

INTERNAL REPORT 61

DIGDAT: THE INFORMATION BANK INTERFACE TO STRIP CHART RECORDERS

ABSTRACT

The Coniferous Forest Biome has access to several strip chart recorders but is definitely limited with respect to data-logging equipment. The methodology reported in this paper interfaces the common strip chart with the Coniferous Forest Biome information bank storage system by converting the strip chart data to card image data on magnetic tape. This conversion allows computer analysis to proceed without further data preparation costs.

INTRODUCTION

DIGDAT is a FORTRAN program that offers an efficient method for using the digitizer to transform strip chart data into readable computer data sets. An investigator planning to use strip chart recorders should study this document in conjunction with Links (1972).

DIGDAT DESIGN

DIGDAT is designed to reduce a strip chart with up to five different lines NLINE and each line cycling through NSTAT different stations (or channels), spending TSTAT time recording each station. DIGDAT first creates a series of card images

STAT, IY(1), IY(2), IY(NLINE)

where IY(1), . . . , IY(NLINE) are the Y counter values for each line for station reading STAT, DIGDAT then performs modular arithmetic to associate each card image with the proper station. DIGDAT produces the final card image. Users will probably prefer to recode the construction of the final card image to include additional information on the card image and to present time in convenient units.

DIGITIZER USE

The digitizer is rented for \$10 per hour. An additional \$5 per hour must be funded if an operator is desired. The following digitizer use form, when completed, becomes a valuable operation guide. Completing the digitizer use form and reading the digitizer user's manual (Links 1972) before the rental time will save much frustration, time, and money.

DIGITIZER USE FORM

To initialize the digitizer:

1. Check to ensure the standard plugboard is in the back of the digitizer.
2. Turn on digitizer.
3. Mount the magnetic tape.
4. Turn off auto writes.
5. Turn tape switch to record.
6. Turn on tape power.
7. Set event offset to zero.
8. Press control reset button.
9. Press BOT button.
10. Fix strip chart on table.
11. Set even counter to 0.
12. Set X counts per inch to ? 250, 500, 1000 _____.
13. Set Y counts per inch to ? 250, 500, 1000 _____.
14. Set X and Y counter direction switches to positive (up).
15. Set X auto write to ? (1-50) counts _____.
16. Set Y auto write to ? (1-50) counts _____.
17. Set event offset to IRG.
18. Set event multiplier to 1.
19. Set preset to 50.
20. Set select to write cycle.

To operate the digitizer, execute the following steps. For each line of the strip chart:

21. Record the line number (the line on the strip chart being processed: 1,2,3,4, or 5) in the FILE LOG.
22. Set fixed data and record in FILE LOG.
23. Check proper chart alignment.
24. Put hairline on starting point.
25. Record the time associated with the starting point in the FILE LOG.
26. Set the X counter and record the value in the FILE LOG.
27. Set the Y counter and record the value in the FILE LOG.
28. Mark the ending point of this run.
29. Turn on X auto write.
30. Move the hairline down the line.
31. Turn off X auto write.
32. Press EOF button.
33. Record ending values of X and Y counters in the FILE LOG.
34. Record ending time in the FILE LOG.
35. Record counts per station in the FILE LOG.
36. Reposition the strip chart for the next line.
37. Go to step 21 if you have not finished.

To terminate digitizer:

38. Turn off auto writes.
39. Press EØF button three times.
40. Set the tape unit selector to rewind.
41. Unload the tape.
42. Turn off the digitizer.

The FILE LOG can be made from an 80-column pad recording the information in the following columns:

<u>Column</u>	<u>Description</u>
1-2 (integer)	Sine number (1, 2, 3, 4, or 5 depending upon which strip chart line is being processed). Record 0 if a mistake was made and this file is to be skipped. Record -1 if the lines from the previous -1 (or start) to here are to be merged into the data set format.
3-10 (Hollerith)	FIXED data information
11-12 (integer)	Starting year 72, 73
13-14 (integer)	Starting month 1, 2, 3, , 12
15-16 (integer)	Starting day 1, , 31
17-18 (integer)	Starting hour 1, , 24
19-20 (integer)	Starting minute 1, , 60
21-30 (integer)	Starting X counter value
31-40 (integer)	Starting Y counter value
41-50 (integer)	Ending X counter value
51-60 (integer)	Ending Y counter value
61-65 (real)	X counts per station
66-67 (integer)	Ending year
68-69 (integer)	Ending month
70-71 (integer)	Ending day
72-73 (integer)	Ending hour
74-75 (integer)	Ending minute

DIGDAT USE

The user probably will want to recode the final card image construction. A source language deck can be obtained by submitting the following job.

```
JØBCARD,T30,CM37000,PI.  
REQUEST,DIGDAT,VRN=P701,DI,IN,FILES=25.  
UPDATE(P=DIGDAT,C=PUNCH,8,F,L=A12)  
(end of record card)  
*IDENT DATE  
(end of job card)
```

(NOTE: If the present version is sufficient, then DIGDAT can be used directly from magnetic tape VRN=P701, FILES=27, according to instructions that follow.)

The following job will execute a run of DIGDAT and store the compiled binary file on magnetic tape. (TAPE1 is the magnetic tape from the digitizer LGØ is the compiled binary file.)

```
JØBCARD,T100,CM75000,PO.
REQUEST,TAPE1,VRN=???,S,HI,IN.
REQUEST,PLØTFL,VRN=GRAF,DI,IN.
REQUEST,LGØ,VRN=???,DI,ØUT,FILES=?.
FØRTRAN.
USERLIB(A=PLØTFL)
SETCØRE.
LGØ.
REWIND(TAPE50)
CØPYSBF(TAPE50,ØUTPUT) or
CØPYBF(TAPE50,PUNCH)
UNLØAD(TAPE1)
(End of record card)
FØRTRAN source deck
(End of record card)
DIGDAT data cards
(End of record card)
FILE LØG
(End of job card)
```

DIGDAT can be used directly from a compiled binary file stored on magnetic tape with the following deck structure. (TAPE1 is the digitizer tape. LGØ is the compiled binary file.)

```
JØBCARD,T100,CM45000,PO.
REQUEST,LGØ VRN=???,DI,IN,FILES=?.
REQUEST,TAPE1,VRN=???,IN,S,HI.
LGØ.
REWIND(TAPE50)
CØPYSBF(TAPE50,ØUTPUT) or
CØPYBF(TAPE50,PUNCH)
UNLØAD(TAPE1)
(End of record card)
DIGDAT data cards
(End of record card)
FILE LØG
(End of job card).
```

(NOTE: The version of DIGDAT on file 25 has already been compiled and is located VRN=P701,FILES=27.)

The format of the DIGDAT data cards are:

<u>Column</u>	<u>Description</u>
1-5	Label (must start in column 1)
6-80	Information

Columns 6-80 contain the following information for the labels. Numbers are entered free field separated by blanks.

<u>Label</u>	<u>Information</u>
NLINE(integer)	Number of strip chart lines to be processed. (Do not punch the decimal.)
FØRM (Hollerith)	FØRMAT of the cards to be punched or listed.
FMULT (real) FADD	The Y counter number IY(I) for the Ith line is converted to a real variable Y(I) for output by the statement: $Y(I) = FADD(I) + FMULT(I) * FLOAT[IY(I)]$ Enter numbers for I=1,NLINE on the same card decimals punched and separated by blanks.
NSTAT (integer)	Number of stations recorded on one strip chart recording. (Do not punch the decimal.)
TSTAT (real)	Time duration of one station recording. (Punch the decimal.)

REFERENCES

LINKS, D. 1972. Digitizer users manual. Univ. Wash. Comput. Cent. Publ. W00049. Univ. Washington, Seattle. 43 p.

Table 1. Sample input.

```

JOB CARD, CM45000, T100, P0.      NAME
REQUEST, LGØ, VRN=P701, DI, IN, FILES=27.
REQUEST, TAPE1, VRN=R389, IN, S, HI.
LGØ.
REWIND(TAPE50)
COPYSBF(TAPE50, ØUTPUT)
UNLOAD(TAPE1)
(ØND OF REØRD CARD)
NLINE 2
FORM (6(1X, 12), 11X, 2(F9.1, 1X))
FMULT .03 .03
FADD 0. 279.
NSTAT 10
TSTAT 1.
(ØND ØF REØRD CARD)
 1HAUG27117208271108      0      2450      10000      2412250.  7208271148
 2BAUG27117208271108      0      1980      10000      1710250.  7208271148
-1
(ØND ØF JØBCARD)

```

Table 2. Sample output

72	8	27	11	8	1	73.5	338.4
72	8	27	11	8	2	73.4	331.3
72	8	27	11	8	3	73.4	329.5
72	8	27	11	8	4	73.4	329.4
72	8	27	11	8	5	73.4	328.5
72	8	27	11	8	6	73.3	328.3
72	8	27	11	8	7	73.3	328.8
72	8	27	11	8	8	73.3	330.4
72	8	27	11	8	9	73.3	331.5
72	8	27	11	8	10	74.7	330.7
72	9	27	11	18	1	73.8	330.3
72	8	27	11	18	2	73.6	324.7
72	8	27	11	18	3	73.6	324.7
72	8	27	11	18	4	73.6	326.5
72	8	27	11	18	5	73.6	326.5
72	8	27	11	18	6	73.6	327.2
72	8	27	11	18	7	73.6	328.2
72	8	27	11	18	8	73.6	330.2
72	8	27	11	18	9	73.8	331.4
72	8	27	11	18	10	74.6	329.8
72	8	27	11	28	1	73.8	327.7
72	8	27	11	28	2	73.0	324.0
72	8	27	11	28	3	73.3	327.6
72	8	27	11	28	4	73.3	332.1
72	8	27	11	28	5	73.2	334.7
72	8	27	11	28	6	73.2	337.1
72	8	27	11	28	7	73.2	340.0
72	8	27	11	28	8	73.2	341.9
72	8	27	11	28	9	73.4	343.3
72	8	27	11	28	10	74.5	343.3
72	8	27	11	38	1	74.0	342.9
72	8	27	11	38	2	73.9	338.6
72	8	27	11	38	3	73.9	339.7
72	8	27	11	38	4	74.0	340.9
72	8	27	11	38	5	73.9	341.3
72	8	27	11	38	6	73.9	339.8
72	8	27	11	38	7	73.9	339.4
72	8	27	11	38	8	73.7	339.1
72	8	27	11	38	9	73.9	337.5
72	8	27	11	38	10	74.8	336.1
72	8	27	11	48	1	73.9	334.5
72	8	27	11	48	2	73.6	330.9
72	8	27	11	48	3	73.6	331.0
72	8	27	11	48	4	73.6	331.2
72	8	27	11	48	5	75.4	328.9
72	8	27	11	48	6	72.5	330.0
72	8	27	11	48	7	71.7	329.3
72	8	27	11	48	8	71.6	330.8
72	8	27	11	48	9	71.5	331.2
72	8	27	11	48	10	72.4	330.3