```
ADBR    = ****** G       ADCS    = ****** G       ANGH1   = ****** G
ANGL1   = ****** G       ANGMID  = ****** G       FIRE    = ****** G
FLAG1   = ****** G       MULPLY  = ****** G       PC      =%000007
PTNUM   = ****** G       RKTSIZ  = ****** G       R0      =%000000
R1      =%000001         R2      =%000002         R3      =%000003
R4      =%000004         R5      =%000005         R6      =%000006
R7      =%000007         SHOTS1  = ****** G       SINCOS  = ****** G
SP      =%000006         TSPEED  = ****** G       UPDAT1    000000RG
UPD11     000176R        UPD115    000204R        UPD117    000210R
UPD12     000226R        UPD13     000232R        UPD14     000314R
UPD15     000340R        XDISP1  = ****** G       XSIZE1  = ****** G
XVELH1  = ****** G       XVELL1  = ****** G       YDISP1  = ****** G
YSIZE1  = ****** G       YVELH1  = ****** G       YVELL1  = ****** G
.       = 000356R

END ?
                ;*************************************************************
                ;
                ;               SUBROUTINE UPDAT1
                ;
                ;               VERSION         3B
                ;               BILL SEILER
                ;               AUG. 24,1974
                ;       UPDATES RKT1 AND FIRES ITS TORPEDOES
                ;       ENTER THE ROUTINE WITH R2 A POINTER AT YSIZE
                ;       AND #401 PUSHED INTO THE ADCS
                ;       R0=MULTIPLIER (NOT DESTROYED)
                ;       R2=POINTER AT RKT DATA
                ;       R3=LOW WORD RESULT OF MULPLY
                ;       R4=HIGH WORD RESULT OF MULPLY AND MULTIPLICAN(DESTROYED)
                ;       R5=SINE OF ANGLE IN SINCOS RETURN
                ;
        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  UPDAT1
                        .GLOBL  UPDAT1,MULPLY,SINCOS,PTNUM,ANGH1,ANGL1
                        .GLOBL  XDISP1,YDISP1,XVELL1,YVELL1,XVELH1,YVELH1
                        .GLOBL  XSIZE1,YSIZE1,FLAG1,FIRE,TSPEED,RKTSIZ
                        .GLOBL  ANGMID,SHOTS1,ADCS,ADBR
        000000          .CSECT
000000  016700'000000 UPDAT1: MOV      ANGH1,R0        ;GET ANG1
000004  004767'000000          JSR     PC,SINCOS       ;DO A SINCOS
000010  010067'000000          MOV     R0,ANGH1        ;SAVE NORMALIZED ANGH1
000014  012700'000000          MOV     #RKTSIZ,R0      ;SET RKT SIZE
000020  004767'000000          JSR     PC,MULPLY       ;RKTSIZE*COS(ANGH1)
000024  010467'000000          MOV     R4,XSIZE1       ;XSIZE1=RKTSIZE*COS(ANGH1)
000030  010504                  MOV     R5,R4           ;PUT SINE IN FOR MULPLY
000032  004767'000000          JSR     PC,MULPLY       ;RKTSIZE*SIN(ANGH1)
000036  010422                  MOV     R4,(R2)+        ;YSIZE1=RKTSIZE*SIN(ANGH1)
000040  016700'                 MOV     ADBR,R0         ;GET ACC1 FROM ATOD
```

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          000000
000044 012767'          MOV     #1,ADCS         ;START ATOD FOR ANGL1
          000001
          000000
000052 005722           TST     (R2)+           ;DID RKT1 FIRE LAST LOOP?
000054 003050           BGT     UPD11           ;YES-DONT FIRE THIS TIME
000056 022700'          CMP     #FIRE,R0        ;NO-IS RKT1 FIRING NOW?
          000000


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000062 003063           BGT     UPD13           ;NO-UPDATE RKT1 VEL
000064 005367'          DEC     SHOTS1          ;YES-ANY TORPS LEFT?
          000000
000070 003445           BLE     UPD115          ;NO-THEN OUT OF AMMO!
000072 005267'          INC     FLAG1           ;YES-SET THE FLAG AND SHOOT
          000000
000076 012705'          MOV     #PTNUM,R5       ;SET UP PTR AT PTS
          000000
000102 011500           MOV     (R5),R0         ;GET # OF TORPS
000104 005225           INC     (R5)+           ;ADD ONE MORE TO TORP CTR
000106 006300           ASL     R0
000110 006300           ASL     R0
000112 006300           ASL     R0              ;MULT BY 8 TO SKIP PRESENT PTS
000114 060005           ADD     R0,R5           ;MOVE PTR OVER PRESENT PTS
000116 016700'          MOV     TSPEED,R0       ;SET FOR MULPLY
          000000
000122 004767'          JSR     PC,MULPLY       ;TSPEED*YSIZE1
          000000
000126 062203           ADD     (R2)+,R3        ;ADD YVELL1 TO TSPEED*YSIZE1
000130 005504           ADC     R4              ;ADD CARRY
000132 062204           ADD     (R2)+,R4        ;ADD HIGH ORDER WORDS
000134 010425           MOV     R4,(R5)+        ;PUT TORP Y VEL IN ARRAY
000136 012215           MOV     (R2)+,(R5)      ;PUT YDISP1 IN ARRAY
000140 066715'          ADD     YSIZE1,(R5)     ;CALC YNOSE1 IN ARRAY
          000000
000144 060425           ADD     R4,(R5)+        ;UPDATE TORP OUT OF RKT1
000146 012204           MOV     (R2)+,R4        ;SET XSIZE1 FOR MULPLY
000150 004767'          JSR     PC,MULPLY       ;TSPEED*XSIZE1
          000000
000154 062203           ADD     (R2)+,R3        ;ADD LOW ORDER WORDS
000156 005504           ADC     R4              ;ADD CARRY TO HIGH WORD
000160 062204           ADD     (R2)+,R4        ;ADD HIGH ORDER WORDS
000162 010425           MOV     R4,(R5)+        ;PUT TORP XVEL IN ARRAY
000164 012215           MOV     (R2)+,(R5)      ;PUT XDISP1 IN ARRAY
000166 066715'          ADD     XSIZE1,(R5)     ;CALC XNOSE1 IN ARRAY
          000000
000172 060425           ADD     R4,(R5)+        ;UPDATE TORP OUT OF RKT1
000174 000405           BR      UPD117          ;GO UPDAT RKT1 POSITION
000176 022700'UPD11:    CMP     #FIRE,R0        ;RKT1 STILL FIRING?
          000000
000202 003011           BGT     UPD12           ;NO-GO UPDATE VEL OF RKT1
000204 062702 UPD115:   ADD     #14.,R2         ;YES-MOVE PTR TO ANGLES
          000016
000210 066767'UPD117:   ADD     YVELH1,YDISP1   ;THEN UPDATE DISP ONLY
          000000
          000000
000216 066767'          ADD     XVELH1,XDISP1   ;    NOT VEL
          000000
          000000
000224 000433           BR      UPD14           ;GO UPDATE ANGLES
000226 005067'UPD12:    CLR     FLAG1           ;NOT FIRING SO CLEAR FLAG1
          000000
000232 004767'UPD13:    JSR     PC,MULPLY       ;ACC1*YSIZE1(IN R4)
          000000
000236 006204           ASR     R4
```

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000240 006003           ROR     R3

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000242 006204           ASR     R4
000244 006003           ROR     R3
000246 006204           ASR     R4
000250 006003           ROR     R3                  ;SCALE YACC1
000252 060322           ADD     R3,(R2)+            ;YYELL1=YYELL1+ACC1*YSIZE1
000254 005504           ADC     R4                  ;ADD CARRY
000256 060412           ADD     R4,(R2)             ;YYELH1=YYELH1+ACCH1
000260 062222           ADD     (R2)+,(R2)+         ;YDISP1=YDISP1+YYELH1
000262 012204           MOV     (R2)+,R4            ;MOV XSIZE1 IN FOR MULPLY
000264 004767'          JSR     PC,MULPLY           ;ACC1*XSIZE1
       000000
000270 006204           ASR     R4
000272 006003           ROR     R3
000274 006204           ASR     R4
000276 006003           ROR     R3
000300 006204           ASR     R4
000302 006003           ROR     R3                  ;SCALE XACC1
000304 060322           ADD     R3,(R2)+            ;XYELL1=XYELL1+ACC1*XSIZE1
000306 005504           ADC     R4                  ;ADD CARRY
000310 060412           ADD     R4,(R2)             ;XYELH1=XYELH1+XACCH1
000312 062222           ADD     (R2)+,(R2)+         ;XDISP1=XDISP1+XYELH1
000314 016700'UPD14:    MOV     ADBR,R0             ;GET ATOD ANGL1
       000000
000320 012767'          MOV     #1401,ADCS          ;START ATOD FOR ACC2
       001401
       000000
000326 005001           CLR     R1                  ;CLEAR FOR FAKE SIGN EXTEND
000330 162700'          SUB     #ANGMID,R0          ;CENTER CONTROL # FOR ANGLE
       000000
000334 100001           BPL     UPD15               ;IF POSITIVE SKIP R1=0
000336 005301           DEC     R1                  ;MAKE R1=-1 (177777)
000340 000300 UPD15:    SWAB    R0                  ;GET HIGH BYTE IN LOW OF R1
000342 110001           MOVB    R0,R1               ;PUT IN LOW OF R1
000344 105000           CLRB    R0                  ;CLEAR LOW BYTE OF R0
000346 060022           ADD     R0,(R2)+            ;ADD LOW WORDS
000350 005501           ADC     R1                  ;ADD CARRY TO HIGH WORD
000352 060122           ADD     R1,(R2)+            ;ADD HIGH WORDS
000354 000207           RTS     PC                  ;ALL DONE!!!!!!!!!!!!!!!!!!!!!!!!
       000001           .END

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000000 ERRORS


PAL-11S  V003A

*S H

*B H

*L T

*T T
```