R2900 PARAPROGRAM RD1 -- PASS 1 -- GROUP B
R2901 ----------

R2902 THIS PARAPROGRAM IS OPERATED BY GROUP B DURING PASS 1 AND READS SYPT, SYLT, AND BYPT RECORDS FROM
R2904 TAPE 1 (SYSTEM TAPE). IT CLASSIFIES SYPT AND SYLT RECORDS INTO DELETE, SAVE, AND INPUT RECORDS. SAVE RECORDS
R2906 ARE SIMPLY PASSED OVER UNTIL THE FIRST DELETE OR INPUT RECORD IS ENCOUNTERED. THEREAFTER, SAVE RECORDS ARE
R2908 TRANSMITTED TO BE WRITTEN ON TAPE 3 BY A PROGRAM IN GROUP C. IN A PROGRAM ASSEMBLY, ALL SYLTSAVES ARE TRANS-
R2910 MITTED. BYPT RECORDS ARE CLASSIFIED INTO DELETE OR SAVE RECORDS, BYPTSAVES BEING TRANSMITTED TO BE WRITTEN ON
R2912 TAPE 4. IN EACH FILE, THOSE RECORDS ARE DELETED WHOSE NAMES ARE THREADED FOR DELETION IN THE YUL FILE. ALSO,
R2914 IN A PROGRAM ASSEMBLY, ANY EXISTING LOAD DECK (BYPT RECORD) FOR THE PROGRAM BEING ASSEMBLED IS DELETED. THERE
R2916 ARE INPUT RECORDS FROM SYPT DURING A PROGRAM RE-ASSEMBLY, AND THERE ARE INPUT RECORDS FROM SYLT DURING A SUBROU-
R2918 TINE RE-ASSEMBLY OR WHENEVER SUBROUTINES ARE USED. THE FINAL TASK OF RD1 IS TO POSITION TAPE 1 CORRECTLY FOR
R2920 WRITING DURING PASS 2. SYLT RECORDS THAT ARE INPUT (EXCEPT BELONGING TO THE PRINCIPAL IN SUBROUTINE ASSEMBLY)
R2922 ARE ALSO SAVED, TO PERMIT ONE-SHOT MODIFICATION OF SUBROUTINES.

R2923 A "PARAPROGRAM" IS A SUBSIDIARY ROUTINE RUNNING IN A SIDE GROUP. WE ARE INDEBTED AS USUAL TO JOHN SHAW FOR
R29232 JSOCTL.

```
 2924              SETLOC,5    1056          B7

 29244             TS          L BANK 1      Z,X6        PASS 1 GPB
 29245             TS          L BANK 1      Z,X6        PASS 1 GPC        MINI-TRANSFER-VECTOR FOR SIDE GP STARTS.

 2925  BIT 6 P     OCT         01
 2926  BIT 25 P    OCT         -4000 0000
 2927  SPEC SGN P  OCT         -10 0000
 2928  BIT 46      OCT         -4
 2929  ONE P       OCT         -1

 2930  D12 P       OCT         -17
 2931  C5T8 P      OCT         -7777 7777
 2932  CAC 3 P     OCT         -17 7777
 2933  THREE P     OCT         -3
 29335 *ONES P     DEC         GGGG GGGG GGGG
 29338  D4T8P      DEC         000G GGGG
 29339  OCT 400    OCT         -400
 2934   OCT 200    OCT         -200
```

P29345 ALPHABETIC CONSTANTS, RESERVATIONS, AND ADDRESS CONSTANTS.

```
 2935   W END SYPT ALF          END SYPT
 2936   W END SYLT ALF          END SYLT
 2937   W END POPO ALF          END¢POPO

 2938   EOF BANER  DEC          -GGGG
 2939   WANTED     RESERVE      1
 2940   LIST NAME  RESERVE      1
 2941   LHS        RESERVE      3

29419   END SYMBF  RESERVE      1
 2942   SAVE XSP   RESERVE      5
 2943   L DO DELET SPEC                          DO DELETE
 2944              SPEC                          DELETE Q
 2945   L WANT PRG SPEC                          WANT PROG
 2946              OCT          -33757
 2947              OCT          -133770

 2948   L DO INPUT SPEC                          DO INPUT
 2949   L DO SAVE  SPEC                          DO SAVE
 2950   L DO INSAV SPEC                          DO INPSAV

 2951   L SUBKNO Q SPEC                          SUBKNOW Q
 2952   L GET SUBS SPEC                          GET SUBS
 2953   L BANK 1   SPEC, B1                      DAMN ZERO
 2954   L ENDTHR 1 SPEC,B7                       7

29544   L EORVF M2 CAC          ANAL SYMB  COMMON  EOR OR EOF -2
```

P29545 ASSIGNMENTS AND EQUIVALENCES.

```
 29546  COMMON      ASSIGN      1,0

  2955  TAPCO NAM   ASSIGN      2,0
  2956  TAPRO NAM   ASSIGN      2,1

  2957  PROG NAME   ASSIGN      6,0
  2958  NEXT NAME   ASSIGN      6,1
  2959  SWITCH      ASSIGN      6,2

  2960  MID POINT   ASSIGN      6,40
  2961  L PROG FIL  ASSIGN      6,44
  2962  INIT X5     ASSIGN      6,49

  2963  SORS NAME   ASSIGN      6,52
  2964  COMPUTER    ASSIGN      6,53
 29645  SEG OWNER   ASSIGN      6,54
  2965  SUBSTRAB    ASSIGN      6,55
  2966  TRACK LOG   ASSIGN      6,57
  2967  DISCALIM    ASSIGN      6,58
  2968  DISC ADDR   ASSIGN      6,59
  2969  REC COUNT   ASSIGN      6,60
  2970  ZERO        ASSIGN      6,62

  2971  BIT 32      ASSIGN      6,69
  2972  BIT 45 NOT  ASSIGN      6,70
  2973  TWO         ASSIGN      6,71
  2974  NINE        ASSIGN      6,72

  2975  FREE NTRY   ASSIGN      6,73
  2976  FREE EXIT   ASSIGN      6,74
  2977  SAPO NTRY   ASSIGN      6,75
  2978  PI MASKS    ASSIGN      6,76

  2979  END PARAS   ASSIGN      6,77
  2980  END YUL     ASSIGN      6,78
  2981  DISASTER    ASSIGN      6,81
  2982  GRAB FREE   ASSIGN      6,83
  2983  FREE INSV   ASSIGN      6,91
  2984  SET FREE    ASSIGN      6,95

  2985  L STOPPER   EQUALS      CAC3 P
 29851  L COMMON P  EQUALS      L EORVF M2
 29852  L ANAL SYM  EQUALS      L EORVF M2
```

```
R2986   DECISION PROCESS UPON THE RECORD IN THE BUFFER WHOSE ADDRESS IS IN X2. SOME EXPLANATION IS CALLED FOR ABOUT THE
R2988   INDEXED SPECIAL REGISTER ADDRESSES ON THIS PAGE (3) AND PAGE 6.  THEY ARE IN PRACTICE INDEXED INDIRECT MEMORY
R2990   ADDRESSES, AND ARE RESPECTIVELY A 3-WAY AND A 2-WAY BRANCH.

R2991   IF THERE ARE NO DELETES AND THE TASK IS NOT A PROGRAM ASSEMBLY, THEN ALL OF SYPT CAN BE PASSED BY.  IN THIS CASE
R2993   X5 CONTAINS GB,R2 (WITH TAB BIT), SO THAT 5,Z,0 = N,R2 = DO DELETE.  THE ADDRESS 5,Z,1 IS NOT USED.

R2995   IF THERE ARE NO DELETES AND THE TASK IS A PROGRAM ASSEMBLY, THEN SYPT RECORDS MIGHT BE EXAMINED FOR WANTEDNESS.
R2997   HERE C(X5) = GB,R4, SO THAT 5,Z,0 = N,R4 = WANTPROG.  AGAIN, 5,Z,1 IS NOT USED.

R2999   IF THERE ARE DELETES AND THE TASK IS NOT A PROGRAM ASSEMBLY, THEN SYPT RECORDS MUST BE EXAMINED FOR DELETION
R3001   ONLY.  HERE C(X5) = -GB,R3, SO THAT 5,Z,0 = N,R3 = DELETEQ. THEN 5,Z,1 IS ACTIVE IF THE RECORD IS NOT DELETED
R3003   AND = N,R2 = DO DELETE OR DO SAVE.

R3004   IF THERE ARE DELETES AND THE TASK IS A PROGRAM ASSEMBLY, THEN SYPT RECORDS MUST BE EXAMINED FIRST FOR DELETION
R3006   AND SECOND FOR WANTEDNESS.  HERE C(X5) = +GB,R3, SO THAT 5,Z,0 = N,R3 = DELETEQ.  THEN 5,Z,1 IS ACTIVE IF THE
R3008   RECORD IS NOT DELETED AND = N,R4 = WANTPROG.

R3009   ANALOGOUS RULES GOVERN SYLT RECORDS IN SUBROUTINE REVISIONS, EXCEPT THAT IN SYLT, N,R2 = DO SAVE ALWAYS.

 3011   END FILE Q LA          N,X2          CAC 3 P       5,Z,0          BRANCH IF NOT END OF FILE.

 3013           TS            C,+1          END FILE Q +1 END SYPT

 3014           TS            GOT EOFRI     END FILE Q +1 END SYLT

 3015   GOT EOFRI TS          L STOPPER     Z,X1          END BYPT

 3016   DELETE Q  TX          9             -             Z,X0           LOOK THROUGH ENTIRE DELETE LIST IF THERE
 3018             TS          TAPRO NAM     6             C,+2           ARE ANY DELETES WAITING.
 3020             SWS, B38T48 N,X0          0             Z,X0
 3021             NA          N,X0,1        TAPRO NAM     C,-1
 3022             NA          Z,X0          L END THR 1   REAL DELE -2   BRANCH IF MATCH ON NAME WAS REAL.
 3024             LA          N,X2          C5T8 P        5,Z,1          FOUND END OF DELETE LIST, SO GO TO INPUT
 3026             LA          LHS           C5T8 P        5,Z,1          OR SAVE RECORD IF COMPUTER NAME IS VOID
 3028             TX          Z,R2          -             Z,SC           OR OK, OTHERWISE ALWAYS SAVE IT.

 3030             LA          N,X2          C5T8 P        REAL DELE      ASSUME MATCH IF COMPUTER NAME IS VOID.
 3032             NA, C1T4    TAPCO NAM     0,0           DELETE Q +2    LOOK AT NEXT DELETE NAME IF WRONG COMP.

 3034   REAL DELE TS          L DO DELET    Z,SC          SAVEMODE -1  C SWITCH FROM PASS TO SAVE MODE IF NEEDED.

 3036   WANT PROG NA          TAPRO NAM     WANTED        N,R2           BRANCH TO SAVE UNWANTED RECORD.
 3038             TS          -             -             SAVE MODE -1 C

 3039   VERSION Q NA, BIT12R  SWITCH        7             DO INPUT       BRANCH IF RECORD IS NOT VERSION INPUT.
 3041             TS          -             -             DO INP SAV
```

```
P3042    PROCEDURE FOR THE END OF THE SYPT (SYMBOLIC YUL PROGRAM TAPE).

 3043    END SYPT    SSL, D12    Z,X5         0             C,-1                  ENSURE WANTEDNESS CHECK DURING SYLT.

 3045                SM          Z,X5,2       Z,SC,1        -                     CHANGE GB,R2 TO GB,R4.
 3047                SM          Z,X5         SPEC SGN P    Z,X5                  CHANGE -GB,R3 TO +GB,R3.
 3049                TS          N,X2         EOF BANER     SAVE MODE -1     C    HIDE END SYPT FROM WWT, GO TO SAVE MODE.
 3051                TS          L PROG FIL   Z,X4          FIND SUBS        C    POINT TO NAME OF 1ST POSSIBLE SUBRO.
 3053                NA, PROG SUB SWITCH      7             UNWASSL               TEST PROG/SUB BIT WHEN NO (OTHER) SUBS.
 3055                NA, PROG SUB SWITCH      ZERO          ITS A SUBR            TEST PROG/SUB BIT WHEN THERE ARE SUBROS.

 3057    ITS A PROG  TX          L SUBKNO Q   -             Z,R4                  SET UP WAIT FOR SUBROS OF THIS COMPUTER.
 3059                TS          N,X4         LIST NAME     UNWASSL +1            POINT TO FIRST SUBROUTINE OF COMPUTER.

 3061    ITS A SUBR  SSL, ONE    SWITCH       46            UNWASSL               OMIT WANT QUESTION IF NOT MERGING.

 3063    UNWASSL     SSL, D12    Z,X5         0             UNWANT -3        C

 3064                NA          NEXT NAME    W END SYPT    C,+2
 3065                NA          Z,S1         ZERO          DO ALT OP             MAYBE AWAIT DISC XFER HERE IF PROGRAM.
 3067                TS          N,X4         LIST NAME     DO SAVE

 3068    UNWANT      HA          Z,X5         SPEC SGN P    Z,X5                  CHANGE +GB,R3 TO -GB,R3.
 3070                WD          Z,X5         TWO           Z,X5                  CHANGE GB,R4 TO GB,R2.

 3072    FIND SUBS   SWS,THREAD10 4,1         0             Z,X4             C    SUBROUTINE TO FIND SUBROUTINE NAMES...
 3074                LA,BIT36R   4,1          ZERO          C,-1             C    SUBS FOR THIS MACH. ONLY ON THIS THREAD.
 3076                LA          Z,X4         L END THR 1   N,SC,1           C    BRANCH IF ONLY END OF LIST WAS FOUND.
 3078                TS          Z,SC,1       -             -                     EXIT SKIPPING WITH NAME FOUND VIA X4.

 3080    SUB CALL Q  LA, ONE     4,1          ZERO          FIND SUBS        C

 3081    SUB KNOW Q  NA          TAPRO NAM    LIST NAME     N,R2                  BYPASS RECORDS UNTIL 1ST POSSIBLE SUBRO.
 3083                LA,KNEW SUBS SWITCH      ZERO          DO ALT OP             WAIT FOR SUBROS TO BE ACCOUNTED FOR.

 3085                TS          SUB CALL Q   FIND SUBS +1  FIND SUBS +1     C    LOOK FOR NAME OF 1ST CALLED SUBRO.
 3087                TS          Z,R2         Z,SC          UNWASSL          C    SAVE REST OF SYLT IF NONE.

 3089                NA          NEXT NAME    W END SYLT    C,+2
 3090                TX          N,X4         -             NEXT NAME             SPECIFY LOCATION OF TAPE BREAK.
 3092                TX          L GET SUBS   -             Z,R4                  SET UP SEARCH FOR SLAVE SUBROUTINES.

 3094    SEE NEXT    NA          TAPRO NAM    N,X4          N,R2                  SAVE IF NOT 1ST REC. OF NEXT WANTED.
 3096                SS          ZERO         ONE P         4,1                   REMOVE CALL BIT FROM SUBROUTINE NAME.
 3098                TS          N,X4         WANTED        FIND SUBS        C    SET NEXT AS WANTED AND SEEK NEXT SLAVE.
 3100                TX          WANT PROG    -             GET SUBS              CHECK WANT ONLY IF NO MORE SUBROS.

 3102    GET SUBS    NA          TAPRO NAM    WANTED        SEE NEXT              BRANCH IF NOT OF CURRENT SUBROUTINE.
 3104                TS          L DO INSAV   Z,SC          SAVEMODE -1      C    DO BOTH INPUT AND SAVE.

R3106    PROCEDURE FOR THE END OF THE SYLT (SYMBOLIC YUL LIBRARY TAPE).

 3107    END SYLT    TS          INIT X5      Z,X5          SAVE MODE -1     C    RESTORE CRITERION FOR WANTEDNESS CHECK.
 3109                NA          Z,S1         ZERO          DO ALT OP             MAYBE AWAIT END OF DISC XFER IF SUBRO.
 3111                TS          Z,SC         Z,R4          DO INP SAV            SET UP BYPT PROCEDURE.
```

B225827

P311202 PROCEDURE TO ADD THE OWNER'S SYMBOL TABLE TO A SEGMENT'S SYMBOL TABLE.

```
311204              NA      TAPRO NAM       SEG OWNER       OLD BINQ                BRANCH IF NOT AUTHMEMO OF SEG'S OWNER.
31121               TX      L EORVF M2      -               Z,AU1
311213              NA      N,AU1           ZERO            C,-1                    WAIT UNTIL PASS 1 IS DONE WITH SYM TAB.
311219              TS      Z,SC            Z,R4            DO SAVE                 SAVE AUTHMEMO AND PROCESS SYMTAB BELOW.

311225              LA      TAPRO NAM +1    CAC3 P          OLD BINQ -1             BACK TO NORMAL WHEN A PARAGRAPH COMES.
311231              TN      Z,X1            5               SAVE XSP
311232*FLIP MXR     HA      Z,MXR           ONE P           Z,MXR           S
311234              WA      Z,X2            THREE P         Z,X4                    X4 POINTS TO 1ST SYMBOL IN RECORD.
31124               WA      Z,X4            OCT 400         END SYMBF               END SYMBF POINTS TO FIRST ORTHOWORD.
311246              SWE, CAC3   L COMMON P  16              Z,X1

311249 SEG SYMBS    TX      N,X4,1          -               COMMON
311252              SWE, CAC3   L ANAL SYM  32              Z,CSC           C       ANALYZE HISTORY OF SYMBOL.
311258              LA      COMMON +2       CAC3 P          C,+3                    BRANCH IF SYMBOL IS UNDEFINED.
311264              SM      N,X2            D4T8 P          N,X2                    OTHERWISE IT'S IN MISCELLANEOUS TROUBLE.
31127               TS      Z,X4,1          -               C,+2
311273              SS      N,X4,1          D4T8 P          N,X2                    SUPPLY HEALTH AND DEFINITION FROM OWNER.
311277*             LA      ONES P          N,X4            C,+2
311279              NA      Z,X4            END SYMBF       SEG SYMBS

311282              TN      SAVE XSP        5               Z,X1
311285*             TS      L DO SAVE       Z,SC            FLIP MXR        C       SAVE EACH SYMBOL TABLE RECORD.
311291              TS      Z,SC            Z,R4            DO SAVE                 SAVE FIRST PARAGRAPH, CONTINUE BELOW.
3113   OLD BINQ     NA      TAPRO NAM       PROG NAME       DO SAVE                 SAVE LOAD DECK UNLESS OF PROG BEING REV.
```

R3115 DISPOSITIONS OF RECORDS FROM TAPE 1. "SLEEP" MEANS "DO DISC (TRANSFERRED) INPUT IF NECESSARY, OTHERWISE SLEEP".

```
3116   DO DELETE    LA      Z,X3            ZERO            RD NEXT                 SIMPLY READ AGAIN IF NO REMOTE COMING.
3118                TX      Z,X3            -               Z,X0                    SWAP NEXT AND REMOTE BUFFERS.
3120                TS      Z,X2            Z,X3            PHI TAPE
3121                RF,1    3,0             -               DISASTER                READ A NEW REMOTE.
3123                TS      Z,X0            Z,X2            RD REMOTE +2

3126   DO INP SAV   NA      N,R5            ZERO            DO ALT OP               GO TO SLEEP IF JOINT LIST IS FULL.
3128                TX      Z,X2            -               N,R5,1                  PUT BUFFER INTO JOINT STATUS.
3130                SM      Z,R5            BIT 46          Z,R5                    MODULATE JOINT LIST ENTRY POINTER.
3132                TX      N,SC,1          -               REMOTE Q -1             CALL FOR SAVE AFTER INPUT.
3134                TS      ZERO            REMOTE Q -1     DO SAVE

3135   DO INPUT     NA      N,R6            ZERO            DO ALT OP               GO TO SLEEP IF INPUT LIST IS FULL.
3137                TS      Z,X2            N,R6,1          MON WAKE        C       PUT BUFFER INTO INPUT LIST, WAKE PASS 1.
3139                SWS, BIT46R Z,SC,5      16              Z,R6                    MODULATE INPUT LIST ENTRY POINTER, SKIP.

3141                LA      N,R7            ZERO            C,+3                    BRANCH IF SAPO LIST NOT FULL.
3143                TS      Z,SC,1          -               DO ALT OP               OTHERWISE SLEEP UNTIL THERE'S A VACANCY.
3145   DO SAVE      TS      SAPO NTRY       Z,R7            C,-2
3146                TS      Z,X2            N,R7,1          -                       PUT SAVE BUFFER INTO SAPO STATUS.
3148                SM      Z,R7            BIT 46          SAPO NTRY               MODULATE SAPO LIST ENTRY POINTER.
3150                PR
```

```
P3151                PROCEDURE AFTER DISPOSITION OF EACH BUFFER.

 3152  REMOTE Q      LA          Z,X3        ZERO        CH NEX BUF          GO FOR A BUFFER IF NO REMOTE.
 3154                TS          Z,X3        Z,X2        CH REM BUF          CHANGE REMOTE TO NEXT, GO FOR REMOTE.
 3156  CH NEX BUF    TS          Z,SC        Z,CSC       GRAB FREE       C
 3157                TS          Z,AU1       Z,X2        C,+1            S   ACQUIRE A FREE BUFFER.
 3159  RD NEXT       TS          Z,X2        Z,X3        PHI TAPE            SET UP DOUBLE TRY FOR REMOTE.
 3161                RF,1        2,0         -           DISASTER

 3162  CH REM BUF    LA          Z,S1        ZERO        GRAB REM -1         BRANCH IF NO DISC TRANSFER INPUT TO DO.
 3164                TS          Z,SC,5      -           DO ALT OP
 3165  REM BUF OK    NA          N,R7        BIT 32      GRAB REM            BRANCH IF WE HAVE A BUFFER FOR REMOTE.
 3167                LA          Z,X3        ZERO        RD REMOTE +2        GIVE UP AFTER 2ND FAILURE AT REMOTE.
 3169                TS          ZERO        Z,X3        PHI TAPE
 3170                RF,1        -           -           DISASTER
 3171                TS          FREE EXIT   Z,R7        REM BUF OK          SECOND TRY FOR A REMOTE BUFFER.

 3173  GRAB REM      TS          N,R7        Z,X3        -                   GRAB NAME OF REMOTE BUFFER.
 3175                TS          BIT 32      N,R7,1      -                   PLANT BUSY FLAG IN FREE LIST.
 3177                EX          Z,R7        BIT 45 NOT  FREE EXIT           MODULATE FREE LIST EXIT POINTER.
 3179  RD REMOTE     TS          -           -           PHI TAPE
 3180                RF,1        3,0         -           DISASTER
 3181                NA, PROG SUB SWITCH     ZERO        SAVE MODE +2        ALWAYS CUT TAPE AT BEGINNING IN PROGRAM
 3183                TS          L DO SAVE   Z,R2        SAVE MODE +1        ASSEMBLY.  NOTE SEQUENCE MODE CALL HERE.
 3185                CC          N,X2        -           LHS
 3186                NA          LHS         ZERO        DISASTER
 3187                NA          LHS +1      ZERO        DISASTER            BRANCH IF INCOMING RECORD HAD BAD ORTHO.
 3189                WA          REC COUNT   ONE P       REC COUNT
 3190                NA, CAC3R   2,0         REC COUNT   DISASTER            BRANCH IF IT HAD BAD RECORD NUMBER.
 3192                LA          N,X2        C5T8 P      END FILE Q          IF NO COMPUTER NAME, SEE WHETHER EOF.
 3194                HA          N,X2        COMPUTER    LHS                 FORM LEFT-HALF ZERO IF NAMES MATCH.
 3196                LA          LHS         C5T8 P      5,Z,0               IF OK COMPUTER NAME, DO 3-WAY BRANCH.
 3198                NA          5,Z,0       N,R4        5,Z,0               OTHERWISE DO ANYTHING BUT INPUT.
 3200                TX          Z,R2        -           Z,SC                ...WHICH FOR WRONG COMPUTER BECOMES SAV.

R3202   CLOSED SUBROUTINE TO CHANGE FROM PASSOVER TO SAVE MODE FOR NOMINALLY SAVE RECORDS.

 3204                NA          Z,R2        L DO DELET  N,SC,1          C
 3205  SAVEMODE      TX          L DO SAVE   -           Z,R2            C   SAVES HEREAFTER ARE WRITTEN ON TAPE 3.
 3207                SWE, SPECMAG N,X2       0           MID POINT           RECORD NO. OF 1ST RECORD WRITTEN OVER.
 3209                TN          RD REMOTE +4 10         RD REMOTE +2        DO THAT TEST ON FIRST RECORD ONLY.
 3211                TS          -           -           RD REMOTE +2
```

```
P3212  PROCEDURE AFTER BYPT IS READ, TO POSITION TAPE 1 AT THE FIRST RECORD THAT WAS INPUT OR DELETED.  THE RECORD
R3214  NUMBER KEPT IN MIDPOINT AND THAT OF THE EOFRI RECORD ARE USED TO DETERMINE THE OPTIMUM WAY OF POSITIONING, CON-
R3216  SIDERING ALL RECORDS TO HAVE EQUAL LENGTH AND THAT RECORDS ARE REWOUND OVER THREE TIMES AS FAST AS READ OVER.

R3218  IF BIT 11 OF SWITCH IS FOUND TO BE ON BEFORE OR DURING POSITIONING, EITHER THE TASK IS A REPRINT, OR A MERGING
R3220  ERROR HAS BEEN FOUND.  IN THESE CASES, YULPROGS WILL NOT BE WRITTEN ON, SO REWIND AND FORGET POSITIONING.

 3222  END BYPT   TS          -           -          PHI TAPE
 3223             RF,1        -           -          -
 3224             LA          Z,X3        ZERO       C,+2              BRANCH IF THERE IS NO REMOTE.
 3226             TS          Z,X3        Z,SH       SET FREE      C   FREE REMOTE EOFRI BUFFER.
 3228             TS          C,+1        REMOTE Q   DO INP SAV        TRANSMIT EOFRI RECORD.
 3230             TS          -           -          C,+1
 3231             WD          N,X2        MID POINT  Z,S3              FORM COUNT FOR BACKWARDS RUN.
 3233             LA          Z,X3        ZERO       C,+2              BRANCH IF THERE WAS NO REMOTE BUFFER.
 3235             WA          Z,S3        ONE P      Z,S3              INCLUDE 2ND EOFRI IN BACKSPACE COUNT.
 3237             WA          MID POINT   MID POINT  LHS

 3238  END P1 RB  SSL, ONE    SWITCH      37         C,+1              OMIT TEST IF BIT 11 IS ON.
 3240             LA          Z,S3        LHS        BK SPACE          BRANCH IF BACKSPACING IS BETTER.

 3242  END P1 RW  TS          MID POINT   Z,S3       PHI TAPE
 3243             RW,1        -           -          -
 3244             WA          Z,S3        ONE P      Z,S3              FORM COUNT FOR READING FORWARD.

 3246  END P1 RF  SSL, ONE    SWITCH      37         C,+1
 3247             TS          Z,SC,4      -          PHI TAPE
 3248             LA          MID POINT   Z,S3       C,+2
 3249             TS          -           -          END P1 RW         IF REWIND WAS NOT DONE, GO TO DO IT NOW.
 3251             NA          MID POINT   Z,S3       DEAD STOP -1      OTHERWISE NO-HUNT FROM BIT TEST TO STOP.
 3253             TS          -           -          END P1 RW

 3254             RF,1        1,0         -          DISASTER
 3255             NA          Z,S3,1      ONE P      END P1 RF

 3256  BK SPACE   TS          -           -          PHI TAPE
 3257             RB,1        1,0         -          DISASTER
 3258             NA          Z,S3,1      ZERO       END P1 RB         GO TO REWIND AND HALT IF BIT 11 IS ON.

 3260             TS          ZERO        Z,S3       PHI TAPE          PLAY SAFE ABOUT MOD3 CHECK BITS.
 3262             RB,1        -           -          DISASTER          FINAL DUMMY READ FOR POSITIONING.

 3264             SWS, CHAR1  ZERO        0          END PARAS

R3265  FINAL INSTRUCTION FOR PARAPROGRAMS.

 3266  DEAD STOP  TS          Z,R0        Z,SC       MON WAKE      C   WAKE OTHERS AND GO BACK TO BED.
```

```
P3268   PROCEDURE TO INPUT CARD IMAGES TO PASS 1 FROM A FILE ON THE DISC INSTEAD OF FROM TAPE.  THE FILE MUST HAVE BEEN
R3270   PUT ON THE DISC BY A TRANSFER TASK.  THE RESULT OF A "TRANSFERRED ASSEMBLY" IS A NEW PROGRAM OR SUBROUTINE.


R3272   CONSTANTS, RESERVATION, AND EQUIVALENCES.

 3273   130 IN A    PR          130
 3274   OCT 1000    OCT         -1000
 3275   8 BLOX      OCT         0000 0010
 3276   SNATRACK    DEC         -31

 3277   DF INC MSG  ALF,3       DISC FILE INCOMPLETE (%)
 3278   END RUINS   ALF,5       ¤999999Q   RUINS OF INCOMPLETE DISCFILE

 3279   DISC BUF 1  CAC                        XFR BEGIN   13288
 3280   DISC BUF 2  SPEC                                   13800
 3281   TRINDEX     RESERVE     15

 3282   L XFR BEGN  EQUALS      DISC BUF 1


 3283   MOVE RECD   RT          N,AU1          -           N,S3          MOVE RECORD FROM DISCBUF2 TO DISCBUF 1.
 3285               NA          DISC ADDR      DISCALIM    READ DB2      BRANCH UNLESS JUST EXHAUSTED A TRACK.

 3287               DS          TRACK LOG      ONE P       TRACK LOG     DECREMENT LOG NO. FROM TRACK TO TRACK.
 3289   XFR BEGIN   SWS, C1T4   TRACK LOG      D,6,L       TRINDEX +2
 3290               TS          ZERO           DISC ADDR   DISCAP      C
 3291               OCT         -1                                       LOOKUP TRACK WITH KNOWN LOG NUMBER.
 3293               SPEC                                   TRINDEX
 3294               TS, B7T13   TRINDEX +6     DISC ADDR   C,+2
 3295   SET DTRAP   TS          DF INCOMP      DTRAP LOC   DTRAP LOC -1  SET UP CUSS FOR INCOMPLETE DISCFILE.
 3297               NA, C7T8    TRINDEX +3     SNATRACK    C,-1          GIVE UP QUICK IF FILE IS WRONG TYPE.
 3299               SWS, B7T13  DISC ADDR      0           DISCALIM

 3300   READ DB2    TX          DISC BUF 2     -           Z,X0
 3301               S, DISC READ 0,0           8           DISC ADDR     READ 512 WORDS FROM DISC.
 3303               WA          DISC ADDR      8 BLOX      DISC ADDR
 3304               TX          SAME 8K        -           C,+0          (SPECIAL INITIAL STATE).
 3306   DTRAP LOC   NA          N,R1           ZERO        DO ALT OP     DO TAPE OPS IF WAITING FOR DISC.
 3308               NA, C1T4    1,0            EOR         SAME 8K       BRANCH IF NOT END OF 8K-WORD SUPER-RECD.

 3310               HA          C,-1           130 IN A    C,-1          AUGMENT IS ALTERNATIVELY 0 AND 130.
 3312               LA, B22T25  C,-2           BIT 25 P    MOVE BAK 2    BRANCH IF END OF 8K BUT NOT END OF 16K.
 3314               TS          DISC BUF 2     Z,X1        SAME 8K +1    AFTER 16K, NO INPUT, THEN MOVE, READ.
```

```
P3316  EACH 512-WORD RECORD FROM DISC HAS A COMPLETE 26-CARD INPUT RECORD AND PIECES OF ONE OR TWO MORE.

 3318  MOVE BAK 2 RT        1,132          -              1,130             SINCE TRANSFER HAD PUT 819 CARDS IN 8K.
 3320             TS        FREE EXIT      Z,R7           XFR INPUT         INPUT LAST 26 CARDS IN OLD 8K.
 3322             WD        DISC BUF 2     TWO            Z,AU1
 3323             SM        Z,X1,2         Z,SC,2         -

 3324  SAME 8K    TS        FREE EXIT      Z,R7           XFR INPUT         INPUT 26 CARDS (260 WORDS) TO PASS 1.
 3326             TX        DISC BUF 2     -              Z,AU1
 3327             WD        Z,X1           OCT 1000       Z,X1              BECAUSE RECORD IS MOVED BACK 512 WORDS.
 3329             TS        DISC BUF 1     Z,S3           MOVE RECD         CLEAR OUT DISC BUF 2 FOR NEW DISC READ.

R3331  SUBROUTINE TO DELIVER 26 CARDS TO PASS 1 BY WAY OF THE INPUT LIST.

 3332  XFR INPUT  TS        Z,SH           Z,S3           -
 3333             NA        N,R7           BIT 32         GRAB XFER         BRANCH IF THERE IS A FREE BUFFER.

 3335  DO ALT OP  TS        Z,S1           Z,SC           C,+1          C
 3336             LA        Z,S1           ZERO           C,+2          C   BRANCH IF NOT DOING TRANSFERRED ASSY.
 3338             WD        Z,SH           ONE P          Z,S1          S   SET UP S1 FOR RETURN AND DO OTHER OP.
 3340             WD        Z,SH           ONE P          Z,SC          C
 3341             TS        Z,SC           Z,CSC          MON SLEEP     C

 3342  GRAB XFER  TS        N,R7           Z,S2           GRAB REM +1   C
 3343             TS        D12 P          Z,CSH          -             C   REMOVE BUFFER NAME FROM FREE LIST.
 3345  XF SET AU2 TN        ZERO           2              N,S2          S   CLEAR 1ST WORD OF 265-WORD BUFFER.
 3347             MT        N,X1,1         52             N,AU2,1           MOVE 260 WORDS.
 3349             LA        BIT 46         Z,CSH,3        C,-1
 3350             TX        END RUINS      -              N,AU2,1           SET UP SEARCH FOR "END OF" CARD.
 3352             TS        EOR            N,AU2          XF SET AU2    C   MAKE 264-WD BUFF LOOK LIKE ODD TAPE REC.
 3354             NA        N,AU2,10       END RUINS      C,+0
 3355             WD        Z,AU2,1        NINE           Z,AU1
 3356             NA        N,AU1          EOR            END DFILE         BRANCH IF FOUND THE "END OF" CARD.

 3358  DO X INPUT NA        N,R6           ZERO           DO ALT OP         SLEEP OR DO TAPE IF NO ROOM IN INPUTLST.
 3360             TS        Z,S2           N,R6,1         MON WAKE      C   PUT BUFFER IN INPUT STATUS, WAKE PASS 1.
 3362             SS        ZERO           BIT 46         Z,R6              MODULATE INPUT LIST ENTRY POINTER.
 3364             NA        Z,S3           Z,S1           N,S3              EXIT UNLESS JUST SENT LAST INPUT.

 3366             NA        N,R1           ZERO           DO ALT OP         SLEEP OR DO TAPE UNTIL DISC READ DONE.
 3368             TS        ZERO           Z,S1           N,S3              SHOW END OF DISC OPS, EXIT.

 3370  END DFILE  TX        EOR            -              N,AU2             SHORTEN BUFFER CONTAINING "END OF" CARD.
 3372             TS        Z,S1           Z,S3           DO X INPUT        SET FLAG AND DO LAST INPUT.

 3374  DF INCOMP  S, MON TYPER DF INC MSG  SPRA +24       C,+1              "DISCFILE INCOMPLETE (?)".
 3376             TN        END RUINS      5              N,X1
 3377             TN        TRINDEX        2              N,AU2             PHONY UP AN "END OF" CARD.
 3379             SWS, BIT 11 ONE P        11             SWITCH            CALL THIS ASSEMBLY A REJECT.
 3381             TS        END YUL +2     END YUL +1     SAME 8K           SET FLAG FOR END OF RD1.
```

P3383 PARAPROGRAM WWT -- PASS 1 -- GROUP C
R3384 ----------

R3385 THIS PARAPROGRAM IS OPERATED BY GROUP C DURING PASS 1 AND WRITES SYPT AND SYLT SAVE RECORDS ON TAPE 3
R3387 AND BYPT SAVE RECORDS ON TAPE 4, KEEPING THE ORIGINAL BANNERS. WWT ALSO WRITES POPO RECORDS ON TAPE 2. AT THE
R3389 END OF PASS 1, TAPES 2 AND 3 ARE REWOUND.

```
3390                TS          -           -           MON SLEEP       C
3391  CH SP LIST    LA          N,R6        ZERO        C,-1                GO TO SLEEP IF SAPO LIST IS EMPTY.
3393                TX          N,R6        -           Z,X2                RECEIVE NAME OF SAPO BUFFER.
3395                TS          ZERO        N,R6,1      MON WAKE        C   PLANT VOID FLAG IN SAPO LIST.
3397                SM          Z,R6        BIT 46      Z,R6                MODULATE SAPO LIST EXIT POINTER.
3399                LA          N,X2        ZERO        WRIT POPO           BRANCH IF SAPO IS A POPO BUFFER.

3401                TS          TRY PO REM  CH SP LIST  PHI TAPE            SET REMOTE SWITCH TO POPO.
3403  WRITE SAV     WF,3        2,0         -           DISASTER
3404                LA          Z,X3        ZERO        C,+2                BRANCH IF THERE IS NO SAVE REMOTE.
3406                TS          Z,X3        Z,SH        FREE IN SV      C   FREE SAVE REMOTE.
3408                LA, C5T8    2,0         EOF BANER   LAS2REM1            BRANCH IF NOT END SYLT OR END BYPT.

3410                WA          WRITE SAV   BIT 6 P     WRITE SAV           CHANGE TAPE 3 TO TAPE 4.
3412                TS          ZERO        Z,X3        PHI TAPE
3413                WF,3        2,0         -           DISASTER            WRITE END-OF-FILE RECORD AGAIN.
3415                WA          DUMMY SAV   BIT 6 P     DUMMY SAV
3416                TS          WRITE SAV   C,-2        PHI TAPE
3417                WF,3        -           -           DISASTER
3418  FREE EOF      TS          Z,X2        Z,SH        FREE IN SV      C   FREE END-OF-FILE BUFFER.
3420                TS          DUMMY SAV   C,-2        PHI TAPE
3421                RW,3        -           -           -
3422                TS          C,+1        FREE EOF +1 CH SP LIST          CHANGE POST-EOF ACTION AND LOOP.
3424                TS          ZERO        W34 WAIT    WR2 WAIT            END OF W34 SECTION OF WWT.

3426  SAV REMOT     LA          Z,X3        ZERO        CH SP LIST -1       GO TO SLEEP IF NEITHER TYPE OF REMOTE.
3428                LA          Z,X3        ZERO        PO REMOT            BRANCH IF NO SAVE REMOTE.
3430                TS          TRY PO REM  CH SP LIST  PHI TAPE            SET REMOTE SWITCH TO POPO.
3432  DUMMY SAV     WF,3        -           -           DISASTER
3433                TS          Z,X3        Z,SH        FREE IN SV      C
3434                TS          ZERO        Z,X3        CH SP LIST          FREE SAVE REMOTE & SHOW LACK THEREOF.

3436  TRY SA REM    LA          N,R6        ZERO        SAV REMOT +1        BRANCH IF SAPO LIST IS EMPTY.
3438  LAS2REM1      TS          Z,X2        Z,X3        CH SP LIST
```

P3439 PROCEDURE IN PARAPROGRAM WWT TO DISPATCH A POPO BUFFER.

```
3440  WRIT POPO  TS        TRY SA REM   CH SP LIST   PHI TAPE              SET REMOTE SWITCH TO SAVE.
3442             WF,2      2,0          -            DISASTER
3443             LA        Z,X4         ZERO         C,+2                 BRANCH IF THERE IS NO POPO REMOTE.
3445             TS        Z,X4         Z,SH         SET FREE       C     FREE POPO REMOTE.
3447             NA        2,2          W END POPO   LAS2REM2              BRANCH IF NOT END OF TAPE.

3449             TS        ZERO         Z,X4         PHI TAPE
3450             WF,2      -            -            DISASTER
3451             TS        Z,X2         Z,SH         SET FREE       C     FREE END POPO BUFFER.
3453             TS        TRY SA REM   CH SP LIST   PHI TAPE              SET REMOTE SWITCH TO SAVE MODE.
3455             RW,2      -            -            -
3456             TS        WR2 WAIT +1  WR2 WAIT     W34 WAIT             END OF WR2 SECTION OF WWT.

3458  PO REMOT   LA        Z,X4         ZERO         CH SP LIST -1        BRANCH IF NEITHER TYPE OF REMOTE.
3460             LA        Z,X4         ZERO         SAV REMOT            BRANCH IF THERE IS NO POPO REMOTE.
3462             TS        TRY SA REM   CH SP LIST   PHI TAPE             SET REMOTE SWITCH TO SAVE MODE.
3464             WF,2      -            -            DISASTER
3465             TS        Z,X4         Z,SH         SET FREE       C
3466             TS        ZERO         Z,X4         CH SP LIST           FREE POPO REMOTE & SHOW LACK THEREOF.

3468  TRY PO REM LA        N,R6         ZERO         PO REMOT +1          BRANCH IF SAPO LIST IS EMPTY.
3470  LAS2REM2   TS        Z,X2         Z,X4         CH SP LIST           LAST POPO BECOMES POPO REMOTE.

3472  W34 WAIT   TS        -            -            CH SP LIST
3473  WR2 WAIT   TS        -            -            CH SP LIST
3474             TS, CAC3R ZERO         END PARAS    DEAD STOP
```

```
34745 *PARA PACH  RESERVE     10
```

R3475 INITIALIZING SEQUENCES FOR PARAPROGRAMS.

```
3477  PASS 1 GPB HA        P1 MASKS     ONE P        Z,MXR                SIDE GRPS USE SAME S, INVERSE F AS GP A.
3479             TN        SUBSTRAB     2            TRINDEX              DISC FILE NAME OF TRANSFERRED INPUT.
3481             EBA       Z,X7         BIT 46       Z,X1                 PRETEND X1 IS LOOKING AT AN END-BUFFLAG.
3483             TN        L DO DELET   5            Z,R2                 LOAD ADDRESSES FOR INSTANT BRANCHING.
3485             SSL, ONE  SWITCH       35           C,+1
3486             TS        ZERO         Z,S1         C,+2                 SHOW THAT THERE IS NO TRANSFERRED INPUT.
3488             SWE, CAC3 L XFR BEGN   16           Z,S1                 SHOW TAPE ROUTINES WHERE TO GO FOR DISC.
3490             TX        INIT X5      -            Z,X5                 SET X5 TO R2, +-R3, OR R4 OF GROUP B.
3492             EBS       Z,X7         OCT 200      Z,R1
3493             SWE, B38T48 DISC CHEK  24           C,+0                 GET A ADDRESS OF ORDER IN XFER VECTOR.
3495             EBA       Z,R1         C,-1         Z,R1
3496             EBA       N,R1         THREE P      Z,R1                 POINT TO DFLOK (DISC FILE LOCK) IN MON.
3498             TS        SORS NAME    WANTED       CH NEX BUF           BEGIN READING TAPE 1.

3501  PASS 1 GPC TS        SAPO NTRY    Z,R6         PASS1 GPB      C     LOAD BUFFER LIST ADDRESS AND MXR.
3503             TS        ZERO         Z,X4         DUMMY SAV +2         INITIALIZE REMOTE SWITCH AND BEGIN.
```