


```

LL      NN      NN      KK      KK      SSSSSSSS  TTTTTTTTTT  AAAAAA  TTTTTTTTTT  SSSSSSSS  000000
LL      NN      NN      KK      KK      SSSSSSSS  TTTTTTTTTT  AAAAAA  TTTTTTTTTT  SSSSSSSS  000000
LL      NN      NN      KK      KK      SS        TT        AA        AA        SS        00        00
LL      NN      NN      KK      KK      SS        TT        AA        AA        SS        00        00
LL      NN      NN      KK      KK      SS        TT        AA        AA        SS        00        00
LL      NNNN     NN      KK      KK      SS        TT        AA        AA        SS        00        00
LL      NNNN     NN      KK      KK      SS        TT        AA        AA        SS        00        00
LL      NN      NN      KKKKKK  KK      SSSSSS    TT        AA        AA        SSSSSS    00        00
LL      NN      NN      KKKKKK  KK      SSSSSS    TT        AA        AA        SSSSSS    00        00
LL      NN      NNNN     KK      KK      SS        TT        AAAAAAAAAA  TT        SS        00        00
LL      NN      NNNN     KK      KK      SS        TT        AAAAAAAAAA  TT        SS        00        00
LL      NN      NN      KK      KK      SS        TT        AA        AA        SS        00        00
LL      NN      NN      KK      KK      SS        TT        AA        AA        SS        00        00
LLLLLLLLLL  NN      NN      KK      KK      SSSSSSSS  TT        AA        AA        SSSSSSSS  000000
LLLLLLLLLL  NN      NN      KK      KK      SSSSSSSS  TT        AA        AA        SSSSSSSS  000000

```

```

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
LLLLLLLLLL  IIIIII  SSSSSSSS
LLLLLLLLLL  IIIIII  SSSSSSSS

```

```
1 0001 0 module lnk_statsout ! LINKER STATISTICS ROUTINE
2 0002 0 (ident = 'V04-000'
3 0003 0 ,addressing_mode
4 0004 0 (external = general
5 0005 0 ,nonexternal = long_relative
6 0006 0 ) =
7 0007 0
8 0008 1 begin
9 0009 1
10 0010 1 *****
11 0011 1 *
12 0012 1 * COPYRIGHT (c) 1978, 1980, 1982, 1984 BY *
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29 0029 1 *
30 0030 1 *
31 0031 1 *****
32 0032 1 ++
33 0033 1 FACILITY: LINKER
34 0034 1
35 0035 1 ABSTRACT: ROUTINE DOES ALL THE WORK OF GATHERING AND OUTPUTTING STATISTICS OF THE LINK
36 0036 1
37 0037 1
38 0038 1 ENVIRONMENT: STARLET NATIVE MODE
39 0039 1
40 0040 1 AUTHOR: T.J. PORTER, CREATION DATE: 27-JUN-77
41 0041 1
42 0042 1 MODIFIED BY:
43 0043 1
44 0044 1 V03-002 ADE0001 Alan D. Eldridge 14-Aug-1984
45 0045 1 Only output the options file contents if a full map
46 0046 1 is requested.
47 0047 1
48 0048 1 V03-001 JWT0099 Jim Teague 14-Mar-1983
49 0049 1 New CLI interface.
50 0050 1
51 0051 1 --
52 0052 1
53 0053 1 TABLE OF CONTENTS:
54 0054 1
55 0055 1 forward routine
56 0056 1 lnk$statsout : novalue; ! OUTPUT THE STATISTICS
57 0057 1 !
```

```

58 0058 1 : INCLUDE FILES:
59 0059 1
60 0060 1 library 'LIBL32';           ! GET PROCESS HEADER DEFINITIONS
61 0061 1
62 0062 1 require 'PREFIX';         ! USEFUL MACROS AND VARIABLES
63 0177 1
64 0178 1 library 'DATBAS';         ! LINKER DATA STRUCTURES
65 0179 1
66 0180 1 sd ('$LINE');
67 0181 1
68 0 82 1 : MACROS:
69 0183 1
70 0184 1 macro
71 0185 1     textadr = 0,0,32,0%,
72 0186 1     fltsadr = 1,0,32,0%,
73 0187 1     cputadr = 2,0,32,0%,
74 0188 1     stimadr = 3,0,32,0%;
75 0189 1
76 0190 1 : EQUATED SYMBOLS:
77 0191 1
78 0192 1 literal
79 0193 1     bufferleng = 132;       ! OUTPUT LINE BUFFER
80 0194 1
81 0195 1 : EXTERNAL REFERENCES:
82 0196 1
83 0197 1 external
84 0198 1     lnk$gl_optextp : ref block [, byte], ! POINTER TO OPTIONS TEXT
85 0199 1     lnk$gl_ctlmsk : block [, byte],    ! LINK CONTROL FLAGS
86 0200 1     lnk$gl_minaddr,                   ! LOWEST ADDRESS ALLOCATED
87 0201 1     lnk$gl_memlhd,                       ! FREE MEMORY LISTHEAD
88 0202 1     lnk$gl_cpustim,                       ! CPU TIME AT START
89 0203 1     lnk$gl_futlsrch,                     ! NUMBER OF SYMBOLS SEARCHED FOR IN THE WRONG LIBRARY
90 0204 1     lnk$gl_librecs,                     ! NUMBER OF OBJ RECORDS READ FROM LIBRARIES
91 0205 1     lnk$gl_nmodsexp,                    ! NUMBER MODULES EXTRACTED EXPLICITLY
92 0206 1     lnk$gl_nmodsrch,                    ! NUMBER OF MODULES EXTRACTED TO RESOLVE SYMBOLS
93 0207 1     lnk$gl_objrecs,                     ! TWO PASS COUNT OF OBJECT RECORDS READ
94 0208 1     lnk$gw_dbgrecs : word,                ! NUMBER OF DEBUG DATA RECORDS
95 0209 1     lnk$gl_dbgestim,                     ! NUMBER OF BYTES IN DEBUG RECORDS
96 0210 1     lnk$gw_dstvbn : word,              ! VBN OF DEBUG SYMBOL TABLE
97 0211 1     lnk$gw_dstblks : word,              ! NUMBER OF BLOCKS ALLOCATED
98 0212 1     lnk$gl_dstend,                     ! END ADDRESS IN THE DST
99 0213 1     lnk$gw_symrecs : word,            ! NUMBER OF GLOBAL SYMBOL TABLE RECORDS WRITTEN TO SEPARATE FILE
100 0214 1     lnk$gw_gstrecs : word,           ! NUMBER WRITTEN TO IMAGE FILE
101 0215 1     lnk$gq_startim,                  ! START TIME QUADWORD
102 0216 1     lnk$gq_endtim,                    ! END TIME QUADWORD
103 0217 1     lnk$gq_ps1stim,                  ! PASS 1 START TIME
104 0218 1     lnk$gq_alostim,                  ! ALLOCATION/RELOCATION START TIME
105 0219 1     lnk$gq_ps2stim,                  ! PASS 2 START TIME
106 0220 1     lnk$gq_mapstim,                  ! BULK OF MAP START TIME
107 0221 1     lnk$gq_stbstim,                  ! SYMBOL TABLE OUTPUT START TIME
108 0222 1     lnk$gl_ps1cput,                   ! CPU TIME AT START OF PASS 1
109 0223 1     lnk$gl_alocput,                   ! CPU TIME AT START OF ALLOCATION PHASE
110 0224 1     lnk$gl_ps2cput,                   ! CPU TIME AT START OF PASS 2
111 0225 1     lnk$gl_mapcput,                   ! CPU TIME AT START OF MAP OUTPUT
112 0226 1     lnk$gl_stbcput,                   ! CPU TIME AT START OF SYMBOL TABLE OUTPUT
113 0227 1     lnk$gl_ps1flts,                   ! PAGE FAULT COUNT AT START OF PASS 1
114 0228 1     lnk$gl_aloflts,                   ! PAGE FAULT COUNT AT START OF ALLOCATION PHASE

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: 115      0229 1      lnk$gl_ps2flts,      : PAGE FAULT COUNT AT START OF PASS 2
: 116      0230 1      lnk$gl_mapflts,      : PAGE FAULT COUNT AT START OF MAP OUTPUT
: 117      0231 1      lnk$gl_stbflts,      : PAGE FAULT COUNT AT START OF SYMBOL TABLE OUTPUT
: 118      0232 1      lnk$gl_spagflts,    : PAGE FAULT COUNT AT START OF THE LINK
: 119      0233 1      lnk$gl_endflts,    : PAGE FAULT COUNT AT END
: 120      0234 1      lnk$gl_endcput;    : CPU TIME AT END
: 121      0235 1
: 122      0236 1      external routine
: 123      0237 1      cli$get_value,
: 124      0238 1      lnk$calcelaps,      : ROUTINE TO DO THE QUADWORD ARITHMETIC
: 125      0239 1
: 126      0240 1      lnk$mapout;      : RETURNING ADDRESS OF THE NEGATIVE ('DELTA') ELAPSED TIME
: 127      0241 1
: 128      0242 1      external literal
: 129      0243 1      len$sc_mapline : wordlit,    : LENGTH OF MAP LINE
: 130      0244 1      lnk$sk_libblocks : short;    : NUMBER OF BLOCKS IN WINDOW OF A LIBRARY
: 131      0245 1
: 132      0246 1      literal
: 133      0247 1      phases = 9;      : NUMBER OF PHASES FOR WHICH THERE ARE STATISTICS
: 134      0248 1
: 135      0249 1      :
: 136      0250 1      : MODULE OWN STORAGE:
: 137      0251 1      :
: 138      0252 1      : own
: 139      0253 1      : command_desc : dynamic_descriptor;
: 140      0254 1      : psect
: 141      0255 1      : own = $split$(nopic, concatenate, local, noshare, noexecute, nowrite);
: 142      0256 1      : own
: 143      0257 1      phastahd1 : descriptor ('!50<Performance Indicators!>Page Faults      CPU Time      Elapsed Time'),
: 144      0258 1      phastahd2 : descriptor ('!50<!22*->!11*-*!8*-*!12*-*'),
: 145      0259 1      phastafmt : descriptor ('!50<!AS!>!11UL      !2ZL:!2ZL:!2ZL.!2ZL      !%T'),
: 146      0260 1      totaltim : descriptor ('Total run values:'),
: 147      0261 1      comandtim : descriptor ('      Command processing:'),
: 148      0262 1      pass1tim : descriptor ('      Pass 1:'),
: 149      0263 1      alloctim : descriptor ('      Allocation/Relocation:'),
: 150      0264 1      pass2tim : descriptor ('      Pass 2:'),
: 151      0265 1      maptim : descriptor ('      Map data after object module synopsis:'),
: 152      0266 1      stbtim : descriptor ('      Symbol table output:'),
: 153      P 0267 1      workset : descriptor (
: 154      0268 1      'Using a working set limited to !UL pages and !UL pages of data storage (excluding image)'),
: 155      0269 1      objrecs : descriptor ('!50<Total number object records read (both passes):!>!UL'),
: 156      P 0270 1      libreccs : descriptor (
: 157      0271 1      'of which !UL were in libraries and !UL were DEBUG data records containing !UL bytes'),
: 158      P 0272 1      dbgdata : descriptor ('!UL bytes of DEBUG data were written, starting at VBN !UW with !UW blocks allocate
: 159      0273 1      '),
: 160      0274 1      extrmods : descriptor ('!50<Number of modules extracted explicitly!> = !UL'),
: 161      0275 1      srchmods : descriptor ('      with !UL extracted to resolve undefined symbols'),
: 162      0276 1      futlsrch : descriptor ('!UL library searches were for symbols not in the library searched'),
: 163      0277 1      symrecs : descriptor ('A total of !UL global symbol table records was written'),
: 164      0278 1      phastatbl : blockvector [phases, 4] initial (
: 165      0279 1      0      , lnk$gl_spagflts, lnk$gl_cpustim, lnk$gq_startim,
: 166      0280 1      comandtim, lnk$gl_ps1flts, lnk$gl_ps1cput, lnk$gq_ps1stim,
: 167      0281 1      pass1tim, lnk$gl_aloflts, lnk$gl_alocput, lnk$gq_alostim,
: 168      0282 1      alloctim, lnk$gl_ps2flts, lnk$gl_ps2cput, lnk$gq_ps2stim,
: 169      0283 1      pass2tim, lnk$gl_mapflts, lnk$gl_mapcput, lnk$gq_mapstim,
: 170      0284 1      maptim, lnk$gl_sfbflts, lnk$gl_sfbcput, lnk$gq_sfbstim,
: 171      0285 1      stbtim, lnk$gl_endflts, lnk$gl_endcput, lnk$gq_endtim,

```

LNK_STATSOUT
V04=000

E 11
16-Sep-1984 00:33:36 VAX-11 Bliss-32 V4.0-742
12-Sep-1984 12:40:36 [LINKER.SRC]LNKSTATSO.B32;1

: 172 0286 1
: 173 0287 1
: 174 0288 1
: 175 0289 1
: 176 0290 1

0
totaltim,lnk\$gl_spagflts,lnk\$gl_cpustim,lnk\$gq_startim,
cvt2secs : initial (100),lnk\$gl_endflts,(lnk\$gl_endcput,(lnk\$gq_endtim),
cvtsecsmins : initial (60);

.....

```

178 0291 1 global routine lnk$statsout : novalue =      ! OUTPUT STATISTICS
179 0292 2     begin
180 0293 2
181 0294 2 ++
182 0295 2 FUNCTIONAL DESCRIPTION:
183 0296 2     THIS MODULE COMPUTES AND OUTPUTS TO THE MAP A GAGGLE OF THE STATISTICS
184 0297 2     ACCUMULATED BY THE LINKER AND THE SYSTEM DURING THE RUN
185 0298 2
186 0299 2 FORMAL PARAMETERS:
187 0300 2     NONE
188 0301 2
189 0302 2 IMPLICIT INPUTS:
190 0303 2     NONE
191 0304 2
192 0305 2 IMPLICIT OUTPUTS:
193 0306 2     NONE
194 0307 2
195 0308 2 ROUTINE VALUE:
196 0309 2     NONE
197 0310 2
198 0311 2 COMPLETION CODES:
199 0312 2     NONE
200 0313 2
201 0314 2 SIDE EFFECTS:
202 0315 2     NONE
203 0316 2
204 0317 2 --
205 0318 2 builtin
206 0319 2     ediv;
207 0320 2
208 0321 2 local
209 0322 2     buffer : ch$sequence (bufferleng),      ! OUTPUT LINE BUFFER
210 0323 2     outbufdesc : vector [2],                ! ITS DESCRIPTOR
211 0324 2     pagefaults,
212 0325 2     cputime : vector [2],
213 0326 2     secfrac,
214 0327 2     cpusecs : vector [2],
215 0328 2     cpumins : vector [2],
216 0329 2     cpuhours,
217 0330 2     worksetlim,
218 0331 2     memused : ref vector,
219 0332 2     dbgbytes,
220 0333 2     outlineleng : word;                    ! LENGTH OF FORMATTED LINE RETURNED BY FAO
221 0334 2
222 0335 2 outbufdesc [0] = bufferleng;                ! INITIALIZE FAO'S BUFFER
223 0336 2 outbufdesc [1] = buffer;                    ! DESCRIPTOR
224 0337 2
225 0338 2 cputime [1] = 0;
226 0339 2 cpusecs [1] = 0;
227 0340 2 cpumins [1] = 0;
228 0341 2
229 0342 2 lnk$mapout (buffer, 0);
230 0343 2 $fao (phastahd1, outlineleng, outbufdesc);
231 0344 2 lnk$mapout (buffer, .outline(leng));
232 0345 2
233 0346 2
234 0347 2

```

```
235 0348 $fao (phastahd2, outlineleng, outbufdesc);
236 0349 lnk$mapout (buffer, .outline[eng]);
237 0350
238 0351 incr i from 1 to phases - 1 do
239 0352
240 0353   if .phastatbl [.i, textadr] neq 0
241 0354   then
242 0355     begin
243 0356       pagefaults = ..phastatbl [.i, fltsadr] - ..phastatbl [.i - 1, fltsadr];
244 0357       cputime [0] = ..phastatbl [.i, cputadr] - ..phastatbl [.i - 1, cputadr];
245 0358       ediv (cvt2secs, cputime [0], cpusecs [0], secfrac);
246 0359       ediv (cvtsecsmins, cpusecs [0], cpumins [0], cpusecs [0]);
247 0360       ediv (cvtsecsmins, cpumins [0], cpuhours, cpumins [0]);
248 0361       $fao (phastafmt, outlineleng, outbufdesc, .phastatbl [.i, textadr], .pagefaults, .cpuhours,
249 0362         .cpumins [0], .cpusecs [0], .secfrac,
250 0363         lnk$calcelaps (.phastatbl [.i - 1, stimadr],
251 0364           .phastatbl [.i, stimadr]));
252 0365       lnk$mapout (buffer, .outline[eng]);
253 0366     end;
254 0367
255 0368 $adjwsl (pagcnt = 0, wsetlm = worksetlim);
256 0369 memused = lnk$gl_memlhd;
257 0370
258 0371 while .memused [0] neq 0 do
259 0372   memused = .memused [0];
260 0373
261 0374 memused = (memused [0] - .lnk$gl_minaddr + 511)/512;
262 0375 lnk$mapout (buffer, 0);
263 0376 $fao (workset, outlineleng, outbufdesc, .worksetlim, .memused);
264 0377 lnk$mapout (buffer, .outline[eng]);
265 0378 lnk$mapout (buffer, 0);
266 0379 $fao (objrecs, outlineleng, outbufdesc, .lnk$gl_objrecs);
267 0380 lnk$mapout (buffer, .outline[eng]);
268 0381 $fao (librecs, outlineleng, outbufdesc, .lnk$gl_librecs, .lnk$gw_dbgreccs, .lnk$gl_dbgestim);
269 0382 lnk$mapout (buffer, .outline[eng]);
270 0383
271 0384 if (dbgbytes = .lnk$gl_dstend) neq 0 and (.lnk$gl_ctlmsk [lnk$V_dbg] or .lnk$gl_ctlmsk [lnk$V_trace])
272 0385 then
273 0386   begin
274 0387     $fao (dbgdata, outlineleng, outbufdesc, .dbgbytes, .lnk$gw_dstvbn, .lnk$gw_dstblks);
275 0388     lnk$mapout (buffer, .outline[eng]);
276 0389   end;
277 0390
278 0391 lnk$mapout (buffer, 0);
279 0392 $fao (extrmods, outlineleng, outbufdesc, .lnk$gl_nmodsexp);
280 0393 lnk$mapout (buffer, .outline[eng]);
281 0394 $fao (srchmods, outlineleng, outbufdesc, .lnk$gl_nmodsrch);
282 0395 lnk$mapout (buffer, .outline[eng]);
283 0396 lnk$mapout (buffer, 0);
284 0397 $fao (futlsrch, outlineleng, outbufdesc, .lnk$gl_futlsrch);
285 0398 lnk$mapout (buffer, .outline[eng]);
286 0399 lnk$mapout (buffer, 0);
287 0400 $fao (symrecs, outlineleng, outbufdesc, (.lnk$gw_symrecs + .lnk$gw_gstreccs));
288 0401 lnk$mapout (buffer, .outline[eng]);
289 0402 lnk$mapout (buffer, 0);           ! SKIP A LINE
290 0403
291 0404 ! PRINT THE COMMAND LINE
```



```

292 0405 !
293 0406 begin
294 0407 local
295 0408     pchars,
296 0409     nchars,
297 0410     chars;
298 0411
299 0412 pchars = 0;
300 0413 cli$get_value(sd $line, command_desc);      ! Get command line from CLI
301 0414 chars = .command_desc [dsc$w_length];
302 0415
303 0416 while (.chars gtr 0) do
304 0417     begin
305 0418         nchars = min (.chars, len$c_mapline);
306 0419         lnk$mapout (.command_desc [dsc$a_pointer] + .pchars, .nchars);
307 0420         chars = .chars - .nchars;
308 0421         pchars = .pchars + .nchars;
309 0422     end;
310 0423
311 0424 PRINT THE OPTION FILE (IF PRESENT) if "/FULL" MAP REQUESTED
312 0425
313 0426 if .lnk$gl_ctlmsk [lnk$v_long]
314 0427 then while .lnk$gl_optextp neq 0
315 0428     do begin
316 0429         lnk$mapout (lnk$gl_optextp [oeb$t_text]          !PRINT THE LINE
317 0430                     ,.lnk$gl[_optextp [oeb$w_bytcnt]
318 0431                     );
319 0432         lnk$gl_optextp = .lnk$gl_optextp [oeb$l_nxtoeb]; !LINK TO NEXT LINE
320 0433     end;
321 0434
322 0435 end;
323 0436 return;
324 0437 end;

```

! End of LNK\$STATSOUT

													.TITLE	LNK_STATSOUT	:		
													.IDENT	\V04-000\	:		
													.PSECT	\$SPLITS,NOWRT,NOEXE,2	:		
													45 4E 49 4C 24	00000 P.AAB:	.ASCII	\\$LINE\	:
														00005	.BLKB	3	:
														00000005	00008 P.AAA:	.LC'G	5
														00000000'	0000C	.ADD' SS P.AAB	:
65 63 6E 61 6D 72 6F 66 72 65 50 3C 30 35 21														00010 P.AAC:	.ASCII	\!50<Performance Indicators!>Page Faults-	:
61 50 3E 21 73 72 6F 74 61 63 69 64 6E 49 20																\<9>	:
65 73 70 61 6C 45 09 65 6D 69 54 20 55 50 43														0002E			:
00 00 00 65 6D 69 54 20 64														00038	.ASCII	\CPU Time\<9>\Elapsed Time\<0><0><0>	:
													00047			:	
													0000003D	00050 PHASTAHD1:		:	
															.LONG	61	:
													00000000'	00054	.ADDRESS	P.AAC	:
2A 31 31 21 3E 21 2D 2A 32 32 21 3C 30 35 21														00058 P.AAD:	.ASCII	\!50<!22*~!>!11*~\<9>\!8*~\<9>\!12*~\<0>	:
00 2D 2A 32 31 21 09 2D 2A 38 21 09 2D														00067			:
													0000001B	00074 PHASTAHD2:		:	
															.LONG	27	:
													00000000'	00078	.ADDRESS	P.AAD	:

61	72	62	69	6C	20	6E	69	20	65	72	65	77	20	4C	00237
					21	20	64	6E	61	20	73	65	69	72	00246
64	20	47	55	42	45	44	20	65	72	65	77	20	4C	55	00250
6E	6F	63	20	73	64	72	6F	63	65	72	20	61	74	61	0025F
					55	21	20	67	6E	69	6E	69	61	74	0026E
							00	73	65	74	79	62	20	4C	00278
												00000057			00280
												00000000			00284
45	44	20	66	6F	20	73	65	74	79	62	20	4C	55	21	00288
77	20	65	72	65	77	20	61	74	61	64	20	47	55	42	00297
					61	74	73	2C	6E	65	74	74	69	72	002A6
55	21	20	4E	42	56	20	74	61	20	67	6E	69	74	72	002B0
63	6F	6C	62	20	57	55	21	20	68	74	69	77	20	57	002BF
					74	61	63	6F	6C	6C	61	20	73	6B	002CE
											00	00	64	65	002D8
												00000052			002DC
												00000000			002E0
6D	20	66	6F	20	72	65	62	6D	75	4E	3C	30	35	21	002E4
65	74	63	61	72	74	78	65	20	73	65	6C	75	64	6F	002F3
					74	69	63	69	6C	70	78	65	20	64	00302
			00	00	4C	55	21	20	3D	20	3E	21	79	6C	0030C
												00000032			00318
												00000000			0031C
78	65	20	4C	55	21	20	68	74	69	77	20	20	20	20	00320
6F	73	65	72	20	6F	74	20	64	65	74	63	61	72	74	0032F
					69	66	65	64	6E	75	20	65	76	6C	0033E
			00	73	6C	6F	62	6D	79	73	20	64	65	6E	00348
												00000033			00354
												00000000			00358
61	65	73	20	79	72	61	72	62	69	6C	20	4C	55	21	0035C
20	72	6F	66	20	65	72	65	77	20	73	65	68	63	72	0036B
					6F	6E	20	73	6C	6F	62	6D	79	73	0037A
72	61	72	62	69	6C	20	65	68	74	20	6E	69	20	74	00384
		00	00	00	64	65	68	63	72	61	65	73	20	79	00393
												00000041			003A0
												00000000			003A4
20	4C	55	21	20	66	6F	20	6C	61	74	6F	74	20	41	003A8
74	20	6C	6F	62	6D	79	73	20	6C	61	62	6F	6C	67	003B7
					72	6F	63	65	72	20	65	6C	62	61	003C6
00	6E	65	74	74	69	72	77	20	73	61	77	20	73	64	003D0
														00	003DF
												00000036			003E0
												00000000			003E4
												00000000			003E8
00000000G	00000000G	00000000	00000000G	00000000G	00000000G	00000000G	00000000G	00000000G	00000000G	00000000G	00000000G	003EC			
00000000	00000000G	00000000G	00000000G	00000000G	00000000	00000000	00000000G	00000000	00000000G	00000000G	00000000G	00404			
00000000G	00000000G	00000000	00000000G	00000000G	00000000G	00000000G	00000000G	00000000G	00000000G	00000000G	00000000G	0041C			
00000000	00000000G	00000000G	00000000G	00000000G	00000000G	00000000	00000000G	00000000	00000000G	00000000G	00000000G	00434			
												00000000G			0044C

```

.ASCII \UL were DEBUG data records containing !U\
LIBRECS: .LONG 87
          .ADDRESS P.AAO
P.AAP: .ASCII \!UL bytes of DEBUG data were written,sta\
          .ASCII \rting at VBN !UW with !UW blocks allocat\
          .ASCII \ed\<0><0>
DBGDATA: .LONG 82
          .ADDRESS P.AAP
P.AAQ: .ASCII \!50<Number of modules extracted explicit\
          .ASCII \ly!> = !UL\<0><0>
EXTRMODS: .LONG 50
          .ADDRESS P.AAQ
P.AAR: .ASCII \ with !UL extracted to resolve undefi\
          .ASCII \ned symbols\<0>
SRCHMODS: .LONG 51
          .ADDRESS P.AAR
P.AAS: .ASCII \!UL library searches were for symbols no\
          .ASCII \t in the library searched\<0><0><0>
FUTLSRCH: .LONG 65
          .ADDRESS P.AAS
P.AAT: .ASCII \A total of !UL global symbol table recor\
          .ASCII \ds was written\<0><0>
SYMRECS: .LONG 54
          .ADDRESS P.AAT
PHASTATBL: .LONG 0
           .ADDRESS LNK$GL SPAGFLTS, LNK$GL CPUSTIM, -
           LNK$GL_STARTIM, COMANDTIM, -
           LNK$GL_PS1FLTS, LNK$GL_PS1CPUT, -
           LNK$GL_PS1STIM, PASS1TIM, LNK$GL_ALOFLTS, -
           LNK$GL_ALOCPUT, LNK$GL_ALOSTIM, ALLOCTIM, -
           LNK$GL_PS2FLTS, LNK$GL_PS2CPUT, -
           LNK$GL_PS2STIM, PASS2TIM, LNK$GL_MAPFLTS, -
           LNK$GL_MAPCPUT, LNK$GL_MAPSTIM, MAPTIM, -
           LNK$GL_STBFLTS, LNK$GL_STBCPUT, -

```

```

LNK$GQ_STBSTIM, STBTIM, LNK$GL_ENDFLTS, -
LNK$GL_ENDCPUT, LNK$GQ_ENDTIM
00000000 00458 .LONG 0
00000000G 0045C .ADDRESS LNK$GL_SPAGFLTS, LNK$GL_CPUTIM, -
00000000G 00474 LNK$GQ_STARTIM, TOTALTIM, LNK$GL_ENDFLTS, -
LNK$GL_ENDCPUT, LNK$GQ_ENDTIM
00000064 00478 CVT2SECS:
0000003C 0047C CVTSECSMINS:
.LONG 100
.LONG 60
.PSECT $OWNS,NOEXE,2
0000 00000 COMMAND_DESC:
00 00002 .WORD 0
02 00003 .BYTE 0
00000000 00004 .BYTE 2
.LONG 0
SD_$LINE=
.P.AAA
.EXTRN LNK$GL_OPTEXTP, LNK$GL_CTLMSK
.EXTRN LNK$GL_MINADDR, LNK$GL_MEMLHD
.EXTRN LNK$GL_CPUTIM, LNK$GL_FUTLSRCH
.EXTRN LNK$GL_LIBRECS, LNK$GL_NMODSEXP
.EXTRN LNK$GL_NMODSRCH
.EXTRN LNK$GL_OBJRECS, LNK$GW_DBGRECS
.EXTRN LNK$GL_DBGESTIM
.EXTRN LNK$GW_DSTVBN, LNK$GW_DSTBLKS
.EXTRN LNK$GL_DSTEND, LNK$GW_SYMRECS
.EXTRN LNK$GW_GSTRECS, LNK$GQ_STARTIM
.EXTRN LNK$GQ_ENDTIM, LNK$GQ_PS1STIM
.EXTRN LNK$GQ_ALOSTIM, LNK$GQ_PS2STIM
.EXTRN LNK$GQ_MAPSTIM, LNK$GQ_STBSTIM
.EXTRN LNK$GL_PS1CPUT, LNK$GL_ALOCPUT
.EXTRN LNK$GL_PS2CPUT, LNK$GL_MAPCPUT
.EXTRN LNK$GL_STBCPUT, LNK$GL_PS1FLTS
.EXTRN LNK$GL_ALOFLTS, LNK$GL_PS2FLTS
.EXTRN LNK$GL_MAPFLTS, LNK$GL_STBFLTS
.EXTRN LNK$GL_SPAGFLTS
.EXTRN LNK$GL_ENDFLTS, LNK$GL_ENDCPUT
.EXTRN CLISGET VALUE, LNK$CALCELAPS
.EXTRN LNK$MAPOUT, LNK$C_MAPLINE
.EXTRN LNK$K_LIBBLOCKS
.EXTRN SYSSFAO, SYSSADJWSL
.PSECT $CODES,NOWRT,2
OFFC 00000
.ENTRY LNK$STATSOUT, Save R2,R3,R4,R5,R6,R7,R8,R9,-; 0291
R10,R11
5B 00000000G 00 9E 00002 MOVAB LNK$GL_CTLMSK, R11
5A 00000000G 00 9E 00009 MOVAB SYSSFAO, R10
59 00000000G 00 9E 00010 MOVAB LNK$MAPOUT, R9
58 00000000' EF 9E 00017 MOVAB PHASTATBL, R8
5E FF54 CE 9E 0001E MOVAB -172(SP), SP
20 AE 84 8F 9A 00023 MOVZBL #132, OUTBUFDESC
24 AE 28 AE 9E 00028 MOVAB BUFFER, OUTBUFDESC+4
1C AE D4 0002D CLRL CPUTIME+4
0340
0341
0342

```

			14	AE	D4	00030	CLRL	CPUSECS+4	0343	
			0C	AE	D4	00033	CLRL	CPUMINS+4	0344	
				7E	D4	00036	CLRL	-(SP)	0345	
			2C	AE	9F	00038	PUSHAB	BUFFER		
		69		02	FB	0003B	CALLS	#2, LNK\$MAPOUT		
			20	AE	9F	0003E	PUSHAB	OUTBUFDESC	0346	
			08	AE	9F	00041	PUSHAB	OUTLINELENG		
			FC68	C8	9F	00044	PUSHAB	PHASTAHD1		
		6A		03	FB	00048	CALLS	#3, SYSS\$FAO		
		7E		04	AE	3C	MOVZWL	OUTLINELENG, -(SP)	0347	
			2C	AE	9F	0004F	PUSHAB	BUFFER		
		69		02	FB	00052	CALLS	#2, LNK\$MAPOUT		
			20	AE	9F	00055	PUSHAB	OUTBUFDESC	0348	
			08	AE	9F	00058	PUSHAB	OUTLINELENG		
			FC8C	C8	9F	0005B	PUSHAB	PHASTAHD2		
		6A		03	FB	0005F	CALLS	#3, SYSS\$FAO		
		7E		04	AE	3C	MOVZWL	OUTLINELENG, -(SP)	0349	
			2C	AE	9F	00066	PUSHAB	BUFFER		
		69		02	FB	00069	CALLS	#2, LNK\$MAPOUT		
		52		01	D0	0006C	MOVL	#1, I	0351	
	53		52		04	78	ASHL	#4, I, R3	0353	
				6843	9F	00073	PUSHAB	PHASTATBL[R3]		
				9E	D5	00076	TSTL	@(SP)+		
				03	12	00078	BNEQ	2\$		
				0082	31	0007A	BRW	3\$		
				04	A843	9F	PUSHAB	PHASTATBL+4[R3]	0356	
			54		9E	D0	MOVL	@(SP)+, R4		
	50		52		04	78	ASHL	#4, I, R0		
				F4	A840	9F	PUSHAB	PHASTATBL-12[R0]		
			51		9E	D0	MOVL	@(SP)+, R1		
	57		64		61	C3	SUBL3	(R1), (R4), PAGEFAULTS		
				08	A843	9F	PUSHAB	PHASTATBL+8[R3]	0357	
			54		9E	D0	MOVL	@(SP)+, R4		
				F8	A840	9F	PUSHAB	PHASTATBL-8[R0]		
			51		9E	D0	MOVL	@(SP)+, R1		
			64		61	C3	SUBL3	(R1), (R4), CPUTIME	0358	
	56	18	AE		0090	C8	EDIV	CVT2SECS, CPUTIME, CPUSECS, SECFRAC	0359	
	10	AE	18	AE	0094	C8	EDIV	CVTSECSMINS, CPUSECS, CPUMINS, CPUSECS	0360	
10	AE	08	AE	10	AE	0094	EDIV	CVTSECSMINS, CPUMINS, CPUHOURS, CPUMINS	0364	
08	AE		55	08	AE	0C	PUSHAB	PHASTATBL+12[R3]		
						9E	PUSHL	@(SP)+		
						FC	PUSHAB	PHASTATBL-4[R0]		
						9E	PUSHL	@(SP)+		
		00000006	00			02	CALLS	#2, LNK\$CALCELAPS		
						50	PUSHL	R0		
						56	PUSHL	SECFRAC		
						18	PUSHL	CPUSECS		
						14	PUSHL	CPUMINS		
						55	PUSHL	CPUMINS		
						57	PUSHL	CPUMINS		
						6843	PUSHAB	PAGEFAULTS		
						9E	PUSHAB	PHASTATBL[R3]		
						3C	PUSHL	@(SP)+		
						24	PUSHAB	OUTBUFDESC		
						FCBC	PUSHAB	OUTLINELENG		
						C8	PUSHAB	PHASTAFMT		
			6A			0A	CALLS	#10, SYSS\$FAO		
			7E			04	MOVZWL	OUTLINELENG, -(SP)	0365	

FF6A	52	69	2C	AE 9F 000F9	PUSHAB	BUFFER		
		01		02 FB 000FC	CALLS	#2, LNK\$MAPOUT		0353
				08 F1 000FF	ACBL	#8, #1, I, 1\$		0368
				5E DD 00105	PUSHL	SP		
				7E D4 00107	CLRL	-(SP)		
	00000000G	00		02 FB 00109	CALLS	#2, SYSS\$ADJWSL		0369
		52	00000000G	00 9E 00110	MOVAB	LNK\$GL_MEMLHD, MEMUSED		0371
				62 D5 00117	TSTL	(MEMUSED)		
				05 13 00119	BEQL	5\$		0372
		52		62 D0 0011B	MOVL	(MEMUSED), MEMUSED		
				F7 11 0011E	BRB	4\$		0374
		52	00000000G	00 C3 00120	SUBL3	LNK\$GL_MINADDR, MEMUSED, R0		
50		50	01FF	C0 9E 00128	MOVAB	511(R0), R0		
		52	00000200	8F C7 0012D	DIVL3	#512, R0, MEMUSED		
				7E D4 00135	CLRL	-(SP)		0375
		69	2C	AE 9F 00137	PUSHAB	BUFFER		
				02 FB 0013A	CALLS	#2, LNK\$MAPOUT		0376
				52 DD 0013D	PUSHL	MEMUSED		
			04	AE DD 0013F	PUSHL	WORKSETLIM		
			28	AE 9F 00142	PUSHAB	OUTBUFDESC		
			10	AE 9F 00145	PUSHAB	OUTLINELENG		
			FD8	C8 9F 00148	PUSHAB	WORKSET		
6A				05 FB 0014C	CALLS	#5, SYSS\$FAO		
7E			04	AE 3C 0014F	MOVZWL	OUTLINELENG, -(SP)		0377
			2C	AE 9F 00153	PUSHAB	BUFFER		
		69		02 FB 00156	CALLS	#2, LNK\$MAPOUT		
				7E D4 00159	CLRL	-(SP)		0378
		69	2C	AE 9F 0015B	PUSHAB	BUFFER		
				02 FB 0015E	CALLS	#2, LNK\$MAPOUT		0379
			00000000G	00 DD 00161	PUSHL	LNK\$GL_OBJRECS		
			24	AE 9F 00167	PUSHAB	OUTBUFDESC		
			0C	AE 9F 0016A	PUSHAB	OUTLINELENG		
			FE38	C8 9F 0016D	PUSHAB	OBJRECS		
6A				04 FB 00171	CALLS	#4, SYSS\$FAO		
7E			04	AE 3C 00174	MOVZWL	OUTLINELENG, -(SP)		0380
			2C	AE 9F 00178	PUSHAB	BUFFER		
		69		02 FB 0017B	CALLS	#2, LNK\$MAPOUT		
			00000000G	00 DD 0017E	PUSHL	LNK\$GL_DBGESTIM		0381
		7E	00000000G	00 3C 00184	MOVZWL	LNK\$GW_DBGRECS, -(SP)		
			00000000G	00 DD 0018B	PUSHL	LNK\$GL_LIBRECS		
			2C	AE 9F 00191	PUSHAB	OUTBUFDESC		
			14	AE 9F 00194	PUSHAB	OUTLINELENG		
			FE98	C8 9F 00197	PUSHAB	LIBRECS		
6A				06 FB 0019B	CALLS	#6, SYSS\$FAO		
7E			04	AE 3C 0019E	MOVZWL	OUTLINELENG, -(SP)		0382
			2C	AE 9F 001A2	PUSHAB	BUFFER		
		69		02 FB 001A5	CALLS	#2, LNK\$MAPOUT		
		50	00000000G	00 D0 001A8	MOVL	LNK\$GL_DSTEND, DBGBYTES		0384
				30 13 001AF	BEQL	7\$		
				06 E0 001B1	BBS	#6, LNK\$GL_CTLMSK, 6\$		
05		68		02 E1 001B5	BBC	#2, LNK\$GL_CTLMSK+2, 7\$		
27		AB		00 3C 001BA	MOVZWL	LNK\$GW_DSTBLKS, -(SP)		0387
		7E	00000000G	00 3C 001C1	MOVZWL	LNK\$GW_DSTVBN, -(SP)		
			00000000G	50 DD 001C8	PUSHL	DBGBYTES		
			2C	AE 9F 001CA	PUSHAB	OUTBUFDESC		
			14	AE 9F 001CD	PUSHAB	OUTLINELENG		
			FEF4	C8 9F 001D0	PUSHAB	DBGDATA		

6A		06	FB	001D4	CALLS	#6, SYSSFAO		
7E	04	AE	3C	001D7	MOVZWL	OUTLINELENG, -(SP)	0388	
	2C	AE	9F	001DB	PUSHAB	BUFFER		
69		02	FB	001DE	CALLS	#2, LNK\$MAPOUT		
		7E	D4	001E1	CLRL	-(SP)	0391	
	2C	AE	9F	001E3	PUSHAB	BUFFER		
69		02	FB	001E6	CALLS	#2, LNK\$MAPOUT		
	00000000G	00	DD	001E9	PUSHL	LNK\$GL_NMODSEXP	0392	
	24	AE	9F	001EF	PUSHAB	OUTBUFDESC		
	0C	AE	9F	001F2	PUSHAB	OUTLINELENG		
	FF30	C8	9F	001F5	PUSHAB	EXTRMODS		
6A		04	FB	001F9	CALLS	#4, SYSSFAO		
7E	04	AE	3C	001FC	MOVZWL	OUTLINELENG, -(SP)	0393	
	2C	AE	9F	00200	PUSHAB	BUFFER		
69		02	FB	00203	CALLS	#2, LNK\$MAPOUT		
	00000000G	00	DD	00206	PUSHL	LNK\$GL_NMODSRCH	0394	
	24	AE	9F	0020C	PUSHAB	OUTBUFDESC		
	0C	AE	9F	0020F	PUSHAB	OUTLINELENG		
	FF6C	C8	9F	00212	PUSHAB	SRCHMODS		
6A		04	FB	00216	CALLS	#4, SYSSFAO		
7E	04	AE	3C	00219	MOVZWL	OUTLINELENG, -(SP)	0395	
	2C	AE	9F	0021D	PUSHAB	BUFFER		
69		02	FB	00220	CALLS	#2, LNK\$MAPOUT		
		7E	D4	00223	CLRL	-(SP)	0396	
	2C	AE	9F	00225	PUSHAB	BUFFER		
69		02	FB	00228	CALLS	#2, LNK\$MAPOUT		
	00000000G	00	DD	0022B	PUSHL	LNK\$GL_FUTLSRCH	0397	
	24	AE	9F	00231	PUSHAB	OUTBUFDESC		
	0C	AE	9F	00234	PUSHAB	OUTLINELENG		
	B8	A8	9F	00237	PUSHAB	FUTLSRCH		
6A		04	FB	0023A	CALLS	#4, SYSSFAO		
7E	04	AE	3C	0023D	MOVZWL	OUTLINELENG, -(SP)	0398	
	2C	AE	9F	00241	PUSHAB	BUFFER		
69		02	FB	00244	CALLS	#2, LNK\$MAPOUT		
		7E	D4	00247	CLRL	-(SP)	0399	
	2C	AE	9F	00249	PUSHAB	BUFFER		
69		02	FB	0024C	CALLS	#2, LNK\$MAPOUT		
50	00000000G	00	3C	0024F	MOVZWL	LNK\$GW_SYMRECS, R0	0400	
51	00000000G	00	3C	00256	MOVZWL	LNK\$GW_GSTRECS, R1		
		6140	9F	0025D	PUSHAB	(R1)[R0]		
	24	AE	9F	00260	PUSHAB	OUTBUFDESC		
	0C	AE	9F	00263	PUSHAB	OUTLINELENG		
	F8	A8	9F	00266	PUSHAB	SYMRECS		
6A		04	FB	00269	CALLS	#4, SYSSFAO		
7E	04	AE	3C	0026C	MOVZWL	OUTLINELENG, -(SP)	0401	
	2C	AE	9F	00270	PUSHAB	BUFFER		
69		02	FB	00273	CALLS	#2, LNK\$MAPOUT		
		7E	D4	00276	CLRL	-(SP)	0402	
	2C	AE	9F	00278	PUSHAB	BUFFER		
69		02	FB	0027B	CALLS	#2, LNK\$MAPOUT		
		53	D4	0027E	CLRL	PCHARS	0412	
	00000000'	EF	9F	00280	PUSHAB	COMMAND_DESC	0413	
	FC20	C8	9F	00286	PUSHAB	SD \$LINE		
00000000G	00	02	FB	0028A	CALLS	#2, CLISGET VALUE		
	52	00000000'	EF	3C	00291	MOVZWL	COMMAND_DESC, CHARS	0414
		52	D5	00298	TSTL	CHARS	0416	
		28	15	0029A	BLEQ	10\$		

00000000G	50		52	DO	0029C	MOVL	CHARS, R0	:	0418
	8F		50	D1	0029F	CMPL	R0, #LENSC_MAPLINE	:	
			05	15	002A6	BLEQ	9\$:	
	50	0000G	8F	3C	002A8	MOVZWL	#LENSC_MAPLINE, R0	:	
	54		50	DO	002AD	9\$:	MOVL	R0, NCHARS	:
			54	DD	002B0	PUSHL	NCHARS	:	0419
	69	00000000'FF	43	9F	002B2	PUSHAB	@COMMAND_DESC+4[PCHARS]	:	
	52		02	FB	002B9	CALLS	#2, LNK\$MAPOUT	:	
	53		54	C2	002BC	SUBL2	NCHARS, CHARS	:	0420
			54	CO	002BF	ADDL2	NCHARS, PCHARS	:	0421
			D4	11	002C2	BRB	8\$:	0416
	23	01	AB	E9	002C4	10\$:	BLBC	LNK\$GL_CTLMSK+1, 12\$:
	50	00000000G	00	DO	002C8	11\$:	MOVL	LNK\$GL_OPTEXTP, R0	:
			1A	13	002CF	BEQL	12\$:	0426
	7E	04	A0	3C	002D1	MOVZWL	4(R0), -(SP)	:	0430
		06	A0	9F	002D5	PUSHAB	6(R0)	:	0429
	69		02	FB	002D8	CALLS	#2, LNK\$MAPOUT	:	
	50	00000000G	00	DO	002DB	MOVL	LNK\$GL_OPTEXTP, R0	:	0432
00000000G	00		60	DO	002E2	MOVL	(R0), [LNK\$GL_OPTEXTP	:	
			DD	11	002E9	BRB	11\$:	0427
			04	002EB	12\$:	RET		:	0437

: Routine Size: 748 bytes, Routine Base: \$CODE\$ + 0000

: 325 0438 1
: 326 0439 1 end
: 327 0440 0 eludom

PSECT SUMMARY

Name	Bytes	Attributes
\$PLITS	1152	NOVEC, NOWRT, RD, NOEXE, NOSHR, LCL, REL, CON, NOPIC, ALIGN(2)
\$OWNS	8	NOVEC, WRT, RD, NOEXE, NOSHR, LCL, REL, CON, NOPIC, ALIGN(2)
\$CODE\$	748	NOVEC, NOWRT, RD, EXE, NOSHR, LCL, REL, CON, NOPIC, ALIGN(2)

Library Statistics

File	----- Total	Symbols Loaded	----- Percent	Pages Mapped	Processing Time
\$255\$DUA28:[SYSLIB]LIB.L32;1	18619	9	0	1000	00:02.0
\$255\$DUA28:[LINKER.OBJ]DATBAS.L32;1	538	6	1	28	00:00.8

LNK_STATSOUT
V04=000

C 12
16-Sep-1984 00:33:36
14-Sep-1984 12:40:36

VAX-11 Bliss-32 V4.0-742
[LINKER.SRC]LNKSTATSO.B32;1

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(2)

LNK
V04

```
:  
:          COMMAND QUALIFIERS  
:  BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/LIS=LIS$:LNKSTATSO/OBJ=OBJ$:LNKSTATSO MSRC$:LNKSTATSO/UPDATE=(ENH$:LNKSTATSO)  
:  328          0441  0          !End of module  
: Size:          748 code + 1160 data bytes  
: Run Time:      00:17.7  
: Elapsed Time:  00:54.4  
: Lines/CPU Min: 1499  
: Lexemes/CPU-Min: 15372  
: Memory Used:  217 pages  
: Compilation Complete
```


LNKPROLTB
LIS

LNKSYMTBL
LIS

LNKSYMOUT
LIS

LNKUMALLO
LIS

LNKPSCTBL
LIS

LNKPROSHR
LIS

LNKSTATSD
LIS