

# I. SUNSPOTS

## Sunspot Relative-Numbers and Sunspot Areas

### Cooperating Observatories for Sunspot Relative-Numbers :

Altamira(two stat.)(Venezuela); Americana(Brasil); Ankara (Turkey); Athens Nat. Obs.(Greece); Attikis Nat. Obs. (Greece); Auckland (New-Zealand); Australian Obs.(Australia) Berlin(Germany); Beyazit(Turkey); Bodenteich(Germany); Boom (Belgium); Boulder(U.S.A.); Bruxelles-Uccle(Belgium); Bucharest(Rumania); Buenos-Aires(Argentina); Campinas(Cap. Obs. Brasil); Caracas(two stat.)(Venezuela); Catania(Italy); Cochabamba(two stat.)(Bolivia); Culgoora(Australia); Dinant (Belgium); Dover(U.K.); Grimbergen(Belgium); Holloman(U.S.A.) Helwan(Egypt); Invercargill(New-Zealand); Inzernhagen (Germany); Jeddah(Saudi Arabia); Kandilli(Turkey); Kanzelöhe (Austria); Kavlinge(Sweden); Kawaguchi-Saitama(Japan); Kayeme (Venezuela); Kiev(U.R.S.S.); Kislovodsk(U.R.S.S.); Langemark (Belgium); Learmonth(Australia); Locarno(Switzerland); Luning(Taiwan); Agr. Madrid(Spain); Marcq en Baroeul(France) Mons(Belgium); Mosta(Malta); Museros(Spain); Naxxar(Malta); Nijmegen(Netherland); Mie-Ken(Japan); Oostende(Belgium); Potsdam(Germany); Palea Penteli(Greece); Palehua(Hawai); Prades(France); Pulligny(France); Pyong Yang(North Korea); Quezon-City(Philippines); Ramey(Puerto-Rico); Roma(Italy); Ronse-Renaix(Belgium); Roqueta-Tortosa(Spain); San Jose (Argentina); San Miguel(Argentina); Santiago(Chile); Skalnate-Pleso(Czechoslovakia); Suwa City(Japan); Taipei Obs.(Taiwan); Taipei Weather Bureau(Taiwan); Tangjungsari(Indonesia); Tashkent(U.R.S.S.); Tokyo-Mitaka(Japan); Tokyo Nat. Science Museum(Japan); Trieste(Italy); Urawa-Saitama(Japan); Valencia (two stat.)(Spain); Vedrin(Belgium); Vivy(Belgium); Wittelsheim(France).

The first column gives the definitive international Sunspot-Numbers for the disk of the sun ( $R_1$ ) established by the Sunspot Index Data Center-Brussels on the basis of the observations of Locarno station as reference, the second that for the central zone ( $R_{1c}$ ) on the basis of the observations of Athens (Nat.Obs.) Bruxelles-Uccle; Grimbergen; Inzernhagen; Kawaguchi-Saitama; Kiev; Kislovodsk; Mie-Ken; Nijmegen; Palea Penteli; Roquetas-Tortosa; Skalnate-Pleso; Suwa-City; Taipei Obs.; Tashkent; Tokyo-Sc. Mus.; Urawa-Saitama.

The diameter of the central zone is half that of sun's projected disk.

The Sunspot-Areas  $A_c$  are determined at Catania,  $A_R$  at Roma and  $A_1$  are evaluated by the Sunspot Index Data Center-Brussels on the observations of Athens(Nat. Obs.); Luning; Helwan; Jeddah; Palea Penteli; Taipei Obs. and Taipei Weather Bureau rattached to Catania values by a monthly scaling factor. The apparent total area of the umbra plus penumbra is uncorrected for foreshortening and expressed in millionths of the solar disk.

## JANUARY 1989

| 1989 JAN. | R <sub>I</sub> | R <sub>IC</sub> | A <sub>C</sub> | A <sub>R</sub> | A <sub>I</sub> |
|-----------|----------------|-----------------|----------------|----------------|----------------|
| 1         | 148            | 45              | 1417           | --             | 1268           |
| 2         | 173            | 35              | 1825           | 2379           | 2308           |
| 3         | 146            | 22              | --             | --             | 2341           |
| 4         | 120            | 13              | --             | 2440           | 2608           |
| 5         | 155            | 0               | --             | --             | 2674           |
| 6         | 142            | 20              | 2302           | --             | 2702           |
| 7         | 165            | 40              | 2302           | --             | 3293           |
| 8         | 155            | 69              | 3162           | --             | 3395           |
| 9         | 165            | 108             | 3889           | --             | 3396           |
| 10        | 190            | 73              | 3585           | --             | 3855           |
| 11        | 211            | 68              | 3909           | --             | 3837           |
| 12        | 229            | 62              | --             | 3890           | 4645           |
| 13        | 206            | 81              | 5082           | --             | 3680           |
| 14        | 189            | 83              | 4565           | --             | 4668           |
| 15        | 177            | 80              | 6916           | --             | 6665           |
| 16        | 164            | 96              | 6063           | --             | 6136           |
| 17        | 155            | 63              | 5862           | --             | 6594           |
| 18        | 160            | 30              | 5103           | 4551           | 5733           |
| 19        | 140            | 30              | --             | --             | 4298           |
| 20        | 126            | 19              | 2743           | 3060           | 2933           |
| 21        | 114            | 15              | --             | --             | 2373           |
| 22        | 165            | 46              | 2309           | --             | 2407           |
| 23        | 171            | 29              | 2538           | --             | 2959           |
| 24        | 142            | 14              | --             | 3643           | 3271           |
| 25        | 144            | 48              | 3237           | 2648           | 2850           |
| 26        | 152            | 73              | 3476           | 3865           | 3324           |
| 27        | 157            | 104             | 4144           | 3455           | 3853           |
| 28        | 172            | 107             | 3147           | 4114           | 3005           |
| 29        | 169            | 82              | 2876           | --             | 2830           |
| 30        | 157            | 85              | 2257           | 2800           | 2384           |
| 31        | 140            | 50              | 1694           | 1622           | 1744           |
| MEAN      | 161.3          | 54.5            | 3537           | 3206           | 3485           |

## FEBRUARY 1989

| 1989 FEB. | R <sub>I</sub> | R <sub>IC</sub> | A <sub>C</sub> | A <sub>R</sub> | A <sub>I</sub> |
|-----------|----------------|-----------------|----------------|----------------|----------------|
| 1         | 141            | 32              | 1153           | 963            | 1031           |
| 2         | 144            | 45              | 901            | 792            | 901            |
| 3         | 164            | 54              | 1769           | --             | 1271           |
| 4         | 133            | 29              | 965            | 372            | 861            |
| 5         | 127            | 34              | 944            | --             | 1368           |
| 6         | 127            | 32              | 1619           | 557            | 2313           |
| 7         | 152            | 43              | 1673           | --             | 2352           |
| 8         | 161            | 30              | 2447           | 2628           | 3256           |
| 9         | 172            | 44              | --             | 4105           | 4384           |
| 10        | 192            | 19              | 4865           | 5451           | 4789           |
| 11        | 190            | 24              | 6624           | 5838           | 5773           |
| 12        | 216            | 55              | 6113           | --             | 5109           |
| 13        | 219            | 94              | 5967           | 4667           | 4962           |
| 14        | 208            | 100             | 4870           | --             | 4463           |
| 15        | 191            | 75              | --             | 4407           | 4553           |
| 16        | 195            | 60              | 4201           | 4278           | 4048           |
| 17        | 209            | 50              | 3326           | 3035           | 3353           |
| 18        | 163            | 56              | 1671           | 2247           | 2035           |
| 19        | 164            | 50              | 1735           | --             | 1540           |
| 20        | 169            | 54              | 1703           | 1372           | 1545           |
| 21        | 149            | 92              | 2467           | --             | 2265           |
| 22        | 142            | 86              | 2823           | --             | 2379           |
| 23        | 134            | 79              | 3781           | --             | 3160           |
| 24        | 153            | 42              | 3724           | --             | 4330           |
| 25        | 189            | 47              | --             | --             | 2704           |
| 26        | 163            | 35              | 2130           | --             | 2312           |
| 27        | 147            | 61              | --             | 1244           | 1605           |
| 28        | 128            | 62              | 888            | 718            | 1144           |
| MEAN      | 165.1          | 53.0            | 2848           | 2667           | 2850           |

## MARCH 1989

| 1989 MAR. | R <sub>I</sub> | R <sub>Ic</sub> | A <sub>c</sub> | A <sub>R</sub> | A <sub>I</sub> |
|-----------|----------------|-----------------|----------------|----------------|----------------|
| 1         | 127            | 76              | 1295           | --             | 1194           |
| 2         | 107            | 69              | 1472           | --             | 1324           |
| 3         | 103            | 25              | 2133           | --             | 1447           |
| 4         | 98             | 16              | 1290           | 1635           | 1072           |
| 5         | 90             | 26              | 1291           | --             | 992            |
| 6         | 103            | 15              | 1206           | 1088           | 996            |
| 7         | 98             | 18              | 1695           | 2082           | 1835           |
| 8         | 109            | 11              | 3273           | --             | 3575           |
| 9         | 133            | 28              | 4096           | 4048           | 4052           |
| 10        | 163            | 26              | 4093           | 4911           | 4370           |
| 11        | 155            | 37              | 5384           | 3587           | 4724           |
| 12        | 140            | 51              | 5303           | --             | 5471           |
| 13        | 162            | 48              | 6141           | 7501           | 5742           |
| 14        | 181            | 60              | 6658           | --             | 6533           |
| 15        | 165            | 63              | --             | 6103           | 5880           |
| 16        | 187            | 64              | 4883           | --             | 5608           |
| 17        | 168            | 76              | 3913           | --             | 4922           |
| 18        | 164            | 26              | 2936           | 1634           | 2688           |
| 19        | 148            | 22              | 2058           | --             | 1720           |
| 20        | 158            | 80              | 1979           | 2475           | 1896           |
| 21        | 155            | 110             | 2810           | --             | 3152           |
| 22        | 155            | 103             | 3984           | 3272           | 3538           |
| 23        | 145            | 35              | 2769           | 3776           | 3054           |
| 24        | 155            | 20              | 2494           | 3178           | 2821           |
| 25        | 131            | 30              | 2124           | 1619           | 2688           |
| 26        | 117            | 55              | 1412           | --             | 1434           |
| 27        | 102            | 59              | 1147           | --             | 1043           |
| 28        | 89             | 59              | 961            | 1318           | 784            |
| 29        | 95             | 47              | 1506           | 906            | 947            |
| 30        | 78             | 10              | 1281           | 497            | 1184           |
| 31        | 91             | 16              | --             | 1488           | 1624           |
| MEAN      | 131.4          | 44.5            | 2813           | 2840           | 2849           |

## APRIL 1989

| 1989 APR. | R <sub>I</sub> | R <sub>Ic</sub> | A <sub>c</sub> | A <sub>R</sub> | A <sub>I</sub> |
|-----------|----------------|-----------------|----------------|----------------|----------------|
| 1         | 104            | 10              | 1949           | --             | 2137           |
| 2         | 122            | 12              | 2493           | --             | 2507           |
| 3         | 140            | 65              | 2142           | --             | 2785           |
| 4         | 115            | 76              | 2780           | --             | 2743           |
| 5         | 106            | 72              | 2613           | --             | 2796           |
| 6         | 139            | 103             | 2519           | --             | 2326           |
| 7         | 170            | 94              | 2614           | 3033           | 3173           |
| 8         | 185            | 90              | 2931           | 2252           | 3056           |
| 9         | 153            | 54              | 1692           | --             | 1711           |
| 10        | 122            | 23              | 1125           | 1067           | 1551           |
| 11        | 106            | 16              | --             | --             | 565            |
| 12        | 96             | 15              | --             | 438            | 497            |
| 13        | 92             | 22              | 729            | --             | 1070           |
| 14        | 103            | 44              | 1662           | --             | 1999           |
| 15        | 120            | 41              | 2559           | 3016           | 2666           |
| 16        | 130            | 49              | 2777           | --             | 2823           |
| 17        | 144            | 88              | 3025           | --             | 3101           |
| 18        | 137            | 86              | 3602           | 3642           | 3579           |
| 19        | 160            | 52              | 3605           | 3580           | 3278           |
| 20        | 165            | 68              | 3405           | --             | 3318           |
| 21        | 175            | 75              | 2832           | --             | 3044           |
| 22        | 167            | 63              | 2636           | --             | 2758           |
| 23        | 128            | 48              | 2531           | --             | 2427           |
| 24        | 135            | 54              | 1791           | 1339           | 2007           |
| 25        | 132            | 64              | 2404           | --             | 1729           |
| 26        | 125            | 33              | 1852           | --             | 1899           |
| 27        | 118            | 34              | 1989           | --             | 2153           |
| 28        | 109            | 18              | 2045           | 1874           | 2285           |
| 29        | 107            | 23              | 1567           | --             | 1781           |
| 30        | 114            | 50              | 1327           | --             | 1406           |
| MEAN      | 130.6          | 51.4            | 2328           | 2249           | 2306           |

## MAY 1989

| 1989 MAY | R <sub>I</sub> | R <sub>IC</sub> | A <sub>C</sub> | A <sub>R</sub> | A <sub>I</sub> |
|----------|----------------|-----------------|----------------|----------------|----------------|
| 1        | 93             | 25              | 1321           | --             | 1420           |
| 2        | 94             | 36              | 1424           | 1088           | 1355           |
| 3        | 85             | 38              | 1588           | 1797           | 1515           |
| 4        | 97             | 27              | --             | 2338           | 1925           |
| 5        | 85             | 18              | 2145           | 2476           | 2023           |
| 6        | 105            | 21              | 1948           | 2201           | 2111           |
| 7        | 134            | 10              | 1560           | --             | 1821           |
| 8        | 149            | 53              | 1380           | 836            | 1938           |
| 9        | 137            | 46              | 1317           | 1132           | 1505           |
| 10       | 123            | 61              | 1351           | --             | 1318           |
| 11       | 120            | 76              | 1222           | 1464           | 1374           |
| 12       | 115            | 43              | 994            | --             | 1380           |
| 13       | 129            | 41              | 1267           | 1439           | 1203           |
| 14       | 123            | 46              | 1215           | --             | 1173           |
| 15       | 148            | 62              | 1591           | --             | 1632           |
| 16       | 154            | 57              | 1510           | 1671           | 1602           |
| 17       | 161            | 64              | 1601           | --             | 1589           |
| 18       | 177            | 98              | 1856           | --             | 1657           |
| 19       | 191            | 87              | 1892           | 2970           | 2093           |
| 20       | 195            | 118             | 3239           | 3127           | 2059           |
| 21       | 168            | 62              | 2910           | --             | 2544           |
| 22       | 156            | 68              | 2133           | 3494           | 2317           |
| 23       | 180            | 86              | 2446           | 2848           | 2366           |
| 24       | 196            | 63              | 3069           | 2484           | 2941           |
| 25       | 173            | 16              | --             | 2914           | 2782           |
| 26       | 157            | 18              | --             | 3025           | 2627           |
| 27       | 163            | 21              | 2772           | 2737           | 2557           |
| 28       | 130            | 51              | 2365           | --             | 1921           |
| 29       | 121            | 62              | 1539           | 1775           | 1627           |
| 30       | 122            | 82              | 1815           | 2055           | 1779           |
| 31       | 111            | 84              | 2259           | --             | 2049           |
| MEAN     | 138.5          | 52.9            | 1847           | 2194           | 1877           |

## JUNE 1989

| 1989 JUN. | R <sub>I</sub> | R <sub>IC</sub> | A <sub>C</sub> | A <sub>R</sub> | A <sub>I</sub> |
|-----------|----------------|-----------------|----------------|----------------|----------------|
| 1         | 136            | 49              | 2651           | 3254           | 2561           |
| 2         | 148            | 40              | 2147           | 3480           | 2481           |
| 3         | 158            | 31              | 2592           | 3172           | 2310           |
| 4         | 157            | 33              | 1262           | --             | 2417           |
| 5         | 171            | 49              | 1969           | 1899           | 2203           |
| 6         | 145            | 56              | 2212           | 2226           | 1825           |
| 7         | 130            | 28              | 1845           | 2136           | 1448           |
| 8         | 143            | 67              | 1731           | 1846           | 1663           |
| 9         | 168            | 79              | 2766           | 1670           | 2504           |
| 10        | 192            | 88              | 4147           | 3977           | 3620           |
| 11        | 203            | 78              | 5467           | --             | 4917           |
| 12        | 218            | 58              | 5882           | 7280           | 5985           |
| 13        | 253            | 109             | 6793           | 8289           | 7087           |
| 14        | 251            | 104             | 8262           | 9999           | 7394           |
| 15        | 264            | 141             | 8917           | 10159          | 8241           |
| 16        | 265            | 150             | 7613           | 7682           | 6667           |
| 17        | 233            | 68              | 7005           | --             | 6444           |
| 18        | 216            | 32              | 5456           | --             | 6534           |
| 19        | 235            | 31              | 3577           | --             | 4136           |
| 20        | 232            | 81              | 3804           | --             | 4409           |
| 21        | 187            | 49              | 2925           | 2360           | 2748           |
| 22        | 174            | 61              | 2794           | 3623           | 3484           |
| 23        | 196            | 49              | 4309           | --             | 3968           |
| 24        | 215            | 51              | 5111           | 5485           | 4400           |
| 25        | 227            | 104             | 5350           | --             | 4184           |
| 26        | 237            | 158             | 3965           | 4164           | 3774           |
| 27        | 206            | 189             | 3990           | 4418           | 3929           |
| 28        | 187            | 145             | 3687           | 4855           | 3634           |
| 29        | 182            | 111             | 3332           | --             | 3371           |
| 30        | 156            | 60              | 2640           | --             | 3262           |
| MEAN      | 196.2          | 78.3            | 4140           | 4599           | 4053           |

## JULY 1989

| 1989 JUL. | R <sub>I</sub> | R <sub>IC</sub> | A <sub>C</sub> | A <sub>R</sub> | A <sub>I</sub> |
|-----------|----------------|-----------------|----------------|----------------|----------------|
| 1         | 128            | 15              | 1648           | --             | 2007           |
| 2         | 149            | 0               | 1645           | --             | 1778           |
| 3         | 129            | 0               | 1004           | --             | 1142           |
| 4         | 120            | 34              | 944            | --             | 1321           |
| 5         | 101            | 47              | 893            | 1188           | 906            |
| 6         | 120            | 65              | 908            | --             | 828            |
| 7         | 149            | 79              | 1280           | --             | 1326           |
| 8         | 141            | 55              | 1301           | 1617           | 1233           |
| 9         | 116            | 55              | 1077           | --             | 1051           |
| 10        | 104            | 57              | 994            | 1533           | 1029           |
| 11        | 136            | 64              | 1269           | --             | 1343           |
| 12        | 111            | 74              | 1266           | --             | 1366           |
| 13        | 116            | 58              | 1454           | 1213           | 1389           |
| 14        | 116            | 31              | 1269           | 1727           | 1351           |
| 15        | 92             | 14              | 1551           | 1794           | 1354           |
| 16        | 91             | 40              | 1236           | --             | 1440           |
| 17        | 99             | 52              | 1295           | 1765           | 1440           |
| 18        | 113            | 57              | 1529           | --             | 1736           |
| 19        | 138            | 20              | 1819           | 2076           | 1702           |
| 20        | 149            | 56              | 1863           | 2084           | 1595           |
| 21        | 170            | 71              | 2021           | 2414           | 1949           |
| 22        | 197            | 99              | 2259           | 2345           | 2018           |
| 23        | 195            | 132             | 2783           | --             | 2238           |
| 24        | 168            | 84              | 2679           | 1720           | 2176           |
| 25        | 132            | 27              | 1709           | 1237           | 1655           |
| 26        | 111            | 17              | 1279           | 1978           | 1398           |
| 27        | 99             | 20              | 813            | 948            | 997            |
| 28        | 75             | 25              | 973            | 556            | 999            |
| 29        | 112            | 30              | 1003           | --             | 1295           |
| 30        | 125            | 41              | 1916           | --             | 1814           |
| 31        | 132            | 30              | 1805           | 2109           | 1745           |
| MEAN      | 126.9          | 46.7            | 1467           | 1665           | 1472           |

## AUGUST 1989

| 1989 AUG. | R <sub>I</sub> | R <sub>IC</sub> | A <sub>C</sub> | A <sub>R</sub> | A <sub>I</sub> |
|-----------|----------------|-----------------|----------------|----------------|----------------|
| 1         | 171            | 45              | 2257           | 2263           | 1970           |
| 2         | 196            | 53              | 2337           | 2209           | 2361           |
| 3         | 193            | 84              | 2065           | 2468           | 1975           |
| 4         | 213            | 70              | 2552           | 2647           | 2724           |
| 5         | 227            | 79              | 2993           | 3032           | 2943           |
| 6         | 220            | 84              | 3453           | --             | 3649           |
| 7         | 215            | 51              | 4330           | 5854           | 3941           |
| 8         | 218            | 94              | 4078           | 5444           | 3916           |
| 9         | 218            | 79              | 4576           | --             | 4072           |
| 10        | 200            | 78              | 3311           | 4407           | 3284           |
| 11        | 202            | 88              | 3191           | 3923           | 3260           |
| 12        | 188            | 39              | 3308           | 3372           | 3306           |
| 13        | 207            | 44              | 3280           | --             | 3830           |
| 14        | 197            | 47              | 4246           | 5751           | 4962           |
| 15        | 203            | 70              | 4792           | --             | 1897           |
| 16        | 177            | 95              | 5097           | 6173           | 4500           |
| 17        | 192            | 122             | 4919           | 7239           | 4456           |
| 18        | 189            | 125             | 4599           | 6676           | 4204           |
| 19        | 202            | 139             | 3955           | 4997           | 3658           |
| 20        | 209            | 102             | 3706           | --             | 3245           |
| 21        | 203            | 79              | 3016           | --             | 3192           |
| 22        | 160            | 34              | 2268           | --             | 2476           |
| 23        | 133            | 38              | 1289           | --             | 1588           |
| 24        | 129            | 57              | 769            | --             | 1151           |
| 25        | 105            | 42              | 737            | 303            | 681            |
| 26        | 82             | 28              | 425            | --             | 345            |
| 27        | 57             | 16              | 549            | --             | 443            |
| 28        | 50             | 13              | 528            | --             | 402            |
| 29        | 70             | 22              | 550            | 608            | 805            |
| 30        | 94             | 27              | 1938           | 1735           | 1968           |
| 31        | 116            | 25              | 2685           | 3207           | 3071           |
| MEAN      | 168.9          | 63.5            | 2832           | 3806           | 2815           |

## SEPTEMBER 1989

| 1989 SEP. | R <sub>I</sub> | R <sub>Ic</sub> | A <sub>c</sub> | A <sub>R</sub> | A <sub>I</sub> |
|-----------|----------------|-----------------|----------------|----------------|----------------|
| 1         | 147            | 16              | 4880           | --             | 4285           |
| 2         | 171            | 24              | --             | --             | 4882           |
| 3         | 180            | 49              | 5188           | --             | 5079           |
| 4         | 204            | 148             | 5405           | 7446           | 5500           |
| 5         | 212            | 118             | 5801           | 6523           | 5603           |
| 6         | 230            | 137             | --             | 6778           | 6052           |
| 7         | 267            | 86              | --             | 6469           | 5686           |
| 8         | 261            | 79              | 6032           | 6657           | 6288           |
| 9         | 296            | 118             | 6948           | --             | 6064           |
| 10        | 270            | 127             | 6538           | --             | 5892           |
| 11        | 280            | 135             | 6566           | 5991           | 5444           |
| 12        | 264            | 142             | 4792           | 5353           | 4318           |
| 13        | 248            | 153             | 4295           | 3985           | 3859           |
| 14        | 215            | 110             | 3372           | 3454           | 3184           |
| 15        | 207            | 98              | 3236           | 3540           | 3151           |
| 16        | 180            | 65              | 3413           | 2992           | 2941           |
| 17        | 159            | 29              | 3282           | --             | 3560           |
| 18        | 155            | 22              | 2562           | 2088           | 3032           |
| 19        | 152            | 27              | 2911           | 2646           | 2669           |
| 20        | 137            | 32              | 2075           | 3007           | 2497           |
| 21        | 111            | 28              | 2563           | 2643           | 2205           |
| 22        | 109            | 40              | 2013           | 2694           | 2055           |
| 23        | 103            | 44              | 2155           | 2516           | 2292           |
| 24        | 75             | 22              | 2043           | --             | 2171           |
| 25        | 80             | 17              | 1477           | 1889           | 1916           |
| 26        | 93             | 9               | 1821           | --             | 1975           |
| 27        | 101            | 13              | --             | --             | 2323           |
| 28        | 111            | 30              | 1390           | 833            | 1780           |
| 29        | 134            | 25              | 1501           | 1254           | 1583           |
| 30        | 150            | 21              | 1496           | 1893           | 1662           |
| MEAN      | 176.7          | 65.5            | 3606           | 3841           | 3665           |

## OCTOBER 1989

| 1989 OCT. | R <sub>I</sub> | R <sub>Ic</sub> | A <sub>c</sub> | A <sub>R</sub> | A <sub>I</sub> |
|-----------|----------------|-----------------|----------------|----------------|----------------|
| 1         | 129            | 28              | 1655           | --             | 1637           |
| 2         | 150            | 47              | 1666           | 1914           | 1913           |
| 3         | 167            | 85              | 1939           | 1789           | 2137           |
| 4         | 186            | 84              | 2351           | 2816           | 2534           |
| 5         | 209            | 71              | 2857           | 2496           | 2742           |
| 6         | 189            | 54              | 4495           | --             | 2971           |
| 7         | 168            | 68              | 1941           | --             | 1812           |
| 8         | 166            | 95              | 1894           | --             | 1745           |
| 9         | 187            | 104             | 1420           | --             | 1727           |
| 10        | 178            | 96              | 1600           | 1272           | 1492           |
| 11        | 191            | 57              | 1428           | 1271           | 1457           |
| 12        | 154            | 45              | 1936           | 1941           | 1895           |
| 13        | 148            | 54              | --             | --             | 2323           |
| 14        | 159            | 69              | --             | 2101           | 2904           |
| 15        | 189            | 96              | 3674           | --             | 3746           |
| 16        | 209            | 87              | 3223           | 4666           | 3859           |
| 17        | 206            | 59              | 3100           | 4446           | 3491           |
| 18        | 184            | 66              | 2899           | 4397           | 3307           |
| 19        | 159            | 40              | 2519           | --             | 2894           |
| 20        | 140            | 53              | 2506           | 2615           | 2467           |
| 21        | 152            | 43              | 2817           | 2503           | 2517           |
| 22        | 158            | 36              | 2576           | --             | 2244           |
| 23        | 145            | 24              | 2399           | 3252           | 2578           |
| 24        | 131            | 29              | 2625           | 2939           | 2943           |
| 25        | 121            | 64              | 1646           | 897            | 2118           |
| 26        | 109            | 55              | 1471           | 1002           | 1660           |
| 27        | 97             | 43              | 1165           | 1157           | 942            |
| 28        | 116            | 51              | 1274           | 1260           | 1089           |
| 29        | 131            | 49              | 1726           | --             | 1342           |
| 30        | 156            | 44              | 1867           | 1281           | 1781           |
| 31        | 157            | 42              | 2401           | 2060           | 2219           |
| MEAN      | 159.4          | 59.3            | 2244           | 2289           | 2274           |

## NOVEMBER 1989

| 1989 NOV. | R <sub>I</sub> | R <sub>IC</sub> | A <sub>C</sub> | A <sub>R</sub> | A <sub>I</sub> |
|-----------|----------------|-----------------|----------------|----------------|----------------|
| 1         | 153            | 34              | 2183           | --             | 2371           |
| 2         | 160            | 46              | 2179           | --             | 2914           |
| 3         | 191            | 102             | 2496           | 3159           | 2930           |
| 4         | 216            | 118             | 2745           | --             | 3069           |
| 5         | 228            | 115             | 2897           | --             | 3196           |
| 6         | 245            | 118             | 3430           | --             | 3183           |
| 7         | 233            | 98              | 4705           | 4578           | 4120           |
| 8         | 215            | 114             | 4027           | 4065           | 3969           |
| 9         | 214            | 128             | 2915           | --             | 3318           |
| 10        | 203            | 112             | 3902           | 4077           | 3810           |
| 11        | 179            | 95              | --             | 3495           | 3899           |
| 12        | 173            | 80              | 5908           | --             | 4048           |
| 13        | 153            | 56              | 3087           | 2591           | 2878           |
| 14        | 140            | 61              | 2691           | 2656           | 2336           |
| 15        | 132            | 60              | 1975           | 2043           | 2933           |
| 16        | 124            | 55              | --             | 1747           | 1469           |
| 17        | 124            | 54              | --             | --             | 1414           |
| 18        | 134            | 29              | --             | --             | 1390           |
| 19        | 124            | 46              | --             | --             | 1899           |
| 20        | 141            | 32              | 3332           | 3150           | 2881           |
| 21        | 159            | 81              | 3023           | 2543           | 3279           |
| 22        | 162            | 79              | 2401           | --             | 2854           |
| 23        | 157            | 73              | 3079           | --             | 2625           |
| 24        | 160            | 83              | 2786           | --             | 3369           |
| 25        | 175            | 90              | 3411           | --             | 3896           |
| 26        | 184            | 98              | 4820           | --             | 5433           |
| 27        | 183            | 80              | --             | 5026           | 4943           |
| 28        | 183            | 55              | 3453           | 4231           | 4301           |
| 29        | 164            | 58              | 3721           | --             | 3414           |
| 30        | 182            | 52              | --             | 2316           | 3722           |
| MEAN      | 173.0          | 76.7            | 3268           | 3263           | 3195           |

## DECEMBER 1989

| 1989 DEC. | R <sub>I</sub> | R <sub>IC</sub> | A <sub>C</sub> | A <sub>R</sub> | A <sub>I</sub> |
|-----------|----------------|-----------------|----------------|----------------|----------------|
| 1         | 198            | 89              | --             | 2310           | 2424           |
| 2         | 182            | 71              | --             | 2667           | 1877           |
| 3         | 203            | 106             | --             | --             | 2293           |
| 4         | 182            | 71              | --             | 3064           | 2159           |
| 5         | 192            | 68              | --             | --             | 2387           |
| 6         | 184            | 65              | --             | --             | 2509           |
| 7         | 217            | 87              | 1832           | --             | 2137           |
| 8         | 167            | 54              | --             | --             | 1714           |
| 9         | 161            | 50              | 3472           | --             | 1779           |
| 10        | 148            | 60              | --             | --             | 1154           |
| 11        | 104            | 51              | 845            | --             | 923            |
| 12        | 99             | 41              | 543            | --             | 575            |
| 13        | 107            | 31              | 927            | --             | 914            |
| 14        | 100            | 29              | 707            | --             | 639            |
| 15        | 84             | 26              | 872            | --             | 770            |
| 16        | 101            | 22              | 1078           | 920            | 893            |
| 17        | 120            | 35              | 1609           | --             | 1280           |
| 18        | 123            | 32              | 1810           | 2312           | 1533           |
| 19        | 131            | 44              | 2244           | --             | 1792           |
| 20        | 127            | 62              | 1550           | 1684           | 1742           |
| 21        | 111            | 63              | 1953           | --             | 1601           |
| 22        | 150            | 55              | 1457           | 1750           | 1386           |
| 23        | 201            | 60              | 1751           | 1771           | 1430           |
| 24        | 191            | 37              | 2428           | --             | 2293           |
| 25        | 209            | 39              | 2999           | --             | 2913           |
| 26        | 221            | 53              | 3960           | --             | 3802           |
| 27        | 240            | 100             | 4219           | --             | 4104           |
| 28        | 249            | 164             | --             | 5318           | 3729           |
| 29        | 213            | 133             | --             | 6774           | 3873           |
| 30        | 214            | 91              | --             | 6156           | 3679           |
| 31        | 201            | 42              | --             | --             | 3435           |
| MEAN      | 165.5          | 62.3            | 1908           | 3157           | 2056           |