

**YOUR
64**

MEGABASIC FOR THE COMMODORE 64

Ross Symons



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**YOUR
64**

MEGABASIC

**EXTENDED BASIC
FOR THE
COMMODORE 64**

ROSS SYMONS



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FOREWORD – Tim Hartnell

Ross Symons was certainly a discovery. A 17-year-old programmer, with experience on the VIC, the BBC Micro and the Commodore 64, Ross was just bursting with ideas when I first met him. The concept of an Extended BASIC for the '64, which did not cost the earth, was the most exciting and practical of those ideas.

The first version of the program was widely distributed in Australia. As a result of feedback from users, and following interest from America, Ross completely rewrote his BASIC, to make it easier to use, more extensive and more flexible.

You now have the greatly improved version of this BASIC. It is just waiting to give you and your '64 access to all the commands you wish Commodore had included when they built the machine.

Good programming,
Tim Hartnell,
London, 1985

Tim Hartnell is the most widely published author of computer books in the world. He is managing director of Interface Publications Ltd., which is based in London, with offices in New York and Melbourne. Recent works by Tim include *Exploring Artificial Intelligence on Your Commodore 64* (Interface, 1985) and *The Giant Book of Games for the Commodore 64* (Fontana, 1984).

THE HISTORY OF THE CITY OF BOSTON

The city of Boston, situated on a neck of land between the harbor and the bay, has been the seat of government and commerce since the first settlement in 1630. It was the first city in America to have a city government, and it was the first to have a city seal. The city has a long and rich history, and it has played a major role in the development of the United States. It was the site of the first American Revolution, and it was the birthplace of many of the nation's founders. The city has a diverse population, and it is a center of culture and education. It is a city of many firsts, and it is a city that has shaped the course of American history.

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INTRODUCTION

The Commodore 64 is a very powerful computer. It has brilliant colors, high-resolution graphics and sprites, to name only a few features. The only thing that the Commodore 64 lacks is a BASIC vocabulary to properly control these functions.

Extended BASIC is designed to remedy this problem. It adds new commands to the Commodore 64 which can be used very simply.

Extended BASIC adds a number of commands such as RENUMBER and RSTRIP to regulate and control program flow. It also gives you commands such as SET and DRAW which enable you to manipulate the Commodore 64's high-resolution graphics.

Extended BASIC comes with many interesting and useful commands. As well, it is able to grow with you. Extended BASIC is expandable; that is, you can add your own commands.

This manual includes details of all the commands offered by Extended BASIC and instructions on how to use each of them.

**Ross Symons,
1985**

MAKING THE MOST OF YOUR C64

Cassette of MEGABASIC — MEGABASIC is available on cassette (which can easily be copied to disc, if you like) for just £4.95. Think of the typing you'll save yourself.

MASTERING THE COMMODORE 64 — Mark Greenshields — 224 pages — ISBN 0 907563 38 4. This book is a must for all Commodore 64 Users who wish to increase their understanding of how the computer works, and their mastery of it. **MASTERING THE COMMODORE 64** includes explanations of sound and music synthesis, programmable characters, high resolution graphics, function key programming, and animation and sprites in both BASIC and machine code. Just £7.95.

HOW TO PROGRAM THE COMMODORE 64 — Robert Young — 176 pages — ISBN 0 907563 47 3. If you've never programmed a computer before, and you'd like to be able to program your Commodore 64 in just a few hours, then this book is for you. This easy-to-follow guide assumes no prior knowledge of computer programming. However, in just a few hours, you'll be writing worthwhile programs of your own. You'll discover the most important words of programming, and once you've worked through the book, you'll have an entire library of interesting programs to keep you, and your Commodore 64, occupied for weeks to come. Just £5.95.

MASTERING MACHINE CODE ON THE COMMODORE 64 — Mark Greenshields — ISBN 0 907563 69 4. If you want to get to grips with machine code, then this is the guide you want. Highly recommended by the computer press. The book assumes you know how to program in BASIC but assumes your knowledge of machine code is zero. And you're led from this point, to real machine code mastery, step by step. If you're serious about programming your Commodore 64, you need the skills machine code gives you. And this is the book to give you those skills. Just £7.95.

You can get these books from the store where you bought MEGABASIC. In case of difficulties, write to us, and we'll send them to you, post free. Use the coupon below, or if you don't want to cut up your book (and I don't imagine you do) copy the main bits onto a piece of paper, and send it to us with the correct amount for the books.

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THE PROGRAM

If you have either the cassette or disk versions of Extended BASIC then LOAD"EXT-LOADER", and turn to the next section of this manual. If you don't have either of these, read on.

Before you can begin programming in Extended BASIC you must enter the following program. The program should be SAVED before it is RUN, because errors may crash the computer.

The program has four data banks (four separate groups of data) which must be typed correctly. If, however, you make a mistake, the program will tell you which part of the data is wrong.

```
10 AD=0:DB$="#1"
20 FOR LOOP=49152 TO 50078
30 READ N:AD=AD+N
40 POKE LOOP,N
50 NEXT LOOP
60 IF AD<>103649 THEN GOTO 310
70 GOSUB 290
80 AD=0:DB$="#2"
90 FOR LOOP=50079 TO 51023
100 READ N:AD=AD+N
110 POKE LOOP,N
120 NEXT LOOP
130 IF AD<>106451 THEN GOTO 310
140 GOSUB 290
150 AD=0:DB$="#3"
160 FOR LOOP=51024 TO 51967
170 READ N:AD=AD+N
180 POKE LOOP,N
190 NEXT LOOP
200 IF AD<>133952 THEN GOTO 310
210 GOSUB 290
220 AD=0:DB$="#4"
230 FOR LOOP=51968 TO 52918
```

Extended BASIC Commodore 64

```
240 READ N:AD=AD+N
250 POKE LOOP,N
260 NEXT LOOP
270 IF AD<>137741 THEN GOTO 310
280 SYS49736:NEW
290 PRINT"DATA BANK";DB#;" O.K"
300 RETURN
310 PRINT"ERROR IN DATA BANK";DB#:END
320 REM ***** DATA BANK #1 *****
330 DATA 3,73,78,75,194,255,5,66
340 DATA 176,68,69,82,195,8,5,80
350 DATA 65,80,69,82,195,17,4,83
360 DATA 76,79,87,195,26,3,79,76
370 DATA 68,195,76,3,70,73,88,195
380 DATA 166,4,75,73,76,76,227,147
390 DATA 5,80,65,85,83,69,195,187
400 DATA 5,67,85,82,83,176,195,213
410 DATA 4,69,88,73,84,195,237,5
420 DATA 65,68,67,79,77,195,251,6
430 DATA 82,69,80,69,65,84,196,74
440 DATA 4,84,69,88,84,196,83,5
450 DATA 72,73,82,69,83,196,103,3
460 DATA 67,76,71,196,131,3,67,76
470 DATA 83,196,188,4,71,67,79,76
480 DATA 196,197,4,66,67,79,76,196
490 DATA 216,3,83,69,84,197,106,6
500 DATA 83,87,73,84,67,72,197,120
510 DATA 5,82,69,83,69,84,197,134
520 DATA 6,82,69,68,82,65,87,199
530 DATA 184,4,68,82,65,87,199,171
540 DATA 6,83,87,68,82,65,87,199
550 DATA 197,4,72,69,76,80,199,209
560 DATA 6,66,65,67,75,85,80,200
570 DATA 223,3,68,73,82,200,246,6
580 DATA 82,83,84,82,73,80,202,86
590 DATA 6,83,83,84,82,73,80,203
600 DATA 43,8,82,69,78,85,77,66
610 DATA 69,82,206,148,0,0,0,0
620 DATA 0,0,0,0,0,0,0,0
630 DATA 0,0,0,0,0,0,0,0
640 DATA 0,0,0,0,0,0,0,0
650 DATA 255,78,69,87,13,79,76,68
```

```
660 DATA 13,20,4,217,226,40,8,1
670 DATA 2,4,8,16,32,64,128,234
680 DATA 234,234,237,62,3,141,68,3
690 DATA 96,234,234,234,234,234,234,234
700 DATA 234,234,238,234,234,234,234
710 DATA 234,234,234,234,234,234,234
720 DATA 234,234,234,234,234,234
730 DATA 234,234,234,234,13,13,50,55,32
740 DATA 65,68,67,79,77,32,66,89,84,69
750 DATA 83,32,70,82,69,69,0,32,32
760 DATA 32,32,32,32,32,32,32,32
770 DATA 32,68,73,83,75,32,79,82
780 DATA 32,84,65,80,69,32,40,68
790 DATA 47,84,41,63,32,0,13,70
800 DATA 82,79,77,0,13,13,84,79
810 DATA 0,13,13,69,78,84,69,82
820 DATA 32,84,72,69,32,70,73,76
830 DATA 69,78,65,77,69,58,0,0
840 DATA 11,88,88,88,88,88,88,88
850 DATA 88,88,88,88,234,234,234,234
860 DATA 234,234,234,234,234,0,192,0
870 DATA 207,13,69,78,84,69,82,32
880 DATA 68,69,83,84,73,78,65,84
890 DATA 73,79,78,32,68,73,83,75
900 DATA 32,79,82,32,84,65,80,69
910 DATA 0,147,82,83,84,82,73,80
920 DATA 13,0,234,234,10,0,234,234
930 DATA 83,89,83,53,50,53,52,48
940 DATA 13,13,70,65,73,76,69,68,234
950 DATA 234,234,234,234,234,234,234
960 DATA 234,234,234,234,234,234,234
970 DATA 234,147,42,42,42,42,42,32
980 DATA 69,88,84,69,78,68,69,68
990 DATA 32,66,65,83,73,67,32,86
1000 DATA 79,76,85,77,69,32,50,46
1010 DATA 54,49,32,42,42,42,42,42
1020 DATA 42,13,40,67,41,32,82,79
1030 DATA 83,83,32,83,89,77,79,78
1040 DATA 83,32,49,57,56,53,32,32
1050 DATA 32,13,0,234,234,234,234,234
1060 DATA 169,98,141,8,3,169,194,141
```

```
1070 DATA 9,3,162,0,189,0,194,208
1080 DATA 1,96,32,210,255,232,76,84
1090 DATA 194,234,32,115,0,8,72,162
1100 DATA 0,160,0,165,122,133,251,165
1110 DATA 123,133,252,189,0,192,208,5
1120 DATA 104,40,76,231,167,133,253,232
1130 DATA 177,251,240,46,221,0,192,208
1140 DATA 41,198,253,240,9,232,230,251
1150 DATA 208,2,230,252,208,234,165,251
1160 DATA 133,122,165,252,133,123,104,40
1170 DATA 169,167,72,169,173,72,189,1
1180 DATA 192,72,232,189,1,192,72,76,121
1190 DATA 0,138,56,101,253,170,232,208
1200 DATA 177,234,234,234,234,234,234
1210 DATA 234,234,234,234,234,234,234
1220 DATA 234,234,234,234,234,234,234
1230 DATA 234,234,234,234,234,234,234
1240 DATA 234,234,234,234,234,234,234
1250 DATA 234,234,234,234,234,234,234
1260 DATA 234,234,234,234,234,234,234
1270 DATA 234,234,234,234,234,234,234
1280 DATA 234,234,234,234,234,234,234
1290 DATA 234,234,234,234,234,234,234
1300 DATA 234,32,155,183,165,101,141,134
1310 DATA 2,96,32,155,183,165,101,141,32
1320 DATA 208,96,32,155,183,165,101,141
1330 DATA 33,208,96,32,155,183,165,101
1340 DATA 240,30,141,0,193,169,195,162
1350 DATA 50,120,142,20,3,141,21,3
1360 DATA 88,96,162,0,172,0,193,202
1370 DATA 208,253,136,208,250,76,49,234
1380 DATA 120,169,49,141,20,3,169,234
1390 DATA 141,21,3,88,96,160,3,200
1400 DATA 177,43,208,251,200,152,24,101
1410 DATA 43,160,255,200,145,43,133,45
1420 DATA 200,165,44,145,43,133,46,160
1430 DATA 255,200,177,45,72,240,11,200
1440 DATA 177,45,133,46,104,133,45,24
1450 DATA 144,237,200,177,45,208,243
1460 DATA 104,24,165,45,105,2,133,45
1470 DATA 144,2,230,46,133,47,133,49
1480 DATA 165,46,133,48,133,50,169,0
1490 DATA 133,51,133,52,165,55,133,53
```

```
1500 REM ***** DATA BANK #2 *****
1510 DATA 165,56,133,54,32,115,0,96,169
1520 DATA 8,133,198,162,0,189,1,193
1530 DATA 157,119,2,232,224,8,208,245
1540 DATA 32,115,0,96,169,202,141,6
1550 DATA 3,169,195,141,7,3,32,115
1560 DATA 0,96,72,173,141,2,41,1
1570 DATA 208,249,104,76,26,167,32,155
1580 DATA 183,165,101,141,9,193,32,155
1590 DATA 183,164,101,174,9,193,24,32
1600 DATA 240,255,32,6,169,96,169,228
1610 DATA 141,8,3,169,167,141,9,3
1620 DATA 32,6,169,96,32,115,0,201
1630 DATA 34,208,249,162,0,138,24,125
1640 DATA 0,192,105,3,170,189,0,192
1650 DATA 208,243,142,11,193,160,0,32
1660 DATA 115,0,157,1,192,200,232,201
1670 DATA 34,208,244,136,152,234,142,12
1680 DATA 193,174,11,193,157,0,192,32
1690 DATA 115,0,32,138,173,32,247,183
1700 DATA 174,12,193,165,20,56,233,1
1710 DATA 157,1,192,165,21,233,0,157
1720 DATA 0,192,96,169,128,141,138,2
1730 DATA 32,115,0,96,173,24,208,41
1740 DATA 247,141,24,208,173,17,208,41
1750 DATA 223,141,17,208,32,115,0,96
1760 DATA 173,24,208,9,8,141,24,208
1770 DATA 173,17,208,9,32,141,17,208
1780 DATA 169,31,133,52,169,255,133,51
1790 DATA 32,115,0,96,169,32,133,98
1800 DATA 169,0,133,97,168,145,97,230
1810 DATA 97,208,250,166,98,232,134,98
1820 DATA 224,64,208,241,32,115,0,96
1830 DATA 160,0,162,4,132,251,134,252
1840 DATA 177,251,37,2,5,253,145,251
1850 DATA 230,251,208,244,230,252,166
1860 DATA 252,224,8,208,236,96,169,147
1870 DATA 32,210,255,32,115,0,96,32,155
1880 DATA 183,165,101,10,10,10,10,133
1890 DATA 253,162,15,134,2,32,160,196
1900 DATA 96,32,155,183,165,101,133,253
1910 DATA 162,240,134,2,32,160,196,96
```

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1920 DATA 165,252,74,74,74,133,98,165
1930 DATA 253,133,99,165,254,74,102,99
1940 DATA 74,102,99,74,102,99,133,254
1950 DATA 165,252,41,7,133,100,165,253
1960 DATA 41,7,133,101,169,7,56,229
1970 DATA 101,133,101,169,0,133,102,169
1980 DATA 32,133,103,166,98,240,16,230
1990 DATA 103,165,102,24,105,64,133,102
2000 DATA 144,2,230,103,202,208,240,165
2010 DATA 99,10,10,10,144,3,230,103
2020 DATA 24,101,102,133,102,144,2,230
2030 DATA 103,165,102,24,101,100,133
2040 DATA 102,144,2,230,103,166,101,160
2050 DATA 0,96,32,115,0,32,138,173,32
2060 DATA 247,183,165,20,133,253,165,21
2070 DATA 133,254,32,253,174,32,158,183
2080 DATA 134,252,96,32,81,197,32,232
2090 DATA 196,177,102,29,15,193,145,102
2100 DATA 96,32,81,197,32,232,196,177
2110 DATA 102,93,15,193,145,102,96,32
2120 DATA 81,197,32,232,196,169,255,56
2130 DATA 253,15,193,49,102,145,102,96
2140 DATA 32,115,0,32,138,173,32,247
2150 DATA 183,165,20,141,60,3,165,21
2160 DATA 141,61,3,32,253,174,32,158
2170 DATA 183,142,62,3,32,253,174,32
2180 DATA 138,173,32,247,183,165,20,141
2190 DATA 63,3,165,21,141,64,3,32,253
2200 DATA 174,32,158,183,142,65,3,96
2210 DATA 234,234,234,234,234,234,234
2220 DATA 234,234,234,234,234,234,234
2230 DATA 234,234,234,234,138,56,237,62
2240 DATA 3,141,68,3,173,63,3,56,237
2250 DATA 60,3,141,66,3,173,64,3
2260 DATA 237,61,3,141,67,3,32,0
2270 DATA 199,32,16,199,173,71,3,208
2280 DATA 106,173,70,3,205,72,3,176
2290 DATA 98,173,68,3,74,141,58,3
2300 DATA 169,0,32,116,199,238,62,3
2310 DATA 173,58,3,24,109,70,3,141
2320 DATA 58,3,173,59,3,109,71,3
2330 DATA 141,59,3,208,8,173,58,3
```

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2340 DATA 205,68,3,144,26,206,60,3
2350 DATA 208,3,206,61,3,173,58,3
2360 DATA 56,237,68,3,141,58,3,173
2370 DATA 59,3,233,0,141,59,3,173
2380 DATA 60,3,133,253,173,61,3,133
2390 DATA 254,173,62,3,133,252,32,225
2400 DATA 198,206,72,3,208,175,96,234
2410 DATA 234,234,234,32,139,199,173,71
2420 DATA 3,74,141,59,3,173,70,3
2430 DATA 106,141,58,3,238,60,3,208
2440 DATA 3,238,61,3,173,58,3,24
2450 DATA 109,68,3,141,58,3,173,59
2460 DATA 3,105,0,141,59,3,173,58
2470 DATA 3,56,237,70,3,173,59,3
2480 DATA 237,71,3,48,22,238,62,3
2490 DATA 173,58,3,56,237,70,3,141
2500 DATA 58,3,173,59,3,237,71,3
2510 DATA 141,59,3,173,60,3,133,253
2520 DATA 173,61,3,133,254,173,62,3
2530 DATA 133,252,32,225,198,206,66,3
2540 DATA 208,170,206,67,3,16,165,96
2550 DATA 234,173,255,3,48,6,240,8
2560 DATA 32,124,197,96,32,110,197,96
2570 DATA 32,138,197,96,234,234,234,234
2580 DATA 234,234,234,234,234,234,234
2590 DATA 234,173,68,3,16,5,73,255,24
2600 DATA 105,1,141,72,3,96,234,234
2610 DATA 173,67,3,48,10,141,71,3
2620 DATA 173,66,3,141,70,3,96,73
2630 DATA 255,173,71,3,173,66,3,73
2640 DATA 255,24,41,255,105,5,141,70
2650 DATA 3,96,141,59,3,173,68,3
2660 DATA 48,1,96,32,71,199,104,104
2670 DATA 173,65,3,76,228,197,234,173
2680 DATA 60,3,72,173,61,3,72,173
2690 REM ***** DATA BANK #3 *****
2700 DATA 62,3,72,173,63,3,141,60
2710 DATA 3,173,64,3,141,61,3,173
2720 DATA 65,3,141,62,3,104,141,65
2730 DATA 3,104,141,64,3,104,141,63
2740 DATA 3,96,234,234,174,67,3,48
2750 DATA 5,162,238,76,128,199,162,206
2760 DATA 142,61,198,142,66,198,76,50

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```
2770 DATA 199,234,234,173,68,3,48,5
2780 DATA 169,238,76,151,199,169,206,141
2790 DATA 173,198,173,67,3,48,1,96
2800 DATA 32,71,199,104,104,173,65,3
2810 DATA 76,228,197,234,169,255,141,255
2820 DATA 3,32,152,197,32,227,197,96
2830 DATA 234,169,0,141,255,3,32,152
2840 DATA 197,32,227,197,96,234,169,1
2850 DATA 141,255,3,32,152,197,32,227
2860 DATA 197,96,32,35,200,133,252,169
2870 DATA 0,133,251,160,0,177,251,240
2880 DATA 46,230,251,170,32,253,199,162
2890 DATA 20,134,211,177,251,170,240,31
2900 DATA 230,251,32,253,199,169,13,32
2910 DATA 210,255,76,219,199,177,251,48
2920 DATA 19,32,210,255,230,251,202,208
2930 DATA 244,230,251,230,251,96,234,32
2940 DATA 44,200,96,234,201,176,208,233
2950 DATA 169,79,32,210,255,169,82,76
2960 DATA 1,200,234,169,147,32,210,255
2970 DATA 169,192,96,234,32,115,0,169
2980 DATA 255,56,229,251,168,169,0,32
2990 DATA 145,179,32,221,189,173,1,1
3000 DATA 141,66,193,173,2,1,141,67
3010 DATA 193,162,0,189,64,193,240,7
3020 DATA 32,210,255,232,76,75,200,96
3030 DATA 234,162,0,189,96,193,240,247
3040 DATA 32,210,255,232,76,91,200,234
3050 DATA 162,0,189,118,193,240,7,32
3060 DATA 210,255,232,76,106,200,32,89
3070 DATA 200,96,234,162,0,189,124,193
3080 DATA 240,7,32,210,255,232,76,125
3090 DATA 200,32,89,200,96,234,32,104
3100 DATA 200,165,197,201,64,240,250,201
3110 DATA 22,240,17,201,18,240,3,76
3120 DATA 145,200,169,68,32,210,255,169
3130 DATA 1,133,2,96,169,84,32,210
3140 DATA 255,169,0,133,2,96,234,32
3150 DATA 123,200,165,197,201,64,240,250
3160 DATA 201,22,240,17,201,18,240,3
3170 DATA 76,186,200,169,68,32,210,255
3180 DATA 169,8,133,254,96,169,84,32
3190 DATA 210,255,169,1,133,254,96,234
```

```

3200 DATA 32,142,200,162,0,160,0,202
3210 DATA 208,253,136,208,250,32,183,200
3220 DATA 169,0,133,198,76,137,201,32
3230 DATA 115,0,169,1,32,195,255,169
3240 DATA 36,133,251,169,48,133,252,169
3250 DATA 1,162,8,160,0,32,186,255
3260 DATA 169,2,162,251,160,0,32,189
3270 DATA 255,32,192,255,169,64,32,144
3280 DATA 255,162,1,32,198,255,32,144
3290 DATA 255,32,207,255,32,207,255,32
3300 DATA 207,255,32,207,255,201,0,240
3310 DATA 58,32,204,255,32,228,255,201
3320 DATA 32,208,3,32,128,201,162,1
3330 DATA 32,198,255,32,207,255,168,32
3340 DATA 207,255,72,152,170,104,32,205
3350 DATA 189,169,32,32,210,255,32,207
3360 DATA 255,201,0,208,8,169,13,32
3370 DATA 210,255,76,47,201,32,210,255
3380 DATA 76,94,201,169,1,32,195,255
3390 DATA 32,204,255,96,234,234,234,96
3400 DATA 32,228,255,201,32,208,249,96
3410 DATA 234,162,0,189,129,193,240,7
3420 DATA 32,210,255,232,76,139,201,169
3430 DATA 0,141,152,193,32,228,255,201
3440 DATA 0,240,249,32,210,255,201,13
3450 DATA 240,12,238,152,193,172,152,193
3460 DATA 153,152,193,76,156,201,165,2
3470 DATA 240,68,169,1,32,195,255,169
3480 DATA 36,133,251,169,48,133,252,169
3490 DATA 1,162,8,160,0,32,186,255
3500 DATA 173,152,193,162,153,160,193,32
3510 DATA 189,255,32,192,255,162,1,32
3520 DATA 198,255,32,207,255,141,173,193
3530 DATA 32,207,255,141,174,193,165,174
3540 DATA 141,175,193,165,175,141,176
3550 DATA 193,32,115,201,76,22,202,173
3560 DATA 61,3,141,173,193,173,62,3,141
3570 DATA 174,193,173,63,3,141,175,193
3580 DATA 173,64,3,141,176,193,162,0
3590 DATA 189,177,193,240,7,32,210,255
3600 DATA 232,76,24,202,32,228,255,201
3610 DATA 13,208,249,32,210,255,166,254

```

```
3620 DATA 32,186,255,173,152,193,160,193
3630 DATA 162,153,32,189,255,173,173,193
3640 DATA 133,252,173,174,193,133,253
3650 DATA 169,252,174,175,193,172,176
3660 DATA 193,32,216,255,32,115,0,96,234
3670 DATA 160,0,173,128,3,201,255,240,19
3680 DATA 169,3,133,251,169,8,133,252
3690 DATA 133,254,169,5,133,253,169,255
3700 DATA 141,128,3,177,253,240,14,201
3710 DATA 143,240,63,230,253,208,244,230
3720 DATA 254,76,115,202,234,200,177,253
3730 DATA 208,14,200,177,253,208,9,169
3740 DATA 0,141,128,3,32,115,0,96
3750 DATA 160,0,165,253,24,105,3,133
3760 DATA 251,165,254,105,0,133,252,165
3770 DATA 253,24,105,5,133,253,165,254
3780 DATA 105,0,133,254,76,115,202,234
3790 DATA 234,234,165,253,56,229,251,160
3800 DATA 0,170,72,202,202,240,51,177
3810 DATA 251,133,20,200,177,251,133,21
3820 DATA 200,177,251,153,254,1,200,202
3830 DATA 208,247,104,24,105,3,133,11
3840 DATA 169,0,32,17,203,162,0,189
3850 DATA 209,193,157,119,2,232,224,8
3860 DATA 208,245,169,8,133,198,76,164
3870 DATA 164,234,177,251,133,20,200,177
3880 REM ***** DATA BANK #4 *****
3890 DATA 251,133,21,169,0,141,0,2
3900 DATA 169,5,133,11,104,76,229,202
3910 DATA 234,153,254,1,136,185,254,1
3920 DATA 201,58,240,1,96,198,253,208
3930 DATA 2,198,254,198,11,169,0,153
3940 DATA 254,1,96,234,169,8,133,254
3950 DATA 169,0,133,253,133,2,160,0
3960 DATA 177,253,240,18,201,34,240,65
3970 DATA 201,32,240,71,230,253,208,240
3980 DATA 230,254,76,56,203,234,200,177
3990 DATA 253,208,14,200,177,253,208,9
4000 DATA 169,0,141,128,3,32,115,0
4010 DATA 96,160,0,165,253,24,105,3
4020 DATA 133,251,165,254,105,0,133,252
4030 DATA 165,253,24,105,5,133,253,165
4040 DATA 254,105,0,133,254,76,56,203
4050 DATA 234,165,2,73,255,133,2,76
```

```
4060 DATA 68,203,234,165,2,16,3,76
4070 DATA 68,203,177,251,133,20,200,177
4080 DATA 251,133,21,162,0,200,177,251
4090 DATA 240,36,201,34,240,12,201,32
4100 DATA 240,19,157,0,2,232,76,157
4110 DATA 203,234,72,165,2,73,255,133
4120 DATA 2,104,76,170,203,72,165,2
4130 DATA 48,247,104,76,157,203,157,0
4140 DATA 2,138,24,105,5,133,11,162
4150 DATA 0,189,209,193,157,119,2,232
4160 DATA 224,8,208,245,169,8,133,198
4170 DATA 169,83,141,120,2,76,164,164
4180 DATA 234,32,115,0,32,138,173,32
4190 DATA 247,183,165,20,141,216,193,165
4200 DATA 21,141,217,193,32,253,174,32
4210 DATA 158,183,134,2,224,0,240,244
4220 DATA 96,234,169,159,133,252,169,255
4230 DATA 133,251,169,8,133,254,169,3
4240 DATA 133,253,160,0,177,253,145,251
4250 DATA 32,99,204,32,91,204,234,177
4260 DATA 253,145,251,32,99,204,32,91
4270 DATA 204,234,173,216,193,145,251,32
4280 DATA 91,204,234,173,217,193,145,251
4290 DATA 32,91,204,173,216,193,24,101
4300 DATA 2,141,216,193,173,217,193,105
4310 DATA 0,141,217,193,32,107,204,76
4320 DATA 26,204,234,198,251,208,2,198
4330 DATA 252,96,234,230,253,208,2,230
4340 DATA 254,96,234,200,177,253,208,251
4350 DATA 152,24,101,253,133,253,165,254
4360 DATA 105,0,133,254,160,1,177,253
4370 DATA 208,8,200,177,253,208,3,104
4380 DATA 104,96,165,253,24,105,3,133
4390 DATA 253,165,254,105,0,133,254,96
4400 DATA 234,234,169,8,133,254,169,0
4410 DATA 133,253,160,0,177,253,240,15
4420 DATA 201,137,240,53,201,141,240,58
4430 DATA 32,99,204,76,162,204,234,200
4440 DATA 177,253,208,6,200,177,253,208
4450 DATA 1,96,165,253,24,105,3,133
4460 DATA 187,165,254,105,0,133,188,165
4470 DATA 253,24,105,5,133,253,165,254
```

```
4480 DATA 105,0,133,254,76,162,204,234
4490 DATA 234,169,1,141,16,205,76,242
4500 DATA 204,234,169,2,141,16,205,234
4510 DATA 234,234,165,253,133,122,165
4520 DATA 254,133,123,32,115,0,32,138
4530 DATA 173,32,247,183,32,67,205,32
4540 DATA 145,179,32,221,189,32,163,205
4550 DATA 169,1,153,254,1,152,170,232,32
4560 DATA 99,204,32,186,205,32,203,205
4570 DATA 201,0,240,3,32,221,205,157
4580 DATA 254,1,32,237,205,32,0,206
4590 DATA 32,13,206,169,147,32,210,255
4600 DATA 76,164,164,234,32,154,204,76
4610 DATA 32,206,234,169,159,133,252,169
4620 DATA 255,133,251,160,0,177,251,197
4630 DATA 20,208,25,32,91,204,177,251
4640 DATA 197,21,208,19,32,91,204,177
4650 DATA 251,170,32,91,204,177,251,72
4660 DATA 138,168,104,96,32,91,204,201
4670 DATA 255,240,6,32,91,204,76,75
4680 DATA 205,32,91,204,201,255,208,203
4690 DATA 160,0,169,0,96,234,234,234,234
4700 DATA 234,234,234,234,234,234,234
4710 DATA 234,234,234,234,234,234,234
4720 DATA 234,234,234,234,234,234,234
4730 DATA 234,234,234,234,234,165,253,56
4740 DATA 229,187,160,2,170,202,202,240
4750 DATA 9,177,187,153,254,1,200,202
4760 DATA 208,247,96,234,160,0,185,1,1
4770 DATA 240,8,157,254,1,232,200,76,188
4780 DATA 205,96,234,160,0,177,253,240
4790 DATA 10,201,58,240,6,32,99,204
4800 DATA 76,205,205,96,234,177,253,240
4810 DATA 10,157,254,1,232,32,99,204
4820 DATA 76,221,205,96,234,162,0,189
4830 DATA 0,2,240,4,232,76,239,205
4840 DATA 138,24,105,5,133,11,96,234
4850 DATA 160,0,177,187,133,20,200,177
4860 DATA 187,133,21,96,234,162,0,189
4870 DATA 224,193,157,119,2,232,224,9
4880 DATA 208,245,169,9,133,198,96,234
4890 DATA 169,13,141,216,193,169,0,141
```

```
4900 DATA 217,193,173,220,193,133,251
4910 DATA 173,221,193,133,252,169,3,133
4920 DATA 253,169,8,133,254,160,0,165
4930 DATA 251,145,253,32,99,204,165
4940 DATA 252,145,253,32,99,204,177,253
4950 DATA 240,28,201,1,240,8,201,2,240
4960 DATA 12,76,73,206,0,169,137,145,253
4970 DATA 76,73,206,234,169,141,145,253
4980 DATA 76,73,206,234,200,177,253,208
4990 DATA 8,200,177,253,208,3,76,123
5000 DATA 227,165,251,24,101,2,133,251
5010 DATA 165,252,105,0,133,252,32,99
5020 DATA 204,32,99,204,32,99,204,76
5030 DATA 60,206,234,234,234,32,233,203
5040 DATA 165,20,141,220,193,165,21,141
5050 DATA 221,193,32,10,204,160,0,169
5060 DATA 255,145,251,32,91,204,145,251
5070 DATA 234,32,154,204,76,32,206,234
```


EXTENDED BASIC SYNTAX

Extended BASIC keywords (instructions) are entered much the same as are Commodore BASIC keywords, except for one minor difference.

If an Extended BASIC command is used after an IF . . . THEN statement, a colon MUST follow the THEN. For example, to use the command INK (this command is explained later) directly after THEN, you need to type IF . . . THEN:INK. You only have to follow this rule when an Extended BASIC command directly follows the THEN statement.

If you want to see the list of Extended BASIC commands at any time, type HELP, and the full list will appear.

The next section of this manual covers all the Extended BASIC commands, so that information can be found quickly and easily.

THE HISTORY OF THE UNITED STATES

The history of the United States is a story of growth and change. From the first settlers to the present day, the nation has evolved through various stages of development. The early years were marked by exploration and settlement, followed by a period of rapid expansion and industrialization. The American Revolution and the Civil War were pivotal moments in the nation's history, shaping its identity and values. The 20th century brought significant social and political changes, including the rise of the American Dream and the challenges of the Cold War. Today, the United States continues to grow and adapt to a rapidly changing world.

EXTENDED BASIC UTILITIES

BACKUP

The BACKUP command allows you to backup your programs, either on disk or cassette. The BACKUP command can be used to copy almost any programs; BASIC or Machine Code. Here's how you use this command:

- (1) Load the program to be copied with LOAD" ",1,1 for cassette or LOAD"filename",8,1 for disk.
- (2) Type BACKUP and press RETURN. You will be prompted with a question asking you the source of the loaded program; press either D or T (Disk or Tape).
- (3) You will then be asked to which device the program is to be sent. Again enter either D or T.
- (4) You will then be asked for the filename under which you wish to save the program. If you are using disk then you must get this right. If you accidentally type the wrong filename, press RUN/STOP RESTORE.
- (5) The computer will then tell you to enter the destination disk or tape. Do NOT remove the source disk or tape until the computer gives you this message.
- (6) The computer will then BACKUP your program.

If you follow this procedure almost all programs can be copied. If the backed up program doesn't work when re-loaded it is probably because the program loads a second (or more) program. If this happens then BACKUP these programs as you did the first.

Some programs auto-RUN. 10% of these cannot be copied using BACKUP. The other 90% can be copied by pressing RUN/STOP-RESTORE when the first filename appears, and then copying the other programs on the disk or tape. (This works because programs that auto-RUN are generally very small and load up other programs.)

Even though I have given you instructions on how to backup any programs, this command must NEVER be used to copy copyrighted programs.

SLOW

SLOW, as the name suggests, slows the computer down. This is often useful if you want to list a program slowly or you have games which are too hard and *fast for you* to get high scores.

The **SLOW** command is followed by a number between 0 and 255. Numbers between 1 and 255 slow the computer down, while **SLOW 0** sets the computer to normal speed.

SLOW 255 is the slowest that you can get, while **SLOW 1** is the fastest (not counting normal speed).

Because the Commodore 64 is slowed down by **SLOW**, the system clock (TI, TI\$) will also run slowly.

FIX

FIX is a very useful command. It will fix most load errors, or programs that have gone “bad” for one reason or another.

If it is possible to resurrect a program, **FIX** will do it every time. When a program is **FIXed** it becomes a normal program, that is, it can be edited, **SAVED**, etc . . .

DIR

DIR is a disk-based command”. It brings up the directory of a disk. One difference between using **DIR** and **LOAD“\$”, 8** is that **DIR** does not affect any programs that are in memory.

KILL

The **KILL** command turns the Commodore off and then on again, without using the power switch.

If you want to re-enter Extended BASIC after **KILL**, type **SYS 49736**.

If you want to recover a program after **KILL**, re-enter Extended BASIC, and type **FIX**.

EXIT

The **EXIT** command turns the Extended BASIC off. This means that you can't use any of the Extended BASIC commands. If you try to do so, you will just get a **SYNTAX ERROR**.

However, because the Extended BASIC remains in memory, it can be re-initialised with **SYS 49736**.

We have now looked at all of Extended BASIC's utilities. The next section introduces Programming Aids.

1914-1915

1915-1916

1916-1917

1917-1918

1918-1919

1919-1920

1920-1921

PROGRAMMER'S AIDS

Extended BASIC has six commands which will help you to edit BASIC programs.

OLD

The OLD command will restore a program which has been NEWed. However, OLD will not work if, after typing NEW, you begin typing another program.

PAUSE

PAUSE allows you to temporarily stop a listing. This offers greater readability than the "slow" list that the CONTROL key offers.

To halt a listing (after typing PAUSE), type LIST and press the shift key. If you press the SHIFT-LOCK key you can freeze a list for as long as you like.

RENUMBER

RENUMBER will renumber your program lines. It also renumbers all GOTOs and GOSUBs which reference these lines.

RENUMBER has two parameters, the first is the starting line number. The second is the increment, that is, the difference in value of one line number to the next.

Here is an example:

```
1 PRINT"HERE":GOTO 600
99 PRINT"EVERYWHERE":END
600 PRINT"THERE"
777 PRINT"AND":GOTO99
```

Using RENUMBER 100,10, which means start at line 100 and go up in 10's, the program ends up as:

```
100 PRINT "HERE":GOTO120
110 PRINT "EVERYWHERE":END
120 PRINT "THERE"
130 PRINT "AND":GOTO110
```

As you can see, the GOTO references are changed, so that they still point to the same lines as they did before the RENUMBER.

Some points to note about RENUMBER:

- ★ The increment must not be zero (0) (otherwise every line would have the same line number).
- ★ The starting line (the first parameter) must NOT exceed 32500.
- ★ If a GOTO or GOSUB references a line that does not exist, that GOTO or GOSUB will point to line zero (0).

Here is an example:

```
10 GOTO 20
19 END
```

After RENUMBER 100,10 it becomes:

```
100 GOTO0
110 END
```

- ★ RENUMBER will not change references following an ON statement. Also it will not change ones directly following a THEN statement. You can get around this by typing THEN GOTO followed by the line number, rather than THEN followed by a line number.

REPEAT

The REPEAT command causes all of the Commodore 64's keys to auto repeat (just as the space bar repeats).

RSTRIP

RSTRIP removes all REMs from a program. This is an extremely powerful command when you're running out of memory.

SSTRIP

The SSTRIP command removes all unnecessary spaces from a BASIC program. It will not take out spaces within quotation marks, ie. after PRINT and DATA statements. Like RSTRIP, this command becomes extremely useful when memory is scarce.

RENUMBER, SSTRIP and RSTRIP can all take a while when they are working on programs that are very long or have many REMs, many spaces or many GOTO's and GOSUB's. They take between five seconds and five minutes, depending on the program.

CONTROLLING GRAPHICS

In this section of the manual we will look at the ten commands that Extended BASIC offers to control the text and high-resolution modes of the Commodore 64.

INK

INK, followed by one parameter between 0 and 15, sets the color of the cursor. That is, the color in which all PRINTing will be done. The following information shows each color's INK:

INK	RESULTING COLOR
0	Black
1	White
2	Red
3	Cyan
4	Purple
5	Green
6	Blue
7	Yellow
8	Orange
9	Brown
10	Light Red
11	Gray 1
12	Gray 2
13	Light Green
14	Light Blue
15	Gray 3

For example, to get a black cursor, type INK 0.

BORDER

BORDER sets the color of the border. Like **INK**, it is followed by a parameter that determines the color. The table used for **INK** can also be used for **BORDER**.

For example, to set the border to red you type **BORDER 2**.

PAPER

PAPER sets the color of the foreground. It is followed by a parameter that tells the computer which color you want. **PAPER** uses the same table as **INK** and **BORDER**.

So, to change the foreground to purple, you type **PAPER 4**.

CLS

CLS clears the screen.

CURSOR

CURSOR allows you to place the cursor anywhere on the screen. Two parameters follow the **CURSOR** instruction. The first is the X co-ordinate of the new position, the second is the Y co-ordinate.

For example, to set the cursor five places across the screen and thirteen down you would type **CURSOR 5,13**.

HIRES

HIRES selects a high-resolution screen. This enables you to do such things as set points and draw lines.

TEXT

TEXT selects the text screen, that is, a normal screen. You use **TEXT** to turn a **HIRES** screen off.

CLG

CLG clears the graphic screen. If you use HIRES then CLG will clear the screen. CLS does not work with the graphic screen.

BCOL

BCOL sets the background color when you are in HIRES mode. It has one parameter which may take the same values as INK, PAPER and BORDER.

SET

SET will set a dot on the HIRES screen. It is followed by two parameters, the X and Y co-ordinates of the point to be set.

The X co-ordinate can be between 0 and 319. The Y co-ordinate can be between 0 and 199. For example to set a point 20 dots across and 60 dots down you would type SET 20,60.

GCOL

GCOL selects the color of the points that you set on the HIRES screen. GCOL has one parameter, which represents the color that you want. The effects of this parameter are the same as for INK and BCOL.

RESET

RESET will reset any point on the HIRES screen. This is the opposite of SET.

For example, to RESET the point 20 dots across and 60 dots down, you would type RESET 20,60.

SWITCH

SWITCH will reverse a point on the HIRES screen. If a point is on (SET) and it is SWITCHed, it will be turned off (RESET). If a point is off and it is SWITCHed, it will be turned on.

For example to SWITCH a point 80 across and 40 dots down, you would type SWITCH 80,40.

DRAW

DRAW will draw lines on the HIRES screen. It has four parameters, two pairs of co-ordinates.

For example, to draw a line from 0,10 to 100,90, you would type DRAW 0,10,100,90

REDRAW

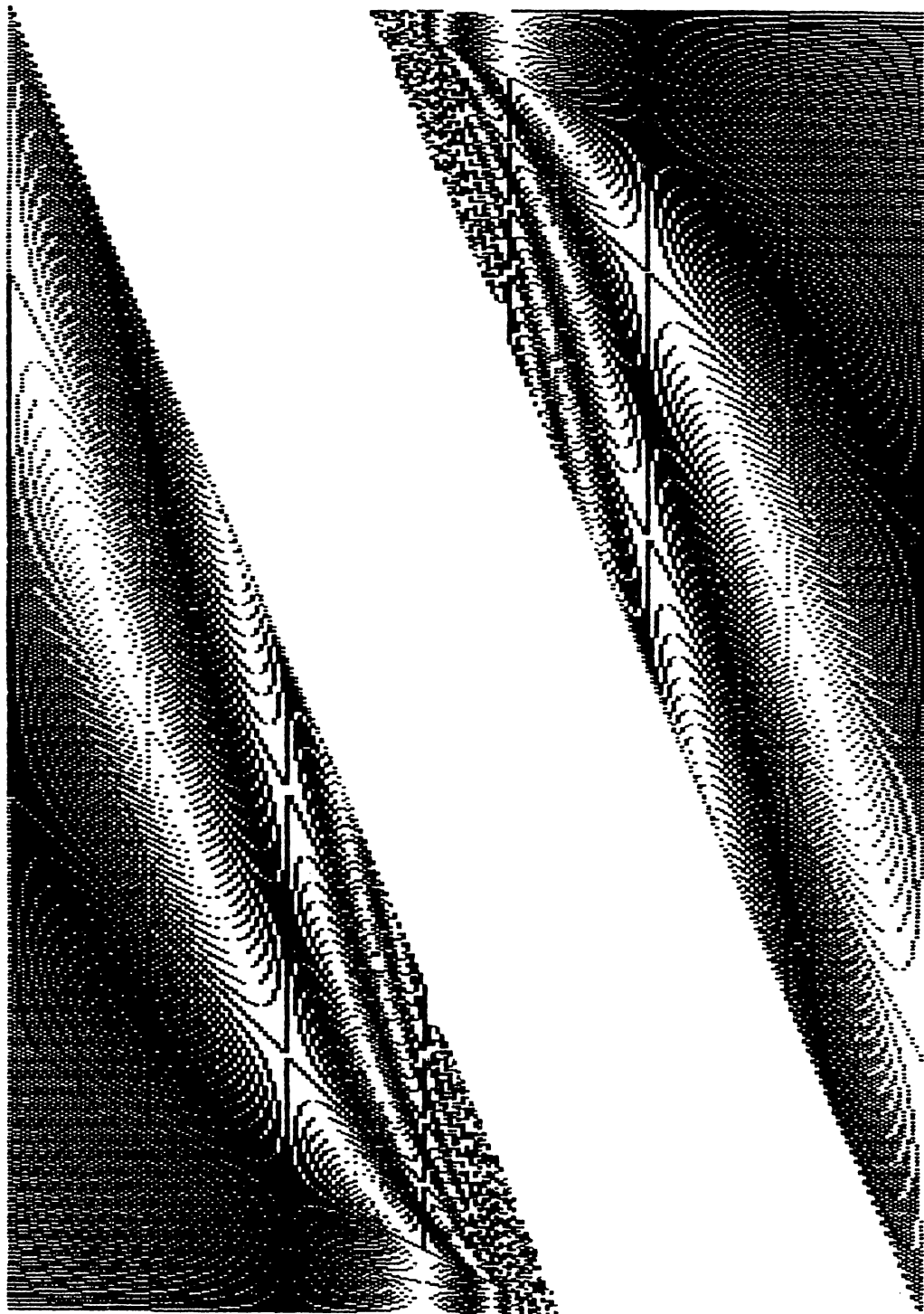
REDRAW will reset a line of dots on the screen. This is the same as DRAW, except it RESETs the points, rather than SETs them. Like DRAW, it has four parameters, which make up two pairs of co-ordinates.

SWDRAW

SWDRAW (SWitch DRAW) will switch the points in a line. Like DRAW and REDRAW, SWDRAW has four parameters, which make up two pairs of co-ordinates.

SWDRAW can produce some great effects. Here is a sample of its power (the listing is followed by a screen dump):

```
10 CLG
20 HIRES
30 GCOL 0
40 BCOL 1
50 BORDER 1
60 FOR LOOP=0 TO 318 STEP 3
70 SWDRAW 318,99,LOOP,0
80 SWDRAW 0,99,LOOP,198
90 NEXT LOOP
100 GOTO 100
```



NOTES ON DRAW, REDRAW AND SWDRAW

★ The difference between the X co-ordinates in DRAW, SWDRAW or REDRAW must not be greater than 127. The same is true for the Y co-ordinates. They must not be greater than 127.

★★★ These limitations may be overcome by using two instructions, instead of one. For example, to draw from 0,0 to 200,200 you could use DRAW 0,0,100, 100, then DRAW 100,100,200,200.

ADDING YOUR OWN COMMANDS

If you have machine code routines for additional commands then you can add these commands to Extended BASIC.

ADCOM

ADCOM will add a new command for you. It is followed by the name of the new command and the address of the machine code routine. After a new command has been added it acts as any other command. It even comes up on the menu when you type HELP.

When you add your own commands, the machine code routines that they point to must end with JMP \$0073.

For example, to add the command “HELLO” with a machine code routine at locations 828 and following, you would type ADCOM “HELLO” 828. (Only try this if you have a machine code routine at 828, otherwise the computer will probably crash.)

When you type HELP, you are given the number of “ADCOM BYTES FREE”. This refers to the number of bytes left for you add your own commands. When there are no ADCOM BYTES free, obviously enough, you can’t add any more commands.

Each instruction you add takes up three bytes, plus one byte for every character of the command name. For example, ADCOM “HELLO” 828 takes up eight bytes (three, plus five for the name “HELLO”).

ASSEMBLY LANGUAGE LISTING

If you know how to program in machine code (and if you don't, my Corgi-Bantam book "First Steps in Machine Code on your C64" might be of interest), I have included the starting address of each instruction, and the complete assembly language listing.

COMMAND	START ADDRESS (HEX)
INK	C300
BORDER	C309
PAPER	C312
SLOW	C31B
OLD	C34D
FIX	C3A7
KILL	E394
PAUSE	C3BC
CURSOR	C3D6
EXIT	C3EE
ADCOM	C3FC
REPEAT	C44B
TEXT	C454
HIRES	C468

COMMAND START ADDRESS (HEX)

CLG C484

CLS C4BD

GCOL C4C6

BCOL C4D9

SET C56B

SWITCH C579

RESET C586

REDRAW C7B9

DRAW C7AC

SWDRAW C7C6

HELP C7D2

BACKUP C900

DIR C8F7

RSTRIP CA57

SSTRIP CB2B

RENUMBER CE95

```
:C000 03 49 4E 4B C2 FF 05 42 CINKB.EB
:C008 B0 44 45 52 C3 08 05 50 0DERCHEP
:C010 41 50 45 52 C3 11 04 53 APERCQDS
:C018 4C 4F 57 C3 1A 03 4F 4C LOWCZCOL
:C020 44 C3 4C 03 46 49 58 C3 DCLCFIXC
:C028 A6 04 4B 49 4C 4C E3 93 &DKILL.S
:C030 05 50 41 55 53 45 C3 BB EPAUSEC;
```

```

:C038 05 43 55 52 53 B0 C3 D5 ECURS0CU
:C040 04 45 58 49 54 C3 ED 05 DEXITC.E
:C048 41 44 43 4F 4D C3 FB 06 ADCOMC.F
:C050 52 45 50 45 41 54 C4 4A REPEATDJ
:C058 04 54 45 58 54 C4 53 05 DTEXTDSE
:C060 48 49 52 45 53 C4 67 03 HIRES0.C
:C068 43 4C 47 C4 83 03 43 4C CLG0CCCL
:C070 53 C4 BC 04 47 43 4F 4C SD/DGCOL
:C078 C4 C5 04 42 43 4F 4C C4 DEDBCOLD
:C080 D8 03 53 45 54 C5 6A 06 XCSETA.F
:C088 53 57 49 54 43 48 C5 78 SWITCHA.
:C090 05 52 45 53 45 54 C5 86 ERESETA.F
:C098 06 52 45 44 52 41 57 C7 FREDRAW6
:C0A0 B8 04 44 52 41 57 C7 AB 8DDRAW6+
:C0A8 06 53 57 44 52 41 57 C7 FSWDRAW6
:C0B0 C5 04 48 45 4C 50 C7 D1 EDHELP6Q
:C0B8 06 42 41 43 4B 55 50 C8 FBACKUPH
:C0C0 DF 03 44 49 52 C8 F6 06 _CDIRH.F
:C0C8 52 53 54 52 49 50 CA 56 RSTRIPJV
:C0D0 06 53 53 54 52 49 50 CB FSSTRIPX
:C0D8 2B 08 52 45 4E 55 4D 42 +HRENUMB
:C0E0 45 52 CE 94 00 00 00 00 ERN70000
:C0E8 00 00 00 00 00 00 00 00 00000000
:C0F0 00 00 00 00 00 00 00 00 00000000
:C0F8 00 00 00 00 00 00 00 00 00000000
:C100 FF 4E 45 57 0D 4F 4C 44 .NEWMOLD
:C108 0D 14 04 D9 E2 28 08 01 MTDY.(HA
:C110 02 04 08 10 20 40 80 EA BDHP @.
:C118 EA EA ED 3E 03 8D 44 03 ...>CMD
:C120 60 EA EA EA EA EA EA EA .....
:C128 EA EA EA EE EA EA EA EA .....
:C130 EA EA EA EA EA EA EA EA .....
:C138 EA EA EA EA EA EA EA EA .....
:C140 0D 0D 32 37 20 41 44 43 MM27 ADC
:C148 4F 4D 20 42 59 54 45 53 OM BYTES
:C150 20 46 52 45 45 00 20 20 FREE@
:C158 20 20 20 20 20 20 20 20
:C160 20 44 49 53 4B 20 4F 52 DISK OR
:C168 20 54 41 50 45 20 28 44 TAPE (D
:C170 2F 54 29 3F 20 00 0D 46 /T)? @MF
:C178 52 4F 4D 00 0D 0D 54 4F ROM@MMTO
:C180 00 0D 0D 45 4E 54 45 52 @MMENTER
:C188 20 54 48 45 20 46 49 4C THE FIL
:C190 45 4E 41 4D 45 3A 00 00 ENAME:@@

```

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:C198 0B 58 58 58 58 58 58 58 KXXXXXXX
:C1A0 58 58 58 58 EA EA EA EA XXXX....
:C1A8 EA EA EA EA EA 00 C0 00 .....000
:C1B0 CF 0D 45 4E 54 45 52 20 0MENTER
:C1B8 44 45 53 54 49 4E 41 54 DESTINAT
:C1C0 49 4F 4E 20 44 49 53 4B ION DISK
:C1C8 20 4F 52 20 54 41 50 45 OR TAPE
:C1D0 00 93 52 53 54 52 49 50 @SRSTRIP
:C1D8 0D 00 EA EA 0A 00 EA EA M0...J0..
:C1E0 53 59 53 35 32 35 34 30 SYS52540
:C1E8 0D 0D 46 41 49 4C 45 44 MMFAILED
:C1F0 EA EA EA EA EA EA EA EA .....
:C1F8 EA EA EA EA EA EA EA EA .....
:C200 93 2A 2A 2A 2A 2A 2A 20 S*****
:C208 45 58 54 45 4E 44 45 44 EXTENDED
:C210 20 42 41 53 49 43 20 56 BASIC V
:C218 4F 4C 55 4D 45 20 32 2E OLUME 2.
:C220 36 31 20 2A 2A 2A 2A 2A 61 *****
:C228 2A 0D 28 43 29 20 52 4F *M(C) RO
:C230 53 53 20 53 59 4D 4F 4E 5S SYMON
:C238 53 20 31 39 38 35 20 20 S 1985
:C240 20 0D 00 EA EA EA EA EA M0.....
,C248 A9 62 LDA #$62
,C24A 8D 08 03 STA $0308
,C24D A9 C2 LDA #$C2
,C24F 8D 09 03 STA $0309
,C252 A2 00 LDX #$00
,C254 BD 00 C2 LDA $C200,X
,C257 D0 01 BNE $C25A
,C259 60 RTS
,C25A 20 D2 FF JSR $FFD2
,C25D E8 INX
,C25E 4C 54 C2 JMP $C254
,C261 EA NOP
,C262 20 73 00 JSR $0073
,C265 08 PHP
,C266 48 PHA
,C267 A2 00 LDX #$00
,C269 A0 00 LDY #$00
,C26B A5 7A LDA $7A
,C26D 85 FB STA $FB
,C26F A5 7B LDA $7B
,C271 85 FC STA $FC

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```
,C273 BD 00 C0 LDA $C000,X
,C276 D0 05 BNE $C27D
,C278 68 PLA
,C279 28 PLP
,C27A 4C E7 A7 JMP $A7E7
,C27D 85 FD STA $FD
,C27F E8 INX
,C280 B1 FB LDA ($FB),Y
,C282 F0 2E BEQ $C2B2
,C284 DD 00 C0 CMP $C000,X
,C287 D0 29 BNE $C2B2
,C289 C6 FD DEC $FD
,C28B F0 09 BEQ $C296
,C28D E8 INX
,C28E E6 FB INC $FB
,C290 D0 02 BNE $C294
,C292 E6 FC INC $FC
,C294 D0 EA BNE $C280
,C296 A5 FB LDA $FB
,C298 85 7A STA $7A
,C29A A5 FC LDA $FC
,C29C 85 7B STA $7B
,C29E 68 PLA
,C29F 28 PLP
,C2A0 A9 A7 LDA #$A7
,C2A2 48 PHA
,C2A3 A9 AD LDA #$AD
,C2A5 48 PHA
,C2A6 BD 01 C0 LDA $C001,X
,C2A9 48 PHA
,C2AA E8 INX
,C2AB BD 01 C0 LDA $C001,X
,C2AE 48 PHA
,C2AF 4C 79 00 JMP $0079
,C2B2 8A TXA
,C2B3 38 SEC
,C2B4 65 FD ADC $FD
,C2B6 AA TAX
,C2B7 E8 INX
,C2B8 D0 B1 BNE $C26B
,C2BA EA NOP
,C2BB EA NOP
```

```
,C2BC EA NOP
,C2BD EA NOP
,C2BE EA NOP
,C2BF EA NOP
,C2C0 EA NOP
,C2C1 EA NOP
,C2C2 EA NOP
,C2C3 EA NOP
,C2C4 EA NOP
,C2C5 EA NOP
,C2C6 EA NOP
,C2C7 EA NOP
,C2C8 EA NOP
,C2C9 EA NOP
,C2CA EA NOP
,C2CB EA NOP
,C2CC EA NOP
,C2CD EA NOP
,C2CE EA NOP
,C2CF EA NOP
,C2D0 EA NOP
,C2D1 EA NOP
,C2D2 EA NOP
,C2D3 EA NOP
,C2D4 EA NOP
,C2D5 EA NOP
,C2D6 EA NOP
,C2D7 EA NOP
,C2D8 EA NOP
,C2D9 EA NOP
,C2DA EA NOP
,C2DB EA NOP
,C2DC EA NOP
,C2DD EA NOP
,C2DE EA NOP
,C2DF EA NOP
,C2E0 EA NOP
,C2E1 EA NOP
,C2E2 EA NOP
,C2E3 EA NOP
,C2E4 EA NOP
,C2E5 EA NOP
,C2E6 EA NOP
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,C2E7 EA	NOP	,C32A 8E 14 03	STX \$0314
,C2E8 EA	NOP	,C32D 8D 15 03	STA \$0315
,C2E9 EA	NOP	,C330 58	CLI
,C2EA EA	NOP	,C331 60	RTS
,C2EB EA	NOP	,C332 A2 00	LDX ##00
,C2EC EA	NOP	,C334 AC 00 C1	LDY \$C100
,C2ED EA	NOP	,C337 CA	DEX
,C2EE EA	NOP	,C338 D0 FD	BNE \$C337
,C2EF EA	NOP	,C33A 88	DEY
,C2F0 EA	NOP	,C33B D0 FA	BNE \$C337
,C2F1 EA	NOP	,C33D 4C 31 EA	JMP \$EA31
,C2F2 EA	NOP	,C340 78	SEI
,C2F3 EA	NOP	,C341 A9 31	LDA ##31
,C2F4 EA	NOP	,C343 8D 14 03	STA \$0314
,C2F5 EA	NOP	,C346 A9 EA	LDA ##EA
,C2F6 EA	NOP	,C348 8D 15 03	STA \$0315
,C2F7 EA	NOP	,C34B 58	CLI
,C2F8 EA	NOP	,C34C 60	RTS
,C2F9 EA	NOP	,C34D A0 03	LDY ##03
,C2FA EA	NOP	,C34F C8	INY
,C2FB EA	NOP	,C350 B1 2B	LDA (\$2B),Y
,C2FC EA	NOP	,C352 D0 FB	BNE \$C34F
,C2FD EA	NOP	,C354 C8	INY
,C2FE EA	NOP	,C355 98	TYA
,C2FF EA	NOP	,C356 18	CLC
,C300 20 9B B7	JSR \$B79B	,C357 65 2B	ADC \$2B
,C303 A5 65	LDA \$65	,C359 A0 FF	LDY ##FF
,C305 8D 86 02	STA \$0286	,C35B C8	INY
,C308 60	RTS	,C35C 91 2B	STA (\$2B),Y
,C309 20 9B B7	JSR \$B79B	,C35E 85 2D	STA \$2D
,C30C A5 65	LDA \$65	,C360 C8	INY
,C30E 8D 20 D0	STA \$D020	,C361 A5 2C	LDA \$2C
,C311 60	RTS	,C363 91 2B	STA (\$2B),Y
,C312 20 9B B7	JSR \$B79B	,C365 85 2E	STA \$2E
,C315 A5 65	LDA \$65	,C367 A0 FF	LDY ##FF
,C317 8D 21 D0	STA \$D021	,C369 C8	INY
,C31A 60	RTS	,C36A B1 2D	LDA (\$2D),Y
,C31B 20 9B B7	JSR \$B79B	,C36C 48	PHA
,C31E A5 65	LDA \$65	,C36D F0 0B	BEQ \$C37A
,C320 F0 1E	BEQ \$C340	,C36F C8	INY
,C322 8D 00 C1	STA \$C100	,C370 B1 2D	LDA (\$2D),Y
,C325 A9 C3	LDA ##C3	,C372 85 2E	STA \$2E
,C327 A2 32	LDX ##32	,C374 68	PLA
,C329 78	SEI	,C375 85 2D	STA \$2D

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,C377 18      CLC
,C378 90 ED    BCC $C367
,C37A C8      INY
,C37B B1 2D    LDA ($2D),Y
,C37D D0 F3    BNE $C372
,C37F 68      PLA
,C380 18      CLC
,C381 A5 2D    LDA $2D
,C383 69 02    ADC #$02
,C385 85 2D    STA $2D
,C387 90 02    BCC $C38B
,C389 E6 2E    INC $2E
,C38B 85 2F    STA $2F
,C38D 85 31    STA $31
,C38F A5 2E    LDA $2E
,C391 85 30    STA $30
,C393 85 32    STA $32
,C395 A9 00    LDA #$00
,C397 85 33    STA $33
,C399 85 34    STA $34
,C39B A5 37    LDA $37
,C39D 85 35    STA $35
,C39F A5 38    LDA $38
,C3A1 85 36    STA $36
,C3A3 20 73 00 JSR $0073
,C3A6 60      RTS
,C3A7 A9 08    LDA #$08
,C3A9 85 C6    STA $C6
,C3AB A2 00    LDX #$00
,C3AD BD 01 C1 LDA $C101,X
,C3B0 9D 77 02 STA $0277,X
,C3B3 E8      INX
,C3B4 E0 08    CPX #$08
,C3B6 D0 F5    BNE $C3AD
,C3B8 20 73 00 JSR $0073
,C3BB 60      RTS
,C3BC A9 CA    LDA #$CA
,C3BE 8D 06 03 STA $0306
,C3C1 A9 C3    LDA #$C3
,C3C3 8D 07 03 STA $0307
,C3C6 20 73 00 JSR $0073
,C3C9 60      RTS
,C3CA 48      PHA
,C3CB AD 8D 02 LDA $028D
,C3CE 29 01    AND #$01
,C3D0 D0 F9    BNE $C3CB
,C3D2 68      PLA
,C3D3 4C 1A A7 JMP $A71A
,C3D6 20 9B B7 JSR $B79B
,C3D9 A5 65    LDA $65
,C3DB 8D 09 C1 STA $C109
,C3DE 20 9B B7 JSR $B79B
,C3E1 A4 65    LDY $65
,C3E3 AE 09 C1 LDX $C109
,C3E6 18      CLC
,C3E7 20 F0 FF JSR $FFFF
,C3EA 20 06 A9 JSR $A906
,C3ED 60      RTS
,C3EE A9 E4    LDA #$E4
,C3F0 8D 08 03 STA $0308
,C3F3 A9 A7    LDA #$A7
,C3F5 8D 09 03 STA $0309
,C3F8 20 06 A9 JSR $A906
,C3FB 60      RTS
,C3FC 20 73 00 JSR $0073
,C3FF C9 22    CMP #$22
,C401 D0 F9    BNE $C3FC
,C403 A2 00    LDX #$00
,C405 8A      TXA
,C406 18      CLC
,C407 7D 00 C0 ADC $C000,
,C40A 69 03    ADC #$03
,C40C AA      TAX
,C40D BD 00 C0 LDA $C000,
,C410 D0 F3    BNE $C405
,C412 8E 0B C1 STX $C10B
,C415 A0 00    LDY #$00
,C417 20 73 00 JSR $0073
,C41A 9D 01 C0 STA $C001,
,C41D C8      INY
,C41E E8      INX
,C41F C9 22    CMP #$22
,C421 D0 F4    BNE $C417
,C423 88      DEY
,C424 98      TYA
,C425 EA      NOP
,C426 8E 0C C1 STX $C10C
,C429 AE 0B C1 LDX $C10B

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,C42C 9D 00 C0 STA \$C000,X	,C491 D0 FA BNE \$C48D
,C42F 20 73 00 JSR \$0073	,C493 A6 62 LDX \$62
,C432 20 8A AD JSR \$AD8A	,C495 E8 INX
,C435 20 F7 B7 JSR \$B7F7	,C496 86 62 STX \$62
,C438 AE 0C C1 LDX \$C10C	,C498 E0 40 CPX #\$40
,C43B A5 14 LDA \$14	,C49A D0 F1 BNE \$C48D
,C43D 38 SEC	,C49C 20 73 00 JSR \$0073
,C43E E9 01 SBC #\$01	,C49F 60 RTS
,C440 9D 01 C0 STA \$C001,X	,C4A0 A0 00 LDY #\$00
,C443 A5 15 LDA \$15	,C4A2 A2 04 LDX #\$04
,C445 E9 00 SBC #\$00	,C4A4 84 FB STY \$FB
,C447 9D 00 C0 STA \$C000,X	,C4A6 86 FC STX \$FC
,C44A 60 RTS	,C4A8 B1 FB LDA (\$FB),Y
,C44B A9 80 LDA #\$80	,C4AA 25 02 AND \$02
,C44D 8D 8A 02 STA \$028A	,C4AC 05 FD ORA \$FD
,C450 20 73 00 JSR \$0073	,C4AE 91 FB STA (\$FB),Y
,C453 60 RTS	,C4B0 E6 FB INC \$FB
,C454 AD 18 D0 LDA \$D018	,C4B2 D0 F4 BNE \$C4A8
,C457 29 F7 AND #\$F7	,C4B4 E6 FC INC \$FC
,C459 8D 18 D0 STA \$D018	,C4B6 A6 FC LDX \$FC
,C45C AD 11 D0 LDA \$D011	,C4B8 E0 08 CPX #\$08
,C45F 29 DF AND #\$DF	,C4BA D0 EC BNE \$C4A8
,C461 8D 11 D0 STA \$D011	,C4BC 60 RTS
,C464 20 73 00 JSR \$0073	,C4BD A9 93 LDA #\$93
,C467 60 RTS	,C4BF 20 D2 FF JSR \$FFD2
,C468 AD 18 D0 LDA \$D018	,C4C2 20 73 00 JSR \$0073
,C46B 09 08 ORA #\$08	,C4C5 60 RTS
,C46D 8D 18 D0 STA \$D018	,C4C6 20 9B B7 JSR \$B79B
,C470 AD 11 D0 LDA \$D011	,C4C9 A5 65 LDA \$65
,C473 09 20 ORA #\$20	,C4CB 0A ASL
,C475 8D 11 D0 STA \$D011	,C4CC 0A ASL
,C478 A9 1F LDA #\$1F	,C4CD 0A ASL
,C47A 85 34 STA \$34	,C4CE 0A ASL
,C47C A9 FF LDA #\$FF	,C4CF 85 FD STA \$FD
,C47E 85 33 STA \$33	,C4D1 A2 0F LDX #\$0F
,C480 20 73 00 JSR \$0073	,C4D3 86 02 STX \$02
,C483 60 RTS	,C4D5 20 A0 C4 JSR \$C4A0
,C484 A9 20 LDA #\$20	,C4D8 60 RTS
,C486 85 62 STA \$62	,C4D9 20 9B B7 JSR \$B79B
,C488 A9 00 LDA #\$00	,C4DC A5 65 LDA \$65
,C48A 85 61 STA \$61	,C4DE 85 FD STA \$FD
,C48C A8 TAY	,C4E0 A2 F0 LDX #\$F0
,C48D 91 61 STA (\$61),Y	,C4E2 86 02 STX \$02
,C48F E6 61 INC \$61	,C4E4 20 A0 C4 JSR \$C4A0

,C4E7 60	RTS	,C533 0A	ASL
,C4E8 A5 FC	LDA \$FC	,C534 90 03	BCC \$C539
,C4EA 4A	LSR	,C536 E6 67	INC \$67
,C4EB 4A	LSR	,C538 18	CLC
,C4EC 4A	LSR	,C539 65 66	ADC \$66
,C4ED 85 62	STA \$62	,C53B 85 66	STA \$66
,C4EF A5 FD	LDA \$FD	,C53D 90 02	BCC \$C541
,C4F1 85 63	STA \$63	,C53F E6 67	INC \$67
,C4F3 A5 FE	LDA \$FE	,C541 A5 66	LDA \$66
,C4F5 4A	LSR	,C543 18	CLC
,C4F6 66 63	ROR \$63	,C544 65 64	ADC \$64
,C4F8 4A	LSR	,C546 85 66	STA \$66
,C4F9 66 63	ROR \$63	,C548 90 02	BCC \$C54C
,C4FB 4A	LSR	,C54A E6 67	INC \$67
,C4FC 66 63	ROR \$63	,C54C A6 65	LDX \$65
,C4FE 85 FE	STA \$FE	,C54E A0 00	LDY #\$00
,C500 A5 FC	LDA \$FC	,C550 60	RTS
,C502 29 07	AND #\$07	,C551 20 73 00	JSR \$0073
,C504 85 64	STA \$64	,C554 20 8A AD	JSR \$AD8A
,C506 A5 FD	LDA \$FD	,C557 20 F7 B7	JSR \$B7F7
,C508 29 07	AND #\$07	,C55A A5 14	LDA \$14
,C50A 85 65	STA \$65	,C55C 85 FD	STA \$FD
,C50C A9 07	LDA #\$07	,C55E A5 15	LDA \$15
,C50E 38	SEC	,C560 85 FE	STA \$FE
,C50F E5 65	SBC \$65	,C562 20 FD AE	JSR \$AEFD
,C511 85 65	STA \$65	,C565 20 9E B7	JSR \$B79E
,C513 A9 00	LDA #\$00	,C568 86 FC	STX \$FC
,C515 85 66	STA \$66	,C56A 60	RTS
,C517 A9 20	LDA #\$20	,C56B 20 51 C5	JSR \$C551
,C519 85 67	STA \$67	,C56E 20 E8 C4	JSR \$C4E8
,C51B A6 62	LDX \$62	,C571 B1 66	LDA (\$66),Y
,C51D F0 10	BEQ \$C52F	,C573 1D 0F C1	ORA \$C10F,X
,C51F E6 67	INC \$67	,C576 91 66	STA (\$66),Y
,C521 A5 66	LDA \$66	,C578 60	RTS
,C523 18	CLC	,C579 20 51 C5	JSR \$C551
,C524 69 40	ADC #\$40	,C57C 20 E8 C4	JSR \$C4E8
,C526 85 66	STA \$66	,C57F B1 66	LDA (\$66),Y
,C528 90 02	BCC \$C52C	,C581 5D 0F C1	EOR \$C10F,X
,C52A E6 67	INC \$67	,C584 91 66	STA (\$66),Y
,C52C CA	DEX	,C586 60	RTS
,C52D D0 F0	BNE \$C51F	,C587 20 51 C5	JSR \$C551
,C52F A5 63	LDA \$63	,C58A 20 E8 C4	JSR \$C4E8
,C531 0A	ASL	,C58D A9 FF	LDA \$FF
,C532 0A	ASL	,C58F 38	SEC

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,C590	FD	0F	C1	SBC	\$C10F,X	,C5E4	38		SEC		
,C593	31	66		AND	(\$66),Y	,C5E5	ED	3E	03	SBC	\$033E
,C595	91	66		STA	(\$66),Y	,C5E8	8D	44	03	STA	\$0344
,C597	60			RTS		,C5EB	AD	3F	03	LDA	\$033F
,C598	20	73	00	JSR	\$0073	,C5EE	38		SEC		
,C59B	20	8A	AD	JSR	\$AD8A	,C5EF	ED	3C	03	SBC	\$033C
,C59E	20	F7	B7	JSR	\$B7F7	,C5F2	8D	42	03	STA	\$0342
,C5A1	A5	14		LDA	\$14	,C5F5	AD	40	03	LDA	\$0340
,C5A3	8D	3C	03	STA	\$033C	,C5F8	ED	3D	03	SBC	\$033D
,C5A6	A5	15		LDA	\$15	,C5FB	8D	43	03	STA	\$0343
,C5A8	8D	3D	03	STA	\$033D	,C5FE	20	00	C7	JSR	\$C700
,C5AB	20	FD	AE	JSR	\$AEFD	,C601	20	10	C7	JSR	\$C710
,C5AE	20	9E	B7	JSR	\$B79E	,C604	AD	47	03	LDA	\$0347
,C5B1	8E	3E	03	STX	\$033E	,C607	D0	6A		BNE	\$C673
,C5B4	20	FD	AE	JSR	\$AEFD	,C609	AD	46	03	LDA	\$0346
,C5B7	20	8A	AD	JSR	\$AD8A	,C60C	CD	48	03	CMP	\$0348
,C5BA	20	F7	B7	JSR	\$B7F7	,C60F	B0	62		BCS	\$C673
,C5BD	A5	14		LDA	\$14	,C611	AD	44	03	LDA	\$0344
,C5BF	8D	3F	03	STA	\$033F	,C614	4A		LSR		
,C5C2	A5	15		LDA	\$15	,C615	8D	3A	03	STA	\$033A
,C5C4	8D	40	03	STA	\$0340	,C618	A9	00		LDA	##00
,C5C7	20	FD	AE	JSR	\$AEFD	,C61A	20	74	C7	JSR	\$C774
,C5CA	20	9E	B7	JSR	\$B79E	,C61D	EE	3E	03	INC	\$033E
,C5CD	8E	41	03	STX	\$0341	,C620	AD	3A	03	LDA	\$033A
,C5D0	60			RTS		,C623	18		CLC		
,C5D1	EA			NOP		,C624	6D	46	03	ADC	\$0346
,C5D2	EA			NOP		,C627	8D	3A	03	STA	\$033A
,C5D3	EA			NOP		,C62A	AD	3B	03	LDA	\$033B
,C5D4	EA			NOP		,C62D	6D	47	03	ADC	\$0347
,C5D5	EA			NOP		,C630	8D	3B	03	STA	\$033B
,C5D6	EA			NOP		,C633	D0	08		BNE	\$C63D
,C5D7	EA			NOP		,C635	AD	3A	03	LDA	\$033A
,C5D8	EA			NOP		,C638	CD	44	03	CMP	\$0344
,C5D9	EA			NOP		,C63B	90	1A		BCC	\$C657
,C5DA	EA			NOP		,C63D	CE	3C	03	DEC	\$033C
,C5DB	EA			NOP		,C640	D0	03		BNE	\$C645
,C5DC	EA			NOP		,C642	CE	3D	03	DEC	\$033D
,C5DD	EA			NOP		,C645	AD	3A	03	LDA	\$033A
,C5DE	EA			NOP		,C648	38		SEC		
,C5DF	EA			NOP		,C649	ED	44	03	SBC	\$0344
,C5E0	EA			NOP		,C64C	8D	3A	03	STA	\$033A
,C5E1	EA			NOP		,C64F	AD	3B	03	LDA	\$033B
,C5E2	EA			NOP		,C652	E9	00		SBC	##00
,C5E3	8A			TXA		,C654	8D	3B	03	STA	\$033B

,C657	AD	3C	03	LDA	\$033C	,C6BD	ED	47	03	SBC	\$0347
,C65A	85	FD		STA	\$FD	,C6C0	8D	3B	03	STA	\$033B
,C65C	AD	3D	03	LDA	\$033D	,C6C3	AD	3C	03	LDA	\$033C
,C65F	85	FE		STA	\$FE	,C6C6	85	FD		STA	\$FD
,C661	AD	3E	03	LDA	\$033E	,C6C8	AD	3D	03	LDA	\$033D
,C664	85	FC		STA	\$FC	,C6CB	85	FE		STA	\$FE
,C666	20	E1	C6	JSR	\$C6E1	,C6CD	AD	3E	03	LDA	\$033E
,C669	CE	48	03	DEC	\$0348	,C6D0	85	FC		STA	\$FC
,C66C	D0	AF		BNE	\$C61D	,C6D2	20	E1	C6	JSR	\$C6E1
,C66E	60			RTS		,C6D5	CE	42	03	DEC	\$0342
,C66F	EA			NOP		,C6D8	D0	AA		BNE	\$C684
,C670	EA			NOP		,C6DA	CE	43	03	DEC	\$0343
,C671	EA			NOP		,C6DD	10	A5		BPL	\$C684
,C672	EA			NOP		,C6DF	60			RTS	
,C673	20	8B	C7	JSR	\$C78B	,C6E0	EA			NOP	
,C676	AD	47	03	LDA	\$0347	,C6E1	AD	FF	03	LDA	\$03FF
,C679	4A			LSR		,C6E4	30	06		BMI	\$C6EC
,C67A	8D	3B	03	STA	\$033B	,C6E6	F0	08		BEQ	\$C6F0
,C67D	AD	46	03	LDA	\$0346	,C6E8	20	7C	C5	JSR	\$C57C
,C680	6A			ROR		,C6EB	60			RTS	
,C681	8D	3A	03	STA	\$033A	,C6EC	20	6E	C5	JSR	\$C56E
,C684	EE	3C	03	INC	\$033C	,C6EF	60			RTS	
,C687	D0	03		BNE	\$C68C	,C6F0	20	8A	C5	JSR	\$C58A
,C689	EE	3D	03	INC	\$033D	,C6F3	60			RTS	
,C68C	AD	3A	03	LDA	\$033A	,C6F4	EA			NOP	
,C68F	18			CLC		,C6F5	EA			NOP	
,C690	6D	44	03	ADC	\$0344	,C6F6	EA			NOP	
,C693	8D	3A	03	STA	\$033A	,C6F7	EA			NOP	
,C696	AD	3B	03	LDA	\$033B	,C6F8	EA			NOP	
,C699	69	00		ADC	##00	,C6F9	EA			NOP	
,C69B	8D	3B	03	STA	\$033B	,C6FA	EA			NOP	
,C69E	AD	3A	03	LDA	\$033A	,C6FB	EA			NOP	
,C6A1	38			SEC		,C6FC	EA			NOP	
,C6A2	ED	46	03	SBC	\$0346	,C6FD	EA			NOP	
,C6A5	AD	3B	03	LDA	\$033B	,C6FE	EA			NOP	
,C6A8	ED	47	03	SBC	\$0347	,C6FF	EA			NOP	
,C6AB	30	16		BMI	\$C6C3	,C700	AD	44	03	LDA	\$0344
,C6AD	EE	3E	03	INC	\$033E	,C703	10	05		BPL	\$C70A
,C6B0	AD	3A	03	LDA	\$033A	,C705	49	FF		EOR	##FF
,C6B3	38			SEC		,C707	18			CLC	
,C6B4	ED	46	03	SBC	\$0346	,C708	69	01		ADC	##01
,C6B7	8D	3A	03	STA	\$033A	,C70A	8D	48	03	STA	\$0348
,C6BA	AD	3B	03	LDA	\$033B	,C70D	60			RTS	

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```
,C70E EA      NOP
,C70F EA      NOP
,C710 AD 43 03 LDA $0343
,C713 30 0A    BMI $C71F
,C715 8D 47 03 STA $0347
,C718 AD 42 03 LDA $0342
,C71B 8D 46 03 STA $0346
,C71E 60      RTS
,C71F 49 FF    EOR #$FF
,C721 AD 47 03 LDA $0347
,C724 AD 42 03 LDA $0342
,C727 49 FF    EOR #$FF
,C729 18      CLC
,C72A 29 FF    AND #$FF
,C72C 69 05    ADC #$05
,C72E 8D 46 03 STA $0346
,C731 60      RTS
,C732 8D 3B 03 STA $033B
,C735 AD 44 03 LDA $0344
,C738 30 01    BMI $C73B
,C73A 60      RTS
,C73B 20 47 C7 JSR $C747
,C73E 68      PLA
,C73F 68      PLA
,C740 AD 41 03 LDA $0341
,C743 4C E4 C5 JMP $C5E4
,C746 EA      NOP
,C747 AD 3C 03 LDA $033C
,C74A 48      PHA
,C74B AD 3D 03 LDA $033D
,C74E 48      PHA
,C74F AD 3E 03 LDA $033E
,C752 48      PHA
,C753 AD 3F 03 LDA $033F
,C756 8D 3C 03 STA $033C
,C759 AD 40 03 LDA $0340
,C75C 8D 3D 03 STA $033D
,C75F AD 41 03 LDA $0341
,C762 8D 3E 03 STA $033E
,C765 68      PLA
,C766 8D 41 03 STA $0341
,C769 68      PLA
,C76A 8D 40 03 STA $0340
```

```
,C76D 68      PLA
,C76E 8D 3F 03 STA $033F
,C771 60      RTS
,C772 EA      NOP
,C773 EA      NOP
,C774 AE 43 03 LDX $0343
,C777 30 05    BMI $C77E
,C779 A2 EE    LDX #$EE
,C77B 4C 80 C7 JMP $C780
,C77E A2 CE    LDX #$CE
,C780 8E 3D C6 STX $C63D
,C783 8E 42 C6 STX $C642
,C786 4C 32 C7 JMP $C732
,C789 EA      NOP
,C78A EA      NOP
,C78B AD 44 03 LDA $0344
,C78E 30 05    BMI $C795
,C790 A9 EE    LDA #$EE
,C792 4C 97 C7 JMP $C797
,C795 A9 CE    LDA #$CE
,C797 8D AD C6 STA $C6AD
,C79A AD 43 03 LDA $0343
,C79D 30 01    BMI $C7A0
,C79F 60      RTS
,C7A0 20 47 C7 JSR $C747
,C7A3 68      PLA
,C7A4 68      PLA
,C7A5 AD 41 03 LDA $0341
,C7A8 4C E4 C5 JMP $C5E4
,C7AB EA      NOP
,C7AC A9 FF    LDA #$FF
,C7AE 8D FF 03 STA $03FF
,C7B1 20 98 C5 JSR $C598
,C7B4 20 E3 C5 JSR $C5E3
,C7B7 60      RTS
,C7B8 EA      NOP
,C7B9 A9 00    LDA #$00
,C7BB 8D FF 03 STA $03FF
,C7BE 20 98 C5 JSR $C598
,C7C1 20 E3 C5 JSR $C5E3
,C7C4 60      RTS
,C7C5 EA      NOP
,C7C6 A9 01    LDA #$01
```

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,C7C8 8D FF 03 STA $03FF      ,C823 A9 93      LDA #$93
,C7CB 20 98 C5 JSR $C598      ,C825 20 D2 FF JSR $FFD2
,C7CE 20 E3 C5 JSR $C5E3      ,C828 A9 C0      LDA #$C0
,C7D1 60          RTS          ,C82A 60          RTS
,C7D2 20 23 C8 JSR $C823      ,C82B EA          NOP
,C7D5 85 FC          STA $FC    ,C82C 20 73 00 JSR $0073
,C7D7 A9 00          LDA #$00    ,C82F A9 FF      LDA $FFF
,C7D9 85 FB          STA $FB     ,C831 38          SEC
,C7DB A0 00          LDY #$00    ,C832 E5 FB      SBC $FB
,C7DD B1 FB          LDA ($FB),Y ,C834 A8          TAY
,C7DF F0 2E          BEQ $C80F   ,C835 A9 00      LDA #$00
,C7E1 E6 FB          INC $FB     ,C837 20 91 B3 JSR $B391
,C7E3 AA            TAX          ,C83A 20 DD BD JSR $BDDD
,C7E4 20 FD C7 JSR $C7FD       ,C83D AD 01 01 LDA $0101
,C7E7 A2 14          LDX #$14    ,C840 8D 42 C1 STA $C142
,C7E9 86 D3          STX $D3     ,C843 AD 02 01 LDA $0102
,C7EB B1 FB          LDA ($FB),Y ,C846 8D 43 C1 STA $C143
,C7ED AA            TAX          ,C849 A2 00      LDX #$00
,C7EE F0 1F          BEQ $C80F   ,C84B BD 40 C1 LDA $C140,X
,C7F0 E6 FB          INC $FB     ,C84E F0 07      BEQ $C857
,C7F2 20 FD C7 JSR $C7FD       ,C850 20 D2 FF JSR $FFD2
,C7F5 A9 0D          LDA #$0D    ,C853 E8          INX
,C7F7 20 D2 FF JSR $FFD2       ,C854 4C 4B C8 JMP $C84B
,C7FA 4C DB C7 JMP $C7DB       ,C857 60          RTS
,C7FD B1 FB          LDA ($FB),Y ,C858 EA          NOP
,C7FF 30 13          BMI $C814   ,C859 A2 00      LDX #$00
,C801 20 D2 FF JSR $FFD2       ,C85B BD 60 C1 LDA $C160,X
,C804 E6 FB          INC $FB     ,C85E F0 F7      BEQ $C857
,C806 CA            DEX          ,C860 20 D2 FF JSR $FFD2
,C807 D0 F4          BNE $C7FD   ,C863 E8          INX
,C809 E6 FB          INC $FB     ,C864 4C 5B C8 JMP $C85B
,C80B E6 FB          INC $FB     ,C867 EA          NOP
,C80D 60          RTS          ,C868 A2 00      LDX #$00
,C80E EA            NOP          ,C86A BD 76 C1 LDA $C176,X
,C80F 20 2C C8 JSR $C82C       ,C86D F0 07      BEQ $C876
,C812 60          RTS          ,C86F 20 D2 FF JSR $FFD2
,C813 EA            NOP          ,C872 E8          INX
,C814 C9 B0          CMP #$B0    ,C873 4C 6A C8 JMP $C86A
,C816 D0 E9          BNE $C801   ,C876 20 59 C8 JSR $C859
,C818 A9 4F          LDA #$4F    ,C879 60          RTS
,C81A 20 D2 FF JSR $FFD2       ,C87A EA          NOP
,C81D A9 52          LDA #$52    ,C87B A2 00      LDX #$00
,C81F 4C 01 C8 JMP $C801       ,C87D BD 7C C1 LDA $C17C,X
,C822 EA            NOP          ,C880 F0 07      BEQ $C889

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,C882 20 D2 FF JSR \$FFD2	,C8DE 60 RTS
,C885 E8 INX	,C8DF EA NOP
,C886 4C 7D C8 JMP \$C87D	,C8E0 20 8E C8 JSR \$C88E
,C889 20 59 C8 JSR \$C859	,C8E3 A2 00 LDX ##00
,C88C 60 RTS	,C8E5 A0 00 LDY ##00
,C88D EA NOP	,C8E7 CA DEX
,C88E 20 68 C8 JSR \$C868	,C8E8 D0 FD BNE \$C8E7
,C891 A5 C5 LDA \$C5	,C8EA 88 DEY
,C893 C9 40 CMP ##40	,C8EB D0 FA BNE \$C8E7
,C895 F0 FA BEQ \$C891	,C8ED 20 B7 C8 JSR \$C887
,C897 C9 16 CMP ##16	,C8F0 A9 00 LDA ##00
,C899 F0 11 BEQ \$C8AC	,C8F2 85 C6 STA \$C6
,C89B C9 12 CMP ##12	,C8F4 4C 89 C9 JMP \$C989
,C89D F0 03 BEQ \$C8A2	,C8F7 20 73 00 JSR \$0073
,C89F 4C 91 C8 JMP \$C891	,C8FA A9 01 LDA ##01
,C8A2 A9 44 LDA ##44	,C8FC 20 C3 FF JSR \$FFC3
,C8A4 20 D2 FF JSR \$FFD2	,C8FF A9 24 LDA ##24
,C8A7 A9 01 LDA ##01	,C901 85 FB STA \$FB
,C8A9 85 02 STA \$02	,C903 A9 30 LDA ##30
,C8AB 60 RTS	,C905 85 FC STA \$FC
,C8AC A9 54 LDA ##54	,C907 A9 01 LDA ##01
,C8AE 20 D2 FF JSR \$FFD2	,C909 A2 08 LDX ##08
,C8B1 A9 00 LDA ##00	,C90B A0 00 LDY ##00
,C8B3 85 02 STA \$02	,C90D 20 BA FF JSR \$FFBA
,C8B5 60 RTS	,C910 A9 02 LDA ##02
,C8B6 EA NOP	,C912 A2 FB LDX ##FB
,C8B7 20 7B C8 JSR \$C87B	,C914 A0 00 LDY ##00
,C8BA A5 C5 LDA \$C5	,C916 20 BD FF JSR \$FFBD
,C8BC C9 40 CMP ##40	,C919 20 C0 FF JSR \$FFC0
,C8BE F0 FA BEQ \$C8BA	,C91C A9 40 LDA ##40
,C8C0 C9 16 CMP ##16	,C91E 20 90 FF JSR \$FF90
,C8C2 F0 11 BEQ \$C8D5	,C921 A2 01 LDX ##01
,C8C4 C9 12 CMP ##12	,C923 20 C6 FF JSR \$FFC6
,C8C6 F0 03 BEQ \$C8CB	,C926 20 90 FF JSR \$FF90
,C8C8 4C BA C8 JMP \$C8BA	,C929 20 CF FF JSR \$FFCF
,C8CB A9 44 LDA ##44	,C92C 20 CF FF JSR \$FFCF
,C8CD 20 D2 FF JSR \$FFD2	,C92F 20 CF FF JSR \$FFCF
,C8D0 A9 08 LDA ##08	,C932 20 CF FF JSR \$FFCF
,C8D2 85 FE STA \$FE	,C935 C9 00 CMP ##00
,C8D4 60 RTS	,C937 F0 3A BEQ \$C973
,C8D5 A9 54 LDA ##54	,C939 20 CC FF JSR \$FFCC
,C8D7 20 D2 FF JSR \$FFD2	,C93C 20 E4 FF JSR \$FFE4
,C8DA A9 01 LDA ##01	,C93F C9 20 CMP ##20
,C8DC 85 FE STA \$FE	,C941 D0 03 BNE \$C946

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,C943 20 80 C9 JSR $C980
,C946 A2 01 LDX ##01
,C948 20 C6 FF JSR $FFC6
,C94B 20 CF FF JSR $FFCF
,C94E A8 TAY
,C94F 20 CF FF JSR $FFCF
,C952 48 PHA
,C953 98 TYA
,C954 AA TAX
,C955 68 PLA
,C956 20 CD BD JSR $BDCD
,C959 A9 20 LDA ##20
,C95B 20 D2 FF JSR $FFD2
,C95E 20 CF FF JSR $FFCF
,C961 C9 00 CMP ##00
,C963 D0 08 BNE $C96D
,C965 A9 0D LDA ##0D
,C967 20 D2 FF JSR $FFD2
,C96A 4C 2F C9 JMP $C92F
,C96D 20 D2 FF JSR $FFD2
,C970 4C 5E C9 JMP $C95E
,C973 A9 01 LDA ##01
,C975 20 C3 FF JSR $FFC3
,C978 20 CC FF JSR $FFCC
,C97B 60 RTS
,C97C EA NOP
,C97D EA NOP
,C97E EA NOP
,C97F 60 RTS
,C980 20 E4 FF JSR $FFE4
,C983 C9 20 CMP ##20
,C985 D0 F9 BNE $C980
,C987 60 RTS
,C988 EA NOP
,C989 A2 00 LDX ##00
,C98B BD 81 C1 LDA $C181,X
,C98E F0 07 BEQ $C997
,C990 20 D2 FF JSR $FFD2
,C993 E8 INX
,C994 4C 8B C9 JMP $C98B
,C997 A9 00 LDA ##00
,C999 8D 98 C1 STA $C198
,C99C 20 E4 FF JSR $FFE4
,C99F C9 00 CMP ##00
,C9A1 F0 F9 BEQ $C99C
,C9A3 20 D2 FF JSR $FFD2
,C9A6 C9 0D CMP ##0D
,C9A8 F0 0C BEQ $C9B6
,C9AA EE 98 C1 INC $C198
,C9AD AC 98 C1 LDY $C198
,C9B0 99 98 C1 STA $C198,Y
,C9B3 4C 9C C9 JMP $C99C
,C9B6 A5 02 LDA $02
,C9B8 F0 44 BEQ $C9FE
,C9BA A9 01 LDA ##01
,C9BC 20 C3 FF JSR $FFC3
,C9BF A9 24 LDA ##24
,C9C1 85 FB STA $FB
,C9C3 A9 30 LDA ##30
,C9C5 85 FC STA $FC
,C9C7 A9 01 LDA ##01
,C9C9 A2 08 LDX ##08
,C9CB A0 00 LDY ##00
,C9CD 20 BA FF JSR $FFBA
,C9D0 AD 98 C1 LDA $C198
,C9D3 A2 99 LDX ##99
,C9D5 A0 C1 LDY ##C1
,C9D7 20 BD FF JSR $FFBD
,C9DA 20 C0 FF JSR $FFC0
,C9DD A2 01 LDX ##01
,C9DF 20 C6 FF JSR $FFC6
,C9E2 20 CF FF JSR $FFCF
,C9E5 8D AD C1 STA $C1AD
,C9E8 20 CF FF JSR $FFCF
,C9EB 8D AE C1 STA $C1AE
,C9EE A5 AE LDA $AE
,C9F0 8D AF C1 STA $C1AF
,C9F3 A5 AF LDA $AF
,C9F5 8D B0 C1 STA $C1B0
,C9F8 20 73 C9 JSR $C973
,C9FB 4C 16 CA JMP $CA16
,C9FE AD 3D 03 LDA $033D
,CA01 8D AD C1 STA $C1AD
,CA04 AD 3E 03 LDA $033E
,CA07 8D AE C1 STA $C1AE
,CA0A AD 3F 03 LDA $033F
,CA0D 8D AF C1 STA $C1AF
,CA10 AD 40 03 LDA $0340

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,CA13 8D B0 C1 STA \$C1B0	,CA77 C9 8F CMP #\$8F
,CA16 A2 00 LDX #\$00	,CA79 F0 3F BEQ \$CABA
,CA18 BD B1 C1 LDA \$C1B1,X	,CA7B E6 FD INC \$FD
,CA1B F0 07 BEQ \$CA24	,CA7D D0 F4 BNE \$CA73
,CA1D 20 D2 FF JSR \$FFD2	,CA7F E6 FE INC \$FE
,CA20 E8 INX	,CA81 4C 73 CA JMP \$CA73
,CA21 4C 18 CA JMP \$CA18	,CA84 EA NOP
,CA24 20 E4 FF JSR \$FFE4	,CA85 C8 INY
,CA27 C9 0D CMP #\$0D	,CA86 B1 FD LDA (\$FD),Y
,CA29 D0 F9 BNE \$CA24	,CA88 D0 0E BNE \$CA98
,CA2B 20 D2 FF JSR \$FFD2	,CA8A C8 INY
,CA2E A6 FE LDX \$FE	,CA8B B1 FD LDA (\$FD),Y
,CA30 20 BA FF JSR \$FFBA	,CA8D D0 09 BNE \$CA98
,CA33 AD 98 C1 LDA \$C198	,CA8F A9 00 LDA #\$00
,CA36 A0 C1 LDY #\$C1	,CA91 8D 80 03 STA \$0380
,CA38 A2 99 LDX #\$99	,CA94 20 73 00 JSR \$0073
,CA3A 20 BD FF JSR \$FFBD	,CA97 60 RTS
,CA3D AD AD C1 LDA \$C1AD	,CA98 A0 00 LDY #\$00
,CA40 85 FC STA \$FC	,CA9A A5 FD LDA \$FD
,CA42 AD AE C1 LDA \$C1AE	,CA9C 18 CLC
,CA45 85 FD STA \$FD	,CA9D 69 03 ADC #\$03
,CA47 A9 FC LDA #\$FC	,CA9F 85 FB STA \$FB
,CA49 AE AF C1 LDX \$C1AF	,CAA1 A5 FE LDA \$FE
,CA4C AC B0 C1 LDY \$C1B0	,CAA3 69 00 ADC #\$00
,CA4F 20 D8 FF JSR \$FFD8	,CAA5 85 FC STA \$FC
,CA52 20 73 00 JSR \$0073	,CAA7 A5 FD LDA \$FD
,CA55 60 RTS	,CAA9 18 CLC
,CA56 EA NOP	,CAAA 69 05 ADC #\$05
,CA57 A0 00 LDY #\$00	,CAAC 85 FD STA \$FD
,CA59 AD 80 03 LDA \$0380	,CAAE A5 FE LDA \$FE
,CA5C C9 FF CMP \$FFF	,CAB0 69 00 ADC #\$00
,CA5E F0 13 BEQ \$CA73	,CAB2 85 FE STA \$FE
,CA60 A9 03 LDA #\$03	,CAB4 4C 73 CA JMP \$CA73
,CA62 85 FB STA \$FB	,CAB7 EA NOP
,CA64 A9 08 LDA #\$08	,CAB8 EA NOP
,CA66 85 FC STA \$FC	,CAB9 EA NOP
,CA68 85 FE STA \$FE	,CABA A5 FD LDA \$FD
,CA6A A9 05 LDA #\$05	,CABC 38 SEC
,CA6C 85 FD STA \$FD	,CABD E5 FB SBC \$FB
,CA6E A9 FF LDA \$FFF	,CABF A0 00 LDY #\$00
,CA70 8D 80 03 STA \$0380	,CAC1 AA TAX
,CA73 B1 FD LDA (\$FD),Y	,CAC2 48 PHA
,CA75 F0 0E BEQ \$CA85	,CAC3 CA DEX

,CAC4 CA	DEX	,CB18 C9 3A	CMP ##3A
,CAC5 F0 33	BEQ \$CAFA	,CB1A F0 01	BEQ \$CB1D
,CAC7 B1 FB	LDA (\$FB),Y	,CB1C 60	RTS
,CAC9 85 14	STA \$14	,CB1D C6 FD	DEC \$FD
,CACB C8	INY	,CB1F D0 02	BNE \$CB23
,CACC B1 FB	LDA (\$FB),Y	,CB21 C6 FE	DEC \$FE
,CACE 85 15	STA \$15	,CB23 C6 0B	DEC \$0B
,CAD0 C8	INY	,CB25 A9 00	LDA ##00
,CAD1 B1 FB	LDA (\$FB),Y	,CB27 99 FE 01	STA \$01FE,Y
,CAD3 99 FE 01	STA \$01FE,Y	,CB2A 60	RTS
,CAD6 C8	INY	,CB2B EA	NOP
,CAD7 CA	DEX	,CB2C A9 08	LDA ##08
,CAD8 D0 F7	BNE \$CAD1	,CB2E 85 FE	STA \$FE
,CADA 68	PLA	,CB30 A9 00	LDA ##00
,CADB 18	CLC	,CB32 85 FD	STA \$FD
,CADC 69 03	ADC ##03	,CB34 85 02	STA \$02
,CADE 85 0B	STA \$0B	,CB36 A0 00	LDY ##00
,CAE0 A9 00	LDA ##00	,CB38 B1 FD	LDA (\$FD),Y
,CAE2 20 11 CB	JSR \$CB11	,CB3A F0 12	BEQ \$CB4E
,CAE5 A2 00	LDX ##00	,CB3C C9 22	CMP ##22
,CAE7 BD D1 C1	LDA \$C1D1,X	,CB3E F0 41	BEQ \$CB81
,CAEA 9D 77 02	STA \$0277,X	,CB40 C9 20	CMP ##20
,CAED E8	INX	,CB42 F0 47	BEQ \$CB8B
,CAEE E0 08	CPX ##08	,CB44 E6 FD	INC \$FD
,CAF0 D0 F5	BNE \$CAE7	,CB46 D0 F0	BNE \$CB38
,CAF2 A9 08	LDA ##08	,CB48 E6 FE	INC \$FE
,CAF4 85 C6	STA \$C6	,CB4A 4C 38 CB	JMP \$CB38
,CAF6 4C A4 A4	JMP \$A4A4	,CB4D EA	NOP
,CAF9 EA	NOP	,CB4E C8	INY
,CAFA B1 FB	LDA (\$FB),Y	,CB4F B1 FD	LDA (\$FD),Y
,CAFC 85 14	STA \$14	,CB51 D0 0E	BNE \$CB61
,CAFE C8	INY	,CB53 C8	INY
,CAFF B1 FB	LDA (\$FB),Y	,CB54 B1 FD	LDA (\$FD),Y
,CB01 85 15	STA \$15	,CB56 D0 09	BNE \$CB61
,CB03 A9 00	LDA ##00	,CB58 A9 00	LDA ##00
,CB05 8D 00 02	STA \$0200	,CB5A 8D 80 03	STA \$0380
,CB08 A9 05	LDA ##05	,CB5D 20 73 00	JSR \$0073
,CB0A 85 0B	STA \$0B	,CB60 60	RTS
,CB0C 68	PLA	,CB61 A0 00	LDY ##00
,CB0D 4C E5 CA	JMP \$CAE5	,CB63 A5 FD	LDA \$FD
,CB10 EA	NOP	,CB65 18	CLC
,CB11 99 FE 01	STA \$01FE,Y	,CB66 69 03	ADC ##03
,CB14 88	DEY	,CB68 85 FB	STA \$FB
,CB15 B9 FE 01	LDA \$01FE,Y	,CB6A A5 FE	LDA \$FE

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,CB6C 69 00	ADC #\$00	,CBBE A5 02	LDA \$02
,CB6E 85 FC	STA \$FC	,CBC0 30 F7	BMI \$CBB9
,CB70 A5 FD	LDA \$FD	,CBC2 68	PLA
,CB72 18	CLC	,CBC3 4C 9D CB	JMP \$CB9D
,CB73 69 05	ADC #\$05	,CBC6 9D 00 02	STA \$0200,X
,CB75 85 FD	STA \$FD	,CBC9 8A	TXA
,CB77 A5 FE	LDA \$FE	,CBCA 18	CLC
,CB79 69 00	ADC #\$00	,CBCB 69 05	ADC #\$05
,CB7B 85 FE	STA \$FE	,CBCD 85 0B	STA \$0B
,CB7D 4C 38 CB	JMP \$CB38	,CBCF A2 00	LDX #\$00
,CB80 EA	NOP	,CBD1 BD D1 C1	LDA \$C1D1,X
,CB81 A5 02	LDA \$02	,CBD4 9D 77 02	STA \$0277,X
,CB83 49 FF	EOR \$FF	,CBD7 E8	INX
,CB85 85 02	STA \$02	,CBD8 E0 08	CPX #\$08
,CB87 4C 44 CB	JMP \$CB44	,CBDA D0 F5	BNE \$CBD1
,CB8A EA	NOP	,CBDC A9 08	LDA #\$08
,CB8B A5 02	LDA \$02	,CBDE 85 C6	STA \$C6
,CB8D 10 03	BPL \$CB92	,CBE0 A9 53	LDA #\$53
,CB8F 4C 44 CB	JMP \$CB44	,CBE2 8D 78 02	STA \$0278
,CB92 B1 FB	LDA (\$FB),Y	,CBE5 4C A4 A4	JMP \$A4A4
,CB94 85 14	STA \$14	,CBE8 EA	NOP
,CB96 C8	INY	,CBE9 20 73 00	JSR \$0073
,CB97 B1 FB	LDA (\$FB),Y	,CBEC 20 8A AD	JSR \$AD8A
,CB99 85 15	STA \$15	,CBEF 20 F7 B7	JSR \$B7F7
,CB9B A2 00	LDX #\$00	,CBF2 A5 14	LDA \$14
,CB9D C8	INY	,CBF4 8D D8 C1	STA \$C1D8
,CB9E B1 FB	LDA (\$FB),Y	,CBF7 A5 15	LDA \$15
,CBA0 F0 24	BEQ \$CBC6	,CBF9 8D D9 C1	STA \$C1D9
,CBA2 C9 22	CMP #\$22	,CBFC 20 FD AE	JSR \$AEFD
,CBA4 F0 0C	BEQ \$CBB2	,CBFF 20 9E B7	JSR \$B79E
,CBA6 C9 20	CMP #\$20	,CC02 86 02	STX \$02
,CBA8 F0 13	BEQ \$CBBD	,CC04 E0 00	CPX #\$00
,CBAA 9D 00 02	STA \$0200,X	,CC06 F0 F4	BEQ \$CBFC
,CBAD E8	INX	,CC08 60	RTS
,CBAE 4C 9D CB	JMP \$CB9D	,CC09 EA	NOP
,CBB1 EA	NOP	,CC0A A9 9F	LDA #\$9F
,CBB2 48	PHA	,CC0C 85 FC	STA \$FC
,CBB3 A5 02	LDA \$02	,CC0E A9 FF	LDA \$FF
,CBB5 49 FF	EOR \$FF	,CC10 85 FB	STA \$FB
,CBB7 85 02	STA \$02	,CC12 A9 08	LDA \$08
,CBB9 68	PLA	,CC14 85 FE	STA \$FE
,CBBA 4C AA CB	JMP \$CBAA	,CC16 A9 03	LDA \$03
,CBBD 48	PHA	,CC18 85 FD	STA \$FD

,CC1A A0 00	LDY ##00	,CC72 65 FD	ADC \$FD
,CC1C B1 FD	LDA (\$FD),Y	,CC74 85 FD	STA \$FD
,CC1E 91 FB	STA (\$FB),Y	,CC76 A5 FE	LDA \$FE
,CC20 20 63 CC	JSR \$CC63	,CC78 69 00	ADC ##00
,CC23 20 5B CC	JSR \$CC5B	,CC7A 85 FE	STA \$FE
,CC26 EA	NOP	,CC7C A0 01	LDY ##01
,CC27 B1 FD	LDA (\$FD),Y	,CC7E B1 FD	LDA (\$FD),Y
,CC29 91 FB	STA (\$FB),Y	,CC80 D0 08	BNE \$CC8A
,CC2B 20 63 CC	JSR \$CC63	,CC82 C8	INY
,CC2E 20 5B CC	JSR \$CC5B	,CC83 B1 FD	LDA (\$FD),Y
,CC31 EA	NOP	,CC85 D0 03	BNE \$CC8A
,CC32 AD D8 C1	LDA \$C1D8	,CC87 68	PLA
,CC35 91 FB	STA (\$FB),Y	,CC88 68	PLA
,CC37 20 5B CC	JSR \$CC5B	,CC89 60	RTS
,CC3A EA	NOP	,CC8A A5 FD	LDA \$FD
,CC3B AD D9 C1	LDA \$C1D9	,CC8C 18	CLC
,CC3E 91 FB	STA (\$FB),Y	,CC8D 69 03	ADC ##03
,CC40 20 5B CC	JSR \$CC5B	,CC8F 85 FD	STA \$FD
,CC43 AD D8 C1	LDA \$C1D8	,CC91 A5 FE	LDA \$FE
,CC46 18	CLC	,CC93 69 00	ADC ##00
,CC47 65 02	ADC \$02	,CC95 85 FE	STA \$FE
,CC49 8D D8 C1	STA \$C1D8	,CC97 60	RTS
,CC4C AD D9 C1	LDA \$C1D9	,CC98 EA	NOP
,CC4F 69 00	ADC ##00	,CC99 EA	NOP
,CC51 8D D9 C1	STA \$C1D9	,CC9A A9 08	LDA ##08
,CC54 20 6B CC	JSR \$CC6B	,CC9C 85 FE	STA \$FE
,CC57 4C 1A CC	JMP \$CC1A	,CC9E A9 00	LDA ##00
,CC5A EA	NOP	,CCA0 85 FD	STA \$FD
,CC5B C6 FB	DEC \$FB	,CCA2 A0 00	LDY ##00
,CC5D D0 02	BNE \$CC61	,CCA4 B1 FD	LDA (\$FD),Y
,CC5F C6 FC	DEC \$FC	,CCA6 F0 0F	BEQ \$CCB7
,CC61 60	RTS	,CCA8 C9 89	CMP ##89
,CC62 EA	NOP	,CCAA F0 35	BEQ \$CCE1
,CC63 E6 FD	INC \$FD	,CCAC C9 8D	CMP ##8D
,CC65 D0 02	BNE \$CC69	,CCAE F0 3A	BEQ \$CCEA
,CC67 E6 FE	INC \$FE	,CCB0 20 63 CC	JSR \$CC63
,CC69 60	RTS	,CCB3 4C A2 CC	JMP \$CCA2
,CC6A EA	NOP	,CCB6 EA	NOP
,CC6B C8	INY	,CCB7 C8	INY
,CC6C B1 FD	LDA (\$FD),Y	,CCB8 B1 FD	LDA (\$FD),Y
,CC6E D0 FB	BNE \$CC6B	,CCBA D0 06	BNE \$CCC2
,CC70 9B	TYA	,CCBC C8	INY
,CC71 18	CLC	,CCBD B1 FD	LDA (\$FD),Y

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```
,CCBF D0 01      BNE $CCCC2
,CCC1 60          RTS
,CCC2 A5 FD      LDA $FD
,CCC4 18          CLC
,CCC5 69 03      ADC #$03
,CCC7 85 BB      STA $BB
,CCC9 A5 FE      LDA $FE
,CCCB 69 00      ADC #$00
,CCCD 85 BC      STA $BC
,CCCF A5 FD      LDA $FD
,CCD1 18          CLC
,CCD2 69 05      ADC #$05
,CCD4 85 FD      STA $FD
,CCD6 A5 FE      LDA $FE
,CCD8 69 00      ADC #$00
,CCDA 85 FE      STA $FE
,CCDC 4C A2 CC   JMP $CCA2
,CCDF EA          NOP
,CCE0 EA          NOP
,CCE1 A9 01      LDA #$01
,CCE3 8D 10 CD   STA $CD10
,CCE6 4C F2 CC   JMP $CCF2
,CCE9 EA          NOP
,CCEA A9 02      LDA #$02
,CCEC 8D 10 CD   STA $CD10
,CCEF EA          NOP
,CCF0 EA          NOP
,CCF1 EA          NOP
,CCF2 A5 FD      LDA $FD
,CCF4 85 7A      STA $7A
,CCF6 A5 FE      LDA $FE
,CCF8 85 7B      STA $7B
,CCFA 20 73 00   JSR $0073
,CCFD 20 8A AD   JSR $AD8A
,CD00 20 F7 B7   JSR $B7F7
,CD03 20 43 CD   JSR $CD43
,CD06 20 91 B3   JSR $B391
,CD09 20 DD BD   JSR $BDDDD
,CD0C 20 A3 CD   JSR $CDA3
,CD0F A9 01      LDA #$01
,CD11 99 FE 01   STA $01FE,Y
,CD14 98          TYA
,CD15 AA          TAX
,CD16 E8          INX
,CD17 20 63 CC   JSR $CC63
,CD1A 20 BA CD   JSR $CDBA
,CD1D 20 CB CD   JSR $CDCB
,CD20 C9 00      CMP #$00
,CD22 F0 03      BEQ $CD27
,CD24 20 DD CD   JSR $CDDD
,CD27 9D FE 01   STA $01FE,X
,CD2A 20 ED CD   JSR $CDED
,CD2D 20 00 CE   JSR $CE00
,CD30 20 0D CE   JSR $CE0D
,CD33 A9 93      LDA #$93
,CD35 20 D2 FF   JSR $FFD2
,CD38 4C A4 A4   JMP $A4A4
,CD3B EA          NOP
,CD3C 20 9A CC   JSR $CC9A
,CD3F 4C 20 CE   JMP $CE20
,CD42 EA          NOP
,CD43 A9 9F      LDA #$9F
,CD45 85 FC      STA $FC
,CD47 A9 FF      LDA $FF
,CD49 85 FB      STA $FB
,CD4B A0 00      LDY #$00
,CD4D B1 FB      LDA ($FB),Y
,CD4F C5 14      CMP $14
,CD51 D0 19      BNE $CD6C
,CD53 20 5B CC   JSR $CC5B
,CD56 B1 FB      LDA ($FB),Y
,CD58 C5 15      CMP $15
,CD5A D0 13      BNE $CD6F
,CD5C 20 5B CC   JSR $CC5B
,CD5F B1 FB      LDA ($FB),Y
,CD61 AA          TAX
,CD62 20 5B CC   JSR $CC5B
,CD65 B1 FB      LDA ($FB),Y
,CD67 48          PHA
,CD68 8A          TXA
,CD69 A8          TAY
,CD6A 68          PLA
,CD6B 60          RTS
,CD6C 20 5B CC   JSR $CC5B
,CD6F C9 FF      CMP $FF
,CD71 F0 06      BEQ $CD79
,CD73 20 5B CC   JSR $CC5B
```

,CD76	4C	4B	CD	JMP	\$CD4B	,CDAD	F0	09		BEQ	\$CDB8
,CD79	20	5B	CC	JSR	\$CC5B	,CDAF	B1	BB		LDA	(\$BB),Y
,CD7C	C9	FF		CMP	#\$FF	,CDB1	99	FE	01	STA	\$01FE,Y
,CD7E	D0	CB		BNE	\$CD4B	,CDB4	C8			INY	
,CD80	A0	00		LDY	#\$00	,CDB5	CA			DEX	
,CD82	A9	00		LDA	#\$00	,CDB6	D0	F7		BNE	\$CDAF
,CD84	60			RTS		,CDB8	60			RTS	
,CD85	EA			NOP		,CDB9	EA			NOP	
,CD86	EA			NOP		,CDBA	A0	00		LDY	#\$00
,CD87	EA			NOP		,CDBC	B9	01	01	LDA	\$0101,Y
,CD88	EA			NOP		,CDBF	F0	08		BEQ	\$CDC9
,CD89	EA			NOP		,CDC1	9D	FE	01	STA	\$01FE,X
,CD8A	EA			NOP		,CDC4	E8			INX	
,CD8B	EA			NOP		,CDC5	C8			INY	
,CD8C	EA			NOP		,CDC6	4C	BC	CD	JMP	\$CDBC
,CD8D	EA			NOP		,CDC9	60			RTS	
,CD8E	EA			NOP		,CDCA	EA			NOP	
,CD8F	EA			NOP		,CDCB	A0	00		LDY	#\$00
,CD90	EA			NOP		,CDCD	B1	FD		LDA	(\$FD),Y
,CD91	EA			NOP		,CDCF	F0	0A		BEQ	\$CDD8
,CD92	EA			NOP		,CDD1	C9	3A		CMP	#\$3A
,CD93	EA			NOP		,CDD3	F0	06		BEQ	\$CDD8
,CD94	EA			NOP		,CDD5	20	63	CC	JSR	\$CC63
,CD95	EA			NOP		,CDD8	4C	CD	CD	JMP	\$CDCD
,CD96	EA			NOP		,CDD8	60			RTS	
,CD97	EA			NOP		,CDDC	EA			NOP	
,CD98	EA			NOP		,CDDD	B1	FD		LDA	(\$FD),Y
,CD99	EA			NOP		,CDDF	F0	0A		BEQ	\$CDEB
,CD9A	EA			NOP		,CDE1	9D	FE	01	STA	\$01FE,X
,CD9B	EA			NOP		,CDE4	E8			INX	
,CD9C	EA			NOP		,CDE5	20	63	CC	JSR	\$CC63
,CD9D	EA			NOP		,CDE8	4C	DD	CD	JMP	\$CDDD
,CD9E	EA			NOP		,CDEB	60			RTS	
,CD9F	EA			NOP		,CDEC	EA			NOP	
,CDA0	EA			NOP		,CDED	A2	00		LDX	#\$00
,CDA1	EA			NOP		,CDEF	BD	00	02	LDA	\$0200,X
,CDA2	EA			NOP		,CDF2	F0	04		BEQ	\$CDF8
,CDA3	A5	FD		LDA	\$FD	,CDF4	E8			INX	
,CDA5	38			SEC		,CDF5	4C	EF	CD	JMP	\$CDEF
,CDA6	E5	BB		SBC	\$BB	,CDF8	8A			TXA	
,CDA8	A0	02		LDY	#\$02	,CDF9	18			CLC	
,CDA9	AA			TAX		,CDFA	69	05		ADC	#\$05
,CDAB	CA			DEX		,CDFC	85	0B		STA	\$0B
,CDAC	CA			DEX		,CDFE	60			RTS	

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,CDFF EA	NOP	,CE58 4C 49 CE	JMP \$CE49
,CE00 A0 00	LDY ##00	,CE5B 00	BRK
,CE02 B1 BB	LDA (\$BB),Y	,CE5C A9 89	LDA ##89
,CE04 85 14	STA \$14	,CE5E 91 FD	STA (\$FD),Y
,CE06 C8	INY	,CE60 4C 49 CE	JMP \$CE49
,CE07 B1 BB	LDA (\$BB),Y	,CE63 EA	NOP
,CE09 85 15	STA \$15	,CE64 A9 8D	LDA ##8D
,CE0B 60	RTS	,CE66 91 FD	STA (\$FD),Y
,CE0C EA	NOP	,CE68 4C 49 CE	JMP \$CE49
,CE0D A2 00	LDX ##00	,CE6B EA	NOP
,CE0F BD E0 C1	LDA \$C1E0,X	,CE6C C8	INY
,CE12 9D 77 02	STA \$0277,X	,CE6D B1 FD	LDA (\$FD),Y
,CE15 E8	INX	,CE6F D0 08	BNE \$CE79
,CE16 E0 09	CPX ##09	,CE71 C8	INY
,CE18 D0 F5	BNE \$CE0F	,CE72 B1 FD	LDA (\$FD),Y
,CE1A A9 09	LDA ##09	,CE74 D0 03	BNE \$CE79
,CE1C 85 C6	STA \$C6	,CE76 4C 7B E3	JMP \$E37B
,CE1E 60	RTS	,CE79 A5 FB	LDA \$FB
,CE1F EA	NOP	,CE7B 18	CLC
,CE20 A9 0D	LDA ##0D	,CE7C 65 02	ADC \$02
,CE22 8D D8 C1	STA \$C1D8	,CE7E 85 FB	STA \$FB
,CE25 A9 00	LDA ##00	,CE80 A5 FC	LDA \$FC
,CE27 8D D9 C1	STA \$C1D9	,CE82 69 00	ADC ##00
,CE2A AD DC C1	LDA \$C1DC	,CE84 85 FC	STA \$FC
,CE2D 85 FB	STA \$FB	,CE86 20 63 CC	JSR \$CC63
,CE2F AD DD C1	LDA \$C1DD	,CE89 20 63 CC	JSR \$CC63
,CE32 85 FC	STA \$FC	,CE8C 20 63 CC	JSR \$CC63
,CE34 A9 03	LDA ##03	,CE8F 4C 3C CE	JMP \$CE3C
,CE36 85 FD	STA \$FD	,CE92 EA	NOP
,CE38 A9 08	LDA ##08	,CE93 EA	NOP
,CE3A 85 FE	STA \$FE	,CE94 EA	NOP
,CE3C A0 00	LDY ##00	,CE95 20 E9 CB	JSR \$CBE9
,CE3E A5 FB	LDA \$FB	,CE98 A5 14	LDA \$14
,CE40 91 FD	STA (\$FD),Y	,CE9A 8D DC C1	STA \$C1DC
,CE42 20 63 CC	JSR \$CC63	,CE9D A5 15	LDA \$15
,CE45 A5 FC	LDA \$FC	,CE9F 8D DD C1	STA \$C1DD
,CE47 91 FD	STA (\$FD),Y	,CEA2 20 0A CC	JSR \$CC0A
,CE49 20 63 CC	JSR \$CC63	,CEA5 A0 00	LDY ##00
,CE4C B1 FD	LDA (\$FD),Y	,CEA7 A9 FF	LDA \$FF
,CE4E F0 1C	BEQ \$CE6C	,CEA9 91 FB	STA (\$FB),Y
,CE50 C9 01	CMP ##01	,CEAB 20 5B CC	JSR \$CC5B
,CE52 F0 08	BEQ \$CE5C	,CEAE 91 FB	STA (\$FB),Y
,CE54 C9 02	CMP ##02	,CEB0 EA	NOP
,CE56 F0 0C	BEQ \$CE64	,CEB1 20 9A CC	JSR \$CC9A

,CEB4	4C	20	CE	JMP	\$CE20		
,CEB7	EA			NOP			
,CEB8	EA			NOP			
,CEB9	EA			NOP			
,CEBA	EA			NOP			
,CEBB	EA			NOP			
,CEBC	EA			NOP		,CEE2	EA
,CEBD	EA			NOP		,CEE3	EA
,CEBE	EA			NOP		,CEE4	EA
,CEBF	EA			NOP		,CEE5	EA
,CEC0	EA			NOP		,CEE6	EA
,CEC1	EA			NOP		,CEE7	EA
,CEC2	EA			NOP		,CEE8	EA
,CEC3	EA			NOP		,CEE9	EA
,CEC4	EA			NOP			
,CEC5	EA			NOP			
,CEC6	EA			NOP			
,CEC7	EA			NOP			
,CEC8	EA			NOP			
,CEC9	EA			NOP			
,CECA	EA			NOP			
,CECB	EA			NOP			
,CECC	EA			NOP			
,CED0	EA			NOP			
,CED1	EA			NOP			
,CED2	EA			NOP			
,CED3	EA			NOP			
,CED4	EA			NOP			
,CED5	EA			NOP			
,CED6	EA			NOP			
,CED7	EA			NOP			
,CED8	EA			NOP			
,CED9	EA			NOP			
,CEDA	EA			NOP			
,CEDB	EA			NOP			
,CEDC	EA			NOP			
,CEDD	EA			NOP			
,CEDE	EA			NOP			
,CEDF	EA			NOP			
,CEE0	EA			NOP			
,CEE1	EA			NOP			



FURTHER READING

If you wish to explore your Commodore 64 further, the following books from Interface Publications Ltd. will be of interest.

MASTERING THE COMMODORE 64 – Mark Greenshields – ISBN 0 907563 38 4 – £7.95. Contains detailed information on advanced programming in BASIC, and introductory programming in machine code, to achieve many goals including a sound and music synthesis, the creation of programmable characters and high resolution graphics, function key programming, and the use and development of sprites.

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OLD — restore a program which has been NEWed

RENUMBER — renumbers all lines, including GOTOs and GOSUBs

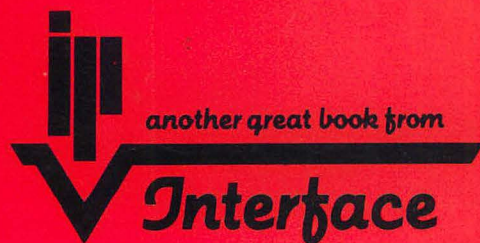
REPEAT — gets all keys to autorepeat

RSTRIP — removes all REM statements

SSTRIP — removes all spaces

Graphics commands include:

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