

DR. JOHN MANIOTES
COMPUTER TECHNOLOGY DEPT.
PURDUE UNIVERSITY
CALLUMET CAMPUS
HAMMOND, IN 46323

COMPUTER
TECHNOLOGY

DR. JOHN MANNING
COMPUTER TECHNOLOGY DEPT.
PURDUE UNIVERSITY
CALUMET CAMPUS
HAMMOND, IN 46323

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1620 USERS GROUP PROGRAM REVIEW AND EVALUATION

(fill out in typewriter or pencil, do not use ink)

Program No. _____

Date _____

Program Name: _____

1. Does the abstract adequately describe what the program is and what it does? Yes ___ No ___
Comment _____
2. Does the program do what the abstract says? Yes ___ No ___
Comment _____
3. Is the Description clear, understandable, and adequate? Yes ___ No ___
Comment _____
4. Are the Operating Instructions understandable and in sufficient detail? Yes ___ No ___
Comment _____
Are the Sense Switch options adequately described (if applicable)? Yes ___ No ___
Are the mnemonic labels identified or sufficiently understandable? Yes ___ No ___
Comment _____
5. Does the source program compile satisfactorily (if applicable)? Yes ___ No ___
Comment _____
6. Does the object program run satisfactorily? Yes ___ No ___
Comment _____
7. Number of test cases run _____. Are any restrictions as to data, size, range, etc. covered adequately in description? Yes ___ No ___
Comment _____
8. Does the Program Meet the minimal standards of the 1620 Users Group? Yes ___ No ___
Comment _____
9. Were all necessary parts of the program received? Yes ___ No ___
Comment _____
10. Please list on the back any suggestions to improve the usefulness of the program. These will be passed onto the author for his consideration.

Please return to:

Mr. Richard L. Pratt
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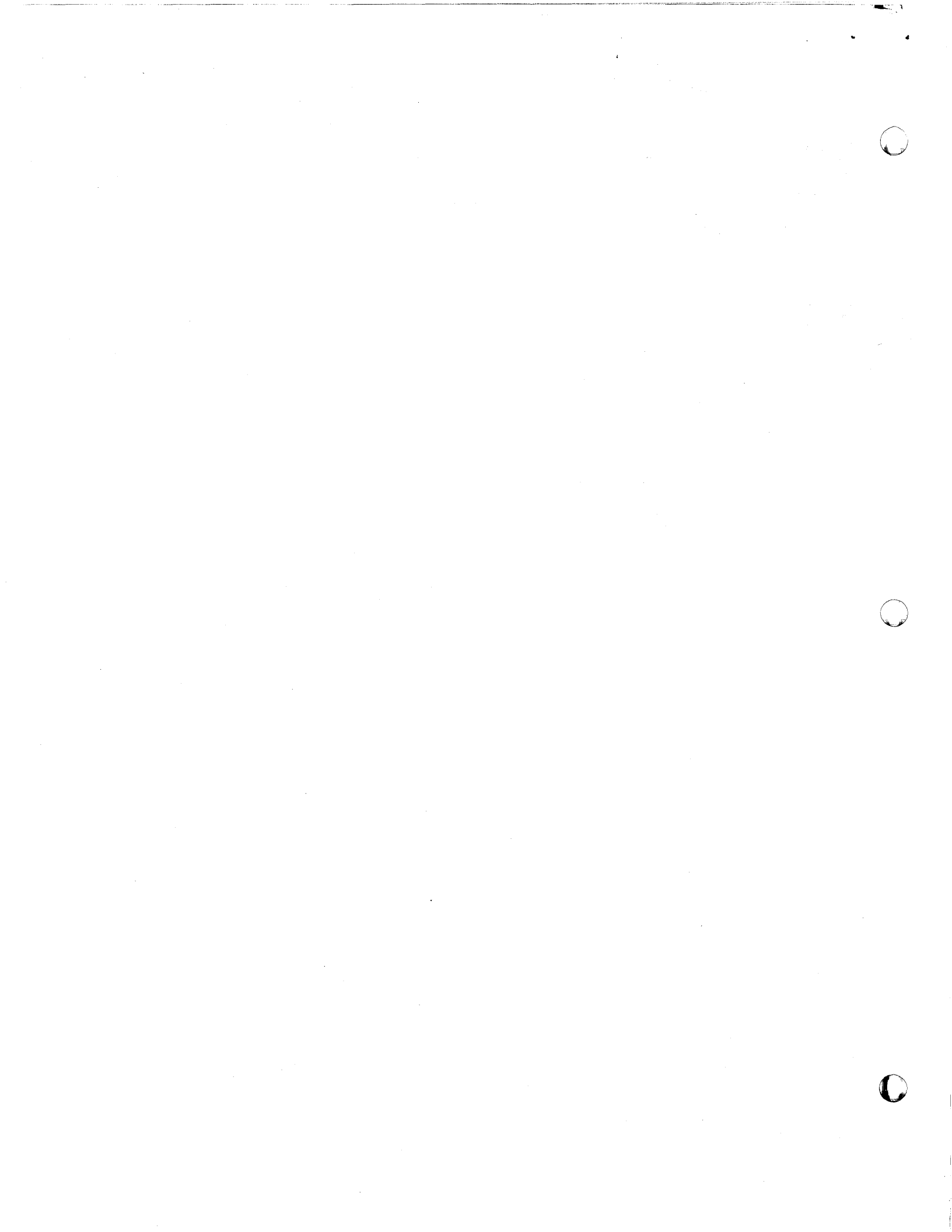
Company _____

Address _____

User Group Code _____

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11/09/64



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PROGRAM ABSTRACT

1. TITLE (If subroutine, state in Title): Gregorian Calendar-1585 to 2599 A. D. /CARD/
Subject Classification: 11.0-Type IV
2. Author; Organization: Roger K. Simpson, Electrical Engineering Department, California State College-Long Beach, 6101 E. 7th Street, Long Beach, California
Date: December 9, 1964 Users Group Membership Code: 5198
3. Direct Inquiries to Name: Roger Simpson, 13134 Deming Avenue, Downey, Calif. 90242
Phone: 213-633-3454
4. Description/Purpose: (5. Method; 6. Restriction/Range; When Applicable) This program types the day of the week corresponding to any date in the Gregorian Calendar. Illegal dates and dates before 1585 AD are excluded. Console switch determines card or typewriter input. Input data is re-typed with output. Sums number of days using Jan. 1, 1583 as first day. The program makes special corrections for quadrennial and centesimal leap years. Converts sum of days to day of week by repeated subtraction of seven. Optimized program gives result in from two to seven seconds. For use with any 1620 with card I/O. Written in UTO Fortran (1620-U2,U,U24)
7. Specifications (Check or fill in appropriate spaces):
- a. Storage used by program: usable with 20K storage capacity machine
- b. Equipment required by program:
Card System X ; Magnetic Tape System ; No. of Tapes ;
Paper Tape System ; Disk File System ; No. of Packs ;
TNS, TNF, MF ; Auto divide ; Indirect addressing ; Floating point hardware ;
Other (specify) none-basic 1620
- Can program be used on lesser Machine? . Specify which requirements can be easily removed
- c. Programming type (Check appropriate spaces):
Fortran without Format ; Fortran with Format X ; (UTO FORTRAN)
Fortran II ; Mainline, Complete ; Subroutine or function subprogram(S or F) ;
Is the program a library (ie, SPS) function to the Fortran system checked? no ;
SPS ; SPS - 1620/1710 ;
Mainline, Complete ; Macro ; Subroutine ;
Other programming language: ; Give details
- d. Language used in the writeup: English
8. Additional Remarks:
Input dates of calendar limited to 1585 AD to 2599 AD. Dates earlier than 1585 AD are not meaningful since the Gregorian Calendar was invented by Pope Gregory XIII in 1582 and did not come into general use until somewhat later. The Julian Calendar was used prior to this time, but there were so many local options regulating its use that a general program for it is not suggested.

GREGORIAN CALENDAR-1585 A.D. TO 2599 A.D. /CARD/

December 9, 1964

Author:

Roger K. Simpson
Electrical Engineering Student
California State College-Long Beach
6101 East 7th Street
Long Beach 4, California
Telephone 213-433-0951

User Group Code: 5198

Direct Inquiries to:

Roger K. Simpson
13134 Deming Avenue
Downey, California 90242
Telephone 213-633-3454

Modifications or revisions to this program, as they occur, will be announced in the appropriate Catalog of Programs for IBM Data Processing Systems. When such an announcement occurs, users should order a complete new program from the Program Information Department.

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LABELING OF CARD DECKS USED

Deck 1

Source Deck written for use with UTO Fortran (1620 User Group Library #1620-2-0-024). This deck is numbered sequentially in columns 73-80. The total number of cards in this deck is 212.
Labeled CAL 0001-CAL 0212

Deck 2

Object Deck including subroutines plus a zero core loading routine. This deck was made by compiling deck #1 using UTC Fortran Compiler and Subroutines. An additional four cards were placed in front of the deck. The four header cards are core zeroing instructions. This deck is not numbered sequentially. The total number of cards in this deck is 284.

Deck 3

This deck is a deck of Sample Data Cards. These 20 cards are numbered sequentially in columns 73-80.
Labeled DAT 0001-DAT 0020

GREGORIAN CALENDAR-1585 AD TO 2599 AD-/CARD/

- I. Author-Roger K. Simpson, Electrical Engineering Student, California State College-Long Beach
- II. User Group Code Number-5198
- III. Description-The purpose of this program is to give the operator the day of the week which corresponds to any date in the Gregorian Calendar. The Gregorian Calendar was devised by Pope Gregory XIII in 1682 to correct certain errors which had appeared under the Julian Calendar invented in 46 BC by Julius Caesar. The Gregorian Calendar was not universally accepted at its inception. It came into use as follows:

<u>country/area</u>	<u>date of adoption</u>
United States	1752
England	1752
Poland	1586
Western Europe	1585
Sweden	1753
Japan	1873
China	1912
Turkey	1917
U.S.S.R.	1918
Greece	1923

Virtually all countries use the Gregorian Calendar today. A universal calendar program is difficult to write because of the large number of divergent calendar systems used by different civilizations. The Julian Calendar was used prior to the Gregorian Era, but local options regulated its use. Therefore it was thought best to concentrate programming efforts on the Gregorian Calendar.

In the Gregorian Calendar leap years are all years that are exactly divisible by four except centesimal years (years ending in 00), which are common unless divisible by 400.

- IV. Operating Procedures
- Place deck #2 into the 1622 card reader.
 - Press the RESET key on the 1620 console and the LOAD key on the 1622 card reader.
 - Press the READER START key on the card reader when the card reading operation comes to a halt. This allows the last several cards to be read.
 - The typewriter will type a message and then the processor will reach PAUSE 0001.
 - At this time PROGRAM SWITCH 1 on the console is set as directed by the typewriter message. (Switch 1 up for card input; off for typewriter input).
 - Enter data as follows:
 - Cards-The data is entered in three 6 digit columns. The data should be right justified in the columns to

avoid possible misinterpretation by the processor. The first column contains the fixed point numbers 1-12 and corresponds to the month; the second column contains a fixed point number corresponding to the number of the day of the month; the third column contains a four digit fixed point number between 1585 and 2599 corresponding to the year AD. Only one date may be punched on a card.

- Typewriter-For typewriter input the column arrangement used for card input also applies. After inserting the number of the year type in several spaces and then type the R-E character or press the RELEASE key and the START key.
 - General notes-Data input format used is: I6,I6,I6. Decimal points should not be included in the input.
 - Upon completion of one calculation the processor branches to the input statements to await more input data.
 - This program is written in UTO Fortran. General information regarding the operation of UTO Fortran is not assumed, but may be useful. See documentation for UTO Fortran, 1620 Users Group Library #1620-2-0-024.
- V. Performance
- Data Checks-The processor checks for dates which are not found in the Gregorian Calendar. Numbers of months other than those from 1-12 are detected and excluded. Only valid dates for any given month are allowed. Thus April 30, 1964; February 29, 1964; and February 29, 2000 are legal while April 31, 1964; February 29, 1965; and February 29, 1900 are illegal. Input data which is zero or negative is excluded. For any illegal input the message: "THIS DATE IS NOT ALLOWED" is typed. The processor also excludes dates outside the range of 1585 to 2599 AD. When this condition exists the following message is typed: "DATA NOT IN LIMITS OF 1585 AD TO 2599 AD."
 - Accuracy and Speed-There are no known errors in the calendar calculations. The speed of calculation, exclusive of printout time, is between 2 and 6 seconds for the 1620 Model 1. Times should be faster for the 1620 Model 2.
- VI. Equipment Required-The program was compiled and executed on a 1620 Model 1 with 20K storage capacity. No special features were used. A 1622 card reader-punch unit is necessary. The program should be compatible with any 1620 which is equipped with the 1622 card I/O.

Listing 1

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```

C GREGORIAN CALENDAR PROGRAM-1585 AD TO 2599 AD-/CARD/
  PRINT 80
  PRINT 113
  PRINT 114
  PAUSE 1
C SENSE SWITCH 1 DETERMINES INPUT MODE
  16 IF (SENSE SWITCH 1) 116.115
  115 ACCEPT 82.M.JD.JY
  GO TO 503
  116 READ 82.M.JD.JY
C IF STATEMENTS REJECT NOT ALLOWED MONTHS
  503 IF (M-12) 509.509.500
  509 IF (M) 500.500.117
C GO TO TRANSFERS TO PROPER MONTH NAME FOR INPUT
C DATA PRINTOUT AND TALLYS PROPER NUMBER OF DAYS DUE TO MONTH
  117 GO TO (63.64.65.66.67.68.69.70.71.72.73.74).M
  63 PRINT 83.JD.JY
  JDM=0
  IF (JD-31) 8.8.500
  64 PRINT 84.JD.JY
  JDM=31
  EXECUTE PROCEDURE 703
  IF (LEAP) 500.602.603
  602 IF (JD-28) 8.8.500
  603 IF (JD-29) 8.8.500
  65 PRINT 85.JD.JY
  JDM=59
  IF (JD-31) 8.8.500
  66 PRINT 86.JD.JY
  JDM=90
  IF (JD-30) 8.8.500
  67 PRINT 87.JD.JY
  JDM=120
  IF (JD-31) 8.8.500
  68 PRINT 88.JD.JY
  JDM=151
  IF (JD-30) 8.8.500
  69 PRINT 89.JD.JY
  JDM=181
  IF (JD-31) 8.8.500
  70 PRINT 90.JD.JY
  JDM=212
  IF (JD-31) 8.8.500
  71 PRINT 91.JD.JY
  JDM=243
  IF (JD-30) 8.8.500
  72 PRINT 92.JD.JY
  JDM=273
  IF (JD-31) 8.8.500
  73 PRINT 93.JD.JY
  JDM=304
  IF (JD-30) 8.8.500
  74 PRINT 94.JD.JY
  JDM=334
  IF (JD-31) 8.8.500
  500 PRINT 501
  GO TO 16
C IF STATEMENT REJECTS NOT ALLOWED DAYS
  8 IF (JD) 500.500.81
  81 JYD=JY
  DD=JD
  
```

```

CAL 0001
CAL 0002
CAL 0003
CAL 0004
CAL 0005
CAL 0006
CAL 0007
CAL 0008
CAL 0009
CAL 0010
CAL 0011
CAL 0012
CAL 0013
CAL 0014
CAL 0015
CAL 0016
CAL 0017
CAL 0018
CAL 0019
CAL 0020
CAL 0021
CAL 0022
CAL 0023
CAL 0024
CAL 0025
CAL 0026
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CAL 0028
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CAL 0040
CAL 0041
CAL 0042
CAL 0043
CAL 0044
CAL 0045
CAL 0046
CAL 0047
CAL 0048
CAL 0049
CAL 0050
CAL 0051
CAL 0052
CAL 0053
CAL 0054
CAL 0055
CAL 0056
CAL 0057
CAL 0058
CAL 0059
CAL 0060
CAL 0061
C IF STATEMENTS REJECT YEARS OUTSIDE 1585 TO 2599 LIMIT
  10 IF (JYD-1585) 15.10.10
  15 PRINT 19
  GO TO 16
C FROM HERE TO STATEMENT 110-CENTESIMAL LEAP YEAR CORRECTION
C TALLYING 1 DAY FOR EVERY NON QUADRICENTENNIAL CENTESIMAL YEAR
  SINCE 1582
  96 IF (JYD-2500) 98.98.97
  97 DYC=7.
  GO TO 17
  98 IF (JYD-2300) 100.100.99
  99 DYC=6.
  GO TO 17
  100 IF (JYD-2200) 102.102.101
  101 DYC=5.
  GO TO 17
  102 IF (JYD-2100) 104.104.103
  103 DYC=4.
  GO TO 17
  104 IF (JYD-1900) 106.106.105
  105 DYC=3.
  GO TO 17
  106 IF (JYD-1800) 108.108.107
  107 DYC=2.
  GO TO 17
  108 IF (JYD-1700) 110.110.109
  109 DYC=1.
  GO TO 17
  110 DYC=0.
C FROM HERE TO STATEMENT 112-ADDING DAYS IN 4, 40, 400 YEAR
  BLOCKS INCLUDING QUADRENNIAL LEAP YEARS
  17 DY=0.
  3 JYD=JYD-400
  DY=DY+146100.
  IF (JYD-1584) 4.4.3
  4 JYD=JYD+400
  DY=DY-146100.
  5 JYD=JYD-40
  DY=DY+14610.
  IF (JYD-1584) 9.9.5
  9 JYD=JYD+40
  DY=DY-14610.
  7 JYD=JYD-4
  DY=DY+1461.
  IF (JYD-1584) 26.12.7
  26 JYD=JYD+4
  DY=DY-1461.
  122 JYD=JYD-1
  DY=DY+365.
  IF (JYD-1584) 26.112.122
  112 DY=DY+1.
C FROM HERE TO STATEMENT 28-USED TO TALLY DAY FOR FEB 29 IF LEAP
  YEAR EXISTS
  12 EXECUTE PROCEDURE 703
  IF (LEAP) 21.21.20
C STATEMENT 20 CHECKS TO SEE IF MONTH IS MARCH OR GREATER.
  20 IF (M-2) 21.21.28
C STATEMENT 28 ADDS DAY FOR FEB 29 IF MONTH IS GREATER THAN FEB
  AND YEAR IS A LEAP YEAR
  28 JDM=JDM+1
  
```

5

```

CAL 0062
CAL 0063
CAL 0064
CAL 0065
CAL 0066
CAL 0067
CAL 0068
CAL 0069
CAL 0070
CAL 0071
CAL 0072
CAL 0073
CAL 0074
CAL 0075
CAL 0076
CAL 0077
CAL 0078
CAL 0079
CAL 0080
CAL 0081
CAL 0082
CAL 0083
CAL 0084
CAL 0085
CAL 0086
CAL 0087
CAL 0088
CAL 0089
CAL 0090
CAL 0091
CAL 0092
CAL 0093
CAL 0094
CAL 0095
CAL 0096
CAL 0097
CAL 0098
CAL 0099
CAL 0100
CAL 0101
CAL 0102
CAL 0103
CAL 0104
CAL 0105
CAL 0106
CAL 0107
CAL 0108
CAL 0109
CAL 0110
CAL 0111
CAL 0112
CAL 0113
CAL 0114
CAL 0115
CAL 0116
CAL 0117
CAL 0118
CAL 0119
CAL 0120
CAL 0121
CAL 0122
  
```



```

21 DM=JDM
C THIS STATEMENT TALLYS TOTAL DAYS COUNTING JAN 31, 1583 AS FIRST
C DAY (DT=TOTAL DAYS, DY=DAYS FROM YEAR, DM=DAYS FROM MONTH,
C DD=DAYS FROM DAYS, DYC=DAYS FROM NON QUADRACENTENNIAL CENTESIMAL
C LEAP YEARS, .05 KEEPS VALUE OF DT HIGH FOR LATER FIXED POINT
C CONVERSION)
DT=DY+DM+DD-DYC+.05
C FROM HERE TO STATEMENT 77-SUBTRACT DAYS IN 70000, 7000, 700,
C 70, 7 DAY BLOCKS GIVING NUMBER OF DAY IN WEEK (1-7)
1 DT=DT-70000.
IF (DT-7.) 2,2,1
2 DT=DT+70000.
40 DT=DT-7000.
IF (DT-7.) 39,39,40
39 DT=DT+7000.
48 DT=DT-700.
IF (DT-7.) 62,62,48
62 DT=DT+700.
75 DT=DT-70.
IF (DT-7.) 76,76,75
76 DT=DT+70.
385 IF (DT-7.8) 6,6,77
77 DT=DT-7.
GO TO 385
6 JDT=DT
C GO TO TRANSFERS TO PROPER DAY OF WEEK FOR PRINTOUT
C GO TO (31,32,33,34,35,36,37),JDT
31 PRINT 41
GO TO 16
32 PRINT 42
GO TO 16
33 PRINT 43
GO TO 16
34 PRINT 44
GO TO 16
35 PRINT 45
GO TO 16
36 PRINT 46
GO TO 16
37 PRINT 47
GO TO 16
C PROCEDURE 703 TESTS FOR BOTH TYPES OF LEAP YEARS (LEAP=1 FOR
C LEAP YEAR, LEAP=0 FOR NON-LEAP YEAR)
BEGIN PROCEDURE 703
JYL=JY
IF (JYL-1700) 18,200,18
18 IF (JYL-1800) 22,200,22
22 IF (JYL-1900) 23,200,23
23 IF (JYL-2100) 25,200,25
25 IF (JYL-2200) 27,200,27
27 IF (JYL-2300) 29,200,29
29 IF (JYL-2500) 907,200,907
907 JYL=JYL-400
IF (JYL-4) 13,13,907
13 JYL=JYL+400
95 JYL=JYL-40
IF (JYL-4) 30,30,95
30 JYL=JYL+40
38 JYL=JYL-4
IF (JYL-4) 200,201,38
200 LEAP=0

```

```

GO TO 300
201 LEAP=1
300 END PROCEDURE 703
80 FORMAT (//38H GREGORIAN CALENDAR-1585 AD TO 2599 AD//)
113 FORMAT (39H SENSE SWITCH NUMBER 1 ON FOR CARD DATA)
114 FORMAT (32H INPUT, OFF FOR TYPEWRITER INPUT//)
82 FORMAT (16,16,16)
83 FORMAT (8H JANUARY,15,2H ..15)
84 FORMAT (9H FEBRUARY,15,2H ..15)
85 FORMAT (6H MARCH,15,2H ..15)
86 FORMAT (6H APRIL,15,2H ..15)
87 FORMAT (4H MAY,15,2H ..15)
88 FORMAT (5H JUNE,15,2H ..15)
89 FORMAT (5H JULY,15,2H ..15)
90 FORMAT (7H AUGUST,15,2H ..15)
91 FORMAT (10H SEPTEMBER,15,2H ..15)
92 FORMAT (8H OCTOBER,15,2H ..15)
93 FORMAT (9H NOVEMBER,15,2H ..15)
94 FORMAT (9H DECEMBER,15,2H ..15)
501 FORMAT (25H THIS DATE IS NOT ALLOWED/)
19 FORMAT (41H DATA NOT IN LIMITS OF 1585 AD TO 2599 AD/)
41 FORMAT (12H IS A SUNDAY/)
42 FORMAT (12H IS A MONDAY/)
43 FORMAT (13H IS A TUESDAY/)
44 FORMAT (15H IS A WEDNESDAY/)
45 FORMAT (14H IS A THURSDAY/)
46 FORMAT (12H IS A FRIDAY/)
47 FORMAT (14H IS A SATURDAY/)
END

```

```

CAL 0184
CAL 0185
CAL 0186
CAL 0187
CAL 0188
CAL 0189
CAL 0190
CAL 0191
CAL 0192
CAL 0193
CAL 0194
CAL 0195
CAL 0196
CAL 0197
CAL 0198
CAL 0199
CAL 0200
CAL 0201
CAL 0202
CAL 0203
CAL 0204
CAL 0205
CAL 0206
CAL 0207
CAL 0208
CAL 0209
CAL 0210
CAL 0211
CAL 0212

```

Listing 2

8

1	13	1965
5	8	2367
4	23	1843
8	20	2011
13	2	1899
3	8	1943
10	23	1492
12	25	1965
2	29	2000
2	29	1965
2	29	1964
11	25	2000
2	29	1900
6	31	1967
11	31	1965
6	13	1999
12	6	85
7	4	1776
9	43	1600
15	5	1988

DAT 0001
 DAT 0002
 DAT 0003
 DAT 0004
 DAT 0005
 DAT 0006
 DAT 0007
 DAT 0008
 DAT 0009
 DAT 0010
 DAT 0011
 DAT 0012
 DAT 0013
 DAT 0014
 DAT 0015
 DAT 0016
 DAT 0017
 DAT 0018
 DAT 0019
 DAT 0020

Listing 3

9

GREGORIAN CALENDAR-1585 AD TO 2599 AD

SENSE SWITCH NUMBER 1 ON FOR CARD DATA
 INPUT, OFF FOR TYPEWRITER INPUT

PAUSE 0001

JANUARY 13, 1965
 IS A WEDNESDAY

MAY 8, 2367
 IS A MONDAY

APRIL 23, 1843
 IS A SUNDAY

AUGUST 20, 2011
 IS A SATURDAY

THIS DATE IS NOT ALLOWED

MARCH 8, 1943
 IS A MONDAY

OCTOBER 23, 1492
 DATA NOT IN LIMITS OF 1585 AD TO 2599 AD

DECEMBER 25, 1965
 IS A SATURDAY

FEBRUARY 29, 2000
 IS A TUESDAY

FEBRUARY 29, 1965
 THIS DATE IS NOT ALLOWED

FEBRUARY 29, 1964
 IS A SATURDAY

NOVEMBER 25, 2000
 IS A SATURDAY

FEBRUARY 29, 1900
 THIS DATE IS NOT ALLOWED

10

JUNE 31, 1967
THIS DATE IS NOT ALLOWED

NOVEMBER 31, 1965
THIS DATE IS NOT ALLOWED

JUNE 13, 1999
IS A SUNDAY

DECEMBER 6, 65
DATA NOT IN LIMITS OF 1585 AD TO 2599 AD

JULY 4, 1776
IS A THURSDAY

SEPTEMBER 43, 1600
THIS DATE IS NOT ALLOWED

THIS DATE IS NOT ALLOWED

page 2 of 2