```
RRRRRRRRRRR      UUU        UUU NNN       NNN   000000000   FFFFFFFFFFFFFF   FFFFFFFFFFFFFF
RRRRRRRRRRR      UUU        UUU NNN       NNN   000000000   FFFFFFFFFFFFFF   FFFFFFFFFFFFFF
RRRRRRRRRRR      UUU        UUU NNN       NNN   000000000   FFFFFFFFFFFFF    FFFFFFFFFFFFF
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
RRR       RRR    UUU        UUU NNNNNN    NNN   000     000 FFF              FFF
RRRRRRRRRRR      UUU        UUU NNN  NNN  NNN   000     000 FFFFFFFFFF       FFFFFFFFFF
RRRRRRRRRRR      UUU        UUU NNN  NNN  NNN   000     000 FFFFFFFFFF       FFFFFFFFFF
RRRRRRRRRRR      UUU        UUU NNN   NNN NNN   000     000 FFFFFFFFFF       FFFFFFFFFF
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    NNNNNN   000     030 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  UUUUUUUUUUUUUU NNN       NNN   000000000   FFF              FFF
RRR         RRR  UUUUUUUUUUUUUU NNN       NNN   000000000   FFF              FFF
RRR         RRR  UUUUUUUUUUUUUU NNN       NNN   000000000   FFF              FFF
```

NDX
V04

```
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
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        SSSSSS
LL              II        SSSSSS
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    0C23  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 tell-tale 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
```

```
 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$H_FORMAT] to CMDBLK [NDX$A_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 XPGOL 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 eac'
 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.
 165    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
```

```
 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 oold 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  :         004   JPK00003        24-Sep-1982
 201   0201  1  !              Modified NDXPAG for TOPS-20. A 'SIGNAL' was not conditionalized
 202   0202  1  !              to produce an $XPO_PUT_MSG if not %BLISS (BLISS32).
 203   0203  1  !              Modified to add requested /TMS=E change..
 204   0204  1  !
 205   0205  1         003   JPK00002        16-Sep-1982
 206   0206  1  !              Fix transaction mapping bug in INDEX. This bug occurred only
 207   0207  1  !              when processing more than one input file where a file in the
 208   0208  1  !              middle of the sequence contained no indexing information.
 209   0209  1  !              If there had been only one transaction previous to the
 210   0210  1  !              empty file, the resulting page numbers would be incorrect
 211   0211  1  !              but the error would not be discovered by INDEX. If there
 212   0212  1  !              were more than one transaction preceeding the empty file,
 213   0213  1  !              transaction numbers would appear out of sequence which would
 214   0214  1  !              be reported by INDEX as an internal logic error.
 215   0215  1  !
 216   0216  1         002   JPK00001        13-Aug-1982
 217   0217  1  !              Removed reference to CLI$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  !
```

NDXVRS
V04-000
Main module -- DSR / DSRPLUS INDEX Utility
J 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 5
(1)

NDX)
V04-

```
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::.ADDRFSS P.AAA
                                     00000007   00004 NDXVRL::.LONG   7

                                                            .EXTRN   NDXCLI

                                                            .PSECT   $CODE$,NOWRT,2

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

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


```
;  280          0410  1
;  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