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UC-48 - Biology and Medicine

COMPUTER PROGRAM FOR INBRED AND/OR HYBRID  
ANIMAL BREEDING AND PRODUCTION COLONIES

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Computing Technology Center

Oak Ridge Gaseous Diffusion Plant

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JULY 1968

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CONTENTS

ABSTRACT . . . . .	1
I. INTRODUCTION . . . . .	1
II. GENERAL DESCRIPTION OF PROGRAMS . . . . .	3
III. <u>MATCAR</u> PROGRAM . . . . .	7
IV. <u>MATGEN</u> PROGRAM . . . . .	22
V. <u>SUMCAR</u> PROGRAM . . . . .	33
VI. <u>MASCAR</u> PROGRAM . . . . .	34
VII. <u>REMCAR</u> PROGRAM . . . . .	37
VIII. SUMMARY . . . . .	38
IX. ACKNOWLEDGMENT . . . . .	39
X. REFERENCES . . . . .	39
APPENDIX A . . . . .	40
Master Record . . . . .	40
APPENDIX B . . . . .	43
Input Data . . . . .	43
APPENDIX C . . . . .	49
Error Messages . . . . .	49
APPENDIX D . . . . .	51
Flow Diagram . . . . .	51
APPENDIX E . . . . .	53
List of COBOL Programs . . . . .	53

COMPUTER PROGRAM FOR INBRED AND/OR HYBRID  
ANIMAL BREEDING AND PRODUCTION COLONIES

B. S. Bishop and M. G. Hanna, Jr.

ABSTRACT

Five computer programs have been developed to process records on animal breeding and production colonies. The programs provide means for creating and maintaining complete master records on the lineage and current status of the colonies and for, listing as output, supervisory action that has been taken as well as maintenance duties that should be performed. The programs were written in the COBOL language for the IBM-7090 computer.

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I. INTRODUCTION

A complicated and time consuming factor in maintaining a breeding colony of mice for laboratory use is the processing of data required to conduct the necessary events of the colony on a schedule. The problem is further complicated when strict barrier conditions (sterilized material and showered personnel) must be applied in a specific pathogen free colony, since either the record-keeping materials must be sterilized before being brought into the animal rooms or a data transmission system must be installed within the barrier. Whichever method is used in collecting data,

additional time must be spent in accumulating these data and retrieving the information needed to schedule the future events of the colony. Assuming that the animal caretakers are trained to report the immediate data on the colony, when a manual system of record keeping is employed, generally one additional person is needed to document these data and schedule the future events.

Computers have been used to maintain a variety of data in the commercial fields and have proved to be faster and more accurate than manual methods. Based on a combined breeding and experimental program of Serrano and Amsbury (1966), a modified system has been devised to apply computer methods specifically to animal record keeping and colony status. The computer programs have been used for two and one half years to store records of a colony of specific pathogen-free mice. The animals are housed in a barrier facility and animal caretakers report the daily events of the colony on data sheets. The data cards are keypunched directly from these data sheet entries. An alternate system provided in the program is the transmission of data to a punch card format via an IBM 357 data collection system. The data from the cards are matched to a master tape record for each breeder cage by the computer program and the current data are added to the appropriate section of the master record. Another section of the computer system scans the updated master record, issues a printed list of dates in final printed form for litter weanings, animal matings, or breeder retirements, and prints a card for animal cage identification. Another section of the computer system gives a weekly summation of the colony and a complete list of all the master tape records.

## II. GENERAL DESCRIPTION OF PROGRAMS

The five programs associated with the automatic record keeping system are code-named MATCAR, MATGEN, SUMCAR, MASCAR, and REMCAR and are briefly described below:

- A. MATCAR - maintains the master file on all breeding animals. It creates master records for newly mated animals, records any new events in the life of the colony, makes error analyses of the input (transaction) data, and deletes any invalid records. The program also generates schedules of coming events (weanings, matings, retirements, etc.), and prints the cards necessary for cage identification. The data are originated from entries on data sheets by the animal caretakers.
- B. MATGEN - is essentially the same program as MATCAR with the exception of the input data format. The data for this program are originated through the use of an IBM 357 data collection system. The punched cards necessary to propagate the data collection system are also provided.
- C. SUMCAR - provides a summary of all animals available for experimental and breeding purposes. This summary includes unweaned animals and those currently in "holding" cages.
- D. MASCAR - supplies a complete listing of the master file. Some options of the type of information listed are available.

- E. REMCAR - removes the breeding records of inactive animals to a separate historical master tape.

#### Master File and Animal Number Description

Records are maintained on each female breeder on a binary master tape and are amended or updated as new information becomes available. A new master tape is created each time any information is added. The females are identified by an eleven digit number which contains the strain, room, and cage numbers. If the female is mated at the time she enters the program, it is necessary to supply a female number that is different from any other female number already on the master tape. However, if the mating is between offspring of a female already on the master tape, it is necessary to provide the mother's female number as well as any additional information necessary to create a new female number for the offspring.

Data are entered either through data sheet entries (MATCAR program) or through the IBM 357 data collection system (MATGEN program) to record information on: (1) the birth of a litter (six litters are allowed), (2) death of an animal before weaning, (3) weight of a litter at weaning, (4) weaning of a litter, (5) assignment to a separate cage at weaning, (6) mating of a breeding pair, (7) assignment to the experimental program, or, (8) the death of an animal. A description of the input data is given in Appendix B. The master tape is maintained in female number sequence and the incoming data are sorted in this sequence before being processed. The data are matched to the master tape by female number and each female record is amended by all matching data cards.

Since offspring mating transactions can generate female numbers that are not in proper sequence, a temporary storage table is provided in the computer memory to store new female records. This table is scanned each time a master record is read and all records of female numbers lower than the current master record are transferred to the new tape.

### Program Output

The output will be comprised of master tape record lists, event prediction lists, printed cage cards, and error messages. If the MATGEN program is used, four cards are punched for each cage: (1) an adult female card, (2) an adult male card, (3) a female offspring card, and (4) a male offspring card. These cards are used as input data to the IBM 357 data collection system. New offspring cards are punched and new cage cards are printed when a litter is weaned; the offspring card for the litter being weaned is placed on the weaning cage. The offspring are not individually identified.

The prediction lists will be sorted according to room number and each room list will be printed on a separate page for convenient distribution to the animal rooms. The weaning and mating lists will be issued one to two weeks before the animals are to be weaned or mated and will indicate the exact date the event is to take place, exclusive of Saturday or Sunday. The wean dates are scheduled to occur three weeks from the birth date and the mate dates are scheduled six weeks from birth. The retirement list indicates the date a female breeder is to be retired for one of the following three reasons:

1. She has produced the fifth litter.
2. She has had three consecutive non-viable litters.
3. She has produced no litter for a period of 60 days.

Since it is possible for the sixth litter to be born before appropriate retirement measures are taken, the program allows for data storage of the sixth litter.

Error checks are made on the incoming data and detection of any error results in the rejection of the transaction. Errors may also be detected in the master records. A list of the error messages that may be reported is given in Appendix C.

At the time a breeding animal is removed or killed, a new five-digit identification number may be assigned to the animal for unique identification in a pathology program. Space is also provided in the master record for a removal cage number if the breeding animal is removed alive. A two-digit numeric removal code is stored to indicate the reason for removal. The removal information is recorded separately for the female and the male breeder.

When a program transaction is made to assign offspring animals to an experimental program, a punched card output is produced which contains the experimental cage number, the number of animals being assigned to the experimental cage, the date of assignment, the birth date of the animals, and the mother's cage and room number. The cards may be used as input to an experimental program.

When the master tape has been updated, the tape is rewound and a one-line-per-record list is produced for all of the breeders on the master tape. Both live and dead animals are included in the list.

Appendix D shows a simplified flow diagram of the programs and a complete list of the COBOL language programs is given in Appendix E. A more detailed description of the programs is presented in the following pages.

### III. MATCAR PROGRAM

#### Program Description

The MATCAR computer program is designed to create and update a master tape containing records of breeding animals which produce offspring to be used for experimental purposes and to perpetuate the breeding colony. The breeding colony consists of both inbred and hybrid animals. The animals are identified by a three-digit strain number assigned at the time they are introduced to the computer program, for example, a C57 Black strain has been assigned the strain number 011. The master tape records are identified by a number assigned to the female breeder at the time of mating and the master tape is maintained in ascending record number sequence. The record number is divided into fields containing the three-digit strain numbers a two-digit room number and a six-digit cage number. An example of a master record number may be:

Strain	Room	Cage
011	02	000132

The male breeder is identified only by the female number; and once a mated pair of animals have been assigned to a given room and cage number, they must maintain the same master record number. An additional three-digit generation count is carried for the inbred animals and is increased by one for each inbred mating

controlled by the computer program. The generation count for hybrid animals is carried as zero. A further genealogical identification is carried by adding the female's mother's number to the master record which for the inbred animals is the same for the male. The male genealogical record is not maintained for hybrid animals. The master records are made unique by varying the room and cage numbers and any attempt to assign an identical record number to two pairs of animals results in an error message and a rejection of the second set of data entered. Stock animals may be added to the master tape at any time by the assignment of a unique record number and the setting of an appropriate control field on the input data sheet.

Offspring animals are not individually identified and are maintained by their mother's number and a litter number until they are weaned at three weeks of age. When the offspring are weaned, they are sexed, weighed as a litter, and assigned either to a HOLDING cage for future mating or a RESEARCH cage for experimental purposes. HOLDING-cage animals may be mated as inbred or hybrid matings. For easy identification, and as a signal to the computer, the cage numbers have been divided into four ranges of numbers as follows:

000000 - 099999	Inbred mating cages
100000 - 499999	Holding cages
500000 - 899999	Research cages
900000 - 999999	Hybrid mating cages

The range of cage numbers may be repeated for each room. When the animals are assigned to a mating cage from a holding cage, the computer assigns the mother's strain number if the mating-cage number falls in the inbred mating-cage range, or a predetermined strain number if the cage number falls in the hybrid mating-cage range.

The hybrid strain numbers are set in the program and are selected by the strain number on the female offspring mating transaction. The information for research offspring animals is recorded in the mother's record and a punched card output is produced to be transmitted to another computer program. A complete list of information carried for each master record is shown in Appendix A.

The computer program will create a master tape with all new records (startup case) when no master tape is available, or add information to an existing master tape (update case) once a master tape has been created. In either case all master records are subjected to a scanning procedure in the program which produces supervisory lists of actions to be completed, printed cage cards to be used as visual cage identification, and litter summary information.

#### Input Data

The first input data card is used to control the flow of the program and to obtain the correct date for calculating the prediction lists. The remainder of the data consists of information concerning an event applicable to an existing master record or the creation of a new master record (see Appendix B for a list and format of input data). The data cards, with the exception of the control card, are sorted by record number and transaction date at the beginning of the computer program.

Four alphabetic sex codes are used on the data cards to indicate the type of animal involved in the transaction. The codes are: FAD, MAD, FOF, and MOF which represent a female adult, a male adult, a female offspring, and a male offspring, respectively. The correct litter number is needed in transacting litter

events since the program provides for the storage of information for six litters for each breeder female. During the updating of the master record the transaction data are checked for possible errors and error messages are printed. When an error is detected on the transaction data, the data are not transferred to the master record. A list of the error messages that may be encountered is shown in Appendix C. An override signal of 1 indicates that the card information is to replace the previously entered master record information. If the information to be changed could occupy more than one position in the master record, the correct position is indicated in the counter position (column 71) on the data card.

To create the first master tape (startup case) the appropriate control is set in column 8 of the control card and the remainder of the data appears on record addition data cards, which contain the transaction date, the strain, room, breeder cage, and litter number (if available), and the correct generation count. Since the transaction date is used as the first mate date, the birth date of the animal may be entered in the mating-cage number field on the data card. The generation count field on the data card is also used to delete an unwanted record from the master tape and add additional stock animal records to the master tape after the first master tape has been created. A generation count of 999 results in the deletion of a master record with the corresponding record number and any other non-zero generation count results in the addition of a new record providing the female number on the card is unique. The hybrid animal generation count is reset to zero by the computer program.

The data cards containing a blank or zero generation count are used to transmit information concerning events to an existing master record. The events that may be recorded are:

1. Birth of a litter
2. Weaning of a litter
3. Weight of a litter at weaning
4. Assignment of offspring to holding cages for mating
5. Assignment to an experimental program
6. Mating of offspring from holding cages
7. Death or retirement of an adult breeder
8. Death of offspring before weaning
9. Death of offspring in a holding cage

An example of some of these data recorded on a data sheet used by the Biology Division of the Oak Ridge National Laboratory is shown in Figure 1. The cards represent the following transactions (see legend to the left of the page in Figure 1):

- a) Birth transaction
- b) Wean transaction
- c) Weight transaction
- d) Holding to mate transaction; FOF and MOF
- e) Research cage transaction; FOF and MOF
- f) Mating transaction; three new breeder pairs
- g) Removal transaction; retirement of one female adult and one male adult
- h) Combination; birth of 3rd litter and forced weaning of 2nd litter which was weighed and placed into holding
- i) Addition of new breeder record to master tape

INHALATION CARCINOGENESIS BREEDING COLONY DAILY RECORD

DATE 04-14-67\*  
 STRAIN 011  
 ROOM 02

REQUEST \_\_\_\_\_ BREEDER TECHNICIAN *Joe Gray*

	BREEDER		BIRTH		WEAN		WEIGH		HOLDING		RESEARCH		MATING		REMOVAL				LITTER	SEX	COUNTER	OVERRIDE	ADD RECORD
	CAGE NO.	NO. BORN	NO. F	NO. M	NO.	WT.	CAGE NO.	NO.	CAGE NO.	NO.	CAGE NO.	NO.	CAGE NO.	NEW ID NO.	NO.	CODE	GEN.						
a.	020115	08				1												1	F				
b.	020120		04	03														2	F				
c.	020113				08	720												4	F				
d.	020127							400126	04									2	F				
	020127							400127	04									2	M				
e.	020119										500188	04						3	F				
	020119										500189	01						3	M				
f.	020130												020301					2	F				
	020130												020302					2	F				
	020130												020303					2	F				
g.	020137															0108		F	A	D			
	020137															0108		M	A	D			
h.	020140	09	04	04	08	7504	0023	04										3	F				
	020140						40023	104										2	F				
	020140																	2	M				
i.	021196												030367	**				3	F	A	D		111

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Fig. 1 - Input record sheet.

Birth of a litter — The transaction date is entered as the birth date with the number of animals born recorded for the given litter. Either FOF or MOF may be used as the sex code. The date and number born may be changed by the use of the override signal. A zero transaction date removes the information from the record when combined with the override signal.

Weaning of a litter — Since the animals are sexed at weaning, space has been provided to record the number of weaned females and the number of weaned males separately. A sex code of either FOF or MOF may be used and the data may be changed with the use of the override signal. A combination of a zero transaction date and the override signal will delete the data from the master record.

Weight of a litter at weaning — The total litter weight (in grams), the number of animals weighed, and the weighing date, are recorded. The information may be changed by the use of the override signal or removed with a transaction date of zero combined with the override signal.

Assignment of offspring to a holding cage — Holding cages are used to segregate weaned offspring that are to be assigned to the breeding program. The master record stores the holding cage number and number of animals in each cage for males and females for each of the six litters. Since the date assigned to the holding cage is assumed to be the same as the wean date, the date is not stored with the holding cage information. The appropriate sex (FOF or MOF) and litter number should be entered for the transaction. The data may be changed by using the override signal or deleted by a transaction date of zero with the override signal.

Assignment to an experimental program — The assignment to an experimental program transaction results in the assignment date, the research cage number, and the number of animals in the cage being stored in the mother's record. To allow the offspring animals to be sexed, and litters to be split between research cages, the mother's record stores information for two female and two male research cages. The transaction also results in a punched card with the following format that may be used as input data to another computer program:

<u>Column</u>	<u>Data</u>
1 - 6	Transaction date
7	Card type
8 - 10	Program number
11 - 16	Research cage number
17 - 19	Station number (used with an IBM 357 system)
20 - 25	Birth date
26	Blank
27 - 32	Mother's cage number
33 - 34	Blank
35	Litter number
36	Sex (F -female, M -male)
37 - 38	Strain
39 - 40	Number of animals
41 - 44	Weight of animals
45	Blank
46	Override signal (if needed)

The card type will be 3 the first time the transaction is entered, however, if the override signal is used to change the master record information, another

card will be punched with a card type of 2 and an override signal of 1. If the information is deleted from the master record a punched card is produced with a card type of 2 with no override signal.

Mating of offspring — The mating of offspring transaction requires the mating cage number, the correct litter count, a sex code of FOF, and the mother's record number. If the cage containing newly mated animals is to be moved to another room, the new room number should be entered in the "change room number" field on the data sheet. When the transaction is matched to the mother's record in the program, the necessary information is placed in a temporary storage table and a new record is put on the master tape when the proper sequence is located for the record number. The inbred animals assume the same strain number as the mother. The same type of transaction is entered for the hybrid animals, however, the strain numbers are determined by the program, for instance, when a C57 Black female (strain 011) is mated with a C3H male (strain 053) the program automatically assigns the new strain number 052 to the hybrid mated pair. As new hybrid strains are combined the program must be adjusted to assign the correct strain number. If the program has not been adjusted to accept the incoming hybrid mating, a strain number of 999 will be assigned to the hybrid pair. The hybrid mating records are stored in the same storage table as the inbred strains. The storage table is maintained in record number sequence.

For both the inbred and hybrid animals the mating-cage number and the mate date are stored in the mother's record. If incorrect data are entered, the mother's record may be changed with the use of the override signal or the breeding

information deleted from the mother's record by using a transaction date of zero with the override signal. Since the mother's record provides for six breeder-cage numbers to be stored for each litter, the correct position to be changed or deleted must be entered in the counter field on the data card when the override signal is used. The override signal on the mating transaction affects only the mother's record and the delete record code (999 in the generation count) must be used to delete the incorrect female record.

Death or retirement of adult breeder — When either a female or male breeder dies or is retired, the information is recorded by entering one of the removal codes identified as follows:

<u>Removal Code</u>	<u>Reason for Removal</u>
01	Dead from natural cause
02	Removed from breeding program
03	Dead from physical cause
04	Dead as a result of treatment
05	Dead from disease
06	Assigned to a testing program
07	Missing
08	Retired

The removal code list may be expanded if desired. A female breeder may be retired for one of the following three reasons:

1. She has produced the sixth litter.
2. She has had three consecutive non-viable litters.
3. She has produced no litter for a period of 60 days.

If the breeder animals are removed alive and assigned to another cage, the cage number may be included as a part of the removal information. The breeder animal may be killed and sent to a pathology or testing program, and a new five digit pathology number may be stored. An override signal is not necessary to replace the removal information on the master record. The information may be reset to zero by entering a positive removal code and zero transaction date.

Death of an offspring before weaning — If one or more offspring die before the wean date has been entered on the master record, the information is recorded by using a sex code of either FOF or MOF, entering the number of dead offspring and a removal code of 1, 3, 4, 5, 8, or 9. A removal code of 2 or 6 indicates that the animals were removed alive before weaning and a code of 7 indicates that the animals were missing. The override signal may be used to correct erroneous data. A counter of 1 changes the number dead, a counter of 2 changes the number missing, and a counter of 3 changes the number removed when combined with the override signal. If the number removed on the data card is zero, the information will be removed when combined with the override signal, the appropriate counter and a removal code.

Death of offspring in a holding cage — Any offspring death that occurs after the wean date has been recorded on the master tape is assumed to be the death of a holding-cage animal, since the records for experimental animals are recorded by a computer program which maintains the experimental data. The number of animals removed, as shown on the data card, is subtracted from the number of animals either

in the female or the male holding cage depending on the sex code given on the data card. The override signal is not applicable in this case since the number of animals in the holding cage may be adjusted by using an override signal on the assignment to a holding cage transaction.

Since the transactions described above are sorted by record number, each existing master record is read into an input field in the computer and updated with all of the corresponding record number transactions. The master record is then moved to an output field and scanned for any supervisory or maintenance procedures that are necessary. New records that result from mating offspring or additional record transactions are moved directly to the output field and subjected to the same scanning procedure as an updated record.

#### Supervisory and Maintenance Procedures

The scanning section of the computer program uses the information from the master record to output the printed cage cards and to give lists of anticipated weanings, matings, and retirements of animals. The record status field in the master record is set to N when a new record is added. Upon detecting an N in the record status field, the scanning procedure writes a printed card to identify the breeding cage and places a zero in the record status field which is maintained as zero as long as the record is active. When the breeders are retired and all litter information is complete the scanning procedure places an R in the record status field, indicating that the record is ready to be moved to a historical master tape.

Another status field is carried on the master record for each litter and carries the following connotation:

- 0 - No litter information
- 1 - Birth of a litter
- 2 - Weaning has been predicted
- 3 - Holding cards have been printed
- 4 - Mating has been predicted

A Q-Factor (Lane-Petter, et al., 1959) is calculated for each female breeder by the following formula:

$$\text{Q-Factor} = \frac{\text{number of offspring weaned}}{\text{total number of days in breeding}} \times 100$$

The Q-Factor is an indication of the breeding capability of the female and is used to select future matings of offspring. When available, the Q-Factor for the previous generation is carried in the master record and a weighted Q-Factor is calculated according to the number of litters a female has produced by the following method:

No Litter and first Litter:

$$\text{Weighted Q-Factor} = \text{Breeder's Mother's Q-Factor}$$

Second Litter

$$\text{Weighted Q-Factor} = 0.25 \text{ Breeder's Q-Factor} + 0.75 \text{ Breeder's Mother's Q-Factor}$$

Third Litter

$$\text{Weighted Q-Factor} = 0.50 \text{ Breeder's Q-Factor} + 0.50 \text{ Breeder's Mother's Q-Factor}$$

Fourth Litter

$$\text{Weighted Q-Factor} = 0.75 \text{ Breeder's Q-Factor} + 0.25 \text{ Breeder's Mother's Q-Factor}$$

## Fifth and Sixth Litter

Weighted Q-Factor = Breeder's Q-Factor

Printed Cage Cards

Two types of cage cards are printed for the animal cages and are headed:

BREEDING

HOLDING

The BREEDING card provides a visual summary of the litters born to a female breeder. The cards are first produced when a new record is placed on the master tape. The cards are produced with additional litter information as each successive litter is transferred to the predicted weaning list. When a holding-cage number is encountered along with a litter status field of 2, a HOLDING-cage card is printed with the correct holding-cage number. The program assumes that the holding cages for both the males and the females will be available at the time the cards are printed; therefore, if either cage number is not available, a HOLDING card with cage number "zero" will be printed. An override of the holding cage information will produce another set of HOLDING cards. Samples of the BREEDING and HOLDING cards are shown in Figure 2.

Weaning List

When the program encounters a litter status field of 3 and the elapsed time between the birth date and the current date exceeds twenty-eight days, a projected mate date of six weeks from the birth date is calculated and the information is recorded on the mate list, along with the female number, the holding cage number, and the number of animals in the female or male holding cage. The litter status field is increased to 4.

ORNL-BIO 17454

BREEDING							
CAGE CCCCIC				ROOM C9			
FEMALE NUMBER		LITTER	SEX	MATE DATE			
053 09 CCCCIC 0E2		I	FAD	NCV 11 65			
LITTER NO.	BIRTH DATE	NO. BORN	NC.	F WEAN	NC.	M WEAN	
I	DEC 3 66	06		04		04	
I	DEC 31 66	06		02		04	
I	FEB 10 67	06		03		03	
I	MAR 6 67	12		03		06	
I	APR 3 67	10					

HOLDING			
CAGE 400275		ROOM C2	
FEMALE NUMBER	LITTER	SEX	MATE DATE
011 02 020029 002	4	FFF	MAR 30 67
NO OF MICE	4	TREATMENT	
SEX	FFF		
DATE OF BIRTH	FEB 16 67		

Fig. 2 - BREEDING and HOLDING cage cards.

### Retirement List

Female breeders are placed on the retirement list for the reasons given previously. Although the female breeder is placed on the retirement list when the birth of the fifth litter is detected, the breeder is not usually retired until the sixth litter has been weaned. Some error checks are made on the master record during the scanning procedure and the error messages are included in the list given in Appendix C.

### Output

The sorted transactions are listed as the first output of the program (Figure 3) followed by any error messages that may occur during the updating procedure (Figure 4). A print-out of the master record is given for each record that is amended by the input transactions (Figure 5). The prediction lists are then printed in order of room number and prediction date (Figure 6). A new page is started for each room and prediction date in order to facilitate distribution to the animal rooms. When the master tape has been updated, the tape is rewound and a one-line-per-record list is produced for each record on the master tape (Figure 7).

## IV. MATGEN PROGRAM

The MATGEN computer program is designed to create and update a master tape containing records of animals to be used for experimental and breeding purposes. This program uses an IBM 357 data collection system to transmit the input data for the

DATE 03 29 67

MATCAR TRANSACTION LIST

DATE	ANIMAL STR	NUMBER RM	NO BORN	WEANED F	WEIGHT M	HOLDING CAGE-NO	RESEARCH CAGE-NO	MATE CAGE	REMOVAL CAGE-NO	LIT	SEX	ROOM	GEN
		B-CAGE			NO WT	NO	NO		NEW ID NO				
03 22 67	011	02	020052					900203		2	F	8	
03 22 67	011	02	020052					900204		2	F	8	
03 22 67	011	02	020052					900205		2	F	8	
03 22 67	011	02	020056					900138		1	F	8	
03 22 67	011	02	020056					900139		1	F	8	
03 22 67	011	02	020056					900140		1	F	8	
03 22 67	011	02	020056	5	3	9 620	400336			3	F	8	
03 22 67	011	02	020056				400337			3	M	8	
03 22 67	011	02	020060					900169		1	F	8	
03 22 67	011	02	020060					900170		1	F	8	
03 23 67	011	02	020060	3	5	8 530	400344			3	F	8	
03 23 67	011	02	020060				400345			5	F	8	
03 27 67	011	02	020060								3	M	8
03 28 67	011	02	020060	8						3	1	2	M
03 22 67	011	02	020062							10	1	2	F
03 22 67	011	02	020062				400330			1	1	1	F
03 22 67	011	02	020062				400331			3	1	1	M
03 15 67	011	26	001192	2	4			601851	2			3	F
03 15 67	011	26	001192					601852	4			3	M
03 15 67	011	26	001193	3	4	7 540		601851	3			3	F
03 15 67	011	26	001193					601852	1			3	M
03 15 67	011	26	001193					601853	3			3	M
03 23 67	011	26	001194	9						3	1	4	F
03 24 67	011	26	001194							1	1	4	F
03 23 67	011	26	001196	6						1	1	3	F
03 28 67	011	26	001196							5	7	3	F
03 15 67	011	26	001197					601847	1			3	M
03 22 67	011	26	001198	4		4 370		601868	4			3	F
03 22 67	011	26	001203	3	4	7 630		601868	1			3	F
03 22 67	011	26	001203					601869	4			3	M
03 22 67	011	26	001203					601870	2			3	F
03 27 67	011	26	001203	9								3	F
03 27 67	011	26	001207			4 490		601874	1		1	4	F
03 27 67	011	26	001207					601875	2			3	F
03 27 67	011	26	001207					601876	3			3	M
03 22 67	011	26	001208	5								3	F
03 27 67	011	26	001209			1 2 3 260		601875	2			3	F
03 27 67	011	26	001209					601876	1			3	M
03 27 67	011	26	001209									3	F

Fig. 3 - MATCAR transaction list.



MAR 29 1967 MATCAR MASTER TAPE LIST

PAGE 97

FEMALE NUMBER	LO	MOTHER NUMBER	BIRTH DATE	REM	REM DATE	NEW ID	R	CAGE	STAT	LC	BP	TDB	Q1	Q2	QW
011 26	001054	006 3	11 26 66	000875	005	JUL 11 66	F-8	MAR 6 67	R	5	9	194	23.61	23.61	
							M-8	MAR 6 67							
LITTER	MATE DATE	BIRTH DATE	WEAN DATE	E-SIZE	D-SIZE	M-SIZE	R-SIZE	F-WEAN	M-WEAN	WT-DATE	WT	NUM	AV-WT	BREEDER	CAGES
1	ALG 24 66	SEP 26 66	OCT 18 66	10	1			4	5	OCT 18 66	87	9	9		
F-H-CAGE NUM	M-F-CAGE NUM	F-E-CAGE NUM	DATE	M-E-CAGE NUM	DATE			ML							
		601258	4 OCT 21 66	601259	5 OCT 21 66			4							
2	SEP 26 66	OCT 20 66	NOV 11 66	10	1			3	7	NOV 11 66	70	10	7		
F-H-CAGE NUM	M-F-CAGE NUM	F-E-CAGE NUM	DATE	M-E-CAGE NUM	DATE			ML							
		601368	3 NOV 17 66	601367	7 NOV 14 66			4							
3	OCT 20 66	NOV 14 66	NOV 17 66	6	6			ML							
F-H-CAGE NUM	M-F-CAGE NUM	F-E-CAGE NUM	DATE	M-E-CAGE NUM	DATE			10							
4	NOV 14 66	DEC 22 66	JAN 12 67	11				4	7	JAN 12 67	79	11	7	1284	1285
F-H-CAGE NUM	M-F-CAGE NUM	F-E-CAGE NUM	DATE	M-E-CAGE NUM	DATE			ML						1285	1287
		200487		200488		601657	4 JAN 16 67	4							
5	DEC 22 66	FEB 13 67	MAR 6 67	10				4	6	MAR 6 67	71	10	7	1353	1354
F-H-CAGE NUM	M-F-CAGE NUM	F-E-CAGE NUM	DATE	M-E-CAGE NUM	DATE			ML						1355	1356
		200527		200528		601832	1 MAR 6 67	4							
						601834	1 MAR 6 67								

25

Fig. 5 - MATCAR master tape list.

ORNL-BIO 17453

WEAN LIST		03 29 67	
ROOM-NO 27			
ANIMAL NUMBER	WEAN DATE	WQ-FACTOR	
011 27 010544 009	APR 11 67	9.61	
011 27 010407 007	APR 11 67	9.23	
011 27 010505 003	APR 11 67	.36	
011 27 010496 008	APR 11 67	1.29	
011 27 010378 008	APR 11 67	17.53	

MATE LIST		03 29 67	
ROOM-NO 02			
ANIMAL NUMBER	MATE DATE	FEMALE	MALE
400348	011 02 020159 003	APR 13 67	4
400349	011 02 020159 003	APR 13 67	4
400340	011 02 020047 003	APR 13 67	2
400341	011 02 020047 003	APR 13 67	2

MATE LIST		03 29 67	
ROOM-NO 27			
ANIMAL NUMBER	MATE DATE	FEMALE	MALE
100900	011 27 010417 007	APR 4 67	4
100899	011 27 010417 007	APR 4 67	4

RETIPEMENT LIST		03 29 67	
ROOM-NO 26			
ANIMAL NUMBER	RETIPE DATE		
011 26 001255 008	MAR 29 67	NO LITTERS 2 MONTHS	
011 26 001170 007	MAR 29 67	NO LITTERS 2 MONTHS	
011 26 001161 007	APR 6 67	FIFTH LITTER BORN	
011 26 001134 007	APR 3 67	FIFTH LITTER BORN	
011 26 001135 007	APR 6 67	FIFTH LITTER BORN	
011 26 001160 007	APR 7 67	FIFTH LITTER BORN	
011 26 001167 008	APR 10 67	FIFTH LITTER BORN	
011 26 001114 006	APR 11 67	FIFTH LITTER BORN	

Fig. 6 - MATCAR prediction lists.

computer program. With the exception of the input data and the output punched cards used to perpetuate the IBM 357 system, the program is the same as the MATCAR program.

### IBM 357 Data Collection System

The IBM 357 data collection system accepts data at a remote terminal from a badge, a punched card, and a manual entry and transmits the data in that order through a cable system to a master station. The master station precedes the data with the current date supplied by an automatic clock in the master station and transmits the data to an IBM 026 keypunch which produces a punched card output used as input transactions for the MATGEN program. The computer program supplies new punched cards as needed for input to the 357 system.

### Input Data

The first input data card is used to control the flow of the program and to obtain the correct date for calculating the prediction lists. The remainder of the data, as shown in Appendix B, consists of information concerning an event applicable to an existing master record, addition of a new master record or deletion of an unwanted master record. The data cards, with the exception of the control card, are transmitted via the IBM 357 system and are sorted by the record number, transaction date, and transaction code at the beginning of the computer program. If the transaction requires a cage number other than the one given as part of the record number it should be entered in the cage number field (columns 11 - 16). The variable data (number of animals born, etc.) are entered in the manual entry field (columns 39 - 44).

DATE 03 25 67		MASTER TAPE LIST												
FEMALE NUMBER	BIRTH DATE	SEM CODE	STAT	DAYS PREED	LIT	M-PAIR	Q2	QW	PER	WEAN	AVBRN/LIT	AVWT/LIT		
011 26 001106	007 08 08 66	F-00 M-00	D	174	4	4	12.06	9.04	80		6	71		
011 26 001107	007 08 08 66	F-00 M-00	D	174	4	3	10.91	8.18	90		5	50		
011 26 001110	007 08 08 66	F-06 M-00	D	147	3		10.38	5.44	70		7	44		
011 26 001111	007 08 08 66	F-06 M-00	R	153	5		15.68	15.64	80		7	52		
011 26 001114	006 08 10 66	F-00 M-00	D	167	5	5	20.95	20.95	80		9	64		
011 26 001115	006 08 10 66	F-08 M-00	D	145	4		13.10	9.82	60		7	38		
011 26 001116	006 08 10 66	F-08 M-00	R	145	5	3	6.20	6.20	20		10	39		
011 26 001123	006 08 11 66	F-06 M-00	R	160	5	4	13.75	13.75	70		7	52		
011 26 001128	007 08 13 66	F-08 M-00	D	144	5		17.36	17.36	60		7	55		
011 26 001133	007 08 15 66	F-06 M-00	R	132	4	4	12.12	9.07	50		7	42		
011 26 001134	007 08 15 66	F-00 M-00	D	153	5	2	14.37	14.37	70		7	53		
011 26 001135	007 07 02 66	F-00 M-00	D	153	5	2	9.80	9.80	40		8	49		
011 26 001143	007 08 17 66	F-06 M-00	D	151	5		13.90	13.90	50		8	94		
011 26 001145	007 08 19 66	F-00 M-00	D	146	3		8.90	4.45	50		8	43		
011 26 001146	007 08 19 66	F-00 M-00	D	146	4	4	16.43	12.32	100		6	50		
011 26 001153	007 08 19 66	F-00 M-00	D	135	4		16.54	12.40	70		7	58		
011 26 001156	007 08 23 66	F-00 M-00	D	135	4		12.94	9.70	60		6	43		
011 26 001159	007 09 22 66	F-00 M-00	D	132	4		12.87	9.65	50		6	54		
011 26 001160	007 09 22 66	F-00 M-00	D	132	5		25.75	25.75	90		8	62		
011 26 001161	007 09 21 66	F-00 M-00	D	132	5	3	13.63	13.63	60		7	25		
011 26 001163	007 09 21 66	F-00 M-00	D	132	4	3	15.90	11.92	80		7	48		
011 26 001165	008 10 10 66	F-00 M-00	D	124	3		8.87	4.43	70		6	55		
011 26 001167	008 10 10 66	F-00 M-00	D	124	5		13.70	13.70	60		7	31		
011 26 001169	008 10 10 66	F-00 M-00	D	124	4		15.32	11.49	60		9	43		
011 26 001170	007 10 17 66	F-00 M-00	D	118	1		5.08		100		6	57		

DATE 03 25 67

TOTAL NUMBER OF BREEDERS

R29

Fig. 7 - MATCAR tape list.

The events that would add new information to an existing female record are the same as those previously given in the MATCAR program. The transaction codes (column 7 on the transaction card) determine the event to be recorded and are identified as follows:

<u>Transaction Code</u>	<u>Event</u>
0	Add new master tape record
1	Delete a master record
2	Mate offspring
3	Not assigned at present
4	Assign offspring to a research cage
5	Birth of a litter
6	Wean a litter
7	Weigh a litter
8	Assign offspring to a holding cage
9	Death of an animal

Code 0 (Add new master tape record) — A master record may be added to the master tape with a unique animal number through the use of Code 0. The data are supplied by manual entries on a data sheet that simulate an IBM 357 transaction. The transaction card format is used as shown in Appendix B. The birth date of the female breeder is located in the manual entry field. The override signal cannot be used for this transaction.

Code 1 (Deletion of a master record) — A complete master record may be eliminated from the master tape by entering a transaction code of 1 and the record number to be deleted.

Code 2 (Mating of an offspring) — The transaction requires that the mating cage number, the correct litter count, a sex code of FOF, and the mother's record number, be entered in the cage number field. If the newly mated cage is to be moved to another room, the new room number should be entered in the room number field in the manual entry. For both the inbred and hybrid animals the mating cage number and the mate date are stored in the mother's record. Incorrect data may be replaced with the use of the override signal or deleted using a transaction date of zero with the override signal. The delet record transaction (Code 1) should be used to delete the incorrect female record derived for the offspring.

Code 4 (Assignment to an experimental program) — The assignment to an experimental program transaction results in the storage on the mother's record of the assignment date, the research cage number, and the number of animals in the cage. The transaction also results in a punched card output identical to the one produced in program MATCAR.

Code 5 (Birth of a litter) — The transaction date is entered as the birth date with the number born (manual entry) recorded for the given litter. Either FOF or MOF may be used as the sex code. The date and number born may be changed by the use of the override signal and the data may be deleted by using a combination of the override signal with a zero transaction date.

Code 6 (Wean a litter) — Space has been provided to record the number of females and number of males weaned (manual entry) separately. A sex code of either FOF

or MOF may be used and the data may be changed with the use of the override signal or deleted with the zero transaction date and override signal.

Code 7 (Weigh a litter) — The total litter weight in grams and the number of animals weighed (manual entry) are recorded along with the weighing date. The information may be changed or deleted in the usual manner.

Code 8 (Assign offspring to a holding cage) — The master record stores the holding-cage number and the number of animals in the male or female cage for each of the six litters. The appropriate sex (FOF or MOF) and litter should be entered for the transaction. The number of animals involved is in the manual entry. The data may be changed or deleted with the override signal and a combination of a zero transaction date and override signal.

Code 9 (Death of an animal) — Death transactions should be entered for each animal dead, missing, removed, or retired for both the adult breeders and the offspring, with the exception of offspring after they are assigned to a research cage. The death code and removal cage (if applicable) are in the manual entry and the IBM 357 system input card contains the appropriate sex code. The offspring will be listed as dead, missing, or removed before weaning if the wean date for the given litter is zero and death from a holding cage if the wean date is present.

#### Punched Cage Cards

Each breeder cage is equipped with four punched cage cards: (1) one for the female breeder, (2) one for the male breeder, (3) one for the female offspring, and

(4) one for the male offspring. The card is punched with the following format:

<u>Column</u>	<u>Format</u>	<u>Data</u>
1 - 12		Blank
13 - 23	X(11)	Female breeder number
24 - 27		Blank
28	X	Litter number
29 - 31	X(3)	Sex
		FAD - Female adult breeder
		MAD - Male adult breeder
		FOF - Female offspring
		MOF - Male offspring

Columns 1 - 12 in the card are reserved for the IBM 357 system control punches and are entered on the card at a later date. The litter number in the above record always reflects the particular litter into which the animal is born. When the cards are first produced for a newly mated breeding pair, the offspring cards contain the litter number 1. At the time the litter is placed on the predicted wean list, punched cards are produced for the next litter.

The female breeder card (FAD) and the male breeder card (MAD) are used only to record the death of the breeder. Either the female offspring card (FOF) or the male offspring card (MOF) may be used in the following transactions:

1. Birth of a litter
2. Weaning of a litter
3. Weighing a litter
4. Death of offspring before weaning

The female offspring card is used to transact:

1. Assignment to a female research cage
2. Assignment to a female holding cage
3. Death of a female offspring in a holding cage.

The male offspring card is used in the following transactions:

1. Assignment to a male research cage
2. Assignment to a male holding cage
3. Death of a male offspring in a holding cage

A list of error messages that may be encountered during the updating procedure is given in Appendix C.

#### V. SUMCAR PROGRAM

The SUMCAR program provides a summary of animals that are not weaned and animals that are in holding cages. A control card is required as input data with a current date and a "start" date. Output is in the form of two lists:

1. Animals not weaned
2. Animals in holding cages

Summaries of the animals follow the lists. A date eight weeks prior to the current date is calculated by the SUMCAR program and only animals whose birth date is later than the calculated date are included in the output lists.

The control card conforms to the following format:

<u>Column</u>	<u>Data</u>
1 - 6	Current Date (numeric)
11 - 16	"Start" Date (numeric)

The output list for the animals not weaned records the cage number, the birth date, and the total number of animals in the cage. The list is in birth date sort order. A total number of animals is given for each day and week (the week starts on the same day of the week as the "start" day given on the control card). The animals in holding cages are listed by cage number, birth date, cage sex, and number of animals in each cage and the totals are accumulated for each day. A grand total output of animals not weaned, animals in holding cages, and total animals is given at the end of the lists. Totals are also given for each number of female breeders which have 1, 2, 3, 4, 5, and 6 litters in each room, number of litters not weaned for each room, and total number of animals not weaned and in holding for each room. Totals may be accumulated for a maximum of six rooms and six litters.

A complete output of lists and summaries is given for each strain of animals on the master tape, as shown in Figure 8.

## VI. MASCAR PROGRAM

The MASCAR program is used to obtain an output list of the master tape. One female breeder record is listed on each page. One input data card is required with the following format:

<u>Column</u>	<u>Format</u>	<u>Data</u>	
1 - 4	X(4)	Month	} Date of computer run
5 - 6	99	Day	
7 - 10	9(4)	Year	
11		Blank	
12	9	Control Character	
13 - 27	9(14)	Starting female number	
28 - 42	9(14)	Ending female number	
43 - 80	X(37)	Title	

ORNL-BIO 17456

DATE 03 29 67		ANIMALS NOT WEANED		STRAIN 52		
ROOM	CAGE	BIRTH DATE	WEAN DATE	NUMBER	TOTAL/DAY	TOTAL/WEEK
8	900022	03 11 67	04 01 67	9		
8	900017	03 11 67	04 01 67	9		
8	900026	03 11 67	04 01 67	3	31	
8	900047	03 13 67	04 03 67	3	3	
8	900051	03 14 67	04 04 67	6		
8	900052	03 14 67	04 04 67	7		
8	900046	03 14 67	04 04 67	9		
8	900064	03 14 67	04 04 67	5		
8	900053	03 14 67	04 04 67	9	36	234

DATE 03 29 67		ROOM ANIMAL TOTALS		STRAIN 52	
TOTAL NUMBER OF LITTERS NOT WEANED				IN ROOM 8	89
NUMBER OF LIVE BREEDERS WHICH HAVE				1 LITTER IN ROOM 8	96

DATE 03 29 67		ROOM ANIMAL TOTALS		STRAIN 11	
TOTAL NUMBER OF LITTERS NOT WEANED				IN ROOM 2	34
NUMBER OF LIVE BREEDERS WHICH HAVE				1 LITTER IN ROOM 2	2
NUMBER OF LIVE BREEDERS WHICH HAVE				2 LITTER IN ROOM 2	21
NUMBER OF LIVE BREEDERS WHICH HAVE				3 LITTER IN ROOM 2	35
NUMBER OF LIVE BREEDERS WHICH HAVE				4 LITTER IN ROOM 2	16
NUMBER OF LIVE BREEDERS WHICH HAVE				5 LITTER IN ROOM 2	12
TOTAL NUMBER OF MICE IN HOLDING CAGES					376
TOTAL NUMBER OF MICE NOT WEANED					1330
TOTAL NUMBER OF MICE NOT WEANED AND IN HOLDING CAGES					1706

Fig. 8 - SUMCAR list.

Optional output may be obtained by varying the control character in column 12 as follows:

<u>Control</u>	<u>Output</u>
0	List all of master tape
1	List live animals only
2	List dead animals only
3	List a selected portion of the master tape

If option control 3 is chosen, a starting female number and an ending female number must be entered in the positions shown in the control card. The title and run date are listed at the top of each page of output.

## VII. REMCAR PROGRAM

Since the Breeding master tape acquires additional breeder records with each update run, it is desirable to remove inactive records to a separate storage tape. The REMCAR program is designed to remove inactive records from the Breeding master tape and place the records in the proper female number sequence on the Removal master tape.

Only one card is needed as input data for the REMCAR program and it conforms to the following format:

<u>Column</u>	<u>Format</u>	<u>Data</u>
1 - 4	X(4)	Month (alphabetic)
5 - 6	99	Day
7 - 10	9(4)	Year
11 - 12	XX	Control Character
	" "	(Blank) Removal Master present
	"01"	No Removal Master (Start-Up Case)
13 - 15		Blank
16 - 18	X(65)	Title for output

The program requires four tapes:

1. Breeding master in (with inactive records)
2. Breeding master out (minus inactive records)
3. Removal master in (inactive records to date)
4. Removal master out (additional inactive records from Breeding Master).

The signal to designate a breeder record as inactive is an "R" in the record status field on the master record (see Appendix A) generated by the MATCAR program when both breeder animals are listed as removed and all events concerning

the litters are recorded. When an inactive record is placed on the Removal master tape, an output of the record is made using the same output format as the MASCAR program. A total count of the number of records removed from the breeding master tape during the update run is given at the end of the output list.

The entire Removal master tape may be listed using the MASCAR program or a short list (one-line-per-record) may be obtained by using the "list only" option on the MATCAR or MATGEN program.

### VIII. SUMMARY

Due to the complexity of maintaining manual records on breeding colonies of mice used in laboratory experiments and the laborious process involved in retrieving pertinent information from manual records, five computer programs have been developed to store breeding information and provide supervisory control for inbred and/or hybrid animal breeding colonies. The programs accept data from data sheet entries keypunched into cards or data transmitted via an IBM 357 data collection system and punched into cards. The card data are stored on a master tape and updated weekly. The updated tape is then scanned for predictions of colony events such as weanings, matings, etc. Based on the number of young born during a four-week period, a prediction list of mice to be weaned and mice in holding (to be mated) is printed, along with a list of all master tape information. The time and cost required for maintaining the computer program is less than that required for manual record keeping and the reliability and accuracy are greatly improved. This system also provides a means of storing historical records and

tracing the genetic lineage of a colony of inbred or hybrid mice. With all pertinent data stored on a master tape, the program provides a breeding production analysis; i.e., number of young born per female, number of young weaned per female, etc. This analysis can be made weekly or monthly and contributes in determining the number of breeding pairs necessary to produce the desired number of experimental mice at any given period of time.

#### IX. ACKNOWLEDGMENT

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## Appendix A

## Master Record

01	Master Record	
02	Female number	
03	Record number	
04	Strain	999
04	Room	99
04	Breeder cage	9(6)
03	Generation	999
02	Litter number	9
02	Mother number	9(14)
02	Removal information	
03	Female	
04	Removal code	99
04	New identification	9(5)
04	Removal date	9(6)
04	Removal cage	9(6)
03	Male	
04	Removal code	99
04	New identification	9(5)
04	Removal date	9(6)
04	Removal cage	9(6)
02	Birth date	9(6)
02	Q-Factor1	99V99
02	Q-Factor2	99V99
02	Weighted Q-Factor	99V99
02	Mated pairs produced	99
02	Litters produced	9
02	Total days breeding	9(3)

02	Record Status	X
02	Litters (occurs 6 times)	
03	Litter status	9
03	Mate date	9(6)
03	Birth date	9(6)
03	Wean date	9(6)
03	Birth size	99
03	Offspring before weaning	
	04 Number dead	99
	04 Number missing	99
	04 Number removed	99
03	Number of females weaned	99
03	Number of males weaned	99
03	Weight at weaning	
	04 Total litter weight	999V9
	04 Date weight	9(6)
	04 Number of animals weighed	99
03	Female holding cage	
	04 Cage number	9(6)
	04 Number in cage	99
03	Male holding cage	
	04 Cage number	9(6)
	04 Number in cage	99
03	Breeding cage (occurs 6 times)	
	04 Cage number	9(6)
	04 Date assigned	9(6)
03	Experimental cage (occurs 2 times)	
	04 Female experimental cage	
	05 Cage number	9(6)
	05 Number in cage	99

05 Date assigned	9(6)
04 Male experimental cage	
05 Cage number	9(6)
05 Number in cage	99
05 Date assigned	9(6)

The numbers to the left of the data description are data level numbers; the higher numbers represent data pertinent to the preceding lower level numbers. The numbers to the right of the data description represent the amount of space reserved to contain the data; a "9" indicates one numeric character of space. The numbers enclosed in parenthesis indicate the number of times a "9" is repeated, thus a 99 and a 9(2) will reserve two spaces of data. A "V" inserted in a series of "9's" indicates an assumed decimal point. The characters "99V99" may contain the number 41.67. The occurs clause indicates that all the following higher level numbers of data will be repeated \_\_\_\_\_ times; for example, the term:

03 Breeding cage (occurs 6 times)	
04 Cage number	9(6)
04 Date assigned	9(6)

means that locations for six breeding-cage numbers and six assignment dates are reserved.

Appendix B  
Input Data

MATCAR Program

Control Card

<u>Column</u>	<u>Format</u>	<u>Data</u>
1 - 6	9(6)	Current Date
7	X	Blank
8	9	Control
		0 - Startup run - no old master
		1 - Update old master and list new master
		2 - List new master only
9	X	Blank
10	9	Control-2
		1 - Print cards for every record on master
		Blank or any other character - Print only cards for new records, new litters, or new holding cages.

Data Card

<u>Column</u>	<u>Format</u>	<u>Data</u>
1 - 6	9(6)	Transaction date
7 - 9	9(3)	Strain
10 - 11	99	Room
12 - 17	9(6)	Breeder cage number
18 - 19	99	Number born
20 - 21	9(2)	Number of females weaned
22 - 23	99	Number of males weaned
24 - 25	99	Number of animals weighed
26 - 29	999V9	Weight in grams
30 - 35	9(6)	Holding cage number

36 - 37	9(2)	Number assigned to holding cage
38 - 43	9(6)	Research cage number
44 - 45	9(2)	Number assigned to research cage
46 - 51	9(6)	Mating cage number
52 - 57	9(6)	Removal cage number
58 - 62	9(5)	New identification
63 - 64	9(2)	Number of offspring removed
65 - 66	9(2)	Removal code
67	9	Litter number
68 - 70	x(3)	Sex
71	9	Counter
72	9	Override signal
73 - 74	9(2)	Change room number
75 - 77		Blank
78 - 80	9(3)	Generation count for adding new record

### MATGEN Program

#### Control Card

<u>Column</u>	<u>Format</u>	<u>Data</u>
1 - 6	9(6)	Transaction date
7	X	Blank
8	9	Control-1 0 - Startup run - no old master 1 - Update old master and list new master 2 - List new master only
9	X	Blank
10	9	Control-2 1 - Print cards for every record on master  Blank or any other character - Print only cards for new records, new litters or new holding cages.

Data Card

<u>Column</u>	<u>Format</u>	<u>Data</u>	
1 - 6	9(6)	Transaction date	
7	9	Transaction code	} Badge
8 - 10	999	Program identification	
11 - 16	9(6)	Cage number	
17 - 19	999	IBM 357 station number	
20 - 30	9(11)	Record number	} Input Card for 357 system
31		Blank	
32 - 34	999	Generation	
35	9	Litter number	
36 - 38	X(3)	Sex	
		FAD - Female adult	
		MAD - Male adult	
		MOF - Male offspring	
		FOF - Female offspring	
39 - 44	9(6)	Manual entry	
45	9	Counter	
46	9	Override signal	

The manual entry is defined as follows:

Code 0 (Add new master tape record)

<u>Column</u>	<u>Data</u>
39 - 44	Birth date of female breeder

Code 2 (Room change for mating transaction)

<u>Column</u>	<u>Data</u>
39 - 40	Room number
41 - 44	Blank or zero

Code 4 (Assignment to an experimental program)

<u>Column</u>	<u>Data</u>
39 - 40	Number of animals
41 - 44	Weight of animals (if available)

Code 5 (Birth of a litter)

<u>Column</u>	<u>Data</u>
39 - 42	Blank or zero
43 - 44	Number of animals born

Code 6 (Wean a litter)

<u>Column</u>	<u>Data</u>
39 - 40	Blank or zero
41 - 42	Number of females weaned
43 - 44	Number of males weaned

Code 7 (Weigh a litter)

<u>Column</u>	<u>Data</u>
39 - 40	Number of animals weighed
41 - 44	Weight of animals

Code 8 (Assign offspring to a holding cage)

<u>Column</u>	<u>Data</u>
39 - 40	Number of animals in cage
41 - 44	Blank or zero

Code 9 (Death of an animal)

<u>Column</u>	<u>Data</u>
39	Removal code
40 - 44	New identification

Code 9 (Override offspring death before weaning)

<u>Column</u>	<u>Data</u>
39 - 40	Number of offspring dead, missing, or removed
41 - 44	Blank or zero

Note: Use the above form of the manual entry with an override signal.

SUMCAR ProgramControl Card

<u>Column</u>	<u>Format</u>	<u>Data</u>
1 - 6	9(6)	Current
7 - 9		Blank
10 - 15	9(6)	Start date (Currently, date of first Wednesday in the year)

MASCAR ProgramControl Card

<u>Column</u>	<u>Format</u>	<u>Data</u>
1 - 4	X(4)	Month (alphabetic)
5 - 6	99	Day
7 - 10	9(4)	Year
11		Blank
12	9	Control character 0 - List all animals 1 - List live animals 2 - List dead animals 3 - List between Record 1 and Record 2
13 - 27	X(15)	Record 1
28 - 42	X(15)	Record 2
43 - 80	X(38)	Title to be printed on each page

REMCAR ProgramControl Card

<u>Column</u>	<u>Format</u>	<u>Data</u>
1 - 4	x(4)	Month (alphabetic)
5 - 6	99	Day
7 - 10	9(4)	Year

11		Blank
12	X	Control Character Blank - Removal tape present 1 - No removal tape (start-up)
13 - 15		Blank
16 - 80	X(65)	Title for output

Appendix C  
Error Messages

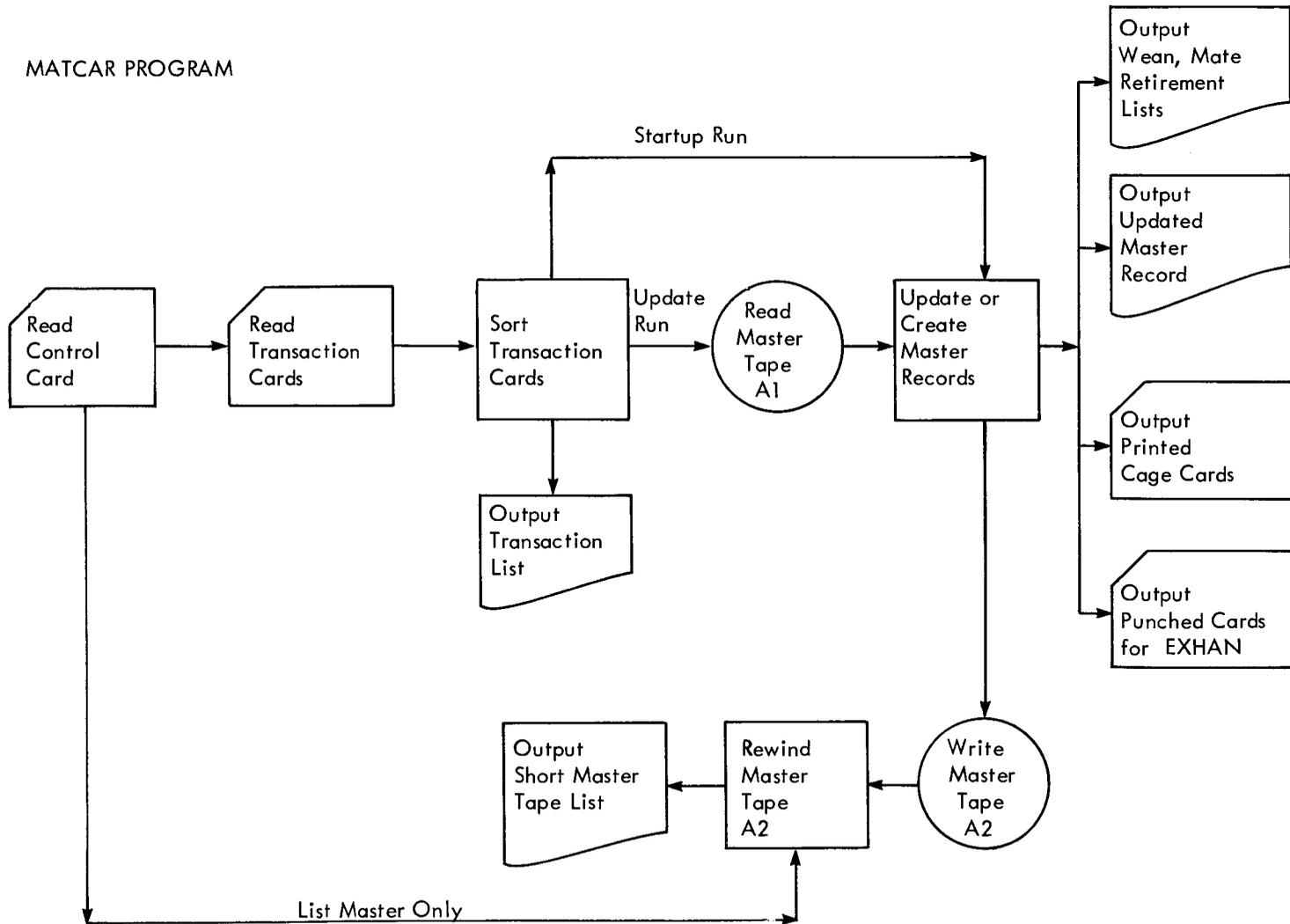
MATCAR and MATGEN Programs

NO CONTROL CARD  
SORT NOT GOOD - RESUBMIT  
NO RECORDS ON OLD MASTER TAPE  
WRONG CARD FOR STARTUP CASE  
ANIMAL NOT ON MASTER TAPE  
ANIMAL ALREADY ON TAPE - CANNOT ADD  
DUPLICATE CAGE NUMBER FOR MATE  
INCORRECT LITTER COUNT  
SEX NOT ENTERED FOR TRANSACTION  
DUPLICATE ANIMAL NUMBER ON CARDS  
INCORRECT BREEDER CAGE NUMBER  
NUMBER DEAD LARGER THAN NUMBER BORN  
HOLDING CAGE DEATHS EXCEED NUMBER IN CAGE  
THIS BIRTH HAS ALREADY BEEN RECORDED  
WRONG LITTER COUNT TO RECORD BIRTH  
BIRTH DATE NOT RECORDED  
DATE LESS THAN 17 DAYS SINCE PREVIOUS BIRTH  
BIRTH NOT RECORDED - CANNOT WEAN  
NUMBER BORN NOT RECORDED  
WEAN DATE NOT RECORDED  
NUMBER OF ANIMALS WEANED NOT RECORDED  
WEAN DATE LESS THAN 17 DAYS FROM BIRTH  
WEAN DATE MORE THAN 28 DAYS FROM BIRTH  
WRONG NUMBER OF ANIMALS BEING WEANED  
LITTER HAS ALREADY BEEN WEIGHED  
NUMBER OF ANIMALS WEIGHED NOT RECORDED

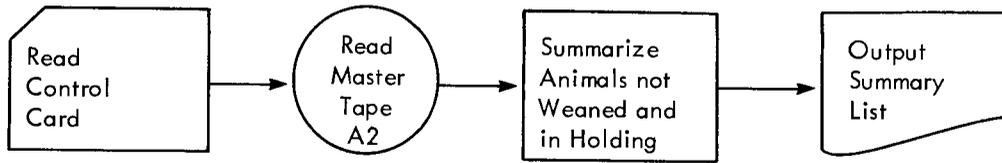
WEIGHT NOT RECORDED  
INCORRECT HOLDING CAGE NUMBER  
NUMBER OF HOLDING ANIMALS NOT RECORDED  
NUMBER IN HOLDING EXCEEDS NUMBER WEANED  
INCORRECT RESEARCH CAGE NUMBER  
NUMBER OF RESEARCH ANIMALS NOT RECORDED  
NUMBER IN RESEARCH EXCEEDS NUMBER WEANED  
CAGE NUMBER HAS BEEN ASSIGNED  
MORE THAN 12 ANIMALS IN CAGE  
THIRD CAGE NOT ADDED  
COUNT WRONG TO CHANGE EXPERIMENTAL CAGE  
NO ANIMALS IN HOLDING  
INCORRECT CAGE NUMBER FOR BREEDER CAGE  
SAVE TABLE FULL - RESUBMIT THIS MATING  
SEVENTH BREEDER CAGE CANNOT BE ADDED  
DUPLICATE BREEDER CAGE NUMBER ON DATA CARDS  
DUPLICATE BREEDER CAGE NUMBER ON MASTER TAPE  
COUNT WRONG TO CHANGE BREEDER CAGE  
MALE DEAD - FEMALE ALIVE  
FEMALE DEAD - MALE ALIVE  
FEMALE DEAD - LITTER NOT WEANED  
ANIMALS NOT MATED - IN HOLDING  
LITTER NOT WEANED  
TOO MANY ANIMALS IN HOLDING AND RESEARCH  
LIST SORT NO GOOD - RESUBMIT THIS JOB

Appendix D  
Flow Diagram

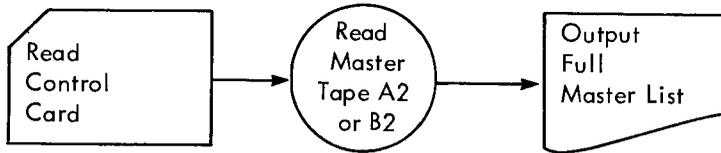
MATCAR PROGRAM



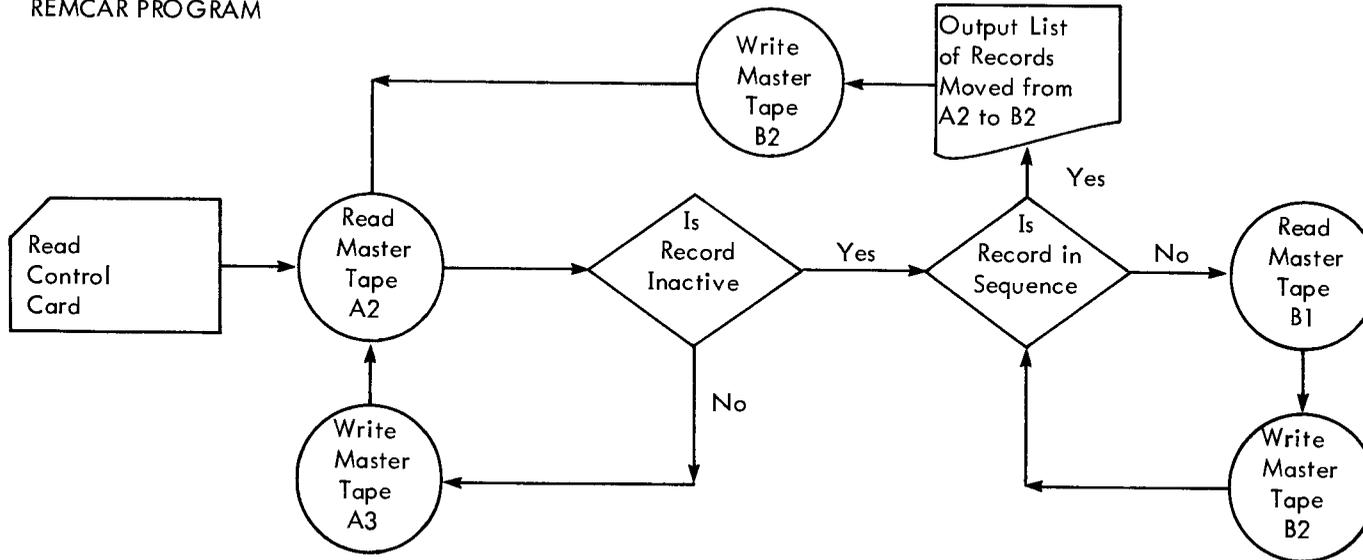
SUMCAR PROGRAM



MASCAR PROGRAM



REMCAR PROGRAM



Appendix E  
List of COBOL Programs

## APPENDIX E

## LIST OF PROGRAMS IN COBOL LANGUAGE

```

$TBCBC MATCAR DECK
  IDENTIFICATION DIVISION.
  PROGRAM-ID. BREEDING PROGRAM.
  AUTHOR. BARBARA BISHOP.
  ENVIRONMENT DIVISION.
  CONFIGURATION SECTION.
  SOURCE-COMPUTER. IBM-7090.
  OBJECT-COMPUTER. IBM-7090.
  INPUT-OUTPUT SECTION.
  FILE-CONTROL.
    SELECT CARD-IN ASSIGN TO SYSIN1.
    SELECT REPORT ASSIGN TO SYSOUI.
    SELECT PUNCH ASSIGN TO SYSPPI.
    SELECT MAMMY-IN ASSIGN TO A(1).
    SELECT MAMMY-OUT ASSIGN TO B(1).
    SELECT NEWMAS RENAMING MAMMY-OUT ASSIGN TO B(1).
    SELECT MAMMY-FX ASSIGN TO B(2).
    SELECT MAMMY-MEX RENAMING MAMMY-EX ASSIGN TO B(2).
    SELECT CA-CAD ASSIGN TO A(2).
    SELECT SRTIN ASSIGN TO B(3).
    SELECT SRTOUT ASSIGN TO A(1).
    SELECT SROUT ASSIGN TO A(1).
  DATA DIVISION.
  FILE SECTION.
  FD CARD-IN LABEL RECORDS OMITTED DATA RECORD IS CARDS.
    01 CARDS.
      02 FIE OCCURS 80 TIMES.
      03 CHAR PICTURE X.
  FD REPORT LABEL RECORDS OMITTED DATA RECORD IS LIST.
    01 LIST.
      02 FILLER PICTURE X(132).
  FD PUNCH LABEL RECORDS OMITTED DATA RECORD IS PUNCH-CARD.
    01 PUNCH-CARD.
      02 FILLER PICTURE X(80).
  FD MAMMY-IN LABEL RECORDS OMITTED RECORDING MODE BINARY DATA
  RECORD MAMMY.
    01 MAMMY.
      02 FEM-NO.
      03 REC.
        04 STRAIN PICTURE 999.
        04 ROOM PICTURE 99.
        04 BCAGE PICTURE 9(6).
      03 COMP-I REDEFINES REC IN MAMMY PICTURE 9(11).
      03 GEN PICTURE 999.
      02 FEMIN REDEFINES FEM-NO IN MAMMY PICTURE 9(14).
      02 PARITY PICTURE 9.
      02 MOTHER PICTURE 9(14).
      02 REMOVE.
      03 FEMALE.
        04 FCODE PICTURE 99.

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04 FNEWID PICTURE 9(5).  
 04 FRDATE PICTURE 9(6).  
 04 FRCAGE PICTURE 9(6).  
 03 MALE.  
   04 MCODE PICTURE 99.  
   04 MNEWID PICTURE 9(5).  
   04 MRDATE PICTURE 9(6).  
   04 MRCAGE PICTURE 9(6).  
 02 BIRTH-DATE PICTURE 9(6).  
 02 QFAC1 PICTURE 99V99.  
 02 QFAC2 PICTURE 99V99.  
 02 WQFAC PICTURE 99V99.  
 02 MATE-PAIR PICTURE 99.  
 02 LITTER-COUNT PICTURE 9.  
 02 TOTAL-DAYS-BREEDING PICTURE 9(3).  
 02 RECON PICTURE X.  
 02 LITTER OCCURS 6 TIMES.  
   03 ML PICTURE 99.  
   03 M-DATE PICTURE 9(6).  
   03 B-DATE PICTURE 9(6).  
   03 W-DATE PICTURE 9(6).  
   03 B-SIZE PICTURE 99.  
   03 DEAD.  
     04 D-SIZE PICTURE 99.  
     04 M-SIZE PICTURE 99.  
     04 R-SIZE PICTURE 99.  
   03 NO-F-WEAN PICTURE 99.  
   03 NO-M-WEAN PICTURE 99.  
   03 WTS.  
     04 WT PICTURE 999V9.  
     04 WTDATE PICTURE 9(6).  
     04 WTNUM PICTURE 99.  
   03 HCAGFF.  
     04 CAGFF PICTURE 9(6).  
     04 FHNUM PICTURE 99.  
   03 HCAGEM.  
     04 CAGEM PICTURE 9(6).  
     04 MHNUM PICTURE 99.  
 03 BREED-CAGE OCCURS 6 TIMES.  
   04 MCAGE PICTURE 9(6).  
   04 MDATE PICTURE 9(6).  
 03 EXP-CAGE OCCURS 2 TIMES.  
   04 FECAGE.  
     05 FCAGEE PICTURE 9(6).  
     05 FENUM PICTURE 99.  
     05 FEDATE PICTURE 9(6).  
   04 MECAGE.  
     05 MCAGEE PICTURE 9(6).  
     05 MENUM PICTURE 99.  
     05 MEDATE PICTURE 9(6).  
 FD MAMMY-OUT LABEL RECORDS OMITTED RECORDING MODE BINARY DATA  
 RECORD MAMMYO.  
 01 MAMMYO.  
 02 FEM-NO.  
 03 STRAIN PICTURE 999.

03 ROOM PICTURE 99.  
 03 BCAGE PICTURE 9(6).  
 02 COMP-MO RDEFINES FEM-NO IN MAMMYO PICTURE 9(11).  
 02 GEN PICTURE 999.  
 02 PARITY PICTURE 9.  
 02 MOTHER PICTURE 9(14).  
 02 REMOVE.  
 03 FEMALE.  
   04 FCODE PICTURE 99.  
   04 FNEWID PICTURE 9(5).  
   04 FRDATE PICTURE 9(6).  
   04 FRCAGE PICTURE 9(6).  
 03 MALF.  
   04 MCODE PICTURE 99.  
   04 MNEWID PICTURE 9(5).  
   04 MRDATE PICTURE 9(6).  
   04 MRCAGE PICTURE 9(6).  
 02 BIRTH-DATE PICTURE 9(6).  
 02 QFAC1 PICTURE 99V99.  
 02 QFAC2 PICTURE 99V99.  
 02 WQFAC PICTURE 99V99.  
 02 MATE-PAIR PICTURE 99.  
 02 LITTER-COUNT PICTURE 9.  
 02 TOTAL-DAYS-BREEDING PICTURE 9(3).  
 02 RECON PICTURE X.  
 02 LITTER OCCURS 6 TIMES.  
   03 ML PICTURE 99.  
   03 M-DATE PICTURE 9(6).  
   03 B-DATE PICTURE 9(6).  
   03 W-DATE PICTURE 9(6).  
   03 B-SIZE PICTURE 99.  
 03 DEAD.  
   04 D-SIZE PICTURE 99.  
   04 M-SIZE PICTURE 99.  
   04 R-SIZE PICTURE 99.  
 03 NO-F-WEAN PICTURE 99.  
 03 NO-M-WEAN PICTURE 99.  
 03 WTS.  
   04 WT PICTURE 999V9.  
   04 WTDATE PICTURE 9(6).  
   04 WTNUM PICTURE 99.  
 03 HCAGEF.  
   04 CAGEF PICTURE 9(6).  
   04 FHNUM PICTURE 99.  
 03 HCAGEM.  
   04 CAGEM PICTURE 9(6).  
   04 MHNUM PICTURE 99.  
 03 BREED-CAGE OCCURS 6 TIMES.  
   04 MCAGE PICTURE 9(6).  
   04 MDATE PICTURE 9(6).  
 03 EXP-CAGE OCCURS 2 TIMES.  
   04 FECAGE.  
     05 FCAGEE PICTURE 9(6).  
     05 FENUM PICTURE 99.  
     05 FEDATE PICTURE 9(6).

04 MECAGE.  
     05 MCAGEE PICTURE 9(6).  
     05 MENUM PICTURE 99.  
     05 MEDATE PICTURE 9(6).  
 FD MAMMY-EX LABEL RECORDS OMITTED RECORDING MODE BINARY  
     DATA RECORDS MAMEX, MAMREC.  
     01 MAMEX.  
         02 COMP-MEX PICTURE 9(11).  
         02 FILLER PICTURE X(1213).  
     01 MAMREC PICTURE X(132).  
 FD SRTIN LABEL RECORDS OMITTED DATA RECORD IS SIN.  
     01 SIN.  
         02 FILLER PICTURE X(80).  
 FD SRTOUT LABEL RECORDS OMITTED DATA RECORD IS TRAN.  
     01 TRAN.  
         02 TRAI.  
             03 T-DATE PICTURE 9(6).  
             03 DATE REDEFINES T-DATE IN TRAN.  
                 04 MO PICTURE 99.  
                 04 DA PICTURE 99.  
                 04 YR PICTURE 99.  
             03 REC.  
                 04 STRAIN PICTURE 999.  
                 04 ROOM PICTURE 99.  
                 04 BCAGE PICTURE 9(6).  
             03 COMP-C REDEFINES REC IN TRAN PICTURE 9(11).  
             03 NO-BORN PICTURE 99.  
             03 WEAN.  
                 04 FEMALES PICTURE 99.  
                 04 MALES PICTURE 99.  
             03 WEIGH.  
                 04 NOWT PICTURE 99.  
                 04 WT PICTURE 999V9.  
             03 HOLD.  
                 04 HCAGE PICTURE 9(6).  
                 04 NOH PICTURE 99.  
             03 RESEARCH.  
                 04 RCAGE PICTURE 9(6).  
                 04 NOR PICTURE 99.  
             03 MATE.  
                 04 MCAGE PICTURE 9(6).  
             03 REMOVE.  
                 04 RECAGE PICTURE 9(6).  
                 04 NEW-ID PICTURE 9(5).  
                 04 NOREM PICTURE 99.  
                 04 CODE PICTURE 99.  
             03 LITTER PICTURE 9.  
             03 SEX PICTURE X(3).  
             03 KOUNT PICTURE 9.  
             03 OVER PICTURE 9.  
                 88 OVERRIDE VALUE 1.  
             03 CROOM PICTURE 99.  
             03 FILLER PICTURE X(3).  
             03 GEN PICTURE 999.  
                 88 NOREC VALUE ZERO.

88 DELREC VALUE 999.  
 02 TRA2 REDEFINES TRA1 IN TRAN PICTURE X(80).  
 FD SROUT LABEL RECORDS OMITTED DATA RECORD IS SOUT.  
 01 SOUT PICTURE X(48).  
 FD CA-CAD, BLOCK CONTAINS 1 RECORD, LABEL RECORDS ARE OMITTED,  
 DATA RECORD IS CAGE-CRD.  
 01 CAGE-CRD.  
 02 TITLE PICTURE IS X(792).  
 WORKING-STORAGE SECTION.  
 77 M PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 D PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 U PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 S PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 E PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 T PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 R PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 A PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 88 SAT VALUE IS 0.  
 88 SUN VALUE IS 1.  
 77 P PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 N PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 K PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 PRINT-FLAG PICTURE 9 VALUE ZERO.  
 88 PRTREC VALUE 1.  
 77 C PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 WTCH PICTURE 999V9 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 KNT PICTURE 99.  
 77 LNCNT PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 88 JUMP1 VALUE 50.  
 88 JUMP2 VALUE 25.  
 77 NOM PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 CDATE PICTURE 9(6).  
 77 CWTS PICTURE 9999V99 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 WDATE1 PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 WDATE2 PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 FN-CHECK PICTURE 9(11).  
 77 FN-HOLD PICTURE 9(11).  
 77 RDCNT PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT VALUE  
 ZERO.  
 77 MAMMY-END PICTURE 9(11) VALUE 9999999999.  
 77 COMP-M PICTURE 9(11) VALUE ZERO.  
 88 END-M VALUE 9999999999.  
 77 RCMARK PICTURE IS J.  
 77 FIRST-SAT PICTURE 9 VALUE 7.  
 77 SW4 PICTURE 9 VALUE ZERO.  
 01 SEQ-NUM.  
 02 REC.  
 03 STRAIN PICTURE 999.  
 03 ROOM PICTURE 99.  
 03 BCAGE PICTURE 9(6).  
 02 COMP-CM REDEFINES REC IN SEQ-NUM PICTURE 9(11).  
 02 GEN PICTURE 999.  
 01 EXPER-MOUSE.  
 02 DATE PICTURE 9(6).  
 02 CODE PICTURE 9 VALUE 3.

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02 EX-ID PICTURE 9(3) VALUE 413.
02 CAGE-NO PICTURE 9(6).
02 STA PICTURE 9(3) VALUE 999.
02 B-DATE PICTURE 9(6).
02 FILLER PICTURE X VALUE ' '.
02 M-CAGE PICTURE 9(6).
02 FILLER PICTURE XX VALUE ' '.
02 L-ORDER PICTURE 9.
02 SEX PICTURE X.
02 STRAIN PICTURE 99.
02 NUM PICTURE 99.
02 WT PICTURE 999V9.
02 FILLER PICTURE X VALUE ' '.
02 OVER PICTURE Z VALUE 0.
02 FILLER PICTURE X(34) VALUE ' '.
01 SRTDK1.
02 FILLER PICTURE X(84) VALUE '          OPT,VAR,TAP,CAR,NOF,NOC
- 'PT'.
  02 FILLER PICTURE X(84) VALUE '          CHA,INP/J1,MER/(A,B,U
- '),OUT/B'.
02 FILLER PICTURE X(84) VALUE '          FIL,INP/5,MOD/D,BLO/14'
  02 FILLER PICTURE X(84) VALUE '          FIL,OUT,MOD/D,BLO/14'
  02 FILLER PICTURE X(84) VALUE '          REC,TYP/F,LEN/14,FIE/
- '4,2,11,12,6,2,6,2,6,29)'.
  02 FILLER PICTURE X(84) VALUE '          SOR,FIL/5,SEQ/C,ORD/2
- 'FIE/(3,2,1,5,7,9)'.
  02 FILLER PICTURE X(84) VALUE '          END'.
01 SRTDK.
02 FILLER PICTURE X(84) VALUE '          OPT,VAR,TAP,CAR,NOF,NOC
- 'PT'.
  02 FILLER PICTURE IS X(84) VALUE IS '          CHA,INP/J1R,MER
- '(A,B,UT),OUT/B'.
  02 FILLER PICTURE IS X(84) VALUE IS '          FIL,INP/5,MOD/D
- 'BLO/14'.
  02 FILLER PICTURE IS X(84) VALUE IS '          FIL,OUT,MOD/D,B
- 'D/8'.
  02 FILLER PICTURE IS X(84) VALUE IS '          REC,TYP/F,LEN/(
- '4,8,8),FIE/(1,4,2,3,2,36)'.
  02 FILLER PICTURE IS X(84) VALUE IS '          SOR,FIL/5,SEQ/C
- 'ORD/2,FIE/(1,5,3,2)'.
  02 FILLER PICTURE X(84) VALUE '          END'.
01 CONTROL-CARD.
  02 DATE.
    03 MO PICTURE 99.
    03 DA PICTURE 99.
    03 YR PICTURE 99.
  02 DATEN REDEFINES DATE IN CONTROL-CARD PICTURE 9(6).
  02 FILLER PICTURE X.
  02 CONTRL PICTURE 9.
    88 STARTUP VALUE IS 0.
    88 LISMAS VALUE 1.
    88 LISTON VALUE 2.
  02 FILLER PICTURE IS X.
  02 C1 PICTURE IS 9.
  02 FILLER PICTURE X.

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02 EDATE1 PICTURE 99.
02 FILLER PICTURE X.
02 EDATE2 PICTURE 99.
02 FILLER PICTURE X.
02 EDATE3 PICTURE 99.
01 HEAD.
02 FILLER PICTURE X VALUE '1'.
02 FILLER PICTURE X(5) VALUE 'DATE '.
02 DATE PICTURE 99B99B99.
02 FILLER PICTURE X(7) VALUE ' '.
02 T1 PICTURE X(30) VALUE 'MATCAR TRANSACTION LIST'.
02 FILLER PICTURE X(5) VALUE ' '.
02 T2 PICTURE Z(6).
01 TH1.
02 FILLER PICTURE X VALUE '0'.
02 FILLER PICTURE X(20) VALUE 'DATE          ANIMAL NUM'.
02 FILLER PICTURE X(20) VALUE 'BER      NO  WEANED W'.
02 FILLER PICTURE X(20) VALUE 'EIGHT    HOLDING  '.
02 FILLER PICTURE X(20) VALUE ' RESEARCH  MATE   '.
02 FILLER PICTURE X(20) VALUE ' REMOVAL   '.
02 FILLER PICTURE X(20) VALUE '          LIT SEX  C D  '.
02 FILLER PICTURE X(10) VALUE 'ROOM GEN '.
01 TH2.
02 FILLER PICTURE X VALUE ' '.
02 FILLER PICTURE X(20) VALUE '          STR RM B-C'.
02 FILLER PICTURE X(20) VALUE 'AGE  BORN  F  M  N'.
02 FILLER PICTURE X(20) VALUE 'D  WT    CAGE-NO NO'.
02 FILLER PICTURE X(20) VALUE ' CAGE-NO NO  CAGE  '.
02 FILLER PICTURE X(20) VALUE ' CAGE-NO NEW ID NO '.
02 FILLER PICTURE X(4) VALUE 'CODE'.
01 TRA.
02 TRA1.
03 FILLER PICTURE X VALUE ' '.
03 T-DATE PICTURE 99B99B99.
03 FILLER PICTURE XX VALUE ' '.
03 REC.
04 STRAIN PICTURE 999.
04 FILLER PICTURE X VALUE ' '.
04 ROOM PICTURE 99.
04 FILLER PICTURE X VALUE ' '.
04 BCAGE PICTURE 9(6).
03 FILLER PICTURE XXX VALUE ' '.
03 NO-BORN PICTURE ZZ.
03 FILLER PICTURE XXX VALUE ' '.
03 WEAN.
04 FEMALES PICTURE ZZ.
04 FILLER PICTURE X VALUE ' '.
04 MALES PICTURE ZZ.
03 FILLER PICTURE XXX VALUE ' '.
03 WEIGH.
04 NOWT PICTURE ZZ.
04 FILLER PICTURE X VALUE ' '.
04 WT PICTURE Z7ZV9 BLANK WHEN ZERO.
03 FILLER PICTURE X(4) VALUE ' '.
03 HOLD.

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    04 HCAGE PICTURE Z(6).
    04 FILLER PICTURE XX VALUE ' '.
    04 NOH PICTURE ZZ.
03 FILLER PICTURE XX VALUE ' '.
03 RESEARCH.
    04 RCAGE PICTURE Z(6).
    04 FILLER PICTURE XX VALUE ' '.
    04 NDR PICTURE ZZ.
03 FILLER PICTURE XX VALUE ' '.
03 MATE.
    04 MCAGE PICTURE Z(6).
03 FILLER PICTURE XX VALUE ' '.
03 REMOVE.
    04 RECAGE PICTURE Z(6).
    04 FILLER PICTURE XX VALUE ' '.
    04 NEW-ID PICTURE Z(5).
    04 FILLER PICTURE XX VALUE ' '.
    04 NOREM PICTURE ZZ.
    04 FILLER PICTURE XX VALUE ' '.
    04 CODE PICTURE ZZ.
    04 FILLER PICTURE XXXX VALUE ' '.
03 LITTER PICTURE Z.
03 FILLER PICTURE XX VALUE ' '.
03 SEX PICTURE X(3).
03 FILLER PICTURE XX VALUE ' '.
03 KOUNT PICTURE Z.
03 FILLER PICTURE X VALUE ' '.
03 OVER PICTURE Z.
03 FILLER PICTURE XXX VALUE ' '.
03 CROOM PICTURE ZZ.
03 FILLER PICTURE XXX VALUE ' '.
03 GEN PICTURE ZZZ.
01 TRA-DATE.
    02 MO PICTURE 99.
    02 DA PICTURE 99.
    02 YR PICTURE 99.
01 DATE-SCR.
    02 MO PICTURE 99.
    02 DA PICTURE 99.
    02 YR PICTURE 99.
01 DATE-S REDEFINES DATE-SCR PICTURE 9(6).
01 YRTAB1.
    02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT
    VALUE 000.
    02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT
    VALUE 031.
    02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT
    VALUE IS 060.
    02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT
    VALUE IS 091.
    02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT
    VALUE IS 121.
    02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT
    VALUE IS 152.
    02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT

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VALUE IS 182.
02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT
VALUE IS 213.
02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT
VALUE IS 244.
02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT
VALUE IS 274.
02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT
VALUE IS 305.
02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT
VALUE IS 335.
02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT
VALUE IS 366.
01 YRTAB2 REDEFINES YRTAB1.
  02 YRTAB OCCURS 13 TIMES PICTURE 999 COMPUTATIONAL
  SYNCHRONIZED RIGHT.
01 DATE-TABLE.
  02 MOT PICTURE X(36) VALUE 'JANFEBMARAPRMAYJUNJULAUGSEPOCTN
- 'OVDEC'.
  02 MONT REDEFINES MOT PICTURE X(3) OCCURS 12 TIMES.
01 DDATE.
  02 MONTH PICTURE XXX.
  02 FILLER PICTURE X.
  02 DA PICTURE ZZ.
  02 FILLER PICTURE X.
  02 YR PICTURE 99.
01 FRR.
  02 CARR PICTURE X VALUE '0'.
  02 TITLE PICTURE X(45).
  02 FILLER PICTURE X(5) VALUE ' '.
  02 CARD0 PICTURE X(80).
01 MAMMY-EXPAND.
  02 KOUNTER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT.
  02 DRABYX OCCURS 100 TIMES.
    03 BABYX.
      04 FEMALE-NUMBER.
        05 REC.
          06 STRAIN PICTURE 999.
          06 ROOM PICTURE 99.
          06 BCAGE PICTURE 9(6).
        05 COMP-E REDEFINES REC IN BABYX PICTURE 9(11).
        05 GEN PICTURE 999.
      04 FEM REDEFINES FEMALE-NUMBER IN BABYX PICTURE 9(14).
      04 PARITY PICTURE 9.
      04 MOTHER PICTURE 9(14).
      04 BIRTH-DATE PICTURE 9(6).
      04 QFAC1 PICTURE 99V99.
      04 M-DATE PICTURE 9(6).
01 LISTHD.
  02 FILLER PICTURE X VALUE '0'.
  02 FILLER PICTURE X(20) VALUE 'FEMALE NUMBER      B'.
  02 FILLER PICTURE X(20) VALUE 'IRTH DATE      REM CODE'.
  02 FILLER PICTURE X(20) VALUE '      STAT  DAYS BREED '.
  02 FILLER PICTURE X(20) VALUE 'LIT  M-PAIR   Q2   '.
  02 FILLER PICTURE X(20) VALUE 'QW    PER WEAN  AVB'.

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02 FILLER PICTURE X(20) VALUE 'RN/LIT AVWT/LIT ' .
01 DATA01.
02 FILLER PICTURE X VALUE '0' .
02 FEM PICTURE 999B99B999999 .
02 FILLER PICTURE X VALUE ' ' .
02 GEN PICTURE 999 .
02 FILLER PICTURE XX VALUE ' ' .
02 BIRTH-DATE PICTURE 99B99B99 .
02 FILLER PICTURE X(7) VALUE ' F-' .
02 REMOVE .
03 FEMALE .
04 FCODE PICTURE 99 .
03 FILLER PICTURE X(3) VALUE ' M-' .
03 MALE .
04 MCODE PICTURE 99 .
02 FILLER PICTURE X(3) VALUE ' ' .
02 RECON PICTURE X .
02 FILLER PICTURE X(7) VALUE ' ' .
02 TOTAL-DAYS-BREEDING PICTURE Z(3) .
02 FILLER PICTURE X(7) VALUE ' ' .
02 LITTER-COUNT PICTURE Z .
02 FILLER PICTURE X(5) VALUE ' ' .
02 MATE-PAIR PICTURE ZZ .
02 FILLER PICTURE XXX VALUE ' ' .
02 QFAC2 PICTURE ZZ.99 BLANK WHEN ZERO .
02 FILLER PICTURE XX VALUE ' ' .
02 WQFAC PICTURE ZZ.99 BLANK WHEN ZERO .
02 FILLER PICTURE X(4) VALUE ' ' .
02 PERWN PICTURE ZZZ .
02 FILLER PICTURE X(8) VALUE ' ' .
02 AVBRN PICTURE ZZ .
02 FILLER PICTURE X(8) VALUE ' ' .
02 AVWT PICTURE ZZZ .
01 HEAD22.
02 FILLER PICTURE X(21) VALUE 'OFFEMALE NUMBER L' .
02 FILLER PICTURE X(20) VALUE '0 MOTHER NUMBER ' .
02 FILLER PICTURE X(20) VALUE ' BIRTH DATE REM ' .
02 FILLER PICTURE X(20) VALUE 'REM DATE NEW ID R' .
02 FILLER PICTURE X(20) VALUE ' CAGE STAT LC BP' .
02 FILLER PICTURE X(20) VALUE ' TDB Q1 Q2 ' .
02 FILLER PICTURE X(4) VALUE ' QW' .
01 DATA22.
02 FILLER PICTURE X VALUE ' ' .
02 FND PICTURE 999B99B999999 .
02 FILLER PICTURE X VALUE ' ' .
02 GEN PICTURE 999 .
02 FILLER PICTURE XX VALUE ' ' .
02 LO PICTURE Z .
02 FILLER PICTURE XXX VALUE ' ' .
02 MND PICTURE ZZZBZZBZZZZZZBZZZ .
02 FILLER PICTURE XX VALUE ' ' .
02 B-DATE PICTURE X(9) .
02 FILLER PICTURE X(5) VALUE ' F-' .
02 RC PICTURE ZZ .
02 FILLER PICTURE XX VALUE ' ' .

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02 RDATE PICTURE X(9).
02 FILLER PICTURE XX VALUE ' '.
02 NID PICTURE Z(5).
02 FILLER PICTURE XXX VALUE ' '.
02 RCAGE PICTURE Z(6).
02 FILLER PICTURE X(4) VALUE ' '.
02 RECON PICTURE X.
02 FILLER PICTURE X(5) VALUE ' '.
02 LC PICTURE 9.
02 FILLER PICTURE XX VALUE ' '.
02 BP PICTURE ZZ.
02 FILLER PICTURE XX VALUE ' '.
02 TDB PICTURE Z(3).
02 FILLER PICTURE XX VALUE ' '.
02 Q1 PICTURE ZZ.99 BLANK WHEN ZERO.
02 FILLER PICTURE XX VALUE ' '.
02 Q2 PICTURE ZZ.99 BLANK WHEN ZERO.
02 FILLER PICTURE XX VALUE ' '.
02 QW PICTURE ZZ.99 BLANK WHEN ZERO.
01 DATA22.
02 FILLER PICTURE X(55) VALUE ' '.
02 FILLER PICTURE XX VALUE 'M-'.
02 RC PICTURE ZZ.
02 FILLER PICTURE XX VALUE ' '.
02 RDATE PICTURE X(9).
02 FILLER PICTURE XX VALUE ' '.
02 NID PICTURE Z(5).
02 FILLER PICTURE XXX VALUE ' '.
02 RCAGE PICTURE Z(6).
01 HEAD33.
02 FILLER PICTURE X VALUE '0'.
02 FILLER PICTURE X(20) VALUE 'LITTER MATE DATE B'.
02 FILLER PICTURE X(20) VALUE 'IRTH DATE WEAN DATE'.
02 FILLER PICTURE X(20) VALUE ' B-SIZE D-SIZE M-'.
02 FILLER PICTURE X(20) VALUE 'SIZE R-SIZE F-WEAN'.
02 FILLER PICTURE X(20) VALUE ' M-WEAN WT-DATE '.
02 FILLER PICTURE X(20) VALUE 'WT NUM AV-WT BRE'.
02 FILLER PICTURE X(10) VALUE 'EDER CAGES'.
01 DATA33.
02 FILLER PICTURE X VALUE ' '.
02 FILLER PICTURE XX VALUE ' '.
02 LN1 PICTURE 9.
02 FILLER PICTURE X(5) VALUE ' '.
02 MD PICTURE X(9).
02 FILLER PICTURE XX VALUE ' '.
02 BD PICTURE X(9).
02 FILLER PICTURE XXX VALUE ' '.
02 WD PICTURE X(9).
02 FILLER PICTURE XXX VALUE ' '.
02 BS PICTURE ZZ.
02 FILLER PICTURE X(6) VALUE ' '.
02 DS PICTURE ZZ.
02 FILLER PICTURE X(6) VALUE ' '.
02 MS PICTURE ZZ.
02 FILLER PICTURE X(6) VALUE ' '.

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02 RS PICTURE ZZ.
02 FILLER PICTURE X(6) VALUE ' '.
02 NFW PICTURE ZZ.
02 FILLER PICTURE X(5) VALUE ' '.
02 NMW PICTURE ZZ.
02 FILLER PICTURE X(4) VALUE ' '.
02 WTD PICTURE X(9).
02 FILLER PICTURE XX VALUE ' '.
02 WT PICTURE Z(3).
02 FILLER PICTURE XX VALUE ' '.
02 WTNUM PICTURE ZZ.
02 FILLER PICTURE X(4) VALUE ' '.
02 AVWT1 PICTURE Z(3).
02 FILLER PICTURE X(4) VALUE ' '.
02 BC1 PICTURE Z(6).
02 FILLER PICTURE X VALUE ' '.
02 BC2 PICTURE Z(6).
01 DATA331.
02 FILLER PICTURE X VALUE ' '.
02 FILLER PICTURE X(20) VALUE 'F-H-CAGE NUM M-H-CAG'.
02 FILLER PICTURE X(20) VALUE 'E NUM F-E-CAGE NUM D'.
02 FILLER PICTURE X(20) VALUE 'ATE M-E-CAGE NU'.
02 FILLER PICTURE X(20) VALUE 'M DATE ML '.
02 FILLER PICTURE X(37) VALUE ' '.
02 BC1 PICTURE Z(6).
02 FILLER PICTURE X VALUE ' '.
02 BC2 PICTURE Z(6).
01 DATA332.
02 FILLER PICTURE XX VALUE ' '.
02 FHC PICTURE Z(6).
02 FILLER PICTURE XXX VALUE ' '.
02 FHCND PICTURE ZZ.
02 FILLER PICTURE XX VALUE ' '.
02 MHC PICTURE Z(6).
02 FILLER PICTURE X(3) VALUE ' '.
02 MHCND PICTURE ZZ.
02 FILLER PICTURE XX VALUE ' '.
02 FEC PICTURE Z(6).
02 FILLER PICTURE XXX VALUE ' '.
02 FECND PICTURE ZZ.
02 FILLER PICTURE X VALUE ' '.
02 FECDT PICTURE X(9).
02 FILLER PICTURE XX VALUE ' '.
02 MEC PICTURE Z(6).
02 FILLER PICTURE XXX VALUE ' '.
02 MECND PICTURE ZZ.
02 FILLER PICTURE X VALUE ' '.
02 MECDT PICTURE X(9).
02 FILLER PICTURE X(5) VALUE ' '.
02 ML PICTURE ZZ.
02 FILLER PICTURE X(39) VALUE ' '.
02 BC1 PICTURE Z(6).
02 FILLER PICTURE X VALUE ' '.
02 BC2 PICTURE Z(6).
01 DATA333.

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02 FILLER PICTURE X(28) VALUE ' '.  
 02 FEC PICTURE Z(6).  
 02 FILLER PICTURE XXX VALUE ' '.  
 02 FECNO PICTURE ZZ.  
 02 FILLER PICTURE X VALUE ' '.  
 02 FECDT PICTURE X(9).  
 02 FILLER PICTURE XX VALUE ' '.  
 02 MEC PICTURE Z(6).  
 02 FILLER PICTURE XXX VALUE ' '.  
 02 MECNO PICTURE ZZ.  
 02 FILLER PICTURE X VALUE ' '.  
 02 MECDT PICTURE X(9).  
 01 HEAD2.  
 02 CARR PICTURE IS X VALUE IS '0'.  
 02 FILLER PICTURE IS A(20) VALUE IS ' '.  
 02 RM PICTURE IS X(7) VALUE IS 'ROOM-NO'.  
 02 FILLER PICTURE IS A VALUE IS ' '.  
 02 ROOM-NO PICTURE IS XX.  
 01 HEAD3.  
 02 CARR PICTURE IS X VALUE IS '0'.  
 02 CAGE PICTURE X(7).  
 02 FILLER PICTURE IS A(5) VALUE IS ' '.  
 02 ANM-NO PICTURE IS A(13) VALUE IS 'ANIMAL NUMBER'.  
 02 FILLER PICTURE IS A(11) VALUE IS ' '.  
 02 TITLE PICTURE IS X(11).  
 02 FILLER PICTURE IS A(5) VALUE IS ' '.  
 02 QFACT PICTURE IS X(9).  
 02 FILLER PICTURE IS X(4) VALUE IS ' '.  
 02 TCHM PICTURE IS X(12).  
 01 REPOUT.  
 02 CARR PICTURE IS X VALUE IS '0'.  
 02 CAGE PICTURE Z(6).  
 02 FILLER PICTURE IS A(6) VALUE IS ' '.  
 02 FN PICTURE 999B99B999999B999.  
 02 FILLER PICTURE X(7) VALUE ' '.  
 02 X-DATE PICTURE IS X(9).  
 02 FILLER PICTURE X(6) VALUE ' '.  
 02 Q-FACT PICTURE ZZ.99 BLANK WHEN ZERO.  
 02 T-NUM.  
 03 FILLER PICTURE X(10) VALUE ' '.  
 03 F-NUM PICTURE ZZ.  
 03 FILLER PICTURE X(5) VALUE ' '.  
 03 M-NUM PICTURE ZZ.  
 03 FILLER PICTURE X(6) VALUE ' '.  
 02 TR PICTURE IS X(20).  
 01 SORT-LIST.  
 02 SORT1 PICTURE IS 9.  
 88 WEANEM VALUE 1.  
 88 MATEM VALUE 2.  
 88 RETIRE VALUE 3.  
 02 S-DATE PICTURE IS 9(6).  
 02 ANM-NO.  
 03 FN PICTURE 9(14).  
 03 REC REDEFINES FN IN SORT-LIST.  
 04 STRAIN PICTURE 999.

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04 ROOM PICTURE 99.
04 BCAGE PICTURE 9(6).
04 GEN PICTURE 999.
03 PAR PICTURE 9.
03 SEX PICTURE IS X(3).
02 Q-FACT PICTURE IS 99V99.
02 T1 PICTURE IS 9(6).
02 NUM REDEFINES T1 IN SORT-LIST.
03 NUM-M PICTURE 99.
03 NUM-F PICTURE 99.
03 FILLER PICTURE 99.
02 CAGE PICTURE 9(6).
01 WCARD.
02 WCARD1.
03 FILLER PICTURE IS X VALUE IS '1'.
03 FILLER PICTURE IS X(30) VALUE IS ' '.
03 T1 PICTURE IS X(10).
03 FILLER PICTURE IS J.
03 FILLER PICTURE IS J.
03 FILLER PICTURE X(14) VALUE '          CAGE '.
03 CAGE PICTURE 9(6).
03 FILLER PICTURE X(13) VALUE '          ROOM '.
03 ROOM PICTURE 99.
03 FILLER PICTURE J.
02 WCARD2.
03 FILLER PICTURE IS X VALUE IS '0'.
03 FILLER PICTURE X(20) VALUE 'FEMALE NUMBER      '.
03 FILLER PICTURE X(20) VALUE 'LITTER SEX      MATE'.
03 FILLER PICTURE X(5) VALUE ' DATE'.
03 FILLER PICTURE IS J.
03 FILLER PICTURE IS X VALUE IS ' '.
03 FMNO PICTURE 999B998999999.
03 FILLER PICTURE X VALUE ' '.
03 GEN PICTURE 999.
03 FILLER PICTURE X(5) VALUE ' '.
03 PARITY PICTURE Z.
03 FILLER PICTURE X(6) VALUE ' '.
03 SEX PICTURE X(3).
03 FILLER PICTURE X(4) VALUE ' '.
03 M-DATE PICTURE X(9).
03 FILLER PICTURE X(5) VALUE ' '.
03 FILLER PICTURE IS J.
02 WCARDBH.
03 TOUT PICTURE X(623).
03 RCDMRK PICTURE X.
01 WCARDB.
02 WCARD3.
03 FILLER PICTURE IS X VALUE IS '0'.
03 FILLER PICTURE IS X(10) VALUE IS 'LITTER NO.'.
03 FILLER PICTURE IS X(5) VALUE IS ' '.
03 FILLER PICTURE IS X(10) VALUE IS 'BIRTH DATE'.
03 FILLER PICTURE IS X(5) VALUE IS ' '.
03 FILLER PICTURE IS X(8) VALUE IS 'NO. BORN'.
03 FILLER PICTURE IS X(5) VALUE IS ' '.
03 FILLER PICTURE IS X(10) VALUE IS 'NO. F WEAN'.

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03 FILLER PICTURE IS X(5) VALUE IS ' '.
03 FILLER PICTURE IS X(10) VALUE IS 'NO. M WEAN'.
03 FILLER PICTURE IS X(36) VALUE IS ' '.
03 FILLER PICTURE IS J.
02 LINE OCCURS 6 TIMES.
03 LN PICTURE IS X(65).
03 RCDMRK PICTURE IS X.
02 FILLER PICTURE IS J.
02 FILLER PICTURE IS X(120) VALUE IS ' '.
02 FILLER PICTURE IS J.
01 WCARD4.
02 FILLER PICTURE IS X(6) VALUE IS ' '.
02 L4 PICTURE IS Z.
02 FILLER PICTURE IS X(10) VALUE IS ' '.
02 DATE PICTURE IS X(9).
02 FILLER PICTURE IS X(8) VALUE IS ' '.
02 NB PICTURE IS X(2).
02 FILLER PICTURE IS X(12) VALUE IS ' '.
02 NFW PICTURE IS X(2).
02 FILLER PICTURE IS X(13) VALUE IS ' '.
02 NMW PICTURE IS XX.
01 WCARDH.
02 FILLER PICTURE IS X VALUE IS '0'.
02 FILLER PICTURE IS X(12) VALUE IS 'NG OF MICE '.
02 NOMCE PICTURE IS ZZZ.
02 FILLER PICTURE IS X(19) VALUE IS ' '.
02 FILLER PICTURE IS X(9) VALUE IS 'TREATMENT'.
02 FILLER PICTURE IS J.
02 FILLER PICTURE IS X VALUE IS '0'.
02 FILLER PICTURE IS X(5) VALUE IS 'SEX '.
02 SEX PICTURE X(3).
02 FILLER PICTURE IS J.
02 FILLER PICTURE IS X(16) VALUE IS 'DATE OF BIRTH '.
02 ODAT PICTURE IS X(9).
02 FILLER PICTURE X(25) VALUE ' '.
02 FILLER PICTURE IS J.
PROCEDURE DIVISION.
OPEN INPUT CARD-IN, OUTPUT REPORT, OUTPUT PUNCH.
READ CARD-IN RECORD INTO CONTROL-CARD AT END MOVE
'NO CONTROL CARD' TO TITLE IN ERR MOVE SPACES TO CARDO IN
ERR WRITE LIST FROM ERR GO TO POTS.
MOVE DATEN IN CONTROL-CARD TO DATE IN HEAD.
MOVE ZERO TO T2 IN HEAD.
IF LISTON CLOSE CARD-IN, PUNCH GO TO LIST-WRITE.
OPEN OUTPUT MAMMY-OUT, SRTIN, MAMMY-EX.
IF STARTUP NEXT SENTENCE OTHERWISE OPEN INPUT MAMMY-IN.
RDCRD.
READ CARD-IN RECORD AT END GO TO SRTONE.
PERFORM CHAR-CHECK VARYING M FROM 1 BY 1 UNTIL M = 81.
WRITE SIN FROM CARDS GO TO RDCRD.
CHAR-CHECK.
IF CHAR IN CARDS (M) = SPACE MOVE ZERO TO CHAR IN CARDS (M).
SRTONE.
CLOSE SRTIN, CARD-IN.
MOVE ZERO TO M.

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NOTE *****
CARDS ARE SORTED IN FEMALE NUMBER ORDER WITH SUBSORT ON DATE
*****
ENTER LINKAGE-MODE.
CALL 'GETSRT' USING SRTDK1, SRTIN, SRTOUT, M.
ENTER COBOL.
IF M IS NOT EQUAL TO ZERO MOVE 'SORT NOT GOOD - RESUBMIT'
TO TITLE IN ERR MOVE SPACE TO CARDO IN ERR WRITE LIST
FROM ERR DISPLAY QUOTE 'ERROR IN SORT' GO TO POTS.
OPEN INPUT SRTOUT MOVE ZERO TO M.
RDSRT1.
READ SRTOUT RECORD AT END GO TO ENDCRDS.
NOTE *****
SORTED TRANSACTIONS ARE LISTED BEFORE MASTER TAPE IS
UPDATED
*****
IF STRAIN IN TRAN IS NOT EQUAL TO M MOVE STRAIN IN TRAN TO
M MOVE 50 TO LNCNT.
IF JUMP1 WRITE LIST FROM HEAD WRITE LIST FROM TH1 WRITE LIST
FROM TH2 MOVE ZERO TO LNCNT.
MOVE CORRESPONDING TRAN TO TRA.
WRITE LIST FROM TRA ADD 1 TO LNCNT.
GO TO RDSRT1.
ENDCRDS.
CLOSE SRTOUT OPEN INPUT SRTOUT, OUTPUT SRTIN, CA-CAD.
MOVE 'MATCAR ERROR LIST' TO T1 IN HEAD WRITE LIST FROM HEAD.
MOVE 'MATCAR MASTER RECORD' TO T1 IN HEAD.
MOVE ZERO TO FN-CHECK.
IF LISMAS READ MAMMY-IN RECORD AT END MOVE 'NO RECORDS ON OLD
- ' MASTER TAPE' TO TITLE IN ERR MOVE SPACES TO CARDO IN ERR
WRITE LIST FROM ERR AND GO TO POTS.
IF LISMAS MOVE COMP-I TO COMP-M.
MOVE ZERO TO KOUNTER.
PERFORM ZERO-MOVE VARYING M FROM 1 BY 1 UNTIL M = 101.
GO TO READ-CARD.
ZERO-MOVE. MOVE ZEROS TO BABYX (M).
READ-CARD.
MOVE 1 TO E.
READ SRTOUT AT END MOVE COMP-M TO FN-HOLD GO TO END-CARD.
MOVE ZERO TO E.
IF STARTUP PERFORM TA1 THRU TAEX GO TO READ-CARD.
IF NOREC OR DELREC GO TO COMPARE OTHERWISE GO TO SEQUENCE.
COMPARE.
IF COMP-C IS GREATER THAN COMP-M PERFORM MASTER-MOVE THRU
MMEX GO TO COMPARE.
IF COMP-C = COMP-M GO TO SCAT.
MOVE 'ANIMAL NOT ON MASTER TAPE' TO TITLE IN ERR GO TO
ERR-CARD.
SEQUENCE.
IF COMP-C = COMP-M MOVE 'ANIMAL ALREADY ON TAPE - CANNOT ADD'
TO TITLE IN ERR GO TO ERR-CARD.
IF COMP-C IS GREATER THAN COMP-M PERFORM MASTER-MOVE THRU
MMEX AND GO TO SEQUENCE.
PERFORM TRAN-ADD GO TO READ-CARD.
MASTER-MOVE.

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NOTE \*\*\*\*\*  
 MASTER MOVE WILL WRITE OUT NEW RECORDS AND SCAN OLD RECORDS  
 FOR PREDICTIONS AND PRINTED CARDS  
 \*\*\*\*\*.

MM1. MOVE MAMMY TO MAMMYO PERFORM TOP-SCAN.  
 IF PRTRC PERFORM WRITE1 MOVE ZERO TO PRINT-FLAG.  
 MOVE COMP-M TO FN-HOLD WRITE MAMMYO.

MM2. READ MAMMY-IN AT END GO TO END-TAPE.  
 MOVE COMP-I TO COMP-M.

MM3. IF KOUNTER = ZERO GO TO MMEX.  
 COMPUTE K = KOUNTER + 1.  
 PERFORM EXPAND-SCAN THRU ESEX VARYING M FROM 1 BY 1 UNTIL  
 M = K.

MMEX. EXIT.

EXPAND-SCAN.  
 IF COMP-E (M) = ZERO GO TO ESEX.  
 NOTE \*\*\*\*\*  
 NEWLY MATED PAIRS ARE PLACED ON THE MASTER TAPE IN  
 SEQUENTIAL ORDER  
 \*\*\*\*\*.

IF COMP-E (M) = COMP-M MOVE 'DUPLICATE CAGE NUMBER FOR MATE'  
 TO TITLE IN ERR MOVE COMP-E (M) TO CARDO IN ERR WRITE LIST  
 FROM ERR MOVE ZERO TO COMP-E (M) GO TO ESEX.  
 IF COMP-E (M) IS GREATER THAN COMP-M GO TO ESEX.  
 IF COMP-E (M) IS LESS THAN FN-HOLD GO TO ESEX.  
 MOVE ZERO TO MAMMYO.  
 MOVE FEMALE-NUMBER IN BABYX (M) TO FEM-NO IN MAMMYO.  
 MOVE GEN IN BABYX (M) TO GEN IN MAMMYO.  
 MOVE PARITY IN BABYX (M) TO PARITY IN MAMMYO.  
 MOVE MOTHER IN BABYX (M) TO MOTHER IN MAMMYO.  
 MOVE BIRTH-DATE IN BABYX (M) TO BIRTH-DATE IN MAMMYO.  
 MOVE QFAC1 IN BABYX (M) TO QFAC1 IN MAMMYO.  
 MOVE M-DATE IN BABYX (M) TO M-DATE IN MAMMYO (1).  
 MOVE 'N' TO RECON IN MAMMYO.  
 PERFORM TOP-SCAN PERFORM WRITE1.  
 MOVE COMP-MO TO FN-HOLD.  
 WRITE MAMMYO.  
 MOVE ZERO TO COMP-E (M).

ESEX. EXIT.

ERR-CARD.  
 MOVE TRA2 IN TRAN TO CARDO IN ERR WRITE LIST FROM ERR.

ER. GO TO READ-CARD.

SCAT.  
 MOVE 1 TO PRINT-FLAG.  
 IF DELREC PERFORM MM2 THRU MMEX GO TO READ-CARD.  
 IF SEX IN TRAN = 'FAD' OR 'MAD' PERFORM TRAN-REMOVE GO TO  
 READ-CARD.  
 IF LITTER IN TRAN IS GREATER THAN 6 OR LESS THAN 1 MOVE  
 'INCORRECT LITTER COUNT' TO TITLE IN ERR GO TO ERR-CARD.  
 MOVE LITTER IN TRAN TO M.  
 IF SEX IN TRAN = 'FOF' OR 'MOF' NEXT SENTENCE OTHERWISE  
 MOVE 'SEX NOT ENTERED FOR TRANSACTION' TO TITLE IN ERR GO TO  
 ERR-CARD.  
 IF NO-BORN IN TRAN IS NOT = ZERO PERFORM TRAN-BIRTH.  
 IF WEAN IN TRAN IS NOT = ZERO PERFORM TRAN-WEAN.

IF WEIGH IN TRAN IS NOT = ZERO PERFORM TRAN-WEIGH.  
 IF HOLD IN TRAN IS NOT = ZERO PERFORM TRAN-HOLD.  
 IF RESEARCH IN TRAN IS NOT = ZERO PERFORM TRAN-RESEARCH.  
 IF MATE IN TRAN IS NOT = ZERO PERFORM TRAN-MATE.  
 IF CODE IN TRAN IS NOT = ZERO PERFORM TRAN-REMOVE.  
 GO TO READ-CARD.

## TRAN-ADD SECTION.

NOTE \*\*\*\*\*  
 THIS SECTION WILL ADD A NEW RECORD TO THE MASTER TAPE IN  
 PROPER SEQUENTIAL ORDER  
 CAGES RANGING FROM 0 - 99999 CONTAIN INBRED ANIMALS  
 CAGES FROM 899999 - 999999 CONTAIN CROSS BREED ANIMALS  
 \*\*\*\*\*.

TA1. IF COMP-C IS GREATER THAN FN-CHECK MOVE COMP-C TO FN-CHECK  
 OTHERWISE MOVE 'DUPLICATE ANIMAL NUMBER ON CARDS' TO  
 TITLE IN ERR GO TO ERR-CARD.  
 IF BCAGE IN TRAN IS GREATER THAN 899999 GO TO TA2.  
 IF BCAGE IN TRAN IS GREATER THAN 99999 MOVE 'INCORRECT BREED  
 - 'R CAGE NUMBER' TO TITLE IN ERR GO TO ERR-CARD.

TA2. MOVE ZERO TO MAMMYO.

MOVE STRAIN IN TRAN TO STRAIN IN MAMMYO.  
 MOVE ROOM IN TRAN TO ROOM IN MAMMYO.  
 MOVE BCAGE IN TRAN TO BCAGE IN MAMMYO.  
 IF BCAGE IN TRAN IS GREATER THAN 899999 MOVE ZERO TO GEN  
 IN MAMMYO ELSE MOVE GEN IN TRAN TO GEN IN MAMMYO.  
 MOVE LITTER IN TRAN TO PARITY IN MAMMYO.  
 MOVE MCAGE IN TRAN TO BIRTH-DATE IN MAMMYO.  
 MOVE T-DATE IN TRAN TO M-DATE IN MAMMYO (1).  
 MOVE 'N' TO RECON IN MAMMYO.  
 PERFORM TOP-SCAN PERFORM WRITE1.  
 MOVE COMP-MO TO FN-HOLD.  
 WRITE MAMMYO.

TAFX. EXIT.

## TRAN-REMOVE SECTION.

IF SEX IN TRAN = 'FAD' MOVE T-DATE IN TRAN TO FRDATE IN MAMMY  
 MOVE RECAE IN TRAN TO FRCAGE IN MAMMY MOVE NEW-ID IN TRAN  
 TO FNEWID IN MAMMY MOVE CODE IN TRAN TO FCODE IN MAMMY.  
 IF SEX IN TRAN = 'FAD' AND T-DATE IN TRAN = ZERO MOVE ZERO  
 TO FCODE IN MAMMY.  
 IF SEX IN TRAN = 'FAD' GO TO TREX.  
 IF SEX IN TRAN = 'MAD' MOVE T-DATE IN TRAN TO MRDATE IN MAMMY  
 MOVE RECAE IN TRAN TO MRCAGE IN MAMMY MOVE NEW-ID IN TRAN  
 TO MNEWID IN MAMMY MOVE CODE IN TRAN TO MCODE IN MAMMY.  
 IF SEX IN TRAN = 'MAD' AND T-DATE IN TRAN = ZERO MOVE ZERO  
 TO MCODE IN MAMMY.  
 IF SEX IN TRAN = 'MAD' GO TO TREX.  
 IF W-DATE IN MAMMY (M) IS NOT = ZERO GO TO TR1.  
 COMPUTE O = D-SIZE IN MAMMY (M) + M-SIZE IN MAMMY (M)  
 + R-SIZE IN MAMMY (M) + NOREM IN TRAN.  
 IF OVERRIDE GO TO TRO.  
 IF O = B-SIZE IN MAMMY (M) MOVE T-DATE IN TRAN TO W-DATE IN  
 MAMMY (M) MOVE 90 TO ML IN MAMMY (M).  
 IF O IS GREATER THAN B-SIZE IN MAMMY (M) MOVE 'NUMBER DEAD LA  
 - 'RGER THAN NUMBER BORN' TO TITLE IN ERR PERFORM ERR-CARD  
 GO TO TREX.

IF CODE IN TRAN = 2 OR 6 ADD NOREM IN TRAN TO R-SIZE IN  
 MAMMY (M) GO TO TREX.  
 IF CODE IN TRAN = 7 ADD NOREM IN TRAN TO M-SIZE IN MAMMY (M)  
 GO TO TREX.  
 ADD NOREM IN TRAN TO D-SIZE IN MAMMY (M) GO TO TREX.  
 TR1. IF SEX IN TRAN = 'FOF' SUBTRACT NOREM IN TRAN FROM FHNUM IN  
 MAMMY (M) ELSE GO TO TR2.  
 - IF FHNUM IN MAMMY (M) IS LESS THAN ZERO MOVE 'HOLDING CAGE DE  
 'ATHS EXCEED NUMBER IN CAGE' TO TITLE IN ERR PERFORM  
 ERR-CARD ADD NOREM IN TRAN TO FHNUM IN MAMMY (M).  
 GO TO TREX.  
 TR2. IF SEX IN TRAN = 'MOF' SUBTRACT NOREM IN TRAN FROM MHNUM IN  
 MAMMY (M) ELSE GO TO TREX.  
 - IF MHNUM IN MAMMY (M) IS LESS THAN ZERO MOVE 'HOLDING CAGE DE  
 'ATHS EXCEED NUMBER IN CAGE' TO TITLE IN ERR PERFORM  
 ERR-CARD ADD NOREM IN TRAN TO MHNUM IN MAMMY (M).  
 GO TO TREX.  
 TR0.  
 COMPUTE O = O-SIZE IN MAMMY (M) + M-SIZE IN MAMMY (M) +  
 R-SIZE IN MAMMY (M).  
 IF KOUNT IN TRAN = 1 COMPUTE O = O - D-SIZE IN MAMMY (M)  
 + NOREM IN TRAN GO TO TR01.  
 IF KOUNT IN TRAN = 2 COMPUTE O = O - M-SIZE IN MAMMY (M)  
 + NOREM IN TRAN GO TO TR01.  
 COMPUTE O = O - R-SIZE IN MAMMY (M) + NOREM IN TRAN.  
 TR01. IF O IS GREATER THAN B-SIZE IN MAMMY (M) MOVE 'NUMBER DEAD  
 - 'LARGER THAN NUMBER BORN' TO TITLE IN ERR PERFORM ERR-CARD  
 GO TO TREX.  
 IF O = B-SIZE IN MAMMY (M) MOVE T-DATE IN TRAN TO W-DATE IN  
 MAMMY (M) MOVE 90 TO ML IN MAMMY (M).  
 IF KOUNT IN TRAN = 1 MOVE NOREM IN TRAN TO D-SIZE  
 IN MAMMY (M).  
 IF KOUNT IN TRAN = 2 MOVE NOREM IN TRAN TO M-SIZE  
 IN MAMMY (M).  
 IF KOUNT IN TRAN = 3 MOVE NOREM IN TRAN TO R-SIZE  
 IN MAMMY (M).  
 TREX. EXIT.  
 TRAN-BIRTH SECTION.  
 NOTE \*\*\*\*\*  
 BIRTH DATE SHOULD NOT BE LESS THAN 17 DAYS SINCE PREVIOUS  
 BIRTH  
 \*\*\*\*\*.  
 TB1. IF OVERRIDE GO TO TB2.  
 IF LITTER-COUNT IN MAMMY = M MOVE 'THIS BIRTH HAS ALREADY BEE  
 - 'N RECORDED' TO TITLE IN ERR PERFORM ERR-CARD GO TO TBEX.  
 MOVE LITTER-COUNT IN MAMMY TO S.  
 ADD 1 TO LITTER-COUNT IN MAMMY.  
 IF LITTER-COUNT IN MAMMY IS NOT = M MOVE 'WRONG LITTER COUNT  
 - 'TO RECORD BIRTH' TO TITLE IN ERR PERFORM ERR-CARD SUBTRACT  
 1 FROM LITTER-COUNT IN MAMMY GO TO TBEX.  
 IF M = 1 GO TO TB2.  
 MOVE DATE IN TRAN TO TRA-DATE.  
 MOVE B-DATE IN MAMMY (S) TO DATE-SCR.  
 PERFORM DT8.  
 IF T IS LESS THAN 17 MOVE 'DATE LESS THAN 17 DAYS SINCE PREVI

- 'OUS BIRTH' TO TITLE IN ERR PERFORM ERR-CARD SUBTRACT 1 FROM LITTER-COUNT IN MAMMY GO TO TBEX.

TB2. MOVE T-DATE IN TRAN TO B-DATE IN MAMMY (M).  
 IF T-DATE IN TRAN = ZERO AND LITTER-COUNT IN MAMMY = M  
 SUBTRACT 1 FROM LITTER-COUNT IN MAMMY.  
 IF T-DATE IN TRAN = ZERO MOVE ZERO TO B-SIZE IN MAMMY (M)  
 GO TO TBEX.  
 IF M IS LESS THAN 6 COMPUTE S = M + 1 MOVE T-DATE IN TRAN  
 TO M-DATE IN MAMMY (S).  
 MOVE NO-BORN IN TRAN TO B-SIZE IN MAMMY (M).  
 MOVE 1 TO ML IN MAMMY (M).

TBEX. EXIT.

TRAN-WEAN SECTION.

NOTE \*\*\*\*\*  
 LITTERS ARE DUE TO BE WEANED 21 DAYS FROM BIRTH  
 WEAN DATE SHOULD FALL BETWEEN 17 DAYS AND 28 DAYS FROM BIRTH  
 \*\*\*\*\*.

TW1. IF OVERRIDE GO TO TW2.  
 IF B-DATE IN MAMMY (M) = ZERO OR LITTER-COUNT IN MAMMY =  
 ZERO MOVE 'BIRTH NOT RECORDED - CANNOT WEAN' TO TITLE IN ERR  
 PERFORM ERR-CARD GO TO TWEX.  
 MOVE DATE IN TRAN TO TRA-DATE.  
 MOVE B-DATE IN MAMMY (M) TO DATE-SCR.  
 PERFORM DT8.  
 IF T IS LESS THAN 17 MOVE 'WEAN DATE LESS THAN 17 DAYS FROM B  
 - 'IRTH' TO TITLE IN ERR PERFORM ERR-CARD GO TO TWEX.  
 IF T IS GREATER THAN 28 MOVE 'WEAN DATE MORE THAN 28 DAYS FRO  
 - 'M BIRTH' TO TITLE IN ERR PERFORM ERR-CARD GO TO TWEX.  
 COMPUTE A = B-SIZE IN MAMMY (M) - D-SIZE IN MAMMY (M) -  
 M-SIZE IN MAMMY (M) - R-SIZE IN MAMMY (M).  
 COMPUTE R = FEMALES IN TRAN + MALES IN TRAN.  
 IF A IS NOT = R MOVE 'WRONG NUMBER OF ANIMALS BEING WEANED'  
 TO TITLE IN ERR PERFORM ERR-CARD GO TO TWEX.

TW2. MOVE T-DATE IN TRAN TO W-DATE IN MAMMY (M).  
 MOVE FEMALES IN TRAN TO NO-F-WEAN IN MAMMY (M).  
 MOVE MALES IN TRAN TO NO-M-WEAN IN MAMMY (M).  
 IF T-DATE IN TRAN = ZERO MOVE ZERO TO NO-F-WEAN IN MAMMY  
 (M), NO-M-WEAN IN MAMMY (M).

TWEX. EXIT.

TRAN-WEIGH SECTION.

NOTE \*\*\*\*\*  
 A LITTER IS WEIGHED AT WEANING AND THE TOTAL LITTER WEIGHT  
 AND THE NUMBER WEIGHED IS RECORDED  
 \*\*\*\*\*.

TWT1. IF OVERRIDE GO TO TWT2.  
 IF WT IN MAMMY (M) IS NOT = ZERO MOVE 'LITTER HAS ALREADY BEE  
 - 'N WEIGHED' TO TITLE IN ERR PERFORM ERR-CARD GO TO TWTEX.  
 IF NOWT IN TRAN = ZERO MOVE 'NUMBER OF ANIMALS WEIGHED NOT RE  
 - 'CORDED' TO TITLE IN ERR PERFORM ERR-CARD GO TO TWTEX.  
 IF WT IN TRAN = ZERO MOVE 'WEIGHT NOT RECORDED' TO TITLE IN  
 ERR PERFORM ERR-CARD GO TO TWTEX.

TWT2. MOVE NOWT IN TRAN TO WTNUM IN MAMMY (M).  
 MOVE WT IN TRAN TO WT IN MAMMY (M).  
 MOVE T-DATE IN TRAN TO WTDAT IN MAMMY (M).  
 IF T-DATE IN TRAN = ZERO MOVE ZERO TO WT IN MAMMY (M), WTNUM

IN MAMMY (M).  
 TWTEX. EXIT.  
 TRAN-HOLD SECTION.  
 IF OVERRIDE GO TO TH1.  
 NOTE \*\*\*\*\*  
 WEANED ANIMALS ARE PLACED IN HOLDING CAGES TO BE MATED SIX  
 WEEKS FROM BIRTH  
 HOLDING CAGE NUMBER RANGE FROM 100000 TO 499999  
 \*\*\*\*\*.  
 IF HCAGE IN TRAN IS LESS THAN 100000 OR GREATER THAN 499999  
 MOVE 'INCORRECT HOLDING CAGE NUMBER' TO TITLE IN ERR PERFORM  
 ERR-CARD GO TO THEX.  
 IF NOH IN TRAN = ZERO MOVE 'NUMBER OF HOLDING ANIMALS NOT REC  
 - 'ORDED' TO TITLE IN ERR PERFORM ERR-CARD GO TO THEX.  
 COMPUTE O = NO-F-WEAN IN MAMMY (M) + NO-M-WEAN IN MAMMY (M).  
 COMPUTE U = FHNUM IN MAMMY (M) + MHNUM IN MAMMY (M) + NOH  
 IN TRAN.  
 IF U IS GREATER THAN O MOVE 'NUMBER IN HOLDING EXCEEDS NUMBER  
 - ' WEANED' TO TITLE IN ERR PERFORM ERR-CARD GO TO THEX.  
 TH1. IF SEX IN TRAN = 'MCF' GO TO TH2.  
 MOVE HCAGE IN TRAN TO CAGEF IN MAMMY (M).  
 MOVE NOH IN TRAN TO FHNUM IN MAMMY (M).  
 IF T-DATE IN TRAN = ZERO MOVE ZERO TO CAGEF IN MAMMY (M),  
 FHNUM IN MAMMY (M) ELSE MOVE 2 TO ML IN MAMMY (M).  
 GO TO THEX.  
 TH2. MOVE HCAGE IN TRAN TO CAGEM IN MAMMY (M).  
 MOVE NOH IN TRAN TO MHNUM IN MAMMY (M).  
 IF T-DATE IN TRAN = ZERO MOVE ZERO TO CAGEM IN MAMMY (M),  
 MHNUM IN MAMMY (M) ELSE MOVE 2 TO ML IN MAMMY (M).  
 THEX. EXIT.  
 TRAN-RESEARCH SECTION.  
 IF OVERRIDE GO TO TREF.  
 NOTE \*\*\*\*\*  
 RESEARCH CAGE NUMBERS RANGE FROM 500000 TO 899999  
 \*\*\*\*\*.  
 IF RCAGE IN TRAN IS LESS THAN 500000 OR GREATER THAN  
 899999 MOVE 'INCORRECT RESEARCH CAGE NUMBER' TO TITLE IN  
 ERR PERFORM ERR-CARD GO TO TREEX.  
 IF NOR IN TRAN = ZERO MOVE 'NUMBER OF RESEARCH ANIMALS NOT RE  
 - 'CORDED' TO TITLE IN ERR PERFORM ERR-CARD GO TO TREEX.  
 COMPUTE O = NO-F-WEAN IN MAMMY (M) + NO-M-WEAN IN MAMMY (M).  
 COMPUTE U = FENUM IN MAMMY (M,1) + FENUM IN MAMMY (M,2) +  
 MENUM IN MAMMY (M,1) + MENUM IN MAMMY (M,2) + NOR IN TRAN.  
 IF U IS GREATER THAN O MOVE 'NUMBER IN RESEARCH EXCEEDS NUMBE  
 - 'R WEANED' TO TITLE IN ERR PERFORM ERR-CARD GO TO TREEX.  
 IF RCAGE IN TRAN = FECAGE IN MAMMY (M,1) OR FECAGE IN MAMMY  
 (M,2) OR MECAGE IN MAMMY (M,1) OR MECAGE IN MAMMY (M,2) MOVE  
 'CAGE NUMBER HAS BEEN ASSIGNED' TO TITLE IN ERR PERFORM  
 ERR-CARD GO TO TREEX.  
 IF NOR IN TRAN IS GREATER THAN 12 MOVE 'MORE THAN 12 ANIMALS  
 - ' IN CAGE' TO TITLE IN ERR PERFORM ERR-CARD GO TO TREEX.  
 TRE1. MOVE 3 TO CODE IN EXPER-MOUSE.  
 IF SEX IN TRAN = 'FOF' GO TO TRE2 OTHERWISE GO TO TRE4.  
 TRE2. IF FCAGEE IN MAMMY (M,2) IS NOT = ZERO MOVE 'THIRD CAGE NOT  
 - 'ADDED' TO TITLE IN ERR PERFORM ERR-CARD GO TO TREEX.

MOVE 'F' TO SEX IN EXPER-MOUSE.  
 IF FCAGEE IN MAMMY (M,1) = ZERO MOVE 1 TO S OTHERWISE MOVE  
 2 TO S.  
 TREF3. MOVE RCAGE IN TRAN TO FCAGEE IN MAMMY (M,S) MOVE NOR IN  
 TRAN TO FENUM IN MAMMY (M,S) MOVE T-DATE IN TRAN TO FEDATE  
 IN MAMMY (M,S).  
 GO TO TREP.

TREF4. IF MCAGEE IN MAMMY (M,2) IS NOT = ZERO MOVE 'THIRD CAGE NOT  
 - 'ADDED' TO TITLE IN ERR PERFORM ERR-CARD GO TO TREEX.  
 MOVE 'M' TO SEX IN EXPER-MOUSE.  
 IF MCAGEE IN MAMMY (M,1) = ZERO MOVE 1 TO S OTHERWISE MOVE  
 2 TO S.

TREF5. MOVE RCAGE IN TRAN TO MCAGEE IN MAMMY (M,S) MOVE NOR IN  
 TRAN TO MENUM IN MAMMY (M,S) MOVE T-DATE IN TRAN TO MEDATE  
 IN MAMMY (M,S).  
 GO TO TREP.

TREF6. IF KOUNT IN TRAN IS LESS THAN 1 OR GREATER THAN 4 MOVE  
 'COUNT WRONG TO CHANGE EXPERIMENTAL CAGE' TO TITLE IN ERR  
 PERFORM ERR-CARD GO TO TREEX.  
 IF KOUNT IN TRAN = 3 MOVE 1 TO S.  
 IF KOUNT IN TRAN = 4 MOVE 2 TO S.  
 IF KOUNT IN TRAN = 1 OR 2 MOVE KOUNT IN TRAN TO S.  
 MOVE 2 TO CODE IN EXPER-MOUSE MOVE 1 TO OVER IN EXPER-MOUSE.  
 IF SEX IN TRAN = 'FOF' MOVE 'F' TO SEX IN EXPER-MOUSE.  
 IF SEX IN TRAN = 'MOF' MOVE 'M' TO SEX IN EXPER-MOUSE.  
 PERFORM TREP MOVE 3 TO CODE IN EXPER-MOUSE MOVE ZERO TO OVER  
 IN EXPER-MOUSE.  
 IF KOUNT IN TRAN = 3 OR 4 AND SEX IN TRAN = 'FOF' MOVE ZERO  
 TO FCAGEE IN MAMMY (M,S) GO TO TREEX.  
 IF KOUNT IN TRAN = 3 OR 4 AND SEX IN TRAN = 'MOF' MOVE ZERO  
 TO MCAGEE IN MAMMY (M,S) GO TO TREEX.  
 IF SEX IN TRAN = 'FOF' GO TO TREF3.  
 IF SEX IN TRAN = 'MOF' GO TO TREF5.

TREP. MOVE W-DATE IN MAMMY (M) TO DATE IN EXPER-MOUSE.  
 MOVE RCAGE IN TRAN TO CAGE-NO IN EXPER-MOUSE.  
 MOVE B-DATE IN MAMMY (M) TO R-DATE IN EXPER-MOUSE.  
 MOVE BCAGE IN MAMMY TO M-CAGE IN EXPER-MOUSE.  
 MOVE M TO L-ORDER IN EXPER-MOUSE.  
 MOVE WT IN TRAN TO WT IN EXPER-MOUSE.  
 MOVE NOR IN TRAN TO NUM IN EXPER-MOUSE.  
 MOVE STRAIN IN TRAN TO STRAIN IN EXPER-MOUSE.  
 WRITE PUNCH-CARD FROM EXPER-MOUSE.  
 MOVE ZERO TO OVER IN EXPER-MOUSE.

TREEX. EXIT.

TRAN-MATE SECTION.  
 IF OVERRIDE GO TO TMO.  
 NOTE \*\*\*\*\*  
 ANIMALS ARE MATED OUT OF HOLDING CAGES WHEN THEY ARE SIX  
 WEEKS OLD  
 INBRED MATE CAGE NUMBERS RANGE FROM 0 TO 99999  
 CROSS BREED MATE CAGE NUMBERS RANGE FROM 900000 TO 999999  
 \*\*\*\*\*.  
 IF FHNUM IN MAMMY (M) = ZERO AND MHNUM IN MAMMY (M) = ZERO  
 MOVE 'NO ANIMALS IN HOLDING' TO TITLE IN ERR PERFORM  
 ERR-CARD GO TO TMEX.

IF MCAGE IN TRAN IS GREATER THAN 899999 PERFORM CROSS-BREED  
THRU CBEX GO TO TM1.

IF MCAGE IN TRAN IS GREATER THAN 99999 MOVE 'INCORRECT CAGE N  
- 'UMBER FOR BREEDER CAGE' TO TITLE IN ERR PERFORM ERR-CARD  
GO TO TMEX.

TM1. IF KOUNTER = 100 MOVE 'SAVE TABLE FULL - RESUBMIT THIS MATIN  
- 'G' TO TITLE IN EPR PERFORM ERR-CARD GO TO TMEX.

COMPUTE S = KOUNTER + 1.  
PERFORM CAGE-CHECK VARYING O FROM 1 BY 1 UNTIL O = S.  
MOVE ZERO TO U.  
PERFORM ADD-CAGE THRU ACEX VARYING O FROM 1 BY 1 UNTIL O = 7  
OR U IS UNEQUAL TO ZERO.  
IF U = ZERO MOVE 'SEVENTH BREEDER CAGE CANNOT BE ADDED' TO  
TITLE IN ERR PERFORM ERR-CARD GO TO TMEX.  
MOVE T TO STRAIN IN SEQ-NUM MOVE ZERO TO GEN IN SEQ-NUM.  
MOVE MCAGE IN TRAN TO BCAGE IN SEQ-NUM.  
IF MCAGE IN TRAN IS LESS THAN 99999 MOVE STRAIN IN TRAN TO  
STRAIN IN SEQ-NUM MOVE GEN IN MAMMY TO GEN IN SEQ-NUM ADD  
1 TO GEN IN SEQ-NUM.  
IF CROOM IN TRAN = ZERO MOVE ROOM IN TRAN TO ROOM IN SEQ-NUM  
ELSE MOVE CROOM IN TRAN TO ROOM IN SEQ-NUM.  
MOVE ZERO TO N.  
PERFORM SEQ-CHECK VARYING O FROM 1 BY 1 UNTIL O = S OR N IS  
UNEQUAL TO ZERO.  
IF N IS UNEQUAL TO ZERO MOVE N TO S.  
ADD 1 TO KOUNTER ADD 1 TO MATE-PAIR IN MAMMY.  
MOVE SEQ-NUM TO FEMALE-NUMBER IN BABYX (S).  
MOVE LITTER IN TRAN TO PARITY IN BABYX (S).  
MOVE FEMIN TO MOTHER IN BABYX (S).  
MOVE B-DATE IN MAMMY (M) TO BIRTH-DATE IN BABYX (S).  
MOVE QFAC2 IN MAMMY TO QFAC1 IN BABYX (S).  
MOVE T-DATE IN TRAN TO M-DATE IN BABYX (S).  
SUBTRACT 1 FROM FHNUM IN MAMMY (M).  
IF MCAGE IN TRAN IS LESS THAN 99999 SUBTRACT 1 FROM MHNUM IN  
MAMMY (M).  
GO TO TMEX.

CAGE-CHECK.  
IF MCAGE IN TRAN = BCAGE IN BABYX (O) MOVE 'DUPLICATE BREEDER  
- ' CAGE NUMBER ON DATA CARDS' TO TITLE IN ERR PERFORM ERR-CARD  
GO TO TMEX.

ADD-CAGE.  
IF MCAGE IN TRAN = MCAGE IN MAMMY (M,O) MOVE 'DUPLICATE BREED  
- 'ER CAGE NUMBER ON MASTER TAPE' TO TITLE IN ERR PERFORM  
ERR-CARD GO TO TMEX.  
IF MCAGE IN MAMMY (M,O) = ZERO MOVE MCAGE IN TRAN TO MCAGE  
IN MAMMY (M,O) MOVE T-DATE IN TRAN TO MDATE IN MAMMY (M,O)  
MOVE 1 TO U.

ACEX.  
EXIT.

SEQ-CHECK.  
IF COMP-CM IS LESS THAN COMP-E (O) PERFORM COMP-MOVE  
VARYING U FROM S BY -1 UNTIL U = O.

COMP-MOVE.  
COMPUTE N = U - 1 MOVE BABYX (N) TO BABYX (U).

TM0.

IF KOUNT IN TRAN IS LESS THAN 1 OR GREATER THAN 6 MOVE  
 'COUNT WRONG TO CHANGE BREEDER CAGE' TO TITLE IN ERR PERFORM  
 ERR-CARD GO TO TMEX.  
 MOVE KOUNT IN TRAN TO 0.  
 MOVE T-DATE IN TRAN TO MDATE IN MAMMY (M,0).  
 MOVE MCAGE IN TRAN TO MCAGE IN MAMMY (M,0).  
 IF T-DATE IN TRAN = ZERO ADD 1 TO FHNUM IN MAMMY (M) ADD 1 TO  
 MHNUM IN MAMMY (M) SUBTRACT 1 FROM MATE-PAIR IN MAMMY MOVE  
 ZERO TO MCAGE IN MAMMY (M,0).  
 GO TO TMEX.

## CROSS-BREED.

IF STRAIN IN TRAN = 53 MOVE 60 TO T GO TO CBEX.  
 IF STRAIN IN TRAN = 11 MOVE 52 TO T GO TO CBEX.  
 MOVE 999 TO T.

CBEX. EXIT.

TMEX. EXIT.

## TOP-SCAN SECTION.

MOVE FEM-NO IN MAMMYO TO CARDO IN ERR.  
 MOVE LITTER-COUNT IN MAMMYO TO N.  
 COMPUTE  $S = N + 1$ .  
 IF RECON IN MAMMYO = 'R' GO TO TSEX.  
 IF RECON IN MAMMYO = 'N' PERFORM WRITE-CAGE THRU WCEX MOVE  
 ZERO TO RECON IN MAMMYO GO TO TSEX.  
 IF FCODE IN MAMMYO IS NOT EQUAL TO ZERO OR MCODE IN MAMMYO  
 IS NOT EQUAL TO ZERO PERFORM DEAD-CHECK THRU DCEX OTHERWISE  
 PERFORM RETIRE-CHECK THRU RCEX.  
 IF N = ZERO GO TO TSEX.  
 PERFORM COMP-Q THRU CQEX.  
 PERFORM LITTER-CHECK THRU LCEX VARYING N FROM 1 BY 1 UNTIL  
 N = S.  
 GO TO TSEX.

## DEAD-CHECK.

NOTE \*\*\*\*\*  
 THIS SECTION CHECKS TO SEE IF THE MALE AND FEMALE BREEDERS  
 ARE DEAD \* AN ERROR MESSAGE IS GIVEN IF THE FEMALE IS DEAD  
 AND THE MALE IS ALIVE OR IF THE MALE IS DEAD AND THE FEMALE  
 IS ALIVE \* WHEN BOTH BREEDERS ARE DEAD A CHECK IS MADE TO  
 SEE IF ALL LITTERS ARE LISTED AS WEANED AND MATED \* WHEN ALL  
 LITTER LISTS ARE COMPLETE AN 'R' IS MOVED TO RECON ON THE  
 MASTER RECORD

\*\*\*\*\*.

DC1. IF FCODE IN MAMMYO = ZERO AND MCODE IN MAMMYO IS NOT = ZERO  
 MOVE 'MALE DEAD - FEMALE ALIVE' TO TITLE IN ERR WRITE LIST  
 FROM ERR GO TO DCEX.

IF FCODE IN MAMMYO IS NOT = ZERO AND MCODE IN MAMMYO = ZERO  
 MOVE 'FEMALE DEAD - MALE ALIVE' TO TITLE IN ERR WRITE LIST  
 FROM ERR GO TO DCEX.

IF N = ZERO MOVE 'R' TO RECON IN MAMMYO AND GO TO TSEX.  
 PERFORM DC2 VARYING U FROM 1 BY 1 UNTIL U = S.  
 MOVE 'R' TO RECON IN MAMMYO GO TO TSEX.

DC2. IF W-DATE IN MAMMYO (U) = ZERO PERFORM DEAD-LITTER.

IF ML IN MAMMYO (U) = 90 MOVE 4 TO ML IN MAMMYO (U).

IF W-DATE IN MAMMYO (U) = ZERO MOVE 'FEMALE DEAD - LITTER NOT  
 - ' WEANED' TO TITLE IN ERR WRITE LIST FROM ERR GO TO DCEX.  
 IF FHNUM IN MAMMYO (U) IS GREATER THAN ZERO GO TO DCEX.

IF MNUM IN MAMMYO (U) IS GREATER THAN ZERO GO TO DCEX.  
 MOVE B-DATE IN MAMMYO (U) TO DATE-SCR.  
 IF MD IN DATE-SCR = (EDATE1 OR EDATE2 OR EDATE3) GO TO DCEX.  
 MOVE W-DATE IN MAMMYO (U) TO DATE-SCR.  
 IF MD IN DATE-SCR = (EDATE1 OR EDATE2 OR EDATE3) GO TO DCEX.  
 DEAD-LITTER.  
 COMPUTE NOM = B-SIZE IN MAMMYO (U) - D-SIZE IN MAMMYO (U) -  
 M-SIZE IN MAMMYO (U) - R-SIZE IN MAMMYO (U).  
 IF NOM IS LESS THAN 1 MOVE DATEN TO W-DATE IN MAMMYO (U)  
 MOVE 90 TO ML IN MAMMYO (U).  
 DCEX. EXIT.  
 COMP-Q.  
 IF M-DATE IN MAMMYO (1) = ZERO GO TO CQEX.  
 MOVE M-DATE IN MAMMYO (1) TO DATE-SCR.  
 IF FCODE IN MAMMYO = ZERO MOVE DATE IN CONTROL-CARD TO  
 TRA-DATE OTHERWISE MOVE FRDATE IN MAMMYO TO TRA-DATE.  
 PERFORM DT8 MOVE T TO TOTAL-DAYS-BREEDING IN MAMMYO.  
 MOVE ZERO TO NOM.  
 IF N = ZERO MOVE ZERO TO QFAC2 IN MAMMYO GO TO CQ3.  
 PERFORM CQ1 VARYING U FROM 1 BY 1 UNTIL U = S.  
 GO TO CQ2.  
 CQ1. COMPUTE NOM = NOM + NO-F-WEAN IN MAMMYO (U) + NO-M-WEAN IN  
 MAMMYO (U).  
 CQ2. COMPUTE QFAC2 IN MAMMYO = (NOM / TOTAL-DAYS-BREEDING IN  
 MAMMYO) \* 100.  
 GO TO CQ3, CQ4, CQ5, CQ6, CQ7 DEPENDING ON N.  
 CQ3. MOVE QFAC1 IN MAMMYO TO WQFAC IN MAMMYO GO TO CQEX.  
 CQ4. COMPUTE WQFAC IN MAMMYO = 0.25 \* QFAC2 IN MAMMYO + 0.75  
 \* QFAC1 IN MAMMYO GO TO CQEX.  
 CQ5. COMPUTE WQFAC IN MAMMYO = 0.50 \* QFAC2 IN MAMMYO + 0.50  
 \* QFAC1 IN MAMMYO GO TO CQEX.  
 CQ6. COMPUTE WQFAC IN MAMMYO = 0.75 \* QFAC2 IN MAMMYO + 0.25  
 \* QFAC1 IN MAMMYO GO TO CQEX.  
 CQ7. MOVE QFAC2 IN MAMMYO TO WQFAC IN MAMMYO.  
 CQEX. EXIT.  
 WRITE-CAGE.  
 NOTE \*\*\*\*\*  
 THIS SECTION PREPARES A PRINTED CARD TO BE ATTACHED TO A  
 BREEDER CAGE FOR VISUAL IDENTIFICATION  
 \*\*\*\*\*.  
 WC1. IF C1 = 1 GO TO WCEX.  
 WC2. PERFORM BLANK-MOVE VARYING U FROM 1 BY 1 UNTIL U = 7.  
 MOVE 'BREEDING' TO T1 IN WCARD1.  
 MOVE ROOM IN MAMMYO TO ROOM IN WCARD1.  
 MOVE BCAGE IN MAMMYO TO CAGE IN WCARD1.  
 MOVE COMP-MD TO FMNO IN WCARD2.  
 MOVE GEN IN MAMMYO TO GEN IN WCARD2.  
 MOVE PARITY IN MAMMYO TO PARITY IN WCARD2.  
 MOVE 'FAD' TO SEX IN WCARD2.  
 MOVE M-DATE IN MAMMYO (1) TO DATE-SCR PERFORM DT5 THRU DT6.  
 MOVE ODATE TO M-DATE IN WCARD2.  
 IF S = 1 GO TO WC4.  
 PERFORM WC3 VARYING U FROM 1 BY 1 UNTIL U = S.  
 GO TO WC4.  
 WC3. MOVE U TO L4 IN WCARD4.

MOVE B-DATE IN MAMMYO (U) TO DATE-SCR PERFORM DT5 THRU DT6.  
 MOVE ODATE TO DATE IN WCARD4.  
 MOVE B-SIZE IN MAMMYO (U) TO NB IN WCARD4.  
 IF W-DATE IN MAMMYO (U) = ZERO MOVE SPACES TO NFW IN WCARD4.  
 NMW IN WCARD4 OTHERWISE MOVE NO-F-WEAN IN MAMMYO (U) TO NFW  
 IN WCARD4 MOVE NO-M-WEAN IN MAMMYO (U) TO NMW IN WCARD4.  
 MOVE WCARD4 TO LN (U).  
 WC4. MOVE WCARDB TO WCARDBH WRITE CAGE-CRD FROM WCARD.  
 WCEX. EXIT.  
 BLANK-MOVE. MOVE SPACES TO LN IN LINE (U) MOVE RCMARK TO RCDMRK  
 IN LINE (U).  
 RETIRE-CHECK.  
 NOTE \*\*\*\*\*  
 FEMALE BREEDERS ARE LISTED FOR RETIREMENT WHEN ONE OF 3  
 CRITERIA ARE MET \*\*\*\*\*  
 1 \*\* FIFTH LITTER BORN \*\*\*\*\*  
 2 \*\* THREE NON-VIABLE LITTERS BORN \*\*\*\*\*  
 3 \*\* 60 DAYS WITH NO LITTERS BORN \*\*\*\*\*  
 THE CURRENT DATE IS USED AS THE RETIREMENT DATE EXCEPT FOR  
 THE FIFTH LITTER RETIREMENT WHERE THE RETIRE DATE IS  
 CALCULATED TO BE THE LITTER WEAN DATE  
 \*\*\*\*\*.

RC1. MOVE ZERO TO SORT-LIST.  
 IF N = 6 GO TO RCEX.  
 IF N = 5 MOVE 3 TO T1 IN SORT-LIST GO TO RC4.  
 MOVE M-DATE IN MAMMYO (S) TO DATE-SCR.  
 COMPUTE T = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR + 60.  
 PERFORM DT1 THRU DT4.  
 IF YR IN DATE-SCR IS GREATER THAN YR IN TRA-DATE GO TO RC2.  
 IF YR IN DATE-SCR IS LESS THAN YR IN TRA-DATE MOVE 2 TO T1 IN  
 SORT-LIST GO TO RC4.  
 IF DATE-SCR IS LESS THAN TRA-DATE MOVE 2 TO T1 IN SORT-LIST  
 GO TO RC4.

RC2. IF N IS LESS THAN 3 GO TO RCEX.  
 IF W-DATE IN MAMMYO (N) = ZERO GO TO RCEX.  
 MOVE ZERO TO NOM COMPUTE U = N - 2.

RC3. IF U IS GREATER THAN N MOVE 1 TO T1 IN SORT-LIST GO TO RC4.  
 COMPUTE NOM = NO-F-WEAN IN MAMMYO (U) + NO-M-WEAN IN  
 MAMMYO (U).  
 IF NOM = ZERO COMPUTE U = U + 1 GO TO RC3 OTHERWISE GO TO  
 RCEX.

RC4. MOVE 3 TO SORT1 IN SORT-LIST.  
 MOVE DATEN TO S-DATE IN SORT-LIST.  
 IF T1 IN SORT-LIST = 3 MOVE B-DATE IN MAMMYO (N) TO DATE-SCR  
 COMPUTE T = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR + 21  
 PERFORM DT1 THRU DT4 PERFORM DT7 MOVE DATE-S TO S-DATE  
 IN SORT-LIST.  
 MOVE FEM-NO IN MAMMYO TO REC IN SORT-LIST.  
 MOVE GEN IN MAMMYO TO GEN IN SORT-LIST.  
 MOVE 1 TO SW4.  
 WRITE SIN FROM SORT-LIST.

RCEX. EXIT.  
 LITTER-CHECK.

LC1. IF ML IN MAMMYO (N) = ZERO GO TO LCEX.  
 IF W-DATE IN MAMMYO (N) = ZERO MOVE N TO U PERFORM

DEAD-LITTER.

IF ML IN MAMMYO (N) = 90 PERFORM WRITE-CAGE THRU WCEX MOVE  
4 TO ML IN MAMMYO (N) GO TO LCEX.

IF ML IN MAMMYO (N) IS GREATER THAN 3 GO TO LCEX.

MOVE B-DATE IN MAMMYO (N) TO DATE-SCR PERFORM DT8.

IF T IS GREATER THAN 28 AND W-DATE IN MAMMYO (N) = ZERO MOVE  
'LITTER NOT WEANED' TO TITLE IN ERR WRITE LIST FROM ERR.

IF T IS GREATER THAN 28 PERFORM LIT-CHECK.

GO TO LC2, LC3, LC4 DEPENDING ON ML IN MAMMYO (N).

LC2. IF W-DATE IN MAMMYO (N) IS NOT = ZERO MOVE 2 TO ML IN  
MAMMYO (N) GO TO LC3.

IF T IS GREATER THAN 7 PERFORM WEANING MOVE 2 TO ML IN  
MAMMYO (N).

GO TO LCEX.

LC3. IF CAGEF IN MAMMYO (N) IS NOT = ZERO AND CAGEM IN MAMMYO  
(N) IS NOT = ZERO MOVE 3 TO ML IN MAMMYO (N).

IF CAGEF IN MAMMYO (N) IS NOT = ZERO PERFORM HOLDING GO TO  
LC4.

IF CAGEM IN MAMMYO (N) IS NOT = ZERO PERFORM HOLDING.

LC4. IF T IS GREATER THAN 28 PERFORM MATING.

LCEX. EXIT.

TSEX. IF C1 = 1 PERFORM WC2 THRU WCEX.

TSSEX. EXIT.

LIT-CHECK SECTION.

COMPUTE NOM = NO-F-WEAN IN MAMMYO (N) + NO-M-WEAN IN MAMMYO  
(N).

COMPUTE O = FHNUM IN MAMMYO (N) + MHNUM IN MAMMYO (N) +  
FENUM IN MAMMY (N,1) + FENUM IN MAMMY (N,2) + MENUM IN MAMMYO  
(N,1) + MENUM IN MAMMYO (N,2).

IF O IS GREATER THAN NOM MOVE 'TOO MANY ANIMALS IN HOLDING AN  
'D RESEARCH' TO TITLE IN ERR WRITE LIST FROM ERR.

COMPUTE O = FHNUM IN MAMMYO (N) + MHNUM IN MAMMYO (N).

IF T IS GREATER THAN 49 AND O IS GREATER THAN ZERO MOVE  
'ANIMALS NOT MATED - IN HOLDING' TO TITLE IN ERR WRITE  
LIST FROM ERR.

LCKEX. EXIT.

DATE-CHECK SECTION.

NOTE \*\*\*\*\*

DT1 THRU DT4 WILL CALCULATE A SIX DIGIT DATE FROM A PROJECTED  
DATE CALCULATED WITH A CONTINUOUS YEAR TABLE (YRTAB IN DATA)\*

DT5 THRU DT6 CHANGES A DIGITAL DATE TO THE ALPHABETIC FORM\*

DT7 CORRECTS A DATE TO FRIDAY IF IT FALLS ON SATURDAY AND  
TO MONDAY IF IT FALLS ON SUNDAY \* FIRST-SAT IS THE DAY OF  
THE FIRST SATURDAY IN THE YEAR\*

DT8 CALCULATES THE DIFFERENCE BETWEEN TWO GIVEN DATES

\*\*\*\*\*

DT1. IF MD IN DATE-SCR IS LESS THAN 1 OR GREATER THAN 12

GO TO DT4.

COMPUTE R = MD IN DATE-SCR.

DT2. IF T IS GREATER THAN YRTAB (R) COMPUTE R = R + 1 OTHERWISE  
GO TO DT3.

IF R IS GREATER THAN 13 COMPUTE R = R - 13, COMPUTE T = T -  
365, COMPUTE YR IN DATE-SCR = YR IN DATE-SCR + 1.

GO TO DT2.

DT3. COMPUTE MD IN DATE-SCR = R - 1.

COMPUTE DA IN DATE-SCR = T - YRTAB (MO IN DATE-SCR).  
 DT4. EXIT.  
 DT5. MOVE SPACES TO ODATE.  
 IF MO IN DATE-SCR IS LESS THAN 1 OR GREATER THAN 12 GO TO  
 DT6.  
 MOVE CORRESPONDING DATE-SCR TO ODATE.  
 MOVE MONT (MO IN DATE-SCR) TO MOTH.  
 DT6. EXIT.  
 DT7. COMPUTE T = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR  
 - FIRST-SAT.  
 COMPUTE R = T / 7.  
 COMPUTE A = T - R \* 7.  
 IF SAT COMPUTE DA IN DATE-SCR = DA IN DATE-SCR - 1.  
 IF SUN COMPUTE DA IN DATE-SCR = DA IN DATE-SCR + 1.  
 DT8. COMPUTE P = YR IN TRA-DATE - YR IN DATE-SCR.  
 COMPUTE A = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR.  
 COMPUTE R = YRTAB (MO IN TRA-DATE) + DA IN TRA-DATE.  
 COMPUTE T = (365 - A) + R + (365 \* (P - 1)).  
 WEANING SECTION.

NOTE \*\*\*\*\*  
 THIS SECTION PRODUCES THE WEAN LIST AND CAGE CARDS \*  
 WHEN A LITTER IS FOUND TO BE OVER 7 DAYS OLD A WEAN LIST IS  
 ISSUED WITH THE WEAN DATE CALCULATED 3 WEEKS FROM BIRTH \*  
 NEW PRINTED BREEDING CARDS ARE ISSUED AT THIS TIME \* THE ML  
 COUNTER FOR THE LITTER IS INCREASED FROM 1 TO 2 \*  
 \*\*\*\*\*.  
 WN1. MOVE B-DATE IN MAMMYO (N) TO DATE-SCR.  
 COMPUTE T = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR + 21.  
 PERFORM DT1 THRU DT4.  
 PERFORM DT7.  
 MOVE 1 TO SORT1 IN SORT-LIST  
 MOVE DATE-S TO S-DATE IN SORT-LIST  
 MOVE FEM-NO IN MAMMYO TO REC IN SORT-LIST.  
 MOVE GEN IN MAMMYO TO GEN IN SORT-LIST.  
 MOVE PARITY IN MAMMYO TO PAR IN SORT-LIST.  
 MOVE 'FAD' TO SEX IN SORT-LIST.  
 MOVE WQFAC IN MAMMYO TO Q-FACT IN SORT-LIST.  
 WRITE SIN FROM SORT-LIST MOVE 1 TO SW4.  
 PERFORM WRITE-CAGE THRU WCEX.

WNEX. EXIT.

HOLDING SECTION.

NOTE \*\*\*\*\*  
 THIS SECTION PUTS OUT THE PRINTED CAGE CARDS USED TO IDENTIFY  
 THE HOLDING CAGES \*\* WHEN THE ML COUNTER IN EACH LITTER  
 EQUALS 2 (COUNTER IS SET TO 2 WHEN THE LITTER IS DUE TO BE  
 WEANED) AND THE HOLDING CAGES ARE ASSIGNED IN THE MOTHER  
 RECORD THE HOLDING CAGE CARD IS PRINTED \*\*  
 \*\*\*\*\*.  
 HC1. MOVE 'HOLDING' TO T1 IN WCARD1.  
 MOVE ROOM IN MAMMYO TO ROOM IN WCARD1.  
 MOVE B-DATE IN MAMMYO (N) TO DATE-SCR.  
 COMPUTE T = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR + 42.  
 PERFORM DT1 THRU DT4 PERFORM DT7 PERFORM DT5 THRU DT6.  
 MOVE ODATE TO M-DATE IN WCARD2.  
 MOVE COMP-MO TO FMNO IN WCARD2.

MOVE GEN IN MAMMYO TO GEN IN WCARD2.  
 MOVE N TO PARITY IN WCARD2.  
 MOVE B-DATE IN MAMMYO (N) TO DATE-SCR.  
 PERFORM DT5 THRU DT6 MOVE ODATE TO ODAT IN WCARDH.  
 MOVE SPACES TO WCARDBH MOVE RCMARK TO RCDMRK IN WCARDBH.  
 MOVE CAGEF IN MAMMYO (N) TO CAGE IN WCARD1 MOVE 'FOF' TO SEX  
 IN WCARD2, SEX IN WCARDH MOVE FHNUM IN MAMMYO (N) TO NOMCE  
 IN WCARDH MOVE WCARDH TO WCARDBH WRITE CAGE-CRD FROM WCARD.  
 MOVE CAGEM IN MAMMYO (N) TO CAGE IN WCARD1 MOVE 'MOF' TO SEX  
 IN WCARD2, SEX IN WCARDH MOVE MHNUM IN MAMMYO (N) TO NOMCE  
 IN WCARDH MOVE WCARDH TO WCARDBH WRITE CAGE-CRD FROM WCARD.

HCEX. EXIT.

MATING SECTION.

NOTE \*\*\*\*\*  
 THIS SECTION PREDICTS THE AVAILABLE DATE A LITTER IS TO BE  
 MATED BASED ON A MATE DATE OF SIX WEEKS FROM BIRTH  
 \*\*\*\*\*.

M1. MOVE B-DATE IN MAMMYO (N) TO DATE-SCR.  
 COMPUTE T = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR + 42.  
 PERFORM DT1 THRU DT4 PERFORM DT7.  
 MOVE ZERO TO SORT-LIST.  
 MOVE 2 TO SORT1 IN SORT-LIST.  
 MOVE DATE-S TO S-DATE IN SORT-LIST.  
 MOVE FEM-NO IN MAMMYO TO REC IN SORT-LIST.  
 MOVE GEN IN MAMMYO TO GEN IN SORT-LIST.  
 MOVE N TO PAR IN SORT-LIST.  
 MOVE 1 TO SW4.  
 IF CAGEF IN MAMMYO (N) = ZERO GO TO M2.  
 IF FHNUM IN MAMMYO (N) = ZERO GO TO M2.  
 MOVE ZERO TO NUM-M IN SORT-LIST.  
 MOVE FHNUM IN MAMMYO (N) TO NUM-F IN SORT-LIST.  
 MOVE CAGEF IN MAMMYO (N) TO CAGE IN SORT-LIST.  
 MOVE 'FOF' TO SEX IN SORT-LIST.  
 WRITE SIN FROM SORT-LIST.  
 M2. IF CAGEM IN MAMMYO (N) = ZERO GO TO M3.  
 IF MHNUM IN MAMMYO (N) = ZERO GO TO M3.  
 MOVE ZERO TO NUM-F IN SORT-LIST.  
 MOVE MHNUM IN MAMMYO (N) TO NUM-M IN SORT-LIST.  
 MOVE 'MOF' TO SEX IN SORT-LIST.  
 MOVE CAGEM IN MAMMYO (N) TO CAGE IN SORT-LIST.  
 WRITE SIN FROM SORT-LIST.  
 M3. MOVE 4 TO ML IN MAMMYO (N).

MTEX. EXIT.

END-CARD SECTION.

IF STARTUP GO TO END-UPDATE.

EC1. MOVE MAMMY TO MAMMYO PERFORM TOP-SCAN.  
 IF PRTREC PERFORM WRITE1 MOVE ZERO TO PRINT-FLAG.  
 WRITE MAMMYO.  
 READ MAMMY-IN AT END GO TO END-UPDATE.  
 IF KOUNTER = ZERO GO TO EC1.  
 COMPUTE K = KOUNTER + 1 PERFORM EXPAND-SCAN THRU ESEX  
 VARYING M FROM 1 BY 1 UNTIL M = K.  
 GO TO EC1.

END-TAPE.

IF COMP-C IS GREATER THAN FN-HOLD MOVE 1 TO E.

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MOVE MAMMY-END TO COMP-M.
ET1. IF E = ZERO READ SRTOUT AT END GO TO END-UPDATE.
MOVE ZERO TO E.
IF NOREC OR DELREC MOVE 'ANIMAL NOT ON MASTER TAPE' TO TITLE
IN ERR PERFORM ERR-CARD GO TO ET1.
PERFORM TRAN-ADD AND GO TO ET1.
TABLE-SCAN.
IF COMP-E (M) = ZERO GO TO TSCEX.
MOVE 1 TO U.
TSCEX. EXIT.
END-UPDATE.
MOVE MAMMY-END TO COMP-M.
IF KOUNTER = ZERO GO TO EU1.
COMPUTE K = KOUNTER + 1 PERFORM EXPAND-SCAN THRU ESEX
VARYING M FROM 1 BY 1 UNTIL M = K.
CLOSE MAMMY-EX OPEN INPUT MAMMY-MEX.
NOTE *****
WRITE-REC OUTPUTS A MASTER RECORD LIST FOR RECORDS THAT HAVE
BEEN ADDED OR UPDATED
*****
WRITE-REC.
READ MAMMY-MEX AT END GO TO WR1.
WRITE LIST FROM MAMREC GO TO WRITE-REC.
WR1. CLOSE MAMMY-MEX.
MOVE ZERO TO U.
PERFORM TABLE-SCAN THRU TSCEX VARYING M FROM 1 BY 1 UNTIL
M = K OR U IS UNEQUAL TO ZERO.
IF U = ZERO GO TO EU1.
MOVE ZERO TO FN-HOLD.
CLOSE MAMMY-OUT OPEN INPUT NEWMAS OUTPUT MAMMY-EX.
NOTE *****
THE FOLLOWING PARAGRAPHS TO EU1 PUT RECORDS ON THE MASTER
TAPE THAT WERE OUT OF SEQUENTIAL ORDER IN THE UPDATE
PROCEDURE
*****
WRTMEX. READ NEWMAS AT END GO TO ENDMEX.
WRITE MAMEX FROM MAMMYO GO TO WRTMEX.
ENDMEX. CLOSE NEWMAS, MAMMY-EX.
OPEN INPUT MAMMY-MEX OUTPUT MAMMY-OUT.
RDMEX. READ MAMMY-MEX AT END CLOSE MAMMY-MEX GO TO EU1.
MOVE COMP-MEX TO COMP-M PERFORM EXPAND-SCAN THRU ESEX
VARYING M FROM 1 BY 1 UNTIL M = K.
WRITE MAMMYO FROM MAMEX GO TO RDMEX.
EU1. CLOSE PUNCH, SRTOUT, SRTIN, CA-CAD WITH LOCK, MAMMY-OUT.
IF LISMAS CLOSE MAMMY-IN WITH LOCK.
IF SW4 = ZERO GO TO LIST-WRITE.
MOVE ZERO TO M.
ENTER LINKAGE-MODE.
CALL 'GETSRT' USING SRTDK, SRTIN, SROUT, M.
ENTER COBOL.
IF M IS GREATER THAN ZERO MOVE 'LIST SORT NO GOOD - RESUBMIT
- ' THIS JOB' TO TITLE IN ERR MOVE SPACE TO CARDO WRITE LIST
FROM ERR GO TO POTS.
EU2. OPEN INPUT SROUT MOVE ZERO TO KNT, NOM, CDATE.
WRITE-LIST.

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READ SROUT INTO SORT-LIST AT END GO TO GETOUT.
NOTE *****
WRITE-LIST PRINTS THE PREDICTION LISTS IN ROOM AND DATE
SORT ORDER
*****.
MOVE SPACES TO TR IN REPOUT, CAGE IN HEAD3.
MOVE ZERO TO F-NUM IN REPOUT, M-NUM IN REPOUT, CAGE IN
REPOUT.
IF ROOM IN SORT-LIST IS NOT = NOM MOVE ROOM IN SORT-LIST TO
NOM, ROOM-NO IN HEAD2 MOVE 25 TO LNCNT.
IF SORT1 IN SORT-LIST IS GREATER THAN KNT MOVE SORT1 IN
SORT-LIST TO KNT MOVE 25 TO LNCNT GO TO WNHD, MTHD, RETHD
DEPENDING ON SORT1 IN SORT-LIST.
GO TO WRT.
WNHD. MOVE 'WEAN LIST' TO T1 IN HEAD MOVE 'WEAN DATE' TO TITLE IN
HEAD3 MOVE SPACES TO TCHM IN HEAD3 CAGE IN HEAD3 MOVE
'WQ-FACTOR' TO QFACT IN HEAD3 GO TO WRT.
MTHD. MOVE 'MATE LIST' TO T1 IN HEAD MOVE 'MATE DATE' TO TITLE IN
HEAD3 MOVE SPACES TO QFACT IN HEAD3 MOVE 'FEMALE MALE' TO
TCHM IN HEAD3 MOVE 'CAGE-NO' TO CAGE IN HEAD3 GO TO WRT.
RETHD. MOVE 'RETIREMENT LIST' TO T1 IN HEAD MOVE 'RETIRE DATE' TO
TITLE IN HEAD3 MOVE SPACES TO TCHM IN HEAD3, QFACT IN HEAD3.
WRT. IF JUMP2 WRITE LIST FROM HEAD WRITE LIST FROM HEAD2 WRITE
LIST FROM HEAD3 MOVE ZERO TO LNCNT.
MOVE CORRESPONDING SORT-LIST TO REPOUT.
MOVE FN IN SORT-LIST TO FN IN REPOUT.
MOVE S-DATE TO DATE-SCR PERFORM DT5 THRU DT6 MOVE ODATE
TO X-DATE IN REPOUT.
IF WEANEM MOVE ZERO TO CAGE IN REPOUT.
IF MATEM MOVE NUM-F IN SORT-LIST TO F-NUM IN REPOUT MOVE
NUM-M IN SORT-LIST TO M-NUM IN REPOUT.
IF RETIRE AND T1 IN SORT-LIST = 1 MOVE 'THREE DEAD LITTERS'
TO TR IN REPOUT.
IF RETIRE AND T1 IN SORT-LIST = 2 MOVE 'NO LITTERS 2 MONTHS'
TO TR IN REPOUT.
IF RETIRE AND T1 IN SORT-LIST = 3 MOVE 'FIFTH LITTER BORN'
TO TR IN REPOUT.
WRITE LIST FROM REPOUT ADD 1 TO LNCNT GO TO WRITE-LIST.
GETOUT. CLOSE SROUT.
LIST-WRITE SECTION.
OPEN INPUT NEWMAS MOVE 25 TO LNCNT.
NOTE *****
LIST-WRITE PRINTS A ONE-LINE-PER-RECORD LIST OF THE MASTER
TAPE AND CALCULATES THE PERCENTAGE WEANED, THE AVERAGE
NUMBER BORN PER LITTER AND THE AVERAGE WEIGHT PER LITTER
FOR EACH RECORD
*****.
MOVE 'MASTER TAPE LIST' TO T1 IN HEAD MOVE ZERO TO P.
READNEW. READ NEWMAS AT END GO TO LISTDONE.
MOVE CORRESPONDING MAMMYO TO DATAOUT.
MOVE COMP-MO TO FEM IN DATAOUT.
IF LITTER-COUNT IN MAMMYO IS GREATER THAN ZERO PERFORM
ANALYSIS OTHERWISE MOVE ZERO TO PERWN, AVBRN, AVWT.
IF JUMP2 WRITE LIST FROM HEAD WRITE LIST FROM LISTHD MOVE
ZERO TO LNCNT.

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ADD 1 TO P.  
 WRITE LIST FROM DATAOUT ADD 1 TO LNCNT GO TO READNEW.  
 ANALYSIS.  
 MOVE LITTER-COUNT IN MAMMYO TO M.  
 COMPUTE S = M + 1.  
 MOVE ZERO TO NOM, CWTS, T, R, A.  
 PERFORM AN1 VARYING E FROM 1 BY 1 UNTIL E = S.  
 COMPUTE NOM = NOM / M MOVE NOM TO AVBRN.  
 COMPUTE T = (T / R) \* 100 MOVE T TO PERWN.  
 COMPUTE CWTS = CWTS / A MOVE CWTS TO AVWT.  
 AN1.  
 ADD B-SIZE IN MAMMYO (E) TO NOM.  
 IF W-DATE IN MAMMYO (E) IS GREATER THAN ZERO ADD NO-F-WEAN IN  
 MAMMYO (E) TO T ADD NO-M-WEAN IN MAMMYO (E) TO T ADD B-SIZE  
 IN MAMMYO (E) TO R.  
 IF WT IN MAMMYO (E) IS GREATER THAN ZERO ADD WT IN MAMMYO  
 (E) TO CWTS ADD 1 TO A.  
 LISTDONE.  
 MOVE 'TOTAL NUMBER OF BREEDERS' TO T1 IN HEAD MOVE P TO T2  
 IN HEAD WRITE LIST FROM HEAD.  
 CLOSE REPORT, NEWMAS WITH LOCK.  
 POTS. STOP RUN.  
 WRITE1 SECTION.  
 WRITE MAMREC FROM HEAD.  
 WRITE MAMREC FROM HEAD22.  
 MOVE COMP-MO IN MAMMYO TO FNO IN DATA22.  
 MOVE GEN IN MAMMYO TO GEN IN DATA22.  
 MOVE PARITY IN MAMMYO TO LO IN DATA22.  
 MOVE MOTHER IN MAMMYO TO MNO IN DATA22.  
 MOVE BIRTH-DATE IN MAMMYO TO DATE-SCR PERFORM DT5 THRU DT6  
 MOVE ODATE TO B-DATE IN DATA22.  
 MOVE MATE-PAIR IN MAMMYO TO BP IN DATA22.  
 MOVE TOTAL-DAYS-BREEDING IN MAMMYO TO TDB IN DATA22.  
 MOVE FCODE IN MAMMYO TO RC IN DATA22.  
 MOVE FRDATE IN MAMMYO TO DATE-SCR PERFORM DT5 THRU DT6 MOVE  
 ODATE TO RDATE IN DATA22.  
 MOVE FNEWID IN MAMMYO TO NID IN DATA22.  
 MOVE FRCAGE IN MAMMYO TO RCAGE IN DATA22.  
 MOVE RECON IN MAMMYO TO RECON IN DATA22.  
 MOVE LITTER-COUNT IN MAMMYO TO LC IN DATA22.  
 MOVE QFAC1 IN MAMMYO TO Q1 IN DATA22.  
 MOVE QFAC2 IN MAMMYO TO Q2 IN DATA22.  
 MOVE WQFAC IN MAMMYO TO QW IN DATA22.  
 WRITE MAMREC FROM DATA22.  
 MOVE MCODE IN MAMMYO TO RC IN DATA22.  
 MOVE MRDATE IN MAMMYO TO DATE-SCR PERFORM DT5 THRU DT6 MOVE  
 ODATE TO RDATE IN DATA22.  
 MOVE MNEWID IN MAMMYO TO NID IN DATA22.  
 MOVE MRCAGE IN MAMMYO TO RCAGE IN DATA22.  
 WRITE MAMREC FROM DATA22.  
 IF LITTER-COUNT IN MAMMYO = ZERO GO TO WR1EX.  
 WRITE MAMREC FROM HEAD33.  
 COMPUTE S = LITTER-COUNT IN MAMMYO + 1.  
 PERFORM W1 VARYING N FROM 1 BY 1 UNTIL N = S.  
 GO TO WR1EX.

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W1. MOVE N TO LNI IN DATA33.
MOVE M-DATE IN MAMMYO (N) TO DATE-SCR PERFORM DT5 THRU DT6
MOVE ODATE TO MD IN DATA33.
MOVE B-DATE IN MAMMYO (N) TO DATE-SCR PERFORM DT5 THRU DT6
MOVE ODATE TO RD IN DATA33.
MOVE W-DATE IN MAMMYO (N) TO DATE-SCR PERFORM DT5 THRU DT6
MOVE ODATE TO WD IN DATA33.
MOVE B-SIZE IN MAMMYO (N) TO BS IN DATA33.
MOVE D-SIZE IN MAMMYO (N) TO DS IN DATA33.
MOVE M-SIZE IN MAMMYO (N) TO MS IN DATA33.
MOVE R-SIZE IN MAMMYO (N) TO RS IN DATA33.
MOVE NO-F-WEAN IN MAMMYO (N) TO NFW IN DATA33.
MOVE NO-M-WEAN IN MAMMYO (N) TO NMW IN DATA33.
MOVE WT IN WTS IN MAMMYO (N) TO WT IN DATA33, WTCH.
MOVE WTDATE IN MAMMYO (N) TO DATE-SCR PERFORM DT5 THRU DT6
MOVE ODATE TO WTD IN DATA33.
MOVE WTNUM IN MAMMYO (N) TO WTNUM IN DATA33, C.
COMPUTE WTCH = WTCH / C.
MOVE WTCH TO AVWT1 IN DATA33.
MOVE MCAGE IN MAMMYO (N,1) TO BC1 IN DATA33.
MOVE MCAGE IN MAMMYO (N,2) TO BC2 IN DATA33.
WRITE MAMREC FROM DATA33.
MOVE MCAGE IN MAMMYO (N,3) TO BC1 IN DATA331.
MOVE MCAGE IN MAMMYO (N,4) TO BC2 IN DATA331.
WRITE MAMREC FROM DATA331.
MOVE CAGEF IN HCAGEF IN MAMMYO (N) TO FHC IN DATA332.
MOVE CAGEM IN HCAGEM IN MAMMYO (N) TO MHC IN DATA332.
MOVE FHNUM IN MAMMYO (N) TO FHCNO IN DATA332.
MOVE MHNUM IN MAMMYO (N) TO MHCNO IN DATA332.
MOVE FCAGEE IN MAMMYO (N,1) TO FEC IN DATA332.
MOVE MCAGEE IN MAMMYO (N,1) TO MEC IN DATA332.
MOVE FEDATE IN MAMMYO (N,1) TO DATE-SCR PERFORM DT5 THRU DT6
MOVE ODATE TO FECDT IN DATA332.
MOVE FENUM IN MAMMYO (N,1) TO FECNO IN DATA332.
MOVE MENUM IN MAMMYO (N,1) TO MECNO IN DATA332.
MOVE MEDATE IN MAMMYO (N,1) TO DATE-SCR PERFORM DT5 THRU DT6
MOVE ODATE TO MECDT IN DATA332.
MOVE ML IN MAMMYO (N) TO ML IN DATA332.
MOVE MCAGE IN MAMMYO (N,5) TO BC1 IN DATA332.
MOVE MCAGE IN MAMMYO (N,6) TO BC2 IN DATA332.
WRITE MAMREC FROM DATA332.
MOVE FCAGEE IN MAMMYO (N,2) TO FEC IN DATA333.
MOVE MCAGEE IN MAMMYO (N,2) TO MEC IN DATA333.
MOVE FEDATE IN MAMMYO (N,2) TO DATE-SCR PERFORM DT5 THRU DT6
MOVE ODATE TO FECDT IN DATA333.
MOVE MEDATE IN MAMMYO (N,2) TO DATE-SCR PERFORM DT5 THRU DT6
MOVE ODATE TO MECDT IN DATA333.
MOVE FENUM IN MAMMYO (N,2) TO FECNO IN DATA333.
MOVE MENUM IN MAMMYO (N,2) TO MECNO IN DATA333.
WRITE MAMREC FROM DATA333.

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WRTX. EXIT.

BEND  
BCBC MATGEN DECK  
IDENTIFICATION DIVISION.  
PROGRAM-ID. BREEDING PROGRAM.

AUTHOR. BARBARA BISHOP.  
 ENVIRONMENT DIVISION.  
 CONFIGURATION SECTION.  
 SOURCE-COMPUTER. IBM-7090.  
 OBJECT-COMPUTER. IBM-7090.  
 INPUT-OUTPUT SECTION.  
 FILE-CONTROL.

SELECT CARD-IN ASSIGN TO SYSIN1.  
 SELECT REPORT ASSIGN TO SYSOUL.  
 SELECT PUNCH ASSIGN TO SYSPPL.  
 SELECT MAMMY-IN ASSIGN TO A(1).  
 SELECT MAMMY-OUT ASSIGN TO B(1).  
 SELECT NEWMAS RENAMING MAMMY-OUT ASSIGN TO B(1).  
 SELECT MAMMY-EX ASSIGN TO B(3).  
 SELECT MAMMY-MEX RENAMING MAMMY-EX ASSIGN TO B(3).  
 SELECT CA-CAD ASSIGN TO A(2).  
 SELECT SRTIN ASSIGN TO B(2).  
 SELECT SRTOUT ASSIGN TO A(1).  
 SELECT SROUT ASSIGN TO A(1).

DATA DIVISION.

FILE SECTION.

FD CARD-IN LABEL RECORDS OMITTED DATA RECORD IS CARDS.  
 01 CARDS.

02 FIE OCCURS 48 TIMES.  
 03 CHAR PICTURE X.

FD REPORT LABEL RECORDS OMITTED DATA RECORD IS LIST.  
 01 LIST.

02 FILLER PICTURE X(132).

FD PUNCH LABEL RECORDS OMITTED DATA RECORD IS PUNCH-CARD.  
 01 PUNCH-CARD.

02 FILLER PICTURE X(80).

FD MAMMY-IN LABEL RECORDS OMITTED RECORDING MODE BINARY DATA  
 RECORD MAMMY.

01 MAMMY.

02 FEM-NO.

03 REC.

04 STRAIN PICTURE 999.

04 ROOM PICTURE 99.

04 BCAGE PICTURE 9(6).

03 COMP-I REDEFINES REC IN MAMMY PICTURE 9(11).

03 GEN PICTURE 999.

02 FEMIN REDEFINES FEM-NO IN MAMMY PICTURE 9(14).

02 PARITY PICTURE 9.

02 MOTHER PICTURE 9(14).

02 REMOVE.

03 FEMALE.

04 FCODE PICTURE 99.

04 FNEWID PICTURE 9(5).

04 FRDATE PICTURE 9(6).

04 FRCAGE PICTURE 9(6).

03 MALE.

04 MCODE PICTURE 99.

04 MNEWID PICTURE 9(5).

04 MRDATE PICTURE 9(6).

04 MRCAGE PICTURE 9(6).

02 BIRTH-DATE PICTURE 9(6).  
 02 QFAC1 PICTURE 99V99.  
 02 QFAC2 PICTURE 99V99.  
 02 WQFAC PICTURE 99V99.  
 02 MATE-PAIR PICTURE 99.  
 02 LITTER-COUNT PICTURE 9.  
 02 TOTAL-DAYS-BREEDING PICTURE 9(3).  
 02 RECON PICTURE X.  
 02 LITTER OCCURS 6 TIMES.  
   03 ML PICTURE 99.  
   03 M-DATE PICTURE 9(6).  
   03 B-DATE PICTURE 9(6).  
   03 W-DATE PICTURE 9(6).  
   03 B-SIZE PICTURE 99.  
   03 DEAD.  
     04 D-SIZE PICTURE 99.  
     04 M-SIZE PICTURE 99.  
     04 R-SIZE PICTURE 99.  
   03 NO-F-WEAN PICTURE 99.  
   03 NO-M-WEAN PICTURE 99.  
   03 WTS.  
     04 WT PICTURE 999V9.  
     04 WTDATE PICTURE 9(6).  
     04 WTNUM PICTURE 99.  
   03 HCAGEF.  
     04 CAGEF PICTURE 9(6).  
     04 FHNUM PICTURE 99.  
   03 HCAGEM.  
     04 CAGEM PICTURE 9(6).  
     04 MHNUM PICTURE 99.  
   03 BREED-CAGE OCCURS 6 TIMES.  
     04 MCAGE PICTURE 9(6).  
     04 MDATE PICTURE 9(6).  
   03 EXP-CAGE OCCURS 2 TIMES.  
     04 FECAGE.  
       05 FCAGEE PICTURE 9(6).  
       05 FENUM PICTURE 99.  
       05 FEDATE PICTURE 9(6).  
     04 MECAGE.  
       05 MCAGEE PICTURE 9(6).  
       05 MENUM PICTURE 99.  
       05 MEDATE PICTURE 9(6).

FD MAMMY-OUT LABEL RECORDS OMITTED RECORDING MODE BINARY DATA  
RECORD MAMMYO.

01 MAMMYO.

  02 FEM-NO.

    03 REC.

      04 STRAIN PICTURE 999.

      04 ROOM PICTURE 99.

      04 BCAGE PICTURE 9(6).

    03 GEN PICTURE 999.

  02 COMP-MO REDEFINES FEM-NO IN MAMMYO PICTURE 9(14).

  02 PARITY PICTURE 9.

  02 MOTHER PICTURE 9(14).

  02 REMOVE.

03 FEMALE.  
   04 FCODE PICTURE 99.  
   04 FNEWID PICTURE 9(5).  
   04 FRDATE PICTURE 9(6).  
   04 FRCAGE PICTURE 9(6).  
 03 MALE.  
   04 MCODE PICTURE 99.  
   04 MNEWID PICTURE 9(5).  
   04 MRDATE PICTURE 9(6).  
   04 MRCAGE PICTURE 9(6).  
 02 BIRTH-DATE PICTURE 9(6).  
 02 QFAC1 PICTURE 99V99.  
 02 QFAC2 PICTURE 99V99.  
 02 WQFAC PICTURE 99V99.  
 02 MATE-PAIR PICTURE 99.  
 02 LITTER-COUNT PICTURE 9.  
 02 TOTAL-DAYS-BREEDING PICTURE 9(3).  
 02 RECDN PICTURE X.  
 02 LITTER OCCURS 6 TIMES.  
   03 ML PICTURE 99.  
   03 M-DATE PICTURE 9(6).  
   03 B-DATE PICTURE 9(6).  
   03 W-DATE PICTURE 9(6).  
   03 B-SIZE PICTURE 99.  
 03 DEAD.  
   04 D-SIZE PICTURE 99.  
   04 M-SIZE PICTURE 99.  
   04 R-SIZE PICTURE 99.  
 03 NO-F-WEAN PICTURE 99.  
 03 NO-M-WEAN PICTURE 99.  
 03 WTS.  
   04 WT PICTURE 999V9.  
   04 WTDATE PICTURE 9(6).  
   04 WTNUM PICTURE 99.  
 03 HCAGEF.  
   04 CAGEF PICTURE 9(6).  
   04 FHNUM PICTURE 99.  
 03 HCAGEM.  
   04 CAGEM PICTURE 9(6).  
   04 MHNUM PICTURE 99.  
 03 BREED-CAGE OCCURS 6 TIMES.  
   04 MCAGE PICTURE 9(6).  
   04 MDATE PICTURE 9(6).  
 03 EXP-CAGE OCCURS 2 TIMES.  
   04 FECAGE.  
     05 FCAGEE PICTURE 9(6).  
     05 FENUM PICTURE 99.  
     05 FEDATE PICTURE 9(6).  
   04 MECAGE.  
     05 MCAGEE PICTURE 9(6).  
     05 MENUM PICTURE 99.  
     05 MEDATE PICTURE 9(6).

FD MAMMY-EX LABEL RECORDS OMITTED RECORDING MODE BINARY  
 DATA RECORD MAMEX, MAMREC.  
 01 MAMEX.

02 COMP-MFX PICTURE 9(11).  
 02 FILLER PICTURE X(1213).  
 01 MAMREC PICTURE X(132).  
 FD SRTIN LABEL RECORDS OMITTED DATA RECORD IS SIN.  
 01 SIN.  
 02 FILLER PICTURE X(48).  
 FD SRTOUT LABEL RECORDS OMITTED DATA RECORD IS TRAN.  
 01 TRAN.  
 02 TRAI.  
 03 T-DATE PICTURE 9(6).  
 03 DATE REDEFINES T-DATE IN TRAN.  
 04 MO PICTURE 99.  
 04 DA PICTURE 99.  
 04 YR PICTURE 99.  
 03 CODE PICTURE 9.  
 88 ADDEM VALUE 0.  
 88 DELEM VALUE 1.  
 88 MATEM VALUE 2.  
 88 EXEM VALUE 4.  
 88 BORNEM VALUE 5.  
 88 WEANEM VALUE 6.  
 88 WEIGHM VALUE 7.  
 88 HOLDEM VALUE 8.  
 88 KILLEM VALUF 9.  
 03 BADGE.  
 04 IDEN PICTURE 9(3).  
 04 CAGE PICTURE 9(6).  
 03 STA PICTURE 9(3).  
 03 REC.  
 04 STRAIN PICTURE 999.  
 04 ROOM PICTURE 99.  
 04 BCAGE PICTURE 9(6).  
 03 COMP-C REDEFINES REC IN TRAN PICTURE 9(11).  
 03 FILLER PICTURE X.  
 03 GEN PICTURE 9(3).  
 03 LIT PICTURE 9.  
 03 SFX PICTURE X(3).  
 03 MANUAL-ENTRY PICTURE 9(6).  
 03 MAN-DEATH REDEFINES MANUAL-ENTRY IN TRAN.  
 04 RCODE PICTURE 9.  
 04 NEW-ID PICTURE 9(5).  
 03 MAN-BIRTH REDEFINES MANUAL-ENTRY IN TRAN.  
 04 FILLER PICTURE X(4).  
 04 B-SIZE PICTURE 99.  
 03 MAN-WEAN REDDEFINES MANUAL-ENTRY IN TRAN.  
 04 FILLER PICTURE XX.  
 04 NO-F-WEAN PICTURE 99.  
 04 NO-M-WEAN PICTURE 99.  
 03 MAN-CW REDEFINES MANUAL-ENTRY IN TRAN.  
 04 QUAN PICTURE 99.  
 04 WT PICTURE 999V9.  
 03 MAN-DO REDEFINES MANUAL-ENTRY IN TRAN.  
 04 NOREM PICTURE 99.  
 04 FILLER PICTURE X(4).  
 03 MAN-ROOM REDEFINES MANUAL-ENTRY IN TRAN.

04 CROOM PICTURE 99.  
 04 FILLER PICTURE X(4).  
 03 KOUNT PICTURE 9.  
 03 OVER PICTURE 9.  
 88 OVERRIDE VALUE 1.  
 03 FILLER PICTURE XX.  
 02 TRA2 REDEFINES TRAI IN TRAN PICTURE X(48).  
 FD SROUT LABEL RECORDS OMITTED DATA RECORD IS SOUT.  
 01 SOUT PICTURE X(48).  
 FD CA-CAD, BLOCK CONTAINS 1 RECORD, LABEL RECORDS ARE OMITTED,  
 DATA RECORD IS CAGE-CRD.  
 01 CAGE-CRD.  
 02 TITLE PICTURE IS X(792).  
 WORKING-STORAGE SECTION.  
 77 M PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 O PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 U PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 S PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 E PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 T PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 R PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 A PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 88 SAT VALUE IS 0.  
 88 SUN VALUE IS 1.  
 77 P PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 N PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 K PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 PRINT-FLAG PICTURE 9 VALUE ZERO.  
 88 PRTREC VALUE 1.  
 77 C PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 WTCH PICTURE 999V9 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 KNT PICTURE 99.  
 77 LNCNT PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 88 JUMP1 VALUE 50.  
 88 JUMP2 VALUE 25.  
 77 NDM PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 CDATE PICTURE 9(6).  
 77 CWTS PICTURE 9999V99 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 WDATE1 PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 WDATE2 PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 FN-CHECK PICTURE 9(11).  
 77 FN-HOLD PICTURE 9(11).  
 77 RDCNT PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT VALUE  
 ZERO.  
 77 MAMMY-END PICTURE 9(11) VALUE 99999999999.  
 77 COMP-M PICTURE 9(11) VALUE ZERO.  
 88 END-M VALUE 99999999999.  
 77 RCMARK PICTURE IS J.  
 77 FIRST-SAT PICTURE 9 VALUE 7.  
 77 SW4 PICTURE 9 VALUE ZERO.  
 01 SEQ-NUM.  
 02 REC.  
 03 STRAIN PICTURE 999.  
 03 ROOM PICTURE 99.  
 03 BCAGE PICTURE 9(6).

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02 COMP-CM REDEFINES REC IN SEQ-NUM PICTURE 9(11).
02 GEN PICTURE 999.
01 EXPER-MOUSE.
02 DATE PICTURE 9(6).
02 CODE PICTURE 9 VALUE 3.
02 EX-ID PICTURE 9(3) VALUE 413.
02 CAGE-NO PICTURE 9(6).
02 STA PICTURE 9(3) VALUE 999.
02 B-DATE PICTURE 9(6).
02 FILLER PICTURE X VALUE ' '.
02 M-CAGE PICTURE 9(6).
02 FILLER PICTURE F XX VALUE ' '.
02 L-ORDER PICTURE 9.
02 SEX PICTURE X.
02 STRAIN PICTURE 99.
02 NUM PICTURE 99.
02 WT PICTURE 999V9.
02 FILLER PICTURE X VALUE ' '.
02 OVER PICTURE Z VALUE 0.
02 FILLER PICTURE X(34) VALUE ' '.
01 SRTDK1.
02 FILLER PICTURE X(32) VALUE '      OPT,VAR,TAP,CAR,NOF,NOCK
- 'PT'.
02 FILLER PICTURE X(52) VALUE ' '.
- 02 FILLER PICTURE X(35) VALUE '      CHA,INP/J1,MER/(A,B,UT
- ',OUT/B'.
02 FILLER PICTURE X(49) VALUE ' '.
02 FILLER PICTURE X(27) VALUE '      FIL,INP/5,MOD/D,BLO/8'.
02 FILLER PICTURE X(57) VALUE ' '.
02 FILLER PICTURE X(25) VALUE '      FIL,OUT,MOD/D,BLO/8'.
02 FILLER PICTURE X(59) VALUE ' '.
- 02 FILLER PICTURE X(42) VALUE '      REC,TYP/F,LEN/8,FIE/(4
- ',2,1,3,6,3,15)'.
02 FILLER PICTURE X(42) VALUE ' '.
- 02 FILLER PICTURE X(43) VALUE '      SOR,FIL/5,SEQ/C,ORD/2,
- 'FIE/(7,2,1,3,5)'.
02 FILLER PICTURE X(41) VALUE ' '.
02 FILLER PICTURE X(9) VALUE '      END'.
02 FILLER PICTURE X(75) VALUE ' '.
01 SRTDK.
02 FILLER PICTURE X(32) VALUE '      OPT,VAR,TAP,CAR,NOF,NOCK
- 'PT'.
02 FILLER PICTURE X(52) VALUE ' '.
- 02 FILLER PICTURE IS X(36) VALUE IS '      CHA,INP/J1R,MER/
- '(A,B,UT),OUT/B'.
02 FILLER PICTURE IS X(48) VALUE IS ' '.
- 02 FILLER PICTURE IS X(28) VALUE IS '      FIL,INP/5,MOD/D,
- 'BLO/14'.
02 FILLER PICTURE IS X(56) VALUE IS ' '.
- 02 FILLER PICTURE IS X(25) VALUE IS '      FIL,OUT,MOD/D,BL
- 'D/8'.
02 FILLER PICTURE IS X(59) VALUE IS ' '.
- 02 FILLER PICTURE IS X(47) VALUE IS '      REC,TYP/F,LEN/(1
- '4,8,8),FIE/(1,4,2,3,2,36)'.
02 FILLER PICTURE IS X(37) VALUE IS ' '.

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02 FILLER PICTURE IS X(41) VALUE IS '      SOR,FIL/5,SEQ/C,
- 'ORD/2,FIE/(1,5,3,2)'.
02 FILLER PICTURE IS X(43) VALUE IS ' '.
02 FILLER PICTURE IS X(9) VALUE IS '      END'.
02 FILLER PICTURE IS X(75) VALUE IS ' '.
01 CONTROL-CARD.
02 DATE.
03 MO PICTURE 99.
03 DA PICTURE 99.
03 YR PICTURE 99.
02 DATEN REDEFINES DATE IN CONTROL-CARD PICTURE 9(6).
02 FILLER PICTURE X.
02 CONTRL PICTURE 9.
08 STARTUP VALUE IS 0.
08 LISMAS VALUF 1.
08 LISTON VALUE 2.
02 FILLER PICTURE IS X.
02 C1 PICTURE IS 9.
01 HEAD.
02 FILLER PICTURE X VALUE '1'.
02 FILLER PICTURE X(5) VALUE 'DATE '.
02 DATE PICTURE 99B99B99.
02 FILLER PICTURE X(17) VALUE ' '.
02 T1 PICTURE X(30) VALUE 'MATGEN TRANSACTION LIST'.
02 FILLER PICTURE X(5) VALUE ' '.
02 T2 PICTURE Z(6).
01 TH1.
02 FILLER PICTURE 9 VALUE 0.
02 FILLER PICTURE X(20) VALUE 'MO DA YR TC IDEN CA'.
02 FILLER PICTURE X(20) VALUE 'GE NO STA ANIMAL N'.
02 FILLER PICTURE X(20) VALUE 'D          MAN '.
02 FILLER PICTURE X(10) VALUE 'ENT LC OV'.
01 TRA.
02 FILLER PICTURE X VALUE ' '.
02 T-DATE PICTURE 99B99B99.
02 FILLER PICTURE XX VALUE ' '.
02 CODE PICTURE 9.
02 FILLER PICTURE XX VALUE ' '.
02 BADGE.
03 IDEN PICTURE Z(3).
03 FILLER PICTURE XX VALUE ' '.
03 CAGE PICTURE Z(6).
02 FILLER PICTURE X(3) VALUE ' '.
02 STA PICTURE Z(3).
02 FILLER PICTURE XX VALUE ' '.
02 REC.
03 STRAIN PICTURE 9(3).
03 FILLER PICTURE X VALUE ' '.
03 ROOM PICTURE 99.
03 FILLER PICTURE X VALUE ' '.
03 BCAGE PICTURE Z(6).
03 FILLER PICTURE X VALUE ' '.
02 GEN PICTURE Z(3).
02 FILLER PICTURE X VALUE ' '.
02 LIT PICTURE 9.

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02 FILLER PICTURE X VALUE ' '.  
 02 SEX PICTURE X(3).  
 02 FILLER PICTURE XX VALUE ' '.  
 02 MANUAL-ENTRY PICTURE Z(6).  
 02 FILLER PICTURE XX VALUE ' '.  
 02 KOUNT PICTURE Z.  
 02 FILLER PICTURE X VALUE ' '.  
 02 OVER PICTURE Z.  
 01 PCARD.  
   02 FILLER PICTURE X(12) VALUE ' '.  
   02 REC.  
     03 STRAIN PICTURE 9(3).  
     03 ROOM PICTURE 99.  
     03 BCAGE PICTURE 9(6).  
     03 FILLER PICTURE 9(4) VALUE ZERO.  
   02 LIT PICTURE 9.  
   02 SEX PICTURE X(3).  
 01 TRA-DATE.  
   02 MO PICTURE 99.  
   02 DA PICTURE 99.  
   02 YR PICTURE 99.  
 01 DATE-SCR.  
   02 MO PICTURE 99.  
   02 DA PICTURE 99.  
   02 YR PICTURE 99.  
 01 DATE-S REDEFINES DATE-SCR PICTURE 9(6).  
 01 YRTAB1.  
   02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT  
   VALUE 000.  
   02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT  
   VALUE 031.  
   02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT  
   VALUE 059.  
   02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT  
   VALUE 090.  
   02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT  
   VALUE 120.  
   02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT  
   VALUE 151.  
   02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT  
   VALUE 181.  
   02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT  
   VALUE 212.  
   02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT  
   VALUE 243.  
   02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT  
   VALUE 273.  
   02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT  
   VALUE 304.  
   02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT  
   VALUE 334.  
   02 FILLER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT  
   VALUE 365.  
 01 YRTAB2 REDEFINES YRTAB1.  
   02 YRTAB OCCURS 13 TIMES PICTURE 999 COMPUTATIONAL

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    SYNCHRONIZED RIGHT.
01 DATE-TABLE.
    02 MDT PICTURE X(36) VALUE 'JANFEBMARAPRMAYJUNJULAUGSEPOCTN
'DVDEC'.
    02 MONT REDEFINES MDT PICTURE X(3) OCCURS 12 TIMES.
01 ODATE.
    02 MOTH PICTURE XXX.
    02 FILLER PICTURE X.
    02 DA PICTURE Z7.
    02 FILLER PICTURE X.
    02 YR PICTURE F 99.
01 ERR.
    02 CARR PICTURE X VALUE '0'.
    02 TITLE PICTURE X(45).
    02 FILLER PICTURE X(5) VALUE ' '.
    02 CARDO PICTURE X(80).
01 MAMMY-EXPAND.
    02 KOUNTER PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT.
    02 QBABYX OCCURS 100 TIMES.
        03 BABYX.
            04 FEMALE-NUMBER.
                05 REC.
                    06 STRAIN PICTURE 999.
                    06 ROOM PICTURE 99.
                    06 BCAGE PICTURE 9(6).
                05 COMP-E REDEFINES REC IN BABYX PICTURE 9(11).
                05 GEN PICTURE 999.
                04 FEM REDEFINES FEMALE-NUMBER IN BABYX PICTURE 9(14).
                04 PARITY PICTURE 9.
                04 MOTHER PICTURE 9(14).
                04 BIRTH-DATE PICTURE 9(6).
                04 QFAC1 PICTURE 99V99.
                04 M-DATE PICTURE 9(6).
01 LISTHD.
    02 FILLER PICTURE X VALUE '0'.
    02 FILLER PICTURE X(20) VALUE 'FEMALE NUMBER      B'.
    02 FILLER PICTURE X(20) VALUE 'IRTH DATE      REM CODE'.
    02 FILLER PICTURE X(20) VALUE '      STAT  DAYS BREED '.
    02 FILLER PICTURE X(20) VALUE ' LIT  M-PAIR   Q2   '.
    02 FILLER PICTURE X(20) VALUE ' QW    PER WEAN  AVB'.
    02 FILLER PICTURE X(20) VALUE 'RN/LIT  AVWT/LIT   '.
01 DATAOUT.
    02 FILLER PICTURE X VALUE '0'.
    02 FEM PICTURE 999B99B999999B999.
    02 FILLER PICTURE XX VALUE ' '.
    02 BIRTH-DATE PICTURE 99B99B99.
    02 FILLER PICTURE X(7) VALUE '      F-'.
    02 REMOVE.
        03 FEMALE.
            04 FCODE PICTURE 99.
        03 FILLFR PICTURE X(3) VALUE ' M-'.
        03 MALE.
            04 MCODE PICTURE 99.
    02 FILLER PICTURE X(3) VALUE ' '.
    02 RECON PICTURE X.

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02 FILLER PICTURE X(7) VALUE ' '.
02 TOTAL-DAYS-BREEDING PICTURE Z(3).
02 FILLER PICTURE X(7) VALUE ' '.
02 LITTER-COUNT PICTURE Z.
02 FILLER PICTURE X(5) VALUE ' '.
02 MATE-PAIR PICTURE ZZ.
02 FILLER PICTURE XXX VALUE ' '.
02 QFAC2 PICTURE ZZ.99 BLANK WHEN ZERO.
02 FILLER PICTURE XX VALUE ' '.
02 WQFAC PICTURE ZZ.99 BLANK WHEN ZERO.
02 FILLER PICTURE X(4) VALUE ' '.
02 PERWN PICTURE ZZZ.
02 FILLER PICTURE X(8) VALUE ' '.
02 AVBRN PICTURE ZZ.
02 FILLER PICTURE X(8) VALUE ' '.
02 AVWT PICTURE ZZZ.
01 HEAD22.
02 FILLER PICTURE X(21) VALUE 'OFEMALE NUMBER      L'.
02 FILLER PICTURE X(20) VALUE 'O MOTHER NUMBER      '.
02 FILLER PICTURE X(20) VALUE ' BIRTH DATE REM    '.
02 FILLER PICTURE X(20) VALUE 'REM DATE    NEW ID  P'.
02 FILLER PICTURE X(20) VALUE ' CAGE STAT    LC  BP'.
02 FILLER PICTURE X(20) VALUE ' TDB      Q1    Q2    '.
02 FILLER PICTURE X(4) VALUE ' QW'.
01 DATA22.
02 FILLER PICTURE X VALUE ' '.
02 FNO PICTURE 999B999B999999.
02 FILLER PICTURE X VALUE ' '.
02 GEN PICTURE 999.
02 FILLER PICTURE XX VALUE ' '.
02 LD PICTURE Z.
02 FILLER PICTURE XXX VALUE ' '.
02 MND PICTURE ZZZBZZBZZZZZZBZZZ.
02 FILLER PICTURE XX VALUE ' '.
02 B-DATE PICTURE X(9).
02 FILLER PICTURE X(5) VALUE ' F-'.
02 RC PICTURE ZZ.
02 FILLER PICTURE XX VALUE ' '.
02 RDATE PICTURE X(9).
02 FILLER PICTURE XX VALUE ' '.
02 NID PICTURE Z(5).
02 FILLER PICTURE XXX VALUE ' '.
02 RCAGE PICTURE Z(6).
02 FILLER PICTURE X(4) VALUE ' '.
02 RECON PICTURE X.
02 FILLER PICTURE X(5) VALUE ' '.
02 LC PICTURE 9.
02 FILLER PICTURE XX VALUE ' '.
02 BP PICTURE ZZ.
02 FILLER PICTURE XX VALUE ' '.
02 TDB PICTURE Z(3).
02 FILLER PICTURE XX VALUE ' '.
02 Q1 PICTURE ZZ.99 BLANK WHEN ZERO.
02 FILLER PICTURE XX VALUE ' '.
02 Q2 PICTURE ZZ.99 BLANK WHEN ZERO.

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02 FILLER PICTURE XX VALUE ' '.
02 QW PICTURE ZZ.99 BLANK WHEN ZERO.
01 DATA222.
02 FILLER PICTURE X(55) VALUE ' '.
02 FILLER PICTURE XX VALUE 'M-'.
02 RC PICTURE ZZ.
02 FILLER PICTURE XX VALUE ' '.
02 RDATE PICTURE X(9).
02 FILLER PICTURE XX VALUE ' '.
02 NID PICTURE Z(5).
02 FILLER PICTURE XXX VALUE ' '.
02 RCAGE PICTURE Z(6).
01 HEAD33.
02 FILLER PICTURE X VALUE '0'.
02 FILLER PICTURE X(20) VALUE 'LITTER MATE DATE B'.
02 FILLER PICTURE X(20) VALUE 'IRTH DATE WEAN DATE'.
02 FILLER PICTURE X(20) VALUE ' B-SIZE D-SIZE M-'.
02 FILLER PICTURE X(20) VALUE 'SIZE R-SIZE F-WEAN'.
02 FILLER PICTURE X(20) VALUE ' M-WEAN WT-DATE '.
02 FILLER PICTURE X(20) VALUE 'WT NUM AV-WT BRE'.
02 FILLER PICTURE X(10) VALUE 'EDER CAGES'.
01 DATA33.
02 FILLER PICTURE X VALUE ' '.
02 FILLER PICTURE XX VALUE ' '.
02 LNI PICTURE 9.
02 FILLER PICTURE X(5) VALUE ' '.
02 MD PICTURE X(9).
02 FILLER PICTURE XX VALUE ' '.
02 BD PICTURE X(9).
02 FILLER PICTURE XXX VALUE ' '.
02 WD PICTURE X(9).
02 FILLER PICTURE XXX VALUE ' '.
02 BS PICTURE ZZ.
02 FILLER PICTURE X(6) VALUE ' '.
02 DS PICTURE ZZ.
02 FILLER PICTURE X(6) VALUE ' '.
02 MS PICTURE ZZ.
02 FILLER PICTURE X(6) VALUE ' '.
02 RS PICTURE ZZ.
02 FILLER PICTURE X(6) VALUE ' '.
02 NFW PICTURE ZZ.
02 FILLER PICTURE X(5) VALUE ' '.
02 NMW PICTURE ZZ.
02 FILLER PICTURE X(4) VALUE ' '.
02 WTD PICTURE X(9).
02 FILLER PICTURE XX VALUE ' '.
02 WT PICTURE Z(3).
02 FILLER PICTURE XX VALUE ' '.
02 WTNUM PICTURE ZZ.
02 FILLER PICTURE X(4) VALUE ' '.
02 AVWT1 PICTURE Z(3).
02 FILLER PICTURE X(4) VALUE ' '.
02 BCI PICTURE Z(6).
02 FILLER PICTURE X VALUE ' '.
02 BC2 PICTURE Z(6).

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01 DATA331.

02 FILLER PICTURE X VALUE ' '。  
 02 FILLER PICTURE X(20) VALUE 'F-H-CAGE NUM M-H-CAG'。  
 02 FILLER PICTURE X(20) VALUE 'E NUM F-E-CAGE NUM D'。  
 02 FILLER PICTURE X(20) VALUE 'ATE M-E-CAGE NU'。  
 02 FILLER PICTURE X(20) VALUE 'M DATE ML '。  
 02 FILLER PICTURE X(37) VALUE ' '。  
 02 BC1 PICTURE Z(6)。  
 02 FILLER PICTURE X VALUE ' '。  
 02 BC2 PICTURE Z(6)。

01 DATA332.

02 FILLER PICTURE XX VALUE ' '。  
 02 FHC PICTURE Z(6)。  
 02 FILLER PICTURE XXX VALUE ' '。  
 02 FHCNO PICTURE ZZ。  
 02 FILLER PICTURE XX VALUE ' '。  
 02 MHC PICTURE Z(6)。  
 02 FILLER PICTURE X(3) VALUE ' '。  
 02 MHCNO PICTURE ZZ。  
 02 FILLER PICTURE XX VALUE ' '。  
 02 FEC PICTURE Z(6)。  
 02 FILLER PICTURE XXX VALUE ' '。  
 02 FECNO PICTURE ZZ。  
 02 FILLER PICTURE X VALUE ' '。  
 02 FECDT PICTURE X(9)。  
 02 FILLER PICTURE XX VALUE ' '。  
 02 MEC PICTURE Z(6)。  
 02 FILLER PICTURE XXX VALUE ' '。  
 02 MECNO PICTURE ZZ。  
 02 FILLER PICTURE X VALUE ' '。  
 02 MECDT PICTURE X(9)。  
 02 FILLER PICTURE X(5) VALUE ' '。  
 02 ML PICTURE ZZ。  
 02 FILLER PICTURE X(39) VALUE ' '。  
 02 BC1 PICTURE Z(6)。  
 02 FILLER PICTURE X VALUE ' '。  
 02 BC2 PICTURE Z(6)。

01 DATA333.

02 FILLER PICTURE X(28) VALUE ' '。  
 02 FEC PICTURE Z(6)。  
 02 FILLER PICTURE XXX VALUE ' '。  
 02 FECNO PICTURE ZZ。  
 02 FILLER PICTURE X VALUE ' '。  
 02 FECDT PICTURE X(9)。  
 02 FILLER PICTURE XX VALUE ' '。  
 02 MEC PICTURE Z(6)。  
 02 FILLER PICTURE XXX VALUE ' '。  
 02 MECNO PICTURE ZZ。  
 02 FILLER PICTURE X VALUE ' '。  
 02 MECDT PICTURE X(9)。

01 HEAD1.

02 CARR PICTURE IS X VALUE IS '1'。  
 02 FILLER PICTURE IS A(20) VALUE IS ' '。  
 02 TITLE PICTURE IS X(15)。  
 02 FILLER PICTURE IS A(20) VALUE IS ' '。

02 DATE PICTURE 99B99B99.  
 01 HEAD2.  
   02 CARR PICTURE IS X VALUE IS '0'.  
   02 FILLER PICTURE IS A(20) VALUE IS ' '.  
   02 RM PICTURE IS X(7) VALUE IS 'ROOM-NO'.  
   02 FILLER PICTURE IS A VALUE IS ' '.  
   02 ROOM-NO PICTURE IS XX.  
 01 HEAD3.  
   02 CARR PICTURE IS X VALUE IS '0'.  
   02 CAGE PICTURE X(7).  
   02 FILLER PICTURE IS A(5) VALUE IS ' '.  
   02 ANM-NO PICTURE IS A(13) VALUE IS 'ANIMAL NUMBER'.  
   02 FILLER PICTURE IS A(11) VALUE IS ' '.  
   02 TITLE PICTURE IS X(11).  
   02 FILLER PICTURE IS A(5) VALUE IS ' '.  
   02 QFACT PICTURE IS X(9).  
   02 FILLER PICTURE IS X(4) VALUE IS ' '.  
   02 TCHM PICTURE IS X(12).  
 01 REPOUT.  
   02 CARR PICTURE IS X VALUE IS '0'.  
   02 CAGE PICTURE Z(6).  
   02 FILLER PICTURE IS A(6) VALUE IS ' '.  
   02 FN PICTURE 999B99B999999B999.  
   02 FILLER PICTURE X(7) VALUE ' '.  
   02 X-DATE PICTURE IS X(9).  
   02 FILLER PICTURE X(6) VALUE ' '.  
   02 Q-FACT PICTURE ZZ.99 BLANK WHEN ZERO.  
   02 T-NUM.  
     03 FILLER PICTURE X(10) VALUE ' '.  
     03 F-NUM PICTURE Z7.  
     03 FILLER PICTURE X(5) VALUE ' '.  
     03 M-NUM PICTURE ZZ.  
     03 FILLER PICTURE X(6) VALUE ' '.  
   02 TR PICTURE IS X(20).  
 01 SORT-LIST.  
   02 SORT1 PICTURE IS 9.  
     88 WEANIT VALUE 1.  
     88 MATEIT VALUE 2.  
     88 RETIRE VALUE 3.  
   02 S-DATE PICTURE IS 9(6).  
   02 ANM-NO.  
     03 FN PICTURE 9(14).  
     03 REC REDEFINES FN IN SORT-LIST.  
       04 STRAIN PICTURE 999.  
       04 ROOM PICTURE 99.  
       04 RCAGE PICTURE 9(6).  
       04 GEN PICTURE 999.  
     03 PAR PICTURE 9.  
     03 SEX PICTURE IS X(3).  
   02 Q-FACT PICTURE IS 99V99.  
   02 T1 PICTURE IS 9(6).  
   02 NUM REDEFINES T1 IN SORT-LIST.  
     03 NUM-M PICTURE 99.  
     03 NUM-F PICTURE 99.  
     03 FILLER PICTURE 99.

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02 CAGE PICTURE 9(6).
01 WCARD.
02 WCARD1.
03 FILLER PICTURE IS X VALUE IS '1'.
03 FILLER PICTURE IS X(30) VALUE IS ' '.
03 T1 PICTURE IS X(10).
03 FILLER PICTURE IS J.
03 FILLER PICTURE IS J.
03 FILLER PICTURE X(14) VALUE '          CAGE '.
03 CAGE PICTURE 9(6).
03 FILLER PICTURE X(13) VALUE '          ROOM '.
03 ROOM PICTURE 99.
03 FILLER PICTURE J.
02 WCARD2.
03 FILLER PICTURE IS X VALUE IS '0'.
03 FILLER PICTURE X(20) VALUE 'FEMALE NUMBER      '.
03 FILLER PICTURE X(20) VALUE 'LITTER SEX      MATE'.
03 FILLER PICTURE X(5) VALUE ' DATE'.
03 FILLER PICTURE IS J.
03 FILLER PICTURE IS X VALUE IS ' '.
03 FMNO PICTURE 999B99B999999.
03 FILLER PICTURE X VALUE ' '.
03 GEN PICTURE 999.
03 FILLER PICTURE X(5) VALUE ' '.
03 PARITY PICTURE Z.
03 FILLER PICTURE X(6) VALUE ' '.
03 SEX PICTURE X(3).
03 FILLER PICTURE X(4) VALUE ' '.
03 M-DATE PICTURE X(9).
03 FILLER PICTURE X(5) VALUE ' '.
03 FILLER PICTURE IS J.
02 WCARDBH.
03 TOUT PICTURE X(623).
03 RCDMRK PICTURE X.
01 WCARDB.
02 WCARD3.
03 FILLER PICTURE IS X VALUE IS '0'.
03 FILLER PICTURE IS X(10) VALUE IS 'LITTER NO.'.
03 FILLER PICTURE IS X(5) VALUE IS ' '.
03 FILLER PICTURE IS X(10) VALUE IS 'BIRTH DATE'.
03 FILLER PICTURE IS X(5) VALUE IS ' '.
03 FILLER PICTURE IS X(8) VALUE IS 'NO. BORN'.
03 FILLER PICTURE IS X(5) VALUE IS ' '.
03 FILLER PICTURE IS X(10) VALUE IS 'NO. F WEAN'.
03 FILLER PICTURE IS X(5) VALUE IS ' '.
03 FILLER PICTURE IS X(10) VALUE IS 'NO. M WEAN'.
03 FILLER PICTURE IS X(36) VALUE IS ' '.
03 FILLER PICTURE IS J.
02 LINE OCCURS 6 TIMES.
03 LN PICTURE IS X(65).
03 RCDMRK PICTURE IS X.
02 FILLER PICTURE IS J.
02 FILLER PICTURE IS X(120) VALUE IS ' '.
02 FILLER PICTURE IS J.
01 WCARD4.

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02 FILLER PICTURE IS X(6) VALUE IS ' '.
02 L4 PICTURE IS Z.
02 FILLER PICTURE IS X(10) VALUE IS ' '.
02 DATE PICTURE IS X(9).
02 FILLER PICTURE IS X(8) VALUE IS ' '.
02 NB PICTURE IS X(2).
02 FILLER PICTURE IS X(12) VALUE IS ' '.
02 NFW PICTURE IS X(2).
02 FILLER PICTURE IS X(13) VALUE IS ' '.
02 NMW PICTURE IS XX.
01 WCARDH.
02 FILLER PICTURE IS X VALUE IS '0'.
02 FILLER PICTURE IS X(12) VALUE IS 'NO OF MICE '.
02 NOMCE PICTURE IS ZZZ.
02 FILLER PICTURE IS X(19) VALUE IS ' '.
02 FILLER PICTURE IS X(9) VALUE IS 'TREATMENT'.
02 FILLER PICTURE IS J.
02 FILLER PICTURE IS X VALUE IS '0'.
02 FILLER PICTURE IS X(5) VALUE IS 'SEX '.
02 SFX PICTURE X(3).
02 FILLER PICTURE IS J.
02 FILLER PICTURE IS X(16) VALUE IS 'ODATE OF BIRTH '.
02 ODAT PICTURE IS X(9).
02 FILLER PICTURE X(25) VALUE ' '.
02 FILLER PICTURE IS J.
PROCEDURE DIVISION.
OPEN INPUT CARD-IN, OUTPUT REPORT, OUTPUT PUNCH.
READ CARD-IN RECORD INTO CONTROL-CARD AT END MOVE
'NO CONTROL CARD' TO TITLE IN ERR MOVE SPACES TO CARDD IN
ERR WRITE LIST FROM ERR GO TO POTS.
MOVE DATEN IN CONTROL-CARD TO DATE IN HEAD.
MOVE ZERO TO T2 IN HEAD.
IF LISTON CLOSE CARD-IN, PUNCH GO TO LIST-WRITE.
OPEN OUTPUT MAMMY-OUT, SRTIN, MAMMY-EX.
IF STARTUP NEXT SENTENCE OTHERWISE OPEN INPUT MAMMY-IN.
RDCRD.
READ CARD-IN RECORD AT END GO TO SRTONE.
PERFORM CHAR-CHECK VARYING M FROM 1 BY 1 UNTIL M = 49.
WRITE SIN FROM CARDS GO TO RDCRD.
CHAR-CHECK.
IF CHAR IN CARDS (M) = SPACE MOVE ZERO TO CHAR IN CARDS (M).
SRTONE.
CLOSE SRTIN, CARD-IN.
MOVE ZERO TO M.
NOTE *****
CARDS ARE SORTED IN FEMALE NUMBER ORDER WITH SUBSORT ON DATE
*****.
ENTER LINKAGE-MODE.
CALL 'GETSRT' USING SRTDK1, SRTIN, SRTOUT, M.
ENTER COBOL.
IF M IS NOT EQUAL TO ZERO MOVE 'SORT NOT GOOD - RESUBMIT'
TO TITLE IN ERR MOVE SPACE TO CARDD IN ERR WRITE LIST
FROM ERR DISPLAY QUOTE 'ERROR IN SORT' GO TO POTS.
OPEN INPUT SRTOUT MOVE ZERO TO M.
RDSRT1.

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READ SRTOUT RECORD AT END GO TO ENDCRDS.

NOTE \*\*\*\*\*  
SORTED TRANSACTIONS ARE LISTED BEFORE MASTER TAPE IS  
UPDATED

\*\*\*\*\*.

IF STRAIN IN TRAN IS NOT EQUAL TO M MOVE STRAIN IN TRAN TO  
M MOVE 50 TO LNCNT.

IF JUMP1 WRITE LIST FROM HEAD WRITE LIST FROM TH1 MOVE ZERO  
TO LNCNT.

MOVE CORRESPONDING TRAI TO TRA.

WRITE LIST FROM TRA ADD 1 TO LNCNT.

GO TO RDSRT1.

ENDCRDS.

CLOSE SRTOUT OPEN INPUT SRTOUT, OUTPUT SRTIN, CA-CAD.

MOVE 'MATGEN ERROR LIST' TO T1 IN HEAD WRITE LIST FROM HEAD.

MOVE 'MATGEN MASTER RECORD' TO T1 IN HEAD.

MOVE ZERO TO FN-CHECK.

IF LISMAS READ MAMMY-IN RECORD AT END MOVE 'NO RECORDS ON OLD

' MASTER TAPE' TO TITLE IN ERR MOVE SPACES TO CARD0 IN ERR

WRITE LIST FROM FRR AND GO TO PCTS.

IF LISMAS MOVE COMP-I TO COMP-M.

MOVE ZERO TO KOUNTER.

PERFORM ZERO-MOVE VARYING M FROM 1 BY 1 UNTIL M = 101.

GO TO READ-CARD.

ZERO-MOVE. MOVE ZEROS TO BABYX (M).

READ-CARD.

MOVE 1 TO E.

READ SRTOUT RECORD AT END GO TO END-CARD.

MOVE ZERO TO E.

IF STARTUP AND ADDEM PERFORM TRAN-ADD GO TO READ-CARD.

IF STARTUP MOVE 'WRONG CARD FOR STARTUP CASE' TO TITLE IN

ERR GO TO ERR-CARD.

IF ADDEM GO TO SEQUENCE.

COMPARE.

IF COMP-C IS GREATER THAN COMP-M PERFORM MASTER-MOVE THRU

MMEX GO TO COMPARE.

IF COMP-C = COMP-M GO TO SCAT.

MOVE 'ANIMAL NOT ON MASTER TAPE' TO TITLE IN ERR GO TO

ERR-CARD.

SEQUENCE.

IF COMP-C = COMP-M MOVE 'ANIMAL ALREADY ON TAPE - CANNOT ADD'  
TO TITLE IN ERR GO TO ERR-CARD.

IF COMP-C IS GREATER THAN COMP-M PERFORM MASTER-MOVE THRU

MMEX AND GO TO SEQUENCE.

PERFORM TRAN-ADD GO TO READ-CARD.

MASTER-MOVE.

NOTE \*\*\*\*\*

MASTER MOVE WILL WRITE OUT NEW RECORDS AND SCAN OLD RECORDS  
FOR PREDICITIONS AND PRINTED CARDS

\*\*\*\*\*.

MM1. MOVE MAMMY TO MAMMY0 PERFORM TOP-SCAN.

IF PRTREC PERFORM WRITE1 MOVE ZERO TO PRINT-FLAG.

WRITE MAMMY0.

MOVE COMP-M TO FN-HOLD.

MM2. READ MAMMY-IN AT END GO TO END-TAPE.

MOVE COMP-I TO COMP-M.  
 MM3. IF KOUNTER = ZERO GO TO MMEX.  
 COMPUTE K = KOUNTER + 1.  
 PERFORM EXPAND-SCAN THRU ESEX VARYING M FROM 1 BY 1 UNTIL  
 M = K.  
 MMEX. EXIT.  
 EXPAND-SCAN.  
 IF COMP-E (M) = ZERO GO TO ESEX.  
 IF COMP-E (M) = COMP-M MOVE 'DUPLICATE CAGE NUMBER FOR MATE'  
 TO TITLE IN ERR MOVE COMP-E (M) TO CARDO IN ERR WRITE LIST  
 FROM ERR MOVE ZERO TO COMP-E (M) GO TO ESEX.  
 IF COMP-E (M) IS GREATER THAN COMP-M GO TO ESEX.  
 IF COMP-E (M) IS LESS THAN FN-HOLD GO TO ESEX.  
 MOVE ZERO TO MAMMYO.  
 MOVE FEMALE-NUMBER IN BABYX (M) TO FEM-NO IN MAMMYO.  
 MOVE GEN IN BABYX (M) TO GEN IN MAMMYO.  
 MOVE PARITY IN BABYX (M) TO PARITY IN MAMMYO.  
 MOVE MOTHER IN BABYX (M) TO MOTHER IN MAMMYO.  
 MOVE BIRTH-DATE IN BABYX (M) TO BIRTH-DATE IN MAMMYO.  
 MOVE QFAC1 IN BABYX (M) TO QFAC1 IN MAMMYO.  
 MOVE M-DATE IN BABYX (M) TO M-DATE IN MAMMYO (1).  
 MOVE 'N' TO RECON IN MAMMYO.  
 PERFORM TOP-SCAN PERFORM WRITE1.  
 WRITE MAMMYO.  
 MOVE ZERO TO COMP-E (M).  
 ESEX. EXIT.  
 ERR-CARD.  
 MOVE TRA2 IN TRAN TO CARDO IN ERR WRITE LIST FROM ERR.  
 FR. GO TO READ-CARD.  
 SCAT.  
 MOVE I TO PRINT-FLAG.  
 IF DELEM PERFORM MM2 THRU MMEX GO TO READ-CARD.  
 IF LIT IN TRAN IS GREATER THAN 6 OR LESS THAN 1 MOVE  
 'INCORRECT LITTER COUNT' TO TITLE IN ERR GO TO ERR-CARD.  
 MOVE LIT IN TRAN TO M.  
 IF KILLEM PERFORM TRAN-REMOVE GO TO READ-CARD.  
 IF SEX IN TRAN = 'FOF' OR 'MOF' NEXT SENTENCE OTHERWISE  
 MOVE 'SEX NOT ENTERED FOR TRANSACTION' TO TITLE IN ERR GO TO  
 ERR-CARD.  
 GO TO READ-CARD, TRAN-MATE, READ-CARD, TRAN-RESEARCH,  
 TRAN-BIRTH, TRAN-WEAN, TRAN-WEIGH, TRAN-HOLD DEPENDING  
 ON CODE IN TRAN.  
 GO TO READ-CARD.  
 TRAN-ADD SECTION.  
 NOTE \*\*\*\*\*  
 THIS SECTION WILL ADD A NEW RECORD TO THE MASTER TAPE IN  
 PROPER SEQUENTIAL ORDER  
 CAGES RANGING FROM 0 - 99999 CONTAIN INBRED ANIMALS  
 CAGES FROM 899999 - 999999 CONTAIN CROSS BREED ANIMALS  
 \*\*\*\*\*.  
 TA1. IF COMP-C IS GREATER THAN FN-CHECK MOVE COMP-C TO FN-CHECK  
 OTHERWISE MOVE 'DUPLICATE ANIMAL NUMBER ON CARDS' TO  
 TITLE IN ERR GO TO ERR-CARD.  
 IF BCAGE IN TRAN IS GREATER THAN 899999 GO TO TA2.  
 IF BCAGE IN TRAN IS GREATER THAN 99999 MOVE 'INCORRECT BREED

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- 'R CAGE NUMBER' TO TITLE IN ERR GO TO ERR-CARD.
TA2. MOVE ZERO TO MAMMYO.
  MOVE REC IN TRAN TO REC IN MAMMYO.
  MOVE GEN IN TRAN TO GEN IN MAMMYO.
  MOVE LIT IN TRAN TO PARITY IN MAMMYO.
  MOVE MANUAL-ENTRY IN TRAN TO BIRTH-DATE IN MAMMYO.
  MOVE T-DATE IN TRAN TO M-DATE IN MAMMYO (1).
  MOVE 'N' TO RECON IN MAMMYO.
  PERFORM TOP-SCAN PERFORM WRITE1.
  WRITE MAMMYO.
TAEX. EXIT.
TRAN-REMOVE SECTION.
  IF SEX IN TRAN = 'FAD' MOVE T-DATE IN TRAN TO FRDATE IN MAMMY
  MOVE CAGE IN TRAN TO FRCAGE IN MAMMY MOVE NEW-ID IN TRAN
  TO FNEWID IN MAMMY MOVE RCODE IN TRAN TO FCODE IN MAMMY
  GO TO TREX.
  IF SEX IN TRAN = 'MAD' MOVE T-DATE IN TRAN TO MRDATE IN MAMMY
  MOVE CAGE IN TRAN TO MRCAGE IN MAMMY MOVE NEW-ID IN TRAN
  TO MNEWID IN MAMMY MOVE RCODE IN TRAN TO MCODE IN MAMMY
  GO TO TREX.
  IF W-DATE IN MAMMY (M) IS NOT = ZERO GO TO TR1.
  COMPUTE O = D-SIZE IN MAMMY (M) + M-SIZE IN MAMMY (M)
  + R-SIZE IN MAMMY (M) + 1.
  IF OVERRIDE GO TO TRO.
  IF O = B-SIZE IN MAMMY (M) MOVE T-DATE IN TRAN TO W-DATE IN
  MAMMY (M) MOVE 90 TO ML IN MAMMY (M).
  IF O IS GREATER THAN B-SIZE IN MAMMY (M) MOVE 'NUMBER DEAD LA
- 'RGER THAN NUMBER BORN' TO TITLE IN ERR PERFORM ERR-CARD
  GO TO TREX.
  IF RCODE IN TRAN = 2 OR 6 ADD 1 TO R-SIZE IN MAMMY (M)
  GO TO TREX.
  IF RCODE IN TRAN = 7 ADD 1 TO M-SIZE IN MAMMY (M) GO TO TREX.
  GO TO TREX.
  ADD NOREM IN TRAN TO D-SIZE IN MAMMY (M) GO TO TREX.
TR1. IF SEX IN TRAN = 'FOF' SUBTRACT 1 FROM FHNUM IN MAMMY (M)
  OTHERWISE GO TO TR2.
  IF FHNUM IN MAMMY (M) IS LESS THAN ZERO MOVE 'HOLDING CAGE DE
- 'ATHS EXCEED NUMBER IN CAGE' TO TITLE IN ERR PERFORM
  ERR-CARD ADD 1 TO FHNUM IN MAMMY (M).
  GO TO TREX.
TR2. IF SEX IN TRAN = 'MOF' SUBTRACT 1 FROM MHNUM IN MAMMY (M)
  OTHERWISE GO TO TREX.
  IF MHNUM IN MAMMY (M) IS LESS THAN ZERO MOVE 'HOLDING CAGE DE
- 'ATHS EXCEED NUMBER IN CAGE' TO TITLE IN ERR PERFORM
  ERR-CARD ADD 1 TO MHNUM IN MAMMY (M).
  GO TO TREX.
TRO.
  COMPUTE O = D-SIZE IN MAMMY (M) + M-SIZE IN MAMMY (M) +
  R-SIZE IN MAMMY (M).
  IF KOUNT IN TRAN = 1 COMPUTE O = O - D-SIZE IN MAMMY (M)
  + NOREM IN TRAN GO TO TRO1.
  IF KOUNT IN TRAN = 2 COMPUTE O = O - M-SIZE IN MAMMY (M)
  + NOREM IN TRAN GO TO TRO1.
  COMPUTE O = O - R-SIZE IN MAMMY (M) + NOREM IN TRAN.
TRO1. IF O IS GREATER THAN B-SIZE IN MAMMY (M) MOVE 'NUMBER DEAD

```

- 'LARGER THAN NUMBER BORN' TO TITLE IN ERR PERFORM ERR-CARD  
GO TO T Rex.

IF 0 = B-SIZE IN MAMMY (M) MOVE T-DATE IN TRAN TO W-DATE IN  
MAMMY (M) MOVE 90 TO ML IN MAMMY (M).

IF KOUNT IN TRAN = 1 MOVE NOREM IN TRAN TO D-SIZE  
IN MAMMY (M).

IF KOUNT IN TRAN = 2 MOVE NOREM IN TRAN TO M-SIZE  
IN MAMMY (M).

IF KOUNT IN TRAN = 3 MOVE NOREM IN TRAN TO R-SIZE  
IN MAMMY (M).

T Rex. EXIT.

TRAN-BIRTH SECTION.

NOTE \*\*\*\*\*  
BIRTH DATE SHOULD NOT BE LESS THAN 17 DAYS SINCE PREVIOUS  
BIRTH  
\*\*\*\*\*.

TB1. IF OVERRIDE GO TO TB2.

IF LITTER-COUNT IN MAMMY = M MOVE 'THIS BIRTH HAS ALREADY BEE  
- 'N RECORDED' TO TITLE IN ERR PERFORM ERR-CARD GO TO TBEX.

IF DATE IN TRAN = ZERO MOVE 'BIRTH DATE NOT RECORDED' TO  
TITLE IN ERR GO TO ERR-CARD.

IF B-SIZE IN TRAN = ZERO MOVE 'NUMBER BORN NOT RECORDED' TO  
TITLE IN ERR GO TO ERR-CARD.

MOVE LITTER-COUNT IN MAMMY TO S.

ADD 1 TO LITTER-COUNT IN MAMMY.

IF LITTER-COUNT IN MAMMY IS NOT = M MOVE 'WRONG LITTER COUNT  
- 'TO RECORD BIRTH' TO TITLE IN ERR PERFORM ERR-CARD SUBTRACT  
1 FROM LITTER-COUNT IN MAMMY GO TO TBEX.

IF M = 1 GO TO TB2.

MOVE DATE IN TRAN TO TRA-DATE.

MOVE B-DATE IN MAMMY (S) TO DATE-SCR.

PERFORM DT8.

IF T IS LESS THAN 17 MOVE 'DATE LESS THAN 17 DAYS SINCE PREVI  
- 'OUS BIRTH' TO TITLE IN ERR PERFORM ERR-CARD SUBTRACT 1 FROM  
LITTER-COUNT IN MAMMY GO TO TBEX.

TB2. MOVE T-DATE IN TRAN TO B-DATE IN MAMMY (M).

IF M IS LESS THAN 6 COMPUTE  $S = M + 1$  MOVE T-DATE IN TRAN  
TO M-DATE IN MAMMY (S).

MOVE B-SIZE IN TRAN TO B-SIZE IN MAMMY (M).

MOVE 1 TO ML IN MAMMY (M).

IF T-DATE IN TRAN = ZERO MOVE ZERO TO B-SIZE IN MAMMY (M).

IF T-DATE IN TRAN = ZERO AND LITTER-COUNT IN MAMMY = M  
SUBTRACT 1 FROM LITTER-COUNT IN MAMMY.

TBEX. EXIT.

GO TO READ-CARD.

TRAN-WFAN SECTION.

NOTE \*\*\*\*\*  
LITTERS ARE DUE TO BE WEANED 21 DAYS FROM BIRTH  
WEAN DATE SHOULD FALL BETWEEN 17 DAYS AND 28 DAYS FROM BIRTH  
\*\*\*\*\*.

TW1. IF OVERRIDE GO TO TW2.

IF B-DATE IN MAMMY (M) = ZERO OR LITTER-COUNT IN MAMMY =  
ZERO MOVE 'BIRTH NOT RECORDED - CANNOT WEAN' TO TITLE IN ERR  
PERFORM ERR-CARD GO TO TWEX.

IF DATE IN TRAN = ZERO MOVE 'WEAN DATE NOT RECORDED' TO

TITLE IN ERR GO TO ERR-CARD.  
 MOVE DATE IN TRAN TO TRA-DATE.  
 MOVE B-DATE IN MAMMY (M) TO DATE-SCR.  
 PERFORM DT8.

- IF T IS LESS THAN 17 MOVE 'WEAN DATE LESS THAN 17 DAYS FROM B  
 - 'IRTH' TO TITLE IN ERR PERFORM ERR-CARD GO TO TWEX.  
 - IF T IS GREATER THAN 28 MOVE 'WEAN DATE MORE THAN 28 DAYS FRO  
 - 'M BIRTH' TO TITLE IN ERR PERFORM ERR-CARD GO TO TWEX.  
 COMPUTE A = B-SIZE IN MAMMY (M) - D-SIZE IN MAMMY (M) -  
 M-SIZE IN MAMMY (M) - R-SIZE IN MAMMY (M).  
 COMPUTE R = NO-F-WEAN IN TRAN + NO-M-WEAN IN TRAN.  
 IF A IS NOT = R MOVE 'WRONG NUMBER OF ANIMALS BEING WEANED'  
 TO TITLE IN ERR PERFORM ERR-CARD GO TO TWEX.

TW2. MOVE T-DATE IN TRAN TO W-DATE IN MAMMY (M).  
 MOVE NO-F-WEAN IN TRAN TO NO-F-WEAN IN MAMMY (M).  
 MOVE NO-M-WEAN IN TRAN TO NO-M-WEAN IN MAMMY (M).  
 IF T-DATE IN TRAN = ZERO MOVE ZERO TO NO-F-WEAN IN MAMMY  
 (M), NO-M-WEAN IN MAMMY (M).

TWEX. EXIT.  
 GO TO READ-CARD.

TRAN-WEIGH SECTION.  
 NOTE \*\*\*\*\*  
 A LITTER IS WEIGHED AT WEANING AND THE TOTAL LITTER WEIGHT  
 AND THE NUMBFR WEIGHED IS RECORDED  
 \*\*\*\*\*.

TWT1. IF OVERRIDE GO TO TWT2.  
 IF WT IN MAMMY (M) IS NOT = ZERO MOVE 'LITTER HAS ALREADY BEE  
 - 'N WEIGHED' TO TITLE IN ERR PERFORM ERR-CARD GO TO TWTEX.  
 - IF WT IN TRAN = ZERO MOVE 'WEIGHT NOT RECORDED' TO TITLE IN  
 ERR GO TO ERR-CARD.  
 IF QUAN IN TRAN = ZERO MOVE 'NUMBER OF ANIMALS WEIGHED NOT RE  
 - 'CORDED' TO TITLE IN ERR GO TO ERR-CARD.

TWT2. MOVE QUAN IN TRAN TO WTNUM IN MAMMY (M).  
 MOVE WT IN TRAN TO WT IN MAMMY (M).  
 MOVE T-DATE IN TRAN TO WDATE IN MAMMY (M).  
 IF T-DATE IN TRAN = ZERO MOVE ZERO TO WT IN MAMMY (M), WTNUM  
 IN MAMMY (M).

TWTEX. EXIT.  
 GO TO READ-CARD.

TRAN-HOLD SECTION.  
 IF OVERRIDE GO TO TH1.  
 NOTE \*\*\*\*\*  
 WEANED ANIMALS ARE PLACED IN HOLDING CAGES TO BE MATED SIX  
 WEEKS FROM BIRTH  
 HOLDING CAGE NUMBER RANGE FROM 100000 TO 499999  
 \*\*\*\*\*.  
 IF CAGE IN TRAN IS LESS THAN 100000 OR GREATER THAN 499999  
 MOVE 'INCORRECT HOLDING CAGE NUMBER' TO TITLE IN ERR PERFORM  
 ERR-CARD GO TO THEX.  
 IF QUAN IN TRAN = ZERO MOVE 'NUMBER OF ANIMALS NOT RECORDED'  
 TO TITLE IN ERR PERFORM ERR-CARD GO TO THEX.  
 COMPUTE O = NO-F-WEAN IN MAMMY (M) + NO-M-WEAN IN MAMMY (M).  
 COMPUTE U = FHNUM IN MAMMY (M) + MHNUM IN MAMMY (M) + QUAN  
 IN TRAN.  
 IF U IS GREATER THAN O MOVE 'NUMBER IN HOLDING EXCEEDS NUMBER

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- 'WEANED' TO TITLE IN ERR PERFORM ERR-CARD GO TO THEX.
TH1. IF SEX IN TRAN = 'MOF' GO TO TH2.
    MOVE CAGE IN TRAN TO CAGEF IN MAMMY (M).
    MOVE QUAN IN TRAN TO FHNUM IN MAMMY (M).
    IF T-DATE IN TRAN = ZERO MOVE ZERO TO CAGEF IN MAMMY (M),
    FHNUM IN MAMMY (M) ELSE MOVE 2 TO ML IN MAMMY (M).
    GO TO THEX.
TH2. MOVE CAGE IN TRAN TO CAGEM IN MAMMY (M).
    MOVE QUAN IN TRAN TO MHNUM IN MAMMY (M).
    IF T-DATE IN TRAN = ZERO MOVE ZERO TO CAGEM IN MAMMY (M),
    MHNUM IN MAMMY (M) ELSE MOVE 2 TO ML IN MAMMY (M).
THEX. EXIT.
    GO TO READ-CARD.
TRAN-RESEARCH SECTION.
    IF OVERRIDE GO TO TREQ.
    NOTE *****
    RESEARCH CAGE NUMBERS RANGE FROM 500000 TO 899999
    *****.
    IF CAGE IN TRAN IS LESS THAN 500000 OR GREATER THAN
    899999 MOVE 'INCORRECT RESEARCH CAGE NUMBER' TO TITLE IN
    ERR PERFORM ERR-CARD GO TO TREEX.
    IF QUAN IN TRAN = ZERO MOVE 'NUMBER OF ANIMALS NOT RECORDED'
    TO TITLE IN ERR PERFORM ERR-CARD GO TO TREEX.
    COMPUTE O = NO-F-WEAN IN MAMMY (M) + NO-M-WEAN IN MAMMY (M).
    COMPUTE U = FENUM IN MAMMY (M,1) + FENUM IN MAMMY (M,2) +
    MENUM IN MAMMY (M,1) + MENUM IN MAMMY (M,2) + QUAN IN TRAN.
    IF U IS GREATER THAN O MOVE 'NUMBER IN RESEARCH EXCEEDS NUMBE
- 'R WEANED' TO TITLE IN ERR PERFORM ERR-CARD GO TO TREEX.
    IF CAGE IN TRAN = FCAGE IN MAMMY (M,1) OR FCAGE IN MAMMY
    (M,2) OR MECAGE IN MAMMY (M,1) OR MECAGE IN MAMMY (M,2) MOVE
    'CAGE NUMBER HAS BEEN ASSIGNED' TO TITLE IN ERR PERFORM
    ERR-CARD GO TO TREEX.
    IF QUAN IN TRAN IS GREATER THAN 12 MOVE 'MORE THAN 12 ANIMALS
- 'IN CAGE' TO TITLE IN ERR PERFORM ERR-CARD GO TO TREEX.
TRE1. MOVE 3 TO CODE IN EXPER-MOUSE.
    IF SEX IN TRAN = 'FOF' GO TO TRE2 OTHERWISE GO TO TRE4.
TRE2. IF FCAGEE IN MAMMY (M,2) IS NOT = ZERO MOVE 'THIRD CAGE NOT
- 'ADDED' TO TITLE IN ERR PERFORM ERR-CARD GO TO TREEX.
    MOVE 'F' TO SEX IN EXPER-MOUSE.
    IF FCAGEE IN MAMMY (M,1) = ZERO MOVE 1 TO S OTHERWISE MOVE
    2 TO S.
TRE3. MOVE CAGE IN TRAN TO FCAGEE IN MAMMY (M,S) MOVE QUAN IN
    TRAN TO FENUM IN MAMMY (M,S) MOVE T-DATE IN TRAN TO FEDATE
    IN MAMMY (M,S).
    GO TO TREP.
TRE4. IF MCAGEE IN MAMMY (M,2) IS NOT = ZERO MOVE 'THIRD CAGE NOT
- 'ADDED' TO TITLE IN ERR PERFORM ERR-CARD GO TO TREEX.
    MOVE 'M' TO SEX IN EXPER-MOUSE.
    IF MCAGEE IN MAMMY (M,1) = ZERO MOVE 1 TO S OTHERWISE MOVE
    2 TO S.
TRE5. MOVE CAGE IN TRAN TO MCAGEE IN MAMMY (M,S) MOVE QUAN IN
    TRAN TO MENUM IN MAMMY (M,S) MOVE T-DATE IN TRAN TO MEDATE
    IN MAMMY (M,S).
    GO TO TREP.
TREQ. IF KOUNT IN TRAN IS LESS THAN 1 OR GREATER THAN 4 MOVE

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'COUNT WRONG TO CHANGE EXPERIMENTAL CAGE' TO TITLE IN ERR  
 PERFORM ERR-CARD GO TO TREEX.  
 IF KOUNT IN TRAN = 3 MOVE 1 TO S.  
 IF KOUNT IN TRAN = 4 MOVE 2 TO S.  
 IF KOUNT IN TRAN = 1 OR 2 MOVE KOUNT IN TRAN TO S.  
 MOVE 2 TO CODE IN EXPER-MOUSE MOVE 1 TO OVER IN EXPER-MOUSE.  
 IF SEX IN TRAN = 'FOF' MOVE 'F' TO SEX IN EXPER-MOUSE.  
 IF SEX IN TRAN = 'MOF' MOVE 'M' TO SEX IN EXPER-MOUSE.  
 PERFORM TREP MOVE 3 TO CODE IN EXPER-MOUSE MOVE ZERO TO  
 OVER IN EXPER-MOUSE.  
 IF KOUNT IN TRAN = 3 OR 4 AND SEX IN TRAN = 'FOF' MOVE ZERO  
 TO FECAGE IN MAMMY (M,S) GO TO TREEX.  
 IF KOUNT IN TRAN = 3 OR 4 AND SEX IN TRAN = 'MOF' MOVE ZERO  
 TO MECAGE IN MAMMY (M,S) GO TO TREEX.  
 IF SEX IN TRAN = 'FOF' GO TO TRE3.  
 IF SEX IN TRAN = 'MOF' GO TO TRE5.  
 TREP. MOVE W-DATE IN MAMMY (M) TO DATE IN EXPER-MOUSE.  
 MOVE CAGE IN TRAN TO CAGE-NO IN EXPER-MOUSE.  
 MOVE B-DATE IN MAMMY (M) TO B-DATE IN EXPER-MOUSE.  
 MOVE BCAGE IN MAMMY TO M-CAGE IN EXPER-MOUSE.  
 MOVE M TO L-ORDER IN EXPER-MOUSE.  
 MOVE WT IN TRAN TO WT IN EXPER-MOUSE.  
 MOVE QUAN IN TRAN TO NUM IN EXPER-MOUSE.  
 MOVE STRAIN IN TRAN TO STRAIN IN EXPER-MOUSE.  
 WRITE PUNCH-CARD FROM EXPER-MOUSE.  
 MOVE ZERO TO OVER IN EXPER-MOUSE.  
 TREP. EXIT.  
 GO TO READ-CARD.  
 TRAN-MATE SECTION.  
 IF OVERRIDE GO TO TMO.  
 NOTE \*\*\*\*\*  
 ANIMALS ARE MATED OUT OF HOLDING CAGES WHEN THEY ARE SIX  
 WEEKS OLD  
 INBRED MATE CAGE NUMBERS RANGE FROM 0 TO 99999  
 CROSS BREED MATE CAGE NUMBERS RANGE FROM 900000 TO 999999  
 \*\*\*\*\*.  
 MOVE ZERO TO U.  
 IF PHNUM IN MAMMY (M) = ZERO AND MNUM IN MAMMY (M) = ZERO  
 MOVE 'NO ANIMALS IN HOLDING' TO TITLE IN ERR PERFORM  
 ERR-CARD GO TO TMEX.  
 PERFORM ADD-CAGE THRU ACEX VARYING 0 FROM 1 BY 1 UNTIL 0 = 7  
 OR U IS UNEQUAL TO ZERO.  
 IF CAGE IN TRAN IS GREATER THAN 899999 PERFORM CROSS-BREED  
 THRU CBEX GO TO TM1.  
 IF CAGE IN TRAN IS GREATER THAN 99999 MOVE 'INCORRECT CAGE N  
 - 'UMBER FOR BREEDER CAGE' TO TITLE IN ERR PERFORM ERR-CARD  
 GO TO TMEX.  
 TM1. IF KOUNTER = 100 MOVE 'SAVE TABLE FULL - RESUBMIT THIS MATIN  
 - 'G' TO TITLE IN ERR PERFORM ERR-CARD GO TO TMEX.  
 COMPUTE S = KOUNTER + 1.  
 PERFORM CAGE-CHECK VARYING 0 FROM 1 BY 1 UNTIL 0 = S.  
 IF CAGE IN TRAN IS LESS THAN 99999 MOVE STRAIN IN TRAN TO  
 STRAIN IN SEQ-NUM MOVE GEN IN MAMMY TO GFN IN SEQ-NUM ADD 1  
 TO GEN IN SEQ-NUM ELSE MOVE T TO STRAIN IN SEQ-NUM MOVE  
 ZERO TO GEN IN SEQ-NUM.

IF MANUAL-ENTRY IN TRAN = 654321 OR ZERO MOVE ROOM IN TRAN  
 TO ROOM IN SEQ-NUM ELSE MOVE CROOM IN TRAN TO ROOM IN  
 SEQ-NUM.  
 MOVE CAGE IN TRAN TO BCAGE IN SEQ-NUM MOVE ZERO TO N.  
 PERFORM SEQ-CHECK VARYING 0 FROM 1 BY 1 UNTIL 0 = S OR N IS  
 UNEQUAL TO ZERO.  
 IF N IS GREATER THAN ZERO MOVE N TO S.  
 ADD 1 TO KOUNTER ADD 1 TO MATE-PAIR IN MAMMY.  
 MOVE SEQ-NUM TO FEMALE-NUMBER IN BABYX (S).  
 MOVE LIT IN TRAN TO PARITY IN BABYX (S).  
 MOVE FEMIN TO MOTHER IN BABYX (S).  
 MOVE B-DATE IN MAMMY (M) TO BIRTH-DATE IN BABYX (S).  
 MOVE QFAC2 IN MAMMY TO QFAC1 IN BABYX (S).  
 MOVE T-DATE IN TRAN TO M-DATE IN BABYX (S).  
 SUBTRACT 1 FROM FHNUM IN MAMMY (M).  
 IF CAGE IN TRAN IS LESS THAN 99999 SUBTRACT 1 FROM MHNUM  
 IN MAMMY (M).  
 GO TO TMFX.

CAGE-CHECK.  
 IF CAGE IN TRAN = BCAGE IN BABYX (0) MOVE 'DUPLICATE BREEDER  
 - ' CAGE NUMBER ON DATA CARDS' TO TITLE IN ERR PERFORM ERR-CARD  
 GO TO TMFX.

ADD-CAGE.  
 IF CAGE IN TRAN = MCAGE IN MAMMY (M,0) MOVE 'DUPLICATE BREED  
 - 'ER CAGE NUMBER ON MASTER TAPE' TO TITLE IN ERR PERFORM  
 ERR-CARD GO TO TMFX.  
 IF MCAGE IN MAMMY (M,0) = ZERO MOVE CAGE IN TRAN TO MCAGE  
 IN MAMMY (M,0) MOVE T-DATE IN TRAN TO MDATE IN MAMMY (M,0)  
 MOVE 1 TO U.

ACEX.  
 IF 0 = 6 MOVE 'SEVENTH BREEDER CAGE CANNOT BE ADDED' TO  
 TITLE IN ERR PERFORM ERR-CARD GO TO TMFX.

SEQ-CHECK.  
 IF COMP-CM IS LESS THAN COMP-E (0) PERFORM COMP-MOVE VARYING  
 U FROM S BY -1 UNTIL U = 0.

COMP-MOVE.  
 COMPUTE N = U - 1 MOVE BABYX (N) TO BABYX (U).

TMO.  
 IF KOUNT IN TRAN IS LESS THAN 1 OR GREATER THAN 6 MOVE  
 'COUNT WRONG TO CHANGE BREEDER CAGE' TO TITLE IN ERR PERFORM  
 ERR-CARD GO TO TMFX.  
 MOVE KOUNT IN TRAN TO 0.  
 MOVE T-DATE IN TRAN TO MDATE IN MAMMY (M,0).  
 MOVE CAGE IN TRAN TO MCAGE IN MAMMY (M,0).  
 IF T-DATE IN TRAN = ZERO ADD 1 TO FHNUM IN MAMMY (M) ADD 1 TO  
 MHNUM IN MAMMY (M) SUBTRACT 1 FROM MATE-PAIR IN MAMMY MOVE  
 ZERO TO MCAGE IN MAMMY (M,0).  
 GO TO TMFX.

CROSS-BREED.  
 IF STRAIN IN TRAN = 11 MOVE 52 TO T GO TO CBEX.  
 IF STRAIN IN TRAN = 53 MOVE 60 TO T GO TO CBEX.  
 MOVE 999 TO T.

CBEX. EXIT.  
 TMEX. EXIT.  
 GO TO READ-CARD.

## TOP-SCAN SECTION.

MOVE FEM-NO IN MAMMYO TO CARDO IN ERR.  
 MOVE LITTER-COUNT IN MAMMYO TO N.  
 COMPUTE S = N + 1.  
 IF RECON IN MAMMYO = 'R' GO TO TSEX.  
 IF RECON IN MAMMYO = 'N' PERFORM WRITE-CAGE THRU WCEX MOVE  
 1 TO KNT PERFORM PUNCH-CAD THRU PC1 MOVE ZERO TO RECON IN  
 MAMMYO GO TO TSEX.  
 IF FCODE IN MAMMYO IS NOT EQUAL TO ZERO OR MCODE IN MAMMYO  
 IS NOT EQUAL TO ZERO PERFORM DEAD-CHECK THRU DCEX OTHERWISE  
 PERFORM RETIRE-CHECK THRU RCEX.  
 IF N = ZERO GO TO TSEX.  
 PERFORM COMP-Q THRU CQEX.  
 PERFORM LITTER-CHECK THRU LCEX VARYING N FROM 1 BY 1 UNTIL  
 N = S.  
 GO TO TSEX.

## DEAD-CHECK.

NOTE \*\*\*\*\*  
 THIS SECTION CHECKS TO SEE IF THE MALE AND FEMALE BREEDERS  
 ARE DEAD \* AN ERROR MESSAGE IS GIVEN IF THE FEMALE IS DEAD  
 AND THE MALE IS ALIVE OR IF THE MALE IS DEAD AND THE FEMALE  
 IS ALIVE \* WHEN BOTH BREEDERS ARE DEAD A CHECK IS MADE TO  
 SEE IF ALL LITTERS ARE LISTED AS WEANED AND MATED \* WHEN ALL  
 LITTER LISTS ARE COMPLETE AN 'R' IS MOVED TO RECON ON THE  
 MASTER RECORD

\*\*\*\*\*.

DC1. IF FCODE IN MAMMYO = ZERO AND MCODE IN MAMMYO IS NOT = ZERO  
 MOVE 'MALE DEAD - FEMALE ALIVE' TO TITLE IN ERR WRITE LIST  
 FROM ERR GO TO DCEX.  
 IF FCODE IN MAMMYO IS NOT = ZERO AND MCODE IN MAMMYO = ZERO  
 MOVE 'FEMALE DEAD - MALE ALIVE' TO TITLE IN ERR WRITE LIST  
 FROM ERR GO TO DCEX.  
 IF N = ZERO MOVE 'R' TO RECON IN MAMMYO AND GO TO TSEX.  
 PERFORM DC2 VARYING U FROM 1 BY 1 UNTIL U = S.  
 MOVE 'R' TO RECON IN MAMMYO GO TO TSEX.

DC2. IF W-DATE IN MAMMYO (U) = ZERO PERFORM DEAD-LITTER.  
 IF ML IN MAMMYO (U) = 90 MOVE 4 TO ML IN MAMMYO (U).  
 IF W-DATE IN MAMMYO (U) = ZERO MOVE 'FEMALE DEAD - LITTER NOT  
 - ' WEANED' TO TITLE IN ERR WRITE LIST FROM ERR GO TO DCEX.  
 IF FHNUM IN MAMMYO (U) IS GREATER THAN ZERO GO TO DCEX.  
 IF MHNUM IN MAMMYO (U) IS GREATER THAN ZERO GO TO DCEX.

## DEAD-LITTER.

COMPUTE NOM = B-SIZE IN MAMMYO (U) - D-SIZE IN MAMMYO (U) -  
 M-SIZE IN MAMMYO (U) - R-SIZE IN MAMMYO (U).  
 IF NOM IS LESS THAN 1 MOVE DATEN TO W-DATE IN MAMMYO (U)  
 MOVE 90 TO ML IN MAMMYO (U).

## DCEX. EXIT.

## COMP-Q.

IF M-DATE IN MAMMYO (1) = ZERO GO TO CQEX.  
 MOVE M-DATE IN MAMMYO (1) TO DATE-SCR.  
 IF FCODE IN MAMMYO = ZERO MOVE DATE IN CONTROL-CARD TO  
 TRA-DATE OTHERWISE MOVE FRDATE IN MAMMYO TO TRA-DATE.  
 PERFORM DT8 MOVE T TO TOTAL-DAYS-BREEDING IN MAMMYO.  
 MOVE ZERO TO NOM.  
 IF N = ZERO MOVE ZERO TO QFAC2 IN MAMMYO GO TO CQ3.

PERFORM CQ1 VARYING U FROM 1 BY 1 UNTIL U = S.  
GO TO CQ2.  
CQ1. COMPUTE NOM = NOM + NO-F-WEAN IN MAMMYO (U) + NO-M-WEAN IN  
MAMMYO (U).  
CQ2. COMPUTE QFAC2 IN MAMMYO = (NOM / TOTAL-DAYS-BREEDING IN  
MAMMYO) \* 100.  
GO TO CQ3, CQ4, CQ5, CQ6, CQ7, CQ7 DEPENDING ON N.  
CQ3. MOVE QFAC1 IN MAMMYO TO WQFAC IN MAMMYO GO TO CQEX.  
CQ4. COMPUTE WQFAC IN MAMMYO = 0.25 \* QFAC2 IN MAMMYO + 0.75  
\* QFAC1 IN MAMMYO GO TO CQEX.  
CQ5. COMPUTE WQFAC IN MAMMYO = 0.50 \* QFAC2 IN MAMMYO + 0.50  
\* QFAC1 IN MAMMYO GO TO CQEX.  
CQ6. COMPUTE WQFAC IN MAMMYO = 0.75 \* QFAC2 IN MAMMYO + 0.25  
\* QFAC1 IN MAMMYO GO TO CQEX.  
CQ7. MOVE QFAC2 IN MAMMYO TO WQFAC IN MAMMYO.  
CQEX. EXIT.  
WRITE-CAGE.  
NOTE \*\*\*\*\*  
THIS SECTION PREPARES A PRINTED CARD TO BE ATTACHED TO A  
BREEDER CAGE FOR VISUAL IDENTIFICATION  
\*\*\*\*\*.  
WC1. IF C1 = 1 GO TO WCEX.  
WC2. PERFORM BLANK-MOVE VARYING U FROM 1 BY 1 UNTIL U = 7.  
MOVE 'BREEDING' TO T1 IN WCARD1.  
MOVE ROOM IN MAMMYO TO ROOM IN WCARD1.  
MOVE BCAGE IN MAMMYO TO CAGE IN WCARD1.  
MOVE COMP-MO TO FMNO IN WCARD2.  
MOVE GEN IN MAMMYO TO GEN IN WCARD2.  
MOVE PARITY IN MAMMYO TO PARITY IN WCARD2.  
MOVE 'FAD' TO SEX IN WCARD2.  
MOVE M-DATE IN MAMMYO (1) TO DATE-SCR PERFORM DT5 THRU DT6.  
MOVE ODATE TO M-DATE IN WCARD2.  
IF S = 1 GO TO WC4.  
PERFORM WC3 VARYING U FROM 1 BY 1 UNTIL U = S.  
GO TO WC4.  
WC3. MOVE U TO L4 IN WCARD4.  
MOVE B-DATE IN MAMMYO (U) TO DATE-SCR PERFORM DT5 THRU DT6.  
MOVE ODATE TO DATE IN WCARD4.  
MOVE B-SIZE IN MAMMYO (U) TO NB IN WCARD4.  
IF W-DATE IN MAMMYO (U) = ZERO MOVE SPACES TO NFW IN WCARD4,  
NMW IN WCARD4 OTHERWISE MOVE NO-F-WEAN IN MAMMYO (U) TO NFW  
IN WCARD4 MOVE NO-M-WEAN IN MAMMYO (U) TO NMW IN WCARD4.  
MOVE WCARD4 TO LN (U).  
WC4. MOVE WCARDB TO WCARDBH WRITE CAGE-CRD FROM WCARD.  
WCEX. EXIT.  
PUNCH-CAD.  
MOVE REC IN MAMMYO TO REC IN PCARD MOVE KNT TO LIT IN PCARD.  
MOVE 'FOF' TO SEX IN PCARD WRITE PUNCH-CARD FROM PCARD.  
MOVE 'MOF' TO SEX IN PCARD WRITE PUNCH-CARD FROM PCARD.  
PC1. MOVE PARITY IN MAMMYO TO LIT IN PCARD.  
MOVE 'FAD' TO SEX IN PCARD WRITE PUNCH-CARD FROM PCARD.  
MOVE 'MAD' TO SEX IN PCARD WRITE PUNCH-CARD FROM PCARD.  
BLANK-MOVE. MOVE SPACES TO LN IN LINE (U) MOVE RCMARK TO RCDMRK  
IN LINE (U).  
RETIRE-CHECK.

NOTE \*\*\*\*\*  
 FEMALE BREEDERS ARE LISTED FOR RETIREMENT WHEN ONE OF 3  
 CRITERIA ARE MET \*\*\*\*\*  
 1 \*\* FIFTH LITTER BORN \*\*\*\*\*  
 2 \*\* THREE NON-VIABLE LITTERS BORN \*\*\*\*\*  
 3 \*\* 60 DAYS WITH NO LITTERS BORN \*\*\*\*\*  
 THE CURRENT DATE IS USED AS THE RETIREMENT DATE EXCEPT FOR  
 THE FIFTH LITTER RETIREMENT WHERE THE RETIRE DATE IS  
 CALCULATED TO BE THE LITTER WEAN DATE  
 \*\*\*\*\*.

RC1. MOVE ZERO TO SORT-LIST.  
 IF N = 6 GO TO RCEX.  
 IF N = 5 MOVE 3 TO T1 IN SORT-LIST GO TO RC4.  
 MOVE M-DATE IN MAMMYD (S) TO DATE-SCR.  
 COMPUTE T = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR + 60.  
 PERFORM DT1 THRU DT4.  
 IF YR IN DATE-SCR IS GREATER THAN YR IN TRA-DATE GO TO RC2.  
 IF YR IN DATE-SCR IS LESS THAN YR IN TRA-DATE MOVE 2 TO T1 IN  
 SORT-LIST GO TO RC4.  
 IF DATE-SCR IS LESS THAN TRA-DATE MOVE 2 TO T1 IN SORT-LIST  
 GO TO RC4.

RC2. IF N IS LESS THAN 3 GO TO RCEX.  
 IF W-DATE IN MAMMYD (N) = ZERO GO TO RCEX.  
 MOVE ZERO TO NOM COMPUTE U = N - 2.

RC3. IF U IS GREATER THAN N MOVE 1 TO T1 IN SORT-LIST GO TO RC4.  
 COMPUTE NOM = NO-F-WEAN IN MAMMYD (U) + NO-M-WEAN IN  
 MAMMYD (U).  
 IF NOM = ZERO COMPUTE U = U + 1 GO TO RC3 OTHERWISE GO TO  
 RCEX.

RC4. MOVE 3 TO SORT1 IN SORT-LIST.  
 MOVE DATEN TO S-DATE IN SORT-LIST.  
 IF T1 IN SORT-LIST = 3 MOVE B-DATE IN MAMMYD (N) TO DATE-SCR  
 COMPUTE T = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR + 21  
 PERFORM DT1 THRU DT4 PERFORM DT7 MOVE DATE-S TO S-DATE  
 IN SORT-LIST.  
 MOVE FEM-NO IN MAMMYD TO RFC IN SORT-LIST.  
 MOVE GEN IN MAMMYD TO GEN IN SORT-LIST.  
 MOVE 1 TO SW4.  
 WRITE SIN FROM SORT-LIST.

RCEX. EXIT.  
 LITTER-CHECK.

LC1. IF ML IN MAMMYD (N) = ZERO GO TO LCEX.  
 IF W-DATE IN MAMMYD (N) = ZERO MOVE N TO U PERFORM  
 DEAD-LITTER.  
 IF ML IN MAMMYD (N) = 90 PERFORM WRITE-CAGE THRU WCEX MOVE  
 4 TO ML IN MAMMYD (N) GO TO LCEX.  
 IF ML IN MAMMYD (N) IS GREATER THAN 3 GO TO LCEX.  
 MOVE B-DATE IN MAMMYD (N) TO DATE-SCR PERFORM DT8.  
 IF T IS GREATER THAN 28 AND W-DATE IN MAMMYD (N) = ZERO MOVE  
 'LITTER NOT WEANED' TO TITLE IN ERR WRITE LIST FROM ERR.  
 IF T IS GREATER THAN 28 PERFORM LIT-CHECK.  
 GO TO LC2, LC3, LC4 DEPENDING ON ML IN MAMMYD (N).

LC2. IF W-DATE IN MAMMYD (N) IS NOT = ZERO MOVE 2 TO ML IN  
 MAMMYD (N) GO TO LC3.  
 IF T IS GREATER THAN 7 PERFORM WEANING MOVE 2 TO ML IN

MAMMYO (N).  
GO TO LCEX.

LC3. IF CAGEF IN MAMMYO (N) IS NOT = ZERO AND CAGEM IN MAMMYO (N) IS NOT = ZERO MOVE 3 TO ML IN MAMMYO (N).  
IF CAGEF IN MAMMYO (N) IS NOT = ZERO PERFORM HOLDING GO TO LC4.  
IF CAGEM IN MAMMYO (N) IS NOT = ZERO PERFORM HOLDING.

LC4. IF T IS GREATER THAN 28 PERFORM MATING.

LCEX. EXIT.

TSEX. IF C1 = 1 PERFORM WC2 THRU WCEX.

TSSEX. EXIT.

LIT-CHECK SECTION.

COMPUTE NOM = NO-F-WEAN IN MAMMYO (N) + NO-M-WEAN IN MAMMYO (N).  
COMPUTE O = FHNUM IN MAMMYO (N) + MHNUM IN MAMMYO (N) + FENUM IN MAMMYO (N,1) + FENUM IN MAMMYO (N,2) + MENUM IN MAMMYO (N,1) + MENUM IN MAMMYO (N,2).  
IF O IS GREATER THAN NOM MOVE 'TOO MANY ANIMALS IN HOLDING AN  
- 'O RESEARCH' TO TITLE IN ERR WRITE LIST FROM ERR.  
COMPUTE O = FHNUM IN MAMMYO (N) + MHNUM IN MAMMYO (N).  
IF T IS GREATER THAN 49 AND O IS GREATER THAN ZERO MOVE 'ANIMALS NOT MATED - IN HOLDING' TO TITLE IN ERR WRITE LIST FROM ERR.

LCKEX. EXIT.

DATE-CHECK SECTION.

NOTE \*\*\*\*\*  
DT1 THRU DT4 WILL CALCULATE A SIX DIGIT DATE FROM A PROJECTED DATE CALCULATED WITH A CONTINUOUS YEAR TABLE (YRTAB IN DATA)\*  
DT5 THRU DT6 CHANGES A DIGITAL DATE TO THE ALPHABETIC FORM\*  
DT7 CORRECTS A DATE TO FRIDAY IF IT FALLS ON SATURDAY AND TO MONDAY IF IT FALLS ON SUNDAY \* FIRST-SAT IS THE DAY OF THE FIRST SATURDAY IN THE YEAR\*  
DT8 CALCULATES THE DIFFERENCE BETWEEN TWO GIVEN DATES  
\*\*\*\*\*.

DT1. IF MO IN DATE-SCR IS LESS THAN 1 OR GREATER THAN 12  
GO TO DT4.  
COMPUTE R = MO IN DATE-SCR.

DT2. IF T IS GREATER THAN YRTAB (R) COMPUTE R = R + 1 OTHERWISE  
GO TO DT3.  
IF R IS GREATER THAN 13 COMPUTE R = R - 13, COMPUTE T = T - 365, COMPUTE YR IN DATE-SCR = YR IN DATE-SCR + 1.  
GO TO DT2.

DT3. COMPUTE MO IN DATE-SCR = R - 1.  
COMPUTE DA IN DATE-SCR = T - YRTAB (MO IN DATE-SCR).

DT4. EXIT.

DT5. MOVE SPACES TO ODATE.  
IF MO IN DATE-SCR IS LESS THAN 1 OR GREATER THAN 12 GO TO DT6.  
MOVE CORRESPONDING DATE-SCR TO ODATE.  
MOVE MONT (MO IN DATE-SCR) TO MOTH.

DT6. EXIT.

DT7. COMPUTE T = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR - FIRST-SAT.  
COMPUTE R = T / 7.  
COMPUTE A = T - R \* 7.

IF SAT COMPUTE DA IN DATE-SCR = DA IN DATE-SCR - 1.

IF SUN COMPUTE DA IN DATE-SCR = DA IN DATE-SCR + 1.

DT8. COMPUTE P = YR IN TRA-DATE - YR IN DATE-SCR.

COMPUTE A = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR.

COMPUTE R = YRTAB (MO IN TRA-DATE) + DA IN TRA-DATE.

COMPUTE T = (365 - A) + R + (365 \* (P - 1)).

WEANING SECTION.

NOTE \*\*\*\*\*

THIS SECTION PRODUCES THE WEAN LIST AND CAGE CARDS \*

WHEN A LITTER IS FOUND TO BE OVER 7 DAYS OLD A WEAN LIST IS

ISSUED WITH THE WEAN DATE CALCULATED 3 WEEKS FROM BIRTH \*

NEW PRINTED BREEDING CAPDS ARE ISSUED AT THIS TIME \* THE ML

COUNTER FOR THE LITTER IS INCREASED FROM 1 TO 2 \*

\*\*\*\*\*.

WN1. MOVE B-DATE IN MAMMYO (N) TO DATE-SCR.

COMPUTE T = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR + 21.

PERFORM DT1 THRU DT4.

PERFORM DT7.

MOVE 1 TO SORT1 IN SORT-LIST

MOVE DATE-S TO S-DATE IN SORT-LIST

MOVE FEM-NO IN MAMMYO TO REC IN SORT-LIST.

MOVE GEN IN MAMMYO TO GEN IN SORT-LIST.

MOVE PARITY IN MAMMYO TO PAR IN SORT-LIST.

MOVE 'FAD' TO SEX IN SORT-LIST.

MOVE WQFAC IN MAMMYO TO Q-FACT IN SORT-LIST.

WRITE SIN FROM SORT-LIST MOVE 1 TO SW4.

PERFORM WRITE-CAGE THRU WCEX.

MOVE N TO KNT PERFORM PUNCH-CAD.

WNEX. EXIT.

HOLDING SECTION.

NOTE \*\*\*\*\*

THIS SECTION PUTS OUT THE PRINTED CAGE CARDS USED TO IDENTIFY

THE HOLDING CAGES \*\* WHEN THE ML COUNTER IN EACH LITTER

EQUALS 2 (COUNTER IS SET TO 2 WHEN THE LITTER IS DUE TO BE

WEANED) AND THE HOLDING CAGES ARE ASSIGNED IN THE MOTHER

RECORD THE HOLDING CAGE CARD IS PRINTED \*\*

\*\*\*\*\*.

HC1. MOVE 'HOLDING' TO T1 IN WCARD1.

MOVE ROOM IN MAMMYO TO ROOM IN WCARD1.

MOVE B-DATE IN MAMMYO (N) TO DATE-SCR.

COMPUTE T = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR + 42.

PERFORM DT1 THRU DT4 PERFORM DT7 PERFORM DT5 THRU DT6.

MOVE ODATE TO M-DATE IN WCARD2.

MOVE COMP-MO TO FMNO IN WCARD2.

MOVE GEN IN MAMMYO TO GEN IN WCARD2.

MOVE N TO PARITY IN WCARD2.

MOVE B-DATE IN MAMMYO (N) TO DATE-SCR.

PERFORM DT5 THRU DT6 MOVE ODATE TO ODAT IN WCARDH.

MOVE SPACES TO WCARDBH MOVE RCMARK TO RCDMRK IN WCARDBH.

MOVE CAGEF IN MAMMYO (N) TO CAGE IN WCARD1 MOVE 'FOF' TO SEX

IN WCARD2, SEX IN WCARDH MOVE FHNUM IN MAMMYO (N) TO NOMCE

IN WCARDH MOVE WCARDH TO WCARDBH WRITE CAGE-CRD FROM WCARD.

MOVE CAGEM IN MAMMYO (N) TO CAGE IN WCARD1 MOVE 'MOF' TO SEX

IN WCARD2, SEX IN WCARDH MOVE MHNUM IN MAMMYO (N) TO NOMCE

IN WCARDH MOVE WCARDH TO WCARDBH WRITE CAGE-CRD FROM WCARD.

HCEX. EXIT.

MATING SECTION.

NOTE \*\*\*\*\*  
 THIS SECTION PREDICTS THE AVAILABLE DATE A LITTER IS TO BE  
 MATED BASED ON A MATE DATE OF SIX WEEKS FROM BIRTH  
 \*\*\*\*\*.

M1. MOVE B-DATE IN MAMMYO (N) TO DATE-SCR.

COMPUTE T = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR + 42.

PERFORM DT1 THRU DT4 PERFORM DT7.

MOVE ZERO TO SORT-LIST.

MOVE 2 TO SORT1 IN SORT-LIST.

MOVE DATE-S TO S-DATE IN SORT-LIST.

MOVE FEM-NO IN MAMMYO TO REC IN SORT-LIST.

MOVE GEN IN MAMMYO TO GEN IN SORT-LIST.

MOVE N TO PAR IN SORT-LIST.

MOVE 1 TO SW4.

IF CAGEF IN MAMMYO (N) = ZERO GO TO M2.

IF FHNUM IN MAMMYO (N) = ZERO GO TO M2.

MOVE ZERO TO NUM-M IN SORT-LIST.

MOVE FHNUM IN MAMMYO (N) TO NUM-F IN SORT-LIST.

MOVE CAGEF IN MAMMYO (N) TO CAGE IN SORT-LIST.

MOVE 'FOF' TO SEX IN SORT-LIST.

WRITE SIN FROM SORT-LIST.

M2. IF CAGEM IN MAMMYO (N) = ZERO GO TO M3.

IF MHNUM IN MAMMYO (N) = ZERO GO TO M3.

MOVE ZERO TO NUM-F IN SORT-LIST.

MOVE MHNUM IN MAMMYO (N) TO NUM-M IN SORT-LIST.

MOVE 'MOF' TO SEX IN SORT-LIST.

MOVE CAGEM IN MAMMYO (N) TO CAGE IN SORT-LIST.

WRITE SIN FROM SORT-LIST.

M3. MOVE 4 TO ML IN MAMMYO (N).

MTEX. EXIT.

END-CARD SECTION.

IF STARTUP GO TO END-UPDATE.

EC1. MOVE MAMMY TO MAMMYO PERFORM TOP-SCAN.

IF PRTRC PERFORM WRITE1 MOVE ZERO TO PRINT-FLAG.

WRITE MAMMYO.

READ MAMMY-IN AT END GO TO END-UPDATE.

IF KOUNTER = ZERO GO TO EC1.

COMPUTE K = KOUNTER + 1 PERFORM EXPAND-SCAN THRU ESEX  
 VARYING M FROM 1 BY 1 UNTIL M = K.

GO TO EC1.

END-TAPE.

MOVE MAMMY-END TO COMP-M.

ET1. IF E = ZERO READ SRTOUT AT END GO TO END-UPDATE.

MOVE ZERO TO E.

IF ADDEM PERFORM TRAN-ADD ELSE MOVE 'ANIMAL NOT ON MASTER TAP  
 - 'E' TO TITLE IN ERR PERFORM ERR-CARD.

GO TO ET1.

TABLE-SCAN.

IF COMP-E (M) = ZERO GO TO TSCEX.

MOVE 1 TO U.

TSCEX. EXIT.

END-UPDATE.

MOVE MAMMY-END TO COMP-M.

IF KOUNTER = ZERO GO TO EU1.  
 COMPUTE K = KOUNTER + 1 PERFORM EXPAND-SCAN THRU ESEX  
 VARYING M FROM 1 BY 1 UNTIL M = K.  
 CLOSE MAMMY-EX OPEN INPUT MAMMY-MEX.  
 NOTE \*\*\*\*\*  
 WRITE-REC OUTPUTS A MASTER RECORD LIST FOR RECORDS THAT HAVE  
 BEEN ADDED OR UPDATED  
 \*\*\*\*\*.

WRITE-REC.

READ MAMMY-MEX AT END GO TO WR1.  
 WRITE LIST FROM MAMREC GO TO WRITE-REC.

WR1. CLOSE MAMMY-MEX.

MOVE ZERO TO U.  
 PERFORM TABLE-SCAN THRU TSCEX VARYING M FROM 1 BY 1 UNTIL  
 M = K OR U IS UNEQUAL TO ZERO.

IF U = ZERO GO TO FU1.

MOVE ZERO TO FN-HOLD.

CLOSE MAMMY-OUT OPEN INPUT NEWMAS OUTPUT MAMMY-EX.

NOTE \*\*\*\*\*  
 THE FOLLOWING PARAGRAPHS TO EU1 PUT RECORDS ON THE MASTER  
 TAPE THAT WERE OUT OF SEQUENTIAL ORDER IN THE UPDATE  
 PROCEDURE

\*\*\*\*\*.

WR1MEX. READ NEWMAS AT END GO TO ENDMEX.

WRITE MAMEX FROM MAMMYO GO TO WR1MEX.

ENDMEX. CLOSE NEWMAS, MAMMY-EX.

OPEN INPUT MAMMY-MEX OUTPUT MAMMY-OUT.

RD1MEX. READ MAMMY-MEX AT END CLOSE MAMMY-MEX GO TO EU1.

MOVE COMP-MEX TO COMP-M PERFORM EXPAND-SCAN THRU ESEX  
 VARYING M FROM 1 BY 1 UNTIL M = K.

WRITE MAMMYO FROM MAMEX GO TO RD1MEX.

FU1. CLOSE PUNCH, SR1OUT, SR1IN, CA-CAD WITH LOCK, MAMMY-OUT.

IF LISMAS CLOSE MAMMY-IN WITH LOCK.

IF SW4 = ZERO GO TO LIST-WRITE.

MOVE ZERO TO M.

ENTER LINKAGE-MODE.

CALL 'GETSRT' USING SR1DK, SR1IN, SR1OUT, M.

ENTER COBOL.

IF M IS GREATER THAN ZERO MOVE 'LIST SORT NO GOOD - RESUBMIT  
 - ' THIS JOB' TO TITLE IN ERR MOVE SPACE TO CARDO WRITE LIST  
 FROM ERR GO TO POTS.

FU2. OPEN INPUT SR1OUT MOVE ZERO TO KNT, NOM, CDATE.

MOVE DATEN TO DATE IN HEAD1.

WRITE-LIST.

READ SR1OUT INTO SORT-LIST AT END GO TO GETOUT.

MOVE SPACES TO TR IN REPOUT, CAGE IN HEAD3.

MOVE ZERO TO F-NUM IN REPOUT, M-NUM IN REPOUT, CAGE IN  
 REPOUT.

IF ROOM IN SORT-LIST IS NOT = NOM MOVE ROOM IN SORT-LIST TO  
 NOM, ROOM-NO IN HEAD2 MOVE 25 TO LNCNT.

IF SORT1 IN SORT-LIST IS GREATER THAN KNT MOVE SORT1 IN  
 SORT-LIST TO KNT MOVE 25 TO LNCNT GO TO WNHD, MTHD, RETHD  
 DEPENDING ON SORT1 IN SORT-LIST.

GO TO WRT.

WNHD. MOVE 'WEAN LIST' TO TITLE IN HEAD1 MOVE 'WEAN DATE' TO

TITLE IN HEAD3 MOVE SPACES TO TCHM IN HEAD3 CAGE IN HEAD3  
 MOVE 'WQ-FACTOR' TO QFACT IN HEAD3 GO TO WRT.

MTHD. MOVE 'MATE LIST' TO TITLE IN HEAD1 MOVE 'MATE DATE' TO  
 TITLE IN HEAD3 MOVE SPACES TO QFACT IN HEAD3 MOVE  
 'FEMALE MALE' TO TCHM IN HEAD3 MOVE 'CAGE-NO' TO CAGE IN  
 HEAD3 GO TO WRT.

RETHD. MOVE 'RETIREMENT LIST' TO TITLE IN HEAD1 MOVE 'RETIRE DATE  
 - '' TO TITLE IN HEAD3 MOVE SPACES TO TCHM IN HEAD3, QFACT  
 IN HEAD3.

WRT. IF JUMP2 WRITE LIST FROM HEAD1 WRITE LIST FROM HEAD2 WRITE  
 LIST FROM HEAD3 MOVE ZERO TO LNCNT.  
 MOVE CORRESPONDING SORT-LIST TO REPOUT.  
 MOVE FN IN SORT-LIST TO FN IN REPOUT.  
 MOVE S-DATE TO DATE-SCR PERFORM DT5 THRU DT6 MOVE ODATE  
 TO X-DATE IN REPOUT.  
 IF WEANIT MOVE ZERO TO CAGE IN REPOUT.  
 IF MATEIT MOVE NUM-F IN SORT-LIST TO F-NUM IN REPOUT MOVE  
 NUM-M IN SORT-LIST TO M-NUM IN REPOUT.  
 IF RETIRE AND T1 IN SORT-LIST = 1 MOVE 'THREE DEAD LITTERS'  
 TO TR IN REPOUT.  
 IF RETIRE AND T1 IN SORT-LIST = 2 MOVE 'NO LITTERS 2 MONTHS'  
 TO TR IN REPOUT.  
 IF RETIRE AND T1 IN SORT-LIST = 3 MOVE 'FIFTH LITTER BORN'  
 TO TR IN REPOUT.  
 WRITE LIST FROM REPOUT ADD 1 TO LNCNT GO TO WRITE-LIST.

GETOUT. CLOSE SROUT.  
 LIST-WRITE SECTION.  
 OPEN INPUT NEWMAS MOVE 25 TO LNCNT.  
 MOVE 'MASTER TAPE LIST' TO T1 IN HEAD MOVE ZERO TO P.  
 READNEW. READ NEWMAS AT END GO TO LISTDONE.  
 MOVE CORRESPONDING MAMMYO TO DATAOUT.  
 MOVE COMP-MO TO FEM IN DATAOUT.  
 IF LITTER-COUNT IN MAMMYO IS GREATER THAN ZERO PERFORM  
 ANALYSIS OTHERWISE MOVE ZERO TO PERWN, AVBRN, AVWT.  
 IF JUMP2 WRITE LIST FROM HEAD WRITE LIST FROM LISTHD MOVE  
 ZERO TO LNCNT.  
 ADD 1 TO P.  
 WRITE LIST FROM DATAOUT ADD 1 TO LNCNT GO TO READNEW.

ANALYSIS.  
 MOVE LITTER-COUNT IN MAMMYO TO M.  
 COMPUTE  $S = M + 1$ .  
 MOVE ZERO TO NOM, CWTS, T, R, A.  
 PERFORM AN1 VARYING E FROM 1 BY 1 UNTIL  $E = S$ .  
 COMPUTE  $NOM = NOM / M$  MOVE NOM TO AVBRN.  
 COMPUTE  $T = (T / R) * 100$  MOVE T TO PERWN.  
 COMPUTE  $CWTS = CWTS / A$  MOVE CWTS TO AVWT.

AN1.  
 ADD B-SIZE IN MAMMYO (E) TO NOM.  
 IF W-DATE IN MAMMYO (E) IS GREATER THAN ZERO ADD NO-F-WEAN IN  
 MAMMYO (E) TO T ADD NO-M-WEAN IN MAMMYO (E) TO T ADD B-SIZE  
 IN MAMMYO (E) TO R.  
 IF WT IN MAMMYO (E) IS GREATER THAN ZERO ADD WT IN MAMMYO  
 (E) TO CWTS ADD 1 TO A.

LISTDONE.  
 MOVE 'TOTAL NUMBER OF BREEDERS' TO T1 IN HEAD MOVE P TO T2

IN HEAD WRITE LIST FROM HEAD.  
 CLOSE REPORT, NEWMAS WITH LOCK.  
 POTS. STOP RUN.  
 WRITE1 SECTION.  
 WRITE MAMREC FROM HEAD.  
 WRITE MAMREC FROM HEAD22.  
 MOVE COMP-MO IN MAMMYO TO FNO IN DATA22.  
 MOVE GEN IN MAMMYO TO GEN IN DATA22.  
 MOVE PARITY IN MAMMYO TO LO IN DATA22.  
 MOVE MOTHER IN MAMMYO TO MNO IN DATA22.  
 MOVE BIRTH-DATE IN MAMMYO TO DATE-SCR PERFORM DT5 THRU DT6  
 MOVE ODATE TO B-DATE IN DATA22.  
 MOVE MATE-PAIR IN MAMMYO TO BP IN DATA22.  
 MOVE TOTAL-DAYS-BREEDING IN MAMMYO TO TDB IN DATA22.  
 MOVE FCODE IN MAMMYO TO RC IN DATA22.  
 MOVE FRDATE IN MAMMYO TO DATE-SCR PERFORM DT5 THRU DT6 MOVE  
 ODATE TO RDATE IN DATA22.  
 MOVE FNEWID IN MAMMYO TO NID IN DATA22.  
 MOVE FRCAGE IN MAMMYO TO RCAGE IN DATA22.  
 MOVE RECON IN MAMMYO TO RECON IN DATA22.  
 MOVE LITTER-COUNT IN MAMMYO TO LC IN DATA22.  
 MOVE QFAC1 IN MAMMYO TO Q1 IN DATA22.  
 MOVE QFAC2 IN MAMMYO TO Q2 IN DATA22.  
 MOVE WQFAC IN MAMMYO TO QW IN DATA22.  
 WRITE MAMREC FROM DATA22.  
 MOVE MCODE IN MAMMYO TO RC IN DATA222.  
 MOVE MRDATE IN MAMMYO TO DATE-SCR PERFORM DT5 THRU DT6 MOVE  
 ODATE TO RDATE IN DATA222.  
 MOVE MNEWID IN MAMMYO TO NID IN DATA222.  
 MOVE MRCAGE IN MAMMYO TO RCAGE IN DATA222.  
 WRITE MAMREC FROM DATA222.  
 IF LITTER-COUNT IN MAMMYO = ZERO GO TO WR1EX.  
 WRITE MAMREC FROM HEAD33.  
 COMPUTE S = LITTER-COUNT IN MAMMYO + 1.  
 PERFORM W1 VARYING N FROM 1 BY 1 UNTIL N = S.  
 GO TO WR1EX.  
 W1. MOVE N TO LN1 IN DATA33.  
 MOVE M-DATE IN MAMMYO (N) TO DATE-SCR PERFORM DT5 THRU DT6  
 MOVE ODATE TO MD IN DATA33.  
 MOVE B-DATE IN MAMMYO (N) TO DATE-SCR PERFORM DT5 THRU DT6  
 MOVE ODATE TO BD IN DATA33.  
 MOVE W-DATE IN MAMMYO (N) TO DATE-SCR PERFORM DT5 THRU DT6  
 MOVE ODATE TO WD IN DATA33.  
 MOVE B-SIZE IN MAMMYO (N) TO BS IN DATA33.  
 MOVE D-SIZE IN MAMMYO (N) TO DS IN DATA33.  
 MOVE M-SIZE IN MAMMYO (N) TO MS IN DATA33.  
 MOVE R-SIZE IN MAMMYO (N) TO RS IN DATA33.  
 MOVE NO-F-WEAN IN MAMMYO (N) TO NFW IN DATA33.  
 MOVE NO-M-WEAN IN MAMMYO (N) TO NMW IN DATA33.  
 MOVE WT IN WTS IN MAMMYO (N) TO WT IN DATA33, WTCH.  
 MOVE WTDATE IN MAMMYO (N) TO DATE-SCR PERFORM DT5 THRU DT6  
 MOVE ODATE TO WTD IN DATA33.  
 MOVE WTNUM IN MAMMYO (N) TO WTNUM IN DATA33, C.  
 COMPUTE WTCH = WTCH / C.  
 MOVE WTCH TO AVWT1 IN DATA33.

MOVE MCAGE IN MAMMYO (N,1) TO BC1 IN DATA33.  
 MOVE MCAGE IN MAMMYO (N,2) TO BC2 IN DATA33.  
 WRITE MAMREC FROM DATA33.  
 MOVE MCAGE IN MAMMYO (N,3) TO BC1 IN DATA331.  
 MOVE MCAGE IN MAMMYO (N,4) TO BC2 IN DATA331.  
 WRITE MAMREC FROM DATA331.  
 MOVE CAGEF IN HCAGEF IN MAMMYO (N) TO FHC IN DATA332.  
 MOVE CAGEM IN HCAGEM IN MAMMYO (N) TO MHC IN DATA332.  
 MOVE FHNUM IN MAMMYO (N) TO FHCNO IN DATA332.  
 MOVE MHNUM IN MAMMYO (N) TO MHCNO IN DATA332.  
 MOVE FCAGEE IN MAMMYO (N,1) TO FEC IN DATA332.  
 MOVE MCAGEE IN MAMMYO (N,1) TO MEC IN DATA332.  
 MOVE FEDATE IN MAMMYO (N,1) TO DATE-SCR PERFORM DT5 THRU DT6  
 MOVE ODATE TO FECDT IN DATA332.  
 MOVE FENUM IN MAMMYO (N,1) TO FECNO IN DATA332.  
 MOVE MENUM IN MAMMYO (N,1) TO MECNO IN DATA332.  
 MOVE MEDATE IN MAMMYO (N,1) TO DATE-SCR PERFORM DT5 THRU DT6  
 MOVE ODATE TO MECDT IN DATA332.  
 MOVE ML IN MAMMYO (N) TO ML IN DATA332.  
 MOVE MCAGE IN MAMMYO (N,5) TO BC1 IN DATA332.  
 MOVE MCAGE IN MAMMYO (N,6) TO BC2 IN DATA332.  
 WRITE MAMREC FROM DATA332.  
 MOVE FCAGEE IN MAMMYO (N,2) TO FEC IN DATA333.  
 MOVE MCAGEE IN MAMMYO (N,2) TO MEC IN DATA333.  
 MOVE FEDATE IN MAMMYO (N,2) TO DATE-SCR PERFORM DT5 THRU DT6  
 MOVE ODATE TO FECDT IN DATA333.  
 MOVE MEDATE IN MAMMYO (N,2) TO DATE-SCR PERFORM DT5 THRU DT6  
 MOVE ODATE TO MECDT IN DATA333.  
 MOVE FENUM IN MAMMYO (N,2) TO FECNO IN DATA333.  
 MOVE MENUM IN MAMMYO (N,2) TO MECNO IN DATA333.  
 WRITE MAMREC FROM DATA333.

WRIEX. EXIT.

ND

BC MASCAR DECK

IDENTIFICATION DIVISION.  
 PROGRAM ID. LIST MASTER TAPE.  
 AUTHOR. BARBARA BISHOP.  
 ENVIRONMENT DIVISION.  
 CONFIGURATION SECTION.  
 SOURCE-COMPUTER IBM-7090.  
 OBJECT-COMPUTER IBM-7090.  
 INPUT-OUTPUT SECTION.  
 FILE-CONTROL.

    SELECT CARDIN ASSIGN TO SYSIN1.

    SELECT REPORT ASSIGN TO SYSOUI.

    SELECT MAMMY-IN ASSIGN TO B(1).

DATA DIVISION.

FILE SECTION.

FD CARDIN, LABEL RECORDS ARE OMITTED, DATA RECORD IS CCARD.

  01 CCARD.

    02 DATE.

      03 MONTH PICTURE X(4).

      03 DAY PICTURE 99.

      03 YEAR PICTURE 9(4).

  02 C1 PICTURE XX.

88 LISTALL VALUE IS ' 0'.  
 88 LISTLIVE VALUE IS ' 1'.  
 88 LISTDEAD VALUE IS ' 2'.  
 88 LISTRECL VALUE IS ' 3'.

02 REC1 PICTURE IS X(15).  
 02 REC2 PICTURE IS X(15).  
 02 TITLE PICTURE IS X(38).

FD REPORT, BLOCK CONTAINS 1 RECORDS, LABEL RECORDS ARE OMITTED  
 DATA RECORD IS LIST.

01 LIST.

02 FILLER PICTURE IS X(132).

FD MAMMY-IN LABEL RECORDS OMITTED RECORDING MODE BINARY DATA  
 RECORD MAMMY.

01 MAMMY.

02 FEM-NO.

03 REC.

04 STRAIN PICTURE 999.

04 ROOM PICTURE 99.

04 BCAGE PICTURE 9(6).

03 COMP-I REDEFINES REC IN MAMMY PICTURE 9(11).

03 GEN PICTURE 999.

02 COMP-M REDEFINES FEM-NO IN MAMMY PICTURE 9(14).

02 PARITY PICTURE 9.

02 MOTHER PICTURE 9(14).

02 REMOVE.

03 FEMALE.

04 FCODE PICTURE 99.

04 FNEWID PICTURE 9(5).

04 FRDATE PICTURE 9(6).

04 FRCAGE PICTURE 9(6).

03 MALE.

04 MCODE PICTURE 99.

04 MNEWID PICTURE 9(5).

04 MRDATE PICTURE 9(6).

04 MRCAGE PICTURE 9(6).

02 BIRTH-DATE PICTURE 9(6).

02 QFAC1 PICTURE 99V99.

02 QFAC2 PICTURE 99V99.

02 WQFAC PICTURE 99V99.

02 MATE-PAIR PICTURE 99.

02 LITTER-COUNT PICTURE 9.

02 TOTAL-DAYS-BREEDING PICTURE 9(3).

02 RECON PICTURE X.

02 LITTER OCCURS 6 TIMES.

03 ML PICTURE 99.

03 M-DATE PICTURE 9(6).

03 B-DATE PICTURE 9(6).

03 W-DATE PICTURE 9(6).

03 B-SIZE PICTURE 99.

03 DEAD.

04 D-SIZE PICTURE 99.

04 M-SIZE PICTURE 99.

04 R-SIZE PICTURE 99.

03 NO-F-WEAN PICTURE 99.

03 NO-M-WEAN PICTURE 99.

03 WTS.  
   04 WT PICTURE 999V9.  
   04 WTDATA PICTURE 9(6).  
   04 WTNUM PICTURE 99.  
 03 HCAGFF.  
   04 CAGFF PICTURE 9(6).  
   04 FHNUM PICTURE 99.  
 03 HCAGEM.  
   04 CAGEM PICTURE 9(6).  
   04 MHNUM PICTURE 99.  
 03 BREED-CAGE OCCURS 6 TIMES.  
   04 MCAGE PICTURE 9(6).  
   04 MDATE PICTURE 9(6).  
 03 EXP-CAGE OCCURS 2 TIMES.  
   04 FECAGE.  
     05 FCAGEE PICTURE 9(6).  
     05 FENUM PICTURE 99.  
     05 FEDATE PICTURE 9(6).  
   04 MECAGE.  
     05 MCAGEE PICTURE 9(6).  
     05 MENUM PICTURE 99.  
     05 MEDATE PICTURE 9(6).

## WORKING-STORAGE SECTION

77 LINECOUNT PICTURE IS 99 COMPUTATIONAL SYNCHRONIZED RIGHT.  
   88 JUMP VALUE IS 25.  
 77 LTCOUNT PICTURE IS 9 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 M PICTURE 99 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 I PICTURE 99 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 C PICTURE 99 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 N PICTURE 99 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 LTC PICTURE 99 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 PGCNT PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 WTCH PICTURE 999V9 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 CHREC1 PICTURE X(6).  
 77 CHREC2 PICTURE X(6).  
 77 CM PICTURE 9 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 01 DATE-SCR.  
   02 MO PICTURE 99.  
   02 DA PICTURE 99.  
   02 YR PICTURE 99.  
 01 ODATE.  
   02 MOT PICTURE IS XXX.  
   02 FILLER PICTURE IS X VALUE IS ' '.  
   02 DA PICTURE IS ZZ.  
   02 FILLER PICTURE IS X VALUE IS ' '.  
   02 YR PICTURE IS ZZ.  
 01 DATED REDEFINES ODATE PICTURE IS X(9).  
 01 DAT.  
   02 MOT PICTURE IS X(36) VALUE IS 'JANFEBMARAPR MAYJUNJUL AUGS  
 - 'EPOCTNOVDEC'.  
   02 MOTA REDEFINES MOT PICTURE IS X(3) OCCURS 12 TIMES.  
 01 HEAD1.  
   02 FILLER PICTURE X VALUE '1'.  
   02 FILLER PICTURE X(10) VALUE ' '.  
   02 DATE.

03 MONTH PICTURE X(4).  
 03 FILLER PICTURE X VALUE ' '.  
 03 DAY PICTURE 99.  
 03 FILLER PICTURE X VALUE ' '.  
 03 YEAR PICTURE 9(4).  
 02 FILLER PICTURE X(5) VALUE ' '.  
 02 TITLE PICTURE X(60).  
 02 FILLER PICTURE X(20) VALUE ' '.  
 02 FILLER PICTURE X(5) VALUE 'PAGE'.  
 02 PAGE PICTURE Z(6).  
 01 HEAD2.  
 02 FILLER PICTURE X(21) VALUE 'OFEMALE NUMBER L'.  
 02 FILLER PICTURE X(20) VALUE 'D MOTHER NUMBER '.  
 02 FILLER PICTURE X(20) VALUE ' BIRTH DATE REM '.  
 02 FILLER PICTURE X(20) VALUE 'REM DATE NEW ID R'.  
 02 FILLER PICTURE X(20) VALUE ' CAGE STAT LC BP'.  
 02 FILLER PICTURE X(20) VALUE ' TDB Q1 Q2 '.  
 02 FILLER PICTURE X(4) VALUE ' QW'.  
 01 DATA2.  
 02 FILLER PICTURE X VALUE ' '.  
 02 FNO PICTURE 999B99B999999B9999.  
 02 FILLER PICTURE XX VALUE ' '.  
 02 LD PICTURE Z.  
 02 FILLER PICTURE XXX VALUE ' '.  
 02 MNO PICTURE ZZZBZZBZZZZZZBZZZ.  
 02 FILLER PICTURE XX VALUE ' '.  
 02 B-DATE PICTURE X(9).  
 02 FILLER PICTURE X(5) VALUE ' F-'.  
 02 RC PICTURE ZZ.  
 02 FILLER PICTURE XX VALUE ' '.  
 02 RDATE PICTURE X(9).  
 02 FILLER PICTURE XX VALUE ' '.  
 02 NID PICTURE Z(5).  
 02 FILLER PICTURE XXX VALUE ' '.  
 02 RCAGE PICTURE Z(6).  
 02 FILLER PICTURE X(4) VALUE ' '.  
 02 RECON PICTURE X.  
 02 FILLER PICTURE X(5) VALUE ' '.  
 02 LC PICTURE 9.  
 02 FILLER PICTURE XX VALUE ' '.  
 02 BP PICTURE ZZ.  
 02 FILLER PICTURE XX VALUE ' '.  
 02 TDB PICTURE Z(3).  
 02 FILLER PICTURE XX VALUE ' '.  
 02 Q1 PICTURE ZZ.99 BLANK WHEN ZERO.  
 02 FILLER PICTURE XX VALUE ' '.  
 02 Q2 PICTURE ZZ.99 BLANK WHEN ZERO.  
 02 FILLER PICTURE XX VALUE ' '.  
 02 QW PICTURE ZZ.99 BLANK WHEN ZERO.  
 01 DATA22.  
 02 FILLER PICTURE X(55) VALUE ' '.  
 02 FILLER PICTURE XX VALUE 'M-'.  
 02 RC PICTURE ZZ.  
 02 FILLER PICTURE XX VALUE ' '.  
 02 RDATE PICTURE X(9).

02 FILLER PICTURE XX VALUE ' '.  
 02 NID PICTURE Z(5).  
 02 FILLER PICTURE XXX VALUE ' '.  
 02 RCAGE PICTURE Z(6).

## 01 HEAD3.

02 FILLER PICTURE X VALUE IS '0'.  
 02 FILLER PICTURE X(20) VALUE 'LITTER MATE DATE B'.  
 02 FILLER PICTURE X(20) VALUE 'IRTH DATE WEAN DATE'.  
 02 FILLER PICTURE X(20) VALUE ' B-SIZE D-SIZE M-'.  
 02 FILLER PICTURE X(20) VALUE 'SIZE R-SIZE F-WEAN'.  
 02 FILLER PICTURE X(20) VALUE ' M-WEAN WT-DATE '.  
 02 FILLER PICTURE X(20) VALUE 'WT NUM AV-WT BRE'.  
 02 FILLER PICTURE X(10) VALUE 'EDER CAGES'.

## 01 DATA3.

02 FILLER PICTURE X VALUE ' '.  
 02 FILLER PICTURE IS X(2) VALUE ' '.  
 02 LN PICTURE 9.  
 02 FILLER PICTURE IS X(5) VALUE ' '.  
 02 MD PICTURE X(9).  
 02 FILLER PICTURE IS X(2) VALUE ' '.  
 02 BD PICTURE X(9).  
 02 FILLER PICTURE IS X(3) VALUE ' '.  
 02 WD PICTURE X(9).  
 02 FILLER PICTURE IS X(4) VALUE ' '.  
 02 BS PICTURE ZZ.  
 02 FILLER PICTURE X(6) VALUE ' '.  
 02 DS PICTURE ZZ.  
 02 FILLER PICTURE IS X(6) VALUE ' '.  
 02 MS PICTURE ZZ.  
 02 FILLER PICTURE X(6) VALUE ' '.  
 02 RS PICTURE ZZ.  
 02 FILLER PICTURE X(6) VALUE ' '.  
 02 NFW PICTURE ZZ.  
 02 FILLER PICTURE X(5) VALUE ' '.  
 02 NMW PICTURE ZZ.  
 02 FILLER PICTURE X(4) VALUE ' '.  
 02 WTD PICTURE X(9).  
 02 FILLER PICTURE X(2) VALUE ' '.  
 02 WT PICTURE Z(3).  
 02 FILLER PICTURE X(2) VALUE ' '.  
 02 WTNUM PICTURE Z(2).  
 02 FILLER PICTURE X(4) VALUE ' '.  
 02 AVWT PICTURE Z(3).  
 02 FILLER PICTURE X(3) VALUE ' '.  
 02 BC1 PICTURE Z(6).  
 02 FILLER PICTURE X VALUE ' '.  
 02 BC2 PICTURE Z(6).

## 01 DATA31.

02 FILLER PICTURE X VALUE ' '.  
 02 FILLER PICTURE X(20) VALUE 'F-H-CAGE NUM M-H-CAG'.  
 02 FILLER PICTURE X(20) VALUE 'E NUM F-E-CAGE NUM D'.  
 02 FILLER PICTURE X(20) VALUE 'ATE M-E-CAGE NU'.  
 02 FILLER PICTURE X(20) VALUE 'M DATE ML '.  
 02 FILLER PICTURE X(37) VALUE ' '.  
 02 BC1 PICTURE Z(6).

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02 FILLER PICTURE X VALUE ' '.
02 BC2 PICTURE Z(6).
01 DATA32.
02 FILLER PICTURE XX VALUE ' '.
02 FHC PICTURE Z(6).
02 FILLER PICTURE X(3) VALUE ' '.
02 FHCNO PICTURE ZZ.
02 FILLER PICTURE XX VALUE ' '.
02 MHC PICTURE Z(6).
02 FILLER PICTURE X(3) VALUE ' '.
02 MHCNO PICTURE ZZ.
02 FILLER PICTURE XX VALUE ' '.
02 FEC PICTURE Z(6).
02 FILLER PICTURE X(3) VALUE ' '.
02 FECNO PICTURE ZZ.
02 FILLER PICTURE X VALUE ' '.
02 FECDT PICTURE X(9).
02 FILLER PICTURE XX VALUE ' '.
02 MEC PICTURE Z(6).
02 FILLER PICTURE X(3) VALUE ' '.
02 MECNO PICTURE ZZ.
02 FILLER PICTURE X VALUE ' '.
02 MECDT PICTURE X(9).
02 FILLER PICTURE X(5) VALUE ' '.
02 ML PICTURE ZZ.
02 FILLER PICTURE X(39) VALUE ' '.
02 BC1 PICTURE Z(6).
02 FILLER PICTURE X VALUE ' '.
02 BC2 PICTURE Z(6).

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01 DATA33.
02 FILLER PICTURE X(28) VALUE ' '.
02 FEC PICTURE Z(6).
02 FILLER PICTURE X(3) VALUE ' '.
02 FECNO PICTURE ZZ.
02 FILLER PICTURE X VALUE ' '.
02 FECDT PICTURE X(9).
02 FILLER PICTURE XX VALUE ' '.
02 MEC PICTURE Z(6).
02 FILLER PICTURE X(3) VALUE ' '.
02 MECNO PICTURE ZZ.
02 FILLER PICTURE X VALUE ' '.
02 MECDT PICTURE X(9).

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01 ERRMES.
02 FILLER PICTURE IS X VALUE '0'.
02 TITLE PICTURE X(110).
02 FILLER PICTURE X(5) VALUE ' '.
02 FEM PICTURE X(15).

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PROCEDURE DIVISION.

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OPEN INPUT CARDIN, MAMMY-IN, OUTPUT REPORT.
READ CARDIN RECORD AT END MOVE SPACES TO FEM IN ERRMES
MOVE 'NO CONTROL CARD- RESUBMIT JOB' TO TITLE IN ERRMES
WRITE LIST FROM ERRMES GO TO POTS.
MOVE 1 TO PGCNT, PAGE IN HEAD1.
MOVE CORRESPONDING CCARD TO HEAD1.
IF LISTALL OR LISTLIVE OR LISTDEAD OR LISTREC1 NEXT

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SENTENCE OTHERWISE MOVE SPACE TO FFM IN ERRMES MOVE  
 'INCORRECT VALUE FOR CONTROL' TO TITLE IN ERRMES WRITE LIST  
 FROM ERRMES GO TO POTS.  
 RDMAS. READ MAMMY-IN AT END GO TO POTS.  
 WRITE LIST FROM HEAD1.  
 WRITE LIST FROM HEAD2.  
 ADD 1 TO PGCNT MOVE PGCNT TO PAGE IN HEAD1.  
 IF LISTALL PERFORM WRITE1 AND GO TO RDMAS.  
 IF LISTREC1 AND (COMP-M IS LESS THAN REC1) GO TO RDMAS.  
 IF LISTREC1 AND (COMP-M IS GREATER THAN REC2) GO TO POTS.  
 IF LISTREC1 PERFORM WRITE1 AND GO TO RDMAS.  
 IF LISTLIVE AND FCODE IN MAMMY = ZERO PERFORM WRITE1 AND  
 GO TO RDMAS.  
 IF LISTDEAD AND FCODE IN MAMMY IS NOT = ZERO PERFORM WRITE1  
 AND GO TO RDMAS.  
 GO TO RDMAS.  
 POTS SECTION.  
 CLOSE MAMMY-IN WITH LOCK.  
 CLOSE REPORT, CARDIN.  
 STOP RUN.  
 SCRDAT SECTION.  
 MOVE SPACES TO ODATE.  
 IF MO IN DATE-SCR IS LESS THAN 1 OR GREATER THAN 12  
 GO TO FXS.  
 MOVE CORRESPONDING DATE-SCR TO ODATE.  
 MOVE MOTA (MO IN DATE-SCR) TO MOTM.  
 FXS. EXIT.  
 WRITE1 SECTION.  
 MOVE COMP-M IN MAMMY TO FNO IN DATA2.  
 MOVE PARITY IN MAMMY TO LO IN DATA2.  
 MOVE MOTHER IN MAMMY TO MNO IN DATA2.  
 MOVE BIRTH-DATE IN MAMMY TO DATE-SCR PERFORM SCRDAT MOVE  
 DATED TO B-DATE IN DATA2.  
 MOVE MATE-PAIR IN MAMMY TO BP IN DATA2.  
 MOVE TOTAL-DAYS-BREEDING IN MAMMY TO TDB IN DATA2.  
 MOVE FCODE IN MAMMY TO RC IN DATA2.  
 MOVE FRDATE IN MAMMY TO DATE-SCR PERFORM SCRDAT.  
 MOVE DATED TO RDATE IN DATA2.  
 MOVE FNEWID TO NID IN DATA2.  
 MOVE FRCAGE IN MAMMY TO RCAGE IN DATA2.  
 MOVE RECON IN MAMMY TO RECON IN DATA2.  
 MOVE LITTER-COUNT IN MAMMY TO LC IN DATA2.  
 MOVE QFAC1 IN MAMMY TO Q1 IN DATA2.  
 MOVE QFAC2 IN MAMMY TO Q2 IN DATA2.  
 MOVE WQFAC IN MAMMY TO QW IN DATA2.  
 WRITE LIST FROM DATA2.  
 MOVE MCODE IN MAMMY TO RC IN DATA22.  
 MOVE MRDATE IN MAMMY TO DATE-SCR PERFORM SCRDAT.  
 MOVE DATED TO RDATE IN DATA22.  
 MOVE MNEWID TO NID IN DATA22.  
 MOVE MRCAGE IN MAMMY TO RCAGE IN DATA22.  
 WRITE LIST FROM DATA22.  
 IF LITTER-COUNT IN MAMMY = ZERO GO TO EXW.  
 COMPUTE LTCOUNT = LITTER-COUNT IN MAMMY + 1.  
 WRITE LIST FROM HEAD3.

PERFORM W1 VARYING M FROM 1 BY 1 UNTIL M = LTCCOUNT.  
GO TO FXW.

W1. MOVE M TO LN IN DATA3  
MOVE M-DATE IN LITTER IN MAMMY (M) TO DATE-SCR PERFORM  
SCRDAT MOVE DATED TO MD IN DATA3.  
MOVE B-DATE IN LITTER IN MAMMY (M) TO DATE-SCR PERFORM  
SCRDAT MOVE DATED TO RD IN DATA3.  
MOVE W-DATE IN LITTER IN MAMMY (M) TO DATE-SCR PERFORM  
SCRDAT MOVE DATED TO WD IN DATA3.  
MOVE B-SIZE IN LITTER IN MAMMY (M) TO BS IN DATA3.  
MOVE D-SIZE IN LITTER IN MAMMY (M) TO DS IN DATA3.  
MOVE M-SIZE IN LITTER IN MAMMY (M) TO MS IN DATA3.  
MOVE R-SIZE IN LITTER IN MAMMY (M) TO RS IN DATA3.  
MOVE NO-F-WEAN IN LITTER IN MAMMY (M) TO NFW IN DATA3  
MOVE NO-M-WEAN IN LITTER IN MAMMY (M) TO NMW IN DATA3.  
MOVE WT IN WTS IN MAMMY (M) TO WT IN DATA3, WTCH.  
MOVE WDATE IN MAMMY (M) TO DATE-SCR PERFORM SCRDAT.  
MOVE DATED TO WTD IN DATA3.  
MOVE WTNUM IN MAMMY (M) TO WTNUM IN DATA3, C.  
COMPUTE WTCH = WTCH / C.  
MOVE WTCH TO AVWT IN DATA3.  
MOVE MCAGE IN MAMMY (M,1) TO BC1 IN DATA3.  
MOVE MCAGE IN MAMMY (M,2) TO BC2 IN DATA3.  
WRITE LIST FROM DATA3.  
MOVE MCAGE IN MAMMY (M,3) TO BC1 IN DATA31.  
MOVE MCAGE IN MAMMY (M,4) TO BC2 IN DATA31.  
WRITE LIST FROM DATA31.  
MOVE CAGEF IN HCAGEF IN LITTER IN MAMMY (M) TO FHC IN DATA32.  
MOVE CAGEM IN HCAGEM IN LITTER IN MAMMY (M) TO MHC IN DATA32.  
MOVE FHNUM IN MAMMY (M) TO FHCND IN DATA32.  
MOVE MHNUM IN MAMMY (M) TO MHCND IN DATA32.  
MOVE FCAGEE IN MAMMY (M,1) TO FEC IN DATA32.  
MOVE MCAGEE IN MAMMY (M,1) TO MEC IN DATA32.  
MOVE FEDATE IN MAMMY (M,1) TO DATE-SCR.  
PERFORM SCRDAT MOVE DATED TO FECDT IN DATA32.  
MOVE FENUM IN MAMMY (M,1) TO FECNO IN DATA32.  
MOVE MENUM IN MAMMY (M,1) TO MECNO IN DATA32.  
MOVE MEDATE IN MAMMY (M,1) TO DATE-SCR.  
PERFORM SCRDAT MOVE DATED TO MECDT IN DATA32.  
MOVE ML IN MAMMY (M) TO ML IN DATA32.  
MOVE MCAGE IN MAMMY (M,5) TO BC1 IN DATA32.  
MOVE MCAGE IN MAMMY (M,6) TO BC2 IN DATA32.  
WRITE LIST FROM DATA32.  
MOVE FCAGEE IN MAMMY (M,2) TO FEC IN DATA33.  
MOVE MCAGEE IN MAMMY (M,2) TO MEC IN DATA33.  
MOVE FEDATE IN MAMMY (M,2) TO DATE-SCR.  
PERFORM SCRDAT MOVE DATED TO FECDT IN DATA33.  
MOVE MEDATE IN MAMMY (M,2) TO DATE-SCR.  
PERFORM SCRDAT MOVE DATED TO MECDT IN DATA33.  
MOVE FENUM IN MAMMY (M,2) TO FECNO IN DATA33.  
MOVE MENUM IN MAMMY (M,2) TO MECNO IN DATA33.  
WRITE LIST FROM DATA33.

FXW. EXIT.

;)BEND  
BCBC SUMCAR DECK

IDENTIFICATION DIVISION.  
 PROGRAM ID. SUMMARY REPORT FOR HANNA.  
 AUTHOR. BARBARA BISHOP.  
 ENVIRONMENT DIVISION.  
 CONFIGURATION SECTION.  
 SOURCE-COMPUTER IBM-7090.  
 OBJECT-COMPUTER IBM-7090.  
 INPUT-OUTPUT SECTION.  
 FILE-CONTROL.

SELECT CARD-IN ASSIGN TO SYSIN1.  
 SELECT REPORT ASSIGN TO SYSOUT1.  
 SELECT SRTOUT ASSIGN TO A(1).  
 SELECT SRTIN ASSIGN TO B(1).  
 SELECT MAMMY-IN ASSIGN TO A(1).

DATA DIVISION.

FILE SECTION.

FD CARD-IN LABEL RECORDS ARE OMITTED DATA RECORD IS CONTROL-CARD.

01 CONTROL-CARD.

02 DATE.

03 MO PICTURE 99.

03 DA PICTURE 99.

03 YR PICTURE 99.

02 CDATE REDEFINES DATE IN CONTROL-CARD PICTURE 9(6).

02 FILLER PICTURE X(3).

02 CHECK-DATE.

03 MON PICTURE 99.

03 DAY PICTURE 99.

03 YER PICTURE 99.

FD REPORT, BLOCK CONTAINS 1 RECORDS, LABEL RECORDS ARE OMITTED  
 DATA RECORD IS LIST.

01 LIST.

04 FILLER PICTURE IS X(132).

FD SRTOUT BLOCK CONTAINS 1 RECORDS LABEL RECORDS OMITTED DATA  
 RECORD IS SOUT.

01 SOUT.

02 FILLER PICTURE IS X(24).

FD SRTIN BLOCK CONTAINS 1 RECORDS LABEL RECORDS OMITTED DATA  
 RECORD IS SIN.

01 SIN.

02 FILLER PICTURE IS X(24).

FD MAMMY-IN LABEL RECORDS OMITTED RECORDING MODE BINARY DATA  
 RECORD MAMMY.

01 MAMMY.

02 FEM-NO.

03 REC.

04 STRAIN PICTURE 999.

04 ROOM PICTURE 99.

04 BCAGE PICTURE 9(6).

03 COMP-I REDEFINES REC IN MAMMY PICTURE 9(11).

03 GEN PICTURE 999.

02 COMP-M REDEFINES FEM-NO IN MAMMY PICTURE 9(14).

02 PARITY PICTURE 9.

02 MOTHER PICTURE 9(14).

02 REMOVE.

03 FEMALE.

04 FCODE PICTURE 99.  
 04 FNEWID PICTURE 9(5).  
 04 FRDATE PICTURE 9(6).  
 04 FRCAGE PICTURE 9(6).  
 03 MALE.  
   04 MCODE PICTURE 99.  
   04 MNEWID PICTURE 9(5).  
   04 MRDATE PICTURE 9(6).  
   04 MRCAGE PICTURE 9(6).  
 02 BIRTH-DATE PICTURE 9(6).  
 02 QFAC1 PICTURE 99V99.  
 02 QFAC2 PICTURE 99V99.  
 02 WOFAC PICTURE 99V99.  
 02 MATE-PAIR PICTURE 99.  
 02 LITTER-COUNT PICTURE 9.  
 02 TOTAL-DAYS-BREEDING PICTURE 9(3).  
 02 RECON PICTURE X.  
 02 LITTEP OCCURS 6 TIMES.  
   03 ML PICTURE 99.  
   03 M-DATE PICTURE 9(6).  
   03 B-DATE.  
     04 MD PICTURE 99.  
     04 DA PICTURE 99.  
     04 YR PICTURE 99.  
   03 BDATE REDEFINES B-DATE IN MAMMY PICTURE 9(6).  
   03 W-DATE PICTURE 9(6).  
   03 B-SIZE PICTURE 99.  
   03 DEAD.  
     04 D-SIZE PICTURE 99.  
     04 M-SIZE PICTURE 99.  
     04 R-SIZE PICTURE 99.  
   03 NO-F-WEAN PICTURE 99.  
   03 NO-M-WEAN PICTURE 99.  
   03 WTS.  
     04 WT PICTURE 99V99.  
     04 WTDATE PICTURE 9(6).  
     04 WTNUM PICTURE 99.  
   03 HCAGEE.  
     04 CAGEE PICTURE 9(6).  
     04 FHNUM PICTURE 99.  
   03 HCAGEM.  
     04 CAGEM PICTURE 9(6).  
     04 MHNUM PICTURE 99.  
   03 BREED-CAGE OCCURS 6 TIMES.  
     04 MCAGE PICTURE 9(6).  
     04 MDATE PICTURE 9(6).  
   03 EXP-CAGE OCCURS 2 TIMES.  
     04 FECAGE.  
       05 FCAGEE PICTURE 9(6).  
       05 FENUM PICTURE 99.  
       05 FEDATE PICTURE 9(6).  
     04 MECAGE.  
       05 MCAGEE PICTURE 9(6).  
       05 MENUM PICTURE 99.  
       05 MEDATE PICTURE 9(6).

## WORKING-STORAGE SECTION.

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77 M PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.
77 I PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.
   88 NOT-WEANED VALUE 1.
   88 HOLDING VALUE 2.
77 C PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.
77 E PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.
77 J PICTURE 999 VALUE ZERO.
77 NOM PICTURE 99 COMPUTATIONAL SYNCHRONIZED RIGHT.
77 PGCT PICTURE 99 COMPUTATIONAL SYNCHRONIZED RIGHT.
77 LNCT PICTURE 99 COMPUTATIONAL SYNCHRONIZED RIGHT.
   88 JUMP VALUE 25.
77 SW PICTURE 9 VALUE ZERO.
77 LTCNT PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT.
77 TOTAL-MICE PICTURE 99999 COMPUTATIONAL SYNCHRONIZED
RIGHT.
77 TOTAL-NOT-WEANED PICTURE 9999 COMPUTATIONAL SYNCHRONIZED
RIGHT.
77 TOTAL-IN-HOLDING PICTURE 9999 COMPUTATIONAL SYNCHRONIZED
RIGHT.
77 START-DAY PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT.
77 TOTAL-DAY PICTURE 9(4) COMPUTATIONAL SYNCHRONIZED RIGHT.
77 TOTAL-WEEK PICTURE 9(4) COMPUTATIONAL SYNCHRONIZED RIGHT.
77 CALC-DAY PICTURE 9(3) COMPUTATIONAL SYNCHRONIZED RIGHT.
77 CHECK-DAY PICTURE 9(6).
77 DD PICTURE 999 COMPUTATIONAL SYNCHRONIZED RIGHT.
01 SRTDK.
02 FILLER PICTURE X(32) VALUE '      OPT,VAR,TAP,CAR,NCF,NCKK
- 'PT'.
02 FILLER PICTURE X(52) VALUE ' '.
   02 FILLER PICTURE IS X(36) VALUE IS '      CHA,INP/J1R,MER/
- '(A,B,UT),OUT/B'.
   02 FILLER PICTURE IS X(48) VALUE IS ' '.
   02 FILLER PICTURE IS X(27) VALUE IS '      FIL,INP/5,MOD/D,
- 'BLO/4'.
   02 FILLFR PICTURE IS X(57) VALUE IS ' '.
   02 FILLER PICTURE IS X(25) VALUE IS '      FIL,OUT,MOD/D,BL
- 'O/4'.
   02 FILLER PICTURE IS X(59) VALUE IS ' '.
   02 FILLER PICTURE IS X(38) VALUE IS '      REC,TYP/F,LEN/4,
- 'FIE/(3,1,4,2,14)'.
   02 FILLER PICTURE IS X(46) VALUE IS ' '.
   02 FILLER PICTURE IS X(41) VALUE IS '      SOR,FIL/5,SEQ/C,
- 'ORD/2,FIE/(1,2,4,3)'.
   02 FILLER PICTURE IS X(43) VALUE IS ' '.
   02 FILLER PICTURE IS X(9) VALUE IS '      END'.
   02 FILLER PICTURE IS X(75) VALUE IS ' '.
01 DELETE-DATE.
   02 DD-DATE.
       03 MO PICTURE 99.
       03 DA PICTURE 99.
       03 YR PICTURE 99.
   02 D-DATE REDEFINES DD-DATE PICTURE 9(6).
01 SUMDAT.
   02 ROOM OCCURS 7 TIMES.

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03 RM-NO PICTURE 99.  
 03 NO-WEAN PICTURE 9(6).  
 03 LITTER OCCURS 6 TIMES.  
 04 NUMBER PICTURE 9(6).

01 DATE-SCR.

02 MO PICTURE 99.  
 02 DA PICTURE 99.  
 02 YR PICTURE 99.

01 DATE-S REDEFINES DATE-SCR PICTURE 9(6).

01 YRTAB1.

02 FILLER PICTURE 999 USAGE COMPUTATIONAL SYNCHRONIZED RIGHT  
 VALUE IS 000.  
 02 FILLER PICTURE 999 USAGE COMPUTATIONAL SYNCHRONIZED RIGHT  
 VALUE IS 031.  
 02 FILLER PICTURE 999 USAGE COMPUTATIONAL SYNCHRONIZED RIGHT  
 VALUE IS 060.  
 02 FILLER PICTURE 999 USAGE COMPUTATIONAL SYNCHRONIZED RIGHT  
 VALUE IS 091.  
 02 FILLER PICTURE 999 USAGE COMPUTATIONAL SYNCHRONIZED RIGHT  
 VALUE IS 121.  
 02 FILLER PICTURE 999 USAGE COMPUTATIONAL SYNCHRONIZED RIGHT  
 VALUE IS 152.  
 02 FILLER PICTURE 999 USAGE COMPUTATIONAL SYNCHRONIZED RIGHT  
 VALUE IS 182.  
 02 FILLER PICTURE 999 USAGE COMPUTATIONAL SYNCHRONIZED RIGHT  
 VALUE IS 213.  
 02 FILLER PICTURE 999 USAGE COMPUTATIONAL SYNCHRONIZED RIGHT  
 VALUE IS 244.  
 02 FILLER PICTURE 999 USAGE COMPUTATIONAL SYNCHRONIZED RIGHT  
 VALUE IS 274.  
 02 FILLER PICTURE 999 USAGE COMPUTATIONAL SYNCHRONIZED RIGHT  
 VALUE IS 305.  
 02 FILLER PICTURE 999 USAGE COMPUTATIONAL SYNCHRONIZED RIGHT  
 VALUE IS 335.  
 02 FILLER PICTURE 999 USAGE COMPUTATIONAL SYNCHRONIZED RIGHT  
 VALUE IS 366.

01 YRTAB2 REDEFINES YRTAB1.

02 YRTAB OCCURS 13 TIMES PICTURE 999 USAGE IS COMPUTATIONAL  
 SYNCHRONIZED RIGHT.

01 SORT-LIST.

02 STRAIN PICTURE 9(3).  
 02 TYPE PICTURE 9.  
 02 B-DATE PICTURE 9(6).  
 02 BDATE REDEFINES B-DATE IN SORT-LIST.  
 03 MO PICTURE 99.  
 03 DA PICTURE 99.  
 03 YR PICTURE 99.  
 02 CAGE PICTURE 9(6).  
 02 ROOM PICTURE 99.  
 02 NUM PICTURE 9(4).  
 02 LIT PICTURE 9.  
 02 SEX PICTURE X.

01 HEAD1.

02 FILLER PICTURE X(6) VALUE '1DATE '  
 02 DATE PICTURE 99B99B99.

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02 FILLER PICTURE X(6) VALUE ' '.
02 T1 PICTURE X(28) VALUE 'ANIMALS NOT WEANED STRAIN '.
02 STRAIN PICTURE Z(3).
01 HEAD2.
02 FILLER PICTURE X(18) VALUE 'OROOM CAGE '.
02 T1 PICTURE X(4) VALUE 'SEX '.
02 FILLER PICTURE X(20) VALUE ' BIRTH DATE WEAN '.
02 FILLER PICTURE X(20) VALUE 'DATE NUMBER TOTA'.
02 FILLER PICTURE X(8) VALUE 'L/DAY '.
02 T2 PICTURE X(10) VALUE 'TOTAL/WEEK'.
01 DATA2.
02 FILLER PICTURE XX VALUE '0 '.
02 ROOM PICTURE ZZ.
02 FILLER PICTURE X(4) VALUE ' '.
02 CAGE PICTURE Z(6).
02 FILLER PICTURE X(4) VALUE ' '.
02 SEX PICTURE X.
02 FILLER PICTURE X(4) VALUE ' '.
02 B-DATE PICTURE 99B99B99.
02 FILLER PICTURE X(5) VALUE ' '.
02 W-DATE PICTURE 99B99B99.
02 FILLER PICTURE X(5) VALUE ' '.
02 NUM PICTURE Z(4).
02 FILLER PICTURE X(6) VALUE ' '.
02 T-DAY PICTURE Z(4).
02 FILLER PICTURE X(8) VALUE ' '.
02 T-WEEK PICTURE Z(4).
01 ERR.
02 FILLER PICTURE X VALUE '0'.
02 TITLE PICTURE X(130).
02 FILLER PICTURE J.
01 MOUSE-TOTALS.
02 CARR PICTURE X.
02 TITLE PICTURE X(55).
02 LIT PICTURE Z VALUE 0.
02 FILLER PICTURE X VALUE ' '.
02 LITTER PICTURE X(6) VALUE ' '.
02 FILLER PICTURE X VALUE ' '.
02 TROOM PICTURE X(7) VALUE ' '.
02 FILLER PICTURE X VALUE ' '.
02 ROOM PICTURE ZZ VALUE 0.
02 FILLER PICTURE X(5) VALUE ' '.
02 NUM PICTURE Z(5).

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PROCEDURE DIVISION.

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OPEN INPUT CARD-IN, MAMMY-IN, OUTPUT REPORT, SRTIN.
READ CARD-IN RECORD, AT END MOVE 'NO CONTROL CARD' TO TITLE
IN ERR WRITE LIST FROM ERR GO TO POTS.
IF CHECK-DATE IN CONTROL-CARD = ZERO MOVE 'NO CHECK DATE'
TO TITLE IN ERR WRITE LIST FROM ERR GO TO POTS.
MOVE DATE IN CONTROL-CARD TO DELETE-DATE.
MOVE COATE IN CONTROL-CARD TO DATE IN HEAD1.
COMPUTE DD = YRTAB (MO IN DELETE-DATE) + DA IN DELETE-DATE
- 56.
IF DD IS LESS THAN 1 SUBTRACT 1 FROM YR IN DELETE-DATE
COMPUTE DD = 365 + DD.

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MOVE 1 TO M.  
 DD1. IF DD IS LESS THAN YRTAB (M) COMPUTE  $M = M - 1$  OTHERWISE  
 COMPUTE  $M = M + 1$  AND GO TO DD1.  
 MOVE M TO MD IN DELETE-DATE.  
 COMPUTE  $DD = DD - YRTAB (M)$ .  
 MOVE DD TO DA IN DELETE-DATE.  
 MOVE ZERO TO J, SUMDAT MOVE 'ROOM ANIMAL TOTALS STRAIN '  
 TO T1 IN HEAD1.  
 READMAS.  
 READ MAMMY-IN AT FND GO TO ALLDONE.  
 IF J = ZERO MOVE STRAIN IN MAMMY TO J, STRAIN IN HEAD1.  
 IF STRAIN IN MAMMY IS NOT = J PERFORM SUM-OUT THRU SOFX MOVE  
 STRAIN IN MAMMY TO J, STRAIN IN HEAD1.  
 IF RECON IN MAMMY = 'R' GO TO READMAS.  
 IF LITTER-COUNT IN MAMMY = ZERO GO TO READMAS OTHERWISE  
 MOVE LITTER-COUNT IN MAMMY TO M.  
 MOVE ZERO TO E.  
 PERFORM SUM-MOVE THRU SMFX VARYING C FROM 1 BY 1 UNTIL C = 7  
 OR E IS UNEQUAL TO ZERO.  
 IF E = ZERO MOVE 7 TO E.  
 ADD 1 TO M.  
 MOVE STRAIN IN MAMMY TO STRAIN IN SORT-LIST.  
 MOVE ROOM IN MAMMY TO ROOM IN SORT-LIST.  
 MOVE BCAGE IN MAMMY TO CAGE IN SORT-LIST.  
 PERFORM LITTER-CHECK THRU LCEX VARYING C FROM 1 BY 1 UNTIL  
 C = M.  
 GO TO READMAS.  
 LITTER-CHECK.  
 MOVE ZERO TO NOM.  
 IF YR IN B-DATE IN MAMMY (C) IS GREATER THAN YR IN  
 DELETE-DATE GO TO LC1.  
 IF YR IN B-DATE IN MAMMY (C) IS LESS THAN YR IN DELETE-DATE  
 GO TO LCFX.  
 IF B-DATE IN MAMMY (C) IS LESS THAN DELETE-DATE GO TO LCEX.  
 LC1. IF W-DATE IN MAMMY (C) = ZERO COMPUTE  $NOM = B-SIZE$  IN MAMMY  
 (C) - D-SIZE IN MAMMY (C) - M-SIZE IN MAMMY (C) - R-SIZE IN  
 MAMMY (C).  
 IF NOM IS GREATER THAN ZERO MOVE 1 TO TYPE IN SORT-LIST MOVE  
 SPACE TO SEX IN SORT-LIST PERFORM WRITE-SORT ADD 1 TO  
 NO-WEAN IN SUMDAT (E).  
 IF FHNUM IN MAMMY (C) IS GREATER THAN ZERO MOVE 2 TO TYPE IN  
 SORT-LIST MOVE FHNUM IN MAMMY (C) TO NOM MOVE 'F' TO SEX IN  
 SORT-LIST PERFORM WRITE-SORT.  
 IF MHNUM IN MAMMY (C) IS GREATER THAN ZERO MOVE 2 TO TYPE IN  
 SORT-LIST MOVE MHNUM IN MAMMY (C) TO NOM MOVE 'M' TO SEX IN  
 SORT-LIST PERFORM WRITE-SORT.  
 LCEX. EXIT.  
 WRITE-SORT.  
 MOVE BDATE IN MAMMY (C) TO B-DATE IN SORT-LIST.  
 MOVE NOM TO NUM IN SORT-LIST.  
 MOVE C TO LIT IN SORT-LIST.  
 MOVE 1 TO SW WRITE SIN FROM SORT-LIST.  
 SUM-MOVE.  
 IF RM-NO IN SUMDAT (C) = ZERO MOVE ROOM IN MAMMY TO RM-NO IN  
 SUMDAT (C) GO TO SM1.

IF RM-NO IN SUMDAT (C) = ROOM IN MAMMY GO TO SM1.  
 GO TO SMEX.

SM1. ADD 1 TO NUMBER IN SUMDAT (C,M) MOVE C TO E.  
 SMEX. EXIT.

SUM-OUT.  
 WRITE LIST FROM HEAD1 MOVE ZERO TO CARR IN MOUSE-TOTALS.  
 MOVE 'IN ROOM' TO TROOM IN MOUSE-TOTALS.  
 PERFORM ROOM-TOTALS VARYING C FROM 1 BY 1 UNTIL C = 7.  
 MOVE ZERO TO SUMDAT.

SOEX. EXIT.

ROOM-TOTALS.  
 MOVE SPACES TO LITTER IN MOUSE-TOTALS  
 MOVE ZERO TO LIT IN MOUSE-TOTALS.  
 IF NO-WEAN IN SUMDAT (C) IS GREATER THAN ZERO MOVE  
 'TOTAL NUMBER OF LITTERS NOT WEANED' TO TITLE IN MOUSE-TOTALS  
 MOVE RM-NO IN SUMDAT (C) TO ROOM IN MOUSE-TOTALS MOVE NO-WEAN  
 IN SUMDAT (C) TO NUM IN MOUSE-TOTALS WRITE LIST FROM  
 MOUSE-TOTALS.  
 PERFORM LITTER-TOTALS VARYING E FROM 1 BY 1 UNTIL E = 7.

LITTER-TOTALS.  
 IF NUMBER IN SUMDAT (C,F) IS GREATER THAN ZERO MOVE  
 'NUMBER OF LIVE BREEDERS WHICH HAVE' TO TITLE IN MOUSE-TOTALS  
 MOVE 'LITTER' TO LITTER IN MOUSE-TOTALS MOVE E TO LIT IN  
 MOUSE-TOTALS MOVE RM-NO IN SUMDAT (C) TO ROOM IN MOUSE-TOTALS  
 MOVE NUMBER IN SUMDAT (C,E) TO NUM IN MOUSE-TOTALS WRITE  
 LIST FROM MOUSE-TOTALS.

ALLDONE.  
 PERFORM SUM-OUT THRU SOFX.  
 CLOSE MAMMY-IN WITH LOCK.  
 CLOSE SRTIN.  
 IF SW = ZERO GO TO ENDALL OTHERWISE MOVE ZERO TO SW.  
 ENTER LINKAGE-MODE.  
 CALL 'GETSRT' USING SRTDK, SRTIN, SRTOUT, SW.  
 ENTER COBOL.  
 IF SW = ZERO NEXT SENTENCE OTHERWISE DISPLAY QUOTE  
 'SORT NOT GOOD' MOVE 'SORT NOT GOOD - RESUBMIT JOB' TO  
 TITLE IN ERR WRITE LIST FROM ERR GO TO POTS.  
 OPEN INPUT SRTOUT.  
 MOVE ZERO TO M, I, C, F.

LIST-WRITE.  
 READ SRTOUT INTO SORT-LIST AT END GO TO LIST-END.  
 COMPUTE CALC-DAY = YRTAB (MO IN SORT-LIST) + DA IN SORT-LIST.  
 IF M = ZERO GO TO LW1.  
 IF STRAIN IN SORT-LIST = M GO TO LW2.  
 MOVE TOTAL-DAY TO T-DAY.  
 IF NOT-WEANED MOVE TOTAL-WEEK TO T-WEEK.  
 PERFORM LW4 PERFORM TOTAL-OUT.

LW1. MOVE STRAIN IN SORT-LIST TO M, STRAIN IN HEAD1.  
 MOVE TYPE IN SORT-LIST TO I.  
 MOVE ZERO TO TOTAL-MICE, TOTAL-NOT-WEANED, TOTAL-IN-HOLDING.  
 PERFORM TYPE-MOVE PERFORM DATA-MOVE.  
 MOVE B-DATE IN SORT-LIST TO CHECK-DAY.  
 PERFORM CALC-START.  
 MOVE 25 TO LNCT.  
 GO TO LIST-WRITE.

LW2. IF TYPE IN SORT-LIST = I GO TO LW3.  
 MOVE TOTAL-DAY TO T-DAY.  
 MOVE B-DATE IN SORT-LIST TO CHECK-DAY.  
 IF NOT-WEANED MOVE TOTAL-WEEK TO T-WEEK.  
 PERFORM LW4, PERFORM TYPE-MOVE, PERFORM DATA-MOVE, PERFORM  
 CALC-START MOVE 25 TO LNCT.  
 GO TO LIST-WRITE.

LW3. IF B-DATE IN SORT-LIST = CHECK-DAY GO TO LW4.  
 MOVE B-DATE IN SORT-LIST TO CHECK-DAY.  
 MOVE TOTAL-DAY TO T-DAY MOVE ZERO TO TOTAL-DAY.  
 IF NOT-WEANED PERFORM CALC-WEEK.

LW4. IF JUMP WRITE LIST FROM HEAD1 WRITE LIST FROM HEAD2 MOVE  
 ZERO TO LNCT.  
 WRITE LIST FROM DATA2 ADD 1 TO LNCT.

LW5. EXIT.

LW6. PERFORM DATA-MOVE GO TO LIST-WRITE.

LIST-END.  
 MOVE TOTAL-DAY TO T-DAY.  
 IF NOT-WEANED MOVE TOTAL-WEEK TO T-WEEK.  
 WRITE LIST FROM DATA2.  
 PERFORM TOTAL-CUT.

ENDALL.  
 CLOSE SRTOUT, REPORT, CARD-IN.

POTS. STOP RUN.

CALC-START SECTION.  
 IF YR IN BDATE IN SORT-LIST IS LESS THAN YER IN CONTROL-CARD  
 ADD 1 TO DAY IN CONTROL-CARD SUBTRACT 1 FROM YER IN  
 CONTROL-CARD.  
 IF YR IN BDATE IN SORT-LIST IS GREATER THAN YER IN  
 CONTROL-CARD SUBTRACT 1 FROM DAY IN CONTROL-CARD ADD 1 TO  
 YER IN CONTROL-CARD.  
 COMPUTE START-DAY = YRTAB (MON IN CONTROL-CARD) + DAY IN  
 CONTROL-CARD.

CS1. IF CALC-DAY IS GREATER THAN START-DAY ADD 7 TO START-DAY  
 GO TO CS1.

CSEX. EXIT.

CALC-WEEK SECTION.  
 IF START-DAY IS GREATER THAN 365 AND CALC-DAY IS LESS THAN  
 30 COMPUTE START-DAY = START-DAY - 365.  
 IF CALC-DAY IS GREATER THAN START-DAY MOVE TOTAL-WEEK TO  
 T-WEEK MOVE ZERO TO TOTAL-WEEK ADD 7 TO START-DAY ELSE  
 MOVE ZERO TO T-WEEK.

CW1. IF CALC-DAY IS GREATER THAN START-DAY ADD 7 TO START-DAY  
 GO TO CW1.

CWEX. EXIT.

CALC-WEAN SECTION.  
 MOVE B-DATE IN SORT-LIST TO DATE-SCR.  
 COMPUTE C = YRTAB (MO IN DATE-SCR) + DA IN DATE-SCR + 21.  
 IF C IS GREATER THAN 365 ADD 1 TO YR IN DATE-SCR SUBTRACT  
 365 FROM C.

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MOVE 1 TO F.
CWN1. IF C IS GREATER THAN YRTAB (E) COMPUTE E = E + 1 GO TO
CWN1.
COMPUTE MD IN DATE-SCR = E - 1.
COMPUTE DA IN DATE-SCR = C - YRTAB (MD IN DATE-SCR).
MOVE DATE-S TO W-DATE IN DATA2.
CWNEX. EXIT.
DATA-MOVE SECTION.
MOVE ZERO TO T-DAY, T-WEEK.
MOVE B-DATE IN SORT-LIST TO B-DATE IN DATA2.
MOVE CAGE IN SORT-LIST TO CAGE IN DATA2.
MOVE ROOM IN SORT-LIST TO ROOM IN DATA2.
MOVE NUM IN SORT-LIST TO NUM IN DATA2.
MOVE SEX IN SORT-LIST TO SEX IN DATA2.
PERFORM CALC-WEAN.
ADD NUM IN SORT-LIST TO TOTAL-DAY.
ADD NUM IN SORT-LIST TO TOTAL-MICE.
IF NOT-WEANED ADD NUM IN SORT-LIST TO TOTAL-NOT-WEANED
ADD NUM IN SORT-LIST TO TOTAL-WEEK OTHERWISE ADD NUM IN
SORT-LIST TO TOTAL-IN-HOLDING.
TYPE-MOVE SECTION.
IF TYPE IN SORT-LIST = 1 MOVE 'ANIMALS NOT WEANED STRAIN'
TO T1 IN HEAD1 MOVE SPACES TO T1 IN HEAD2 MOVE 'TOTAL/WEEK'
TO T2 IN HEAD2 OTHERWISE MOVE 'ANIMALS IN HOLDING STRAIN'
TO T1 IN HEAD1 MOVE 'SEX' TO T1 IN HEAD2 MOVE SPACES TO T2
IN HEAD2.
MOVE TYPE IN SORT-LIST TO I.
MOVE ZERO TO TOTAL-DAY, TOTAL-WEEK.
TOTAL-OUT SECTION.
MOVE SPACE TO TROOM IN MOUSE-TOTALS, LITTER IN MOUSE-TOTALS.
MOVE ZERO TO LIT IN MOUSE-TOTALS, ROOM IN MOUSE-TOTALS.
MOVE 1 TO CARR IN MOUSE-TOTALS
MOVE 'TOTAL NUMBER OF MICE IN HOLDING CAGES' TO TITLE IN
MOUSE-TOTALS MOVE TOTAL-IN-HOLDING TO NUM IN MOUSE-TOTALS
WRITE LIST FROM MOUSE-TOTALS.
MOVE 0 TO CARR IN MOUSE-TOTALS
MOVE 'TOTAL NUMBER OF MICE NOT WEANED' TO TITLE IN
MOUSE-TOTALS MOVE TOTAL-NOT-WEANED TO NUM IN MOUSE-TOTALS
WRITE LIST FROM MOUSE-TOTALS.
MOVE 'TOTAL NUMBER OF MICE NOT WEANED AND IN HOLDING CAGES'
TO TITLE IN MOUSE-TOTALS MOVE TOTAL-MICE TO NUM IN
MOUSE-TOTALS WRITE LIST FROM MOUSE-TOTALS.

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ND

BC REMCAR DECK

IDENTIFICATION DIVISION.

PROGRAM ID. REMOVE DEAD ANIMAL RECORDS FROM MASTER.

AUTHOR. BARBARA BISHOP.

ENVIRONMENT DIVISION.

CONFIGURATION SECTION.

SOURCE-COMPUTER IBM-7090.

OBJECT-COMPUTER IBM-7090.

INPUT-OUTPUT SECTION.

FILE-CONTROL.

SELECT CARDIN ASSIGN TO SYSIN1.

SELECT REPORT ASSIGN TO SYSOUT1.

SELECT MAMMY-IN ASSIGN TO A(1).  
 SELECT MAMMY-OUT ASSIGN TO B(1).  
 SELECT REMIN ASSIGN TO A(2).  
 SELECT REMOU ASSIGN TO B(2).

DATA DIVISION.

FILE SECTION.

FD CCARD, LABEL RECORDS ARE OMITTED, DATA RECORD IS CCARD.

01 CCARD.

02 DATE.

03 MONTH PICTURE X(4).

03 DAY PICTURE 99.

03 YEAR PICTURE 9(4).

02 C1 PICTURE XX.

88 MASTER VALUE ' '.

88 STARTUP VALUE ' 1'.

02 FILLER PICTURE X(3).

02 TITLE PICTURE IS X(65).

FD REPORT, BLOCK CONTAINS 1 RECORDS, LABEL RECORDS ARE OMITTED  
 DATA RECORD IS LIST.

01 LIST.

02 FILLER PICTURE IS X(132).

FD MAMMY-IN LABEL RECORDS OMITTED RECORDING MODE BINARY DATA  
 RECORD MAMMY.

01 MAMMY.

02 FEM-NO.

03 REC.

04 STRAIN PICTURE 999.

04 ROOM PICTURE 99.

04 BCAGE PICTURE 9(6).

03 GEN PICTURE 999.

02 COMP-M REDEFINES FEM-NO IN MAMMY PICTURE 9(14).

02 PARITY PICTURE 9.

02 MOTHER PICTURE 9(14).

02 REMOVE.

03 FEMALE.

04 FCODE PICTURE 99.

04 FNEWID PICTURE 9(5).

04 FRDATE PICTURE 9(6).

04 FRCAGE PICTURE 9(6).

03 MALE.

04 MCODE PICTURE 99.

04 MNEWID PICTURE 9(5).

04 MRDATE PICTURE 9(6).

04 MRCAGE PICTURE 9(6).

02 BIRTH-DATE PICTURE 9(6).

02 QFAC1 PICTURE 99V99.

02 QFAC2 PICTURE 99V99.

02 WQFAC PICTURE 99V99.

02 MATE-PAIR PICTURE 99.

02 LITTER-COUNT PICTURE 9.

02 TOTAL-DAYS-BREEDING PICTURE 9(3).

02 RECON PICTURE X.

88 DEAD-MOUSE VALUE 'R'.

02 LITTER OCCURS 6 TIMES.

03 ML PICTURE 99.

03 M-DATE PICTURE 9(6).  
 03 B-DATE PICTURE 9(6).  
 03 W-DATE PICTURE 9(6).  
 03 B-SIZE PICTURE 99.  
 03 DEAD.  
   04 D-SIZE PICTURE 99.  
   04 M-SIZE PICTURE 99.  
   04 R-SIZE PICTURE 99.  
 03 NO-F-WEAN PICTURE 99.  
 03 NO-M-WEAN PICTURE 99.  
 03 WTS.  
   04 WT PICTURE 999V9.  
   04 WTDATA PICTURE 9(6).  
   04 WTNUM PICTURE 99.  
 03 HCAGEF.  
   04 CAGEF PICTURE 9(6).  
   04 FHNUM PICTURE 99.  
 03 HCAGEM.  
   04 CAGEM PICTURE 9(6).  
   04 MHNUM PICTURE 99.  
 03 BREED-CAGE OCCURS 6 TIMES.  
   04 MCAGE PICTURE 9(6).  
   04 MDATE PICTURE 9(6).  
 03 EXP-CAGE OCCURS 2 TIMES.  
   04 FECAGE.  
     05 FCAGEE PICTURE 9(6).  
     05 FENUM PICTURE 99.  
     05 FEDATE PICTURE 9(6).  
   04 MFCAGE.  
     05 MCAGEE PICTURE 9(6).  
     05 MENUM PICTURE 99.  
     05 MEDATE PICTURE 9(6).  
 FD MAMMY-OUT LABEL RECORDS OMITTED RECORDING MODE BINARY DATA  
 RECORD MAMMYO.  
 01 MAMMYO.  
   02 FILLER PICTURE X(1224).  
 FD REMIN LABEL RECORDS OMITTED RECORDING MODE BINARY DATA  
 RECORD DEAD1.  
 01 DEAD1.  
   02 FEM-NO.  
   03 REC.  
     04 STRAIN PICTURE 999.  
     04 ROOM PICTURE 99.  
     04 BCAGE PICTURE 9(6).  
   03 GEN PICTURE 999.  
   02 COMP-D REDEFINES FEM-NO IN DEAD1 PICTURE 9(14).  
   02 PARITY PICTURE 9.  
   02 MOTHER PICTURE 9(14).  
   02 REMOVE.  
   03 FEMALE.  
     04 FCODE PICTURE 99.  
     04 FNEWID PICTURE 9(5).  
     04 FRDATE PICTURE 9(6).  
     04 FRCAGE PICTURE 9(6).  
   03 MALE.

04 MCODE PICTURE 99.  
 04 MNEWID PICTURE 9(5).  
 04 MRDATE PICTURE 9(6).  
 04 MRCAGE PICTURE 9(6).  
 02 BIRTH-DATE PICTURE 9(6).  
 02 QFAC1 PICTURE 99V99.  
 02 QFAC2 PICTURE 99V99.  
 02 WQFAC PICTURE 99V99.  
 02 MATE-PAIR PICTURE 99.  
 02 LITTER-COUNT PICTURE 9.  
 02 TOTAL-DAYS-BREEDING PICTURE 9(3).  
 02 RECON PICTURE X.  
 02 LITTER OCCURS 6 TIMES.  
 03 ML PICTURE 99.  
 03 M-DATE PICTURE 9(6).  
 03 B-DATE PICTURE 9(6).  
 03 W-DATE PICTURE 9(6).  
 03 B-SIZE PICTURE 99.  
 03 DEAD.  
 04 D-SIZE PICTURE 99.  
 04 M-SIZE PICTURE 99.  
 04 R-SIZE PICTURE 99.  
 03 NO-F-WEAN PICTURE 99.  
 03 NO-M-WEAN PICTURE 99.  
 03 WTS.  
 04 WT PICTURE 999V9.  
 04 WTDATA PICTURE 9(6).  
 04 WTNUM PICTURE 99.  
 03 HCAGEF.  
 04 CAGEF PICTURE 9(6).  
 04 FHNUM PICTURE 99.  
 03 HCAGEM.  
 04 CAGEM PICTURE 9(6).  
 04 MHNUM PICTURE 99.  
 03 BREED-CAGE OCCURS 6 TIMES.  
 04 MCAGE PICTURE 9(6).  
 04 MDATE PICTURE 9(5).  
 03 EXP-CAGE OCCURS 2 TIMES.  
 04 FECAGE.  
 05 FCAGEE PICTURE 9(6).  
 05 FENUM PICTURE 99.  
 05 FEDATE PICTURE 9(6).  
 04 MECAGE.  
 05 MCAGEE PICTURE 9(6).  
 05 MENUM PICTURE 99.  
 05 MEDATE PICTURE 9(6).

FD RMOU LABEL RECORDS OMITTED RECORDING MODE BINARY DATA  
 RECORD DEAD0.

01 DEAD0.

02 FILLER PICTURE X(1224).

WORKING-STORAGE SECTION

77 LINECOUNT PICTURE IS 99 COMPUTATIONAL SYNCHRONIZED RIGHT.

88 JUMP VALUE IS 25.

77 LTCOUNT PICTURE IS 9 COMPUTATIONAL SYNCHRONIZED RIGHT.

77 M PICTURE 99 COMPUTATIONAL SYNCHRONIZED RIGHT.

77 I PICTURE 99 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 C PICTURE 99 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 N PICTURE 9(6) COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 LTC PICTURE 99 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 PGCNT PICTURE IS 9.  
 77 WTCH PICTURE 999V9 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 CM PICTURE 9 COMPUTATIONAL SYNCHRONIZED RIGHT.  
 77 TC PICTURE 9.  
 01 DATE-SCR.  
   02 MO PICTURE 99.  
   02 DA PICTURE 99.  
   02 YR PICTURE 99.  
 01 ODATE.  
   02 MOth PICTURE IS XXX.  
   02 FILLER PICTURE IS X VALUE IS ' '.  
   02 DA PICTURE IS ZZ.  
   02 FILLER PICTURE IS X VALUE IS ' '.  
   02 YR PICTURE IS ZZ.  
 01 DATE0 REDEFINES ODATE PICTURE IS X(9).  
 01 DAT.  
   02 MOT PICTURE IS X(36) VALUE IS 'JANFEBMARAPR MAYJUNJUL AUGS  
 - 'EPDCTNOVDFC'.  
   02 MOTA REDEFINES MOT PICTURE IS X(3) OCCURS 12 TIMES.  
 01 HEAD1.  
   02 FILLER PICTURE X VALUE '1'.  
   02 FILLER PICTURE X(10) VALUE ' '.  
   02 DATE.  
     03 MONTH PICTURE X(4).  
     03 FILLER PICTURE X VALUE ' '.  
     03 DAY PICTURE 99.  
     03 FILLER PICTURE X VALUE ' '.  
     03 YEAR PICTURE 9(4).  
   02 FILLER PICTURE X(5) VALUE ' '.  
   02 TITLE PICTURE X(65).  
   02 FILLER PICTURE X(10) VALUE ' '.  
   02 PAGE PICTURE Z(6).  
 01 HEAD2.  
   02 FILLER PICTURE X(21) VALUE 'OFEMALE NUMBER       L'.  
   02 FILLER PICTURE X(20) VALUE 'O MOTHER NUMBER       '.  
   02 FILLER PICTURE X(20) VALUE ' BIRTH DATE REM       '.  
   02 FILLER PICTURE X(20) VALUE 'REM DATE       NEW ID R'.  
   02 FILLER PICTURE X(20) VALUE ' CAGE   STAT    LC   BP'.  
   02 FILLER PICTURE X(20) VALUE ' TDB       Q1       Q2   '.  
   02 FILLER PICTURE X(4) VALUE ' QW'.  
 01 DATA2.  
   02 FILLER PICTURE X VALUE ' '.  
   02 FNO PICTURE 999B99B999999B999.  
   02 FILLER PICTURE XX VALUE ' '.  
   02 LO PICTURE Z.  
   02 FILLER PICTURE XXX VALUE ' '.  
   02 MNO PICTURE 999B99B999999B999.  
   02 FILLER PICTURE XX VALUE ' '.  
   02 B-DATE PICTURE X(9).  
   02 FILLER PICTURE X(5) VALUE ' F-'.  
   02 RC PICTURE ZZ.

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02 FILLER PICTURE XX VALUE ' '.
02 RDATE PICTURE X(9).
02 FILLER PICTURE XX VALUE ' '.
02 NID PICTURE Z(5).
02 FILLER PICTURE XXX VALUE ' '.
02 RCAGE PICTURE Z(6).
02 FILLER PICTURE X(4) VALUE ' '.
02 RECON PICTURE X.
02 FILLER PICTURE X(4) VALUE ' '.
02 LC PICTURE 9.
02 FILLER PICTURE XXX VALUE ' '.
02 BP PICTURE ZZ.
02 FILLER PICTURE XX VALUE ' '.
02 TDB PICTURE Z(3).
02 FILLER PICTURE XX VALUE ' '.
02 Q1 PICTURE ZZ.99 BLANK WHEN ZERO.
02 FILLER PICTURE XX VALUE ' '.
02 Q2 PICTURE ZZ.99 BLANK WHEN ZERO.
02 FILLER PICTURE XX VALUE ' '.
02 QW PICTURE ZZ.99 BLANK WHEN ZERO.
01 DATA2.
02 FILLER PICTURE X(55) VALUE ' '.
02 FILLER PICTURE XX VALUE 'M-'.
02 RC PICTURE ZZ.
02 FILLER PICTURE XX VALUE ' '.
02 RDATE PICTURE X(9).
02 FILLER PICTURE XX VALUE ' '.
02 NID PICTURE Z(5).
02 FILLER PICTURE XXX VALUE ' '.
02 RCAGE PICTURE Z(6).
01 HEAD3.
02 FILLER PICTURE X VALUE '0'.
02 FILLER PICTURE X(20) VALUE 'LITTER MATE DATE B'.
02 FILLER PICTURE X(20) VALUE 'IRTH DATE WEAN DATE'.
02 FILLER PICTURE X(20) VALUE ' B-SIZE D-SIZE M-'.
02 FILLER PICTURE X(20) VALUE 'SIZE R-SIZE F-WEAN'.
02 FILLER PICTURE X(20) VALUE ' M-WEAN WT-DATE '.
02 FILLER PICTURE X(20) VALUE 'WT NUM AV-WT BRE'.
02 FILLER PICTURE X(10) VALUE 'EDER CAGES'.
01 DATA3.
02 FILLER PICTURE X VALUE ' '.
02 FILLER PICTURE IS X(2) VALUE ' '.
02 LN PICTURE 9.
02 FILLER PICTURE IS X(5) VALUE ' '.
02 MD PICTURE X(9).
02 FILLER PICTURE IS X(2) VALUE ' '.
02 BD PICTURE X(9).
02 FILLER PICTURE IS X(3) VALUE ' '.
02 WD PICTURE X(9).
02 FILLER PICTURE IS X(4) VALUE ' '.
02 BS PICTURE ZZ.
02 FILLER PICTURE X(6) VALUE ' '.
02 DS PICTURE ZZ.
02 FILLER PICTURE IS X(6) VALUE ' '.
02 MS PICTURE ZZ.

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02 FILLER PICTURE X(6) VALUE ' '.
02 RS PICTURE ZZ.
02 FILLER PICTURE X(6) VALUE ' '.
02 NFW PICTURE ZZ.
02 FILLER PICTURE X(5) VALUE ' '.
02 NMW PICTURE ZZ.
02 FILLER PICTURE X(4) VALUE ' '.
02 WTD PICTURE X(9).
02 FILLER PICTURE X(2) VALUE ' '.
02 WT PICTURE Z(3).
02 FILLFR PICTURE X(2) VALUE ' '.
02 WTNUM PICTURE Z(2).
02 FILLER PICTURE X(4) VALUE ' '.
02 AVWT PICTURE Z(3).
02 FILLER PICTURE X(3) VALUE ' '.
02 BC1 PICTURE Z(6).
02 FILLER PICTURE X VALUE ' '.
02 BC2 PICTURE Z(6).
02 FILLER PICTURE J.
01 DATA31.
02 FILLER PICTURE X VALUE ' '.
02 FILLER PICTURE X(20) VALUE 'F-H-CAGE NUM M-H-CAG'.
02 FILLER PICTURE X(20) VALUE 'E NUM F-E-CAGE NUM D'.
02 FILLER PICTURE X(20) VALUE 'ATE          M-E-CAGE NU'.
02 FILLER PICTURE X(10) VALUE 'M DATE      '.
02 FILLER PICTURE X(47) VALUE ' '.
02 BC1 PICTURE Z(6).
02 FILLER PICTURE X VALUE ' '.
02 BC2 PICTURE Z(6).
02 FILLER PICTURE J.
01 DATA32.
02 FILLER PICTURE XX VALUE ' '.
02 FHC PICTURE Z(6).
02 FILLER PICTURE X(3) VALUE ' '.
02 FHCND PICTURE ZZ.
02 FILLER PICTURE XX VALUE ' '.
02 MHC PICTURE Z(6).
02 FILLER PICTURE X(3) VALUE ' '.
02 MHCND PICTURE ZZ.
02 FILLER PICTURE XX VALUE ' '.
02 FEC PICTURE Z(6).
02 FILLER PICTURE X(3) VALUE ' '.
02 FECND PICTURE ZZ.
02 FILLER PICTURE X VALUE ' '.
02 FECDT PICTURE X(9).
02 FILLER PICTURE XX VALUE ' '.
02 MEC PICTURE Z(6).
02 FILLER PICTURE X(3) VALUE ' '.
02 MECND PICTURE ZZ.
02 FILLER PICTURE X VALUE ' '.
02 MECDT PICTURE X(9).
02 FILLER PICTURE X(46) VALUE ' '.
02 BC1 PICTURE Z(6).
02 FILLER PICTURE X VALUE ' '.
02 BC2 PICTURE Z(6).

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02 FILLER PICTURE J.  
 01 DATA33.  
 02 FILLER PICTURE X(28) VALUE ' '.  
 02 FEC PICTURE Z(6).  
 02 FILLER PICTURE X(3) VALUE ' '.  
 02 FECNO PICTURE ZZ.  
 02 FILLER PICTURE X VALUE ' '.  
 02 FECDT PICTURE X(9).  
 02 FILLER PICTURE XX VALUE ' '.  
 02 MEC PICTURE Z(6).  
 02 FILLER PICTURE X(3) VALUE ' '.  
 02 MECNO PICTURE ZZ.  
 02 FILLER PICTURE X VALUE ' '.  
 02 MECDT PICTURE X(9).  
 02 FILLER PICTURE X(59) VALUE ' '.  
 02 FILLER PICTURE J.

01 ERRMES.  
 02 FILLER PICTURE IS X VALUE '1'.  
 02 TITLE PICTURE X(110).  
 02 FILLER PICTURE X(5) VALUE ' '.  
 02 FEM PICTURE 9(15), BLANK WHEN ZERO.  
 02 FILLER PICTURE J.

PROCEDURE DIVISION.

OPEN INPUT CARDIN, OUTPUT REPORT.  
 OPEN INPUT MAMMY-IN OUTPUT MAMMY-OUT.  
 OPEN OUTPUT REMOU.

READ CARDIN RECORD AT END MOVE ZERGES TO FEM IN ERRMES  
 MOVE 'NO CONTROL CARD- RESUBMIT JOB' TO TITLE IN ERRMES  
 WRITE LIST FROM ERRMES GO TO POTS.  
 MOVE CORRESPONDING CCARD TO HEAD1.  
 MOVE ZERO TO N, TC.

IF MASTER OPEN INPUT REMIN READ REMIN RECORD AT END MOVE  
 'ERROR IN REMOVAL MASTER - NO RECORDS ON TAPE' TO TITLE  
 IN ERRMES WRITE LIST FROM ERRMES MOVE 1 TO TC GO TO POTS.

READLIVE. READ MAMMY-IN AT END GO TO ENDLIVE.

IF DEAD-MOUSE PERFORM DEAD-MOVE OTHERWISE WRITE MAMMYO FROM  
 MAMMY.

GO TO READLIVE.

DEAD-MOVE SECTION.

IF STARTUP PERFORM WRITE1 WRITE DEADD FROM MAMMY ADD 1 TO N  
 GO TO DMEX.

DEAD-CHECK.

DC1. IF COMP-M IS GREATER THAN COMP-D WRITE DEADD FROM DEADI  
 OTHERWISE GO TO DC2.

READ REMIN AT END GO TO ENDDEAD.

GO TO DEAD-CHECK.

DC2. IF COMP-M IS LESS THAN COMP-D PERFORM WRITE1 WRITE DEADD  
 FROM MAMMY ADD 1 TO N GO TO DMEX.

IF COMP-M = COMP-D MOVE 'FEMALE NUMBER IS ALREADY ON REMOVAL  
 - 'MASTER\* DATA NOT MOVED' TO TITLE IN ERRMES MOVE COMP-M  
 TO FEM IN ERRMES WRITE LIST FROM ERRMES WRITE MAMMYO FROM  
 MAMMY.

DMEX. EXIT.

END-RUN SECTION.

ENDLIVE.

IF STARTUP GO TO ENDUPDATE.  
 WRITE DEADO FROM DEADI READ REMIN RECORD AT END GO TO  
 ENDUPDATE.  
 GO TO ENDLIVE.  
 ENDDFAD.  
 PERFORM WRITE1 WRITE DEADO FROM MAMMY.  
 MOVE ' 1' TO C1 IN CCARD MOVE 1 TO TC GO TO READLIVE.  
 ENDUPDATE.  
 MOVE 'TOTAL NUMBER OF MICE MOVED TO REMOVAL TAPE' TO TITLE  
 IN ERRMES MOVE N TO FEM IN ERRMES WRITE LIST FROM ERRMES.  
 POTS SECTION.  
 CLOSE REPORT, CARDIN.  
 CLOSE MAMMY-IN WITH LOCK MAMMY-OUT WITH LOCK REMOU WITH LOCK.  
 IF TC = 1 CLOSE REMIN WITH LOCK.  
 STOP RUN.  
 SCRDAT SECTION.  
 MOVE SPACES TO ODATE.  
 IF MO IN DATE-SCR IS LESS THAN 1 OR GREATER THAN 12  
 GO TO EXS.  
 MOVE CORRESPONDING DATE-SCR TO ODATE.  
 MOVE MOTA (MO IN DATE-SCR) TO MOTH.  
 EXS. EXIT.  
 WRITE1 SECTION.  
 WRITE LIST FROM HEAD1 WRITE LIST FROM HEAD2.  
 MOVE COMP-M IN MAMMY TO FNG IN DATA2.  
 MOVE PARITY IN MAMMY TO LD IN DATA2.  
 MOVE MOTHER IN MAMMY TO MNO IN DATA2.  
 MOVE BIRTH-DATE IN MAMMY TO DATE-SCR PERFORM SCRDAT MOVE  
 DATED TO B-DATE IN DATA2.  
 MOVE FCODE IN MAMMY TO RC IN DATA2.  
 MOVE FRDATE IN MAMMY TO DATE-SCR PERFORM SCRDAT MOVE DATED  
 TO RDATE IN DATA2.  
 MOVE FNEWID IN MAMMY TO NID IN DATA2.  
 MOVE FRCAGE IN MAMMY TO RCAGE IN DATA2.  
 MOVE MATE-PAIR IN MAMMY TO BP IN DATA2.  
 MOVE TOTAL-DAYS-BREEDING IN MAMMY TO TDB IN DATA2.  
 MOVE RECON IN MAMMY TO RECON IN DATA2.  
 MOVE LITTER-COUNT IN MAMMY TO LC IN DATA2.  
 MOVE QFAC1 IN MAMMY TO Q1 IN DATA2.  
 MOVE QFAC2 IN MAMMY TO Q2 IN DATA2.  
 MOVE WQFAC IN MAMMY TO QW IN DATA2.  
 WRITE LIST FROM DATA2.  
 MOVE MCODE IN MAMMY TO RC IN DATA22.  
 MOVE MRDATE IN MAMMY TO DATE-SCR PERFORM SCRDAT MOVE DATED  
 TO RDATE IN DATA22.  
 MOVE MNEWID IN MAMMY TO NID IN DATA22.  
 MOVE MRCAGE IN MAMMY TO RCAGE IN DATA22.  
 WRITE LIST FROM DATA22.  
 IF LITTER-COUNT IN MAMMY = ZERO GO TO EXW.  
 COMPUTE LTCOUNT = LITTER-COUNT IN MAMMY + 1.  
 WRITE LIST FROM HEAD3.  
 PERFORM W1 VARYING M FROM 1 BY 1 UNTIL M = LTCOUNT.  
 GO TO EXW.  
 W1. MOVE M TO LN IN DATA3  
 MOVE M-DATE IN LITTER IN MAMMY (M) TO DATE-SCR PERFORM

SCRDAT MOVE DATED TO MD IN DATA3.  
 MOVE B-DATE IN LITTER IN MAMMY (M) TO DATE-SCR PERFORM  
 SCRDAT MOVE DATED TO BD IN DATA3.  
 MOVE W-DATE IN LITTER IN MAMMY (M) TO DATE-SCR PERFORM  
 SCRDAT MOVE DATED TO WD IN DATA3.  
 MOVE B-SIZE IN LITTER IN MAMMY (M) TO BS IN DATA3.  
 MOVE D-SIZE IN LITTER IN MAMMY (M) TO DS IN DATA3.  
 MOVE M-SIZE IN LITTER IN MAMMY (M) TO MS IN DATA3.  
 MOVE R-SIZE IN LITTER IN MAMMY (M) TO RS IN DATA3.  
 MOVE NO-F-WEAN IN LITTER IN MAMMY (M) TO NFW IN DATA3  
 MOVE NO-M-WEAN IN LITTER IN MAMMY (M) TO NMW IN DATA3.  
 MOVE WT IN WTS IN MAMMY (M) TO WT IN DATA3, WTCH.  
 MOVE WTDATE IN MAMMY (M) TO DATE-SCR PERFORM SCRDAT MOVE  
 DATED TO WTD IN DATA3.  
 MOVE WTNUM IN MAMMY (M) TO WTNUM IN DATA3, C.  
 COMPUTE WTCH = WTCH / C.  
 MOVE WTCH TO AVWT IN DATA3.  
 MOVE MCAGE IN MAMMY (M,1) TO BC1 IN DATA3.  
 MOVE MCAGE IN MAMMY (M,2) TO BC2 IN DATA3.  
 WRITE LIST FROM DATA3.  
 MOVE MCAGE IN MAMMY (M,3) TO BC1 IN DATA31.  
 MOVE MCAGE IN MAMMY (M,4) TO BC2 IN DATA31.  
 WRITE LIST FROM DATA31.  
 MOVE CAGEF IN MAMMY (M) TO FHC IN DATA32.  
 MOVE CAGEM IN MAMMY (M) TO MHC IN DATA32.  
 MOVE FHNUM IN MAMMY (M) TO FHCNO IN DATA32.  
 MOVE MHNUM IN MAMMY (M) TO MHCNO IN DATA32.  
 MOVE FCAGEE IN MAMMY (M,1) TO FEC IN DATA32.  
 MOVE MCAGEE IN MAMMY (M,1) TO MEC IN DATA32.  
 MOVE FEDATE IN MAMMY (M,1) TO DATE-SCR PERFORM SCRDAT MOVE  
 DATED TO FECDT IN DATA32.  
 MOVE FENUM IN MAMMY (M,1) TO FECNO IN DATA32.  
 MOVE MENUM IN MAMMY (M,1) TO MECNO IN DATA32.  
 MOVE MEDATE IN MAMMY (M,1) TO DATE-SCR PERFORM SCRDAT MOVE  
 DATED TO MECDT IN DATA32.  
 MOVE MCAGE IN MAMMY (M,5) TO BC1 IN DATA32.  
 MOVE MCAGE IN MAMMY (M,6) TO BC2 IN DATA32.  
 WRITE LIST FROM DATA32.  
 MOVE FCAGEE IN MAMMY (M,2) TO FEC IN DATA33.  
 MOVE MCAGEE IN MAMMY (M,2) TO MEC IN DATA33.  
 MOVE FEDATE IN MAMMY (M,2) TO DATE-SCR PERFORM SCRDAT MOVE  
 DATED TO FECDT IN DATA33.  
 MOVE MEDATE IN MAMMY (M,2) TO DATE-SCR PERFORM SCRDAT MOVE  
 DATED TO MECDT IN DATA33.  
 MOVE FENUM IN MAMMY (M,2) TO FECNO IN DATA33.  
 MOVE MENUM IN MAMMY (M,2) TO MECNO IN DATA33.  
 WRITE LIST FROM DATA33.

EXW. EXIT.

BCBEND

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