 |    |       |  | 3   |             |
| 172 |       |        |        |     | 10E | EHC  | 0.36 | 820  | 439  | 261         | 3 |    |       |  | 3   |             |
| 173 |       |        |        |     | 34E | AXX  | 0.61 | 4    | 3    | 3           | 3 |    |       |  | 3   |             |
| 175 |       |        |        |     | 55E | DSO  | 0.82 | 227  | 196  | 116         | 3 |    |       |  | 3   |             |
| 176 |       |        |        |     | 34E | AXX  | 0.60 | 4    | 3    | 3           | 3 |    |       |  | 3   |             |
| 177 |       |        | 7-12.9 | 27  | 38E | AXX  | 0.69 | 4    | 3    | 3           | 3 |    |       |  | 3   |             |
| 172 | 10.07 |        |        |     | 1W  | ESC  | 0.32 | 938  | 495  | 195         | 3 |    |       |  | 3   |             |
| 173 |       |        |        |     | 21E | AXX  | 0.45 | 4    | 2    | 2           | 3 |    |       |  | 3   |             |
| 175 |       |        |        |     | 41E | DSO  | 0.69 | 303  | 209  | 139         | 3 |    |       |  | 3   |             |
| 176 |       |        |        |     | 21E | AXX  | 0.41 | 4    | 2    | 2           | 3 |    |       |  | 3   |             |
| 177 |       |        |        |     | 35E | BXI  | 0.66 | 21   | 14   | 3           | 3 |    |       |  | 3   |             |
| 178 |       |        | 7-10.2 | -16 | 2E  | AXX  | 0.33 | 4    | 2    | 2           | 3 |    |       |  | 3   |             |
| 172 | 11.21 |        |        |     | 16W | EAI  | 0.41 | 589  | 323  | 166         | 3 |    |       |  | 3   |             |
| 175 |       |        |        |     | 27E | EAI  | 0.53 | 202  | 119  | 74          | 3 |    |       |  | 3   |             |
| 176 |       |        |        |     | 5E  | AXX  | 0.26 | 8    | 4    | 2           | 3 |    |       |  | 3   |             |
| 177 |       |        |        |     | 21E | CAI  | 0.51 | 71   | 41   | 19          | 3 |    |       |  | 3   |             |
| 178 |       |        | 7-13.0 | 18  | 12W | BXO  | 0.41 | 8    | 5    | 2           | 3 |    |       |  | 3   |             |
| 179 |       |        |        |     | 25E | AXX  | 0.47 | 8    | 5    | 2           | 3 |    |       |  | 3   |             |
| 180 |       |        | 7-17.2 | -15 | 80E | HSX  | 0.99 | 25   | 83   | 83          | 3 |    |       |  | 3   |             |
| 172 | 12.07 |        |        |     | 27W | EAI  | 0.55 | 484  | 290  | 179         | 4 |    |       |  | 4   |             |
| 175 |       |        |        |     | 17E | DAI  | 0.41 | 362  | 199  | 81          | 4 |    |       |  | 4   |             |
| 176 |       |        |        |     | 6W  | AXX  | 0.28 | 8    | 4    | 2           | 4 |    |       |  | 4   |             |
| 177 |       |        |        |     | 10E | DAI  | 0.43 | 143  | 79   | 46          | 4 |    |       |  | 4   |             |
| 178 |       |        |        |     | 25W | BXI  | 0.53 | 8    | 5    | 2           | 4 |    |       |  | 4   |             |
| 179 |       |        |        |     | 13E | AXX  | 0.32 | 8    | 4    | 2           | 4 |    |       |  | 4   |             |
| 180 |       |        |        |     | 69E | HSX  | 0.94 | 59   | 88   | 88          | 4 |    |       |  | 4   |             |
| 181 |       |        | 7-18.0 | -21 | 77E | EHO  | 0.98 | 189  | 444  | 414         | 4 |    |       |  | 4   |             |
| 172 | 13.01 |        |        |     | 40W | EAI  | 0.69 | 400  | 276  | 174         | 5 |    |       |  | 5   |             |
| 175 |       |        |        |     | 5E  | DAI  | 0.33 | 282  | 149  | 54          | 5 |    |       |  | 5   |             |
| 176 |       |        |        |     | 18W | AXX  | 0.49 | 8    | 5    | 2           | 5 |    |       |  | 5   |             |
| 177 |       |        |        |     | 2W  | DAI  | 0.39 | 147  | 80   | 41          | 5 |    |       |  | 5   |             |
| 178 |       |        |        |     | 36W | BXO  | 0.66 | 8    | 6    | 3           | 5 |    |       |  | 5   |             |
| 179 |       |        |        |     | 0W  | BXI  | 0.25 | 8    | 4    | 2           | 5 |    |       |  | 5   |             |
| 180 |       |        |        |     | 56E | HSX  | 0.84 | 101  | 93   | 93          | 5 |    |       |  | 5   |             |
| 181 |       |        |        |     | 64E | EKC  | 0.92 | 639  | 813  | 573         | 5 |    |       |  | 5   |             |
| 172 | 14.06 |        |        |     | 55W | ESO  | 0.83 | 231  | 206  | 154         | 5 |    |       |  | 5   |             |
| 175 |       |        |        |     | 8W  | ERI  | 0.36 | 168  | 90   | 45          | 5 |    |       |  | 5   |             |
| 176 |       |        |        |     | 32W | AXX  | 0.55 | 8    | 5    | 3           | 5 |    |       |  | 5   |             |
| 177 |       |        |        |     | 15W | DRI  | 0.45 | 63   | 35   | 14          | 5 |    |       |  | 5   |             |
| 179 |       |        |        |     | 15W | BXI  | 0.34 | 13   | 7    | 2           | 5 |    |       |  | 5   |             |
| 180 |       |        |        |     | 42E | HSX  | 0.71 | 147  | 105  | 105         | 5 |    |       |  | 5   |             |
| 181 |       |        |        |     | 51E | EKC  | 0.83 | 1148 | 1023 | 629         | 5 |    |       |  | 5   |             |
| 172 | 15.22 |        |        |     | 72W | CSO  | 0.95 | 55   | 91   | 84          | 4 |    |       |  | 4   |             |
| 175 |       |        |        |     | 20W | CAI  | 0.47 | 114  | 64   | 33          | 4 |    |       |  | 4   |             |
| 177 |       |        |        |     | 30W | BXI  | 0.59 | 38   | 23   | 5           | 4 |    |       |  | 4   |             |
| 180 |       |        |        |     | 26E | HSX  | 0.53 | 177  | 104  | 104         | 4 |    |       |  | 4   |             |
| 181 |       |        |        |     | 36E | EKC  | 0.69 | 1682 | 1162 | 813         | 4 |    |       |  | 4   |             |

## DAILY SUNSPOT OBSERVATIONS

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| Day   | Group | CMP    |     | L   | CMD | Type | r/R  | Sd   | Corre.<br>Whole | Area<br>Max | See | Remarks |
|-------|-------|--------|-----|-----|-----|------|------|------|-----------------|-------------|-----|---------|
|       |       | Mo-Day | Lat |     |     |      |      |      |                 |             |     |         |
| 16.12 | 172   |        |     |     | 85W | AXX  | 0.99 | 8    | 28              | 28          | 3   |         |
|       | 175   |        |     |     | 31W | CRI  | 0.59 | 76   | 47              | 26          | 3   |         |
|       | 177   |        |     |     | 43W | CRO  | 0.72 | 34   | 24              | 12          | 3   |         |
|       | 180   |        |     |     | 14E | CSI  | 0.40 | 168  | 92              | 85          | 3   |         |
|       | 181   |        |     |     | 24E | EKC  | 0.56 | 1892 | 1145            | 769         | 3   |         |
|       | 182   | 7-18.5 | -15 | 145 | 31E | BXI  | 0.60 | 21   | 13              | 8           | 3   |         |
| 17.10 | 175   |        |     |     | 43W | CRO  | 0.71 | 38   | 27              | 9           | 4   |         |
|       | 177   |        |     |     | 54W | BXO  | 0.83 | 13   | 11              | 4           | 4   |         |
|       | 180   |        |     |     | 1E  | CSO  | 0.33 | 156  | 83              | 80          | 4   |         |
|       | 181   |        |     |     | 11E | EKI  | 0.46 | 1951 | 1099            | 741         | 4   |         |
|       | 182   |        |     |     | 18E | BXI  | 0.45 | 17   | 9               | 2           | 4   |         |
|       | 183   | 7-18.0 | 36  | 151 | 11E | AXX  | 0.54 | 8    | 5               | 2           | 4   |         |
|       | 184   | 7-19.2 | -21 | 135 | 27E | AXX  | 0.60 | 4    | 3               | 3           | 4   |         |
| 18.08 | 175   |        |     |     | 56W | BXI  | 0.84 | 17   | 15              | 4           | 4   |         |
|       | 180   |        |     |     | 12W | CSI  | 0.38 | 156  | 84              | 77          | 4   |         |
|       | 181   |        |     |     | 2W  | EKI  | 0.44 | 1892 | 1052            | 736         | 4   |         |
|       | 182   |        |     |     | 5E  | CRI  | 0.34 | 50   | 27              | 18          | 4   |         |
|       | 183   |        |     |     | 1W  | AXX  | 0.53 | 4    | 2               | 2           | 4   |         |
|       | 185   | 7-16.7 | -18 | 168 | 18W | AXX  | 0.48 | 4    | 2               | 2           | 4   |         |
|       | 186   | 7-19.8 | -21 | 127 | 24E | AXX  | 0.55 | 4    | 3               | 3           | 4   |         |
|       | 187   | 7-22.8 | -22 | 88  | 63E | BXO  | 0.92 | 17   | 21              | 11          | 4   |         |
|       | 188   | 7-23.7 | -18 | 77  | 76E | AXX  | 0.98 | 4    | 10              | 10          | 4   |         |
| 19.04 | 175   |        |     |     | 70W | AXX  | 0.93 | 8    | 12              | 6           | 4   |         |
|       | 180   |        |     |     | 24W | CSO  | 0.51 | 151  | 88              | 85          | 4   |         |
|       | 181   |        |     |     | 15W | EKI  | 0.49 | 1543 | 888             | 474         | 4   |         |
|       | 182   |        |     |     | 8W  | BXI  | 0.34 | 17   | 9               | 2           | 4   |         |
|       | 183   |        |     |     | 14W | AXX  | 0.53 | 4    | 2               | 2           | 4   |         |
|       | 185   |        |     |     | 34W | BXI  | 0.63 | 8    | 5               | 3           | 4   |         |
|       | 186   |        |     |     | 11E | AXX  | 0.46 | 4    | 2               | 2           | 4   |         |
|       | 187   |        |     |     | 52E | BXO  | 0.83 | 13   | 11              | 4           | 4   |         |
|       | 188   |        |     |     | 63E | AXX  | 0.91 | 4    | 5               | 5           | 4   |         |
| 20.00 | 180   |        |     |     | 37W | HSX  | 0.66 | 114  | 75              | 75          | 3   |         |
|       | 181   |        |     |     | 28W | EKI  | 0.61 | 1337 | 843             | 477         | 3   |         |
|       | 182   |        |     |     | 23W | AXX  | 0.49 | 8    | 5               | 2           | 3   |         |
|       | 184   |        |     |     | 11W | AXX  | 0.47 | 8    | 5               | 2           | 3   |         |
|       | 185   |        |     |     | 48W | BXO  | 0.78 | 8    | 7               | 3           | 3   |         |
|       | 187   |        |     |     | 38E | BXO  | 0.71 | 8    | 6               | 3           | 3   |         |
|       | 188   |        |     |     | 50E | AXX  | 0.80 | 4    | 4               | 4           | 3   |         |
| 21.09 | 180   |        |     |     | 51W | HSX  | 0.82 | 76   | 65              | 65          | 4   |         |
|       | 181   |        |     |     | 43W | EKI  | 0.75 | 988  | 743             | 380         | 4   |         |
|       | 182   |        |     |     | 31W | BXI  | 0.61 | 8    | 5               | 3           | 4   |         |
|       | 183   |        |     |     | 43W | AXX  | 0.72 | 4    | 3               | 3           | 4   |         |
|       | 184   |        |     |     | 25W | BXO  | 0.59 | 8    | 5               | 3           | 4   |         |
|       | 185   |        |     |     | 61W | CAI  | 0.90 | 63   | 71              | 38          | 4   |         |
|       | 186   |        |     |     | 11W | AXX  | 0.45 | 4    | 2               | 2           | 4   |         |
|       | 187   |        |     |     | 25E | BXO  | 0.59 | 13   | 8               | 3           | 4   |         |
|       | 189   | 7-22.1 | 24  | 97  | 13E | BXI  | 0.39 | 17   | 9               | 2           | 4   |         |

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| CMP       |        |     |     |      |      |     |     |     |   | Core. Area |   | Whole Max |   | See Remarks |   |
|-----------|--------|-----|-----|------|------|-----|-----|-----|---|------------|---|-----------|---|-------------|---|
| Day Group | Mo-Day | Lat | L   | CMD  | Type | r/R | Sd  |     |   |            |   |           |   |             |   |
| 22.10     | 180    | 65W | HSX | 0.92 | 38   | 48  | 48  | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 181    | 57W | EKI | 0.86 | 589  | 581 | 319 | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 184    | 37W | CRI | 0.70 | 29   | 21  | 15  | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 185    | 74W | DAI | 0.97 | 71   | 137 | 73  | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 187    | 9E  | BXI | 0.46 | 8    | 5   | 2   | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 188    | 21E | BXO | 0.51 | 8    | 5   | 2   | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 189    | OW  | BXI | 0.33 | 25   | 13  | 2   | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 190    | 88E | AXX | 0.99 | 13   | 42  | 42  | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 23.06  | 180 | 79W | HSX  | 0.98 | 25  | 59  | 5   | 5 | 5          | 5 | 5         | 5 | 5           | 5 |
|           | 181    | 70W | DAO | 0.94 | 357  | 535 | 271 | 5   | 5 | 5          | 5 | 5         | 5 | 5           | 5 |
| 23.06     | 180    | 79W | HSX | 0.98 | 25   | 59  | 59  | 5   | 5 | 5          | 5 | 5         | 5 | 5           | 5 |
|           | 181    | 70W | DAO | 0.94 | 357  | 535 | 271 | 5   | 5 | 5          | 5 | 5         | 5 | 5           | 5 |
|           | 184    | 51W | BXO | 0.83 | 13   | 11  | 7   | 5   | 5 | 5          | 5 | 5         | 5 | 5           | 5 |
|           | 187    | 5W  | BXO | 0.46 | 8    | 5   | 2   | 5   | 5 | 5          | 5 | 5         | 5 | 5           | 5 |
|           | 189    | 12W | BXI | 0.38 | 17   | 9   | 2   | 5   | 5 | 5          | 5 | 5         | 5 | 5           | 5 |
|           | 190    | 80E | ESO | 0.98 | 137  | 325 | 286 | 5   | 5 | 5          | 5 | 5         | 5 | 5           | 5 |
|           | 191    | 15W | BXI | 0.53 | 17   | 10  | 2   | 5   | 5 | 5          | 5 | 5         | 5 | 5           | 5 |
|           | 24.00  | 181 | 84W | CSD  | 0.99 | 71  | 236 | 209 | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 184    | 64W | AXX | 0.92 | 4    | 5   | 5   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 189    | 26W | BXI | 0.52 | 21   | 12  | 2   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
| 24.00     | 181    | 84W | CSD | 0.99 | 71   | 236 | 209 | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 184    | 64W | AXX | 0.92 | 4    | 5   | 5   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 189    | 26W | BXI | 0.52 | 21   | 12  | 2   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 190    | 65E | ESO | 0.89 | 151  | 163 | 149 | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 191    | 27W | BXI | 0.62 | 17   | 11  | 3   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 192    | 38W | BXI | 0.62 | 21   | 13  | 3   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 193    | 73E | ESO | 0.97 | 63   | 121 | 81  | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 25.38  | 189 | 40W | BXO  | 0.68 | 8   | 6   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 190    | 43E | CHI | 0.67 | 349  | 234 | 220 | 2   | 2 | 2          | 2 | 2         | 2 | 2           | 2 |
|           | 191    | 50W | BXO | 0.82 | 17   | 15  | 4   | 2   | 2 | 2          | 2 | 2         | 2 | 2           | 2 |
| 25.38     | 189    | 40W | BXO | 0.68 | 8    | 6   | 3   | 2   | 2 | 2          | 2 | 2         | 2 | 2           | 2 |
|           | 190    | 43E | CHI | 0.67 | 349  | 234 | 220 | 2   | 2 | 2          | 2 | 2         | 2 | 2           | 2 |
|           | 191    | 50W | BXO | 0.82 | 17   | 15  | 4   | 2   | 2 | 2          | 2 | 2         | 2 | 2           | 2 |
|           | 192    | 58W | AXX | 0.85 | 4    | 4   | 62  | 2   | 2 | 2          | 2 | 2         | 2 | 2           | 2 |
|           | 193    | 52E | DRI | 0.84 | 147  | 135 | 62  | 2   | 2 | 2          | 2 | 2         | 2 | 2           | 2 |
|           | 194    | 20E | BXO | 0.41 | 8    | 5   | 2   | 2   | 2 | 2          | 2 | 2         | 2 | 2           | 2 |
|           | 195    | 62E | AXX | 0.89 | 4    | 5   | 5   | 2   | 2 | 2          | 2 | 2         | 2 | 2           | 2 |
|           | 26.01  | 189 | 49W | BXO  | 0.78 | 8   | 7   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 190    | 34E | CHI | 0.55 | 421  | 252 | 240 | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 191    | 58W | BXO | 0.89 | 8    | 9   | 5   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
| 26.01     | 189    | 49W | BXO | 0.78 | 8    | 7   | 3   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 190    | 34E | CHI | 0.55 | 421  | 252 | 240 | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 191    | 58W | BXO | 0.89 | 8    | 9   | 5   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 192    | 63W | AXX | 0.86 | 4    | 4   | 4   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 193    | 45E | DKI | 0.78 | 366  | 293 | 179 | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 195    | 55E | AXX | 0.82 | 8    | 7   | 4   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 196    | 33E | AXX | 0.64 | 8    | 5   | 3   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 27.03  | 188 | 45W | BXO  | 0.79 | 8   | 7   | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 190    | 20E | CHO | 0.36 | 446  | 239 | 234 | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 191    | 69W | BXO | 0.95 | 8    | 14  | 7   | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
| 28.11     | 190    | 6E  | CSD | 0.16 | 429  | 217 | 213 | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 193    | 18E | DKC | 0.52 | 967  | 565 | 312 | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 195    | 23E | BXI | 0.41 | 13   | 7   | 2   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |
|           | 197    | 81E | DSI | 0.99 | 219  | 723 | 376 | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 196    | 22E | AXX | 0.57 | 4    | 3   | 3   | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 195    | 37E | AXX | 0.60 | 8    | 5   | 3   | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 193    | 32E | DKI | 0.66 | 967  | 640 | 562 | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 191    | 69W | BXO | 0.95 | 8    | 14  | 7   | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 190    | 20E | CHO | 0.36 | 446  | 239 | 234 | 4   | 4 | 4          | 4 | 4         | 4 | 4           | 4 |
|           | 195    | 23E | BXI | 0.41 | 13   | 7   | 2   | 3   | 3 | 3          | 3 | 3         | 3 | 3           | 3 |

## DAILY SUNSPOT OBSERVATIONS

JULY 1988

| Day   | Group | CMP           |     | L   | CMD | Type | r/R  | Sd   | Corre. |     | Area | See  | Remarks |
|-------|-------|---------------|-----|-----|-----|------|------|------|--------|-----|------|------|---------|
|       |       | Mo-Day        | Lat |     |     |      |      |      | Whole  | Max |      |      |         |
|       | 196   |               |     |     | 8E  | AXX  | 0.47 | 4    | 2      | 2   | 3    |      |         |
|       | 197   |               |     |     | 73E | FKC  | 0.95 | 652  | 1087   | 288 | 3    |      |         |
|       | 198   | 7-24.3        | 26  | 68  | 50W | BXI  | 0.78 | 13   | 10     | 3   | 3    |      |         |
|       | 199   | 8- 3.7        | 35  | 290 | 85E | AXX  | 0.99 | 8    | 28     | 28  | 3    |      |         |
| 29.00 |       | Not Available |     |     |     |      |      |      |        |     |      |      |         |
| 30.16 | 190   |               |     |     | 25W | HSX  | 0.41 | 315  | 173    | 173 | 4    | PURP |         |
|       | 193   |               |     |     | 12W | DAI  | 0.49 | 749  | 431    | 266 | 4    | PURP |         |
|       | 195   |               |     |     | 8W  | DAC  | 0.20 | 315  | 161    | 58  | 4    | PURP |         |
|       | 197   |               |     |     | 44E | FKC  | 0.72 | 1106 | 802    | 406 | 4    | PURP |         |
|       | 200   | 8- 1.0        | 26  | 326 | 22E | DRI  | 0.48 | 71   | 41     | 31  | 4    | PURP |         |
| 31.12 | 190   |               |     |     | 34W | HSX  | 0.55 | 349  | 209    | 209 | 3    |      |         |
|       | 193   |               |     |     | 21W | DKC  | 0.54 | 816  | 485    | 310 | 3    |      |         |
|       | 195   |               |     |     | 18W | DAC  | 0.33 | 631  | 335    | 154 | 3    |      |         |
|       | 197   |               |     |     | 32E | FKI  | 0.60 | 1749 | 1091   | 629 | 3    |      |         |
|       | 200   |               |     |     | 12E | CRO  | 0.40 | 34   | 18     | 14  | 3    |      |         |
|       | 201   | 8- 4.0        | -24 | 287 | 50E | BXO  | 0.84 | 8    | 8      | 4   | 3    |      |         |

## S U N S P O T G R O U P S

JUNE 1988

| CMP Group |   | Date | Lat | L   | CMD | Type | r/R  | Sd  | Corre. Area |     | Photo | Remarks |
|-----------|---|------|-----|-----|-----|------|------|-----|-------------|-----|-------|---------|
| Mo-Day    |   |      |     |     |     |      |      |     | Whole       | Max |       |         |
| 140       | 6 | 1    | 38  | 72  | 19W | AXX  | 0.68 | 4   | 3           | 3   |       |         |
| 5-30.6    |   | 2    |     |     | 32W | AXX  | 0.74 | 4   | 3           | 3   |       |         |
|           |   | 3    |     |     | 45W | AXX  | 0.83 | 4   | 4           | 4   |       |         |
|           |   | 4    |     |     | 55W | AXX  | 0.90 | 4   | 5           | 5   |       |         |
| 141       | 6 | 1    | 26  | 345 | 63E | HRX  | 0.91 | 34  | 40          | 40  | 70    |         |
| 6- 5.2    |   | 2    |     |     | 50E | HAX  | 0.82 | 55  | 47          | 47  | 56    |         |
|           |   | 3    |     |     | 37E | HAX  | 0.70 | 50  | 35          | 32  | 59    |         |
|           |   | 4    |     |     | 24E | BXI  | 0.56 | 13  | 8           | 5   | 26    |         |
|           |   | 5    |     |     | 11E | BXI  | 0.57 | 17  | 10          | 5   | 19    |         |
|           |   | 6    |     |     | 2E  | BXI  | 0.44 | 42  | 23          | 5   | 71    |         |
|           |   | 7    |     |     | 12W | CRI  | 0.48 | 84  | 48          | 22  |       |         |
|           |   | 8    |     |     | 22W | BXI  | 0.55 | 55  | 33          | 5   | 153   |         |
|           |   | 9    |     |     | 33W | DRI  | 0.67 | 147 | 99          | 54  | 200   |         |
|           |   | 10   |     |     | 45W | DSI  | 0.78 | 139 | 111         | 88  | 104   |         |
|           |   | 11   |     |     | 57W | CSO  | 0.87 | 97  | 99          | 95  | 54    |         |
|           |   | 12   |     |     | 69W | CSO  | 0.94 | 67  | 101         | 94  | 63    |         |
|           |   | 13   |     |     | 84W | AXX  | 0.99 | 8   | 28          | 28  |       |         |
| 142       | 6 | 1    | -21 | 331 | 80E | HRX  | 0.99 | 17  | 56          | 42  |       |         |
| 6- 7.2    |   | 2    |     |     | 71E | DRO  | 0.94 | 84  | 126         | 63  | 189   |         |
|           |   | 3    |     |     | 58E | DAO  | 0.86 | 147 | 145         | 75  | 432   |         |
|           |   | 4    |     |     | 43E | DAI  | 0.72 | 282 | 204         | 159 | 443   |         |
|           |   | 5    |     |     | 29E | CAI  | 0.56 | 240 | 145         | 127 | 260   |         |
|           |   | 6    |     |     | 16E | CAI  | 0.43 | 294 | 163         | 144 | 278   |         |
|           |   | 7    |     |     | 1E  | CAI  | 0.36 | 353 | 189         | 167 |       |         |
|           |   | 8    |     |     | 11W | CAI  | 0.39 | 336 | 183         | 167 | 253   |         |
|           |   | 9    |     |     | 24W | CAI  | 0.53 | 294 | 173         | 164 | 175   |         |
|           |   | 10   |     |     | 37W | CAO  | 0.67 | 181 | 121         | 116 | 88    |         |
|           |   | 11   |     |     | 48W | CRO  | 0.78 | 29  | 24          | 10  | 17    |         |
|           |   | 12   |     |     | 63W | AXX  | 0.91 | 8   | 10          | 5   |       |         |
|           |   | 13   |     |     | 70W | AXX  | 0.95 | 4   | 7           | 7   |       |         |
| 143       | 6 | 4    | 13  | 41  | 29W | BXO  | 0.52 | 21  | 12          | 5   | 25    |         |
| 6- 1.9    |   | 5    |     |     | 43W | BXI  | 0.69 | 21  | 15          | 6   | 48    |         |
|           |   | 6    |     |     | 57W | CRO  | 0.84 | 17  | 15          | 12  | 49    |         |
|           |   | 7    |     |     | 72W | AXX  | 0.95 | 8   | 14          | 7   |       |         |
|           |   | 8    |     |     | 83W | AXX  | 0.99 | 8   | 28          | 14  |       |         |
| 144       | 6 | 5    | -17 | 280 | 78E | CSO  | 0.98 | 38  | 89          | 69  | 404   |         |
| 6-11.1    |   | 6    |     |     | 70E | ESC  | 0.94 | 290 | 434         | 195 | 818   |         |
|           |   | 7    |     |     | 56E | EAC  | 0.85 | 673 | 640         | 240 |       |         |
|           |   | 8    |     |     | 44E | EAC  | 0.72 | 757 | 549         | 186 | 759   |         |
|           |   | 9    |     |     | 30E | EAC  | 0.54 | 547 | 325         | 110 | 372   |         |
|           |   | 10   |     |     | 15E | EAC  | 0.37 | 446 | 240         | 118 | 315   |         |
|           |   | 11   |     |     | 1E  | EAI  | 0.30 | 265 | 139         | 82  | 67    |         |
|           |   | 12   |     |     | 12W | EAI  | 0.37 | 210 | 113         | 59  | 178   |         |
|           |   | 13   |     |     | 27W | CSI  | 0.53 | 130 | 77          | 52  | 118   |         |
|           |   | 14   |     |     | 40W | CSO  | 0.69 | 55  | 38          | 32  |       |         |
|           |   | 15   |     |     | 57W | CRO  | 0.86 | 17  | 17          | 12  |       |         |
|           |   | 16   |     |     | 66W | BXO  | 0.92 | 13  | 16          | 11  |       |         |

# SUNSPOT GROUPS

JUNE 1988

| CMP Group | Mo-Day | Date | Lat | L   | CMD | Type | r/R      | Sd  | Corre. Whole | Area Max | Photo | Remarks |
|-----------|--------|------|-----|-----|-----|------|----------|-----|--------------|----------|-------|---------|
| 145       | 6-     | 6    | 6   | -25 | 10  | 24W  | BXI 0.55 | 29  | 18           | 3        | 116   |         |
| 6- 4.3    |        | 7    |     |     |     | 40W  | CSI 0.71 | 156 | 111          | 72       |       |         |
|           |        | 8    |     |     |     | 50W  | DAI 0.80 | 336 | 283          | 127      | 425   |         |
|           |        | 9    |     |     |     | 64W  | ESI 0.91 | 193 | 231          | 90       | 161   |         |
|           |        | 10   |     |     |     | 76W  | ESO 0.98 | 135 | 316          | 168      | 81    |         |
|           |        | 11   |     |     |     | 85W  | AXX 0.99 | 4   | 14           | 14       |       |         |
| 146       | 6-     | 6    | 6   | 31  | 321 | 27E  | BXO 0.66 | 8   | 6            | 3        |       |         |
| 6- 8.0    |        | 7    |     |     |     | 11E  | AXX 0.54 | 4   | 2            | 2        |       |         |
|           |        | 9    |     |     |     | 12W  | BXO 0.54 | 8   | 5            | 2        |       |         |
|           |        | 10   |     |     |     | 25W  | AXX 0.61 | 8   | 5            | 3        |       |         |
|           |        | 11   |     |     |     | 36W  | BXO 0.71 | 8   | 6            | 3        |       |         |
|           |        | 12   |     |     |     | 46W  | AXX 0.80 | 8   | 7            | 4        |       |         |
| 147       | 6-     | 6    | 7   | -16 | 312 | 20E  | AXX 0.41 | 4   | 2            | 2        |       |         |
| 6- 8.7    |        | 8    |     |     |     | 9E   | AXX 0.32 | 8   | 4            | 2        |       |         |
| 148       | 6-     | 6    | 8   | 14  | 243 | 80E  | HSX 0.98 | 50  | 118          | 118      | 148   |         |
| 6-13.8    |        | 9    |     |     |     | 65E  | CSO 0.91 | 118 | 141          | 131      | 151   |         |
|           |        | 10   |     |     |     | 52E  | CSI 0.80 | 210 | 177          | 149      | 190   |         |
|           |        | 11   |     |     |     | 39E  | CSO 0.64 | 231 | 151          | 132      | 167   |         |
|           |        | 12   |     |     |     | 25E  | DSI 0.47 | 349 | 198          | 160      | 336   |         |
|           |        | 13   |     |     |     | 10E  | DSI 0.28 | 391 | 203          | 133      | 264   |         |
|           |        | 14   |     |     |     | 3W   | DSI 0.22 | 400 | 205          | 136      |       |         |
|           |        | 15   |     |     |     | 18W  | DSI 0.37 | 294 | 158          | 127      |       |         |
|           |        | 16   |     |     |     | 29W  | DAI 0.52 | 261 | 152          | 108      |       |         |
|           |        | 17   |     |     |     | 41W  | CRI 0.67 | 126 | 85           | 37       | 229   |         |
|           |        | 18   |     |     |     | 53W  | CRI 0.80 | 93  | 78           | 25       | 91    |         |
|           |        | 20   |     |     |     | 84W  | AXX 0.99 | 8   | 28           | 14       |       |         |
| 149       | 6-     | 6    | 9   | 24  | 281 | 27E  | BXO 0.62 | 8   | 5            | 3        | 11    |         |
| 6-11.0    |        | 10   |     |     |     | 15E  | BXO 0.53 | 8   | 5            | 2        |       |         |
|           |        | 12   |     |     |     | 14W  | BXO 0.44 | 8   | 5            | 2        |       |         |
| 150       | 6-     | 6    | 14  | 37  | 147 | 86E  | HSX 0.99 | 8   | 28           | 28       |       |         |
| 6-21.2    |        | 15   |     |     |     | 71E  | HSX 0.97 | 76  | 145          | 145      |       |         |
|           |        | 16   |     |     |     | 62E  | HSX 0.92 | 122 | 155          | 155      |       |         |
|           |        | 17   |     |     |     | 50E  | HSX 0.84 | 147 | 135          | 135      | 332   |         |
|           |        | 18   |     |     |     | 38E  | HSX 0.76 | 236 | 181          | 181      | 167   |         |
|           |        | 20   |     |     |     | 12E  | HAX 0.60 | 214 | 134          | 131      | 188   |         |
|           |        | 21   |     |     |     | 1E   | HSX 0.57 | 231 | 141          | 141      |       |         |
|           |        | 22   |     |     |     | 11W  | HSX 0.60 | 227 | 142          | 142      |       |         |
|           |        | 23   |     |     |     | 26W  | HSX 0.68 | 219 | 149          | 149      |       |         |
|           |        | 24   |     |     |     | 36W  | HSX 0.74 | 168 | 124          | 124      |       |         |
|           |        | 25   |     |     |     | 51W  | HSX 0.84 | 101 | 93           | 93       | 160   |         |
|           |        | 26   |     |     |     | 62W  | HSX 0.92 | 88  | 112          | 112      | 161   |         |
|           |        | 27   |     |     |     | 77W  | HSX 0.98 | 46  | 108          | 108      | 119   |         |
|           |        | 28   |     |     |     | 87W  | AXX 0.99 | 13  | 42           | 42       |       |         |
| 151       | 6-     | 6    | 15  | -22 | 171 | 53E  | AXX 0.83 | 8   | 7            | 4        |       |         |
| 6-19.3    |        | 16   |     |     |     | 43E  | AXX 0.74 | 4   | 3            | 3        |       |         |

# SUNSPOT GROUPS

JUNE 1988

| CMP Group<br>Mo-Day | Date | Lat | L   | CMD | Type | r/R | Sd   | Corre. Area |      | Photo | Remarks |
|---------------------|------|-----|-----|-----|------|-----|------|-------------|------|-------|---------|
|                     |      |     |     |     |      |     |      | Whole       | Max  |       |         |
| 152<br>6-20.7       | 6    | 15  | -15 | 153 | 72E  | DSI | 0.95 | 257         | 428  | 302   |         |
|                     |      | 16  |     |     | 60E  | DHI | 0.87 | 450         | 462  | 337   |         |
|                     |      | 17  |     |     | 47E  | DHI | 0.75 | 589         | 443  | 383   | 539     |
|                     |      | 18  |     |     | 34E  | DHI | 0.61 | 606         | 382  | 345   | 429     |
|                     |      | 20  |     |     | 7E   | DHI | 0.31 | 812         | 427  | 363   | 515     |
|                     |      | 21  |     |     | 6W   | DHI | 0.30 | 862         | 452  | 353   |         |
|                     |      | 22  |     |     | 17W  | DKI | 0.40 | 883         | 482  | 326   |         |
|                     |      | 23  |     |     | 33W  | EKC | 0.60 | 1283        | 800  | 525   |         |
|                     |      | 24  |     |     | 44W  | EKC | 0.74 | 1514        | 1118 | 745   |         |
|                     |      | 25  |     |     | 58W  | EKC | 0.86 | 1081        | 1066 | 714   | 1040    |
|                     |      | 26  |     |     | 72W  | EKC | 0.97 | 408         | 783  | 541   | 1123    |
| 153<br>6-18.1       | 6    | 16  | -29 | 187 | 27E  | AXX | 0.64 | 8           | 5    | 3     |         |
|                     |      | 17  |     |     | 14E  | AXX | 0.55 | 8           | 5    | 3     |         |
| 154<br>6-20.0       | 6    | 16  | 34  | 162 | 51E  | BXO | 0.84 | 8           | 8    | 4     |         |
|                     |      | 17  |     |     | 38E  | BXI | 0.74 | 21          | 16   | 3     |         |
|                     |      | 18  |     |     | 25E  | BXO | 0.63 | 17          | 11   | 5     |         |
|                     |      | 20  |     |     | 2W   | BXI | 0.54 | 13          | 7    | 2     | 5       |
|                     |      | 21  |     |     | 14W  | BXI | 0.56 | 21          | 13   | 3     |         |
|                     |      | 22  |     |     | 26W  | DAI | 0.64 | 240         | 157  | 91    |         |
|                     |      | 23  |     |     | 41W  | DAO | 0.77 | 160         | 125  | 82    |         |
|                     |      | 24  |     |     | 52W  | DSO | 0.85 | 122         | 116  | 80    |         |
|                     |      | 25  |     |     | 64W  | DRI | 0.92 | 84          | 107  | 54    | 127     |
|                     |      | 26  |     |     | 75W  | CRO | 0.97 | 21          | 40   | 32    |         |
| 155<br>6-11.4       | 6    | 17  | -33 | 276 | 75W  | AXX | 0.98 | 8           | 20   | 10    |         |
|                     |      |     |     |     |      |     |      |             |      |       |         |
| 156<br>6-17.6       | 6    | 17  | 25  | 194 | 7E   | AXX | 0.40 | 4           | 2    | 2     |         |
|                     |      | 18  |     |     | 6W   | AXX | 0.41 | 4           | 2    | 2     |         |
| 157<br>6-21.8       | 6    | 17  | -23 | 139 | 62E  | AXX | 0.90 | 4           | 5    | 5     |         |
|                     |      |     |     |     |      |     |      |             |      |       |         |
| 158<br>6-23.9       | 6    | 20  | -25 | 111 | 40E  | AXX | 0.72 | 8           | 6    | 3     |         |
|                     |      | 21  |     |     | 27E  | BXO | 0.60 | 17          | 10   | 3     |         |
|                     |      | 22  |     |     | 19E  | BXI | 0.53 | 21          | 12   | 2     |         |
|                     |      | 23  |     |     | 4E   | BXO | 0.44 | 8           | 5    | 2     |         |
|                     |      | 24  |     |     | 2W   | AXX | 0.45 | 4           | 2    | 2     |         |
|                     |      | 25  |     |     | 24W  | BXI | 0.57 | 13          | 8    | 5     |         |
|                     |      | 26  |     |     | 38W  | BXO | 0.72 | 8           | 6    | 3     |         |
| 159<br>6-24.8       | 6    | 20  | -21 | 99  | 63E  | HSX | 0.91 | 42          | 50   | 50    | 161     |
|                     |      | 21  |     |     | 49E  | HSX | 0.79 | 71          | 59   | 55    |         |
|                     |      | 22  |     |     | 37E  | HSX | 0.68 | 63          | 43   | 43    |         |
|                     |      | 23  |     |     | 21E  | CSO | 0.51 | 67          | 39   | 37    |         |
|                     |      | 24  |     |     | 10E  | HRX | 0.43 | 38          | 21   | 21    |         |
|                     |      | 25  |     |     | 4W   | AXX | 0.38 | 13          | 7    | 2     |         |
|                     |      | 28  |     |     | 48W  | AXX | 0.80 | 4           | 4    | 4     |         |

# SUNSPOT GROUPS

JUNE 1988

| CMP Group |   | Date | Lat | L   | CMD | Type | r/R  | Sd   | Corre. Area |      | Photo | Remarks |
|-----------|---|------|-----|-----|-----|------|------|------|-------------|------|-------|---------|
| Mo-Day    |   |      |     |     |     |      |      |      | Whole       | Max  |       |         |
| 160       | 6 | 21   | -23 | 83  | 60E | AXX  | 0.89 | 4    | 5           | 5    |       |         |
| 6-25.9    |   | 22   |     |     | 48E | AXX  | 0.79 | 4    | 3           | 3    |       |         |
|           |   | 23   |     |     | 32E | BXO  | 0.63 | 8    | 5           | 3    |       |         |
|           |   | 24   |     |     | 20E | BXO  | 0.54 | 13   | 7           | 2    |       |         |
|           |   | 25   |     |     | 8E  | BXI  | 0.44 | 13   | 7           | 2    |       |         |
|           |   | 26   |     |     | 3W  | AXX  | 0.43 | 8    | 5           | 2    |       |         |
|           |   | 27   |     |     | 23W | BXI  | 0.56 | 13   | 8           | 3    | 13    |         |
|           |   | 28   |     |     | 33W | BXO  | 0.66 | 25   | 17          | 6    | 57    |         |
|           |   | 29   |     |     | 46W | BXO  | 0.78 | 17   | 13          | 7    |       |         |
|           |   | 30   |     |     | 57W | AXX  | 0.87 | 8    | 9           | 4    |       |         |
| 161       | 6 | 23   | -13 | 140 | 21W | AXX  | 0.40 | 4    | 2           | 2    |       |         |
| 6-21.7    |   |      |     |     |     |      |      |      |             |      |       |         |
| 162       | 6 | 23   | 20  | 87  | 33E | AXX  | 0.60 | 4    | 3           | 3    |       |         |
| 6-25.7    |   | 28   |     |     | 31W | AXX  | 0.57 | 4    | 3           | 3    |       |         |
| 163       | 6 | 24   | -17 | 30  | 79E | HSX  | 0.98 | 42   | 99          | 99   |       |         |
| 6-30.0    |   | 25   |     |     | 64E | HSX  | 0.91 | 97   | 115         | 115  | 176   |         |
|           |   | 26   |     |     | 50E | HSX  | 0.79 | 126  | 104         | 104  | 109   |         |
|           |   | 27   |     |     | 35E | HAX  | 0.63 | 181  | 117         | 117  | 99    |         |
|           |   | 28   |     |     | 26E | HAX  | 0.53 | 139  | 82          | 79   | 124   |         |
|           |   | 29   |     |     | 12E | CAO  | 0.39 | 164  | 89          | 80   |       |         |
|           |   | 30   |     |     | 1W  | CAO  | 0.34 | 109  | 58          | 56   |       |         |
|           | 7 | 1    |     |     | 16W | CAO  | 0.44 | 63   | 35          | 33   |       |         |
|           |   | 2    |     |     | 26W | CSO  | 0.53 | 38   | 22          | 17   | 590   | PLAT    |
|           |   | 3    |     |     | 38W | AXX  | 0.67 | 8    | 6           | 3    |       | PLAT    |
| 164       | 6 | 25   | -5  | 73  | 22E | AXX  | 0.39 | 8    | 5           | 2    |       |         |
| 6-26.7    |   |      |     |     |     |      |      |      |             |      |       |         |
| 165       | 6 | 25   | 15  | 55  | 39E | BXI  | 0.64 | 21   | 14          | 8    |       |         |
| 6-28.1    |   | 26   |     |     | 23E | CRO  | 0.43 | 17   | 9           | 7    |       |         |
|           |   | 27   |     |     | 7E  | AXX  | 0.22 | 8    | 4           | 2    |       |         |
|           |   | 28   |     |     | 1E  | BXI  | 0.21 | 8    | 4           | 2    |       |         |
|           |   | 29   |     |     | 13W | BXO  | 0.34 | 8    | 4           | 2    |       |         |
| 166       | 6 | 25   | -19 | 5   | 84E | HHX  | 0.99 | 76   | 250         | 250  | 278   |         |
| 7- 1.9    |   | 26   |     |     | 75E | FKC  | 0.97 | 942  | 1809        | 1777 | 1616  |         |
|           |   | 27   |     |     | 60E | FKC  | 0.87 | 2124 | 2182        | 2147 | 2217  |         |
|           |   | 28   |     |     | 50E | FKC  | 0.79 | 2952 | 2423        | 2372 | 1035  |         |
|           |   | 29   |     |     | 36E | FKC  | 0.67 | 3911 | 2624        | 2460 |       |         |
|           |   | 30   |     |     | 23E | FKC  | 0.52 | 3995 | 2334        | 1661 |       |         |
|           | 7 | 1    |     |     | 7E  | FKC  | 0.39 | 4458 | 2421        | 1935 |       |         |
|           |   | 2    |     |     | 1W  | FKC  | 0.37 | 4567 | 2456        | 1845 | 2819  | PLAT    |
|           |   | 3    |     |     | 14W | FKC  | 0.43 | 4193 | 2316        | 1875 | 2343  | PLAT    |
|           |   | 4    |     |     | 31W | FKC  | 0.61 | 3840 | 2421        | 1538 |       | PURP    |
|           |   | 5    |     |     | 45W | FKC  | 0.77 | 2481 | 1945        | 1170 | 2137  |         |
|           |   | 6    |     |     | 57W | EKC  | 0.86 | 1808 | 1784        | 1203 | 1640  |         |
|           |   | 7    |     |     | 68W | EKC  | 0.94 | 913  | 1366        | 384  |       |         |
|           |   | 8    |     |     | 80W | EKC  | 0.99 | 273  | 904         | 529  |       |         |

# SUNSPOT GROUPS

JUNE 1988

| CMP Group |   | Date | Lat | L   | CMD | Type | r/R  | Sd   | Corre. Area |     | Photo | Remarks |
|-----------|---|------|-----|-----|-----|------|------|------|-------------|-----|-------|---------|
| Mo-Day    |   |      |     |     |     |      |      |      | Whole       | Max |       |         |
| 167       | 6 | 26   | 13  | 1   | 85E | AXX  | 0.99 | 8    | 28          | 14  |       |         |
| 7- 2.2    |   | 27   |     |     | 66E | CRI  | 0.92 | 55   | 70          | 43  | 70    |         |
|           |   | 28   |     |     | 58E | DAI  | 0.84 | 177  | 162         | 77  | 225   |         |
|           |   | 29   |     |     | 43E | EAI  | 0.68 | 324  | 220         | 106 |       |         |
|           |   | 30   |     |     | 28E | EAI  | 0.48 | 421  | 240         | 139 |       |         |
|           | 7 | 1    |     |     | 11E | EKC  | 0.24 | 715  | 368         | 238 |       |         |
|           |   | 2    |     |     | 1E  | EKC  | 0.17 | 736  | 374         | 239 | 43    | PLAT    |
|           |   | 3    |     |     | 12W | EKC  | 0.26 | 845  | 438         | 294 | 672   | PLAT    |
|           |   | 4    |     |     | 26W | FKC  | 0.44 | 1236 | 687         | 411 |       | PURP    |
|           |   | 5    |     |     | 49W | EH1  | 0.76 | 715  | 549         | 420 | 640   |         |
|           |   | 6    |     |     | 60W | EH1  | 0.87 | 442  | 454         | 389 | 640   |         |
|           |   | 7    |     |     | 73W | EH1  | 0.95 | 269  | 449         | 365 |       |         |
|           |   | 8    |     |     | 86W | DHO  | 0.99 | 42   | 139         | 97  |       |         |
| 168       | 6 | 26   | 26  | 350 | 87E | HSX  | 0.99 | 42   | 139         | 139 |       |         |
| 7- 3.0    |   | 27   |     |     | 73E | HSX  | 0.95 | 93   | 154         | 154 | 242   |         |
|           |   | 28   |     |     | 64E | HHX  | 0.91 | 168  | 201         | 201 | 301   |         |
|           |   | 29   |     |     | 51E | HHX  | 0.80 | 240  | 202         | 202 |       |         |
|           |   | 30   |     |     | 38E | HHX  | 0.68 | 286  | 195         | 195 |       |         |
|           | 7 | 1    |     |     | 22E | HHX  | 0.52 | 320  | 187         | 187 |       |         |
|           |   | 2    |     |     | 13E | HHX  | 0.44 | 433  | 241         | 241 | 284   | PLAT    |
|           |   | 3    |     |     | 1E  | HSX  | 0.38 | 366  | 198         | 198 | 274   | PLAT    |
|           |   | 4    |     |     | 13W | CSI  | 0.43 | 378  | 209         | 204 |       | PURP    |
|           |   | 5    |     |     | 29W | HHX  | 0.59 | 315  | 195         | 192 | 214   |         |
|           |   | 6    |     |     | 40W | HSX  | 0.70 | 257  | 180         | 177 | 217   |         |
|           |   | 7    |     |     | 52W | HAX  | 0.82 | 172  | 149         | 146 |       |         |
|           |   | 8    |     |     | 65W | HAX  | 0.92 | 84   | 107         | 107 |       |         |
|           |   | 9    |     |     | 77W | HAX  | 0.98 | 42   | 99          | 99  |       |         |
| 169       | 6 | 30   | 19  | 10  | 18E | BXI  | 0.40 | 8    | 5           | 2   |       |         |
| 7- 1.5    | 7 | 1    | 19  | 10  | 2E  | BXO  | 0.28 | 8    | 4           | 2   |       |         |

# SUNSPOT GROUPS

JULY 1988

| CMP Group |   | Date | Lat | L   | CMD | Type | r/R  | Sd  | Corre. Area |     |       | Remarks |
|-----------|---|------|-----|-----|-----|------|------|-----|-------------|-----|-------|---------|
| Mo-Day    |   |      |     |     |     |      |      |     | Whole       | Max | Photo |         |
| 170       | 7 | 1    | 13  | 11  | 1E  | BXO  | 0.18 | 8   | 4           | 2   |       |         |
| 7-        |   |      |     |     |     |      |      |     |             |     |       |         |
| 171       | 7 | 4    | 29  | 307 | 30E | BXI  | 0.57 | 8   | 5           | 3   |       | PURP    |
| 7-        |   | 8    |     |     | 25W | BXO  | 0.57 | 8   | 5           | 3   |       |         |
|           |   | 9    |     |     | 39W | AXX  | 0.70 | 8   | 6           | 3   |       |         |
| 172       | 7 | 5    | 23  | 257 | 63E | BXI  | 0.90 | 8   | 9           | 5   | 54    |         |
| 7-        |   | 6    |     |     | 49E | CRO  | 0.78 | 63  | 51          | 40  | 35    |         |
|           |   | 7    |     |     | 36E | CSO  | 0.63 | 231 | 149         | 136 |       |         |
|           |   | 8    |     |     | 23E | DSI  | 0.48 | 513 | 293         | 163 | 499   |         |
|           |   | 9    |     |     | 10E | EHC  | 0.36 | 820 | 439         | 261 | 540   |         |
|           |   | 10   |     |     | 1W  | ESC  | 0.32 | 938 | 495         | 195 | 597   |         |
|           |   | 11   |     |     | 16W | EAI  | 0.41 | 589 | 323         | 166 | 532   |         |
|           |   | 12   |     |     | 27W | EAI  | 0.55 | 484 | 290         | 179 | 458   |         |
|           |   | 13   |     |     | 40W | EAI  | 0.69 | 400 | 276         | 174 | 501   |         |
|           |   | 14   |     |     | 55W | ESO  | 0.83 | 231 | 206         | 154 | 298   |         |
|           |   | 15   |     |     | 72W | CSO  | 0.95 | 55  | 91          | 84  |       |         |
|           |   | 16   |     |     | 85W | AXX  | 0.99 | 8   | 28          | 28  |       |         |
| 173       | 7 | 5    | -13 | 235 | 81E | AXX  | 0.99 | 4   | 14          | 14  |       |         |
| 7-        |   | 6    |     |     | 71E | BXO  | 0.95 | 8   | 14          | 7   |       |         |
|           |   | 7    |     |     | 57E | BXO  | 0.86 | 8   | 8           | 4   |       |         |
|           |   | 8    |     |     | 43E | BXO  | 0.71 | 8   | 6           | 3   |       |         |
|           |   | 9    |     |     | 34E | AXX  | 0.61 | 4   | 3           | 3   |       |         |
|           |   | 10   |     |     | 21E | AXX  | 0.45 | 4   | 2           | 2   |       |         |
| 174       | 7 | 7    | -18 | 284 | 12E | AXX  | 0.41 | 4   | 2           | 2   |       |         |
| 7-        |   |      |     |     |     |      |      |     |             |     |       |         |
| 175       | 7 | 7    | 23  | 212 | 82E | DSO  | 0.99 | 63  | 209         | 139 |       |         |
| 7-        |   | 8    |     |     | 68E | DSO  | 0.92 | 189 | 241         | 123 | 320   |         |
|           |   | 9    |     |     | 55E | DSO  | 0.82 | 227 | 196         | 116 | 348   |         |
|           |   | 10   |     |     | 41E | DSO  | 0.69 | 303 | 209         | 139 | 237   |         |
|           |   | 11   |     |     | 27E | EAI  | 0.53 | 202 | 119         | 74  | 252   |         |
|           |   | 12   |     |     | 17E | DAI  | 0.41 | 362 | 199         | 81  | 255   |         |
|           |   | 13   |     |     | 5E  | DAI  | 0.33 | 282 | 149         | 54  | 293   |         |
|           |   | 14   |     |     | 8W  | ERI  | 0.36 | 168 | 90          | 45  | 203   |         |
|           |   | 15   |     |     | 20W | CAI  | 0.47 | 114 | 64          | 33  |       |         |
|           |   | 16   |     |     | 31W | CRI  | 0.59 | 76  | 47          | 26  | 105   |         |
|           |   | 17   |     |     | 43W | CRO  | 0.71 | 38  | 27          | 9   |       |         |
|           |   | 18   |     |     | 56W | BXI  | 0.84 | 17  | 15          | 4   | 83    |         |
|           |   | 19   |     |     | 70W | AXX  | 0.93 | 8   | 12          | 6   |       |         |
| 176       | 7 | 8    | 19  | 237 | 46E | AXX  | 0.74 | 8   | 6           | 6   |       |         |
| 7-        |   | 9    |     |     | 34E | AXX  | 0.60 | 4   | 3           | 3   |       |         |
|           |   | 10   |     |     | 21E | AXX  | 0.41 | 4   | 2           | 2   |       |         |
|           |   | 11   |     |     | 5E  | AXX  | 0.26 | 8   | 4           | 2   |       |         |
|           |   | 12   |     |     | 6W  | AXX  | 0.28 | 8   | 4           | 2   |       |         |
|           |   | 13   |     |     | 18W | AXX  | 0.49 | 8   | 5           | 2   |       |         |
|           |   | 14   |     |     | 32W | AXX  | 0.55 | 8   | 5           | 3   |       |         |

# SUNSPOT GROUPS

JULY 1988

| CMP Group |   | Date | Lat | L   | CMD | Type | r/R  | Sd   | Corre. Area |     | Photo | Remarks |
|-----------|---|------|-----|-----|-----|------|------|------|-------------|-----|-------|---------|
| Mo-Day    |   |      |     |     |     |      |      |      | Whole       | Max |       |         |
| 177       | 7 | 9    | 27  | 219 | 38E | AXX  | 0.69 | 4    | 3           | 3   |       |         |
| 7-12.9    |   | 10   |     |     | 35E | BXI  | 0.66 | 21   | 14          | 3   | 28    |         |
|           |   | 11   |     |     | 21E | CAI  | 0.51 | 71   | 41          | 19  | 149   |         |
|           |   | 12   |     |     | 10E | DAI  | 0.43 | 143  | 79          | 46  | 140   |         |
|           |   | 13   |     |     | 2W  | DAI  | 0.39 | 147  | 80          | 41  | 139   |         |
|           |   | 14   |     |     | 15W | DRI  | 0.45 | 63   | 35          | 14  | 145   |         |
|           |   | 15   |     |     | 30W | BXI  | 0.59 | 38   | 23          | 5   |       |         |
|           |   | 16   |     |     | 43W | CRO  | 0.72 | 34   | 24          | 12  | 109   |         |
|           |   | 17   |     |     | 54W | BXO  | 0.83 | 13   | 11          | 4   |       |         |
| 178       | 7 | 10   | -16 | 254 | 2E  | AXX  | 0.33 | 4    | 2           | 2   |       |         |
| 7-10.2    |   | 11   |     |     | 12W | BXO  | 0.41 | 8    | 5           | 2   |       |         |
|           |   | 12   |     |     | 25W | BXI  | 0.53 | 8    | 5           | 2   |       |         |
|           |   | 13   |     |     | 36W | BXO  | 0.66 | 8    | 6           | 3   |       |         |
| 179       | 7 | 11   | 18  | 217 | 25E | AXX  | 0.47 | 8    | 5           | 2   |       |         |
| 7-13.0    |   | 12   |     |     | 13E | AXX  | 0.32 | 8    | 4           | 2   |       |         |
|           |   | 13   |     |     | OW  | BXI  | 0.25 | 8    | 4           | 2   |       |         |
|           |   | 14   |     |     | 15W | BXI  | 0.34 | 13   | 7           | 2   |       |         |
| 180       | 7 | 11   | -15 | 162 | 80E | HSX  | 0.99 | 25   | 83          | 83  | 139   |         |
| 7-17.2    |   | 12   |     |     | 69E | HSX  | 0.94 | 59   | 88          | 88  | 189   |         |
|           |   | 13   |     |     | 56E | HSX  | 0.84 | 101  | 93          | 93  | 116   |         |
|           |   | 14   |     |     | 42E | HSX  | 0.71 | 147  | 105         | 105 | 145   |         |
|           |   | 15   |     |     | 26E | HSX  | 0.53 | 177  | 104         | 104 |       |         |
|           |   | 16   |     |     | 14E | CSI  | 0.40 | 168  | 92          | 85  | 102   |         |
|           |   | 17   |     |     | 1E  | CSO  | 0.33 | 156  | 83          | 80  |       |         |
|           |   | 18   |     |     | 12W | CSI  | 0.38 | 156  | 84          | 77  | 114   |         |
|           |   | 19   |     |     | 24W | CSO  | 0.51 | 151  | 88          | 85  |       |         |
|           |   | 20   |     |     | 37W | HSX  | 0.66 | 114  | 75          | 75  |       |         |
|           |   | 21   |     |     | 51W | HSX  | 0.82 | 76   | 65          | 65  | 145   |         |
|           |   | 22   |     |     | 65W | HSX  | 0.92 | 38   | 48          | 48  | 351   |         |
|           |   | 23   |     |     | 79W | HSX  | 0.98 | 25   | 59          | 59  |       | PURP    |
| 181       | 7 | 12   | -21 | 152 | 77E | EHO  | 0.98 | 189  | 444         | 414 | 789   |         |
| 7-18.0    |   | 13   |     |     | 64E | EKC  | 0.92 | 639  | 813         | 573 | 1231  |         |
|           |   | 14   |     |     | 51E | EKC  | 0.83 | 1148 | 1023        | 629 | 1487  |         |
|           |   | 15   |     |     | 36E | EKC  | 0.69 | 1682 | 1162        | 813 |       |         |
|           |   | 16   |     |     | 24E | EKC  | 0.56 | 1892 | 1145        | 769 | 1650  |         |
|           |   | 17   |     |     | 11E | EKI  | 0.46 | 1951 | 1099        | 741 |       |         |
|           |   | 18   |     |     | 2W  | EKI  | 0.44 | 1892 | 1052        | 736 | 1346  |         |
|           |   | 19   |     |     | 15W | EKI  | 0.49 | 1543 | 888         | 474 |       |         |
|           |   | 20   |     |     | 28W | EKI  | 0.61 | 1337 | 843         | 477 |       |         |
|           |   | 21   |     |     | 43W | EKI  | 0.75 | 988  | 743         | 380 | 872   |         |
|           |   | 22   |     |     | 57W | EKI  | 0.86 | 589  | 581         | 319 | 830   |         |
|           |   | 23   |     |     | 70W | DAO  | 0.94 | 357  | 535         | 271 |       | PURP    |
|           |   | 24   |     |     | 84W | CSO  | 0.99 | 71   | 236         | 209 |       | PURP    |
| 182       | 7 | 16   | -15 | 145 | 31E | BXI  | 0.60 | 21   | 13          | 8   | 26    |         |
| 7-18.5    |   | 17   |     |     | 18E | BXI  | 0.45 | 17   | 9           | 2   |       |         |
|           |   | 18   |     |     | 5E  | CRI  | 0.34 | 50   | 27          | 18  | 26    |         |

# SUNSPOT GROUPS

JULY 1988

| CMP Group<br>Mo-Day | Date | Lat | L   | CMD | Type | r/R  | Sd   | Corre. Area |     |       | Remarks |
|---------------------|------|-----|-----|-----|------|------|------|-------------|-----|-------|---------|
|                     |      |     |     |     |      |      |      | Whole       | Max | Photo |         |
|                     | 19   |     |     | 8W  | BXI  | 0.34 | 17   | 9           | 2   |       |         |
|                     | 20   |     |     | 23W | AXX  | 0.49 | 8    | 5           | 2   |       |         |
|                     | 21   |     |     | 31W | BXI  | 0.61 | 8    | 5           | 3   |       |         |
| 183                 | 7    | 17  | 36  | 151 | 11E  | AXX  | 0.54 | 8           | 5   | 2     |         |
| 7-18.0              |      | 18  |     |     | 1W   | AXX  | 0.53 | 4           | 2   | 2     |         |
|                     |      | 19  |     |     | 14W  | AXX  | 0.53 | 4           | 2   | 2     |         |
|                     |      | 21  |     |     | 43W  | AXX  | 0.72 | 4           | 3   | 3     |         |
| 184                 | 7    | 17  | -21 | 135 | 27E  | AXX  | 0.60 | 4           | 3   | 3     |         |
| 7-19.2              |      | 20  |     |     | 11W  | AXX  | 0.47 | 8           | 5   | 2     |         |
|                     |      | 21  |     |     | 25W  | BXO  | 0.59 | 8           | 5   | 3     |         |
|                     |      | 22  |     |     | 37W  | CRI  | 0.70 | 29          | 21  | 15    | 29      |
|                     |      | 23  |     |     | 51W  | BXO  | 0.83 | 13          | 11  | 7     | PURP    |
|                     |      | 24  |     |     | 64W  | AXX  | 0.92 | 4           | 5   | 5     | PURP    |
| 185                 | 7    | 18  | -18 | 168 | 18W  | AXX  | 0.48 | 4           | 2   | 2     |         |
| 7-16.7              |      | 19  |     |     | 34W  | BXI  | 0.63 | 8           | 5   | 3     |         |
|                     |      | 20  |     |     | 48W  | BXO  | 0.78 | 8           | 7   | 3     |         |
|                     |      | 21  |     |     | 61W  | CAI  | 0.90 | 63          | 71  | 38    |         |
|                     |      | 22  |     |     | 74W  | DAI  | 0.97 | 71          | 137 | 73    |         |
| 186                 | 7    | 18  | -21 | 127 | 24E  | AXX  | 0.55 | 4           | 3   | 3     |         |
| 7-19.8              |      | 19  |     |     | 11E  | AXX  | 0.46 | 4           | 2   | 2     |         |
|                     |      | 21  |     |     | 11W  | AXX  | 0.45 | 4           | 2   | 2     |         |
| 187                 | 7    | 18  | -22 | 88  | 63E  | BXO  | 0.92 | 17          | 21  | 11    |         |
| 7-22.8              |      | 19  |     |     | 52E  | BXO  | 0.83 | 13          | 11  | 4     |         |
|                     |      | 20  |     |     | 38E  | BXO  | 0.71 | 8           | 6   | 3     |         |
|                     |      | 21  |     |     | 25E  | BXO  | 0.59 | 13          | 8   | 3     |         |
|                     |      | 22  |     |     | 9E   | BXI  | 0.46 | 8           | 5   | 2     |         |
|                     |      | 23  |     |     | 5W   | BXO  | 0.46 | 8           | 5   | 2     | PURP    |
| 188                 | 7    | 18  | -18 | 77  | 76E  | AXX  | 0.98 | 4           | 10  | 10    |         |
| 7-23.7              |      | 19  |     |     | 63E  | AXX  | 0.91 | 4           | 5   | 5     |         |
|                     |      | 20  |     |     | 50E  | AXX  | 0.80 | 4           | 4   | 4     |         |
|                     |      | 22  |     |     | 21E  | BXO  | 0.51 | 8           | 5   | 2     |         |
|                     |      | 27  |     |     | 45W  | BXO  | 0.79 | 8           | 7   | 3     |         |
| 189                 | 7    | 21  | 24  | 97  | 13E  | BXI  | 0.39 | 17          | 9   | 2     | 68      |
| 7-22.1              |      | 22  |     |     | 0W   | BXI  | 0.33 | 25          | 13  | 2     | 56      |
|                     |      | 23  |     |     | 12W  | BXI  | 0.38 | 17          | 9   | 2     | PURP    |
|                     |      | 24  |     |     | 26W  | BXI  | 0.52 | 21          | 12  | 2     | PURP    |
|                     |      | 25  |     |     | 40W  | BXO  | 0.68 | 8           | 6   | 3     |         |
|                     |      | 26  |     |     | 49W  | BXO  | 0.78 | 8           | 7   | 3     |         |
| 190                 | 7    | 22  | 12  | 12  | 88E  | AXX  | 0.99 | 13          | 42  | 42    |         |
| 7-28.6              |      | 23  |     |     | 80E  | ESO  | 0.98 | 137         | 325 | 286   | PURP    |
|                     |      | 24  |     |     | 65E  | ESO  | 0.89 | 151         | 163 | 149   | PURP    |
|                     |      | 25  |     |     | 43E  | CHI  | 0.67 | 349         | 234 | 220   |         |
|                     |      | 26  |     |     | 34E  | CHI  | 0.55 | 421         | 252 | 240   | 227     |
|                     |      | 27  |     |     | 20E  | CHO  | 0.36 | 446         | 239 | 234   | 333     |

S U N S P O T G R O U P S

JULY 1988

| CMP Group | Mo-Day | Date | Lat | L   | CMD | Type | r/R  | Sd   | Corre. Area | Whole | Max | Photo | Remarks |
|-----------|--------|------|-----|-----|-----|------|------|------|-------------|-------|-----|-------|---------|
| 191       | 7      | 23   | -22 | 103 | 15W | BXI  | 0.53 | 17   | 10          | 2     | 288 |       |         |
| 192       | 7      | 24   | 21  | 110 | 38W | BXI  | 0.62 | 21   | 13          | 3     | 272 |       |         |
| 193       | 7      | 24   | -24 | 359 | 73E | ESO  | 0.97 | 63   | 121         | 81    | 270 |       |         |
| 194       | 7      | 25   | 21  | 34  | 20E | BXO  | 0.41 | 8    | 5           | 2     | 268 |       |         |
| 195       | 7      | 25   | 15  | 355 | 62E | AXX  | 0.89 | 4    | 5           | 5     | 213 |       |         |
| 196       | 7      | 26   | -22 | 10  | 33E | AXX  | 0.64 | 8    | 5           | 3     | 295 |       |         |
| 197       | 7      | 27   | 28  | 303 | 81E | DSI  | 0.99 | 219  | 723         | 376   | 642 |       |         |
| 198       | 7      | 28   | 28  |     | 8E  | AXX  | 0.47 | 4    | 2           | 2     | 706 |       |         |
| 199       | 7      | 28   | 27  |     | 22E | AXX  | 0.57 | 4    | 3           | 3     | 642 |       |         |
| 200       | 7      | 28   | 27  |     | 33E | AXX  | 0.64 | 8    | 5           | 3     | 395 |       |         |
| 201       | 7      | 28   | 27  |     | 86W | HSX  | 0.99 | 13   | 42          | 42    | 252 |       |         |
| 202       | 7      | 28   | 27  |     | 73W | DSC  | 0.95 | 147  | 246         | 77    | 497 |       |         |
| 203       | 7      | 28   | 27  |     | 57W | DAC  | 0.84 | 463  | 425         | 170   | 413 |       |         |
| 204       | 7      | 28   | 27  |     | 44W | DKC  | 0.69 | 656  | 453         | 290   | 413 |       |         |
| 205       | 7      | 28   | 27  |     | 31W | DKC  | 0.52 | 607  | 472         | 295   | 268 |       |         |
| 206       | 7      | 28   | 27  |     | 18W | DAC  | 0.33 | 631  | 335         | 154   | 268 |       |         |
| 207       | 7      | 28   | 27  |     | 8W  | DAC  | 0.20 | 315  | 161         | 58    | 213 |       |         |
| 208       | 7      | 28   | 27  |     | 23E | BXI  | 0.41 | 13   | 7           | 2     | 213 |       |         |
| 209       | 7      | 28   | 27  |     | 37E | AXX  | 0.60 | 8    | 5           | 3     | 213 |       |         |
| 210       | 7      | 28   | 27  |     | 55E | AXX  | 0.82 | 8    | 7           | 4     | 213 |       |         |
| 211       | 7      | 28   | 27  |     | 62E | AXX  | 0.89 | 4    | 5           | 5     | 213 |       |         |
| 212       | 7      | 28   | 27  |     | 194 | 7    | 25   | 21   | 34          | 2     | 213 |       |         |
| 213       | 7      | 28   | 27  |     | 72W | HAX  | 0.97 | 135  | 258         | 178   | 162 |       |         |
| 214       | 7      | 28   | 27  |     | 58W | DKC  | 0.90 | 278  | 313         | 223   | 375 |       |         |
| 215       | 7      | 28   | 27  |     | 46W | DKC  | 0.79 | 433  | 356         | 231   | 303 |       |         |
| 216       | 7      | 28   | 27  |     | 32W | DKC  | 0.66 | 723  | 479         | 340   | 310 |       |         |
| 217       | 7      | 28   | 27  |     | 21W | DKC  | 0.54 | 816  | 485         | 310   | 510 |       |         |
| 218       | 7      | 28   | 27  |     | 12W | DAI  | 0.49 | 749  | 431         | 266   | 447 |       |         |
| 219       | 7      | 28   | 27  |     | 18E | DKC  | 0.52 | 967  | 565         | 312   | 566 |       |         |
| 220       | 7      | 28   | 27  |     | 32E | DKI  | 0.66 | 967  | 640         | 562   | 678 |       |         |
| 221       | 7      | 28   | 27  |     | 45E | DKI  | 0.78 | 366  | 293         | 179   | 270 |       |         |
| 222       | 7      | 28   | 27  |     | 52E | DRI  | 0.84 | 147  | 135         | 62    | 270 |       |         |
| 223       | 7      | 28   | 27  |     | 73E | ESO  | 0.97 | 63   | 121         | 81    | 270 |       |         |
| 224       | 7      | 28   | 27  |     | 63W | AXX  | 0.86 | 4    | 4           | 4     | 270 |       |         |
| 225       | 7      | 28   | 27  |     | 58W | AXX  | 0.85 | 4    | 4           | 4     | 270 |       |         |
| 226       | 7      | 28   | 27  |     | 38W | BXI  | 0.62 | 21   | 13          | 3     | 270 |       |         |
| 227       | 7      | 28   | 27  |     | 69W | BXO  | 0.95 | 8    | 14          | 7     | 270 |       |         |
| 228       | 7      | 28   | 27  |     | 58W | BXO  | 0.89 | 8    | 9           | 5     | 270 |       |         |
| 229       | 7      | 28   | 27  |     | 50W | BXO  | 0.82 | 17   | 15          | 4     | 270 |       |         |
| 230       | 7      | 28   | 27  |     | 27W | BXI  | 0.62 | 17   | 11          | 3     | 270 |       |         |
| 231       | 7      | 28   | 27  |     | 15W | BXI  | 0.53 | 17   | 10          | 2     | 270 |       |         |
| 232       | 7      | 28   | 27  |     | 86W | HSX  | 0.99 | 34   | 111         | 111   | 232 |       |         |
| 233       | 7      | 28   | 27  |     | 73W | HSX  | 0.95 | 101  | 168         | 166   | 232 |       |         |
| 234       | 7      | 28   | 27  |     | 59W | HSX  | 0.85 | 240  | 228         | 226   | 280 |       |         |
| 235       | 7      | 28   | 27  |     | 46W | CSO  | 0.71 | 294  | 210         | 210   | 280 |       |         |
| 236       | 7      | 28   | 27  |     | 34W | HSX  | 0.55 | 349  | 209         | 209   | 178 |       |         |
| 237       | 7      | 28   | 27  |     | 25W | HSX  | 0.41 | 315  | 173         | 173   | 272 |       |         |
| 238       | 7      | 28   | 27  |     | 6E  | CSO  | 0.16 | 429  | 217         | 213   | 288 |       |         |
| 239       | 7      | 28   | 27  |     | 44E | FKC  | 0.72 | 1106 | 802         | 406   | 706 |       |         |
| 240       | 7      | 28   | 27  |     | 73E | FKC  | 0.95 | 652  | 1087        | 288   | 642 |       |         |
| 241       | 7      | 28   | 27  |     | 81E | DSI  | 0.99 | 219  | 723         | 376   | 395 |       |         |
| 242       | 7      | 28   | 27  |     | 8E  | AXX  | 0.47 | 4    | 2           | 2     | 706 |       |         |
| 243       | 7      | 28   | 27  |     | 22E | AXX  | 0.57 | 4    | 3           | 3     | 642 |       |         |
| 244       | 7      | 28   | 27  |     | 33E | AXX  | 0.64 | 8    | 5           | 3     | 395 |       |         |
| 245       | 7      | 28   | 27  |     | 86W | HSX  | 0.99 | 13   | 42          | 42    | 252 |       |         |
| 246       | 7      | 28   | 27  |     | 73W | DSC  | 0.95 | 147  | 246         | 77    | 497 |       |         |
| 247       | 7      | 28   | 27  |     | 57W | DAC  | 0.84 | 463  | 425         | 170   | 413 |       |         |
| 248       | 7      | 28   | 27  |     | 44W | DKC  | 0.69 | 656  | 453         | 290   | 413 |       |         |
| 249       | 7      | 28   | 27  |     | 31W | DKC  | 0.52 | 607  | 472         | 295   | 268 |       |         |
| 250       | 7      | 28   | 27  |     | 18W | DAC  | 0.33 | 631  | 335         | 154   | 268 |       |         |
| 251       | 7      | 28   | 27  |     | 8W  | DAC  | 0.20 | 315  | 161         | 58    | 213 |       |         |
| 252       | 7      | 28   | 27  |     | 23E | BXI  | 0.41 | 13   | 7           | 2     | 213 |       |         |
| 253       | 7      | 28   | 27  |     | 37E | AXX  | 0.60 | 8    | 5           | 3     | 213 |       |         |
| 254       | 7      | 28   | 27  |     | 55E | AXX  | 0.82 | 8    | 7           | 4     | 213 |       |         |
| 255       | 7      | 28   | 27  |     | 62E | AXX  | 0.89 | 4    | 5           | 5     | 213 |       |         |

# SUNSPOT GROUPS

JULY 1988

| CMP Group |   | Date | Lat | L   | CMD Type | r/R      | Sd   | Corre. Area |     | Photo | Remarks |
|-----------|---|------|-----|-----|----------|----------|------|-------------|-----|-------|---------|
| Mo-Day    |   |      |     |     |          |          |      | Whole       | Max |       |         |
|           |   | 31   |     |     | 32E      | FKI 0.60 | 1749 | 1091        | 629 | 534   |         |
|           | 8 | 1    |     |     | 20E      | FKI 0.48 | 1581 | 903         | 336 |       |         |
|           |   | 2    |     |     | 8E       | FKI 0.38 | 1543 | 834         | 273 | 756   |         |
|           |   | 3    |     |     | 4W       | FKI 0.37 | 1463 | 787         | 271 | 707   |         |
|           |   | 4    |     |     | 15W      | FAI 0.44 | 1114 | 619         | 129 | 615   |         |
|           |   | 5    |     |     | 30W      | FKI 0.56 | 1135 | 687         | 229 |       |         |
|           |   | 6    |     |     | 39W      | FAI 0.68 | 892  | 607         | 183 |       |         |
|           |   | 7    |     |     | 54W      | FAC 0.83 | 904  | 805         | 195 |       |         |
|           |   | 8    |     |     | 63W      | FAC 0.89 | 551  | 592         | 185 | 703   |         |
|           |   | 9    |     |     | 76W      | EAC 0.97 | 328  | 630         | 137 | 404   |         |
|           |   | 10   |     |     | 85W      | DAC 0.99 | 80   | 264         | 125 |       |         |
| 198       | 7 | 28   | 26  | 68  | 50W      | BXI 0.78 | 13   | 10          | 3   | 22    |         |
| 7-24.3    |   |      |     |     |          |          |      |             |     |       |         |
| 199       | 7 | 28   | 35  | 290 | 85E      | AXX 0.99 | 8    | 28          | 28  | 485   |         |
| 8- 3.7    | 8 | 2    |     |     | 19E      | BXI 0.56 | 8    | 5           | 3   |       |         |
|           |   | 4    |     |     | 5W       | AXX 0.49 | 4    | 2           | 2   |       |         |
| 200       | 7 | 30   | 26  | 326 | 22E      | DRI 0.48 | 71   | 41          | 31  | 61    | PURP    |
| 8- 1.0    |   | 31   |     |     | 12E      | CRO 0.40 | 34   | 18          | 14  | 14    |         |
|           | 8 | 1    |     |     | 0W       | BXO 0.33 | 17   | 9           | 4   |       |         |
|           |   | 2    |     |     | 19W      | CRI 0.43 | 97   | 53          | 35  | 46    |         |
|           |   | 3    |     |     | 34W      | CRI 0.60 | 151  | 94          | 87  | 165   |         |
|           |   | 4    |     |     | 48W      | CRI 0.76 | 93   | 71          | 55  | 62    |         |
|           |   | 5    |     |     | 67W      | CRI 0.92 | 50   | 64          | 54  |       |         |
|           |   | 6    |     |     | 77W      | CRO 0.97 | 17   | 32          | 24  |       |         |
| 201       | 7 | 31   | -24 | 287 | 50E      | BXO 0.84 | 8    | 8           | 4   |       |         |
| 8- 4.0    | 8 | 1    |     |     | 36E      | BXO 0.75 | 6    | 6           | 3   |       |         |
|           |   | 2    |     |     | 23E      | BXI 0.62 | 13   | 6           | 3   |       |         |
|           |   | 3    |     |     | 12E      | BXO 0.53 | 13   | 7           | 5   | 25    |         |
|           |   | 4    |     |     | 1W       | AXX 0.51 | 6    | 5           | 2   | 7     |         |
|           |   | 6    |     |     | 29W      | AXX 0.67 | 8    | 6           | 3   |       |         |

## H-ALPHA SOLAR FLARES

JUNE 1988

| Day | Sta  | T i m e    |          |          | Lat | L   | CMD | Area Measurement |            |           | Imp | Obs Type | A.R. | Remarks |
|-----|------|------------|----------|----------|-----|-----|-----|------------------|------------|-----------|-----|----------|------|---------|
|     |      | Start (UT) | Max (UT) | End (UT) |     |     |     | Cen Dist         | Appar (Sd) | Corr (Sp) |     |          |      |         |
| 1   | BEIJ | 0210       | 0212     | 0219     | S21 | 113 | W61 | .885             | 42         | 45        | -N  | C        | 132  |         |
| 1   | BEIJ | 2344       | 2346     | 2354     | N25 | 353 | E47 | .782             | 42         | 34        | -N  | P        | 139  |         |
| 2   | YUNN | 0332       | 0335     | 0345     | S23 | 92  | W54 | .843             | 241        | 224       | 1B  | C        | 132  |         |
| 3   | YUNN | 0237E      | 0241     | 0249     | S20 | 323 | E63 | .907             | 32         |           | -N  | P        | 142  |         |
| 6   | YUNN | 0118E      | 0118U    | 0120D    | N18 | 359 | W12 | .374             | 113        | 61        | -N  | P        | 138  | E       |
| 9   | YUNN | 0140       | 0143     | 0147     | S16 | 279 | E28 | .538             | 64         | 38        | -F  | C        | 144  | T       |
| 9   | YUNN | 0146E      | 0146U    | 0148     | S18 | 283 | E24 | .497             | 96         | 55        | -N  | P        | 144  | T       |
| 9   | YUNN | 0203       | 0211     | 0214     | S17 | 277 | E29 | .551             | 96         | 58        | -N  | C        | 144  | T       |
| 9   | YUNN | 0250       | 0254     | 0254D    | S17 | 277 | E29 | .549             | 32         | 19        | -F  | P        | 144  | T       |
| 10  | BEIJ | 0336E      | 0342     | 0352     | S17 | 271 | E21 | .460             | 126        | 71        | -N  | P        | 144  | D       |
| 11  | YUNN | 0118E      | 0118U    | 0134     | S15 | 276 | E 4 | .276             | 161        | 84        | -N  | P        | 144  | E       |
| 11  | YUNN | 0208       | 0219     | 0240     | S17 | 275 | E 5 | .312             | 225        | 118       | 1N  | C        | 144  | F       |
| 11  | BEIJ | 0649       | 0651     | 0709     | N27 | 339 | W62 | .897             | 42         | 48        | -N  | P        | 141  | E       |
| 11  | BEIJ | 0855       | 0856     | 0904     | N15 | 2   | W86 | 1.               | 50         |           | 1N  | P        | 138  | D       |
| 12  | BEIJ | 0614       | 0617     | 0621     | S23 | 325 | W61 | .897             | 84         | 95        | -B  | P        | 142  | CD      |
| 12  | YUNN | 0651       | 0655     | 0705D    | S23 | 327 | W63 | .913             | 80         |           | -N  | C        | 142  |         |
| 12  | YUNN | 0751E      | 0751U    | 0755     | N12 | 243 | E21 | .407             | 80         | 44        | -N  | P        | 148  |         |
| 16  | YUNN | 0136E      | 0136U    | 0144     | S13 | 276 | W62 | .890             | 257        | 282       | 2B  | P        | 144  |         |
| 16  | YUNN | 0257       | 0258     | 0304     | N11 | 243 | W30 | .516             | 32         | 19        | -F  | C        | 148  | D       |
| 17  | BEIJ | 0232       | 0239     | 0255     | N13 | 243 | W43 | .701             | 84         | 59        | -B  | C        | 143  | E       |
| 17  | WLMQ | 0235E      | 0236     | 0244     | N13 | 244 | W45 | .696             | 16         | 11        | -F  | C        | 148  | D       |
| 17  | BEIJ | 0342       | 0346     | 0443     | S18 | 157 | E43 | .724             | 378        | 274       | 2B  | C        | 152  | E       |
| 17  | WLMQ | 0344E      | 0349     | 0415     | S17 | 156 | E44 | .728             | 113        | 82        | -N  | C        | 152  | E       |
| 18  | BEIJ | 0535       | 0537     | 0541     | S17 | 152 | E33 | .598             | 121        | 75        | -N  | C        | 152  | D       |
| 18  | BEIJ | 0603E      | 0606     |          | S18 | 154 | E31 | .598             | 294        | 183       | 1B  | C        | 152  | DK      |
| 18  | BEIJ |            | 0611     | 0620     | S19 | 154 | E31 | .589             | 336        | 208       | 1B  | C        | 152  |         |
| 18  | BEIJ | 0653       | 0655     | 0700     | S19 | 154 | E31 | .598             | 42         | 26        | -N  | C        | 152  | D       |
| 19  | WLMQ | 0059       | 0100     | 0105     | S21 | 97  | E77 | .976             | 64         |           | -N  | C        | 159  | D       |
| 20  | BEIJ | 0228E      | 0233     | 0240     | S17 | 156 | E 4 | .310             | 126        | 66        | -F  | C        | 152  | D       |
| 20  | BEIJ | 0345       | 0348     | 0355     | S17 | 157 | E 3 | .310             | 84         | 44        | -F  | C        | 152  | E       |
| 21  | WLMQ | 0220E      | 0224     | 0234     | S16 | 150 | W 3 | .304             | 48         | 25        | -F  | C        | 152  | E       |
| 22  | WLMQ | 0107       | 0109     | 0120     | S17 | 154 | W19 | .456             | 96         | 54        | -N  | C        | 152  | D       |



## H-ALPHA SOLAR FLARES

JUNE-JULY 1988

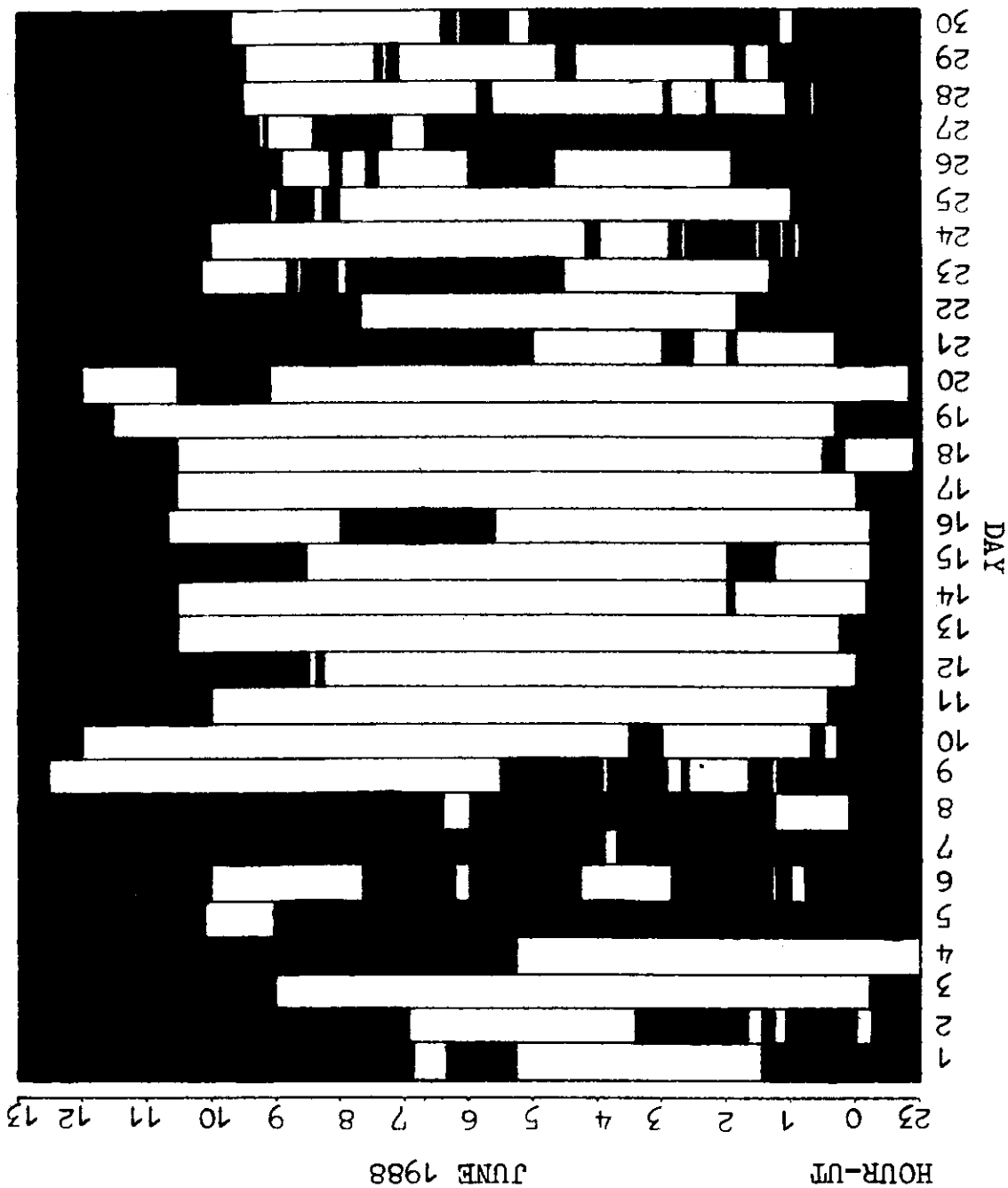
|           |      | T i m e    |          |          | Area Measurement |     |     |          |            |           |     |          |      |         |  |  |
|-----------|------|------------|----------|----------|------------------|-----|-----|----------|------------|-----------|-----|----------|------|---------|--|--|
| Day       | Sta  | Start (UT) | Max (UT) | End (UT) | Lat              | L   | CMD | Cen Dist | Appar (Sd) | Corr (Sp) | Imp | Obs Type | A.R. | Remarks |  |  |
| JUNE 1988 |      |            |          |          |                  |     |     |          |            |           |     |          |      |         |  |  |
| 30        | YUNN | 0504E      | 0504U    | 0508     | S17              | 360 | E27 | .549     | 64         | 38        | -B  | P        | 166  | T       |  |  |
| 30        | YUNN | 0624E      | 0630     | 0639     | N13              | 356 | E30 | .518     | 161        | 94        | -F  | P        | 167  |         |  |  |
| 30        | YUNN | 0820       | 0823     | 0855     | S21              | 4   | E21 | .525     | 370        | 217       | 1B  | C        | 166  | FT      |  |  |
| 30        | YUNN | 0904E      | 0908     | 0940     | S16              | 2   | E23 | .493     | 338        | 194       | 1B  | P        | 166  | FHT     |  |  |
| JULY 1988 |      |            |          |          |                  |     |     |          |            |           |     |          |      |         |  |  |
| 1         | YUNN | 0836E      | 0844U    | 0905     | S19              | 17  | W 5 | .388     | 321        | 174       | 1B  | P        | 166  |         |  |  |
| 2         | BEIJ | 0048       | 0100     | 0137     | S19              | 14  | W11 | .425     | 1030       | 569       | 2B  | C        | 166  | U       |  |  |
| 2         | BEIJ | 0145       | 0147     | 0150     | N13              | 356 | E 6 | .207     | 29         | 15        | -F  | C        | 167  | E       |  |  |
| 2         | BEIJ | 0530       | 0532     | 0535     | N13              | 355 | E 5 | .184     | 50         | 25        | -F  | C        | 167  | D       |  |  |
| 2         | BEIJ | 0635       | 0644     | 0655     | S23              | 10  | W11 | .460     | 463        | 261       | 2N  | C        | 166  | D       |  |  |
| 2         | BEIJ | 0653       | 0655     | 0657     | N13              | 354 | E 5 | .184     | 59         | 30        | -F  | C        | 167  | D       |  |  |
| 3         | BEIJ | 0043       | 0046     | 0055     | S17              | 4   | W15 | .425     | 126        | 70        | -N  | C        | 166  | D       |  |  |
| 3         | BEIJ | 0054       | 0055     | 0100     | N16              | 5   | W16 | .345     | 92         | 49        | -N  | C        | 167  | E       |  |  |
| 7         | YUNN | 0600E      | 0604U    | 0635D    | N13              | 10  | W76 | .968     | 32         |           | -N  | P        | 167  |         |  |  |
| 7         | YUNN | 0727E      | 0729U    | 0745     | N13              | 12  | W79 | .979     | 48         |           | -N  | P        | 167  |         |  |  |
| 13        | YUNN | 0025E      | 0039U    | 0039D    | N30              | 221 | W 4 | .441     | 402        | 224       | 1B  | P        | 177  |         |  |  |
| 13        | YUNN | 0030       | 0035     | 0048     | S20              | 149 | E68 | .945     | 161        |           | 1B  | C        | 181  |         |  |  |
| 13        | BEIJ | 0033E      | 0033U    | 0131     | N29              | 219 | W 2 | .425     | 442        | 244       | 1B  | C        | 177  | E       |  |  |
| 13        | BEIJ | 0033E      |          |          | S23              | 146 | E71 | .942     | 29         |           | -F  | P        | 181  | D       |  |  |
| 13        | BEIJ | 0107E      | 0107U    | 0123     | N21              | 212 | E 5 | .310     | 105        | 55        | -B  | C        | 175  | D       |  |  |
| 13        | BEIJ | 0132E      | 0137U    |          | S23              | 148 | E69 | .931     | 50         |           | -B  | P        | 181  | D       |  |  |
| 13        | BEIJ | 0426       | 0430     | 0437     | S19              | 148 | E67 | .920     | 46         |           | -F  | C        | 181  | E       |  |  |
| 13        | BEIJ | 0428       | 0430     | 0459     | N29              | 220 | W 5 | .425     | 252        | 139       | 1B  | C        | 177  | E       |  |  |
| 13        | BEIJ | 0444       | 0446     | 0448     | S22              | 150 | E65 | .920     | 42         |           | -F  | C        | 181  | D       |  |  |
| 13        | BEIJ | 0528       | 0535     | 0536D    | S23              | 146 | E68 | .931     | 67         |           | -F  | C        | 181  | D       |  |  |
| 14        | YUNN | 0638       | 0645     | 0722     | N25              | 216 | W15 | .425     | 32         | 18        | -N  | C        | 177  |         |  |  |
| 14        | BEIJ | 0647E      | 0650     | 0655     | N25              | 212 | W12 | .402     | 105        | 57        | -F  | P        | 175  | E       |  |  |
| 17        | YUNN | 0419       | 0431     | 0442     | S21              | 159 | E 3 | .428     | 32         | 18        | -N  | C        | 181  | E       |  |  |
| 18        | YUNN | 0221       | 0223     | 0231     | S18              | 147 | E 3 | .383     | 80         | 43        | -N  | C        | 181  | E       |  |  |
| 18        | YUNN | 0305       | 0317     | 0330     | S20              | 159 | W 9 | .443     | 64         | 36        | -N  | C        | 181  |         |  |  |
| 18        | YUNN | 0742       | 0802     | 0817     | S23              | 160 | W13 | .513     | 48         | 28        | -N  | C        | 181  |         |  |  |
| 18        | BEIJ | 0759       | 0800     | 0812     |                  |     |     |          |            |           | 1N  | V        |      | E       |  |  |

## H-ALPHA SOLAR FLARES

JULY 1988

| Day | Sta  | T i m e    |          |          | Lat | L   | CMD | Area Measurement |            |           | Imp | Obs Type | A.R. | Remarks |
|-----|------|------------|----------|----------|-----|-----|-----|------------------|------------|-----------|-----|----------|------|---------|
|     |      | Start (UT) | Max (UT) | End (UT) |     |     |     | Cen Dist         | Appar (Sd) | Corr (Sp) |     |          |      |         |
| 20  | YUNN | 0128       | 0137     | 0247     | S20 | 173 | W49 | .806             | 32         | 27        | -N  | C        | 185  |         |
| 20  | YUNN | 0254       | 0306     | 0312     | S17 | 174 | W51 | .817             | 32         | 28        | -N  | C        | 185  |         |
| 21  | YUNN | 0709E      | 0709U    | 0719     | S17 | 159 | W51 | .817             | 161        | 140       | 1B  | P        | 181  |         |
| 22  | BEIJ | 0155E      | 0158     | 0203     | S18 | 157 | W60 | .874             | 130        | 134       | 1B  | C        | 181  | D       |
| 22  | BEIJ | 0556E      | 0557     | 0600     | S18 | 159 | W64 | .897             | 95         | 107       | 1F  | C        | 181  | E       |
| 26  | BEIJ | 0251E      | 0255U    | 0312     |     |     |     |                  |            |           | 1N  | V        |      | D       |
| 27  | YUNN | 0740E      | 0744     | 0755     | S23 | 0   | E28 | .639             | 402        | 261       | 2N  | P        | 193  |         |
| 31  | YUNN | 0800E      | 0804U    | 0813D    | N34 | 294 | E41 | .738             | 32         | 24        | -B  | P        | 199  |         |
| 31  | YUNN | 0855E      | 0902U    | 0902D    | N13 | 355 | W21 | .378             | 32         | 17        | -B  | P        | 195  |         |

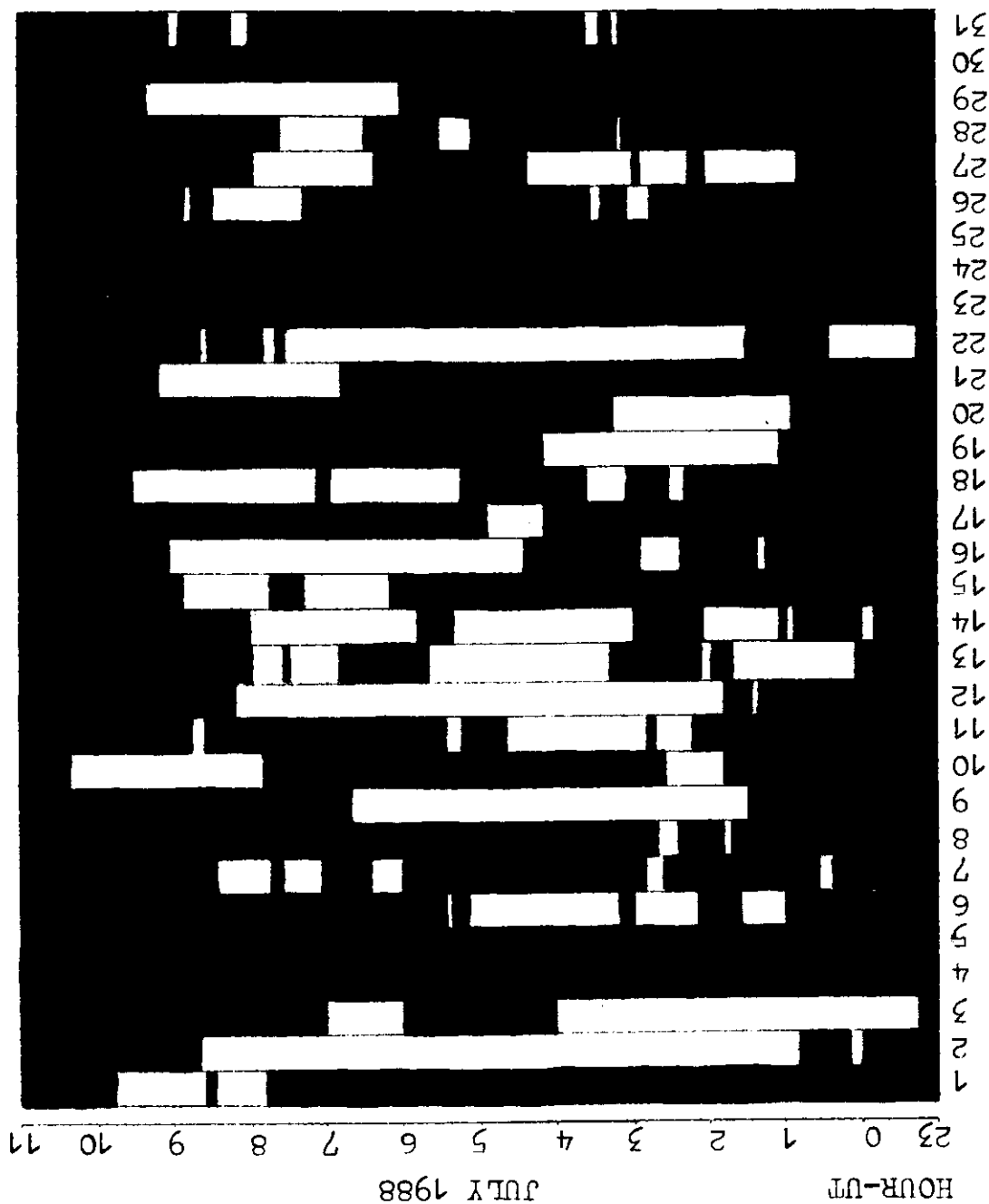
# INTERVALS OF H-ALPHA FLARE PATROL OBSERVATION



Combined reports from the observatories listed below.

BEIJ YUNN WLMQ

DAY



Combined reports from the observatories listed below.

BEIJ YUNN

# SOLAR RADIO EMISSION FLUX

JUNE 1988

| Day  | PURP<br>2700 | YUNN<br>2840 | BEIJ<br>2840 |
|------|--------------|--------------|--------------|
| 1    | 136          | 148          | 132          |
| 2    | 129          | 142          | 128          |
| 3    | 132          | 145          | 133          |
| 4    | 136          | 147          | 142          |
| 5    | 136          | 147          | 138          |
| 6    | 140          | 149          | 139          |
| 7    | 144          | 151          | 131          |
| 8    | 110          | 152          | 140          |
| 9    | 149          | 156          | 149          |
| 10   | 139          | 148          | 137          |
| 11   | 125          | 140          | 127          |
| 12   | 123          | 132          | 119          |
| 13   | 110          | 122          | 107          |
| 14   | 103          | 119          | 106          |
| 15   | 109          | 128          | 101          |
| 16   | 106          | 129          | 106          |
| 17   | 116          | 130          | 104          |
| 18   | 113          | 130          | 108          |
| 19   | 109          | 122          | 104          |
| 20   | 107          | 119          | 104          |
| 21   | 117          | 122          | 103          |
| 22   | 109          | 121          | 106          |
| 23   | 109          | 131          | 106          |
| 24   | 114          | 130          | 108          |
| 25   | 129          | 144          | 120          |
| 26   | 134          | 147          | 130          |
| 27   | 145          | 155          | 142          |
| 28   | 143          | 160          | 145          |
| 29   | 149          | 177          | 158          |
| 30   | 162          | 176          | 163          |
| Mean | 126.1        | 140.6        | 124.5        |

## SOLAR RADIO EMISSION FLUX

JULY 1988

| Day  | PURP<br>2700 | YUNN<br>2840 | BEIJ<br>2840 |
|------|--------------|--------------|--------------|
| 1    | 170          | 185          | 152          |
| 2    | 181          | 198          | 172          |
| 3    | 171          | 182          |              |
| 4    | 164          | 176          | 165          |
| 5    | 153          | 166          | 156          |
| 6    | 148          | 161          | 146          |
| 7    | 140          | 152          | 125          |
| 8    | 138          | 147          | 125          |
| 9    | 123          | 137          | 123          |
| 10   | 121          | 130          | 118          |
| 11   | 133          | 144          | 130          |
| 12   | 121          | 134          | 120          |
| 13   | 132          | 144          | 127          |
| 14   | 129          | 143          | 126          |
| 15   | 131          | 143          | 129          |
| 16   | 133          | 146          | 127          |
| 17   | 136          | 149          | 129          |
| 18   | 136          | 148          | 132          |
| 19   | 141          | 146          | 132          |
| 20   | 133          | 131          | 127          |
| 21   | 131          | 142          | 122          |
| 22   | 131          | 142          | 123          |
| 23   | 126          | 140          | 121          |
| 24   | 132          | 142          | 123          |
| 25   | 118          | 135          | 118          |
| 26   | 133          | 146          | 129          |
| 27   | 143          | 154          | 136          |
| 28   | 146          | 154          | 146          |
| 29   | 155          | 166          | 152          |
| 30   | 160          | 169          | 154          |
| 31   | 171          | 175          | 155          |
| Mean | 141.3        | 152.5        | 134.7        |

## SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

JUNE 1988

| Day | Freq | Sta  | Type   | Start<br>(UT) | Time of<br>Maximum<br>(UT) | Duration<br>(Min) | Flux<br>Peak | Density<br>Rel | Mean |
|-----|------|------|--------|---------------|----------------------------|-------------------|--------------|----------------|------|
| 4   | 2840 | YUNN | 45 C   | 0426.7        | 0428.2                     | 4.8               | 18           |                |      |
| 7   | 2840 | BEIJ | 45 C   | 0608          | 0610.5                     | 8                 | 33.0         | 25.2           |      |
| 11  | 2840 | YUNN | 1 S    | 0556.2        | 0557.1                     | 5.9               | 7            |                |      |
| 11  | 2840 | YUNN | 1 S    | 0650.9        | 0651.7                     | 2.8               | 8            |                |      |
| 15  | 2840 | YUNN | 5 S    | 0031          | 0033.4                     | 14                | 9            | 8.5            |      |
| 17  | 2840 | YUNN | 45 C   | 0336.8        | 0346                       | 28.2              | 82           |                |      |
| 17  | 2840 | BEIJ | 46 C   | 0340          | 0345.8                     | 30                | 77.2         | 74.2           |      |
| 18  | 2840 | YUNN | 5 S    | 0602          | 0603.4                     | 3.5               | 13           |                |      |
| 19  | 2840 | YUNN | 45 C   | 0222.8        | 0224.6                     | 8.8               | 15           |                |      |
| 19  | 2840 | YUNN | 45 C   | 0750.4        | 0754.1                     | 10.7              | 8            |                |      |
| 21  | 2840 | YUNN | 45 C   | 0309.5        | 0311.8                     | 34                | 33           |                |      |
| 21  | 2840 | BEIJ | 5 S    | 0329          | 0329.3                     | 4                 | 30.3         | 29.5           |      |
| 21  | 2700 | PURP | 3 S    | 0522          | 0525.7                     | 7                 | 75           |                |      |
| 21  | 2840 | YUNN | 3 S    | 0522.5        | 0526.1                     | 9.5               | 80           |                |      |
| 21  | 2840 | BEIJ | 5 S    | 0524          | 0524.9                     | 2                 | 72           | 69.9           |      |
| 21  | 2840 | YUNN | 45 C   | 0654.1        | 0655.2                     | 8.4               | 45           |                |      |
| 21  | 2840 | BEIJ | 5 S    | 0707          | 0708.2                     | 3                 | 44.6         | 43.3           |      |
| 21  | 2840 | BEIJ | 5 S    | 2339          | 2339.9                     | 2                 | 14.2         | 13.4           |      |
| 22  | 2700 | PURP | 1 S    | 0346.0        | 0347.9                     | 4                 | 19           |                |      |
| 22  | 2840 | YUNN | 20 GRF | 0511.3        | 0526.9                     | 11.9              | 20           |                |      |
| 22  | 2700 | PURP | 20 GRF | 0516          | 0526.6                     | 19                | 21           |                |      |
| 22  | 2700 | PURP | 1 S    | 0544.9        | 0545.9                     | 1.4               | 9            |                |      |
| 23  | 2700 | PURP | 1 S    | 0237.7        | 0238.5                     | 1.3               | 11           |                |      |
| 24  | 2840 | YUNN | 45 C   | 0417.5        | 0422.9                     | 17.2              | 208 D        |                |      |
| 24  | 2700 | PURP | 3 S    | 0419          | 0422.8                     | 11                | 247          |                |      |
| 24  | 2840 | YUNN | 29 PBI | 0434.7        |                            | 123.8             | 14           |                |      |
| 24  | 2840 | BEIJ | 45 C   | 0421          | 0424.2                     | 35                | 245.8        | 227.6          |      |
| 24  | 2840 | BEIJ | 29 PBI | 0456          | 0553                       | 140               | 6.9          | 6.3            |      |
| 25  | 2700 | PURP | 3 S    | 0210.0        | 0213.1                     | 10                | 55           |                |      |
| 25  | 2840 | BEIJ | 3 S    | 0212          | 0214                       | 13                | 53.0         | 44.1           |      |
| 26  | 2700 | PURP | 45 C   | 0015.0        | 0020.8                     |                   | 86           |                |      |
| 26  | 2700 | PURP | 45 C   |               | 0024.7                     | 22.1              | 32           |                |      |
| 26  | 2840 | BEIJ | 45 C   | 0018          | 0021.0                     | 11                | 87.8         | 67.5           |      |
| 26  | 2840 | BEIJ | 29 PBI | 0029          |                            | 42                | 3.9          | 3.0            |      |
| 26  | 2700 | PURP | 2 S/F  | 0238.0        | 0239.4                     | 4.0               | 12           |                |      |
| 28  | 2700 | PURP | 1 S    | 0441.5        | 0443.0                     | 9.5               | 23           |                |      |
| 28  | 2840 | YUNN | 5 S    | 0442.3        | 0444.1                     | 4.7               | 28           |                |      |
| 28  | 2840 | YUNN | 45 C   | 0954.3        | 0956.8                     | 16.3              | 269          |                |      |

## SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

JUNE-JULY 1988

| Day | Freq | Sta | Type | Start<br>(UT) | Time of<br>Maximum<br>(UT) | Duration<br>(Min) | Peak<br>Flux | Rel<br>Density | Mean |
|-----|------|-----|------|---------------|----------------------------|-------------------|--------------|----------------|------|
|-----|------|-----|------|---------------|----------------------------|-------------------|--------------|----------------|------|

JUNE 1988

|    |      |      |        |        |        |      |       |      |  |
|----|------|------|--------|--------|--------|------|-------|------|--|
| 29 | 2700 | PURP | 3 S    | 0028.0 | 0029.4 | 5.0  | 69    |      |  |
| 29 | 2840 | BEIJ | 5 S    | 0029.5 | 0031.4 | 4.5  | 89.4  | 56.6 |  |
| 29 | 2840 | PURP | 3 S    | 0046.0 | 0049.0 | 13.0 | 80    |      |  |
| 29 | 2840 | BEIJ | 5 S    | 0046   | 0049.7 | 8    | 65.2  | 41.3 |  |
| 29 | 2840 | BEIJ | 29 PBI | 0054   |        | 47.6 | 6.2   | 3.9  |  |
| 29 | 2840 | BEIJ | 5 S    | 0150   | 0151.4 | 5    | 48.5  | 30.7 |  |
| 29 | 2840 | BEIJ | 29 PBI | 0155   |        | 15   | 2.6   | 1.6  |  |
| 29 | 2700 | PURP | 3 S    | 0151.0 | 0151.5 | 4.0  | 57    |      |  |
| 29 | 2840 | BEIJ | 21 GRF | 0306.5 | 0313   | 23.5 | 3.5   | 2.2  |  |
| 29 | 2840 | BEIJ | 8 S    | 0310.8 | 0311   | 0.4  | 26.97 | 17.1 |  |
| 29 | 2840 | BEIJ | 3 S    | 0610   | 0614   | 11   | 16.7  | 10.6 |  |
| 29 | 2840 | BEIJ | 3 S    | 0613   | 0614.4 | 7    | 18    |      |  |
| 29 | 2840 | YUNN | 5 S    | 0613   | 0614.6 | 3    | 16    |      |  |
| 29 | 2840 | YUNN | 45 C   | 0728.8 | 0736.5 | 27.2 | 347   |      |  |
| 29 | 2840 | YUNN | 29 PBI | 0806   |        | 73.2 | 21    |      |  |
| 30 | 2840 | BEIJ | 20 GRF | 0156   | 0201.4 | 46   | 8.2   | 5.0  |  |
| 30 | 2840 | YUNN | 45 C   | 0819.5 | 0821.8 | 5.3  | 25    |      |  |
| 30 | 2840 | YUNN | 45 C   | 0903   | 0904   | 16.5 | 263   |      |  |

JULY 1988

|    |      |      |        |        |        |      |      |      |  |
|----|------|------|--------|--------|--------|------|------|------|--|
| 1  | 2840 | YUNN | 45 C   | 0841.1 | 0845.6 | 13.4 | 27   |      |  |
| 2  | 2840 | BEIJ | 45 C   | 0041   | 0046.2 | 40   | 47.3 | 27.5 |  |
| 2  | 2840 | BEIJ | 1 S    | 0404   | 0406.4 | 5    | 8.0  | 4.6  |  |
| 2  | 2840 | BEIJ | 3 S    | 0637   | 0642.9 | 24   | 68.9 | 40.1 |  |
| 2  | 2840 | YUNN | 45 C   | 0641.8 | 0642.8 | 3.7  | 83   |      |  |
| 3  | 2840 | BEIJ | 45 C   | 0043   | 0044.1 | 9.6  | 67.9 | 44.1 |  |
| 3  | 2840 | BEIJ | 5 S    |        | 0052.6 | 30.4 | 47.9 | 31.3 |  |
| 5  | 2700 | PURP | 1 S    | 0429.0 | 0429.5 | 2.0  | 34   |      |  |
| 8  | 2840 | YUNN | 45 C   | 0334.1 | 0335.4 | 4.3  | 78   |      |  |
| 8  | 2840 | YUNN | 45 C   | 0934.4 | 0936.1 | 9    | 31   |      |  |
| 13 | 2700 | PURP | 4 S/F  | 0028.2 | 0029.7 | 3.0  | 39   |      |  |
| 13 | 2840 | BEIJ | 46 C   | 0029   | 0030   | 7    | 56.3 | 44.3 |  |
| 13 | 2840 | BEIJ | 46 C   | 0106   | 0030.4 |      | 34.8 | 27.4 |  |
| 13 | 2840 | BEIJ | 1 S    | 0428   | 0107.2 | 3    | 7.4  | 5.8  |  |
| 13 | 2840 | BEIJ | 46 C   | 0430   | 0429.5 | 2    | 57.5 | 45.3 |  |
| 13 | 2840 | BEIJ | 29 PBI | 0611   |        | 14   | 3.7  | 2.9  |  |
| 13 | 2840 | BEIJ | 45 C   | 0611   | 0613.3 | 11   | 9.2  | 7.3  |  |
| 13 | 2840 | YUNN | 45 C   | 0611.1 | 0613.3 | 11.3 | 10   |      |  |
| 15 | 2840 | YUNN | 5 S    | 0900.5 | 0900.9 | 1    | 17   |      |  |

## SOLAR RADIO EMISSION OUTSTANDING OCCURRENCES

JULY 1988

| Day | Freq | Sta  | Type   | Start<br>(UT) | Time of<br>Maximum<br>(UT) | Duration<br>(Min) | Peak   | Flux<br>Rel | Density<br>Mean |
|-----|------|------|--------|---------------|----------------------------|-------------------|--------|-------------|-----------------|
| 19  | 2840 | BEIJ | 46 C   | 0025          | 0027.2                     | 23                | 45.2   | 34.3        |                 |
| 21  | 2840 | BEIJ | 46 C   | 0128          | 0131                       | 14                | 53.6   | 44.7        |                 |
| 21  | 2700 | PURP | 45 C   | 0128.2        | 0131.0                     | 5.3               | 58     |             |                 |
| 21  | 2700 | PURP | 2 S/F  | 0424.4        | 0425.2                     | 3.8               | 11     |             |                 |
| 21  | 2840 | BEIJ | 45 C   | 0706          | 0708.4                     | 5                 | 72.6   | 60.5        |                 |
| 21  | 2840 | YUNN | 45 C   | 0706          | 0708.3                     | 6.3               | 78     |             |                 |
| 24  | 2700 | PURP | 2 S/F  | 0049.9        | 0050.9                     | 2.0               | 12     |             |                 |
| 24  | 2840 | BEIJ | 47 GB  | 0618          | 0649 E                     |                   | 506.8D | 412.0D      |                 |
| 24  | 2840 | BEIJ |        |               | 0655                       | 52                | 189.9D | 154.4D      |                 |
| 24  | 2840 | BEIJ | 29 PBI | 0710          |                            | 70                | 50.1D  | 40.7D       |                 |
| 24  | 2700 | PURP | 28 PRE | 0619.2        |                            | 16.3              |        |             |                 |
| 24  | 2700 | PURP | 47 GB  | 0635.5        | 0647.6                     | 32.0              | 545    |             |                 |
| 24  | 2700 | PURP | 29 PBI | 0707.5        |                            | 27.0U             |        |             |                 |
| 24  | 2840 | YUNN | 47 GB  | 0630 U        | 0647.7                     | 52.5              | 732    |             |                 |
| 24  | 2840 | YUNN | 29 PBI | 0722.5        |                            | 49.7              | 19     |             |                 |
| 25  | 2700 | PURP | 7 C    | 0441.7        | 0447.3                     | 8.1               | 11     |             |                 |
| 27  | 2840 | BEIJ | 1 S    | 0333          | 0334.3                     | 3                 | 9.3    | 6.8         |                 |
| 27  | 2840 | YUNN | 45 C   | 0334          | 0334.9                     | 3.7               | 19     |             |                 |
| 27  | 2840 | YUNN | 45 C   | 0641.4        | 0642.9                     | 18.9              | 20     |             |                 |
| 28  | 2840 | YUNN | 41 F   | 0730.4        | 0733.9                     | 5.8               | 25     |             |                 |
| 29  | 2700 | PURP | 1 S    | 0037.0        | 0039.2                     | 4.3               | 19     |             |                 |
| 29  | 2840 | BEIJ | 5 S    | 0037.2        | 0038.4                     | 9                 | 22.9   | 15.1        |                 |
| 29  | 2840 | YUNN | 1 S    | 0528.2        | 0528.7                     | 3.8               | 9      |             |                 |

# INTERVALS OF SOLAR RADIO EMISSION PATROL OBSERVATION

JUNE 1988

| Day | PURP<br>From To | YUNN<br>From To | BEIJ<br>From To |
|-----|-----------------|-----------------|-----------------|
|     | 2700            | 2840            | 2840            |

|    |           |           |           |
|----|-----------|-----------|-----------|
| 1  | 0000 0737 | 0230 0830 | 0000 0720 |
| 2  | 2347 2400 | 0200 0700 | 2321 2400 |
| 3  | 0000 0742 | 0206 0700 | 0000 0550 |
| 4  | 2339 2347 | 0212 0700 | 2321 2400 |
| 5  | 0002 0741 | 0248 0700 | 0000 0650 |
| 6  | 2315 2400 | 0250 0645 | 2342 2400 |
| 7  | 0000 0737 | 0245 0810 | 2328 2400 |
| 8  | 2332 2400 | 0200 0510 | 0000 0715 |
| 9  | 0000 0740 | 0100 0700 | 2320 2400 |
| 10 | 2351 2400 | 0315 0800 | 0000 0722 |
| 11 | 0000 0641 | 0120 0750 | 0000 0722 |
| 12 | 2345 2400 | 0215 0610 | 0000 0803 |
| 13 | 0000 0643 | 0040 0803 | 2340 2400 |
| 14 | 2342 2400 | 0200 0837 | 0000 0720 |
| 15 | 0019 0641 | 0150 0400 | 0046 0720 |
| 16 | 0000 0642 | 0620 0805 | 2334 2400 |
| 17 | 0000 0640 | 0105 0930 | 2332 2400 |
| 18 | 2322 2400 | 0201 0807 | 0000 0430 |
| 19 | 0000 0640 | 0157 0808 | 2336 2400 |
| 20 | 0309 0503 | 0155 0701 | 0000 0531 |
| 21 | 2314 2400 | 0115 0706 | 0005 0915 |
| 22 | 0000 0637 | 0105 0705 | 2315 2400 |
| 23 | 2343 2400 | 0140 0700 | 0000 0723 |
| 24 | 0000 0640 | 0057 0947 | 2331 2400 |
| 25 | 0010 0649 | 0029 1012 | 0000 0716 |
| 26 | 2342 2400 | 0038 0940 | 2325 2400 |
|    | 0000 0732 |           | 2328 2400 |
|    | 2323 2400 |           | 0000 0722 |
|    | 0000 0640 |           | 2334 2400 |
|    | 2342 2400 |           | 0000 0718 |
|    | 0000 0640 |           | 2336 2400 |
|    | 2342 2400 |           | 0000 0651 |
|    | 0000 0732 |           | 2352 2400 |

# INTERVALS OF SOLAR RADIO EMISSION PATROL OBSERVATION

JUNE-JULY 1988

| Day | PURP<br>From To<br>2700 | YUNN<br>From To<br>2840 | BEIJ<br>From To<br>2840 |
|-----|-------------------------|-------------------------|-------------------------|
|-----|-------------------------|-------------------------|-------------------------|

JUNE 1988

|    |           |           |           |
|----|-----------|-----------|-----------|
| 27 | 0000 0500 | 0047 1010 | 0000 0720 |
| 28 | 2355 2400 | 0022 1042 | 2334 2400 |
| 29 | 0023 0707 | 0054 0945 | 0000 0720 |
| 30 | 0000 0642 | 0032 1015 | 0000 0720 |
|    | 2341 2400 |           | 2335 2400 |

JULY 1988

|    |           |           |           |
|----|-----------|-----------|-----------|
| 1  | 0000 0642 | 0053 1012 | 0000 0723 |
| 2  | 2325 2400 | 0042 0800 | 2330 2400 |
| 3  | 0000 0442 |           | 0000 0915 |
| 4  | 2313 2352 | 0052 0952 | 2350 2400 |
| 5  | 0054 0623 |           | 0000 0813 |
| 6  | 0127 0640 | 0304 0900 | 0255 0634 |
| 7  | 2324 2352 |           | 2340 2400 |
| 8  | 0005 0645 | 0211 0920 | 0000 0715 |
| 9  | 2328 2400 |           | 2348 2400 |
| 10 | 0000 0030 | 0116 1015 | 0000 0520 |
| 11 | 0520 0630 |           | 2330 2400 |
| 12 | 2324 2400 | 0130 0932 | 0000 0720 |
| 13 | 0000 0635 |           | 2343 2400 |
| 14 | 2322 2400 | 0154 1015 | 0000 0715 |
| 15 | 0000 0630 |           | 2331 2400 |
| 16 | 2325 2400 | 0044 0944 | 0000 0650 |
| 17 | 0000 0635 |           | 2351 2400 |
| 18 | 2315 2400 | 0200 0800 | 0000 0711 |
| 19 | 2333 2400 |           | 2358 2400 |
| 20 | 0000 0635 | 0045 1000 | 0000 0630 |
| 21 | 2334 2400 |           | 2336 2400 |
| 22 | 0000 0635 | 0055 1000 | 0000 0720 |
| 23 | 2343 2400 |           | 2351 2400 |
| 24 | 0000 0637 | 0034 1000 | 0000 0711 |
| 25 | 2339 2400 |           | 2332 2400 |
| 26 | 0000 0637 | 0240 0832 | 0000 0722 |
| 27 | 2347 2400 |           | 2328 2400 |
| 28 | 0000 0640 | 0030 1002 | 0000 0720 |
| 29 | 2342 2400 |           | 2331 2400 |
| 30 | 0000 0640 | 0020 0937 | 0000 0650 |
| 31 | 2320 2337 |           | 2336 2400 |
| 32 | 0219 0732 | 0140 0850 | 0000 0455 |
| 33 | 2340 2400 |           | 2354 2400 |
| 34 | 0000 0635 | 0130 0910 | 0000 0649 |
| 35 | 2339 2400 |           | 2339 2400 |
| 36 | 0000 0635 |           | 0000 0721 |
| 37 | 2331 2400 |           | 2346 2400 |

# INTERVALS OF SOLAR RADIO EMISSION PATROL OBSERVATION

JULY 1988

| Day | PURP<br>From To<br>2700                                                                              | YUNN<br>From To<br>2840                                                                 | BEIJ<br>From To<br>2840                                                                                           |
|-----|------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| 20  | 0000 0635<br>2335 2400<br>0000 0636<br>2340 2400<br>0000 0635                                        | 0125 0910<br>0120 0832<br>0000 0714<br>2358 2400<br>0000 0455<br>2341 2400<br>0000 0905 | 0000 0658<br>2343 2400<br>0000 0720<br>2345 2400<br>0000 0714<br>2358 2400<br>0000 0455<br>2341 2400<br>0000 0905 |
| 21  | 0000 0636<br>2340 2400<br>0000 0635<br>2333 2349<br>0112 0636<br>2329 2400<br>0000 0801              | 0125 0910<br>0120 0832<br>0000 0714<br>2358 2400<br>0000 0455<br>2341 2400<br>0000 0905 | 0000 0636<br>2340 2400<br>0000 0635<br>2333 2349<br>0112 0636<br>2329 2400<br>0000 0801                           |
| 22  | 0000 0635<br>2333 2349<br>0112 0636<br>2329 2400<br>0000 0801                                        | 0125 0910<br>0120 0832<br>0000 0714<br>2358 2400<br>0000 0455<br>2341 2400<br>0000 0905 | 0000 0635<br>2333 2349<br>0112 0636<br>2329 2400<br>0000 0801                                                     |
| 23  | 0000 0801<br>2324 2400<br>0000 0040<br>0240 0640<br>2331 2400<br>0000 0637<br>2342 2400<br>0000 0702 | 0225 0907<br>0115 0915<br>0000 0720<br>2342 2400<br>0000 0721<br>2342 2400<br>0000 0715 | 0000 0801<br>2324 2400<br>0000 0040<br>0240 0640<br>2331 2400<br>0000 0637<br>2342 2400<br>0000 0702              |
| 24  | 0000 0640<br>0240 0640<br>2331 2400<br>0000 0637<br>2342 2400<br>0000 0702                           | 0225 0907<br>0115 0915<br>0000 0720<br>2342 2400<br>0000 0721<br>2342 2400<br>0000 0715 | 0000 0640<br>0240 0640<br>2331 2400<br>0000 0637<br>2342 2400<br>0000 0702                                        |
| 25  | 0000 0640<br>0240 0640<br>2331 2400<br>0000 0637<br>2342 2400<br>0000 0702                           | 0225 0907<br>0115 0915<br>0000 0720<br>2342 2400<br>0000 0721<br>2342 2400<br>0000 0715 | 0000 0640<br>0240 0640<br>2331 2400<br>0000 0637<br>2342 2400<br>0000 0702                                        |
| 26  | 0000 0637<br>2342 2400<br>0000 0702<br>2345 2400<br>0000 0655<br>2345 2400<br>0000 0645<br>2340 2400 | 0155 0950<br>0045 1037<br>0109 0958<br>0057 0944<br>0120 0948<br>0245 1008              | 0000 0637<br>2342 2400<br>0000 0702<br>2345 2400<br>0000 0655<br>2345 2400<br>0000 0645<br>2340 2400              |
| 27  | 0000 0637<br>2342 2400<br>0000 0702<br>2345 2400<br>0000 0655<br>2345 2400<br>0000 0645<br>2340 2400 | 0155 0950<br>0045 1037<br>0109 0958<br>0057 0944<br>0120 0948<br>0245 1008              | 0000 0637<br>2342 2400<br>0000 0702<br>2345 2400<br>0000 0655<br>2345 2400<br>0000 0645<br>2340 2400              |
| 28  | 0000 0655<br>2345 2400<br>0000 0645<br>2340 2400<br>0000 0637<br>2342 2400<br>0000 0702              | 0109 0958<br>0057 0944<br>0120 0948<br>0245 1008                                        | 0000 0655<br>2345 2400<br>0000 0645<br>2340 2400<br>0000 0637<br>2342 2400<br>0000 0702                           |
| 29  | 0000 0645<br>2340 2400<br>0000 0637<br>2342 2400<br>0000 0702                                        | 0057 0944<br>0120 0948<br>0245 1008                                                     | 0000 0645<br>2340 2400<br>0000 0637<br>2342 2400<br>0000 0702                                                     |
| 30  | 0000 0700<br>2340 2400<br>0000 0645<br>2337 2400<br>0000 0750                                        | 0120 0948<br>0245 1008                                                                  | 0000 0700<br>2340 2400<br>0000 0645<br>2337 2400<br>0000 0750                                                     |
| 31  | 0006 0653                                                                                            | 0245 1008                                                                               | 2338 2400                                                                                                         |

## SUDDEN IONOSPHERIC DISTURBANCES (D Layer)

JULY 1988

| Day | Sta  | Start<br>(UT) | Max<br>(UT) | End<br>(UT) | Imp | LF    | SPA<br>VLF | SFA<br>LF    |
|-----|------|---------------|-------------|-------------|-----|-------|------------|--------------|
| 4   | YUNN | 0226          | 0226        | 0251        | 1-  | - 0.6 |            |              |
| 4   | LINT | 0223          | 0228        | 0246        | 1-  | - 0.6 |            | - 1.3        |
| 5   | LINT | 0058          | 0110        | 0128U       | 1-  | - 0.2 |            | + 0.7        |
| 5   | LINT | 0430          | 0434        | 0454        | 1-  | - 0.6 |            | - 0.6        |
| 5   | YUNN | 0432          | 0435        | 0514        | 1-  | - 0.7 |            |              |
| 6   | LINT | 0450          | 0456        | 0520        | 1-  | - 0.4 |            | - 1.1        |
| 7   | LINT | 0558          | 0607        | 0714        | 2-  | - 3.7 |            | - 2.1, +1.5  |
| 7   | LINT | 0722          | 0727        | 0834        | 3-  | - 6.5 |            | + 3.6        |
| 7   | YUNN | 0722          | 0728        | 0803        | 2-  | - 3.4 |            |              |
| 7   | YUNN | 0837          | 0952        | 1057        | 3+  | - 9.3 |            |              |
| 8   | YUNN | 0333          | 0340        | 0425        | 1   | - 1.8 |            |              |
| 8   | LINT | 0333          | 0341        | 0438        | 2-  | - 3.3 |            | - 1.6, +1.4  |
| 8   | YUNN | 0754          | 0760        | 0833        | 2-  | - 3.3 |            |              |
| 8   | LINT | 0754          | 0800        | 0858        | 2-  | - 4.0 |            | - 1.5        |
| 8   | LINT | 0938          | 0944        | 1005        | 1   | - 1.5 |            | + 1.5        |
| 9   | LINT | 0651          | 0700        | 0721D       | 1   | - 1.1 |            | - 0.9        |
| 9   | YUNN | 0718          | 0721        | 0756        | 1   | - 0.6 |            |              |
| 9   | LINT | 0718          | 0726        | 0810        | 1+  | - 3.0 |            | - 1.1        |
| 10  | LINT | 0652          | 0702        | 0717D       | 1   | - 1.5 |            | - 1.0        |
| 10  | YUNN | 0711          | 0714        | 0738        | 1-  | - 0.6 |            |              |
| 10  | LINT | 0713          | 0720        | 0750        | 1   | - 1.1 |            | - 0.7        |
| 10  | LINT | 2339          | 2347        | 0110        | 3-  | - 6.1 |            | + 5.9        |
| 11  | LINT | 2346          | 0010        | 0106D       | 1-  | - 0.8 |            | + 1.2        |
| 11  | LINT | 0032          | 0041        | 0120        | 1   | - 1.2 |            | + 2.3        |
| 12  | YUNN | 0002          | 0012        | 0017        | 2-  | - 3.6 |            |              |
| 12  | YUNN | 0714          | 0724        | 0754        | 1-  | - 0.4 |            |              |
| 12  | YUNN | 1003          | 1007        | 1100        | 2   | - 4.7 |            |              |
| 13  | YUNN | 0005          | 0007        | 0012        | 1   | - 1.9 |            |              |
| 13  | YUNN | 0029          | 0034        | 0119        | 2   | - 4.1 |            |              |
| 13  | LINT | 0030          | 0035        | 0110        | 2-  | - 3.8 | - 2.5      | - 1.2, + 0.9 |
| 13  | YUNN | 0430          | 0433        | 0453        | 1   | - 1.4 |            |              |
| 13  | LINT | 0430          | 0433        | 0504        | 1   | - 1.8 | - 0.8      | - 1.5        |
| 13  | YUNN | 0532          | 0535        | 0550        | 1-  | - 0.5 |            |              |
| 13  | YUNN | 0615          | 0618        | 0628        | 1-  | - 0.4 |            |              |
| 14  | YUNN | 0113          | 0119        | 0124        | 3+  | - 0.9 |            |              |
| 16  | YUNN | 1015          | 1020        | 1100        | 2+  | - 5.2 |            |              |
| 18  | LINT | 0027          | 0032        | 0047U       | 1-  | - 0.8 | 0          | - 0.5        |
| 18  | LINT | 0400          | 0418        | 0457        | 1-  | - 0.6 | 0          | - 2.5        |
| 18  | LINT | 0532          | 0536        | 0550        | 1-  | - 0.4 | 0          | - 1.6        |
| 19  | LINT | 0027          | 0037        | 0138        | 2   | - 5.0 | - 6.6      | - 1.1, +1.4  |
| 19  | YUNN | 0752          | 0759        | 0819        | 1   | - 0.8 |            |              |
| 20  | YUNN | 1023          | 1030        | 1100        | 2+  | - 5.5 |            |              |
| 21  | LINT | 0120          | 0127        | 0228        | 1+  | - 2.3 | - 3.3      | - 1.1        |
| 21  | YUNN | 0130          | 0136        | 0226        | 1+  | - 3.0 |            |              |
| 21  | LINT | 0455          | 0500        | 0510        | 1-  | - 0.4 | 0          | - 4.0        |
| 24  | LINT | 0025          | 0030        | 0035U       | 1-  | - 0.4 | - 2.6      | - 0.3        |
| 24  | LINT | 0338          | 0342        | 0357        | 1-  | - 0.4 | 0          | - 0.8        |
| 24  | LINT | 0635          | 0700        | 0900        | 2+  | - 5.8 | 0          | - 1.8, +1.2  |

## SUDDEN IONOSPHERIC DISTURBANCES (D Layer)

JULY 1988

| Day | Sta  | Start<br>(UT) | Max<br>(UT) | End<br>(UT) | Imp | SPA   |       | SFA<br>LF   |
|-----|------|---------------|-------------|-------------|-----|-------|-------|-------------|
|     |      |               |             |             |     | LF    | VLF   |             |
| 25  | LINT | 0138          | 0148        | 0210        | 1-  | - 0.3 | - 1.3 | - 0.6       |
| 26  | LINT | 0021          | 0030        | 0048        | 1   | - 1.2 | 0     | 0           |
| 26  | LINT | 0154          | 0200        | 0214D       | 1-  | - 0.9 | - 0.8 | - 0.6       |
| 26  | LINT | 0210          | 0220        | 0230        | 1-  | - 0.5 | - 1.0 | - 0.6       |
| 26  | LINT | 0238          | 0244        | 0309        | 1-  | - 0.8 | - 0.9 | + 0.2       |
| 27  | LINT | 0156          | 0159        | 0210        | 1-  | - 0.4 | - 0.8 | - 0.4       |
| 27  | LINT | 0333          | 0343        | 0420        | 1-  | - 0.9 | 0     | - 0.2       |
| 27  | LINT | 0746          | 0747        | 0850        | 2-  | - 3.7 | 0     | - 0.9       |
| 28  | LINT | 0009          | 0015        | 0026        | 1   | - 1.9 | - 1.7 | + 0.8       |
| 28  | LINT | 0235          | 0255        | 0354        | 2-  | - 3.5 | - 2.3 | - 0.6, +1.8 |
| 28  | LINT | 0440          | 0445        | 0513        | 1-  | - 0.9 | 0     | - 0.8       |
| 28  | LINT | 0732          | 0737        | 0752        | 1-  | - 0.9 | 0     | - 1.6       |
| 29  | LINT | 0039          | 0042        | 0058        | 1-  | - 0.4 | - 0.6 | + 1.2       |
| 30  | LINT | 0009          | 0044        | 0119D       | 1+  | - 2.1 | - 1.7 | + 2.8       |
| 30  | LINT | 0156          | 0159        | 0211U       | 1-  | - 0.6 | - 1.3 | 0           |
| 30  | LINT | 0234          | 0238        | 0249U       | 1-  | - 0.6 | - 1.3 | - 0.8       |
| 30  | LINT | 0258          | 0308        | 0348        | 1   | - 1.4 | - 2.2 | - 1.8       |
| 30  | LINT | 0653          | 0700        | 0729        | 1   | - 1.3 | 0     | + 1.4       |
| 30  | LINT | 0847          | 0854        | 1010        | 3   | - 7.2 | 0     | + 5.1       |
| 31  | LINT | 2353          | 0002        | 0023        | 1+  | - 2.9 | - 1.0 | - 1.5, +1.1 |
| 31  | LINT | 0330          | 0343        | 0438        | 1-  | - 0.4 | 0     | + 0.4       |
| 31  | LINT | 0720          | 0731        | 0908        | 3-  | - 6.9 | 0     | + 6.7       |

# GEOMAGNETIC ACTIVITY INDICES K AND A<sub>k</sub>

JUNE 1988

| Day  | Three-Hourly Indices K |     |     |      |       |       |       |       | Sum  | Ak   |
|------|------------------------|-----|-----|------|-------|-------|-------|-------|------|------|
|      | 0-3                    | 3-6 | 6-9 | 9-12 | 12-15 | 15-18 | 18-21 | 21-24 |      |      |
| 1    | 2                      | 2   | 3   | 3    | 2     | 2     | 2     | 1     | 17   | 9    |
| 2 Q  | 2                      | 3   | 2   | 3    | 2     | 2     | 2     | 3     | 19   | 10   |
| 3 Q  | 2                      | 2   | 2   | 1    | 1     | 2     | 1     | 2     | 13   | 6    |
| 4 Q  | 2                      | 2   | 2   | 2    | 2     | 2     | 1     | 2     | 15   | 7    |
| 5    | 3                      | 2   | 2   | 2    | 4     | 2     | 4     | 2     | 21   | 13   |
| 6    | 3                      | 3   | 3   | 3    | 1     | 2     | 2     | 2     | 19   | 11   |
| 7    | 3                      | 3   | 4   | 3    | 1     | 1     | 2     | 2     | 19   | 12   |
| 8    | 2                      | 3   | 3   | 3    | 2     | 1     | 2     | 2     | 18   | 10   |
| 9    | 2                      | 2   | 3   | 3    | 3     | 3     | 3     | 2     | 21   | 12   |
| 10   | 4                      | 5   | 5   | 3    | 2     | 2     | 1     | 2     | 24   | 20   |
| 11   | 2                      | 3   | 3   | 1    | 2     | 2     | 1     | 1     | 15   | 8    |
| 12 Q | 1                      | 3   | 2   | 2    | 2     | 2     | 1     | 3     | 16   | 8    |
| 13   | 3                      | 3   | 2   | 2    | 1     | 0     | 2     | 3     | 16   | 9    |
| 14 D | 3                      | 5   | 6   | 4    | 3     | 3     | 3     | 2     | 29   | 28   |
| 15   | 3                      | 3   | 3   | 1    | 1     | 2     | 3     | 3     | 19   | 11   |
| 16   | 2                      | 3   | 2   | 1    | 2     | 1     | 1     | 2     | 14   | 7    |
| 17   | 4                      | 3   | 3   | 2    | 3     | 2     | 2     | 2     | 21   | 13   |
| 18   | 3                      | 3   | 2   | 3    | 2     | 5     | 4     | 3     | 25   | 19   |
| 19 D | 2                      | 4   | 4   | 4    | 4     | 4     | 4     | 2     | 28   | 22   |
| 20   | 3                      | 3   | 4   | 2    | 3     | 1     | 1     | 3     | 20   | 13   |
| 21 Q | 3                      | 2   | 3   | 2    | 2     | 2     | 1     | 1     | 16   | 8    |
| 22   | 3                      | 3   | 3   | 2    | 3     | 2     | 2     | 2     | 20   | 11   |
| 23   | 3                      | 3   | 3   | 2    | 3     | 2     | 3     | 2     | 21   | 12   |
| 24   | 3                      | 4   | 3   | 3    | 4     | 5     | 3     | 3     | 28   | 22   |
| 25 D | 3                      | 5   | 5   | 5    | 3     | 4     | 4     | 4     | 33   | 32   |
| 26   | 4                      | 3   | 3   | 1    | 2     | 3     | 4     | 4     | 24   | 17   |
| 27   | 3                      | 3   | 2   | 3    | 1     | 3     | 3     | 2     | 20   | 12   |
| 28   | 3                      | 4   | 4   | 3    | 3     | 2     | 2     | 3     | 24   | 16   |
| 29 D | 4                      | 5   | 6   | 3    | 4     | 4     | 4     | 3     | 33   | 33   |
| 30 D | 2                      | 3   | 4   | 3    | 4     | 3     | 3     | 3     | 25   | 17   |
|      |                        |     |     |      |       |       |       |       | Sum  | 428  |
|      |                        |     |     |      |       |       |       |       | Mean | 14.3 |

GEOMAGNETIC ACTIVITY INDICES K AND A<sub>k</sub>

JULY 1988

| Day  | Three-Hourly Indices K |     |     |      |       |       |       |       |    |    |      | Sum | A <sub>k</sub> |
|------|------------------------|-----|-----|------|-------|-------|-------|-------|----|----|------|-----|----------------|
|      | 0-3                    | 3-6 | 6-9 | 9-12 | 12-15 | 15-18 | 18-21 | 21-24 |    |    |      |     |                |
| 1    | 2                      | 4   | 4   | 3    | 3     | 2     | 3     | 3     | 24 | 16 |      |     |                |
| 2    | 3                      | 3   | 3   | 2    | 2     | 2     | 2     | 2     | 19 | 10 |      |     |                |
| 3    | 2                      | 3   | 2   | 3    | 2     | 2     | 3     | 2     | 19 | 10 |      |     |                |
| 4 Q  | 3                      | 2   | 3   | 3    | 1     | 1     | 1     | 2     | 16 | 9  |      |     |                |
| 5 Q  | 3                      | 1   | 3   | 1    | 1     | 3     | 3     | 2     | 17 | 10 |      |     |                |
| 6    | 4                      | 4   | 3   | 3    | 3     | 3     | 2     | 2     | 24 | 16 |      |     |                |
| 7    | 3                      | 3   | 4   | 3    | 2     | 1     | 3     | 1     | 20 | 13 |      |     |                |
| 8    | 2                      | 2   | 3   | 2    | 2     | 2     | 3     | 2     | 19 | 10 |      |     |                |
| 9 Q  | 3                      | 1   | 2   | 1    | 1     | 0     | 0     | 2     | 10 | 5  |      |     |                |
| 10   | 2                      | 3   | 2   | 2    | 2     | 2     | 2     | 3     | 18 | 9  |      |     |                |
| 11 D | 4                      | 4   | 4   | 3    | 4     | 3     | 3     | 3     | 28 | 21 |      |     |                |
| 12   | 2                      | 5   | 5   | 3    | 4     | 3     | 3     | 3     | 28 | 24 |      |     |                |
| 13 Q | 4                      | 3   | 3   | 1    | 1     | 1     | 2     | 2     | 17 | 10 |      |     |                |
| 14   | 3                      | 5   | 3   | 1    | 2     | 1     | 3     | 2     | 20 | 14 |      |     |                |
| 15   | 3                      | 4   | 2   | 3    | 3     | 5     | 4     | 3     | 27 | 21 |      |     |                |
| 16 D | 3                      | 4   | 5   | 4    | 4     | 2     | 2     | 2     | 26 | 21 |      |     |                |
| 17   | 3                      | 2   | 3   | 3    | 3     | 1     | 2     | 2     | 19 | 11 |      |     |                |
| 18   | 1                      | 3   | 4   | 3    | 2     | 3     | 1     | 2     | 19 | 12 |      |     |                |
| 19   | 1                      | 2   | 3   | 4    | 2     | 1     | 2     | 2     | 17 | 10 |      |     |                |
| 20   | 3                      | 1   | 3   | 1    | 1     | 0     | 1     | 1     | 11 | 6  |      |     |                |
| 21 D | 3                      | 4   | 5   | 5    | 4     | 3     | 2     | 3     | 29 | 25 |      |     |                |
| 22 D | 5                      | 3   | 3   | 3    | 2     | 4     | 3     | 2     | 25 | 19 |      |     |                |
| 23   | 3                      | 3   | 4   | 3    | 3     | 0     | 1     | 1     | 18 | 12 |      |     |                |
| 24   | 3                      | 3   | 4   | 2    | 1     | 2     | 2     | 2     | 19 | 11 |      |     |                |
| 25   | 2                      | 4   | 2   | 2    | 2     | 2     | 3     | 2     | 19 | 11 |      |     |                |
| 26 D | 3                      | 3   | 2   | 4    | 4     | 4     | 3     | 3     | 26 | 19 |      |     |                |
| 27   | 3                      | 4   | 4   | 2    | 2     | 1     | 1     | 1     | 18 | 12 |      |     |                |
| 28   | 3                      | 2   | 3   | 3    | 3     | 3     | 3     | 4     | 23 | 15 |      |     |                |
| 29 Q | 3                      | 3   | 3   | 3    | 1     | 2     | 3     | 3     | 21 | 13 |      |     |                |
| 30   | 3                      | 3   | 4   | 3    | 1     | 2     | 1     | 1     | 18 | 11 |      |     |                |
| 31   | 1                      | 3   | 3   | 2    | 1     | 1     | 2     | 2     | 15 | 8  |      |     |                |
| Sum  |                        |     |     |      |       |       |       |       |    |    | 414  |     |                |
| Mean |                        |     |     |      |       |       |       |       |    |    | 13.4 |     |                |

## MAGNETIC STORMS

JUNE-JULY 1988

| Time of Magnetic |    |     |     |      | Sudden Com. |     |     | Deg. | Maximum Acti. |     |   | Maximum |       |     |     |
|------------------|----|-----|-----|------|-------------|-----|-----|------|---------------|-----|---|---------|-------|-----|-----|
| Begin            |    | End |     | Type | Amplitude   |     |     | of   | on K          |     | K | Range   |       |     |     |
| Day              | h  | m   | Day |      | h           | D'  | HnT | ZnT  | Acti.         | Day |   | Int.    | Index | D'  | HnT |
| JUNE 1988        |    |     |     |      |             |     |     |      |               |     |   |         |       |     |     |
| 29               | 04 | 08  | 30  | 08   | SC          | 0.9 | 29  |      | ms            | 29  | 3 | 6       | 13.5  | 143 | 50  |
| JULY 1988        |    |     |     |      |             |     |     |      |               |     |   |         |       |     |     |
| 21               | 03 | 17  | 21  | 21   | SC          | 0.9 | 24  |      | m             | 21  | 3 | 5       | 7.3   | 68  | 35  |