



```

BBBBBBBB      AAAAAA      SSSSSSSS      EEEEEEEEEE      NN      NN      DDDDDDDD      DDDDDDDD      FFFFFFFFFF      SSSSSSSS
BBBBBBBB      AAAAAA      SSSSSSSS      EEEEEEEEEE      NN      NN      DDDDDDDD      DDDDDDDD      FFFFFFFFFF      SSSSSSSS
BB      BB      AA      AA      SS      EE      NN      NN      DD      DD      DD      DD      FF      SS
BB      BB      AA      AA      SS      EE      NN      NN      DD      DD      DD      DD      FF      SS
BB      BB      AA      AA      SS      EE      NNNN      NN      DD      DD      DD      DD      FF      SS
BB      BB      AA      AA      SS      EE      NNNN      NN      DD      DD      DD      DD      FF      SS
BBBBBBBB      AA      AA      SSSSSS      EEEEEEEE      NN      NN      NN      DD      DD      DD      DD      FFFFFFFF      SSSSSS
BBBBBBBB      AA      AA      SSSSSS      EEEEEEEE      NN      NN      NN      DD      DD      DD      DD      FFFFFFFF      SSSSSS
BB      BB      AAAAAAAAAA      SS      EE      NN      NNNN      DD      DD      DD      DD      FF      SS
BB      BB      AAAAAAAAAA      SS      EE      NN      NNNN      DD      DD      DD      DD      FF      SS
BB      BB      AA      AA      SS      EE      NN      NN      DD      DD      DD      DD      FF      SS
BB      BB      AA      AA      SS      EE      NN      NN      DD      DD      DD      DD      FF      SS
BBBBBBBB      AA      AA      SSSSSSSS      EEEEEEEEEE      NN      NN      DDDDDDDD      DDDDDDDD      FF      SSSSSSSS
BBBBBBBB      AA      AA      SSSSSSSS      EEEEEEEEEE      NN      NN      DDDDDDDD      DDDDDDDD      FF      SSSSSSSS

```

```

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      IIIIII      SSSSSSSS
LLLLLLLLLL      IIIIII      SSSSSSSS
LLLLLLLLLL      IIIIII      SSSSSSSS

```

```

1 0001 0 MODULE BASSEND_DFS (
2 0002 0 IDENT = '1-004'
3 0003 0 ) =
4 0004 1 BEGIN
5 0005 1
6 0006 1 .....
7 0007 1 *
8 0008 1 * COPYRIGHT (c) 1978, 1980, 1982, 1984 BY
9 0009 1 * DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.
10 0010 1 * ALL RIGHTS RESERVED.
11 0011 1 *
12 0012 1 * THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND COPIED
13 0013 1 * ONLY IN ACCORDANCE WITH THE TERMS OF SUCH LICENSE AND WITH THE
14 0014 1 * INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR ANY OTHER
15 0015 1 * COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY
16 0016 1 * OTHER PERSON. NO TITLE TO AND OWNERSHIP OF THE SOFTWARE IS HEREBY
17 0017 1 * TRANSFERRED.
18 0018 1 *
19 0019 1 * THE INFORMATION IN THIS SOFTWARE IS SUBJECT TO CHANGE WITHOUT NOTICE
20 0020 1 * AND SHOULD NOT BE CONSTRUED AS A COMMITMENT BY DIGITAL EQUIPMENT
21 0021 1 * CORPORATION.
22 0022 1 *
23 0023 1 * DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE OR RELIABILITY OF ITS
24 0024 1 * SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.
25 0025 1 *
26 0026 1 *
27 0027 1 .....
28 0028 1
29 0029 1
30 0030 1
31 0031 1 **
32 0032 1 FACILITY: BASIC-PLUS-2 Frame Support
33 0033 1
34 0034 1 ABSTRACT:
35 0035 1
36 0036 1 These routines set up and tear down frames for BASIC-PLUS-2.
37 0037 1 Frames are used for main routines, external functions,
38 0038 1 external subroutines, internal functions (both DEFs and DEF*s)
39 0039 1 internal subroutines (GOSUBs) and condition handlers.
40 0040 1
41 0041 1 ENVIRONMENT: VAX-11 user mode
42 0042 1
43 0043 1 AUTHOR: John Sauter, CREATION DATE: 10-Oct-78
44 0044 1
45 0045 1 MODIFIED BY:
46 0046 1
47 0047 1 . : VERSION
48 0048 1
49 0049 1 1-001 - Original. This is just a skeleton.
50 0050 1 1-002 - Change LIB$$ and DTSS$ to STR$. JBS 21-MAY-1979
51 0051 1 1-003 - Code this routine, based on BASSEND_DEF. JBS 03-AUG-1979
52 0052 1 1-004 - signal FNEWITFUN for kinds of frames that we know about, rather
53 0053 1 than simply signalling PROLOSSOR blindly. MDL 22-Feb-1984
54 0054 1 --
55 0055 1
56 0056 1
57 0057 1 <BLF/PAGE>

```

File: BASENDDFS.B32 Edit:MDL1004

```

59 0058 1 |
60 0059 1 | SWITCHES:
61 0060 1 |
62 0061 1 |
63 0062 1 | SWITCHES ADDRESSING_MODE (EXTERNAL = GENERAL, NONEXTERNAL = WORD_RELATIVE);
64 0063 1 |
65 0064 1 |
66 0065 1 | LINKAGES:
67 0066 1 |
68 0067 1 |
69 0068 1 | LINKAGE
70 0069 1 |     BASSINIT_LINK = JSB (REGISTER = 0, REGISTER = 1, REGISTER = 2) :
71 0070 1 |     GLOBAL (BSFSA_MAJOR_STG = 11, BSFSA_MINOR_STG = 10, BSFSA_TEMP_STG = 9)
72 0071 1 |     NOPRESERVE (8, 7, 6, 5, 4, 3, 2, 1, 0);
73 0072 1 |
74 0073 1 | REQUIRE 'RTLIN:STRLNK';           ! String facility linkages
75 0258 1 |
76 0259 1 |
77 0260 1 | TABLE OF CONTENTS:
78 0261 1 |
79 0262 1 |
80 0263 1 | FORWARD ROUTINE
81 0264 1 |     BASSEND_DFS_R8 : NOVALUE BASSINIT_LINK;           ! end DEF*
82 0265 1 |
83 0266 1 |
84 0267 1 | INCLUDE FILES:
85 0268 1 |
86 0269 1 |
87 0270 1 | REQUIRE 'RTLIN:RTLPSECT';       ! macros for defining psects
88 0365 1 |
89 0366 1 | REQUIRE 'RTLIN:BASFRAME';       ! Define frame structure
90 0569 1 |
91 0570 1 | REQUIRE 'RTLIN:BASINARG';       ! Define argument list
92 0654 1 |
93 0655 1 |
94 0656 1 | MACROS:
95 0657 1 |
96 0658 1 |     NONE
97 0659 1 |
98 0660 1 | EQUATED SYMBOLS:
99 0661 1 |
100 0662 1 |     NONE
101 0663 1 |
102 0664 1 | PSECTS:
103 0665 1 |
104 0666 1 | DECLARE_PSECTS (BAS);           ! declare psects for BASS facility
105 0667 1 |
106 0668 1 | OWN STORAGE:
107 0669 1 |
108 0670 1 |     NONE
109 0671 1 |
110 0672 1 | EXTERNAL REFERENCES:
111 0673 1 |
112 0674 1 |
113 0675 1 | EXTERNAL ROUTINE
114 0676 1 |     BASS$STOP : NOVALUE,           ! signals error
115 0677 1 |     STR$FREE1_DX_R4 : STR$JSB_GETFRE, ! Deallocate a string

```

```
: 116      0678 1      BAS$$UNWIND : NOVALUE,          ! Unwind a frame
: 117      0679 1      BAS$HANDLER;          ! Marker for BASIC frame
: 118      0680 1
: 119      0681 1      !+
: 120      0682 1      ! The following are the error codes used in this module.
: 121      0683 1      !-
: 122      0684 1
: 123      0685 1      EXTERNAL LITERAL
: 124      0686 1      BAS$K_RETWITGOS : UNSIGNED (8),      ! RETURN without GOSUB
: 125      0687 1      BAS$K_PROLOSSOR : UNSIGNED (8),      ! Program lost, sorry
: 126      0688 1      BAS$K_NOTIMP : UNSIGNED (8),          ! Not implemented
: 127      0689 1      BAS$K_FNEWITFUN : UNSIGNED (8),      ! F$END without FUNCTION CALL
: 128      0690 1      BAS$K_ERRTRANEE : UNSIGNED (8);      ! ERROR trap needs RESUME
: 129      0691 1
```

```

131 0692 1 GLOBAL ROUTINE BASSEND_DFS_RB (
132 0693 1     ARGLIST
133 0694 1     ) : NOVALUE BASSINIT_LINK =
134 0695 1
135 0696 1
136 0697 1     **
137 0698 1     FUNCTIONAL DESCRIPTION:
138 0699 1         Tear down a frame for a BASIC-PLUS-2 DEF*.
139 0700 1         All heap storage is deallocated. The argument is the same
140 0701 1         as for BASSINIT_DFS_RB, for validity checking.
141 0702 1
142 0703 1     FORMAL PARAMETERS:
143 0704 1
144 0705 1         ARGLIST.ra.v     List of information used to set up the
145 0706 1         frame. See BASIC-PLUS-2/VAX Description
146 0707 1         of Generated Code for details.
147 0708 1
148 0709 1     IMPLICIT INPUTS:
149 0710 1
150 0711 1         The frame, as set up by BASSINIT_DFS_RB.
151 0712 1
152 0713 1     IMPLICIT OUTPUTS:
153 0714 1
154 0715 1         NONE
155 0716 1
156 0717 1     ROUTINE VALUE:
157 0718 1
158 0719 1         NONE
159 0720 1
160 0721 1     COMPLETION CODES:
161 0722 1
162 0723 1         NONE
163 0724 1
164 0725 1     SIDE EFFECTS:
165 0726 1
166 0727 1         Deallocates the heap storage local to this DEF*.
167 0728 1
168 0729 1     --
169 0730 1
170 0731 2     BEGIN
171 0732 2
172 0733 2     EXTERNAL REGISTER
173 0734 2         BSF$A_MAJOR_STG : REF BLOCK [0, BYTE],
174 0735 2         BSF$A_MINOR_STG : REF BLOCK [0, BYTE],
175 0736 2         BSF$A_TEMP_STG : REF VECTOR;
176 0737 2
177 0738 2     BUILTIN
178 0739 2         FP;
179 0740 2
180 0741 2     MAP
181 0742 2         ARGLIST : REF BLOCK [0, BYTE] FIELD (BASSINIT_ARGS);     ! arg list
182 0743 2
183 0744 2     REGISTER
184 0745 2         FMP : REF BLOCK [0, BYTE] FIELD (BSF$FCD);     ! pointer to FCD
185 0746 2         PREV_FMP : REF BLOCK [0, BYTE] FIELD (BSF$FCD); ! previous FCD
186 0747 2
187 0748 2 !*

```

```

: 188 0749 2 | First cut back any GOSUB frames. We wish to make the presence of
: 189 0750 | the GOSUB frame invisible except on traceback.
: 190 0751 | -
: 191 0752 |   FMP = .FMP;
: 192 0753 |
: 193 0754 |   WHILE (.FMP [BSFSB_PROC_CODE] EQL BSFSK_PROC_GOSB) DO
: 194 0755 |     BEGIN
: 195 0756 |
: 196 0757 |     * We have a GOSUB frame, remove it. Note we do not restore any
: 197 0758 |     registers it might have saved.
: 198 0759 |     -
: 199 0760 |       BAS$$UNWIND (.FMP);
: 200 0761 |       PREV_FMP = .FMP [BSFSA_SAVED_FP];
: 201 0762 |
: 202 0763 |       IF (.PREV_FMP [BSFSA_HANDLER] NEQA BAS$HANDLER)
: 203 0764 |         THEN
: 204 0765 |         *
: 205 0766 |         The previous frame is not a BASIC frame. This is unreasonable
: 206 0767 |         since GOSUBs should only be callable from inside a BASIC main
: 207 0768 |         procedure.
: 208 0769 |         -
: 209 0770 |           BAS$$STOP (BAS$K_RETWITGOS);
: 210 0771 |
: 211 0772 |           FMP = .PREV_FMP;
: 212 0773 |           END;
: 213 0774 |
: 214 0775 |         *
: 215 0776 |         Make sure this is a DEF frame.
: 216 0777 |         -
: 217 0778 |
: 218 0779 |         CASE .FMP [BSFSB_PROC_CODE] FROM BSFSK_PROC_MAIN TO BSFSK_PROC_IOL OF
: 219 0780 |           SET
: 220 0781 |             [BSFSK_PROC_ONER] :
: 221 0782 |               BAS$$STOP (BAS$K_ERRTRANE);
: 222 0783 |
: 223 0784 |             [BSFSK_PROC_DEFS] :
: 224 0785 |               BEGIN
: 225 0786 |                 0
: 226 0787 |               END;
: 227 0788 |
: 228 0789 |             [BSFSK_PROC_MAIN, BSFSK_PROC_SUB, BSFSK_PROC_DEF] :
: 229 0790 |               BAS$$STOP (BAS$K_FNEWITFON);
: 230 0791 |
: 231 0792 |             [INRANGE, OTRANGE] :
: 232 0793 |               BAS$$STOP (BAS$K_PROLOSSOR);
: 233 0794 |
: 234 0795 |             TES;
: 235 0796 |
: 236 0797 |         *
: 237 0798 |         Check to be sure that this is the correct exit. This should
: 238 0799 |         only fail if the user branches from one DEF* into the body of
: 239 0800 |         another.
: 240 0801 |         -
: 241 0802 |
: 242 0803 |         IF (.FMP [BSFSA_INIT_ARG] NEQA .ARGLIST)
: 243 0804 |           THEN
: 244 0805 |         *

```

```

: 245 0806 2 | The argument lists are not at the same address. This exit must not
: 246 0807 2 | correspond to the entry. Signal an error.
: 247 0808 2 |
: 248 0809 2 |     BAS$$STOP (BAS$$K_FNEWITFUN);
: 249 0810 2 |
: 250 0811 2 |     +
: 251 0812 2 |     Deallocate any temporary string storage.
: 252 0813 2 |
: 253 0814 2 |
: 254 0815 2 |     INCR COUNTER FROM 1 TO .ARGLIST [BAS$$L_IN_NO_TST] DO
: 255 0816 2 |     STR$FREE1_DX_R4 (BSF$A_TEMP_STG [(COUNTER - 1)*2]);
: 256 0817 2 |
: 257 0818 2 |     +
: 258 0819 2 |     Deallocate local dynamic strings.
: 259 0820 2 |
: 260 0821 2 |
: 261 0822 2 |     INCR COUNTER FROM 1 TO .ARGLIST [BAS$$W_IN_NO_DST] DO
: 262 0823 2 |     STR$FREE1_DX_R4 (.FMP [BSF$A_STR_DESC] + (2*%UPVAL*(COUNTER - 1)));
: 263 0824 2 |
: 264 0825 2 |     +
: 265 0826 2 |     All done. The 'RET' instruction done by the compiled code
: 266 0827 2 |     will cut back the stack, so we don't need to do it here.
: 267 0828 2 |
: 268 0829 2 |     FP = .FMP;
: 269 0830 2 |     RETURN;
: 270 0831 1 |     END;

```

! of BASSEND\_DFS\_R8

```

.TITLE BASSEND_DFS
.IDENT \1-004\

.EXTRN BAS$$STOP, STR$FREE1_DX_R4
.EXTRN BAS$$UNWIND, BAS$HANDLER
.EXTRN BAS$$K_RETWITGOS
.EXTRN BAS$$K_PROLOSSOR
.EXTRN BAS$$K_NOTIMP, BAS$$K_FNEWITFUN
.EXTRN BAS$$K_ERRTRANE

.PSECT _BAS$CODE, NOWRT, SHR, PIC, 2

```

```

57          50 D0 00000 BASSEND_DFS_R8::
55          5D D0 00003      MOVCL  R0, R7          : 0692
06          E5 A5 91 00006 1$:  MOVCL  FP, FMP          : 0752
                    29 12 0000A      CMPBL  -27(FMP), #6      : 0754
                    55 DD 0000C      BNEQ   3$
00000000G 00          01 FB 0000E      PUSHL  FMP          : 0760
                    52          0C A5 D0 00015      CALLS  #1, BAS$$UNWIND
                    50 00000000G 00 9E 00019      MOVCL  12(FMP), PREV_FMP : 0761
                    50          62 D1 00020      MOVAB  BAS$HANDLER, R0  : 0763
                    08 13 00023      CML    (PREV_FMP), R0
                    7E          00G 8F 9A 00025      BEQL   2$
00000000G 00          01 FB 00029      MOVZBL #BAS$$K_RETWITGOS, -(SP) : 0770
                    55          52 D0 00030 2$:  CALLS  #1, BAS$$STOP
                    D1 11 00033      MOVCL  PREV_FMP, FMP    : 0772
001C          07          01          E5 A5 8F 00035 3$:  BRB    1$              : 0754
                    0010          001C          001C          0003A 4$:  CASEB  -27(FMP), #1, #7  : 0779

```



0010	0016	0010	0027	00042			
		7E	00G 8F 9A 0004A 58:	MOVZBL	#BASSK_PROLOSSOR, -(SP)		0794
		7E	00G 8F 9A 00050 68:	BRB	88		0783
		7E	00G 8F 9A 00056 78:	MOVZBL	#BASSK_FNEWITFUN, -(SP)		0791
	00000000G	00	01 FB 0005A 88:	CALLS	#1, BASS\$STOP		
		57	DB A5 D1 00061 98:	CMPL	-40(FMP), ARGLIST		0803
		7E	00G 8F 9A 00067	BEQL	108		
	00000000G	00	01 FB 0006B	MOVZBL	#BASSK_FNEWITFUN, -(SP)		0809
			56 D4 00072 108:	CALLS	#1, BASS\$STOP		
			OF 11 00074	CLRL	COUNTER		0816
	50	56	01 78 00076 118:	BRB	128		
		50	F8 A940 DE 0007A	ASHL	#1, COUNTER, R0		
			00 16 0007F	MOVAL	-8(BSF\$A TEMP STG)[R0], R0		
	EC	56	30 A7 F3 00085 128:	JSB	STR\$FREE1 DX_R4		
		57	28 A7 3C 0008A	AOBLEQ	48(ARGLIST), COUNTER, 118		
			56 D4 0008E	MOVZWL	40(ARGLIST), R7		0822
			0E 11 00090	CLRL	COUNTER		0823
		50	EO B546 7E 00092 138:	BRB	148		
		50	08 C2 00097	MOVAQ	@-32(FMP)[COUNTER], R0		
			00 16 0009A	SUBL2	#8, R0		
	EE	56	57 F3 000A0 148:	JSB	STR\$FREE1 DX_R4		
		5D	55 D0 000A4	AOBLEQ	R7, COUNTER, -138		
			05 000A7	MOVL	FMP, FP		0829
				RSB			0831

: Routine Size: 168 bytes, Routine Base: \_BASS\$CODE + 0000

: 271	0832	1	
: 272	0833	1	END
: 273	0834	1	
: 274	0835	0	ELUDOM

PSECT SUMMARY

Name	Bytes	Attributes
_BASS\$CODE	168	NOVEC, NOWRT, RD, EXE, SHR, LCL, REL, CON, PIC, ALIGN(2)

COMMAND QUALIFIERS

:  
: BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/NOTRACE/LIS=LISS:BASENDDFS/OBJ=OBJ\$:BASENDDFS MSRCS:BASENDDFS/UPDATE=(ENMS:BASENDDFS  
: )  
:

: Size: 168 code + 0 data bytes  
: Run Time: 00:06.1  
: Elapsed Time: 00:16.1  
: Lines/CPU Min: 8226  
: Lexemes/CPU-Min: 29349  
: Memory Used: 70 pages  
: Compilation Complete

0022 AH-BT13A-SE  
VAX/VMS V4.0

DIGITAL EQUIPMENT CORPORATION  
CONFIDENTIAL AND PROPRIETARY

BASEDDFS  
LIS

BASEROR  
LIS

BASEDDDF  
LIS

BASEDIT  
LIS

BASEND  
LIS

BASEDUP  
LIS

BASEMJP  
LIS

BASEDGSB  
LIS

BASERTXT  
LIS