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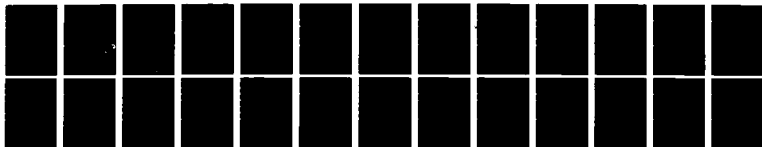
COMPUTER ASSISTED DATA STORAGE AND RETRIEVAL IN
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W W JEDERBERG ET AL. NOV 82 LAIR-82-42TN

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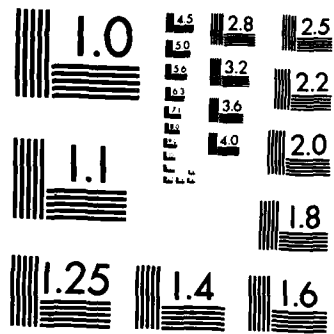
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TECHNICAL NOTE NO. 82-42TN

**COMPUTER ASSISTED DATA STORAGE AND RETRIEVAL
IN MUTAGENICITY TESTING**

II. *The Drosophila melanogaster* Sex-linked Recessive Lethal Assay

WARREN W. JEDERBERG, MS, CPT MSC

and

NELSON R. POWERS, PhD, CPT MSC

TOXICOLOGY GROUP

DIVISION OF RESEARCH SUPPORT

NOVEMBER 1982

Toxicology Series 44

**LETTERMAN ARMY INSTITUTE OF RESEARCH
PRESIDIO OF SAN FRANCISCO, CALIFORNIA 94129**

88 AR OR 034

Computer-Assisted Data Storage and Retrieval in Mutagenicity Testing.
II. The Drosophila melanogaster sex-linked recessive lethal assay
--Jederberg and Powers

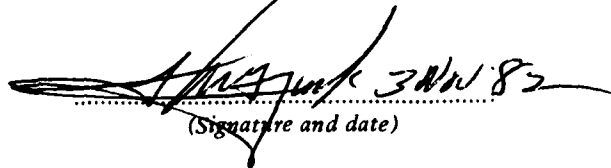
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PREFACE

This technical note is the second in a series on the utilization of the computer facilities at Letterman Institute of Research to assist in mutagenicity testing as part of the institute's toxicology program. This report details the use of the computer in recording, storing and retrieving data. Its use in the Drosophila melanogaster sex-linked recessive lethal assay provides a form in which it is easy to view the raw data.

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ACKNOWLEDGMENTS

The authors wish to express their appreciation to the Information Sciences Group, Letterman Army Institute of Research, for making computer facilities available and to all those who have made suggestions for improving the utility of the program described herein.

COMPUTER-ASSISTED DATA STORAGE AND RETRIEVAL IN MUTAGENICITY TESTING.
II. The Drosophila melanogaster Sex-Linked Recessive Lethal Assay.

The mutagenicity testing of materials in compliance with federal regulations (4) requires several standards. Among these are the implementation of an extensive labelling system. A computer-assisted system has been established and described (2). Regulations also require storage of data. A computer program has been developed that records these new data from the Sex-Linked Recessive Lethal Assay (3), stores it in permanent computer files, and allows the user to see the data by means of a "print-out copy" as they are stored. The data also can be retrieved easily. Other programs which allow for a formatted print-out of a selected data set will also be described

PROGRAM DESCRIPTION

The program DROSTOXDATA (Appendix A) records the raw data and stores it in the file DROSDATA. It records the number of failures, lethals and non-lethal offspring from each individual numbered male that was exposed to negative controls, positive controls, and test compounds. This recording is done for each of the four broods. In addition, the program makes a provision under the category of lethals so that the user may designate whether lethals are single or multiple. For each individual numbered male the program totals the number of failures, lethals (single or multiple), non-lethals, number of tests performed, and the mutation frequency. The program checks the total single and multiple lethals against the total as given by the individual broods. If they do not agree, an error message will appear and the user may re-enter the number of single and multiple lethals. If the total number of failures, lethals, and non-lethals for a given brood is greater than 99, only the brood data will be requested to be re-entered. As seen in the sample (Figure 1), the program displays the last run experiment number and the last male for which data were recorded.

The program requests the following information from the user (Figure 1):

(1) Select if more data from the same run are to be entered or if data for a new run are to be entered.

(2) Specify the run number if data for a new run are to be entered.

(3) Enter the identification number for each male fly tested. (The user is allowed up to 6 characters of any type.)

(4) Enter the identification of the compound tested. (The user is allowed up to 6 characters of any type.).

(5) Enter the data for the first brood as to the number of failures, lethals, and non-lethals. (If anything is greater than 99, an error message will be displayed and the user must re-enter the data for that brood. This procedure is repeated for broods 2 through 4).

If lethals are present:

(6) Enter the total number of single lethals.

(7) Then, enter the total number of multiple lethals. (The computer program will check the total number of single and multiple lethals against the total lethals in the broods. If there is an error, an error message will be displayed and the user will be requested to re-enter the number of single and multiple lethals. When total lethals agree, or there are none, the computer will type: TOTAL FAILURES, TOTAL LETHALS, TOTAL NON-LETHALS, TOTAL TESTS, and MUTATION RATE for data that have been entered.

(8) The user at this point may view how the data have been entered. If any of these data are incorrect the user may so indicate and return to Step 1.

(9) The user may then decide to continue by entering more data; beginning a new run or terminating the program.

(10) The user may log off the program and the data are stored in the DROSDATA file or the user may create a new file name to store the data.

(11) The user may receive a print-out of the data in their "raw" form (Figure 2), by giving the appropriate command to the operating system.

In addition, the user may receive a formatted print-out of the data accumulated by DROSTOXDATA by executing the program DROSRPT (Figure 3). This formatted print-out (Figure 4) is generated from DROSRPT and its associated subroutines RDDROSDATA, WRDROSDATA, and STRING (Appendices B, C, D and E).

The program, DROSRPT, requests the following information from the

user (Figure 3):

(1) Type in the date; day, month, and year the program is being executed.

(2) Type in the name of the file to be printed out.

(3) Type in the appropriate command to the selected operating system name to receive a print-out of the data in the formatted form (Figure 4).

DISCUSSION

By utilizing these programs and the subroutines presented in this report, the raw data may be presented in a form which is easy to view and which saves time in analysis.

CONCLUSION

None.

RECOMMENDATION

None.

SAMPLE RUN OF X DROSTOXDATA

(Underlined entries are sample user inputs)

) X DROSTOXDATA

The computer will type:

LETTERMAN ARMY INSTITUTE OF RESEARCH
TOXICOLOGY GROUP: DROSOPHILA DATA

LAST RUN NUMBER RECORDED WAS: 37
LAST MALE DATA RECORDED WAS: T2-904

WOULD YOU LIKE:
TO ENTER MORE DATA FOR THE SAME RUN (= 1) ?
TO ENTER DATA FOR A NEW RUN (= 2) ?

ENTER CHOICE: (1 or 2)

1

MALE IDENTIFIER (AN/6) - ??

T2-905

TEST COMPOUND (AN/6) = ??

002MPT

ENTER FIRST BROOD DATA:

FAILURES (0-99), LETHALS (0-99), NONLETHALS (0-99):

1,0,24

ENTER SECOND BROOD DATA:

FAILURES (0-99), LETHALS (0-99), NONLETHALS (0-99):

0,0,25

ENTER THIRD BROOD DATA: FAILURES (0-99), LETHALS (0-99), NONLETHALS (0-99):

0,1,24

ENTER FOURTH BROOD DATA: FAILURES (0-99), LETHALS (0-99), NONLETHALS (0-99):

0,1,25

HOW MANY LETHALS WERE SINGLE ? (0-99)

1

Figure 1. Sample Run of X DROSTOXDATA

HOW MANY LETHALS WERE MULTIPLE ? (0-99)

0

*****ERROR*****

TOTAL LETHALS DON'T AGREE:

TOTAL LETHALS FROM BROODS = XX

TOTAL FROM SINGLES + MULTIPLES = XX

TOTAL FAILURES: 1 TOTAL LETHALS: 1

TOTAL NONLETHALS: 98 TOTAL TESTS: 99

MUTATION RATE FOR THESE DATA: 1.01

37 T2 905 002MPT 0,1,24 0,0,25 0,1,24 0,0,25 1 101 98 99 1.01

ARE THE DATA ALL RIGHT ? (1=YES, 0=NO)

1

WOULD YOU LIKE:

TO ENTER MORE DATA FOR THE SAME RUN (= 1)?

TO ENTER DATA FOR A NEW RUN (= 2) ?

TO ENTER NO MORE DATA (= 3) ?

ENTER CHOICE: 1, 2, OR 3. 1

)

Figure 1. Sample Run of X DROSTOXDATA

37	C1	908	1XFRUT	0	025	0	025	0	025	0	025	0	0	0	0	100	100	.00	
37	C1	907	1XFRUT	0	025	0	025	0	025	0	025	0	0	0	0	100	100	.00	
37	C1	909	1XFRUT	1	024	0	025	0	124	0	025	1	1	0	1	98	99	1.01	
37	C1	910	1XFRUT	1	024	1	024	0	025	0	025	2	0	0	0	98	98	.00	
37	C1	911	1XFRUT	0	025	0	025	0	025	0	025	0	0	0	0	100	100	.00	
37	C1	912	1XFRUT	0	025	0	025	1	024	0	025	1	0	0	0	99	99	.00	
37	C1	913	1XFRUT	0	025	0	025	0	025	1	021	1	0	0	0	96	96	.00	
37	P1	889	1EMST	2	419	1	222	0	520	0	0	0	3	11	011	61	72	15.28	
37	P1	890	1EMST	0	421	0	223	0	223	1	0	0	1	8	0	8	71	79	10.13
37	P1	891	1EMST	0	223	0	124	1	222	0	0	0	1	5	0	5	69	74	6.76
37	P1	892	1EMST	0	124	0	421	0	025	0	0	0	0	5	0	5	70	75	6.07
37	P1	893	1EMST	0	421	0	421	0	124	0	111	0	10	010	77	87	11.49		
37	P1	894	1EMST	2	023	1	321	0	124	0	0	0	3	4	0	4	68	72	5.56
37	P1	895	1EMST	1	321	3	022	8	215	0	0	0	12	5	0	5	58	63	7.94
37	P1	896	1EMST	1	519	0	124	0	619	0	0	0	1	12	012	62	74	16.22	
37	P1	897	1EMST	0	223	2	122	1	321	0	0	0	3	6	0	6	66	72	8.33
37	P1	898	1EMST	1	222	0	223	0	223	0	0	0	1	6	0	6	68	74	8.11
37	T1	889	005MPT	0	025	0	025	0	025	0	025	0	0	0	0	100	100	.00	
37	T1	890	005MPT	0	025	0	025	1	024	0	025	1	0	0	0	99	99	.00	
37	T1	891	005MPT	0	025	0	025	0	025	0	025	0	0	0	0	100	100	.00	
37	T1	892	005MPT	0	025	0	025	0	025	0	025	0	0	0	0	100	100	.00	
37	T1	893	005MPT	0	025	0	025	0	025	1	024	1	0	0	0	99	99	.00	
37	T1	894	005MPT	0	025	3	121	0	025	0	025	3	1	0	1	96	97	1.03	
37	T1	895	005MPT	0	025	0	025	0	025	0	025	0	0	0	0	100	100	.00	
37	T1	896	005MPT	0	025	0	025	1	116	0	070	1	1	0	1	86	87	1.15	
37	T1	897	005MPT	0	025	0	025	1	024	0	016	1	0	0	0	90	90	.00	
37	T1	898	005MPT	1	024	0	025	0	025	0	025	1	0	0	0	99	99	.00	
37	T1	899	005MPT	0	025	0	025	0	025	0	020	0	0	0	0	95	95	.00	
37	T1	900	005MPT	1	024	0	025	0	025	0	025	1	0	0	0	99	99	.00	
37	T1	901	005MPT	0	025	0	025	0	025	0	025	0	0	0	0	100	100	.00	
37	T1	902	005MPT	0	025	2	023	0	025	0	025	2	0	0	0	98	98	.00	
37	T1	903	005MPT	1	024	0	0	0	0	0	0	1	0	0	0	24	24	.00	
37	T1	904	005MPT	0	025	0	025	0	025	1	024	1	0	0	0	99	99	.00	
37	T1	905	005MPT	1	024	0	025	1	024	0	025	2	0	0	0	98	98	.00	
37	T1	906	005MPT	0	025	0	025	0	025	0	025	0	0	0	0	100	100	.00	
37	T1	907	005MPT	0	025	0	025	0	025	1	024	1	0	0	0	99	99	.00	
37	T1	908	005MPT	0	025	1	024	0	025	1	016	2	0	0	0	92	92	.00	
37	T1	909	005MPT	0	025	0	0	0	0	0	0	0	0	0	0	25	25	.00	
37	T1	910	005MPT	0	025	0	025	0	025	0	025	0	0	0	0	100	100	.00	
37	T1	911	005MPT	1	024	0	025	0	025	0	025	1	0	0	0	99	99	.00	
37	T1	912	005MPT	2	023	0	025	0	025	0	025	2	0	0	0	98	98	.00	
37	T1	913	005MPT	3	022	0	025	0	0	0	0	3	0	0	0	47	47	.00	
37	T2	889	002MPT	5	020	0	025	0	025	0	025	5	0	0	0	95	95	.00	
37	T2	890	002MPT	0	025	0	025	0	025	0	0	9	0	0	0	84	84	.00	
37	T2	891	002MPT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	.00	
37	T2	892	002MPT	0	015	0	025	0	025	1	024	1	0	0	0	89	89	.00	
37	T2	893	002MPT	0	020	0	025	0	025	0	025	0	0	0	0	95	95	.00	
37	T2	894	002MPT	1	044	14	011	0	025	0	025	15	0	0	0	85	85	.00	
37	T2	895	002MPT	0	025	1	024	0	010	0	0	1	0	0	0	59	59	.00	
37	T2	896	002MPT	0	025	0	0	0	0	0	0	0	0	0	0	25	25	.00	
37	T2	897	002MPT	1	024	0	0	0	0	0	0	1	0	0	0	49	49	.00	
37	T2	898	002MPT	1	024	0	025	0	025	0	025	1	0	0	0	99	99	.00	
37	T2	900	002MPT	0	025	0	025	0	025	0	025	0	0	0	0	100	100	.00	
37	T2	901	002MPT	0	025	0	025	0	025	1	024	1	0	0	0	83	83	.00	
37	T2	902	002MPT	0	025	0	025	0	025	0	025	0	0	0	0	95	99	.00	
37	T2	903	002MPT	0	025	0	025	0	025	0	025	0	0	0	0	100	100	.00	
37	T2	904	002MPT	0	025	0	025	0	025	0	025	0	0	0	0	97	97	.00	
37	T2	905	002MPT	0	025	0	025	0	025	0	025	0	0	0	0	100	100	.00	
37	T2	906	002MPT	0	025	0	025	0	025	0	025	1	1	0	1	98	99	1.11	
37	T2	907	002MPT	0	025	1	024	0	025	0	025	1	0	0	0	99	99	.00	

Figure 2. Raw Data of X DRUSTOXDATA

SAMPLE RUN OF X DROSRPT

(Underlined entries are sample user inputs)

) X DROSRPT

The computer will type:

ENTER DATA TO APPEAR ON REPORT (XXMONXX). 10Jun82

The computer will type:

NAME OF FILE TO BE REPORTED: DROSDATA

The computer will type:

REPORT READY IN `SLRRPT`

)

Figure 3. Sample Run of X DROSRPT

LETTERMAN ARMY INSTITUTE OF RESEARCH
SEX-LINKED RECESSIVE LETHAL DROSOPHILA ASSAY
(RAM DATA PRINT-OUT)

DATE: 10JUN62

PAGE: 30

TEST	WASLET	COMPOUND	H5000-111		H5000-122		H5000-131		H5000-141		SUMMARY TOTALS		MUTATION RATE (2)	
			FE	LE	FE	LE	FE	LE	FE	LE	FE	LE		FE
37	T2 896	002MPT	0	0 25	0	0 0	0	0 0	0	0 0	0	0 0	25	.00
37	T2 897	002MPT	1	0 24	0	0 0	0	0 25	1	0 0	0	0 49	49	.00
37	T2 898	012MPT	1	0 24	0	0 25	0	0 25	1	0 0	0	0 99	99	.00
37	T2 899	002MPT	0	0 25	0	0 25	0	0 25	0	0 0	0	0 100	100	.00
37	T2 900	002MPT	0	0 25	0	0 25	0	0 0	0	0 0	0	0 83	83	.00
37	T2 901	012MPT	0	0 25	0	0 25	1	0 24	1	0 0	0	0 99	99	.00
37	T2 902	002MPT	0	0 25	0	0 25	0	0 25	0	0 0	0	0 100	100	.00
37	T2 903	002MPT	3	0 22	0	0 25	0	0 25	3	0 0	0	0 97	97	.00
37	T2 904	012MPT	0	0 25	0	0 25	0	0 25	0	0 0	0	0 100	100	.00
37	T2 905	002MPT	1	0 24	0	0 25	0	1 24	0	0 25	1	1 0 1 98	99	1.01
37	T2 906	002MPT	0	0 25	0	0 25	0	0 25	0	0 25	0	0 0 0 100	100	.00
37	T2 907	012MPT	0	0 25	1	0 24	0	0 25	0	0 25	1	0 0 0 99	99	.00
37	T2 908	002MPT	1	0 24	0	0 25	0	0 15	0	0 7	1	0 0 0 71	71	.00
37	T2 909	002MPT	0	0 25	0	0 25	0	0 25	0	0 25	0	0 0 0 100	100	.00
37	T2 910	002MPT	0	0 25	0	0 25	0	0 25	0	0 17	0	0 0 0 92	92	.00
37	T2 911	002MPT	0	0 25	1	0 24	0	0 25	0	0 9	1	0 0 0 83	83	.00
37	T2 912	002MPT	0	0 25	0	0 25	0	0 25	0	0 20	0	0 0 0 95	95	.00
37	T2 913	002MPT	0	0 25	0	1 24	0	0 25	1	0 21	1	1 0 1 95	96	1.04
38	G1 914	112MPT	1	0 24	0	0 25	0	0 25	0	0 25	1	0 0 0 99	99	.00
38	G1 915	112MPT	1	0 24	0	0 25	0	0 25	0	0 25	1	0 0 0 99	99	.00
38	G1 916	112MPT	1	0 24	1	0 24	0	0 25	0	0 18	2	0 0 0 91	91	.00
38	G1 917	112MPT	0	0 25	0	0 25	0	0 25	0	0 25	0	0 0 0 100	100	.00
38	G1 918	112MPT	0	0 25	0	0 25	0	0 25	0	0 25	0	0 0 0 100	100	.00

EXPLANATORY NOTES: FE=FAILURE(S), LE=LETHALS, MLE=NONLETHALS
FE=FEATAL FAILURES, SLE=SINGLE LETHALS, MLE=MULTIPLE LETHALS, TLE=TOTAL LETHALS,
TMS=TOTAL NONLETHALS

Figure 4. Formatted Data of X DROSPT

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3. WIRTZ, R.A., N.R. POWERS and J.T. FRUIN. Mutagenicity Testing using the Drosophila melanogaster Sex-linked Recessive Lethal Assay. Institute Report No. 112, Letterman Army Institute of Research, Presidio of San Francisco, CA 94129, February 1982.

Appendix A.	Listing for DROSTOXDATA.FR	12
Appendix B.	Listing for DROSRPT.FR	17
Appendix C.	Listing for Subroutine RDDROSDATA.FR	19
Appendix D.	Listing for Subroutine WRDROSDATA.FR	20
Appendix E.	Listing for Subroutine STRING.FR	22

APPENDICES

Appendix A.

```
C --- PROGRAM NAME:  DROSTOXDATA.FR
C --- WRITTEN BY:    WARREN W JEDERBERG, CUTANEOUS HAZARDS
C --- INPUT:        AT TIME OF EXECUTION
C --- FORMAT FOR INPUT:  DASHER OR CRT
C --- SPECIAL EQUIPMENT: NONE
C --- PURPOSE:      TO STORE DATA FROM THE SEX-LINKED RECESSIVE LETHAL
C ---                DROSOPHILA TOXICOLOGICAL TEST, AND ALLOW CHECKING THE DATA
C ---                BEFORE IT IS STORED IN "DROSDATA" FILE
C ---
      REAL MR
C --- MR = MUTATION RATE FOR THE DATA
      INTEGER MNUM, SL, TL, TNL, TT,  ML, CNAM, TTL
      DIMENSION CNAM(6),MNUM(6)
C --- MNUM = MALE INDENTIFICATION
C --- SL   = SINGLE LETHALS
C --- ML   = MULTIPLE LETHALS
C --- TL   = TOTAL LETHALS
C --- TNL  = TOTAL NONLETHALS
C --- TT   = TOTAL TESTS
C --- CNAM = COMPOUND INDENTIFIER
C ---
      INTEGER BFF,BFL,BFNL, BSF,BSL,BSNL, BTF,BTL,BTNL, BLF,BLL,BLNL
C --- BFF = FIRST BROOD FAILURES
C --- BFL = FIRST BROOD LETHALS
C --- BFNL = FIRST BROOD NONLETHALS
C ---
C --- BSF = SECOND BROOD FAILURES
C --- BSL = SECOND BROOD LETHALS
C --- BSNL = SECOND BROOD NONLETHALS
C ---
C --- BTF = THIRD BROOD FAILURES
C --- BTL = THIRD BROOD LETHALS
C --- BTNL = THIRD BROOD NONLETHALS
C ---
C --- BLF = FOURTH BROOD FAILURES
C --- BLL = FOURTH BROOD LETHALS
C --- BLNL = FOURTH BROOD NONLETHALS
C ---
C *** OUTPUT HEADER ***
99  WRITE (10,1)
1   FORMAT (///,10X,"LETTERMAN ARMY INSTITUTE OF RESEARCH",/,10X,
1     "TOXICOLOGY GROUP:  DROSOPHILA DATA",//)
C ---
C *** GET DATA LAST RECORDED ***
      OPEN 2, "LDATA", ATT = "SIB"
      READ (2,11) NR, MNUM
      CLOSE 2
```

Appendix A.
(Continued)

```
11  FORMAT (I4,1X,6A1)
    WRITE (10,12) NR, MNUM
12  FORMAT (1X,"LAST RUN NUMBER RECORDED WAS:",2X,I4,/,
    11X,"LAST MALE DATA RECORDED WAS:",2X,6A1,/)
C ---
C *** OPTIONS (SAME RUN = 1, NEW RUN = 2) ***
301 CONTINUE
    WRITE (10,13)
13  FORMAT (10X," WOULD YOU LIKE:",/,15X,
    1"TO ENTER MORE DATA FOR THE SAME RUN (= 1) ?",/,15X,
    2"TO ENTER DATA FOR A NEW RUN (= 2) ?",/)
    ACCEPT " ENTER CHOICE: 1 OR 2 ",K
    IF (K.NE.1.AND.K.NE.2) GO TO 301
    IF (K.NE.2) GO TO 101
C ---
C *** GET NEW RUN NUMBER ***
999 CONTINUE
    TYPE
    ACCEPT " NEW RUN NUMBER ? ",NR
    IF (NR.LE.9999) GO TO 101
    TYPE
    TYPE " ++++++ERROR+++++"
    TYPE " RUN NUMBER > 9999"
    GO TO 999
101 CONTINUE
C ---
C *** GET MALE IDENTIFIER ***
    TYPE
    TYPE " MALE IDENTIFIER (AN/6)= ??"
    READ (11,8) (MNUM(K), K=1,6)
8   FORMAT (6A1)
C ---
C *** GET COMPOUND IDENTIFIER ***
    TYPE
    TYPE " TEST COMPOUND (AN/6)= ??"
    READ (11,7) (CNAM(K), K=1,6)
7   FORMAT (6A1)
C ---
C *** ENTER BROOD DATA
2   FORMAT (/, "ENTER FIRST BROOD DATA:")
3   FORMAT (/, "ENTER SECOND BROOD DATA:")
4   FORMAT (/, "ENTER THIRD BROOD DATA:")
5   FORMAT (/, "ENTER FOURTH BROOD DATA:")
6   FORMAT ("FAILURES (0-99), LETHALS (0-99), NONLETHALS (0-99):")
C ---
```

Appendix A.
(Continued)

```
C --- ENTER FIRST BROOD DATA
10  WRITE (10,2)
    WRITE (10,6)
    ACCEPT "**", BFF,BFL,BFNL
    IF (BFF.GT.99.OR.BFL.GT.99.OR.BFNL.GT.99) GO TO 10

C ---
C --- ENTER SECOND BROOD DATA
20  WRITE (10,3)
    WRITE (10,6)
    ACCEPT "**", BSF,BSL,BSNL
    IF (BSF.GT.99.OR.BSL.GT.99.OR.BSNL.GT.99) GO TO 20

C ---
C --- ENTER THIRD BROOD DATA
30  WRITE (10,4)
    WRITE (10,6)
    ACCEPT "**", BTF,BTL,BTNL
    IF (BTF.GT.99.OR.BTL.GT.99.OR.BTNL.GT.99) GO TO 30

C ---
C --- ENTER FOURTH BROOD DATA
40  WRITE (10,5)
    WRITE (10,6)
    ACCEPT "**", BLF,BLL,BLNL
    IF (BLF.GT.99.OR.BLL.GT.99.OR.BLNL.GT.99) GO TO 40

C ---
C *** CALCULATE TOTALS ***
    ML = 0.00
    SL = 0.00
    TL = BFL + BSL + BTL + BLL
    IF (TL.LE.0.1) GO TO 150
    TYPE
    TYPE
50  TYPE " HOW MANY LETHALS WERE SINGLE ? (0-99)"
    ACCEPT "**",SL
    TYPE " HOW MANY LETHALS WERE MULTIPLE ? (0-99)"
    ACCEPT "**",ML

C ---
C --- CHECK TOTAL LETHALS FROM BROODS AND FROM QUERY
    TTL = SL + ML
    IF (ABS(TTL-TL).LE.0.1) GO TO 150
    TYPE
    TYPE "*****ERROR*****"
    TYPE " TOTAL LETHALS DON'T AGREE:"
    TYPE " TOTAL LETHALS FROM BROODS = ",TL
    TYPE " TOTAL FROM SINGLES + MULTIPLES = ",TTL
    TYPE
    GO TO 50
```

Appendix A.
(Continued)

```

150 CONTINUE
    TNL = BFNL + BSNL + BTNL + BLNL
    TT = TNL + TL
    IF (TT.LE.100) GO TO 60
    TYPE "*****ERROR*****"
    TYPE "TOTAL TESTS ARE MORE THAN 100, RE-ENTER ALL DATA"
    GO TO 99
60 CONTINUE
    MR = TL*(100.00/TT)
    TF = BFF + BSF + BTF + BLF
C ---
C *** CHECK DATA ****
C --- DISPLAY CALCULATED DATA ***
    WRITE (10,70) TF,TL,TNL,TT,MR
70 FORMAT (/,"TOTAL FAILURES:",1X,I3,2X,"TOTAL LETHALS:",1X,I3,/,
1"TOTAL NONLETHALS:",1X,I3,2X,"TOTAL TESTS:",1X,I3,/,
2"MUTATION RATE FOR THESE DATA:",2X,F6.2)
C --- DATA AS WILL BE RECORDED
    WRITE (10,80)
80 FORMAT (//,"DATA WILL BE RECORDED AS:")
    WRITE (10,100) NR,MNUM,CNAM,BFF,BFL,BFNL,BSF,BSL,BSNL,
1BTF,BTL,BTNL,BLF,BLL,BLNL,TF,SL,ML,TL,TNL,TT,MR
    TYPE
81 TYPE "ARE THE DATA ALL RIGHT ? (1=YES,0=NO)"
    ACCEPT "*",I
    IF (I.NE.O.AND.I.NE.1) GO TO 81
    IF (I.NE.1) GO TO 99
C ---
C *** STORE DATA IN DROSDATA ***
    OPEN 1, "DROSDATA", ATT = "SA"
    WRITE (1,100) NR,MNUM,CNAM,BFF,BFL,BFNL,BSF,BSL,BSNL,
1BTF,BTL,BTNL,BLF,BLL,BLNL,TF,SL,ML,TL,TNL,TT,MR
100 FORMAT (I4,1X,6A1,1X,6A1,4(1X,3I2),1X,I2,1X,3I2,
12(1X,I3),1X,F6.2)
    CLOSE 1
C ---
C *** RECORD LAST RUN NUMBER AND MALE IN LDATA
    OPEN 2, "LDATA", ATT = "SO"
    WRITE (2,11) NR, MNUM
    CLOSE 2
C ---

```

Appendix A.
(Continued)

```
C *** OPTION FOR MORE DATA OR LOG OFF ***
200 CONTINUE
    WRITE (10,14)
14  FORMAT (//,10X,"WOULD YOU LIKE:",/,15X,
1"TO ENTER MORE DATA FOR THE SAME RUN (= 1) ?",/,15X,
2"TO ENTER DATA FOR A NEW RUN (= 2) ?",/,15X,
3"TO ENTER NO MORE DATA (= 3) ?",/)
    ACCEPT " ENTER CHOICE: 1, 2, OR 3 ",K
    IF (K.NE.1.AND.K.NE.2.AND.K.NE.3) GO TO 200
    IF (K.NE.2.AND.K.NE.3) GO TO 101
    IF (K.NE.3) GO TO 999
C ---
    END
```

Appendix B.

```
C *** PROGRAM NAME:          DROSRPT.FR
C *** WRITTEN BY:           WARREN JEDERBERG
C *** PURPOSE:             TO GENERATE A REPORT OF THE
C ***                     RAW DATA AS STORED IN 'DROSDATA'
```

```
INTEGER NR,MNUM,CNAM,BFF,BFL,BFNL,BSF,BSL,BSNL,
1BTF,BTL,BTNL,BLF,BLL,BLNL,TF,SL,ML,TL,TNL,TT,SFNAM
```

REAL MR

```
COMMON/DREC/NR,MNUM(6),CNAM(6),BFF,BFL,BFNL,BSF,BSL,BSNL,
1BTF,BTL,BTNL,BLF,BLL,BLNL,TF,SL,ML,TL,TNL,TT,MR
```

LOGICAL EOF

```
DIMENSION NATE(5),SFNAM(20)
```

C --- GET REPORT DATE

```
TYPE "Enter Date to appear on report: (XX-MON-XX)"
READ (11,400) (NATE(I),I=1,5)
400 FORMAT (5A2)
```

C --- INITIALIZE PAGE AND LINE

```
PAGE = 0
LINE = 0
```

C --- INITIALIZE EOF

```
EOF = .FALSE.
```

C --- GET AND OPEN FILE TO BE REPORTED

```
WRITE (10,300)
300 FORMAT (/"NAME OF FILE TO BE REPORTED: ",Z)
READ (11,310) SFNAM
310 FORMAT (20A2)
CALL STRING (SFNAM,20)
OPEN 1, SFNAM, ATT="SIB",ERR=100
READ (1,1)
1 FORMAT (/)
GO TO 120
100 CONTINUE
WRITE (10,6) SFNAM
6 FORMAT (//,"**** ERROR **** ERROR **** ERROR ****",/,
14X,"FILE ",20A2," NOT FOUND . . .")
STOP
```

Appendix B.
(Continued)

```
C --- DELETE OLD REPORT
      DELETE "SLRRPT"

C --- OPEN REPORT FILE SLRRPT
      120 OPEN 2, "SLRRPT", ATT = "SOP"

C --- READ DATA RECORD
      140 CALL RDDROSDATA (EOF)
           IF(EOF) GO TO 220

C --- REPORT DATA

           CALL WRDROSDATA (LINE,PAGE,NATE(1))
           GO TO 140

C --- EOF DETECTED
      220 CLOSE 1
           IF (LINE.NE.O.OR.PAGE.NE.O) GO TO 250
           TYPE
           TYPE " EMPTY DATA FILE"
           CLOSE 2
           STOP

      250 CLOSE 2
           TYPE
           TYPE " REPORT READY IN 'SLRRPT'"
           END
```


Appendix C.

```
COMPILER NOSTACK
C *** PROGRAM NAME:          RDDROSDATA.FR
C *** WRITTEN BY:           WARREN JEDERBERG
C *** PURPOSE:              TO READ DATA FOR MAKING REPORTS
C ***                       FOR THE SLRL-DROSOPHILA ASSAY
```

```
SUBROUTINE RDDROSDATA (EOF)
COMMON/DREC/NR,MNUM(6),CNAM(6),BFF,BFL,BFNL,BSF,BSL,BSNL,
1BTF,BTL,BTNL,BLF,BLL,BLNL,TF,SL,ML,TL,TNL,TT,MR
```

```
INTEGER NR,MNUM,CNAM,BFF,BFL,BFNL,BSF,BSL,BSNL,BTF,BTL,BTNL,
1BLF,BLL,BLNL,TF,SL,ML,TL,TNL,TT
```

```
REAL MR
```

```
LOGICAL EOF
```

```
READ (1,100, END= 120) NR,MNUM,CNAM,BFF,BFL,BFNL,BSF,BSL,BSNL,
1BTF,BTL,BTNL,BLF,BLL,BLNL,TF,SL,ML,TL,TNL,TT,MR
```

```
100 FORMAT(I4,1X,6A1,1X,6A1,4(1X,3I2),1X,I2,1X,3I2,
12(1X,I3),1X,F6.2)
RETURN
```

```
120 EOF = .TRUE.
RETURN
END
```

Appendix D.

```
C *** PROGRAM NAME:          WRDROSDATA.FR
C *** WRITTEN BY:           WARREN JEDERBERG
C *** PURPOSE:             THIS SUBROUTINE HANDLES PAGING AND
C ***                      OUTPUTTING OF RECORDS FOR DROS RPT.
```

```
      SUBROUTINE WRDROSDATA (LINE,PAGE,IDATE)
      INTEGER NR,MNUM,CNAM,BFF,BFL,BFNL,BSF,BSL,BSNL,BTF,BTL,BTNL,
1     BLF,BLL,BLNL,TF,SL,ML,TL,TNL,TT
```

```
      DIMENSION IDATE(5)
      REAL MR
```

```
      COMMON/DREC/NR,MNUM(6),CNAM(6),BFF,BFL,BFNL,BSF,BSL,BSNL,BTF,BTL,
1     BTNL,BLF,BLL,BLNL,TF,SL,ML,TL,TNL,TT,MR
      IF (LINE.GT.0.AND.LINE.LT.54) GO TO 120
```

```
      PAGE=PAGE + 1
      WRITE (2,100) (IDATE(I),I=1,5), PAGE
```

```
100  FORMAT (1H1,42X,"LETTERMAN ARMY INSTITUTE OF RESEARCH",
1     1/,39X,"SEX-LINKED RECESSIVE LETHAL DROSOPHILA ASSAY",
2     2/,50X,"(RAW DATA PRINT-OUT)",
3     3//," DATE:",2X,5A2,94X,"PAGE:",1X,I3,
4     4//,27X,"BROOD #1:   BROOD #2:   BROOD #3:   BROOD #4:",9X,
5     5"SUMMARY TOTALS",4X,"TOTAL",4X,"MUTATION",/,
6     61H+,26X,4(9(" "),4X),3X,19(" "),
7     7/," RUN:",2X,"MALE:",2X,"COMPOUND:",4X,4("F: L: NL:",4X),3X,
8     82X,"TF SL ML TL TNL",3X,"TESTS:",3X,"RATE (%)")
```

```
      LINE = 3
```

```
120  WRITE (2,140) NR,MNUM,CNAM,BFF,BFL,BFNL,BSF,BSL,BSNL,
1     1BTF,BTL,BTNL,BLF,BLL,BLNL,TF,SL,ML,TL,TNL,TT,MR
```

```
140  FORMAT (/ ,I4,3X,6A1,1X,6A1,7X,4(3(I2,1X),4X),5X,4(I2,1X),I3,
1     14X,I3,6X,F6.2)
      LINE = LINE + 2
```

```
      IF (LINE.GE.54) GO TO 150
      RETURN
```

```
150  WRITE (2,160)
```

Appendix D.
(Continued)

```
160 FORMAT (/, " EXPLANATORY NOTES: F=FAILURES, L=LETHALS, NL=NONLETHALS", /,  
120X, "TF=TOTAL FAILURES, SL=SINGLE LETHALS, ML=MULTIPLE LETHALS, TL=",  
2"TOTAL LETHALS, ", /, 20X, "TNL=TOTAL NONLETHALS", /)
```

```
LINE=0  
RETURN
```

```
END
```

Appendix E.

```
C --- TO CONVERT FILE NAMES TO USE IN OPEN STATEMENTS
SUBROUTINE STRING(LINE,LLEN)
  COMPILER STATIC
  DIMENSION LINE (LLEN)
  DO 100 I=1,LLEN
  IF (LINE(I).EQ." ") LINE(I)=0
  IF (FLD(LINE(I),9,16).EQ.FLD(" ",9,16))FLD(LINE(I),9,16)=0
100 CONTINUE
  RETURN
  END
```

END

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