

All Commodore 64 programs in this issue work with the Commodore 128 in 64 mode.

Snapshot

See instructions in article on page 76.

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," which appears before the Program Listings.

Program 1: Snapshot

```
C124:78 AD 15 03 C9 C1 F0 20 79
C12C:8D E8 C1 AD 14 03 8D E7 73
C134:C1 A9 64 8D 14 03 A9 C1 2A
C13C:8D 15 03 A0 00 8C 36 C7 9C
C144:AD 63 C1 D0 03 20 4E C1 B3
C14C:58 60 98 99 00 C0 C8 D0 26
C154:FA A9 FF 8D FE C0 A9 BF A6
C15C:8D FF C0 8D 63 C1 60 00 7A
C164:AD 36 C7 D0 07 AD 8E 02 60
C16C:C9 04 F0 03 4C E6 C1 A5 4B
C174:C5 CD 13 C1 F0 6C 8D 13 34
C17C:C1 C9 14 F0 1B C9 29 F0 28
C184:1D C9 0D F0 1F C9 2A F0 1F
C18C:21 C9 12 F0 23 C9 21 F0 D7
C194:25 C9 15 F0 27 4C E6 C1 C8
C19C:20 C6 C1 4C 0D C3 20 C6 5D
C1A4:C1 4C C0 C4 20 C6 C1 4C 6C
C1AC:F9 C7 20 C6 C1 4C 12 C8 BB
C1B4:20 C6 C1 4C DF C5 20 C6 14
C1BC:C1 4C F2 C6 20 C6 C1 4C EA
C1C4:67 C2 BA FE 01 01 D0 03 A4
C1CC:FE 02 01 E8 E8 8E 16 C1 6E
C1D4:A9 20 48 E8 48 8D 36 77
C1DC:C7 85 CC 20 F1 C2 A9 36 65
C1E4:85 01 4C 31 EA 20 FF C2 A2
C1EC:A0 00 8C 36 C7 BA CE 16 CE
C1F4:C1 F0 04 68 4C F1 C1 AE F8
C1FC:37 C7 D0 06 68 A8 68 AA E9
C204:68 40 8C 37 C7 60 A2 00 D7
C20C:84 0B AD 37 C7 F0 04 AC 76
C214:14 C1 60 85 CC 86 D0 20 33
C21C:E4 FF A6 0D C9 0D F0 1A 38
C224:C9 14 D0 05 CA 10 0C 30 DC
C22C:EE 29 7F C9 20 90 E6 9D AE
C234:00 C1 E8 20 D7 C2 E4 0B E7
C23C:D0 DB A9 0D D0 D7 C2 8A 97
C244:D0 03 4C E9 C1 A8 A9 20 3F
C24C:9D 00 C1 60 AD FE C0 85 4F
C254:04 85 08 AD FF C0 85 05 2C
C25C:85 09 A0 00 20 71 C4 20 6B
C264:71 C4 60 20 50 C2 20 C0 70
C26C:C2 85 02 8D 65 C3 86 03 18
C274:8E 69 C3 AD 86 02 85 0D 43
C27C:A2 02 CA E4 D0 F0 FB 8E 2E
C284:86 02 AD 21 D0 29 F0 CD AC
C28C:86 02 F0 EE 84 C0 20 E4 5F
C294:FF F0 FB C9 0D F0 06 20 CA
C29C:D7 C2 4C 92 C2 A0 00 85 8F
C2A4:CC 20 C0 C2 18 69 02 90 D7
C2AC:01 E8 8D 63 C4 8E 69 C4 CC
C2B4:98 20 D7 C2 A5 0D 8D 86 B8
C2BC:02 4C 3B C3 18 A5 D1 65 5A
C2C4:D3 08 20 71 C4 28 48 A5 4E
C2CC:D2 69 00 20 71 C4 A4 68 74
C2D4:60 85 01 A4 CF F0 0A A0 4D
C2DC:01 84 CD A4 A2 C4 A2 F0 66
C2E4:FC 20 D2 FF A0 02 84 CD 2F
C2EC:A0 00 84 CF 60 A0 00 B9 8F
C2F4:00 00 99 7C C9 C8 C0 07 77
C2FC:D0 F5 60 A0 00 B9 7C C9 28
C304:99 00 00 C8 C0 0F D0 F5 BE
```

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C30C:60 20 50 C2 84 02 8C 65 AC
C314:C3 98 20 71 C4 AD 88 02 AE
C31C:85 03 20 71 C4 A2 EA 8E 57
C324:63 C4 CA CA 8A 20 71 C4 11
C32C:AD 88 02 18 69 03 8D 69 4A
C334:C4 20 71 C4 8C 69 C3 84 B6
C33C:0A 84 0C 8C 15 C1 20 95 B9
C344:C4 85 0B C9 00 F0 50 20 12
C34C:95 C4 85 0E A5 0B C5 0E 54
C354:F0 36 20 71 C4 A5 0E 85 5B
C35C:0B F0 3C 4C 4B C3 84 0A 6E
C364:A9 00 85 02 A9 00 29 03 34
C36C:09 D8 85 03 85 0C AD 69 B0
C374:C4 29 03 09 D8 8D 69 C4 2E
C37C:20 CD C5 A5 04 91 08 A5 B6
C384:05 C8 91 08 88 4C 42 C3 31
C38C:EE 15 C1 20 95 C4 C5 0B 61
C394:D0 26 EE 15 C1 F0 2B 20 85
C39C:95 C4 C5 0B F0 F4 85 0E FD
C3A4:A9 00 20 71 C4 A5 0B 20 0F
C3AC:71 C4 AD 15 C1 20 71 C4 5B
C3B4:A9 00 8D 15 C1 4C 59 C3 C9
C3BC:85 0E A5 0B 8D 15 C1 4C 80
C3C4:AB C3 CE 15 C1 4C A2 C3 86
C3CC:68 68 AD 15 C1 F0 08 85 11
C3D4:0E CE 15 C1 4C A4 C3 A5 F7
C3DC:0C D0 03 4C 62 C3 A9 20 59
C3E4:85 02 84 0A A9 D0 85 03 7F
C3EC:20 95 C4 20 71 C4 20 95 F8
C3F4:C4 20 71 C4 20 95 C4 20 62
C3FC:71 C4 A9 00 20 5F C7 A0 52
C404:03 20 0A C2 AC FD C0 C8 2C
C40C:C8 AD FE C0 99 00 C0 C8 68
C414:AD FF C0 99 00 C0 C8 8C 47
C41C:FD C0 A5 04 8D FE C0 A5 59
C424:05 8D FF C0 20 B3 C6 C0 BD
C42C:FF F0 03 20 08 C6 AC FD 07
C434:C0 88 88 88 88 C0 FB B0 C9
C43C:0F AD C0 C1 99 00 C0 AD D0
C444:01 C1 99 01 C0 4C B9 C1 CE
C44C:8C FD C0 A9 3A 20 5F C7 27
C454:4C E9 C1 91 02 A6 02 E8 67
C45C:86 02 D0 02 E6 03 E0 EA D3
C464:D0 0A A6 03 E0 07 90 04 26
C46C:A9 01 85 0A 60 91 04 A6 54
C474:04 D0 02 C6 05 CA 86 04 45
C47C:E4 37 D0 14 A6 05 E4 38 EC
C484:D0 E6 06 04 D0 02 E6 05 78
C48C:A9 2B 20 5F C7 4C E9 C1 B4
C494:60 A5 0C F0 1A B1 02 29 0D
C49C:0F 85 D0 A6 0A D0 1A 20 03
C4A4:59 C4 B1 02 0A 0A 0A 0A F8
C4AC:18 65 0D 20 59 C4 60 B1 8F
C4B4:02 20 59 C4 A6 0A D0 01 BE
C4BC:60 4C CC C3 A9 00 20 5F 4C
C4C4:C7 A0 03 20 0A C2 20 B3 0C
C4CC:C6 C0 FF D0 08 A9 48 20 8E
C4D4:5F C7 4C E9 C1 B9 00 C0 DD
C4DC:85 04 B9 01 C0 85 05 A0 38
C4E4:00 20 C0 C5 85 09 20 C0 3C
C4EC:C5 85 08 20 C0 C5 85 02 E7
C4F4:85 06 20 C0 C5 85 03 29 46
C4FC:03 09 D8 85 07 20 C0 C5 BD
C504:8D 63 C4 20 C0 C5 8D 69 6B
C50C:C4 84 0A 84 0E A9 02 85 45
C514:0F 20 C0 C5 C9 00 F0 2B FE
C51C:20 57 C4 A5 0A D0 0A C6 EE
C524:0F D0 EE 20 69 C5 4C 15 5B
C52C:C5 C6 0F D0 06 20 69 C5 84
C534:4C 99 C5 A9 60 8D 7E C5 9B
C53C:20 69 C5 A9 4A 8D 7E C5 D0
C544:4C 99 C5 20 C0 C5 85 0B 4A
C54C:20 C0 C5 85 0D E6 0D A5 EC
C554:0B 20 57 C4 C6 0D F0 C3 B4
C55C:C6 F0 D0 F3 20 69 C5 4C E6
C564:53 C5 4C 1F C5 A6 0E F0 5C
C56C:07 A5 C0 C6 0E 4C 7B C5 31
C574:20 CB C5 C9 00 F0 0F 20 5A
C57C:D6 C5 4A 4A 4A 20 D6 65
C584:C5 A2 02 86 0F 60 20 CB 4A
C58C:C5 85 08 20 CB C5 85 0E 6E
C594:A5 0C 4C 7B C5 AC BC C5 57
C59C:D0 1F A9 20 85 02 A9 D0 E7
C5A4:85 03 20 CB C5 20 57 C4 96
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C5AC:A6 02 E0 25 B0 0B 4A 4A 0B
C5B4:4A 4A 20 57 C4 4C A6 C5 DB
C5BC:00 4C E9 C1 B1 04 A6 04 A3
C5C4:D0 02 C6 05 C6 04 60 B1 1B
C5CC:08 A6 08 D0 02 C6 09 C6 18
C5D4:08 60 91 06 E6 06 D0 02 02
C5DC:E6 07 60 A9 00 20 5F C7 4B
C5E4:A0 03 20 0A C2 A9 2A 20 57
C5EC:DD C6 A9 AC 20 DD C6 20 3F
C5F4:B3 C6 C0 FF D0 08 A9 48 66
C5FC:20 5F C7 4C E9 C1 20 08 CC
C604:C6 4C E9 C1 84 0D 98 18 03
C60C:69 02 CD FD C0 D0 0F B9 83
C614:00 C0 8D FE C0 B9 01 C0 23
C61C:8D FF C0 4C 7B C6 B9 00 B7
C624:C0 85 02 B9 01 C0 85 03 68
C62C:B9 04 C0 85 04 B9 05 C0 D9
C634:85 05 20 8E C6 A4 0D 38 CD
C63C:B9 00 C0 F9 04 C0 85 08 94
C644:B9 01 C0 F9 05 C0 85 09 E5
C64C:88 88 A6 0D E8 E8 BD 00 4C
C654:C0 99 00 C0 C8 E8 EC FD 76
C65C:C0 90 F3 A4 0D 18 B9 00 73
C664:C0 65 08 99 00 C0 C8 B9 94
C66C:00 C0 65 09 99 00 C0 C8 7E
C674:F0 05 C8 C8 4C 61 C6 AD 84
C67C:FD C0 38 E9 04 8D FD C0 F1
C684:A8 A9 20 99 00 C0 99 01 A5
C68C:C0 60 A2 00 A1 04 81 02 09
C694:A5 02 D0 02 C6 03 C6 02 81
C69C:A5 04 D0 02 C6 05 C6 04 14
C6A4:AD FE C0 C5 04 D0 E5 AD 1A
C6AC:FF C0 C5 05 D0 DE 60 A0 D6
C6B4:00 CC FD C0 B0 1E AD 00 9A
C6BC:C1 D9 00 C0 F0 07 C8 C8 AB
C6C4:C8 C8 4C B5 C6 C8 AD 01 83
C6CC:C1 D9 00 C0 F0 09 C8 C8 C3
C6D4:C8 4C B5 C6 A9 FE A8 C8 60
C6DC:60 CD 00 C1 F0 06 CD 01 66
C6E4:C1 F0 01 68 68 A0 00 DB
C6EC:20 4E C1 4C E9 C1 A9 93 58
C6F4:20 D2 FF A9 20 AC FD C0 52
C6FC:99 00 C0 C8 C0 FB 90 F8 0C
C704:A2 54 20 56 C7 A0 00 B9 DD
C70C:00 C0 20 D2 FF B9 01 C0 A6
C714:20 D2 FF A2 0D 20 56 C7 EF
C71C:B9 54 C0 20 D2 FF B9 55 17
C724:C0 20 D2 FF A2 0D 20 56 56
C72C:C7 B9 A8 C0 20 D2 FF 4C C7
C734:3B C7 00 00 4C 5E C8 B9 7A
C73C:A9 C0 20 D2 FF A2 04 20 B4
C744:51 C7 C8 C8 C8 C8 54 53
C74C:D0 BD 4C E9 C1 A9 0D 20 CA
C754:D2 FF A9 20 20 D2 FF CA 9B
C75C:D0 FA 60 A8 AD 37 C7 F0 74
C764:05 C0 2B B0 01 60 A9 13 07
C76C:20 D2 FF A2 27 20 56 C7 19
C774:84 0B A0 5D 20 82 C7 A4 32
C77C:0B A9 12 20 D2 FF B9 94 DE
C784:C7 F0 07 20 D2 FF C8 4C 8B
C78C:82 C7 A9 92 20 D2 FF 60 5A
C794:53 43 52 45 45 4E 20 4E 2F
C79C:41 4D 45 3F 00 46 49 4C B4
C7A4:45 20 4E 41 4D 45 3F 00 BA
C7AC:54 41 50 45 20 4F 52 20 18
C7B4:44 49 53 4B 20 28 54 2F 51
C7BC:44 29 00 4D 45 4D 4F 52 DD
C7C4:59 20 49 53 20 46 55 4C 78
C7CC:4C 00 49 4E 44 45 58 20 98
C7D4:49 53 20 46 55 4C 4C 00 BA
C7DC:4E 41 4D 45 20 4E 4F 54 0F
C7E4:20 46 4F 55 4E 44 00 45 1E
C7EC:52 52 4F 52 00 14 20 9D 77
C7F4:94 20 1D 91 00 20 1D C8 17
C7FC:AD FE C0 85 04 AD FF C0 2B
C804:85 05 A9 04 A0 C1 A2 00 60
C80C:20 D8 FF 4C E9 C1 20 1D 5C
C814:C8 A9 00 20 D5 FF 4C E9 A7
C81C:C1 A9 0D 20 5F C7 A0 10 08
C824:20 A0 C2 98 A2 00 A0 C1 42
C82C:20 BD FF A9 18 20 5F C7 9F
C834:A2 10 A0 11 20 C0 C2 AD A4
C83C:10 C1 C9 44 D0 04 A2 08 A7
C844:D0 06 C9 54 D0 0A A2 01 33
C84C:A9 02 A0 01 20 BA FF 60 A3
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C854:68 68 A9 57 20 5F C7 4C 39
C85C:E9 C1 A0 00 20 F1 C2 AD 63
C864:63 C1 D0 03 20 4E C1 A9 C9
C86C:36 85 01 8D 37 C7 8D 36 9D
C874:C7 BA 8E 16 C1 A0 00 8C E8
C87C:01 C1 20 73 00 8D 37 C7 A6
C884:C9 49 F0 55 85 0D 20 73 D4
C88C:00 20 73 00 F0 C4 99 00 62
C894:C1 C8 20 73 00 F0 10 C9 22
C89C:2C F0 0C C9 24 F0 63 99 E3
C8A4:00 C1 C0 0F D0 EB C8 A9 21
C8AC:20 99 00 C1 8C 14 C1 A5 AE
C8B4:0D C9 4C F0 2C C9 53 F0 F7
C8BC:28 20 FB C8 A5 0D C9 43 AE
C8C4:F0 0B C9 44 F0 0A C9 50 A2
C8CC:F0 09 4C 56 C8 4C 0D C3 5D
C8D4:4C DF C5 4C C0 C4 4C F9 AD
C8DC:C7 20 73 00 D0 FB 4C F2 CA
C8E4:C6 20 73 00 C9 2C F0 F9 2B
C8EC:8D 10 C1 20 FB C8 A5 0D DE
C8F4:C9 4C D0 E2 4C 12 C8 20 23
C8FC:79 00 F0 05 20 73 00 D0 59
C904:F0 60 A5 2D 85 02 A5 2E E2
C90C:85 03 A0 00 AD 01 C1 09 35
C914:80 8D 01 C1 AE 00 C1 8A 0B
C91C:D1 02 F0 06 20 60 C9 4C F9
C924:1B C9 C8 AD 01 C1 D1 02 60
C92C:F0 07 88 20 60 C9 4C 1B EA
C934:C9 C8 B1 02 C9 10 90 02 E6
C93C:A9 0F 8D 14 C1 AA CA C8 72
C944:B1 02 85 04 C8 B1 02 85 B8
C94C:05 A0 00 B1 04 99 00 C1 ED
C954:C8 CA 10 F7 A9 20 99 00 81
C95C:1C 4C AB C8 18 A5 02 69 AA
C964:07 85 02 A5 03 69 00 85 BA
C96C:C3 C5 30 B0 01 60 A5 02 DA
C974:C5 2F B0 01 60 4C 54 C8 82
C97C:00 00 00 00 00 00 00 10

```

Program 2: Snapshot Demo

```

KQ 100 POKE56,146:CLR:SC=1024:
CM=54272:XT=0:YT=0:X=0:
Y=0:R=24:C=39:DIMNAS(31)
KQ 110 SNAPSHOT=51000:POKE5328
0,11:POKE53281,12:GOSUB
240
AE 120 PRINT TAB(7)"SET UP AND
COPY SCREENS":FORI=0TO
1200:NEXT
FX 130 GOSUB240:PRINTTAB(9)"SN
APSHOT DEMONSTRATION"
EA 140 SYSSNAPSHOT,D,*,REM ERA
SE OLD SCREENS
BB 150 FORI=0 TO 31:X=I:Y=0:G
OSUB250
SQ 160 X=X-1:Y=Y+1:IF X<=0 THE
N GOSUB250:GOTO160
ME 170 NAS(I)=STR$(I):NAS(I)=R
IGHT$(NAS(I),LEN(NAS(I)
)-1):N$=NAS(I)
EM 180 SYSSNAPSHOT,C,N$:NEXT:R
EM COPY SCREEN
ME 190 GOSUB240:PRINT TAB(8)"S
NAPSHOT PRINTS SCREENS"
KQ 200 PRINT:PRINT:PRINT TAB(1
0)"PRESS (STOP) TO END"
:FORI=0TO3000:NEXT
KJ 210 FORI=0TO31:N$=NAS(I):SY
SSNAPSHOT,P,N$:NEXT
QA 220 FORI=31TO0:STEP-1:N$=NAS
(I):SYSSNAPSHOT,P,N$:NE
XT
CX 230 GOTO210
KD 240 PRINT"[CLR][WHT]":FORI=
0TO9:PRINT:NEXT:RETURN
CC 250 IF Y>24 THEN300
JX 260 XT=X:YT=Y:CH=78:GOSUB31
0
XA 270 XT=X-CH:CH=77:GOSUB310
JK 280 YT=Y-CH:CH=78:GOSUB310
CP 290 XT=X:CH=77:GOSUB310

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HJ 300 RETURN
CM 310 P=40*YT+XT+SC:IFPEEK(P)
=77ORPEEK(P)=78THENCH=8
6
GD 320 POKEP,CH:POKEP+CM,0
DM 330 RETURN

```

All Commodore 64 programs in this issue work with the Commodore 128 in 64 mode.

Mini-Filer

See instructions in article on page 99.

BEFORE TYPING . . .

Before typing in programs, please refer to "How To Type In COMPUTE!'s GAZETTE Programs," which appears before the Program Listings.

```

0801:0B 08 00 00 9E 32 30 36 EC
0809:31 00 00 00 A9 00 8D 20 3A
0811:D0 A9 36 85 01 A9 0C 8D 67
0819:21 D0 8D 86 02 A9 93 20 06
0821:D2 FF A9 0B 8D 21 D0 A9 BC
0829:17 8D 18 D0 A9 11 18 69 63
0831:01 8D B5 10 18 69 04 85 D0
0839:04 85 46 A9 CC 85 06 A9 42
0841:00 85 05 85 03 8D B4 10 73
0849:85 45 8D 87 11 8D 88 11 78
0851:8D 89 11 8D 8A 11 A9 00 71
0859:20 90 FF 20 DA 09 20 E6 C1
0861:08 20 D8 08 20 AF 08 48 31
0869:20 E6 08 68 AE 8D 08 DD 64
0871:8D 08 F0 05 CA D0 F8 F0 35
0879:EB CA 8A 0A AA A9 08 48 78
0881:A9 61 48 BD 9A 08 48 BD E6
0889:99 08 48 0B 43 41 46 A5
0891:50 91 11 52 8C 88 93 C6 E9
0899:29 0A 13 0C 66 0D F7 0D 48
08A1:D9 0E F6 0E 15 0F 2F 0F 34
08A9:73 0F CB 09 60 D0 20 E4 9D
08B1:FF F0 FB 60 A9 00 85 FB D7
08B9:AD 04 86 FC AD B4 10 85 A2
08C1:FD AD B5 10 85 FE A0 28 85
08C9:B1 FD 91 FB C8 D0 F9 E6 88
08D1:FE E6 FC CA D0 F2 60 20 9A
08D9:B5 08 A0 00 B1 45 10 01 9E
08E1:60 20 83 09 60 AD 00 04 E8
08E9:C9 CD F0 07 A9 0F A0 FE AA
08F1:4C F5 08 60 85 FC 84 FB D1
08F9:A0 27 A9 A0 99 00 04 88 C0
0901:10 FA A9 13 20 D2 FF A9 36
0909:12 20 D2 FF A0 00 B1 FB EA
0911:F0 06 20 D2 FF C8 D0 F6 0A
0919:A9 92 20 D2 FF 60 A9 27 D1
0921:38 E5 D3 8D B3 10 A0 00 3B
0929:A9 12 20 D2 FF 8C 8B 11 20
0931:A9 A4 20 D2 FF A9 9D 20 74
0939:D2 FF 20 AF 08 C9 0D F0 26
0941:35 C9 14 F0 19 C9 20 90 B2
0949:E4 AC 8B 11 CC B3 10 F0 C1
0951:DC 99 00 02 20 D2 FF A9 4E
0959:00 85 D4 C8 D0 CF AC 8B 9E
0961:11 C0 00 F0 C8 8B A9 20 17
0969:20 D2 FF A9 9D 20 D2 FF ED
0971:20 D2 FF 4C 2E 09 AC 8B 87
0979:11 A9 00 99 00 02 8C B3 EC
0981:10 60 A5 45 85 FB A5 46 6A
0989:85 FC A2 00 8E 84 11 BD 58
0991:B9 10 85 FD BD EB 10 85 58
0999:FE BD 1D 11 8D 86 11 F0 E8
09A1:29 A0 00 8C 85 11 AC 84 87
09A9:11 B1 FB 10 02 A9 20 AC D4

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09B1:85 11 91 FD EE 85 11 EE 7B
09B9:84 11 D0 02 E6 FC C8 CC 16
09C1:86 11 D0 E2 E8 BD 1D 11 2D
09C9:D0 C5 60 A9 0F A0 E9 20 4B
09D1:F5 08 20 AF 08 C9 59 D0 CA
09D9:4D A5 03 85 45 85 FD A5 96
09E1:04 85 46 85 FE A0 00 8C 7F
09E9:B2 10 A9 FF 91 FD C8 D0 75
09F1:FB E6 FE A6 FE E0 D0 D0 F3
09F9:F3 AD B4 10 85 FD A2 04 76
0A01:AD B5 10 85 FE A0 28 A9 28
0A09:20 91 FD C8 D0 FB E6 FE 21
0A11:CA D0 F6 A9 00 A2 32 9D C4
0A19:B8 10 9D EA 10 9D 1C 11 30
0A21:9D 4E 11 CA D0 F1 4C E6 34
0A29:08 AD B2 10 F0 01 60 EE 3F
0A31:B2 10 A9 00 8D B6 10 8D CC
0A39:B7 10 20 B5 08 A9 10 A0 34
0A41:27 20 F5 08 AC B7 10 B9 4E
0A49:80 10 85 FB 85 14 B9 99 9B
0A51:10 85 FC 18 69 D4 85 15 AE
0A59:AC B6 10 A9 0F 91 14 B1 A6
0A61:FB 8D B8 10 09 80 91 FB 58
0A69:20 AF 08 AE 9E 0A 48 AC BF
0A71:B6 10 A9 0C 91 14 AD B8 CB
0A79:10 91 FB 68 DD 9E 0A F0 6E
0A81:09 CA D0 F8 20 3B 0B 4C C6
0A89:45 0A CA 8A 0A AA A9 0A 1D
0A91:48 A9 44 48 BD AA 0A 48 36
0A99:BD A9 0A 48 60 0A 91 11 1C
0AA1:9D 1D 13 94 14 A0 0D 85 3A
0AA9:BC 0A C5 0A D0 0A D9 0A 64
0AB1:EC 0A 0B 0B F5 0A 21 0B F5
0AB9:32 0B 78 0B AD B7 10 F0 C6
0AC1:03 CE B7 10 60 AD B7 10 3C
0AC9:C9 17 F0 03 EE B7 10 60 AD
0AD1:AD B6 10 F0 03 CE B6 10 4C
0AD9:60 AD B6 10 C9 27 F0 04 32
0AE1:EE B6 10 60 A9 00 8D B6 42
0AE9:10 4C C6 0A A9 00 8D B6 B1
0AF1:10 8D B7 10 60 20 D1 0A 9A
0AF9:AC B6 10 C8 B1 FB 88 91 C0
0B01:FB C8 C0 27 D0 F5 A9 20 A3
0B09:91 FB 60 A0 27 88 B1 FB B7
0B11:C8 91 FB 88 CC B6 10 D0 2A
0B19:F4 AC B6 10 A9 20 91 FB 99
0B21:60 AD 8D 02 C9 01 D0 05 9D
0B29:A9 A0 4C 4E 0B A9 AE 4C 53
0B31:4E 0B A9 00 8D B6 10 4C 1A
0B39:C6 0A C9 20 90 17 C9 60 45
0B41:90 08 C9 C1 90 0F C9 DB 27
0B49:B0 0B 20 57 0B AC B6 10 7C
0B51:91 FB 20 DA 0A 60 48 29 6C
0B59:80 4A 8D B8 10 68 29 3F 33
0B61:0D B8 10 60 8D B8 10 29 CC
0B69:3F 0E B8 10 2C B8 10 10 2F
0B71:02 09 80 70 02 09 40 60 F6
0B79:68 68 AD B4 10 85 FD AD 1F
0B81:B5 10 85 FE A2 04 86 FC 46
0B89:A9 00 85 FB A0 28 B1 FB E9
0B91:91 FD C8 D0 F9 E6 FC E6 62
0B99:FE CA D0 F2 A9 04 85 FE 92
0BA1:A2 00 86 FD A0 28 B1 FD C0
0BA9:30 0E C8 D0 F9 E6 FE A5 90
0BB1:FE C9 08 D0 F1 4C EF 0B 73
0BB9:48 E0 32 D0 02 F0 2F A5 57
0BC1:FE 9D EB 10 98 18 65 FD 2B
0BC9:9D B9 10 8E 81 11 A2 00 9D
0BD1:B1 FD 10 08 E8 C8 D0 F8 C7
0BD9:E6 FE D0 F4 8A EA 81 11 AF
0BE1:9D 1D 11 68 38 E9 A0 9D FE
0BE9:4F 11 E8 4C A7 0B A9 00 8A
0BF1:8D 82 11 8D 83 11 A0 00 0C
0BF9:B9 1D 11 F0 13 18 6D 82 BB
0C01:11 8D 82 11 AD 83 11 69 6D
0C09:00 8D 83 11 C8 4C F9 0B 7C
0C11:4C E6 08 A9 10 A0 75 20 B2
0C19:F5 0C A5 45 85 FB A5 46 E4
0C21:85 FC A2 00 8E 84 11 BD F5
0C29:B9 10 85 FD 85 14 BD EB 96
0C31:10 85 FE 18 69 D4 85 15 D2
0C39:BD 1D 11 8D 86 11 F0 D0 9D
0C41:A0 00 8C 85 11 8E 81 11 6A
0C49:AC 85 11 A9 0F 91 14 B1 6E

```



```

0C51:FD 8D 8B 11 09 80 91 FD B9
0C59:20 E4 FF F0 FB AE 51 0D 14
0C61:DD 51 0D F0 05 CA D0 F8 5B
0C69:F0 0D CA 8A 0A AA BD 58 0E
0C71:0D 48 BD 57 0D 48 60 C9 63
0C79:20 90 DD C9 80 90 04 C9 36
0C81:A0 90 D5 20 57 0B C9 5B A0
0C89:B0 CE AE 81 11 BC 4F 11 C6
0C91:F0 08 C9 30 90 C2 C9 3A BD
0C99:B0 BE AC 84 11 91 FB EE 4D
0CA1:84 11 D0 02 E6 FC AC 85 84
0CA9:11 91 FD A9 0C 91 14 EE C6
0CB1:85 11 C8 CC 86 11 D0 90 61
0CB9:AE 81 11 E8 BD 1D 11 D0 8F
0CC1:0C AA A5 45 85 FB A5 46 41
0CC9:85 FC 8E 84 11 4C 28 0C 14
0CD1:20 E9 C0 EE 84 11 D0 02 F0
0CD9:E6 FC EE 85 11 AD 85 11 36
0CE1:CD 86 11 F0 D3 4C 49 0C 22
0CE9:AC 85 11 A9 0C 91 14 AD F2
0CF1:8B 11 91 FD 60 20 E9 0C 89
0CF9:AD 85 11 F0 0D CE 85 11 3B
0D01:AD 84 11 D0 02 C6 FC CE 36
0D09:84 11 4C 49 0C 20 E9 0C 88
0D11:EE 84 11 D0 02 E6 FC EE 87
0D19:85 11 AD 85 11 CD 86 11 26
0D21:D0 EE AE 81 11 E8 BD 1D 12
0D29:11 F0 03 4C 28 0C A2 00 E3
0D31:A5 45 85 FB A5 46 85 FC 2E
0D39:8E 84 11 4C 28 0C 20 E9 3E
0D41:0C 20 F7 0E 20 D8 08 4C 0A
0D49:14 0C 20 E9 0C 4C E6 08 7A
0D51:05 0D 14 88 85 1D D0 0D 04
0D59:F5 0C 3E 0D 4A D0 D0 0C 3E
0D61:20 F7 0E 4C 8A 0D A9 10 FB
0D69:A0 65 20 F5 08 AD B2 10 FC
0D71:F0 08 20 1F 09 AC B3 10 6E
0D79:D0 03 4C E6 08 B9 FF 01 DC
0D81:20 57 0B 99 3B 03 88 D0 44
0D89:F4 A5 45 85 FD 85 FB A5 2C
0D91:46 85 FE 85 FC A9 00 8D 84
0D99:8C 11 8D 8D 11 A2 00 A0 7C
0DA1:00 B1 FD DD 3C 03 D0 0A 5F
0DA9:C8 E8 EC B3 10 D0 F2 4C 31
0DB1:E6 08 E6 FD D0 02 E6 FE 59
0DB9:EE 8C 11 D0 03 EE 8D 11 9D
0DC1:AD 8C 11 CD 82 11 D0 D5 A4
0DC9:AD 8D 11 CD 83 11 D0 CD EC
0DD1:A5 46 C5 06 F0 12 AD 82 17
0DD9:11 18 65 45 85 45 A5 46 56
0DE1:6D 83 11 85 46 4C 96 0D AB
0DE9:A5 FB 85 45 A5 FC 85 46 4D
0DF1:A9 10 A0 6B 4C F5 08 A5 9F
0DF9:45 85 FD A5 46 85 FE AD 26
0E01:B2 10 D0 03 4C E6 08 AD 80
0E09:B4 10 18 69 28 85 FB AD 1A
0E11:B5 10 69 00 85 FC A9 00 AC
0E19:8D 85 11 8D 81 11 8D 84 48
0E21:11 20 BD FF A9 01 A2 04 20
0E29:A0 07 20 BA FF 20 C0 FF 09
0E31:A2 01 20 C9 FF AE 81 11 4E
0E39:BD 1D 11 8D 86 11 D0 03 93
0E41:4C C9 0E AC 84 11 B1 FB 4A
0E49:30 2A 20 65 0B 20 D2 FF E0
0E51:EE 84 11 AD 84 11 C9 28 27
0E59:D0 E9 A9 D0 20 D2 FF A9 54
0E61:00 8D 84 11 A5 FB 18 69 39
0E69:28 85 FB A5 FC 69 00 85 E7
0E71:FC 4C 44 0E AC 85 11 B1 D7
0E79:FD 10 02 A9 20 20 65 0B CA
0E81:20 D2 FF EE 84 11 AD 84 99
0E89:11 C9 28 D0 17 A9 0D 20 4C
0E91:D2 FF A9 00 8D 84 11 A5 92
0E99:FB 18 69 28 85 FB A5 FC CD
0EA1:69 00 85 FC EE 85 11 AD 50
0EA9:85 11 CD 86 11 D0 94 A5 89
0EB1:FD 18 6D 86 11 85 FD A5 29
0EB9:FE 69 00 85 FE EE 81 11 CF
0EC1:A9 00 8D 85 11 4C 36 0E F0
0EC9:A9 0D 20 D2 FF 20 D2 FF 55
0ED1:20 CC FF A9 01 20 C3 FF DB
0ED9:60 A5 45 C5 03 D0 07 A5 A3
0EE1:46 C5 04 D0 01 60 A5 45 3A
0EE9:38 ED 82 11 85 45 A5 46 D1

```

```

0EF1:ED 83 11 85 46 60 A0 00 55
0EF9:B1 45 30 17 A5 46 C5 06 8F
0F01:B0 11 A5 45 18 6D 82 11 51
0F09:85 45 A5 46 6D 83 11 85 75
0F11:46 18 60 38 60 A5 03 85 0D
0F19:45 A5 04 85 46 20 F7 0E CC
0F21:20 DA 0E 20 F8 0D 20 F7 FD
0F29:0E 20 F7 0E 90 F2 60 A9 F0
0F31:10 A0 59 20 F5 08 20 1F DB
0F39:09 AD B3 10 D0 03 4C E6 D0
0F41:08 20 F7 0E 90 FB A9 02 15
0F49:A2 08 A0 01 20 BA FF A2 6D
0F51:00 A0 02 AD B3 10 20 BD 8E
0F59:FF A9 10 85 FE A9 B2 85 C5
0F61:FD A9 FD A6 45 A4 46 20 7C
0F69:D8 FF B0 3D A9 10 A0 4F FB
0F71:4C F5 08 A9 10 A0 5F 20 B0
0F79:F5 08 20 1F 09 AD B3 10 01
0F81:D0 03 4C E6 08 20 DA 09 40
0F89:A9 02 A2 08 A0 01 20 BA D5
0F91:FF A2 00 A0 02 AD B3 10 A0
0F99:20 BD FF A9 00 A2 B2 A0 62
0FA1:10 20 D5 FF B0 03 4C 6D 22
0FA9:0F A9 13 20 D2 FF A9 12 1A
0FB1:20 D2 FF A0 27 A9 A0 99 59
0FB9:00 04 88 10 FA A9 0F A8 30
0FC1:A2 08 20 BA FF A9 00 20 A9
0FC9:BD FF 20 C0 FF A2 0F 20 9F
0FD1:C6 FF 20 E4 FF C9 0D F0 D7
0FD9:06 20 D2 FF 4C D3 0F 20 4D
0FE1:CC FF A9 0F 20 C3 FF 60 FC
0FE9:C3 CC C5 C1 D2 3A 20 C1 73
0FF1:52 45 20 59 4F 55 20 53 87
0FF9:55 52 45 3F 00 CD 49 4E 0C
1001:49 2D C6 49 4C 45 52 20 BA
1009:3A C1 2C C3 2C C6 2C D0 1E
1011:2C D2 2C 46 37 2C 46 38 15
1019:2C C3 CC D2 2C 55 50 2C 8A
1021:44 4F 57 4E 3A 00 C3 D2 33
1029:C5 C1 D4 C5 3A 20 C5 4E BF
1031:54 45 52 20 52 45 43 4F 96
1039:52 44 20 46 4F 52 4D 41 9B
1041:54 2C 20 46 31 20 54 4F 01
1049:20 45 58 49 54 00 CE 4F F9
1051:20 C5 52 52 4F 52 53 00 CC
1059:D3 41 56 45 3A 00 CC 4F 8D
1061:41 44 3A 00 C6 49 4E 44 B6
1069:3A 00 CE 4F 54 20 C6 4F 75
1071:55 4E 44 00 C1 C4 C4 20 23
1079:D2 45 43 4F 52 44 00 28 7D
1081:50 78 A0 C8 F0 18 40 68 59
1089:90 B8 E0 08 30 58 80 A8 49
1091:D0 F8 20 48 70 98 C0 EA 33
1099:04 04 04 04 04 04 05 05 BC
10A1:05 05 05 05 06 06 06 06 D0
10A9:06 06 06 07 07 07 07 07 E8
10B1:07 00 00 00 00 00 00 00 55

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All
Commodore 64
programs in
this issue
work with the
Commodore 128
in 64 mode.

All programs
listed in
this magazine
are available
on the
GAZETTE Disk.
See elsewhere
in this issue
for details.

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• The description of Dictionary Manager, Program 1 of "SpeedCheck" (December 1985), did not explicitly state that this program creates a blank dictionary disk by *formatting* it. If you type in the program, save it to disk, and then run the program on the same disk, that disk will be formatted and your copy of the program lost.

Those readers who are still using the original *SpeedScript* (January 1984) will have to make a minor change to *SpeedCheck*. After loading the program, enter **POKE 4242, 24**. Then save the modified copy of *SpeedCheck*.

GAZETTE DISK subscribers may have run into a problem with *SpeedCheck*. If you want to make the modifications for *WordPro* or *PaperClip* listed in the article, the MLX program on the disk will not allow you to load the program on the disk. The solution is to modify MLX. Note that this is not a permanent change, it's a temporary fix to allow loading of *SpeedCheck*:

1. Load, but don't run MLX.
2. LIST 845-850 and change the final POKE in 845 to **POKE782,0**. Also, add **POKE781,0: POKE782,192:** to the beginning of line 850.

3. Run MLX and you'll be able to load *SpeedCheck* to make the *Wordpro* or *Paperclip* modifications.

One more note about *SpeedCheck* and the GAZETTE DISK: The program requires its own dictionary disk. You cannot load and run it directly from the menu. A program that copies the dictionary files to a new disk is included on the GAZETTE DISK.

• "Auto File" (November 1985) creates a directory reading program called ".DIR." But the program assumes that .DIR is the first program on a disk and the directory it provides doesn't include the first pro-

gram. This inconvenience can be avoided by moving .DIR to the first place on the directory. Instructions for doing this can be found in the article describing the Auto File program. A quicker solution, however, is to load "Auto File," (do not run), type **POKE 2537,224:POKE 2571, 224** then save the program under a new name. Before running it, you'll have to scratch previously created .DIR files.

• If you turn on your computer, run "Backgammon" (November 1985) and play a game, then turn your computer off and on, load it again, and run it, you'll find that the dice rolls are exactly the same. To fix this, add a line like **1 X = RND (TI/97)** at the beginning of the program. For a more detailed description of why this is necessary, see the "Gazette Feedback" item on page 12, top right corner, of the November issue.

• A typographical error appeared in the article about "Digi-Clock" (November 1985). When you run the program, the screen displays SYS 682 to re-enable the clock after pressing RUN/STOP-RESTORE. But the article lists SYS 628. The program message is correct.

• Reader Richard D. Kyle has discovered a glitch in "Power Poker" (November 1985). If you should score more than 1000 points in a game and it becomes the new high score, the screen display of any further games will be slightly off because the length of the high score will print in the last column, causing a new line to open up and the screen to scroll. Although Power Poker was tested extensively, no member of our staff was able to attain a score of 1000 or higher.

Lines 390-420 determine the length (LEN) of the high score and position it properly on the screen.

You could modify this routine to allow for scores above 1000, or simply subtract one from each SPC() function in lines 390-420. This problem does not affect the playability of the game and you needn't make these modifications unless you anticipate scoring over 1000.

DISKS 69c



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Better By Design

PROMAL was designed from "scratch" for optimum performance and ease of use on microcomputers. It has a simplified syntax with no awkward terminators

like ";", "or" and indentation is part of the syntax, so structuring your code is natural and easy. Just compare PROMAL with BASIC in this example:

Equivalent Program Segments

PROMAL	BASIC
REPEAT	11910 REM
PROMPT AT 5.24, "Add Chg Quit?"	11920 CL=5LN-24:PR= "Add Chg Quit?"
IF Reply = "A"	11925 GOSUB 9490 REM GET REPLY
ADD Item	11930 IF RPS<>"A" THEN 11950
New Items = New Items + 1	11940 R=IT:GOSUB 10100 REM ADD
ELSE IF Reply = "C"	11945 NI=NI+1:GOTO 11920
CHANGE Item	11950 IF RPS<>"C" THEN 11970
UNTIL Reply = "Q"	11960 R=IT:GOSUB 6050 REM CHG
	11970 IF RPS<>"Q" THEN 11920

PROMAL is readable and understandable. You see the logic from the structure. And PROMAL lets you call procedures by name—so no more GOSUBs. But there's more.

Slick Editor

Editing your source is a snap with the specially-designed and integrated **full-screen Editor**—it not only helps you structure your program, it **even finds compilation errors**—automatically.

Quick Compiler

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PROMAL blows away Apple II and C64 languages from BASIC and PASCAL to FORTH. (Send \$3 for a copy of our full benchmark report.) It's **2000% faster than BASIC.** And on a normal IBM PC, the native 8088 code from PROMAL beat Turbo Pascal 3.0 by 10% on the standard sieve benchmark!

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Ridgeway, New York

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E. C. R.
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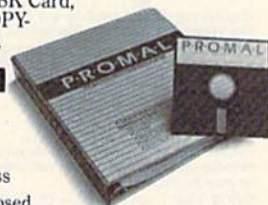
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PROMAL 2.0 FEATURES

COMPILED LANGUAGE

- Structured indentation syntax
- No line numbers or terminators
- Long variable names (31 characters)
- Global, Local, & Argument variables
- Byte, Word, Integer & Real data types
- Decimal or Hex number types
- Functions & Procedures with passed arguments
- Predefined DATA of any type
- Multi-Dimensional Arrays (any type)
- Strings & pointers
- Control Statements: IF-ELSE, WHILE, FOR, CHOOSE, REPEAT-UNTIL, BREAK, NEXT, INCLUDE, ESCAPE, REFUGE
- Bit-operators, shifts, type casts
- Variables at any memory location
- Simple Machine Language interface
- Recursion supported
- Program chaining and overlays (IMPORT/EXPORT)
- Separate compilation of modules
- Load and run relocatable M/L programs
- Compile errors trapped for Editor

EXECUTIVE (APPLE II & C64 Only)

- Command driven, with line editing
- Multiple user programs in memory at once
- Function key definitions
- Program abort and pause
- Prior command recall
- I/O Re-direction & batch jobs
- "DOS"-like commands: COPY, RENAME, DELETE, display FILES, TYPE, HELP, etc.
- Memory MAP, SET, and display commands

EDITOR

- Full-screen, cursor driven
- Function key controlled
- Line insert, delete, search
- String search and replace
- Block copy, move, delete & file read/write operations
- Auto indent, undent support

LIBRARY

- 50 Resident Machine-language commands
- Call by name with arguments
- String handling (9 routines)
- Re-directable I/O (STDIN & STDOUT)
- Formatted numeric output
- Decimal & Hexadecimal I/O
- Block fill/move/read/write
- Cursor control & line editing
- Data type conversion
- Random number function
- Real function support (in PROMAL): ABS, ATAN, COS, EXP, LOG, LOG10, POWER, SIN, SQRT, TAN
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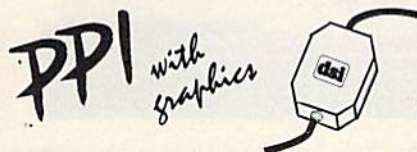
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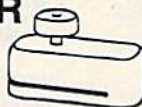
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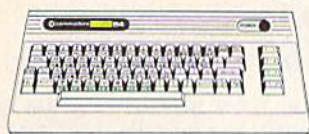
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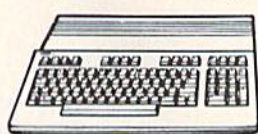
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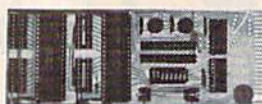
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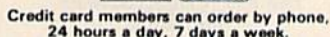
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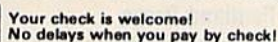
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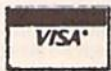
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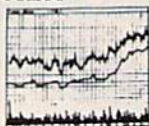


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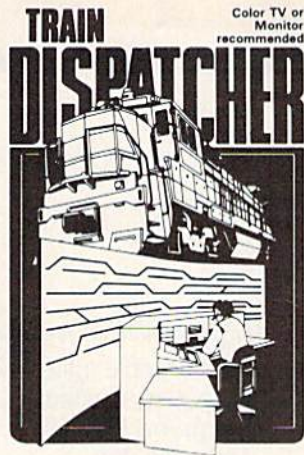
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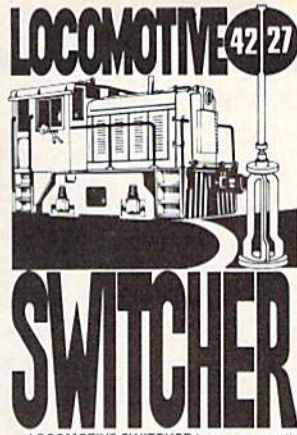
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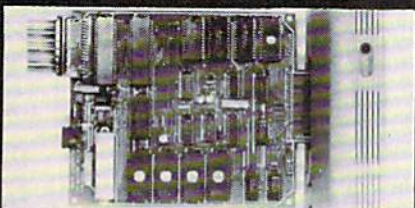


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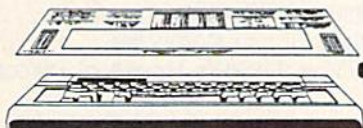
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