


```

000000  TTTTTTTT  SSSSSSSS  DDDDDDDD  IIIIII  VV  VV  CCCCCCCC  GGGGGGGG
000000  TTTTTTTT  SSSSSSSS  DDDDDDDD  IIIIII  VV  VV  CCCCCCCC  GGGGGGGG
00      00      SS      DD      DD      VV  VV  CC      GG
00      00      SS      DD      DD      VV  VV  CC      GG
00      00      SS      DD      DD      VV  VV  CC      GG
00      00      SS      DD      DD      VV  VV  CC      GG
00      00      SS      DD      DD      VV  VV  CC      GG
00      00      SS      DD      DD      VV  VV  CC      GG
00      00      SS      DD      DD      VV  VV  CC      GG
00      00      SS      DD      DD      VV  VV  CC      GG
00      00      SS      DD      DD      VV  VV  CC      GG
00      00      SS      DD      DD      VV  VV  CC      GG
000000  TT      SSSSSSSS  DDDDDDDD  IIIIII  VV  VV  CCCCCCCC  GGGGGGGG
000000  TT      SSSSSSSS  DDDDDDDD  IIIIII  VV  VV  CCCCCCCC  GGGGGGGG

```

```

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

```

(2)	45
(3)	53
(4)	87

HISTORY ; Detailed Current Edit History
DECLARATIONS
G COMPLEX*16 / G COMPLEX*16 giving G COMPLEX*16 result

```

0000 1 .TITLE OTSSDIVCG - G COMPLEX*16 / G COMPLEX*16 DIVISION ROUTINE
0000 2 .IDENT /1-001/ ; File: OTSDIVCG.MAR
0000 3
0000 4
0000 5 *****
0000 6 *****
0000 7 * COPYRIGHT (c) 1978, 1980, 1982, 1984 BY *
0000 8 * DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS. *
0000 9 * ALL RIGHTS RESERVED. *
0000 10 *
0000 11 * THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND COPIED *
0000 12 * ONLY IN ACCORDANCE WITH THE TERMS OF SUCH LICENSE AND WITH THE *
0000 13 * INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR ANY OTHER *
0000 14 * COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY *
0000 15 * OTHER PERSON. NO TITLE TO AND OWNERSHIP OF THE SOFTWARE IS HEREBY *
0000 16 * TRANSFERRED. *
0000 17 *
0000 18 * THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE *
0000 19 * AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL EQUIPMENT *
0000 20 * CORPORATION. *
0000 21 *
0000 22 * DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR RELIABILITY OF ITS *
0000 23 * SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL. *
0000 24 *
0000 25 *
0000 26 *****
0000 27 *****
0000 28
0000 29 FACILITY: MATH LIBRARY
0000 30 ++
0000 31 ABSTRACT:
0000 32
0000 33 Perform G COMPLEX*16 division
0000 34
0000 35 --
0000 36
0000 37 AUTHOR:
0000 38 Steven B. Lionel, 12-July-1979
0000 39
0000 40 MODIFIED BY:
0000 41
0000 42
0000 43

```

OTSS\$DIVCG
1-001

- G COMPLEX*16 / G COMPLEX*16 DIVISION R 16-SEP-1984 01:53:43 VAX/VMS Macro V04-00 Page 2
HISTORY ; Detailed Current Edit History 6-SEP-1984 11:27:37 [MTHRTL.SRC]OTSDIVCG.MAR;1 (2)

0000 45 .SBTTL HISTORY ; Detailed Current Edit History
0000 46
0000 47
0000 48 ; Edit History
0000 49 ;
0000 50
0000 51 ; 1-001 - Adapted from OTSS\$DIVC version 1-003. SBL 12-July-1979

```
0000 53 .SBTTL DECLARATIONS
0000 54
0000 55 :
0000 56 : INCLUDE FILES:
0000 57 :
0000 58 :
0000 59 :
0000 60 : EXTERNAL SYMBOLS:
0000 61 :
0000 62 :
0000 63 :
0000 64 : MACROS:
0000 65 :
0000 66 :
0000 67 :
0000 68 : PSECT DECLARATIONS:
0000 69 :
00000000 70 .PSECT _OTSSCODE PIC, USR, CON, REL, LCL, SHR, -
0000 71 EXE, RD, NOWRT, LONG
0000 72
0000 73 :
0000 74 : EQUATED SYMBOLS:
0000 75 :
00000004 0000 76 a = 4 ; real part of dividend
0000000C 0000 77 b = 12 ; imag part of dividend
00000014 0000 78 c = 20 ; real part of divisor
0000001C 0000 79 d = 28 ; imag part of divisor
0000 80
0000 81 :
0000 82 : OWN STORAGE:
0000 83 :
0000 84 : none
0000 85
```

```

0000 87      .SBTTL G COMPLEX*16 / G COMPLEX*16 giving G COMPLEX*16 result
0000 88
0000 89      **
0000 90      FUNCTIONAL DESCRIPTION:
0000 91
0000 92      OTSSDIVCG_R3 - G COMPLEX*16 / G COMPLEX*16 giving G COMPLEX*16 result
0000 93
0000 94
0000 95      The COMPLEX*16 result is computed as follows:
0000 96
0000 97      1) Let (a, b) represent the COMPLEX*16 dividend.
0000 98      2) Let (c, d) represent the COMPLEX*16 divisor.
0000 99      3) Let (r, i) represent the COMPLEX*16 quotient.
0000 100
0000 101      Then:
0000 102
0000 103      r = (ac + bd) / (cc + dd)
0000 104      i = (bc - ad) / (cc + dd)
0000 105
0000 106      CALLING SEQUENCE:
0000 107
0000 108      Complex_quotient.wgc.w = OTSSDIVCG_R3(dividend.rgc.v, divisor.rgc.v)
0000 109
0000 110      INPUT PARAMETERS:
0000 111
0000 112      Dividend and divisor parameters are represented as
0000 113      FORTRAN G COMPLEX*16 numbers and are CALL BY VALUE.
0000 114      Passing 128 bit quantities by value is a violation
0000 115      of the VAX calling standard, but is excused because
0000 116      this is a code support routine not meant to be
0000 117      callable by users.
0000 118
0000 119      IMPLICIT INPUTS:
0000 120      NONE
0000 121
0000 122      OUTPUT PARAMETERS:
0000 123      NONE
0000 124
0000 125      IMPLICIT OUTPUTS:
0000 126      NONE
0000 127
0000 128      FUNCTIONAL VALUE:
0000 129
0000 130      The G COMPLEX*16 value returned is (a, b) / (c, d)
0000 131      in registers R0-R3! This is a violation of the VAX
0000 132      calling standard, but is excused because this is
0000 133      a code support routine, not meant to be callable
0000 134      by users.
0000 135
0000 136      SIDE EFFECTS:
0000 137
0000 138      Modifies registers R0-R3!
0000 139      $$$_ROPRAND if either argument is a reserved operand.
0000 140      $$$_FLTOVF if floating overflow
0000 141      $$$_FLTDIV if divide by zero
0000 142      --
  
```

```

OFF0 0000 144 .ENTRY OTS$DIVCG_R3, ^M<R4,R5,R6,R7,R8,R9,R10,R11>
      0002 145 MTH$FLAG_JACKET ; establish math error handler
      0002
6D 00000000'GF 9E 0002 MOVAB G^MTH$$JACKET_HND, (FP)
      0009 ; set handler address to jacket
      0009 ; handler
      0009
      0009 146
      0009 147 ; Perform scaling of all operands before division
      0009 148 ;
51 14 AC 0B 04 EF 0009 149 EXTZV #4, #11, c(AP), R1 ; R1 = c(AP)<exp> 0,1,...3777
50 1C AC 0B 04 EF 000F 150 EXTZV #4, #11, d(AP), R0 ; R0 = d(AP)<exp> 0,1,...3777
      51 50 B1 0015 151 CMPW R0, R1 ; R0 = MAX (c<exp>, d<exp>)
      50 03 14 0018 152 BGTR 2$
      50 51 B0 001A 153 MOVW R1, R0
      50 50 AE 001D 154 2$: MNEGW R0, R0 ; R0 = scaling exponent 0,3777,3776,....,1
      50 50 04 9C 0020 155 ROTL #4, R0, R0 ; build a floating scale factor
      51 D4 0024 156 CLRL R1
      0026 157 ; scale all operands
58 14 AC 50 45FD 0026 158 MULG3 R0, c(AP), R8 ; R8-R9 gets c
5A 1C AC 50 45FD 002C 159 MULG3 R0, d(AP), R10 ; R10-R11 gets d
54 04 AC 50 45FD 0032 160 MULG3 R0, a(AP), R4 ; a
52 0C AC 50 45FD 0038 161 MULG3 R0, b(AP), R2 ; b
      003E 162
      50 58 54 45FD 003E 163 MULG3 R4, R8, R0 ; R0 = ac
      56 5A 52 45FD 0043 164 MULG3 R2, R10, R6 ; R7 = bd
      50 56 40FD 0048 165 ADDG2 R6, R0 ; R0 = ac+bd
      54 5A 44FD 004C 166 MULG2 R10, R4 ; R4 = ad
      52 58 44FD 0050 167 MULG2 R8, R2 ; R2 = bc
      52 54 42FD 0054 168 SUBG2 R4, R2 ; R2 = bc - ad
      58 58 44FD 0058 169 MULG2 R8, R8 ; R8 = cc
      5A 5A 44FD 005C 170 MULG2 R10, R10 ; R10 = dd
      58 5A 40FD 0060 171 ADDG2 R10, R8 ; R8 = cc + dd
      50 58 46FD 0064 172 DIVG2 R8, R0 ; R0 = (ac+bd) / (cc+dd)
      52 58 46FD 0068 173 DIVG2 R8, R2 ; R2 = (bc-ad) / (cc+dd)
      006C 174
      04 006C 175 RET ; (R0-R1, R2-R3) = (r, i)
      006D 176
      006D 177 .END

```


A = 00000004
 B = 0000000C
 C = 00000014
 D = 0000001C
 MTHSSJACKET_HND ***** X 01
 OTSSDIVCG_R3 00000000 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
_OTSSCODE	0000006D (109.)	01 (1.)	PIC USR CON REL LCL SHR EXE RD NOWRT NOVEC LONG

 ! Performance indicators !

Phase	Page faults	CPU Time	Elapsed Time
Initialization	33	00:00:00.08	00:00:00.69
Command processing	105	00:00:00.70	00:00:03.82
Pass 1	78	00:00:00.76	00:00:02.95
Symbol table sort	0	00:00:00.00	00:00:00.00
Pass 2	47	00:00:00.52	00:00:01.85
Symbol table output	2	00:00:00.01	00:00:00.01
Psect synopsis output	2	00:00:00.02	00:00:00.02
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	269	00:00:02.12	00:00:09.41

The working set limit was 750 pages.
 3071 bytes (6 pages) of virtual memory were used to buffer the intermediate code.
 There were 10 pages of symbol table space allocated to hold 6 non-local and 1 local symbols.
 237 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
_\$255SDUA28:[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\$:OTSDIVCG/OBJ=OBS\$:OTSDIVCG MSRCS:MTHJACKET/UPDATE=(ENHS:MTHJACKET)+MSRC

0264 AH-BT13A-SE
VAX/VMS V4.0

DIGITAL EQUIPMENT CORPORATION
CONFIDENTIAL AND PROPRIETARY

The image shows a large array of computer terminal screens, likely from a VAX/VMS system. Each screen displays a different view of data or code. The screens are arranged in a grid, and many of them have labels that identify the data being displayed. The labels include:

- OTSMULCD LIS
- OTSPOWGC LIS
- OTSDIUC LIS
- OTSPOWDD LIS
- OTSPOWCC LIS
- OTSPOWCJ LIS
- MHTAN LIS
- MTHVECTOR LIS
- OTSDIUCG LIS
- OTSPOWCJ LIS
- OTSPOWDLJ LIS
- MHTANH LIS
- OTSMULCG LIS
- OTSPOWCGJ LIS
- OTSPOWDJ LIS
- OTSDIUCD LIS
- OTSPOWDC LIS

The screens themselves show various types of information, including lists of data, code snippets, and graphical representations of data. The overall appearance is that of a busy, multi-user computer environment from the late 1970s or early 1980s.