HERE, THERE and EVERYWHERE

Users of the Aim 65 are continuing to snowball support. One area is Rockwell’s soon to be released newsletter for the Aim 65. The newsletter will cost only $5.00 and provide low cost support. Target will continue as an independent newsletter so Aim users should really be happy. In addition a new magazine is being formed to support Single Board Computers based on the 6502. The first issue of Compute II will be available shortly.

Hudson Digital Electronics and RNB Enterprises have announced floppy disk interfaces for the Aim. RNB is 8 inch while HDE may be either 8 or 5½ inch. Cyberdyne has cassette software (see this issue). Hopefully this is just the tip of the iceberg to come.

Scitronics Inc and Connecticut Micro-Computer have or will have, shortly controllers that interface with the AC control modules sold by Radio Shack, etc. These controllers and the remote modules combined with your computer allow remote operation of lights, appliances or whatever is connected to normal house wiring.

No discrete wiring is required between the computer and the remote location. All communication is over the house wiring. Even if you move the remote module it will still respond in its new location. One remote module (lamp) will turn a light off or on and may be used to control the brightness. Since these modules require a minimum of wiring a user can eliminate costly house rewiring and if you move they can go with you. This idea of remote control is not new but to have the remotes available through Radio Shack or Sears is.

GRAPEVINE

The grapevine has some changes to zero page usage in Basic. Ø6= A delimit character, Ø7=another delimiting char, Ø8=a general counter, Ø9=for determining sign of tangent, 11=position of terminal carriage, 96=pointer used in function selection, 98=pointer to a string descriptor.

Pyramid Data Systems has a cassette based operating system in the works.

Thanks grapevine!!

Ron Riley has labels for Short Cut so if you would like to have a set, send a business size SASE and $1.00 to Ron.

Have you had any problems with your Aim that you were able to fix? Why not share your answers with the rest of us! Along the same lines, would you like to be a Good Guy and offer your services to others? Just send your name and your field of expertise and we’ll put out the word.

SOFTWARE

<table>
<thead>
<tr>
<th>SOFTWARE</th>
<th>Auto Number</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOFTWARE</td>
<td>Slow Display</td>
<td>3</td>
</tr>
<tr>
<td>SOFTWARE</td>
<td>Assembler</td>
<td>6</td>
</tr>
<tr>
<td>SOFTWARE</td>
<td>Scan</td>
<td>7</td>
</tr>
<tr>
<td>SOFTWARE</td>
<td>Lunar Lander</td>
<td>9</td>
</tr>
<tr>
<td>HARDWARE</td>
<td>Kim-4</td>
<td>6</td>
</tr>
<tr>
<td>HARDWARE</td>
<td>Invisible Bugs</td>
<td>8</td>
</tr>
<tr>
<td>PRODUCTS</td>
<td>6502 Books</td>
<td>5</td>
</tr>
</tbody>
</table>
Short Cut—AUTO O Number

Steve Sliber
5815 Southminster
Houston, TX 77035

This modified version of Don Clem's original Short Cut program provides for automatic line numbering in addition to automatic typing of the longer Basic statements. The first table at $10D0 to $1EDF is the ASCII strings for the various Basic statements. The main difference is the addition of a five byte line number string at M1 ($1E60) following the carriage return.

Table two at $1E5E to $1F77 is just the vectors to table one, in order to be indexed by the ASCII control codes $01-$1B.

The main program at $1E70 to $1EFC operates in a manner essentially identical to the original program. The only significant difference is that after a control Z a second character is input and decoded. Control O toggles the auto-line number on/off, control R resets the line number and increment, and on my system control L is echoed to provide a form feed to the line printer. Any other input results in a control Z being sent back to clear the user input function. Additional code could be added here to provide additional functions that may be desired to customize the system further.

At $1E00 to $1F17 is the toggle routine. The autonumber function is disabled at two points: a zero is stored at M1 to inhibit the printing of line numbers, and the ONPLG is reset to inhibit incrementing line numbers.

The reset routine at $1F18 to $1F7F uses the GET routine at $1F51 to input a new starting line number and increment. Up to five ASCII characters may be input and right justified. No testing is done to verify the legality of the input. A space or carriage return will terminate the input and cause the input data to be right justified.

Copyright 1980 Donald Clem Jr.

6502 Assembly Language Programming by Lance A. Leventhal from Osborne/McGraw-Hill. $12.50 plus $1.00 handling (non-US or CAN-$4.00) C/O Donald Clem

THE TARGET MAR/APR 1980
SLOW

Steve Dresson
1302 Strawberry Lane
Hanover, MD 21076

This program slows down the rate at which characters are displayed on the Am-65 display. This is done through the display link vector. It is changed so that a new subroutine is executed each time a character is output to the display.

This subroutine produces a delay before jumping to $6F05, which is the default value in DILINK. This subroutine uses the T1 timer in the user VIA. It does not affect the printer operation, and is not itself affected by a reset.

The F1 key is used to change the DILINK so that "SLOW is used. F2 changes it back to the default value.

The subroutines are located at $0000-002F. To see it in action, load it. Then disassemble memory from $F000. Goss sort of fast, right? Now hit F1 and again disassemble memory. The change is noticeable. The amount of delay is determined by the data loaded at $06 and $0B.

This may look trivial at first, but wait till you are trying to trace a long program that doesn't work, and you don't want to use the printer to slow the display down.

Note: Lest you find that I am wasteful, because the VIA is set up each time through, try moving the setup portion over to the F1 subroutine, so that it is only set up once. Put a load $A004 to clear the interrupt each time through. Works fine! Now hit reset.

MARCH/APRIL 1980 THE TARQON
MAIN PROGRAM

;***EDIT INPUT
;07 TXA
;05 PHA
;02 DEX
;05 BCS GET
;08 PLA
;06 PSL
;05 INI; initialization
;06 TXA
;08 RTS
;
;FIRST TEST IF DONE WITH LAST INPUT
;0E EFS GET
;00001 FDA NEXT
;0E C BEG IN
;0C 01 FDV LSLV
;01 D IN
;0E EFS OUT
;00 D IN
;01 E50D LDA A1, V

00081F STA NEXT
08 DEV
0C 01FSTV HSLV
0905FD LDA A1, V
0E EFS OUT
01 ACF1 STA HSLDA
08 PLA
08 TXA
01 ACF1 LDA HSLDA
00 SEC
06 RTS
;
;INPUT NEW DATA
;0E EFS IN
;0D 01E1 LDA ENFLG
;0C 01F9 AND ONFLG
;00 01FD CMP #000
;00 D01 RNE INI
;
;EFLD ENFLG (ENFLG) AND ON FLAG (ONFLG) ARE SET, THEN
;I NCREMENT LINE NUMBER
;A900 LDA #0
;000E1F STA ENFLG
;JRESET PLLG
;A804 LDDY #0
;01 E01 RCL
;00 E02B ADDLP
;09051F LDA INCR. V
;090D1E RDC M1, V
;C5A CMP #03A
;00 01F2B BCC SKIP
;E9A BNE #10
;0E EFS SKIP
;090E1E STA M1, V
;08 DEV
;10F7 BPL ADDLP
;A9 001F STA HSLV
;0000 LDA #0
;20001F JSR MPRINT
;20011F JSR GET2
;0F04 LDIV #4
;0E 01F2S MOULP
;09051F LDA M1, V
;990E1E STA M1, V
;08 DEV
;10F7 BPL MOULP
;A900 LDA #0
;20001F JSR MPRINT
;20011F JSR GET2
;0F04 LDIV #4
;0E 01F3S DECP
;32 SEC
;09051F LDA INCR. V
;00 01FD CMP #000
;09051F STA INCR. V

--------------------------------------------------------------------------------

Time to Renew- The mailing label contains the last issue that you will receive. If no date appears you have at least two issues left. This is the only method that is used to determine if your subscription is running out.

The Target- An Aim 65 newsletter is published bimonthly with an annual subscription rate of $5.00 in the US and CAN. $12.00 elsewhere (US Funds). First Class and Air Mail respectively. Contact Donald Clem RR#2 Spencerville, OH 45887.
6502 BOOKS

If you are in need of a book on programming the 6502 here is a partial listing.

6502 Assembly Language Programming
Osborne/McGraw-Hill $12.50

6502 Games
Sybex $12.95

6502 Programming and Interfacing the, Sam's $13.95

6502 Software Design
Sam's $10.50

6502 Programming the, Sybex $12.95

6502 Applications Book
Sybex $12.95

Microprocessor Systems Engineering
Matrix $16.00

6502 Software Cookbook
Scelbi $10.95

Shipping and handling are approximately $1.50 (UPS) for domestic and $4.00 for foreign.

Osborne/McGraw-Hill
630 Bancroft Way
Berkeley, CA 94710

Sybex
2344 Sixth St.
Berkeley, CA 94710

Howard W. Sams & Co, Inc
4300 West 62nd St.
PO Box 7092
Indianapolis, IN 46206

Matrix Publishers, Inc
207 Kenyon Rd.
Champaign, IL 61820

Scelbi Publications
20 Hurlbut St.
Elwood, CT 06110

TARGET
Assembler

Michael R. Corder
Vice President
Compaq Microsystems
224 S.E. 16th Street
Ames, IA 50010

In the Jan/Feb 1980 issue a reader was interested in a comparison of the AIM and ARESCO assemblers. Since our company was indirectly responsible for both these products, I thought I would respond.

We started working with MOS/Technology as a software support group in Jan, 1975 when the 6502 was still a dream. One of the products we produced for them was the software for their MDT 650 development system. This was a very fine, two processor system which never saw widespread acceptance due to financial problems at MOS/Technology which are commonly known. Incidentally, the MDT hardware was produced by COMLOG in Phoenix. The MDT assembler served as the basis for the ARESCO product.

When it became evident that the MDT was going nowhere, we started development of a simpler system. Rockwell then became another source of the 6500 and was looking for a development system. We eventually licensed them to build our system which they sell under the name SYSTEM 65. The SYSTEM 65 features an improved version of the MDT assembler. The SYSTEM 65 software was used as the basis for the AIM.

Users who have had a chance to use both the AIM and SYSTEM 65 will note that they are identical from a command standpoint.

The SYSTEM 65 assembler requires about 5.25K of memory. ROCKWELL took this product and squeezed it into 4K so it would fit into a single ROM. In doing so, they had to reduce its functionality as well as alter its output format to fit the 20 column AIM printer. The other major differences are that most of the .OPT options no longer exist and the sorted symbol table is not printed. Hence, the major difference most users will notice is in the listing format.

To continue our history lesson one step further, our firm took the basic minifloppy disk controller design and software from the SYSTEM 65 and turned it into the DAIM disk system for the AIM. We also took the assembler and turned it into A/65.

A/65 is designed to be loaded from disk into RAM and has all the features of the SYSTEM 65 assembler. Thus it is designed to be used with a terminal and give a full width listing and offers the other features described.

There is one more SYSTEM 65 product which has converted to the AIM that may be of interest to you readers. Our group offers a high level language for the SYSTEM 65 (or FDP-11) that is sold by us as CSL/65 and by ROCKWELL as PL/65. We have developed a subset of this language that will shortly be available from ROCKWELL as two chip ROM set that plugs into the locations occupied by BASIC ($8000 to $CFFF).
An AIM 65 Scanning Subroutine—SCAN by Jim Clark

The AIM 65 has some very useful programs within its Monitor for reading the keyboard. However, this reading process requires your program to stop and wait for you to press a key. You may prefer to just "scan" the keyboard. The scanning process checks to see if a key is pressed and if it is, then gets the key and responds to it. If, however, no key is pressed, the scanning process is terminated. This scanning process is given in the program below as the SCAN Subroutine. SCAN makes use of the Monitor Subroutine ONEKEY ($ED05). ONEKEY checks for a key depression. If a key is depressed, the Y Register will return with the row value (1-8). If no key was depressed, the Y Register will contain a 0. Upon returning from ONEKEY, the Y Register is decremented. If no key was depressed, the contents of the Y Register will be negative and execution will return to the calling program. If a key was depressed, the contents of the Y Register will be a 0 or plus (both considered positive) and the key pressed will be decoded by Monitor Subroutine GETK2 ($ED2C). Actually, the first line in GETK2 is skipped since it is a debounce delay. In the SCAN Subroutine shown in the listings at the right only the A, B, and ESC keys are checked. If A is pressed, pseudo Program A is executed (CRLF); if B was depressed pseudo Program B; and if ESC is pressed the program uses the Q command from the Editor STOP Subroutine ($F870) to neatly return to the Monitor Program. If none of the keys are pressed, execution returns to the calling pro-gran. A sample calling program is included so something interesting is happening while SCAN is looking for a key closure. The calling program (CPRG) outputs the contents of TIMER 1 LOW (A004) as well as going to the SCAN Subroutine. In the example program the only keys that will cause the scanning process to hang up and execute improperly are the PRINT and the LF keys. You may wish to change the keys which are checked by SCAN or expand to additional keys. Both of these changes may be done quite simply and easily by changing or expanding the instructions shown in the program listings. To run the SCAN Program as shown, load the program as shown in the disassembly (K) listing or, if you are using the Assembler ROM, the source listing provided. The SCAN Subroutine begins at $0200; the Calling Program (CPRG) at $0250; and the called Program A at $0227 and Program B at $022B. The F1 Users Key (010C) is used to start the execution of the calling program.

This program is one which I've found very handy in many applications. It can be used in many game programs which require a specific key closure as a player response to some portion of the game. Its applications in the many industrial uses of the AIM 65 are too numerous to mention. I hope that you find many uses for it and that it will save you programming time and solve some problems for you. I would appreciate hearing some of the uses which you may find for it.
A perfect software package is there; data stored in memory changes quite unexpectedly; one bit of a memory, buffer, or select chip quits working. Hours are spent trying to determine why. All of these problems and more can many times be traced back to high voltage "glitches" being passed thru our power supplies. There are usually many other devices attached to the same power line as our power supply. Many of these can and do produce high voltage "spikes" which are not fully filtered out by our power supply circuits. This is especially true of the hobbyist or non-industrial power supplies to which most of the AIM's I've seen are attached. After experiencing a costly bout of 2114 RAM failures I decided to solve this problem. Using a high speed oscilloscope to watch these "transients" zip right thru my supplies, I applied some new solid state "bug traps" and got rid of them once and for forever. The solution was easy and inexpensive. You will need to get a GE-MOV Varistor, Model V130LA10, from your local General Electric components dealer, for each power supply. This two lead device, which looks like a large red disc capacitor, should be soldered directly across the 110 volt power input line where it enters your power supply right inside the case. If you are using 220 volt power (overseas) use a model V250LA20. At this same point should be connected in parallel, a 0.001 mfd. 1500 volt disc ceramic capacitor. If your supply has a fuse in the input circuit, then the above connections could be made so that the fuse would blow if the Varistor should short circuit. The next step involves a tiny but very potent "glitch eater." One of these devices, in parallel with a 0.001 mfd. 1000 volt disc ceramic cap., should be soldered directly across the output leads of each of the low voltage supplies. This device is polarized so you must be careful to insert it into the circuit properly. The end of the device with a band of color around it should be connected to the positive terminal. These devices are made by UNITRODE Corp. of Watertown, Mass. (580 Pleasant Ave.) 02172. For the 5 volt supply you should use a Type UZS306 and for the 24 volt supply a Type UZS330, if your 24 volt supply is regulated, and a Type UZS336, if it is not regulated. If you are using Dynamic memories or A/Dor D/A converters which use ±12 or ±15 volts, use type UZS314 on the 2 volt supplies and UZS318 on the 15 volt supplies. These devices present a near infinite impedance until thier breakdown voltage (last two digits of type number) is exceeded. When this voltage is exceeded, they change, in one pico second, to a nearly dead short. When the voltage returns to normal, they revert to their prior state.
Lunar Lander

1 REM V1E.7.18.79.S
2 REM REAL TIME LUN
AR LANDER!
3 REM BY STEVE BRES
SON AND BILL SEMANCI
K
5 REM LUNAR LANDER
7 PRINT"YOUR RATING"
="; INPUT RATE
8 C1=150-10*RAT
E
9 FUDGE=40
10 CF=20;CF="G"
11 FUDGE=FUDGE-2*RA
TE
12 RATE=1
13 GOTO 100
20 PRINT"#"; INPUT $;
RETURN
24 GOSUB 25
25 GOSUB 30
30 FOR S=0 TO FUDGE:
21=INT(.1);NEXTX;R
30 RETURN
40 FUDGE=2*FUDGE: G
SUB 30
41 FUDGE=FUDGE/2;RE
TURN
98 REM START PG
100 PRINT"LUNAR LAN
DER";GOSUB 25
110 PRINT"YOU ARE A
N MANUAL";GOSUB 25
130 LET ALT=120:VEL
=3600:*NC=32500:MF=16
500
140 LET FS=3600*360
0/5280:G=5*FS
141 REM ALT: MI,VEL:
MPH; TIME: SEC; ACC: XI/
HE**2
150 C2=3600/5280; T
=0
151 PRINT"YOUR CONT
ROLS"; GOSUB 25
152 PRINT"THRUST: 1-
0=20--200;"; GOSUB 24
153 PRINT"NO KEY = O
THRUST"; GOSUB 25
154 PRINT"YOUR HEAD
OUT!"; GOSUB 25
155 PRINT"ALT SPE
ED FUEL"; GOSUB 25

156 REM START TIMER
157 POKE 4097; 224: POKE 40964; 224: POKE 40965; 1
158 POKE 40968, 255: POKE 40969, 255: TT=6
5535
159 REM PRINT STATU
S
160 AA=10: IF ALT<10
0 THEN AA=100: IF ALT <10 THEN AA=1000
161 A$=STR$(INT(ALT
*AA)/AA)
162 IF LEN(A$)<6 TH
EN A$=A$+" ; GOTO 16
2
165 C$=STR$(INT(VEL
)/10): D$=STR$(MF)
170 PRINT C$; A$; 
174 PRINTSPC(6-LEN(
C$);C$); D$;
180 PRINTSPC(6-LEN( 
D$); D$);
200 GOSUB 800
240 LET T=TI
250 IF MF<0 GOTO 5
00
260 IF TC=.01 GOTO 1
60
270 LET S=T
280 IF S>BUCK=MF G0
T 0 300
290 S=MF/B
300 REM DO CALCUL
310 THRUST=01*BU==F1
=INT(MF*BU*S)
320 IF BU>.001 GOTO 340
340
330 AT=0; AG=0: GOTO
360
340 AT=LOG((MF+NC)/( 
NC+F1))
350 AT=AT+TH: AG=FS
AT/ST
360 MF=F1
370 VX=VEL+G-AG*5
/3600
380 ALT=ALT-(VEL+VX
)^2/7200
390 VEL=VX
400 T=T-S
410 TT=TT+S
420 IF ALT<.001 G0
T 0 550
430 IF MF>0 GOTO 16
0
500 REM OUT OF FUEL
1
510 PRINT" FUEL OUT
AT:"; INT(TT)
520 LET S=(-VEL+G/2)*ALT*G)/G
530 LET VEL=VEL+G*S
540 S=S*3600: TT=TT+S
550 PRINT" ON MOON
AT:"; INT(TT);"SEC"
570 PRINT" IMPACT V
EL:"; INT(VEL)
580 PRINT" FUEL LEFT
AT:"; INT(MF)
590 IF VEL<5 THEN PRINT
"! GOD LANDING!"; G
10700
600 IF VEL<15 THEN PR
INT!"SO-DO LANDING"
: GOTO 700
610 IF VX<10 THEN PID
INT!"POOR LANDING"
: GOTO 700
659 IF VX<5 THEN PRINT
"CRAFT DAMAGED!"
: GOTO 700
610 IF VX<10 THEN PR
INT!"LICENSE REVOKED
!"; GOTO 700
630 PRINT"SORRY, NO
SURVIVORS!"
640 PRINT!INT(3*VEL
);"FT CRATER"
700 PRINT" PLAY AGA
IN? (Y/N): "
710 INPUT $; IF $="Y"
=LEFTS($;1) THEN RUN
""N"
720 PRINT"--CONTROL
OUT="; GOSUB 40
730 END
800 REM CALC TIME F
ROM TIMER
810 T3=PEEK(40961):
T4=PEEK(40968); TN=4
+265*T3
820 TT=TT+IF TI<
0 THEN TI=65536
830 TI=TI/1000: TT=T

832 TI=TI*RATE
840 H$=CHR$(0)
845 GET I$: IF I$="O"
GOTO 860
846 IF I$="E" AND I$="G"
GOTO 870
848 IF I$="I"
THEN RA=RA-1; PRINT"RATE="
1RA=GOSUB 30
849 IF I$="U" THEN R
A=RA+1; PRINT"RATE=";
RA=GOSUB 30
850 IF I$="S" THEN T
HENCF$=3: CF="S"
851 IF I$="F" THENCF
=10: CF="F"
852 IF I$="C" THEN
CF=20; CF="C"
853 IF I$="V" THENCF
=5: CF="V"
860 BU=0: GOTO 895
870 BU=ASC(I$)-48: I
890 BU=BU*CF
895 POKE 42111, 254
900 RETURN

?!

SAMPLE GAME WITH
THE PRINTER ON

RUN
YOUR RATING=? 4
LUNAR LANDER
YOU ARE ON MANUAL
YOUR CONTROLS:
THRUST: 1-0=20--200;
NO KEY = 0 THRUST
YOUR HEADOUT:
ALT SPEED FUEL
C 120 3600 16500
C 119 3602 16500
C 118 5 3605 16500
BREAK IN 180

ENOUGH OF THAT!
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</thead>
<tbody>
<tr>
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<td>59¢ea</td>
<td>49¢ea</td>
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<td>68¢ea</td>
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SPENCERVILLE, OHIO 45887

MAR/ APR 1980