```
 OPTIONS NODECK,LIST,XREF,NOREL,OBJ(P)

THE LIST OF OPTIONS USED DURING THIS ASSEMBLY IS--   NODECK,LIST,XREF,NOREL,OBJ
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```
                        EXTERNAL SYMBOL LIST

SYMBOL   TYPE                                    VER 15, MOD 00  03/06/22  PAGE   1

#GRAPR   MODULE
```

```
ERR LOC  OBJECT CODE     ADDR STMT SOURCE STATEMENT          VER 15, MOD 00  03/06/22  PAGE   2

    0000                        1 #GRAPR START 0
                                2        PRINT ON,NODATA
                                3 *      @SYS  EXP-N
                              214+       PRINT ON
                              215 *      @ERM  EXP-N
                              837+       PRINT ON
                              838 *      @SPF  EXP-N
                             1301+       PRINT ON
                             1302 *      @FXD  EXP-N
                             1707+       PRINT ON
                             1708 *      @CAN  EXP-N
                             1811+       PRINT ON
                             1812 *      @WKA  EXP-N
                             1882+       PRINT ON
```

```
      #GRAPR - RETRIVE FILE STATEMENTS

ERR LOC   OBJECT CODE    ADDR STMT SOURCE STATEMENT        VER 15, MOD 00  03/06/22  PAGE   3
```

```
                          1885 ******************************************************************************
                          1886 * 5703-XM1  COPYRIGHT IBM CORP. 1970                           *
                          1887 *            REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083  *
                          1888 *                                                             *
                          1889 ******************************************************************************
                          1890 *STATUS -                                                     *
                          1891 *    VERSION 1 MODIFICATION 0                                 *
                          1892 *                                                             *
                          1893 *FUNCTION -                                                   *
                          1894 *    GRAPRO PROVIDES TWO FUNCTIONS.  THE CALL SECTION, WHICH   *
                          1895 *    REPLACES THE KEYBOARD CALL SECTION, I.E. $$PRES ENTRY POINT,  *
                          1896 *    USES POINTERS IN THE SYSTEM NUCLEUS TO ACCESS THE NEXT    *
                          1897 *    SEQUENTIAL PROCEDURE LINE IN THE TEMPORARY WORK AREA.  THE  *
                          1898 *    SECOND FUNCTION IS TO SIMULATE THE CARD BUSY ROUTINE OF   *
                          1899 *    DREADN, I.E. $$CDBS ENTRY POINT.                          *
                          1900 *                                                             *
                          1901 *INPUT -                                                      *
                          1902 *    INPUT CONSISTS OF ONE SECTOR CONTAINING THE NEXT PROCEDURE LINE  *
                          1903 *    LOCATED IN THE TEMPORARY SPF WORK AREA.  THE FIT IS ALSO INPUT  *
                          1904 *    IF IT WAS IN CORE BEFORE BEING OVERLAYED WITH THE PROCEDURE  *
                          1905 *    BUFFER                                                    *
                          1906 *                                                             *
                          1907 *ENTRY POINTS -                                               *
                          1908 *    GRAPRO HAS TWO ENTRY POINTS BASED UPON THE FUNCTION:      *
                          1909 *    $$CDBS - SIMULATE THE CARD BUSY ROUTINE                   *
                          1910 *    GRAPRO - INITIATES ACCESS OF SEQUENTIAL PROCEDURE LINES FROM  *
                          1911 *    THE TEMPORARY WORK AREA                                   *
                          1912 *                                                             *
                          1913 *OUTPUT -                                                     *
                          1914 *    OUTPUT CONSISTS OF WRITING THE FIT TO DISK IF IT IT IS IN CORE  *
                          1915 *    UPON ENTRY TO GRAPRO                                      *
                          1916 *                                                             *
                          1917 *EXTERNAL REFERENCES                                          *
                          1918 *     $NEXTB - RELATIVE DISK DADDR OF NEXT DB SECTOR           *
                          1919 *     $NEXTL - DISPLACEMENT WITHIN NEXT DB SECTOR TO TEXT      *
                          1920 *     $DFDET - INTERNAL GRAPRO INDICATOR                       *
                          1921 *     $DISKN - PHYSICAL DISK IOCS                              *
                          1922 *     $CIMSK - ADDRESS OF INQUIRY REQUEST                      *
                          1923 *     $KEYCD - KEYBOARD INDICATORS                             *
                          1924 *     $INDR3 - SYSTEM INDICATORS                               *
                          1925 *     $$INLN - START OF INPUT LINE BUFFER                      *
                          1926 *     $SPRNT - SYSTEM PRINT ROUTINE                            *
                          1927 *     $$INND - END OF INPUT LINE BUFFER                        *
                          1928 *     $INDR1 - WORK AREA INDICATORS                            *
                          1929 *     $UNMSK - ADDRESS OF ENTRY TO UNMASK IR                   *
                          1930 *     $CAERR - SAVE AREA FOR ERROR CODE                        *
                          1931 *     $CAERK - ENTRY POINT TO ERROR PROGRAM                    *
                          1932 *                                                             *
                          1933 *EXITS, NORMAL -                                              *
                          1934 *    GRAPRO HAS TWO NORMAL EXITS:                              *
                          1935 *    - RETURN TO CALLING ROUTINE - GUFUDI                      *
                          1936 *    - $CAIPL - EXIT TO KEYBOARD MODE AFTER PROCESSING LAST PROCEDURE  *
                          1937 *      LINE                                                    *
                          1938 *                                                             *
                          1939 *EXITS, ERROR -                                               *
                          1940 *    $CAERR - WITH ERROR CODE                                  *
```

```
                            1941 *              @@E551 - TRAGIC DISK ERROR                    *
                            1942 *                                                           *
                            1943 *TABLES/WORK AREAS -                                         *
                            1944 *   ONE SECTOR (FIT) USED TO READ IN NEXT DO SECTOR CONTAINING THE   *
                            1945 *   NEXT PROCEDURE LINE                                      *
                            1946 *                                                           *
                            1947 *ATTRIBUTES -                                                *
                            1948 *   N/A                                                      *
                            1949 *                                                           *
                            1950 *CHARACTER CODE DEPENDENCY -                                 *
                            1951 *   THE OPERATION OF THIS MODULE DEPENDS UPON AN INTERNAL     *
                            1952 *   REPRESENTATION OF THE EXTERNAL CHARACTER SET WHICH IS EQUIVALENT   *
                            1953 *   TO THE ONE USED AT ASSEMBLEY TIME. THE CODING HAS BEEN ARRANGED   *
                            1954 *   SO THAT REDEFINITION OF CHARACTER CONSTANTS, BY REASSEMBLEY, WILL *
                            1955 *   RESULT IN A CORRECT MODULE FOR THE NFW DEFINITIONS        *
                            1956 *                                                           *
                            1957 *NOTES -                                                     *
                            1958 *   ERROR PROCEDURES -                                       *
                            1959 *      THE ERROR CODE IS SET AT $CAERK                        *
                            1960 *                                                           *
                            1961 *   REGISTER USAGE -                                         *
                            1962 *      BOTH REGISTERS ARE USED DURING PROGRAM USAGE           *
                            1963 *      THE BASE REGISTER IS SAVED AND RESTORED                *
                            1964 *                                                           *
                            1965 *   SAVED/RESTORED AREAS -                                   *
                            1966 *      FIT TABLE                                             *
                            1967 *                                                           *
                            1968 *   MODIFICATION CONSIDERATIONS -                            *
                            1969 *      N/A                                                   *
                            1970 *                                                           *
                            1971 *   REQUIRED MODULES -                                       *
                            1972 *      @SYSEQ - COMMON SYSTEM EQUATES                         *
                            1973 *      @FXDEQ - SYSTEM NUCLEUS ADDRESSES AND INDICATORS       *
                            1974 *      @CANEQ - SYSTEM LOCATION EQUATES                       *
                            1975 *      @WKAEQ - WORK AREA EQUATES                             *
                            1976 *      @DIREQ - FILE LIBRARY ADDRESS AND EQUATES              *
                            1977 *      DL2ICS - DISK I/O INTERFACE                            *
                            1978 *                                                           *
                            1979 *   OTHER -                                                  *
                            1980 *      N/A                                                   *
                            1981 ************************************************************************
```

```
                            1983 *         HDR   #GRAPR,0                  PRGRAM NAME
                            1984 ****************************************************************************
                            1985 * PROGRAM HEADER FOR DISK LOAD                                           *
                            1986 ****************************************************************************
                            1987 *#$GRAP EQU   X'0690'                    DISK ADDR OF #GRAPR
                            1988 *#$$GRA EQU   X'0889'                    CORE LOAD ADDRESS OF #GRAPR
                            1989 *#$@GRA EQU   003                        SECTOR CNT OF #GRAPR
      0889                  1990        ORG   #$$GRA                      CORE LOAD ADDRESS
                       0889 1991 $$$$$$ EQU   *                           FIRST LOCATION IN PROGRAM
      0889 7BC7D9C1D7D9     088E 1992        DC    CL6'#GRAPR'            PROGRAM NAME
      088F 6E               088F 1993        DC    IL1'110'               PROGRAM NUMBER OF #GRAPR
                       0890 1994 #GRAP  EQU   *                           ENTRY POINT TO PROGRAM
                            1995 *** END OF EXPANSION ***

                       09F6 1997        USING GRABSE,@BR
                       0890 1998 GRAPRO EQU   *                           ENTRY POINT
      0890 34 01 0933       1999        ST    GRASBR,@BR                 SAVE CALLING PROG'S BASE REG.
      0894 C2 01 09F6       2000        LA    GRABSE,@BR                 LOAD LOCAL BASE TO BASE REG.
      0898 34 08 093B       2001        ST    GRASAR,@ARR                SAVE RETURN ADDR.
      089C 4C 00 52 03E6    2002        MVC   GRANDA(1,@BR),$NEXTB       INIT REL BASE DADDR
      08A1 1C 01 0B85 61    2003        MVC   DL2RAD(@DADDR),GRASPF(,@BR) INIT BASE DADDR
      08A6 0E 01 0B85 0587  2004        ALC   DL2RAD(@DADDR),$BSADR      UPDATE BY BASE DADDR
      08AC 3C 80 0476       2005 GRA005 MVI   $CIMSK,@NOP                MASK INTERRUPTS
      08B0 38 10 03D4       2006        TBN   $INDR1,$FITIN              FIT IN CORE ?
      08B4 F2 90 21         2007        JF    GRA007                     NO
      08B7 7C 02 B3         2008        MVI   GRADPL(,@BR),@DPUT         INIT FOR WRITE FUNC
      08BA F2 87 0F         2009        J     GRA010                     BYPASS CARD BUSY CHECK
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    08C0                     2011          ORG    $$CDBS              CARD BUSY CHECK
                             2012 ********************************************************************
                             2013 *      SIMULATE CARD BUSY CHECK
                             2014 ********************************************************************
                             2015 *
    08C0 34 08 08CB          2016          ST     GRA000+@OP1,@ARR    SAVE RETURN ADDRESS
    08C4 3B 10 03C3          2017          SBF    $KEYCD,$KYBSY       SET OFF CARD BUSY CHECK
    08C8 C0 87 0000          2018 GRA000 B       *-*                 RETURN TO CALL

    08CC C0 87 0025          2020 GRA010 B       $DISKN              SAVE FIT TABLE IF IN CORE
    08D0 0AA9          08D1  2021          DC     AL2(GRADPL)         DPL OF PARAMETER CALL
    08D2 C0 87 0025          2022          B      $DISKN              PERFORM DISK OP WAIT FUNC
    08D6 057F          08D7  2023          DC     AL2($WAITF)         DPL OF PARAMETER LIST
                             2024 *GRA007 DSKL2 GRANPL,WAIT           PRIME GRAPRO BUFFERS
    08D8 C0 87 0AED          2025 GRA007 B       DL2ICS              PERFORM RELATIVE DISK OP
    08DC 0A46          08DD  2026          DC     AL2(GRANPL)         DPL ADDRESS
    08DE C0 87 0025          2027          B      $DISKN              WAIT AND CHECK DISK ERRORS
    08E2 057F          08E3  2028          DC     AL2($WAITF)         WAIT DPL ADDRESS
                             2029 *** END OF EXPANSION ***

    08E4 0C 00 08F0 03E7     2031          MVC    GRA020+2(1),$NEXTL  INIT DISPL INTER SECTOR
    08EA C2 02 1D00          2032          LA     GRBFR1,@XR          POINT TO START OF BFR
    08EE E2 02 00            2033 GRA020 LA      *-*(,@XR),@XR       UPDATE XR BY DISP
    08F1 4C 00 59 03E8       2034          MVC    GRASIZ(1,@BR),$DFDET  INIT INTERNAL POINTER
    08F6 F2 87 56            2035          J      GRA300              YES, GO RETURN STMNT ROUTINE
                             2036 *
                             2037 *      ACCESS NEXT STATEMENT OR NEXT SEGMENT ROUTINE
                             2038 *
    08F9 6F 00 59 02         2039 GRA210 SLC     GRASIZ(1,@BR),GRAES1(,@XR)  DECR BFR CT BY SEGMENT LENGTH
    08FD B6 02 02            2040          A      GRAES1(,@XR),@XR    INCR @XR BY SEGMENT LENGTH
    0900 7D 00 59            2041 GRA220 CLI     GRASIZ(,@BR),@ZERO  IS BUFFER EMPTY
    0903 D0 82 91            2042          BL     GRAERR(,@BR)        GONE NEG,GO TO BAD ERR
    0906 F2 81 33            2043          JE     GRA250              YES,G0 TO GET NEXT BFR
    0909 BD 80 01            2044          CLI    GRAES0(,@XR),@SNULL  IS SEGMENT NULL
    090C F2 81 2D            2045          JE     GRA250              YES,G0 TO GET NEXT BFR
    090F 74 02 63            2046 GRA230 ST      GRATEM(,@BR),@XR    SAVE XR REG
    0912 5F 01 63 55         2047          SLC    GRATEM(@DADDR,@BR),GRANCA(,@BR)  DECREMENT BY START BFR
    0916 1C 00 03E7 63       2048          MVC    $NEXTL(1),GRATEM(,@BR)  INIT DISPL
    091B 1C 00 03E6 52       2049          MVC    $NEXTB(1),GRANDA(,@BR)  SAVE REL DADDR
    0920 1C 00 03E8 59       2050          MVC    $DFDET(1),GRASIZ(,@BR)  SAVE INTERNAL PONTR
    0925 3A 10 03D6          2051          SBN    $INDR3,$CLBFR       CLEAR INPUT BUFFER
    0929 35 02 0A2A          2052          L      GRTEND,@XR          POINT TO EOS CODE
    092D BC 40 00            2053          MVI    0(,@XR),@BLANK      BLANK EOS CODE
    0930 C2 01 0000          2054 GRA240 LA      *-*,@BR             LOAD BR REGISTER
                        0933 2055 GRASBR EQU     GRA240+@OP1         * STORED IN INST GRA240
    0934 C0 87 0A60          2056          B      GRAFIT              REINT FIT TABLE

    0938 C0 87 0000          2058 GRA245 B       *-*                 RETURN TO USER
                        093B 2059 GRASAR EQU     GRA245+@OP1         * TO CADDR SAVED IN GRA245
    093C D0 87 43            2060 GRA250 B       GRA500(,@BR)        ACCESS NEXT BUFFER
    093F BD 80 01            2061 GRA260 CLI     GRAES0(,@XR),@SNULL  IS 1ST SEG.NULL
    0942 D0 81 91            2062          BE     GRAERR(,@BR)        YES, GO TO BAD ERR
    0945 B9 02 03            2063          TBF    GRAES2(,@XR),GRAETP  PRIMARY SEGMENT
    0948 C0 10 090F          2064          BT     GRA230              YES, SAVE LOCATION
    094C D0 87 91            2065          B      GRAERR(,@BR)        EXIT TO ERROR PRGM
                             2066 *
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```
                              2067 *              RETURN TEXT ROUTINE
                              2068 *
     094F 5C 00 65 07         2069 GRA300 MVC   GRTYPE(1,@BR),GRAEDT(,@BR)   SAVE TYPE CODE
     0953 5C 01 34 5B         2070        MVC   GRTEND(@CADDR,@BR),GRATXT(,@BR)   INIT START BFR
     0957 BD 75 07            2071 GRA302 CLI   GRAEDT(,@XR),GRAEET          END OF FILE STATEMENT ?
     095A F2 01 09            2072        JNE   GRA303                       NO GO RESET SEGMENT SWITCH
     095D 1C 07 060E C0       2073        MVC   $$INLN+7(GRASEM-GRAMES),GRASEM-1(,@BR)  MOVE READ KEY
     0962 C0 87 0930          2074        B     GRA240                       EXIT TO FILE CRUSHER
     0966 7C 87 04            2075 GRA303 MVI   GRA310+@Q(,@BR),@UCB         INITLZ BRANCH FOR ONLY SEGMENT
     0969 BD 00 03            2076        CLI   GRAES2(,@XR),@SONLY          IS IT AN ONLY SEGMENT ?
     096C F2 81 03            2077        JE    GRA305                       YES, BYPASS BRANCH RESET
     096F 7C 80 04            2078        MVI   GRA310+@Q(,@BR),@NOP         SET FOR MORE SEGMENTS
     0972 6F 00 59 02         2079 GRA305 SLC   GRASIZ(1,@BR),GRAES1(,@XR)   DECR BFR CT BY SEG LENGTH
     0976 9F 00 02 5F         2080        SLC   GRAES1(1,@XR),GRAPSG(,@BR)   DECR SEG CT BY SDF-HDR LENGTH
     097A 6C 00 69 02         2081        MVC   GRASEG(1,@BR),GRAES1(,@XR)   MOVE TEXT LENGTH TO TEXT CTR
     097E E2 02 07            2082        LA    GRAELP(,@XR),@XR             INCR TO TYPE CODE
                              2083 *
                              2084 *      PRINT PROCEDURE NO., PROCESS DISABLED LINES, AND TEXT
                              2085 *
     0981 1C 01 099A 5D       2086        MVC   GRA307+@OP1(@CADDR),GRAPST(,@BR)   INIT START BFR
     0986 7C 02 C2            2087        MVI   GRAPPL+@B1(,@BR),X'2'        INIT PRINT CNT TO '2'
     0989 3C 7B 0607          2088        MVI   $$INLN,C'#'                  INIT SC IN BUFFER
     098D BD 40 01            2089 GRA306 CLI   1(,@XR),@BLANK               BLANK CHARACTER ?
     0990 F2 81 09            2090        JE    GRA308                       YES
     0993 3C 80 09A7          2091        MVI   GRAMOD+@Q,@NOP               SET CODE TO BYPASS LOOP
     0997 2C 00 0000 01       2092 GRA307 MVC   *-*(@B1),1(,@XR)             MOVE DIGIT
     099C E2 02 01            2093 GRA308 LA    1(,@XR),@XR                  UPDATE XR REG
     099F 5F 00 69 58         2094        SLC   GRASEG(1,@BR),GRABOA(,@BR)   DEC SEG COUNTER
     09A3 D0 81 00            2095        BZ    GRARAP(,@BR)                 INIT TO NEXT SECTOR
     09A6 C0 87 098D          2096 GRAMOD BC    GRA306,@UCB                  SET INDR FOR 1ST TIME
     09AA 5E 00 C2 58         2097        ALC   GRAPPL+@B1(1,@BR),GRANPB(,@BR)   UPDATE PPL
     09AE 1E 01 099A 58       2098        ALC   GRA307+@OP1(@CADDR),GRANPB(,@BR)   UPDATE ADDR
     09B3 BD 40 01            2099        CLI   1(,@XR),@BLANK               BLANK CHAR ?
     09B6 C0 01 0997          2100        BNE   GRA307                       NO
     09BA E2 02 01            2101 GRA309 LA    1(,@XR),@XR                  UPDATE XR REG
     09BD 5F 00 69 58         2102        SLC   GRASEG(1,@BR),GRABOA(,@BR)   DEC SEG COUNT
     09C1 D0 81 00            2103        BZ    GRARAP(,@BR)                 INIT TO NEXT SECTOR
     09C4 BD 40 01            2104        CLI   1(,@XR),@BLANK               BLANK CHAR ?
     09C7 C0 81 09BA          2105        BE    GRA309                       YES
     09CB 3C 87 09A7          2106        MVI   GRAMOD+@Q,@UCB
                              2107 *       SPRNT GRAPPL                      PRINT LINE NO.
     09CF C0 87 0465          2108        B     $SPRNT                       PRINT ON SYSTEM PRINTER
     09D3 0AB7          09D4  2109        DC    AL2(GRAPPL)                  PPL ADDRESS
                              2110 *** END OF EXPANSION ***
     09D5 C0 87 0465          2111        B     $SPRNT                       PRINT WAIT EUNC
     09D9 057F          09DA  2112        DC    AL2($WAITF)                  PPL OF WAIT FUNC
     09DB 3C 40 06FA          2113        MVI   $$INND,@BLANK                STORE BLANKS
     09DF 0C F2 06F9 06FA     2114        MVC   $$INND-1($$INND-$$INLN),$$INND RECURSIVELY
     09E5 78 80 65            2115        TBN   GRTYPE(,@BR),GRADIS          DISABLED LINE ?
     09E8 F2 90 08            2116        JF    GRABLE                       NO
     09EB 3C 5C 0607          2117        MVI   $$INLN,C'*'                  INIT IMAGE TO COMMENT
     09EF 5E 01 34 58         2118        ALC   GRTEND(@CADDR,@BR),GRANPB(,@BR)   UPDATE ADDRESS
     09F3 F2 87 31            2119 GRABLE J     GRA317                       FETCH TEXT

                              2121 ****************************************************************
                              2122 *      INITIALIZE TO NEXT SDF SECTOR                          *
```

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     #GRAPR - RETRIVE FILE STATEMENTS
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```
                           2123 ********************************************************************
          09F6 2124 GRARAP EQU  *                               ENTRY POINT TO INIT
     09F6 74 08 2C         2125        ST    GRAEND+@OP1(,@BR),@ARR   SAVE RETURN ADDR
     09F9 C0 87 0900       2126 GRA310 B     GRA220                   GO ACCESS NEXT STATEMENT
     09F9                  2127        ORG   GRA310                   * UNLESS CURRENT STATEMENT
     09F9 C0 87 0900       2128        BC    GRA220,@UCB              * HAS MORE SEGMENTS
     09FD 6C 00 27 00      2129        MVC   GRASVC(,@BR),@ZERO(1,@XR) SAVE CURR CHAR IN RESTORE INST
     0A01 D0 87 43         2130        B     GRA500(,@BR)             ACCESS NEXT BUFFER
     0A04 BD 02 03         2131        CLI   GRAES2(,@XR),@SLAST      LAST SEGMENT ?
     0A07 F2 01 03         2132        JNE   GRA313                   NO, GO RESET SEG COUNTER
     0A0A 7C 87 04         2133        MVI   GRA310+@Q(,@BR),@UCB     RESET BRANCH OUT
     0A0D 6F 00 59 02      2134 GRA313 SLC   GRASIZ(1,@BR),GRAES1(,@XR)  DECR BUFFER COUNTER
     0A11 9F 00 02 68      2135        SLC   GRAES1(1,@XR),GRASSG(,@BR)  DECR SEG COUNT BY SDF LENGTH
     0A15 6C 00 69 02      2136        MVC   GRASEG(1,@BR),GRAES1(,@XR)  MOVE TEXT LNG TO SEG COUNTER
     0A19 E2 02 04         2137        LA    GRAELS(,@XR),@XR         INCR @XR PAST 2NDARY SDF
     0A1C BC 00 00         2138 GRA315 MVI   @ZERO(,@XR),*-*          RESTORE CHAR SAVED IN Q-CODE
     0A1F C0 87 0000       2139 GRAEND B     *-*                      RETURN TO CALLING ROUTINE
                           2140 *********************************************************************
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      #GRAPR - RETRIEVE FILE STATEMENTS
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```
                               0A1D 2142 GRASVC EQU  GRA315+@Q                SAVED CHAR HOLD AREA
     0A23 5E 01 34 58               2143 GRA316 ALC  GRTEND(@CADDR,@BR),GRABOA(,@BR)  INCR RECEIVING CADDR
                               0A27 2144 GRA317 EQU  *                        MOVE TEXT TO GRTEXT
     0A27 2C 00 0000 01             2145 GRA350 MVC  *-*,GRAENC(1,@XR)         MOVE NON-REPEAT CHAR TO OUTPUT
                               0A2A 2146 GRTEND EQU  GRA350+@OP1              * ADDR SUPPLIED
     0A2C E2 02 01                  2147 GRA360 LA   GRAENC(,@XR),@XR          INCR @XR TO NEXT CHAR.
     0A2F 5F 00 69 58               2148        SLC  GRASEG(1,@BR),GRABOA(,@BR)  DECR BFR SPACE CTR
     0A33 D0 81 00                  2149        BZ   GRARAP(,@BR)              INIT TO NEXT SECTOR
     0A36 D0 87 2D                  2150        B    GRA316(,@BR)              MORE TEXT, GO INCR RECV CADDR
                                    2151 *
                                    2152 *            ACCESS NEXT BUFFER ROUTINE
                                    2153 *
     0A39 74 08 4F                  2154 GRA500 ST   GRA5SA(,@BR),@ARR
     0A3C F2 87 54                  2155        J    GRASHT                    INPUT BUFFERS
     0A3F 7C FF 59                  2156 GRA660 MVI  GRASIZ(,@BR),GRAEBS       RE-INIT BFR SPACE CNT
     0A42 C0 87 0000               2157 GRA680 B    *-*                        RETURN TO
                               0A45 2158 GRA5SA EQU  GRA680+@OP1              * CADDR SUPPLIED
                               0A46 2159 GRANPL EQU  *                        DPL FOR NEXT BFR
     0A46 01                   0A46 2160        DC   AL1(@DGET)                READ FUNCTION CODE
     0A47 0000                 0A48 2161 GRANDA DC   XL2'0000'                 DADDR OF NEXT BFR
     0A49                      0A49 2162 GRSCTR DS   CL1                       SECTOR COUNT
     0A49                           2163        ORG  *-1                       * INIT TO 1
     0A49 01                   0A49 2164        DC   XL1'01'
     0A4A 1D00                 0A4B 2165 GRANCA DC   AL2(GRBFR1)               CADDR OF NEXT BFR
     0A4C                      0A4C 2166 GRWHAT DS   CL1                       FUNCT CODE
     0A4C                           2167        ORG  *-1                       SET TO ONE FOR
     0A4C 01                   0A4C 2168        DC   XL1'01'                   *  TEXT CALL
     0A4D 0001                 0A4E 2169 GRANPB DC   XL2'01'
                               0002 2170 GRAEDB EQU  2                         DB DADDR ADJUSTMENT FACTOR
     0A4F                      0A4F 2171 GRASIZ DS   CL1                       BUFFER SPACE COUNTER
     0A50 0607                 0A51 2172 GRATXT DC   AL2(GRTEXT)               ADDRESS OF TEXT OUTPUT AREA
     0A52 0609                 0A53 2173 GRAPST DC   AL2(GRTEXT+2)             ADDRESS OF LINE NO.
     0A54 0007                 0A55 2174 GRAPSG DC   XL2'07'                   SIZE OF PRIMARY SEG. HEADER
     0A56 2300                 0A57 2175 GRASPF DC   AL2(#$#PWR)               ADDRESS OF
     0A58                      0A59 2176 GRATEM DS   CL2                       TEMPORARY WORKAREA
     0A5A                      0A5C 2177 GRAKEP DS   CL3                       TEMPORARY WORK AREA
     0A5D 0004                 0A5E 2178 GRASSG DC   XL2'04'                   SIZE OF 2NDARY SEG. HEADER
                               0A4E 2179 GRAONE EQU  GRANPB                    DECR FACTOR FOR REPITITION CTR
                               0A4E 2180 GRABOA EQU  GRANPB                    INCR FACTOR FOR NEXT TEXT CHAR
                               0A4E 2181 GRANXC EQU  GRANPB                    CYL ADJ FACTOR
     0A5F                      0A5F 2182 GRASEG DS   CL1                       SEGMENT TEXT COUNTER
                               0000 2183 GRAEFI EQU  X'00'                     INITIALIZATION FUNC. CODE
                               0003 2184 GRAEFW EQU  X'03'                     WRITE BACK ONLY FUNC. CODE
                               0001 2185 GRAEFR EQU  X'01'                     RETURN TEXT FUNC. CODE
                               0002 2186 GRAEFS EQU  X'02'                     SKIP STATEMENT FUNC. CODE
                               0004 2187 GRAEFG EQU  X'04'                     SKIP SEGMENT FUNC. CODE
                               00FF 2188 GRAEBS EQU  X'FF'                     BUFFER TEXT AREA SIZE
                               0001 2189 GRAESC EQU  X'01'                     SCTR COUNT IF DL4ICS USED
                               0000 2190 GRAELK EQU  X'00'                     DISP TO LINK CODE WITHIN DB
                               0000 2191 GRAELN EQU  X'00'                     LINK CODE TO NEXT PHYS DB
                               0001 2192 GRAEXA EQU  X'01'                     ADJ. TO '@' EQU'S FOR @XR ADDRG
                               0006 2193 GRAEDL EQU  @SBLN+GRAEXA              DISP TO STMNT BINARL LINE NO.
                               0007 2194 GRAEDT EQU  @STYPE+GRAEXA             DISP TO STMNT TYPE CODE
                               0002 2195 GRAELL EQU  X'02'                     LENGTH OF BINARY LINE NUMBER
                               0075 2196 GRAEET EQU  @EOFTC                    TYPE CODE OF END-OF-FILE STMNT
                               0001 2197 GRAES0 EQU  @SDF0+GRAEXA              DISP TO SDF0 - NULL INDR
```

```
                        0002 2198 GRAES1 EQU   @SDF1+GRAEXA            DISP TO SDF1 - LENGTH
                        0003 2199 GRAES2 EQU   @SDF2+GRAEXA            DISP TO SDF2 - SEGMENTATION CDE
                        0080 2200 GRADIS EQU   X'80'                  DISABLED LINE INDR
                        0002 2201 GRAETP EQU   X'02'                  MASK FOR A PRIMARY SEGMENT
                        0007 2202 GRAELP EQU   X'07'                  LENGTH OF PRIMARY SEG.
                        0004 2203 GRAELS EQU   X'04'                  LENGTH OF 2NDARY SEG.
                        001B 2204 GRAEMR EQU   27                     MAX. REPITITION CODE
                        0001 2205 GRAENC EQU   X'01'                  DISP TO NEXT TEXT CHARACTER
                        0001 2206 GRAEDC EQU   X'01'                  DISP TO CYL IN DADDR
                        09F6 2207 GRABSE EQU   GRARAP                 BASE USING ADDRESS
                        0005 2208 GRAED5 EQU   X'05'                  LNG OF DPL DADDR,SCTR-CL&CADDR
                        0006 2209 GRAEW2 EQU   6                      SECOND CYL OF WORK FILE
                             2210 *
                             2211 *          ROUTINE RESTORES FIT TABLE/ ENABLES INTERRUPTS
                             2212 *
    0A60 34 08 0A86          2213 GRAFIT ST    GRA600+@OP1,@ARR       SAVE RETURN ADDRESS
    0A64 38 10 03D4          2214        TBN   $INDR1,$FITIN          WAS FIT IN CORE ?
    0A68 F2 90 14            2215        JF    GRA550                 NO
    0A6B 3C 01 0AA9          2216        MVI   GRADPL,@DGET           INIT FOR READ
    0A6F C0 87 0025          2217        B     $DISKN                 RESTORE FIT TABLE
    0A73 0AA9        0A74    2218        DC    AL2(GRADPL)            DPL OF PARAMETER CALL
    0A75 C0 87 0025          2219        B     $DISKN                 DISK WAIT FUNCTION
    0A79 057F        0A7A    2220        DC    AL2($WAITF)             DPL OF PARAMETER CALL
    0A7B 3A 10 03D4          2221        SBN   $INDR1,$FITIN           SET INDR FIT IN CORE
    0A7F C0 87 048D          2222 GRA550 B     $UNMSK                 ENABLE INTERRUPTS
    0A83 C0 87 0000          2223 GRA600 B     *-*                    RETURN TO CALLING ROUTINE
                             2224 *
                             2225 *          ERROR ROUTINE
                             2226 *
    0A87 3C 98 03CD          2227 GRAERR MVI   $CAERR,@@E551          SET BAD FILE ERROR CODE
                             2228 *      THE ABOVE ERROR CODE IS INITIALLY SET FOR A SAVED
                             2229 *      FILE, BUT IS MODIFIED TO THE WORK FILE IF DL4ICS
                             2230 *      IS USED
                             2231 *
    0A8B 3A 04 03D6          2232        SBN   $INDR3,$ERHRD          SET INDR FOR HARD ERROR
    0A8F C0 87 0469          2233        B     $CAERK                 GO TO ERRPGM INTERFACE
                             2234 *
                             2235 *          DL2ICS BEING USED - ACCESS NEXT DATA BLOCK
                             2236 *
    0A93            0A93     2237 GRASHT EQU   *                      ORG HERE TO OVERLAY DL2ICS HDLG
    0A93 5E 00 52 53         2238 GRA720 ALC   GRANDA(1,@BR),GRSCTR(,@BR)  INCR LAST DADDR BY SCTRS READ
    0A97 C0 87 0AED          2239 GRA730 B     DL2ICS                 REFILL CORE BUFFER
    0A9B 0A46        0A9C    2240        DC    AL2(GRANPL)            CADDR OF DPL
    0A9D C0 87 0025          2241        B     $DISKN                 WAIT FOR READ COMPLETE
    0AA1 057F        0AA2    2242        DC    AL2($WAITF)            *
    0AA3 75 02 55            2243 GRA740 L     GRANCA(,@BR),@XR       POINT UR TO START OF BFR
    0AA6 D0 87 49            2244        B     GRA660(,@BR)           GO RE-INITLZ BFR SPACE CTR
                             2245 *
                             2246 *          DPI TO RESTORE FIT TAKE
                             2247 *
                             2248 *GRADPL DPL   FUNC-@DGET,DADDR-#@#WFT,CNT-#@@#WF,CADDR-$$FITS
    0AA9            0AA9     2249 GRADPL EQU   *                      DISK PARAMETER LIST
    0AA9 01         0AA9     2250        DC    AL1(@DGET)             REQUESTED FUNCTION
    0AAA 0500       0AAB     2251        DC    AL2(#@#WFT)            DISK ADDRESS
    0AAC 03         0AAC     2252        DC    AL1(#@@#WF)            SECTOR COUNT
    0AAD 1D00       0AAE     2253        DC    AL2($$FITS)            BUFFER ADDRESS
```

```
                                2254 *** END OF EXPANSION ***

                                2256 ************************************************************
                                2257 *         MESSAGE USED IN GRAPRO
                                2258 ************************************************************
                  0AAF          2259 GRAMES EQU    *                       PROCEDURE END MESSAGE
     0AAF D9C5C1C440D2C5E8 0AB6 2260        DC     CL8'READ KEY'           PROCEDURE TERMINATOR
                  0AB7          2261 GRASEM EQU    *
                                2262 ************************************************************
                                2263 * PPL USED IN GRAPRO
                                2264 ************************************************************
                                2265 *
                                2266 *             PPL TO PRINT DISABLED LINE TEXT
                                2267 *
                                2268 *GRAPPL PPL    FUNC-@PRETR,CADDR-$$INLN
                  0AB7          2269 GRAPPL EQU    *                       PPL ADDRESS
     0AB7 C0          0AB7      2270        DC     AL1(@PRETR)             FUNCTION REQUESTED
     0AB8 00          0AB8      2271        DC     AL1(*-*)                PRINT COUNT
     0AB9 0607        0ABA      2272        DC     AL2($$INLN)             DATA ADDRESS
                                2273 *** END OF EXPANSION ***

                                2275 *       PATCH 50
                                2276 *******************************************************************************
                                2277 * PATCH AREA 1
                                2278 *******************************************************************************
     0ABB               0AEC    2279 $$$$$1 DS    CL50                     PATCH AREA FOR PROGRAM
                                2280 *******************************************************************************
                                2281 *
                                2282 *       $DL2P
```

```
                              2284+****************************************************************************
                              2285+*  5703-XM1   COPYRIGHT IBM CORP 1970                              *
                              2286+*               REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE. 120-2083 *
                              2287+*                                                                  *
                              2288+****************************************************************************
                              2289+*STATUS -                                                          *
                              2290+*    VERSION 1 MODIFICATION 0                                       *
                              2291+*                                                                  *
                              2292+*FUNCTION                                                          *
                              2293+*    * DL2ICS CONVERTS A RELATIVE DISK ADDRESS TO A PHYSICAL DISK   *
                              2294+*      ADDRESS AND COMBINES IT WITH A BASE ADDRESS PLACED IN DL2RAD *
                              2295+*      BY THE CALLER.                                               *
                              2296+*    * THE RELATIVE DISK ADDRESS IS A TWO BYTE CYLINDER SECTOR COUNT*
                              2297+*      IN THE CALLERS DISK PARAMETER LIST (DPL).                    *
                              2298+*    * THE COUNT IS A CYLINDER SECTOR DISPLACEMENT FROM THE BASE    *
                              2299+*      ADDRESS PLACED IN DL2RAD                                     *
                              2300+*    * DL2ICS IS USED TO PROCESS DATA ON THE FIXED OR REMOVABLE DISK*
                              2301+*      ON EITHER DRIVE AND PROVIDES THE INTERFACE TO $DISKN.        *
                              2302+*    * THE PHYSICAL DISK ADDRESS IS PLACED IN A COPY OF THE USERS DPL*
                              2303+*      IN DL2ICS AND A CALL IS MADE TO $DISKN TO PERFORM THE REQUESTED *
                              2304+*      OPERATION.                                                   *
                              2305+*                                                                  *
                              2306+*ENTRY POINTS                                                      *
                              2307+*    * THE ENTRY IS DL2ICS. THE BASE REGISTER IS SAVED AND RESTORED *
                              2308+*      ON RETURN. THE INDEX REGISTER IS NOT USED.                   *
                              2309+*    * THE FORMAT OF THE CALLING SEQUENCE IS AS FOLLOWS:            *
                              2310+*         B    DL2ICS                                              *
                              2311+*         DC   AL2(PARMLT)                                          *
                              2312+*      WHERE PARMLT IS THE ADDR OF THE PARAMETER LIST TO BE PROCESSED. *
                              2313+*                                                                  *
                              2314+*INPUT                                                             *
                              2315+*    * THE INPUT IS A TWO BYTE BASE DISK ADDRESS PLACED IN          *
                              2316+*      DL2RAD AND A SIX BYTE DPL. THE SAME FORMAT AS THE DPL FOR    *
                              2317+*      $DISKN EXCEPT FOR THE DISK ADDRESS WHICH IS A RELATIVE CYLINDER *
                              2318+*      AND SECTOR DISPLACEMENT FROM THE BASE ADDRESS IN DL2RAD.     *
                              2319+*                                                                  *
                              2320+*OUTPUT                                                            *
                              2321+*    NONE.                                                         *
                              2322+*                                                                  *
                              2323+*EXTERNAL REFERENCES                                               *
                              2324+*     $DISKN - ENTRY TO PHYSICAL DISK ROUTINE IS THE SYSTEM NUCLEUS. *
                              2325+*                                                                  *
                              2326+*EXITS, NORMAL                                                     *
                              2327+*     NORMAL - EXIT IS TO THE FIRST INSTRUCTION FOLLOWING THE POINTER *
                              2328+*     TO THE DPL. THE BASE REGISTER IS RESTORED. THE RETURN ADDRESS *
                              2329+*     IS THE ADDRESS RECALL REGISTER (ARR) +2.                      *
                              2330+*                                                                  *
                              2331+*EXITS, ERROR                                                      *
                              2332+*     NONE                                                         *
                              2333+*                                                                  *
                              2334+*TABLES/WORK AREAS                                                 *
                              2335+*    * THE CONSTANTS AND WORK AREAS RESIDE AT THE END OF THE EXECUTABLE*
                              2336+*      CODE AND ARE REFERENCED BY A DISPLACEMENT RELATIVE TO THE VALUE *
                              2337+*      IN INDEX REGISTER 1 (@BR).                                   *
                              2338+*    * DL2SEC AND DL2SAD ARE EQUATED TO OPERAND LOCATIONS IN THE    *
                              2339+*      EXECUTABLE CODE TO ELIMINATE EXCESS WORKING STORAGE.         *
```

```
                                  2340+*                                                      *
                                  2341+*ATTRIBUTES                                            *
                                  2342+*   * DL2ICS IS REUSABLE                               *
                                  2343+*                                                      *
                                  2344+*CHARACTER CODE DEPENDENCY                             *
                                  2345+*     THE OPERATION OF THIS MODULE DOES NOT DEPEND UPON A PARTICULAR  *
                                  2346+*      INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET.        *
                                  2347+*                                                      *
                                  2348+*NOTES                                                 *
                                  2349+*     ERROR PROCEDURES                                 *
                                  2350+*       NONE                                           *
                                  2351+*                                                      *
                                  2352+*     REGISTER USAGE                                   *
                                  2353+*      INDEX REGISTER 1 (@BR) IS SAVED AND RESTORED. THIS REGISTER IS *
                                  2354+*      USED DURING EXECUTION. REGISTER 2 (@BR) IS NOT USED.          *
                                  2355+*                                                      *
                                  2356+*     SAVED/RESTORED AREAS                             *
                                  2357+*       NONE                                           *
                                  2358+*                                                      *
                                  2359+*     MODIFICATION CONSIDERATIONS                      *
                                  2360+*       NONE                                           *
                                  2361+*                                                      *
                                  2362+*     REQUIRED MODULES                                 *
                                  2363+*      @SYSEQ - COMMON SYSTEM EQUATES.                 *
                                  2364+*      @FXDEQ - SYSTEM NUCLEUS ADDRESSES AND INDICATORS VALUES EQUATES *
                                  2365+*                                                      *
                                  2366+*     OTHER                                            *
                                  2367+*      DL2ICS MAY BE USED TO CONVERT THE DISK ADDRESS ONLY AND NOT TO *
                                  2368+*      CALL $DISKN IF THE USER MOVES A UCB CODE TO DL2SWH.           *
                                  2369+*      THIS OPTION IS NOT STANDARD USAGE.              *
                                  2370+***********************************************************************
                       0AF1 2371+       USING DL2000,@BR                 ESTABLISH ADDRESSABILITY
                            2372+*
              0001 2373+DL2E01 EQU   X'01'                       FIELD LENGTH OF 1
              0002 2374+DL2E02 EQU   X'02'                       FIELD LENGTH OF 2
              0018 2375+DL2E18 EQU   X'18'                       HEX TRACK SECTOR COUNT
              0060 2376+DL2E60 EQU   X'60'                       PHYSICAL SECTOR COUNT
              0083 2377+DL2TSD EQU   X'83'                       MASK OFF TRACK SPINDLE DISK
              007C 2378+DL2E7C EQU   X'7C'                       MASK OUT SECTOR COUNT
              0AED 2379+DL2ICS EQU   *                           ENTRY POINT
  0AED 34 01 0B6E       2380+       ST    DL2900+@OP1,@BR        SAVE OLD BASE
              0AF1 2381+DL2000 EQU   *                           START PROCESSING
  0AF1 C2 01 0AF1       2382+       LA    DL2000,@BR             SET BASE ADORESS
  0AF5 76 08 8A         2383+       A     DL2C01(,@BR),@ARR      BUMP TO RIGHT BYTE OF ADDR
  0AF8 74 08 14         2384+       ST    DL2001+@DOP2(,@BR),@ARR  ADDR OF PARAM
  0AFB 76 08 8A         2385+       A     DL2C01(,@BR),@ARR      BUMP TO RETURN ADDR
  0AFE 74 08 81         2386+       ST    DL2910+@OP1(,@BR),@ARR  SAVE RETURN ADDR
                        2387+*
  0B01 4C 01 1D 0000    2388+DL2001 MVC   DL2002+@DOP2(@DADDR,@BR),*-* SETUP ADDR OF DPL
  0B06 5E 01 1D 8C      2389+       ALC   DL2002+@DOP2(@CADDR,@BR),DL2C05(,@BR) DUMP TO RIGHT END
  0B0A 4C 05 92 0000    2390+DL2002 MVC   DL2DPL(@DPLNG,@BR),*-*   MOVE USER DPL TO WORK AREA
  0B0F 5F 00 8F 86      2391+DL2005 SLC   DL2LST+@DSAD(DL2E01,@BR),DL2C48(,@BR) ADJUST SCTR/CYL
  0B13 F2 82 07         2392+       JM    DL2006                 GO TO RESTORE TO CONTINUE
  0B16 5E 00 8E 8A      2393+       ALC   DL2LST+@DCYL(DL2E01,@BR),DL2C01(,@BR) BUMP CYLINDER COUNT
  0B1A D0 87 1E         2394+       B     DL2005(,@BR)           BACK FOR NEXT CYLINDER
  0B1D 5E 00 8F 86      2395+DL2006 ALC   DL2LST+@DSAD(DL2E01,@BR),DL2C48(,@BR) RESTORE POSITIVE
```

```
                                 2396+*
                                 2397+*          GET THE LOGICAL SECTOR FROM THE DPL. THE NUMBER IS LEFT ADJUSTED
                                 2398+*          TO COMAE IT MTN THE POINTER ESTABLISHED PRIOR TO AN ENTRY.
   0B21 5C 00 1D 8F              2399+     MVC    DL2SEC(DL2E01,@BR),DL2LST+@DSAD(,@BR) GET SECTOR NUMBER
   0B25 7C 00 8F                 2400+     MVI    DL2LST+@DSAD(,@BR),@ZERO  CLEAR SECTOR BYTE
                                 2401+*
                                 2402+*          MOVE THE RELATIVE START TO THE DFL
                                 2403+*
   0B28 5E 01 8F 94              2404+     ALC    DL2LST+@DSAD(DL2E02,@BR),DL2RAD(,@BR) DL2RAD TO DPL
   0B2C 7D 18 1D                 2405+     CLI    DL2SEC(,@BR),DL2E18         IS COUNT OVER A TRACK
   0B2F F2 82 08                 2406+     JL     DL2008                      NO GO CHANGE A PHYSICAL ADOR
   0B32 5E 01 8F 85              2407+     ALC    DL2LST+@DSAD(DL2E02,@BR),DL2K80(,@BR) BUMP TRACK VALUE
   0B36 5F 00 1D 88              2408+     SLC    DL2SEC(1,@BR),DL2K18(,@BR) DECR BY TRACK VALUE
   0B3A 5E 00 1D 1D              2409+DL2008 ALC  DL2SEC(1,@BR),DL2SEC(,@BR) SHIFT LEFT 1
   0B3E 5E 00 1D 1D              2410+     ALC    DL2SEC(1,@BR),DL2SEC(,@BR) SHIFT LEFT
   0B42 5C 00 14 8F              2411+     MVC    DL2SAD(DL2E01,@BR),DL2LST+@DSAD(,@BR) GET SECTOR ADDRESS
                                 2412+*
                                 2413+*          ZERO OUT THE SECTOR COUNT AND LEAVE THE DISK. SPINDLE AND
                                 2414+*          TRACK BITS AS IS TO BE RE INSERTED AFTER THE SECTOR HAS BEEN
                                 2415+*          LOCATES.
                                 2416+*
   0B46 7B 7C 8F                 2417+     SBF    DL2LST+@DSAD(,@BR),DL2E7C TURN OFF
   0B49 7B 83 14                 2418+     SBF    DL2SAD(,@BR),DL2TSD        OFF TRACK SPINDLE DISK
   0B4C 5E 00 14 1D              2419+     ALC    DL2SAD(DL2E01,@BR),DL2SEC(,@BR) COMBINE SECTOR COUNTS
   0B50 7D 60 14                 2420+DL2010 CLI  DL2SAD(,@BR),DL2E60        TEST IF TRACK CROSSED
   0B53 F2 82 08                 2421+     JL     DL2100
                                 2422+*
                                 2423+*          INCREMENT TRACK BIT. OVERFLOW INTO THE CYLINDER COUNT.
                                 2424+*
   0B56 5E 01 8F 85              2425+     ALC    DL2LST+@DSAD(DL2E02,@BR),DL2K80(,@BR)
   0B5A 5F 00 14 83              2426+     SLC    DL2SAD(1,@BR),DL2K60(,@BR) DECR BY TRACK VALUE
                                 2427+*
   0B5E 5E 00 8F 14              2428+DL2100 ALC  DL2LST+@DSAD(1,@BR),DL2SAD(,@BR) INSERT SECTOR COUNT
                                 2429+*
   0B62 F2 80 06                 2430+DL2110 JC   DL2900,@NOP                CONVERSION SWITCH
                           0B63  2431+DL2SWH EQU  DL2110+@Q                  ADDR OF Q CODE FOR SWITCH
   0B65 C0 87 0025              2432+     B      $DISKN                     GO PROCESS I/O
   0B69 0B7E                0B6A 2433+     DC     AL2(DL2LST)                ADDRESS OF DPL
   0B6B C2 01 0000              2434+DL2900 LA    *-*,@BR                    RESTORE CALLERS BASE
   0B6F C0 87 0000              2435+DL2910 B     *-*
                                 2436+***************************************************************
                                 2437+*        CONSTANTS
                                 2438+***************************************************************
   0B73 0060                0B74 2439+DL2K60 DC   XL2'0060'                  SECTOR COUNT OF 24 LEFT ADJUSTD
   0B75 0080                0B76 2440+DL2K80 DC   XL2'0080'                  BIT FOR INCREMENTING TRACK
   0B77 30                  0B77 2441+DL2C48 DC   IL1'48'                    CYLINDER VALUE FOR 1 DISK
   0B78 0018                0B79 2442+DL2K18 DC   XL2'18'                    HEX SECTORS PER TRACK
   0B7A 0001                0B7B 2443+DL2C01 DC   IL2'1'                     CONSTANT FOR REGISTER MODE
   0B7C 0005                0B7D 2444+DL2C05 DC   IL2'5'                     DISP TO RIGHT END OF DPL
                                 2445+***************************************************************
                                 2446+*        WORK AREA
                                 2447+***************************************************************
                           0B7E  2448+DL2LST EQU  *                          LIST HIGH END
   0B7E                     0B83  2449+DL2DPL DS   CL(@DPLNG)                 WORKING DPL
                           0B80  2450+DL2PHY EQU  DL2LST+@DSAD               POINTER TO PHYSICAL DADDR
                           0B05  2451+DL2SAD EQU  DL2001+@DOP2               SAVE SECTOR BYTE FROM DPI
```

```
      DL2ICS - TWO TRACK LOGICAL IOCR
```
```
                           0B0E 2452+DL2SEC EQU   DL2002+@DOP2              WORKING SECTOR ADDRESS FIELD
      0B84                 0B85 2453+DL2RAD DS    CL(@DADDR)                USER RELATIVE STARTING ADDR.
                           0B86 2454+DL2END EQU   *                         END OF DL2ICS
                                2455+***                        END OF DL2ICS                      ***
                           0607 2456 GRTEXT EQU   $$INLN
                           0A5B 2457 GRLINE EQU   GRAKEP-1                      NEXT LINE NO.
                           0A5B 2458 GRTYPE EQU   GRAKEP-1                      FILE TYPE
                                2459 ***                        END OF GRAPRO
                           1D00 2460 GRBFR1 EQU   $$FITS                    DL2ICS BUFFER = FIT
                                2461 *
                                2462        PRINT ON
                           FFFF 2463        END

TOTAL STATEMENTS IN ERROR IN THIS ASSEMBLY =       0
```

```
SYMBOL  LEN VALUE DEFN   REFERENCES                          VER 15, MOD 00  03/06/22  PAGE  17

$$$$$$  001  0889 1991
$$$$$1  050  0AEC 2279
$$$CMD  001  0020 1746
$$$DAT  001  0040 1745
$$$EPL  001  0091 1742
$$$ERN  001  0080 1796
$$$FUN  001  0010 1747
$$$NLN  001  00A0 1792
$$$STD  001  0081 1741
$$BNLN  001  0605 1722   1724
$$CDBS  001  08C0 1772   2011
$$CDND  001  0666 1731
$$CDRD  001  0890 1770   1772
$$CKEY  001  0603 1720
$$CKFF  001  0B3D 1752
$$COFF  001  0B44 1751
$$CSNS  001  209C 1781
$$DATB  001  0BBF 1753
$$EOSA  001  0AFE 1750
$$ERSK  001  1C00 1791
$$FITS  001  1D00 1799   2253   2460
$$FLIB  001  06FF 1798
$$ILEN  001  0601 1716   1718   1722
$$ILHD  001  0600 1714   1716
$$INLN  001  0607 1729   1731   1733   2073*  2088*  2114   2117*  2272   2456
$$INND  001  06FA 1733   2113*  2114   2114   2114*
$$KBDT  001  09E1 1740   1744
$$KBSN  001  09E2 1744   1749
$$KLD1  001  0600 1804
$$KLD2  001  0700 1806
$$KLD3  001  0C00 1808
$$LPOS  001  09EB 1749
$$PCNT  001  07E9 1765
$$PLYN  001  2004 1779
$$PRES  001  0890 1738   1740   1750   1751   1752   1753   1770
$$PRFL  001  2143 1783
$$PRNT  001  0707 1759   1760   1764   1765
$$PRTN  001  0782 1760
$$PSIO  001  07CE 1764
$$PYCD  001  2200 1785
$$PYMP  001  2000 1777   1779   1781   1783   1785
$$SLIB  001  1C00 1794
$$TPCD  001  0606 1724   1729
$$UPAR  001  0602 1718   1720
$$WSPB  001  1E00 1797
$$XIND  001  06FF 1795   1798
$$ZERO  001  0000 1310   1311   1313   1314   1315   1319   1777
$ABORT  001  0010 1423
$BASIC  001  0080 1481
$BIGCD  001  0080 1557
$BLDPL  001  0579 1690   1692
$BLNOE  001  0569 1680
$BLOAD  001  0522 1671   1673   1676   1689   1690
$BLRTN  001  0550 1679   1680
$BRSAV  001  03C5 1368   1369
$BSADR  001  0587 1695   1697   2004
```

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SYMBOL   LEN VALUE DEFN    REFERENCES                              VER 15, MOD 00  03/06/22  PAGE  18

$BUFPT   001  03E3 1576    1577
$CABLD   001  04B4 1649    1650
$CAERK   001  0469 1626    1629  2233
$CAERR   001  03CD 1374    1376  2227*
$CAIPL   001  049D 1645    1647
$CALLI   001  0008 1566
$CARDI   001  0001 1337
$CARPL   001  04A1 1647    1649
$CIENT   001  0483 1636    1637
$CIEXT   001  0480 1635    1636
$CIMSK   001  0476 1632    1635  2005*
$CISUS   001  0496 1640    1645
$CLBFR   001  0010 1524    2051
$CMDKY   001  0008 1436
$CMODE   001  0002 1486
$CONFG   001  03DD 1549    1559
$CRPOS   001  03E2 1575    1576
$CRTAD   001  044D 1614    1615
$CRTAV   001  0002 1430
$CRTDN   001  0002 1454
$CRTIN   001  03D3 1451    1458
$CRTNO   001  0004 1433
$CRTPU   001  0004 1455
$CRTSP   001  0008 1456
$CRTUP   001  0001 1453
$CRUSH   001  0080 1562
$CSDPL   001  050E 1661    1662
$C0001   001  0464 1618    1624
$DATE    001  043A 1599    1600
$DBGUF   001  03E0 1561    1570
$DBLOK   001  0001 1511
$DFDET   001  03E8 1582    1583  2034  2050*
$DISKN   001  0025 1313    2020  2022  2027  2217  2219  2241  2432
$DKERR   001  0008 1492
$DKSIZ   001  03D7 1536    1544  1585
$DK100   001  0001 1538
$DK200   001  0002 1539
$DK400   001  0004 1540
$DK600   001  0008 1541
$DK800   001  0010 1542
$DPLSV   001  0449 1610    1612
$DTNMB   001  0040 1357
$DTRDR   001  0040 1445
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$ERDPL   001  046F 1629    1631
$ERFIL   001  0040 1384
$ERHRD   001  0004 1516    2232
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$ERLOG   001  0345 1318
$ERMAD   001  0472 1631    1632
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$ER050   001  0363 1319
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$GUFIR   001  0008 1346
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$HRDER   001  0020 1442
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$INDR2   001  03D5 1484   1509
$INDR3   001  03D6 1509   1536   2051* 2232*
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$INRPT   001  0020 1354
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$IOPGS   001  0010 1565
$IOYES   001  0002 1340
$IPLDV   001  05FF 1701   1704
$IRKEY   001  0020 1564
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$KEYCD   001  03C3 1334   1368   2017*
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$KE130   001  01D5 1315
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$LEVEL   001  03DF 1559   1561
$LIST    001  0002 1513
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$LNPTR   001  0080 1448
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$LOADR   001  051A 1666   1669
$LPRIO   001  03EA 1583
$LPROS   001  03E5 1578   1580
$LPRP3   001  03E4 1577   1578
$MOUNT   001  0020 1527
$MPDWN   001  0001 1427
$NEXTB   001  03E6 1580   1581   2002   2049*
$NEXTL   001  03E7 1581   1582   2031   2048*
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$NOLST   001  0004 1343
$NUCBS   001  03C0 1326   1327
$NWRKF   001  0080 1532
$NWRKR   001  0040 1529
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$PGMDT   001  0020 1475
$PGMST   001  0010 1439
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$PROCI  001  0001 1460
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$PSDBR  001  04FA 1655
$PSDXR  001  04F2 1654   1655
$PSTEP  001  0004 1421
$PSTMT  001  0008 1422
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$REORD  001  0040 1563
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$SPRNT  001  0465 1624   1626  2108  2111
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$TRACE  001  0004 1401
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$TRUNK  001  0080 1359
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$VOLF2  001  040E 1593
$VOLID  001  03F6 1589   1590  1594
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$VOLR2  001  0406 1592   1593
$WAITF  001  057F 1692   1694  2023  2028  2112  2220  2242
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$WFLOK  001  0008 1469
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$WSIND  001  0004 1466
$XIND1  001  03D0 1397   1416
$XIND2  001  03D1 1416   1425
$XIND3  001  03D8 1544   1547
$XPREC  001  0040 1409
$XRSAV  001  03C7 1369   1371
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SYMBOL  LEN VALUE DEFN   REFERENCES                      VER 15, MOD 00  03/06/22  PAGE  22

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#$$KSY  001  0C00 1006
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#$$TVK  001  0FC0 1086
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#$@ZLO  001  000C 1227
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#@@#04	001	0004	1848	
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SYMBOL   LEN VALUE DEFN   REFERENCES                    VER 15, MOD 00  03/06/22  PAGE  28

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@@E042   001  0025 0823   0825
@@E043   001  0026 0825   0827
@@E044   001  0027 0827   0829
@@E045   001  0028 0829   0831
@@E046   001  0029 0831   0833
@@E060   001  002A 0833   0835
@@E080   001  002B 0835
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@@E101   001  0001 0223   0225
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@@E103   001  0003 0227   0229
@@E110   001  0004 0229   0231
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@@E115   001  0008 0237   0239
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@@E117   001  000A 0241   0243
@@E120   001  000B 0243   0245
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@@E133  001  0012 0257   0259
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@@E212  001  0025 0295   0297
@@E213  001  0026 0297   0299
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@@E216  001  0028 0301   0303
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@@E222  001  002C 0309   0311
@@E223  001  002D 0311   0313
@@E225  001  002E 0313   0315
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@@E227  001  0030 0317   0319
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@@E237  001  0036 0329   0331
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@@E242  001  0039 0335   0337
@@E248  001  003A 0337   0339
@@E249  001  003B 0339   0341
@@E250  001  003C 0341   0343
@@E251  001  003D 0343   0345
@@E252  001  003E 0345   0347
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@@E305	001	0048	0365	0367
@@E308	001	0049	0367	0369
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@@E315	001	004B	0371	0373
@@E316	001	004C	0373	0375
@@E320	001	004D	0375	0377
@@E325	001	004E	0377	0379
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@@E335	001	0050	0381	0383
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@@E340	001	0052	0385	0387
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@@E351	001	0054	0389	0391
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@@E362	001	0058	0397	0399
@@E371	001	0059	0399	0401
@@E380	001	005A	0401	0403
@@E390	001	005B	0403	0405
@@E400	001	005C	0405	0407
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@@E417	001	005F	0411	0413
@@E420	001	0060	0413	0415
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@@E432	001	0062	0417	0419
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@@E461	001	0067	0427	0429
@@E464	001	0068	0429	0431
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@@E467	001	006B	0435	0437
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@@E479	001	0075	0455	0457
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@@E481	001	0077	0459	0461
@@E482	001	0078	0461	0463
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@@E485	001	007B	0467	0469

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@@E720   001  00BE 0601   0603
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@@E723   001  00C0 0605   0607
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@@E762   001  00D3 0643   0645
@@E763   001  00D4 0645   0647
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@@E906   001  00FA 0721   0723
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@ASTER   001  005C 0069
@BCRDL   001  0050 0088
@BE      001  0081 0043
@BF      001  0090 0052
@BH      001  0084 0041
@BL      001  0082 0042
@BLANK   001  0040 0065   2053  2089  2099  2104  2113
@BM      001  0082 0054
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@BNH     001  0004 0044
@BNL     001  0002 0045
@BNM     001  0002 0057
@BNOL    001  0020 0050
@BNOZ    001  0008 0049
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@BNZ     001  0001 0058
@BOL     001  00A0 0048
@BOZ     001  0088 0047
@BP      001  0084 0053
@BR      001  0001 0013   1997  1999  2000* 2002  2003  2008  2034  2039  2041  2042  2046  2047
                          2047  2048  2049  2050  2054* 2060  2062  2065  2069  2069  2070  2070
                          2073  2075  2078  2079  2080  2081  2086  2087  2094  2094  2095  2097
                          2097  2098  2102  2102  2103  2115  2118  2118  2125  2129  2130  2133
                          2134  2135  2136  2143  2143  2148  2148  2149  2150  2154  2156  2238
                          2238  2243  2244  2371  2380  2382* 2383  2384  2385  2386  2388  2389
                          2389  2390  2391  2391  2393  2393  2394  2395  2395  2399  2399  2400
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                        CROSS REFERENCE

SYMBOL   LEN VALUE DEFN   REFERENCES                        VER 15, MOD 00  03/06/22  PAGE  34

                         2404   2404   2405   2407   2407   2408   2408   2409   2409   2410   2410   2411
                         2411   2417   2418   2419   2419   2420   2425   2425   2426   2426   2428   2428
                         2434*
@BT      001  0010 0051
@BZ      001  0081 0055
@B1      001  0001 0063   2087*  2092   2097*
@CADDR   001  0002 0142   2070   2086   2098   2118   2143   2389
@CARDL   001  0060 0087   1731
@CHARA   001  00C1 0072
@CHARF   001  00C6 0073
@CHARR   001  00D9 0074
@CHARZ   001  00E9 0075
@CLOFF   001  0010 0094
@CLON    001  0011 0093
@COMMA   001  006B 0066
@CPLUS   001  004E 0079
@DADDR   001  0002 0140   2003   2004   2047   2388   2453
@DBFR1   001  0004 0129
@DBFR2   001  0005 0130
@DCALK   001  0001 0081
@DCBCY   001  0009 0115
@DCBT1   001  0050 0117
@DCNT    001  0003 0128
@DCST1   001  0040 0116
@DCTRL   001  0000 0125
@DCYL    001  0001 0126   2393*
@DD2     001  0003 0030
@DGET    001  0001 0134   2160   2216   2250
@DOLAR   001  005B 0068
@DOP2    001  0004 0028   2384*  2388*  2389*  2451   2452
@DPLNG   001  0006 0132   2390   2449
@DPOS    001  0000 0133
@DPUT    001  0002 0135   2008
@DSAD    001  0002 0127   2391*  2395*  2399   2400*  2404*  2407*  2411   2417*  2425*  2428*  2450
@DSBCY   001  0004 0106
@DSCS1   001  0000 0107
@DSIVF   001  0003 0138
@DSPIN   001  0002 0131
@DTRSZ   001  0018 0085
@DVBCY   001  0007 0108
@DVRFY   001  0031 0136
@DWAIT   001  00FF 0137
@DWBCY   001  0005 0103
@DWSIZ   001  00C0 0105
@DWTB1   001  0003 0104
@DZERO   001  00F0 0064
@D1      001  0002 0026
@EOF     001  001C 0077
@EOFTC   001  0075 0162   2196
@EOS     001  001E 0076
@FDDBC   001  0000 0195
@FDE1    001  000C 0200
@FDFNA   001  000B 0198
@FDHLN   001  0002 0208
@FDLNC   001  0002 0193
@FDNSC   001  0003 0210
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@FDSD    001  0000 0206
@FLACE   001  0009 0197
@FLDBC   001  0001 0196
@FLENT   001  0004 0201
@FLFNA   001  0002 0199
@FLHLN   001  0002 0209
@FLLNC   001  0002 0194
@FLNSC   001  0001 0211
@FLSD    001  0001 0207
@HDRLN   001  0007 0092   1759
@IAR     001  0010 0017
@INDEX   001  0001 0156   0157
@INST3   001  0003 0032
@INST4   001  0004 0033
@INST5   001  0005 0034
@INST6   001  0006 0035
@I1IAR   001  00C0 0020
@LINSZ   001  00F4 0084   1733
@MAPEN   001  0005 0089
@MINCR   001  2000 0083
@MINUS   001  0060 0080
@NOP     001  0080 0040   2005  2078  2091  2430
@NUMBR   001  007B 0070
@OPD2    001  0004 0029
@OP1     001  0003 0027   2016* 2055  2059  2086* 2098* 2125* 2146  2158  2213* 2380* 2386*
@OP2     001  0005 0031
@PCTRL   001  0000 0149
@PDATA   001  0003 0151
@PGCSZ   001  0020 0082   0083
@PPLNG   001  0004 0148
@PRCNT   001  0001 0150
@PRETR   001  00C0 0154   2270
@PRINT   001  0040 0152   0154
@PSR     001  0004 0015
@PWAIT   001  00FF 0158
@P1IAR   001  0020 0018
@P2IAR   001  0040 0019
@Q       001  0001 0024   2075* 2078* 2091* 2106* 2133* 2142  2431
@REGL    001  0002 0012
@RETRN   001  0080 0153   0154
@RLDWN   001  004F 0159
@RTRNC   001  0080 0161
@SBLN    001  0005 0170   2193
@SBLNL   001  0002 0184
@SCTSZ   001  0100 0100
@SDFLN   001  0007 0090
@SDF0    001  0000 0166   2197
@SDF1    001  0001 0167   2198
@SDF2    001  0002 0168   2199
@SDF3    001  0003 0169
@SECCY   001  0030 0086
@SIST    001  0001 0181
@SLASH   001  0061 0067
@SLAST   001  0002 0183   2131
@SMIDL   001  0003 0182
@SNULL   001  0080 0173   2044  2061
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@SONLY  001  0000 0180   2076
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@TBLEF  001  0010 0155   0157
@TBLIX  001  0011 0157
@UCB    001  0087 0039   2075   2096   2106   2128   2133
@UPARW  001  005A 0078
@VADDR  001  0002 0141
@VENTA  001  0056 0113
@VMDDV  001  00FE 0114
@VMFD1  001  0000 0109
@VMFD2  001  0001 0110
@VMRS3  001  0002 0112
@VMTRL  001  0001 0111
@VOLID  001  0006 0091
@VQ     001  0001 0025
@WSFIT  001  0500 0101
@WSTBL  001  0503 0102
@XR     001  0002 0014   2032*  2033   2033*  2039   2040   2040*  2044   2046   2052*  2053   2061   2063
                         2071   2076   2079   2080   2081   2082   2082*  2089   2092   2093   2093*  2099
                         2101   2101*  2104   2129   2131   2134   2135   2136   2137   2137*  2138   2145
                         2147   2147*  2243*
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DL2C05  002  0B7D 2444   2389
DL2C48  001  0B77 2441   2391   2395
DL2DPL  006  0B83 2449   2390*
DL2END  001  0B86 2454
DL2E01  001  0001 2373   2391   2393   2395   2399   2411   2419
DL2E02  001  0002 2374   2404   2407   2425
DL2E18  001  0018 2375   2405
DL2E60  001  0060 2376   2420
DL2E7C  001  007C 2378   2417
DL2ICS  001  0AED 2379   2025   2239
DL2K18  002  0B79 2442   2408
DL2K60  002  0B74 2439   2426
DL2K80  002  0B76 2440   2407   2425
DL2LST  001  0B7E 2448   2391*  2393*  2395*  2399   2400*  2404*  2407*  2411   2417*  2425*  2428*  2433
                         2450
DL2PHY  001  0B80 2450
DL2RAD  002  0B85 2453   2003*  2004*  2404
DL2SAD  005  0B05 2451   2411*  2418*  2419*  2420   2426*  2428
DL2SEC  005  0B0E 2452   2399*  2405   2408*  2409   2409*  2410   2410*  2419
DL2SWH  003  0B63 2431
DL2TSD  001  0083 2377   2418
DL2000  001  0AF1 2381   2371   2382
DL2001  005  0B01 2388   2384*  2451
DL2002  005  0B0A 2390   2388*  2389*  2452
DL2005  004  0B0F 2391   2394
DL2006  004  0B1D 2395   2392
DL2008  004  0B3A 2409   2406
DL2010  003  0B50 2420
DL2100  004  0B5E 2428   2421
DL2110  003  0B62 2430   2431
DL2900  004  0B6B 2434   2380*  2430
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SYMBOL   LEN VALUE DEFN   REFERENCES                        VER 15, MOD 00  03/06/22  PAGE  37

DL2910   004 0B6F 2435   2386*
GRABLE   003 09F3 2119   2116
GRABOA   002 0A4E 2180   2094   2102   2143   2148
GRABSE   001 09F6 2207   1997   2000
GRADIS   001 0080 2200   2115
GRADPL   001 0AA9 2249   2008*  2021   2216*  2218
GRAEBS   001 00FF 2188   2156
GRAEDB   001 0002 2170
GRAEDC   001 0001 2206
GRAEDL   001 0006 2193
GRAEDT   001 0007 2194   2069   2071
GRAED5   001 0005 2208
GRAEET   001 0075 2196   2071
GRAEFG   001 0004 2187
GRAEFI   001 0000 2183
GRAEFR   001 0001 2185
GRAEFS   001 0002 2186
GRAEFW   001 0003 2184
GRAELK   001 0000 2190
GRAELL   001 0002 2195
GRAELN   001 0000 2191
GRAELP   001 0007 2202   2082
GRAELS   001 0004 2203   2137
GRAEMR   001 001B 2204
GRAENC   001 0001 2205   2145   2147
GRAEND   004 0A1F 2139   2125*
GRAERR   004 0A87 2227   2042   2062   2065
GRAESC   001 0001 2189
GRAES0   001 0001 2197   2044   2061
GRAES1   001 0002 2198   2039   2040   2079   2080*  2081   2134   2135*  2136
GRAES2   001 0003 2199   2063   2076   2131
GRAETP   001 0002 2201   2063
GRAEW2   001 0006 2209
GRAEXA   001 0001 2192   2193   2194   2197   2198   2199
GRAFIT   004 0A60 2213   2056
GRAKEP   003 0A5C 2177   2457   2458
GRAMES   001 0AAF 2259   2073
GRAMOD   004 09A6 2096   2091*  2106*
GRANCA   002 0A4B 2165   2047   2243
GRANDA   002 0A48 2161   2002*  2049   2238*
GRANPB   002 0A4E 2169   2097   2098   2118   2179   2180   2181
GRANPL   001 0A46 2159   2026   2240
GRANXC   002 0A4E 2181
GRAONE   002 0A4E 2179
GRAPPL   001 0AB7 2269   2087*  2097*  2109
GRAPRO   001 0890 1998
GRAPSG   002 0A55 2174   2080
GRAPST   002 0A53 2173   2086
GRARAP   001 09F6 2124   2095   2103   2149   2207
GRASAR   004 093B 2059   2001*
GRASBR   004 0933 2055   1999*
GRASEG   001 0A5F 2182   2081*  2094*  2102*  2136*  2148*
GRASEM   001 0AB7 2261   2073   2073
GRASHT   001 0A93 2237   2155
GRASIZ   001 0A4F 2171   2034*  2039*  2041   2050   2079*  2134*  2156*
GRASPF   002 0A57 2175   2003
```

```
                              CROSS REFERENCE

SYMBOL  LEN VALUE DEFN    REFERENCES                        VER 15, MOD 00  03/06/22  PAGE  38

GRASSG  002  0A5E 2178    2135
GRASVC  003  0A1D 2142    2129*
GRATEM  002  0A59 2176    2046* 2047* 2048
GRATXT  002  0A51 2172    2070
GRA000  004  08C8 2018    2016*
GRA005  004  08AC 2005
GRA007  004  08D8 2025    2007
GRA010  004  08CC 2020    2009
GRA020  003  08EE 2033    2031*
GRA210  004  08F9 2039
GRA220  003  0900 2041    2126  2128
GRA230  003  090F 2046    2064
GRA240  004  0930 2054    2055  2074
GRA245  004  0938 2058    2059
GRA250  003  093C 2060    2043  2045
GRA260  003  093F 2061
GRA300  004  094F 2069    2035
GRA302  003  0957 2071
GRA303  003  0966 2075    2072
GRA305  004  0972 2079    2077
GRA306  003  098D 2089    2096
GRA307  005  0997 2092    2086* 2098* 2100
GRA308  003  099C 2093    2090
GRA309  003  09BA 2101    2105
GRA310  004  09F9 2126    2075* 2078* 2127  2133*
GRA313  004  0A0D 2134    2132
GRA315  003  0A1C 2138    2142
GRA316  004  0A23 2143    2150
GRA317  001  0A27 2144    2119
GRA350  005  0A27 2145    2146
GRA360  003  0A2C 2147
GRA5SA  004  0A45 2158    2154*
GRA500  003  0A39 2154    2060  2130
GRA550  004  0A7F 2222    2215
GRA600  004  0A83 2223    2213*
GRA660  003  0A3F 2156    2244
GRA680  004  0A42 2157    2158
GRA720  004  0A93 2238
GRA730  004  0A97 2239
GRA740  003  0AA3 2243
GRBFR1  001  1D00 2460    2032  2165
GRLINE  003  0A5B 2457
GRSCTR  001  0A49 2162    2238
GRTEND  005  0A2A 2146    2052  2070* 2118* 2143*
GRTEXT  001  0607 2456    2172  2173
GRTYPE  003  0A5B 2458    2069* 2115
GRWHAT  001  0A4C 2166


TOTAL STATEMENTS IN ERROR IN THIS ASSEMBLY =      0


OL105 I  THE CODE LENGTH OF #GRAPR IS  2950 DECIMAL.
OL103 I  TOTAL NUMBER OF LIBRARY SECTORS REQUIRED IS    5
         NAME-#GRAPR,PACK-R1R1R1,UNIT-R1,RETAIN-P,LIBRARY-R,CATEGORY-000
```

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         OVERLAY LINKAGE EDITOR CORE USAGE MAP      03/06/22


  START      CATEGORY   NAME AND        CODE LENGTH
 ADDRESS                 ENTRY      HEXADECIMAL DECIMAL

  0C00          0      #GRAPR          0B86    2950


OL100 I   THE TOTAL CORE USED BY #GRAPR IS  2950 DECIMAL.
OL101 I   THE START CONTROL ADDRESS OF THIS MODULE IS 0C00.
OL104 I   TOTAL NUMBER OF LIBRARY SECTORS REQUIRED IS    12
          NAME-#GRAPR,PACK-R1R1R1,UNIT-R1,RETAIN-P,LIBRARY-O
```