



```

MM      MM      TTTTTTTTTT  HH      HH      CCCCCCCC  GGGGGGGG  LL      000000  GGGGGGGG
MM      MM      TTTTTTTTTT  HH      HH      CCCCCCCC  GGGGGGGG  LL      000000  GGGGGGGG
MMM     MMM     TT          HH      HH      CC          GG          LL      00      00  GG
MMM     MMM     TT          HH      HH      CC          GG          LL      00      00  GG
MM      MM      TT          HH      HH      CC          GG          LL      00      00  GG
MM      MM      TT          HH      HH      CC          GG          LL      00      00  GG
MM      MM      TT          HH      HH      CC          GG          LL      00      00  GG
MM      MM      TT          HHHHHHHHHH  CC          GG          LL      00      00  GG
MM      MM      TT          HHHHHHHHHH  CC          GG          LL      00      00  GG
MM      MM      TT          HH      HH      CC          GG  GGGGGG  LL      00      00  GG  GGGGGG
MM      MM      TT          HH      HH      CC          GG  GGGGGG  LL      00      00  GG  GGGGGG
MM      MM      TT          HH      HH      CC          GG          GG      LL      00      00  GG
MM      MM      TT          HH      HH      CC          GG          GG      LL      00      00  GG
MM      MM      TT          HH      HH      CCCCCCCC  GGGGGG  LLLLLLLLLL  000000  GGGGGG
MM      MM      TT          HH      HH      CCCCCCCC  GGGGGG  LLLLLLLLLL  000000  GGGGGG

```

```

LL      IIIIIII  SSSSSSSS
LL      IIIIIII  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 IIIIIII  SSSSSSSS
LLLLLLLLLLLL IIIIIII  SSSSSSSS

```

(2) 51  
(3) 61  
(4) 90

HISTORY ; Detailed Current Edit History  
DECLARATIONS  
MTH\$CGLOG

```

0000 1      .TITLE MTH$CGLOG      G COMPLEX*16 Natural Logarithm
0000 2      .IDENT /1-004/      ; File: MTHCGLOG.MAR Edit: SBL1004
0000 3
0000 4
0000 5
0000 6 *****
0000 7 *
0000 8 *  COPYRIGHT (c) 1978, 1980, 1982, 1984 BY *
0000 9 *  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS. *
0000 10 *  ALL RIGHTS RESERVED. *
0000 11 *
0000 12 *  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND COPIED *
0000 13 *  ONLY IN ACCORDANCE WITH THE TERMS OF SUCH LICENSE AND WITH THE *
0000 14 *  INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR ANY OTHER *
0000 15 *  COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY *
0000 16 *  OTHER PERSON. NO TITLE TO AND OWNERSHIP OF THE SOFTWARE IS HEREBY *
0000 17 *  TRANSFERRED. *
0000 18 *
0000 19 *  THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE *
0000 20 *  AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL EQUIPMENT *
0000 21 *  CORPORATION. *
0000 22 *
0000 23 *  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR RELIABILITY OF ITS *
0000 24 *  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL. *
0000 25 *
0000 26 *
0000 27 *****
0000 28
0000 29
0000 30
0000 31 FACILITY: MATH LIBRARY
0000 32 ++
0000 33 ABSTRACT:
0000 34
0000 35 This module contains routine MTH$CGLOG - perform G COMPLEX*16 log
0000 36
0000 37 --
0000 38
0000 39 VERSION: 1
0000 40
0000 41 HISTORY:
0000 42
0000 43 AUTHOR:
0000 44 Steven B. Lionel, 20-July-1979
0000 45
0000 46 MODIFIED BY:
0000 47
0000 48
0000 49

```

0000 51 .SBTTL HISTORY ; Detailed Current Edit History  
0000 52  
0000 53  
0000 54 ; Edit History  
0000 55  
0000 56 : 1-001 - Adapted from MTHSCLOG version 1-002. SBL 20-July-1979  
0000 57 : 1-002 - Change PUSHAB to PUSHAG. SBL 23-Aug-1979  
0000 58 : 1-003 - Change shared external references to G^ RNH 25-Sep-81  
0000 59 : 1-004 - Use general mode addressing. SBL 30-Nov-1981

MTHS  
Sym

ARG  
MTHS  
MTHS  
MTHS  
MTHS  
MTHS  
RESI  
WOR

PSE  
---

MT

Pha  
---  
Ini  
COM  
Pas  
Sym  
Pas  
Sym  
Pse  
Cro  
Ass

The  
361  
The  
285  
1 p

Mac  
---

\_\$2

O G

The

MAC

```
0000 61      .SBTTL  DECLARATIONS
0000 62
0000 63  :
0000 64  : INCLUDE FILES:
0000 65  :
0000 66  :
0000 67  :
0000 68  : EXTERNAL SYMBOLS:
0000 69      .DSABL  GBL
0000 70      .EXTRN  MTH$GATAN2
0000 71      .EXTRN  MTH$CGABS
0000 72      .EXTRN  MTH$GLOG_R8
0000 73
0000 74  :
0000 75  : MACROS:
0000 76  :     NONE
0000 77  :
0000 78  :
0000 79  : PSECT DECLARATIONS:
0000 80  :
00000000 81      .PSECT  _MTH$CODE          PIC, SHR, LONG, EXE, NOWRT
0000 82
0000 83  :
0000 84  : EQUATED SYMBOLS:
0000 85  :
0000 86  :
0000 87  : OWN STORAGE:
0000 88  :     NONE
```

```

0000 90      .SBTTL MTH$CGLOG
0000 91
0000 92      :++
0000 93      : FUNCTIONAL DESCRIPTION:
0000 94      :
0000 95      :   The Natural Logarithm of a complex number (r, i) is
0000 96      :   computed as follows:
0000 97      :
0000 98      :       CLOG(arg) = (LOG(CABS(arg)), ATAN2(arg))
0000 99      :
0000 100     : CALLING SEQUENCE:
0000 101     :   CALL MTH$CGLOG (result.wgc.r, arg.rgc.r)
0000 102     :
0000 103     :
0000 104     : INPUT PARAMETERS:
0000 105     :   arg = 8 ; Argument by reference, a G COMPLEX*16
0000 106     : ; value.
0000 107     :
0000 108     : IMPLICIT INPUTS:
0000 109     :   NONE
0000 110     :
0000 111     : OUTPUT PARAMETERS:
0000 112     :
0000 113     :   result = 4 ; Result by reference, a G COMPLEX*16
0000 114     : ; value.
0000 115     :
0000 116     : IMPLICIT OUTPUTS:
0000 117     :   NONE
0000 118     :
0000 119     : COMPLETION CODES:
0000 120     :   NONE
0000 121     :
0000 122     : SIDE EFFECTS:
0000 123     :   Signals Reserved Operand if the input parameter is bad (-0.0)
0000 124     :
0000 125     :--
0000 126
0000 127
01FC 0000 128     .ENTRY MTH$CGLOG, ^M<R2,R3,R4,R5,R6,R7,R8>
0002 0002 129     MTH$FLAG_JACKET ; set up error handler
0002 0002
6D 00000000'GF 9E 0002     MOVAB G^MTH$$JACKET_HND, (FP)
0009 0009 ; set handler address to jacket
0009 0009 ; handler
0009 0009
50 08 AC DO 0009 130     MOVL arg(AP), R0 ; R0 -> (arg)
80 7F 000D 131     PUSHAG (R0)+ ; push addr(r)
50 DD 000F 132     PUSHL R0 ; push addr(i)
00000000'GF 02 FB 0011 133     CALLS #2, G^MTH$GATAN2 ; R0-R1 = GATAN2(arg)
7E 50 7D 0018 134     MOVQ R0, -(SP) ; Save ATAN2(arg)
08 AC DD 001B 135     PUSHL arg(AP) ; Get CABS(arg)
00000000'GF 01 FB 001E 136     CALLS #1, G^MTH$CGABS ; Get CABS(arg)
00000000'GF 16 0025 137     JSB G^MTH$GLOG_R8 ; R0-R1 gets LOG(CABS(arg))
52 04 AC DO 002B 138     MOVL result(AP), R2 ; Address of result
82 50 7D 002F 139     MOVQ R0, (R2)+ ; Real part of result
62 8E 7D 0032 140     MOVQ (SP)+, (R2) ; Imaginary part of result
04 0035 141     RET

```

MTHSCGLOG  
1-004

G COMPLEX\*16 Natural Logarithm  
MTHSCGLOG

L 4

16-SEP-1984 01:09:24  
6-SEP-1984 11:21:06

VAX/VMS Macro V04-00  
[MTHRTL.SRC]MTHCGLOG.MAR;1

Page 5  
(4)

MTHS  
1-00

0036 142  
0036 143  
0036 144 .END



MTH\$CGLOG  
Symbol table

G COMPLEX\*16 Natural Logarithm

M 4

16-SEP-1984 01:09:24  
6-SEP-1984 11:21:06

VAX/VMS Macro V04-00  
[MTHRTL.SRC]MTHCGLOG.MAR;1

Page 6  
(4)

MTH\$  
1-00

ARG	= 00000008		
MTH\$\$JACKET_HND	*****	X	01
MTH\$CGABS	*****	X	00
MTH\$CGLOG	00000000	RG	01
MTH\$GATAN2	*****	X	00
MTH\$GLOG_RB	*****	X	00
RESULT	= 00000004		

-----  
! Psect synopsis !  
-----

PSECT name	Allocation	PSECT No.	Attributes												
ABS	00000000 ( 0.)	00 ( 0.)	NOPIC	USR	CON	ABS	LCL	NOSHR	NOEXE	NORD	NOWRT	NOVEC	BYTE		
_MTH\$CODE	00000036 ( 54.)	01 ( 1.)	PIC	USR	CON	REL	LCL	SHR	EXE	RD	NOWRT	NOVEC	LONG		

-----  
! Performance indicators !  
-----

Phase	Page faults	CPU Time	Elapsed Time
Initialization	29	00:00:00.07	00:00:01.47
Command processing	142	00:00:00.63	00:00:04.02
Pass 1	78	00:00:00.64	00:00:02.60
Symbol table sort	0	00:00:00.00	00:00:00.00
Pass 2	40	00:00:00.42	00:00:01.95
Symbol table output	2	00:00:00.01	00:00:00.01
Psect synopsis output	3	00:00:00.01	00:00:00.18
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	296	00:00:01.79	00:00:10.24

The working set limit was 900 pages.  
 2267 bytes (5 pages) of virtual memory were used to buffer the intermediate code.  
 There were 10 pages of symbol table space allocated to hold 7 non-local and 0 local symbols.  
 204 source lines were read in Pass 1, producing 11 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/ENABLE=SUPPRESSION/DISABLE=(GLOBAL,TRACEBACK)/LIS=LIS\$:MTHCGLOG/OBJ=OBJ\$:MTHCGLOG MSRC\$:MTHJACKET/UPDATE=(ENH\$:MTHJACKET)+MSRC



