

| MACHINE | DATE ANNOUNCED | IBM FCS             | TPI | BPI                 | AREA DENSITY | IR     | OR    | RPM  | LATENCY | DATA RATE BITS |
|---------|----------------|---------------------|-----|---------------------|--------------|--------|-------|------|---------|----------------|
| 350     | 1956           | 1957                | 20  | 100                 | 2000         |        |       | 1200 | 25 MS   | 77.6 KB/S      |
| 1405    |                | 1959                | 40  | 200                 | 8000         |        |       | 1200 |         | 155 KB/S       |
| 1301    | 1961           | 1961                | 50  | 500                 | 25000        |        |       | 1800 | 33 MS   | 625 KB/S       |
| 1311    |                | 1962                | 50  | 1000                | 50000        |        |       | 1500 | 20 MS   | 700 KB/S       |
| 1302    | 1963           |                     | 100 | 1100                | 110000       |        |       | 1800 | 33 MS   | 1.25 MB/S      |
| 230-1/2 |                |                     |     |                     |              |        |       |      |         |                |
| 2311    | 4/64           | 1964                | 100 | 2200/1100           | 110000       | 4.468" | 6.506 | 2400 | 12.5 MS | 1.25 MB/S      |
| 2305    |                |                     |     |                     |              |        |       |      |         |                |
| 2314    | 4/65           | 1966                | 100 | 4400/2200           | 220000       | 4.46   | 6.50  | 2400 | 12.5 MS | 2.5 MB/S       |
| 2319    |                | 1969                |     | 4400/2200           |              | 4.46   | 6.50  | 2400 | 12.5 MS | 2.5 MB/S       |
| 3330    | 6/70           | 1971                | 192 | 4040                | 775680       | 4.24   | 6.38  | 3600 | 8.4 MS  | 6.45 MB/S      |
| 3330-11 | 7/17/73        | 3/74                | 370 | 4040                | 1494800      | 4.24   | 6.44  | 3600 | 8.4 MS  | 6.45 MB/S      |
| 3340    | 3/74           | 11/73 (125)<br>3/74 | 300 | 5630                | 1690500      | 4.06   | 6.60  | 2964 | 10.1 MS | 7.08 MB/S      |
| Sys 32  |                |                     | 300 | 5635                | 1690500      |        |       | 2964 | 10.1 MS | 7.08 MB/S      |
| 3344    |                | 4/76                |     |                     |              | 4.69   | 5.863 |      |         |                |
| 3350    |                | 4/76                | 480 | 6250                | 3000000      |        |       | 3600 | 8.4 MS  | 9.58 MB/S      |
| 3370    | 1979           | 1/80                | 635 | 11900<br>TPI (7930) | 7556500      |        |       | 2964 | 10.1 MS | 14.827 MB/S    |
| 3375    | 1980           | 10/81               |     |                     |              |        |       | 2964 | 10.1 MS | 14.827 MB/S    |
| 3380    | 1980           |                     |     |                     |              |        |       | 3600 | 8.4 MS  | 24.0 MB/S      |

| MACHINE | SEEK | MAX SEEK | AVG SEEK | HEADS/ SPINDLE | SURFACES R/W DISKS SPINDLE | TRACK FIXED/ MOVING | HEADS R/W FIXED MOVING | CAPACITY/ SPINDLE | TRACK BYTES CAPACITY    | TRACK CUSTOMER CAPACITY | MATTED TRACK CAPACITY |
|---------|------|----------|----------|----------------|----------------------------|---------------------|------------------------|-------------------|-------------------------|-------------------------|-----------------------|
| 350     |      |          | 800 MS   | 2              | 50                         | F                   | 2                      | 5 MBy             | 485                     | 460                     | 460                   |
| 1405    |      |          | 800 MS   |                |                            | F                   |                        | 20 MBy            | 970                     |                         |                       |
| 1301    |      |          | 180 MS   | 48             | 50                         | F                   | 24 + 24                | 56 MBy            | 2600                    |                         |                       |
| 1311    |      |          | 150 MS   |                |                            | R                   |                        | 3.65 MBy          | 3500                    |                         |                       |
| 1302    |      |          |          | 48             | 50                         | F                   | 24 + 24                | 234 MBy           | 5208                    |                         |                       |
| 230-1/2 |      |          |          |                |                            | F                   |                        |                   |                         |                         |                       |
| 2311    | 25   | 100      | 75 MS    | 10             | 10                         | R                   | 10                     | 7.25 MBy          | 3906                    | 3675                    | 3675                  |
| 2305    |      |          |          |                |                            | F                   |                        |                   |                         |                         |                       |
| 2314    | 25   | 100      | 75 MS    | 20             | 20                         | R                   | 20                     | 29.3 MBy          | 7812                    | 7200                    | 7200                  |
| 2319    |      |          | 60 MS    | 20             | 20                         | R                   | 20                     | 29.3 MBy          |                         |                         |                       |
| 3330    | 10   | 55       | 30 MS    | 20             | 19                         | R                   | 19                     | 100 MBy           | 13440                   | 13030                   | 13030                 |
| 3330-11 |      |          | 30 MS    | 20             | 19                         | R                   | 19                     | 200 MBy           | 13440                   | 13030                   | 13030                 |
| 3340    |      |          | 25 MS    | 7/13 / 30      | 6                          | R                   | 6-12 / 30              | 35/70 MBy         | 8960                    | 8368                    | 8368                  |
| Sys 32  |      |          |          |                |                            | F                   |                        |                   |                         |                         |                       |
| 3344    | 10   | 50       | 25 MS    |                | 30                         | F                   |                        | 280 MBy           | 8960                    | 8368                    | 8368                  |
| 3350    | 10   | 50       | 25 MS    | 31 / 60        | 30                         | F                   | 30 / 60                | 317.5 MBy         | 19968                   | 29069                   | 19069                 |
| 3370    |      |          | 20 MS    | 26             | 6 R/W+1/2S/ACT             | F                   | 12/ACT                 | 571.3 MBy         | 37632 R/W (25088)1.5Ser | 744 B1/Cyl 24 Alt/Cyl   | 512/Block             |
| 3375    |      |          | 19 MS    |                |                            | F                   |                        | 819 MBy           |                         |                         |                       |
| 3380    |      |          | 16 MS    |                |                            |                     |                        | 1260 MBy          |                         |                         |                       |

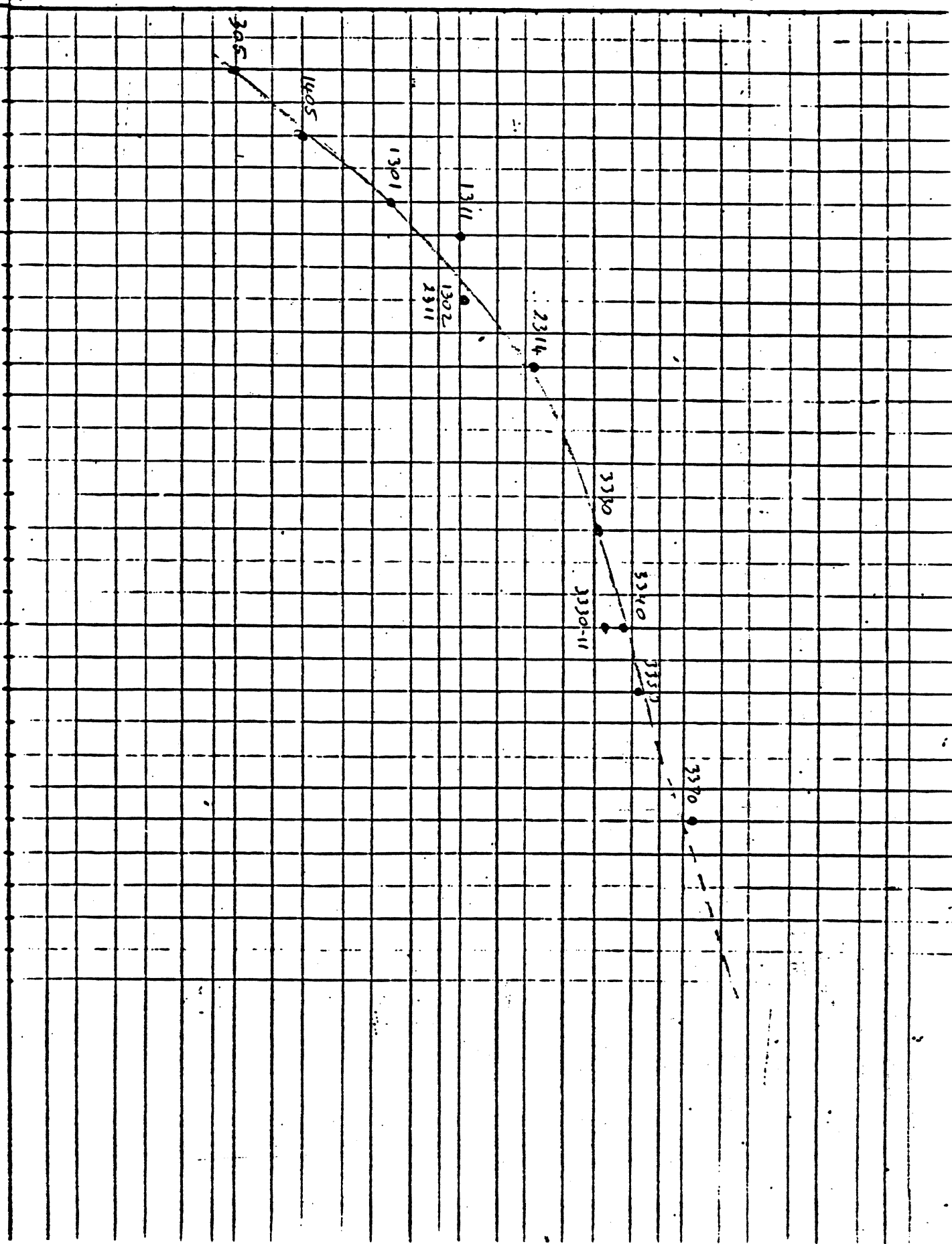
| MACHINE | ACCESS MECH          | CODE   | PRE COMP | AVG. FLYING HEIGHT | ERASE ELEMENT | CLOCKING METHOD | CYLINDERS          | COATING | GAP LENGTH | MRX FCS | TKsp    | TW       |
|---------|----------------------|--------|----------|--------------------|---------------|-----------------|--------------------|---------|------------|---------|---------|----------|
| 350     | Elec Servo           | NRZ1   | 0        | 1                  | Yes           | Clock Track     | ----               | 1.2     | 1000       |         |         |          |
| 1405    |                      | NRZ1   | 0        | 500                | Yes           |                 |                    | .8      |            |         |         |          |
| 1301    | Dual Hydra           | NRZ1   | 0        | 250                | Yes           | Clock Track     |                    | 500     |            |         |         |          |
| 1311    | Hydraulic            | NRZ1   | 0        | 125                | Yes           |                 |                    | 200     |            |         |         |          |
| 1302    | Dual Hydra           | NRZ1   | 0        | 125                | Yes           | Clock Track     |                    | 200     |            |         |         |          |
| 230-1/2 | Fixed                | NRZ1   | 0        |                    |               |                 |                    |         |            |         |         |          |
| 2311    | Hydraulic            | FM     | 0        | 125                | Yes           | Hard Sep        | 200                | 200     | 200(M)     | 9/69    |         |          |
| 2305    |                      | NRZ1   | 0        |                    |               | VFO             |                    |         |            |         |         |          |
| 2314    | Hydraulic            | FM     | 0        | 80                 | Yes           | VFO             | 300                | 100     | 100(F)     | 12/69   | 10 Mill | 7.0 Mill |
| 2319    | Hydraulic            | FM     | 0        |                    | Yes           | VFO             | 200                |         |            |         | 10 Mill | 7.0 Mill |
| 3330    | Ser VC Lin           | MFM    | 7        | 50                 | No            | VFO             | 404                | 50      | 50(F)      |         | 5.2     | 4.3      |
| 3330-11 | Ser VC Lin           | MFM    | 7        | 35                 | No            | VFO             | 808                | 50      | 50(F)      |         | 2.7     | 2.0      |
| 3340    | Cou VC Lin           | MFM    | 0        | 22                 | No            | VFO             | 348/696            | 35      | 50(F)      |         | 3.34    | 2.6      |
| Sys 32  | VC Rot Lin           | MFM    | 0        | 22                 | No            | VFO             |                    |         | 50(F)      |         | 3.34    | 2.6      |
| 3344    |                      |        |          |                    |               | VFO             |                    |         | 50(F)      |         | 2.08    | 1.45     |
| 3350    | Voice Coil Lin Motor | MFM    | 5        | 20                 | No            | VFO             | 555                | 35      | 50(F)      | 4/77    | 2.08    | 1.45     |
| 3370    | L.V.C.               | ½(2,7) | 0        | 15                 | No            | VFO             | 746 + 746<br>+4 +4 |         | 25(TF)     |         | 1.57    | 1.33     |
| 3375    | L.V.C.               | ½(2,7) | 0        |                    | No            | VFO             |                    |         | (TF)       |         |         |          |
| 3380    | L.V.C.               | ½(2,7) | 0        |                    | No            | VFO             |                    |         | (TF)       |         |         |          |

# LINEAR DENSITY BITS/INCH X 10

1/2 Cycle Log

10000  
5000  
6000  
4000  
3000  
2000  
1500  
1000  
800  
600  
400  
300  
200  
150  
100  
80  
60  
40  
30  
20  
15  
10  
9  
8  
6  
4  
3  
2  
1.5

1955  
1956  
1957  
1958  
1959  
1960  
1961  
1962  
1963  
1964  
1965  
1966  
1967  
1968  
1969  
1970  
1971  
1972  
1973  
1974  
1975  
1976  
1977  
1978  
1979  
1980  
1981  
1982  
1983  
1984  
1985

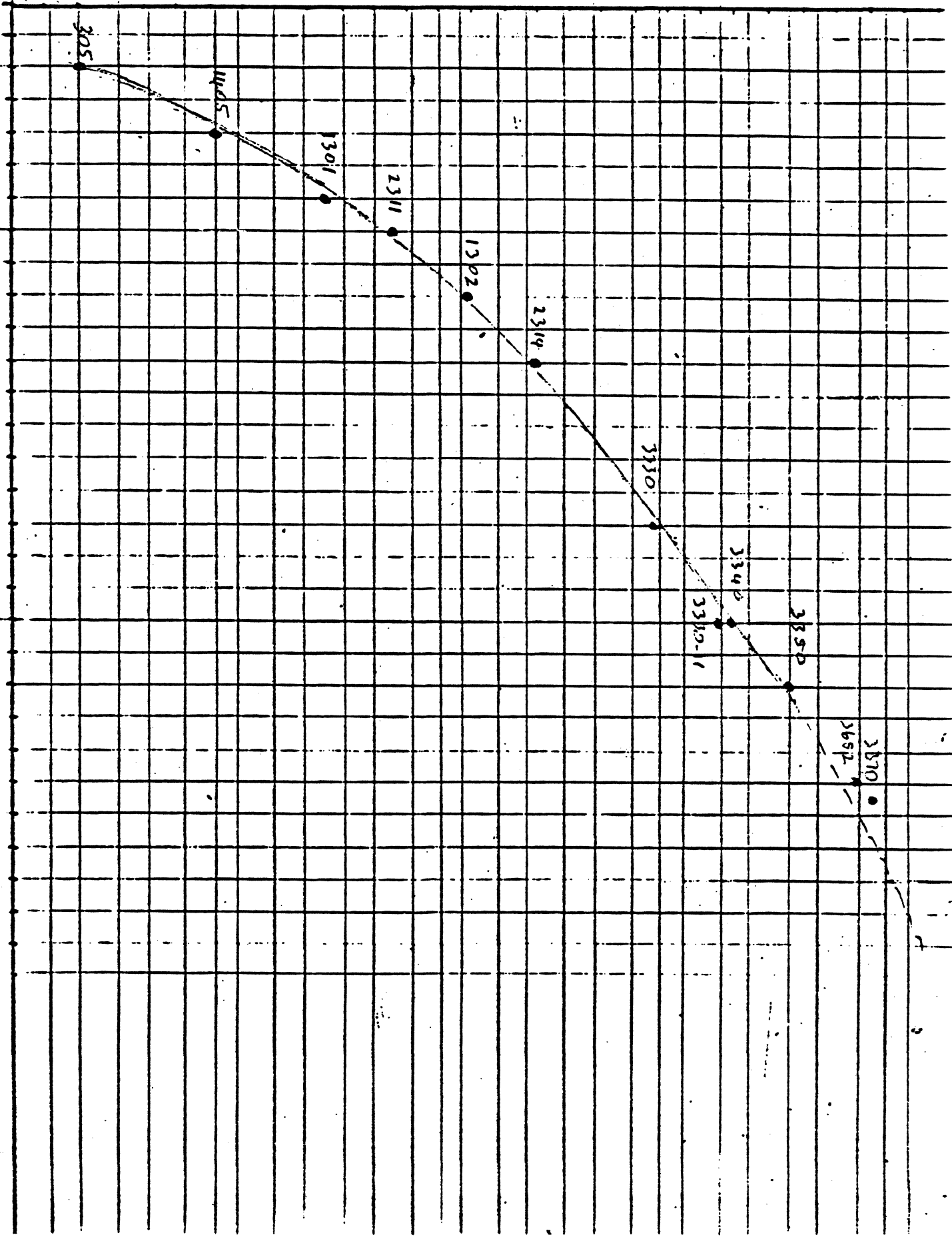


4 cycle log

# AREAL DENSITY BIT/SQUARE INCH X 1000.

10000  
5000  
6000  
4000  
3000  
2000  
1500  
1000  
800  
600  
400  
300  
200  
150  
100  
80  
60  
40  
30  
20  
15  
10  
8  
6  
4  
3  
2  
1.5

1955  
1956  
1957  
1958  
1959  
1960  
1961  
1962  
1963  
1964  
1965  
1966  
1967  
1968  
1969  
1970  
1971  
1972  
1973  
1974  
1975  
1976  
1977  
1978  
1979  
1980  
1981  
1982  
1983  
1984  
1985

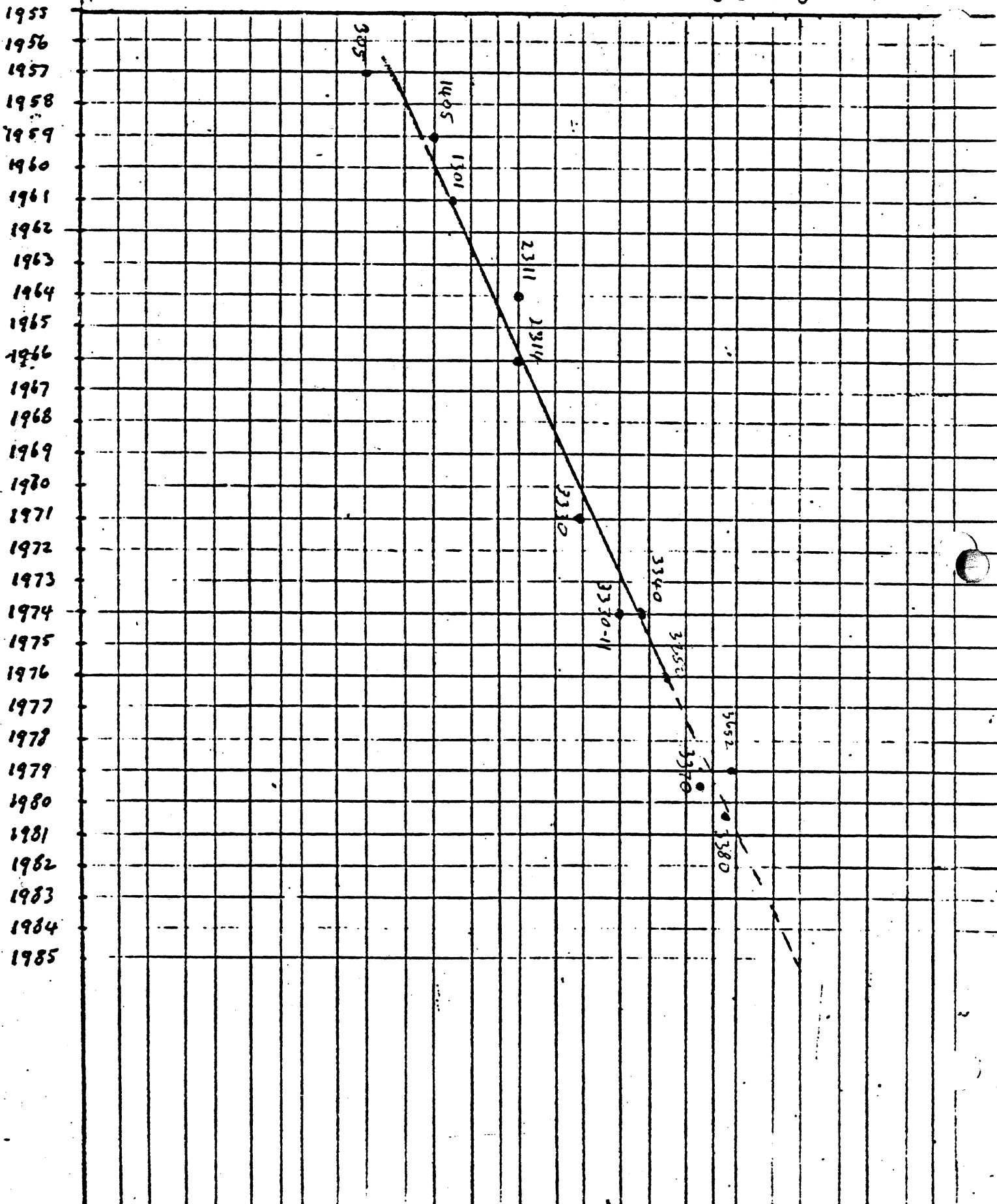


4 Cycle Log

# TRACK DENSITY

TRACKS/INCH

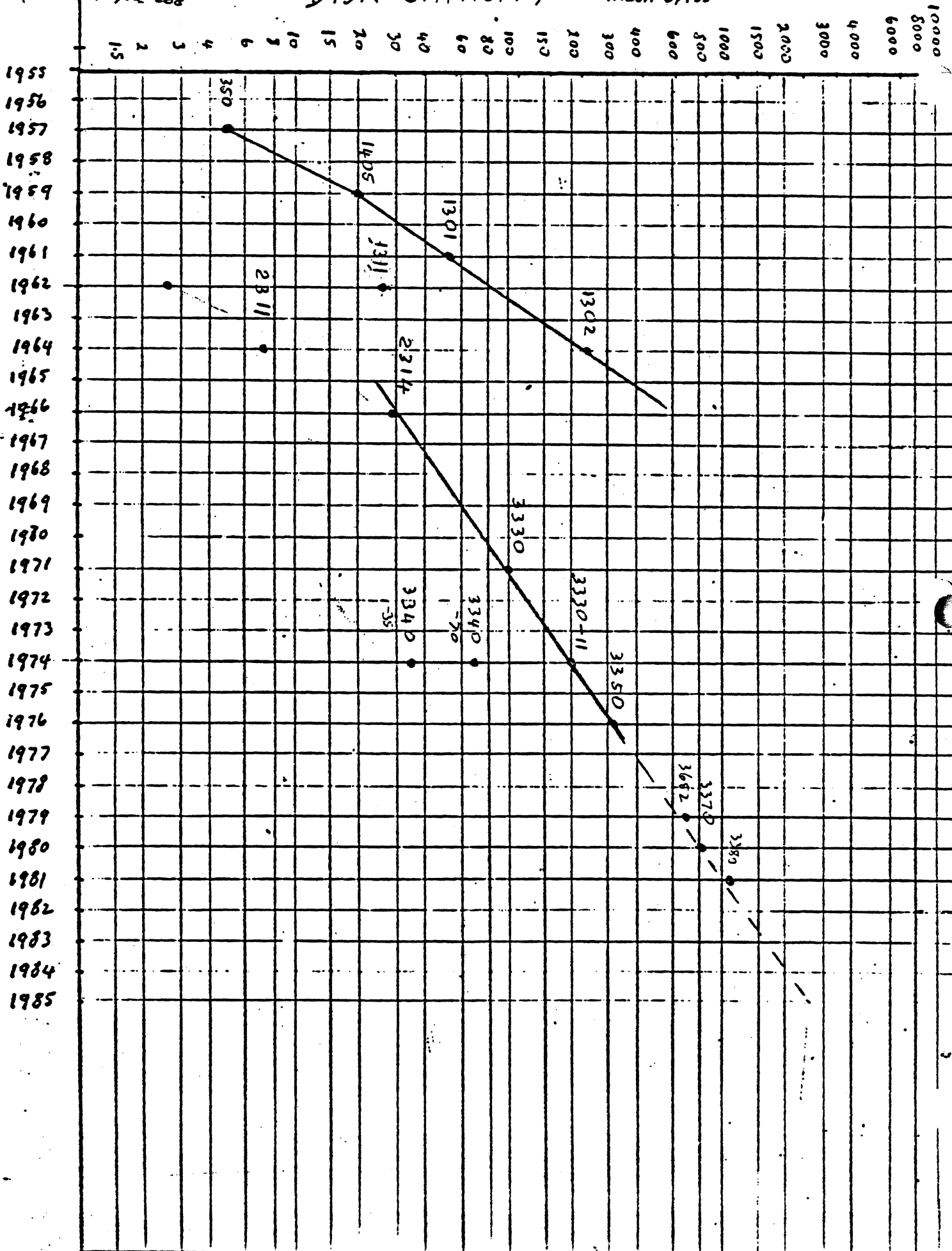
10000  
8000  
6000  
4000  
3000  
2000  
1500  
1000  
500  
400  
300  
200  
150  
100  
80  
60  
40  
30  
20  
15  
10  
9  
8  
6  
5  
4  
3  
2  
1.5



4 Cycle Log

# DISK CAPACITY

MEGA BYTES

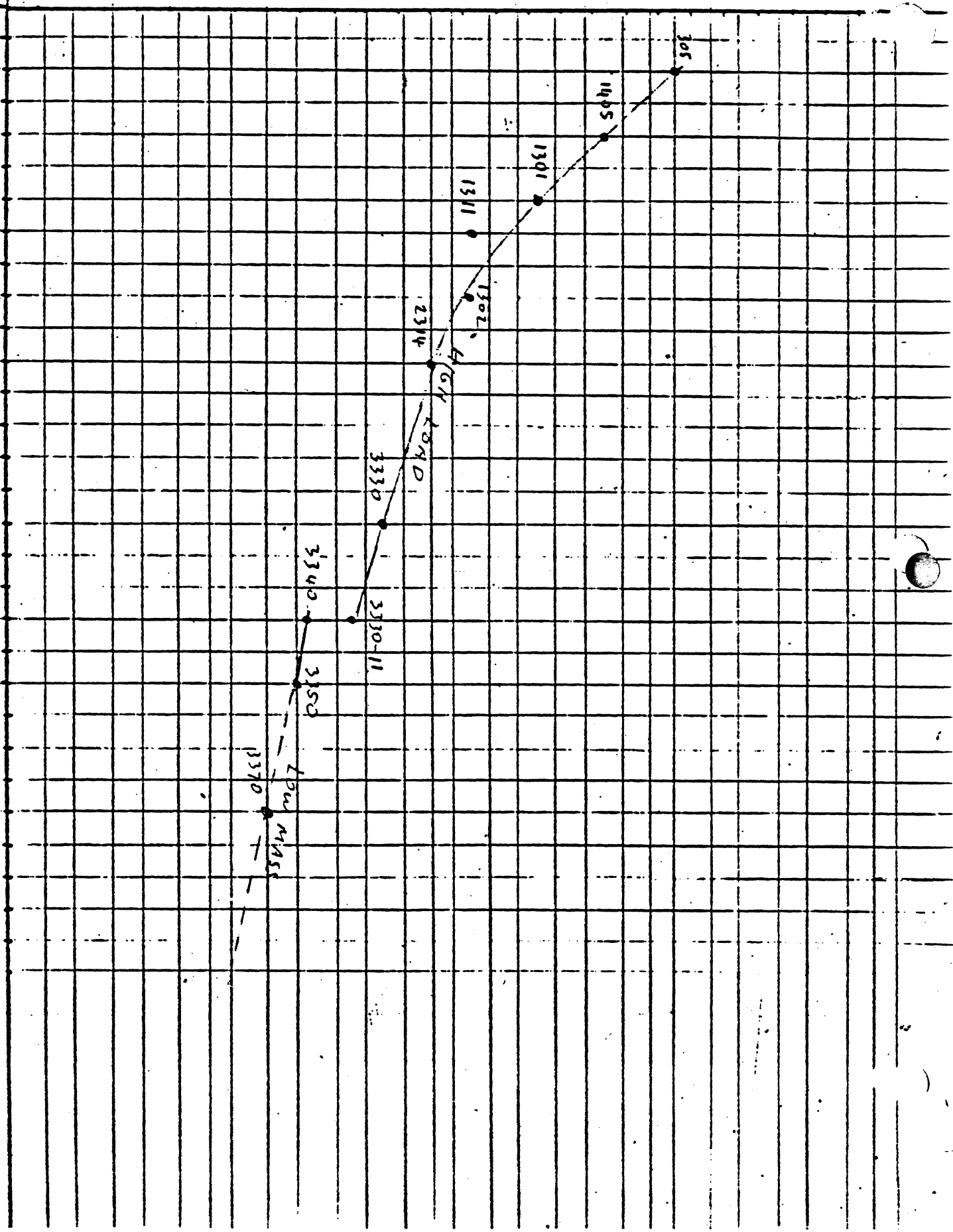


4946200

# FLYING HEIGHT IN INCHES

10000  
5000  
6000  
4000  
3000  
2000  
1500  
1000  
800  
600  
400  
300  
200  
150  
100  
80  
60  
40  
30  
20  
15  
10  
9  
8  
6  
4  
3  
2  
1

1955  
1956  
1957  
1958  
1959  
1960  
1961  
1962  
1963  
1964  
1965  
1966  
1967  
1968  
1969  
1970  
1971  
1972  
1973  
1974  
1975  
1976  
1977  
1978  
1979  
1980  
1981  
1982  
1983  
1984  
1985



HIGH LAND

Low MASS

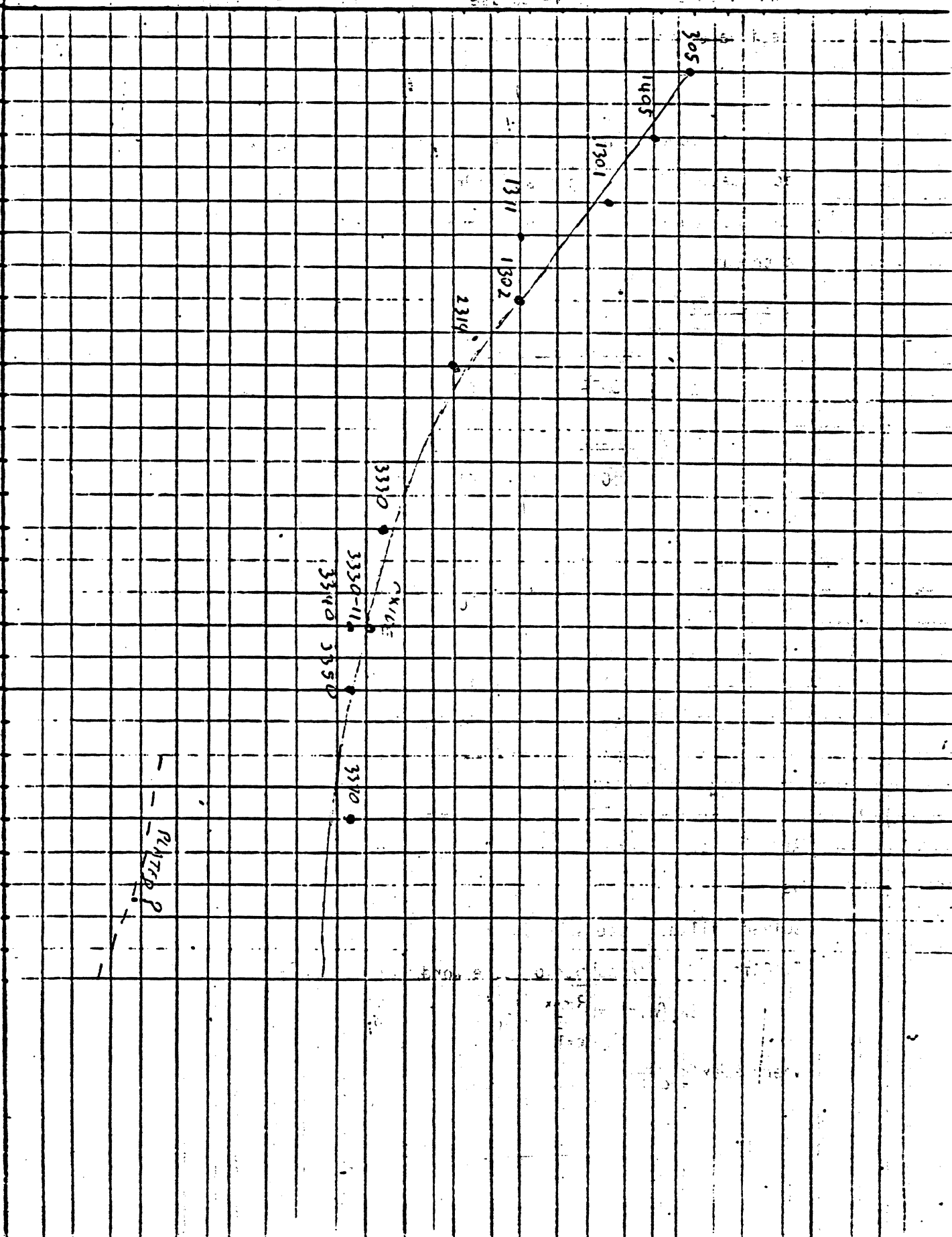


# COATING THICKNESS

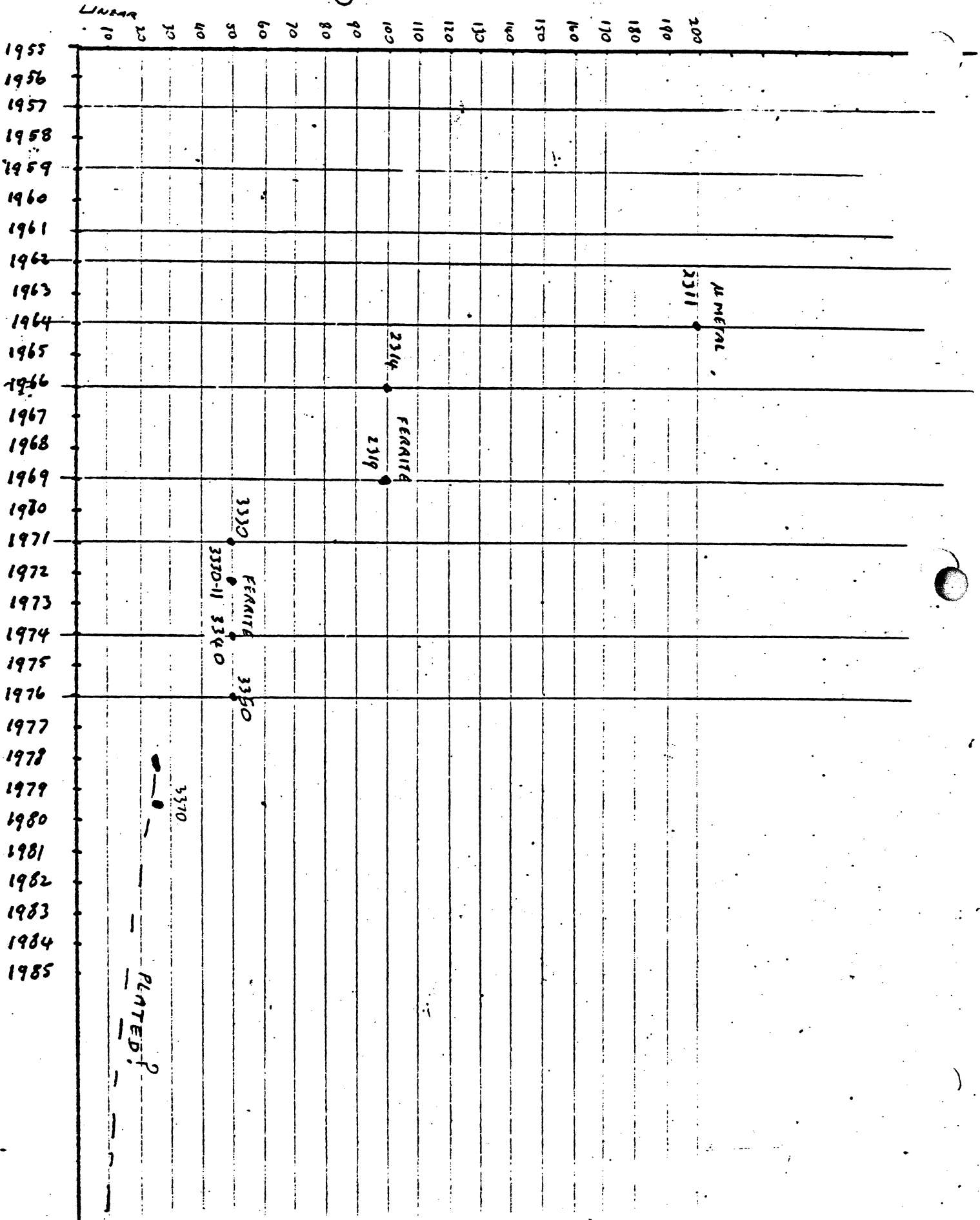
μ INCHES

10000  
8000  
6000  
4000  
3000  
2000  
1500  
1000  
500  
400  
300  
200  
150  
100  
80  
60  
40  
30  
20  
15  
10  
8  
6  
4  
3  
2  
1.5

1955  
1957  
1958  
1959  
1960  
1961  
1962  
1963  
1964  
1965  
1966  
1967  
1968  
1969  
1970  
1971  
1972  
1973  
1974  
1975  
1976  
1977  
1978  
1979  
1980  
1981  
1982  
1983  
1984  
1985



# GAP LENGTH μ INCHES



| DATE | CLOCK | CODE                          | ECC    | AVE<br>RESOLUTION | ELECTRONIC      | MACHINE |
|------|-------|-------------------------------|--------|-------------------|-----------------|---------|
| 1956 | CLOCK | NRZI                          | NO     | 1.0               | CLIPPING        | 350     |
| 7    |       |                               |        |                   |                 |         |
| 8    |       |                               |        |                   |                 |         |
| 9    | CLOCK | NRZI                          | NO     | 1.0               | CLIPPING        | 1405    |
| 60   |       |                               |        |                   |                 |         |
| 1    | CLOCK | NRZI                          | NO     | 1.0               | CLIPPING        | 1301    |
| 2    | CLOCK | NRZI                          | NO     | 1.0               | CLIPPING        | 1311    |
| 3    |       |                               |        |                   |                 |         |
| 4    | CLOCK | NRZI                          | NO     | 1.0               | CLIPPING        | 1302    |
| 5    | SELF  | FM                            | NO     | 2.5               | LIMIT           | 2311    |
| 6    | SELF  | FM                            | NO     | 2.5               | LIMIT           | 2314    |
| 7    |       |                               |        |                   |                 |         |
| 8    |       |                               |        |                   |                 |         |
| 9    |       |                               |        |                   |                 |         |
| 70   |       |                               |        |                   |                 |         |
| 1    | SELF  | MFM                           | 11 bit | 1.5               | $\Delta V$ GATE | 3330    |
| 2    |       |                               |        |                   |                 |         |
| 3    |       |                               |        |                   |                 |         |
| 4    | SELF  | MFM                           | 11 bit | 1.5               | GATE            | 3330-11 |
| 5    | SELF  | MFM                           | 4 bit  | 1.3               | CLIPPING        | 3340    |
| 6    | SELF  | MFM                           | 4 bit  | 1.3               | $\Delta V$ GATE | 3350    |
| 7    |       |                               |        |                   |                 |         |
| 8    |       |                               |        |                   |                 |         |
| 9    | SELF  | $\frac{1}{2}$ (2.7)           | 16 BIT | 1.1               | CLIPPING        | 3370    |
| 80   |       |                               |        |                   |                 |         |
| 1    |       | SELF CLOCKING<br>GROUP CODES. |        |                   |                 |         |
| 2    |       |                               |        |                   |                 |         |
| 3    |       |                               |        |                   |                 |         |
| 4    |       |                               |        |                   |                 |         |
| 5    |       |                               |        |                   |                 |         |

# The Memorex Drive Family

| DRIVE # | INTERFACE                | CONTR UNIT                                 | REQUIRE EXTERNAL VFO PLO | ROT (RPM) SPEED | DATA TR. RATE (KILOBYTES) | REVOLUTION TIME | NO. OF CYLINDERS | # REC. SURFACES | FIRED HEADS |                     | MOVING HEADS |                         | BYTES/ TRACK | TRACK DENSITY      | MAX BIT DENSITY | SEEK TIME |         | INTERFACE LEVELS        |                         | DATA ERROR RATE                                     | SEEK ERROR RATE        | BIT CELL TIME |
|---------|--------------------------|--|--------------------------|-----------------|---------------------------|-----------------|------------------|-----------------|-------------|---------------------|--------------|-------------------------|--------------|--------------------|-----------------|-----------|---------|-------------------------|-------------------------|---|------------------------|---------------|
|         |                          |  |                          |                 |                           |                 |                  |                 | QTY.        | TOTAL CAPACITY      | QTY.         | TOTAL CAPACITY          |              |                    |                 | MINIMUM   | AVERAGE | CONTROL                 | DATA/CLK                |   |                        |               |
| 660     | IBM 2314                 | MRX 661                                    | YES                      | 2400            | 312 KB/S                  | 25 MS           | 203              | 20              |             |                     | 20           | 29 MB                   | 7.250        | 100 TPI            | 2228 BPI        | 12 MC     | 35 MS   | -2.5V<br>+1.5V          | 0V<br>+3V               | 10 <sup>8</sup> SOFT<br>10 <sup>12</sup> HARD       | 10 <sup>8</sup> RANDOM | 400 NS        |
| 3670    | IBM 3330-1               | MRX 3673                                   | YES                      | 3600            | 808 KB/S                  | 16.67 MS        | 404              | 19              |             |                     | 19           | 100 MB PER SPINDLE      | 13,000       | 192 TPI            | 4040 BPI        | 5 MS      | 27 MS   | 0V<br>1.7V<br>(8T23/24) | 0V<br>1VT               | 10 <sup>8</sup> SOFT<br>10 <sup>12</sup> HARD       | 10 <sup>8</sup> RANDOM | 155 NS        |
| 3675    | IBM 3330-2               | MRX 3673                                   | YES                      | 3600            | 808 KB/S                  | 16.67 MS        | 808              | 19              |             |                     | 19           | 200 MB PER SPINDLE      | 13,000       | 370 TPI            | 4040 BPI        | 5 MS      | 27 MS   | 0V<br>1.7V<br>(8T23/24) | 0V<br>1V                | 10 <sup>8</sup> SOFT<br>10 <sup>12</sup> HARD       | 10 <sup>8</sup> RANDOM | 155 NS        |
| 677-30  | CDC 9766                 |  | NO                       | 3600            | 1209 KB/S                 | 16.67 MS        | 823              | 19              |             |                     | 19           | 309.5 MB                | 20,160       | 384 TPI            | 6060 BPI        | 6 MS      | 38.33   |                         |                         | 10 <sup>8</sup> SOFT<br>10 <sup>12</sup> HARD       | 10 <sup>8</sup> RANDOM | 103 NS        |
| 677-0   | CDC 9760                 | TELEFILE                                   | NO                       | 3600            | 808 KB/S                  | 16.67 MS        | 411<br>815       | 19              |             |                     | 19           | 100 MB<br>200 MB        | 13,440       | 192 TPI<br>370 TPI | 4040 BPI        | 6 MS      | 28.5 MS | 75107<br>75110          | 75108<br>75110          | 10 <sup>8</sup> SOFT<br>10 <sup>12</sup> HARD       | 10 <sup>8</sup> RANDOM | 155 NS        |
| 677-1   | DEC-DCL                  | DEC-DCL                                    | NO                       | 3600            | 808 KB/S                  | 16.67 MS        | 411<br>815       | 19              |             |                     | 19           | 100 MB<br>200 MB        | 13,440       | 192 TPI<br>370 TPI | 4040 BPI        | 6 MS      | 28.5 MS | 7404<br>7438            | 75108<br>75113          | 10 <sup>8</sup> SOFT<br>10 <sup>12</sup> HARD       | 10 <sup>8</sup> RANDOM | 155 NS        |
| 677-2   | IBM 3330-2               | ISSI                                       | YES                      | 3600            | 808 KB/S                  | 16.67 MS        | 411<br>815       | 19              |             |                     | 19           | 100 MB<br>200 MB        | 13,440       | 192 TPI<br>370 TPI | 4040 BPI        | 6 MS      | 28.5 MS | 0V<br>1.7V<br>(8T23/24) | -1.6V<br>-0.9V          | 10 <sup>8</sup> SOFT<br>10 <sup>12</sup> HARD       | 10 <sup>8</sup> RANDOM | 155 NS        |
| 612     | CDC 9760                 |  | NO                       | 3600            | 1209 KB/S                 | 16.67 MS        | 350              | 2<br>4<br>6     |             |                     | 4<br>8<br>12 | 28 MB<br>57 MB<br>85 MB | 20,160       | 300 TPI            | 5636 BPI        | 7 MS      | 32 MS   | 75107<br>75110          | 75107<br>75110          | 10 <sup>8</sup> SOFT<br>10 <sup>12</sup> HARD       | 10 <sup>8</sup> RANDOM | 141 NS        |
| 601     | CDC 9760<br>+FIXED HEADS | MSC 1000                                   | NO                       | 2964            | 885 KB/S                  | 20.24 MS        | 350              | 7               | 30<br>60    | 0.5 MB<br>1.0 MB    | 4<br>8<br>12 | 25 MB<br>50 MB<br>75 MB | 17,290       | 300 TPI            | 5636 BPI        | 7 MS      | 32 MS   | 75107<br>75110          | 75107<br>75110          | 10 <sup>8</sup> SOFT<br>10 <sup>12</sup> HARD       | 10 <sup>8</sup> RANDOM | 141 NS        |
| 3640    | IBM 3340-B2              | IBM 3343<br>MRX 3643                       | YES                      | 2964            | 885 KB/S                  | 20.24 MS        | 349<br>699       | 3<br>7          | 30          | 0.5 MB              | 6<br>12      | 35 MB<br>70 MB          | 8,368        |                    |                 | 7 MS      | 20 MS   | 0V<br>1.7V<br>(8T23/24) |                         | 10 <sup>8</sup> SOFT<br>10 <sup>12</sup> HARD       | 10 <sup>8</sup> RANDOM | 141 NS        |
| 3643    | IBM 3340-A2              | IBM 3830-2<br>ISC OR IFA                   | NO                       | 2964            | 885 KB/S                  | 20.24 MS        | 349<br>699       | 3<br>7          | 30          | 0.5 MB              | 6<br>12      | 35 MB<br>70 MB          | 8,368        |                    |                 | 7 MS      | 20 MS   | 0V<br>1.7V<br>(8T23/24) | 0V<br>1.7V<br>(8T23/24) | 10 <sup>8</sup> SOFT<br>10 <sup>12</sup> HARD       | 10 <sup>8</sup> RANDOM | 141 NS        |
| 3650    | IBM 3350-B2              | IBM 3350-A2<br>MRX 3653                    | YES                      | 3600            | 1198 KB/S                 | 16.8 MS         | 555              | 15              | 60          | 1.14 MB             | 30           | 317.5 MB PER SPINDLE    | 19,069       | 480 TPI            | 6350 BPI        | 10 MS     | 25 MS   | 0V<br>1.7V<br>(8T23/24) | 0V<br>-0.6V             | 10 <sup>8</sup> CORRECT<br>10 <sup>10</sup> RECOVER | 10 <sup>8</sup> RANDOM | 104 NS        |
| 3653    | IBM 3350-A2              | IBM 3830-2<br>ISC (370 MOD 45)<br>MRX 3674 | NO                       | 3600            | 1198 KB/S                 | 16.8 MS         | 555              | 15              | 60          | 1.14 MB             | 30           | 317.5 MB PER SPINDLE    | 19,069       | 480 TPI            | 6350 BPI        | 10 MS     | 25 MS   | 0V<br>1.7V<br>(8T23/24) |                         | 10 <sup>8</sup> CORRECT<br>10 <sup>10</sup> RECOVER | 10 <sup>8</sup> RANDOM | 104 NS        |
| 3644    | IBM 3344                 | IBM 3343<br>MRX 3643                       | NO                       | 2964            | 885 KB/S                  | 20.2 MS         | 2784             | 15              | 60          | 1.0 MB              | 30           | 280 MB PER SPINDLE      | 8,368        | 480 TPI            | 5640 BPI        | 10 MS     | 25 MS   | 0V<br>1.7V              |                         | 10 <sup>8</sup> CORRECT<br>10 <sup>10</sup> RECOVER | 10 <sup>8</sup> RANDOM | 141 NS        |
| 3652    | IBM                      | MRX 3655                                   | YES                      | 3600            | 1198 KB/S                 | 16.8 MS         | 1110             | 15              | 120         | 2.28 MB PER SPINDLE | 30           | 635 MB PER SPINDLE      | 19,069       | 905 TPI            | 6350            | 6 MS      | 22 MS   | 0V<br>1.7V<br>(8T23/24) |                         | 10 <sup>8</sup> SOFT<br>10 <sup>12</sup> HARD       | 10 <sup>8</sup> RANDOM | 104 NS        |