```
RRRRRRRRRRRR        UUU          UUU  NNN        NNN   000000000    FFFFFFFFFFFFFFF   FFFFFFFFFFFFFFF
RRRRRRRRRRRR        UUU          UUU  NNN        NNN   000000000    FFFFFFFFFFFFFFF   FFFFFFFFFFFFFFF
RRRRRRRRRRRR        UUU          UUU  NNN        NNN   000000000    FFFFFFFFFFFFFFF   FFFFFFFFFFFFFFF
RRR      RRR        UUU          UUU  NNN        NNN   000      000  FFF               FFF
RRR      RRR        UUU          UUU  NNN        NNN   000      000  FFF               FFF
RRR      RRR        UUU          UUU  NNN        NNN   000      000  FFF               FFF
RRR      RRR        UUU          UUU  NNNNNN     NNN   000      000  FFF               FFF
RRR      RRR        UUU          UUU  NNNNNN     NNN   000      000  FFF               FFF
RRRRRRRRRRRR        UUU          UUU  NNN  NNN   NNN   000      000  FFFFFFFFFFF       FFFFFFFFFFF
RRRRRRRRRRRR        UUU          UUU  NNN  NNN   NNN   000      000  FFFFFFFFFFF       FFFFFFFFFFF
RRRRRRRRRRRR        UUU          UUU  NNN  NNN   NNN   000      000  FFFFFFFFFFF       FFFFFFFFFFF
RRR   RRR           UUU          UUU  NNN   NNNNNN     000      000  FFF               FFF
RRR    RRR          UUU          UUU  NNN   NNNNNN     000      000  FFF               FFF
RRR     RRR         UUU          UUU  NNN    NNN       000      000  FFF               FFF
RRR      RRR        UUU          UUU  NNN        NNN   000      000  FFF               FFF
RRR      RRR        UUU          UUU  NNN        NNN   000      000  FFF               FFF
RRR       RRR       UUUUUUUUUUUUUUUU  NNN        NNN   000000000    FFF               FFF
RRR       RRR       UUUUUUUUUUUUUUUU  NNN        NNN   000000000    FFF               FFF
RRR       RRR       UUUUUUUUUUUUUUUU  NNN        NNN   000000000    FFF               FFF
```

FILEID**NDXVRS

```
NN      NN  DDDDDDD   XX      XX  VV      VV  RRRRRRR      SSSSSSSS
NN      NN  DDDDDDD   XX      XX  VV      VV  RRRRRRR      SSSSSSSS
NN      NN  DD    DD  XX      XX  VV      VV  RR      RR  SS
NNNN    NN  DD    DD    XX  XX    VV      VV  RR      RR  SS
NNNN    NN  DD    DD    XX  XX    VV      VV  RR      RR  SS
NN  NN  NN  DD    DD      XX      VV      VV  RRRRRRR      SSSSSS
NN  NN  NN  DD    DD      XX      VV      VV  RRRRRRR      SSSSSS
NN  NNNN    DD    DD    XX  XX    VV      VV  RR  RR            SS
NN  NNNN    DD    DD    XX  XX    VV      VV  RR  RR            SS
NN      NN  DD    DD  XX      XX    VV  VV    RR      RR        SS   ....
NN      NN  DD    DD  XX      XX    VV  VV    RR      RR        SS   ....
NN      NN  DDDDDDD   XX      XX      VV      RR      RR  SSSSSSSS   ....
NN      NN  DDDDDDD   XX      XX      VV      RR      RR  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                II                SS
LLLLLLLLLL      IIIIII      SSSSSSSS
LLLLLLLLLL      IIIIII      SSSSSSSS
```

```
    1    0001   0 %TITLE 'Main module -- DSR / DSRPLUS INDEX Utility'
    2    0002   0 MODULE NDXVRS    (MAIN = $INDEX,
    3    0003   0                   IDENT = 'V04-000'
    4    0004   0                   %BLISS32[, ADDRESSING_MODE(EXTERNAL = LONG_RELATIVE, NONEXTERNAL = LONG_RELATIVE)]
    5    0005   0                   ) =
    6    0006   0
    7    0007   1 BEGIN
    8    0008   1
    9    0009   1 !
   10    0010   1 !********************************************************************
   11    0011   1 !*                                                                  *
   12    0012   1 !*  COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                         *
   13    0013   1 !*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.          *
   14    0014   1 !*  ALL RIGHTS RESERVED.                                            *
   15    0015   1 !*                                                                  *
   16    0016   1 !*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND COPIED  *
   17    0017   1 !*  ONLY IN  ACCORDANCE WITH  THE  TERMS  OF  SUCH  LICENSE  AND WITH THE  *
   18    0018   1 !*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR  ANY  OTHER  *
   19    0019   1 !*  COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY  *
   20    0020   1 !*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE IS  HEREBY  *
   21    0021   1 !*  TRANSFERRED.                                                    *
   22    0022   1 !*                                                                  *
   23    0023   1 !*  THE INFORMATION IN THIS SOFTWARE IS  SUBJECT TO CHANGE WITHOUT NOTICE  *
   24    0024   1 !*  AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT  *
   25    0025   1 !*  CORPORATION.                                                    *
   26    0026   1 !*                                                                  *
   27    0027   1 !*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE  OR  RELIABILITY OF ITS  *
   28    0028   1 !*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.         *
   29    0029   1 !*                                                                  *
   30    0030   1 !*                                                                  *
   31    0031   1 !********************************************************************
   32    0032   1 !
   33    0033   1
   34    0034   1 !++
   35    0035   1 ! FACILITY:
   36    0036   1 !   DSR (Digital Standard RUNOFF) /DSRPLUS DSRINDEX/INDEX Utility
   37    0037   1 !
   38    0038   1 ! ABSTRACT:
   39    0039   1 !
   40    0040   1 !       Defines the version number for TOPS-20 and VAX versions.
   41    0041   1 !       Changes whenever INDEX code changes and describes the change.
   42    0042   1 !
   43    0043   1 ! VERSION PREFIX CHARACTER CONVENTIONS:
   44    0044   1 !
   45    0045   1 !       While building a new version:    X
   46    0046   1 !       Final link, but internal:        E
   47    0047   1 !       Released version:                V
   48    0048   1 !
   49    0049   1 ! ENVIRONMENT:   Transportable
   50    0050   1 !
   51    0051   1 ! AUTHOR:        JPK
   52    0052   1 !
   53    0053   1 ! CREATION DATE: June 1982
   54    0054   1 !
   55    0055   1 ! MODIFIED BY:
   56    0056   1 !
   57    0057   1 !       028      JPK00024          23-May-1983
```

```
  58    0058  1 |             Modified lowercasing algorithm in PERMUTE. Now lowercase only
  59    0059  1 |             if word contains only 1 letter or if second letter in word is
  60    0060  1 |             lowercase. Picked up modules PAGMRG and POOL from DSR/DSRPLUS
  61    0061  1 |             since they are no longer used by DSR/DSRPLUS.
  62    0062  1 |
  63    0063  1 |     027    JPK00023         20-May-1983
  64    0064  1 |             Modified INDEX, NDXT20 and NDXVMS to check status of
  65    0065  1 |             $XPO_PARSE_SPEC to avoid error messages from XPORT.
  66    0066  1 |
  67    0067  1 |     026    JPK00022         12-Apr-1983
  68    0068  1 |             Modified NDXVMS, NDXFMT, NDXPAG, NDXVMSMSG and NDXVMSREQ
  69    0069  1 |             to generate TEX output. Added module NDXTEX.
  70    0070  1 |
  71    0071  1 |     025    JPK00021         28-Mar-1983
  72    0072  1 |             Modified NDXT20 to include E2.0 functionality.
  73    0073  1 |             Modified NDXCLIDMP, NDXFMT, NDXPAG, NDXVRS to require RNODEF
  74    0074  1 |             for BLISS36 and to remove any conditional require based on
  75    0075  1 |             DSRPLUS_DEF.
  76    0076  1 |
  77    0077  1 |     024    JPK00020         17-Mar-1983
  78    0078  1 |             Modified NDXFMT to generate a ".NO PAGING" in the prologue
  79    0079  1 |             for /LAYOUT=GALLEY
  80    0080  1 |
  81    0081  1 |     023    JPK00019         14-MAR-1983
  82    0082  1 |             Modified NDXVMS to conditionalize /PAGE_NUMBERS=[NO]MERGE
  83    0083  1 |             and /PAGE_NUMBERS=STANDARD for DSRPLUS only.
  84    0084  1 |
  85    0085  1 |     022    JPK00018         09-Mar-1983
  86    0086  1 |             Modified INDEX to handle new BRN format.
  87    0087  1 |             Modified NDXOUT to handle specifyable levels on SORT= string.
  88    0088  1 |             Modified NDXFMT to output new RUNOFF prologue.
  89    0089  1 |             Modified NDXPAG to output new TMS prologue and RUNOFF epilogue.
  90    0090  1 |
  91    0091  1 |     021    JPK00017         23-Feb-1983
  92    0092  1 |             Modified NDXINI to initialize the zero'th entries of LLINES,
  93    0093  1 |             RLINES and TLINES which is where the telltale strings are
  94    0094  1 |             stored by NDXFMT.
  95    0095  1 |             Modified NDXFMT to write appropriate prologue for /TELLTALE,
  96    0096  1 |             save the appropriate lines for left and right telltales, and
  97    0097  1 |             to mark the end of every entry with a NULL.
  98    0098  1 |             Modified NDXPAG to change the NULL following each entry to a
  99    0099  1 |             space if LAYOUT is SEPARATE or to a comma otherwise and to
 100    0100  1 |             generate and output telltales.
 101    0101  1 |
 102    0102  1 |     020    JPK00016         23-Feb-1983
 103    0103  1 |             Modified NDXVMS to change the default number of lines per page
 104    0104  1 |             when /TELLTALE is specified but /LINES is not.
 105    0105  1 |
 106    0106  1 |     019    JPK00015         04-Feb-1983
 107    0107  1 |             Cleaned up module names, modified revision history to
 108    0108  1 |             conform with established standards. Updated copyright dates.
 109    0109  1 |
 110    0110  1 |     018    JPK00014         02-Feb-1983
 111    0111  1 |             Modified PERMUTE to remove extra whitespace in index entries.
 112    0112  1 |             Changed module name.
 113    0113  1 |
 114    0114  1 |     017    JPK00013         31-Jan-1983
```

NDXVRS
V04-000
Main module -- DSR / DSRPLUS INDEX Utility
H 1
16-Sep-1984 01:15:44   VAX-11 Bliss-32 V4.0-742
14-Sep-1984 13:07:22   [RUNOFF.SRC]NDXVRS.BLI;1
Page 3
(1)

115	0115	1		Changed default subindex level value from 6 to 99 in NDXVMS
116	0116	1		and NDXCLIDMP. This value is the subindexing level.
117	0117	1		It is NOT A HEADER LEVEL.
118	0118	1		
119	0119	1	016	JPK00012 24-Jan-1983
120	0120	1		Modified NDXVMSMSG.MSG to define error messages for both
121	0121	1		DSRINDEX and INDEX.
122	0122	1		Added require of NDXVMSREQ.R32 to NDXOUT, NDXFMT, NDXDAT,
123	0123	1		INDEX, NDXMSG, NDXXTN, NDXTMS, NDXVMS and NDXPAG for BLISS32.
124	0124	1		Since this file defines the error message literals,
125	0125	1		the EXTERNAL REFERENCEs for the error message literals
126	0126	1		have been removed.
127	0127	1		
128	0128	1	015	JPK00011 24-Jan-1983
129	0129	1		Changed CMDBLK [NDX$G_LEVEL] to CMDBLK [NDX$H_LEVEL]
130	0130	1		Changed CMDBLK [NDX$H_FORMAT] to CMDBLK [NDX$H_LAYOUT]
131	0131	1		Changed CMDBLK [NDX$V_TMS11] and CMDBLK [NDX$V_TEX] to CMDBLK [NDX$H_FORMAT]
132	0132	1		Changed comparisons of (.CHRSIZ EQLA CHRSZA) to
133	0133	1		(.CMDBLK [NDX$H_FORMAT] EQL TMS11_A).
134	0134	1		Definitions were changed in NDXCLI and references to the
135	0135	1		effected fields were changed in NDXPAG, NDXFMT, INDEX, NDXVMS
136	0136	1		and NDXCLIDMP.
137	0137	1		
138	0138	1	014	JPK00010 24-Jan-1983
139	0139	1		Removed routines GETDAT and UPDDAT from NDXDAT - they
140	0140	1		performed no useful function. Removed references to these
141	0141	1		routines from NDXOUT, NDXFMT, and NDXMSG.
142	0142	1		Removed reference to XPOOL in NDXOUT - not used.
143	0143	1		
144	0144	1	013	JPK00009 24-Jan-1983
145	0145	1		Modified to enhance performance. The sort buckets have each
146	0146	1		been divided into 27 sub-buckets; 1 for each letter and 1
147	0147	1		for non-alphas. Removed reference to BUCKET from INDEX.
148	0148	1		Definition of the structure was added to NDXPOL. References
149	0149	1		to BUCKET were changed in modules NDXOUT, NDXINI, NDXFMT
150	0150	1		and NDXDAT.
151	0151	1		
152	0152	1	012	RER00002 20-Jan-1983
153	0153	1		Modified VMS command line interface module NDXVMS:
154	0154	1		- changed /FORMAT qualifier to /LAYOUT.
155	0155	1		- changed use of /RESERVE and /REQUIRE for DSRPLUS.
156	0156	1		- added code for new DSRPLUS qualifiers /FORMAT and
157	0157	1		/TELLTALE_HEADINGS.
158	0158	1		Added fields to NDXCLI for new qualifiers: NDX$V_TELLTALE
159	0159	1		and NDX$V_TEX.
160	0160	1		Conditionalized output of NDX$V_PAGE_MERGE in NDXCLIDMP to
161	0161	1		account for different DSR and DSRPLUS default values.
162	0162	1		
163	0163	1	011	REM00001 11-Jan-1983
164	0164	1		Modified command line dumper NDXCLIDMP:
165	0165	1		- Updated copyright date.
166	0166	1		- Added more subtitles and paging.
167	0167	1		- Conditionalized output to only report items that are
168	0168	1		other then the default values.
169	0169	1		- Added output of an identifying header.
170	0170	1		
171	0171	1	010	RER00001 17-Dec-1982

NDXVRS
V04-000
Main module -- DSR / DSRPLUS INDEX Utility
I 1
16-Sep-1984 01:15:44   VAX-11 Bliss-32 V4.0-742
14-Sep-1984 13:07:22   [RUNOFF.SRC]NDXVRS.BLI;1
Page 4
(1)

```
172    0172   1 :                 Modified VMS command line interface module NDXVMS:
173    0173   1 :                   - Added code to treat keyword NORUNNING in same way as
174    0174   1 :                     keyword STANDARD.
175    0175   1 :                   - Added code for new DSR qualifiers /RESERVE and /REQUIRE.
176    0176   1 :                   - Changed header level default value from 99 to 6.
177    0177   1 :                   - Conditionalized code to compile for DSRPLUS if BLISS
178    0178   1 :                     /VARIANT = 8192 is used; otherwise, to compile for DSR.
179    0179   1 :                   - Deleted foreign-command code; INDEX is now called
180    0180   1 :                     as a subcommand of DSR.
181    0181   1 :
182    0182   1 :        009      JPK00008           19-Nov-1982
183    0183   1 :                 Changed name of POOL.REQ to DMDEFS.REQ in NDXXTN.
184    0184   1 :
185    0185   1 :        008      JPK00007           24-Sep-1982
186    0186   1 :                 Reset PAGENO if not concatenated input in INDEX.
187    0187   1 :
188    0188   1 :        007      JPK00006           24-Sep-1982
189    0189   1 :                 Modified NDXFMT to ignore REQUIRE file if filename string
190    0190   1 :                 is null. Added bold guide headings for RUNOFF output.
191    0191   1 :
192    0192   1 :        006      JPK00005           24-Sep-1982
193    0193   1 :                 Removed definition of CHRFWD in NDXINI. No longer needed.
194    0194   1 :
195    0195   1 :        005      JPK00004           24-Sep-1982
196    0196   1 :                 Modified NDXOUT, NDXMSG, NDXFMT, and NDXDAT for TOPS-20.
197    0197   1 :                 Strings stored in the index pool use the first fullword
198    0198   1 :                 for their length. References to these strings were incorrect.
199    0199   1 :
200    0200   1 :        004      JPK00003           24-Sep-1982
201    0201   1 :                 Modified NDXPAG for TOPS-20. A 'SIGNAL' was not conditionalized
202    0202   1 :                 to produce an $XPO_PUT_MSG if not %BLISS (BLISS32).
203    0203   1 :                 Modified to add requested /TMS=E changes.
204    0204   1 :
205    0205   1 :        003      JPK00002           16-Sep-1982
206    0206   1 :                 Fix transaction mapping bug in INDEX. This bug occurred only
207    0207   1 :                 when processing more than one input file where a file in the
208    0208   1 :                 middle of the sequence contained no indexing information.
209    0209   1 :                 If there had been only one transaction previous to the
210    0210   1 :                 empty file, the resulting page numbers would be incorrect
211    0211   1 :                 but the error would not be discovered by INDEX. If there
212    0212   1 :                 were more than one transaction preceeding the empty file,
213    0213   1 :                 transaction numbers would appear out of sequence which would
214    0214   1 :                 be reported by INDEX as an internal logic error.
215    0215   1 :
216    0216   1 :        002      JPK00001           13-Aug-1982
217    0217   1 :                 Removed reference to CLI$END_PARSE in NDXVMS. It is no longer
218    0218   1 :                 supported by VMS.
219    0219   1 :--
220    0220   1
221    0221   1 REQUIRE 'REQ:RNODEF';                              !RUNOFF definition
222    0352   1
223    0353   1 FORWARD ROUTINE
224    0354   1     $INDEX;
225    0355   1
226    0356   1 :
227    0357   1 : GLOBAL STORAGE:
228    0358   1 :
```

```
  229     0359  1
  230   L 0360  1 %IF DSRPLUS
  231   U 0361  1 %THEN
  232   U 0362  1
  233   U 0363  1 GLOBAL
  234   U 0364  1     NDXVRP : INITIAL (CH$PTR (UPLIT ('X2.8'))),      ! Version # string
  235   U 0365  1     NDXVRL : INITIAL (4);                            ! Length of version string
  236   U 0366  1
  237     0367  1 %ELSE
  238     0368  1
  239     0369  1 GLOBAL
  240     0370  1     NDXVRP : INITIAL (CH$PTR (UPLIT ('V2.1-12'))),   ! Version # string
  241     0371  1     NDXVRL : INITIAL (7);                            ! Length of version string
  242     0372  1
  243     0373  1 %FI
  244     0374  1
  245     0375  1 !
  246     0376  1 ! EXTERNAL REFERENCES:
  247     0377  1 !
  248     0378  1 EXTERNAL ROUTINE
  249     0379  1     NDXCLI;
  250     0380  1
  251     0381  1 GLOBAL ROUTINE $INDEX
  252     0382  1
  253   L 0383  1 %IF %BLISS(BLISS36)
  254   U 0384  1 %THEN
  255   U 0385  1
  256   U 0386  1     %IF %SWITCHES(TOPS10)
  257   U 0387  1     %THEN
  258   U 0388  1
  259   U 0389  1         ( P1, P2, P3, P4, CCL_OFFSET )
  260   U 0390  1
  261   U 0391  1     %FI
  262   U 0392  1
  263     0393  1 %FI
  264     0394  1
  265     0395  1     = NDXCLI (
  266     0396  1
  267   L 0397  1 %IF %BLISS(BLISS36)
  268   U 0398  1 %THEN
  269   U 0399  1
  270   U 0400  1     %IF %SWITCHES(TOPS10)
  271   U 0401  1     %THEN
  272   U 0402  1
  273   U 0403  1         .P1, .P2, .P3, .P4, .CCL_OFFSET
  274   U 0404  1
  275   U 0405  1     %FI
  276   U 0406  1
  277     0407  1 %FI
  278     0408  1
  279     0409  1     );
```

```
                                                          .TITLE  NDXVRS Main module -- DSR / DSRPLUS INDEX Utili
                                                                                                               ty
                                                          .IDENT  \V04-000\
```

```
                                                                     .PSECT    $PLIT$,NOWRT,NOEXE,2

                        00  32  31  2D  31  2E  32  56  00000 P.AAA:  .ASCII    \V2.1-12\<0>

                                                                     .PSECT    $GLOBAL$,NOEXE,2

                                              00000000'  00000 NDXVRP::.ADDRESS P.AAA
                                              00000007   00004 NDXVRL::.LONG    7

                                                                     .EXTRN    NDXCLI

                                                                     .PSECT    $CODE$,NOWRT,2

                                                      0000 00000     .ENTRY    $INDEX, Save nothing                    ; 0393
                         00000000G EF               00 FB 00002      CALLS     #0, NDXCLI                              ; 0395
                                                     04 00009         RET                                             ; 0409

; Routine Size:  10 bytes,     Routine Base:  $CODE$ + 0000


;   280           0410 1                                                                                              ! End of module
;   281           0411 1 END                                 ! End of module
;   282           0412 0 ELUDOM
```

```
;
;                                PSECT SUMMARY
;
;         Name                      Bytes                        Attributes
;     $PLIT$                           8   NOVEC,NOWRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;     $GLOBAL$                         8   NOVEC,  WRT,  RD ,NOEXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)
;     $CODE$                          10   NOVEC,NOWRT,  RD ,  EXE,NOSHR,  LCL,  REL,  CON,NOPIC,ALIGN(2)



;                              COMMAND QUALIFIERS

;        BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/LIS=LIS$:NDXVRS/OBJ=OBJ$:NDXVRS MSRC$:NDXVRS/UPDATE=(ENH$:NDXVRS)

; Size:              10 code + 16 data bytes
; Run Time:            00:02.5
; Elapsed Time:        00:08.3
; Lines/CPU Min:       9770
; Lexemes/CPU-Min:     8276
; Memory Used:  13 pages
; Compilation Complete
```

NEWPAG
LIS

NODOPX
LIS

OUTTXT
LIS

OFT
LIS

NDXVRS
LIS

NDXVRS
LIS

NOTE
LIS

OUTLIN
LIS

NM
LIS

PACK
LIS

OUTXHR
LIS

NDXXTN
LIS

OUTCHA
LIS

OUTHDR
LIS