

[illegible]

— 32 —

Val

[illegible]

```
IIIIII  NN  NN  IIIII  88888888  IIIII  TTTTTTTTTT
IIIIII  NN  NN  IIIII  88888888  IIIII  TTTTTTTTTT
  II    NN  NN  II     88      88    II     TT
  II    NN  NN  II     88      88    II     TT
  II    NNNN  NN  II     88      88    II     TT
  II    NNNN  NN  II     88888888  II     TT
  II    NN  NN  II     88888888  II     TT
  II    NN  NN  II     88      88    II     TT
  II    NN  NN  II     88      88    II     TT
  II    NN  NN  II     88      88    II     TT
  II    NN  NN  IIIII  88888888  IIIII  TT
IIIIII  NN  NN  IIIII  88888888  IIIII  TT
IIIIII
```

```
LL      IIIII  SSSSSSSS
LL      IIIII  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
LLLLLLLLLL  IIIII  SSSSSSSS
LLLLLLLLLL  IIIII  SSSSSSSS
```



```
1 0001 0 MODULE INIBIT (
2 0002 0 LANGUAGE (BLISS32),
3 0003 0 IDENT = 'V04-000'
4 0004 0 ) =
5 0005 1 BEGIN
6 0006 1
7 0007 1
8 0008 1 *****
9 0009 1 *
10 0010 1 * COPYRIGHT (c) 1978, 1980, 1982, 1984 BY
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27 0027 1 *
28 0028 1 *
29 0029 1 *****
30 0030 1
31 0031 1 ++
32 0032 1
33 0033 1 FACILITY: INIT Utility Structure Level 1
34 0034 1
35 0035 1 ABSTRACT:
36 0036 1
37 0037 1 This routine initializes the contents of the volume storage bitmap.
38 0038 1
39 0039 1 ENVIRONMENT:
40 0040 1
41 0041 1 STARLET operating system, including privileged system services
42 0042 1 and internal exec routines.
43 0043 1
44 0044 1 --
45 0045 1
46 0046 1
47 0047 1 AUTHOR: Andrew C. Goldstein, CREATION DATE: 13-Nov-1977 14:37
48 0048 1
49 0049 1 MODIFIED BY:
50 0050 1
51 0051 1 V02-003 LMP0002 L. Mark Pilant 11-Nov-1981 13:15
52 0052 1 Fix bitmap allocation when a large number of blocks are
53 0053 1 to be allocated.
54 0054 1
55 0055 1 V02-002 ACG0191 Andrew C. Goldstein, 1-Apr-1981 10:33
56 0056 1 Fix index file allocation at end of volume
57 0057 1
```


INIBIT
V04-000

C 2
16-Sep-1984 01:43:57 VAX-11 Bliss-32 V4.0-742 Page 2
14-Sep-1984 12:35:13 DISK\$VMSMASTER:[INIT.SRC]INIBIT.B32;1 (1)

```
: 58      0058 1 |      V0101  ACG0069      Andrew C. Goldstein,   9-Oct-1979  16:58
: 59      0059 1 |      Remove device data table
: 60      0060 1 |
: 61      0061 1 |      V0100  ACG00001      Andrew C. Goldstein, 10-Oct-1978  21:27
: 62      0062 1 |      Previous revision history moved to [INIT.SRC]INIT.REV
: 63      0063 1 |      **
: 64      0064 1 |
: 65      0065 1 |
: 66      0066 1 | LIBRARY 'SYSS$LIBRARY:LIB.L32';
: 67      0067 1 | REQUIRE 'SRC$:INIDEF.B32';
: 68      0358 1 | REQUIRE 'LIBD$: [VMSLIB.OBJ]INITMSG.B32';
```

IN
VO

```

70 0490 1 GLOBAL ROUTINE INIT_BITMAP : NOVALUE =
71 0491 1
72 0492 1 ++
73 0493 1
74 0494 1 FUNCTIONAL DESCRIPTION:
75 0495 1
76 0496 1 This routine initializes the contents of the volume storage bitmap.
77 0497 1
78 0498 1
79 0499 1 CALLING SEQUENCE:
80 0500 1 INIT_BITMAP ()
81 0501 1
82 0502 1 INPUT PARAMETERS:
83 0503 1 NONE
84 0504 1
85 0505 1 IMPLICIT INPUTS:
86 0506 1 device data table
87 0507 1 allocation table
88 0508 1
89 0509 1 OUTPUT PARAMETERS:
90 0510 1 NONE
91 0511 1
92 0512 1 IMPLICIT OUTPUTS:
93 0513 1 NONE
94 0514 1
95 0515 1 ROUTINE VALUE:
96 0516 1 NONE
97 0517 1
98 0518 1 SIDE EFFECTS:
99 0519 1 storage bitmap file written
100 0520 1
101 0521 1 --
102 0522 1
103 0523 2 BEGIN
104 0524 2
105 0525 2 BUILTIN
106 0526 2 ROT;
107 0527 2
108 0528 2 LOCAL
109 0529 2 BLOCK_COUNT,
110 0530 2 MAP_LBN,
111 0531 2 PREV_LBN,
112 0532 2 NEXT_LBN,
113 0533 2 INDEX,
114 0534 2 BIT_COUNT,
115 0535 2 MAP_VBN,
116 0536 2 BIT_POS,
117 0537 2 BIT_IDX;
118 0538 2
119 0539 2 EXTERNAL
120 0540 2 INIT_OPTIONS : BITVECTOR,
121 0541 2 ALLOC_TABLE_CNT : VECTOR,
122 0542 2 ALLOC_TABLE_LBN : VECTOR,
123 0543 2 BITMAP_CNT,
124 0544 2 BITMAP_LBN,
125 0545 2 VOLUME_SIZE,
126 0546 2 CLUSTER,

! number of blocks in storage map
! LBN of current bitmap block
! start LBN + 1 of last entry processed
! start LBN of current allocation table entry
! table index of current entry
! number of bits to clear in storage map
! relative block in storage map to use
! bit position of start of area
! index into bitmap buffer

! command option flags
! allocation block count table
! allocation LBN table
! block count of storage map file
! starting LBN of storage map file
! size of volume rounded to next cluster
! volume cluster factor
```



```
127 0547 2          BUFFER      : BBLOCK,      ! I/O buffer
128 0548 2          DEVICE_CHAR : BBLOCK;      ! device characteristics
129 0549 2
130 0550 2  EXTERNAL LITERAL
131 0551 2          ALLOC_MAX    : UNSIGNED (16); ! total number of entries in allocation table
132 0552 2
133 0553 2  EXTERNAL ROUTINE
134 0554 2          CHECKSUM2,      ! compute block checksum
135 0555 2          WRITE_BLOCK;    ! write block on volume
136 0556 2
137 0557 2
138 0558 2  ! Build the storage control block and write it out.
139 0559 2  !
140 0560 2
141 0561 2  CH$FILL (0, 512, BUFFER);
142 0562 2
143 0563 2  IF .INIT_OPTIONS[OPT_STRUCTURE1]
144 0564 2  THEN
145 0565 2      BEGIN
146 0566 2          MAP BUFFER : VECTOR;
147 0567 2          BLOCK_COUNT = .BITMAP_CNT - 1;
148 0568 2          IF .BLOCK_COUNT GTRU T26
149 0569 2          THEN BLOCK_COUNT = 0;
150 0570 2
151 0571 2          (BUFFER+3)<0,8> = .BLOCK_COUNT;
152 0572 2          INCR J FROM 0 TO .BLOCK_COUNT - 1
153 0573 2          DO BUFFER[J+1] = 4096;
154 0574 2          BUFFER[BLOCK_COUNT+1] = ROT (.VOLUME_SIZE, 16);
155 0575 2          END
156 0576 2
157 0577 2  ELSE
158 0578 2      BEGIN
159 0579 2          BUFFER[SCB$W_STRUCLEV] = SCB$C_LEVEL2 + 1;
160 0580 2          BUFFER[SCB$W_CLUSTER] = .CLUSTER;
161 0581 2          BUFFER[SCB$L_VOLSIZE] = .DEVICE_CHAR[DIB$L_MAXBLOCK];
162 0582 2          BUFFER[SCB$L_BLKSIZE] = (.DEVICE_CHAR[DIB$B_SECTORS]
163 0583 2          * .DEVICE_CHAR[DIB$B_TRACKS]
164 0584 2          * .DEVICE_CHAR[DIB$W_CYLINDERS])
165 0585 2          / .DEVICE_CHAR[DIB$L_MAXBLOCK];
166 0586 2          BUFFER[SCB$L_SECTORS] = .DEVICE_CHAR[DIB$B_SECTORS];
167 0587 2          BUFFER[SCB$L_TRACKS] = .DEVICE_CHAR[DIB$B_TRACKS];
168 0588 2          BUFFER[SCB$L_CYLINDER] = .DEVICE_CHAR[DIB$W_CYLINDERS];
169 0589 2
170 0590 2          CHECKSUM2 (BUFFER, $BYTEOFFSET (SCB$W_CHECKSUM));
171 0591 2          END;
172 0592 2
173 0593 2  WRITE_BLOCK (.BITMAP_LBN, BUFFER);
174 0594 2
175 0595 2  ! Now write the contents of the bitmap, marking off the areas listed in the
176 0596 2  ! allocation table. To save disk thrashing, we process the table entries
177 0597 2  ! in LBN order.
178 0598 2  !
179 0599 2
180 0600 2  MAP_LBN = .BITMAP_LBN + 1;
181 0601 2  CH$FILL (-1, 512, BUFFER);
182 0602 2  PREV_LBN = 0;
183 0603 2  WHILE 1 DO
```



```
184 0604 3 BEGIN
185 0605 3
186 0606 3 ! Search the allocation table for the lowest LBN which is greater than the
187 0607 3 ! one previously processed.
188 0608 3
189 0609 3
190 0610 3 NEXT_LBN = -1;
191 0611 3 INCR J FROM 0 TO ALLOC_MAX-1 DO
192 0612 4 BEGIN
193 0613 4 IF .ALLOC_TABLE_LBN[J] GEQU .PREV_LBN
194 0614 4 AND .ALLOC_TABLE_LBN[J] LSSU .NEXT_LBN
195 0615 4 THEN
196 0616 5 BEGIN
197 0617 5 NEXT_LBN = .ALLOC_TABLE_LBN[J];
198 0618 5 INDEX = .J;
199 0619 4 END;
200 0620 3 END;
201 0621 3 IF .NEXT_LBN EQL -1 THEN EXITLOOP; ! done all entries
202 0622 3 PREV_LBN = .NEXT_LBN + 1;
203 0623 3
204 0624 3 ! For this group of blocks, compute the bit count and block and bit offset
205 0625 3 ! from the current block in the storage map.
206 0626 3
207 0627 3
208 0628 3 BIT_COUNT = .ALLOC_TABLE_CNT[INDEX] / .CLUSTER;
209 0629 3 BIT_POS = .NEXT_LBN / .CLUSTER - (.MAP_LBN - .BITMAP_LBN - 1) * 4096;
210 0630 3
211 0631 3 ! Now mark off the blocks represented by the allocated entry. This is coded
212 0632 3 ! one bit at a time to keep the code simple; the areas are not large enough
213 0633 3 ! in general to warrant more intelligent code. If the bit position points
214 0634 3 ! off the end of the current block, pass blocks until its doesn't.
215 0635 3
216 0636 3
217 0637 3 UNTIL .BIT_POS LSSU 4096 DO
218 0638 4 BEGIN
219 0639 4 WRITE_BLOCK(.MAP_LBN, BUFFER);
220 0640 4 CH$FICL (-1, 512, BUFFER);
221 0641 4 MAP_LBN = .MAP_LBN + 1;
222 0642 4 BIT_POS = .BIT_POS - 4096;
223 0643 3 END;
224 0644 3
225 0645 3 DECR J FROM .BIT_COUNT TO 1 DO
226 0646 4 BEGIN
227 0647 4 MAP_BUFFER : BITVECTOR;
228 0648 4
229 0649 4 BUFFER[.BIT_POS] = 0;
230 0650 4 BIT_POS = .BIT_POS + 1;
231 0651 4
232 0652 4 IF .BIT_POS GEQU 4096
233 0653 4 THEN
234 0654 5 BEGIN
235 0655 5 WRITE_BLOCK(.MAP_LBN, BUFFER);
236 0656 5 CH$FICL (-1, 512, BUFFER);
237 0657 5 MAP_LBN = .MAP_LBN + 1;
238 0658 5 BIT_POS = 0;
239 0659 4 END;
240 0660 3 END;
```


INIBIT
V04-000

G 2
16-Sep-1984 01:43:57
14-Sep-1984 12:35:13

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DISK\$VMSMASTER:[INIT.SRC]INIBIT.B32;1 Page 6
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```

: 241      0661 3
: 242      0662 2      END;
: 243      0663 2      ! end of allocation scan loop
: 244      0664 2      ! Finally flush the last buffer and zero any additional blocks present
: 245      0665 2      ! in the storage map due to cluster roundup.
: 246      0666 2      !
: 247      0667 2
: 248      0668 2      WRITE BLOCK (.MAP_LBN, BUFFER);
: 249      0669 2      MAP_LBN = .MAP_LBN + 1;
: 250      0670 2      CH$FILL (0, 512, BUFFER);
: 251      0671 2
: 252      0672 2      UNTIL .MAP_LBN GEQU .BITMAP_LBN + .BITMAP_CNT DO
: 253      0673 2      BEGIN
: 254      0674 3      WRITE BLOCK (.MAP_LBN, BUFFER);
: 255      0675 3      MAP_LBN = .MAP_LBN + 1;
: 256      0676 2      END;
: 257      0677 2
: 258      0678 1      END;
                                ! end of routine INIT_BITMAP
```

.TITLE INIBIT
.IDENT \V04-000\

.EXTRN INIT_OPTIONS, ALLOC_TABLE_CNT
.EXTRN ALLOC_TABLE_LBN
.EXTRN BITMAP_CNT, BITMAP_LBN
.EXTRN VOLUME_SIZE, CLUSTER
.EXTRN BUFFER, DEVICE_CHAR
.EXTRN ALLOC_MAX, CHECKSUM2
.EXTRN WRITE_BLOCK

.PSECT \$CODE\$,NOWRT,2

.ENTRY INIT_BITMAP, Save R2,R3,R4,R5,R6,R7,R8,R9,- ; 0490
R10,R11
SUBL2 #4, SP
MOVC5 #0, (SP), #0, #512, BUFFER ; 0561

TSTB INIT_OPTIONS+3 ; 0563
BGEQ 4\$
SUBL3 #1, BITMAP_CNT, BLOCK_COUNT ; 0567
CMPL BLOCK_COUNT, #126 ; 0568
BLEQU 1\$
CLRL BLOCK_COUNT ; 0569
MOVB BLOCK_COUNT, BUFFER+3 ; 0571
MNEGL #1, J ; 0572
BRB 3\$
MOVZWL #4096, BUFFER+4[J] ; 0573
AOBLSS BLOCK_COUNT, J, 2\$
ROTL #16, VOLUME_SIZE, BUFFER+4[BLOCK_COUNT] ; 0574
BRB 5\$; 0563
MOVW #513, BUFFER ; 0579
MOVW CLUSTER, BUFFER+2 ; 0580
MOVL DEVICE_CHAR+112, BUFFER+4 ; 0581
MOVZBL DEVICE_CHAR+8, R0 ; 0583
MOVZBL DEVICE_CHAR+9, R1
MULL2 R1, R0

```

                                OFFC 00000
0200 8F      00      5E      04 C2 00002
                6E      00 2C 00005
                0000G CF      0000C
                0000G CF 95 0000F
                        32 18 00013
                50      0000G CF 01 C3 00015
                0000007E 8F 50 D1 0001B
                        02 1B 00022
                        50 D4 00024
                        0000G CF 50 90 00026 1$:
                        51 01 CE 0002B
                        08 11 0002E
                0000GCF41 1000 8F 3C 00030 2$:
                F4      50 F2 00038 3$:
                0000GCF40 0000G CF 10 9C 0003C
                        55 11 00045
                        0000G CF 0201 8F B0 00047 4$:
                        0000G CF 0000G CF B0 0004E
                        0000G CF 0000G CF D0 00055
                        50      0000G CF 9A 0005C
                        51      0000G CF 9A 00061
                        50      51 C4 00066
```


INIBIT
V04-000

H 2
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DISK\$VMSMASTER:[INIT.SRC]INIBIT.B32;1

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				52	0000G	CF	3C	00069	MOVZWL	DEVICE_CHAR+10, R2	0584		
				50			52	C4	0006E	MULL2	R2, R0	0585	
		0000G	CF	50	0000G	CF	C7	00071	DIVL3	DEVICE_CHAR+112, R0, BUFFER+8	0586		
					0000G	CF	9A	00079	MOVZBL	DEVICE_CHAR+8, BUFFER+12	0587		
					0000G	CF	9A	00080	MOVZBL	DEVICE_CHAR+9, BUFFER+16	0588		
					0000G	CF	3C	00087	MOVZWL	DEVICE_CHAR+10, BUFFER+20	0590		
				7E	01FE	8F	3C	0008E	MOVZWL	#510, =(SP)	0593		
					0000G	CF	9F	00093	PUSHAB	BUFFER	0600		
					0000G	CF	02	FB	00097	CALLS	#2, CHECKSUM2	0601	
					0000G	CF	9F	0009C	PUSHAB	BUFFER	0602		
					0000G	CF	DD	000A0	PUSHL	BITMAP_LBN	0610		
					0000G	CF	02	FB	000A4	CALLS	#2, WRITE_BLOCK	0613	
					0000G	CF	01	C1	000A9	ADDL3	#1, BITMAP_LBN, MAP_LBN	0614	
0200	8F	FF	56	8F			00	2C	000AF	MOVC5	#0, (SP), #-1, #512, BUFFER	0617	
					0000G	CF			000B7			0618	
							6E	D4	000BA	CLRL	PREV_LBN	0622	
							01	CE	000BC	MNEGL	#1, NEXT_LBN	0628	
							01	CE	000BF	MNEGL	#1, J	0629	
							16	11	000C2	BRB	8\$	0637	
							40	D0	000C4	MOVL	ALLOC_TABLE_LBN[J], R1	0639	
					0000G	CF	51	D1	000CA	CMPL	R1, PREV_LBN	0641	
							0B	1F	000CD	BLSSU	8\$	0642	
							51	D1	000CF	CMPL	R1, NEXT_LBN	0645	
							06	1E	000D2	BGEQU	8\$	0649	
							51	D0	000D4	MOVL	R1, NEXT_LBN	0650	
							50	D0	000D7	MOVL	J, INDEX	0652	
							8F	F3	000DA	AOBLEQ	#ALLOC_MAX-1, J, 7\$	0655	
							59	D1	000E2	CMPL	NEXT_LBN, #-1	0656	
							03	12	000E9	BNEQ	9\$	0657	
							0084	31	000EB	BRW	15\$	0658	
							01	A9	9E	000EE	9\$:	0659	
							0000G	CF	C7	000F2	MOVAB	1(R9), PREV_LBN	0660
							0000G	CF	C7	000FB	DIVL3	CLUSTER, ALLOC_TABLE_CNT[INDEX], BIT_COUNT	0661
							0000G	CF	C3	00101	DIVL3	CLUSTER, NEXT_LBN, RT	0662
							0C	78	00107	SUBL3	BITMAP_LBN, MAP_LBN, R0	0663	
							50	C2	0010B	ASHL	#12, R0, R0	0664	
							51			SUBL2	R0, R1	0665	
							58	C1	9E	0010E	MOVAB	4096(R1), BIT_POS	0666
							58	D1	00113	CMPL	BIT_POS, #4096	0667	
							1F	1F	0011A	BLSSU	11\$	0668	
							0000G	CF	9F	0011C	PUSHAB	BUFFER	0669
							56	DD	00120	PUSHL	MAP_LBN	0670	
							02	FB	00122	CALLS	#2, WRITE_BLOCK	0671	
							00	2C	00127	MOVC5	#0, (SP), #-1, #512, BUFFER	0672	
							0000G	CF		0012F		0673	
							56	D6	00132	INCL	MAP_LBN	0674	
							58	C8	9E	00134	MOVAB	-4096(R8), BIT_POS	0675
							D8	11	00139	BRB	10\$	0676	
							01	AA	9E	0013B	MOVAB	1(R10), J	0677
							2B	11	0013F	BRB	14\$	0678	
							58	E5	00141	BBCC	BIT_POS, BUFFER, 13\$	0679	
							58	D6	00147	INCL	BIT_POS	0680	
							58	D1	00149	CMPL	BIT_POS, #4096	0681	
							1A	1F	00150	BLSSU	14\$	0682	
							0000G	CF	9F	00152	PUSHAB	BUFFER	0683
							56	DD	00156	PUSHL	MAP_LBN	0684	
							02	FB	00158	CALLS	#2, WRITE_BLOCK	0685	
0200	8F	FF	8F				00	2C	0015D	MOVC5	#0, (SP), #-1, #512, BUFFER	0686	

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COMMAND QUALIFIERS

INIBIT
V04-000

J 2
16-Sep-1984 01:43:57
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VAX-11 Bliss-32 V4.0-742
DISK\$VMSMASTER:[INIT.SRC]INIBIT.B32;1 Page 9 (2)

; BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/LIS=LIS\$:INIBIT/OBJ=OBJ\$:INIBIT MSRC\$:INIBIT/UPDATE=(ENHS:INIBIT)

; Size: 422 code + 0 data bytes
; Run Time: 00:14.5
; Elapsed Time: 00:29.3
; Lines/CPU Min: 2827
; Lexemes/CPU-Min: 34999
; Memory Used: 150 pages
; Compilation Complete

0187 AH-BT13A-SE
VAX/VMS V4.0

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