

IBM 7094 PROGRAMMING FOR AN H-DIAL AND ASSOCIATED ISSUES

An IBM 7094 simulator for the PC can be found at:-

<http://www.members.optushome.com.au/intaemul/Emul7094.htm>

And with it comes the simulator, some scripts, and an implementation of FORTRAN II for the 7094.

Some manuals are located at:-

http://www.bitsavers.org/pdf/ibm/7094/A22-6760_7094model2.pdf	summary
A22-6703-4_7094_PoO_Oct66.pdf	principles of operation

The zip file when unloaded has some critical files:-

B7094.exe	the raw simulator, which is GUI and friendly
B7094.INI	the startup script which sets the machine size and a startup script. [Operation] StartupScript=B7094.EC7 RunStartupScript=1 CoreInitCheck=0 [Forms] Main.Top=0 and a lot of other lines
B7094.EC7	the script to compile, assemble and then run this h-dial program ;----- ; Setup to IPL IBSYS ;----- Config Set Channels=2 Config Del All Config Add Tape=A1 Config Add Tape=B1 Show Window Tape Mount Tape=1201 File='ASYS1.BIN' Mount Tape B1 File='' Set SenSw 1 ON Show Reader :MainLoop Display 'IBSYS operating system.' space 'Click on one of the following options:-' space Option('Return to previous screen') space Option('Compile and run a HDIAL.FOR program') ; Prepare system for (Re)IPL Show Printer Rewind Tape A1 Press Clear ; Process selected option If OptNum=1 Exit If OptNum=2 Goto JOB1 If OptNum=3 Goto JOB2

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```
Goto MainLoop

;-----
; Compile and run a Fortran program
;-----
:JOB1

Config Del All
Config Add Tape=A1
Config Add Tape=A2
Config Add Tape=A3
Config Add Tape=A4
Config Add Tape=A5
Config Add Tape=A6
Config Add Tape=A7
Config Add Tape=B1
Config Add Tape=B2
Config Add Tape=B3
Config Add Tape=B4
Config Add Tape=B5
Config Add Tape=B6
Config Add Tape=B7
Show Window Tape,Printer
Mount Tape=A1 File='ASYS1.BIN'
Mount Tape=A2 File='ASYS8.BIN'
Mount Tape=A3 SCRATCH
Mount Tape=A4 SCRATCH
Mount Tape=A5 SCRATCH
Mount Tape=A6 SCRATCH
Mount Tape=A7 SCRATCH
Mount Tape=B1 SCRATCH
Mount Tape=B2 SCRATCH
Mount Tape=B3 SCRATCH
Mount Tape=B4 SCRATCH
Mount Tape=B5 SCRATCH
Mount Tape=B6 SCRATCH
Mount Tape=B7 SCRATCH
Set Sensw 1 ON
// Load a job to the reader
Reader Clear
Reader Card '$ATTACH      B1'
Reader Card '$AS          SYSOU1'
Reader Card '$DATE        081699'
Reader Card '$JOB         IBFORT'
Reader Card '$ATTACH      RDA'
Reader Card '$AS          SYSIN1'
Reader Card '$ATTACH      A1'
Reader Card '$AS          SYSLB1'
Reader Card '$ATTACH      A2'
Reader Card '$AS          SYSLB2'
Reader Card '$ATTACH      A3'
Reader Card '$AS          SYSLB3'
Reader Card '$ATTACH      A4'
Reader Card '$AS          SYSLB4'
Reader Card '$ATTACH      A5'
Reader Card '$AS          SYSUT1'
Reader Card '$ATTACH      A6'
Reader Card '$AS          SYSUT2'
Reader Card '$ATTACH      A7'
Reader Card '$AS          SYSUT3'
Reader Card '$ATTACH      B1'
Reader Card '$AS          SYSOU1'
Reader Card '$ATTACH      B2'
Reader Card '$AS          SYSOU2'
Reader Card '$ATTACH      B3'
Reader Card '$AS          SYSP1'
Reader Card '$ATTACH      B4'
Reader Card '$AS          SYSP2'
Reader Card '$ATTACH      B5'
Reader Card '$AS          SYSUT4'
Reader Card '$ATTACH      B6'
```

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```

Reader Card '$AS          SYSUT5'
Reader Card '$ATTACH      B7'
Reader Card '$AS          SYSUT6'
Reader Card '$EXECUTE     IBJOB'
Reader Card '$IBJOB       GO,LOGIC,MAP,FIOCS'
Reader Card '$IBFTC DECK1  FULIST,REF,NODECK,M94/2,XR7'
Reader Load File='hdial.FOR'
;Reader Card ''
Reader Card '$IBSYS'
Reader Card '$STOP'
Reader Card ''
// Run it
Press Clear
;Pause 'check reader display'
Press LoadTape
; .. runs ..
Press Start
; .. runs ..
TapeView Tape=B1,Mode=BCD,Line=600
TapeView Save File='hdial.LST'
Goto MainLoop

```

The simulator's control panel looks like:-

NOTE: When you first start the simulator, look for a panel called "B7094.EC7", it may be almost out of sight on the bottom left side, if so bring it up into sight, and move the mouse over the COMPILE AND RUN A HDIAL.FOR PROGRAM, and continue to answer any prompts.

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The original source for the horizontal dial is in a file called:-

hdial.FOR

The final program

```
C
C   FORTRAN II FOR THE IBM 7094 FOR A HORIZONTAL DIAL
C
C   RIGHT NOW, DATA IS ENTERED INTO THE THREE STATEMENTS FOR
C       LAT
C       LNG
C       REF
C   INTEGER I,J,SIZE
C   REAL LAT,SLAT,HOUR,THOUR,LHA,ATNHA
C   REAL LNG,REF
C
C   WRITE(6,900)
C   WRITE(6,901)
C   WRITE(6,900)
C   WRITE(6,902)
C   CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C   CCC   ENTER   DATA   BELOW   PLEASE   CCC
C   CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C   LAT = 32.75
C   LNG = 108.2
C   REF = 105.0
C   CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C   FOR LAT 32.75 LNG 108.2 REF 105.0 THE RESULTS SHOULD BE AS BELOW
C   CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C   LAT      Hour:  -6 hour angle:  93.20  Angle: -84.10
C   32.75    Hour:  -5 hour angle:  78.20  Angle:  68.88
C           Hour:  -4 hour angle:  63.20  Angle:  46.96
C   LNG      Hour:  -3 hour angle:  48.20  Angle:  31.18
C   108.2    Hour:  -2 hour angle:  33.20  Angle:  19.49
C           Hour:  -1 hour angle:  18.20  Angle:  10.09
C   REF      noon
C   105.0    Hour:   0 hour angle:   3.20  Angle:   1.73
C           noon
C           Hour:   1 hour angle: -11.80  Angle:  -6.45
C           Hour:   2 hour angle: -26.80  Angle: -15.28
C           Hour:   3 hour angle: -41.80  Angle: -25.81
C           Hour:   4 hour angle: -56.80  Angle: -39.58
C           Hour:   5 hour angle: -71.80  Angle: -58.71
C           Hour:   6 hour angle: -86.80  Angle: -84.10
C   CCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC
C   DO 10 I = 1,13
C   J = I-7
C
C   J IS INTEGER HOUR FOR DISPLAYING
C
C   NOTE THE USE OF TRAILING .0 ETC BECAUSE OF TYPE CONVERSION RULES
C       IN FORTRAN II AS IMPLEMENTED IN THE 7079 COMPUTER SERIES
C   TAN(TIME)
C
C   HOUR = J
C   LHA = (15.0 * HOUR) - (LNG - REF)
C   LHA = (LHA * 2.0 * 3.1416) / 360.0
C
C   FORTRAN II ON THE IBM 7090 HERE HAS NO TAN FUNCTION HENCE SIN COS
C   THOUR = SIN(LHA) / COS(LHA)
C   SLAT = SIN((LAT * 2.0 * 3.1416) / 360.0)
C   ATNHA = SLAT * THOUR
C   ATNHA = ATAN(ATNHA) * 360.0 / (2.0 * 3.1416)
C   WRITE (6,905) J, LHA, ATNHA
C
C 10 CONTINUE
C
C   WRITE(6,900)
```

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```
      WRITE(6,901)
      WRITE(6,900)
      WRITE(6,906)
      WRITE(6,907) LAT, LNG, REF
      WRITE(6,900)
C
      50 STOP
C
C      NOTE - THE LENGTH BEFORE AN H IS CRITICAL - EG 45H 36H ETC
900 FORMAT(1X, 45HXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX)
901 FORMAT(1X, 45HXX HORIZONTAL DIAL - FORTRAN II - IBM 7094 XX)
902 FORMAT(1X, 45HHOUR-NOON          HOUR ANGLE          HOUR LINE ANGLE)
903 FORMAT(I4)
904 FORMAT(F10.4)
905 FORMAT(I5, F18.1, F15.2)
906 FORMAT(1X, 36HLATITUDE          LONGITUDE          REF)
907 FORMAT(F6.2,F20.2,F15.2)
      END
```

Of course, the purist would say that this program does nothing more than the other FORTRAN programs or any other programs on this web site. However, my response is that just as sundials hark back to an earlier era, so too does the IBM 7094. This document shows how to locate the simulator which is in a zip file and with the scripts here, how to hark back to those days of yesteryear.

TAN was not functional, so SIN/COS was used.

NOTE: The output is in "hdial.LST" down towards the end, or, in the "SCRATCH02201.BIN" panel which you can scroll, and looks like the following.

```
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XX HORIZONTAL DIAL - FORTRAN II - IBM 7094 XX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
HOUR-NOON          HOUR ANGLE          HOUR LINE ANGLE
-6                 -93.2                84.10
-5                 -78.2                -68.88
-4                 -63.2                -46.96
-3                 -48.2                -31.18
-2                 -33.2                -19.49
-1                 -18.2                -10.09
0                  -3.2                 -1.73
1                  11.8                  6.45
2                  26.8                 15.28
3                  41.8                 25.81
4                  56.8                 39.58
5                  71.8                 58.71
6                  86.8                 84.10
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
XX HORIZONTAL DIAL - FORTRAN II - IBM 7094 XX
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
LATITUDE          LONGITUDE          REF
32.75             108.20             105.00
XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX
```