

PPPPPPPPPP		AAAAAAAA		SSSSSSSSSS		CCCCCCCCCC		AAAAAAAA		LLL
PPPPPPPPPP		AAAAAAAA		SSSSSSSSSS		CCCCCCCCCC		AAAAAAAA		LLL
PPPPPPPPPP		AAAAAAAA		SSSSSSSSSS		CCCCCCCCCC		AAAAAAAA		LLL
PPP	PPP	AAA	AAA	SSS		CCC		AAA	AAA	LLL
PPP	PPP	AAA	AAA	SSS		CCC		AAA	AAA	LLL
PPP	PPP	AAA	AAA	SSS		CCC		AAA	AAA	LLL
PPP	PPP	AAA	AAA	SSS		CCC		AAA	AAA	LLL
PPP	PPP	AAA	AAA	SSS		CCC		AAA	AAA	LLL
PPP	PPP	AAA	AAA	SSS		CCC		AAA	AAA	LLL
PPPPPPPPPP		AAA	AAA	SSS	SSSSSSSS	CCC		AAA	AAA	LLL
PPPPPPPPPP		AAA	AAA	SSS	SSSSSSSS	CCC		AAA	AAA	LLL
PPPPPPPPPP		AAA	AAA	SSS	SSSSSSSS	CCC		AAA	AAA	LLL
PPP		AAAAAAAAAAAAAAAA		SSS		CCC		AAAAAAAAAAAAAAAA		LLL
PPP		AAAAAAAAAAAAAAAA		SSS		CCC		AAAAAAAAAAAAAAAA		LLL
PPP		AAAAAAAAAAAAAAAA		SSS		CCC		AAAAAAAAAAAAAAAA		LLL
PPP		AAA	AAA	SSS		CCC		AAA	AAA	LLL
PPP		AAA	AAA	SSS		CCC		AAA	AAA	LLL
PPP		AAA	AAA	SSS		CCC		AAA	AAA	LLL
PPP		AAA	AAA	SSS		CCC		AAA	AAA	LLL
PPP		AAA	AAA	SSS	SSSSSSSS	CCC	CCCCCCCC	AAA	AAA	LLLLLLLLLLLLLLLL
PPP		AAA	AAA	SSS	SSSSSSSS	CCC	CCCCCCCC	AAA	AAA	LLLLLLLLLLLLLLLL
PPP		AAA	AAA	SSS	SSSSSSSS	CCC	CCCCCCCC	AAA	AAA	LLLLLLLLLLLLLLLL

```

PPPPPPPP      AAAAAA      SSSSSSSS  RRRRRRRR  TTTTTTTTTT  44  44
PPPPPPPP      AAAAAA      SSSSSSSS  RRRRRRRR  TTTTTTTTTT  44  44
PP      PP    AA      AA    SS      RR      RR    TT      44  44
PP      PP    AA      AA    SS      RR      RR    TT      44  44
PP      PP    AA      AA    SS      RR      RR    TT      44  44
PP      PP    AA      AA    SS      RR      RR    TT      44  44
PPPPPPPP      AA      AA    SSSSSS  RRRRRRRR  TT      4444444444
PPPPPPPP      AA      AA    SSSSSS  RRRRRRRR  TT      4444444444
PP      AAAAAAAAAA      SS      RR      RR    TT      44
PP      AAAAAAAAAA      SS      RR      RR    TT      44
PP      AA      AA    SS      RR      RR    TT      44
PP      AA      AA    SS      RR      RR    TT      44
PP      AA      AA    SSSSSSSS  RR      RR    TT      44
PP      AA      AA    SSSSSSSS  RR      RR    TT      44

```

```

LL      IIIIII      SSSSSSSS
LL      IIIIII      SSSSSSSS
LL      II      SS
LL      II      SS
LL      II      SS
LL      II      SS
LL      II      SSSSSS
LL      II      SSSSSS
LL      II      SS
LL      II      SS
LL      II      SS
LL      II      SS
LLLLLLLLLLLL IIIIII      SSSSSSSS
LLLLLLLLLLLL IIIIII      SSSSSSSS

```

```

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0000 21 :*
0000 22 :*
0000 23 :*****
0000 24 :*
0000 25 :* PAS$RT FUNC
0000 26 :* RUNTIME SUPPORT MODULE FOR PASCAL -- SECTION 4
0000 27 :*
0000 28 :* VERSION V1.0-1 -- OCTOBER 1979
0000 29 :*
0000 30 :* This module defines the following routines:
0000 31 :*
0000 32 :* pas$<math>: a number of routines to convert call by value
0000 33 :* to call by name for mathematical library functions
0000 34 :*
0000 35 :* Written by: Hellmut Golde 15-Feb-79
0000 36 :*
0000 37 :* Revision history:
0000 38 :*
0000 39 :* 1-001 5/14/80: Paul Hohensee: add a .psect directive for the code section
0000 40 :*
0000 41 :* 1-002 11-Aug-81 Paul Hohensee. Change to general addressing of exter
0000 42 :*
0000 43 :*****
0000 44 :* .title pas$rt_func
0000 45 :* .ident 'V04-000'
0000 46 :*
0000 47 :* .psect _pas$code,pic,shr,exe,nowrt
0000 48 :*
0000 49 :* ROUTINES TO CONVERT CALL BY VALUE (IMMEDIATE) TO CALL BY NAME
0000 50 :* FOR MATHEMATICAL LIBRARY FUNCTIONS
0000 51 :*
0000 52 :* .macro libsngl p1 ; macro to make definitions
0000 53 :* .entry pas$'p1,'m<>
0000 54 :* pushl 4(ap) ; move value to stack
0000 55 :* pushal (sp) ; and address on stack
0000 56 :* calls #1,G^mth$'p1 ; call library routine
0000 57 :* ret

```

MSG

MSG

MSG

MSG

```

0000 58      .endm   libsngl
0000 59      :
0000 60      Macro calls to create entry points for math library functions
0000 61      :
0000 62      libsngl SIN
000F 63      libsngl COS
001E 64      libsngl EXP
002D 65      libsngl SQRT
003C 66      libsngl ALOG
004B 67      libsngl ATAN
005A 68      :
005A 69      Entry points for various Pascal standard functions--used only when
005A 70      functions are passed as parameters
005A 71      :
50 04 AC 0000 005A 72      .entry pas$immABSint,^m<>
03 50 1F D0 005C 73      movl 4(ap),r0
50 50 50 E1 0060 74      bbc #31,r0,10$
50 50 CE 0064 75      mnegl r0,r0
04 0067 76 10$:      ret
0068 77      :
50 04 AC 0000 0068 78      .entry pas$immABSreal,^m<>
03 50 0F 50 006A 79      movf 4(ap),r0
50 50 52 E1 006E 80      bbc #15,r0,10$
04 0072 81      mnegf r0,r0
0075 82 10$:      ret
0076 83      :
50 04 BC 0000 0076 84      .entry pas$ABSdoub,^m<>
03 50 0F 70 0078 85      movd @4(ap),r0
50 50 72 E1 007C 86      bbc #15,r0,10$
04 0080 87      mnegd r0,r0
0083 88 10$:      ret
0084 89      :
50 04 AC 04 AC 0000 0084 90      .entry pas$immSQrint,^m<>
C5 0086 91      mull3 4(ap),4(ap),r0
04 008C 92      ret
008D 93      :
50 04 AC 04 AC 0000 008D 94      .entry pas$immSQRreal,^m<>
45 008F 95      mulf3 4(ap),4(ap),r0
04 0095 96      ret
0096 97      :
50 04 BC 04 BC 0000 0096 98      .entry pas$SQRdoub,^m<>
65 0098 99      muld3 @4(ap),@4(ap),r0
04 009E 100     ret
009F 101     :
50 04 AC 0000 009F 102     .entry pas$immORD,^m<>
D0 00A1 103     movl 4(ap),r0
04 00A5 104     ret
00A6 105     :
50 04 AC 0000 00A6 106     .entry pas$immCHR,^m<>
D0 00A8 107     movl 4(ap),r0
04 00AC 108     ret
00AD 109     :
50 04 AC 01 0000 00AD 110     .entry pas$immPRED,^m<>
C3 00AF 111     subl3 #1,4(ap),r0
04 00B4 112     ret
00B5 113     :
0000 00B5 114     .entry pas$immSUCC,^m<>

```

Sym

LIE

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LIE

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PAS

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PAS

```

50 04 AC 01 01 C1 00B7 115      addl3 #1,4(ap),r0
    04 00BC 116      ret
    00BD 117      ;
50 04 AC 01 00 0000 00BD 118      .entry pas$immODD, ^m<>
    EF 00BF 119      extzv #0,#1,4(ap),r0
    04 00C5 120      ret
    00C6 121      ;
    0000 00C6 122      .entry pas$SNGL, ^m<>
50 04 BC 76 00C8 123      cvtdf @4(ap),r0
    04 00CC 124      ret
    00CD 125      ;
    0000 00CD 126      .entry pas$refABSint, ^m<>
50 04 BC D0 00CF 127      movl @4(ap),r0
03 50 1F E1 00D3 128      bbc #31,r0,10$
50 50 CE 00D7 129      mnegl r0,r0
    04 00DA 130 10$:   ret
    00DB 131      ;
    0000 00DB 132      .entry pas$refABSreal, ^m<>
50 04 BC 50 00DD 133      movf @4(ap),r0
03 50 OF E1 00E1 134      bbc #15,r0,10$
50 50 52 00E5 135      mnegf r0,r0
    04 00E8 136 10$:   ret
    00E9 137      ;
    0000 00E9 138      .entry pas$refSQRint, ^m<>
50 04 BC 04 BC C5 00EB 139      mull3 @4(ap),@4(ap),r0
    04 00F1 140      ret
    00F2 141      ;
    0000 00F2 142      .entry pas$refSQRreal, ^m<>
50 04 BC 04 BC 45 00F4 143      mulf3 @4(ap),@4(ap),r0
    04 00FA 144      ret
    00FB 145      ;
    0000 00FB 146      .entry pas$refORD, ^m<>
50 04 BC D0 00FD 147      movl @4(ap),r0
    04 0101 148      ret
    0102 149      ;
    0000 0102 150      .entry pas$refCHR, ^m<>
50 04 BC D0 0104 151      movl @4(ap),r0
    04 0108 152      ret
    0109 153      ;
    0000 0109 154      .entry pas$refPRED, ^m<>
50 04 BC 01 C3 010B 155      subl3 #1,@4(ap),r0
    04 0110 156      ret
    0111 157      ;
    0000 0111 158      .entry pas$refSUCC, ^m<>
50 04 BC 01 C1 0113 159      addl3 #1,@4(ap),r0
    04 0118 160      ret
    0119 161      ;
    0000 0119 162      .entry pas$refODD, ^m<>
50 04 BC 01 00 EF 011B 163      extzv #0,#1,@4(ap),r0
    04 0121 164      ret
    0122 165      .end
  
```

MTHSALOG	*****	X	01
MTHSATAN	*****	X	01
MTHSCOS	*****	X	01
MTHSEXP	*****	X	01
MTHSSIN	*****	X	01
MTHSSQRT	*****	X	01
PASSABSDOUB	00000076	RG	01
PASSALOG	0000003C	RG	01
PASSATAN	0000004B	RG	01
PASSCOS	0000000F	RG	01
PASSEXP	0000001E	RG	01
PASSIMMABSINT	0000005A	RG	01
PASSIMMABSREAL	00000068	RG	01
PASSIMMCHR	000000A6	RG	01
PASSIMMODD	000000BD	RG	01
PASSIMMORD	0000009F	RG	01
PASSIMMPRED	000000AD	RG	01
PASSIMMSQRINT	0000C084	RG	01
PASSIMMSQRREAL	0000008D	RG	01
PASSIMMSUCC	000000B5	RG	01
PASSREFABSINT	000000CD	RG	01
PASSREFABSREAL	000000DB	RG	01
PASSREFCHR	00000102	RG	01
PASSREFODD	00000119	RG	01
PASSREFORD	000000FB	RG	01
PASSREFPRED	00000109	RG	01
PASSREFSQRINT	000000E9	RG	01
PASSREFSQRREAL	000000F2	RG	01
PASSREFSUCC	00000111	RG	01
PASSSIN	00000000	RG	01
PASSNGL	000000C6	RG	01
PASSSQDOUB	00000096	RG	01
PASSSQRT	0000002D	RG	01

! Psect synopsis !

PSECT name	Allocation	PSECT No.	Attributes
ABS	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
_PASSCODE	00000122 (290.)	01 (1.)	PIC USR CON REL LCL SHR EXE RD NOWRT NOVEC BYTE

! Performance indicators !

Phase	Page faults	CPU Time	Elapsed Time
Initialization	36	00:00:00.07	00:00:00.42
Command processing	127	00:00:00.48	00:00:01.88
Pass 1	82	00:00:00.62	00:00:01.21
Symbol table sort	0	00:00:00.02	00:00:00.02
Pass 2	46	00:00:00.50	00:00:01.42
Symbol table output	4	00:00:00.04	00:00:00.04
Psect synopsis output	2	00:00:00.01	00:00:00.01
Cross-reference output	0	00:00:00.00	00:00:00.00

Assembler run totals 300 00:00:01.75 00:00:05.03

Sym

The working set limit was 900 pages.
3625 bytes (8 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 33 non-local and 5 local symbols.
165 source lines were read in Pass 1, producing 89 object records in Pass 2.
1 page of virtual memory was used to define 1 macro.

↑-----↑
! Macro library statistics !
↑-----↑

Macro library name	Macros defined
-----	-----
_\$255\$DUA28:[SYSLIB]STARLET.MLB;2	0

0 GETS were required to define 0 macros.

There were no errors, warnings or information messages.

MACRO/DISABLE=TRACE/LIS=LISS:PASRT4/OBJ=OBJ\$:PASRT4 MSRC\$:PASRT4/UPDATE=(ENH\$:PASRT4)

PAS
PAS

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VAX/VMS V4.0

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