```
PC      =%000007     R0      =%000000     R1      =%000001
R2      =%000002     R3      =%000003     R4      =%000004
R5      =%000005     R6      =%000006     R7      =%000007
SINCOS    000000RG   SINTBL    000174R    SIN01     000002R
SIN02     000014R    SIN03     000030R    SIN04     000046R
SIN05     000062R    SIN06     000076R    SIN07     000106R
SIN08     000122R    SIN09     000136R    SIN10     000152R
SIN11     000166R    SP      =%000006            = 000462R


END ?
```

```
; ***************************************************************
;
;                 BLITZKRIEG SINE COSINE ROUTINE
;
;                           VERSION 1G
;
;              BY L. M. BRYANT AND B. SEILER 1974
;                         AUG 19,1974
;          R0=ANGLE TO BE CONVERTED(NORMALIZED BY PROGRAM)
;          R1=USED AS A FLAG
;          R4=COSINE
;          R5=SINE
;
;
;
```

```
        000000              R0=0%
        000001              R1=1%
        000002              R2=2%
        000003              R3=3%
        000004              R4=4%
        000005              R5=5%
        000006              R6=6%
        000007              R7=7%
        000006              SP=R6
        000007              PC=R7
                            .TITLE   SINCOS
                            .GLOBL   SINCOS
        000000              .CSECT
000000 005001 SINCOS:  CLR     R1                      ;CLR FLG REGISTER
000002 005700 SIN01:   TST     R0                      ;TEST IF ANGLE<0
000004 002003          BGE     SIN02                   ;IF NOT JUMP AROUND
000006 062700          ADD     #360.,R0                ;ADD ONE FULL CYCLE
       000550
000012 000773          BR      SIN01                   ;GO TEST AGIN
000014 022700 SIN02:   CMP     #360.,R0                ;SEE IF > ONE CYCLE
       000550
000020 002003          BGE     SIN03                   ;AINT THEN AVOID
000022 162700          SUB     #360.,R0                ;SUBTRACT A CYCLE
       000550
000026 000772          BR      SIN02                   ;TRY AGAIN
000030 010046 SIN03:   MOV     R0,-(SP)                ;SAVE NORMALED ANGLE
000032 022700          CMP     #180.,R0                ;IS ANGLE > PIE?
       000264
000036 002003          BGE     SIN04                   ;NO, SKIP IT
000040 005201          INC     R1                      ;SET NEGATIVE FLG
000042 162700          SUB     #180.,R0                ;MAKE ANGL < PIE
       000264
000046 022700 SIN04:   CMP     #90.,R0                 ;CHECK FOR FIRST QUAD
```

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                  000132
000052 002003            BGE      SIN05              ;IT'S OK - SKIP
000054 005400            NEG      R0                 ;MAKE ANGLE NEG
000056 062700            ADD      #180.,R0           ;INVERT ANGLE 2ND QUAD
                  000264
000062 006300 SIN05:     ASL      R0                 ;MAKE WORD POINTER
000064 016005'           MOV      SINTBL(R0),R5      ;GRAB SINE
                  000174


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000070 005701            TST      R1                 ;LOOK AT NEG FLG
000072 003401            BLE      SIN06              ;POS. SINE - SKIP
000074 005405            NEG      R5                 ;MAKE VALUE NEG
000076 005001 SIN06:     CLR      R1                 ;CLEAR NEG FLG
000100 011600            MOV      (SP),R0            ;GRAB ANGLE AGAIN
000102 062700            ADD      #90.,R0            ;ADD 90 DEG. FOR COS
                  000132
000106 022700 SIN07:     CMP      #360.,R0           ;ONE CYCLE ONLY!
                  000550
000112 002003            BGE      SIN08              ;IT'S OK YOUR OK
000114 162700            SUB      #360.,R0           ;TOO BIG CHOP DOWN
                  000550
000120 000772            BR       SIN07              ;TRY AGAIN
000122 022700 SIN08:     CMP      #180.,R0           ;NEGATIVE QUADRANT?
                  000264
000126 002003            BGE      SIN09              ;NO GO AWAY
000130 005201            INC      R1                 ;YES,MARK IT
000132 162700            SUB      #180.,R0           ;MAKE IT SMALLER
                  000264
000136 022700 SIN09:     CMP      #90.,R0            ;IS IT UNDER 90?
                  000132
000142 002003            BGE      SIN10              ;YES,GO AROUND
000144 005400            NEG      R0                 ;SET FOR FLIP FLOP
000146 062700            ADD      #180.,R0           ;FLIP ANGLE
                  000264
000152 006300 SIN10:     ASL      R0                 ;SET FOR WORD POINTER
000154 016004'           MOV      SINTBL(R0),R4      ;GRAB COSINE
                  000174
000160 005701            TST      R1                 ;TEST FOR NEG COS
000162 003401            BLE      SIN11              ;IT'S OK , GET
000164 005404            NEG      R4                 ;MAKE COSINE NEGATIVE
000166 005001 SIN11:     CLR      R1                 ;CLEAR FLAG
000170 012600            MOV      (SP)+,R0           ;REPLACE NORMALIZED ANGL
000172 000207            RTS      PC
000174 000000 SINTBL:    .WORD    00000.,00571.,01143.,01714.,02285.,02855.,03425.
000176 001073
000200 002167
000202 003262
000204 004355
000206 005447
000210 006541
000212 007631            .WORD    03993.,04560.,05125.,05689.,06252.,06812.,07370.
000214 010720
000216 012005
000220 013071
000222 014154
000224 015234
000226 016312
000230 017367            .WORD    07927.,08480.,09031.,09580.,10125.,10667.,11206.
000232 020440
000234 021507
000236 022554
000240 023615
000242 024653
000244 025706
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000246 026736          . WORD    11742.,12274.,12803.,13327.,13847.,14364.,14875.

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000250 027762
000252 031003
000254 032017
000256 033027
000260 034034
000262 035033
000264 036027          . WORD    15383.,15885.,16383.,16876.,17363.,17846.,18323.
000266 037015
000270 037777
000272 040754
000274 041723
000276 042666
000300 043623
000302 044552          WORD      18794.,19259.,19719.,20173.,20620.,21062.,21497.
000304 045473
000306 046407
000310 047315
000312 050214
000314 051106
000316 051771
000320 052645          . WORD    21925.,22347.,22761.,23169.,23570.,23964.,24350.
000322 053513
000324 054351
000326 055201
000330 056022
000332 056634
000334 057436
000336 060231          WORD      24729.,25100.,25464.,25820.,26168.,26509.,26841.
000340 061014
000342 061570
000344 062334
000346 063070
000350 063615
000352 064331
000354 065035          . WORD    27165.,27480.,27787.,28086.,28377.,28658.,28931.
000356 065530
000360 066213
000362 066666
000364 067331
000366 067762
000370 070403
000372 071013          WORD      29195.,29450.,29696.,29934.,30162.,30381.,30590.
000374 071412
000376 072000
000400 072356
000402 072722
000404 073255
000406 073576
000410 074106          . WORD    30790.,30981.,31163.,31335.,31497.,31650.,31793.
000412 074405
000414 074673
000416 075147
000420 075411
000422 075642
000424 076061
000426 076267          WORD      31927.,32050.,32164.,32269.,32363.,32448.,32522.

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000430 076462
000432 076644
000434 077015
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000438 077153
000440 077300
000442 077412
000444 077513          WORD    32587 ,32642 ,32687 ,32722 ,32747 ,32762 ,32767
000446 077602
000450 077657
000452 077722
000454 077753
000456 077772
000460 077777
       000001          . END

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000000 ERRORS


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*S H

*B H

*L T

*T T
```