```
CLEAR STORAGE 1     ,008015,022026,030037,044,049,053053N000000N00001026                                1
CLEAR STORAGE 2     L068116,105106,110117B101/I9I#071029C029056B026/B001/0991,001/001117I0?             2
BOOTSTRAP           ,008015,022029,036040,047054,061068,072/061039              ,0010011040             3

                          ZZTAPE INPUT/OUTPUT TAPE PACKAGE            03-27-67       ZTAPB               PAGE    1

 SEQ PG LIN  LABEL  OP    OPERANDS                                            SFX CT  LOCN  INSTRUCTION TYPE  CARD

 101 01 010         JOB   ZZTAPE INPUT/OUTPUT TAPE PACKAGE            03-27-67
 102 01 020         CTL   551  1
 103 01 030         ORG   336                                                                 0336
 104 01 040  *                                                                     ZTAPB
 105 01 050  *                                                                     ZTAPB
 106 01 060  *                                                                     ZTAPB
 107 01 070  *     THIS TAPE INPUT/OUTPUT PACKAGE OPENS, READS, WRITES, AND        ZTAPB
 108 01 080  *  CLOSES TAPE FILES.  IT OPENS AND CLOSES FILES WITH STANDARD        ZTAPB
 109 01 090  *  IBM HEADER AND TRAILER LABELS.  COMPLETE HEADER LABEL CHECKING     ZTAPB
 110 01 100  *  IS DONE ON INPUT INCLUDING DATE CREATION WITH THE USE              ZTAPB
 111 01 110  *  OF PERAMETERS FOR LEAST AND MOST NUMBER OF DAYS OLD.  OUTPUT       ZTAPB
 112 01 120  *  TAPES ARE CHECKED FOR POSSIBLE RETENTION BEFORE BEING OPENED       ZTAPB
 113 01 130  *  WITH A NEW HEADER LABEL.  IN READING AND WRITING TAPE, ALL         ZTAPB
 114 01 140  *  ERROR CHECKING IS DONE INCLUDING NOISE RECORD AND RECORD LENGTH    ZTAPB
 115 01 150  *  CHECKING ON INPUT FILES.  MULTI-REEL INPUT AND OUTPUT FILES        ZTAPB
 116 01 160  *  ARE HANDLED AUTOMATICALLY.                                         ZTAPB
 117 01 170  *                                                                     ZTAPB
 118 01 180  *     EACH FILE TO BE PROCESSED MUST HAVE A FILE TABLE TO BE USED     ZTAPB
 119 01 190  *  BY THIS INPUT/OUTPUT PACKAGE.  AN EXAMPLE OF A FILE TABLE FOR      ZTAPB
 120 01 200  *  INPUT FILES FOLLOWS.....                                           ZTAPB
 121 02 010  *                                                                     ZTAPB
 122 02 020  *  LABEL   OP    OPERAND         REASON/REMARKS                        ZTAPB
 123 02 030  *                                                                     ZTAPB
 124 02 040  *  FILE1   DCW   1               DRIVE NUMBER.  1 IN THIS CASE.        ZTAPB
 125 02 050  *          DSA   INPUT1          ADDRESS OF INPUT AREA.                ZTAPB
 126 02 060  *          DC    @R@             READ  D  CHARACTER.                   ZTAPB
 127 02 070  *          DSA   EOF1            EXIT TO YOUR PROGRAM IF A  1EOF       ZTAPB
 128 02 080  *                                RECORD IS READ.                       ZTAPB
 129 02 090  *          DC    #1              KEY USED TO DETERMINE IF FIRST OR     ZTAPB
 130 02 100  *                                OTHER REEL OF MULTI-REEL FILE.        ZTAPB
 131 02 110  *          DCW   @FILE1@         FILE NUMBER EXPECTED ON INPUT FILE    ZTAPB
 132 02 120  *          DC    @-001 @         REEL SEQUENCE.  MUST BE 001 FOR       ZTAPB
 133 02 130  *                                FIRST REEL.  ZZTAPE MODIFIES IT.      ZTAPB
 134 02 140  *          DC    @INP MASTER@    EXPECTED INPUT NAME/ID.               ZTAPB
 135 02 150  *          DC    #5              AREA TO RECEIVE DATE FROM FILE.       ZTAPB
 136 02 160  *                                IT IS USED TO CHECK SECOND AND        ZTAPB
 137 02 170  *                                FOLLOWING FILES.                      ZTAPB
 138 02 180  *          DSA   GM1             ADDRESS OF G.M. FOR RECORD LENGTH     ZTAPB
 139 02 190  *                                CHECKING.  SEE BELOW.                 ZTAPB
 140 02 200  *          DCW   000             MINIMUM AGE THE FILE MUST BE, DAYS    ZTAPB
 141 03 010  *          DCW   025             MAXIMUM AGE THE FILE MAY BE, DAYS.    ZTAPB
 142 03 020  *                                                                     ZTAPB
 143 03 030  *  NOTE- WHEN SETTING UP AN INPUT FILE, THE GROUP MARK MUST NOT       ZTAPB
 144 03 040  *  BE SPECIFIED IN THE DA.  AFTER THE DA OR SECOND DA THERE MUST      ZTAPB
 145 03 050  *  BE A DC #1 FOLLOWED BY A DCW OF A GROUP MARK.  THE LATTER DCW      ZTAPB
 146 03 060  *  MUST CONTAIN THE LABEL THAT APPEARS IN YOUR FILE TABLE, SEE        ZTAPB
 147 03 070  *  ABOVE.                                                             ZTAPB
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SEQ PG LIN  LABEL  OP    OPERANDS                                         SFX CT  LOCN  INSTRUCTION TYPE  CARD

148 03 080  *                                                                  ZTAPB
149 03 090  *  THE FOLLOWING IS AN EXAMPLE OF AN OUTPUT FILE TABLE.....           ZTAPB
150 03 100  *                                                                  ZTAPB
151 03 110  *  LABEL   OP    OPERAND         REASON/REMARKS                     ZTAPB
152 03 120  *                                                                  ZTAPB
153 03 130  *  FILE2   DCW   2               DRIVE NUMBER.                      ZTAPB
154 03 140  *          DSA   OUT2            ADDRESS OF OUTPUT AREA.            ZTAPB
155 03 150  *          DC    @W@             WRITE  D  CHARACTER.               ZTAPB
156 03 160  *          DSA   EOR2            EXIT TO YOUR PROGRAM IF END OF     ZTAPB
157 03 170  *                                REEL/TAPE IS ENCOUNTERED.          ZTAPB
158 03 180  *          DC    #1              KEY USED TO DETERMINE IF THIS REEL ZTAPB
159 03 190  *                                IS THE FIRST OR ANOTHER OF A       ZTAPB
160 03 200  *                                MULTI REEL FILE.                   ZTAPB
161 04 010  *          DCW   #5              AREA USED TO ACCUMULATE BLOCK      ZTAPB
162 04 020  *                                COUNT.                             ZTAPB
163 04 030  *          DCW   @FILE2@         FILE NUMBER TO BE WRITTEN ON LABEL ZTAPB
164 04 040  *          DCW   @-001 @         REEL SEQUENCE NUMBER.  MUST BE 001 ZTAPB
165 04 050  *          DCW   @OUT MASTER@    FILE ID TO BE WRITTEN ON LABEL.    ZTAPB
166 04 060  *          DCW   @-015 @         RETENTION CYCLE OF FILE.           ZTAPB
167 04 070  *                                                                  ZTAPB
168 04 080  *     THIS INPUT/OUTPUT PACKAGE IS USED AS AN INSERT OBJECT DECK    ZTAPB
169 04 090  *  TO YOUR PROGRAM.  IT LOADS INTO POSITIONS 336 TO 1519, THERE-    ZTAPB
170 04 100  *  FORE YOUR PROGRAM MUST BE ORIGINED AT POSITION 1520.  BECAUSE    ZTAPB
171 04 110  *  THIS PACKAGE IS NOT COMPILED EACH TIME YOUR PROGRAM IS, A SET    ZTAPB
172 04 120  *  OF EQUATES MUST BE PART OF YOUR PROGRAM.  THE FOLLOWING LISTS    ZTAPB
173 04 130  *  THE PRIMARY EQUATES AND ALSO CONSTANTS WHICH MAY BE              ZTAPB
174 04 140  *  USED BY YOUR PROGRAM.....                                        ZTAPB
175 04 150  *                                                                  ZTAPB
176 04 160  *  LABEL   EQUATE                COMMENT/REASON                     ZTAPB
177 04 170  *                                                                  ZTAPB
178 04 180  *  XXCHNG  EQU   363             ROUTINE TO HANDLE MULTI-REEL       ZTAPB
179 04 190  *                                OUTPUT FILES.                      ZTAPB
180 04 200  *  XXDATE  EQU   485             STORAGE AREA FOR JULIAN DATE.      ZTAPB
181 05 010  *  XXTAPE  EQU   492             ROUTINE TO READ OR WRITE TAPE.     ZTAPB
182 05 020  *  XXOPEN  EQU   790             ROUTINE TO OPEN FILES.             ZTAPB
183 05 030  *  XXCLOZ  EQU   1217            ROUTINE TO CLOSE FILES.            ZTAPB
184 05 040  *                                                                  ZTAPB
185 05 050  *  XXISBD  EQU   977            *MAY BE MODIFIED TO EXIT TO YOUR    ZTAPB
186 05 060  *                                PROGRAM IN CASE OF A BAD INPUT     ZTAPB
187 05 070  *                                LABEL.                             ZTAPB
188 05 080  *  XXOTEX  EQU   1090           *MAY BE MODIFIED TO EXIT TO YOUR    ZTAPB
189 05 090  *                                PROGRAM TO WRITE ADDITIONAL        ZTAPB
190 05 100  *                                INFORMATION IN OUTPUT LABELS.      ZTAPB
191 05 110  *                                                                  ZTAPB
192 05 120  *  XX1     EQU   353            *CONTAINS CONSTANT @001@.           ZTAPB
193 05 130  *  XX366   EQU   356            *CONTAINS CONSTANT @366@.           ZTAPB
194 05 140  *  XXI9I   EQU   1489           *CONTAINS ADDRESS CONSTANT @I9I@.   ZTAPB
195 05 150  *  XXTRAL  EQU   400            *HEADER & TRAILER LABEL I/O AREA DA ZTAPB
196 05 160  *  THOSE EQUATES HAVING  *  IN THE REMARKS FIELD ARE NOT REQUIRED.   ZTAPB
197 05 170  *                                                                  ZTAPB
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SEQ PG LIN  LABEL  OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD

198 05 180  *                                                                   ZTAPB
199 05 190  *    WITH A FILE TABLE FOR EACH FILE AND A DATE IN XXDATE.....      ZTAPB
200 05 200  *  TO OPEN A FILE, BRANCH TO XXOPEN.                                ZTAPB
201 06 010  *  TO READ OR WRITE TAPE, BRANCH TO XXTAPE.                         ZTAPB
202 06 020  *  TO CLOSE A FILE, BRANCH TO XXCLOZ.                               ZTAPB
203 06 030  *  TO CHANGE REELS AT EOR FOR AN OUTPUT FILE, BRANCH TO XXCHNG.     ZTAPB
204 06 040  *                                                                   ZTAPB
205 06 050  *    EACH OF THE ABOVE BRANCHES MUST BE FOLLOWED BY A NOP WITH      ZTAPB
206 06 060  *  THE  A  ADDRESS OPERAND BEING THE ADDRESS/LABEL OF THE FILE      ZTAPB
207 06 070  *  TABLE OF THE FILE TO BE PROCESSED.                               ZTAPB
208 06 080  *                                                                   ZTAPB
209 06 090  *    THIS TAPE INPUT/OUTPUT PACKAGE DOES NOT DO DE-BLOCKING         ZTAPB
210 06 100  *  OF INPUT, BLOCKING OR PADDING OF AN OUTPUT FILE.  IT ALSO        ZTAPB
211 06 110  *  DOES NOT REWIND OR REWIND AND UNLOAD ANY FILE IN XXCLOZ.         ZTAPB
212 06 120  *                                                                   ZTAPB
213 06 130  *    BEFORE ANY FILE OR TAPE CAN BE OPENED A DATE MUST BE           ZTAPB
214 06 140  *  SUPPLIED TO THIS INPUT/OUTPUT PACKAGE.  THIS IS DONE BY          ZTAPB
215 06 150  *  MOVING A FIVE CHARACTER DATE, TWO POSITION YEAR AND THREE        ZTAPB
216 06 160  *  POSITION JULIAN DAY TO XXDATE.                                   ZTAPB
217 06 170  *                                                                   ZTAPB
218 06 180  *    IT SHOULD BE NOTED THAT THIS INPUT/OUTPUT PACKAGE WILL NOT     ZTAPB
219 06 190  *  ACCEPT AN INPUT FILE WITH A BAD LABEL OR EXPIRED DATE.  FOR      ZTAPB
220 06 200  *  PURPOSES OF DE-BUGGING PROGRAMS, POSITION 977 MAY BE NO-OPED     ZTAPB
221 07 010  *  TO ACCEPT ANY HEADER, OR THE  I  ADDRESS MAY BE ALTERED TO 981   ZTAPB
222 07 020  *  TO ACCEPT THAT FILE ONLY.  IT SHOULD BE NOTED THAT A NOP AT      ZTAPB
223 07 030  *  POSITION 977 WILL ACCEPT ALL FILES THAT HAVE HEADERS, GOOD OR    ZTAPB
224 07 040  *  BAD, WHEREAS A RESTART AT 981 WILL ACCEPT A FILE WITH A BAD      ZTAPB
225 07 050  *  HEADER, OR A FILE WITHOUT A HEADER.  ALSO NOTE THAT AN OUTPUT    ZTAPB
226 07 060  *  FILE WHOSE RETENTION CYCLE HAS EXPIRED CANNOT BE OPENED.  AGAIN, ZTAPB
227 07 070  *  FOR PURPOSES OF DE-BUGGING, THE  I  ADDRESS MAY BE ALTERED TO    ZTAPB
228 07 080  *  870 TO OPEN THE FILE.                                            ZTAPB
229 07 090  *                                                                   ZTAPB
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                    ZZTAPE  TAPE I/O PACKAGE.  CONSTANTS AND EQUATES           ZTAPB               PAGE    4

SEQ PG LIN  LABEL  OP    OPERANDS                                        SFX CT  LOCN  INSTRUCTION TYPE  CARD

230 08 010         JOB   ZZTAPE  TAPE I/O PACKAGE.  CONSTANTS AND EQUATES
231 08 020  *                                                                 ZTAPB
232 08 030  **    EQUATES.                                                    ZTAPB
233 08 040  *                                                                 ZTAPB
234 08 050  XXIND3 EQU   99                  EQUATE TO X3.                       0099
235 08 060  XXFADD EQU   3&X3                EQUATE TO FILE ADDRESS.             0003 X
236 08 070  *              EQUATES TO INPUT FILE TABLE.                       ZTAPB
237 08 080  XXINRS EQU   17&X3               EQUATE TO INPUT REEL SEQUENCE.      0017 X
238 08 090  XXINPL EQU   28&X3               EQUATE TO INPUT LABEL.              0028 X
239 08 100  XXINLB EQU   33&X3               EQUATE TO COMPLETE INPUT LABEL.     0033 X
240 08 110  XXINGM EQU   36&X3               EQUATE TO ADDRESS OF INPUT G.M.     0036 X
241 08 120  XXPER1 EQU   39&X3               EQUATE TO LEAST DAYS OLD.           0039 X
242 08 130  XXPER2 EQU   42&X3               EQUATE TO MOST NUMBER OF DAYS OLD   0042 X
243 08 140  *              EQUATES TO INPUT AND OUTPUT FILE TABLES.           ZTAPB
244 08 150  XXDRNO EQU   0&X3                EQUATE TO DRIVE NUMBER.             0000 X
245 08 160  XXIORA EQU   3&X3                EQUATE TO I/O AREA.                 0003 X
246 08 170  XXIODC EQU   4&X3                EQUATE TO  D  CHARACTER.            0004 X
247 08 180  XXEOFX EQU   7&X3                EQUATE TO EOF/EOR EXIT.             0007 X
248 08 190  XXKEY  EQU   8&X3                EQUATE TO OPEN KEY.                 0008 X
249 08 200  *              EQUATES TO OUTPUT FILE TABLES.                     ZTAPB
250 09 010  XXOTCT EQU   13&X3               EQUATE TO OUTPUT BLOCK COUNT.       0013 X
251 09 020  XXOTRS EQU   22&X3               EQUATE TO OUTPUT REEL SEQUENCE.     0022 X
252 09 030  XXOUTN EQU   33&X3               EQUATE TO OUTPUT NAME.              0033 X
253 09 040  XXOUTR EQU   38&X3               EQUATE TO OUTPUT RETENTION CYCLE.   0038 X
254 09 050  *                                                                 ZTAPB
255 09 060  **    CONSTANTS                                                   ZTAPB
256 09 070  *                                                                 ZTAPB
257 09 080  XX1HDR DCW   @1HDR @             HEADER LABEL IDENTIFICATION.     5  0340                     4
258 09 090  XX1EOR DCW   @1EOR @             END OF REEL IDENTIFICATION.      5  0345                     4
259 09 100  XX1EOF DCW   @1EOF @             END OF FILE IDENTIFICATION.      5  0350                     4
260 09 110  XX1    DCW   001                 ADDRESS CONSTANT  001.           3  0353                     4
261 09 120  XX366  DCW   366                 DAYS PER YEAR & 1.               3  0356                     4
262 09 130  XX635  DCW   635                 1000 MINUS DAYS PER YEAR.        3  0359                     4
263 09 140  XXR    DCW   @R@                 CONSTANT  R .                    1  0360                     4
264 09 150  XXERRC DCW   #2                  ERROR COUNTER.                   2  0362                     5
265 09 160  *                                                                 ZTAPB
266 09 170  **    EOR ROUTINE FOR MULTI-REEL OUTPUT FILES.                    ZTAPB
267 09 180  *                                                                 ZTAPB
268 09 190  XXCHNG SBR   XXXXXX&3            STORE LINK IN EXIT.              4  0363  H U28              5
269 09 200         SBR   XXIND3              STORE NSI IN X3                  4  0367  H 099              5
270 10 010         SBR   XXLCA&3,XX1EOR      MODIFY XXLCA TO USE XX1EOR.      7  0371  H T32 345          5
271 10 020         B     XXPOST              GO TO WRITE TRAILER.             4  0378  B S21              5
272 10 030         B     XXEORY              GO TO OPEN NEXT REEL.            4  0382  B T59              5
273 10 040  *                                                                 ZTAPB
274 10 050  ** FILE TABLE FOR HEADER & TRAILER                                ZTAPB
275 10 060  *                                                                 ZTAPB
276 10 070  XXHEAD DCW   @0@                 DRIVE NUMBER.                    1  0386                     5
277 10 080         DC    XXTRAL              I/O AREA.                        3  0389  400                5
278 10 090  XXHDRW DC    @W@                 WRITE D CHARACTER.               1  0390                     5
279 10 100         DCW   XXNOHD              EOF EXIT.                        3  0393  913                6
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                          ZZTAPE  TAPE I/O PACKAGE.  CONSTANTS AND EQUATES           ZTAPB               PAGE    5

SEQ PG LIN  LABEL  OP    OPERANDS                                          SFX CT  LOCN  INSTRUCTION TYPE  CARD

280 10 110  XXW    DCW   @W@              CONSTANT  W .                          1  0394                       6
281 10 120         DCW   #5               ADD BLOCK COUNT DURING TRAILER WT      5  0399                       6
282 10 130  *                                                               ZTAPB
283 10 140  ** HEADER AND TRAILER I/O AREA                                  ZTAPB
284 10 150  *                                                               ZTAPB
285 10 160  XXTRAL DA    1X80,G           LABELS RESIDE HERE.                       0400   0479
285                DCW   @"@                                                     1  0480              GMARK    7
286 10 170  *                                                               ZTAPB
287 10 180  **    WORKING STORAGE                                           ZTAPB
288 10 190  *                                                               ZTAPB
289 10 200  XXDATE DCW   #5               HOLD AREA FOR JULIAN DATE.             5  0485                       7
290 11 010  XXSVDT DCW   #5               SAVE AREA FOR JULIAN DATE.             5  0490                       7
291 11 020         DCW   #1               DUMMY TO ADJUST XXTAPE ADDRESS.        1  0491                       7
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                              ZZTAPE TAPE I/O PACKAGE  READ/WRITE ROUTINE              ZTAPB                PAGE    6

 SEQ PG LIN  LABEL  OP    OPERANDS                                              SFX CT  LOCN  INSTRUCTION TYPE  CARD

 292 12 010         JOB   ZZTAPE TAPE I/O PACKAGE  READ/WRITE ROUTINE
 293 12 020  XXTAPE SBR   XXIND3              STORE NSI IN X3                       4  0492  H 099                 7
 294 12 030         SBR   XXTHRU&3            STORE LINK IN XXTHRU                  4  0496  H 628                 7
 295 12 040         MCW   XXFADD,XXIND3       MOVE FILE ADDRESS TO X3.              7  0500  M 0?3 099             7
 296 12 050         BW    XXNOTO,XXDRNO&1     CHECK IF FILE OPENED.                 8  0507  V 765 0?1 1           8
 297 12 060         MCW   XXIODC,XXRDWR&7     MOVE  A  B  AND  D  I/O INST.         7  0515  M 0?4 533             8
 298 12 070  XXREST S     XXERRC              CLEAR ERROR COUNTER.                  4  0522  S 362                 8
 299 12 080  XXRDWR RT    0,0                 READ OR WRITE TAPE.                   8  0526  M %U0 000 R           8
 300 12 090         SBR   XXLENG&3            STORE NEXT POSITION IN XXLENG         4  0534  H 675                 8
 301 12 100  *                                TO CLEAR WRONG LENGTH RECORD G.M.     ZTAPB
 302 12 110         SBR   XXCLER&6            STORE NEXT POSITION IN XXCLER         4  0538  H 759                 8
 303 12 120  *                                TO CLEAR NOISE LENGTH RECORD G.M.     ZTAPB
 304 12 130         SBR   XXCLR&3             STORE NEXT POSITION IN XXCLR          4  0542  H S55                 8
 305 12 140  *                                TO CLEAR G.M. SET BY T.M. RECORD.     ZTAPB
 306 12 150         BCE   XXCKER,XXIODC,W     GO CHECK TAPE ERROR IF WRITE.         8  0546  B 593 0?4 W           9
 307 12 160         BEF   XXRDTL              GO READ TRAILER IF EOF.               5  0554  B S32 K               9
 308 12 170  XXTMCK SBR   *&14,12             SETUP FOR NOISE                       7  0559  H 579 012             9
 309 12 180         MA    XXIORA,*&7          LENGTH RECORD CHECK.                  7  0566  # 0?3 579             9
 310 12 190         BCE   XXCLER,12,"         CHECK POSITIONS 1 - 13                8  0573  B 753 012 " GMARK     9
 311 12 200         CHAIN 12                  FOR GROUP MARK.                                          MACRO
 312                BCE                                                             1  0581  B         GEN         9
 313                BCE                                                             1  0582  B         GEN         9
 314                BCE                                                             1  0583  B         GEN        10
 315                BCE                                                             1  0584  B         GEN        10
 316                BCE                                                             1  0585  B         GEN        10
 317                BCE                                                             1  0586  B         GEN        10
 318                BCE                                                             1  0587  B         GEN        10
 319                BCE                                                             1  0588  B         GEN        10
 320                BCE                                                             1  0589  B         GEN        10
 321                BCE                                                             1  0590  B         GEN        11
 322                BCE                                                             1  0591  B         GEN        11
 323                BCE                                                             1  0592  B         GEN        11
 324 13 010  XXCKER BER   XXERR               CHECK FOR TAPE ERROR.                 5  0593  B 676 L              11
 325 13 020         BCE   XXCKLG,XXIODC,R     GO CHECK RECORD LENGTH IF READ.       8  0598  B 629 0?4 R          11
 326 13 030         A     XX1,XXOTCT          ADD OUTPUT BLOCK COUNT.               7  0606  A 353 0A3            11
 327 13 040         MCW   XXEOFX,*&4          SETUP EOR EXIT FROM FILE TABLE.       7  0613  M 0?7 623            11
 328 13 050         BEF   0                   EXIT IF END OF REEL.                  5  0620  B 000 K              12
 329 13 060  XXTHRU B     0                   EXIT IF ALL CHECKS OK.                4  0625  B 000                12
 330 13 070  *                                                                      ZTAPB
 331 13 080  ** ROUTINE TO CHECK INPUT BLOCK LENGTH                                 ZTAPB
 332 13 090  *                                                                      ZTAPB
 333 13 100  XXCKLG C     XXSAVE-1,XXIND3     CHECK IF READING                      7  0629  C 831 099            12
 334 13 110         BE    XXTHRU              TRAILER LABEL.                        5  0636  B 625 S              12
 335 13 120         C     XXLENG&3,XXINGM     CHECK IF NEXT POSITION                7  0641  C 675 0C6            12
 336 13 130         BE    XXTHRU              IS INPUT GROUP MARK.                  5  0648  B 625 S              12
 337 13 140         MA    XXI9I,XXLENG&3      DECREMENT ADDRESS AND                 7  0653  # U89 675            13
 338 13 150         C     XXLENG&3,XXINGM     CHECK FOR LONG RECORD.                7  0660  C 675 0C6            13
 339 13 160         BE    XXERR               DO NOT CLEAR G.M. IF LONG RECORD.     5  0667  B 676 S              13
 340 13 170  XXLENG SAR   0                   CLEAR SHORT RECORD G.M.               4  0672  Q 000                13
 341 13 180  *                                                                      ZTAPB
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                          ZZTAPE TAPE I/O PACKAGE  READ/WRITE ROUTINE                ZTAPB                PAGE    7

 SEQ PG LIN  LABEL  OP    OPERANDS                                           SFX CT  LOCN  INSTRUCTION TYPE  CARD

 342 13 190  ** ERROR COUNT & HALT ROUTINES                                      ZTAPB
 343 13 200  *                                                                   ZTAPB
 344 14 010  XXERR  MN    XXDRNO,*&4         SET DRIVE NUMBER AND                7  0676  D 0?0 686            13
 345 14 020         BSP   0                  BACKSPACE TAPE JUST USED.           5  0683  U %U0 B              13
 346 14 030         A     XX1,XXERRC         INCREMENT ERROR COUNTER.            7  0688  A 353 362            14
 347 14 040         BCE   XXHLTR,XXERRC-1,5  CHECK FOR 50 READ ERRORS.           8  0695  B 735 361 5          14
 348 14 050         BCE   XXRDWR,XXIODC,R    CHECK IF READ.                      8  0703  B 526 0?4 R          14
 349 14 060         MN    XXDRNO,*&4         SET DRIVE NUMBER FOR SKIP & ERACE   7  0711  D 0?0 721            14
 350 14 070         SKP   0                  SET ERACE FLIP - FLOP.              5  0718  U %U0 E              14
 351 14 080         BCE   XXHLTW,XXERRC,I    CHECK FOR 9 WRITE ERRORS.           8  0723  B 744 362 I          15
 352 14 090         B     XXRDWR             GO TRY TO WRITE AGAIN.              4  0731  B 526                15
 353 14 100  XXHLTR NOP   1000               SET HALT CODING.                    4  0735  N '00                15
 354 14 110         H                        HALT IF READ ERROR.                 1  0739  .                    15
 355 14 120         B     XXREST             GO TRY AGAIN.                       4  0740  B 522                15
 356 14 130  XXHLTW NOP   2000               SET HALT CODING.                    4  0744  N !00                15
 357 14 140         H                        HALT IF WRITE ERROR.                1  0748  .                    15
 358 14 150         B     XXREST             RESET COUNTER & TRY AGAIN.          4  0749  B 522                16
 359 14 160  XXCLER MN    *,0                CLEAR GROUP MARK SET BY             7  0753  D 759 000            16
 360 14 170         MN                       NOISE LENGTH RECORD.                1  0760  D                    16
 361 14 180         B     XXREST             RESET COUNTER & TRY AGAIN.          4  0761  B 522                16
 362 14 190  XXNOTO MN    XXDRNO,*&4         SET DRIVE NUMBER IN HALT CODING.    7  0765  D 0?0 775            16
 363 14 200         NOP   3000               SET HALT CODING.                    4  0772  N ?00                16
 364 15 010         H                        HALT. NO RESTART.                   1  0776  .                    16
 365 15 020         B     *-8                HALT MEANS FILE NOT OPEN.           4  0777  B 772                17
 366 15 030         DCW   #9                 DUMMY TO ADJUST NOP & RE-STARTS.    9  0789                       17
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                      ZZTAPE OPEN ROUTINE                                       ZTAPB               PAGE    8

 SEQ PG LIN  LABEL  OP    OPERANDS                                        SFX CT  LOCN  INSTRUCTION TYPE  CARD

 367 16 010         JOB   ZZTAPE OPEN ROUTINE
 368 16 020  XXOPEN SBR   XXIND3              STORE NSI IN X3.                 4  0790  H 099              17
 369 16 030         SBR   XXOPNX&3            STORE LINK IN XXOPNX.            4  0794  H '07              17
 370 16 040         SW    97                  SET WORD MARK IN X3              4  0798  , 097              17
 371 16 050         MCW   XXFADD,XXIND3       MOVE FILE ADDRESS TO X3.         7  0802  M 0?3 099          17
 372 16 060         CW    XXDRNO&1            CLEAR WORD MARK UNDER I/O ADDRESS     4  0809  ) 0?1              17
 373 16 070  XXROPN MN    XXDRNO,*&4          SET DRIVE NUMBER IN REWIND.      7  0813  D 0?0 823          18
 374 16 080         RWD   0                   REWIND TAPE.                     5  0820  U %U0 R            18
 375 16 090         MN    XXDRNO,XXHEAD       SET DRIVE NUMBER IN HEADER TABLE.     7  0825  D 0?0 386          18
 376 16 100  XXSAVE SBR   XXTMCK-2,XXTMCK     SETUP TO IGNORE TAPE MARK.       7  0832  H 557 559          18
 377 16 110         B     XXHDRD              GO READ HEADER LABEL, IF ANY.    4  0839  B /91              18
 378 16 120         SBR   XXTMCK-2,XXRDTL     RESET BRANCH-END-FILE.           7  0843  H 557 S32          18
 379 16 130         C     XXTRAL&4,XX1HDR     CHECK IF HEADER.                 7  0850  C 404 340          19
 380 16 140         BE    XXCHIO              IF EQUAL, GO TO CHECK IT.        5  0857  B 881 S            19
 381 16 150         BCE   XXNOHD,XXIODC,R     ELSE IF READ, IT IS BAD.         8  0862  B 913 0?4 R        19
 382 16 160         CS    479                 CLEAR XXTRAL.                    4  0870  / 479              19
 383 16 170         LCA   XX1HDR,XXTRAL&4     LOAD HEADER ID INTO XXTRAL.      7  0874  L 340 404          19
 384 16 180  XXCHIO BCE   XXOUT,XXIODC,W      CHECK IF WRITE.                  8  0881  B '08 0?4 W        19
 385 16 190         BW    *&5,XXKEY           CHECK IF SECOND REEL.            8  0889  V 901 0?8 1        20
 386 16 200         B     XXIN                GO CHECK AGE OF INPUT FILE.      4  0897  B 929              20
 387 17 010         C     XXTRAL&34,XXINLB    CHECK IF SAME FILE AS LAST REEL.      7  0901  C 434 0C3          20
 388 17 020         BE    XXADD1              IF EQUAL, ADD 1 TO REEL SEQUENCE.     5  0908  B 993 S            20
 389 17 030  XXNOHD MN    XXDRNO,*&4          SET DRIVE NUMBER IN HALT CODING.      7  0913  D 0?0 923          20
 390 17 040         NOP   5000                SET HALT CODING.                 4  0920  N '0'              20
 391 17 050         H                         HALT.  INPUT CANNOT BE OPENED.   1  0924  .                  20
 392 17 060         B     XXROPN              GO TRY AGAIN.                    4  0925  B 813              21
 393 17 070  *                                                                 ZTAPB
 394 17 080  **    CHECK AGE OF INPUT FILE.                                    ZTAPB
 395 17 090  *                                                                 ZTAPB
 396 17 100  XXIN   C     XXTRAL&29,XXINPL    CHECK LABEL AGAINST EXPECTED LABL     7  0929  C 429 0B8          21
 397 17 110         BU    XXISBD              IF BAD GO HALT OR TO USER EXIT.  5  0936  B 977 /            21
 398 17 120         SBR   XXAGAD&3,XXPER1     SET PERAMETER 1 CHECK.           7  0941  H /23 0C9          21
 399 17 130         B     XXCKDT              GO CHECK MINIMUM AGE.            4  0948  B /09              21
 400 17 140         BH    XXISBD              IF TOO YOUNG, GO HALT.           5  0952  B 977 U            21
 401 17 150         SBR   XXAGAD&3,XXPER2     SET PERAMETER 2 CHECK.           7  0957  H /23 0D2          21
 402 17 160         B     XXCKDT              GO CHECK MAXIMUM AGE.            4  0964  B /09              22
 403 17 170         BL    XXISBD              IF BAD, GO HALT.                 5  0968  B 977 T            22
 404 17 180         B     *&5                 IF GOOD, SKIP BRANCH TO HALT.    4  0973  B 981              22
 405 17 190  XXISBD B     XXNOHD              GO TO HALT OR USER EXIT.         4  0977  B 913              22
 406 17 200         SW    XXKEY               SET KEY.  INPUT OPENED.          4  0981  , 0?8              22
 407 18 010         MCW   XXTRAL&34,XXINLB    SETUP CHECK FOR                  7  0985  M 434 0C3          22
 408 18 020         MCW                       NEXT REEL OF FILE.               1  0992  M                  22
 409 18 030  XXADD1 MA    XX1,XXINRS          ADD 1 TO REEL SEQUENCE.          7  0993  # 353 0A7          23
 410 18 040  XXOPEX SW    XXKEY               SET KEY.  OUTPUT OPENED.         4  1000  , 0?8              23
 411 18 050  XXOPNX B     0                   EXIT.                            4  1004  B 000              23
 412 18 060  *                                                                 ZTAPB
 413 18 070  **    CHECK RETENTION CYCLE OF OUTPUT FILES.                      ZTAPB
 414 18 080  *                                                                 ZTAPB
 415 18 090  XXOUT  SW    XXTRAL&36           SETUP FOR CHECKING               4  1008  , 436              23
 416 18 100         SBR   XXAGAD&3,XXTRAL&38   RETENTION CYCLE.                7  1012  H /23 438          23
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SEQ PG LIN  LABEL  OP    OPERANDS                                               SFX CT  LOCN  INSTRUCTION TYPE  CARD

417 18 110         B     XXCKDT             GO CHECK RETENTION CYCLE.                4  1019  B /09                23
418 18 120         CW    XXTRAL&36          RESET LAST SETUP.                        4  1023  ) 436                23
419 18 130         BH    *&14               GO HALT IF FILE NOT OLD ENOUGH.          5  1027  B '45 U              24
420 18 140         BL    XXWRHD             WRITE HEADER IF OLD FILE EXPIRED.        5  1032  B '61 T              24
421 18 150         BCE   XXWRHD,XXTRAL&36,     GO WRITE HEADER IF NO RET CYC.        8  1037  B '61 436            24
422 18 160         MN    XXDRNO,*&4         SET DRIVE NUMBER IN HALT CODING.         7  1045  D 0?0 '55            24
423 18 170         NOP   5010               SET HALT CODING.                         4  1052  N '1'                24
424 18 180         H                        HALT.                                    1  1056  .                    24
425 18 190         B     XXROPN             GO TRY AGAIN.                            4  1057  B 813                24
426 18 200  *                                                                        ZTAPB
427 19 010  **    WRITE OUTPUT HEADER LABEL.                                         ZTAPB
428 19 020  *                                                                        ZTAPB
429 19 030  XXWRHD MN    XXDRNO,*&4         SET DRIVE NUMBER IN REWIND.              7  1061  D 0?0 '71            25
430 19 040         RWD   0                  REWIND TAPE.                             5  1068  U %U0 R              25
431 19 050         MCW   XXOUTR,XXTRAL&39   MOVE                                     7  1073  M 0C8 439            25
432 19 060         MCW   XXDATE               INFORMATION                            4  1080  M 485                25
433 19 070         MCW   XXOUTN                 FROM FILE                            4  1084  M 0C3                25
434 19 080         MCW                            TO LABEL.                          1  1088  M                    25
435 19 090         MCW                                                               1  1089  M                    25
436 19 100  XXOTEX B     *&1                GO TO NEXT OR USER ROUTINE.              4  1090  B '94                26
437 19 110         B     XXHDIO             GO WRITE HEADER.                         4  1094  B /61                26
438 19 120         MA    XX1,XXOTRS         INCREMENT OUTPUT REEL SEQUENCE.          7  1098  # 353 0B2            26
439 19 130         B     XXOPEX             GO TO EXIT.                              4  1105  B '00                26
440 19 140  *                                                                        ZTAPB
441 19 150  **    GENERAL AGE CHECK ROUTINE.                                         ZTAPB
442 19 160  *                                                                        ZTAPB
443 19 170  XXCKDT SBR   XXDTCX&3           STORE LINK IN EXIT.                      4  1109  H /60                26
444 19 180         MCW   XXTRAL&34,XXSVDT   MOVE FILE DATE TO SAVE AREA.             7  1113  M 434 490            26
445 19 190  XXAGAD A     0,XXSVDT           ADD PERAMETER TO SAVE AREA.              7  1120  A 000 490            26
446 19 200         C     XXSVDT,XX366       CHECK IF JULIAN DATE                     7  1127  C 490 356            27
447 20 010         BH    *&12               ADJUSTMENT IS NECESSARY.                 5  1134  B /50 U              27
448 20 020         A     XX635,XXSVDT       ADJUST JULIAN DATE.                      7  1139  A 359 490            27
449 20 030         B     *-22               GO CHECK AGAIN.                          4  1146  B /27                27
450 20 040         C     XXDATE,XXSVDT      CHECK PERAMETER.                         7  1150  C 485 490            27
451 20 050  XXDTCX B     0                  GO BACK TO MAINLINE.                     4  1157  B 000                27
452 20 060  *                                                                        ZTAPB
453 20 070  **    GENERAL READ/WRITE HEADER/TRAILER ROUTINE.                         ZTAPB
454 20 080  *                                                                        ZTAPB
455 20 090  XXHDIO SBR   XXHDEX&3           STORE LINK IN EXIT.                      4  1161  H /90                27
456 20 100         SBR   *&15,0&X3          SAVE X3.                                 7  1165  H /86 0?0            28
457 20 110         B     XXTAPE             GO READ OR WRITE TAPE.                   4  1172  B 492                28
458 20 120         NOP   XXHEAD             USE XXTRAL AS I/O AREA.                  4  1176  N 386                28
459 20 130         SBR   XXIND3,0           RESTORE X3.                              7  1180  H 099 000            28
460 20 140  XXHDEX B     0                  GO BACK TO MAINLINE.                     4  1187  B 000                28
461 20 150  XXHDRD SBR   XXHDRX&3           STORE LINK IN EXIT.                      4  1191  H S16                28
462 20 160         MCW   XXR,XXHDRW         SET READ  D  CHARACTER.                  7  1195  M 360 390            28
463 20 170         B     XXHDIO             GO READ HEADER LABEL.                    4  1202  B /61                29
464 20 180         MCW   XXW,XXHDRW         RESET WRITE  D  CHARACTER.               7  1206  M 394 390            29
465 20 190  XXHDRX B     0                  GO BACK TO MAINLINE.                     4  1213  B 000                29
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                             ZZTAPE CLOSE ROUTINE.                                                      ZTAPB               PAGE  10

 SEQ PG LIN  LABEL  OP    OPERANDS                                             SFX CT  LOCN  INSTRUCTION TYPE  CARD

 466 21 010         JOB   ZZTAPE CLOSE ROUTINE.
 467 21 020  XXCLOZ SBR   XXIND3              STORE NSI IN X3.                      4  1217  H 099                 29
 468 21 030  XXPOST SBR   XXCLZX&3            STORE LINK IN EXIT.                   4  1221  H T58                 29
 469 21 040         MCW   XXFADD,XXIND3       MOVE FILE ADDRESS TO X3.              7  1225  M 0?3 099             29
 470 21 050  XXRDTL MN    XXDRNO,XXHEAD       SET DRIVE NUMBER FOR READ/WRITE.      7  1232  D 0?0 386             29
 471 21 060         BCE   XXWRTL,XXIODC,W     CHECK IF WRITE.                       8  1239  B T14 0?4 W           30
 472 21 070         BER   XXERR               GO TO ERROR ROUTINE ON ERROR.         5  1247  B 676 L               30
 473 21 080  XXCLR  SAR   0                   CLEAR G.M. SET BY T.M. RECORD.        4  1252  Q 000                 30
 474 21 090         MCW   XXTHRU&3,XXXXXX&3   SETUP EXIT BACK TO USER.              7  1256  M 628 U28             30
 475 21 100         MCW   XXEOFX,XXEORX&3     SETUP EXIT FOR  1EOF  RECORD.         7  1263  M 0?7 S96             30
 476 21 110         B     XXHDRD              GO READ TRAILER.                      4  1270  B /91                 30
 477 21 120         C     XXTRAL&4,XX1EOR     CHECK FOR END OF REEL                 7  1274  C 404 345             31
 478 21 130         BE    XXEORY              IF YES, GO OPEN NEXT REEL.            5  1281  B T59 S               31
 479 21 140         C     XXTRAL&4,XX1EOF     CHECK FOR END OF FILE.                7  1286  C 404 350             31
 480 21 150  XXEORX BE    0                   IF YES, EXIT TO USER ROUTINE.         5  1293  B 000 S               31
 481 21 160         MN    XXDRNO,*&4          ELSE MOVE DRIVE # TO HALT CODING.     7  1298  D 0?0 T08             31
 482 21 170         NOP   5020                SET HALT CODING.                      4  1305  N '2'                 31
 483 21 180         H                         HALT.                                 1  1309  .                     31
 484 21 190         B     *-8                 NO RESTART.                           4  1310  B T05                 32
 485 21 200  XXWRTL B     XXWRTM              GO WRITE TAPE MARK.                   4  1314  B U29                 32
 486 22 010         CS    479                 CLEAR XXTRAL.                         4  1318  / 479                 32
 487 22 020         MCW   XXOTCT,XXTRAL&9     MOVE OUTPUT BLOCK COUNT TO TRAILR     7  1322  M 0A3 409             32
 488 22 030  XXLCA  LCA   XX1EOF              LOAD XX1EOR OR XX1EOF TO TRAILER.     4  1329  L 350                 32
 489 22 040         SBR   XXLCA&3,XX1EOF      RESET LOAD INSTRUCTION.               7  1333  H T32 350             32
 490 22 050         MCW   XXTRAL&79,XXOTCT    BLANK OLD BLOCK COUNT.                7  1340  M 479 0A3             32
 491 22 060         B     XXHDIO              GO WRITE TRAILER.                     4  1347  B /61                 33
 492 22 070         B     XXWRTM              GO WRITE TAPE MARK.                   4  1351  B U29                 33
 493 22 080  XXCLZX B     0                   EXIT TO USERS PROGRAM OR XXCHNG.      4  1355  B 000                 33
 494 22 090  *                                                                      ZTAPB
 495 22 100  ** END OF REEL ROUTINE FOR MULTI-REEL FILES                            ZTAPB
 496 22 110  *                                                                      ZTAPB
 497 22 120  XXEORY MN    XXDRNO,*&4          SET DRIVE NUMBER IN REWIND.           7  1359  D 0?0 T69             33
 498 22 130         RWU   0                   REWIND AND UNLOAD TAPE.               5  1366  U %U0 U               33
 499 22 140         SW    XXDRNO&1            SET NOT-OPENED FLAG.                  4  1371  , 0?1                 33
 500 22 150         MN    XXDRNO,*&4          MOVE DRIVE NUMBER TO HALT CODING.     7  1375  D 0?0 T85             33
 501 22 160         NOP   7880                SET HALT CODING.                      4  1382  N H8'                 34
 502 22 170         H                         HALT.  OPERATOR HANGS NEW TAPE.       1  1386  .                     34
 503 22 180         SBR   *&8,0&X3            SET FILE ADDRESS IN NOP.              7  1387  H U01 0?0             34
 504 22 190         B     XXOPEN              GO OPEN NEXT REEL.                    4  1394  B 790                 34
 505 22 200         NOP   0                   DELIVER FILE ADDRESS.                 4  1398  N 000                 34
 506 23 010         BCE   XXXXXX,XXIODC,W     CHECK IF WRITE. EXIT IF YES.          8  1402  B U25 0?4 W           34
 507 23 020         SBR   *&8,0&X3            SET FILE ADDRESS IN NOP.              7  1410  H U24 0?0             34
 508 23 030         B     XXTAPE              GO READ FIRST BLOCK.                  4  1417  B 492                 35
 509 23 040         NOP   0                   DELIVER FILE ADDRESS.                 4  1421  N 000                 35
 510 23 050  XXXXXX B     0                   EXIT TO USERS PROGRAM.                4  1425  B 000                 35
 511 23 060  *                                                                      ZTAPB
 512 23 070  ** WRITE TAPE MARK WITH ERROR CHECK ROUTINE                            ZTAPB
 513 23 080  *                                                                      ZTAPB
 514 23 090  XXWRTM SBR   XXTMEX&3            STORE LINK IN EXIT.                   4  1429  H U53                 35
 515 23 100         MN    XXDRNO,*&4          SET DRIVE NUMBER IN WTM.              7  1433  D 0?0 U43             35
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 SEQ PG LIN  LABEL  OP    OPERANDS                                              SFX CT  LOCN  INSTRUCTION TYPE  CARD

 516 23 110  XXWTM  WTM   0                   WRITE TAPE MARK.                          5  1440  U %U0 M             35
 517 23 120         BER   XXTMER              GO SKIP AND TRY AGAIN ON ERROR.           5  1445  B U54 L             35
 518 23 130  XXTMEX B     0                   EXIT.                                     4  1450  B 000               36
 519 23 140  XXTMER NOP   7999                SET HALT CODING.                          4  1454  N I9Z               36
 520 23 150         H                         HALT.                                     1  1458  .                   36
 521 23 160         MN    XXDRNO,XXERAC&3     SET DRIVE NUMBER IN SKIP AND ERAC         7  1459  D 0?0 U81           36
 522 23 170         MN    XXDRNO,XXSLIP&3     SET DRIVE NUMBER IN BACKSPACE.            7  1466  D 0?0 U76           36
 523 23 180  XXSLIP BSP   0                   BACKSPACE TAPE.                           5  1473  U %U0 B             36
 524 23 190  XXERAC SKP   0                   SET SKIP AND ERACE FLIP - FLOP.           5  1478  U %U0 E             36
 525 23 200         B     XXWTM               GO TRY AGAIN.                             4  1483  B U40               37
 526 24 010  XXI9I  DCW   @I9I@               ADDRESS CONSTANT OF MINUS 1.              3  1489                      37
 527 24 020         END   XXTAPE                                                             / 492 080
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SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS	SYMBOL	ADDRESS
XX1	353	XX1EOF	350	XX1EOR	345	XX1HDR	340	XX366	356	XX635	359	XXADD1	993
XXAGAD	1120	XXCHIO	881	XXCHNG	363	XXCKDT	1109	XXCKER	593	XXCKLG	629	XXCLER	753
XXCLOZ	1217	XXCLR	1252	XXCLZX	1355	XXDATE	485	XXDRNO	0+X3	XXDTCX	1157	XXEOFX	7+X3
XXEORX	1293	XXEORY	1359	XXERAC	1478	XXERR	676	XXERRC	362	XXFADD	3+X3	XXHDEX	1187
XXHDIO	1161	XXHDRD	1191	XXHDRW	390	XXHDRX	1213	XXHEAD	386	XXHLTR	735	XXHLTW	744
XXI9I	1489	XXIN	929	XXIND3	99	XXINGM	36+X3	XXINLB	33+X3	XXINPL	28+X3	XXINRS	17+X3
XXIODC	4+X3	XXIORA	3+X3	XXISBD	977	XXKEY	8+X3	XXLCA	1329	XXLENG	672	XXNOHD	913
XXNOTO	765	XXOPEN	790	XXOPEX	1000	XXOPNX	1004	XXOTCT	13+X3	XXOTEX	1090	XXOTRS	22+X3
XXOUT	1008	XXOUTN	33+X3	XXOUTR	38+X3	XXPER1	39+X3	XXPER2	42+X3	XXPOST	1221	XXR	360
XXRDTL	1232	XXRDWR	526	XXREST	522	XXROPN	813	XXSAVE	832	XXSLIP	1473	XXSVDT	490
XXTAPE	492	XXTHRU	625	XXTMCK	559	XXTMER	1454	XXTMEX	1450	XXTRAL	400	XXW	394
XXWRHD	1061	XXWRTL	1314	XXWRTM	1429	XXWTM	1440	XXXXXX	1425				