

FREEFORM<sup>tm</sup>



TEXAS INSTRUMENTS  
INCORPORATED

FREEFORM is a trademark of Texas Instruments Inc.

Copyright 1982 by Texas Instruments Inc. All rights reserved. No part of this work may be reproduced in any form or by any means without the permission in writing of Texas Instruments, Inc.

## 1. FREEFORM

### 1.1 FREEFORM INTRODUCTION AND OVERVIEW

FREEFORM is a software package designed to provide prompted instructions for creation and utilization of mathematical forms as well as a report generation system. These features can reduce costs associated with data collection, computation and storage.

The following is an example of a simple table (Form) representing the distribution of inventory for three part types in five locations. A total of each part type at each location is also computed.

Form Example - Distribution of Inventory by Location

	loc 1	loc 2	loc 3	loc 4	loc 5	Total
part 1	100	200	300	-	50	650
part 2	10	50	80	30	-	170
part 3	200	-	-	120	90	410
Total	310	250	380	150	140	1230

This table can answer many questions: How many units of part type 2 do we have in location 3? Where do we not have any supplies? How much total inventory of part type 1 do we have? Which location has the largest total inventory?

To respond to such questions, one must gather original data, organize it in a tabular format, and then perform the addition of rows and columns to derive the totals. If this data must be retained for future reference, the information must be transcribed and filed. If the number of items changes, the totals must be recomputed. Comparison to last month's quantities must be manually calculated.

In a simple form such as this, the amount of time required to update and recompute is trivial. Much more elaborate information and calculations are usually required. The results are generally typewritten as part of a report or presentation and are referred to repeatedly in comparison with other values of the same information. The time spent in calculation and re-typing alone can represent substantial costs, not to mention the ever-present risk of computational or typing errors. The requirements of extreme flexibility and quick cycle time from data entry to finished copy are difficult to achieve cost-effectively in large data processing systems. FREEFORM provides a low-cost alternative.

#### 1.1.1 The Freeform Form

Many numerical problems, particularly those in business applications, can be represented as tables or matrices. In general terms, a matrix is a set of related data in which each element of the set is ordered by qualifiers called coordinates, the bounds of which form the dimensions of the matrix. Any element in the set may be referenced by specifying the values of each coordinate. A FREEFORM matrix has three dimensions and is referred to throughout this documentation as a Form. Each Form will be assigned a unique name by the user in addition to the specification of

**Freeform [F.4]**  
**Introduction and Overview**  
 6/81

the three dimensions of Page, Row, and Column. A Form is defined by its dimensions and 'attributes' which describe the row and column names, types, calculations, and editing formats. A visual model of how the inventory example on the previous page would be represented by a FREEFORM matrix or Form is shown below. Note an additional page has been provided for a second month's data.

		month 2						
Pages		month 1						
		loc 1	loc 2	loc 3	loc 4	loc 5	Total	
	part 1	100	200	300	-	50	650	//
	part 2	10	50	80	30	-	170	//
	part 3	200	-	-	120	90	410	//
	Total	310	250	380	150	140	1230	//

Version F.4 of FREEFORM is limited to a maximum Form size of 100 pages. Each page has the same number of rows and columns with the constraints of having no more than 32,704 numbers in a page with no more than 101 columns. Up to 18 forms may be stored on one disk. Details of this process and further definition of terms are found in section 1.2.

At this point, a brief word about disk files and the structure of FREEFORM is appropriate.

**1.1.2 System Environment**

The FREEFORM program is named FF/VER4.CODE. FREEFORM uses one file to keep reference information about Forms which are stored on the disk. This 'directory' file is not to be confused with the disk directory. It is just another file on the disk and is named FREEFORM.DIR. For each Form defined, FREEFORM creates a Control, Constants, Titles, and Data file. The Control, Constants, Titles, and Data files' file names are made up of the Form name concatenated with the suffix '.CTL', '.CON', '.TIT', and '.DAT' respectively. The Control file contains the information which describes the Form, and the Data file contains the values input by the user and/or which are computed by FREEFORM under the user's direction.

To run FREEFORM from the system menu, type the command /FF. The FREEFORM main function menu is then displayed in the following format.

\*\*\*\*\*

Copyright (c) 1981, Texas Instruments, Inc. Corporate Engineering Center

**F R E E F O R M    The Electronic Worksheet    [F.4]**

By S. Dale Ander

June 24, 1981

0.    Data Entry Procedure
1.    Define new FORM controls
2.    Modify FORM controls
3.    Display or List directory
4.    Display or List FORM controls
5.    Consolidate Procedure
6.    Roll a FORM
7.    Copy a FORM
8.    Delete a FORM
9.    Help and User's Guide

Enter desired option #    Press CONTROL to leave

\*\*\*\*\*

The cursor will stop on the function selection prompt. Select the appropriate function by typing its respective number. Terminate FREEFORM by pressing the <control> <C> keys. If a FREEFORM function is selected, there will be a pause while the appropriate program is loaded and the system responds with its next prompt. Most inputs to FREEFORM prompts have been designed to be brief yet self-explanatory and allow for error corrections.

### 1.1.3 Standard Keyboard Procedures

Each program requests input from the user via "prompts". These indicate what information is being requested. To enter a response, type as though using a standard typewriter keyboard. Each character entered will appear on the video screen. Pressing the <enter> key terminates the input and sends the response to the program. Prior to pressing <enter>, one may backspace one character at a time by pressing the <left-arrow> or the <char> key. A number of other keys to perform special functions when entering a string response (as opposed to a numerical response) exist. The <del char> key, for example, deletes the character at the current cursor position. The <erase input> key erases all the characters from the current cursor position to the end of the field. The <erase field> key redisplay the field with its original value. The <ins char> key allows characters to be inserted into the middle of a response. After pressing the <ins char> key, simply enter the characters to be added. To get

out of the insert mode, press a different function key. These functions allow the user to correct input prior to sending to the program. All prompts are pre-programmed to expect a certain range or type of response to which the program can properly react. If a user attempts to enter invalid data, the cursor will neither move nor print the character which is being entered. To speed the process of using FREEFORM, many prompts are preset to specific defaults which they will assume if <enter> is pressed. These are typically one-character responses to multiple choice prompts.

Throughout this documentation, prompts will be highlighted by three leading asterisks (\*\*\*) to prevent confusing them with the surrounding explanatory text. These leading asterisks will not appear on the video display during actual program execution. A FREEFORM prompt takes the general form

\*\*\* Prompt text? (valid responses) default [optional comment]

Example:

\*\*\* Select another Form? (Y/N) Y

Most FREEFORM program modules will begin with the prompt

\*\*\* Form Name (8 alpha max.) \_\_\_\_\_ Press CONTROL to leave

A valid Form name consists of 1 to 8 alphanumeric characters. The special characters

! " # \$ % & ' ( ) \* : = - | } [ ] ^ ~ + ; ' @ | \ \_ < > , . ? /

and embedded blanks are not allowed.

## 1.2 FORM DEFINITION PROCEDURES

### 1.2.1 How to Define a Form

Defining a Form involves specifying to FREEFORM the dimensions and the data to be represented. As pointed out in section 1.1, the dimensions of the Forms are Page, Row, and Column. FREEFORM creates a computerized representation of the sheets of paper on which numerical problems are solved.

A Form definition consists of: (1) giving the Form a unique name, (2) specifying the dimensions and parameters of the Form pages, rows, and columns, and (3) describing the calculations, if any, to be performed. These steps are only necessary the first time a Form is to be used. All parameters which describe a Form and its contents are stored on disk files.

The Form definition program does the following: (1) creates an entry in the directory file describing the dimensions and other attributes of the Form, (2) creates and loads the control file per its specifications, detailing the row and column parameters and calculations to be performed, (3) creates and initializes a file to hold any constants that may be defined in the Form, (4) creates and initializes a file to hold all the page titles, and (5) initializes a data file of the proper size to hold the prescribed information.

\*Note> To avoid confusion, review the Standard Keyboard Procedures (1.1.3).

To invoke the new Form definition procedure select menu option number 1.

\*\*\*\*\*

FREEFORM The Electronic Worksheet [F.4]

By S. Dale Ander

June 24, 1981

- 0.
- 1. Define new FORM controls  $\leftarrow$  Form definition
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.

Enter desired option #  Press CONTROL to leave

\*\*\*\*\*



When the program has been loaded, the screen will clear, and a new title will be displayed.

FREEFORM FORMS CONTROLS  
New Forms Definition

If FREEFORM does not find a 'directory' file it will display an error message stating there is no directory. If this happens, FREEFORM will ask if another disk should be looked at. If so press <enter> otherwise type <N>. If <enter> was pressed the program will prompt for the disk drive number to search in for a directory file. After receiving a valid disk drive number, the program will instruct the user to insert a disk into that drive and press <enter>.

If no FREEFORM directory exists then one needs to be created. FREEFORM should be instructed to look on the disk that is to have a directory for a FREEFORM directory. An error message should appear stating that a directory was not found and then FREEFORM will ask if another disk should be checked. One should respond by typing <N>. FREEFORM will ask if a new directory should be created. Press <enter> or <Y>. FREEFORM will create a directory on the last disk searched which is the reason for searching for a directory on one that does not have one. FREEFORM will display:

\*\*\* Creating FREEFORM directory ... one moment, please

Simply wait until this message disappears (several seconds).

\*<Note> The term 'directory' should not be confused with the system directory.

The program then checks to verify there is available space on the diskette to add a new Form. If not, the message

\*\*\* \*\*\* FREEFORM directory is full ... press ENTER

will appear and FREEFORM automatically returns to the main menu. The options of initializing a new diskette or deleting one or more Forms from the current diskette are then available. (For instructions on deleting Forms, see 1.5 Form Controls Modification Procedures.)

\*\*\* Form name (8 alpha max.) \_\_\_\_\_ Press ENTER to leave

\*<Note> This prompt will only accept letters of the alphabet and the numbers zero through nine.

Respond by typing the name to be assigned to the new Form and pressing <enter>. If <control> <C> alone is pressed, control returns to the main menu program. If a valid Form name request is entered, the program then checks the directory to ensure against duplication of Form names. If an existing Form is found with the input name, the option to replace the existing definition and data is given. Replace the form by responding with a <Y> to the prompt

\*\*\* Replace existing FORM? (Y/N) N



To avoid replacing a Form, simply press <enter>. The program will then prompt for a new name.

\*<Note> Use with care as the replaced Form can not be recovered!

The program will then ask if checkpoint prompts are desired. These prompts give the user a chance to review progress at various intervals during Form definition. Until experienced with the sequence of events and comfortable with the various prompts, users should respond <Y> to this option.

\*<Note> Input will be displayed on the screen as a visual verification. If errors are introduced during definition, they can be corrected.

The Form definition program next prompts for descriptive information about the Form being defined. Identifiers such as user initials, descriptive comment, and definition date are provided to help the user keep track of the location of Forms and are entirely optional. FREEFORM will function satisfactorily without this information.

If space is available, the program then asks for the number of pages desired, displaying the maximum number allowed. The program will not allow the user to exceed the maximum.

\*\*\* How many Pages? \_\_ (max. available is 100)

Next, the format of the Form is selected. There are two choices: Row or Column formatting. Formatting indicates whether data is homogenous by row or column and the order in which calculations are performed. Calculated rows are done before calculated columns in row-formatted forms and vice versa in column formatted forms.

\*\*\* Format Rows or Columns? (R/C) R

Examples:

Row Formatted					Column Formatted			
	Col 1	Col 2	Col 3	Total		Col 1	Col 2	Col 3
Row 1	10.0	215.2	65.8	291.0	Row 1	10.0	20	0.500
Row 2	20	460	135	615	Row 2	215.2	460	0.468
Row 3	0.500	0.468	0.489	1.457	Row 3	65.8	135	0.489
					Total	291.0	615	1.457

\*\*\* Do you want automatic month descriptions? (Y/N) N

allows the program to assign the standard month abbreviations either for rows or columns in the Form. If this option is selected, additional prompts will ask if the headings are for rows or for columns and for the starting month number.

\*\*\* How many Calculation constants? \_\_ (max. 200)

allows the user to preset the constants which will be required in the calculations. Input the number of constants required; the program then asks for the values to be assigned.

\*\*\* CHECKPOINT \*\*\* At this point, the user may elect to make corrections or change any or all of the previous control data, terminate definition of this Form, or continue. First the user is prompted.

\*\*\* Anything to change? (Y/N) N

If the response is <N>, the program continues gathering form parameters. If the response is <Y> the program returns to the number of pages prompt. If the response is <N>, the program asks

\*\*\* How many columns might ever be in the FORM? \_\_ (max. 10)

\*\*\* How many rows might ever be in the FORM? \_\_ (max. XXXX)

The response to these prompts are critical to the definition of the FORM. These responses set limits to the size that the FORM will ever be able to obtain. The FORM may contain fewer columns or rows but no more. It is suggested to select maximums that are equal to the final number desired currently plus enough for any additions to the FORM. There is one way to expand a FORM beyond these maximums and that is by using the Copy command (see L6.3)

\*Note> A FORM may contain no more than 32,704 numbers per page, therefore the maximum number of rows allowed will be a function of the maximum number of columns.

After the maximums have been set the number of rows and columns that are actually going to be in the FORM at the present time are gathered. The maximum responses allowed here are determined by the answers just gathered.

\*\*\* How many rows? \_\_ (max. XXXX)

\*\*\* How many columns? \_\_ (max. XXX)

These prompts accept only numeric values =1 and <max. specified

\*\*\* Are the dimensions ok as specified? (Y/N) Y

If the response is N, the maximum number of rows and columns and the actual number of rows and columns prompts are repeated.

The program will then update the FREEFORM directory file on the user diskette and create the necessary control file.

\*\*\* Enter Title for Page (60 char. max.) \_\_\_\_\_

Each page of the Form may have its own unique title which will be displayed when viewing and printed when listing. This title may be up to 60 characters max. and consist of most alphanumeric characters. Invalid characters will not be accepted from the keyboard.

\*\*\* CHECKPOINT \*\*\*

\*\*\*Is Title Correct? (Y/N) Y

allows repeat of title entry until correct.

### 1.2.2 Row and Column Parameter Definition

There are three parameters which must be defined for both rows and columns of a Form, description, type and cross calculation.

The description is a user-defined label which will be displayed and printed when using FREEFORM.

Type refers to one of the following valid types: D-data, I-initial calculations, F-final calculations, and H-heading. Data type indicates the values assigned to a row or column will be input by the user and are variable. Calculated types indicate the values will be computed based on instructions input by the user. The precedence of calculations will vary according to one of several cases which is determined by the mix of operations to be performed. Initial calculations will be done before Final calculations. For example, in a Form formatted by rows, calculations will proceed as follows: Initial calculated rows, Initial calculated columns, Final calculated rows, and Final calculated columns. In a Form formatted by columns calculations will be performed in the following order: Initial calculated columns, Initial calculated rows, Final calculated columns and Final calculated rows. Heading type is only a valid option for a row. A row that is of Heading type will not contain any data.

The third parameter refers to whether or not a cross-calculation can be done. When defining a row, the question "O.K. to set values from Column Calculations?" will be asked. Type  if none of the data items in the row being defined are allowed to be the direct result of a column calculation, otherwise press . When defining a column, the question "O.K. to set values from Row calculations?" will be asked. Type  if none of the data items in the column being defined are allowed to be the direct result of a row calculation, otherwise press .

A fifth parameter, Editing Format, must be specified for either rows or columns in accordance with the formatting option chosen earlier in the Form definition process. One may specify the print format to be used to display or print Form data. Each numeric field will hold thirteen characters and no more than eleven may be to the right of the decimal point.

Example: 1234.567	Editing Format	Result
	###	***
	####	1235
	####.#	1234.6
	####.##	1234.567

- \*Note> If a number will not fit in its specified field asterisks will be displayed.
- \*Note> Rounding is done only on the display of the number and not on the number's internal representation.

If formatting is specified by rows, no prompts for editing columns will appear, and the reverse is true if formatting is specified by columns.

A fourth parameter, Calculate string, will be promoted if the type of a row, or column, is specified as I or F. Simple arithmetic relationships may be expressed using the algebraic operators, + - / \* ^ ( ^ is exponentiation), row or column numbers, parenthesis to force the precedence of operators and any constants if needed as explained earlier. The exponentiation operator has the highest precedence, then multiplication and division and then addition and subtraction. Sequences of operators of the same precedence are executed from left to right.

Calculate examples:

1. Row 3 is to be the sum of rows 1 and 2. Row 3 is declared to be type I and the calculate string is entered as simply 1 + 2.
2. Column 1 is to be divided by column 8 and added to column 5 giving column 12. Column 12 must be declared as type I (or type F) and the calculate string is 1 / 8 + 5. Other possibilities that will give the same result are ( 1 / 8 ) + 5 and 5 + 1 / 8.
3. Row 4 is the product of row 1 and row 2 divided by 1000 and minus row 3. A constant must have been pre-defined as 1000. Assume it is the only constant for this Form, therefore it is constant (1). Row 4 is declared type I and the calculate string ((1 \* 2) / C1) - 3.

\*Note> If automatic month headings for either rows or columns are specified, the parameters are preset, and all prompts are skipped.

\*Note> If checkpoint prompts are suppressed, the user is not given the opportunity to change any of the row or column parameters during Form definition.

Upon completion of the row and column parameter definition sequences, the program will update the Form control file and create a data file initialized with no values.

The Form is now stored and ready for use, and the user is returned to the main menu.

### 1.3 DATA ENTRY PROCEDURES

#### 1.3.1 How to Update Form Data

FREEFORM's data entry procedure, allows a user to change values stored in a Form, compute those rows or columns which have prescribed calculations, prepare printed copies of the Form for presentation, and store the results for future reference.

To invoke the Form DATA ENTRY procedure, select menu option number 0.

.....

FREEFORM The Electronic Worksheet [F.4]

By S. Dale Ander

June 24, 1981

- 0. Data Entry Procedure      <==== Form update procedure
- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.

Enter desired option # \_      Press CONTROL to leave

.....

Once the program has loaded, the screen will clear and a new title will be displayed.

### FREEFORM DATA ENTRY

\*Note> If FREEFORM does not find a 'directory' file on its first try (FREEFORM searches on the prefix disk unless another drive was previously specified), it displays an error message stating there is no directory. If this happens, FREEFORM will ask if it should try another disk. If so press <enter> otherwise type <N>. If <enter> was pressed the program will prompt for the disk drive number to search in for a directory file. After receiving a valid disk drive number, the program will instruct the user to insert a disk into that drive and press <enter>.

\*Note> To avoid confusion, review the Standard Keyboard Procedures (1.1.3).



The program then displays the prompt...

\*\*\* Form Name (8 alpha max.) \_\_\_\_\_ Press CONTROL to leave

There are three possible responses to this command. Press <Control> C to return to the FREEFORM main menu, supply a Form name, or press <?>. Each time <?> is pressed FREEFORM looks at the FreeForm directory and displays a possible Form name. If a selected Form name is not found on the user diskette, the prompt:

\*\*\* Form named <name given> not found...  
\*\*\* Try another Form name? (Y/N) Y

will appear. The user may now try another Form name, by supplying the desired Form name in the manner previously described. If a user chooses not to select another Form name by typing <N>, control will return to the FREEFORM main menu.

If the Form name selected is valid, however, the program will continue its normal progress and inform the user that the Form controls are being loaded.

Data in a Form may be accessed on any plane: row-column, page-column, or row-page. Data may be listed and entered on any plane but a work file may be used, and Math can be done, only when data is accessed on the row-column plane. To access data on the row-column plane press <Y> in response to the following prompt:

\*\*\* Access Data by Pages ? (Y/N) N

If <Enter> or <N> is pressed FREEFORM will ask if the data is to be accessed by Columns (the row-page plane) and then by Rows (the page-column plane). If data is accessed by Pages then the program will prompt:

\*\*\* Use a Work File ? (Y/N) Y

If a work file is used the program will always copy the data in the page being worked on into a separate file. This protects the original information in a page from any changes made. The contents of the work file may, or may not, be saved. If a work file is not used the original data is used and modified when changes are made to the pages. It may not be impossible to use a work file if there is not enough room on the data disk. If this is the case Freeform will display an error message.

If there is more than one page (or column or row depending upon the plane of access chosen) in the selected Form then the program will ask for the page (or column or row) to read in. For example if access is by Pages then FREEFORM will prompt:

\*\*\* Enter Page # 1 (max. XX)

XX is the number of pages defined for the selected Form. If this is a "Map page" to be used with the Planline to Freeform Interface Program (PuFF) then end the page number entered with the letter M.

The program will now display the selected plane of the Form on the screen. The title of the page (or column or row description depending on the access plane)



will appear on the first line of the screen. The column descriptions (or page numbers if access is by Columns) will appear on the third line. The row descriptions (or page numbers if access is by Rows) will be displayed along the left-hand side of the screen and if data has never been stored in the Form, dashes (a dash means no value or null) will appear at each data element position. The position at the intersection of the left most column and uppermost row is known as the Anchor position.

Finally, the command line

\*\*\* Enter Command =>           A,U,M,Z,N,L,S,<CONTROL> <C> (H for Help)

will appear below the form. Each of the letters and the <Control> <C> key represent a data entry command. When one of the letters is pressed the appropriate command will be executed. A description of each of the commands follows.

### 1.3.2 A - Anchor

As many rows and columns of data as the screen size allows will be displayed. In order to move beyond this physical screen size limit, a concept called the 'anchor' provides the bridge between the Form and the screen. By changing the value of the anchor, it is possible to access, display, and update any portion of a Form.

The anchor command calls in a routine which allows the user to change the current value of the anchor. The anchor is specified by giving a page number, row number and column number. Two levels of modifying the anchor exist; one from the command line, and one as described below in the update mode. The command mode allows the changing of pages, whereas the update mode keeps the same page and only resets row and column.

Upon pressing A in response to the command prompt, the current anchor coordinates will be displayed. To change a value, simply type over the appropriate coordinates with the new values.

### 1.3.3 U - Update

When the <U> is typed, the cursor will immediately move to the first data element position. The user is now ready to enter data into that portion of the Form appearing on the screen. Do not enter commas, when entering numbers. When data has been entered, press <enter>, <space>, <cursor-up>, <left>, <down>, <right>, <control> <D>, or <control> <C>. If the Form is formatted by row, the cursor will move to the right one data element position in the same row when <space> or <control> <D> are pressed. When the last data element position in a row is reached, the cursor moves to the leftmost data element position in the next data row. Similarly, if the Form is formatted by column, the cursor moves to the next element of the same data column when <space> or <control> <D> are pressed. When the last data element position has been entered the cursor will again move to the very first data element position of the next data column.

### 1.3.4 The Keyboard

The use of the keyboard is restricted during update. There are only a few special keys, other than the numbers, that can be utilized during update. Move directly to a data element on the screen by using one of the following combination of keys.

**<Cursor-Left>** moves the cursor left one element position. If the cursor is in the leftmost element position of a row, it will move to the rightmost element position of the next row.

**<Cursor-Down>** moves the cursor down one data element position. If the cursor is in the bottom element position of a column, it will move to the top element position of the next column.

**<Cursor-Up>** moves the cursor up one data element position. If the cursor is in the top element position of a column, it will move to the bottom element position of the next column.

**<Cursor-Right>** moves the cursor right one element position. If the cursor is in the rightmost element position of a row, it will move to the leftmost element position of the next row.

**<control> <c>** exits update mode and returns to the command line.

**<A>** automatically resets the anchor position to the coordinates specified by the cursor position. The screen will clear and the Form will be redisplayed at the new anchor.

\*<Note> The <enter>, <space>, <control> <D>, <cursor right>, <cursor left>, <cursor up>, <cursor down>, and <A> keys terminate a numeric field for transmittal to the data entry program.

\*<Note> the program prevents the user from moving the cursor to an element that is in a row of type heading.

\*<Note> The commands U and A, described above, only effect that portion of the Form which is currently displayed on the screen. The following commands affect the currently anchored page.

### 1.3.5 M - Math

From the command line, press <M> and the computer performs all the prescribed calculations which have been defined for the rows and/or columns of the page. The number and complexity of stored calculations, and the number of rows and columns defined in the Form will effect the speed with which the calculations are performed. In any case, it is many times faster than manually keying the data into a calculator.

### 1.3.6 S - Save

The Save command only works if a workfile is being used. To save the current page, type <S> from the command line and the information in the workfile will be transferred to the Form data file. Upon completion, the command line will be redisplayed and the user may continue.

### 1.3.7 Z - Zero

This command sets specified elements of the current plane to zero. The specific data items to set to zero are determined by giving first a sequence or sequences of rows (or pages) to zero and then a sequence or sequences of columns (or pages) to zero. If access is by Pages, or Columns, Freeform will first prompt

\*\*\* Enter sequences of Rows (XX-XX,YY-YY) to Zero below (there are XX)  
\*\*\*

---

The number shown in 'there are XX' tells how many rows the Form contains. For example to set all of row two to zeros enter 2 and press <enter>. Next Freeform prompts for sequences of columns, or pages to Zero. Enter 1 followed by a dash followed by the number of columns, or pages, in the Form, then press <enter>.

### 1.3.8 N - Nullify

This command sets specified elements of the current plane to null. The specific data items to nullify are set in the same manner as in the Zero command (see 1.3.7).

### 1.3.9 L - List

The listing command allows for the printing of reports for use in presentations. The response to the L command by FREEFORM is:

\*\*\* Is there a Control file to use ? (Y/N) N

FREEFORM allows the listing controls (page, row and column specifications, titles, and footing gathered at List time) to be saved in a text file which is referred to as a Control file. To use a Control file, type <Y>. FREEFORM will prompt for the file name of the Control file. If <control> <C> is pressed the Data Entry command line is redisplayed. If the file name entered is not available, the program will prompt for the file name again. When a Control file is used FREEFORM will use the values read as default values when the listing controls are gathered.

\*\*\* Enter sequences of Rows (XX-XX,YY-YY) to List below (there are XX)  
\*\*\*

---

For example to list rows one through ten, row thirteen, and rows 25 through 20 enter

1-10, 13, 25-20

Next a prompt to obtain sequences of columns will appear. An error message will be displayed if an invalid page, row or column is selected, more than the

**Freeform [F.4]  
Data Entry Procedures  
6/81**

maximum number of pages, rows or columns in a Form are selected to be listed, or more columns of data are selected than will fit in the specified line size. If access is by Pages then the rows and columns to list will be gathered, otherwise if access is by Columns the rows and pages to list will be gathered, otherwise access is by Rows and the pages and columns to list will be gathered.

Three title lines and a footing are then prompted. The three additional title lines are provided in addition to the stored page title and column headings. If entered, all titles will be automatically centered above the body of the Form. The page footing will be flush left at the bottom of the page. This feature is optional and must be entered each time the report is to be printed.

**FREEFORM** then prompts

\*\*\* Save this Information in a Control file (Y/N) N

To save the listing controls specified, type <Y> otherwise press <enter>.

The following prompt then appears

\*\*\* List to the printer ? (Y/N) Y

If <enter> is pressed then the user is asked how many characters will fit on one line and how many lines will fit per page and is then advised to set the printer alignment and press <enter>. After printing, the page will eject and control will return to the command line.

If <N> is pressed then **FREEFORM** assumes that the user wishes to send the output to a disk file. A file title consisting of a Volume name and a File name (a type of TEXT is used automatically) are prompted for until **FREEFORM** can 'open up' the file specified for output or <control> <C> is pressed. If a file is 'opened' successfully, the user is asked if the output is to be for Word Processing. The user should type <Y> if it is wished to have Text Formatter commands and tab characters in the output file.

When the Listing is complete **FREEFORM** will redisplay the Data Entry command line.

### 1.3.10 H - Help

This command will display a brief explanation of valid **FREEFORM** data entry commands, one line at a time.

### 1.3.11 <control> <C> - Escape

The command line services the <control> <C> key in the usual manner, when pressed **FREEFORM** will return to the main menu.

## 1.4 DIRECTORY AND CONTROL FILES

### 1.4.1 How to List the Freeform Directory

By selecting Menu Option #3 (Display or List Directory) from the main menu, the user can get a display or printed listing of the currently stored Forms on the FREEFORM disk. This is useful for keeping track of which diskette has which Forms stored on it. If FREEFORM does not find a FREEFORM directory on the first disk it searches, the program will advise and allow the user to specify a disk drive to look in and to insert another disk or opt to abort. If a valid directory file is found, the user is allowed to select display or hardcopy listing. It is a good idea to periodically print directory listings of all FREEFORM diskettes to maintain a current catalogue of all the files on the disks.

### 1.4.2 How to List or Display Controls

Function Menu Option #4 (Display or List Form controls) gives either a printout or display of the controls for a Form stored on the currently logged user disk. The prompts for doing so are straightforward.

As in most FREEFORM programs the user is prompted to supply the Form name. After being entered the prompt below appears.

\*\*\* Listing on Printer? (Y/N) N

To display the controls on the console, press <enter>. After each screen is displayed the user is prompted to press <enter>. This allows plenty of time to study each screen.

To get a printout of the Form controls, press a <Y>. The user may then set the printer alignment and press <enter> when ready. The controls will be read from the control file for the requested Form and printed in a readable format. It is suggested that files of such listings be maintained for each Form used. This will save time in the event it is necessary to redefine or modify a Form.

When the requested Form controls have been displayed or printed, control will pass to the FREEFORM main menu.



## 1.5 CONTROLS MODIFICATION PROCEDURES

### 1.5.1 How to Modify a Form

Modifying a Form involves changing the dimensions of existing Forms that are stored in the Form control files.

\*<Note> Review the procedures described in the Form Definition Procedures section (1.2) as use of the modification program requires that the user be completely familiar with it.

The Form modification program allows the user to: change the dimensions and other attributes of a Form, change the row and column descriptions and calculations to be performed and load the control file accordingly. The formatting of a Form cannot be changed.

### 1.5.2 Calling the Modify Procedure

To invoke the Form modification procedure select menu option number 2.

.....  
FREEFORM The Electronic Worksheet [F.4]

=====  
By S. Dale Ander

June 24, 1981

0  
1  
2 Modify FORM controls <==== Form modification  
3  
4  
5  
6  
7  
8  
9

Enter desired option # \_ Press CONTROL to leave

.....  
When the program has loaded, the screen will clear and a new title will be displayed.

FREEFORM FORMS CONTROLS  
Forms Modification



\*Note> If FREEFORM does not find a 'directory' file on its first try (FREEFORM searches on the prefix disk unless another drive was previously specified), it displays an error message stating there is no directory. If this happens, FREEFORM will ask if you wish to try another disk. If so press <enter> otherwise type <N>. If <enter> was pressed the program will prompt for the disk drive number to search in for a directory file. After receiving a valid disk drive number, the program will instruct the user to insert a disk into that drive and press <enter>.

\*Note> A review of the Standard Keyboard Procedures (L1.3) is recommended.

The program then displays the prompt:

\*\*\* Form Name (8 alpha max.) \_\_\_\_\_ Press CONTROL to leave

There are three possible responses to this command. Press <control> <C> to return to the FREEFORM main menu, supply a Form name, or press <?>. Each time <?> is pressed FREEFORM looks at the FreeForm directory and displays a possible Form name. If a selected Form name is not found on the user diskette, the prompt

\*\*\* Form named <name given> not found...  
\*\*\* Try another Form name? (Y/N) Y

will appear. The user may now try another Form name by supplying the desired Form name in the manner previously described. If a user chooses not to select another Form name by typing <N>, control will return to the FREEFORM main menu.

When a valid Form name is selected FREEFORM will continue its normal progress and inform the user that the Form controls are being loaded.

### 1.5.3 Modifying a Form

The modification portion of the FREEFORM program is now entered. The program then asks whether or not it is desired to change certain controls. The change prompts are of the form:

\*\*\* Change <text>? (Y/N) N

where <text> is the control in question. If a control is to be changed respond with a <Y>, else press <enter>. Once a <Y> response is given to a change question the control may be changed in the same way as in the Form definition program. The user is allowed to do such things as inserting and/or deleting rows and columns from a form, adding pages, changing various descriptions, etc.

**EXAMPLE:**

Change Row Controls? Y

Enter row # to be modified? 23 (max. XX)

The controls for row 23 will be displayed and the user may then elect to change the fields of description, type, editing format, and calculation string as necessary. The parameters are the same as those detailed in How to Define a Form (1.2.1).

#### **1.5.4 Special Hints on Modify**

It is not possible to change the format of a Form once it has been created.

No rows or columns may be added to a Form once the maximum values set for them, at Form definition time, have been reached. It is possible to use the Copy utility (see 1.6.3) to create a new Form, just like the old one but, with larger maximums for either the number of rows, or columns, or both. It will then be possible to add rows, or columns, to the new Form.

To add pages to a Form there has to be fewer than 100 pages in it already and there must be empty space on the data disk immediately below the data file that is to be extended. To create empty space below the data file use the Extended List Directory command and note the block number just below the data file. Then use the Compress Disk command and Compress, not the whole disk but, from the block number noted.

#### **1.5.5 Exiting the Modify Program**

After modifications for a Form have been completed, the program will return to the FREEFORM main menu.

## 1.6 ROLL, COPY AND DELETE UTILITIES

### 1.6.1 How to Use the Roll, Copy and Delete Utilities

The purpose of the roll utility is to allow the user to change, to some degree, the order in which rows and/or columns appear in a form. The copy utility offers the user the capability of setting up duplicate Forms under different Form names without having to repeat Form definition. Using Copy is also a way of expanding the limits set on the numbers of rows and columns of a Form which are set at Form definition time. The delete utility will delete a Form from the 'directory' file and erase the control and data files associated with that Form.

\*Note> To avoid confusion review Standard Keyboard Procedures (1.1.3).

To invoke the ROLL, COPY or DELETE procedures, select the proper menu option number.

\*\*\*\*\*

FREEFORM The Electronic Worksheet [F.4]

By S. Dale Ander

June 24, 1981

- 0.
- 1.
- 2.
- 3.
- 4.
- 5.
- 6. Roll a FORM           <==== ROLL procedure
- 7. Copy a FORM           <==== COPY procedure
- 8. Delete a FORM         <==== DELETE procedure
- 9.

Enter desired option #           Press CONTROL to leave

\*\*\*\*\*

When the program has loaded, the screen will clear and a new title will be displayed.

\*Note> If FREEFORM does not find a 'directory' file on its first try (FREEFORM searches on the prefix disk unless another drive was previously specified), it displays an error message stating there is no directory. If this happens, FREEFORM will ask if you wish to try another disk. If so, press <enter> otherwise type <N>. If <enter> is pressed the program will prompt for the disk drive number to search for a directory file. After receiving a valid disk drive number, the program will instruct the user to insert a disk into that drive and press <enter>.

## 1.6.2 Roll

\*Note\* This option best applies to Forms used in trending information.

As stated at the beginning of this module, the roll allows the user to change, to some degree, the order in which rows and columns appear in a Form. An easy way of seeing this is by example. If a Form has the following column headings

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

By using the roll option one may change this to

APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR

by 'rolling' 3 columns to the left. Of course, whenever a heading is moved, the data associated with that heading is moved as well.

\*Note\* Calculation strings are adjusted when they are moved.

The program will respond to the user's request for a roll with the prompt:

\*\*\* Form name (8 alpha max.) \_\_\_\_\_ Press CONTROL to leave

If the requested Form is not found on the current diskette, a standard error message will be displayed. The user may try a different Form name, use the ? option, or elect to return to the main menu. If the Form is found, the process continues.

\*\*\* Roll rows or columns? (R/C) C

To roll rows type <R>. If column rolls are desired, press <enter> only.

This prompt appears if the roll column option has been selected.

\*\*\* Roll columns left or right? (L/R) L

The columns will move in the specified direction. The program will then ask how many columns are to be rolled.

For example, if prior to the roll the headings are:

JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

and the response to the above prompts is as follows:

\*\*\* Roll rows or columns? (R/C) C

\*\*\* Roll columns left or right? (L/R) L

\*\*\* Roll 03 columns left....(enter number)

The result will be:

APR MAY JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR

Row rolls are like column rolls, except that the user is asked to specify how many rows are to be rolled and whether they are to be rolled up or down.

When the roll has been completed, control will be returned to the FREEFORM main menu.

### 1.6.3 Copy

The Copy command is very powerful, and if the instructions provided by FREEFORM are followed, it is very simple to use. Forms, pages of Forms, portions of Forms, and portions of pages of Forms, may be copied to Forms that already exist or used to create new Forms. Form controls do not have to match to do these copies and Forms may be copied onto different disks.

After the Copy command is given, the prompt:

\*\*\* Copy from one disk to another ? (Y/N) N

will be displayed. Type <Y> if information is going to be transferred from one disk to another, otherwise press <enter>. If <Y> was pressed, then the program will prompt to find out which drive the source and destination disks will be placed in.

\*<Note> The user should not do any disk swapping until instructed by FREEFORM to do so. When swapping is done, it should be done very carefully so as not to confuse the source with the destination disks.

The program will prompt:

\*\*\* Copy a Form or just Pages ? (F/P) F

If only the pages from an existing Form are to be copied to another existing Form, on the same or different disk, type <P>, otherwise press <enter> to create a new Form from an old one.

Then FREEFORM prompts:

\*\*\* Copy a Complete page or Portions of a page ? (C/P) C

A subset of one Form may be used to create a new Form or a subset of each page of an existing form may be copied into an existing Form. To copy portions of pages type <P>, otherwise press <enter> and whole page(s) will be copied.

If information is being copied from one disk to another the program will at this time instruct the user to insert the destination disk into the drive that was specified previously.

FREEFORM now prompts:



\*\*\* Destination Form name  
\*\*\* Form name (8 alpha max.) \_\_\_\_\_ Press CONTROL to leave

This Form is referred to as the Destination Form. The name of an existing Form must be given if only a single page is being copied. Note that a question mark may be typed and FREEFORM will supply a name of an existing Form on the destination disk. If a new Form is being created the question mark option does not work because FREEFORM expects to be given the name of a Form that does not exist. If the Destination Form name already exists on the current diskette, an error message will appear.

If information is being copied from one disk to another the program will at this time instruct the user to insert the source disk into the drive that was specified previously.

Then FREEFORM prompts:

\*\*\* Source Form name  
\*\*\* Form name (8 alpha max.) \_\_\_\_\_ Press CONTROL to leave

Respond with a valid, existing Form name (the question mark option may be used to find the proper Form name). This Form is referred to as the Source Form. If the requested Form is not found on the current diskette, a standard error message will be displayed. The user may try a different Form name or elect to return to the main menu. If the Form is found, the process continues with the prompt:

\*\*\* Searching for Source FORM files, one moment please...

If the contents of one Form are being copied to another Form (the Just Pages option) then Freeform will prompt for starting locations to put the copied pages, rows, and columns. For example to copy pages one through four of the source Form into pages two through five of the destination Form the answer to the place to start putting the pages would be two. Later specify that pages one through four are to be copied.

The sequences of pages, rows, and Columns of the source form to copy will be gathered as is done with the List command (L3.9) during Data Entry.

\*\*\* Enter sequences of Pages (XX-XX,YY-YY) to copy below (there are XX)  
\*\*\* \_\_\_\_\_

\*\*\* Enter sequences of Rows (XX-XX,YY-YY) to copy below (there are XX)  
\*\*\* \_\_\_\_\_

\*\*\* Enter sequences of Columns (XX-XX,YY-YY) to copy below (there are XX)  
\*\*\* \_\_\_\_\_



For example to copy pages one through four, rows one through ten, row thirteen, and row 25, and columns seven through one enter

1-4

in response to the Pages prompt, and

1-10, 13, 25

in response to the Rows prompt, and

7-1

in response to the Columns prompt.

If a new Form is being created, the program will now copy the Control files.

The Page(s) are copied now by the program, but before doing so, the user is prompted:

\*\*\* Copy or Empty data fields? (C/E) \_

The C response will cause the data in the old Form to be duplicated in the new Form. The E response will initialize all the data in the new Form to null.

When the Copy has been completed, the user is instructed to return all disks to their original drives, i.e., all disks should be back where they were before the Copy command was entered. Then, the program returns to the FREEFORM main menu.

#### 2.6.4 Delete

When the Delete command is entered, the user is prompted for a Form name. When an existing Form has been specified the prompt

\*\*\* Delete <requested form>? (Y/N) N

will be displayed on the console screen. If the Form is not to be deleted, simply press <enter>. However, if the Form is to be deleted, respond with a <Y>. At this point, the program will display an update message, the file will be removed from the directory, and the associated control and data files will be erased.

\*Note\* Once a form has been deleted, it can not be restored.

## 1.7 FORM CONSOLIDATION

FREEFORM provides a facility for numerical consolidation of multi-page Forms. Consolidation sequencing is not preset and may be changed at will. Typical applications for consolidation would be instances where the same data is prepared for multiple entities and the summation to one or more overall entity levels is desired.

Prior to Form definition of a multi-page Form, consider the extra pages needed to serve as 'scratch pads' for what-if consolidations and add these to the total number of pages required during a Form definition.

To invoke the Form CONSOLIDATE procedure select menu option number 5.

\*\*\*\*\*

FREEFORM The Electronic Worksheet [F.4]

By S. Dale Ander

June 24, 1981

- 0.
- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.

Consolidation Utility

=====> CONSOLIDATE routine

Enter desired option # \_ Press CONTROL to leave

\*\*\*\*\*

Once the program has loaded, the screen will clear and a new title will be displayed.

## FREEFORM CONSOLIDATION

\*Note> If FREEFORM does not find a 'directory' file on its first try (FREEFORM searches on the prefix disk unless another drive was previously specified), it displays an error message stating there is no directory. If this happens, FREEFORM will ask if you wish to try another disk. If so press <enter>; otherwise type <N>. If <enter> was pressed, the program will prompt for the disk drive number to search in for a directory file. After receiving a valid disk drive number, the program will instruct the user to insert a disk into that drive and press <enter>.

\*Note> To avoid confusion, review the Standard Keyboard Procedures (1.1.3).

The program then displays the prompt...

\*\*\*Form Name (8 alpha max.) \_\_\_\_\_ Press CONTROL to leave

There are three possible responses to this command. Press <control> <D> to return to the FREEFORM main menu, supply a Form name, or press <?>. Each time <?> is pressed FREEFORM looks at the FreeForm directory and displays a possible Form name. If a selected Form name is not found on the user diskette, the prompt

\*\*\* Form named <name given> not found...  
\*\*\* Try another Form name? (Y/N) Y

will appear. The user may now try another Form name by supplying the desired Form name in the manner previously described. If a user chooses not to select another Form name by typing <N>, control will return to the FREEFORM main menu.

If the Form name selected is valid, the program will operate normally and inform the user that the Form controls are being loaded. Freeform then asks if there is a control file to use. Consolidation control files contain the destination page number as well as the consolidation expression to use. To use an existing control file the Volume name of the disk it is on and its name must be specified. When this has been accomplished the program will prompt:

\*\*\* Enter Consolidation Page # \_\_ (max. is XX)

Enter the page number into which the results of the consolidation are to be stored. This should be done carefully to avoid unintentionally writing over other pages.

\*\*\* Enter Consolidation Control

\*\*\*=

A prompt is given for a calculation string which will govern the consolidation process. The syntax and capabilities of this calculate string are similar to those used in defining row and column calculations. Constants may be specified. Parenthesis are not permitted though and all operators are of equal precedence and are therefore executed in left-to-right order.

Examples:

- (1) Pages 1, 2, and 3 represent three department profit and loss statements. A division total profit and loss statement is requested for the three pages. In FORMDEF, 4 pages are allocated; 1 for each department, and 1 for a division total. The consolidation page for this problem is 4. The calculation string which defines the consolidation control is 1 + 2 + 3.
- (2) If, on the other hand, the division total and department 1 and 2 data is known, the objective would be to compute or 'squeeze' department 3 data. The consolidation page for this would be 3, and the appropriate calculation string would be 4 - 1 - 2.

- (3) A different Form may contain inventory in Dollar amounts in page one. To get the amounts in British pounds in page two a constant would have to exist containing the exchange rate for Dollars and Pounds. Suppose C1 equals 2.1900. The appropriate calculation string would be 2 / C1 with the consolidation page set to two.
- (4) The inventory of 12 items in seven warehouses exists. Three of the warehouses are in Texas, two are in Oklahoma, and two are in Louisiana. A record of beginning inventory, issues, receipts, and computed ending inventory by item in each warehouse, a total of all items in each state, and a grand total of all warehouses has been requested. The Form to define would consist of 11 pages; one for each warehouse, one for each state total, and one for a total of all warehouses. Each page would have 12 data rows to represent each of the 12 inventory items and one calculated row to total the 12 items, plus three data columns in which the quantities would be entered and one column for computing the ending inventories. The user would probably want to sequence the pages so the display would be most meaningful. Any sequence will work. Some examples are:

	Sequence #1	Sequence #2	Sequence #3
pg 1	Tex. WH 1	Tex. WH 1	Grand Tot.
pg 2	Tex. WH 2	Tex. WH 2	Tex. SUB
pg 3	Tex. WH 3	Tex. WH 3	Okla. SUB
pg 4	Okla. WH 1	Tex. SUB	La. SUB
pg 5	Okla. WH 2	Okla. WH 1	Tex. WH 1
pg 6	La. WH 1	Okla. WH 2	Tex. WH 2
pg 7	La. WH 2	Okla. SUB	Tex. WH 3
pg 8	Tex. SUB	La. WH 1	Okla. WH 1
pg 9	Okla. SUB	La. WH 2	Okla. WH 2
pg10	La. SUB	La. SUB	La. WH 1
pg11	Grand Tot.	Grand Tot.	La. WH 2

The consolidation controls and sequence for these cases:

8 = 1 + 2 + 3	4 = 1 + 2 + 3	2 = 5 + 6 + 7
9 = 4 + 5	7 = 5 + 6	3 = 8 + 9
10 = 6 + 7	10 = 8 + 9	4 = 10 + 11
11 = 8 + 9 + 10	11 = 4 + 7 + 10	1 = 2 + 3 + 4

\*<Note> The user may want to define an extra page to be used as a scratchpad for hypothetical cases; for example, in the inventory example above, Tex. WH 1 and La. WH 2 are both within 100 miles of a customer. What is the total supply of item 6 available in these locations?

After the consolidation string is entered, the program will perform the prescribed consolidation math and rewrite the consolidation page to the Form data file.

When this process has completed (time required will vary with the number of pages in the consolidation and the number of calculated rows and columns in the Form), FREEFORM will ask if the consolidation controls used should be saved. It will then ask if there are more consolidations to be done with the current Form. When there are no more consolidations to be done with the current Form FREEFORM will return to the main menu.





## 1.8 FORM CREATION EXAMPLE

The following instructions will create a Form which could be used in doing a financial Forecast.

Step one is to set the Prefix to whichever Volume FREEFORM is to put the 'directory' file on or to the disk which already contains a FREEFORM directory. This can be done with the command /SP (Set Prefix) while in Menu mode or while in the Filer program using the Prefix command.

Step two is to execute FREEFORM. This is done with the command /FF from the menu system or by executing the code file FF/VER4.

The following exchange will then take place:

FREEFORM: Puts up FREEFORM main menu.

User Enters: 1

Explanation: Selected Define new FORM controls option.

FREEFORM: Enters Forms control Mode, creates FREEFORM directory if one was not found on the prefixed disk, and prompts for a Form name.

Form Name (8 alpha max.) \_\_\_\_\_

User Enters: FORECAST<enter>

Explanation: User named Form FORECAST.

FREEFORM: Are checkpoint prompts desired? N

User Enters: Y

Explanation: This turns on the Checkpoint option. With the Checkpoint option on, FREEFORM will give the option of re-entering a bad input. An experienced user will normally press <enter> so this option will not be turned on.

FREEFORM: Enter user initials

User Enters: DA<enter>

Explanation: This is optional, it is O.K. to just press <enter>.

FREEFORM: Enter optional descriptive comment ->

User Enters: Forecast Form<enter>

Explanation: This comment is displayed when the FREEFORM directory is listed. This helps one recognize what a Form contains, and is therefore recommended for use, although it is optional.

FREEFORM: Enter today's date (MMDDYY) ->

User Enters: 080680<enter>

Explanation: This is displayed as the date of creation when the Form controls are listed. It is optional also.

FREEFORM: Enter Title for Page 1

User Enters: PCIF FORECAST<enter>

Explanation: Enter the title on the dashed line below the prompt. The title entered will always appear whenever page one of this Form is listed.

FREEFORM: Is Title correct? Y

User Enters: <enter>

Explanation: Yes is the default. If the Title was entered incorrectly type <N> and re-enter the Title.

FREEFORM: This title will be written to the disk. FREEFORM then prompts

Enter Description for Row 1 \_\_\_\_\_

User Enters: EX PEOPLE<enter>

Explanation:

FREEFORM: Enter 1 Type (D/I/F/H) D

User Enters: <enter>

Explanation: This is where the option of defining a Row as Data, Initial calculation, Final calculation or Heading is given. Data is the default and was chosen.

FREEFORM: O.K. to set values from Column calculations? Y

User Enters: N

Explanation: There are going to be quarterly totals of monies, however when dealing with people it is not wished (in this Form) to add them up column-wise. Therefore it is not okay to set values from column calculations in this row. This will be more evident when the Form is finished and being used.

FREEFORM: Enter Row 1 Editing Format ###.##\_

User Enters: ##<erase input><enter>

Explanation: Just defined the field to be two digits wide. This row will be able to store integers in the range -99 through 99. A user must define the field to have at least one digit to the left of the decimal point and at most four digits to the right of the decimal point.

FREEFORM: Are Controls for Row 1 o.k.? Y

User Enters: <enter>

Explanation: Type <N> If an error was made while defining the controls for Row one and all questions asked to describe it will be repeated.

**FREEFORM:** How many pages?

**User Enters:** 1<enter>

**Explanation:** Only one page is wanted in this Form. If more are wanted later, it is possible to add them.

**FREEFORM:** Format Rows or Columns? R

**User Enters:** <enter>

**Explanation:** Form will be formatted by Row because R is the default. Row formatting lets the user define the decimal point position for an entire row, one row at a time. This means that the number of digits to the left and the right of the decimal point will not vary across a row but may vary down a column. With column formatting, the number of digits to the left and the right of the decimal point is fixed for each column but may vary across a row. In either case all numbers will line up when the form and its data are printed.

**FREEFORM:** Do you want automatic month descriptions? N

**User Enters:** Y

**Explanation:** This is a forecast and will contain monthly information as well as a year and quarterly totals. The columns containing the totals will be added to the Form after the initial definition is complete. For now only the columns with month names for headings will be put into the Form.

**FREEFORM:** Month descriptions for rows or columns? C

**User Enters:** <enter>

**Explanation:** Descriptions will be for the columns because C is the default.

**FREEFORM:** Enter starting month # 1

**User Enters:** <enter>

**Explanation:** The first column will be labeled Jan (one was the default) and the last will be labeled Dec. It is possible to start with any month by picking a different number in the range one through twelve.

**FREEFORM:** How many Calculation Constants?

**User Enters:** 1<enter>

**Explanation:** One constant wanted.

FREEFORM: CONSTANT(1) = -

User Enters: .95<enter>

Explanation: FREEFORM will set C1 equal to 0.9500.

FREEFORM: Anything to change? N

User Enters: <enter>

Explanation: Default is N. If something had been entered wrong so far <Y> should be typed. If <Y> is pressed FREEFORM will run through all questions asked so far again. This question would not have been asked if the Checkpoint option had not been turned on.

FREEFORM: How many columns might ever be in the FORM?

User Enters: 20<enter>

Explanation: In this Form a total of 17 columns will be used. By responding with 20 there will be a little room for expansion later.

FREEFORM: How many row might ever be in the FORM?

User Enters: 40<enter>

Explanation: A total of nine rows will be used in this Form now. By telling Freeform 30 there will be plenty of room for expansion.

FREEFORM: How many columns?

User Enters: 12<enter>

Explanation: Twelve columns are desired in this Form, one for each month. Quarterly totals will be added later.

FREEFORM: How many rows?

User Enters: 9<enter>

Explanation: Nine rows are desired in this Form.

FREEFORM: Are the dimensions o.k. as specified? Y

User Enters: <enter>

Explanation: To change the number of rows or columns just specified type **QD**.

FREEFORM: Updating directory ...one moment, please

Creating Control and Data files ...one moment, please

User:

Explanation: These are displayed while FREEFORM writes the information just given it into the FREEFORM directory. FREEFORM then creates new Control and Data files.

FREEFORM: Enter Description for Row 2 \_\_\_\_\_

User Enters: NON-EX PEOPLE<enter>

Explanation: This is the description for Row two. Answer all the rest of the questions about Row two in the same way as for Row one.

FREEFORM: Enter Description for Row 3 \_\_\_\_\_

User Enters: <enter>

Explanation: You want to have a blank line before Row four. The Row type will be the heading.

FREEFORM: Enter 3 Type (D/I/F/H) D

User Enters: H

Explanation: Row type of heading was chosen.

FREEFORM: Are Controls for Row 3 o.k.? Y

User Enters: <enter>

Explanation: Type <N> if an error was made while defining the controls for Row three, and all questions asked to describe it will be repeated.

FREEFORM: Enter Description for Row 4 \_\_\_\_\_

User Enters: TOTAL PEOPLE<enter>

Explanation:

FREEFORM: Enter 4 Type (D/I/F/H) D

User Enters: I

Explanation: This is to be a Initial calculation row.

FREEFORM: = \_\_\_\_\_

User Enters: 1 + 2<enter>

Explanation: This tells FREEFORM that Row four is the sum of Row one and Row two.

FREEFORM: O.K. to set values from Column calculations? Y

User Enters: N

Explanation:

FREEFORM: Enter Row 4 Editing Format ## \_\_\_\_\_

User Enters: <enter>

Explanation: This defines the field to be two digits wide as the default was ##.

Freeform (F.4)  
Form Creation Example  
6/81

FREEFORM: Are Controls for Row 4 o.k.? Y

User Enters: <enter>

Explanation: Type <N> if an error was made while defining the controls for Row four, and all questions asked to describe it will be repeated.

FREEFORM: Enter Description for Row 5 \_\_\_\_\_

User Enters: <enter>

Explanation: You want to have a blank line before Row six just like the one before Row four.

FREEFORM: Enter 5 Type (D/I/F/H) D

User Enters: H

Explanation:

FREEFORM: Are Controls for Row 5 o.k.? Y

User Enters: <enter>

Explanation: Type <N> if an error was made while defining the controls for Row five and all questions asked to describe it will be repeated.

FREEFORM: Enter Description for Row 6 \_\_\_\_\_

User Enters: LABOR<enter>

Explanation:

FREEFORM: Enter 6 Type (D/I/F/H) D

User Enters: <enter>

Explanation: This is to be a Data row (Data is the default).

FREEFORM: O.K. to set values from Column calculations? Y

User Enters: <enter>

Explanation:

FREEFORM: Enter Row 6 Editing Format ## \_\_\_\_\_

User Enters: ####.##<enter>

Explanation: You want the field to have up to four digits before the decimal point and two after it.

FREEFORM: Are Controls for Row 6 o.k.? Y

User Enters: <enter>

Explanation: Type <N> if an error was made while defining the controls for Row six and all questions asked to describe it will be repeated.



FREEFORM: Enter Description for Row 7 \_\_\_\_\_  
User Enters: LESS BILLINGS<enter>  
Explanation:

FREEFORM: Enter 7 Type (D/I/F/H) D  
User Enters: <enter>  
Explanation: This is to be a Data row (Data is the default).

FREEFORM: O.K. to set values from Column calculations? Y  
User Enters: <enter>  
Explanation:

FREEFORM: Enter Row 7 Editing Format ####.##\_  
User Enters: <enter>  
Explanation: Just defined the field to have up to four digits before the decimal point and two after it.

FREEFORM: Are Controls for Row 7 o.k.? Y  
User Enters: <enter>  
Explanation: Type <N> if an error was made while defining the controls for Row seven, and all questions asked to describe it will be repeated.

FREEFORM: Enter Description for Row 8 \_\_\_\_\_  
User Enters: <enter>  
Explanation: Want to have a blank line before Row nine just like the one before Row four.

FREEFORM: Enter 8 Type (D/I/F/H) D  
User Enters: H  
Explanation:

FREEFORM: Are Controls for Row 8 o.k.? Y  
User Enters: <enter>  
Explanation: Type <N> if an error was made while defining the controls for Row eight and all questions asked to describe it will be repeated.

FREEFORM: Enter Description for Row 9 \_\_\_\_\_  
User Enters: NET PROJECT EXP<enter>  
Explanation:

FREEFORM: Enter 9 Type (D/I/F/H) D  
User Enters: I  
Explanation: This is to be a Calculated row.

FREEFORM: =

User Enters: (6 - 7) \* C1<enter>

Explanation: This tells FREEFORM that Row nine is the Row six minus Row seven, all multiplied by C1 which is 0.95.

FREEFORM: O.K. to set values from Column calculations? Y

User Enters: <enter>

Explanation:

FREEFORM: Enter Row 9 Editing Format ####.##\_

User Enters: <enter>

Explanation: Just defined the field to have up to four digits before the decimal point and two after it.

FREEFORM: Are Controls for Row 9 o.k.? Y

User Enters: <enter>

Explanation: Type <N> if an error was made while defining the controls for Row nine, and all questions asked to describe it will be repeated.

FREEFORM: (Will ask if the controls for each column are ok, one at a time.)

User Enters: <enter> (12 times)

Explanation: FREEFORM will not let the user change column descriptions here because automatic month descriptions were asked for. Modify may be used later to change this information.

FREEFORM: FREEFORM definition process completed for FORECAST.  
FREEFORM redisplay the main menu and continues.

User Enters:

Explanation: This is done with definition part. The Form FORECAST, however, will not be complete until Quarter totals have been inserted.

FREEFORM: Enter desired option #

User Enters: 2

Explanation: Picked Modify procedure.

FREEFORM: Form Name (8 alpha max.)

User Enters: FORECAST<enter>

Explanation: It is necessary to modify the definition of the Form named FORECAST. Columns are to be inserted in the current Form to provide totals for each of the quarters and for the year's total. Quarter totals are to be inserted in reverse order. This makes entering calculation strings

simpler as the positions of the columns that are being summed have not been moved due to insertions.

**FREEFORM:** Opening Control and Data files ... one moment, please  
When the files are opened, FREEFORM will prompt  
Change User ID? N

User Enters: <enter>

Explanation: FREEFORM first tries to open the Control and Data files associated with the Form name specified once the Form name is found in the 'directory' file. Then all the 'Change' prompts appear. All 'Change' prompts default to No, so whenever it is desirable to leave a value alone, press <enter>.

**FREEFORM:** Change Form description? N

User Enters: <enter>

Explanation: Do not change it.

**FREEFORM:** Change Form creation date? N

User Enters: <enter>

Explanation: Do not change it.

**FREEFORM:** Change number of Pages? N

User Enters: <enter>

Explanation: Do not change it.

**FREEFORM:** Change number of Constants? N

User Enters: <enter>

Explanation: Do not change it.

**FREEFORM:** Change Value of a Constant? N

User Enters: <enter>

Explanation: Do not change any.

**FREEFORM:** Change Number of Rows? N

User Enters: <enter>

Explanation: Do not change it.

**FREEFORM:** Change Number of Columns? N

User Enters: Y

Explanation: Add a Column.

**FREEFORM:** Insert a Column? N

User Enters: Y

Explanation: Insert a Total column.

Freeform [F.4]  
Form Creation Example  
6/81

FREEFORM: Enter Column # to Insert After  
User Enters: 12<enter>  
Explanation: Insert the 4th quarter total.

FREEFORM: Insert how many columns ? 1  
User Enters: <enter>  
Explanation: Just want to insert one column immediately after column twelve.

FREEFORM: Enter Description for Column 13  
User Enters: 4th QTR<enter>  
Explanation:

FREEFORM: Enter 13 Type (D/I/F/H) D  
User Enters: I  
Explanation: An Initial calculation column.

FREEFORM: = \_\_\_\_\_  
User Enters: 10+11+12<enter>  
Explanation: October, November and December.

FREEFORM: O.K. to set values from Row calculations? Y  
User Enters: <enter>  
Explanation: "Yes" is the default.

FREEFORM: Delete a Column? N  
User Enters: <enter>  
Explanation: "No" is the default.

FREEFORM: Change Number of Columns? N  
User Enters: Y  
Explanation: Add a Column.

FREEFORM: Insert a Column? N  
User Enters: Y  
Explanation: Insert a Total column.

FREEFORM: Enter Column # to Insert After  
User Enters: 9<enter>  
Explanation: Insert the 3rd quarter total.

FREEFORM: Insert how many columns ? 1  
User Enters: <enter>  
Explanation: Just want to insert one column immediately after column nine.

FREEFORM: Enter Description for Column 10

User Enters: 3rd QTR<enter>

Explanation:

FREEFORM: Enter 12 Type (D/I/F/H) D

User Enters: I

Explanation: An Initial calculation column.

FREEFORM: = \_\_\_\_\_

User Enters: 7+8+9<enter>

Explanation: July, August and September.

FREEFORM: O.K. to set values from Row calculations? Y

User Enters: <enter>

Explanation: "Yes" is the default.

FREEFORM: Delete a Column? N

User Enters: <enter>

Explanation: "No" is the default.

FREEFORM: Change Number of Columns? N

User Enters: Y

Explanation: Add a Column.

FREEFORM: Insert a Column? N

User Enters: Y

Explanation: Insert a Total column.

FREEFORM: Enter Column # to Insert After

User Enters: 6<enter>

Explanation: Insert the 2nd quarter total.

FREEFORM: Insert how many columns ? 1

User Enters: <enter>

Explanation: Just want to insert one column immediately after column six.

FREEFORM: Enter Description for Column 7

User Enters: 2nd QTR<enter>

Explanation:

FREEFORM: Enter 7 Type (D/I/F/H) D

User Enters: I

Explanation: An Initial calculation column.

**Freeform [F.4]  
Form Creation Example  
6/81**

**FREEFORM: = \_\_\_\_\_**

**User Enters: 4+5+6<enter>**

**Explanation: April, May and June.**

**FREEFORM: O.K. to set values from Row calculations? Y**

**User Enters: <enter>**

**Explanation: "Yes" is the default.**

**FREEFORM: Delete a Column? N**

**User Enters: <enter>**

**Explanation: "No" is the default.**

**FREEFORM: Change Number of Columns? N**

**User Enters: Y**

**Explanation: Add a Column.**

**FREEFORM: Insert a Column? N**

**User Enters: Y**

**Explanation: Insert a Total column.**

**FREEFORM: Enter Column # to Insert After**

**User Enters: 3<enter>**

**Explanation: Insert the 1st quarter total.**

**FREEFORM: Insert how many columns ? 1**

**User Enters: <enter>**

**Explanation: Just want to insert one column immediately after column three.**

**FREEFORM: Enter Description for Column 4**

**User Enters: 1st QTR<enter>**

**Explanation:**

**FREEFORM: Enter 4 Type (D/I/F/H) D**

**User Enters: I**

**Explanation: An initial calculation column.**

**FREEFORM: = \_\_\_\_\_**

**User Enters: 1+2+3<enter>**

**Explanation: January, February and March.**

**FREEFORM: O.K. to set values from Row calculations? Y**

**User Enters: <enter>**

**Explanation: "Yes" is the default.**



FREEFORM: Delete a Column? N  
User Enters: <enter>  
Explanation: "No" is the default.

FREEFORM: Change Number of Columns? N  
User Enters: Y  
Explanation: Add a Column.

FREEFORM: Insert a Column? N  
User Enters: Y  
Explanation: Insert a Total column.

FREEFORM: Enter Column # to Insert After  
User Enters: 16<enter>  
Explanation: Insert the Year total.

FREEFORM: Insert how many columns ? 1  
User Enters: <enter>  
Explanation: Just want to insert one column immediately after column sixteen.

FREEFORM: Enter Description for Column 17  
User Enters: YEAR 1980<enter>  
Explanation:

FREEFORM: Enter 17 Type (D/I/F/H) D  
User Enters: I  
Explanation: An Initial calculation column.

FREEFORM: =  
User Enters: 4+8+12+16<enter>  
Explanation: 1st, 2nd, 3rd and 4th QTR's.

FREEFORM: O.K. to set values from Row calculations? Y  
User Enters: <enter>  
Explanation: "Yes" is the default.

FREEFORM: Delete a Column? N  
User Enters: <enter>  
Explanation: "No" is the default.

FREEFORM: Change Number of Columns? N  
User Enters: <enter>  
Explanation: Do not add any more.

**FREEFORM:** Are these new specifications ok? Y  
**User Enters:** <enter>  
**Explanation:** If a mistake has been made type QD.

**FREEFORM:** Change Page Titles? N  
**User Enters:** <enter>.  
**Explanation:** Do not change any.

**FREEFORM:** Change Row controls? N  
**User Enters:** <enter>  
**Explanation:** Do not change any.

**FREEFORM:** Change Column controls? N  
**User Enters:** <enter>  
**Explanation:** Do not change any.

**FREEFORM:** Are these new specifications ok? Y  
**User Enters:** <enter>  
**Explanation:** If a mistake has been made type QD.

**FREEFORM:** Updating Directory, Control and Data files, one moment please...

**User Enters:**

**Explanation:** The program is now updating all the mentioned files. FREEFORM will return to the main menu, and the Form named FORECAST is complete. At this point, the user can run the data entry portion of FREEFORM and enter data into the form named FORECAST. For instructions on the Data Entry procedure see Section 2.3.