

**ATARI<sup>®</sup> PROGRAM**  
**exchange**

**DATA MANAGEMENT SYSTEM**  
**by**  
**Ronald & Lynn Marcuse**

**INSTRUCTIONS**

**USER-WRITTEN SOFTWARE FOR ATARI PERSONAL COMPUTER SYSTEMS**

APX-20059

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# DATA MANAGEMENT SYSTEM

by

Ronald and Lynn Marcuse

INSTRUCTIONS

9/1/81

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Lecture Notes  
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## INTRODUCTION

### OVERVIEW

With the DATA MANAGEMENT SYSTEM you can store various kinds of information on your ATARI Personal Computer. You don't need programming experience to use this system, which is ideal for short records, such as record, tape, and book catalogs; telephone and address directories; inventories; appointments; lists; and data used by other programs. Records can be as large as 140 characters and your records may have as many as eight fields (units of information). You can specify that the system edit your field values in one of three ways, or you can specify that no editing be done to the values. You perform activities on a file through a series of menu selections and prompts for information.

The procedure for setting up your files is twofold. First, you define the characteristics of your file. That is, you give it a file name, specify the number of fields, the field headings, the maximum length of each field's value, and the kind of editing desired. Second, you add, update, and remove records within your file as necessary. You can search your file using any field as a search key and using whole or partial values (a partial value is useful for accessing a range of records or for saving on keystrokes). You can display your search results on your video screen or print them on your printer (up to 130 characters). You can specify printed copies of either complete or partial records. You can also sort your file on any field, specifying either ascending or descending ASCII values for characters in that field. If you want sorted search results, you sort first, and then you search the sorted file and display or print the search results.

### REQUIRED ACCESSORIES

32K RAM  
ATARI 810 Disk Drive  
ATARI BASIC Language Cartridge

### OPTIONAL ACCESSORIES

ATARI 825 80-column Printer or Epson MX-80 Printer

### CONTACTING THE AUTHORS

Users wishing to contact the authors about the DATA MANAGEMENT SYSTEM may write to them at:

168 Coachman Drive North  
Freehold, New Jersey 07728

or call:

201/431-2305

## TERMS USED IN THIS MANUAL

Before discussing in detail how to use the DATA MANAGEMENT SYSTEM, let's go over several terms used in this manual. You create a file or data base (in this system, these terms mean the same thing) composed of records. Each record is made up of a set of data fields. Each field can also be a search key, which you can use as part of a search statement to locate records. You may search with a complete or a partial key (field) value. Your fields also have labels preceding field values in the displayed or printed records. In addition, the system assigns every field a number.

To illustrate each term, we'll use the sample PHONE/ADDRESS file already on your diskette. This file has seven fields: (1) person's name, (2) street, (3) city and state, (4) zip code, (5) area code, (6) phone number, and (7) birthday. One record holds the following information: (1) HUGHES, LINDA (2) 123 MAIN STREET (3) SWARTHMORE, PA (4) 19081 (5) 912 (6) 123-4567 (7) June 12, 1958.

Working definitions of the underlined terms are as follows:

**FILE** or **DATA BASE**--a set of records that share a file definition. In our example, the data base is PHONE/ADDRESS.

**RECORD**--one set of fields containing all the information about one entity. In the PHONE/ADDRESS file, one record contains the information about LINDA HUGHES.

**FIELD**--one kind of information within a record. In the PHONE/ADDRESS file, the person's name is one field, street is another field, and so on.

**FIELD LABEL**--a title or heading to identify a field in various displays. In the PHONE/ADDRESS file, the title NAME L,F identifies the name field, STREET identifies the street field, and so on.

**FIELD NUMBER**--the order of a field within the set of fields comprising a record. In the PHONE/ADDRESS FILE, the name field is field 1. The system assigns numbers to fields according to the order in which you enter the fields in your file definition.

**FIELD VALUE**--the unit of information identified by the field label and specific to the particular person or thing the record describes. In the PHONE/ADDRESS file and the LINDA HUGHES record, the value of field 2 (with the label STREET) is "123 MAIN STREET".

**SEARCH KEY**--a field by which the system locates records in response to a search statement. In the PHONE/ADDRESS file, we can search on any of the seven fields--name, street, city and state, and so on.

**KEY VALUE**--the same as field value. In the PHONE/ADDRESS file, if we want to search by the name field to locate the LINDA HUGHES record, the search key is field 1, NAME, and the key value is "HUGHES, LINDA".

**SEARCH STATEMENT**--the combination of a search key, a logical operator, and a key value. Logical operators signify the relationship of the key value to the search key. The logical operators used in the DATA MANAGEMENT SYSTEM are:

1. Less than or equal to <=
2. Equal
3. Greater than or equal to >=
4. Range

If we want to locate all records having a NAME value in the range from "A..." to the value "HUGHES", our search key would be the field 1, NAME, our logical operator would be less than or equal to ( <= ), and our key value would be "HUGHES".

## GETTING STARTED

### SETTING UP

1. Insert the ATARI BASIC Language Cartridge in the (Left Cartridge) slot of your computer.
2. Turn on your disk drive.
3. When the BUSY light goes out, open the disk drive door and insert the DATA MANAGEMENT SYSTEM diskette with the label in the lower right-hand corner nearest to you. (Insert it in disk drive one if you have more than one drive).
4. Turn on your computer and your TV set.
5. If you're planning to use your printer, turn it and the ATARI 850 Interface Module on.
6. At the READY prompt, type RUN "D:DMSDB" and press the RETURN key. The system loads in 15 to 20 seconds and the PRIMARY OPTION MENU then displays:

```
DATA MANAGEMENT SYSTEM VER 2.0
```

```
PRIMARY OPTION MENU
```

1. DATA DICTIONARY
2. FILE MANAGEMENT
3. END SESSION

```
SELECT OPTION ==>_
```

Figure 1 Primary Option Menu

You're now in the DATA MANAGEMENT SYSTEM and ready to go to work.

### SAMPLE SESSION

Let's go through a simple session in the DATA MANAGEMENT SYSTEM to give you an overall idea of how easy it is to use. We'll use the PHONE/ADDRESS file to locate and print the LINDA HUGHES record.

First, we select option 2 of the PRIMARY OPTION MENU--FILE MANAGEMENT--to enter the file system for performing record activities. After we press the 2 key, the FILE MANAGEMENT MENU displays:

DMS FILE MANAGEMENT MENU

1. SELECT DATA BASE
2. DIRECTORY INDEX
3. ADD RECORD
4. LIST/INQUIRY
5. UPDATE RECORD
6. SORT
7. END

SELECT OPTION ==> \_

Figure 2 FILE MANAGEMENT MENU

(Note. In this and other menus, selecting an END option will return you to the next higher level of activity. In this case, if we select option 7, we'd return to the PRIMARY OPTION MENU.)

Before we can proceed, we must access the data base holding the LINDA HUGHES record. Thus, we select option 1, SELECT DATA BASE, which causes this prompt to display:

TO SELECT DATA BASE

TYPE FILE NAME ==> ?\_

Figure 3 SELECT DATA BASE Prompt

We enter the file name (in this case it's PA) we assigned this data base in our file definition and press the RETURN key. The DMS FILE MANAGEMENT MENU then redisplay with the name of our selected data base appearing directly under the DMS FILE MANAGEMENT MENU title.

Our records are already sorted by ascending ASCII values for the NAME field and we're looking for only one record, so we have no need to re-sort the data base via option 6, SORT. The SORT option is most useful for reordering all of the records just prior to printing a number of them. Therefore, we'll select option 4, LIST/INQUIRY, to search for our record. Pressing the 4 key causes the following menu to display:

```
PHONE/ADDRESS

INQUIRY / LIST

1. SEARCH
2. ALL RECORDS
3. END

SELECT OPTION ==>_
```

Figure 4 LIST/INQUIRY Submenu

We know exactly the record we want, so we'll use option 1, SEARCH, to locate it. Otherwise, we could use option 2 to look at all records in the data base, one at a time. (Or, we could use option 1 to locate a range of records by formulating an appropriate search statement.) Pressing the 1 key causes this display:

```
PHONE/ADDRESS

SELECT KEY:

1 NAME L,F
2 STREET
3 CITY, STATE
4 ZIP CODE
5 AREA CODE
6 PHONE NO.
7 BIRTHDAY

ENTER KEY FIELD # OR
PRESS ANY KEY TO CONTINUE_
```

Figure 5 SEARCH option submenu (data base-specific)

Notice that this display depends on the fields defined for records in this data base. This display will vary with each data base. Since this data base defines seven fields in its records, we can search on any of seven fields. We'll use field 1 (NAME L,F) as our search key, so we press the 1 key to go on to the display for selecting our logical operator:

```
SEARCH STRATEGY:

1. LT OR EQ <=
2. EQUAL
3. GT OR EQ >=
4. RANGE

SELECT OPTION ==>_
```

Figure 6 SEARCH STRATEGY Prompt

We want to locate only one record, so we use option 2, the EQUAL logical operator. When

we press the 2 key, the system displays:

```
FOR FIELD NAME L,F          TYPE VALUE:
|-----|
?_
```

Figure 7 KEY VALUE Prompt

This prompt is also specific to the data base we're using. The first line identifies the field we selected as our search key. The second line reminds us of the maximum length permitted for a value in this field (in this case, it's 20). We can enter either the complete value (HUGHES, LINDA) or a partial value (for example, HUGHES--assuming there are no other records with a NAME value of HUGHES). After we enter our value and press the RETURN key, the system displays the output choices:

```
OUTPUT:
1. SCREEN
2. PRINTER, FULL REC
3. PRINTER, PARTIAL
4. END
```

Figure 8 OUTPUT Prompt

We want to print the complete record, so we select option 2 by pressing the 2 key. (If we entered a 3, for a partial record, the system would then have asked us, one field at a time, which fields we wanted printed.) Our printed record looks like this:

```
PHONE/ADDRESS                Page 1
NAME L,F          STREET          CITY, STATE          ZIP CODE          AREA CODE          PHONE NO.          BIRTHDAY
HUGHES, LINDA     123 MAIN STREET        SWARTHMORE, PA      19081              912                123-4567           061258
```

RECORD COUNT= 1

The system returns us automatically to the LIST/INQUIRY submenu and we perform more searches in this data base.

## PRELIMINARY WORK--DETERMINING YOUR FILE'S CHARACTERISTICS

You needn't read this section immediately. If you want first to become familiar with the overall features of the DATA MANAGEMENT SYSTEM, you can use the sample PHONE/ADDRESS file already in the system and browse through the rest of this manual. Then you can come back to this section when you're ready to create your own files.

Before you use the DATA MANAGEMENT SYSTEM to set up files, you first need to think about what your records should look like. You need to decide these aspects:

- (1) What do I want to call this application? You may use any name up to 22 characters long.
- (2) What do I want to name this file? You may use any name with up to 8 alphabetic

or numeric characters, but the first character must be alphabetic (A-Z).

(3) What units of information do I want to include in these records? Decide not only what information you want but also the order in which you want the information to appear. You may use as many as 8 fields.

(4) What name (label) do I want to assign to each field? Your labels may be up to 11 characters long.

(5) What is the maximum length a value can be for each field? Each field must be at least 1 character long and it may be up to 30 characters long. You might need to do some juggling here. Because a record can't exceed 140 characters (and printed lists of records will truncate at 130 characters), you won't be able to assign a maximum value of 30 characters to each field if you have eight fields (that would amount to 240 characters). Therefore, as you work out the maximum values allowed, keep a running total to make sure you don't exceed 130 or 140 characters.

Additionally, both the computer and disk drive tend to be more efficient with shorter records. The diskette can also hold more short records than long ones in the same amount of space. Therefore, it's advantageous to assign field lengths matching the specifications of the data. For example, a length of 20 is suitable for a name but not for a ZIP code. If the data is always 5 characters long, then specify a length of 5.

(6) Do I want the system to edit field values? You may choose no editing or any of three kinds of editing:

(1) NUMERIC--the system will accept only digits as valid values for this field.

(2) DATE--the system will accept only valid dates in the form MMDDYY (e.g., 011481 for January 14, 1981) as values for this field.

(3) DOLLAR--the system will accept only dollar values in the form DDDD.CC (e.g., 123.45 for \$123.45) as valid values for this field.

With this information determined, you will select option 1, DATA DICTIONARY, in the PRIMARY OPTION MENU to create a record defining all the characteristics of your new file. (You do this because the file definition itself constitutes a record in the DATA DICTIONARY file of the DATA MANAGEMENT SYSTEM.) Then you'll select the FILE MANAGEMENT file and add records to your new file.

## USING THE DATA MANAGEMENT SYSTEM

### INTRODUCTION

The PRIMARY OPTION MENU illustrated in Figure 1 shows the two major functions of the system. You use the Data Dictionary option to create and maintain the file definitions for files physically located on that disk. You use the File Management option to process your file records--add, update, and remove records, sort records, and display or print search results. For more information about the technical structure of the DATA MANAGEMENT SYSTEM, see the section titled "Advanced Technical Information".

Use option 3, END SESSION, to terminate your work in the DATA MANAGEMENT SYSTEM and return to BASIC. For system integrity, the BREAK key has been disabled.

\*\*\*\*CAUTION\*\*\*\*

AVOID USING THE SYSTEM RESET KEY. USING IT AT THE WRONG TIME MAY DESTROY VALUABLE FILES.

### ENTERING DATA, SELECTING OPTIONS, AND ANSWERING PROMPTS

When you enter letters in response to system prompts, use only uppercase letters. The computer doesn't interpret uppercase and lowercase in the same way.

When you enter field values for various activities (e.g., to add or update records or to enter a search value) you'll need to press the RETURN key to signal completion of your input. All other input will consist of entering numbers or letters in response to prompts. For example, you'll enter a 1, 2, or 3 to select an option from the PRIMARY OPTION MENU and you'll enter a Y in response to a prompt asking whether you want a file definition deleted. In these cases, pressing the RETURN key isn't necessary.

In some cases, when you answer a prompt by simply pressing the RETURN key without first entering a value, you'll automatically return to the next higher level of activity. In other cases, the system won't accept your pressing the RETURN key without first entering something else. In these instances, either you'll see an ERROR message in inverse video or the prompt will display again, and the system will patiently wait for you to enter a value.

### DISKETTE WRITE PROTECT FEATURE

Because the DATA MANAGEMENT SYSTEM uses both input and output record processing, you must leave the hardware write protect notch on the diskette uncovered.

## DATA DICTIONARY--MENU SELECTIONS

### INTRODUCTION

Use option 1, DATA DICTIONARY, on the PRIMARY OPTION menu to create a record holding your file definition. Also use this option to change field labels at a later time and to remove an entire data base from the diskette. No other kind of file definition revision is possible, so be sure you know what you want your records to look like before you add many records to your data base!

After you press the 1 key for option 1, you're in the DATA DICTIONARY subsystem. The DATA DICTIONARY menu looks like this:

```
DATA DICTIONARY MENU

1. LIST INDEX
2. ADD DATA BASE
3. LIST
4. UPDATE
5. END

SELECT OPTION ==>_
```

Figure 9 DATA DICTIONARY Menu

### OPTION 1--LIST INDEX

Use option 1 to display all your file names and titles for the data bases on this diskette. The display looks like this:

```
DATA SET INDEX

PA          PHONE/ADDRESS
:           :
:           :

PRESS ANY KEY TO CONTINUE
```

Figure 10 LIST INDEX Display

To return to the DATA DICTIONARY menu, press any key.

### OPTION 2--ADD DATA BASE

Use option 2 to add a new file definition to the diskette. (If you haven't yet read "Preliminary Work--Determining Your File's Characteristics" in the GETTING STARTED section, now is the time to do so.)

The system prompts you through the steps for creating your file definition.

1. It asks you to enter an APPLICATION NAME:

DATA DICTIONARY ADD

ENTER:

APPLICATION NAME (1-22)

?\_

This is the title of your data base that will display on various screens and on printouts of your records. Examples are PHONE/ADDRESS and RECORD & TAPE CATALOG. Your title may be between 1 and 22 characters. After you enter the application name, press the RETURN key to continue. If you press the RETURN key without first entering other characters, you'll abort the data base add and return to the DATA DICTIONARY menu.

2. Next you enter a FILE NAME:

FILENAME (1-8)

?\_

This is the name you use throughout the other activities to refer to this data base. Examples are TAXDED81 and PA. Your file name can be between one and eight alphabetic or numeric characters, with the first character always alphabetic. Enter the name and press the RETURN key. (Note. The format of the file name as stored on the disk is D:filename.DB ).

3. Next, you specify the number of fields for your records:

# OF FIELDS IN REC (2-8)

?\_

Enter the total number of fields you intend to include in your records. The minimum is two and the maximum is eight. The PHONE/ADDRESS data base has seven fields.

4. The system then asks you to define the characteristics of each field--its heading (label), maximum length, and the kind of editing wanted on the values. First you enter the field heading:

FOR FIELD n OF m. ENTER:

HEADING (1-11)

?\_

The letter "n" represents a field number, and the letter "m" represents the total number of fields. This line indicates which field number you're working on. For example, if you're on the first of six fields, it displays FOR FIELD #1 OF 6. The heading can be between one and eleven characters. Press the RETURN key to continue. Next, you enter the maximum length for a value in this field:

LENGTH (1-30), TOT REC LEN IS n

?\_

(The letter "n" represents the sum of the characters for all fields up to the one you're defining.) The maximum length for a field value can be as small as one and as large as thirty. Enter the maximum length and press the RETURN key to continue.

Next, you indicate the kind of editing you want the system to do on all values you enter for this field:

EDITING?  
(0 NONE, 1 NUMERIC, 2 DATE, 3 DOLLAR)

SELECT OPTION ==> \_

Enter the number for the kind of editing you want the system to perform (pressing RETURN isn't necessary). If you select NONE, the system accepts any combination of characters as valid values for a field. If you select NUMERIC, it accepts only the digits 0-9. For example, you can't specify a numeric edit on a telephone number containing a hyphen between the first three digits and the final four digits. If you select DATE, the system accepts dates in the form MMDDYY (e.g., 060669 for June 6, 1969). They will appear on screen displays and on printouts in this format. If you select DOLLAR, the system accepts digits in the form DDDD.CC (e.g., 1234.56 for \$1234.56).

Repeat these steps for each field by responding to the system prompts for information.

When you finish entering the information for the last field, the system displays a PLEASE WAIT message and shortly thereafter displays all the information pertaining to your new file definition. For example, the PHONE/ADDRESS data base record looks like this:

#### DATA DICTIONARY RECORD

FILE NAME - PA  
APPLICATION - PHONE/ADDRESS

ELEM #	HEADING	LENGTH	EDIT?
1	NAME L,F	20	
2	STREET	20	
3	CITY, STATE	20	
4	ZIP CODE	5	NUMERIC
5	AREA CODE	3	NUMERIC
6	PHONE NO.	8	
7	BIRTHDAY	6	DATE

RECORD LENGTH = 83

TYPE Y TO ADD  
PRESS ANY KEY TO CONTINUE \_\_\_\_

Figure 11 Sample DATA DICTIONARY Record

Notice that your total maximum record length also displays at the bottom of the record information. This total is one character greater than the total of the field lengths. The extra position is a record delimiter (separator) and/or "delete record" flag.

Enter a Y to add the record to the DATA DICTIONARY. (If the DATA DICTIONARY file hasn't been initialized on the diskette, the system will prompt you for permission to create it: "D:DMSDB NOT ON DISK". This occurs the first time you add a data base to a diskette. Enter a Y to create the DATA DICTIONARY on the diskette and add the new file.) Press any other key to abort the record and to return to the DATA DICTIONARY menu, and use the END option to return to the PRIMARY OPTION menu.

### OPTION 3--LIST

Use option 3 to look over file definition records in the DATA DICTIONARY for this diskette. Pressing the 3 key causes this menu to display:

```
DATA DICTIONARY INQUIRY
```

1. ALL
2. SEARCH
3. END

```
SELECT OPTION ==>_
```

Figure 12 DATA DICTIONARY INQUIRY Submenu

To look at all your file definition records, one at a time, use option 1, ALL. The display is the same format used to verify a new file definition (see Figure 11). Page from record to record by pressing any key except E; terminate this display at any time by typing E.

Use option 2, SEARCH, to locate one or more file definition records. The system will prompt you for the name of the file definition you want to look at:

```
ENTER FILE NAME  
?_
```

Enter the name and press the RETURN key. After the file definition information displays, you return to the DATA DICTIONARY menu.

Use option 3, END, to return to the DATA DICTIONARY menu when you're finished with the DATA DICTIONARY INQUIRY function.

### OPTION 4--UPDATE

Use option 4 to change field headings (labels) in any file definition record on this diskette. Changing field headings and deleting the entire data base are the only kinds of update activities the system permits to file definition records. The system will prompt you for the name of the file:

TYPE FILE NAME  
?\_

The characteristics of the specified file definition will then display. The format is the same as that shown in Figure 11, with the following prompt displayed underneath the record information:

TYPE # TO UPDATE, D TO DELETE  
PRESS ANY KEY TO CONTINUE\_

If you decide not to modify any field, return to the DATA DICTIONARY menu by pressing any key except D or one of the field numbers.

To revise a field heading, enter the field number. For example, to revise field 1 from NAME L,F to NAME L/F, enter a 1 and then respond to the prompt:

ENTER NEW HEADING FOR #1  
?\_

After you enter the new heading, the system redisplay the DATA DICTIONARY menu. (Note. If you want to change more than one field heading, you'll need to repeat these steps for each modification.)

To delete the file definition record and its data base of records (if any), type a D instead of a field number. The system will then ask you to confirm that you want to delete the data base:

TYPE Y TO DELETE D:filename.DE  
PRESS ANY KEY TO CONTINUE

If you type a Y, the system erases both your file definition record and all the records in the FILE MANAGEMENT SYSTEM belonging to this data base. Then the message

DELETED

displays and your file definition and records for this data base are gone forever!

Note. Use this option to delete the sample data base PHONE/ADDRESS, if you want to remove it from your diskette.

OPTION 5--END

Use option 5 to return to the PRIMARY OPTION MENU.

## FILE MANAGEMENT--MENU SELECTIONS

### INTRODUCTION

Use option 2, FILE MANAGEMENT, of the PRIMARY OPTION menu to work with records in your data base. After selecting the data base you want to use, you can add, update, and delete records, sort your file, search the data base, and display or print search results. The FILE MANAGEMENT menu is:

#### DMS FILE MANAGEMENT MENU

1. SELECT DATA BASE
2. DIRECTORY INDEX
3. ADD RECORD
4. LIST/INQUIRY
5. UPDATE RECORD
6. SORT
7. END

SELECT OPTION ==>\_

Figure 13 FILE MANAGEMENT Menu

### OPTION 1--SELECT DATA BASE

Use option 1 before doing anything else in the FILE MANAGEMENT system, which can't process your other work until it knows which data base to use. An exception to this rule is option 2, the DIRECTORY INDEX. After you press the 1 key, the system prompts you for the file name of your desired data base:

#### TO SELECT DATA BASE

TYPE FILE NAME ==>?\_

Enter the one-to-eight character file name and press the RETURN key. The system redisplay the FILE MANAGEMENT menu with your specified data base application name underneath the DMS FILE MANAGEMENT MENU title. This file name also appears on all FILE MANAGEMENT displays and printouts as long as you're working in this data base.

If you press the RETURN key without first entering other characters, you'll return to the FILE MANAGEMENT menu.

If you type in a file name that the system doesn't recognize, it displays the message NOT FOUND and returns you to the FILE MANAGEMENT menu. Check that you entered the file name correctly and that the file resides on your current diskette. You can use option 2 for this step.

## OPTION 2--DIRECTORY INDEX

Use option 2 to review the application and file names of the data bases on your diskette. The format of this display is the same as that shown in Figure 10, which illustrates the LIST INDEX option of the DATA DICTIONARY menu.

## OPTION 3--ADD RECORD

Use option 3 to add a new record or records to your specified data base. The system prompts you for all the field values by indicating the field to be entered and the maximum length for that field. The format looks like this (for a field labeled NAME L,F having a maximum length of 20 characters):

```
PHONE/ADDRESS

TO ADD RECORD, ENTER:
NAME L,F
|-----|
?_
```

Enter the value for the displayed field and press the RETURN key to go on to the next field. If you specified when you created the file definition for this data base that the system edit the value, the editing check occurs immediately. If you enter an invalid value, the system displays an ERROR message and reprompts you to enter the value.

You must enter a value for all fields except field one. Because of this condition, you might want to devise some simple notation to denote an empty field, should empty fields ever occur in your records. For example, you could enter a zero for a null numeric field, a slash (/) for a null non-edited field, and so on.

If you don't enter a value for field one, the system assumes you may have changed your mind about wanting to add a record and so it displays this prompt:

```
TYPE E TO END
PRESS ANY KEY TO CONTINUE
```

Typing an E returns you to the FILE MANAGEMENT menu. Pressing any other key causes the prompt for entering a value in field one to redisplay.

After you enter values for all fields, the system displays your new record in the format:

PHONE/ADDRESS

1	NAME L,F	JOHNSON, BRENT
2	STREET	475 STANTON PLACE
3	CITY, STATE	PENSACOLA, FL
4	ZIP CODE	65032
5	AREA CODE	742
6	PHONE NO.	324-8463
7	BIRTHDAY	080359

TYPE Y TO ADD  
PRESS ANY KEY TO CONTINUE

Figure 14 ADD RECORD Display

The first line indicates your current data base. If you want to add this record to the data base, type Y. The message

RECORD ADDED

will display, along with the prompt for adding another record. Pressing the RETURN key in response to the new record prompt causes this message to display:

TYPE E TO END  
PRESS ANY KEY TO CONTINUE

Press any key except E to cause the prompt for field one to redisplay. Type an E to return to the FILE MANAGEMENT menu.

If you don't want to add this record to the data base, press any key other than Y and you'll return to the FILE MANAGEMENT menu without adding this record to your data base.

OPTION 4--LIST/INQUIRY

Use option 4 to locate records in your data base. Entering a 4 causes the INQUIRY/LIST menu to display:

PHONE/ADDRESS

INQUIRY / LIST

1. SEARCH
2. ALL RECORDS
3. END

Figure 15 INQUIRY/LIST Submenu

The first line indicates your current data base. Use option 2, ALL RECORDS, to browse through the entire data base, record by record, in whatever order you last sorted the data base. (To re-sort your records before browsing, see option 6 of the FILE MANAGEMENT menu.)

Use option 3, END, to return to the FILE MANAGEMENT menu.

Use option 1, SEARCH, to locate subsets of records in your data base. When you enter a 1, the system prompts you to select your desired search key. For example, in the PHONE/ADDRESS data base, the keys are:

```
PHONE/ADDRESS

SELECT KEY:

1 NAME L,F
2 STREET
3 CITY, STATE
4 ZIP CODE
5 AREA CODE
6 PHONE NO.
7 BIRTHDAY

ENTER KEY FIELD # OR
PRESS ANY KEY TO CONTINUE
```

Figure 16 Search Key Prompt

To select a search key, enter the corresponding number of the field. For example, if you want to check on all people having birthdays in August, you would select search key 7. Next, the system prompts you for your search strategy:

```
SEARCH STRATEGY:

1. LT OR EQ <=
2. EQUAL
3. GT OR EQ >=
4. RANGE

SELECT OPTION ==> _
```

Figure 17 Search Strategy Prompt

Enter the number of your preferred strategy. Use strategy 1 to look for records up to and including a certain ASCII value in your specified field--for example, all records having a name field value in the range "AAA..." to "JONES". Use strategy 2 to locate records containing the ASCII values you specify--for example, all records with a name field value of "JONES" (which can also include "JONESTON" or any other value that is an extension of the string "JONES"). Use strategy 3 to locate records with values between a starting ASCII value you specify and the end of the ASCII table of characters--for example, all records with a name field value of "JONES" to "ZZZ...". Use strategy 4 to locate all records having ASCII values in the range between a starting ASCII string and an ending ASCII string, which you specify--for example, all records with name values within the range starting at "ADAMS" and ending at "JONES".

Once you enter your search strategy number, the system prompts you for the last piece of

information needed to complete your search statement, the value(s):

```
FOR FIELD BIRTHDAY      TYPE VALUE:
|-----|
?_
```

The hyphens are a reminder of the maximum length permitted in this field. You may enter either a complete or a partial value. Either way, you could locate one or more records, depending on whether the value occurs in more than one record and depending on your specified search strategy. If you selected a RANGE search strategy (option 4), you enter a LOW and a HIGH search value.

With this information, the system searches the data base for all records meeting your search criteria. But before you see the results, you must answer one more prompt--the format for your search results:

OUTPUT:

- 1 SCREEN
- 2 PRINTER, FULL REC
- 3 PRINTER, PARTIAL
- 4 END

Figure 18 Output Prompt

Enter the option number corresponding to your desired output format. Option 1 displays each complete record on your video screen, one at a time. Press any key except E to page to the next record. Type an E to end the paging sequence and return to the INQUIRY/LIST menu. Before returning to menu, the system displays a count of the number of records it displayed.

Option 2 prints each complete record on your printer. The DATA MANAGEMENT SYSTEM program is coded for an ATARI 825 80-Column Printer. If you have an Epson MX-80 Printer, you'll need to change one line of code. See the "Advanced Technical Information" section for an explanation of the modification.

Make sure your printer is attached to your interface module, the printer and module are turned on, and the printer is in ONLINE mode. If the system can't send output to the printer, it will display a CHECK PRINTER ERROR 138 message. Below is a sample printout of records in the PHONE/ADDRESS data base. Notice that each field heading prints above the field values.

```
PHONE/ADDRESS                               Page 1
NAME L,F      STREET      CITY, STATE      ZIP CODE      AREA CODE      PHONE NO.      BIRTHDAY
HUGHES, LINDA  123 MAIN STREET   SWARTHMORE, PA   19081          912            123-4567       061258
DUCK, DONALD   456 CENTRAL PLAZA  DISNEY WORLD, FL 34507          593            342-9845       061734
JOHNSON, BRENT 475 STANTON PLACE  PENSACOLA, FL    65032          742            324-8463       080359
MOUSE, MICKEY  123 MAIN STREET   DISNEYLAND, CA   92113          404            340-8954       041333

RECORD COUNT= 4
```

Figure 19 Sample Full Record Printout

Option 2 prints partial records on your printer. You specify which fields you want printed by answering a system prompt for each field. An example is:

TYPE 'Y' TO PRINT FIELD

```
1 NAME L,F ==>Y
2 :      ==>
```

If you press any key other than Y, the system won't print the values for that field. If you type a Y, the system will print the values. A sample partial record printout for the PHONE/ADDRESS data base is:

```
PHONE/ADDRESS Page 1
```

NAME L,F	AREA CODE	PHONE NO.	BIRTHDAY
HUGHES, LINDA	912	123-4567	061258
DUCK, DONALD	593	342-9845	061734
JOHNSON, BRENT	742	324-8463	080359
MOUSE, MICKEY	404	340-8954	041333

RECORD COUNT= 4

Figure 20 Sample Partial Record Printout

When the system finishes displaying or printing your search results, it returns you to the INQUIRY/LIST menu.

#### OPTION 5--UPDATE RECORD

Use option 5 to modify the values in a record or to delete whole records. When you press the 5 key, the UPDATE/DELETE prompt displays for formulating your search statement to locate records for updating/deletion:

```
PHONE/ADDRESS
UPDATE/DELETE
SELECT KEY:
1 NAME L,F
2 STREET
:
ENTER KEY FIELD # OR
PRESS ANY KEY TO CONTINUE
```

Figure 21 UPDATE/DELETE Search Key Prompt

You create your search statement by working through the same prompts as in option 4. The system then displays a record meeting your search criteria and prompts you for updating/deleting:

PHONE/ADDRESS

1 NAME L,F	JOHNSON, BRENT
2 STREET	475 STANTON PLACE
3 CITY, STATE	PENSACOLA, FL
4 ZIP CODE	65032
5 AREA CODE	742
6 PHONE NO.	324-8463
7 BIRTHDAY	080359

TYPE FIELD # TO UPDATE, D TO DELETE  
TYPE E TO END  
PRESS ANY KEY TO CONTINUE

Figure 22 UPDATE/DELETE RECORD Display

Enter the number of the field for which you want to change the value. The system displays the field name and maximum length reminder. You then enter the revised value and press RETURN. The system redisplay the record with the same prompt, allowing you to make further revisions. When you're satisfied with the updated record, press any key except D or E. The system then displays the next record meeting your search criteria, if any. Otherwise, it displays the prompt:

MORE UPDATES? (Y OR N)

To continue updating or removing records, answer Y. The UPDATE/DELETE prompt will redisplay. If you're finished working on old records, answer N and you'll return to the FILE MANAGEMENT menu.

To remove a record from the data base, type D when the system displays the record. (Unlike the DATA DICTIONARY record deletion, this deletion has no confirming prompt.) The File Management System will deactivate this record and you won't be able to access it thereafter. (Technical note. The byte that the system appends as a delimiter at the end of each record serves as the delete byte when you flag a record for removal.)

## OPTION 6--SORT

(NOTE. If you didn't turn on your disk drive and the computer with the DATA MANAGEMENT SYSTEM diskette inserted in drive one, the computer will lock during the sorting option. At this point, you'll need to turn the computer off and then on again to proceed. Records you added before using the sort option will already be saved on the diskette.)

If you want a record sequence different from the current one, use option 6 to reorder the records in your data base before doing searching and displaying activities. When you press the 6 key, the system prompts you for the sort key (i.e., field) in the same way it

prompts for a search key in options 5 and 4. Then it asks whether you want the sort in ascending or descending ASCII values:

ASCENDING OR DESCENDING? (A OR D)

Enter an A to sort in ascending order or a D to sort in descending order. Finally, the system displays a verification prompt to sort on the maximum character length of your specified sort key. For example, if we sort by the CITY, STATE field in the PHONE/ADDRESS data base, the prompt is:

TYPE Y TO SORT ON 20 POS OF CITY,STATE

This prompt simply reminds you of your chosen value's maximum length. The system doesn't let you sort on less than the full value. Then several messages display as the system clears the DATA MANAGEMENT SYSTEM program from computer memory, loads in the sort program, compresses the DATA DICTIONARY, and then loads, compresses, sorts, and saves your records on diskette. It also displays the number of records (Dictionary and File) it has read and deleted. (Technical note. The sort program deletes records that the File Management System flagged for deletion in the record delimiter byte.) The system automatically reloads the main DATA MANAGEMENT SYSTEM program. With your records now ordered as specified, you can re-enter your data base and continue working.

This sort program lets you sort a file on multiple levels. For example, you could sequence the sample PHONE / ADDRESS file with a major level of CITY,STATE and a minor level of NAME L,F. When printed out, the report will list the name alphabetically within city, which is also listed alphabetically. Likewise, you may sort and print the file by PHONE NUMBER within AREA CODE or even by PHONE NUMBER within AREA CODE within CITY. To do so, you sort the file once for each level, starting with the lowest level first and ending with the highest. In the first example above, you would sort the file by NAME L,F and then re-sort by CITY,STATE. Obviously, for multisorting to be beneficial, the higher levels should have multiple occurrences of the field value within the sort key. (Technical note. The machine language sort routine doesn't disturb the relative positioning of individual records on each higher level of sequencing.) Repeat this procedure whenever you want to sort on a different field or in another order.

## ADVANCED TECHNICAL INFORMATION

### SYSTEM ELEMENTS AND DESIGN

The DATA MANAGEMENT SYSTEM comprises several subsystems: (1) file management functions, (2) data dictionary maintenance, and (3) a sort program. It is coded in both BASIC and 6502 machine language.

The difference between "data management" and "data base" usually points to the latter's ability to handle cross-referenced data. The DATA MANAGEMENT SYSTEM, like others before it, can't support relationships between information stored in different files, whereas a true data base can process information across file boundaries. But what the DATA MANAGEMENT SYSTEM can do is give you an easy file/record definition and self-generated processing logic for the newly created file. This is a definite improvement over coding individual programs to process each data file.

The theory of operation centers around a data dictionary record created for each processing application. The dictionary records, stored in a separate file named DMS.DB, hold the file, record, and data attributes. These parameters include file name, application title, editing requirements, field lengths and names, and so on. The data dictionary subsystem maintains all these records. The subsystem supports inquiry, update, add, and delete functions.

After loading the data dictionary with one or more records, the file management subsystem can be called to process the application data. Select a file by name, prompting the system to load its attributes to selected variables. Processing of the application data is then done by generalized input/output routines. The system reads records into the computer individually, thereby limiting the size of the file to the higher capacity of the disk (as opposed to available RAM storage). Depending on record length, files in excess of 500 to 600 records can easily be accommodated. Processing functions supported by the file management system include: add record, update data, delete record, search, inquiry, and print. The update and delete options use the NOTE and POINT commands of BASIC, which permit the updated record to be rewritten to the same location on the disk. A "delete byte" on the record is set for deletions. Actual elimination of the record occurs during file reorganization in the sort program.

The sort program, called by the file manager, is not normally resident in RAM. This technique allows the dimensioning of the rather large string necessary to sort the file. The variables controlling the sort program are poked into safe locations while still under control of the file manager. The sort routine itself is a high-speed, machine language bubble sort, which can operate on any positions of the record in either an ascending or a descending mode.

### INCREASING FILE STORAGE OR VOLUME OF DATA

The number of files and/or the volume of data you can store on one diskette depends on several factors. After subtracting the space used by the Disk Operating System (DOS) and the Data Management System (DMS), more than 525 unused sectors remain for the DATA DICTIONARY and for files. This space can accommodate many small files, several larger

ones, or some combination of the two types. You may delete the DUP.SYS filespec from this and other DATA MANAGEMENT SYSTEM diskettes, effectively increasing the number of available sectors to 567. Just remember that you can't load the full version of DOS with these diskettes.

You can create other DMS diskettes by following these procedures: (1) Load DMS into RAM as described in the GETTING STARTED section under the subsection "Setting Up". (2) When the READY prompt displays, type DOS and press the RETURN key. This version of ATARI's DOS (DOS II) loads in about 20 seconds. (3) When the DOS menu displays, insert the new diskette and type I for option I (FORMAT DISKETTE) to erase any previous data on the diskette and format it. (4) When completed, type H for option H (WRITE DOS FILE) to write the DOS files to this blank, formatted diskette. (5) Because DOS I (9/24/79) and DOS II are not compatible, you must follow this procedure with DOS II loaded in your computer, not DOS I. In addition, make sure you don't format the DMS diskette (if you do, DOS will erase all the DMS files). (6) Finally, use option O (DUPLICATE FILE) to copy the files needed to run DMS. The files are: AUTORUN.SYS, DMSSORT, and DMSDB.

You can also follow these steps to create backup copies of all or some of your files. Just substitute your file names during the copy process. Also copy the Data Dictionary (D:DMS.DB). Because no computer or storage mechanism is foolproof, backing up your files is strongly recommended.

#### MODIFYING THE DISPLAY SCREEN MARGINS

The DATA MANAGEMENT SYSTEM uses a full 40-column line on your video screen. This presents no problem if your screen is correctly balanced. If it isn't, however, the system will use a standard 38-column line if you delete the first line of the program code, which contains a POKE statement adjusting the margins to 40 columns. You need do this only once and the program will thereafter use a 38-column display line (the extra two characters on maximum lines will "wrap" to the next line).

To make this modification, load the DMS program into computer memory (RAM) as follows. First, clear out RAM by typing the direct mode NEW command. Then, type the command:

```
LOAD "D:DMSDE"
```

and press the RETURN key. When the DMS program has loaded and the READY prompt displays, type a 1 and press the RETURN key. This erases line 1 from the program code. You'll then want to store this revised version back on diskette by typing the command:

```
SAVE "D:DMSDE"
```

#### USING AN EPSON MX-80 PRINTER

The program is formatted to take into account the control requirements of the ATARI 825 80-Column Printer. However, by changing one line of code, you can modify the program to accommodate an Epson Printer (or other 80- or 132-column printers, for that matter).

First, locate the control characters required for compressed and normal type in your printer manual. For example, the Epson uses CHR\$(15) for the compressed font. Then list

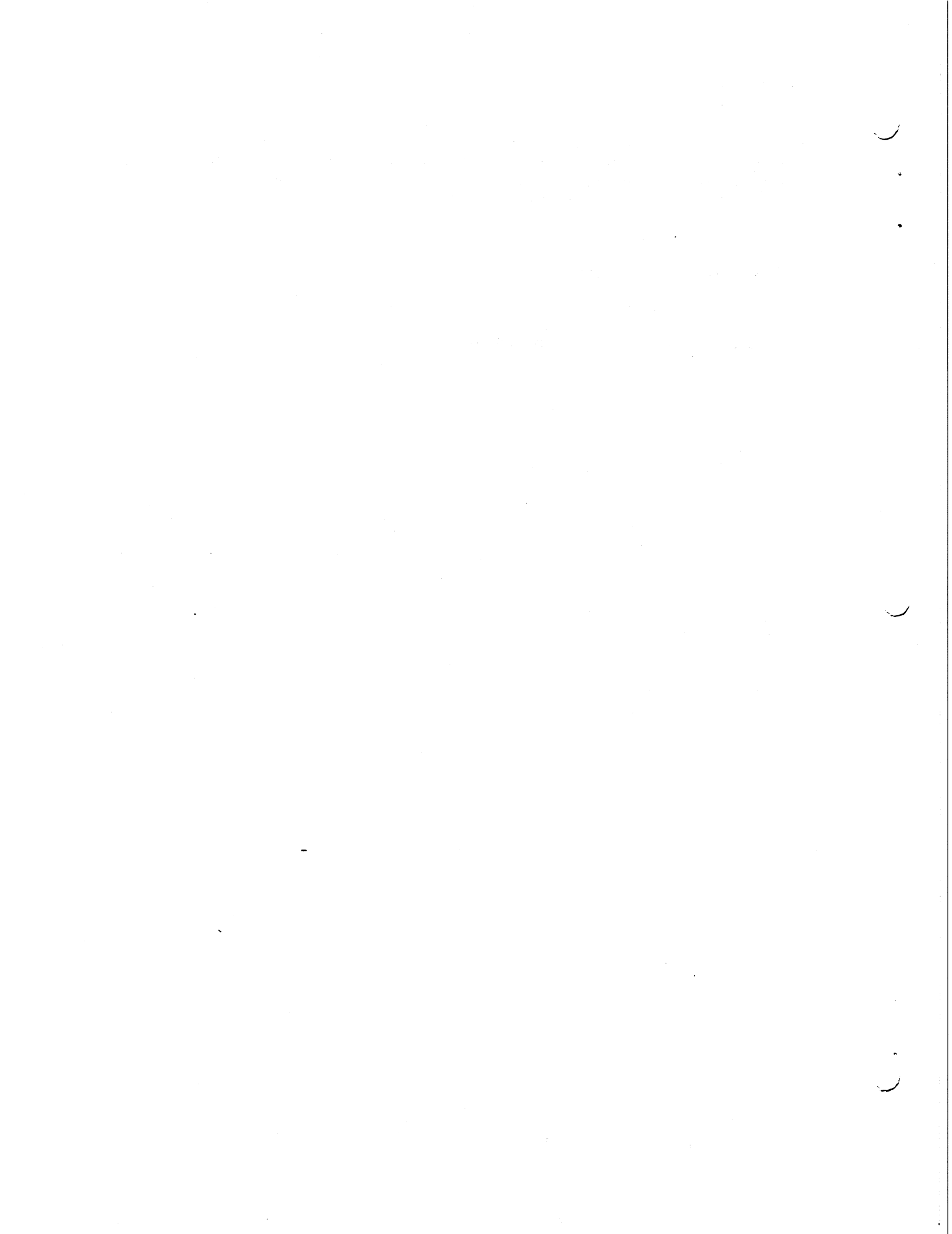
line 80 of the main DMSDB program (D:DMSDB) and substitute your printer's control codes for the present values of C\$(compressed width) and E\$(normal or reset compressed). For the Epson MX-80, line 80 will look like this:

```
80 C$=CHR$(15);E$=CHR$(18)
```

After changing line 80, type

```
SAVE "D:DMSDB"
```

to save the modified version back on diskette.



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1. Name and APX number of program \_\_\_\_\_

2. If you have problems using the program, please describe them here.

---

---

---

3. What do you especially like about this program?

---

---

---

4. What do you think the program's weaknesses are?

---

---

---

5. How can the catalog description be more accurate and/or comprehensive?

---

---

6. On a scale of 1 to 10, 1 being "poor" and 10 being "excellent", please rate the following aspects of this program?

- \_\_\_\_\_ Easy to use
- \_\_\_\_\_ User-oriented (e.g., menus, prompts, clear language)
- \_\_\_\_\_ Enjoyable
- \_\_\_\_\_ Self-instructive
- \_\_\_\_\_ Useful (non-game software)
- \_\_\_\_\_ Imaginative graphics and sound

7. Describe any technical errors you found in the user instructions (please give page numbers).

---

---

---

8. What did you especially like about the user instructions?

---

---

---

9. What revisions or additions would improve these instructions?

---

---

---

10. On a scale of 1 to 10, 1 representing "poor" and 10 representing "excellent", how would you rate the user instructions and why?

---

---

11. Other comments about the software or user instructions:

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