```
 OPTIONS NODECK,LIST,XREF,NOREL,OBJ(P)
THE LIST OF OPTIONS USED DURING THIS ASSEMBLY IS--   NODECK,LIST,XREF,NOREL,OBJ
```

```
                                 EXTERNAL SYMBOL LIST
SYMBOL   TYPE                                                VER 15, MOD 00  31/05/22  PAGE   1
#KENAB   MODULE
```

```
    0000                          1 #KENAB START 0
                                  2        PRINT ON,NODATA
                                  3 *      @SYS  EXP-N
                                214+       PRINT ON
                                215 *      @FXD  EXP-N
                                620+       PRINT ON
                                621 *      @CAN  EXP-N
                                724+       PRINT ON
                                725 *      @ERM  EXP-N
                               1347+       PRINT ON
                               1348 *      @SPF  EXP-N
                               1811+       PRINT ON
```

```
                               1814 ***********************************************************************
                               1815 * 5703-XM1      COPYRIGHT IBM CORP, 1970                              *
                               1816 *               REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083   *
                               1817 *                                                                     *
                               1818 ***********************************************************************
                               1819 *STATUS -                                                             *
                               1820 *   VERSION 1 MODIFICATION 0                                          *
                               1821 *                                                                     *
                               1822 *FUNCTION                                                             *
                               1823 *   KENABL MODIFIES THE TYPE CODE OF BOTH PROGRAM AND KEYBOARD        *
                               1824 *   GENERATED FILES WHICH ARE CURRENTLY IN THE WORK AREA, TO INDICATE *
                               1825 *   WHETHER OR NOT THE STATEMENT SHOULD BE INCLUDED IN FUTURE         *
                               1826 *   COMPILATIONS OF THE PROGRAM,                                      *
                               1827 *                                                                     *
                               1828 *ENTRY POINTS                                                         *
                               1829 *   THE ENTRY POINT TO KENABL IS THE FIRST LOCATION IN THE PROGRAM.   *
                               1830 *                                                                     *
                               1831 *INPUT                                                                *
                               1832 *   INPUT TO KENABL IS THE REQUIRED LINE NUMBER LIST IN THE DISABLE   *
                               1833 *   COMMAND AND THE OPTIONAL LINE NUMBER LIST IN THE ENABLE COMMAND   *
                               1834 *                                                                     *
                               1835 *OUTPUT                                                               *
                               1836 *   NONE                                                              *
                               1837 *                                                                     *
                               1838 *EXTERNAL REFERENCES                                                  *
                               1839 *   * SXRSAV - SAVE AREA FOR REGISTER 2 (@XR)                         *
                               1840 *   * $CARPL - ENTRY POINT TO LOAD #GUFUD                             *
                               1841 *   * GRWHAT - GRABIT FUNCTION INDICATOR                              *
                               1842 *   * SCIMSK - INQUIRY MASK INDICATOR                                 *
                               1843 *   * $UNMSK - ENTRY POINT TO ALLOW INTERRUPTS                        *
                               1844 *   * SCAERR - ERROR CODE SAVE AREA                                   *
                               1845 *   * $CAERK - ENTRY POINT TO LOAD #ERRPG                             *
                               1846 *   * DL4ICS - ENTRY POINT TO CALL 4 SURFACE LOGICAL DISK IOCS RTN    *
                               1847 *   * GRABIT - ENTRY POINT TO ROUTINE TO RETRIEVE FILE STATEMENTS     *
                               1848 *   * C4BIN2 - ENTRY POINT TO ROUTINE TO CONVERT DECIMAL TO BINARY    *
                               1849 *   * SLLIST - ENTRY POINT TO ROUTINE TO CHECK AND CONVERT LINE       *
                               1850 *              LINE NUMBER LISTS                                      *
                               1851 *   * SCANIT - ENTRY POINT TO DELIMITER SCAN ROUTINE                  *
                               1852 *   * GFINDN - ENTRY POINT TO ROUTINE TO PRIME GRABIT'S BUFFERS       *
                               1853 *                                                                     *
                               1854 *EXITS, NORMAL                                                        *
                               1855 *   NORMAL EXIT FROM KENABL IS TO $CARPL TO LOAD #GUFUD.              *
                               1856 *                                                                     *
                               1857 *EXITS, ERROR                                                         *
                               1858 *   ERROR EXIT FROM KENABL IS TO $CAERK TO LOAD #ERRPG.  WITH THE     *
                               1859 *   ERROR CODE SET IN $CAERR,                                         *
                               1860 *                                                                     *
                               1861 *TABLES/WORKAREAS                                                     *
                               1862 *   NONE                                                              *
                               1863 *                                                                     *
                               1864 *ATTRIBUTES                                                           *
                               1865 *   RELOCATABLE                                                       *
                               1866 *                                                                     *
                               1867 *CHARACTER CODE DEPENDENCY                                            *
                               1868 *   NONE                                                              *
                               1869 *                                                                     *
                               1870 *NOTES                                                                *
                               1871 *   ERROR PROCEDURES                                                  *
                               1872 *      ON DETECTING A SYNTAX ERROR CONDITION, KENABL INSURES THAT @XR *
                               1873 *      IS POINTING TO THE INVALID CHARACTER, SETS THE ERROR CODE IN   *
                               1874 *      $CAERR, AND TRANSFERS CONTROL TO $CAERK.  A NON-SYNTAX ERROR   *
                               1875 *      IS TREATED SIMILARLY,  EXCEPT THAT @XR MUST NOT POINT TO THE   *
                               1876 *      INPUT BUFFER,                                                  *
                               1877 *                                                                     *
                               1878 *   REGISTER USAGE                                                    *
                               1879 *      * REGISTER 1 (@BR) IS USED AS A BASE REGISTER FOR              *
                               1880 *        ADDRESSABILITY, USING THE LABEL KEN115 AS A BASE ADDRESS.    *
                               1881 *      * REGISTER 2 (@XR) IS USED INITIALLY TO POINT TO THE INPUT     *
                               1882 *        BUFFER AND LATER TO REFERENCE THE ADDRESS OF THE CURRENT     *
                               1883 *        LINE NUMBER IN SLLINE,                                       *
                               1884 *                                                                     *
                               1885 *   SAVED/RESTORED AREAS                                              *
                               1886 *      NONE                                                           *
                               1887 *                                                                     *
                               1888 *   MODIFICATION CONSIDERATIONS                                       *
                               1889 *      NONE                                                           *
                               1890 *                                                                     *
                               1891 *   REQUIRED MODULES                                                  *
                               1892 *      * THE FOLLOWING EQUATE MODULES MUST BE ASSEMBLED WITH KENABL:  *
                               1893 *        * @SYSEQ - COMMON SYSTEM EQUATES                             *
                               1894 *        * @FXDEQ - NUCLEUS FIXED ADDRESS EQUATES                     *
                               1895 *        * @WKAEQ - WORKAREA EQUATES                                  *
                               1896 *        * @ERMEQ - ERROR MESSAGE EQUATES (SELECTED ERRORS)           *
                               1897 *        * @CANEQ - COMMON CORE LOCATIONS NOT IN NUCLEUS EQUATES      *
                               1898 *      * THE FOLLOWING SOURCE MODULES MUST ALSO BE INCLUDED:          *
                               1899 *        * DL4ICS - 4 SURFACE DISK IOCS ROUTINE                       *
                               1900 *        * GRABIT - RETRIEVE FILE STATEMENTS                          *
                               1901 *        * C4BIN2 - MODULE TO CONVERT DECIMAL TO BINARY               *
                               1902 *        * SLLIST - MODULE TO CHECK AND CONVERT LINE NUMBER LISTS     *
                               1903 *        * SCANIT - DELIMITER SCAN ROUTINE                            *
                               1904 *        * GFINDN - PRIME GRABIT BUFFERS                              *
                               1905 *                                                                     *
                               1906 *   OTHER                                                             *
                               1907 *      NONE                                                           *
                               1908 ***********************************************************************
                               1910 *       HDR  IKENAB,1                   GENERATE PROGRAM HEADER
                               1911 ***********************************************************************
                               1912 *  PROGRAM HEADER FOR DISK LOAD                                       *
                               1913 ***********************************************************************
                               1914 *#$KENA EQU   X'01C4'                   DISK ADDR OF #ENAB
                               1915 *#$$KEN EQU   X'0C00'                   CORE LOAD ADDRESS OF #KENAB
                               1916 *#$@KEN EQU   006                       SECTOR CNT OF #KENAB
    0C00                       1917        ORG   #$$KEN                    CORE LOAD ADDRESS
                          0C00 1918 $$$$$$ EQU   *                         FIRST LOCATION IN PROGRAM
    0C00 7BD2C5D5C1C2     0C05 1919        DC    CL6'#KENAB'               PROGRAM NAME
    0C06 09               0C06 1920        DC    IL1'009'                  PROGRAM NUMBER OF IKENAB
                          0C07 1921 #ENAB  EQU   *                         ENTRY POINT TO PROGRAM
                               1922 *** END OF EXPANSION ***

                          0C40 1924        USING KEN115,@BR                SET VALUE FOR BASE
    0C07 C2 01 0C40            1925        LA    KEN115,@BR                POINT BR TO ORIGIN
    0C0B 35 02 03C7            1926        L     $XRSAV,@XR                POINT XR TO INPUT LINE AT POINT
                               1927 *                                      * FOLLOWING KEYWORD
    0C0F 3C 80 0F27            1928        MVI   GRIDWR,KEN003             SET TO WRITE DBS BACK TO DISK
                               1929 *
                               1930 *            TURN ON APPROPRIATE INDICATOR
                               1931 *
    0C13 76 02 D3              1932        A     KENMIN(,@BR),@XR          POINT XR TO 'S' IN DISABLE
                               1933 *                                      * OR 'N' IN 'ENABLE'
    0C16 BD E2 00              1934        CLI   0(,@XR),KENDIS            XR POINTING TO 'S' IN DISABLE ?
    0C19 F2 01 06              1935        JNE   KEN100                    IF NOT, SKIP SWITCH-ON INSTR
                               1936 *
    0C1C 7C 87 01              1937        MVI   KEN115+@Q(,@BR),@UCB      TURN ON THE DISABLE SWITCHES BY
    0C1F 7C 87 87              1938        MVI   KEN185+@Q(,@BR),@UCB      * MOVING IN UCBS
    0C22 E2 02 05              1939 KEN100 LA    KENPLS(,@XR),@XR          RESTORE ORIGINAL VALUE TO XR
    0C25 C0 87 10E5            1940        B     SCANIT                    RETURN PT TO NEXT NONBLANK CHAR
    0C29 F2 01 06              1941        JNZ   KEN110                    IF AT LEAST ONE BLANK WAS
                               1942 *                                      * PROCESSED, SKIP NEXT 2 INSTR
    0C2C BD 1E 00              1943        CLI   KEN005(,@XR),@EOS         IS NEXT CHAR = EOS ?
    0C2F F2 01 CE              1944        JNE   KEN600                    IF NOT, SET ERROR CODE
                               1945 *
    0C32 C0 87 0FF6            1946 KEN110 B     SLLIST                    SYNTAX CHECK NUMBER LIST AND
                               1947 *                                      * CONVERT TO BINARY
    0C36 F2 82 D2              1948        JL    KEN611                    IF ERR IN SLLIST, CALL ERR PROG
                               1949 *
    0C39 3D FF 1400            1950        CLI   SLLINE,@SCTSZ-1           IS FIRST CHAR - LOS?
    0C3D F2 01 20              1951        JNE   KEN130                    IF NOT, JUMP TO MOVE LINE NO.
                               1952 *
    0C40 F2 80 C4              1953 KEN115 JC   KEN610,@NOP                NOP OR ERROR OF RED OPERAND
                               1954 *                                      * MISSING IF DISABLE SW IS ON
                               1955 *
                               1956 *           'ENABLE' ALL LINES IS INDICATED
                               1957 *
    0C43 1C 01 118D D5         1958 KEN120 MVC   GFILNO(KEN002),KENZER(,@BR)  MOVE LN NO '0000' FOR GFINDN
    0C48 C0 87 1126            1959        B     GFINDN                    PRIME GRABIT BUFFERS
    0C4C 3C 02 0F6D            1960        MVI   GRWHAT,GRAEFS             SET SKIP STMNT FUNCTION CODE
    0C50 BB 80 01              1961 KEN125 SBF   KENTYP(,@XR),KENMSK       SET ENABLE BIT ON
                               1962 *
    0C53 BD 1C 02              1963        CLI   KEN002(,@XR),@EOF         IS IT END OF FILE ?
    0C56 F2 81 3A              1964        JE    KEN155                    IF YES, CALL GRABIT LAST TIME
                               1965 *
    0C59 C0 87 0DD2            1966        B     GRABIT                    GET NEXT SOURCE LINE
    0C5D D0 87 10              1967        B     KEN125(,@BR)              REPEAT LOOP TO SET ENABLE ON
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                               1969 *
                               1970 *            PREPARE TO MODIFY TYPE CODE
                               1971 *
    0C60 C2 02 13FF            1972 KEN130 LA    SLLINE-1,@XR              SET XR TO PT TO FIRST OF SLLINE
                               1973 *
    0C64 E2 02 02              1974 KEN135 LA    KEN002(,@XR),@XR          INCR PTR TO POINT TO LINE NO.
    0C67 2C 01 118D 00         1975        MVC   GFILNO(KEN002),KEN000(,@XR) MOVE LINE NO, TO WORK AREA
                               1976 *
                               1977 *
    0C6C BD FF 01              1978        CLI   KEN001(,@XR),@SCTSZ-1     IS CARRIAGE RETURN INDICATED ?
    0C6F F2 81 1E              1979        JE    KEN150                    IF YES, CALL GRABIT LAST TIME
                               1980 *
    0C72 BD 60 01              1981        CLI   KEN001(,@XR),KENDSH       ELSE, IS NEXT CHAR A HYPHEN ?
    0C75 F2 81 06              1982        JE    KEN140                    IF YES, PROCESS LINE NO. RANGE
                               1983 *
    0C78 D0 87 5F              1984        B     KEN170(,@BR)              ELSE, MODIFY LINE NO. TYPE CODE
    0C7B D0 87 24              1985        B     KEN135(,@BR)              ON RETURN, GET NEXT LINE NO.
                               1986 *
                               1987 *            LINE NUMBER RANGE IS INDICATED
                               1988 *
    0C7E 7C 01 CF              1989 KEN140 MVI   KENRNG(,@BR),KENSON       SET ON RANGE INDR SW
    0C81 E2 02 03              1990        LA    KEN007(,@XR),@XR          INCR PTR TO POINT TO HIGH LIMIT
                               1991 *
    0C84 D0 87 5F              1992        B     KEN170(,@BR)              MODIFY TYPE CODE OF RANGE
                               1993 *
    0C87 BD FF 01              1994        CLI   KEN001(,@XR),@SCTSZ-1     IS EOS INDICATED ?
    0C8A F2 81 06              1995        JE    KEN155                    IF YES, CALL GRABIT LAST TIME
                               1996 *
    0C8D D0 87 24              1997        B     KEN135(,@BR)              GET NEXT LINE IN GFILNO
                               1998 *
                               1999 *            EOS INDICATED
                               2000 *
    0C90 D0 87 5F              2001 KEN150 B     KEN170(,@BR)              MODIFY LAST LINE
                               2002 *
                               2003 *            EOF INDICATED
                               2004 *
    0C93 3C 03 0F6D            2005 KEN155 MVI   GRWHAT,GRAEFW             SET WRITE-BACK ONLY CODE
    0C97 C0 87 0DD2            2006        B     GRABIT                    WRITE BACK LAST LINE
                               2007 *
    0C9B C0 87 04A1            2008        B     $CARPL                    RETURN - GOOD EXIT
```

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                               2010 *
                               2011 *            MODIFICATION OF TYPE CODE
                               2012 *
    0C9F 74 08 BF              2013 KEN170 ST    KEN260+@OP1(,@BR),@ARR    SAVE RETURN ADDRESS
    0CA2 74 02 B7              2014        ST    KEN257+@OP1(,@BR),@XR     SAVE PTR VALUE IN XR
    0CA5 74 02 A4              2015        ST    KEN220+@OP1(,@BR),@XR     IF RANGE, STORE HIGH LIMIT ADDF
    0CA8 3C 80 0476            2016        MVI   $CIMSK,KENIRM             MASK IR
    0CAC C0 87 1126            2017        B     GFINDN                    FIND RECORD IN FIT TABLE
    0CB0 8D 01 00 118D         2018 KEN180 CLC   KEN005(,@XR),GFILNO(KEN002)  IS IT THE LN NO. TO MODIFY ?
    0CB5 F2 81 0E              2019        JE    KEN185                    IF YES, GO TO SET TYPE CODE
    0CB8 F2 84 20              2020        JH    KEN210                    ELSE, IF NO. REFERENCED IS >
                               2021 *                                      * NO. DESIRED, TEST RANGE INDR
    0CBB 3C 02 0F6D            2022 KEN182 MVI   GRWHAT,KEN004             ELSE, SET GRWHAT TO SKIP THE
                               2023 *                                      * LAST STMNT
    0CBF C0 87 0DD2            2024        B     GRABIT                    GET NEXT SOURCE LINE
    0CC3 D0 87 70              2025        B     KEN180(,@BR)              TRY AGAIN
                               2026 *
                               2027 *            CORRECT LINE NUMBER TO MODIFY HAS BEEN FOUND
                               2028 *
    0CC6 F2 80 06              2029 KEN185 JC    KEN190,@NOP               IF 'DISABLE' SWITCH ON. JUMP TO
                               2030 *                                      * SET ON DISABLE TYPE CODE
    0CC9 BB 80 01              2031        SBF   KENTYP(,@XR),KENMSK       OTHERWISE, SET ON 'ENABLE' CODE
    0CCC F2 87 03              2032        J     KEN195                    SKIP NEXT STATEMENT
                               2033 *
    0CCF BA 80 01              2034 KEN190 SBN   KENTYP(,@XR),KENMSK       SET ON 'DISABLE' CODE
                               2035 *
    0CD2 7D 01 CF              2036 KEN195 CLI   KENRNG(,@BR),KENSON       IS LINE-NO. RANGE INDR SW ON ?
    0CD5 F2 01 14              2037        JNE   KEN255                    IF NO, RETURN
    0CD8 D0 87 7B              2038        B     KEN182(,@BR)              OTHERWISE, CONTINUE
                               2039 *
                               2040 *            LINE NO, REFERENCED IS > LINE NO. IN SEARCH OF
                               2041 *
    0CDB 7D 01 CF              2042 KEN210 CLI   KENRNG(,@BR),KENSON       IS RANGE INDR SWITCH ON ?
    0CDE F2 01 0B              2043        JNE   KEN255                    IF NOT, RETURN
                               2044 *
    0CE1 2D 01 0000 00         2045 KEN220 CLC   *-*,KEN005(KEN002,@XR)    IF YES, IS NUMBER IN RANGE ?
    0CE6 D0 02 86              2046        BC    KEN185(,@BR),@BNL         IF YES, SET TYPE ODE
                               2047 *
    0CE9 7C 00 CF              2048 KEN250 MVI   KENRNG(,@BR),KENOFF       ELSE, TURN OFF RANGE INDR SW
                               2049 *
    0CEC 3C 03 0F6D            2050 KEN255 MVI   GRWHAT,GRAEFW             SET CODE TO WRITE BACK ONLY
    0CF0 C0 87 0DD2            2051        B     GRABIT                    WRITE BACK MODIFIED LINE
    0CF4 C2 02 0000            2052 KEN257 LA    *-*,@XR                   RESTORE POINTER VALUE INTO XR
    0CF8 C0 87 048D            2053        B     $UNMSK                    * ALLOW INTERRUPTS AND
    0CFC C0 87 0000            2054 KEN260 B     *-*                       * RETURN TO POINT WHERE CALLED
```

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                               2056 *
                               2057 *            SET ERROR CODES AND CALL ERROR PROGRAM
                               2058 *
    0D00 3C 18 03CD            2059 KEN600 MVI   $CAERR,@@E139             SET ERROR CODE FOR INVALID
                               2060 *                                      * DELIMITER
    0D04 F2 87 04              2061        J     KEN611                    CALL ERROR PROGRAM
                               2062 *
    0D07 3C 16 03CD            2063 KEN610 MVI   $CAERR,@@E137             SET ERROR CODE FOR 'NO LINE NO.
                               2064 *                                      * LIST SPECIFIED'
    0D0B C0 87 0469            2065 KEN611 B     $CAERK                    CALL ERROR PROGRAM
                               2066 *
                               2067 *            SAVE AREA OF KENABL
                               2068 *
                          0D0F 2069 KEN700 EQU   *                         START OF SWITCH
    0D0F                  0D0F 2070 KENRNG DS    CL1                       LINE-NUMBER RANGE INDR SWITCH
    0D0F                       2071        ORG   KEN700                    * INITIALIZE TO ZERO
    0D0F 00               0D0F 2072        DC    XL1'00'                   * (TURN IT OFF)
                               2073 *
    0D10                  0D11 2074 KENWRK DS    CL2                       WORK AREA FOR CURRENT LINE #
                               2075 *
                               2076 *            CONSTANTS USED IN KENABL
                               2077 *
    0D12 FFFB             0D13 2078 KENMIN DC  XL2'FFFB'                   DECREMENT VALUE FOR XR
    0D14 0000             0D15 2079 KENZER DC  XL2'0000'                   LINE NO, '0000' FOR ENABLE ALL
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                               2081 *
                               2082 *            EQUATES USED IN KENABL
                               2083 *
                          0000 2084 KEN000 EQU   0                         CODE FOR GRWHAT-INITLZ GRABIT
                          0001 2085 KEN001 EQU   1                         INITIALIZER OF GRSCTR IN GRABIT
                          0002 2086 KEN002 EQU   2                         LENGTH OF BINARY INTEGER
                          0080 2087 KEN003 EQU   @NOP                      GRIDWR VALUE-WRITE DBS TO DISK
                          0002 2088 KEN004 EQU   2                         CODE FOR GRWHAT-SKIP STATEMENT
                          0000 2089 KEN005 EQU   0                         ZERO DISPLACEMENT
                          0002 2090 KEN006 EQU   2                         TWO-BYTE LENGTH FOR XR
                          0003 2091 KEN007 EQU   3                         INCR FOR PTR TO NEXT LINE NO.
                          0005 2092 KENPLS EQU   X'0005'                   VALUE TO REINSTATE XR
                          00E2 2093 KENDIS EQU   C'S'                      IMMEDIATE VALUE FOR DISABLE CMP
                          2710 2094 KENEOF EQU   X'2710'                   BINARY LINE NO. FOR END-OF-FILE
                          0001 2095 KENSON EQU   1                         VALUE OF RANGE INDR SW WHEN ON
                          0000 2096 KENOFF EQU   0                         VALUE OF RANGE INDR SW WHEN OFF
                          0080 2097 KENMSK EQU   X'80'                     MASK FOR ENABLE/DISABLE BIT
                          0080 2098 KENIRM EQU   X'80'                     MASK FOR IR MASKED
                          0060 2099 KENDSH EQU   C'-'                      VALUE FOR HYPHEN IN COMPARES
                               2100 *
                          0001 2101 KENTYP EQU   1                         1-BYTE INCREMENT TO POINT
                               2102 *                                      * XR TO STMNT-TYPE BYTE
                               2103 *            DUMMY LABELS FOR AREAS USED BY GRABIT WHEN GRWHAT=1
                          0000 2104 GRLINE EQU   @ZERO                     KENABL NEVER SETS GRWHAT - 1.
                          0000 2105 GRTYPE EQU   @ZERO                     * SO THESE LABELS ARE ONLY
                          0000 2106 GRTEXT EQU   @ZERO                     * USED TO AVOID ASSEMBLY ERRORS
                          0000 2107 DL2ICS EQU   @ZERO                     DL2ICS NOT USED IN THIS PROG
                               2108 *
                               2109 *            BUFFER ADDRESSES FOR GRABIT AND SLLIST
                          1200 2110 GFIBF1 EQU   X'1200'                   LABELS USED FOR DB BUFFERS.
                          1300 2111 GFIBF2 EQU   GFIBF1+256                * CREATED DYNAMICALLY
                          1400 2112 SLLINE EQU   GFIBF2+256                SECTOR ALLOCATED TO HOLD
                               2113 *                                      * BINARY LINE NUMBERS
                               2114 *      $DL4P
                               2116+***********************************************************************
                               2117+* 5703-XM1  COPYRIGHT IBM CORP. 1970                                  *
                               2118+*           REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083       *
                               2119+*                                                                     *
                               2120+***********************************************************************
                               2121+*STATUS                                                               *
                               2122+*   VERSION 1 MODIFICATION 0                                          *
                               2123+*                                                                     *
                               2124+*FUNCTION                                                             *
                               2125+*   * DL4ICS WILL CONVERT A RELATIVE DISK ADDRESS TO A PHYSICAL       *
                               2126+*     DISK ADDRESS AND CALL $DISKN TO PERFORM THE SPECIFIED FUNCTION  *
                               2127+*   * THE DISK ADDRESS IS A ONE BYTE CYLINDER ADDRESS AND A ONE BYTE  *
                               2128+*     SECTOR DISPLACEMENT RELATIVE TO SECTOR 0 ON A CYLINDER          *
                               2129+*     BOUNDARY                                                        *
                               2130+*   * WHEN MORE THAN 1 SECTOR IS PROCESSED, DL4ICS WILL MAKE MULTIPLE *
                               2131+*     CALLS TO $DISKN TO CROSS CYLINDER BOUNDARIES IF REQUIRED.       *
                               2132+*   * IF 1 SECTOR ONLY IS TO BE PROCESSED, THE USER MAY OVERLAY THE   *
                               2133+*     UNUSED CODE BY ORGING HIS NEXT MODULE AT DL4SPT                 *
                               2134+*                                                                     *
                               2135+*ENTRY POINTS                                                         *
                               2136+*     DL4ICS - ENTRY TO PROCESS A 4 SURFACE FILE. THE CALLING         *
                               2137+*              SEQUENCE IS AS FOLLOWS                                 *
                               2138+*                  DSKL4  DPL                                         *
                               2139+*              WHERE DPL IS THE LABEL OF A SIX BYTE DISK PARAMETER    *
                               2140+*              LIST AS DESCRIBED FOR $DISKN EXCEPT FOR THE SECTOR     *
                               2141+*              ADDRESS BYTE.                                          *
                               2142+*                                                                     *
                               2143+*INPUT                                                                *
                               2144+*   * INPUT TO DL4ICS IS THE ADDRESS OF THE DPL TO BE PROCESSED.      *
                               2145+*                                                                     *
                               2146+*OUTPUT                                                               *
                               2147+*   * N/A                                                             *
                               2148+*                                                                     *
                               2149+*EXTERNAL REFENECES                                                   *
                               2150+*     $DISKN - ENTRY TO SYSTEM DISK ROUTINE                           *
                               2151+*                                                                     *
                               2152+*EXITS, NORMAL                                                        *
                               2153+*   * NORMAL RETURN IS TO THE 1ST INSTRUCTION FOLLOWING THE TWO BYTE  *
                               2154+*     ADDRESS POINTING TO THE DPL.                                    *
                               2155+*                                                                     *
                               2156+*EXITS, ERROR                                                         *
                               2157+*   * N/A                                                             *
                               2158+*                                                                     *
                               2159+*TABLES/WORK AREAS                                                    *
                               2160+*   * N/A                                                             *
                               2161+*                                                                     *
                               2162+*ATTRIBUTES                                                           *
                               2163+*   * RELOCATABLE                                                     *
                               2164+*   * REUSABLE                                                        *
                               2165+*                                                                     *
                               2166+*CHARACTER CODE DEPENDENCY                                            *
                               2167+*   * THE OPERATION OF THIS MODULE DOES NOT DEPEND UPON A PARTICULAR  *
                               2168+*     INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET.          *
                               2169+*                                                                     *
                               2170+*NOTES                                                                *
                               2171+*   ERROR PROCEDURES                                                  *
                               2172+*      N/A                                                            *
                               2173+*                                                                     *
                               2174+*   REGISTER USAGE                                                    *
                               2175+*      @BR IS SAVED AND RESTORED ON EXIT, @XR IS NOT USED.  @ARR IS   *
                               2176+*      USED TO PROVIDE THE ADDRESS OF THE PARAMETER.  THE @ARR IS     *
                               2177+*      INCREMENTED BT TWO AND SAVED AS THE RETURN ADDRESS.            *
                               2178+*                                                                     *
                               2179+*   SAVED/RESTORED AREAS                                              *
                               2180+*      N/A                                                            *
                               2181+*                                                                     *
                               2182+*   MODIFICATION CONSIDERATIONS                                       *
                               2183+*      N/A                                                            *
                               2184+*                                                                     *
                               2185+*   REQUIRED MODULES                                                  *
                               2186+*      @SYSEQ - SYSTEM SOFTWARE EQUATES                               *
                               2187+*      @FXDEQ - SYSTEM NUCLEUS EQUATES                                *
                               2188+*                                                                     *
                               2189+*   OTHER                                                             *
                               2190+*      NONE                                                           *
                               2191+***********************************************************************
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                          0D16 2193+DL4ICS EQU   *                         ENTRY TO DL4ICS
                          0D1A 2194+       USING DL4010,@BR                ESTABLISH BASE REGISTER USAGE
    0D16 34 01 0D86            2195+       ST    DL4900+@OP1,@BR           SAVE BASE REGISTER FOR EXIT
                          0D1A 2196+DL4010 EQU   *                         BASE ADDRESSABILITY
    0D1A C2 01 0D1A            2197+       LA    DL4010,@BR                ESTABLISH BASE
    0D1E 76 08 78              2198+       A     DL4C01(,@BR),@ARR         BUMP TO HIGH END OF ADDR
    0D21 74 08 14              2199+       ST    DL4020+@DOP2(,@BR),@ARR   SET UP MOVE INSTRUCTION
    0D24 76 08 78              2200+       A     DL4C01(,@BR),@ARR         BUMP TO RETURN ADDR
    0D27 74 08 70              2201+       ST    DL4920+@OP1(,@BR),@ARR    SAVE RETURN ADDR
                               2202+*
    0D2A 4C 01 1D 0000         2203+DL4020 MVC   DL4030+@DOP2(@DADDR,@BR),*-* MOVE DPL ADDR INTO MOVE
    0D2F 5E 01 1D 7A           2204+       ALC   DL4030+@DOP2(@CADDR,@BR),DL4C05(,@BR) BUMP TO RIGHT END
    0D33 4C 05 76 0000         2205+DL4030 MVC   DL4DPL(@DPLNG,@BR),*-*    MOVE USER DPL TO WORK AREA
                               2206+*
    0D38 7C 00 5E              2207+DL4035 MVI   DL4100+@Q(,@BR),@ZERO     CLEAR TRACK, DISK SET INST
    0D3B 7C 80 67              2208+       MVI   DL4200+@Q(,@BR),@NOP      TURN OFF TWICE INDICATOR
                               2209+*
    0D3E 7D 60 73              2210+DL4040 CLI   DL4SCD(,@BR),DL4E96       TEST IF DISPLACEMENT OVER 95 ?
    0D41 F2 82 0B              2211+       JL    DL4050                    JUMP IF NOT OVER 95
    0D44 5E 00 72 78           2212+       ALC   DL4CYL(1,@BR),DL4C01(,@BR) INCREMENT CYLINDER COUNT
    0D48 5F 00 73 25           2213+       SLC   DL4SCD(1,@BR),DL4C96(,@BR) DECREMENT DISP BY 96
    0D4C D0 87 24              2214+       B     DL4040(,@BR)              GO BACK CHECK FOR NEXT CYLINDER
                               2215+*
    0D4F 7D 30 73              2216+DL4050 CLI   DL4SCD(,@BR),DL4E48       TEST IF DISP ON NEXT DISK ?
    0D52 F2 82 07              2217+       JL    DL4060                    JUMP IF NOT OVER 48
    0D55 7A 01 5E              2218+       SBN   DL4100+@Q(,@BR),DL4EFD    TURN ON BIT FOR FIXED DISK
    0D58 5F 00 73 36           2219+       SLC   DL4SCD(1,@BR),DL4C48(,@BR) DECREMENT DISP 1 DISK
    0D5C 7D 01 74              2220+DL4060 CLI   DL4SCT(,@BR),DL4E01       IS SECTOR COUNT GREATER THEN 1 ?
    0D5F F2 84 33              2221+       JH    DL4SPT                    GO TO SPLIT CALL
    0D62 7D 18 73              2222+DL4070 CLI   DL4SCD(,@BR),DL4E24       DISPLACEMENT OVER 23 ?
    0D65 F2 82 07              2223+       JL    DL4080                    JUMP NOT OVER 24
    0D68 7A 80 5E              2224+       SBN   DL4100+@Q(,@BR),DL4ETB    SET TRACK BIT ON
    0D6B 5F 00 73 49           2225+       SLC   DL4SCD(1,@BR),DL4C24(,@BR) DECR DISP TO NEXT TRACK
    0D6F 5E 00 73 73           2226+DL4080 ALC   DL4SCD(1,@BR),DL4SCD(,@BR) SHIFT LEFT 1 PLACE
    0D73 5E 00 73 73           2227+       ALC   DL4SCD(1,@BR),DL4SCD(,@BR) SHIFT LEFT 1 PLACE
    0D77 7A 00 73              2228+DL4100 SBN   DL4SCD(,@BR),*-*          SET TRACK, DISK BIT
                               2229+*
    0D7A C0 87 0025            2230+       B     $DISKN                    GO PERFORM DISK I/O
    0D7E 0D8B             0D7F 2231+       DC    AL2(DL4LST)               ADDR OF DISK PARAM LIST
                               2232+*
    0D80 F2 00 3C              2233+DL4200 JC    DL4600,*-*                BRANCH OR NOP IF TWICE SET
                               2234+*
    0D83 C2 01 0000            2235+DL4900 LA    *-*,@BR                   RESTORE OLD BASE TO RETURN
    0D87 C0 87 0000            2236+DL4920 B     *-*                       RETURN TO CALLER

                          0D8B 2238+DL4LST EQU   *                         LEFT END OF DPL
    0D8B                  0D90 2239+DL4DPL DS    CL(@DPLNG)                DPL SAVE AREA
                          0D8C 2240+DL4CYL EQU   DL4LST+@DCYL              CYLINDER COUNT BYTE
                          0D8D 2241+DL4SCD EQU   DL4LST+@DSAD              DISPLACEMENT SECTOR COUNT
                          0060 2242+DL4E96 EQU   96                        TWO DISK SECTOR COUNT PER CYL
                          0030 2243+DL4E48 EQU   48                        ONE DISK SECTOR COUNT PER CYL
                          0018 2244+DL4E24 EQU   24                        TRACK SECTOR COUNT
                          0001 2245+DL4E01 EQU   01                        VALUE TO TEST SECTOR COUNT
                          0001 2246+DL4EFD EQU   01                        VALUE TO SET FIXED DISK BIT
                          0080 2247+DL4ETB EQU   X'80'                     VALUE TO SET TRACK BIT
    0D91 0001             0D92 2248+DL4C01 DC    IL2'1'                    VALUE TO INCR TO CYLINDER
    0D93 0005             0D94 2249+DL4C05 DC    IL2'5'                    DISP TO RIGHT END OF DPL
                          0D3F 2250+DL4C96 EQU   DL4040+@Q                 VALUE TO DECR DISPLACEMENT
                          0D63 2251+DL4C24 EQU   DL4070+@Q                 VALUE OF 1 TRACK
                          0D8E 2252+DL4SCT EQU   DL4LST+@DCNT              POINTER TO DPL SECTOR COUNT
                          0D50 2253+DL4C48 EQU   DL4050+@Q                 VALUE TO DECR DISP BY 1 DISK

    0D95 5C 00 14 74           2255+DL4500 MVC   DL4WRK(1,@BR),DL4SCT(,@BR) PICKUP SECTOR COUNT
                          0D95 2256+DL4SPT EQU   DL4500                    POSSIBLE OVERLAY REFERENCE
    0D99 5E 00 14 73           2257+       ALC   DL4WRK(1,@BR),DL4SCD(,@BR) BUMP BY DISPLACEMENT
    0D9D 7D 30 14              2258+       CLI   DL4WRK(,@BR),DL4E48       TEST FOR CYLINDER OVERLAP
    0DA0 D0 04 48              2259+       BNH   DL4070(,@BR)              BRANCH BACK IF NO OVERLAY
    0DA3 5F 00 14 36           2260+       SLC   DL4WRK(1,@BR),DL4C48(,@BR) DECREMENT WORK BY 48
    0DA7 5F 00 74 14           2261+       SLC   DL4SCT(1,@BR),DL4WRK(,@BR) SUBTRACT WORK FROM COUNT
    0DAB 7C 87 67              2262+       MVI   DL4200+@Q(,@BR),@UCB      SET TWICE SWITCH
    0DAE 5C 00 13 73           2263+       MVC   DL4SAV(1,@BR),DL4SCD(,@BR) SAVE SECTOR DISP IN WORK AREA
    0DB2 78 01 5E              2264+       TBN   DL4100+@Q(,@BR),DL4EFD    DISK BIT ON IN Q CODE ?
    0DB5 D0 90 48              2265+       BF    DL4070(,@BR)              BRANCH NOT ON
    0DB8 5E 00 13 36           2266+       ALC   DL4SAV(1,@BR),DL4C48(,@BR) BUMP TO NEXT DISK
    0DBC D0 87 48              2267+       B     DL4070(,@BR)              RETURN TO CALL I/O
                               2268+*
    0DBF 5C 00 73 13           2269+DL4600 MVC   DL4SCD(1,@BR),DL4SAV(,@BR) PICKUP NEXT HALF OF I/O
    0DC3 5E 00 75 74           2270+       ALC   DL4LST+@DBFR1(1,@BR),DL4SCT(,@BR) BUMP CORE ADDRESS
    0DC7 5E 00 73 74           2271+       ALC   DL4SCD(1,@BR),DL4SCT(,@BR)
    0DCB 5C 00 74 14           2272+       MVC   DL4SCT(1,@BR),DL4WRK(,@BR) MOVE IN NEW SECTOR COUNT
    0DCF D0 87 1E              2273+       B     DL4035(,@BR)              RETURN FOR SECOND PASS
                               2274+*
                          0D2E 2275+DL4WRK EQU   DL4020+@DOP2              1 BYTE WORK AREA FOR SPLIT CALL
                          0D2D 2276+DL4SAV EQU   DL4020+@DOP2-1            1 BYTE WORK AREA FOR SPLIT CALL
                          0DD2 2277+DL4END EQU   *                         DEFINE END OF CODE
                               2278+***                       END OF DL4ICS                            ***
                               2279 *
                               2281 ************************************************************************
                               2282 * 5703-XM1      COPYRIGHT IBM CORP. 1970                               *
                               2283 *               REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083    *
                               2284 *                                                                      *
                               2285 ************************************************************************
                               2286 *STATUS                                                                *
                               2287 *   VERSION 1 MODIFICATION 0                                           *
                               2288 *                                                                      *
                               2289 *FUNCTION                                                              *
                               2290 *   GRABIT LOCATES SEQUENTIAL STATEMENTS IN THE FILE SPECIFIED BY THE *
                               2291 *   USER, AND, DEPENDING UPON THE OPTION CHOSEN, PASSES BACK THE       *
                               2292 *   STATEMENT OR SKIPS TO THE NEXT.                                    *
                               2293 *   AFTER BEING PRIMED BY THE CALLING PROGRAM, GRABIT READS LOGICALLY *
                               2294 *   CONSECUTIVE BLOCKS OF SEGMENTED STATEMENTS, FROM THE FILE          *
                               2295 *   SPECIFIED BY THE USER, INTO CORE.  GRABIT RETURNS WITH @XR         *
                               2296 *   POINTING TO THE BINARY LINE NUMBER OF THE NEXT STATEMENT.          *
                               2297 *   IN ADDITION TO @XR, GRABIT PARAMETERS CAN BE SET TO CAUSE THE      *
                               2298 *   BINARY LINE NR, THE TYPE CODE AND THE UNPACKED, NON-SEGMENTED      *
                               2299 *   TEXT OF THE NEXT STMT TO BE PLACED IN AREAS DEFINED BY THE USER.   *
                               2300 *   IF GRABIT IS USED TO SKIP THROUGH THE STMTS WITHOUT UNPACKING      *
                               2301 *   THEM OR CHANGING THEIR LENGTH OR SEGMENTED CONDITION, GRABIT CAN   *
                               2302 *   BE INSTRUCTED TO RETURN THE BLOCKS TO THEIR ORIGINAL DISK ADDRESS *
                               2303 *   IF THE SPECIFIED FILE IS ACCESSED BY DL4ICS.                       *
                               2304 *                                                                      *
                               2305 *NOTES                                                                 *
                               2306 *   THIS VERSION OF GRABIT USES ONLY DL4ICS TO ACCESS THE NEXT DATA    *
                               2307 *   BLOCK.  GRABIT IN THE SUBROUTINE LIBRARY USES DL4ICS AND DL2ICS.   *
                               2308 ************************************************************************
                          0EB6 2309        USING GRABSE,@BR
                          0DD2 2310 GRABIT EQU   *                         ENTRY POINT TO ROUTINE
    0DD2 34 01 0E55            2311        ST    GRASBR,@BR                SAVE CALLING PROG'S BASE REG.
    0DD6 C2 01 0EB6            2312        LA    GRABSE,@BR                LOAD LOCAL BASE TO BASE REG.
    0DDA 34 08 0E59            2313        ST    GRASAR,@ARR               SAVE RETURN ADDR.
    0DDE 7D 00 B7              2314        CLI   GRWHAT(,@BR),GRAEFI       IS FUNC REQ'D INITIALIZATION ?
    0DE1 F2 81 19              2315        JE    GRA100                    YES, GO TO INITIALIZATION RTN
    0DE4 7D 03 B7              2316        CLI   GRWHAT(,@BR),GRAEFW       IS FUNC REQ'D WRITE BACK ONLY ?
    0DE7 D0 81 73              2317        BE    GRA520(,@BR)              YES, GO WRITE CURRENT BUFF
                               2318 * THE ADDRESS OF THE NEXT SEGMENT IN THE CURRENT BUFFER IS INITLZ'D
                               2319 * AND MAINTAINED IN THE NEXT INST, WHICH LOADS IT TO THE @XR.
    0DEA C2 02 0000            2320 GRA020 LA    *-*,@XR                   LOAD NEXT STMNT CADDR TO @XR
    0DEE 7D 01 B7              2321        CLI   GRWHAT(,@BR),GRAEFR       IS FUNC REQ'D RETURN TEXT ?
    0DF1 F2 81 87              2322        JE    GRA300                    YES, GO RETURN STMNT ROUTINE
    0DF4 7D 02 B7              2323        CLI   GRWHAT(,@BR),GRAEFS       IS FUNC REQ'D SKIP STATEMENT
    0DF7 F2 81 35              2324        JE    GRA200                    YES, GO TO SKIP STMNT ROUTINE
    0DFA F2 87 38              2325        J     GRA210                    GO TO SKIP SEGMENT RTN
                               2326 *
                               2327 *                  INITIALIZATION ROUTINE
                               2328 *
    0DFD 75 02 B0              2329 GRA100 L     GRBFRA(,@BR),@XR          LOAD 1ST BFR ADDR TO DB
    0E00 74 02 B6              2330        ST    GRANCA(,@BR),@XR          PROPIGATE IT TO NEXT BFR DPL
    0E03 5C 01 B3 AD           2331        MVC   GRANDA(@DADDR,@BR),GRSRDA(,@BR)  INITLZ NEXT BRF DADDR
    0E07 7C FF BC              2332        MVI   GRASIZ(,@BR),GRAEBS       INITLZ BUFFER SIZE COUNTER
    0E0A 5C 00 AE B4           2333        MVC   GRACSC(1,@BR),GRSCTR(,@BR)  INITLZ SCTR COUNT IN DPL
    0E0E C0 87 0025            2334        B     $DISKN                    WAIT FOR FIRST DATA BLOCKS TO
    0E12 057F             0E13 2335        DC    AL2($WAITF)               * GET INTO CORE
    0E14 7C 97 C5              2336        MVI   GRAERR+@Q(,@BR),@@E550    SET ERR CODE TO SPECIFY WRKFILE
    0E17 5E 01 B6 B9           2337        ALC   GRANCA(@CADDR,@BR),GRASSZ(,@BR)  SET CADDR OF NEXT BFR
    0E1B BD 00 00              2338 GRA140 CLI   GRAELK(,@XR),GRAELN       IS 1ST DB LINK CODE = 0 ?
    0E1E F2 81 07              2339        JE    GRA150                    YES, GO INCR TO NEXT LOGICAL DB
    0E21 7C 02 B3              2340        MVI   GRANDA(,@BR),GRAEDB       SET DADDR OF NEXT DB
    0E24 6E 00 B3 00           2341        ALC   GRANDA(1,@BR),GRAELK(,@XR)  *
    0E28 5E 00 B3 BB           2342 GRA150 ALC   GRANDA(1,@BR),GRANPB(,@BR)  INCR TO NEXT BFR DADDR
    0E2C F2 87 2E              2343        J     GRA260                    GO ACCESS FIRST STATEMENT
                               2344 *
                               2345 *                  ACCESS NEXT STATEMENT OR NEXT SEGMENT ROUTINE
                               2346 *
    0E2F BD 75 07              2347 GRA200 CLI   GRAEDT(,@XR),GRAEET       END-OF-FILE RECORD ?
    0E32 F2 81 16              2348        JE    GRA230                    YES, RESET OR TO THIS RECORD
    0E35 6F 00 BC 02           2349 GRA210 SLC   GRASIZ(1,@BR),GRAES1(,@XR)  DECR BFR CT BY SEGMENT LENGTH
    0E39 B6 02 02              2350        A     GRAES1(,@XR),@XR          INCR OR BY SEGMENT LENGTH
    0E3C 7D 00 BC              2351 GRA220 CLI   GRASIZ(,@BR),@ZERO        IS BUFFER EMPTY ?
    0E3F D0 82 C4              2352        BL    GRAERR(,@BR)              GONE NEG, GO TO BAD ERR
    0E42 F2 81 15              2353        JE    GRA250                    YES, GO TO GET NEXT BFR
    0E45 BD 80 01              2354        CLI   GRAES0(,@XR),@SNULL       IS SEGMENT NULL ?
    0E48 F2 81 0F              2355        JE    GRA250                    YES, GO TO GET NEXT BFR
    0E4B 34 02 0DED            2356 GRA230 ST    GRA020+@OP1,@XR           SAVE CADDR OF NEXT SEG.IN INST.
    0E4F E2 02 06              2357        LA    GRAEDL(,@XR),@XR          POINT @XR TO LINE NUMBER
    0E52 C2 01 0000            2358 GRA240 LA    *-*,@BR                   RESTORE THE BASE REGISTER
                          0E55 2359 GRASBR EQU   GRA240+@OP1               * STORED IN INST AT GRA240
    0E56 C0 87 0000            2360 GRA245 B     *-*                       RETURN TO USER
                          0E59 2361 GRASAR EQU   GRA245+@OP1               * TO CADDR SAVED IN GRA245
    0E5A D0 87 67              2362 GRA250 B     GRA500(,@BR)              ACCESS NEXT BUFFER
    0E5D BD 80 01              2363 GRA260 CLI   GRAES0(,@XR),@SNULL       IS 1ST SEG. NULL ?
    0E60 D0 81 C4              2364        BE    GRAERR(,@BR)              YES, GO TO BAD ERR
    0E63 B9 02 03              2365        TBF   GRAES2(,@XR),GRAETP       PRIMARY SEGMENT
    0E66 C0 10 0E4B            2366        BT    GRA230                    YES, SAVE LOCATION
    0E6A 7D 01 B7              2367        CLI   GRWHAT(,@BR),GRAEFR       ACTION REQ'D = RETURN TEXT ?
    0E6D D0 81 C4              2368        BE    GRAERR(,@BR)              YES, GO TO BAD ERR
    0E70 7D 04 B7              2369        CLI   GRWHAT(,@BR),GRAEFG       ACTION REQ'D = SKIP SEGMENT ?
    0E73 C0 81 0E4B            2370        BE    GRA230                    YES, GO SAVE LOCATION
    0E77 C0 87 0E35            2371        B     GRA210                    NO, GO SKIP THIS SEGMENT
                               2372 *
                               2373 *                  RETURN TEXT ROUTINE
                               2374 *
    0E7B 2C 01 0000 06         2375 GRA300 MVC   GRLINE,GRAEDL(GRAELL,@XR)  SET BINARY LINE NO.IN O/P FIELD
    0E80 2C 00 0000 07         2376        MVC   GRTYPE,GRAEDT(1,@XR)       SET TYPE CODE IN OUTPUT FIELD
    0E85 4C 01 58 0F74         2377        MVC   GRTEND(@CADDR,@BR),GRATXT  INITLZ TEXT O/P CADDR IN INST.
    0E8A BD 75 07              2378        CLI   GRAEDT(,@XR),GRAEET       END OF FILE STATEMENT ?
    0E8D F2 01 08              2379        JNE   GRA303                    NO - GO RESET SEGMENT SWITCH
    0E90 3C 1C 0000            2380        MVI   GRTEXT,@EOF               MOVE EOF CODE TO GRTEXT
    0E94 C0 87 0E4B            2381        B     GRA230                    GO GET OUT

    0E98 7C 87 01              2383 GRA303 MVI   GRA310+@Q(,@BR),@UCB      INITLZ BRANCH FOR ONLY SEGMENT
    0E9B BD 00 03              2384        CLI   GRAES2(,@XR),@SONLY       IS IT AN ONLY SEGMENT ?
    0E9E F2 81 03              2385        JE    GRA305                    YES, BYPASS BRANCH RESET
    0EA1 7C 80 01              2386        MVI   GRA310+@Q(,@BR),@NOP      SET FOR MORE SEGMENTS
    0EA4 6F 00 BC 02           2387 GRA305 SLC   GRASIZ(1,@BR),GRAES1(,@XR)  DECR BFR CT BY SEG LENGTH
    0EA8 9F 00 02 C0           2388        SLC   GRAES1(1,@XR),GRAPSG(,@BR)  DECR SEG CT BY SDF-HDR LENGTH
    0EAC 6C 00 C3 02           2389        MVC   GRASEG(1,@BR),GRAES1(,@XR)  MOVE TEXT LENGTH TO TEXT CTR
    0EB0 E2 02 07              2390        LA    GRAELP(,@XR),@XR          INCR TO TYPE CODE
    0EB3 F2 87 2A              2391        J     GRA317                    GO TEST FILE TYPE
    0EB6 C0 87 0E3C            2392 GRA310 B     GRA220                    GO ACCESS NEXT STATEMENT
    0EB6                    2393        ORG   GRA310                    * UNLESS CURRENT STATEMENT
    0EB6 C0 87 0E3C         2394        BC    GRA220,@UCB               * HAS MORE SEGMENTS
    0EBA 6C 00 24 00        2395        MVC   GRASVC(,@BR),@ZERO(1,@XR) SAVE CURR CHAR IN RESTORE INST
    0EBE D0 87 67           2396        B     GRA500(,@BR)              ACCESS NEXT BUFFER
    0EC1 BD 02 03           2397        CLI   GRAES2(,@XR),@SLAST       LAST SEGMENT ?
    0EC4 F2 01 03           2398        JNE   GRA313                    NO, GO RESET SEG COUNTER
    0EC7 7C 87 01           2399        MVI   GRA310+@Q(,@BR),@UCB      RESET BRANCH OUT
    0ECA 6F 00 BC 02        2400 GRA313 SLC   GRASIZ(1,@BR),GRAES1(,@XR)  DECR BUFFER COUNTER
    0ECE 9F 00 02 C2        2401        SLC   GRAES1(1,@XR),GRASSG(,@BR)  DECR SEG COUNT BY SDF LENGTH
    0ED2 6C 00 C3 02        2402        MVC   GRASEG(1,@BR),GRAES1(,@XR)  MOVE TEXT LNG TO SEG COUNTER
    0ED6 E2 02 04           2403        LA    GRAELS(,@XR),@XR          INCR @XR PAST SECONDARY SDF
    0ED9 BC 00 00           2404 GRA315 MVI   @ZERO(,@XR),*-*           RESTORE CHAR SAVED IN Q-CODE
                          0EDA 2405 GRASVC EQU   GRA315+@Q                 SAVED CHAR HOLD AREA
    0EDC 5E 01 58 BB        2406 GRA316 ALC   GRTEND(@CADDR,@BR),GRABOA(,@BR)  INCR RECEIVING CADDR
                          0EE0 2407 GRA317 EQU   *                         MOVE TEXT TO GRTEXT
    0EE0 38 80 03D4         2408        TBN   $INDR1,$BASIC             IS FILE TYPE = BASIC ?
    0EE4 F2 90 24           2409        JF    GRA350                    NO, BYPASS REPITION CODE CHECK
    0EE7 BD 1B 01           2410        CLI   GRAENC(,@XR),GRAEMR       IS CHAR REF A REPITITION CODE ?
    0EEA F2 84 1E           2411        JH    GRA350                    NO, GO RETURN REF'D CHAR
    0EED 5C 01 3E 58        2412        MVC   GRATND(@CADDR,@BR),GRTEND(,@BR)  SET RCV'G CADDR IN INSTR
    0EF1 2C 00 0000 00      2413 GRA320 MVC   *-*,@ZERO(1,@XR)          RETURN REPEATED CHAR TO OUTPUT
                          0EF4 2414 GRATND EQU   GRA320+@OP1               * ADDR SUPPLIED
    0EF6 9F 00 01 BB        2415        SLC   GRAENC(1,@XR),GRAONE(,@BR)  DECR. REPITITION COUNTER
    0EFA F2 01 07           2416        JNZ   GRA330                    IF <> 0, GO INCR O/P CADDR
    0EFD 5C 01 58 3E        2417        MVC   GRTEND(@CADDR,@BR),GRATND(,@BR)  RESTORE NEW O/P CADDR
    0F01 F2 87 0C           2418        J     GRA360                    GO INCR @XR
    0F04 5E 01 3E BB        2419 GRA330 ALC   GRATND(@CADDR,@BR),GRABOA(,@BR) INCR O/P CADDR IN INSTR
    0F08 D0 87 3B           2420        B     GRA320(,@BR)              GO MOVE CHAR TO OUTPUT
    0F0B 2C 00 0000 01      2421 GRA350 MVC   *-*,GRAENC(1,@XR)         MOVE NON-REPEAT CHAR TO OUTPUT
                          0F0E 2422 GRTEND EQU   GRA350+@OP1               * ADDR SUPPLIED
    0F10 E2 02 01           2423 GRA360 LA    GRAENC(,@XR),@XR          INCR @XR TO NEXT CHAR.
    0F13 5F 00 C3 BB        2424        SLC   GRASEG(1,@BR),GRABOA(,@BR)  DECR BFR SPACE CTR
    0F17 D0 81 00           2425        BZ    GRA310(,@BR)              NO MORE TEXT IN SEG, CHK MORE
    0F1A D0 87 26           2426        B     GRA316(,@BR)              MORE TEXT, GO INCR RECV CADDR
                               2427 *
                               2428 *                  ACCESS NEXT BUFFER ROUTINE
                               2429 *
    0F1D 74 08 AA           2430 GRA500 ST    GRA5SA(,@BR),@ARR
    0F20 C0 87 0025         2431        B     $DISKN                    WAIT FOR PRIOR READ TO COMPLETE
    0F24 057F             0F25 2432        DC    AL2($WAITF)               *
                               2433 *      THE FOLLOWING JUMP INSTRUCTION IS A SWITCH FOR BUFFER WRITE BACK
                               2434 *      IT IS INITIALIZED TO BYPASS THE WRITE BACK ROUTINE.  TO WRITE
                               2435 *      BACK, THE USER MUST MOVE @NOP TO GRIDWR.
    0F26 F2 87 0D           2436 GRA510 J     GRA600                    BYPASS WRITE BACK ROUTINE
                          0F27 2437 GRIDWR EQU   GRA510+@Q                 INDR AS NOTED ABOVE.
                               2438 *
                               2439 *                  WRITE BACK BUFFER ROUTINE
                               2440 *
    0F29 C0 87 0D16         2441 GRA520 B     DL4ICS                    GO TO LOGICAL DISK ROUTINE TO
    0F2D 0F61             0F2E 2442        DC    AL2(GRACPL)               * WRITE CURRENT BUFFER BACK
    0F2F 7D 03 B7           2443        CLI   GRWHAT(,@BR),GRAEFW       ACTION REQ'D = WRITE BACK ONLY
    0F32 C0 81 0E52         2444        BE    GRA240                    YES, GO RETURN TO USER
                          0F36 2445 GRA600 EQU   *
                               2446 *
                               2447 *                  DL4ICS BEING USED - ACCESS NEXT DATA BLOCK
                               2448 *
    0F36 75 02 B0              2449        L     GRBFRA(,@BR),@XR          SAVE CURR BFR STARTING CADDR
    0F39 5C 04 B0 B6           2450        MVC   GRBFRA(GRAEDS,@BR),GRANCA(,@BR)  MOVE NEXT DPL TO CURR DPI
    0F3D 74 02 B6              2451        ST    GRANCA(,@BR),@XR          RESTORE NEXT BFR STARTING CADDR
    0F40 75 02 B0              2452        L     GRBFRA(,@BR),@XR          POINT EN TO CURR BFR CADDR
    0F43 BD 00 00              2453        CLI   GRAELK(,@XR),GRAELN       NEXT LOGICAL DB = NEXT PHYS DB ?
    0F46 F2 81 07              2454        JE    GRA620                    YES, GO INCR SCTR DISP.
    0F49 7C 02 B3              2455        MVI   GRANDA(,@BR),GRAEDB       SET DADDR OF NEXT DB
    0F4C 6E 00 B3 00           2456        ALC   GRANDA(1,@BR),GRAELK(,@XR)  *
    0F50 5E 00 B3 BB           2457 GRA620 ALC   GRANDA(1,@BR),GRANPB(,@BR)  INCR SCTR DISP FOR NEXT PHYS D
    0F54 C0 87 0D16            2458 GRA640 B     DL4ICS                    GO READ NEXT DB
    0F58 0F67             0F59 2459        DC    AL2(GRANPL)               * CADDR OF DPL
    0F5A 7C FF BC              2460 GRA660 MVI   GRASIZ(,@BR),GRAEBS       RE-INITLZ BFR SPACE COUNT
    0F5D C0 87 0000            2461 GRA680 B     *-*                       RETURN TO
                          0F60 2462 GRA5SA EQU   GRA680+@OP1               * CADDR SUPPLIED
                          0F61 2463 GRACPL EQU   *                         DPL FOR CURRENT BUFFER
    0F61 02               0F61 2464 GRACFN DC    AL1(@DPUT)                WRITE FUNCTION CODE
    0F62                  0F63 2465 GRSRDA DS    CL2                       RELATIVE DADDR OF CURR. BFR
                          0F62 2466 GRACCA EQU   GRSRDA-@B1                CYLINDER BYTE OF DISK ADDR.
    0F62                       2467        ORG   *-2                       * INITIALIZED TO THE
    0F62 0503             0F63 2468        DC    AL2(@WSTBL)               * 1ST DB OF THE WORK FILE
    0F64                  0F64 2469 GRACSC DS    CL1                       SECTOR COUNT
    0F65 1200             0F66 2470 GRBFRA DC    AL2(GRBFR1)               CADDR OF CURRENT BUFFER
                          0F67 2471 GRANPL EQU   *                         DPL FOR NEXT BUFFER
    0F67 01               0F67 2472        DC    AL1(@DGET)                READ FUNCTION CODE
    0F68                  0F69 2473 GRANDA DS    CL2                       RELATIVE DADDR OF NEXT BFR.
    0F6A                  0F6A 2474 GRSCTR DS    CL1                       SECTOR COUNT
    0F6A                       2475        ORG   *-1                       * INITIALIZE TO 1
    0F6A 01               0F6A 2476        DC    XL1'01'
    0F6B                  0F6C 2477 GRANCA DS    CL2                       CADDR OF NEXT BUFFER
    0F6D                  0F6D 2478 GRWHAT DS    CL1                       USER SPEC'D FUNCTION CODE
    0F6D                       2479        ORG   *-1                       SET TO ZERO FOR
    0F6D 00               0F6D 2480        DC    XL1'00'                   * INITIALIZATION CALL
    0F6E 0100             0F6F 2481 GRASSZ DC    XL2'0100'                 SECTOR SIZE
    0F70 0001             0F71 2482 GRANPB DC    XL2'01'                   DISP TO NEXT PHYS BFR DADDR
                          0002 2483 GRAEDB EQU   2                         DB DADDR ADJUSTMENT FACTOR
    0F72                  0F72 2484 GRASIZ DS    CL1                       BUFFER SPACE COUNTER
    0F73 0000             0F74 2485 GRATXT DC    AL2(GRTEXT)               ADDRESS OF TEXT OUTPUT AREA
    0F75 0007             0F76 2486 GRAPSG DC    XL2'07'                   SIZE OF PRIMARY SEG. HEADER
    0F77 0004             0F78 2487 GRASSG DC    XL2'04'                   SIZE OF 2NDARY SEG. HEADER
                          0F71 2488 GRAONE EQU   GRANPB                    DECR FACTOR FOR REPITITION CTR
                          0F71 2489 GRABOA EQU   GRANPB                    INCR FACTOR FOR NEXT TEXT CHAR
                          0F71 2490 GRANXC EQU   GRANPB                    CYL ADJ FACTOR
    0F79                  0F79 2491 GRASEG DS    CL1                       SEGMENT TEXT COUNTER
                          0000 2492 GRAEFI EQU   X'00'                     INITIALIZATION FUNC. CODE
                          0003 2493 GRAEFW EQU   X'03'                     WRITE BACK ONLY FUNC. CODE
                          0001 2494 GRAEFR EQU   X'01'                     RETURN TEXT FUNC. CODE
                          0002 2495 GRAEFS EQU   X'02'                     SKIP STATEMENT FUNC. CODE
                          0004 2496 GRAEFG EQU   X'04'                     SKIP SEGMENT FUNC. CODE
                          00FF 2497 GRAEBS EQU   X'FF'                     BUFFER TEXT AREA SIZE
                          0001 2498 GRAESC EQU   X'01'                     SCTR COUNT IF DL4ICS USED
                          0000 2499 GRAELK EQU   X'00'                     DISP TO LINK CODE WITHIN DB
                          0000 2500 GRAELN EQU   X'00'                     LINK CODE TO NEXT PHYS DB
                          0001 2501 GRAEXA EQU   X'01'                     ADJ TO '@' EQU'S FOR @XR ADDRG
                          0006 2502 GRAEDL EQU   @SBLN+GRAEXA              DISP TO STMT BINARY LINE NO.
                          0007 2503 GRAEDT EQU   @STYPE+GRAEXA             DISP TO STMNT TYPE CODE
                          0002 2504 GRAELL EQU   X'02'                     LENGTH OF BINARY LINE NUMBER
                          0075 2505 GRAEET EQU   @EOFTC                    TYPE CODE OF END-OF-FILE STMT
                          0001 2506 GRAES0 EQU   @SDF0+GRAEXA              DISP TO SDF0 - NULL INDR
                          0002 2507 GRAES1 EQU   @SDF1+GRAEXA              DISP TO SDF1 - LENGTH
                          0003 2508 GRAES2 EQU   @SDF2+GRAEXA              DISP TO SDF2 - SEGMENTATION CDE
                          0002 2509 GRAETP EQU   X'02'                     MASK FOR A PRIMARY SEGMENT
                          0007 2510 GRAELP EQU   X'07'                     LENGTH OF PRIMARY SEG.
                          0004 2511 GRAELS EQU   X'04'                     LENGTH OF SECONDARY SEG.
                          001B 2512 GRAEMR EQU   27                        MAX. REPITITION CODE
                          0001 2513 GRAENC EQU   X'01'                     DISP TO NEXT TEXT CHARACTER
                          0001 2514 GRAEDC EQU   X'01'                     DISP TO CYL IN DADDR
                          0EB6 2515 GRABSE EQU   GRA310                    BASE ADDRESS OF GRABIT
                          0005 2516 GRAEDS EQU   X'05'                     LNG OF DPL DADDR, SCTR-CT.
                          0006 2517 GRAEW2 EQU   6                         SECOND CYL OF WORK FILE
                               2518 *
                               2519 *            ERROR ROUTINE
                               2520 *
    0F7A 3C 98 03CD            2521 GRAERR MVI   $CAERR,@@E551             SET BAD FILE ERROR CODE
                               2522 *            THE ABOVE ERROR CODE IS INITIALLY SET FOR A SAVED FILE,
                               2523 *            BUT IS MODIFIED TO THE WORK FILE IF DL4ICS IS USED
    0F7E 3A 04 03D6            2524        SBN   $INDR3,$ERHRD             SET INDR FOR HARD ERROR
    0F82 C0 87 0469            2525        B     $CAERK                    GO TO ERRPGM INTERFACE
                               2526 *      $C4BD
                               2528+*                                                                    *
                               2529+*                  INITIALIZATION                                    *
                               2530+*                                                                    *
                          0F86 2531+C4BIN2 EQU   *                         ENTRY POINT
                          0F86 2532+       USING C4BIN2,@BR                BASE VALUE
                               2533+*
    0F86 34 01 0FE8            2534+       ST    C4B800+@OP1,@BR           SAVE CALLERS BASE REGISTER
    0F8A C2 01 0F86            2535+       LA    C4BIN2,@BR                LOAD BASE VALUE
                               2536+*
    0F8E 74 08 66              2537+       ST    C4B850+@OP1(,@BR),@ARR    SAVE RETURN ADDRESS
                               2538+*
    0F91 74 02 6E              2539+       ST    C4BSAV(,@BR),@XR          SAVE VALUE OF POINTER
    0F94 3C 0C 03CD            2540+       MVI   $CAERR,@@E122             SET ERROR CODE IN CASE
    0F98 5C 01 6A 6B           2541+       MVC   C4BVAL(C4BLVL,@BR),C4BINI(,@BR) INIT VALUE TO ZERO
    0F9C 3C 04 0FF5            2542+C4B100 MVI   C4B900,4                  INITLZ CHAR. COUNT
                               2543+*
                               2544+***    DETERMINE IF CHAR NUMERIC AND DECR CHAR COUNT
                               2545+*
    0FA0 F2 80 32              2546+C4B200 JC    C4B600,@NOP               SET TO UCB IF IMBEDDED BLANKS
                               2547+*                                      * ALLOWED
    0FA3 BD F0 00              2548+C4B300 CLI   0(,@XR),C4BLOW            THIS CHAR NUMERIC ?
    0FA6 F2 82 35              2549+       JL    C4B700                    NO, GOTO RETURN
                               2550+*
    0FA9 5F 00 6F 4E           2551+       SLC   C4B900(1,@BR),C4B590+@D1(,@BR) DECR CHAR COUNT
    0FAD F2 82 35              2552+       JL    C4B800                    BR TO ERROR EXIT IF TOO MANY
                               2553+*
                               2554+***    MULTIPLY PREVIOUS VALUE BY TEN
                               2555+*
    0FB0 5E 01 6A 6A           2556+       ALC   C4BVAL(C4BLVL,@BR),C4BVAL(,@BR) DOUBLE PREVIOUS VALUE
    0FB4 5C 01 68 6A           2557+       MVC   C4BWRK(C4BLVL,@BR),C4BVAL(,@BR) SAVE DOUBLE VALUE
    0FB8 5E 01 6A 6A           2558+       ALC   C4BVAL(C4BLVL,@BR),C4BVAL(,@BR) QUADRUPLE PREVIOUS VALUE
    0FBC 5E 01 6A 6A           2559+       ALC   C4BVAL(C4BLVL,@BR),C4BVAL(,@BR) OCTUPLE PREVIOUS VALUE
    0FC0 5E 01 6A 68           2560+       ALC   C4BVAL(C4BLVL,@BR),C4BWRK(,@BR) ADD IN SAVED DOUBLE
                               2561+*
                               2562+***    ADD IN VALUE OF THIS CHAR AND INCR POINTER
                               2563+*
    0FC4 68 03 6C 00           2564+       MNN   C4BCHR(,@BR),0(,@XR)      FETCH NEMERIC VALUE OF NEW CHAR
    0FC8 5E 01 6A 6C           2565+       ALC   C4BVAL(C4BLVL,@BR),C4BCHR(,@BR) INCR VALU BY THIS CHAR
                               2566+*
    0FCC E2 02 01              2567+       LA    @B1(,@XR),@XR             INCR POINTER TO NEXT CHAR
    0FCF D0 87 1A              2568+       B     C4B200(,@BR)              GOTO DO IT AGAIN
                               2569+*                                                                    *
                               2570+*                  ROUTINE TO SCAN BLANKS                            *
                               2571+*                                                                    *
    0FD2 E2 02 01              2572+C4B590 LA    @B1(,@XR),@XR             INCR POINTER TO NEXT CHAR
    0FD5 BD 40 00              2573+C4B600 CLI   0(,@XR),@BLANK            IS THIS CHAR A BLANK ?
    0FD8 D0 01 1D              2574+       BNE   C4B300(,@BR)              RETURN IF NOT
    0FDB D0 87 4C              2575+       B     C4B590(,@BR)              GET NEXT CHAR IF YES
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                               2577+*
                               2578+***    ENDING ROUTINE
                               2579+*
    0FDE 74 02 68              2580+C4B700 ST    C4BLEN(,@BR),@XR          PLACE VALUE OF POINTER
    0FE1 5F 01 68 6E           2581+       SLC   C4BLEN(2,@BR),C4BSAV(,@BR) SUBRACT ENTERING VALUE
                               2582+*
    0FE5 C2 01 0000            2583+C4B800 LA    *-*,@BR                   RESTORE CALLERS BR
                               2584+*
    0FE9 C0 87 0000            2585+C4B850 B     *-*                       RETURN TO CALLING ROUTINE
                               2586+*                                                              *
                               2587+*                  WORK AREA AND CONSTANT                      *
                               2588+*                                                              *
    0FED                  0FEE 2589+C4BWRK DS    CL2                       SAVE AREA FOR DOUBLED VALUE
                               2590+*
                          0FEF 2591+C4BYT1 EQU   *                         FIRST BYTE OF BINARY VALUE
    0FEF                  0FF0 2592+C4BVAL DS    CL2                       SAVE AREA FOR BINARY VALUE
                               2593+*
    0FF1 00               0FF1 2594+C4BINI DC    XL1'00'                   INITIALIZE WA TO ZERO
                               2595+*
    0FF2                  0FF2 2596+C4BCHR DS    CL1                       SAVE AREA FOR EACH NEW CHAR
    0FF2                       2597+       ORG   *-1                       INITIALIZE
    0FF2 00               0FF2 2598+       DC    XL1'00'                   * TO ZERO
                               2599+*
    0FF3                  0FF4 2600+C4BSAV DS    CL2                       SAVE AREA FOR XR
                               2601+*
    0FF5                  0FF5 2602+C4B900 DS    CL1                       SAVE AREA FOR CHAR COUNTER
                               2603+*                                                              *
                               2604+*                  EQUATES FOR C4BIN2                          *
                               2605+*                                                              *
                          0FEE 2606+C4BLEN EQU   C4BWRK                    ON RETURN WILL CONTAIN COUNT
                               2607+*                                      * @XR INCREMENTED BY
                          0004 2608+C4BCHC EQU   4                         NUMBER OF CHAR TO CONVERT
                               2609+*
                          00F0 2610+C4BLOW EQU   C'0'                      LOWEST NUMERIC CHARACTER
                               2611+*
                          0002 2612+C4BLVL EQU   C4BVAL-C4BWRK             LENGTH OF BINARY VALUE
                               2613+*
                          0FA1 2614+C4BLNK EQU   C4B200+@Q                 LOCATION OF IMBEDDED BLANK IND
                               2615+*
                          0087 2616+C4BSPC EQU   @UCB                      MOVED TO C4BLNK TO ALLOW BLANKS
                               2617+*
                          0F9D 2618+C4BNMC EQU   C4B100+@Q                 LOCATION OF CONVERSION COUNT
                               2619+*
                          0080 2620+C4BNOP EQU   @NOP                      CHANGED IF IMBEDDED BLANK OK
                          0FF6 2621+C4END  EQU   *                         DEFINE END OF CODE
                               2622+***                       END OF C4BIN2                            ***
                               2624 ************************************************************************
                               2625 * 5703-XM1      COPYRIGHT IBM CORP. 1970                               *
                               2626 *               REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE  120-2083   *
                               2627 *                                                                      *
                               2628 ************************************************************************
                               2629 *STATUS                                                                *
                               2630 *   VERSION 1 MODIFICATION 0                                           *
                               2631 *                                                                      *
                               2632 *FUNCTION                                                              *
                               2633 *   SLLIST SCANS ACROSS A LINE NUMBER LIST, CHECKING THE SYNTAX OF     *
                               2634 *   THE LIST AND CONVERTING THE DECIMAL LINE NUMBERS TO BINARY.        *
                               2635 *   THESE CONVERTED LINE NUMBERS ARE SAVED IN A BUFFER, SLLINE WHICH   *
                               2636 *   CONTAINS A TWO-BYTE ENTRY FOR EACH LINE NUMBER AND A ONE-BYTE      *
                               2637 *   LINE NUMBER RANGE INDICATOR (THE EBCDIC CODE FOR A DASH) BETWEEN   *
                               2638 *   LINE NUMBERS OF A RANGE.  A CARRIAGE RETURN CODE TERMINATES        *
                               2639 *   SLLINE.                                                            *
                               2640 *                                                                      *
                               2641 *ENTRY POINTS                                                          *
                               2642 *   * THE ENTRY POINT IS SLLIST.  THE BASE REGISTER IS SAVED ON ENTRY  *
                               2643 *     AND RESTORED BEFORE EXIT TO THE CALLING ROUTINE.                 *
                               2644 *   * THE CALLING SEQUENCE IS AS FOLLOWS:                              *
                               2645 *        B     SLLIST                                                  *
                               2646 *                                                                      *
                               2647 *INPUT                                                                 *
                               2648 *   THE INPUT TO SLLIST IS A LINE NUMBER LIST WHICH WILL BE SYNTAX     *
                               2649 *   CHECKED AND CONVERTED.  SLLIST EXPECTS @XR TO POINT TO THE FIRST   *
                               2650 *   CHARACTER TO BE TESTED.                                            *
                               2651 *                                                                      *
                               2652 *OUTPUT                                                                *
                               2653 *   THE OUTPUT FROM SLLIST IS THE BUFFER, SLLINE, WHICH CONTAINS THE   *
                               2654 *   CONVERTED LINE NUMBER LIST TERMINATED BY A CARRIAGE-RETURN CODE.   *
                               2655 *                                                                      *
                               2656 *EXTERNAL REFERENCES                                                   *
                               2657 *   * $CAERR - NUCLEUS LOCATION FOR ERROR CODE.                        *
                               2658 *   * SCANIT - ENTRY TO DELIMITER SCAN ROUTINE.                        *
                               2659 *   * C4BIN2 - ENTRY TO ROUTINE TO CONVERT DECIMAL TO BINARY.          *
                               2660 *                                                                      *
                               2661 *EXITS, NORMAL                                                         *
                               2662 *   NORMAL EXIT IS TO THE FIRST INSTRUCTION FOLLOWING THE BRANCH TO    *
                               2663 *   SLLIST.  THE @PSR WILL BE SET TO THE 'BRANCH NOT LOW' CONDITION    *
                               2664 *   TO INDICATE A GOOD RETURN.                                         *
                               2665 *                                                                      *
                               2666 *EXITS, ERROR                                                          *
                               2667 *   ERROR EXIT IS ALSO MADE TO THE FIRST INSTRUCTION FOLLOWING THE     *
                               2668 *   BRANCH TO SLLIST.  IN THIS CASE @PSR IS SET TO 'BRANCH LOW' AND    *
                               2669 *   $CAERR CONTAINS THE APPROPRIATE ERROR CODE.                        *
                               2670 *                                                                      *
                               2671 *TABLES/WORKAREAS                                                      *
                               2672 *   SLLIST CREARES A BUFFER, SLLINE, WHICH HAS A MAXIMUM LENGTH OF     *
                               2673 *   210 BYTES, IS DEFINED BY THE USER, AND CONTAINS THE BINARY         *
                               2674 *   REPRESENTATION OF THE NUMBERS IN THE LINE-NUMBER LIST.  SINGLE     *
                               2675 *   LINE NUMBERS REQUIRE A TWO-BYTE ENTRY AND LINE NUMBER RANGES       *
                               2676 *   EACH REQUIRE FIVE BYTES (TWO BYTES FOR THE LOW LIMIT LINE NUMBER,  *
                               2677 *   ONE BYTE FOR THE EBCDIC CODE FOR A DASH, AND TWO BYTES FOR THE     *
                               2678 *   HIGH LIMIT LINE NUMBER).  AN EOS CODE TERMINATES SLLINE            *
                               2679 *                                                                      *
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2680 *ATTRIBUTES                                                           *
2681 *   SLLIST IS RELOCATABLE                                             *
2682 *                                                                     *
2683 *CHARACTER CODE DEPENDENCY                                            *
2684 *   THE OPERATION OF THIS MODULE DOES NOT DEPEND ON ANY PARTICULAR    *
2685 *   INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET.            *
2686 *                                                                     *
2687 *NOTES                                                                *
2688 *   ERROR PROCEDURES                                                  *
2689 *      SLLIST RETURNS TO THE CALLING ROUTINE WITH THE @PSR SET TO     *
2690 *      'BRANCH LOW' IF AN ERROR CONDITION IS ENCOUNTERED.             *
2691 *      THE APPROPRIATE ERROR CODE WILL BE SET IN $CAERR.              *
2692 *                                                                     *
2693 *   REGISTER USAGE                                                    *
2694 *      * UPON ENTRY TO SLLIST, RESISTER 2 (@XR) MUST BE POINTING TO   *
2695 *        THE 1ST LINE NUMBER TO BE CHECKED.  UPON RETURN FROM SLLIST  *
2696 *        @XR WILL BE POINTING TO THE INVALID CHARACTER IF AN ERROR IS *
2697 *        DETECTED.  TO THE CARRIAGE RETURN CHARACTER IF THE LIST IS   *
2698 *        GOOD, OR TO THE NEXT CHARACTER FOLLOWING A VALID LIST IF     *
2699 *        SLLIND IS SET TO RETURN (SLLRET MOVED TO SLLIND).            *
2700 *      * REGISTER 1 (@BR) IS SAVED UPON ENTRY TO SLLIST AND IS USED   *
2701 *        BY SLLIST TO CONTAIN THE CURRENT ADDRESS BEING REFERENCED IN *
2702 *        SLLINE.                                                      *
2703 *      * UPON ENTRY TO SLLIST, REGISTER 8 (@ARR) IS STORED AS THE     *
2704 *        RETURN ADDRESS TO THE CALLING ROUTING AFTER CHECKING IS      *
2705 *        COMPLETED.                                                   *
2706 *                                                                     *
2707 *   SAVE RESTORED AREAS                                               *
2708 *      NONE                                                           *
2709 *                                                                     *
2710 *   MODIFICATION CONSIDERATIONS                                       *
2711 *      NONE                                                           *
2712 *                                                                     *
2713 *   REQUIRED MODULES                                                  *
2714 *      * THE FOLLOWTNG EQUATE MODULES ARE USED IN SLLIST:             *
2715 *        * @SYSEQ - COMMON S(STEM ELVES                               *
2716 *        * @FXDEQ - NUCLEUS FIXED ADDRESS EQUATES                     *
2717 *        * @ERMEQ - ERROR MESSAGE EQUATES (SELECTED ERROR CODES)      *
2718 *      * THE FOLLOWING SOURCE MODULES ARE ALSO USED IN SLLIST:        *
2719 *        * SCANIT - DELIMITER SCAN ROUTINE                            *
2720 *        * C4BIN2 - ROUTINE TO CONVERT DECIMAL TO BINARY              *
2721 *                                                                     *
2722 *   OTHER                                                             *
2723 *      IF THE CALLING ROUTINE DESIRES THAT A LINE-NUMBER LIST BE      *
2724 *      CONSIDERED VALID IF IT IS FOLLOWED BY ANOTHER PARAMETER,       *
2725 *      SLLRET SHOULD BE MOVED TO SLLRET BEFORE CALLING SLLIST.        *
2726 *                                                                     *
2727 ***********************************************************************
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                          0FF6 2729 SLLIST EQU   *                         ENTRY POINT TO THIS SUBROUTINE
                               2730 *
    0FF6 34 01 10DE            2731        ST    SLL220+@OP1,@BR           SAVE BASE REGISTER
    0FFA 34 08 10E2            2732        ST    SLL230+@OP1,@ARR          SAVE RETURN ADDRESS
    0FFE C2 01 13FE            2733        LA    SLLINE-SLLLN2,@BR         INITIALIZE SLLINE POINTER
                               2734 *
    1002 C0 87 0F86            2735 SLL100 B     C4BIN2                    CONVERT LINE NO. TO BINARY
    1006 F2 82 CA              2736        JL    SLL210                    IF ERROR IN C4BIN2,
                               2737 *                                      * CALL ERROR PROG.
    1009 F2 81 AC              2738        JZ    SLL180                    CHECK FOR EOS IF NO NUMBER FOUND
                               2739 *
                               2740 *                  INTEGER WAS FOUND
                               2741 *
    100C 4C 01 03 0FF0         2742        MVC   SLL003(,@BR),C4BVAL(SLLLN2)  MOVE INTEGER TO BFR
    1011 F2 80 07              2743 SLL110 JC    SLL115,@NOP+*-*           UCB EXCEPT FOR FIRST LINE NO.
    1014 3C 87 1012            2744        MVI   SLL110+@Q,@UCB            SET OFF 'FIRST' INDR
    1018 F2 87 11              2745        J     SLL120                    GO CHECK FOR DELIMITERS
    101B 5D 01 01 03           2746 SLL115 CLC   SLL001(,@BR),SLL003(SLLLN2,@BR)  THIS INTG > LAST INTG ?
    101F F2 82 0A              2747        JL    SLL120                    YES, GO CHECK FOR DELIMITERS
    1022 3C 87 10B2            2748        MVI   SLL165+@Q,@UCB            SET SW TO TAKE ERR IF VALID INTG
    1026 0C 01 10CB 0FF4       2749        MVC   SLL200+@OP1(SLLLN2),C4BSAV  SET PTR TO THIS NUMBER
    102C D2 01 02              2750 SLL120 LA    SLL002(,@BR),@BR          POINT BR PTR TO THIS ENTRY
    102F C0 87 10E5            2751        B     SCANIT                    BYPASS BLANKS
    1033 BD 60 00              2752        CLI   0(,@XR),SLLDSH            CHAR AFTER INTG = '-' ?
    1036 F2 01 55              2753        JNE   SLL150                    NO, CHECK FOR COMMA
                               2754 *
                               2755 *                  LINE NUMBER FOLLOWED BY A DASH
                               2756 *
    1039 E2 02 01              2757        LA    1(,@XR),@XR               POINT XR PAST DASH
    103C 0C 01 105F 0FF4       2758        MVC   SLL125+@OP1,C4BSAV(@REGL) SAVE PTR TO FIRST NO. IN RANGE
    1042 C0 87 10E5            2759        B     SCANIT                    BYPASS BLANKS
    1046 C0 87 0F86            2760        B     C4BIN2                    CONVERT NO. TO BINARY
    104A F2 82 86              2761        JL    SLL210                    ERR IF MORE THAN 4 DIGITS FOUND
    104D F2 01 17              2762        JNZ   SLL130                    JUMP IF INTG FOUND AFTER DASH
                               2763 *
    1050 BD 1E 00              2764        CLI   0(,@XR),@EOS              IS THIS AN OPEN RANGE ?
    1053 F2 81 06              2765        JE    SLL125                    YES, SET OPEN RANGE ERR CODE
    1056 BD 6B 00              2766        CLI   0(,@XR),@COMMA            IS THIS AN OPEN RANGE ?
    1059 F2 01 65              2767        JNE   SLL195                    NO, INV CHAR IN LINE NO. ERROR
                               2768 *
    105C C2 02 0000            2769 SLL125 LA    *-*,@XR                   RESTORE XR TO FIRST NO. IN RANGE
    1060 3C 0D 03CD            2770        MVI   $CAERR,@@E123             ERR, UNBALANCED LINE NO. SERIES
    1064 F2 87 70              2771        J     SLL215                    ERROR EXIT
                               2772 *
                               2773 *                  MOVE DASH AND HIGH LIMIT TO SLLINE
                               2774 *
    1067 7C 60 02              2775 SLL130 MVI   SLL002(,@BR),SLLDSH       SET DASH IN SLLINE
    106A 4C 01 04 0FF0         2776        MVC   SLL003+1(,@BR),C4BVAL(SLLLN2)  MOVE IN HIGH LIMIT OF RANGE
    106F 5D 01 01 04           2777        CLC   SLL001(,@BR),SLL003+1(SLLLN2,@BR) HIGH LIMIT > LOW LIMIT ?
    1073 F2 82 11              2778        JL    SLL140                    YES, GO INCR POINTER
    1076 3D 87 10B2            2779        CLI   SLL165+@Q,@UCB            OUT OF ORDER PAIR FOUND ALRDY ?
    107A F2 81 0A              2780        JE    SLL140                    YES, DON'T SET SWITCH AGAIN
    107D 3C 87 10B2            2781        MVI   SLL165+@Q,@UCB            ELSE, SET SW TO TAKE ERR EXIT
    1081 0C 01 10CB 0FF4       2782        MVC   SLL200+@OP1(SLLLN2),C4BSAV  SET PTR TO SECOND NO. IN RANGE
    1087 D2 01 03              2783 SLL140 LA    SLL003(,@BR),@BR          INCR PTR TO NEXT ENTRY
    108A C0 87 10E5            2784        B     SCANIT                    BYPASS BLANKS
    108E BD 6B 00              2785 SLL150 CLI   0(,@XR),@COMMA            INTG FOLLOWED BY COMMA ?
    1091 F2 01 10              2786        JNE   SLL160                    NO, TEST FOR A BLANK
                               2787 *
                               2788 *                  LINE NUMBER FOLLOWED BY COMMA
                               2789 *
    1094 E2 02 01              2790        LA    1(,@XR),@XR               PT XR PAST COMMA
    1097 C0 87 10E5            2791        B     SCANIT                    BYPASS BLANKS
    109B BD 1E 00              2792        CLI   0(,@XR),@EOS              COMMA FOLLOWED BY EOS ?
    109E F2 81 36              2793        JE    SLL215                    YES ERR - DANGLING COMMA
    10A1 F2 87 0D              2794        J     SLL165                    ELSE, GO CHECK INTG ASCENDING
                               2795 *
    10A4 3D 00 1125            2796 SLL160 CLI   SCACNT,@ZERO              WERE ANY DELIMITERS FOUND ?
    10A8 F2 01 06              2797        JNZ   SLL165                    YES, GO CHECK FOR PROPER ORDER
    10AB BD 1E 00              2798        CLI   0(,@XR),@EOS              ELSE, IS XR REF AN EOS
    10AE F2 01 10              2799        JNE   SLL195                    NO, ERR - INV CHAR IN LINE NO.
    10B1 F2 80 14              2800 SLL165 JC    SLL200,@NOP+*-*           UCB IF THIS INTG < LAST INTG
    10B4 C0 87 1002            2801        B     SLL100                    CHECK NEXT INTG
                               2802 *
                               2803 *                  INTEGER NOT FOUND BY C4BIN2
                               2804 *
    10B8 7C FF 02              2805 SLL180 MVI   SLL002(,@BR),@SCTSZ-1     MOVE AN 'EOS' TO SLLINE
    10BB BD 1E 00              2806        CLI   SLL000(,@XR),@EOS         IS NEXT CHAR IN INP LINE EOS ?
    10BE F2 81 1A              2807 SLL190 JC    SLL220,@BE+*-*            IF YES OR SLLIND IS ON, RETURN
                               2808 *
    10C1 3C 0B 03CD            2809 SLL195 MVI   $CAERR,@@E120             SET ERR CODE FOR 'NON-NUMERIC
                               2810 *                                      * CHAR IN LINE NO. OR INTG'
    10C5 F2 87 0B              2811        J     SLL210                    RESTORE XR, SET PSR AND RETURN
                               2812 *
                               2813 *                  ERROR EXIT
                               2814 *
    10C8 C2 02 0000            2815 SLL200 LA    *-*,@XR                   PT XR TO CORRECT LINE NUMBER
    10CC 3C 0E 03CD            2816        MVI   $CAERR,@@E124             SET ERROR CODE FOR PARAMS NOT
    10D0 F2 87 04              2817        J     SLL215                    * IN ASCENDING ORDER
    10D3 35 02 0FF4            2818 SLL210 L     C4BSAV,@XR                RETURN POINTER TO FIRST OF NO
    10D7 35 04 10E4            2819 SLL215 L     SLLBLW,@PSR               SET PSR TO BRANCH LOW
                               2820 *
                               2821 *                  RETURN TO CALLING PROGRAM
                               2822 *
    10DB C2 01 0000            2823 SLL220 LA    *-*,@BR                   RESTORE CALLERS BASE REGISTER
    10DF C0 87 0000            2824 SLL230 B     *-*                       RETLRN
```

```
                          0000 2826 SLL000 EQU   0                         DISP OF '0' FOR XR OR PTR
                          0001 2827 SLL001 EQU   1                         DISP OF '1' FOR XR OR PTR
                          0002 2828 SLL002 EQU   2                         DISP OF '2' FOR XR OR PTR
                          0003 2829 SLL003 EQU   3                         DISP OF '3' FOR PTR TO SLLINE
                          0002 2830 SLLLN2 EQU   2                         BINARY LENGTH OF TWO BYTES
                          0060 2831 SLLDSH EQU   C'-'                      HYPHEN SEPARATING RANGES
                               2832 *
                          10BF 2833 SLLIND EQU   SLL190+@Q                 LOC FOR SETTING SLLRET
                          0087 2834 SLLRET EQU   X'87'                     CODE FOR RETURN IF NOT EOS
                               2835 *
                               2836 *                  CONSTANTS AND SAVE AREAS
                               2837 *
    10E3 0082             10E4 2838 SLLBLW DC    XL2'82'                   PSR CODE TO BRANCH LOW
                               2839 *
                               2840 *      $CANI
                               2842+***********************************************************************
                               2843+*  5703-XM1    COPYRIGHT IBM CORP. 1970                               *
                               2844+*              REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083   *
                               2845+*                                                                     *
                               2846+***********************************************************************
                               2847+*STATUS                                                               *
                               2848+*   VERSION 1 MODIFICATION 0                                          *
                               2849+*                                                                     *
                               2850+*FUNCTION                                                             *
                               2851+*   THE FUNCTION OF SCANIT IS TO SCAN PAST VALID DELIMITERS AND       *
                               2852+*   RETURN A POINTER TO THE FIRST CHARACTER THAT'S NOT A DELIMITER.   *
                               2853+*                                                                     *
                               2854+*ENTRY POINTS                                                         *
                               2855+*   * THE ENTRY POINT IS SCANIT.                                      *
                               2856+*   * THE CALLING SEQUENCE IS AS FOLLOWS:                             *
                               2857+*            B     SCANIT                                             *
                               2858+*     WITH REGISTER 2 (@XR) POINTING TO THE FIRST CHARACTER TO BE     *
                               2859+*     EXAMINED.                                                       *
                               2860+*                                                                     *
                               2861+*INPUT                                                                *
                               2862+*   NONE                                                              *
                               2863+*                                                                     *
                               2864+*OUTPUT                                                               *
                               2865+*   NONE                                                              *
                               2866+*                                                                     *
                               2867+*EXTERNAL REFERENCES                                                  *
                               2868+*   $CAERR - ERROR CODE SAVE AREA                                     *
                               2869+*                                                                     *
                               2870+*EXITS, NORMAL                                                        *
                               2871+*   NORMAL EXIT FROM SCANIT IS TO THE BYTE FOLLOWING THE BRANCH TO    *
                               2872+*   SCANIT IN THE CALLING ROUTINE. THE PSR (REGISTER 4) WILL CONTAIN  *
                               2873+*   A ZERO IF NO DELIMITERS WERE FOUND OR A HIGH CONDITION IF ONE OR  *
                               2874+*   MORE DELIMITERS WERE SCANNED.                                     *
                               2875+*                                                                     *
                               2876+*EXITS, ERROR                                                         *
                               2877+*   ERROR EXIT FROM SCANIT IS TO THE BYTE FOLLOWING THE BRANCH TO     *
                               2878+*   SCANIT IN THE CALLING ROUTINE. THE PSR WILL CONTAIN A LOW         *
                               2879+*   CONDITION.                                                        *
                               2880+*                                                                     *
                               2881+*TABLES/WORKAREAS                                                     *
                               2882+*   * SCACNT - AREA CONTAINING NUMBERS OF DELIMITERS SCANNED          *
                               2883+*   * SCAMMA - LOC WHERE SCACOM MAY BE MOVED IF ONE COMMA IS ALSO     *
                               2884+*     TO BE CONSIDERED A DELIMITER. MOVING SCACOF BACK INTO SCAMMA    *
                               2885+*     INDICATES THAT ONLY BLANKS SHOULD BE CONSIDERED DELIMITERS.     *
                               2886+*                                                                     *
                               2887+*ATTRIBUTES                                                           *
                               2888+*   RELOCATABLE AND RE-USABLE                                         *
                               2889+*                                                                     *
                               2890+*CHARACTER CODE DEPENDENCY                                            *
                               2891+*   THE OPERATION OF THIS MODULE DOES NOT DEPEND UPON A PARTICULAR    *
                               2892+*   INTERNAL REPRESENTATION OF THE EXTERNAL CHARACTER SET.            *
                               2893+*                                                                     *
                               2894+*NOTES                                                                *
                               2895+*   ERROR PROCEDURES                                                  *
                               2896+*      THE ONLY ERROR CONDITION DETECTED BY SCANIT IS THE CASE WHERE  *
                               2897+*      A CARRIAGE-RETURN CODE FOLLOWS A COMMA.  UPON RETURN TO THE    *
                               2898+*      CALLING ROUTINE, @PSR WILL BE SET TO A LOW CONDITION, THE      *
                               2899+*      ERROR CODE IS SET IN $CAERR, AND MG WILU BE POINTING TO THE    *
                               2900+*      CARRIAGE-RETURN CHARACTER.                                     *
                               2901+*                                                                     *
                               2902+*   REGISTER USAGE                                                    *
                               2903+*      REGISTER 2 (@XR) IS USED AS A POINTER ACROSS THE AREA BEING    *
                               2904+*      SCANNED FOR DELIMETERS.                                        *
                               2905+*                                                                     *
                               2906+*   SAVED/RESTORED AREAS                                              *
                               2907+*      UPON ENTRY TO SCANIT, REGISTER 8 (@ARR) IS SAVED AND USED AS   *
                               2908+*      THE RETURN ADDRESS.                                            *
                               2909+*                                                                     *
                               2910+*   MODIFICATION CONSIDERATIONS                                       *
                               2911+*      NONE                                                           *
                               2912+*                                                                     *
                               2913+*   REQUIRED MODULES                                                  *
                               2914+*      * @SYSEQ - COMMON SYSTEM EQUATES                               *
                               2915+*      * @FXDEQ - FIXED NUCLEUS ADDRESSES EQUATES                     *
                               2916+*                                                                     *
                               2917+*   OTHER                                                             *
                               2918+*      SCANIT IS INITIALIZED TO BYPASS BLANKS ONLY. IF SCACOM IS      *
                               2919+*      MOVED TO SCAMMA, ONE COMMA WILL BE SCANNED ALONG WITH BLANKS.  *
                               2920+*      THE INSTRUCTION TO DO THIS IS AS FOLLOWS:                      *
                               2921+*            MVI   SCAMMA,SCACOM                                      *
                               2922+*                                                                     *
                               2923+*      TO DROP THE COMMA FROM ITS DELIMITER STATUS, SCACOF SHOULD BE  *
                               2924+*      MOVED TO SCAMMA, USING THE FOLLOWING INSTRUCTION:              *
                               2925+*            MVI   SCAMMA,SCACOF                                      *
                               2926+*                                                                     *
                               2927+***********************************************************************


                               2929+*
                               2930+*                  EQUATES USED IN THIS SUBROUTINE
                               2931+*
                          0001 2932+SCAINC EQU   1                         TO INCREMENT POINTER
                          0001 2933+SCACOM EQU   @BNE                      SWITCH TO ALLOW SCANNING COMMA
                          0087 2934+SCACOF EQU   @UCB                      SWITCH TO SET OFF THE INDICATON
                               2935+*                                      * FOR SCANNING A COMMA
                          10E5 2936+SCANIT EQU   *                         ENTRY POINT TO THIS SUBROUTINE
    10E5 34 08 1121            2937+       ST    SCA500+@OP1,@ARR          SAVE RETURN ADDRESS
    10E9 34 02 1123            2938+       ST    SCASVE,@XR                SAVE POINTER VALUE
    10ED 3C 04 03CD            2939+       MVI   $CAERR,@@E110             SET ERROR CODE
    10F1 F2 87 03              2940+       J     SCA200                    GO TO PROCESS
    10F4 E2 02 01              2941+SCA100 LA    SCAINC(,@XR),@XR          INCREMENT POINTER TO NEXT CHAR
    10F7 BD 40 00              2942+SCA200 CLI   0(,@XR),@BLANK            IS THIS CHAR BLANK ?
    10FA C0 81 10F4            2943+       BE    SCA100                    YES, FETCH NEXT ONE
    10FE BD 6B 00              2944+       CLI   0(,@XR),@COMMA            IS IT A COMMA ?
    1101 F2 87 10              2945+SCA250 JC    SCA400,@UCB               UCS TO RETURN -- OR NOP IF
                               2946+*                                      * SCAMMA IS ACTIVE AND CHAR
    1104 E2 02 01              2947+SCA300 LA    SCAINC(,@XR),@XR          INCREMENT POINTER TO NEXT CHAR
    1107 BD 40 00              2948+       CLI   0(,@XR),@BLANK            IS THIS CHAR A BLANK ?
    110A C0 81 1104            2949+       BE    SCA300                    YES, FETCH NEXT ONE
    110E BD 1F 00              2950+       CLI   0(,@XR),@EOS+1            IS THIS EOS ?
    1111 F2 82 0A              2951+       JL    SCA500                    IF NOT, SKIP ERROR ROUTINE
    1114 34 02 1125            2952+SCA400 ST    SCACNT,@XR                SAVE NEW POINTER VALUE
    1118 0F 01 1125 1123       2953+       SLC   SCACNT(2),SCASVE          SET PSR TO EQUAL IF POINTER
                               2954+*                                      * NOT ADVANCED
    111E C0 87 0000            2955+SCA500 B     *-*                       YES, RETURN
                          1102 2956+SCAMMA EQU   SCA250+@Q                 TO SET SCAN COMMA INDICATOR
                               2957+*
                               2958+*                  SAVE AREA
                               2959+*
                          1122 2960+SCASV1 EQU   *                         FIRST BYTE OF SCASVE
    1122                  1123 2961+SCASVE DS    CL2                       ORIGINAL POINTER VALUE SAVE
    1124                  1125 2962+SCACNT DS    CL2                       SAVE AREA FOR TOTAL CHAR SCAN
                               2963+***                       END OF SCANIT                            ***
                               2965 ***********************************************************************
                               2966 * 5703-XM1      COPYRIGHT IBM CORP. 1970                              *
                               2967 *               REFER TO INSTRUCTIONS ON COPYRIGHT NOTICE, 120-2083   *
                               2968 *                                                                     *
                               2969 ***********************************************************************
                               2970 *STATUS                                                               *
                               2971 *   VERSION 1 MODIFICATION 0                                          *
                               2972 *                                                                     *
                               2973 *FUNCTION                                                             *
                               2974 *   GFINDN IS DESIGNED FOR USE WITH GRABIT IN ACCESSING A GIVEN LINE  *
                               2975 *   IN THE WORK FILE.  THE LINE NUMBER SUPPLIED TO GFILNO IS SEARCHED *
                               2976 *   ON THROUGH THE FIT.  THE DB CONTAINING THIS NUMBER ALONG WITH     *
                               2977 *   THE NEXT LOGICAL DB ARE READ INTO CORE, AND GRABIT IS INITIALIZED *
                               2978 *   AND CALLED.  CONTROL IS THEN RETURNED TO THE CALLING PROGRAM.     *
                               2979 *                                                                     *
                               2980 *ENTRY POINTS                                                         *
                               2981 *   GFINDN - ENTERED VIA A BRANCH.  GFILNO MUST BE PRIMED WITH THE    *
                               2982 *   LINE NUMBER TO BE SEARCHED FOR.                                   *
                               2983 *                                                                     *
                               2984 *INPUT                                                                *
                               2985 *   INPUT TO GFINDN IS THE LINE NUMBER SUPPLIED INTO GFILNO FOR THE   *
                               2986 *   SEARCH TO BE MADE.                                                *
                               2987 *                                                                     *
                               2988 *OUTPUT                                                               *
                               2989 *   OUTPUT IS THE PRIMED BUFFERS FOR GRABIT, WHICH CONTAIN THE DB     *
                               2990 *   WHICH CONTAINS THE SPECIFIED LINE NUMBER AND THE NEXT LOGICAL     *
                               2991 *   DB. (DATA BLOCK)                                                  *
                               2992 *                                                                     *
                               2993 *EXTERNAL REFERENCES                                                  *
                               2994 *      $$FITS - CORE ADDRESS OF THE FILE INDEX TABLE (FIT)            *
                               2995 *      DL4ICS - FOUR TRACK LOGICAL DISK IOCS                          *
                               2996 *      GRABIT - DISK FILE LINE RETRIEVER                              *
                               2997 *      GRSRDA - DADDR SAVE AREA PRIMED FOR GRABIT                     *
                               2998 *      GRWHAT - GRABIT INDR                                           *
                               2999 *      GRAFRA - BUFFER ADDR FOR GRABIT                                *
                               3000 *                                                                     *
                               3001 *EXITS, NORMAL                                                        *
                               3002 *   NEXT SEQUENTIAL INSTRUCTION AFTER CALL FROM USING PROGRAM.        *
                               3003 *                                                                     *
                               3004 *EXITS, ERROR                                                         *
                               3005 *   N/A                                                               *
                               3006 *                                                                     *
                               3007 *TABLES/WORK AREAS                                                    *
                               3008 *   WORK AREAS AND DPL'S ARE LOCATED AT END OF MODULE.                *
                               3009 *                                                                     *
                               3010 *ATTRIBUTES                                                           *
                               3011 *   REUSABLE                                                          *
                               3012 *                                                                     *
                               3013 *CHARACTER CODE DEPMENCY                                              *
                               3014 *   CHARACTER CODE DEPENDENCY CLASS - A                               *
                               3015 *   THE OPERATION OF THIS MOMLE DOES NOT DEPEND UPON A PAATICULAO     *
                               3016 *   INTERNAL REPRESENTATION OR THE EXTERNAL CNANATTEN SET.            *
                               3017 *                                                                     *
                               3018 *NOTES                                                                *
                               3019 *   ERROR PROCEDURES                                                  *
                               3020 *      N/A                                                            *
                               3021 *                                                                     *
                               3022 *   REGISTER USAGE                                                    *
                               3023 *      INDEX REGISTER 1 (@BR) IS SAVED AND RESTORED AND USED AS A     *
                               3024 *      BASE REGISTER DURING EXECUTION.  INDEX REGISTER 2 (@XR) IS     *
                               3025 *      NOT SAVED OR RESTORED BUT IT IS USED TO INDEX THROUGH FIT      *
                               3026 *      IT SEARCHING FOR LINE NUMBER.                                  *
                               3027 *                                                                     *
                               3028 *   SAVED/RESTORED AREAS                                              *
                               3029 *      N/A                                                            *
                               3030 *                                                                     *
                               3031 *   MODIFICATION CONSIDERATIONS                                       *
                               3032 *      $FINDN IS INTERDEPENDENT WITH GRABIT (IE. WHEN PRIMING         *
                               3033 *      SPECIFIC FIELDS IN GRABIT).  ALSO, NOTE 'OTHER'.               *
                               3034 *                                                                     *
                               3035 *   REQUIRED MODULES                                                  *
                               3036 *      @SYSEQ - COMMON SYSTEM SOFTWARE EQUATES                        *
                               3037 *      @CANEQ - COMMON CORE LOCATION EQUATES OUTSIDE NUCLEUS          *
                               3038 *      DL4ICS - FOUR TRACK LOGICAL DISK IOCS                          *
                               3039 *      GRABIT - FILE LINE RETRIEVER                                   *
                               3040 *                                                                     *
                               3041 *   OTHER                                                             *
                               3042 *      GFINDN CAN BE FORCED TO DETECT THAT FIT DB'S ARE NEVER CON-    *
                               3043 *      TIGUOUS BY MOVING A @NOP TO LABEL GFI200 PLUS @Q.              *
                               3044 *                                                                     *
                               3045 ***********************************************************************
                               3047 ***********************************************************************
                               3048 *                                                                     *
                               3049 *            GFINON MODULE EQUATES                                    *
                               3050 *                                                                     *
                               3051 ***********************************************************************

                          0001 3053 GFICT1 EQU   1                         COUNT CODE 1
                          0002 3054 GFICT2 EQU   2                         COUNT CODE 2
                               3055 *
                          0000 3056 GFIDS0 EQU   0                         DISPLACEMENT OF 0
                          0001 3057 GFIDS1 EQU   1                         DISPLACEMENT OF 1
                          0002 3058 GFIDS2 EQU   2                         DISPLACEMENT OF 2
                          0003 3059 GFIDS3 EQU   3                         DISPLACEMENT OF 3
                          0004 3060 GFIDS4 EQU   4                         DISPLACEMENT OF 4
                          0005 3061 GFIDS5 EQU   5                         DISPLACEMENT OF 5
                          0008 3062 GFIDS8 EQU   8                         DISPLACEMENT OF 8
                               3063 *
                          0001 3064 GFILN1 EQU   1                         LENGTH CODE 1
                          0002 3065 GFILN2 EQU   2                         LENGTH OF 2
                               3066 *
                          1200 3067 GRBFR1 EQU   GFIBF1                    ADDR OF FIRST CORE BUFFER
                               3068 *
                          1D00 3069 GFITAD EQU   $$FITS                    ADDR OF FIT IN CORE
                               3070 *
                          1D08 3071 GFINTY EQU   GFITAD+GFIDS8             ADDR FIRST ENTRY IN FIT
                               3072 *
                          0003 3073 GFIDTA EQU   3                         ADDR FIRST FIT DATA SECTOR
                               3074 *
                               3075 ***********************************************************************
                               3077 ***********************************************************************
                               3078 *                                                                     *
                               3079 *            INIT REGS FOR GCLEAR AND SAVE REGS FOR CALLING ROUTINE   *
                               3080 *                                                                     *
                               3081 ***********************************************************************
                               3082 *
                               3083 *GFINDN ENTER BASE=GFIBSE,EXIT=GFIND,@BR,,@ARR
                          1131 3084        USING GFIBSE,@BR                BASE ADDRESS SPECIFICATION
                          1126 3085 GFINDN EQU   *                         MODULE ENTRY POINT
    1126 34 01 1187            3086        ST    GFIND0+@OP1,@BR           SAVE @BR
    112A C2 01 1131            3087        LA    GFIBSE,@BR                LOAD BASE REGISTER
    112E 74 08 5A              3088        ST    GFIND2+@OP1(,@BR),@ARR    SAVE RETURN ADDRESS

                               3090 *
                               3091 *            SEARCH FILE INDEX TABLE FOR NUMBER IN GFLINO
                               3092 *
                          1131 3093 GFIBSE EQU   *
    1131 C2 02 1D08            3094        LA    GFINTY,@XR                LOAD XR WITH ADDR OF FIRST
                               3095 *                                      * ENTRY IN FIT
    1135 E2 02 04              3096 GFI100 LA    GFIDS4(,@XR),@XR          INDEX TO NEXT FIT ENTRY
                               3097 *
    1138 9D 01 02 5C           3098 GFI150 CLC   GFIDS2(GFILN2,@XR),GFILNO(,@BR)  THIS DB CONTAIN NUMBER
                               3099 *                                      * IN GFILNO ?
    113C D0 82 04              3100        BL    GFI100(,@BR)              NO, CHECK NEXT FIT ENTRY

                               3102 ***********************************************************************
                               3103 *                                                                     *
                               3104 *            READ DATA BLOCKS INTO CORE BUFFERS                       *
                               3105 *                                                                     *
                               3106 ***********************************************************************
                               3107 *
    113F 7C 03 60              3108        MVI   GFIRED+@DSAD(,@BR),GFIDTA  INIT DPL FOR 1ST DATA SECTOR
    1142 6E 00 60 00           3109        ALC   GFIRED+@DSAD(GFILN1,@BR),@ZERO(,@XR)  DISP FROM 1ST SECTOR
    1146 7C 02 61              3110        MVI   GFIRED+@DCNT(,@BR),GFICT2  INIT DPL SECTOR COUNT
                               3111 *
                               3112 *            CHECK IF DB'S ARE CONTINUOUS
                               3113 *
    1149 6C 00 5D 04           3114        MVC   GFIWRK(GFILN1,@BR),GFIDS4(,@XR)  COMPUTE IF DB'S ARE
    114D 6F 00 5D 00           3115        SLC   GFIWRK(GFILN1,@BR),@ZERO(,@XR)   * CONTIGUOUS ON DISK
    1151 7D 01 5D              3116        CLI   GFIWRK(,@BR),GFICT1       ARE DB'S CONTIGUOUS FOR READ ?
    1154 F2 81 10              3117 GFI200 JC    GFI500,@BE                YES, DB'S ARE CONTIGUOUS
                               3118 *
                               3119 ***********************************************************************
                               3121 ***********************************************************************
                               3122 *                                                                     *
                               3123 *            PROCESSING OF NON-CONTIGUOUS DATA BLOCKS                 *
                               3124 *                                                                     *
                               3125 ***********************************************************************
                               3126 *
    1157 7C 03 66              3127        MVI   GFIRAD+@DSAD(,@BR),GFIDTA  MODIFY SECTOR ADDR
    115A 6E 00 66 04           3128        ALC   GFIRAD+@DSAD(GFILN1,@BR),GFIDS4(,@XR)

                               3130 *       DSKL4 GFIRAD                    READ SECOND DB
    115E C0 87 0D16            3131        B     DL4ICS                    PERFORM RELATIVE DISK OP
    1162 1195             1163 3132        DC    AL2(GFIRAD)               DPL ADDRESS
                               3133 *** END OF EXPANSION ***
                               3134 *
    1164 7C 01 61              3135        MVI   GFIRED+@DCNT(,@BR),GFICT1  MODIFY DPL SECTOR COUNT

                               3137 *GFI500 DSKL4 WIRED                     READ DB(S)
    1167 C0 87 0D16            3138 GFI500 B     DL4ICS                    PERFORM RELATIVE DISK OP
    116B 118F             116C 3139        DC    AL2(GFIRED)               DPL ADDRESS
                               3140 *** END OF EXPANSION ***


                               3142 ***********************************************************************
                               3143 *                                                                     *
                               3144 *            INITIALIZATION FOR GRABIT                                *
                               3145 *                                                                     *
                               3146 ***********************************************************************
                               3147 *
    116D 1C 01 0F63 60         3148        MVC   GRSRDA(@CADDR),GFIRED+@DSAD(,@BR)  PRIME GRABIT DISK ADDR
    1172 3C 00 0F6D            3149        MVI   GRWHAT,@ZERO              PRIME GRWHAT FOR GRABIT
    1176 0C 01 0F66 1194       3150        MVC   GRBFRA(@CADDR),GFIBR1     PRIME GRABIT
                               3151 *
    117C C0 87 0DD2            3152        B     GRABIT                    GET NEXT STATEMENT
                               3153 *
    1180 3C 01 0F6D            3154        MVI   GRWHAT,GFICT1             SET GRABIT FUNCTION CODE

                               3156 ***********************************************************************
                               3157 *                                                                     *
                               3158 *            END OF ROUTINE PROCESSING                                *
                               3159 *                                                                     *
                               3160 ***********************************************************************
                               3161 *
                               3162 *GFIND  EXIT  @BR,,RETURN
    1184 C2 01 0000            3163 GFIND0 LA    *-*,@BR                   RESTORE @BR
    1188 C0 87 0000            3164 GFIND2 B     *-*                       RETURN TO CALING PROGRAM
                               3165 *** END OF EXPANSION ***
                               3167 ***********************************************************************
                               3168 *                                                                     *
                               3169 *            DATA CONSTANTS, BUFFERS, AND WORK AREAS                  *
                               3170 *                                                                     *
                               3171 ***********************************************************************
                               3172 *
    118C                  118D 3173 GFILNO DS    CL2                       INPUT AREA FOR LINE NUMPER TO
                               3174 *                                      * BE SEARCHED FOR
    118E                  118E 3175 GFIWRK DS    CL1                       USED TO COMPUTE IF DB'S ARE
                               3176 *                                      * CONTIGUOUS IN CORE
                               3177 *            DPL MODIFIED FOR READING OF DATA BLOCKS
                               3178 *
                               3179 *GFIRED DPL   FUNC=@DGET,DADDR=@WSFIT,CADDR=GFIBF1
                          118F 3180 GFIRED EQU   *                         DISK PARAMETER LIST
    118F 01               118F 3181        DC    AL1(@DGET)                REQUESTED FUNCTION
    1190 0500             1191 3182        DC    AL2(@WSFIT)               DISK ADDRESS
    1192 00               1192 3183        DC    AL1(*-*)                  SECTOR COUNT
    1193 1200             1194 3184        DC    AL2(GFIBF1)               BUFFER ADDRESS
                               3185 *** END OF EXPANSION ***

                          1194 3187 GFIBR1 EQU   GFIRED+@DBFR2             ADDR OF FIRST BUFFER
                               3188 *
                               3189 *GFIRAD  DPL  FUNC=@DGET,DADDR=@WSFIT,CNT=@B1,CADDR=GFIBF2
                          1195 3190 GFIRAD EQU   *                         DISK PARAMETER LIST
    1195 01               1195 3191        DC    AL1(@DGET)                REQUESTED FUNCTION
    1196 0500             1197 3192        DC    AL2(@WSFIT)               DISK ADDRESS
    1198 01               1198 3193        DC    AL1(@B1)                  SECTOR COUNT
    1199 1300             119A 3194        DC    AL2(GFIBF2)               BUFFER ADDRESS
                               3195 *** END OF EXPANSION ***

                          119A 3197 GFIBR2 EQU   GFIRAD+@DBFR2             ADDR OF SECOND BUFFER
                               3198 *
                               3200 *      PATCH
                               3201 ***********************************************************************
                               3202 *      PATCH AREA 1                                                   *
                               3203 ***********************************************************************
                               3204 *
                               3205 *  CALCULATE AREA LEFT IN THIS SECTOR
                               3206 *
                          119B 3207 $$$$L1 EQU   *                         START OF PATCH AREA 1
    1200                       3208        ORG   *,256,0                   SET LOC CNTR TO NEXT SECTOR
                          1200 3209 $$$$T1 EQU   *                         DEFINE ADDR OF SCTR BNDRY
    119B                       3210        ORG   $$$$L1                    SET LOC CNTR TO START OF
                               3211 *                                      * PATCH AREA
    119B                  11FF 3212 $$$$$1 DS    CL($$$$T1-$$$$L1)         PATCH AREA
                               3213 ***********************************************************************
                               3214 *** END OF EXPANSION ***
                               3215        PRINT ON
                          FFFF 3216        END

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

```
                                 CROSS REFERENCE
SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  38
$$$$$$  001  0C00 1918
$$$$$1  101  11FF 3212
$$$$L1  001  119B 3207   3210  3212
$$$$T1  001  1200 3209   3212
$$$CMD  001  0020 0659
$$$DAT  001  0040 0658
$$$EPL  001  0091 0655
$$$ERN  001  0080 0709
$$$FUN  001  0010 0660
$$$NLN  001  00A0 0705
$$$STD  001  0081 0654
$$BNLN  001  0605 0635   0637
$$CDBS  001  08C0 0685
$$CDND  001  0666 0644
$$CDRD  001  0890 0683   0685
$$CKEY  001  0603 0633
$$CKFF  001  0B3D 0665
$$COFF  001  0B44 0664
$$CSNS  001  209C 0694
$$DATB  001  0BBF 0666
$$EOSA  001  0AFE 0663
$$ERSK  001  1C00 0704
$$FITS  001  1D00 0712   3069
$$FLIB  001  06FF 0711
$$ILEN  001  0601 0629   0631  0635
$$ILHD  001  0600 0627   0629
$$INLN  001  0607 0642   0644  0646
$$INND  001  06FA 0646
$$KBDT  001  09E1 0653   0657
$$KBSN  001  09E2 0657   0662
$$KLD1  001  0600 0717
$$KLD2  001  0700 0719
$$KLD3  001  0C00 0721
$$LPOS  001  09EB 0662
$$PCNT  001  07E9 0678
$$PLYN  001  2004 0692
$$PRES  001  0890 0651   0653  0663  0664  0665  0666  0683
$$PRFL  001  2143 0696
$$PRNT  001  0707 0672   0673  0677  0678
$$PRTN  001  0782 0673
$$PSIO  001  07CE 0677
$$PYCD  001  2200 0698
$$PYMP  001  2000 0690   0692  0694  0696  0698
$$SLIB  001  1C00 0707
$$TPCD  001  0606 0637   0642
$$UPAR  001  0602 0631   0633
$$WSPB  001  1E00 0710
$$XIND  001  06FF 0708   0711
$$ZERO  001  0000 0223   0224  0226  0227  0228  0232  0690
$ABORT  001  0010 0336
$BASIC  001  0080 0394   2408
$BIGCD  001  0080 0470
$BLDPL  001  0579 0603   0605
$BLNOE  001  0569 0593
$BLOAD  001  0522 0584   0586  0589  0602  0603
$BLRTN  001  0550 0592   0593
```

```
                                 CROSS REFERENCE
SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  39
$BRSAV  001  03C5 0281   0282
$BSADR  001  0587 0608   0610
$BUFPT  001  03E3 0489   0490
$CABLD  001  04B4 0562   0563
$CAERK  001  0469 0539   0542  2065  2525
$CAERR  001  03CD 0287   0289  2059* 2063* 2521* 2540* 2770* 2809* 2816* 2939*
$CAIPL  001  049D 0558   0560
$CALLI  001  0008 0479
$CARDI  001  0001 0250
$CARPL  001  04A1 0560   0562  2008
$CIENT  001  0483 0549   0550
$CIEXT  001  0480 0548   0549
$CIMSK  001  0476 0545   0548  2016*
$CISUS  001  0496 0553   0558
$CLBFR  001  0010 0437
$CMDKY  001  0008 0349
$CMODE  001  0002 0399
$CONFG  001  03DD 0462   0472
$CRPOS  001  03E2 0488   0489
$CRTAD  001  044D 0527   0528
$CRTAV  001  0002 0343
$CRTDN  001  0002 0367
$CRTIN  001  03D3 0364   0371
$CRTNO  001  0004 0346
$CRTPU  001  0004 0368
$CRTSP  001  0008 0369
$CRTUP  001  0001 0366
$CRUSH  001  0080 0475
$CSDPL  001  050E 0574   0575
$C0001  001  0464 0531   0537
$DATE   001  043A 0512   0513
$DBGUF  001  03E0 0474   0483
$DBLOK  001  0001 0424
$DFDET  001  03E8 0495   0496
$DISKN  001  0025 0226   2230  2334  2431
$DKERR  001  0008 0405
$DKSIZ  001  03D7 0449   0457  0498
$DK100  001  0001 0451
$DK200  001  0002 0452
$DK400  001  0004 0453
$DK600  001  0008 0454
$DK800  001  0010 0455
$DPLSV  001  0449 0523   0525
$DTNMB  001  0040 0270
$DTRDR  001  0040 0358
$ENDNU  001  0600 0617   0627  0651  0672  0708  0717  0719  0721
$ERDPL  001  046F 0542   0544
$ERFIL  001  0040 0297
$ERHRD  001  0004 0429   2524
$ERKEY  001  0080 0301
$ERLOG  001  0345 0231
$ERMAD  001  0472 0544   0545
$ERPND  001  0004 0402
$ERRCT  001  03CF 0303
$ERRPG  001  03CE 0291
$ERSFL  001  0035 0296
```

```
                                 CROSS REFERENCE
SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  40
$ERSTK  001  0030 0294
$ER050  001  0363 0232
$ER1N2  001  0050 0299
$EXADR  001  0517 0577   0579
$EXCMD  001  0001 0331
$EXFTR  001  043B 0513   0518
$FCIND  001  0010 0409
$FDIND  001  0040 0416
$FEARR  001  0004 0224
$FEMAP  001  0588 0610   0611
$FILIB  001  03DA 0460   0461
$FITIN  001  0010 0385
$FUIND  001  0020 0414
$GUFIO  001  0583 0607   0608
$GUFIR  001  0008 0259
$HISTE  001  042E 0510   0511
$HIST1  001  0435 0511   0512
$HRDER  001  0020 0355
$INDR1  001  03D4 0371   0397  2408
$INDR2  001  03D5 0397   0422
$INDR3  001  03D6 0422   0449  2524*
$INLNO  001  03CF 0289   0291  0303  0310
$INRPT  001  0020 0267
$IOIND  001  03D2 0338   0364
$IOPGS  001  0010 0478
$IOYES  001  0002 0253
$IPLDV  001  05FF 0614   0617
$IRKEY  001  0020 0477
$KEYBD  001  03E1 0483   0488
$KEYCD  001  03C3 0247   0281
$KEYDT  001  0040 0391
$KE090  001  00DE 0227
$KE130  001  01D5 0228
$KYBSY  001  0010 0264
$LDRTN  001  0571 0602
$LEVEL  001  03DF 0472   0474
$LIST   001  0002 0426
$LMRGN  001  03C1 0242   0244
$LNPTR  001  0080 0361
$LOADB  001  054A 0586
$LOADR  001  051A 0579   0582
$LPRIO  001  03EA 0496
$LPROS  001  03E5 0491   0493
$LPRP3  001  03E4 0490   0491
$MOUNT  001  0020 0440
$MPDWN  001  0001 0340
$NEXTB  001  03E6 0493   0494
$NEXTL  001  03E7 0494   0495
$NOENB  001  0008 0432
$NOLST  001  0004 0256
$NUCBS  001  03C0 0239   0240
$NWRKF  001  0080 0445
$NWRKR  001  0040 0442
$PASWD  001  042D 0509   0510
$PAUSD  001  04BA 0563   0565
$PAUSE  001  0002 0333
```

```
                                 CROSS REFERENCE
SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  41
$PGMDT  001  0020 0388
$PGMST  001  0010 0352
$PKERT  001  0419 0507   0509
$PLST1  001  0454 0528   0529
$PLST2  001  045B 0529   0530
$PLST3  001  0462 0530   0531
$PRDEV  001  044B 0525   0527
$PRESN  001  0002 0376
$PROCI  001  0001 0373
$PRPOS  001  03C2 0244   0247
$PSDBR  001  04FA 0568
$PSDXR  001  04F2 0567   0568
$PSTEP  001  0004 0334
$PSTMT  001  0008 0335
$PTCH1  001  03F5 0498   0502
$READY  001  0080 0418
$REORD  001  0040 0476
$RLOAD  001  051E 0582   0584
$RMRGN  001  03C0 0240   0242
$RSTR   001  04D6 0565   0567  0569  0574
$RUNIT  001  0001 0312
$SFAID  001  050D 0570
$SPRNT  001  0465 0537   0539
$SRTRN  001  04FE 0569   0570
$STEPT  001  0002 0313
$SWPCR  001  0511 0575   0577
$TABLN  001  03CB 0284   0287
$TFLOW  001  0008 0319
$TRACE  001  0004 0314
$TRALL  001  0010 0320
$TROVR  001  054E 0589   0592
$TRUNK  001  0080 0272
$TRVAR  001  0020 0321
$UNMSK  001  048D 0550   0553  2053
$USRDR  001  03DC 0461   0462
$VMDEF  001  0080 0325
$VOLF1  001  03FE 0504   0505
$VOLF2  001  040E 0506
$VOLID  001  03F6 0502   0503  0507
$VOLR1  001  03F6 0503   0504
$VOLR2  001  0406 0505   0506
$WAITF  001  057F 0605   0607  2335  2432
$WFDEF  001  0040 0519
$WFLOK  001  0008 0382
$WFNME  001  0443 0518   0523
$WSIND  001  0004 0379
$XIND1  001  03D0 0310   0329
$XIND2  001  03D1 0329   0338
$XIND3  001  03D8 0457   0460
$XPREC  001  0040 0322
$XRSAV  001  03C7 0282   0284  1926
$ZTRAD  001  05A2 0611
$12K    001  0004 0466
$16CKY  001  0008 0468
$16K    001  0002 0465
$22IMP  001  0001 0463
```

```
                                 CROSS REFERENCE
SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  42
#$$#BL  001  0000 1672
#$$#CK  001  0000 1800
#$$#CN  001  0000 1768
#$$#CO  001  0000 1560
#$$#CS  001  0000 1620
#$$#DR  001  0000 1364
#$$#ER  001  0000 1564
#$$#FS  001  0000 1660
#$$#IN  001  0000 1804
#$$#PW  001  0000 1808
#$$#RS  001  0000 1640
#$$#SA  001  0000 1628
#$$#SS  001  0000 1624
#$$#VU  001  0600 1584
#$$#0T  001  0700 1356
#$$#1T  001  0000 1360
#$$BCO  001  0600 1372
#$$BOV  001  0800 1644
#$$DPR  001  0700 1380
#$$DRE  001  0889 1396
#$$DSP  001  2800 1416
#$$ECM  001  0C00 1676
#$$EFK  001  0C00 1696
#$$ERR  001  0C00 1668
#$$EXM  001  0C00 1556
#$$FIL  001  0E00 1636
#$$FIS  001  0E00 1632
#$$FML  001  0200 1764
#$$FMS  001  0200 1604
#$$GRA  001  0889 1528
#$$GUF  001  0C00 1664
#$$INL  001  0600 1744
#$$INS  001  0600 1368
#$$KAL  001  0C00 1532
#$$KCA  001  0C00 1748
#$$KCH  001  0C00 1500
#$$KCN  001  0C00 1616
#$$KCT  001  0C00 1468
#$$KDE  001  0C00 1464
#$$KDI  001  0D00 1544
#$$KDN  001  0C00 1452
#$$KDO  001  0E00 1548
#$$KED  001  0C00 1388
#$$KEN  001  0C00 1392   1917
#$$KEX  001  0C00 1412
#$$KGO  001  0C00 1384
#$$KHE  001  0C00 1568
#$$KKE  001  0C00 1796
#$$KLI  001  0C00 1472
#$$KLL  001  0920 1772
#$$KLO  001  0C00 1476
#$$KME  001  0D00 1456
#$$KMO  001  0C00 1400
#$$KNA  001  0C00 1512
#$$KOV  001  0E00 1432
#$$KPA  001  0C00 1408
```

```
                                        CROSS REFERENCE
SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  43
#$$KPO  001  0C00 1496
#$$KPR  001  0C00 1520
#$$KRE  001  0C00 1440
#$$KRL  001  0700 1536
#$$KRM  001  0C00 1404
#$$KRN  001  0700 1424
#$$KRO  001  0D00 1428
#$$KRS  001  0C00 1752
#$$KRU  001  0C00 1448
#$$KRV  001  0800 1540
#$$KSA  001  0C00 1484
#$$KSE  001  0E00 1524
#$$KSO  001  0C20 1576
#$$KSS  001  0C00 1508
#$$KSV  001  0980 1504
#$$KSY  001  0C00 1516
#$$KWI  001  0C00 1444
#$$KWR  001  0C00 1436
#$$LOA  001  0600 1376
#$$MIP  001  0C00 1572
#$$SDS  001  0C00 1684
#$$SFF  001  0E00 1688
#$$SFL  001  0F00 1680
#$$SFO  001  1500 1652
#$$SFS  001  0C00 1648
#$$SPA  001  0C00 1488
#$$SPO  001  0806 1492
#$$SPS  001  0C00 1480
#$$STR  001  1600 1656
#$$TDC  001  1000 1460
#$$TSY  001  1000 1420
#$$TVK  001  0FC0 1596
#$$UAL  001  0C00 1612
#$$UAT  001  0900 1708
#$$UCD  001  0900 1716
#$$UCN  001  0C00 1700
#$$UCP  001  0700 1704
#$$UDE  001  0C00 1720
#$$UDI  001  0C00 1724
#$$UEX  001  0C00 1608
#$$UIN  001  0C00 1712
#$$UPA  001  0C00 1692
#$$UPO  001  0C00 1760
#$$UPT  001  0C00 1756
#$$VCR  001  2000 1552
#$$VLO  001  0600 1588
#$$VOD  001  0600 1592
#$$VVM  001  0000 1600
#$$VXI  001  0600 1580
#$$ZDU  001  1100 1732
#$$ZLB  001  1100 1776
#$$ZLO  001  1100 1736
#$$ZLV  001  0F00 1792
#$$ZL1  001  0F00 1780
#$$ZL2  001  0F00 1784
#$$ZL3  001  0C00 1788
```

```
#$$ZTR  001  1000 1728
#$$ZUT  001  0C00 1740
#$#BLN  001  18D4 1671
#$#CKT  001  2118 1799
#$#CNF  001  2000 1767
#$#COR  001  0800 1559
#$#CSA  001  1000 1619
#$#DRT  001  0000 1363
#$#ERM  001  0928 1563
#$#FSP  001  1880 1659
#$#INV  001  212C 1803
#$#PWR  001  2300 1807
#$#RSP  001  1780 1639
#$#SAV  001  1180 1627
#$#SSA  001  1128 1623
#$#VUF  001  0B08 1583
#$#0TR  001  0000 1355
#$#1TR  001  0080 1359
#$@#BL  001  0001 1673
#$@#CK  001  0004 1801
#$@#CN  001  0001 1769
#$@#CO  001  003A 1561
#$@#CS  001  003A 1621
#$@#DR  001  0008 1365
#$@#ER  001  0032 1565
#$@#FS  001  0030 1661
#$@#IN  001  003A 1805
#$@#PW  001  00C0 1809
#$@#RS  001  0030 1641
#$@#SA  001  0108 1629
#$@#SS  001  0001 1625
#$@#VU  001  0002 1585
#$@#0T  001  0018 1357
#$@#1T  001  0018 1361
#$@BCO  001  0018 1373
#$@BOV  001  0018 1645
#$@DPR  001  0005 1381
#$@DRE  001  0001 1397
#$@DSP  001  0004 1417
#$@ECM  001  0006 1677
#$@EFK  001  0002 1697
#$@ERR  001  0003 1669
#$@EXM  001  0003 1557
#$@FIL  001  0009 1637
#$@FIS  001  0009 1633
#$@FML  001  0052 1765
#$@FMS  001  0052 1605
#$@GRA  001  0003 1529
#$@GUF  001  0010 1665
#$@INL  001  0010 1745
#$@INS  001  0010 1369
#$@KAL  001  000F 1533
#$@KCA  001  000C 1749
#$@KCH  001  000C 1501
#$@KCN  001  0010 1617
#$@KCT  001  0009 1469
```

```
                                 CROSS REFERENCE
SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  45
#$@KDE  001  0010 1465
#$@KDI  001  0005 1545
#$@KDN  001  0010 1453
#$@KDO  001  000C 1549
#$@KED  001  000E 1389
#$@KEN  001  0006 1393
#$@KEX  001  0003 1413
#$@KGO  001  0002 1385
#$@KHE  001  000C 1569
#$@KKE  001  0006 1797
#$@KLI  001  0011 1473
#$@KLL  001  0001 1773
#$@KLO  001  0008 1477
#$@KME  001  0003 1457
#$@KMO  001  0004 1401
#$@KNA  001  0008 1513
#$@KOV  001  0009 1433
#$@KPA  001  0005 1409
#$@KPO  001  000D 1497
#$@KPR  001  0009 1521
#$@KRE  001  0002 1441
#$@KRL  001  0004 1537
#$@KRM  001  0003 1405
#$@KRN  001  0003 1425
#$@KRO  001  000A 1429
#$@KRS  001  000A 1753
#$@KRU  001  0003 1449
#$@KRV  001  000D 1541
#$@KSA  001  0011 1485
#$@KSE  001  0004 1525
#$@KSO  001  0005 1577
#$@KSS  001  000B 1509
#$@KSV  001  0002 1505
#$@KSY  001  000F 1517
#$@KWI  001  0002 1445
#$@KWR  001  0002 1437
#$@LOA  001  0013 1377
#$@MIP  001  000D 1573
#$@SDS  001  0004 1685
#$@SFF  001  0008 1689
#$@SFL  001  0005 1681
#$@SFO  001  0003 1653
#$@SFS  001  0011 1649
#$@SPA  001  0004 1489
#$@SPO  001  0003 1493
#$@SPS  001  0001 1481
#$@STR  001  0002 1657
#$@TDC  001  0003 1461
#$@TSY  001  0003 1421
#$@TVK  001  0001 1597
#$@UAL  001  0011 1613
#$@UAT  001  000C 1709
#$@UCD  001  000B 1717
#$@UCN  001  0009 1701
#$@UCP  001  000F 1705
#$@UDE  001  000E 1721
```

```
#$@UDI  001  0008 1725
#$@UEX  001  000E 1609
#$@UIN  001  000F 1713
#$@UPA  001  0004 1693
#$@UPO  001  0005 1761
#$@UPT  001  0012 1757
#$@VCR  001  0008 1553
#$@VLO  001  0002 1589
#$@VOD  001  0016 1593
#$@VVM  001  0030 1601
#$@VXI  001  0002 1581
#$@ZDU  001  0008 1733
#$@ZLB  001  0002 1777
#$@ZLO  001  000C 1737
#$@ZLV  001  0006 1793
#$@ZL1  001  0007 1781
#$@ZL2  001  000D 1785
#$@ZL3  001  000A 1789
#$@ZTR  001  0001 1729
#$@ZUT  001  0014 1741
#$BCOM  001  0080 1371
#$BOLV  001  1780 1643
#$DPRI  001  014C 1379
#$DREA  001  0200 1395
#$DSPL  001  0240 1415
#$ECMA  001  1900 1675
#$EFKE  001  1990 1695
#$ERRP  001  18C0 1667
#$EXMS  001  07D4 1555
#$FILN  001  1724 1635
#$FIST  001  1700 1631
#$FMLN  001  1E00 1763
#$FMST  001  0D00 1603
#$GRAP  001  0690 1527
#$GUFU  001  1880 1663
#$INLN  001  1C84 1743
#$INST  001  0020 1367
#$KALL  001  06A4 1531
#$KCAL  001  1CC4 1747
#$KCHA  001  053C 1499
#$KCND  001  0F80 1615
#$KCTL  001  03BC 1467
#$KDEL  001  035C 1463
#$KDIS  001  0744 1543
#$KDNT  001  0300 1451
#$KDOV  001  0780 1547
#$KEDI  001  0188 1387
#$KENA  001  01C4 1391
#$KEXT  001  0234 1411
#$KGOS  001  0180 1383
#$KHEL  001  0A30 1567
#$KKEY  001  2100 1795
#$KLIS  001  0400 1471
#$KLLA  001  2004 1771
#$KLOG  001  0444 1475
#$KMER  001  030C 1455
```

```
                                        CROSS REFERENCE
SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  47
#$KMOU  001  0204 1399
#$KNAM  001  05C0 1511
#$KOVM  001  0290 1431
#$KPAS  001  0220 1407
#$KPOO  001  0508 1495
#$KPRT  001  063C 1519
#$KREA  001  02BC 1439
#$KRLA  001  0700 1535
#$KRMO  001  0214 1403
#$KRNU  001  0280 1423
#$KROV  001  028C 1427
#$KRSU  001  1D24 1751
#$KRUN  001  02CC 1447
#$KRVL  001  0710 1539
#$KSAV  001  0488 1483
#$KSET  001  0680 1523
#$KSOV  001  0AC8 1575
#$KSSP  001  0594 1507
#$KSVL  001  058C 1503
#$KSYM  001  0600 1515
#$KWID  001  02C4 1443
#$KWRI  001  02B4 1435
#$LOAD  001  0100 1375
#$MIPP  001  0A80 1571
#$SDSY  001  192C 1683
#$SFFI  001  193C 1687
#$SFLO  001  1918 1679
#$SFOV  001  1844 1651
#$SFSY  001  1800 1647
#$SPAC  001  04CC 1487
#$SPOV  001  04DC 1491
#$SPSY  001  0484 1479
#$STRO  001  1850 1655
#$TDCK  001  0350 1459
#$TSYK  001  0250 1419
#$TVKB  001  0BAC 1595
#$UALL  001  0F00 1611
#$UATR  001  1A38 1707
#$UCDI  001  1AD8 1715
#$UCNF  001  19B8 1699
#$UCPL  001  19DC 1703
#$UDEL  001  1B24 1719
#$UDIS  001  1B5C 1723
#$UEXL  001  0EA8 1607
#$UINI  001  1A88 1711
#$UPAC  001  1980 1691
#$UPOV  001  1D24 1759
#$UPTF  001  1D5C 1755
#$VCRT  001  07B4 1551
#$VLOA  001  0B80 1587
#$VODK  001  0B88 1591
#$VVMR  001  0C00 1599
#$VXIT  001  0B00 1579
#$ZDUM  001  1BA4 1731
#$ZLBM  001  2008 1775
#$ZLOA  001  1BC4 1735
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#$ZLVR  001  20B0 1791
#$ZL1M  001  2010 1779
#$ZL2M  001  2030 1783
#$ZL3M  001  2088 1787
#$ZTRA  001  1B9C 1727
#$ZUTM  001  1C14 1739
#ENAB   001  0C07 1921
#KENAB  001  0000 0001
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@@E003  001  0001 1261   1263
@@E004  001  0002 1263   1265
@@E005  001  0003 1265   1267
@@E006  001  0004 1267   1269
@@E007  001  0005 1269   1271
@@E008  001  0006 1271   1273
@@E009  001  0007 1273   1275
@@E010  001  0008 1275   1277
@@E011  001  0009 1277   1279
@@E012  001  000A 1279   1281
@@E013  001  000B 1281   1283
@@E014  001  000C 1283   1285
@@E015  001  000D 1285   1287
@@E016  001  000E 1287   1289
@@E017  001  000F 1289   1291
@@E018  001  0010 1291   1293
@@E019  001  0011 1293   1295
@@E020  001  0012 1295   1297
@@E021  001  0013 1297   1299
@@E023  001  0014 1299   1301
@@E024  001  0015 1301   1303
@@E025  001  0016 1303   1305
@@E026  001  0017 1305   1307
@@E027  001  0018 1307   1309
@@E028  001  0019 1309   1311
@@E029  001  001A 1311   1313
@@E030  001  001B 1313   1315
@@E031  001  001C 1315   1317
@@E032  001  001D 1317   1319
@@E035  001  001E 1319   1321
@@E036  001  001F 1321   1323
@@E037  001  0020 1323   1325
@@E038  001  0021 1325   1327
@@E039  001  0022 1327   1329
@@E040  001  0023 1329   1331
@@E041  001  0024 1331   1333
@@E042  001  0025 1333   1335
@@E043  001  0026 1335   1337
@@E044  001  0027 1337   1339
@@E045  001  0028 1339   1341
@@E046  001  0029 1341   1343
@@E060  001  002A 1343   1345
@@E080  001  002B 1345
@@E100  001  0000 0731   0733
@@E101  001  0001 0733   0735
@@E102  001  0002 0735   0737
@@E103  001  0003 0737   0739
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SYMBOL  LEN VALUE DEFN   REFERENCES                          VER 15, MOD 00  31/05/22  PAGE  49
@@E110  001  0004 0739   0741  2939
@@E112  001  0005 0741   0743
@@E113  001  0006 0743   0745
@@E114  001  0007 0745   0747
@@E115  001  0008 0747   0749
@@E116  001  0009 0749   0751
@@E117  001  000A 0751   0753
@@E120  001  000B 0753   0755  2809
@@E122  001  000C 0755   0757  2540
@@E123  001  000D 0757   0759  2770
@@E124  001  000E 0759   0761  2816
@@E129  001  000F 0761   0763
@@E130  001  0010 0763   0765
@@E131  001  0011 0765   0767
@@E133  001  0012 0767   0769
@@E134  001  0013 0769   0771
@@E135  001  0014 0771   0773
@@E136  001  0015 0773   0775
@@E137  001  0016 0775   0777  2063
@@E138  001  0017 0777   0779
@@E139  001  0018 0779   0781  2059
@@E142  001  0019 0781   0783
@@E143  001  001A 0783   0785
@@E150  001  001B 0785   0787
@@E151  001  001C 0787   0789
@@E160  001  001D 0789   0791
@@E162  001  001E 0791   0793
@@E163  001  001F 0793   0795
@@E164  001  0020 0795   0797
@@E200  001  0021 0797   0799
@@E205  001  0022 0799   0801
@@E210  001  0023 0801   0803
@@E211  001  0024 0803   0805
@@E212  001  0025 0805   0807
@@E213  001  0026 0807   0809
@@E215  001  0027 0809   0811
@@E216  001  0028 0811   0813
@@E217  001  0029 0813   0815
@@E220  001  002A 0815   0817
@@E221  001  002B 0817   0819
@@E222  001  002C 0819   0821
@@E223  001  002D 0821   0823
@@E225  001  002E 0823   0825
@@E226  001  002F 0825   0827
@@E227  001  0030 0827   0829
@@E228  001  0031 0829   0831
@@E229  001  0032 0831   0833
@@E230  001  0033 0833   0835
@@E232  001  0034 0835   0837
@@E234  001  0035 0837   0839
@@E237  001  0036 0839   0841
@@E240  001  0037 0841   0843
@@E241  001  0038 0843   0845
@@E242  001  0039 0845   0847
@@E248  001  003A 0847   0849
@@E249  001  003B 0849   0851
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                                 CROSS REFERENCE
SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  50
@@E250  001  003C 0851   0853
@@E251  001  003D 0853   0855
@@E252  001  003E 0855   0857
@@E253  001  003F 0857   0859
@@E254  001  0040 0859   0861
@@E255  001  0041 0861   0863
@@E256  001  0042 0863   0865
@@E300  001  0043 0865   0867
@@E301  001  0044 0867   0869
@@E302  001  0045 0869   0871
@@E303  001  0046 0871   0873
@@E304  001  0047 0873   0875
@@E305  001  0048 0875   0877
@@E308  001  0049 0877   0879
@@E310  001  004A 0879   0881
@@E315  001  004B 0881   0883
@@E316  001  004C 0883   0885
@@E320  001  004D 0885   0887
@@E325  001  004E 0887   0889
@@E330  001  004F 0889   0891
@@E335  001  0050 0891   0893
@@E338  001  0051 0893   0895
@@E340  001  0052 0895   0897
@@E350  001  0053 0897   0899
@@E351  001  0054 0899   0901
@@E352  001  0055 0901   0903
@@E360  001  0056 0903   0905
@@E361  001  0057 0905   0907
@@E362  001  0058 0907   0909
@@E371  001  0059 0909   0911
@@E380  001  005A 0911   0913
@@E390  001  005B 0913   0915
@@E400  001  005C 0915   0917
@@E410  001  005D 0917   0919
@@E415  001  005E 0919   0921
@@E417  001  005F 0921   0923
@@E420  001  0060 0923   0925
@@E430  001  0061 0925   0927
@@E432  001  0062 0927   0929
@@E433  001  0063 0929   0931
@@E450  001  0064 0931   0933
@@E451  001  0065 0933   0935
@@E460  001  0066 0935   0937
@@E461  001  0067 0937   0939
@@E464  001  0068 0939   0941
@@E465  001  0069 0941   0943
@@E466  001  006A 0943   0945
@@E467  001  006B 0945   0947
@@E469  001  006C 0947   0949
@@E470  001  006D 0949   0951
@@E471  001  006E 0951   0953
@@E473  001  006F 0953   0955
@@E474  001  0070 0955   0957
@@E475  001  0071 0957   0959
@@E476  001  0072 0959   0961
@@E477  001  0073 0961   0963
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@@E481  001  0077 0969   0971
@@E482  001  0078 0971   0973
@@E483  001  0079 0973   0975
@@E484  001  007A 0975   0977
@@E485  001  007B 0977   0979
@@E486  001  007C 0979   0981
@@E487  001  007D 0981   0983
@@E488  001  007E 0983   0985
@@E489  001  007F 0985   0987
@@E490  001  0080 0987   0989
@@E491  001  0081 0989   0991
@@E492  001  0082 0991   0993
@@E493  001  0083 0993   0995
@@E494  001  0084 0995   0997
@@E495  001  0085 0997   0999
@@E496  001  0086 0999   1001
@@E497  001  0087 1001   1003
@@E498  001  0088 1003   1005
@@E500  001  0089 1005   1007
@@E501  001  008A 1007   1009
@@E530  001  008B 1009   1011
@@E531  001  008C 1011   1013
@@E535  001  008D 1013   1015
@@E540  001  008E 1015   1017
@@E541  001  008F 1017   1019
@@E542  001  0090 1019   1021
@@E543  001  0091 1021   1023
@@E544  001  0092 1023   1025
@@E545  001  0093 1025   1027
@@E546  001  0094 1027   1029
@@E547  001  0095 1029   1031
@@E548  001  FFFF 1235
@@E549  001  0096 1031   1033
@@E550  001  0097 1033   1035  2336
@@E551  001  0098 1035   1037  2521
@@E552  001  0099 1037   1039
@@E553  001  009A 1039   1041
@@E554  001  009B 1041   1043
@@E555  001  009C 1043   1045
@@E556  001  009D 1045   1047
@@E558  001  009E 1047   1049
@@E570  001  009F 1049   1051
@@E571  001  00A0 1051   1053
@@E572  001  00A1 1053   1055
@@E573  001  00A2 1055   1057
@@E574  001  00A3 1057   1059
@@E575  001  FFFF 1237
@@E578  001  00A4 1059   1061
@@E579  001  FFFF 1239
@@E580  001  FFFF 1241
@@E585  001  00A5 1061   1063
@@E595  001  FFFF 1243
@@E597  001  FFFF 1245
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SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  52
@@E598  001  FFFF 1247
@@E600  001  00A6 1063   1065
@@E601  001  00A7 1065   1067
@@E602  001  00A8 1067   1069
@@E603  001  00A9 1069   1071
@@E604  001  00AA 1071   1073
@@E606  001  00AB 1073   1075
@@E607  001  00AC 1075   1077
@@E608  001  00AD 1077   1079
@@E609  001  00AE 1079   1081
@@E610  001  00AF 1081   1083
@@E611  001  00B0 1083   1085
@@E612  001  00B1 1085   1087
@@E613  001  00B2 1087   1089
@@E614  001  00B3 1089   1091
@@E700  001  00B4 1091   1093
@@E701  001  00B5 1093   1095
@@E710  001  00B6 1095   1097
@@E712  001  00B7 1097   1099
@@E713  001  00B8 1099   1101
@@E714  001  00B9 1101   1103
@@E715  001  00BA 1103   1105
@@E716  001  00BB 1105   1107
@@E717  001  00BC 1107   1109
@@E718  001  00BD 1109   1111
@@E720  001  00BE 1111   1113
@@E721  001  00BF 1113   1115
@@E723  001  00C0 1115   1117
@@E724  001  00C1 1117   1119
@@E725  001  00C2 1119   1121
@@E726  001  00C3 1121   1123
@@E727  001  00C4 1123   1125
@@E728  001  00C5 1125   1127
@@E729  001  00C6 1127   1129
@@E730  001  00C7 1129   1131
@@E732  001  00C8 1131   1133
@@E752  001  00C9 1133   1135
@@E753  001  00CA 1135   1137
@@E754  001  00CB 1137   1139
@@E755  001  00CC 1139   1141
@@E756  001  00CD 1141   1143
@@E757  001  00CE 1143   1145
@@E758  001  00CF 1145   1147
@@E759  001  00D0 1147   1149
@@E760  001  00D1 1149   1151
@@E761  001  00D2 1151   1153
@@E762  001  00D3 1153   1155
@@E763  001  00D4 1155   1157
@@E764  001  00D5 1157   1159
@@E765  001  00D6 1159   1161
@@E766  001  00D7 1161   1163
@@E767  001  00D8 1163   1165
@@E768  001  00D9 1165   1167
@@E769  001  00DA 1167   1169
@@E770  001  00DB 1169   1171
@@E771  001  00DC 1171   1173
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                                 CROSS REFERENCE
SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  53
@@E772  001  00DD 1173   1175
@@E773  001  00DE 1175   1177
@@E774  001  00DF 1177   1179
@@E775  001  00E0 1179   1181
@@E776  001  00E1 1181   1183
@@E777  001  00E2 1183   1185
@@E778  001  00E3 1185   1187
@@E779  001  00E4 1187   1189
@@E780  001  00E5 1189   1191
@@E781  001  00E6 1191   1193
@@E782  001  00E7 1193   1195
@@E783  001  00E8 1195   1197
@@E784  001  00E9 1197   1199
@@E785  001  00EA 1199   1201
@@E786  001  00EB 1201   1203
@@E790  001  00EC 1203   1205
@@E791  001  00ED 1205   1207
@@E792  001  00EE 1207   1209
@@E793  001  00EF 1209   1211
@@E794  001  00F0 1211   1213
@@E795  001  00F1 1213   1215
@@E796  001  00F2 1215   1217
@@E797  001  00F3 1217   1219
@@E798  001  00F4 1219   1221
@@E800  001  FFFF 1249
@@E801  001  FFFF 1251
@@E802  001  FFFF 1253
@@E803  001  FFFF 1255
@@E804  001  FFFF 1257
@@E900  001  00F5 1221   1223
@@E901  001  00F6 1223   1225
@@E902  001  00F7 1225   1227
@@E903  001  00F8 1227   1229
@@E905  001  00F9 1229   1231
@@E906  001  00FA 1231   1233
@@E910  001  00FB 1233
@ARR    001  0008 0016   2013  2198* 2199  2200* 2201  2313  2430  2537  2732  2937  3088
@ASIGN  001  007C 0071
@ASTER  001  005C 0069
@BCRDL  001  0050 0088
@BE     001  0081 0043   2807  3117
@BF     001  0090 0052
@BH     001  0084 0041
@BL     001  0082 0042
@BLANK  001  0040 0065   2573  2942  2948
@BM     001  0082 0054
@BNE    001  0001 0046   2933
@BNH    001  0004 0044
@BNL    001  0002 0045   2046
@BNM    001  0002 0057
@BNOL   001  0020 0050
@BNOZ   001  0008 0049
@BNP    001  0004 0056
@BNZ    001  0001 0058
@BOL    001  00A0 0048
@BOZ    001  0088 0047
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SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  54
@BP     001  0084 0053
@BR     001  0001 0013   1924  1925* 1932  1937  1938  1958  1967  1984  1985  1989  1992  1997
                         2001  2013  2014  2015  2025  2036  2038  2042  2046  2048  2194  2195
                         2197* 2198  2199  2200  2201  2203  2204  2204  2205  2207  2208  2210
                         2212  2212  2213  2213  2214  2216  2218  2219  2219  2220  2222  2224
                         2225  2225  2226  2226  2227  2227  2228  2235* 2255  2255  2257  2257
                         2258  2259  2260  2260  2261  2261  2262  2263  2263  2264  2265  2266
                         2266  2267  2269  2269  2270  2270  2271  2271  2272  2272  2273  2309
                         2311  2312* 2314  2316  2317  2321  2323  2329  2330  2331  2331  2332
                         2333  2333  2336  2337  2337  2340  2341  2342  2342  2349  2351  2352
                         2358* 2362  2364  2367  2368  2369  2377  2383  2386  2387  2388  2389
                         2395  2396  2399  2400  2401  2402  2406  2406  2412  2412  2415  2417
                         2417  2419  2419  2420  2424  2424  2425  2426  2430  2443  2449  2450
                         2450  2451  2452  2455  2456  2457  2457  2460  2532  2534  2535* 2537
                         2539  2541  2541  2551  2551  2556  2556  2557  2557  2558  2558  2559
                         2559  2560  2560  2564  2565  2565  2568  2574  2575  2580  2581  2581
                         2583* 2731  2733* 2742  2746  2746  2750  2750* 2775  2776  2777  2777
                         2783  2783* 2805  2823* 3084  3086  3087* 3088  3098  3100  3108  3109
                         3110  3114  3115  3116  3127  3128  3135  3148  3163*
@BT     001  0010 0051
@BZ     001  0081 0055
@B1     001  0001 0063   2466  2567  2572  3193
@CADDR  001  0002 0142   2204  2337  2377  2406  2412  2417  2419  3148  3150
@CARDL  001  0060 0087   0644
@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   2766  2785  2944
@CPLUS  001  004E 0079
@DADDR  001  0002 0140   2203  2331
@DBFR1  001  0004 0129   2270*
@DBFR2  001  0005 0130   3187  3197
@DCALK  001  0001 0081
@DCBCY  001  0009 0115
@DCBT1  001  0050 0117
@DCNT   001  0003 0128   2252  3110* 3135*
@DCST1  001  0040 0116
@DCTRL  001  0000 0125
@DCYL   001  0001 0126   2240
@DD2    001  0003 0030
@DGET   001  0001 0134   2472  3181  3191
@DOLAR  001  005B 0068
@DOP2   001  0004 0028   2199* 2203* 2204* 2275  2276
@DPLNG  001  0006 0132   2205  2239
@DPOS   001  0000 0133
@DPUT   001  0002 0135   2464
@DSAD   001  0002 0127   2241  3108* 3109* 3127* 3128* 3148
@DSBCY  001  0004 0106
@DSCS1  001  0000 0107
@DSIVF  001  0003 0138
@DSPIN  001  0002 0131
@DTRSZ  001  0018 0085
@DVBCY  001  0007 0108
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                                 CROSS REFERENCE
SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  55
@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   2551
@EOF    001  001C 0077   1963  2380
@EOFTC  001  0075 0162   2505
@EOS    001  001E 0076   1943  2764  2792  2798  2806  2950
@FDDBC  001  0000 0195
@FDE1   001  000C 0200
@FDFNA  001  000B 0198
@FDHLN  001  0002 0208
@FDLNC  001  0002 0193
@FDNSC  001  0003 0210
@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   0672
@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   0646
@MAPEN  001  0005 0089
@MINCR  001  2000 0083
@MINUS  001  0060 0080
@NOP    001  0080 0040   1953  2029  2087  2208  2386  2546  2620  2743  2800
@NUMBR  001  007B 0070
@OPD2   001  0004 0029
@OP1    001  0003 0027   2013* 2014* 2015* 2195* 2201* 2356* 2359  2361  2414  2422  2462  2534*
                         2537* 2731* 2732* 2749* 2758* 2782* 2937* 3086* 3088*
@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
@PRINT  001  0040 0152   0154
@PSR    001  0004 0015   2819*
@PWAIT  001  00FF 0158
@P1IAR  001  0020 0018
@P2IAR  001  0040 0019
@Q      001  0001 0024   1937* 1938* 2207* 2208* 2218* 2224* 2250  2251  2253  2262* 2264  2336*
                         2383* 2386* 2399* 2405  2437  2614  2618  2744* 2748* 2779  2781* 2833
                         2956
@REGL   001  0002 0012   2758
@RETRN  001  0080 0153   0154
@RLDWN  001  004F 0159
@RTRNC  001  0080 0161
@SBLN   001  0005 0170   2502
@SBLNL  001  0002 0184
@SCTSZ  001  0100 0100   1950  1978  1994  2805
@SDFLN  001  0007 0090
@SDF0   001  0000 0166   2506
@SDF1   001  0001 0167   2507
@SDF2   001  0002 0168   2508
@SDF3   001  0003 0169
@SECCY  001  0030 0086
@SIST   001  0001 0181
@SLASH  001  0061 0067
@SLAST  001  0002 0183   2397
@SMIDL  001  0003 0182
@SNULL  001  0080 0173   2354  2363
@SONLY  001  0000 0180   2384
@STEXT  001  0007 0172
@STYPE  001  0006 0171   2503
@TBCNT  001  0000 0160
@TBLEF  001  0010 0155   0157
@TBLIX  001  0011 0157
@UCB    001  0087 0039   1937  1938  2262  2383  2394  2399  2616  2744  2748  2779  2781  2934
                         2945
@UPARW  001  005A 0078
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@VENTA  001  0056 0113
@VMDDV  001  00FE 0114
@VMFD1  001  0000 0109
@VMFD2  001  0001 0110
@VMRS3  001  0002 0112
@VMTRL  001  0001 0111
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@VQ     001  0001 0025
@WSFIT  001  0500 0101   3182  3192
@WSTBL  001  0503 0102   2468
@XR     001  0002 0014   1926* 1932* 1934  1939  1939* 1943  1961  1963  1972* 1974  1974* 1975
                         1978  1981  1990  1990* 1994  2014  2015  2018  2031  2034  2045  2052*
                         2320* 2329* 2330  2338  2341  2347  2349  2350  2350* 2354  2356  2357
                         2357* 2363  2365  2375  2376  2378  2384  2387  2388  2389  2390  2390*
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                         2423  2423* 2449* 2451  2452* 2453  2456  2539  2548  2564  2567  2567*
                         2572  2572* 2573  2580  2752  2757  2757* 2764  2766  2769* 2785  2790
                         2790* 2792  2798  2806  2815* 2818* 2938  2941  2941* 2942  2944  2947
                         2947* 2948  2950  2952  3094* 3096  3096* 3098  3109  3114  3115  3128
@ZERO   001  0000 0062   2104  2105  2106  2107  2207  2351  2395  2404* 2413  2796  3109  3115
                         3149
C4BCHC  001  0004 2608
C4BCHR  001  0FF2 2596   2564* 2565
C4BINI  001  0FF1 2594   2541
C4BIN2  001  0F86 2531   2532  2535  2735  2760
C4BLEN  002  0FEE 2606   2580* 2581*
C4BLNK  003  0FA1 2614
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                                 CROSS REFERENCE
SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  57
C4BLOW  001  00F0 2610   2548
C4BLVL  002  0002 2612   2541  2556  2557  2558  2559  2560  2565
C4BNMC  004  0F9D 2618
C4BNOP  001  0080 2620
C4BSAV  002  0FF4 2600   2539* 2581  2749  2758  2782  2818
C4BSPC  001  0087 2616
C4BVAL  002  0FF0 2592   2541* 2556  2556* 2557  2558  2558* 2559  2559* 2560* 2565* 2612  2742
                         2776
C4BWRK  002  0FEE 2589   2557* 2560  2606  2612
C4BYT1  001  0FEF 2591
C4B100  004  0F9C 2542   2618
C4B200  003  0FA0 2546   2568  2614
C4B300  003  0FA3 2548   2574
C4B590  003  0FD2 2572   2551  2575
C4B600  003  0FD5 2573   2546
C4B700  003  0FDE 2580   2549
C4B800  004  0FE5 2583   2534* 2552
C4B850  004  0FE9 2585   2537*
C4B900  001  0FF5 2602   2542* 2551*
C4END   001  0FF6 2621
DL2ICS  001  0000 2107
DL4CYL  001  0D8C 2240   2212*
DL4C01  002  0D92 2248   2198  2200  2212
DL4C05  002  0D94 2249   2204
DL4C24  003  0D63 2251   2225
DL4C48  003  0D50 2253   2219  2260  2266
DL4C96  003  0D3F 2250   2213
DL4DPL  006  0D90 2239   2205*
DL4EFD  001  0001 2246   2218  2264
DL4END  001  0DD2 2277
DL4ETB  001  0080 2247   2224
DL4E01  001  0001 2245   2220
DL4E24  001  0018 2244   2222
DL4E48  001  0030 2243   2216  2258
DL4E96  001  0060 2242   2210
DL4ICS  001  0D16 2193   2441  2458  3131  3138
DL4LST  001  0D8B 2238   2231  2240  2241  2252  2270*
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                         2263  2269* 2271*
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DL4SPT  004  0D95 2256   2221
DL4WRK  005  0D2E 2275   2255* 2257* 2258  2260* 2261  2272
DL4010  001  0D1A 2196   2194  2197
DL4020  005  0D2A 2203   2199* 2275  2276
DL4030  005  0D33 2205   2203* 2204*
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DL4040  003  0D3E 2210   2214  2250
DL4050  003  0D4F 2216   2211  2253
DL4060  003  0D5C 2220   2217
DL4070  003  0D62 2222   2251  2259  2265  2267
DL4080  004  0D6F 2226   2223
DL4100  003  0D77 2228   2207* 2218* 2224* 2264
DL4200  003  0D80 2233   2208* 2262*
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DL4600  004  0DBF 2269   2233
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GFIBR1  001  1194 3187   3150
GFIBR2  001  119A 3197
GFIBSE  001  1131 3093   3084  3087
GFICT1  001  0001 3053   3116  3135  3154
GFICT2  001  0002 3054   3110
GFIDS0  001  0000 3056
GFIDS1  001  0001 3057
GFIDS2  001  0002 3058   3098
GFIDS3  001  0003 3059
GFIDS4  001  0004 3060   3096  3114  3128
GFIDS5  001  0005 3061
GFIDS8  001  0008 3062   3071
GFIDTA  001  0003 3073   3108  3127
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GFIRAD  001  1195 3190   3127* 3128* 3132  3197
GFIRED  001  118F 3180   3108* 3109* 3110* 3135* 3139  3148  3187
GFITAD  001  1D00 3069   3071
GFIWRK  001  118E 3175   3114* 3115* 3116
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GFI150  004  1138 3098
GFI200  003  1154 3117
GFI500  004  1167 3138   3117
GRABIT  001  0DD2 2310   1966  2006  2024  2051  3152
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GRACSC  001  0F64 2469   2333*
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GRAEFS  001  0002 2495   1960  2323
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GRASBR  004  0E55 2359   2311*
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GRA220  003  0E3C 2351   2392  2394
GRA230  004  0E4B 2356   2348  2366  2370  2381
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GRA245  004  0E56 2360   2361
GRA250  003  0E5A 2362   2353  2355
GRA260  003  0E5D 2363   2343
GRA300  005  0E7B 2375   2322
GRA303  003  0E98 2383   2379
GRA305  004  0EA4 2387   2385
GRA310  004  0EB6 2392   2383* 2386* 2393  2399* 2425  2515
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GRA520  004  0F29 2441   2317
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KENIRM  001  0080 2098   2016
KENMIN  002  0D13 2078   1932
KENMSK  001  0080 2097   1961  2031  2034
KENOFF  001  0000 2096   2048
KENPLS  001  0005 2092   1939
KENRNG  001  0D0F 2070   1989* 2036  2042  2048*
KENSON  001  0001 2095   1989  2036  2042
KENTYP  001  0001 2101   1961* 2031* 2034*
KENWRK  002  0D11 2074
KENZER  002  0D15 2079   1958
KEN000  001  0000 2084   1975
KEN001  001  0001 2085   1978  1981  1994
KEN002  001  0002 2086   1958  1963  1974  1975  2018  2045
KEN003  001  0080 2087   1928
KEN004  001  0002 2088   2022
KEN005  001  0000 2089   1943  2018  2045
KEN006  001  0002 2090
KEN007  001  0003 2091   1990
KEN100  003  0C22 1939   1935
KEN110  004  0C32 1946   1941
KEN115  003  0C40 1953   1924  1925  1937*
KEN120  005  0C43 1958
KEN125  003  0C50 1961   1967
KEN130  004  0C60 1972   1951
KEN135  003  0C64 1974   1985  1997
KEN140  003  0C7E 1989   1982
KEN150  003  0C90 2001   1979
KEN155  004  0C93 2005   1964  1995
KEN170  003  0C9F 2013   1984  1992  2001
KEN180  005  0CB0 2018   2025
KEN182  004  0CBB 2022   2038
KEN185  003  0CC6 2029   1938* 2019  2046
KEN190  003  0CCF 2034   2029
KEN195  003  0CD2 2036   2032
KEN210  003  0CDB 2042   2020
KEN220  005  0CE1 2045   2015*
KEN250  003  0CE9 2048
KEN255  004  0CEC 2050   2037  2043
KEN257  004  0CF4 2052   2014*
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SYMBOL  LEN VALUE DEFN   REFERENCES                           VER 15, MOD 00  31/05/22  PAGE  61

KEN260  004  0CFC 2054   2013*
KEN600  004  0D00 2059   1944
KEN610  004  0D07 2063   1953
KEN611  004  0D0B 2065   1948  2061
KEN700  001  0D0F 2069   2071
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SCACOF  001  0087 2934
SCACOM  001  0001 2933
SCAINC  001  0001 2932   2941  2947
SCAMMA  003  1102 2956
SCANIT  001  10E5 2936   1940  2751  2759  2784  2791
SCASVE  002  1123 2961   2938* 2953
SCASV1  001  1122 2960
SCA100  003  10F4 2941   2943
SCA200  003  10F7 2942   2940
SCA250  003  1101 2945   2956
SCA300  003  1104 2947   2949
SCA400  004  1114 2952   2945
SCA500  004  111E 2955   2937* 2951
SLLBLW  002  10E4 2838   2819
SLLDSH  001  0060 2831   2752  2775
SLLIND  003  10BF 2833
SLLINE  001  1400 2112   1950  1972  2733
SLLIST  001  0FF6 2729   1946
SLLLN2  001  0002 2830   2733  2742  2746  2749  2776  2777  2782
SLLRET  001  0087 2834
SLL000  001  0000 2826   2806
SLL001  001  0001 2827   2746  2777
SLL002  001  0002 2828   2750  2775* 2805*
SLL003  001  0003 2829   2742* 2746  2776* 2777  2783
SLL100  004  1002 2735   2801
SLL110  003  1011 2743   2744*
SLL115  004  101B 2746   2743
SLL120  003  102C 2750   2745  2747
SLL125  004  105C 2769   2758* 2765
SLL130  003  1067 2775   2762
SLL140  003  1087 2783   2778  2780
SLL150  003  108E 2785   2753
SLL160  004  10A4 2796   2786
SLL165  003  10B1 2800   2748* 2779  2781* 2794  2797
SLL180  003  10B8 2805   2738
SLL190  003  10BE 2807   2833
SLL195  004  10C1 2809   2767  2799
SLL200  004  10C8 2815   2749* 2782* 2800
SLL210  004  10D3 2818   2736  2761  2811
SLL215  004  10D7 2819   2771  2793  2817
SLL220  004  10DB 2823   2731* 2807
SLL230  004  10DF 2824   2732*

TOTAL STATEMENTS IN ERROR IN THIS ASSEMBLY =     0

OL105 I  THE CODE LENGTH OF #KENAB IS  4608 DECIMAL.
OL103 I  TOTAL NUMBER OF LIBRARY SECTORS REQUIRED IS   10
         NAME-#KENAB,PACK-R1R1R1,UNIT-R1,RETAIN-P,LIBRARY-R,CATEGORY-000
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        OVERLAY LINKAGE EDITOR CORE USAGE MAP    31/05/22


 START    CATEGORY  NAME AND       CODE LENGTH
ADDRESS               ENTRY    HEXADECIMAL DECIMAL

 0C00         0     #KENAB          1200    4608


OL100 I  THE TOTAL CORE USED BY #KENAB IS  4608 DECIMAL.
OL101 I  THE START CONTROL ADDRESS OF THIS MODULE IS 0C00.
OL104 I  TOTAL NUMBER OF LIBRARY SECTORS REQUIRED IS   19
         NAME-#KENAB,PACK-R1R1R1,UNIT-R1,RETAIN-P,LIBRARY-O
7
SLL150  003  10B0 2792   2760
SLL160  004  10C6 2803   2793
SLL165  003  10D3 2807   2755* 2786  2788* 2801  2804
SLL180  003  10DA 2812   2745
SLL190  003  10E0 2814   2840
SLL195  004  10E3 2816   2774  2806
SLL200  004  10EA 2822   2756* 2789* 2807
SLL210  004  10F5 2825   2743  2768  2818
SLL215  004  10F9 2826   2778  2800  2824
SLL220  004  10FD 2830   2738* 2814
SLL230  004  1101 2831   2739*
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TOTAL STATEMENTS IN ERROR IN THIS ASSEMBLY =     1
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