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REDATAM

REDATAM: DATABASE GENERATION MANUAL

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REDATAM DATABASE GENERATION MANUAL

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INTRODUCTION

This manual complements the REDATAM User's Manual.1/ Its main objective is to instruct, through examples, in the generation of new databases.

It has three sections and the appendices. The first part describes the database creation for a small census or survey, where the initial input data are already stored in a microcomputer. It is very straightforward and easy to use.

The second section deals with the generation of a database starting from a mainframe computer, connected to a microcomputer. This section is more complex than the former, and it is directed to those who have very large amounts of census data and whose files cannot be stored directly in the normal media accessed by a microcomputer.

The last section describes how to add new variables to an existing database. This process is also very easy to execute.

1/ CELADE, REDATAM User's Manual (versión 2.00). (LC/DEM/G.50), Santiago, Chile, 24 June 1987.

1. THE INITIAL DATA ARE ALREADY IN THE MICROCOMPUTER

1.1 Initial comments.

The example used in this section was a Guyanese survey executed in 1986, called GUYREDEM, where CELADE had a major role. It was chosen because as a relatively small file was already on diskettes, everything could be done using only the microcomputer.

The survey has around 50,000 records each of equal length, with about 42,000 persons and 8,000 households. The whole survey came on three high density diskettes, having one file for each Ennumeration District (ED), in direct form, with no carriage return (CR) nor line feed (LF) at the end of each record.

1.2 Specifics for GUYREDEM.

1.2.1 First of all, the three diskettes were copied to a directory named GUYREDEM.

1.2.2 Then a directory sort was done by name, because the filename structure had the region, major area code and ED numbers, to be used as geographical variables in the REDATAM database.

1.2.3 It was necessary then to create a flat file containing all records, with a Basic program (GUYCODE.BAS), in appendix A.1. This program was also used to insert the record weights, calculated for each region. Because of the order in which the input files were copied, this output file (GY86) should already be sorted by geography (see 1.2.2). This file occupies around 3.7 Mb and has a simple structure of two record types, one for household and the other for persons. It has the following structure, as far as data types are concerned:

```
RECORD TYPE    ID variables...    DATA ...
```

1.2.4 The whole \GUYREDEM directory was backed up on 7 high density floppy disks.

1.2.5 All original files were erased to have free space for the database and the temporary SPSS files that were going to be used in a later stage of processing (see 1.3.4). The SPSS.SYl is very big, 4 bytes for each variable times the number of records.

1.3 Database creation.

1.3.1 Database name.

The database name has to be four characters, beginning with a letter. It was decided to use "GY86".

1.3.2 Sort the input file in geographical order.

In the case of GUYREDEM, this was not necessary because the input file was created that way.

If this is not the case, the input file has to be sorted by the whole set of identification variables that are to be used for geographical access to the REDATAM database.

1.3.3 Creation of the .NOM file.

This file has to have all geography codes and names encountered in the input file. In order to guarantee that, the best way is to write a program to read the input file and produce the .NOM file, with all the codes for the geography levels. This program can also be used to check the sort sequence of the input file. In the case of GUYREDEM, the program is called GUYNOM.BAS (see appendix A.2).

This program produced the GY86.NOM file, but with two minor problems: first of all, it was not in the order required by the REDATAM system, and second, the names corresponding to the geographical levels were fictitious (like, ED 234, REGION 01, etc.). Both were solved using SideKick, sorting the records and entering the actual names using a list provided by Guyana. At that point it was discovered that the file contained some EDs that were not in the Guyana list, proving that the decision to produce the .NOM file automatically from the data input file was a good way to detect errors.

Actually it would have been faster if we had incorporated this function in the first program, creating the input file (GUYCODE.BAS).

The third step was to verify the maximum size of the names for each record level in the .NOM file, in order to inform the REDATAM system later when creating the .GEO file (see step 1.3.6 below). Care should be taken when deciding the name size, because REDATAM truncates the names at the end if they do not fit on the geography selection screen. The maximum name size varies for each level, because they begin being shown on the screen at different columns, depending upon the size of the code and the position in the geographical structure. The first level has more space to print the names than the second, because the latter is indented on the screen. The third level has less space than the second for the same reason, etc.

For GUYREDEM, as it has only three levels, and looking at the GY86.NOM file, we decided to use 30 characters for the first two levels (Region and Major Area), and 33 for the third one (ED), 33 being the maximum accepted by REDATAM without truncation at that level.

1.3.4 Frequencies for the input file.

It is necessary to have a frequency distribution for all variables in the input file. There are several reasons for this:

1. When creating the data dictionary (see step 1.3.5 below), we need to know the minimum and maximum ranges for each variable.
2. Also in the data dictionary step, we need to establish the names for the categories of each variable.
3. It is desirable to find, a priori, if there are out-of-range values for the variables. If such errors are very frequent and statistically meaningful, the file should go through a "cleaning" process before being loaded into the REDATAM format.
4. These frequencies should be compared with the ones executed with the REDATAM system after the database generation (see step 1.3.7), in order to verify the whole process.

In the case of GUYREDEM we used the SPSS system, with three different executions due to disk space limitations. Any other package could be used (e.g., SAS, SL-MICRO, or even a user program, although the latter is much more time-consuming and we do not advise doing so, except in the case when no package is available).

1.3.5 Creating the Data Dictionary.

Inside the GUYREDEM directory, beginning with the Data Dictionary option on the REDATAM main menu, then selecting the Management function and finally the Create function, the database name is requested (i.e., GY86), and then the system requests the proper input entries.

For each variable specify the name, description, data type, original length, initial position, minimum and maximum values, and record type. The record type is: 0 for the geographical variables, 1 for the household variables and 2 for the person variables. The data type can be either B (for binary, which means that the data base will be compressed), or C for the character type (in which case, the data will not be compressed at the Autoload step; see 1.3.7). The other fields are self-explanatory and can be obtained from the input file and the frequency distributions. The maximum value field is used by the system to calculate the variable's compressed length.

For using REDATAM it is desirable to have a .BAT file with the proper settings in order to access the database and its files. By using Sidekick (or any other editor), copy the MIRANDA.BAT file (that comes with REDATAM) and then change accordingly the database name and database directory.

1.3.6 Creating the Geographical file.

This is done by using the Database Management option from the REDATAM main menu, and then selecting the GEO file generation option. It asks for the geo variables and their respective name sizes. For GUYREDEM there were three variables, REGION with 30 characters, MAJAREA with 30 characters, and ED with 33 characters. This process should not take more than a minute or two.

1.3.7 Database Generation.

After selecting the Database Management option from the REDATAM main menu and then selecting the Autoload process, the database name (GY86) must be given when asked. The database is compressed automatically (if the data type was B in step 1.3.5).

After that, it is necessary to obtain a frequency distribution for each variable, to verify that all variables were created correctly, and that the values corresponded to the frequencies previously made using the input file. To obtain frequencies using REDATAM, it is necessary to create a Geographic Selection file selecting the whole survey (T's at the highest level), and to use this file in the GEOGRAPHY command of the Statistical Processor, together with the Frequency command. If a variable is answered only by a certain group of persons (for example, Education applies to people of 5 years old and more), it is necessary to filter the corresponding cases by using the appropriate IF commands before the Frequency command.

The Autoload process took about 2 hours for the whole file (50,000 records) in an IBM/AT. The frequency process for the 39 variables took around 2 hours and 20 minutes.

The whole database occupies about 906 Kb of disk space, 22 Kb for the household variables (4), 820 Kb for the person variables (32), and 64 Kb for the indexes and control files. It should be mentioned that all variables are compressed in binary form.

2. THE INITIAL DATA ARE ON A MAINFRAME COMPUTER

2.1 Database Generation Requirements.

To install a medium-sized REDATAM database, for example the Costa Rica census of Household and Population of 1984 with 2.5 million person records, requires the following equipment:

-a mainframe able to process the total file, like frequencies and sorting, with the facility to communicate with a microcomputer to transmit the census information.

-a microcomputer, IBM or fully compatible, with enough disk space (60 Mb for the Costa Rican example), a backup unit (tape unit or 1.2 Mb diskette) and a communication board (if necessary) for the mainframe-micro communication and file transmission. This microcomputer should be available for the database generation full-time, because it will be used day and night for lengthy processes.

2.2 Initial Comments.

This description summarizes the main steps in a REDATAM database generation for a medium-size census or survey, stored initially in a mainframe computer (on magnetic tape for example). The generation of the CR84 database will be used as an example for the whole process. CR84 is the database of the Household and Population census of Costa Rica of 1984, containing around 500,000 household records and 2,500,000 population records. This information was originally stored on fixed-size records of 80 bytes, occupying 230 Mb of 6 magnetic tapes of 2,400 feet.

The initial space estimates showed the need of 51.5 Mb of hard disk (see Appendix B for the formulae and calculation method), to store this database, using the REDATAM facility to process the information in a compressed format (to store, for each variable, only the necessary bits for its representation).

Before going into the details of each step to be executed, it is necessary to outline them as follows:

a) study the data to be used and obtain frequencies to identify all possible values for the variables.

b) in the mainframe computer, creation of the following files from the original census data:

-BREAKS: file with all geographical breaks.

-NAMES: file with all geographical areas which will have names inside the REDATAM database.

-POINTERS: file with one record per household, with the total number of persons in each household.

-HOUSEHOLD VARIABLE FILES: as many files as there are household variables that will be stored in REDATAM; each file will contain only the values of a given variable.

-POPULATION VARIABLE FILES: as many files as there are population variables to be included in the REDATAM database; each file will contain only the values of a given variable.

c) mainframe file transfer to the microcomputer.

d) REDATAM data dictionary generation.

e) append to the NAMES file the names for each geographical area.

f) REDATAM geographical file generation.

g) REDATAM index files generation.

h) REDATAM pointer file generation.

i) inverted files generation, for household and population variables.

j) system test.

It took around a month to generate the Costa Rican census of 1984 REDATAM database. This period of time depends essentially on the number of records, for the critical path is the mainframe-micro data transmission.

2.3 Initial steps.

The first step is to revise the initial information. One has to identify exactly the number of records to be included, the format for each record type, the possible values to be used for each variable, etc. In order to get all this information it is necessary to obtain the distribution frequencies for all the variables, to detect any existing out-of-range values.

For the Costa Rican census the SISTMARG program, developed at CELADE, was used for the frequency distribution process. The household variables took around 18 minutes of CPU time, and the population variables around 46 minutes, on an IBM 3031.

After that, with the knowledge of all the possible values for each variable, it is necessary to define the following:

a) the minimum and maximum values, and what to do with the out-of-range values (blanks, not known and invalid values). With this information one can calculate the necessary bits to store each variable (if the compressed feature will be used).

b) to study the need to create additional variables or to change existing ones. For the Costa Rican database it was necessary to duplicate some information that existed only in the first household record of each dwelling. Also it was necessary to create additional variables, to simplify the later processing (one to show if the person was born at the same census place, and another one to show if the person lived at the same census place 5 years before).

c) to decide which geographical variables to use, and also to identify which will have names in the REDATAM internal structure. In the Costa Rica example it was decided to use four geographical levels (Province, County, District and Segment), of which only the first three would have names inside REDATAM.

After the definition of these parameters, in the case of Costa Rica the following summary tables were created:

Household Variables

Variable	Range	Size bytes	Space bits	Blank assign	Space Mb
Vivienda	0-552	3	10		.664
Hogar	0-9	1	4		.265
Zona urb-rur.	1-4	1	3		.199
Tipo-vivienda	1-5	1	3	0	.199
Tipo-ocupacion	1-7	1	3	0	.199
Alquiler	0-99999	5	17	0	1.128
Pared	1-12	2	4	0	.265
Techo	1-12	2	4	0	.265
Piso	1-10	2	4	0	.265
Tot.aposentos	0-24	2	5	0	.332
Dormir	0-10	2	4	0	.265
Comedor	0-3	2	2	0	.133
Cocina	0-3	2	2	0	.133
Cocina-comedor	0-3	2	2	0	.133
Otros Usos	0-5	2	3	0	.199
Abast.agua	1-9	1	4	0	.265
Cont.agua ver.	1-5	1	3	0	.199
Cont.agua inv.	1-5	1	3	0	.199
Serv.baño	1-3	1	2	0	.133
Serv.sanitario	1-9	1	4	0	.265
T.alumbrado	1-5	1	3	0	.199
Combustible	1-7	1	3	0	.199

Radio	1-2	1	2	0	.133
Cocina	1-2	1	2	0	.133
Plancha	1-2	1	2	0	.133
TV ByN	1-2	1	2	0	.133
TV color	1-2	1	2	0	.133
Refrigerador	1-2	1	2	0	.133
Lavadora	1-2	1	2	0	.133
Calentador	1-2	1	2	0	.133
Telefono	1-2	1	2	0	.133
Cepillo electr.	1-2	1	2	0	.133
Tanque agua	1-2	1	2	0	.133
Vehículo	1-2	1	2	0	.133
Finca agro.	1-9	1	4	0	.265
Ganado-vacuno	1-9	1	4	0	.265
Total personas	0-99	2	7	0	.465
Hombres	0-99	2	7	0	.465
Mujeres	0-99	2	7	0	.465
		------	-------		-------
		57	145	TOTAL SPACE	9.356 Mb

Population Variables

Variable	Range	Size bytes	Space bits	Blank asign	Space Mb
Relación c/Jefe	1-9	1	4		1.152
Sexo	1-2	1	2		.576
Edad	0-99	2	7		2.017
Nació aquí	0-1	1	1		.288
Prov.nacimiento	0-7	1	3		.864
Cantón nac.	0-20	2	4		1.152
Distrito y país	0-701	3	10		2.881
Año Llegada	0-99	2	7	0	2.016
Nacionalidad	7-998	3	10	0	2.881
Seguro Social	1-5	1	3		.864
Prov.5 años	1-9	1	4	0	1.152
Canton 5 años	0-88	2	7	0	2.016
Residía aquí	0-1	1	1		.228
Matr. escolar	1-2	1	2	0	.576
Nivel Instr.	0-39	2	6	0	1.729
Leer y escr.	1-2	1	2	0	.576
Estado Civil	1-6	1	3	0	.864
Tipo Actividad	1-7	1	3	0	.864
Ocupación	0-980	3	10	0	2.881
Cat.ocupación	1-4	1	3	0	.864
Rama Actividad	0-9600	4	14	0	4.033
Horas trabaj.	1-80	2	7	0	2.016
Hijos tenidos	0-99	2	7	0	2.016
Hijos sobreviv.	0-99	2	7	0	2.016
		------	------		--------
		41	127	TOTAL SPACE	36.52 Mb

2.4 Data Dictionary Creation.

With the above information and the minimum and maximum values for each variable, the next step is to create the REDATAM data dictionary. At this point, one has to provide the database name (consisting of four alphanumeric characters, for example, CR84 for Costa Rica), the variables to include in the database, their ranges, possible values, and their specific types (geographical identification, household or person). For more details, please refer to the Data Dictionary description in the REDATAM User's Manual, Appendix D.

One has to provide, for each variable, its respective name, and then REDATAM will assign a consecutive number to each one of them, which will be used to identify the corresponding files storing the variable's data.

2.5 Mainframe Execution.

At this point it is necessary to execute some procedures in the mainframe computer, with the purpose of creating the files with the formats required by REDATAM to generate the database:

a) First of all, the sorting of the original data by the geographical area codes that will be used later inside REDATAM. In the Costa Rican example the IBM SORT utility program in the OS/VS1 operating system was used, taking 12 minutes of CPU time on an IBM 3031, classifying 2,973,385 records by a 15 character key. This procedure normally is very lengthy and occupies much disk space, so sometimes it is advisable to do it by regions and then concatenate the sorted output files.

b) Using the sorted file as input, one has to create three separate files, the first one with all the geographical area codes to be used ("breaks" file described in 2.9), the second file containing the geographical areas that will have names in REDATAM ("names" file described in 2.7), and the last one containing the number of persons for each household ("pointers" file described in 2.10). This was done by a program written in COBOL ("CORTES COBOL x" in CMS, see appendix F.1), which took 4 minutes to execute, generated 10,817 records for the first output file (geographical areas), 508 records for named geographical areas (second output file), and 556,776 records for the third file (persons by household).

c) The third step is to generate one file for each household variable, using the sorted file again. These files will be used later to create the ".BIN" files in REDATAM. For Costa Rica a COBOL program was used ("VIVIENDA COBOL x", see appendix F.2). Because of the number of files generated by this program it was necessary to execute it in a special operating system partition. Furthermore, before executing it, make sure it has enough disk space to store the output files. It took around 15 minutes of CPU time to generate the 39 household variable files, each with 556,776 records.

d) Similarly, it is necessary to generate one file for each person variable in the questionnaire. For the present example, a COBOL program was written with the same structure as the household one ("POBLACIO" COBOL x, see appendix F.3), which took 36 CPU minutes, generating the 24 person variables files, each with 2,416,809 records. One has to take even more care with the disk space, for the output files are much greater than that for the households (in the order of 4 to 1).

As an operational suggestion, in order to facilitate the control of the whole process, it is advisable to name the output files with the same names they have inside the REDATAM dictionary.

2.6 Data Transmission.

The transmission of the files generated in the former step, from the mainframe to the microcomputer, can be executed concurrently as they are being created. In the case of Costa Rica this process was executed at night, while the day shift was used to generate the files. The specific details about the file transmission are particular for each installation; for the example an AST-PCOX board was used, in the CMS mode, which had the following idiosyncrasies (they are similar to the characteristics of other transmission boards presently available):

-the files to be transmitted had to be stored on CMS disks, which forced copying them from tapes or OS disks onto the CMS disks. This step was used also to block the records of each file conveniently, in order to gain transmission time.

-the maximum record length to be transmitted was 255 characters.

-the records ending with spaces were truncated at the last non-blank character.

-the transmission speed was around 30 minutes per Megabyte at 9600 baud.

-the transmission method involves file editing with the XEDIT in CMS, which requires the virtual machine being used to have enough available memory (16 Mb for instance).

Because of that, to take advantage of the transmission speed and to capitalize on the disk space, in CMS as well as on the microcomputer's hard disk, in the Costa Rica example the files were formed with records of 250 characters, or the closest multiple of the variable size (for example, 240 for the 3 byte variables), and blocked by 1,000 characters in CMS (or 960 for the 3 byte variables).

The transmission was executed during the night, making use of the "batch" facility of the PCOX board, setting it to transmit as many variables as would fit in the available space in the hard disk. On the following day the transmitted files were backed up, releasing the used space for other processing. Another technique that would eliminate these intermediate back-ups would be to execute the data compression (which will be explained later) immediately after the data transmission, and then to back up only the compressed files (called ".BIN").

Because of the many variables that have to be transmited, it is necessary to have very good control of the whole process. It is suggested that a form sheet be used, where one writes the variable name, its number inside REDATAM, its size in bytes, number of records in the mainframe, transmission date, its size in the microcomputer, back-up identification (floppy disk or tape cartridge), compression date, compressed file size, and any other information that is applicable. Appendix D shows an example of a standard form with this information.

For a better understanding of the main steps to be executed in the mainframe computer, please see the program flowchart in Appendix E.

After the data transmission, the work continues only on the microcomputer. In the case of Costa Rica an IBM AT was used, with a 30 Mb hard disk, of which only 20 Mb were available for this process.

2.7 Names File Update.

After the creation and transmission of the "names" file to the microcomputer, it is necessary manually to associate each record with the names of the geographical areas that will have names inside REDATAM. This can be done with any text editor or word processor that can produce an ASCII file. One has to calculate the maximum size for each area name, for this will be used after in the REDATAM generation of the geographic file.

What follows is a portion of the geographic file used in CR84, where the 'xxpccdd' part was generated in the mainframe and the 'nnnnnn' part was appended manually using WORDPERFECT (producing an ASCII file):

```
 xxpccdd nnnnnnnnnnnnnnnnnnnnnnnnn          where
|----------------------------------|
|0110000 San José                  | 'xx' geographical level number
|0210100 Cantón Central            |
|0310101 Carmen                    |   01 first level (Province in CR84)
|0310102 Merced                    |   02 second level (County in CR84)
|0310103 Hospital                  |   03 third level (District in CR84)
|0310104 Catedral                  | 'p'  Code for the first geo
|0310105 Zapote                    |        level (province)
|0310106 San Francisco de Dos Ríos | 'cc' Code for the second
|0310107 La Uruca                  |        geo level (county)
|     . . . . . . . . . . . . . . .| 'dd' Third geo level (district)
|----------------------------------| 'nn...' geo level name
```

Please note that the size of the variable code for each geographical level is taken by REDATAM from its data dictionary. For the higher levels (Province, for instance), the codes for the lower levels should be zero. This file's filename has to be "<database>.NOM" ("CR84.NOM" for Costa Rica).

2.8 Geographical File Generation.

Another step that has to be done at this time is the generation of the geographical file in REDATAM. This file will contain the REDATAM names of the geographical variables and the maximum size of the names for each of their values.

In order to generate this file one has to call REDATAM, select the option "Database Management", then the "Geographical Structure Generation". At this point the system will ask the internal names for each geographical variable, and their name sizes. For the geographical variables without names a "0" (zero) should be entered. Once all geographical variables have been provided, one has to press "PgDn" and the system, in a couple of seconds, will create the geographic file called "<database>.GEO", like "CR84.GEO".

2.9 Index Generation.

The subsequent step is the generation of the index files. The system creates one file for each geographical level specified in the former step (Geographical Structure Generation). In order to do that it is necessary to have the following files:

"<database>.COR": file with the geographical "breaks", containing one record for each geographical area with its number of households. This file was created in 2.5.b in the mainframe and then transmitted to the micro. The file format is the COMPLETE AREA CODE followed by its number of HOUSEHOLDS. For example:

```
             pccddsssttttttt
            |----------------| where:
   rec. 1 |1010100100000123|  'p'    : Province (1st area)
   rec. 2 |1010100200000101|  'cc'   : County   (2nd area)
   rec. 3 |1010100300000045|  'dd'   : District (3rd area)
    ...    |  . . . . . . . . |  'sss'  : Segment  (4th area)
            |----------------|  'ttt..': Total # of households in the area
```

"<database>.NOM": file with the names for the geographical areas that will have them. The format of this file is described in 2.7.

After that, using REDATAM, one has to select the option "Database Management", then the "Manual Load" and finally the "Index Generation".

This step creates files with names as "bbbbnnnn.INX", where

'bbbb' : database name
'nnnn' : variable number for the geographical variable in the data dictionary

for example, for CR84 this process lasted 24 minutes and it generated the following files:

CR840001.INX	(Province indexes: 1st geographical level)
CR840002.INX	(County indexes: 2nd geographical level)
CR840003.INX	(District indexes: 3rd geographical level)
CR840004.INX	(Segment indexes: 4th geographical level)

2.10 Hierarchical Link Generation.

This step creates the "<database>PUNT.RED" file (e.g. CR84PUNT.RED), which contains one pointer for each household in the database, and also the number of persons in each household.

To utilize it one has to call REDATAM and choose the option "Database Management", then the "Generate Hierarchical Access". This option asks for the database name, and after entering it one has to press "PgDn". In CR84 this process took 28 minutes.

The input for this step is the "pointer" file generated in section 2.5.b in the mainframe and then transmitted to the micro. Its format is just one record for each household, containing its number of persons. Its name has to be "<database>.POB", e.g., "CR84.POB". It looks like:

```
        |--|
 rec. 1 |05|  (first household with 5 persons)
 rec. 2 |02|  (second household with 2 persons)
 rec. 3 |11|  (third household with 11 persons)
 rec. 4 |00|  (fourth household without persons: vacant)
 rec. 5 |01|  (fifth household with 1 person)
   ...  |..|   . . . . . . .
        |--|
```

2.11 Inverted Files Generation.

This is the last step of the database generation itself. It is used to create a file, in REDATAM format, for each variable of the census questionnaire (except for the geographical variables).

Before starting it, one has to make sure that the corresponding input file for each is available, with the name of "<database>nnnn", where 'nnnn' are four numeric characters representing the variable number according to the REDATAM data dictionary. Examples:

CR840005	variable 'Número de la vivienda' in CR84
CR840008	variable 'Tipo de vivienda' in CR84
CR840044	variable 'Relación de parentesco con el jefe' in CR84.

To execute this step one has to call REDATAM, select the "Database Management" option, then the "Manual Load", then the "Inverted File Generation". The system will ask the database name and the variable number to invert (and compress, if applicable). The system can invert several variables in each run; after providing them, press "PgDn" and the process will start.

At the end of this step, there should have been created as many files as the number of variables that were provided. Their filenames are "<database>nnnn.BIN", and they are the final data files that will be current at REDATAM's execution time. Examples:

CR840005.BIN	inverted and compressed file for Household # in CR84
CR840008.BIN	inverted and compressed file for Household type in CR84
CR850044.BIN	inverted and compressed file for Relationship.

The estimated time according to the Costa Rica census was approximately 20 minutes per Mb.

2.12 System checks.

The system tests can be done concurrently with the generation itself. Each time a questionnaire variable is created one can produce its frequency distribution with REDATAM and compare them with the original frequencies. In order to do that it is necessary to have already created the "<database>PUNT.RED" file.

Considering the great amount of time that can be spent obtaining frequency distributions for the whole file, one can execute it for just a small geographical area, preferably one that contains the last part of the file, but this requires that the frequency distributions for this small area should have been taken from the original file to compare the results. In addition, at least for some key variables (say, one household variable, and sex and age) it is recommended that the frequencies be checked for the total file. In the course of these tests, to make comparisons with the output results from REDATAM, it is advised to have at hand the census publications and other tabulations using the original file. If one finds any problem or discrepancy, the process should be stopped pending the detection of its cause and possible implications for other variables.

In CR84 the REDATAM frequency distribution for all census observations took 50 minutes for a household variable and about 10 hours for a population variable.

2.13 Backups.

A REDATAM database generation demands very large amount of disk space. For this reason it is necessary to have some files backed up on floppy disks or tape cartridges, to release disk space for the subsequent files.

2.14 Final Space Requirements.

After the total installation and testing of the REDATAM database, the final files that will be really needed are fewer and much smaller than the ones used during the generation process. It is suggested to back up these definitive files in the same way one does for any other system.

The total space used for the CR84 database was as follows:

- Household variables:	9.5 Mb
- Population variables:	39.5 Mb
- Index variables and data dictionary:	.2 Mb
- Pointer file:	2.2 Mb
TOTAL DISK SPACE	51.4 Mb

3. APPENDING NEW VARIABLES TO AN EXISTING DATABASE

3.1 Situation 1: the variable is derived from existing variables.

As an example, suppose you want to create a new variable called GROUP5, which will recode the AGE variable into 5-year age groups. It can be calculated in REDATAM every time you need it, but if you think this is too time-consuming and you have enough space on your hard disk to hold the variable, these are the steps to be followed:

3.1.1 Initial procedures.

First of all, be sure to have a back-up copy of your existing database. For this example we will use the Miranda demonstration database that comes with REDATAM.

3.1.2 Variable creation.

Using an ECF command file, you create a "flat" file containing only the variable you want to append. The REDATAM commands should be like these:

```
run name "Append a new variable GROUP5"
geography  REGALL
compute GROUP5 = (AGE/5) + 1
var label GROUP5 "Age in 5-year age groups"
val label GROUP5 1 " 0 -  4 years" 2 " 5 -  9 years" 3 "etc..."
write  GROUP5 (F2.0)
option filename = MI800058
```

If you load these commands into the statistical processor and execute them, they will create a "flat" file called MI800058, with just one variable (GROUP5).

The Geography REGALL includes all database records. When **CREAT**ing it in the GEOGRAPHY SELECTION step of REDATAM, just put a "t" on **ALL** major divisions.

The "(F2.0)" option is used to force the variable to have a size of two characters.

The filename of the "flat" file is dependent on the REDATAM naming scheme, where "MI80" is the database name and "0058" is the next available variable in the REDATAM dictionary (if you look at the MIRANDA dictionary you will see that there are 57 variables).

3.1.3 Dictionary Update.

From the main menu of REDATAM, go to the Update Data Dictionary Option (letters D, M and U in that order). Go to the end of the existing variables and then create a new one, GROUP5, which should be the 58th according to the previous item. In this case, if you want to compress it, enter a "b" in the data type field. The original length is 2, the initial position is 100, the next available position in the original flat file, to guarantee that no superpositions will occur when generating a subset of this database with the WRITE command (the last variable in MIRANDA is INCOME, starting at position 95 with original length equal to 5). The minimum and maximum ranges are 1 and 20 respectively, and the record type is 2. Exit the Update by saving it (with <ALT>D).

3.1.4 Database generation.

With the Manual Load option of the Data Management selection, you generate the GROUP5 variable by applying the Inverted File Generation option. Enter the database name (MI80) and the variable number (58). The PgDn key starts the process, creating a file named MI800058.BIN, with the values for the GROUP5 variable.

3.1.5 Comments.

If you want to create more than one variable, you have two alternatives:

a) execute the above steps once for each new variable;
b) execute the variable generation only once, with a WRITE instruction containing all variables you want to create, and an OPTION filename with a temporary file. Write a program in BASIC, for example, to read the temporary file and create a separate file for each variable in it, with a filename in accordance with the variable number in the dictionary. Update the dictionary and generate the new variables as explained in the previous items.

3.2 Situation 2: the variable is from an external source.

In this case, the process consists of obtaining a "flat" file with the variable to be appended, and then following the steps 3.1.3 and 3.1.4 above. The user has to ensure that the "flat" file containing the new variable has the same number of cases as the original one.

APPENDIX A.1 - GUYCODE.BAS PROGRAM

```
1100 ' recoding program and batch creation
1400 DIM WEIGHT(10,2),ARCS$(150)
1500 FOR I=1 TO 10:FOR J=1 TO 2:READ WEIGHT(I,J):NEXT J:NEXT I
1600 DATA 12,4, 14,8, 19,75, 20,5, 18,6, 19,4, 12,8, 4,4, 8,2, 14,0
1700 FOR I=1 TO 9:READ REMAIN(I):NEXT I
1800 DATA 5,0,4,0,3,0,2,0,1
1900 A$="C:\guyredem\": B$="C:\guyredem\"  ' input and output disks
2100 RECLEN=61:CONTIN=0:CONTOUT=0:CONTOT=0
2200 CLS:PRINT:PRINT "Recoding program":PRINT
2300 INPUT "enter initial region number ";REGINIT
2400 INPUT "enter final   region number ";REGFINA
2600 PRINT:INPUT "enter output file name (without extension)  ";M$
2700 OPEN "o",#2,B$+M$: OPEN "o",#3,B$+M$+".LST"
2900 FOR JJ = REGINIT TO REGFINA
3000   SEED=0
3100   IF JJ = 3 THEN MAXSEED=4:MAXCOUNT=1: GOTO 3400
3200   IF JJ = 4 THEN MAXSEED=2:MAXCOUNT=1: GOTO 3400
3300   MAXSEED=5:MAXCOUNT=REMAIN(WEIGHT(JJ,2)+1)
3400   IF JJ<10 THEN M$="0"+RIGHT$(STR$(JJ),1) ELSE M$=RIGHT$(STR$(JJ),2)
3500   SHELL "DIR "+M$+"*.FOR > DIR.LST"
3600   OPEN "I",#1,"DIR.LST": I=0
3700   WHILE NOT EOF(1)
3800     INPUT #1,MM$: IF LEFT$(MM$,2)<>M$ THEN 4000
3900     I=I+1: ARCS$(I)=MM$
4000   WEND: MAXARC=I: CLOSE #1
4100   FOR I=1 TO MAXARC
4200     CONTIN=0
4300     OPEN "r",#1,A$+LEFT$(ARCS$(I),7)+".for",RECLEN:CONTIN=0
4400     FIELD #1,RECLEN AS RECO$: LASTREC=LOF(1)/RECLEN
4500     PRINT "reading file ";LEFT$(ARCS$(I),7);
4600     CONTIN=CONTIN+1
4700     IF CONTIN>LASTREC THEN CONTOT=CONTOT+CONTIN-1:CLOSE #1:GOTO 6900
4800     GET #1,CONTIN: ENTR$=RECO$: TYPEREC=VAL(LEFT$(ENTR$,1))
4900     IF TYPEREC <> 1 THEN 5200
5000       INTER$=MID$(ENTR$,13,4)  'saves date of interview
5100       GOSUB 10200              ' weight definition
5200     ' adds date of interview and weight to every record
5300     ENTR$=ENTR$+INTER$+WEIGHT$
5400     IF TYPEREC <> 2 THEN ENTR$="": GOTO 4600
5500     ' age and age group calculations
5600     AGE = 86 - VAL(MID$(ENTR$,21,2))
5650     MON1$ = MID$(ENTR$,19,2): MON2$ = MID$(ENTR$,64,2)
5660     DAY1$ = MID$(ENTR$,17,2): DAY2$ = MID$(ENTR$,62,2)
5700     IF MON1$ > MON2$ THEN AGE=AGE-1
5800     IF MON1$ = MON2$ AND DAY1$ > DAY2$ THEN AGE=AGE-1
5850     A$ = STR$(AGE)
5900     IF AGE < 10 THEN AGE$="0"+RIGHT$(A$,1) ELSE AGE$=RIGHT$(A$,2)
6000     IF AGE > 85 THEN AGE=85
```

```
6100     GROUP=INT(AGE/5)+1: A$=STR$(GROUP)
6200     IF GROUP<10 THEN GROUP$="0"+RIGHT$(A$,1) ELSE GROUP$=RIGHT$(A$,2)
6300     ' adds calculated age and age group to person records
6400     ENTR$=ENTR$+AGE$+GROUP$: CONTIN(TYPEREC)=CONTIN(TYPEREC)+1
6700     CONTOUT(TYPEREC)=CONTOUT(TYPEREC)+1
6750     PRINT #2,ENTR$:CONTTOT=CONTTOT+1: ENTR$="": GOTO 4600
6900     PRINT #3,ARCS$(I);"  records read =";
7060     PRINT #3,USING "#####";CONTIN - 1
7100   NEXT I: PRINT
7300   PRINT #3,"total  input records for region ";JJ;" = ";
7450   PRINT #3,USING "#####";CONTOT
7500   FOR I=1 TO 10
7600     IF CONTIN(I)=0 THEN 8000
7800     PRINT #3,"     type ";I;"  =  ";:PRINT #3,USING "#####";CONTIN(I)
7900     CONTIN(I)=0
8000   NEXT I:PRINT #3,""
8200   PRINT #3,"total output records for region  ";JJ;" = ";
8250   PRINT #3,USING "#####";CONTTOT
8300   FOR I=1 TO 10
8400     IF CONTOUT(I)=0 THEN 8900
8500     FINAL(I)=FINAL(I)+CONTOUT(I)
8750     PRINT #3,USING "#####";CONTOUT(I): CONTOUT(I)=0
8900   NEXT I:PRINT "":PRINT #3,"":CONTOT=0:CONTTOT=0
9000 NEXT JJ
9100 PRINT #3,"":PRINT #3,"final results":PRINT #3,""
9200 FOR I = 1 TO 10
9300   IF FINAL(I)=0 THEN 9700
9500   PRINT #3,"    type  ";I;"  =  ";:PRINT #3,USING "#####";FINAL(I)
9600   FINAL=FINAL+FINAL(I)
9700 NEXT I:PRINT #3,""
9900 PRINT #3,"    total      =  ";:PRINT #3,USING "#####";FINAL
9950 CLOSE #3, #2:PRINT "":SYSTEM: END
10200 ' weight definition
10300 SEED=SEED+1:WEIGHT=WEIGHT(JJ,1)
10400 IF SEED > MAXSEED THEN SEED = 1:GOTO 10600
10500 IF SEED > MAXCOUNT THEN WEIGHT=WEIGHT+1
10550 A$=STR$(WEIGHT)
10600 IF WEIGHT<10 THEN WEIGHT$="0"+RIGHT$(A$,1) ELSE WEIGHT$=RIGHT$(A$,2)
10700 RETURN
```

APPENDIX A.2 - GUYNOM.BAS PROGRAM

```
1000 ' guynom.bas - creates the gy86.nom file and checks sort sequence
1100 NNAME$(1)="REGION": NNAME$(2)="MAJOR AREA": NNAME$(3)="ED"
1250 CLS:PRINT "Guynom Program - creates GY86.NOM":PRINT
1300 OPEN "I",#1,"GY86": OPEN "O",#2,"GY86.NOM": OPEN "O",#3,"GY86NOM.LST"
1450   INPUT #1,ENTR$:TIPO1=1:AREANT$=MID$(ENTR$,2,7)
1500 WHILE NOT EOF(1)
1600   INPUT #1,ENTR$:TYPEREC=VAL(LEFT$(ENTR$,1)):AREAB$=MID$(ENTR$,2,7)
1650   IF TYPEREC <> 1 THEN 2500
1700   TIPO1=TIPO1+1
1750   IF AREAB$= AREANT$ GOTO 2700
1800   IF AREAB$> AREANT$ THEN 1950
1850   PRINT    "sequence error ";AREAB$;" ";AREANT$
1900   PRINT #3,"sequence error ";AREAB$;" ";AREANT$
1950   CODE$(1)= MID$(AREANT$,1,2): CODE$(2)= MID$(AREANT$,3,2)
2050   CODE$(3)= MID$(AREANT$,5,3)
2100   IF MID$(AREAB$,1,2) = CODE$(1) THEN 2250
2150   FOR I=1 TO 3:GOSUB 3350:NEXT I: GOTO 2400
2250   IF MID$(AREAB$,3,2) = CODE$(2) THEN 2350
2300   I=2:GOSUB 3350: I=3:GOSUB 3350: AREANT$ = AREAB$: GOTO 2700
2500   TIPO2=TIPO2+1
2510   IF AREAB$=AREANT$ THEN 2700
2550   PRINT #3,"type 2 does not have the same id as type 1 ";ENTR$
2600   PRINT #3,"type 2 does not have the same id as type 1 ";ENTR$
2650   GOTO 1950
2700 WEND
2750 CODE$(1)= MID$(AREANT$,1,2): CODE$(2)= MID$(AREANT$,3,2)
2850 CODE$(3)= MID$(AREANT$,5,3)
2900 FOR I=1 TO 3:GOSUB 3350:NEXT I
2950 PRINT:PRINT "records type 1 = ";TIPO1
3000       PRINT "        type 2 = ";TIPO2
3050       PRINT "        total  = ";TIPO1+TIPO2
3100 PRINT #3,"":PRINT #3,"records type 1 = ";TIPO1
3150             PRINT #3,"        type 2 = ";TIPO2
3200             PRINT #3,"        total  = ";TIPO1+TIPO2
3250 CLOSE #1,#2,#3: SYSTEM: END
3350 ' areabreaks
3400 SAL$="0"+RIGHT$(STR$(I),1)+CODE$(1)
3450 IF I=1 THEN SAL$=SAL$+"00000":GOTO 3650
3500 SAL$=SAL$+CODE$(2)
3550 IF I=2 THEN SAL$=SAL$+"000":GOTO 3650
3600 SAL$=SAL$+CODE$(3): SAL$=SAL$+NNAME$(I)+" "+CODE$(I)
3700 PRINT #2,SAL$: RETURN
```

APPENDIX B - DATABASE SPACE ESTIMATION

The space estimation depends on four parameter groups: household variables, population variables, geographic indexes and an additional file that will hold the link between the household records and their respective person-records (pointer file).

B.1 - Household and population variables.

These variables both use the same calculation method with the exception of the final multiplier, which is the number of cases (households or persons). If the database will be in an un-compressed form the whole process is very easy: one has to sum up the number of bytes needed for each type of variables (household and person, excluding the geographic variables), and then multiply these totals by the number of records in each case.

On the other hand, if the database is to be compressed, the total space depends on the compression system to be used. So far, based on the fact that REDATAM only works with numeric variables, the only method used is binary conversion, changing the ASCII code to a binary number. In other words, a variable that occupies one byte with values ranging from 0 to 9, will be stored in 4 bits (which holds up to 15 values). If the same variable had a maximum value of 7 instead of 9, it would need only 3 bits.

The whole process is based on: a) determining the space, in bits, needed by the household and person variables separately; b) dividing the two of them by 8 (to transform bits into bytes); and c) multiplying them by the number of existing households and persons. The following table contains the maximum values to be stored for each number of bits.

Maximum value	1	3	7	15	31	63	127	255	511	1023	2047
Size in bits	1	2	3	4	5	6	7	8	9	10	11

Maximum value	4095	8191	16383	32767	65535	131071	232141	...
Size in bits	12	13	14	15	16	17	18	...

The formula consists of counting the number of variables that will occupy 1 bit, 2 bits, etc, and then multiplying them by their respective sizes in bits, to add the totals in two groups (household and persons), divide them by 8, and finally multiply them by their respective number of cases (households and persons).

$$V = \sum ((V_i * i) / 8) * HOUNUM.$$

$$P = \sum ((P_i * i) / 8) * POBNUM.$$

$\underline{Vi}$ is the number of household variables occupying $\underline{i}$ bits,
$\underline{Pi}$ is the number of population variables occupying $\underline{i}$ bits,
$\underline{\text{HOUNUM}}$ is the number of households, and
$\underline{\text{POBNUM}}$ is the number of persons.

For the Costa Rica example, according to the census questionnaire, we have:

	Number of variables occupying $\underline{i}$ bits	
i	Household	Population
1		2
2	16	3
3	8	5
4	8	3
5	1	
6		1
7	3	6
10	1	3
14		1
17	1	
cases	550,000	2,500,000

Applying these values to the formula we will have
V = 9.6 Mb and P = 39.6 Mb.

B.2 - Geographic Indexes.

The total size for these files (one for each geographic variable) depends upon the number of indexes with and without associated names. Those with names need 37 bytes, while those without names will need only 7 bytes. These are approximate because they depend also on the size of each of the variables.

I = WITH * 37 + OUT * 7.

In Costa Rica there were three geographical levels with names and only one without names. The former had roughly 500 records, and the last one, without name, had around 10,000 records. In this case,

I = 500 * 37 + 10,000 * 7 = .1 Mb.

B.3 - Pointer file.

This file needs 4 bytes for each household, that is,

A = HOUNUM * 4.

In Costa Rica, A = 550,000 * 4 = 2.2 Mb.

B.4 - Total.

T = V + P + I + A.

For Costa Rica, that meant, approximately, 51.5 Mb.

By looking at these totals, one can see that the space for the geographic indexes (.1 Mb) is a small percentage of the total so far as very large data bases are concerned, but it cannot be miscalculated for small surveys, since the hierarchical geography of the country is the same for a census or a national survey.

APPENDIX C - SYSTEM FILES

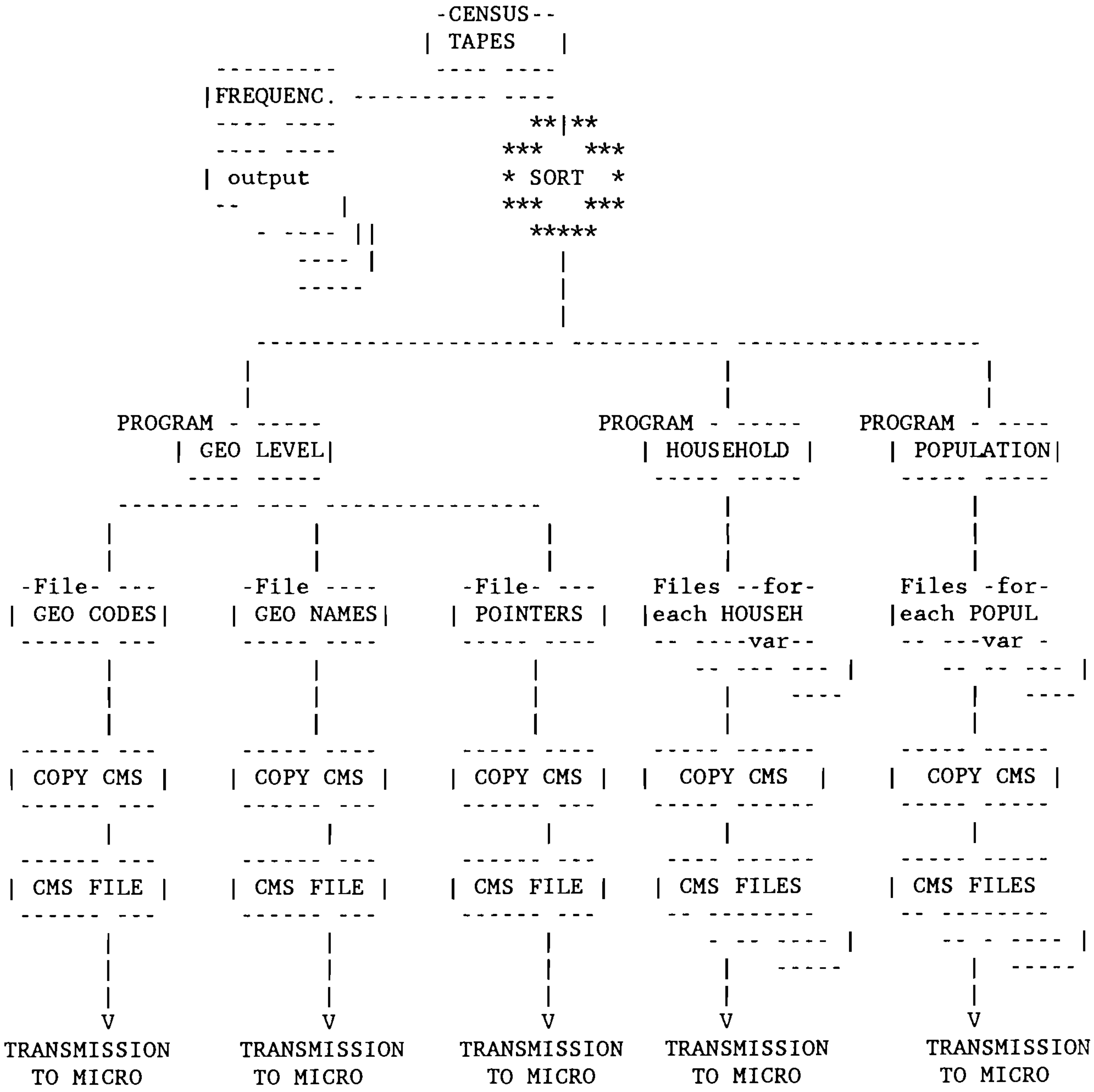
NAME	DESCRIPTION	PLACE OF CREATION
<b.d.>.NOM	file with geographical area codes that will have specific names, and its names	MAINFRAME and changed in the MICRO with any editor to insert the geo names
<b.d.>.COR	geo file with one record for each geo level, with the geo code and a count for households	MAINFRAME
<b.d.>.POB	pointer file, with one record for each household, with the number of persons in the household	MAINFRAME
<b.d.>nnnn	data files for each one of the variables (except the geographical ones). 'nnnn' is the variable number in the REDATAM dictionary	MAINFRAME
<b.d.>.DIC	internal REDATAM file, created when defining the dictionary	REDATAM: Data Dictionary
<b.d.>.CTL	internal REDATAM file, created when defining the dictionary	REDATAM: Data Dictionary
<b.d.>.GEO	REDATAM geo file with the names and info about the geo variables	REDATAM: Geographic structure generation
<b.d.>PUNT.RED	pointer file with the position of each household and the number of persons in it	REDATAM: MANUAL LOAD 'Hierarchical link generation'
<b.d.>nnnn.INX	index files, one for each geo variable. 'nnnn' is the variable number in the REDATAM dictionary	REDATAM: MANUAL LOAD 'Index Generation'
<b.d.>nnnn.BIN	data files, one for each variable 'nnnn' is the variable number in the REDATAM dictionary.	REDATAM: MANUAL LOAD 'Inverted files generation'

APPENDIX D - EXAMPLE OF A PARTIAL CONTROL SHEET

COSTA RICA CENSUS 1984

VARIABLE	TRANSMISSION	BACKUP	GENERATION	BACKUP	FREQUENCIES
No. name	(date)	(diskette#)	(date)	(date)	(date)

APPENDIX E - FOWCHART OF THE WORK IN THE MAINFRAME



APPENDIX F.1 - GEOGRAPHICAL LEVELS PROGRAM

```
------------------------------------------------------------------------------
//STEP1 EXEC COBUCLG                                                    COR00010
       IDENTIFICATION DIVISION.                                         COR00020
       PROGRAM-ID.  CORTES.                                             COR00030
       AUTHOR.      HARRY HERNANDEZ.                                    COR00040
       DATE-WRITTEN. 8 MAYO 1987.                                       COR00050
       DATE-COMPILED.                                                   COR00060
       REMARKS. --------------------------------------------------------COR00070
                ! THIS PROGRAM BELONGS TO THE COSTA RICA'S 1984 CENSUS !COR00080
                ! REDATAM DATABASE GENERATION SYSTEM.                  !COR00090
                ! FUNCTION: READS GEOGRAPHICAL IDENTIFICATION OF ALL   !COR00100
                ! RECORDS OF THE INPUT TAPES AND TO GENERATE 3 FILES:  !COR00110
                ! 1-BREAKS FILE: CONTAINS ONE RECORD FOR EACH DIFFERENT!COR00120
                !    GEOGRAPHICAL IDENTIFICATION, CONTAINING THE       !COR00130
                !    GEOGRAPHICAL AREA CODE AND THE NUMBER OF          !COR00140
                !    HOUSEHOLDS IN EACH AREA.                          !COR00150
                ! 2-NAMES FILE: CONTAINS ONE RECORD FOR EACH DIFFERENT !COR00160
                !    GEOGRAPHICAL AREA THAT WILL HAVE NAMES IN THE     !COR00170
                !    REDATAM SYSTEM. EACH RECORD HAS THE IDENTIFICATION!COR00180
                !    CODE OF THE AREA.                                 !COR00190
                ! 3-POINTERS FILE: CONTAINS THE NUMBER OF PERSONS FOR  !COR00200
                !    EACH HOUSEHOLD. AS MANY RECORDS AS HOUSEHOLDS.    !COR00210
                ! ---------------------------------------------------- !COR00220
                ! TO USE THIS PROGRAM WITH OTHER DATA THAN COSTA RICA'S!COR00230
                ! MODIFY THE FOLLOWING PARTS:                          !COR00240
                ! * INPUT DATA LAY-OUT:                                !COR00250
                !     CHANGE THE STRUCTURE OF 'REGISTRO-CENSO' AND THE !COR00260
                !     SECTION OF 'FD CENSO'                            !COR00270
                ! * 'CORTES' (BREAKS) FILE:                            !COR00280
                !     CHANGE THE NUMBER AND SIZES OF THE VARIABLES     !COR00290
                !     CORRESPONDING TO THE GEOGRAPHICAL AREAS IN THE   !COR00300
                !     STRUCTURE  'REGISTRO-CORTES', AND THE DATA IN    !COR00310
                !     'FD CORTES'                                      !COR00320
                ! * 'NOMBRES' (NAMES) FILE:                            !COR00330
                !     CHANGE THE NUMBER AND SIZES OF THE GEOGRAPHICAL  !COR00340
                !     VARIABLES THAT WILL HAVE NAMES, SO ONE HAS TO    !COR00350
                !     CHANGE THE STRUCTURE OF 'REGISTRO-NOMBRES'       !COR00360
                ! * PROGRAM'S LOGIC SUPPOSES THAT ALL THE RECORD IDENT.!COR00370
                !   IS IN CONSECUTIVE POSITIONS IN THE RECORD ITSELF IN!COR00380
                !   STRUCTURES 'IDENTIFICACION' AND                    !COR00390
                !   'IDENTIFICACION-ANT', SO IT IS NECESSARY TO CHANGE !COR00400
                !   THIS PART IF THE CONDITION DOES NOT HOLD TRUE      !COR00410
                ! * RECORD TYPE '1' CORRESPONDS TO THE HOULSEHOLD      !COR00420
                !   LEVEL AND TYPE '2' TO PERSONS LEVEL.               !COR00430
                ! * PARAGRAPH  'GRABA-NOMBRES' HAS TO BE CHANGED TO    !COR00440
                !   GENERATE RECORDS FOR THE NAMES FILE FOR EACH LEVEL !COR00450
                !   WITH NAMES. THIS EXAMPLE GENERATES RECORDS UP TO   !COR00460
                !   THE THIRD GEOGRAPHICAL LEVEL                       !COR00470
                !                                                      !COR00480
                !------------------------------------------------------!COR00490
```

```
          !IN THIS CENSUS, THE GEOGRAPHICAL VARIABLES ARE:      !COR00500
          !      PROVINCIA  : LEVEL 1  (WITH NAMES IN REDATAM)   !COR00510
          !      CANTON     : LEVEL 2     "     "    "    "      !COR00520
          !      DISTRITO   : LEVEL 3     "     "    "    "      !COR00530
          !      SEGMENTO   : LEVEL 4  (WITHOUT NAMES IN REDATAM)!COR00540
           -------------------------------------------------------COR00550
 ENVIRONMENT DIVISION.                                            COR00560
 CONFIGURATION SECTION.                                           COR00570
 SOURCE-COMPUTER. IBM-370.                                        COR00580
 OBJECT-COMPUTER. IBM-370.                                        COR00590
 INPUT-OUTPUT SECTION.                                            COR00600
 FILE-CONTROL.                                                    COR00610
     SELECT CENSO      ASSIGN TO UT-3410-S-CENSO.                 COR00620
     SELECT CORTES     ASSIGN TO DA-3340-S-CORTES.                COR00630
     SELECT NOMBRES    ASSIGN TO DA-3340-S-NOMBRES.               COR00640
     SELECT PUNTEROS   ASSIGN TO DA-3340-S-PUNTEROS.              COR00650
 DATA DIVISION.                                                   COR00660
 FILE SECTION.                                                    COR00670
 FD  CENSO                                                        COR00680
     BLOCK CONTAINS 0   RECORDS                                   COR00690
     LABEL RECORDS ARE STANDARD                                   COR00700
     RECORD CONTAINS 70 CHARACTERS.                               COR00710
*  ------ SHOULD BE CHANGED FOR THE CORRESPONDING RECORD SIZE.    COR00720
 01  REG-CENSO          PIC    X(70).                             COR00730
*                                                                 COR00740
*  ------ BLOCKING FACTORS FOR THE FOLLOWING FILES CALCULATED     COR00750
*         FOR 3350 DISKS, BUT CAN BE MODIFIED ACCORDINGLY         COR00760
 FD  CORTES                                                       COR00770
     LABEL RECORDS ARE STANDARD                                   COR00780
     BLOCK CONTAINS 1000 RECORDS                                  COR00790
     RECORD CONTAINS 16 CHARACTERS.                               COR00800
*   GEO LEVEL        1:    1 CHARACTERS                           COR00810
*   GEO LEVEL        2:    2 CHARACTERS                           COR00820
*   GEO LEVEL        3:    2 CHARACTERS                           COR00830
*   GEO LEVEL        4:    3 CHARACTERS                           COR00840
*   HOUSEHOLD TOTAL   :    8 CHARACTERS                           COR00850
*                       ------                                    COR00860
*                   TOTAL 16 CARACTERS                            COR00870
 01  REG-CORTES         PIC X(16).                                COR00880
*                                                                 COR00890
 FD  NOMBRES                                                      COR00900
     LABEL RECORDS ARE STANDARD                                   COR00910
     BLOCK CONTAINS 2000 RECORDS                                  COR00920
     RECORD CONTAINS   7 CHARACTERS.                              COR00930
*           LEVEL IDENTIFICATION:   2 CHARACTERS                  COR00940
*           GEOGRAPHICAL LEVEL 1:   1 CHARACTER                   COR00950
*           GEOGRAPHICAL LEVEL 2:   2 CHARACTERS                  COR00960
*           GEOGRAPHICAL LEVEL 3:   2 CHARACTERS                  COR00970
*                    TOTAL     :    7 CHARACTERS                  COR00980
 01  REG-NOMBRES        PIC X(07).                                COR00990
*                                                                 COR01000
 FD  PUNTEROS                                                     COR01010
     LABEL RECORDS ARE STANDARD                                   COR01020
     BLOCK CONTAINS 8000 RECORDS                                  COR01030
     RECORD CONTAINS    2 CHARACTERS.                             COR01040
 01  REG-PUNTEROS       PIC 9(2).                                 COR01050
*                                                                 COR01060
 WORKING-STORAGE SECTION.                                         COR01070
 77  TOTAL-CENSO        PIC     9(8) COMP VALUE ZERO.             COR01080
 77  TOTAL-CORTES       PIC     9(8) COMP VALUE ZERO.             COR01090
 77  TOTAL-NOMBRES      PIC     9(8) COMP VALUE ZERO.             COR01100
 77  TOTAL-PUNTEROS     PIC     9(8) COMP VALUE ZERO.             COR01110
 77  CUENTA-PERSONAS    PIC     9(6)      VALUE ZERO.             COR01120
*                                                                 COR01130
 01  REGISTRO-CENSO.                                              COR01140
     03  IDENTIFICACION.                                          COR01150
         05  SEGMENTO.                                            COR01160
             07 PROVINCIA        PIC X.                           COR01170
             07 CANTON           PIC XX.                          COR01180
             07 DISTRITO         PIC XX.                          COR01190
             07 FILLER           PIC XXX.                         COR01200
         05  VIVIENDA-HOGAR      PIC XXX.                         COR01210
         05  HOGAR               PIC X.                           COR01220
     03  TIPO-REG                PIC X.                           COR01230
     03  FILLER                  PIC X(57).                       COR01240
*                                                                 COR01250
 01  REGISTRO-CORTES.                                             COR01260
     03  SEGMENTO-CORTES         PIC X(8).                        COR01270
     03  HOGARES-CORTES          PIC 9(8) VALUE 0.                COR01280
*                                                                 COR01290
 01  REGISTRO-NOMBRES.                                            COR01300
     03  NIVEL-NOMBRES           PIC XX.                          COR01310
     03  PROVINCIA-NOMBRES       PIC X.                           COR01320
     03  CANTON-NOMBRES          PIC XX.                          COR01330
     03  DISTRITO-NOMBRES        PIC XX.                          COR01340
*                                                                 COR01350
 01  OTRAS-VARS.                                                  COR01360
     03  FIN-ARCH                PIC 9 VALUE 0.                   COR01370
         88 FIN-ARCHIVO          VALUE 1.                         COR01380
     03  IDENTIFICACION-ANT.                                      COR01390
         05  SEGMENTO-ANT.                                        COR01400
             07  PROVINCIA-ANT   PIC X.                           COR01410
             07  CANTON-ANT      PIC XX.                          COR01420
             07  DISTRITO-ANT    PIC XX.                          COR01430
             07  FILLER          PIC XXX.                         COR01440
         05  VIVIENDA-ANT        PIC XXX.                         COR01450
         05  HOGAR-ANT           PIC X.                           COR01460
*                                                                 COR01470
 PROCEDURE DIVISION.                                              COR01480
     OPEN  INPUT  CENSO, OUTPUT CORTES, NOMBRES, PUNTEROS.        COR01490
     READ CENSO INTO REGISTRO-CENSO AT END MOVE 1 TO FIN-ARCH.    COR01500
     MOVE SPACES TO IDENTIFICACION-ANT.                           COR01510
     PERFORM GRABA-NOMBRES.                                       COR01520
     MOVE IDENTIFICACION TO IDENTIFICACION-ANT.                   COR01530
     PERFORM CICLO THRU CICLO-FIN UNTIL FIN-ARCHIVO.              COR01540
     DISPLAY " TOTAL REGISTROS LEIDOS ", TOTAL-CENSO.             COR01550
     DISPLAY " TOTAL REGISTROS CORTES ", TOTAL-CORTES.            COR01560
     DISPLAY " TOTAL REGISTROS NOMBRES ", TOTAL-NOMBRES.          COR01570
     DISPLAY " TOTAL REGISTROS PUNTEROS ", TOTAL-PUNTEROS.        COR01580
     CLOSE CENSO, CORTES, NOMBRES, PUNTEROS.                      COR01590
     STOP RUN.                                                    COR01600
*                                                                 COR01610
 CICLO.                                                           COR01620
     READ CENSO INTO REGISTRO-CENSO AT END MOVE 1 TO FIN-ARCH     COR01630
                                    MOVE SPACES TO IDENTIFICACION COR01640
                                    MOVE 1 TO TIPO-REG.           COR01650
     ADD 1 TO TOTAL-CENSO.                                        COR01660
     IF IDENTIFICACION = IDENTIFICACION-ANT                       COR01670
        IF TIPO-REG = 2                                           COR01680
           ADD 1 TO CUENTA-PERSONAS                               COR01690
        ELSE                                                      COR01700
           DISPLAY "*** ERROR *** REG.HOGAR CON IDENT. IGUAL ANT."COR01710
           DISPLAY "* IDENT.ANTERIOR: ", IDENTIFICACION-ANT       COR01720
           DISPLAY "* REGISTRO MALO:  ", REGISTRO-CENSO           COR01730
     ELSE                                                         COR01740
        IF TIPO-REG = 2                                           COR01750
*          ---- CHANGE IDENTIFICATION AND IT IS HOUSEHOLD RECORD  COR01760
           DISPLAY "+++ ERROR +++ REG.POB. CON IDENT. DIF. ANT."  COR01770
           DISPLAY "+ IDENT.ANTERIOR: ", IDENTIFICACION-ANT       COR01780
           DISPLAY "+ REGISTRO MALO:  ", REGISTRO-CENSO           COR01790
        ELSE                                                      COR01800
           ADD 1 TO HOGARES-CORTES                                COR01810
           PERFORM GRABA-PUNTEROS                                 COR01820
           PERFORM GRABA-CORTES                                   COR01830
           MOVE IDENTIFICACION TO IDENTIFICACION-ANT.             COR01840
 CICLO-FIN.                                                       COR01850
     EXIT.                                                        COR01860
 GRABA-CORTES.                                                    COR01870
     IF SEGMENTO NOT = SEGMENTO-ANT                               COR01880
         MOVE SEGMENTO-ANT TO SEGMENTO-CORTES                     COR01890
         WRITE REG-CORTES FROM REGISTRO-CORTES                    COR01900
         MOVE 0 TO HOGARES-CORTES                                 COR01910
         ADD 1 TO TOTAL-CORTES                                    COR01920
         IF NOT FIN-ARCHIVO PERFORM GRABA-NOMBRES.                COR01930
 GRABA-NOMBRES.                                                   COR01940
      IF PROVINCIA NOT = PROVINCIA-ANT                            COR01950
          MOVE "01" TO NIVEL-NOMBRES                              COR01960
          MOVE PROVINCIA TO PROVINCIA-NOMBRES                     COR01970
          MOVE "00" TO CANTON-NOMBRES                             COR01980
          MOVE "00" TO DISTRITO-NOMBRES                           COR01990
          WRITE REG-NOMBRES FROM REGISTRO-NOMBRES                 COR02000
          ADD 1 TO TOTAL-NOMBRES                                  COR02010
          MOVE SPACES TO CANTON-ANT.                              COR02020
*         ---- THIS MOVE IT TO FORCE THE RECORDING OF             COR02030
*              CANTON AND  DISTRITO                               COR02040
     IF CANTON NOT = CANTON-ANT                                   COR02050
          MOVE "02" TO NIVEL-NOMBRES                              COR02060
          MOVE CANTON TO CANTON-NOMBRES                           COR02070
          MOVE "00" TO DISTRITO-NOMBRES                           COR02080
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                WRITE REG-NOMBRES FROM REGISTRO-NOMBRES                 COR02090
                ADD 1 TO TOTAL-NOMBRES                                  COR02100
                MOVE SPACES TO DISTRITO-ANT.                            COR02110
      *         ---- THIS MOVE FORCES THE RECORDING OF  DISTRITO        COR02120
           IF DISTRITO NOT = DISTRITO-ANT                               COR02130
                MOVE "03" TO NIVEL-NOMBRES                              COR02140
                MOVE DISTRITO TO DISTRITO-NOMBRES                       COR02150
                WRITE REG-NOMBRES FROM REGISTRO-NOMBRES                 COR02160
                ADD 1 TO TOTAL-NOMBRES.                                 COR02170
       GRABA-PUNTEROS.                                                  COR02180
           MOVE CUENTA-PERSONAS TO REG-PUNTEROS.                        COR02190
           WRITE REG-PUNTEROS.                                          COR02200
           ADD 1 TO TOTAL-PUNTEROS.                                     COR02210
           MOVE 0 TO CUENTA-PERSONAS.                                   COR02220
       FIN-PROGRAMA.                                                    COR02230
           EXIT.                                                        COR02240
//GO.SYSUDUMP DD SYSOUT=A                                               COR02250
//SYSOUT  DD SYSOUT=A                                                   COR02260
//CENSO  DD UNIT=TAPE,                                                  COR02270
//   VOL=SER=(R402,R403,R404,R405,R406),DSN=CR84CENS.ORIGIN80           COR02280
//NOMBRES DD UNIT=3350,                                                 COR02290
//   VOL=SER=OSWORK,                                                    COR02300
//           DSN=CR84CENS.NOMBRES,                                      COR02310
//           DCB=(RECFM=FB,LRECL=7,BLKSIZE=14000),                      COR02320
//  SPACE=(TRK,(10,30),RLSE),DISP=(OLD)                                 COR02330
//PUNTEROS DD UNIT=3350,                                                COR02340
//   VOL=SER=OSWORK,                                                    COR02350
//           DSN=CR84CENS.PUNTERO,                                      COR02360
//           DCB=(RECFM=FB,LRECL=2,BLKSIZE=16000),                      COR02370
//  SPACE=(TRK,(10,30),RLSE),DISP=(OLD)                                 COR02380
//CORTES DD UNIT=3350,                                                  COR02390
//   VOL=SER=OSWORK,                                                    COR02400
//           DSN=CR84CENS.CORTES,                                       COR02410
//           DCB=(RECFM=FB,LRECL=16,BLKSIZE=16000),                     COR02420
//  SPACE=(TRK,(100,100),RLSE),DISP=(OLD)                               COR02430
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APPENDIX F.2 - HOUSEHOLD PROGRAM

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//STEP1 EXEC COBUCLG                                                    VIV00010
       IDENTIFICATION DIVISION.                                         VIV00020
       PROGRAM-ID.  VIVIENDA.                                           VIV00030
       AUTHOR.      HARRY HERNANDEZ.                                    VIV00040
       DATE-WRITTEN. 12 MAYO 1987.                                      VIV00050
       DATE-COMPILED.                                                   VIV00060
       REMARKS.   ------------------------------------------------------VIV00070
                ! THIS PROGRAM BELONGS TO THE COSTA RICA'S 1984 CENSUS !VIV00080
                ! REDATAM DATABASE GENERATION SYSTEM.                  !VIV00090
                ! FUNCTION: READS THE HOUSEHOLD RECORDS (REALLY        !VIV00100
                ! DWELLINGS) AND SPLITS THE HOUSEHOLD VARIABLES ONE IN !VIV00110
                ! EACH DIFFERENT OUTPUT FILE, THAT MEANS,  THERE WILL  !VIV00120
                ! AS MANY OUTPUT FILES AS THERE ARE HOUSEHOLD VARIABLES!VIV00130
                ! IN THE CENSUS. OTHER FUNCTIONS ARE TO COUNT THE      !VIV00140
                ! NUMBER OF MALES AND FEMALES TO CREATE THE VARIABLES  !VIV00150
                ! 'TOTAL PERSONS', 'TOTAL MEN' AND 'TOTAL WOMEN' OF    !VIV00160
                ! EACH HOUSEHOLD; ALSO IT HAS TO COPY ALL THE INFORMA- !VIV00170
                ! TION OF THE FIRST HOUSEHOLD OF THE DWELLING TO THE   !VIV00180
                ! TO THE OTHER RECORDS OF THE HOUSEHOLDS OF THE SAME   !VIV00190
                ! DWELLING.                                            !VIV00200
                !                                                      !VIV00210
                !                                                      !VIV00220
                  ------------------------------------------------------VIV00230
       ENVIRONMENT DIVISION.                                            VIV00240
       CONFIGURATION SECTION.                                           VIV00250
       SOURCE-COMPUTER. IBM-370.                                        VIV00260
       OBJECT-COMPUTER. IBM-370.                                        VIV00270
       INPUT-OUTPUT SECTION.                                            VIV00280
       FILE-CONTROL.                                                    VIV00290
           SELECT CENSO      ASSIGN TO UT-3410-S-CENSO.                 VIV00300
      * ----FOLLOWS THE DEFINITION OF A FILE FOR EACH HOUSEHOLD VARIABLEVIV00310
           SELECT VIV        ASSIGN TO DA-3340-S-VIV.                   VIV00320
           SELECT HOG        ASSIGN TO DA-3340-S-HOG.                   VIV00330
           SELECT V01        ASSIGN TO DA-3340-S-V01.                   VIV00340
           SELECT V02A       ASSIGN TO DA-3340-S-V02A.                  VIV00350
           SELECT V02B       ASSIGN TO DA-3340-S-V02B.                  VIV00360
           SELECT V03        ASSIGN TO DA-3340-S-V03.                   VIV00370
           SELECT V04        ASSIGN TO DA-3340-S-V04.                   VIV00380
           SELECT V05        ASSIGN TO DA-3340-S-V05.                   VIV00390
           SELECT V06A       ASSIGN TO DA-3340-S-V06A.                  VIV00400
           SELECT V06B       ASSIGN TO DA-3340-S-V06B.                  VIV00410
           SELECT V06C       ASSIGN TO DA-3340-S-V06C.                  VIV00420
           SELECT V06D       ASSIGN TO DA-3340-S-V06D.                  VIV00430
           SELECT V06E       ASSIGN TO DA-3340-S-V06E.                  VIV00440
           SELECT V06F       ASSIGN TO DA-3340-S-V06F.                  VIV00450
           SELECT V07        ASSIGN TO DA-3340-S-V07.                   VIV00460
           SELECT V08A       ASSIGN TO DA-3340-S-V08A.                  VIV00470
           SELECT V08B       ASSIGN TO DA-3340-S-V08B.                  VIV00480
           SELECT V09        ASSIGN TO DA-3340-S-V09.                   VIV00490
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     SELECT V10        ASSIGN TO DA-3340-S-V10.                   VIV00500
     SELECT V11        ASSIGN TO DA-3340-S-V11.                   VIV00510
     SELECT V12        ASSIGN TO DA-3340-S-V12.                   VIV00520
     SELECT V13A       ASSIGN TO DA-3340-S-V13A.                  VIV00530
     SELECT V13B       ASSIGN TO DA-3340-S-V13B.                  VIV00540
     SELECT V13C       ASSIGN TO DA-3340-S-V13C.                  VIV00550
     SELECT V13D       ASSIGN TO DA-3340-S-V13D.                  VIV00560
     SELECT V13E       ASSIGN TO DA-3340-S-V13E.                  VIV00570
     SELECT V13F       ASSIGN TO DA-3340-S-V13F.                  VIV00580
     SELECT V13G       ASSIGN TO DA-3340-S-V13G.                  VIV00590
     SELECT V13H       ASSIGN TO DA-3340-S-V13H.                  VIV00600
     SELECT V13I       ASSIGN TO DA-3340-S-V13I.                  VIV00610
     SELECT V13J       ASSIGN TO DA-3340-S-V13J.                  VIV00620
     SELECT V13K       ASSIGN TO DA-3340-S-V13K.                  VIV00630
     SELECT V13L       ASSIGN TO DA-3340-S-V13L.                  VIV00640
     SELECT FINCA      ASSIGN TO DA-3340-S-FINCA.                 VIV00650
     SELECT GANADO     ASSIGN TO DA-3340-S-GANADO.                VIV00660
     SELECT TOTALP     ASSIGN TO DA-3340-S-TOTALP.                VIV00670
     SELECT TOTALH     ASSIGN TO DA-3340-S-TOTALH.                VIV00680
     SELECT TOTALM     ASSIGN TO DA-3340-S-TOTALM.                VIV00690
*                                                                 VIV00700
 DATA DIVISION.                                                   VIV00710
 FILE SECTION.                                                    VIV00720
 FD  CENSO                                                        VIV00730
     BLOCK CONTAINS 0   RECORDS                                   VIV00740
     LABEL RECORDS ARE STANDARD                                   VIV00750
     RECORD CONTAINS 70 CHARACTERS.                               VIV00760
*                                                                 VIV00770
*  ------ SHOULD BE CHANGED TO THE SPECIFIC RECORD SIZE           VIV00780
*                                                                 VIV00790
 01  REG-CENSO          PIC     X(70).                            VIV00800
*                                                                 VIV00810
*FOLLOWS THE DEFINITION OF THE FILES FOR EACH HOUSEHOLD VARIABLE  VIV00820
*                                                                 VIV00830
 FD  VIV    LABEL RECORD STANDARD BLOCK  6000. 01 RVIV   PIC X(3).VIV00840
 FD  HOG    LABEL RECORD STANDARD BLOCK 19000. 01 RHOG   PIC X(1).VIV00850
 FD  V01    LABEL RECORD STANDARD BLOCK 19000. 01 RV01   PIC X(1).VIV00860
 FD  V02A   LABEL RECORD STANDARD BLOCK 19000. 01 RV02A  PIC X(1).VIV00870
 FD  V02B   LABEL RECORD STANDARD BLOCK  3000. 01 RV02B  PIC X(5).VIV00880
 FD  V03    LABEL RECORD STANDARD BLOCK  8500. 01 RV03   PIC X(2).VIV00890
 FD  V04    LABEL RECORD STANDARD BLOCK  8500. 01 RV04   PIC X(2).VIV00900
 FD  V05    LABEL RECORD STANDARD BLOCK  8500. 01 RV05   PIC X(2).VIV00910
 FD  V06A   LABEL RECORD STANDARD BLOCK  8500. 01 RV06A  PIC X(2).VIV00920
 FD  V06B   LABEL RECORD STANDARD BLOCK  8500. 01 RV06B  PIC X(2).VIV00930
 FD  V06C   LABEL RECORD STANDARD BLOCK  8500. 01 RV06C  PIC X(2).VIV00940
 FD  V06D   LABEL RECORD STANDARD BLOCK  8500. 01 RV06D  PIC X(2).VIV00950
 FD  V06E   LABEL RECORD STANDARD BLOCK  8500. 01 RV06E  PIC X(2).VIV00960
 FD  V06F   LABEL RECORD STANDARD BLOCK  8500. 01 RV06F  PIC X(2).VIV00970
 FD  V07    LABEL RECORD STANDARD BLOCK 19000. 01 RV07   PIC X(1).VIV00980
 FD  V08A   LABEL RECORD STANDARD BLOCK 19000. 01 RV08A  PIC X(1).VIV00990
 FD  V08B   LABEL RECORD STANDARD BLOCK 19000. 01 RV08B  PIC X(1).VIV01000
 FD  V09    LABEL RECORD STANDARD BLOCK 19000. 01 RV09   PIC X(1).VIV01010
 FD  V10    LABEL RECORD STANDARD BLOCK 19000. 01 RV10   PIC X(1).VIV01020
 FD  V11    LABEL RECORD STANDARD BLOCK 19000. 01 RV11   PIC X(1).VIV01030
 FD  V12    LABEL RECORD STANDARD BLOCK 19000. 01 RV12   PIC X(1).VIV01040
 FD  V13A   LABEL RECORD STANDARD BLOCK 19000. 01 RV13A  PIC X(1).VIV01050
 FD  V13B   LABEL RECORD STANDARD BLOCK 19000. 01 RV13B  PIC X(1).VIV01060
 FD  V13C   LABEL RECORD STANDARD BLOCK 19000. 01 RV13C  PIC X(1).VIV01070
 FD  V13D   LABEL RECORD STANDARD BLOCK 19000. 01 RV13D  PIC X(1).VIV01080
 FD  V13E   LABEL RECORD STANDARD BLOCK 19000. 01 RV13E  PIC X(1).VIV01090
 FD  V13F   LABEL RECORD STANDARD BLOCK 19000. 01 RV13F  PIC X(1).VIV01100
 FD  V13G   LABEL RECORD STANDARD BLOCK 19000. 01 RV13G  PIC X(1).VIV01110
 FD  V13H   LABEL RECORD STANDARD BLOCK 19000. 01 RV13H  PIC X(1).VIV01120
 FD  V13I   LABEL RECORD STANDARD BLOCK 19000. 01 RV13I  PIC X(1).VIV01130
 FD  V13J   LABEL RECORD STANDARD BLOCK 19000. 01 RV13J  PIC X(1).VIV01140
 FD  V13K   LABEL RECORD STANDARD BLOCK 19000. 01 RV13K  PIC X(1).VIV01150
 FD  V13L   LABEL RECORD STANDARD BLOCK 19000. 01 RV13L  PIC X(1).VIV01160
 FD  FINCA  LABEL RECORD STANDARD BLOCK 19000. 01 RFINCA PIC X(1).VIV01170
 FD  GANADO LABEL RECORD STANDARD BLOCK 19000. 01 RGANADO PIC X.  VIV01180
 FD  TOTALP LABEL RECORD STANDARD BLOCK 19000. 01 RTOTALP PIC XX. VIV01190
 FD  TOTALH LABEL RECORD STANDARD BLOCK 19000. 01 RTOTALH PIC XX. VIV01200
 FD  TOTALM LABEL RECORD STANDARD BLOCK 19000. 01 RTOTALM PIC XX. VIV01210
*                                                                 VIV01220
 WORKING-STORAGE SECTION.                                         VIV01230
 77  TOTAL-CENSO        PIC     9(8) COMP VALUE ZERO.             VIV01240
 77  TOTAL-HOGARES      PIC     9(8) COMP VALUE ZERO.             VIV01250
*                                                                 VIV01260
*  THIS RECORD SHOULD BE CHANGED ACCORDINGLY, NOT ONLY FOR THE    VIV01270
*  IDENTIFICATION BUT ALSO FOR THE HOUSEHOLD VARIABLES            VIV01280
*                                                                 VIV01290
 01  REGISTRO-CENSO.                                              VIV01300
     03  IDENTIFICACION.                                          VIV01310
         05  SEGMENTO.                                            VIV01320
             07 PROVINCIA       PIC X.                            VIV01330
             07 CANTON          PIC XX.                           VIV01340
             07 DISTRITO        PIC XX.                           VIV01350
             07 FILLER          PIC XXX.                          VIV01360
         05  EVIV               PIC XXX.                          VIV01370
         05  EHOG               PIC 9.                            VIV01380
     03  TIPO-REG               PIC 9.                            VIV01390
     03  REGISTRO-VIV.                                            VIV01400
              05 FILLER PIC XX.                                   VIV01410
              05 EV01   PIC X(1).                                 VIV01420
              05 EV02A  PIC X(1).                                 VIV01430
              05 EV02B  PIC X(5).                                 VIV01440
              05 EV03   PIC X(2).                                 VIV01450
              05 EV04   PIC X(2).                                 VIV01460
              05 EV05   PIC X(2).                                 VIV01470
              05 EV06A  PIC X(2).                                 VIV01480
              05 EV06B  PIC X(2).                                 VIV01490
              05 EV06C  PIC X(2).                                 VIV01500
              05 EV06D  PIC X(2).                                 VIV01510
              05 EV06E  PIC X(2).                                 VIV01520
              05 EV06F  PIC X(2).                                 VIV01530
              05 EV07   PIC X(1).                                 VIV01540
              05 EV08A  PIC X(1).                                 VIV01550
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                    05 EV08B  PIC X(1).                                 VIV01560
                    05 EV09   PIC X(1).                                 VIV01570
                    05 EV10   PIC X(1).                                 VIV01580
                    05 EV11   PIC X(1).                                 VIV01590
                    05 EV12   PIC X(1).                                 VIV01600
                    05 EV13A  PIC X(1).                                 VIV01610
                    05 EV13B  PIC X(1).                                 VIV01620
                    05 EV13C  PIC X(1).                                 VIV01630
                    05 EV13D  PIC X(1).                                 VIV01640
                    05 EV13E  PIC X(1).                                 VIV01650
                    05 EV13F  PIC X(1).                                 VIV01660
                    05 EV13G  PIC X(1).                                 VIV01670
                    05 EV13H  PIC X(1).                                 VIV01680
                    05 EV13I  PIC X(1).                                 VIV01690
                    05 EV13J  PIC X(1).                                 VIV01700
                    05 EV13K  PIC X(1).                                 VIV01710
                    05 EV13L  PIC X(1).                                 VIV01720
                    05 EFINCA PIC X(1).                                 VIV01730
                    05 EGANADO PIC X.                                   VIV01740
                    05 ETOTALP PIC XX.                                  VIV01750
                    05 ETOTALH PIC XX.                                  VIV01760
                    05 ETOTALM PIC XX.                                  VIV01770
               05  FILLER             PIC X(4).                         VIV01780
           03  REGISTRO-POB  REDEFINES REGISTRO-VIV.                    VIV01790
                    05 FILLER PIC X(2).                                 VIV01800
                    05 EP01   PIC X(1).                                 VIV01810
                    05 EP02   PIC 9.                                    VIV01820
                    05 FILLER PIC X(53).                                VIV01830
      *                                                                 VIV01840
       01  VARIABLES-A-GRABAR.                                          VIV01850
                   03  SVIV           PIC X(3).                         VIV01860
                   03  SHOG           PIC X(1).                         VIV01870
                   03  SV01           PIC X(1).                         VIV01880
                   03  SV02A          PIC X(1).                         VIV01890
                   03  SV02B          PIC X(5).                         VIV01900
                   03  SV03           PIC X(2).                         VIV01910
                   03  SV04           PIC X(2).                         VIV01920
                   03  SV05           PIC X(2).                         VIV01930
                   03  SV06A          PIC X(2).                         VIV01940
                   03  SV06B          PIC X(2).                         VIV01950
                   03  SV06C          PIC X(2).                         VIV01960
                   03  SV06D          PIC X(2).                         VIV01970
                   03  SV06E          PIC X(2).                         VIV01980
                   03  SV06F          PIC X(2).                         VIV01990
                   03  SV07           PIC X(1).                         VIV02000
                   03  SV08A          PIC X(1).                         VIV02010
                   03  SV08B          PIC X(1).                         VIV02020
                   03  SV09           PIC X(1).                         VIV02030
                   03  SV10           PIC X(1).                         VIV02040
                   03  SV11           PIC X(1).                         VIV02050
                   03  SV12           PIC X(1).                         VIV02060
                   03  SV13A          PIC X(1).                         VIV02070
                   03  SV13B          PIC X(1).                         VIV02080
               03  SV13C         PIC X(1).                        VIV02090
               03  SV13D         PIC X(1).                        VIV02100
               03  SV13E         PIC X(1).                        VIV02110
               03  SV13F         PIC X(1).                        VIV02120
               03  SV13G         PIC X(1).                        VIV02130
               03  SV13H         PIC X(1).                        VIV02140
               03  SV13I         PIC X(1).                        VIV02150
               03  SV13J         PIC X(1).                        VIV02160
               03  SV13K         PIC X(1).                        VIV02170
               03  SV13L         PIC X(1).                        VIV02180
               03  SFINCA        PIC X(1).                        VIV02190
               03  SGANADO       PIC X(1).                        VIV02200
               03  STOTALP       PIC 9(2).                        VIV02210
               03  STOTALH       PIC 9(2).                        VIV02220
               03  STOTALM       PIC 9(2).                        VIV02230
      *                                                           VIV02240
       01  OTRAS-VARS.                                            VIV02250
           03  FIN-ARCH              PIC 9 VALUE 0.               VIV02260
               88 FIN-ARCHIVO        VALUE 1.                     VIV02270
           03  SEXO OCCURS 2 TIMES   PIC 9(4) COMP.               VIV02280
      *   THIS VARIABLE IS USED TO COUNT THE MALES AND FEMALES OF EACH  VIV02290
      *   HOUSEHOLD. IT IS NOT NECESSARY TO BE DEFINED IF THERE WILL BE VIV02300
      *   NO NEED FOR THIS INFORMATION IN THE HOUSEHOLD LEVEL OF REDATAMVIV02310
      *                                                           VIV02320
       PROCEDURE DIVISION.                                        VIV02330
      * IN THAT DIVISION IT WAS USED THE FOLLOWING NOMENCLATURE:   VIV02340
      * PARA LA IDENTIFICACION DE CADA VARIABLE DE VIVIENDA        VIV02350
      *         -VARIABLE 'VVVV' IS THE ORIGINAL NAME, IT IS USED VIV02360
      *                          AS THE FILENAME AND THE DDNAME   VIV02370
      *         -VARIABLE 'RVVVV' IS THE OUTPUT RECORD OF THE     VIV02380
      *                           VARIABLE 'VVVV'                 VIV02390
      *         -VARIABLE 'EVVVV' IS THE INPUT FIELD IN THE CENSUS VIV02400
      *                           RECORD                          VIV02410
      *         -VARIABLE 'SVVVV' IS THE OUTPUT FIELD TO WHERE IT IS  VIV02420
      *                           COPIED VARIABEL 'EVVVV' AFTER EDITING VIV02430
           OPEN  INPUT  CENSO, OUTPUT                             VIV02440
                      VIV                                         VIV02450
                      HOG                                         VIV02460
                      V01                                         VIV02470
                      V02A                                        VIV02480
                      V02B                                        VIV02490
                      V03                                         VIV02500
                      V04                                         VIV02510
                      V05                                         VIV02520
                      V06A                                        VIV02530
                      V06B                                        VIV02540
                      V06C                                        VIV02550
                      V06D                                        VIV02560
                      V06E                                        VIV02570
                      V06F                                        VIV02580
                      V07                                         VIV02590
                      V08A                                        VIV02600
                      V08B                                        VIV02610
                      V09                                                 VIV02620
                      V10                                                 VIV02630
                      V11                                                 VIV02640
                      V12                                                 VIV02650
                      V13A                                                VIV02660
                      V13B                                                VIV02670
                      V13C                                                VIV02680
                      V13D                                                VIV02690
                      V13E                                                VIV02700
                      V13F                                                VIV02710
                      V13G                                                VIV02720
                      V13H                                                VIV02730
                      V13I                                                VIV02740
                      V13J                                                VIV02750
                      V13K                                                VIV02760
                      V13L                                                VIV02770
                      FINCA                                               VIV02780
                      GANADO                                              VIV02790
                      TOTALP                                              VIV02800
                      TOTALH                                              VIV02810
                      TOTALM.                                             VIV02820
           READ CENSO INTO REGISTRO-CENSO AT END MOVE 1 TO FIN-ARCH.      VIV02830
           MOVE ZERO TO SEXO (1), SEXO (2).                               VIV02840
           PERFORM PROCESA-HOGAR.                                         VIV02850
           PERFORM CICLO THRU CICLO-FIN UNTIL FIN-ARCHIVO.                VIV02860
           DISPLAY " TOTAL REGISTROS LEIDOS ", TOTAL-CENSO.               VIV02870
           DISPLAY " TOTAL HOGARES GRABADOS ", TOTAL-HOGARES.             VIV02880
           CLOSE CENSO                                                    VIV02890
                 VIV                                                      VIV02900
                 HOG                                                      VIV02910
                 V01                                                      VIV02920
                 V02A                                                     VIV02930
                 V02B                                                     VIV02940
                 V03                                                      VIV02950
                 V04                                                      VIV02960
                 V05                                                      VIV02970
                 V06A                                                     VIV02980
                 V06B                                                     VIV02990
                 V06C                                                     VIV03000
                 V06D                                                     VIV03010
                 V06E                                                     VIV03020
                 V06F                                                     VIV03030
                 V07                                                      VIV03040
                 V08A                                                     VIV03050
                 V08B                                                     VIV03060
                 V09                                                      VIV03070
                 V10                                                      VIV03080
                 V11                                                      VIV03090
                 V12                                                      VIV03100
                 V13A                                                     VIV03110
                 V13B                                                     VIV03120
                 V13C                                                     VIV03130
                 V13D                                                     VIV03140
           V13E                                                    VIV03150
           V13F                                                    VIV03160
           V13G                                                    VIV03170
           V13H                                                    VIV03180
           V13I                                                    VIV03190
           V13J                                                    VIV03200
           V13K                                                    VIV03210
           V13L                                                    VIV03220
           FINCA                                                   VIV03230
           GANADO                                                  VIV03240
           TOTALP                                                  VIV03250
           TOTALH                                                  VIV03260
           TOTALM.                                                 VIV03270
     STOP RUN.                                                     VIV03280
*                                                                  VIV03290
 CICLO.                                                            VIV03300
     READ CENSO INTO REGISTRO-CENSO AT END MOVE 1 TO FIN-ARCH      VIV03310
                                    MOVE 1 TO TIPO-REG.            VIV03320
     ADD 1 TO TOTAL-CENSO.                                         VIV03330
     EXAMINE REGISTRO-CENSO REPLACING ALL SPACES BY ZERO.          VIV03340
*  THIS EXAMINE IS NECESSARY BECAUSE THAT THE SOFTWARE USED IN     VIV03350
*  THE TRANSMISION ELIMINATES THE BLANKS AT THE END OF THE BLOCK   VIV03360
     IF TIPO-REG = 2                                               VIV03370
           ADD 1 TO SEXO (EP02)                                    VIV03380
     ELSE                                                          VIV03390
           PERFORM PROCESA-TOTAL                                   VIV03400
           IF NOT FIN-ARCHIVO PERFORM PROCESA-HOGAR.               VIV03410
 CICLO-FIN.                                                        VIV03420
     EXIT.                                                         VIV03430
 PROCESA-HOGAR.                                                    VIV03440
     MOVE EVIV      TO SVIV.     WRITE RVIV    FROM SVIV.          VIV03450
     MOVE EHOG      TO SHOG.     WRITE RHOG    FROM SHOG.          VIV03460
     MOVE EFINCA    TO SFINCA.   WRITE RFINCA  FROM SFINCA.        VIV03470
     MOVE EGANADO   TO SGANADO.  WRITE RGANADO FROM SGANADO.       VIV03480
     IF EHOG = 1                                                   VIV03490
         PERFORM PROCESA-HOGAR1.                                   VIV03500
*    THE VARIABLES OF THE FIRST HOUSEHOLD ARE STORED IN THIS       VIV03510
*    ROUTINE TO BE PASSED TO THE OTHER HOUSEHOLD OF THE DWELLING.  VIV03520
*    IT IS NECCESARY BECAUSE THEY WERE NOT CAPTURED FOR THE        VIV03530
*    SECOND AND ON HOUSEHOLDS OF THE DWELLING, AND FOR AN          VIV03540
*    EFFECTIVE UTILIZATION OT THOSE DATA WITH REDATAM, IT IS       VIV03550
*    NECESSARY TO HAVE THEM IN EVERY HOUSEHOLD RECORD.             VIV03560
*                                                                  VIV03570
     WRITE RV01      FROM SV01.                                    VIV03580
     WRITE RV02A     FROM SV02A.                                   VIV03590
     WRITE RV02B     FROM SV02B.                                   VIV03600
     WRITE RV03      FROM SV03.                                    VIV03610
     WRITE RV04      FROM SV04.                                    VIV03620
     WRITE RV05      FROM SV05.                                    VIV03630
     WRITE RV06A     FROM SV06A.                                   VIV03640
     WRITE RV06B     FROM SV06B.                                   VIV03650
     WRITE RV06C     FROM SV06C.                                   VIV03660
     WRITE RV06D     FROM SV06D.                                   VIV03670
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           WRITE RV06E     FROM SV06E.                                  VIV03680
           WRITE RV06F     FROM SV06F.                                  VIV03690
           WRITE RV07      FROM SV07.                                   VIV03700
           WRITE RV08A     FROM SV08A.                                  VIV03710
           WRITE RV08B     FROM SV08B.                                  VIV03720
           WRITE RV09      FROM SV09.                                   VIV03730
           WRITE RV10      FROM SV10.                                   VIV03740
           WRITE RV11      FROM SV11.                                   VIV03750
           WRITE RV12      FROM SV12.                                   VIV03760
           WRITE RV13A     FROM SV13A.                                  VIV03770
           WRITE RV13B     FROM SV13B.                                  VIV03780
           WRITE RV13C     FROM SV13C.                                  VIV03790
           WRITE RV13D     FROM SV13D.                                  VIV03800
           WRITE RV13E     FROM SV13E.                                  VIV03810
           WRITE RV13F     FROM SV13F.                                  VIV03820
           WRITE RV13G     FROM SV13G.                                  VIV03830
           WRITE RV13H     FROM SV13H.                                  VIV03840
           WRITE RV13I     FROM SV13I.                                  VIV03850
           WRITE RV13J     FROM SV13J.                                  VIV03860
           WRITE RV13K     FROM SV13K.                                  VIV03870
           WRITE RV13L     FROM SV13L.                                  VIV03880
      *                                                                 VIV03890
           ADD 1 TO TOTAL-HOGARES.                                      VIV03900
       PROCESA-HOGAR1.                                                  VIV03910
      *  THIS PARAGRAPH IS TO HAVE SOME CONSISTENCY CHECKING ON SOME    VIV03920
      *  VARIABLES THAT HAD INVALID VALUES ACCORDING TO THE FREQUENCY   VIV03930
      *  DISTRIBUTIONS EXECUTED ON THE INPUT FILE.                      VIV03940
      *                                                                 VIV03950
           MOVE EV01      TO SV01.                                      VIV03960
           MOVE EV02A     TO SV02A.                                     VIV03970
           IF EV02B NOT NUMERIC MOVE ALL "0" TO SV02B                   VIV03980
                         ELSE   MOVE EV02B   TO SV02B.                  VIV03990
           IF EV03  NOT NUMERIC MOVE ALL "0" TO SV03                    VIV04000
                         ELSE   MOVE EV03    TO SV03.                   VIV04010
           MOVE EV04      TO SV04.                                      VIV04020
           MOVE EV05      TO SV05.                                      VIV04030
           MOVE EV06A     TO SV06A.                                     VIV04040
           IF EV06B NOT NUMERIC MOVE  "00"   TO SV06B                   VIV04050
                         ELSE   MOVE EV06B   TO SV06B.                  VIV04060
               MOVE EV06C     TO SV06C.                                 VIV04070
               MOVE EV06D     TO SV06D.                                 VIV04080
               MOVE EV06E     TO SV06E.                                 VIV04090
               MOVE EV06F     TO SV06F                                  VIV04100
               MOVE EV07      TO SV07                                   VIV04110
               MOVE EV08A     TO SV08A                                  VIV04120
               MOVE EV08B     TO SV08B                                  VIV04130
               MOVE EV09      TO SV09                                   VIV04140
               MOVE EV10      TO SV10                                   VIV04150
               MOVE EV11      TO SV11                                   VIV04160
               MOVE EV12      TO SV12                                   VIV04170
               MOVE EV13A     TO SV13A                                  VIV04180
               MOVE EV13B     TO SV13B                                  VIV04190
               MOVE EV13C     TO SV13C                                  VIV04200
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                MOVE EV13D     TO SV13D                                 VIV04210
                MOVE EV13E     TO SV13E                                 VIV04220
                MOVE EV13F     TO SV13F                                 VIV04230
                MOVE EV13G     TO SV13G                                 VIV04240
                MOVE EV13H     TO SV13H                                 VIV04250
                MOVE EV13I     TO SV13I                                 VIV04260
                MOVE EV13J     TO SV13J                                 VIV04270
                MOVE EV13K     TO SV13K                                 VIV04280
                MOVE EV13L     TO SV13L.                                VIV04290
      *                                                                 VIV04300
       PROCESA-TOTAL.                                                   VIV04310
      * THIS PARAGRAPH COUNTS THE TOTAL OF MALES AND FEMALES OF EACH    VIV04320
      * HOUSEHOLD, AND THE TOTAL OF PERSONS. IT WAS NECESSARY BECAUSE   VIV04330
      * IT WAS DESIRABLE TO HAVE THOSE DATA ALREADY IN THE HOUSEHOLD    VIV04340
      * RECORD OF THE REDATAM DATABASE                                  VIV04350
           MOVE SEXO (1)  TO STOTALH.  WRITE RTOTALH FROM STOTALH.      VIV04360
           MOVE SEXO (2)  TO STOTALM.  WRITE RTOTALM FROM STOTALM.      VIV04370
           ADD  STOTALH, STOTALM GIVING STOTALP.                        VIV04380
                          WRITE RTOTALP FROM STOTALP.                   VIV04390
      *                                                                 VIV04400
           MOVE ZERO TO SEXO (1) SEXO (2).                              VIV04410
       FIN-PROGRAMA.                                                    VIV04420
           EXIT.                                                        VIV04430
//GO.SYSUDUMP DD SYSOUT=A                                               VIV04440
//SYSOUT  DD SYSOUT=A                                                   VIV04450
//CENSO  DD UNIT=TAPE,                                                  VIV04460
//   VOL=SER=(R402,R403,R404,R405,R406),DSN=CR84CENS.ORIGIN80           VIV04470
//VIV DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.VIV,                     VIV04480
// DCB=(RECFM=FB,LRECL=3,BLKSIZE=18000),DISP=(OLD),                     VIV04490
// SPACE=(TRK,(90,30),RLSE)                                             VIV04500
//HOG DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.HOG,                     VIV04510
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV04520
// SPACE=(TRK,(30,10),RLSE)                                             VIV04530
//V01 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V01,                     VIV04540
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV04550
// SPACE=(TRK,(30,20),RLSE)                                             VIV04560
//V02A DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V02A,                   VIV04570
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV04580
// SPACE=(TRK,(30,20),RLSE)                                             VIV04590
//V02B DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V02B,                   VIV04600
// DCB=(RECFM=FB,LRECL=5,BLKSIZE=18000),DISP=(OLD),                     VIV04610
// SPACE=(TRK,(150,20),RLSE)                                            VIV04620
//V03 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V03,                     VIV04630
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=18000),DISP=(OLD),                     VIV04640
// SPACE=(TRK,(60,20),RLSE)                                             VIV04650
//V04 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V04,                     VIV04660
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=18000),DISP=(OLD),                     VIV04670
// SPACE=(TRK,(60,10),RLSE)                                             VIV04680
//V05 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V05,                     VIV04690
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=18000),DISP=(OLD),                     VIV04700
// SPACE=(TRK,(60,20),RLSE)                                             VIV04710
//V06A DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V06A,                   VIV04720
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=18000),DISP=(OLD),                     VIV04730
// SPACE=(TRK,(60,20),RLSE)                                             VIV04740
//V06B DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V06B,                   VIV04750
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=18000),DISP=(OLD),                     VIV04760
// SPACE=(TRK,(60,10),RLSE)                                             VIV04770
//V06C DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V06C,                   VIV04780
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=18000),DISP=(OLD),                     VIV04790
// SPACE=(TRK,(60,10),RLSE)                                             VIV04800
//V06D DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V06D,                   VIV04810
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=18000),DISP=(OLD),                     VIV04820
// SPACE=(TRK,(60,10),RLSE)                                             VIV04830
//V06E DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V06E,                   VIV04840
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=18000),DISP=(OLD),                     VIV04850
// SPACE=(TRK,(60,10),RLSE)                                             VIV04860
//V06F DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V06F,                   VIV04870
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=18000),DISP=(OLD),                     VIV04880
// SPACE=(TRK,(60,10),RLSE)                                             VIV04890
//V07  DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V07,                    VIV04900
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV04910
// SPACE=(TRK,(30,10),RLSE)                                             VIV04920
//V08A DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V08A,                   VIV04930
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV04940
// SPACE=(TRK,(30,10),RLSE)                                             VIV04950
//V08B DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V08B,                   VIV04960
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV04970
// SPACE=(TRK,(30,10),RLSE)                                             VIV04980
//V09  DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V09,                    VIV04990
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05000
// SPACE=(TRK,(30,10),RLSE)                                             VIV05010
//V10  DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V10,                    VIV05020
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05030
// SPACE=(TRK,(30,10),RLSE)                                             VIV05040
//V11  DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V11,                    VIV05050
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05060
// SPACE=(TRK,(30,10),RLSE)                                             VIV05070
//V12  DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V12,                    VIV05080
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05090
// SPACE=(TRK,(30,10),RLSE)                                             VIV05100
//V13A DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V13A,                   VIV05110
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05120
// SPACE=(TRK,(30,10),RLSE)                                             VIV05130
//V13B DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V13B,                   VIV05140
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05150
// SPACE=(TRK,(30,10),RLSE)                                             VIV05160
//V13C DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V13C,                   VIV05170
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05180
// SPACE=(TRK,(30,10),RLSE)                                             VIV05190
//V13D DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V13D,                   VIV05200
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05210
// SPACE=(TRK,(30,10),RLSE)                                             VIV05220
//V13E DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V13E,                   VIV05230
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05240
// SPACE=(TRK,(30,10),RLSE)                                             VIV05250
//V13F DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V13F,                   VIV05260
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// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05270
// SPACE=(TRK,(30,10),RLSE)                                             VIV05280
//V13G DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V13G,                   VIV05290
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05300
// SPACE=(TRK,(30,10),RLSE)                                             VIV05310
//V13H DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V13H,                   VIV05320
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05330
// SPACE=(TRK,(30,10),RLSE)                                             VIV05340
//V13I DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V13I,                   VIV05350
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05360
// SPACE=(TRK,(30,10),RLSE)                                             VIV05370
//V13J DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V13J,                   VIV05380
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05390
// SPACE=(TRK,(30,10),RLSE)                                             VIV05400
//V13K DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V13K,                   VIV05410
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05420
// SPACE=(TRK,(30,10),RLSE)                                             VIV05430
//V13L DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.V13L,                   VIV05440
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05450
// SPACE=(TRK,(30,10),RLSE)                                             VIV05460
//FINCA DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.FINCA,                 VIV05470
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05480
// SPACE=(TRK,(30,10),RLSE)                                             VIV05490
//GANADO DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.GANADO,               VIV05500
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=18000),DISP=(OLD),                     VIV05510
// SPACE=(TRK,(30,10),RLSE)                                             VIV05520
//TOTALP DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.TOTALP,               VIV05530
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=18000),DISP=(OLD),                     VIV05540
// SPACE=(TRK,(60,10),RLSE)                                             VIV05550
//TOTALH DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.TOTALH,               VIV05560
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=18000),DISP=(OLD),                     VIV05570
// SPACE=(TRK,(60,10),RLSE)                                             VIV05580
//TOTALM DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.TOTALM,               VIV05590
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=18000),DISP=(OLD),                     VIV05600
// SPACE=(TRK,(60,10),RLSE)                                             VIV05610
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APPENDIX F.3 - POPULATION PROGRAM

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//STEP1 EXEC COBUCLG                                                    POB00010
       IDENTIFICATION DIVISION.                                         POB00020
       PROGRAM-ID.  POBLACION.                                          POB00030
       AUTHOR.      HARRY HERNANDEZ.                                    POB00040
       DATE-WRITTEN. 15 MAYO 1987.                                      POB00050
       DATE-COMPILED.                                                   POB00060
       REMARKS. --------------------------------------------------------POB00070
               ! THIS PROGRAM BELONGS TO THE COSTA RICA'S 1984 CENSUS !POB00080
               ! REDATAM DATABASE GENERATION SYSTEM.                   !POB00090
               ! FUNCTION:  READS THE PERSONS RECORDS IN THE INPUT    !POB00100
               ! FILE AND SPLITS THE VARIABLES ONE IN A DIFFERENT      !POB00110
               ! OUTPUT FILE.                                          !POB00120
               ! INPUT:                                                !POB00130
               !  -POPULATION AND HOUSEHOLDS CENSUS TAPES              !POB00140
               ! PROCESS:                                              !POB00150
               ! -SELECTS POPULATION RECORDS                           !POB00160
               ! -SPLITS THE RECORD VARIABLES INTO DIFFERENT CLUSTERS !POB00170
               !  FOR  REDATAM                                         !POB00180
               ! -CREATES SOME DERIVED VARIABLES                       !POB00190
               ! -OUTPUTS THOSE VARIABLES                              !POB00200
               ! OUTPUT:                                               !POB00210
               ! -AS MANY FILES AS THERE ARE VARIABLES FOR THE         !POB00220
               !  REDATAM SYSTEM                                       !POB00230
               !                                                       !POB00240
               !                                                       !POB00250
                 -------------------------------------------------------POB00260
       ENVIRONMENT DIVISION.                                            POB00270
       CONFIGURATION SECTION.                                           POB00280
       SOURCE-COMPUTER. IBM-370.                                        POB00290
       OBJECT-COMPUTER. IBM-370.                                        POB00300
       INPUT-OUTPUT SECTION.                                            POB00310
       FILE-CONTROL.                                                    POB00320
           SELECT CENSO      ASSIGN TO UT-3410-S-CENSO.                 POB00330
      * ----FOLLOWS THE DEFINITION OF ONE FILE FOR EACH PERSONS VARIABLEPOB00340
           SELECT P01        ASSIGN TO DA-3350-S-P01.                   POB00350
           SELECT P02        ASSIGN TO DA-3350-S-P02.                   POB00360
           SELECT P03        ASSIGN TO DA-3350-S-P03.                   POB00370
           SELECT NAQUI      ASSIGN TO DA-3350-S-NAQUI.                 POB00380
           SELECT P04A       ASSIGN TO DA-3350-S-P04A.                  POB00390
           SELECT P04B       ASSIGN TO DA-3350-S-P04B.                  POB00400
           SELECT P04C       ASSIGN TO DA-3350-S-P04C.                  POB00410
           SELECT P04D       ASSIGN TO DA-3350-S-P04D.                  POB00420
           SELECT P05        ASSIGN TO DA-3350-S-P05.                   POB00430
           SELECT P06        ASSIGN TO DA-3350-S-P06.                   POB00440
           SELECT RAQUI      ASSIGN TO DA-3350-S-RAQUI.                 POB00450
           SELECT P07A       ASSIGN TO DA-3350-S-P07A.                  POB00460
           SELECT P07B       ASSIGN TO DA-3350-S-P07B.                  POB00470
           SELECT P08        ASSIGN TO DA-3350-S-P08.                   POB00480
           SELECT P09        ASSIGN TO DA-3350-S-P09.                   POB00490
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     SELECT P10        ASSIGN TO DA-3350-S-P10.                   POB00500
     SELECT P11        ASSIGN TO DA-3350-S-P11.                   POB00510
     SELECT P12        ASSIGN TO DA-3350-S-P12.                   POB00520
     SELECT P13        ASSIGN TO DA-3350-S-P13.                   POB00530
     SELECT P14        ASSIGN TO DA-3350-S-P14.                   POB00540
     SELECT P15        ASSIGN TO DA-3350-S-P15.                   POB00550
     SELECT P16        ASSIGN TO DA-3350-S-P16.                   POB00560
     SELECT P17        ASSIGN TO DA-3350-S-P17.                   POB00570
     SELECT P18        ASSIGN TO DA-3350-S-P18.                   POB00580
*                                                                 POB00590
 DATA DIVISION.                                                   POB00600
 FILE SECTION.                                                    POB00610
 FD  CENSO                                                        POB00620
     BLOCK CONTAINS 0   RECORDS                                   POB00630
     LABEL RECORDS ARE STANDARD                                   POB00640
     RECORD CONTAINS 70 CHARACTERS.                               POB00650
*                                                                 POB00660
*  ------ SHOULD BE CHANGED ACCORDING THE SPECIFI RECORD SIZE.    POB00670
*                                                                 POB00680
 01  REG-CENSO          PIC     X(70).                            POB00690
*                                                                 POB00700
* ----FOLLOWS THE DEFINITION OF ONE FILE FOR EACH VARIABLE        POB00710
*                                                                 POB00720
 FD   P01   LABEL RECORD STANDARD BLOCK 0. 01 RP01 PIC X(1).      POB00730
 FD   P02   LABEL RECORD STANDARD BLOCK 0. 01 RP02 PIC X(1).      POB00740
 FD   P03   LABEL RECORD STANDARD BLOCK 0. 01 RP03 PIC X(2).      POB00750
 FD   NAQUI LABEL RECORD STANDARD BLOCK 0. 01 RNAQUI PIC X(1).    POB00760
 FD   P04A  LABEL RECORD STANDARD BLOCK 0. 01 RP04A PIC X(1).     POB00770
 FD   P04B  LABEL RECORD STANDARD BLOCK 0. 01 RP04B PIC X(2).     POB00780
 FD   P04C  LABEL RECORD STANDARD BLOCK 0. 01 RP04C PIC X(3).     POB00790
 FD   P04D  LABEL RECORD STANDARD BLOCK 0. 01 RP04D PIC X(2).     POB00800
 FD   P05   LABEL RECORD STANDARD BLOCK 0. 01 RP05 PIC X(3).      POB00810
 FD   P06   LABEL RECORD STANDARD BLOCK 0. 01 RP06 PIC X(1).      POB00820
 FD   RAQUI LABEL RECORD STANDARD BLOCK 0. 01 RRAQUI PIC X(1).    POB00830
 FD   P07A  LABEL RECORD STANDARD BLOCK 0. 01 RP07A PIC X(1).     POB00840
 FD   P07B  LABEL RECORD STANDARD BLOCK 0. 01 RP07B PIC X(2).     POB00850
 FD   P08   LABEL RECORD STANDARD BLOCK 0. 01 RP08 PIC X(1).      POB00860
 FD   P09   LABEL RECORD STANDARD BLOCK 0. 01 RP09 PIC X(2).      POB00870
 FD   P10   LABEL RECORD STANDARD BLOCK 0. 01 RP10 PIC X(1).      POB00880
 FD   P11   LABEL RECORD STANDARD BLOCK 0. 01 RP11 PIC X(1).      POB00890
 FD   P12   LABEL RECORD STANDARD BLOCK 0. 01 RP12 PIC X(1).      POB00900
 FD   P13   LABEL RECORD STANDARD BLOCK 0. 01 RP13 PIC X(3).      POB00910
 FD   P14   LABEL RECORD STANDARD BLOCK 0. 01 RP14 PIC X(1).      POB00920
 FD   P15   LABEL RECORD STANDARD BLOCK 0. 01 RP15 PIC X(4).      POB00930
 FD   P16   LABEL RECORD STANDARD BLOCK 0. 01 RP16 PIC X(2).      POB00940
 FD   P17   LABEL RECORD STANDARD BLOCK 0. 01 RP17 PIC X(2).      POB00950
 FD   P18   LABEL RECORD STANDARD BLOCK 0. 01 RP18 PIC X(2).      POB00960
*                                                                 POB00970
*                                                                 POB00980
 WORKING-STORAGE SECTION.                                         POB00990
 77  TOTAL-CENSO        PIC     9(8) COMP VALUE ZERO.             POB01000
 77  TOTAL-PERSONAS     PIC     9(8) COMP VALUE ZERO.             POB01010
*                                                                 POB01020
*  THIS RECORD SHOULD BE CHANGED ACCORDINGLY, NOT ONLY THE        POB01030
*  IDENTIFICATION BUT THE PERSONS VARIABLES THEMSELVES            POB01040
*                                                                 POB01050
 01  REGISTRO-CENSO.                                              POB01060
     03  IDENTIFICACION.                                          POB01070
         05  SEGMENTO.                                            POB01080
             07 PROVINCIA       PIC X.                            POB01090
             07 CANTON          PIC XX.                           POB01100
             07 DISTRITO        PIC 99.                           POB01110
             07 FILLER          PIC XXX.                          POB01120
         05  EVIV               PIC XXX.                          POB01130
         05  EHOG               PIC 9.                            POB01140
     03  TIPO-REG               PIC 9.                            POB01150
     03  REGISTRO-VIV.                                            POB01160
         05  FILLER            PIC X(57).                         POB01170
     03  REGISTRO-POB  REDEFINES REGISTRO-VIV.                    POB01180
                      05 FILLER PIC XX.                           POB01190
                      05 EP01 PIC X(1).                           POB01200
                      05 EP02 PIC X(1).                           POB01210
                      05 EP03 PIC X(2).                           POB01220
                      05 EP04.                                    POB01230
                         07 EP04A PIC X(1).                       POB01240
                         07 EP04B PIC X(2).                       POB01250
                         07 EP04C PIC 9(2).                       POB01260
                      05 EP04R REDEFINES EP04.                    POB01270
                         07 EP04X PIC X(2).                       POB01280
                         07 EP04Y PIC 9(3).                       POB01290
                      05 EP04D PIC 9(4).                          POB01300
                      05 EP04DR REDEFINES EP04D.                  POB01310
                         07 FILLER  PIC X(2).                     POB01320
                         07 EP04DX  PIC 9(2).                     POB01330
                      05 EP05  PIC X(3).                          POB01340
                      05 EP06  PIC X(1).                          POB01350
                      05 EP07.                                    POB01360
                         07 EP07A PIC X(1).                       POB01370
                         07 EP07B PIC X(2).                       POB01380
                      05 EP08 PIC X(1).                           POB01390
                      05 EP09 PIC X(2).                           POB01400
                      05 EP10 PIC X(1).                           POB01410
                      05 EP11 PIC X(1).                           POB01420
                      05 EP12 PIC X(1).                           POB01430
                      05 EP13 PIC X(3).                           POB01440
                      05 EP14 PIC X(1).                           POB01450
                      05 EP15 PIC X(4).                           POB01460
                      05 EP16 PIC X(2).                           POB01470
                      05 EP17 PIC X(2).                           POB01480
                      05 EP18 PIC X(2).                           POB01490
*                                                                 POB01500
*                                                                 POB01510
 01  VARIABLES-A-GRABAR.                                          POB01520
* ----FOLLOWS THE DEFINITION OF THE OUTPUT FIELDS OF EACH VARIABLEPOB01530
               05 SP01 PIC X(1).                                  POB01540
               05 SP02 PIC X(1).                                  POB01550
               05 SP03 PIC X(2).                                   POB01560
               05 SNAQUI PIC X(1).                                 POB01570
               05 SP04A PIC X(1).                                  POB01580
               05 SP04B PIC X(2).                                  POB01590
               05 SP04C PIC 9(3).                                  POB01600
               05 SP04D PIC X(2).                                  POB01610
               05 SP05 PIC X(3).                                   POB01620
               05 SP06 PIC X(1).                                   POB01630
               05 SRAQUI PIC X(1).                                 POB01640
               05 SP07A PIC X(1).                                  POB01650
               05 SP07B PIC X(2).                                  POB01660
               05 SP08 PIC X(1).                                   POB01670
               05 SP09 PIC X(2).                                   POB01680
               05 SP10 PIC X(1).                                   POB01690
               05 SP11 PIC X(1).                                   POB01700
               05 SP12 PIC X(1).                                   POB01710
               05 SP13 PIC X(3).                                   POB01720
               05 SP14 PIC X(1).                                   POB01730
               05 SP15 PIC X(4).                                   POB01740
               05 SP16 PIC X(2).                                   POB01750
               05 SP17 PIC X(2).                                   POB01760
               05 SP18 PIC X(2).                                   POB01770
*                                                                  POB01780
 01  OTRAS-VARS.                                                   POB01790
     03  FIN-ARCH                PIC 9 VALUE 0.                    POB01800
         88 FIN-ARCHIVO          VALUE 1.                          POB01810
*                                                                  POB01820
 PROCEDURE DIVISION.                                               POB01830
* FROM THE DATA DIVISION IT WAS USED THE FOLLOWING NOMENCLATURE    POB01840
* FOR THE IDENTIFICATION OF EACH POPULATION VARIABLE               POB01850
*         -VARIABLE 'VVVV' IS THE ORIGINAL NAME, IT IS USED        POB01860
*                          AS THE FILENAME AND THE DDNAME          POB01870
*         -VARIABLE 'RVVVV' IS OUTPUT RECORD OF THE                POB01880
*                           VARIABLE 'VVVV'                        POB01890
*         -VARIABLE 'EVVVV' IS THE INPUT FIELD OF THE VARIABLE     POB01900
*                           IN THE CENSUS DATA RECORD              POB01910
*         -VARIABLE 'SVVVV' IS THE OUTPUT FIELD TO WHERE IT IS     POB01920
*                           COPIED 'EVVVV' AFTER EDITING           POB01930
     OPEN  INPUT  CENSO, OUTPUT                                    POB01940
               P01                                                 POB01950
               P02                                                 POB01960
               P03                                                 POB01970
               NAQUI                                               POB01980
               P04A                                                POB01990
               P04B                                                POB02000
               P04C                                                POB02010
               P04D                                                POB02020
               P05                                                 POB02030
               P06                                                 POB02040
               RAQUI                                               POB02050
               P07A                                                POB02060
               P07B                                                POB02070
               P08                                                 POB02080
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                     P09                                                POB02090
                     P10                                                POB02100
                     P11                                                POB02110
                     P12                                                POB02120
                     P13                                                POB02130
                     P14                                                POB02140
                     P15                                                POB02150
                     P16                                                POB02160
                     P17                                                POB02170
                     P18.                                               POB02180
      *                                                                 POB02190
           READ CENSO INTO REGISTRO-CENSO AT END MOVE 1 TO FIN-ARCH.    POB02200
           PERFORM CICLO THRU CICLO-FIN UNTIL FIN-ARCHIVO.              POB02210
           DISPLAY " TOTAL REGISTROS LEIDOS ", TOTAL-CENSO.             POB02220
           DISPLAY " TOTAL PERSONAS GRABADOS ", TOTAL-PERSONAS.         POB02230
           CLOSE CENSO                                                  POB02240
                     P01                                                POB02250
                     P02                                                POB02260
                     P03                                                POB02270
                     NAQUI                                              POB02280
                     P04A                                               POB02290
                     P04B                                               POB02300
                     P04C                                               POB02310
                     P04D                                               POB02320
                     P05                                                POB02330
                     P06                                                POB02340
                     RAQUI                                              POB02350
                     P07A                                               POB02360
                     P07B                                               POB02370
                     P08                                                POB02380
                     P09                                                POB02390
                     P10                                                POB02400
                     P11                                                POB02410
                     P12                                                POB02420
                     P13                                                POB02430
                     P14                                                POB02440
                     P15                                                POB02450
                     P16                                                POB02460
                     P17                                                POB02470
                     P18.                                               POB02480
      *                                                                 POB02490
           STOP RUN.                                                    POB02500
      *                                                                 POB02510
       CICLO.                                                           POB02520
           ADD 1 TO TOTAL-CENSO.                                        POB02530
           IF TIPO-REG = 2                                              POB02540
                 ADD 1 TO TOTAL-PERSONAS                                POB02550
                 PERFORM PROCESA-PERSONAS.                              POB02560
           READ CENSO INTO REGISTRO-CENSO AT END MOVE 1 TO FIN-ARCH.    POB02570
       CICLO-FIN.                                                       POB02580
           EXIT.                                                        POB02590
       PROCESA-PERSONAS.                                                POB02600
           EXAMINE REGISTRO-POB REPLACING ALL SPACES BY ZERO.           POB02610
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* THIS EXAMINE IS NECESSARY BECAUSE THE SOFTWARE USED FOR THE     POB02620
* DATA TRANSMISSION TRUNCATES THE BLANKS AT THE END OF THE        POB02630
* OUTPUT BLOCKS.                                                  POB02640
     MOVE EP01    TO SP01.                                        POB02650
     MOVE EP02    TO SP02.                                        POB02660
     MOVE EP03    TO SP03.                                        POB02670
     MOVE EP04DX  TO SP04D.                                       POB02680
     IF EP04 = "00008"                                            POB02690
        MOVE "1" TO SNAQUI                                        POB02700
        MOVE PROVINCIA TO SP04A                                   POB02710
        MOVE CANTON    TO SP04B                                   POB02720
        MOVE DISTRITO  TO SP04C                                   POB02730
     ELSE                                                         POB02740
        MOVE "0" TO SNAQUI                                        POB02750
        MOVE EP04A TO SP04A                                       POB02760
        MOVE EP04B TO SP04B                                       POB02770
        MOVE EP04C TO SP04C                                       POB02780
        IF EP04A = "0"                                            POB02790
           MOVE "00"   TO SP04B                                   POB02800
           MOVE EP04Y TO SP04C                                    POB02810
           IF EP04D < 1902                                        POB02820
              MOVE 01 TO SP04D.                                   POB02830
     MOVE EP05    TO SP05.                                        POB02840
     MOVE EP06    TO SP06.                                        POB02850
     MOVE "0"     TO SRAQUI.                                      POB02860
     MOVE EP07A   TO SP07A.                                       POB02870
     MOVE EP07B   TO SP07B.                                       POB02880
     IF EP07 = "008"                                              POB02890
          MOVE PROVINCIA TO SP07A                                 POB02900
          MOVE CANTON    TO SP07B                                 POB02910
          MOVE "1" TO SRAQUI.                                     POB02920
*  THIS SECTION WAS USED TO CREATE THE VARIABLES 'NAQUI' AND      POB02930
*  'RAQUI' TO INDICATE IF THE PERSON WAS BORN WHERE HE WAS ENUME- POB02940
*  RATED, AND IF HE LIVED 5 YEARS BEFORE IN THE SAME PLACE. THIS  POB02950
*  WAS NECESSARY BECAUSE REDATAM, DEPENDING ON THE GEOGRAPHIC     POB02960
*  SELECTION, NOT ALWAYS CAN ACCES THE GEO VARIABLES THAT ARE     POB02970
*  BELOW THE GEO LEVEL SELECTED, SO IT WAS NECESARY TO HAVE THE   POB02980
*  PROVINCIA, CANTON AND DISTRITO WHERE HE WAS BORN, AND A FLAG   POB02990
*  TO SHOW IF IT IS EQUAL TO THE ENUMERATION DISTRICT.            POB03000
     MOVE EP08    TO SP08.                                        POB03010
     MOVE EP09    TO SP09.                                        POB03020
     MOVE EP10    TO SP10.                                        POB03030
     MOVE EP11    TO SP11.                                        POB03040
     MOVE EP12    TO SP12.                                        POB03050
     MOVE EP13    TO SP13.                                        POB03060
     MOVE EP14    TO SP14.                                        POB03070
     MOVE EP15    TO SP15.                                        POB03080
     MOVE EP16    TO SP16.                                        POB03090
     MOVE EP17    TO SP17.                                        POB03100
     MOVE EP18    TO SP18.                                        POB03110
     WRITE RP01    FROM SP01.                                     POB03120
     WRITE RP02    FROM SP02.                                     POB03130
     WRITE RP03    FROM SP03.                                     POB03140
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           WRITE RNAQUI  FROM SNAQUI.                                   POB03150
           WRITE RP04A   FROM SP04A.                                    POB03160
           WRITE RP04B   FROM SP04B.                                    POB03170
           WRITE RP04C   FROM SP04C.                                    POB03180
           WRITE RP04D   FROM SP04D.                                    POB03190
           WRITE RP05    FROM SP05.                                     POB03200
           WRITE RP06    FROM SP06.                                     POB03210
           WRITE RRAQUI  FROM SRAQUI.                                   POB03220
           WRITE RP07A   FROM SP07A.                                    POB03230
           WRITE RP07B   FROM SP07B.                                    POB03240
           WRITE RP08    FROM SP08.                                     POB03250
           WRITE RP09    FROM SP09.                                     POB03260
           WRITE RP10    FROM SP10.                                     POB03270
           WRITE RP11    FROM SP11.                                     POB03280
           WRITE RP12    FROM SP12.                                     POB03290
           WRITE RP13    FROM SP13.                                     POB03300
           WRITE RP14    FROM SP14.                                     POB03310
           WRITE RP15    FROM SP15.                                     POB03320
           WRITE RP16    FROM SP16.                                     POB03330
           WRITE RP17    FROM SP17.                                     POB03340
           WRITE RP18    FROM SP18.                                     POB03350
       FIN-PROGRAMA.                                                    POB03360
           EXIT.                                                        POB03370
//GO.SYSUDUMP DD SYSOUT=A                                               POB03380
//SYSOUT  DD SYSOUT=A                                                   POB03390
//CENSO DD UNIT=TAPE,VOL=SER=(R402,R403,R404,R405,R406),                POB03400
//    DSN=CR84CENS.ORIGIN80                                             POB03410
//P01 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P01,                     POB03420
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=19000),DISP=(OLD),                     POB03430
// SPACE=(TRK,(130,30),RLSE)                                            POB03440
//P02 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P02,                     POB03450
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=19000),DISP=(OLD),                     POB03460
// SPACE=(TRK,(130,10),RLSE)                                            POB03470
//P03 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P03,                     POB03480
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=19000),DISP=(OLD),                     POB03490
// SPACE=(TRK,(260,20),RLSE)                                            POB03500
//P04A DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P04A,                   POB03510
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=19000),DISP=(OLD),                     POB03520
// SPACE=(TRK,(130,20),RLSE)                                            POB03530
//P04B DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P04B,                   POB03540
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=19000),DISP=(OLD),                     POB03550
// SPACE=(TRK,(260,20),RLSE)                                            POB03560
//NAQUI DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.NAQUI,                 POB03570
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=19000),DISP=(OLD),                     POB03580
// SPACE=(TRK,(130,20),RLSE)                                            POB03590
//P04C DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P04C,                   POB03600
// DCB=(RECFM=FB,LRECL=3,BLKSIZE=18000),DISP=(OLD),                     POB03610
// SPACE=(TRK,(390,10),RLSE)                                            POB03620
//P04D DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P04D,                   POB03630
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=19000),DISP=(OLD),                     POB03640
// SPACE=(TRK,(260,20),RLSE)                                            POB03650
//P05 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P05,                     POB03660
// DCB=(RECFM=FB,LRECL=3,BLKSIZE=18000),DISP=(OLD),                     POB03670
// SPACE=(TRK,(390,10),RLSE)                                            POB03680
//P06 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P06,                     POB03690
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=19000),DISP=(OLD),                     POB03700
// SPACE=(TRK,(130,10),RLSE)                                            POB03710
//P07A DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P07A,                   POB03720
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=19000),DISP=(OLD),                     POB03730
// SPACE=(TRK,(130,10),RLSE)                                            POB03740
//P07B DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P07B,                   POB03750
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=19000),DISP=(OLD),                     POB03760
// SPACE=(TRK,(260,10),RLSE)                                            POB03770
//RAQUI DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.RAQUI,                 POB03780
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=19000),DISP=(OLD),                     POB03790
// SPACE=(TRK,(130,10),RLSE)                                            POB03800
//P08  DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P08,                    POB03810
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=19000),DISP=(OLD),                     POB03820
// SPACE=(TRK,(130,10),RLSE)                                            POB03830
//P09  DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P09,                    POB03840
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=19000),DISP=(OLD),                     POB03850
// SPACE=(TRK,(260,10),RLSE)                                            POB03860
//P10  DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P10,                    POB03870
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=19000),DISP=(OLD),                     POB03880
// SPACE=(TRK,(130,10),RLSE)                                            POB03890
//P11  DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P11,                    POB03900
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=19000),DISP=(OLD),                     POB03910
// SPACE=(TRK,(130,10),RLSE)                                            POB03920
//P12  DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P12,                    POB03930
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=19000),DISP=(OLD),                     POB03940
// SPACE=(TRK,(130,10),RLSE)                                            POB03950
//P13 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P13,                     POB03960
// DCB=(RECFM=FB,LRECL=3,BLKSIZE=18000),DISP=(OLD),                     POB03970
// SPACE=(TRK,(390,10),RLSE)                                            POB03980
//P14 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P14,                     POB03990
// DCB=(RECFM=FB,LRECL=1,BLKSIZE=19000),DISP=(OLD),                     POB04000
// SPACE=(TRK,(130,10),RLSE)                                            POB04010
//P15 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P15,                     POB04020
// DCB=(RECFM=FB,LRECL=4,BLKSIZE=19000),DISP=(OLD),                     POB04030
// SPACE=(TRK,(520,10),RLSE)                                            POB04040
//P16 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P16,                     POB04050
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=19000),DISP=(OLD),                     POB04060
// SPACE=(TRK,(260,10),RLSE)                                            POB04070
//P17 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P17,                     POB04080
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=19000),DISP=(OLD),                     POB04090
// SPACE=(TRK,(260,10),RLSE)                                            POB04100
//P18 DD UNIT=3350,VOL=SER=OSWORK,DSN=CR84CENS.P18,                     POB04110
// DCB=(RECFM=FB,LRECL=2,BLKSIZE=19000),DISP=(OLD),                     POB04120
// SPACE=(TRK,(260,10),RLSE)                                            POB04130
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