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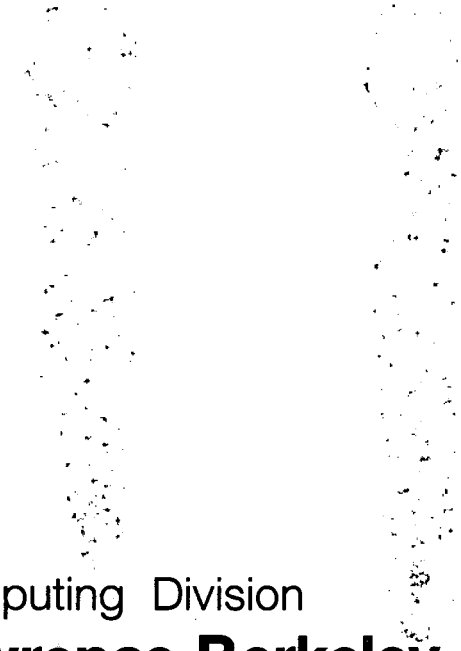
DCN/SEEDIS

The Distributed Computer Network (DCN) and Socio-Economic-Environmental Demographic Information System (SEEDIS)

An Introduction to the CHART Graphic Analysis & Display System



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DISCLAIMER

An Introduction to CHART
A Graphic Analysis and Display System

August, 1984

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Getting Started:

In This Section:

Chart is an interactive graphics program that can be used to create tables of data and to display this data as a table or as a graph. Several different graphic forms are available, including bar charts, line graphs, and pie charts.

Chart is interactive; this means that commands are typed by the user at a terminal and their effects are seen in a few seconds. It is easy to experiment with different display formats and then choose the one that displays your data most effectively. Chart also makes it easy to start with a simple table and then gradually add additional features such as titles, footnotes, and complex column headings in gradual steps. Each step gives the user a clearer idea of what the final published table or graph should look like in order to best communicate the meaning of the data.

This manual provides an introduction to using Chart and at the end of the course you will be able to produce tables and graphic displays like those shown in Figures 1 through 4.

The Introduction to Chart course assumes that the user has taken the Introduction to the Distributed Computer Network course or can demonstrate knowledge of the topics covered in that course.

Figure 1

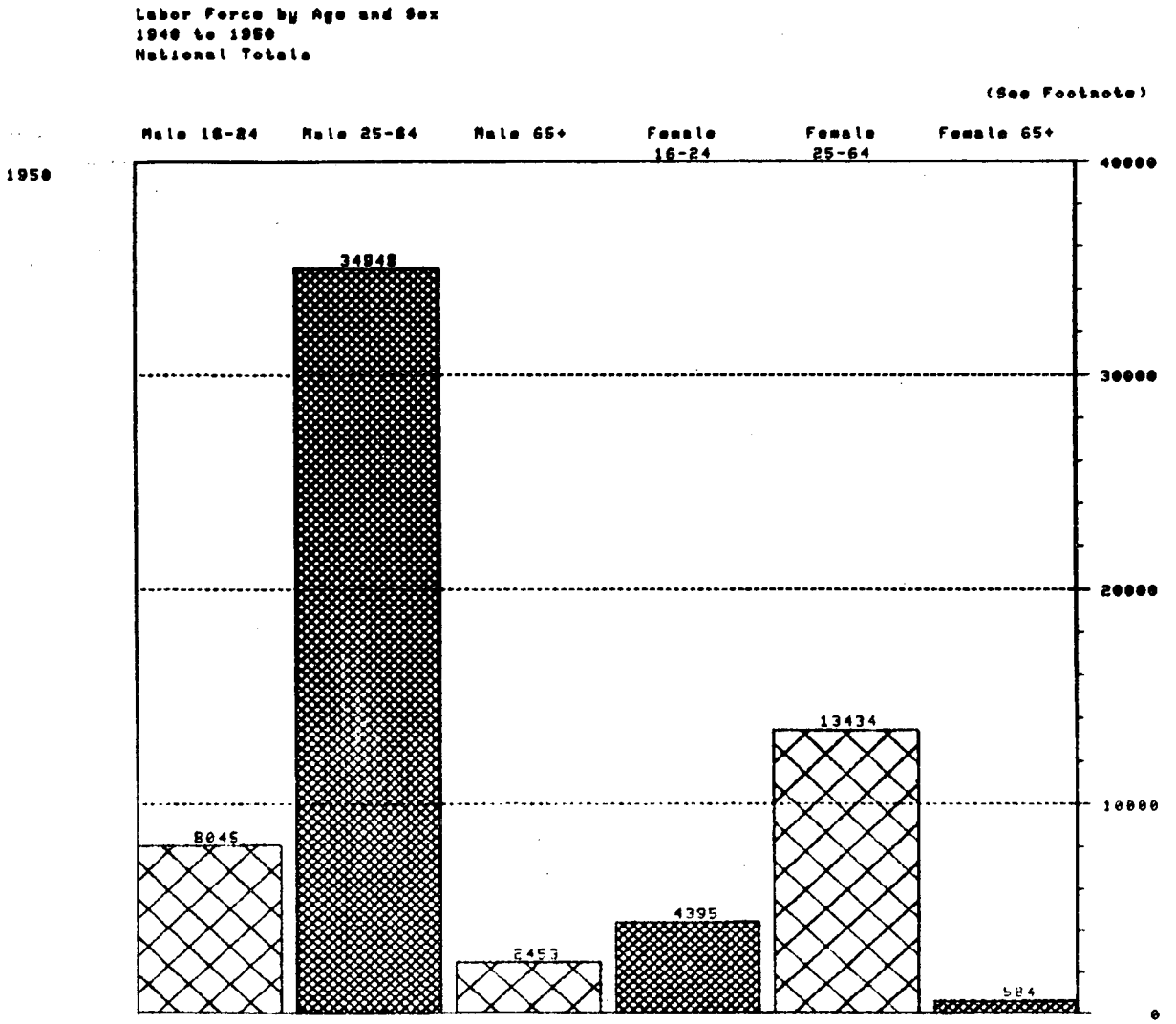
Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

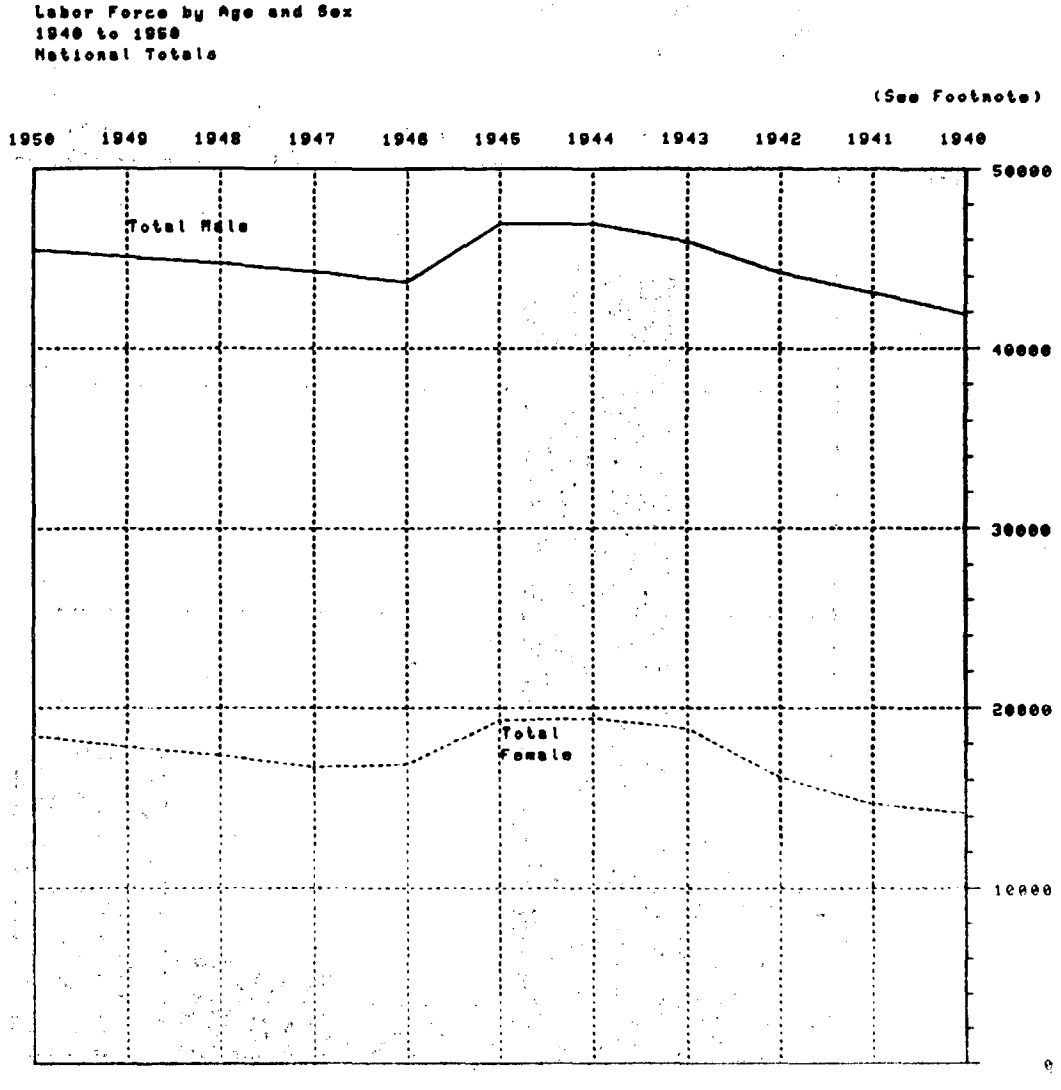
Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

Figure 2



Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

Figure 3



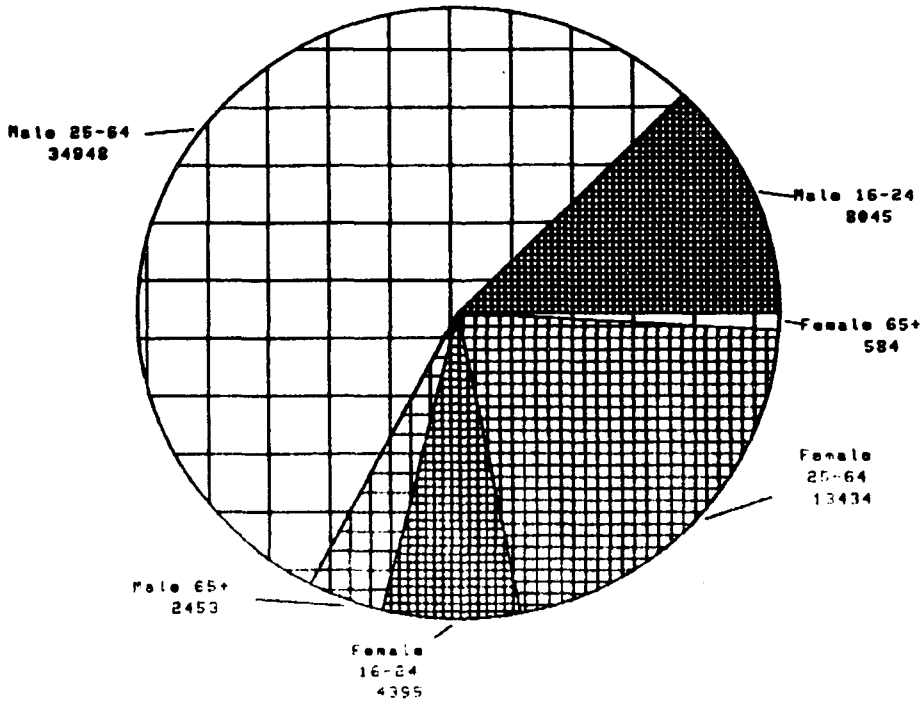
Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

Figure 4

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

1950



Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

Notations Used in this Manual

In this manual, examples of terminal dialogue are shown in shaded boxes.

The symbol <blank line> means you are to insert a blank line by pushing the Return Key.

The symbol <return> means you are to push the Return Key.

Commands typed by the user at the terminal are shown in lower case letters, using dark type. The computer's response is generally in capital letters.

Before Using This Manual

Before entering Chart to follow the examples in this manual, use the Directory Command at the DCL level ($) to be sure that your default directory does not contain a file named "script.dat."

Script.dat is a file name that Chart uses as a special command file. It is automatically executed everytime you enter chart.

The commands in script.dat will interfere with the exercises laid out in this manual.

If you do have a file called script.dat in your directory, use the DCL Command RENAME to change the name of the file to oldscript.dat:

```
rename<return>
S_From: script.dat
S_To: oldscript.dat
```

After completing the examples in this manual you can use the RENAME Command to restore the original file name:

```
rename<return>
S_From: oldscript.dat
S_To: script.dat
```

Invoking Chart

To invoke the Chart program you must log onto the computer and be at the Digital Command Language (DCL) prompt.

You are at DCL if you push the Return key and the terminal displays a $ (dollar sign) at the left hand margin.

Invoke Chart by typing: CHART followed by a return (push the return key).

```
$ chart
    Please type one... (or ? or help for assistance)
    DISPLAY: vt125,4010,4014,4027,4027f,admrg,zt,other
:
```

What Type of Terminal Are You Using?

Chart can be used with many different kinds of terminals. Chart begins a terminal session by asking for the type of terminal you are using.

Just about any terminal can be used to build a table. Only terminals that are specifically designed for graphics use are capable of producing graphic displays (pie, line, and bar graphs).

Many people use any available terminal to build a table and then switch to a graphics terminal, such as the Tektronix, when they are ready to generate the graphic display.

Chart displays a list of the terminals that it recognizes and waits for you to specify the terminal that you are using. Most of the terminals on the list are graphics terminals.

If you are using a terminal that is not listed, specify "other."

For a description of the codes that are used to indicate the type terminal you are using, type a **?** as shown on the next page.

```
:?

Input       Description
---------   ---------------------------------------------------------------

vt125       Digital VT125 Terminal
4010        Tektronix 4010 or 4012
4014        Tektronix 4014 or 4016 or 4054
4027        Tektronix 4025 or 4027
4027f       Tektronix 4027, shading by patterns
admrg       LSI ADM3A with retro-graphics board
zt          Zeta plotter (ten inches). Use " $assign tt: for010 "
other       generic non-graphic terminal
(isi)       (LBLG only) ISI Video Frame Buffer
(ramtek)    (LBLG only) Ramtek 9400 Video Frame Buffer
(varian)    (LBLG only) Varian printer/plotter

?           list available commands
help        explain terminal selection
quit        no terminal selection

            Please type one... (or ? or help for assistance)
            DISPLAY: 4010,4014,4027,4027f,admrg,zt,other

:
```

If you are using a non-graphics terminal to create and modify tables, specify the terminal type by typing: OTHER

```
: other
READY
```

The Chart Command Prompt - READY

Chart indicates that it is ready to accept commands by printing the word READY at the left margin of the screen. READY is called the Chart Command Prompt. It indicates that Chart is ready to accept any valid Chart command.

Getting a List of Valid Chart Commands

Use a question mark to display a list of valid Chart commands. Type: ?

```
READY
?
CHART RECOGNIZES THE FOLLOWING WORDS AT THIS POINT
BACKUP    BAR       BIN       BORDER    CHANGE    DECLARE   DEGREE
DRAW      EOF       ERASE     EXAMPLE   FORMAT    GRADE     GRID
GROUP     HARD      HELP      INSERT    LABEL     LEGEND    LINE
LOG       MARK      MASK      MOSAIC    NOW       OVER      PAGE
PIE       PLOT      PROFILE   QUIT      RANK      RAW       REFEREN
REPLACE   RESTORE   SCALE     SCRIPT    SEQUENCE  SET       SHADE
SIMILAR   SLOPE     STOP      SWITCH    TABLE     TEXTURE   TILE
TITLE     TOTAL     TRANSPOS  VALUE     WIDTH     WINDOW    WRITE
READY
```

Getting HELP

A description of each Chart command is available by typing the command HELP followed by the name of the command for which you want help. For example, to display a description of the BAR Command type: HELP BAR

```
READY
help bar

BAR -Make a standard bar chart.
BAR HORIZONTAL -Make a horizontal bar chart.
BAR VERTICAL -Make a vertical bar chart.
READY


READY
help bar horizontal

BAR HORIZONTAL -Make a horizontal bar chart.
READY
```

Abbreviations

Chart understands abbreviated versions of its commands. In most cases, the first three letters are enough for Chart to understand which command you mean. Multi-word commands can be abbreviated by using the first three letters of each word.

Leaving Chart

To leave Chart and return to DCL level, type the STOP Command:

```
READY
stop
$
```

Leaving Chart

To leave Chart and return to DCL level, type the STOP Command:

```
READY
stop
$
```

Creating Tables

In This Section:

A Chart Table is a collection of data used to create statistical reports, perform analysis, and calculate new data. The same table can be transformed into graphic form to communicate the meaning of the data.

This section describes the steps you will follow to enter a collection of data into Chart. The remaining sections describe commands that you can use to calculate, correct, and add data to the table; make adjustments to the display; and turn the data into charts.

Parts of a Table

A table is a collection of data values organized into rows and columns. Figure 5 identifies the parts of a table.

A "row" consists of a descriptive label and a horizontal list of data values. A "column" consists of a label and a vertical list of data values.

The shaded area in Figure 5 is called the "plot region." It is the area where the data are displayed or plotted.

The plot region does not include the area used for labels and titles.

Areas for titles are available at the top and bottom of a table and can be used to display both titles and/or footnotes.

Areas for labels are available at the left and right of each row and the top and bottom of each column.

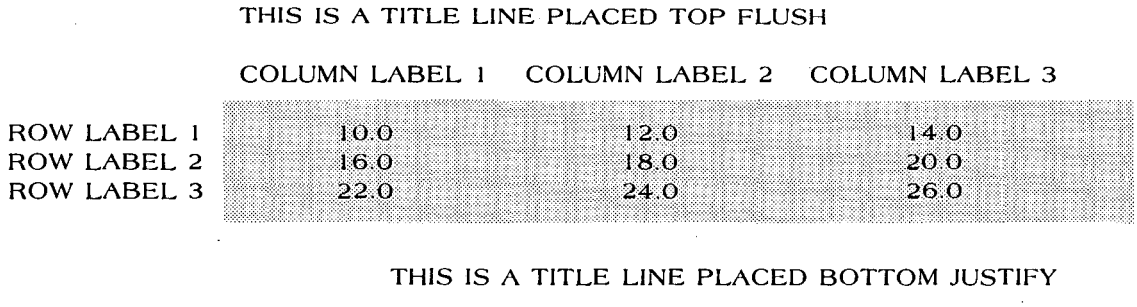


Figure 5 - Parts of a Table

Entering Tables Into Chart

Regardless of the final display format, the first step in using Chart is to build a table that includes the data, row labels, and column labels.

The table shown below displays the size of the labor force by age and sex for the years 1940 through 1950.

This table will be used throughout the manual to demonstrate Chart's various commands.

	Male 16-24	Male 25-64	Male 65+	Female 16-24	Female 25-64	Female 65+
1950	8045	34948	2453	4395	13434	584
1949	8097	34544	2454	4475	12777	556
1948	8119	34226	2385	4556	12282	514
1947	8147	33733	2376	4560	11678	445
1946	8500	32850	2340	4970	11420	450
1944	11010	33500	2420	6240	12650	500
1943	10690	32940	2320	6110	12230	490
1942	9760	32250	2190	5280	10450	400
194a	N/A	N/A	6880	N/A	N/A	1410
1940	N/A	N/A	6610	N/A	N/A	1290

Notice that the last two rows of the table in the example contain flags to denote missing data in eight of the twelve positions. These flags are displayed as "N/A" meaning "Not Available."

Row nine (1941) has been intentionally mislabeled "194a." It will be used as an example of correcting or changing a table in the section titled "Modifying a Table."

The TABLE Command is used to enter a new table into Chart. A table is entered in four steps:

- entering the TABLE Command,
- entering column labels,
- entering row labels and the data, and
- signaling that the table entry process has been completed.

Each of these four steps is described below; you may find it helpful to refer to the example on page 20 as you read through the description.

(1) Type the TABLE Command.

(2) *Enter column labels:*
Enter a list of column labels, one per line, ending the list with a blank line.

The number of column labels that you enter tells Chart how many columns of data you want the table to contain.

When all the column labels have been entered, push the return key an extra time to insert a blank line. This blank line signals the end of the column label entry process.

(3) *Enter row labels and data:*
Enter a row label on one line.

On succeeding lines, enter the data values for that row.

Row labels:
A row label can be up to 79 characters in length; Chart will initially display only the first ten characters of each label. Row labels that are over ten characters are adjusted by the LABEL Command, described in the Section titled "Modifying the Display of Row and Column Labels."

Data values:
Chart requires you to enter a data value for every column label entered in the Step 2. That is, if you have entered four column labels you must enter four data values in each row of the table.

A row of data values can be entered on a single line, separated by blanks, or on multiple lines, with one value on each line.

When a whole row of data has been entered, Chart automatically prompts for the next row label and expects it to be followed on the next line or lines by that rows data values.

The manner in which missing data or inappropriate data are handled is

explained in the section entitled "Flagging Missing Data Values".

(4) *Ending the table entry process:*
After the last row of data has been entered, enter a blank line to end the table-entry process.

When the blank line is entered, Chart will stop requesting additional row labels and data; the Chart Command prompt, READY, will be printed at your terminal.

Flagging Missing Data

It is not unusual for a table to be incomplete. Data values are sometimes missing because they are unavailable or because they are not applicable.

You can signal that a particular data value is missing or not applicable by entering the code 21E30.

Chart displays missing data by printing N/A for corresponding data cells in a table. It also generally excludes missing data cells from calculations based on the data.

Use the TABLE Command as shown below to enter the example table into Chart.

```
 READY
table
 TYPE COLUMN LABELS, ONE PER LINE, TYPE BLANK LINE TO EXIT.
Male 16-24
Male 25-64
Male 65+
Female 16-24
Female 25-64
Female 65+
<blank line>
TYPE LABEL ON ONE LINE, THEN 6 DATA VALUES ON NEXT LINES.
TYPE A BLANK LINE TO EXIT.
ROW 1
1950
8045      34948   2453    4395    13434    584
ROW 2
1949
8097      34544   2454    4475    12777    556
ROW 3
1948
8119      34226   2385    4556    12282    514
ROW 4
1947
8147      33733   2376    4560    11678    445
ROW 5
1946
8500      32850   2340    4970    11420    450
ROW 6
1944
11010     33500   2420    6240    12650    500
ROW 7
1943
10690     32940   2320    6110    12230    490
ROW 8
1942
9760      32250   2190    5280    10450    400
ROW 9
194a
21E30     21E30   6880   21E30    21E30    1410
ROW 10
1940
21E30     21E30   6610   21E30    21E30    1920
ROW 11
<blank line>
 READY
```

Displaying a Table

The PLOT REPORT Command is used to display the current working table.

For example, typing PLOT REPORT will display the table that has just been entered.

In order to make the example tables easy to read, the row labels ("1950," "1949," etc.) are shown in bold face. Please do not confuse the row labels with the commands you are to type.

READY
plot report

	Male 16-24	Male 25-64	Male 65+	Female 16-24	Female 25-64	Female 65+
1950	8045	34948	2453	4395	13434	584
1949	8097	34544	2454	4475	12777	556
1948	8119	34226	2385	4556	12282	514
1947	8147	33733	2376	4560	11678	445
1946	8500	32850	2340	4970	11420	450
1944	11010	33500	2420	6240	12650	500
1943	10690	32940	2320	6110	12230	490
1942	9760	32250	2190	5280	10450	400
194a	N/A	N/A	6880	N/A	N/A	1410
1940	N/A	N/A	6610	N/A	N/A	1920

READY

Modifying a Table

In This Section:

Chart tables are dynamic; they can be changed in order to add new data to the table or replace existing data.

Several commands are provided to enable you to alter the the data and labels within a table. These commands:

- replace an entire row or column;
- replace only the labels for a row or column;
- change or correct individual data values.

Replacing an Entire Row or an Entire Column

The REPLACE ROW and REPLACE COLUMN Commands are used to begin an entry process that replaces an entire row or column.

It is possible to replace an entire row or an entire column by using the commands:

REPLACE ROW n

or

REPLACE COLUMN n

where n stands for the number (position) of the row or column being replaced.

To determine the position of a row or column, count the rows from top to bottom down the table, and the columns from left to right across the table.

As an example, row nine can be replaced by typing: REPLACE ROW 9.

When this command is issued, Chart will prompt for a new row label which should be followed on the next line or lines by data values for each column of row nine.

This entry process is similar to that followed when the table was initially entered.

After a row or column has been replaced, Chart automatically displays the revised table.

replace row 9
TYPE LABEL ON ONE LINE. THEN 6 DATA VALUES FOR ROW 9.
194a
9380 26820 6880 4840 8390 1410

	Male 16-24	Male 25-64	Male 65+	Female 16-24	Female 25-64	Female 65+
1950	8045	34948	2453	4395	13434	584
1949	8097	34544	2454	4475	12777	556
1948	8119	34226	2385	4556	12282	514
1947	8147	33733	2376	4560	11678	445
1946	8500	32850	2340	4970	11420	450
1944	11010	33500	2420	6240	12650	500
1943	10690	32940	2320	6110	12230	490
1942	9760	32250	2190	5280	10450	400
194a	9380	26820	6880	4840	8390	1410
1940	N/A	N/A	6610	N/A	N/A	1290

READY

An entire column can be replaced by typing REPLACE COLUMN followed by the number of the column that is to be replaced.

For example, to replace column one type: REPLACE COLUMN 1

replace column 1
TYPE LABEL ON ONE LINE. THEN 10 DATA VALUES FOR COLUMN 1
Male 16-24
8045 8097 8119 8147 8500 11010 10690 9760 9380 8770

	Male 16-24	Male 25-64	Male 65+	Female 16-24	Female 25-64	Female 65+
1950	8045	34948	2453	4395	13434	584
1949	8097	34544	2454	4475	12777	556
1948	8119	34226	2385	4556	12282	514
1947	8147	33733	2376	4560	11678	445
1946	8500	32850	2340	4970	11420	450
1944	11010	33500	2420	6240	12650	500
1943	10690	32940	2320	6110	12230	490
1942	9760	32250	2190	5280	10450	400
194a	9380	26820	6880	4840	8390	1410
1940	8770	N/A	6610	N/A	N/A	1290

READY

Replacing Only A Row Label or a Column Label

The REPLACE Command can also be used to replace a label without re-entering all the data values.

After the new label has been entered, Chart will automatically display the revised table.

To replace only the label on row nine, and not the data, type: REPLACE LABEL ROW 9

READY
replace label row 9
TYPE LABEL ON ONE LINE FOR ROW 9
1941

	Male 16-24	Male 25-64	Male 65+	Female 16-24	Female 25-64	Female 65+
1950	8045	34948	2453	4395	13434	584
1949	8097	34544	2454	4475	12777	556
1948	8119	34226	2385	4556	12282	514
1947	8147	33733	2376	4560	11678	445
1946	8500	32850	2340	4970	11420	450
1944	11010	33500	2420	6240	12650	500
1943	10690	32940	2320	6110	12230	490
1942	9760	32250	2190	5280	10450	400
1941	9380	26820	6880	4840	8390	1410
1940	8770	N/A	6610	N/A	N/A	1290

READY

Changing an Individual Data Value

The CHANGE Command changes an individual data value.

This command requires that you specify the row and column position of the old data value, followed by the new value.

For example, to change the second column of row ten to a value of 26560 type: CHANGE ROW 10 COLUMN 2 TO 26560

The word "TO" between the row and column positions and new value is a required part of the CHANGE Command.

READY
change row 10 col 2 to 26560

	Male 16-24	Male 25-64	Male 65+	Female 16-24	Female 25-64	Female 65+
1950	8045	34948	2453	4395	13434	584
1949	8097	34544	2454	4475	12777	556
1948	8119	34226	2385	4556	12282	514
1947	8147	33733	2376	4560	11678	445
1946	8500	32850	2340	4970	11420	450
1944	11010	33500	2420	6240	12650	500
1943	10690	32940	2320	6110	12230	490
1942	9760	32250	2190	5280	10450	400
1941	9380	26820	6880	4840	8390	1410
1940	8770	26560	6610	N/A	N/A	1290

READY

To change the fourth column of row ten to a value of 4600 type:

CHANGE ROW 10 COLUMN 4 TO 4600

READY
change row 10 col 4 to 4600

	Male 16-24	Male 25-64	Male 65+	Female 16-24	Female 25-64	Female 65+
1950	8045	34948	2453	4395	13434	584
1949	8097	34544	2454	4475	12777	556
1948	8119	34226	2385	4556	12282	514
1947	8147	33733	2376	4560	11678	445
1946	8500	32850	2340	4970	11420	450
1944	11010	33500	2420	6240	12650	500
1943	10690	32940	2320	6110	12230	490
1942	9760	32250	2190	5280	10450	400
1941	9380	26820	6880	4840	8390	1410
1940	8770	26560	6610	4600	N/A	1290

READY

To change the fifth column of row ten to a value of 8270 type:

CHANGE ROW 10 COLUMN 5 TO 8270

READY
change row 10 col 5 to 8270

	Male 16-24	Male 25-64	Male 65+	Female 16-24	Female 25-64	Female 65+
1950	8045	34948	2453	4395	13434	584
1949	8097	34544	2454	4475	12777	556
1948	8119	34226	2385	4556	12282	514
1947	8147	33733	2376	4560	11678	445
1946	8500	32850	2340	4970	11420	450
1944	11010	33500	2420	6240	12650	500
1943	10690	32940	2320	6110	12230	490
1942	9760	32250	2190	5280	10450	400
1941	9380	26820	6880	4840	8390	1410
1940	8770	26560	6610	4600	8270	1290

READY

Adding Data to a Table

In This Section:

Inserting Rows or Columns
Computing Rows or Columns
Arithmetic Expressions
Assigning Constants
Updating Computed Rows or Columns

Additional rows or columns can be added to an existing table at any time.

New data items can be entered directly, as data values, or can be computed from data within the table.

Inserting Rows or Columns

Additional rows or columns can be added to a table by using the INSERT Command.

The INSERT Command requires that you specify whether a row or a column is being inserted into the table.

If you wish to specify a position for the new row or column, include a position number at the end of the command.

If a position is not specified, Chart will place new rows at the bottom of the table and new columns at the right side of the table.

The INSERT Command initiates the process of entering the new row or column in much the same way as the TABLE Command. You will be prompted for a label and asked to enter the data values. Chart will continue to ask for additional rows or columns of data until a blank line is entered.

For example, to insert a new row six to display the Labor Force data for 1945, type: INSERT ROW 6

insert row 6
TYPE LABEL ON ONE LINE, THEN 6 DATA VALUES ON NEXT LINES.
TYPE A BLANK LINE TO EXIT.
ROW 6
1945
10460 33990 2460 6030 12780 490
ROW 7
<blank line>

	Male 16-24	Male 25-64	Male 65+	Female 16-24	Female 25-64	Female 65+
1950	8045	34948	2453	4395	13434	584
1949	8097	34544	2454	4475	12777	556
1948	8119	34226	2385	4556	12282	514
1947	8147	33733	2376	4560	11678	445
1946	8500	32850	2340	4970	11420	450
1945	10460	33990	2460	6030	12780	490
1944	11010	33500	2420	6240	12650	500
1943	10690	32940	2320	6110	12230	490
1942	9760	32250	2190	5280	10450	400
1941	9380	26820	6880	4840	8390	1410
1940	8770	26560	6610	4600	8270	1290

READY

Computing Rows or Columns

Occasionally a table will include rows or columns whose values can be computed based on other rows or columns of the table, a constant, or a combination of both.

For example, many tables require a total at the bottom of each column.

This row of totals could be computed using a calculator and then entered into the Chart table using the INSERT ROW Command.

However, by using the INSERT ROW Command followed by an arithmetic expression, Chart will perform the calculations.

Arithmetic Expressions

An arithmetic expression is used as an alternative to entering individual data values. It enables you to express calculations in place of data values. Chart will compute the data values when creating the table or inserting or replacing rows or columns.

Arithmetic expressions can be entered instead of individual data values in TABLE, REPLACE, and INSERT Commands.

An arithmetic expression must always begin with an equals sign (=). It can include parentheses and any of the operators listed below:

Operators For Arithmetic Expressions	
Operator	Meaning
+	Addition
-	Subtraction
*	Multiplication
/	Division
^	Exponentiation

An example INSERT Command which calculates the sum of columns one, two, and three as the first column of the table is shown on the next page.

```
insert col 1
 TYPE LABEL ON ONE LINE, THEN 11 DATA VALUES ON NEXT LINES.
 TYPE A BLANK LINE TO EXIT.
COL 1
Total Male
= column 1 + column 2 + column 3
COL 2
<blank line>
```

	Total Male	Male 16-24	Male 25-64	Male 65+	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	4395	13434	584
1949	45095	8097	34544	2454	4475	12777	556
1948	44730	8119	34226	2385	4556	12282	514
1947	44256	8147	33733	2376	4560	11678	445
1946	43690	8500	32850	2340	4970	11420	450
1945	46910	10460	33990	2460	6030	12780	490
1944	46930	11010	33500	2420	6240	12650	500
1943	45950	10690	32940	2320	6110	12230	490
1942	44200	9760	32250	2190	5280	10450	400
1941	43080	9380	26820	6880	4840	8390	1410
1940	41940	8770	26560	6610	4600	8270	1290

```
READY
```

The equals sign (=) tells Chart to use the formula that follows when computing data values for the row or column being inserted.

Chart will continue to prompt for additional rows until it encounters a blank line.

For the sake of completeness, we will compute the total female labor force:

```
insert column 5
 TYPE LABEL ON ONE LINE, THEN  11 DATA VALUES ON NEXT LINES.
 TYPE A BLANK LINE TO EXIT.
COL  5
Total Female
= column 5 + column 6 + column 7
COL  6
<blank line>
```

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

```
 READY
```

Assigning Constants

An arithmetic expression can also include a constant.

A constant is a number that will not change during a calculation.

For example, you could change the name of column 1 to "New Column 1" and add 25 to every value in column 1 with the following commands:

```
REPLACE COL 1
 TYPE LABEL ON ONE LINE, THEN 11 DATA VALUES ON NEXT LINES.
NEW COLUMN 1
= COL 1 + 25
```

Updating Computed Rows or Columns

Values initially created by an arithmetic expression must be updated when the values on which they were based are changed.

If you use the data from a particular row or column in an arithmetic expression, and later change some of these data values, the values previously computed by the arithmetic expression will be inconsistent with the revised data.

Therefore, when you change data values that have been used in arithmetic expressions, you must also recompute the arithmetic expression.

If Column 3 was computed by an arithmetic expression to be the total of Column 1 + Column 2 and, at a later time, the data values in Column 1 were changed, Column 3 would no longer reflect the true sum.

To correct the data, use the Replace Column Command. When Chart prompts for the data values, reenter the original arithmetic expression:

```
= Column 1 + Column 2
```

Creating Titles & Footnotes

In This Section:

Titles and footnotes are lines of text created by the user to describe the contents of a table or graphic display.

Lines of text can be entered into any of twenty available title slots. The contents of the title slots can be displayed at the top and bottom and left and right of a table or display.

Entering Text Into Title Slots

The TITLE Command is used to enter text into one of the twenty numbered title slots.

To enter a title into one of the title slots type: TITLE n where n stands for the number of the title slot being filled.

Chart will prompt for a line of text and store it into the title slot. Chart will automatically display the table after each TITLE Command.

However, the titles will not be printed on the table until they have been positioned by one of the positioning commands shown in the next section.

For example, to enter a line of text in title slot 1 type: TITLE 1

```
READY
title 1
 ENTER 1 TITLE LINES
Labor Force by Age and Sex

      Total    Male     Male     Male 65+  Total    Female   Female   Female
      Male     16-24    25-64              Female   16-24    25-64    65+
1950  45446    8045     34948    2453      18413    4395     13434    584
1949  45095    8097     34544    2454      17808    4475     12777    556
1948  44730    8119     34226    2385      17352    4556     12282    514
1947  44256    8147     33733    2376      16683    4560     11678    445
1946  43690    8500     32850    2340      16840    4970     11420    450
1945  46910    10460    33990    2460      19300    6030     12780    490
1944  46930    11010    33500    2420      19390    6240     12650    500
1943  45950    10690    32940    2320      18830    6110     12230    490
1942  44200    9760     32250    2190      16130    5280     10450    400
1941  43080    9380     26820    6880      14640    4840     8390     1410
1940  41940    8770     26560    6610      14160    4600     8270     1290
READY
```

Text for multiple title lines can be entered at one time by listing several slot numbers.

For example, if the command TITLE 2 3 4 is typed, Chart will prompt for three titles lines and place them in slots 2, 3, and 4 respectively.

```
READY
title 2 3 4
 ENTER 3 TITLE LINES
1940 to 1950
National Totals
(See Footnote)
```

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

```
READY
```

Vertical Positioning of Titles

The TITLE TOP and TITLE BOTTOM Commands are used to position text at the top and bottom of the display.

These commands require that you specify the slot numbers of the titles to be positioned.

For example, to place the contents of title slots 1 through 4 at the top of the table, type TITLE TOP 1 2 3 4

Title slots will be displayed in the order listed on the TITLE TOP Command.

READY
title top 1 2 3 4

Labor Force by Age and Sex
1940 to 1950
National Totals
(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

READY

Reordering Titles

The order in which the title slots are positioned on the display are independent of the order in which they were entered.

For example, to reverse the order in which the title slots are displayed type:
TITLE TOP 4 3 2 1

READY
title top 4 3 2 1

(See Footnote)
National Totals
1940 to 1950
Labor Force by Age and Sex

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

READY

Spacing

Spacing between titles is done through the use of title slot 0.

Slot 0 is not one of the twenty numbered titled slots and cannot accommodate text. It is only used as a spacing device.

For example, to restore the titles to their original order and provide spacing to separate the titles from the parenthetical comment "See Footnote," type:
TITLE TOP 1 2 3 0 4 0

```
READY
title top 1 2 3 0 4 0

      Labor Force by Age and Sex
      1940 to 1950
      National Totals

      (See Footnote)

      Total    Male     Male     Male 65+   Total    Female   Female   Female
      Male     16-24    25-64               Female   16-24    25-64    65+
1950  45446    8045     34948    2453       18413    4395     13434    584
1949  45095    8097     34544    2454       17808    4475     12777    556
1948  44730    8119     34226    2385       17352    4556     12282    514
1947  44256    8147     33733    2376       16683    4560     11678    445
1946  43690    8500     32850    2340       16840    4970     11420    450
1945  46910    10460    33990    2460       19300    6030     12780    490
1944  46930    11010    33500    2420       19390    6240     12650    500
1943  45950    10690    32940    2320       18830    6110     12230    490
1942  44200    9760     32250    2190       16130    5280     10450    400
1941  43080    9380     26820    6880       14640    4840     8390     1410
1940  41940    8770     26560    6610       14160    4600     8270     1290
READY
```

Footnotes

Footnotes are simply title slots that have been placed at the bottom of a display.

The rules for placing titles at the bottom of a display are the same as those for placing them at the top:

Store the lines of text in the numbered title slots using the TITLE n Command and then position the text at the bottom of the display using the TITLE BOTTOM Command.

For example, enter two lines of text into slots as the first step in creating a footnote for the display. Enter the text into slots five and six since they are the next empty slots:

```
READY
title 5  6
ENTER 2 TITLE LINES
Labor force in thousands of persons 16 years old and over except,
prior to 1947, 14 years old and over.

        Labor Force by Age and Sex
        1940 to 1950
        National Totals

        (See Footnote)

      Total    Male     Male      Male 65+   Total    Female   Female   Female
       Male    16-24    25-64                Female   16-24    25-64    65+
1950  45446    8045     34948     2453       18413    4395     13434    584
1949  45095    8097     34544     2454       17808    4475     12777    556
1948  44730    8119     34226     2385       17352    4556     12282    514
1947  44256    8147     33733     2376       16683    4560     11678    445
1946  43690    8500     32850     2340       16840    4970     11420    450
1945  46910    10460    33990     2460       19300    6030     12780    490
1944  46930    11010    33500     2420       19390    6240     12650    500
1943  45950    10690    32940     2320       18830    6110     12230    490
1942  44200    9760     32250     2190       16130    5280     10450    400
1941  43080    9380     26820     6880       14640    4840     8390     1410
1940  41940    8770     26560     6610       14160    4600     8270     1290
READY
```

Use the TITLE BOTTOM Command to specify which title slots are to be displayed under the table.

For example, to insert a blank line followed by the text from title slots 5 and 6 type: TITLE BOTTOM 0 5 6

READY
title bottom 0 5 6

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

Drawing Horizontal Lines

It is often useful to use horizontal lines as part of the title or to use lines to separate the title lines from the rest of the table.

Chart allows you to store a horizontal line, called a "rule" in one of the numbered title slots, instead of text. Once it has been stored, you can position it on the table by using the TITLE TOP or TITLE BOTTOM Commands.

The first step is to store the rule in one of the numbered title slots. This is done with the TITLE Command. To store the rule in title slot 7 type: TITLE 7 RULE

```
READY
title 7 rule
ENTER 1 TITLE LINES
<blank line>

        Labor Force by Age and Sex
        1940 to 1950
        National Totals

        (See Footnote)

        Total    Male     Male      Male 65+    Total    Female   Female   Female
        Male     16-24    25-64                Female   16-24    25-64    65+
1950    45446    8045     34948     2453        18413    4395     13434    584
1949    45095    8097     34544     2454        17808    4475     12777    556
1948    44730    8119     34226     2385        17352    4556     12282    514
1947    44256    8147     33733     2376        16683    4560     11678    445
1946    43690    8500     32850     2340        16840    4970     11420    450
1945    46910    10460    33990     2460        19300    6030     12780    490
1944    46930    11010    33500     2420        19390    6240     12650    500
1943    45950    10690    32940     2320        18830    6110     12230    490
1942    44200    9760     32250     2190        16130    5280     10450    400
1941    43080    9380     26820     6880        14640    4840     8390     1410
1940    41940    8770     26560     6610        14160    4600     8270     1290

        Labor force in thousands of persons 16 years old and over except,
        prior to 1947, 14 years old and over.
READY
```

To place the ruled line on the table, separating the other title lines from the data, type: TITLE TOP 1 2 3 0 4 0 7 0

READY
title top 1 2 3 0 4 0 7 0

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

To remove the ruled line from the table type: TITLE TOP 1 2 3 0 4 0

READY
title top 1 2 3 0 4 0

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except prior to 1947, 14 years old and over.

READY

Horizontal Positioning of Titles

Chart also provides options for specifying the horizontal position of the title. The four positions are called LEFT, FLUSH, CENTER, and RIGHT.

The LEFT title position starts the text at the left margin of the row labels.

The FLUSH title position starts the text at the left side of the plotting area. (The plotting area is the portion of the table that holds the data. The row labels are outside of the plotting area.) FLUSH is the default position; if no other position is specified, a title will be displayed in the FLUSH position.

The CENTER title position centers the text in relation to the plotting area.

The RIGHT title position ends the text at the right margin of the display (right justified).

The horizontal position of the title is one of the attributes that can be specified as part of the TITLE Command. The position can be specified either at the time that text is entered into one of the numbered slots or it can be added later without having to re-enter the text.

To center title lines 1 through 3 type: TITLE 1-3 CENTER

Chart will prompt for three title lines; enter a blank line if the text is to remain as it is. Enter new text if you wish to change the title line.

READY
title 1-3 center
ENTER 3 TITLE LINES
<blank line>
<blank line>
<blank line>

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

To move the titles back to the "flush" position type: TITLE 1-3 FLUSH:

```
 READY
title 1-3 flush
 ENTER 3 TITLE LINES
<blank line>
<blank line>
<blank line>
 READY
```

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

To position the fourth title line at the right hand margin of the table, type: TITLE 4 RIGHT

```
READY
title 4 right
ENTER 1 TITLE LINES
<blank line>
        Labor Force by Age and Sex
        1940 to 1950
        National Totals
```

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

Reordering Rows or Columns

In This Section:

The order in which rows and columns are displayed within a table or a graphic display can be changed at any time.

Reordering the table or display is done with the SEQUENCE or SWITCH Commands.

Ranking or sorting the data within a table or display is discussed later in this manual in the section entitled "Ranking and Grading Data."

Resequencing Rows or Columns

The SEQUENCE Command allows you change the order in which rows or columns are displayed.

You will recall that Chart views the columns as numbered from left to right. If you have a table with eight columns, you can reverse the order of the columns by typing: SEQUENCE COLUMNS 8 7 6 5 4 3 2 1

READY
sequence columns 8 7 6 5 4 3 2 1

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Female 65+	Female 25-64	Female 16-24	Total Female	Male 65+	Male 25-64	Male 16-24	Total Male
1950	584	13434	4395	18413	2453	34948	8045	45446
1949	556	12777	4475	17808	2454	34544	8097	45095
1948	514	12282	4556	17352	2385	34226	8119	44730
1947	445	11678	4560	16683	2376	33733	8147	44256
1946	450	11420	4970	16840	2340	32850	8500	43690
1945	490	12780	6030	19300	2460	33990	10460	46910
1944	500	12650	6240	19390	2420	33500	11010	46930
1943	490	12230	6110	18830	2320	32940	10690	45950
1942	400	10450	5280	16130	2190	32250	9760	44200
1941	1410	8390	4840	14640	6880	26820	9380	43080
1940	1290	8270	4600	14160	6610	26560	8770	41940

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

The "old" column 8 has become the new column 1; the "old" column 7 has now become column 2, etc..

To return the table to its original order, type:
SEQUENCE COLUMNS 8 7 6 5 4 3 2 1

READY
sequence columns 8 7 6 5 4 3 2 1

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

Switching the Position of Two Rows or Columns

The SWITCH Command allows you reverse the position of any pair of rows or columns.

For example, to switch column 1 with column 8, type:
SWITCH COLUMNS 1 8

```
READY
switch columns 1 8
```

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Female 65+	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Total Male
1950	584	8045	34948	2453	18413	4395	13434	45446
1949	556	8097	34544	2454	17808	4475	12777	45095
1948	514	8119	34226	2385	17352	4556	12282	44730
1947	445	8147	33733	2376	16683	4560	11678	44256
1946	450	8500	32850	2340	16840	4970	11420	43690
1945	490	10460	33990	2460	19300	6030	12780	46910
1944	500	11010	33500	2420	19390	6240	12650	46930
1943	490	10690	32940	2320	18830	6110	12230	45950
1942	400	9760	32250	2190	16130	5280	10450	44200
1941	1410	9380	26820	6880	14640	4840	8390	43080
1940	1290	8770	26560	6610	14160	4600	8270	41940

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

```
READY
```

To restore the table to its original order type: SWITCH COLUMNS 1 8

READY
switch columns 1 8

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

Displaying Only Part of a Table

In This Section:

It is frequently necessary to temporarily eliminate rows or columns from a display in order to highlight particular sections of the data.

Two commands are available to temporarily eliminate data from the display:

- the WINDOW Command is used to zoom in and out on a section of the table;

- the MASK Command is used to suppress the display of specific sections of the table.

Focusing On a Portion of a Display

The WINDOW Command is used to zoom in and out on a section of the table.

For example, if you have a table that is eight columns wide, but you want to display only selected columns from that table (columns 1, 2, 3, and 4), you can do so by typing: WINDOW COLUMN 1-4

READY
window column 1-4

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+
1950	45446	8045	34948	2453
1949	45095	8097	34544	2454
1948	44730	8119	34226	2385
1947	44256	8147	33733	2376
1946	43690	8500	32850	2340
1945	46910	10460	33990	2460
1944	46930	11010	33500	2420
1943	45950	10690	32940	2320
1942	44200	9760	32250	2190
1941	43080	9380	26820	6880
1940	41940	8770	26560	6610

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

Notice that the numbers in the WINDOW Command refer to a series of consecutive rows or columns. The command could also be be entered such that each of the columns were listed separately by typing: WINDOW COL 1 2 3 4

The WINDOW Command can be used to zoom in on rows as well as columns. If you have a table with many rows, but want to display only rows 1, 2, 3, 4, and 5, you can type: WINDOW ROW 1 2 3 4 5 or WINDOW ROW 1-5.

```
READY
window row 1-5

        Labor Force by Age and Sex
        1940 to 1950
        National Totals

                                                        (See Footnote)

        Total Male      Male 16-24      Male 25-64      Male 65+

1950      45446           8045            34948           2453
1949      45095           8097            34544           2454
1948      44730           8119            34226           2385
1947      44256           8147            33733           2376
1946      43690           8500            32850           2340

        Labor force in thousands of persons 16 years old and over except,
        prior to 1947, 14 years old and over.

READY
```

Expanding the Focus of a Display

The WINDOW Command changes the portion of a table that is displayed; however, the complete table is maintained and can be redisplayed by using another WINDOW Command. The numbers in a WINDOW Command always refer to the original, complete table, not the smaller "windowed" table.

To redisplay the rows that were suppressed by the previous command type:
WINDOW ROW 1-100

If you do not know exactly how many rows there were in the original display, but you want all of them to be restored, you can use any large number to specify the high number of the range.

READY
window row 1-100

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+
1950	45446	8045	34948	2453
1949	45095	8097	34544	2454
1948	44730	8119	34226	2385
1947	44256	8147	33733	2376
1946	43690	8500	32850	2340
1945	46910	10460	33990	2460
1944	46930	11010	33500	2420
1943	45950	10690	32940	2320
1942	44200	9760	32250	2190
1941	43080	9380	26820	6880
1940	41940	8770	26560	6610

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

In order to return the table to its original state by returning the WINDOWed columns to the display, type: WINDOW COLUMNS 1-100

READY
window columns 1-100

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

Suppressing Portions of a Display

The MASK Command is used to suppress the display of specific rows and columns. With MASK, you specify the rows or columns to be removed from the display. For example, to eliminate columns 2 through 4 and 6 through 8 from the display type: MASK COLUMNS 2-4 6-8

READY
mask columns 2-4 6-8

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Total Female
1950	45446	18413
1949	45095	17808
1948	44730	17352
1947	44256	16683
1946	43690	16840
1945	46910	19300
1944	46930	19390
1943	45950	18830
1942	44200	16130
1941	43080	14640
1940	41940	14160

Labor force in thousands of persons 16 years old and over except prior to 1947, 14 years old and over.

READY

Recovering Suppressed Data

Rows and columns that have been removed from a display using the MASK Command can be restored to the display by the RESTORE ROW or COLUMN n Command, where n indicates how many rows or columns are to be restored.

Rows that are restored are always placed at the bottom of the table; columns are always restored at the right margin of the table.

Unlike most Chart commands the number in the RESTORE Command is NOT a column number or row number, but rather a quantity, indicating how many columns or rows are to be restored.

The number in the RESTORE Command is optional. If a number is not given, all rows or all columns are restored.

For example, columns 2, 3, 4, 6, 7, and 8, which were masked in the last example can be restored by typing: RESTORE COLUMNS 6

READY
restore columns 6

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Total Female	Male 16-24	Male 25-64	Male 65+	Female 16-24	Female 25-64	Female 65+
1950	45446	18413	8045	34948	2453	4395	13434	584
1949	45095	17808	8097	34544	2454	4475	12777	556
1948	44730	17352	8119	34226	2385	4556	12282	514
1947	44256	16683	8147	33733	2376	4560	11678	445
1946	43690	16840	8500	32850	2340	4970	11420	450
1945	46910	19300	10460	33990	2460	6030	12780	490
1944	46930	19390	11010	33500	2420	6240	12650	500
1943	45950	18830	10690	32940	2320	6110	12230	490
1942	44200	16130	9760	32250	2190	5280	10450	400
1941	43080	14640	9380	26820	6880	4840	8390	1410
1940	41940	14160	8770	26560	6610	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

Restoring the Table to Its Original State

If columns or rows have been masked by several successive MASK Commands, they are restored in the reverse order, last masked - first restored.

In order to return the display to its original state following a set of MASK Commands, it may be necessary to resequence the rows or columns.

For example to return the table to the order shown on Page 47, type:
SEQUENCE COLUMNS 1 3 4 5 2 6 7 8

READY
sequence columns 1 3 4 5 2 6 7 8

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

Saving Your Work

In This Section:

There are several compelling reasons for saving either temporary or permanent copies of your work with Chart.

Temporary copies of your work should be made whenever:

- New rows or columns are inserted;
- Rows or columns are replaced;
- Rows or columns are windowed or masked out of a display and will no longer be used;
- Major changes are about to be made to a table. If something goes wrong it is possible to return to the point where you last declared a backup version.

Permanent copies of your work should be made whenever:

- Your work with a set of data requires more than one session to complete;
- You wish to have access to a set of data over a long period of time.

Making Temporary Copies of Your Work

The DECLARE BACKUP Command makes a temporary backup copy of a table.

The temporary copy of the table remains in effect until:

- the next DECLARE BACKUP Command is issued;
- another TABLE Command is issued; (the TABLE Command automatically makes a backup copy of the new table).
- a SCRIPT "filename" Command is issued; the SCRIPT "filename" Command automatically makes a backup copy of any table entered by the SCRIPT Command.
- you leave Chart.

You can make a backup copy of your working table by typing: DECLARE BACKUP

READY
declare backup

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

In order to illustrate the BACKUP Command, first, mask columns 2, 3, 4, and 6, 7, and 8 by typing: MASK COLUMNS 2 3 4 6 7 8

READY
mask columns 2 3 4 6 7 8

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Total Female
1950	45446	18413
1949	45095	17808
1948	44730	17352
1947	44256	16683
1946	43690	16840
1945	46910	19300
1944	46930	19390
1943	45950	18830
1942	44200	16130
1941	43080	14640
1940	41940	14160

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

To access the temporary backup copy of the table, type: BACKUP

The BACKUP Command does not automatically reproduce the display; you will need to issue the PLOT REPORT Command to see the table.

backup
READY
plot report

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

Making Permanent Copies of Your Work

The WRITE TO "filename" Command makes a copy of the data and commands that are necessary to reproduce the current display.

The file containing the copy of the data and commands is placed in your VMS directory under the file name that you specify.

The files created by the WRITE TO "filename" Command are referred to as Chart scripts.

A file containing a Chart script created by the WRITE TO "filename" Command allows you to save your work from one Chart session to another. This file will be saved until you specifically delete it from your directory.

(Remember that the backup version created by the DECLARE BACKUP Command is automatically discarded when you leave Chart and return to DCL level.)

For example, to write a copy of the data and commands that are capable of reproducing the current Chart display type: WRITE TO TABLE1.SCR

The file is written in your default directory under the filename TABLE1.SCR. It is conventional to use "SCR" (an abbreviation for "script") as the extension (the 3 letters after the decimal point) when naming command files that are in Chart format. If you follow this convention it is easy for you or anyone else to recognize that this is a Chart command file.

```
READY
write to table1.scr
SCRIPT WRITTEN
READY
```

Accessing Permanent Copies of Your Work

A Chart command file is called a script. Just as the script for a play contains all the necessary dialogue and instructions for recreating a performance, a Chart script contains the necessary data and instructions for reproducing a table or graph.

The SCRIPT "filename" Command instructs Chart to read the specified command file and to follow all of the commands in the file as though they were typed in at the terminal.

When Chart reaches the end of the file, it prints READY on your terminal and resumes accepting commands from the terminal.

To invoke the command file TABLE1.SCR created in the previous example, type: SCRIPT TABLE1.SCR

READY
script table1.scr

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

The Contents of the Script File

The script file created by the WRITE TO "filename" Command contains all the necessary data and commands for reproducing a table or graph.

The WRITE TO "filename" Command formats the Chart dialogue in a special way. Script files can be edited by the user, if desired, although it is probably easier to change the data or the display characteristics of a table directly through Chart, interactively.

The following script file was created by the WRITE TO TABLE1.SCR Command shown in the previous section.

```
TABLE SIZE  140  140
Total Male
Male 16-24
Male 25-64
Male 65+
Total Female
Female 16-24
Female 25-64
Female 65+
1950
        45446.000000    8045.0000000   34948.000000    2453.0000000
        18413.000000    4395.0000000   13434.000000     584.00000000
1949
        45095.000000    8097.0000000   34544.000000    2454.0000000
        17808.000000    4475.0000000   12777.000000     556.00000000
1948
        44730.000000    8119.0000000   34226.000000    2385.0000000
        17352.000000    4556.0000000   12282.000000     514.00000000
1947
        44256.000000    8147.0000000   33733.000000    2376.0000000
        16683.000000    4560.0000000   11678.000000     445.00000000
1946
        43690.000000    8500.0000000   32850.000000    2340.0000000
        16840.000000    4970.0000000   11420.000000     450.00000000
1945
        46910.000000   10460.000000    33990.000000    2460.0000000
        19300.000000    6030.0000000   12780.000000     490.00000000
1944
        46930.000000   11010.000000    33500.000000    2420.0000000
        19390.000000    6240.0000000   12650.000000     500.00000000
1943
        45950.000000   10690.000000    32940.000000    2320.0000000
        18830.000000    6110.0000000   12230.000000     490.00000000
```

```
1942
        44200.000000    9760.0000000   32250.000000    2190.0000000
        16130.000000    5280.0000000   10450.000000     400.00000000
1941
        43080.000000    9380.0000000   26820.000000    6880.0000000
        14640.000000    4840.0000000    8390.0000000   1410.0000000
1940
        41940.000000    8770.0000000   26560.000000    6610.0000000
        14160.000000    4600.0000000    8270.0000000   1290.0000000
FORMAT
GROUP ROWS   11
GROUP COLS    8
LABEL   LEFT      10
LABEL   TOP        2  1  1  1  1  1  1  1  1
LABEL SCALE   RIGHT
LABEL SCALE   BOTTOM
LABEL NOMINAL     1
LABEL SIZE  130
LABEL LINE    0   0   0   0   0   0   0   0   0   0
LABEL BOX  10   2
TITLE  1
Labor Force by Age and Sex
TITLE  2
1940 to 1950
TITLE  3
National Totals
TITLE  4
(See Footnote);RIGHT
TITLE  5
Labor force in thousands of persons 16 years old and over except,
TITLE  6
prior to 1947, 14 years old and over.
TITLE  7
;RULE
TITLE  8

TITLE  9

TITLE 10

TITLE 11

TITLE 12

TITLE 13

TITLE 14

TITLE 15

TITLE 16

TITLE 17

TITLE 18

TITLE 19

TITLE 20
```

```
TITLE TOP    1 2 3 0 4 0
TITLE BOTTOM 0 5 6
TITLE LEGEND
LEGEND NONE
WIDTH      0.90
TEXTURE  0.  1.  2.  3.  4.  5.  6.  7.  8.  9.
SLOPE      0.00
SHADE SIGN 1 0 0.0
MARK
VALUE   SHOW
GRID   SHOW
BIN        0
SCALE   ABSOLUTE
PAGE      0.00      0.60      0.00      1.00
PLOT   REPORT
EOF
```

Displaying the Current Status of a Chart Session

It is frequently helpful during a Chart session, to examine Chart's current status, by reviewing the contents of the script that Chart uses to generate the current display.

For example, you may be having difficulty getting a particular text string displayed as a title. In that case it would be helpful to find out what is stored in each of the title slots.

The WRITE Command is used to display Chart's current script. The information displayed is exactly the same as would be written by the WRITE TO "filename" Command. The WRITE Command displays the script on your terminal, while the WRITE TO "filename" Command writes the information to a file in your default directory.

There are two other forms of the WRITE Command that let you display parts of a script, without having to display the whole thing.

The WRITE DATA Command displays only the data, row labels, and column labels from Chart's current script.

The WRITE STATUS Command displays the non-data portion of the current Chart script.

Much of the information in the status portion of the script will not be meaningful at this stage of the course. At this point, only the contents of the title slots provide useful information. However, as you learn more about Chart, the information in the status section becomes more and more valuable. A number of additional status elements are explained in the sections that follow.

Ranking and Grading Data

In This Section:

The RANK Command orders the table or display according to the data values within a specified row or column. Ranking can be performed on the basis of the data values within any row or column.

The results of the ranking can be displayed in ascending or descending order.

The GRADE Command replaces the data values in a row or column with a number that represents the relative rank of each data value within the row or column.

Ranking Rows or Columns Based on Data Values

Chart is able to rank rows or columns based on the relative size of the data values in a particular row or column.

The RANK Command is used to reorder either rows or columns based on specified data values.

For example, to reorder the rows, based on the relative size of the data values in column 1, type: RANK COLUMN 1

READY
rank column 1

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1940	41940	8770	26560	6610	14160	4600	8270	1290
1941	43080	9380	26820	6880	14640	4840	8390	1410
1946	43690	8500	32850	2340	16840	4970	11420	450
1942	44200	9760	32250	2190	16130	5280	10450	400
1947	44256	8147	33733	2376	16683	4560	11678	445
1948	44730	8119	34226	2385	17352	4556	12282	514
1949	45095	8097	34544	2454	17808	4475	12777	556
1950	45446	8045	34948	2453	18413	4395	13434	584
1943	45950	10690	32940	2320	18830	6110	12230	490
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

The usual order of ranking is from lowest to highest but you can rank in descending order by adding DESCENDING to the RANK Command.

For example, to rank the rows from highest to lowest based on the values in column 1 type: RANK COLUMN 1 DESCENDING

READY
rank column 1 descending

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1944	46930	11010	33500	2420	19390	6240	12650	500
1945	46910	10460	33990	2460	19300	6030	12780	490
1943	45950	10690	32940	2320	18830	6110	12230	490
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1942	44200	9760	32250	2190	16130	5280	10450	400
1946	43690	8500	32850	2340	16840	4970	11420	450
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

To return the table to its original order, type: SEQUENCE ROWS 4 5 6 7 9 2 1

READY
sequence rows 4 5 6 7 9 2 1

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

Using GRADE To Create Rankings

The GRADE Command replaces the data in a row or column with a number, based on a ranking of the data from lowest to highest. The lowest value is given a grade of 1.

Ties (those rows where the values are the same) are given the same grade and the next number is skipped. This results in gaps in the rankings; however, unless there is a tie for the highest value, the highest grade will equal the number of values in the specified row or column.

Remember that it is a good idea to use the DECLARE BACKUP Command before altering the contents of the table; see section "Saving Your Work."

For example, to replace the data values in column 1 with a number that reflects each data value's relative rank within column 1 type: GRADE COLUMN 1

```
READY
grade col 1
```

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	8	8045	34948	2453	18413	4395	13434	584
1949	7	8097	34544	2454	17808	4475	12777	556
1948	6	8119	34226	2385	17352	4556	12282	514
1947	5	8147	33733	2376	16683	4560	11678	445
1946	3	8500	32850	2340	16840	4970	11420	450
1945	10	10460	33990	2460	19300	6030	12780	490
1944	11	11010	33500	2420	19390	6240	12650	500
1943	9	10690	32940	2320	18830	6110	12230	490
1942	4	9760	32250	2190	16130	5280	10450	400
1941	2	9380	26820	6880	14640	4840	8390	1410
1940	1	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

```
READY
```

To replace the data values in column 5 with a number that reflects each data value's rank within column 5 type: GRADE COLUMN 5

READY
grade column 5

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	8	8045	34948	2453	8	4395	13434	584
1949	7	8097	34544	2454	7	4475	12777	556
1948	6	8119	34226	2385	6	4556	12282	514
1947	5	8147	33733	2376	4	4560	11678	445
1946	3	8500	32850	2340	5	4970	11420	450
1945	10	10460	33990	2460	10	6030	12780	490
1944	11	11010	33500	2420	11	6240	12650	500
1943	9	10690	32940	2320	9	6110	12230	490
1942	4	9760	32250	2190	3	5280	10450	400
1941	2	9380	26820	6880	2	4840	8390	1410
1940	1	8770	26560	6610	1	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

Use the BACKUP Command to return the table to its original state by typing: BACKUP

READY
backup

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

Modifying the Display Characteristics of a Table

In This Section:

Chart provides several commands to enable you to enhance the readability and presentation of a table or display.

These commands adjust column and row labels, place commas and decimal points within data values, and group related parts of a table together.

Modifying the Display of Row Labels

Chart normally allows ten characters at the left side of a table for the display of row labels.

If a table's row labels occupy more than ten characters, Chart will truncate the labels starting at the eleventh character, or at the first blank preceding the eleventh character.

It is possible to display row labels that are longer than 10 characters and/or move the row labels to either side of the table by using the LABEL LEFT or LABEL RIGHT Commands.

To display row labels which are a maximum of five characters in length and are positioned on the right-hand side of the table, type: LABEL RIGHT 5.

READY
label right 5

Labor Force by Age and Sex
1940 to 1950
National Totals

Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+	
45446	8045	34948	2453	18413	4395	13434	584	**1950**
45095	8097	34544	2454	17808	4475	12777	556	**1949**
44730	8119	34226	2385	17352	4556	12282	514	**1948**
44256	8147	33733	2376	16683	4560	11678	445	**1947**
43690	8500	32850	2340	16840	4970	11420	450	**1946**
46910	10460	33990	2460	19300	6030	12780	490	**1945**
46930	11010	33500	2420	19390	6240	12650	500	**1944**
45950	10690	32940	2320	18830	6110	12230	490	**1943**
44200	9760	32250	2190	16130	5280	10450	400	**1942**
43080	9380	26820	6880	14640	4840	8390	1410	**1941**
41940	8770	26560	6610	14160	4600	8270	1290	**1940**

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

To move the labels to the left side of the table type: LABEL LEFT 5

```
READY
label left 5

        Labor Force by Age and Sex
        1940 to 1950
        National Totals

                                                                    (See Footnote)

      Total     Male      Male      Male 65+   Total     Female    Female    Female
      Male      16-24     25-64                Female    16-24     25-64     65+
1950  45446     8045      34948     2453       18413     4395      13434     584
1949  45095     8097      34544     2454       17808     4475      12777     556
1948  44730     8119      34226     2385       17352     4556      12282     514
1947  44256     8147      33733     2376       16683     4560      11678     445
1946  43690     8500      32850     2340       16840     4970      11420     450
1945  46910     10460     33990     2460       19300     6030      12780     490
1944  46930     11010     33500     2420       19390     6240      12650     500
1943  45950     10690     32940     2320       18830     6110      12230     490
1942  44200     9760      32250     2190       16130     5280      10450     400
1941  43080     9380      26820     6880       14640     4840      8390      1410
1940  41940     8770      26560     6610       14160     4600      8270      1290

        Labor force in thousands of persons 16 years old and over except,
        prior to 1947, 14 years old and over.

READY
```

Modifying the Display of Column Labels

Chart initially reserves two lines at the top of the columns for displaying column labels.

If the column label's text fits on a single line, the second label line will be blank. This will result in a blank line between the column labels and the data in the table.

If the column labels are too long to fit on a single line, they will be continued on the second line.

It is possible to adjust the number of lines set aside for column labels. It is also possible to specify whether the column labels are to be positioned at the top or bottom of the table.

For example, the column labels in the example table are only two lines long. Specifying that three lines are to be reserved for the labels will have the effect of printing a blank line between the column labels and the data values; this will make the table easier to read.

To specify that three lines are to be used for labeling the columns and that the labels are to be positioned at the top of the columns, type: LABEL TOP 3 as shown on the next page:

READY
label top 3

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

To position the column labels at the bottom of the table, type: LABEL BOTTOM 3

(The LABEL BOTTOM Command is most often used to place the column labels below the bars of a vertical bar chart.)

```
READY
label bottom 3

        Labor Force by Age and Sex
        1940 to 1950
        National Totals

                                                                  (See Footnote)
1950    45446    8045    34948    2453    18413    4395    13434    584
1949    45095    8097    34544    2454    17808    4475    12777    556
1948    44730    8119    34226    2385    17352    4556    12282    514
1947    44256    8147    33733    2376    16683    4560    11678    445
1946    43690    8500    32850    2340    16840    4970    11420    450
1945    46910   10460    33990    2460    19300    6030    12780    490
1944    46930   11010    33500    2420    19390    6240    12650    500
1943    45950   10690    32940    2320    18830    6110    12230    490
1942    44200    9760    32250    2190    16130    5280    10450    400
1941    43080    9380    26820    6880    14640    4840     8390   1410
1940    41940    8770    26560    6610    14160    4600     8270   1290
         Total    Male     Male  Male 65+  Total  Female   Female  Female
         Male   16-24    25-64            Female  16-24    25-64    65+

        Labor force in thousands of persons 16 years old and over except,
        prior to 1947, 14 years old and over.

READY
```

To return the labels to the top of the columns type: LABEL TOP 3

READY
label top 3

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

Printing Commas Within Data Values

Inserting commas to separate a number into three digit segments (thousands, millions, etc.) greatly increases the readability of the number.

To insert commas into the data values, type: FORMAT COMMA

READY
format comma

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45,446	8,045	34,948	2,453	18,413	4,395	13,434	584
1949	45,095	8,097	34,544	2,454	17,808	4,475	12,777	556
1948	44,730	8,119	34,226	2,385	17,352	4,556	12,282	514
1947	44,256	8,147	33,733	2,376	16,683	4,560	11,678	445
1946	43,690	8,500	32,850	2,340	16,840	4,970	11,420	450
1945	46,910	10,460	33,990	2,460	19,300	6,030	12,780	490
1944	46,930	11,010	33,500	2,420	19,390	6,240	12,650	500
1943	45,950	10,690	32,940	2,320	18,830	6,110	12,230	490
1942	44,200	9,760	32,250	2,190	16,130	5,280	10,450	400
1941	43,080	9,380	26,820	6,880	14,640	4,840	8,390	1,410
1940	41,940	8,770	26,560	6,610	14,160	4,600	8,270	1,290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

To remove commas from the table type: FORMAT

READY
format

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

Displaying Decimal Numbers

Chart normally displays data as whole numbers.

Unless you specify otherwise, numbers entered using decimal points and with digits to the right of the decimal point are displayed as rounded to the nearest whole number.

However, decimal numbers can be displayed by using the FORMAT Command.

For example, to specify that a decimal point is to be displayed, and that two digits are to be displayed to the right of the decimal point type: FORMAT 8.2

READY
format 8.2

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446.00	8045.00	34948.00	2453.00	18413.00	4395.00	13434.00	584.00
1949	45095.00	8097.00	34544.00	2454.00	17808.00	4475.00	12777.00	556.00
1948	44730.00	8119.00	34226.00	2385.00	17352.00	4556.00	12282.00	514.00
1947	44256.00	8147.00	33733.00	2376.00	16683.00	4560.00	11678.00	445.00
1946	43690.00	8500.00	32850.00	2340.00	16840.00	4970.00	11420.00	450.00
1945	46910.00	10460.00	33990.00	2460.00	19300.00	6030.00	12780.00	490.00
1944	46930.00	11010.00	33500.00	2420.00	19390.00	6240.00	12650.00	500.00
1943	45950.00	10690.00	32940.00	2320.00	18830.00	6110.00	12230.00	490.00
1942	44200.00	9760.00	32250.00	2190.00	16130.00	5280.00	10450.00	400.00
1941	43080.00	9380.00	26820.00	6880.00	14640.00	4840.00	8390.00	1410.00
1940	41940.00	8770.00	26560.00	6610.00	14160.00	4600.00	8270.00	1290.00

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

The general form of the FORMAT Command is: FORMAT W.D

The "W" (width) stands for the total number of characters that should be reserved for displaying the number.

In the example on the previous page, the 8 indicates that an eight character field should be set aside for displaying the number.

If a decimal point is to be displayed, the width must allow one character for the decimal point.

The "." (period) indicates that a decimal point should be printed.

The "D" in the FORMAT Command specifies the number of digits that are to be displayed to the right of the decimal point.

In the above example, 2 decimal places are displayed.

A total of 8 characters, minus 1 character for the decimal point, and minus 2 characters for numbers to the right of the decimal point means that we have allowed five characters in which to display numbers to the left of the decimal point.

You can specify a separate W.D parameter for each column in the table by listing them in the FORMAT Command. If you specify fewer W.D parameters than there are columns in the table, the list that you do specify will be repeated.

You can display both commas and decimal digits in a number, but you must include space for the commas in the W parameter.

For example, commas can be added to the above example by typing:
FORMAT COMMA 9.2 as shown on the next page.

READY
format comma 9.2

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45,446.00	8,045.00	34,948.00	2,453.00	18,413.00	4,395.00	13,434.00	584.00
1949	45,095.00	8,097.00	34,544.00	2,454.00	17,808.00	4,475.00	12,777.00	556.00
1948	44,730.00	8,119.00	34,226.00	2,385.00	17,352.00	4,556.00	12,282.00	514.00
1947	44,256.00	8,147.00	33,733.00	2,376.00	16,683.00	4,560.00	11,678.00	445.00
1946	43,690.00	8,500.00	32,850.00	2,340.00	16,840.00	4,970.00	11,420.00	450.00
1945	46,910.00	10,460.00	33,990.00	2,460.00	19,300.00	6,030.00	12,780.00	490.00
1944	46,930.00	11,010.00	33,500.00	2,420.00	19,390.00	6,240.00	12,650.00	500.00
1943	45,950.00	10,690.00	32,940.00	2,320.00	18,830.00	6,110.00	12,230.00	490.00
1942	44,200.00	9,760.00	32,250.00	2,190.00	16,130.00	5,280.00	10,450.00	400.00
1941	43,080.00	9,380.00	26,820.00	6,880.00	14,640.00	4,840.00	8,390.00	1,410.00
1940	41,940.00	8,770.00	26,560.00	6,610.00	14,160.00	4,600.00	8,270.00	1,290.00

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

To restore the table to integer format and to remove the commas type: FORMAT

```
READY
format

        Labor Force by Age and Sex
        1940 to 1950
        National Totals

                                                                    (See Footnote)

        Total    Male     Male     Male 65+   Total    Female   Female   Female
        Male     16-24    25-64               Female   16-24    25-64    65+

1950    45446    8045     34948    2453       18413    4395     13434    584
1949    45095    8097     34544    2454       17808    4475     12777    556
1948    44730    8119     34226    2385       17352    4556     12282    514
1947    44256    8147     33733    2376       16683    4560     11678    445
1946    43690    8500     32850    2340       16840    4970     11420    450
1945    46910    10460    33990    2460       19300    6030     12780    490
1944    46930    11010    33500    2420       19390    6240     12650    500
1943    45950    10690    32940    2320       18830    6110     12230    490
1942    44200    9760     32250    2190       16130    5280     10450    400
1941    43080    9380     26820    6880       14640    4840     8390     1410
1940    41940    8770     26560    6610       14160    4600     8270     1290

        Labor force in thousands of persons 16 years old and over except,
        prior to 1947, 14 years old and over.

READY
```

Grouping Related Rows or Columns

It is often useful to group together certain rows or columns to show that they are related to each other.

In the current exercise it might be useful to group together those columns referring to Males and to make a second group out of those columns referring to Females.

To group together the first four columns type: GROUP COLUMNS 4

READY
group columns 4

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

The number or numbers in the Group Command indicates how many rows or columns should be included in each group.

For example, to divide the columns into four groups consisting of the Total Male column, the 3 Male detail categories, the Total Female category and the 3 Female detail categories type: GROUP COLUMN 1 3 1 3

READY
group column 1 3 1 3

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

To restore the table to the original ungrouped form type: GROUP COLUMN

READY
group column

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

Graphic Displays of the Data

In This Section:

Chart can display data in many graphic forms. This course describes the forms that are used most frequently: bar charts, line graphs, and pie charts. Other display forms are covered in the Intermediate Chart course.

It is necessary to use a graphics terminal such as the Tektronix 4014 or 4016 to do the examples in this section. Therefore, the next several pages describe the steps you will need to follow to move from a non-graphics terminal to a graphics terminal.

Appendix A contains helpful information on the use of the Tektronix.

Restarting a Chart Session

Restarting a Chart session is necessary whenever:

- You move from a non-graphics terminal to a graphics terminal;
- Your work with a set of data requires more than one session to complete.

The steps you will need to follow to restart a Chart session require that you:

(1) Write a Chart command file containing the data and current display characteristics. Please refer to the section "Saving Your Work;"

(2) Exit Chart and log off the VAX;

(3) Move to a new terminal and log back on to the VAX;

(4) Invoke Chart and specify the terminal type;

(5) Read in the Chart command file created in step 1 above;

(6) Adjust the page size to be appropriate to the graphics terminal;

(7) Adjust the label size so that it too is appropriate to the graphics terminal.

Page and label sizes are explained on the next several pages.

Once the Chart system has been restarted, read in the Chart command file "table1.scr" by typing: SCRIPT TABLE1.SCR:

```
READY
script table1.scr
READY
plot report
```

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

```
READY
```

The Terminal Page Size

The term "page" refers to the area on a screen in which Chart will draw a display.

The size of the page available for drawing a display differs from terminal to terminal.

Up to this point you have been using a non-graphics terminal. The scripts you have written contain instructions that enable Chart to recreate a display on a non-graphics terminal.

When you move to the Tektronix you will have to adjust the page size so that it is appropriate to this new device.

The page sizes most commonly used by new users are:

PAGE 0 1 — Enables Chart to use the right three quarters of the screen, leaving the left hand quarter available for commands and Chart responses;

This page size also enables Chart to use a 132 character screen on non-graphics terminals that are capable of displaying 132 characters per line.

Using 132 character per line format requires setting the terminal to 132 characters at DCL level before entering Chart; type: **SET TERMINAL/WIDTH=132** at the DCL prompt, **$**.

PAGE −.3 1 — Enables Chart to use the entire Tektronix screen to draw the display.

PAGE 0 .6 — Enables Chart to use an 80 character screen on a non-graphics terminal to draw the display.

The following examples assume that you are now using a graphics terminal, and therefore set the page size from 0 to 1.

READY
page 0 1

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

Label Sizes

Chart is capable of drawing characters in several sizes on a graphics terminal. You will frequently need to adjust the character size to enable the graphics terminal to display large tables.

It is also necessary to adjust the character size when scripts created on a non-graphics terminal are displayed on a graphics terminal.

The command to change the character size is LABEL SIZE followed by a number.

The number following the command indicates the number of characters which fit on one line of the terminal.

Figure 6 shows character sizes available on the Tektronix.

Figure 6

Labor Force by Age and Sex
1940 to 1950
National Totals

This figure uses a Label Size of 54

Labor Force by Age and Sex
1940 to 1950
National Totals

This figure uses a Label Size of 59

Labor Force by Age and Sex
1940 to 1950
National Totals

This figure uses a Label size of 89

Labor Force by Age and Sex
1940 to 1950
National Totals

This figure uses a Label Size of 99

A label size of 89 will be used for the following examples. Set the label size by typing, LABEL SIZE 89

READY
label size 89

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

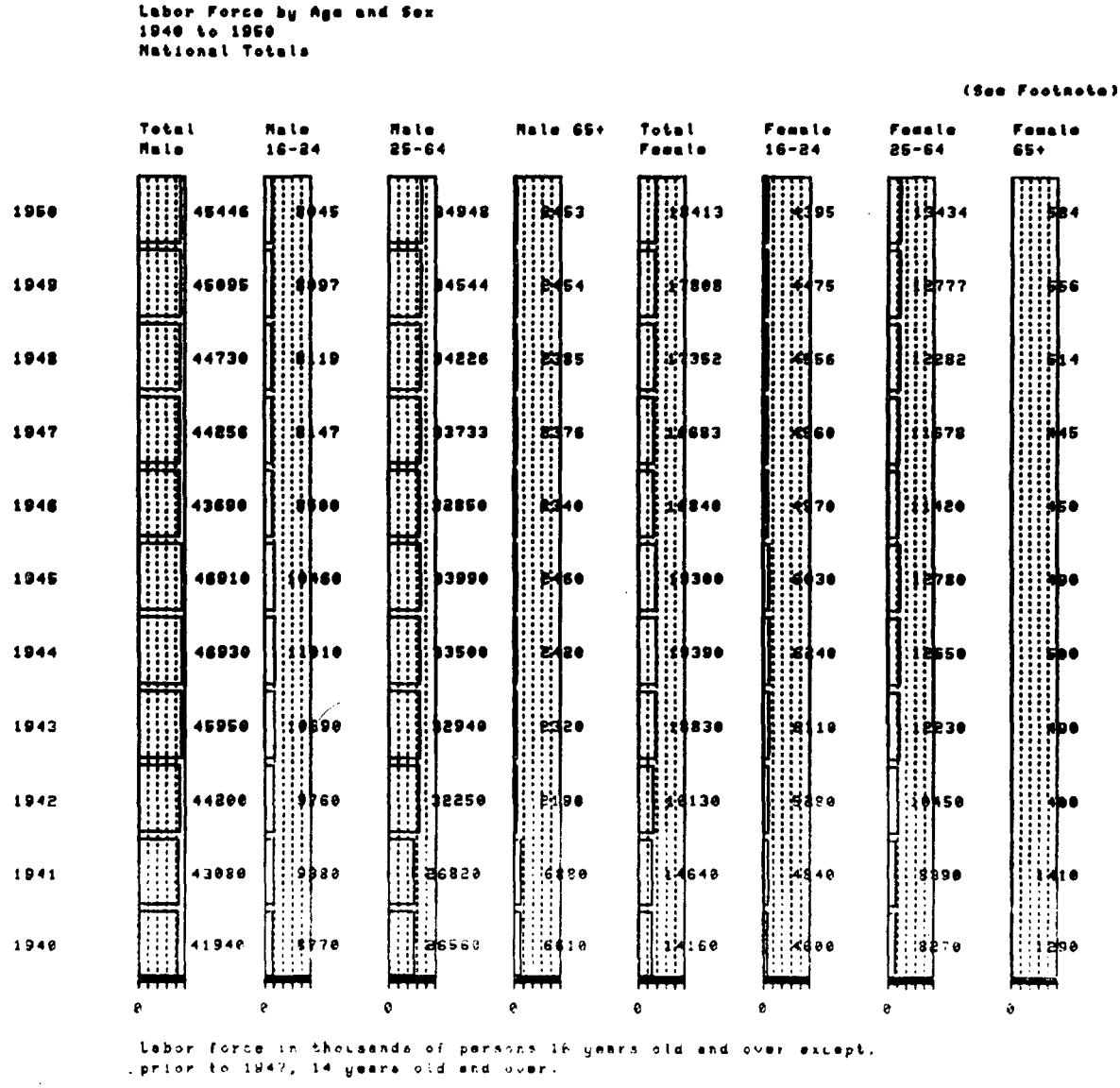
	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584
1949	45095	8097	34544	2454	17808	4475	12777	556
1948	44730	8119	34226	2385	17352	4556	12282	514
1947	44256	8147	33733	2376	16683	4560	11678	445
1946	43690	8500	32850	2340	16840	4970	11420	450
1945	46910	10460	33990	2460	19300	6030	12780	490
1944	46930	11010	33500	2420	19390	6240	12650	500
1943	45950	10690	32940	2320	18830	6110	12230	490
1942	44200	9760	32250	2190	16130	5280	10450	400
,1941	43080	9380	26820	6880	14640	4840	8390	1410
1940	41940	8770	26560	6610	14160	4600	8270	1290

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

Creating Bar Charts

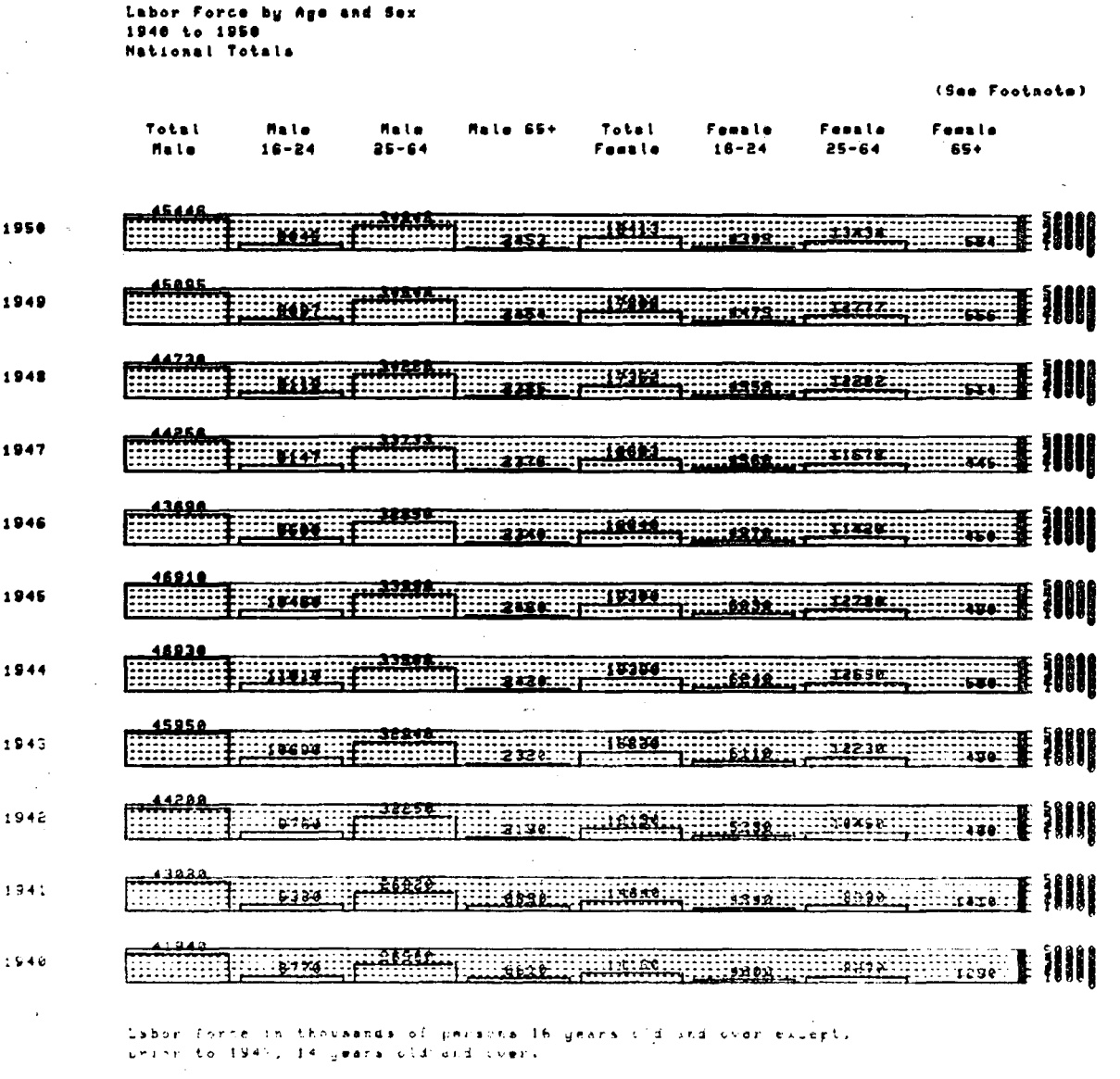
The BAR Command creates a graph containing a bar for each data value in the current table. To display a bar graph of the current table type: BAR

READY
bar



Normally, the bars are horizontal, with one bar for each data value. Chart can also display vertical bars. To display vertical bars type: BAR VERTICAL

READY
bar vertical

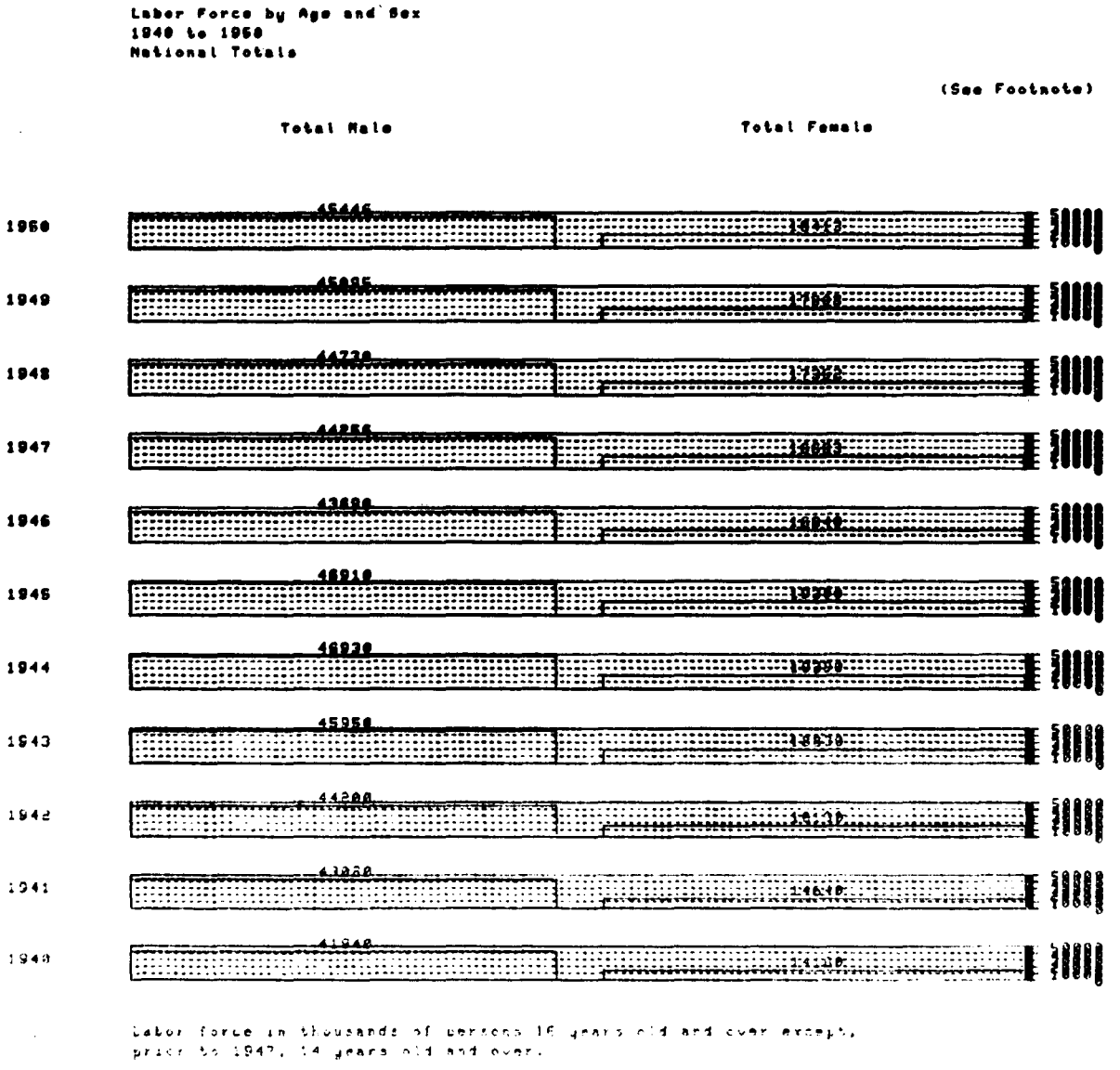


Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

The BAR Command creates bar charts that include the entire table. In many cases, this example included, the table contains more data than can be displayed effectively on a single page.

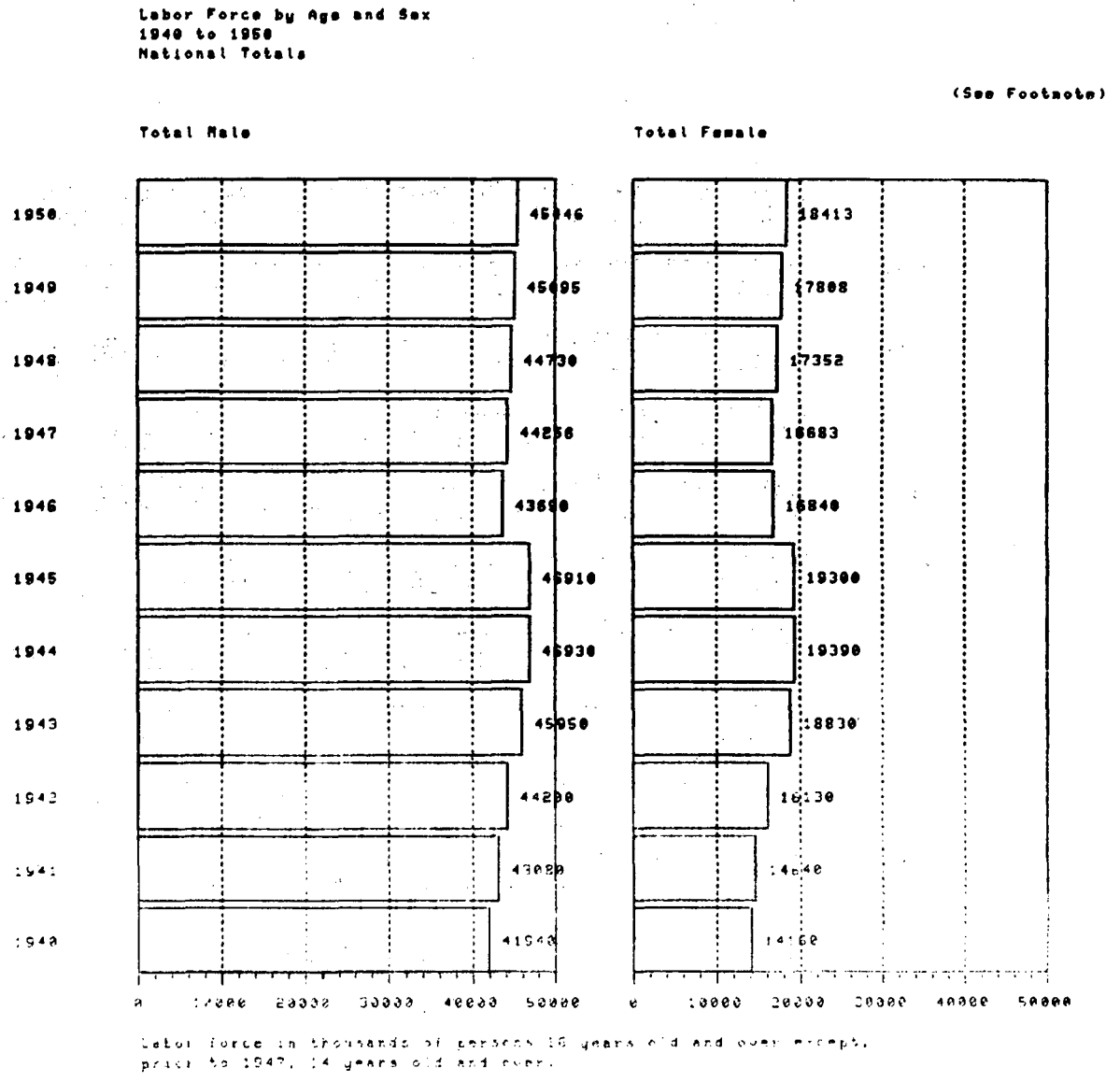
The following examples show bar charts of the "Total Male" and "Total Female" columns from the current display by masking the other columns:

READY
mask columns 2 3 4 6 7 8



The display on the preceding page is less cluttered, but is not yet as communicative as it might be. Displaying so many rows in a vertical format results in bar charts that are too compressed; all the data values look about the same. Therefore, display the two columns as horizontal bars by typing: BAR HORIZONTAL

READY
bar horizontal



Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

Creating Line Graphs

The LINE Command produces a line graph of the current display. It displays a separate line for each row.

Line graphs are particularly effective for displaying trends over time.

In order to take advantage of this effect, we must transpose the current table so that the columns represent time and the rows represent the age and sex groups.

First use the PLOT REPORT Command to examine the current table:

```
READY
plot report

          Labor Force by Age and Sex
          1940 to 1950
          National Totals

                                                    (See Footnote)

          Total Male                  Total Female

1950        45446                       18413
1949        45095                       17808
1948        44730                       17352
1947        44256                       16683
1946        43690                       16840
1945        46910                       19300
1944        46930                       19390
1943        45950                       18830
1942        44200                       16130
1941        43080                       14640
1940        41940                       14160

          Labor force in thousands of persons 16 years old and over except,
          prior to 1947, 14 years old and over.

READY
```

The TRANSPOSE Command turns columns into rows and rows into columns.

To transpose the current table type: TRANSPOSE

READY
transpose
READY
plot report

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	1950	1949	1948	1947	1946	1945	1944	1943	1942	1941	1940
Total	45446	45095	44730	44256	43690	46910	46930	45950	44200	43080	41940
Total	18413	17808	17352	16683	16840	19300	19390	18830	16130	14640	14160

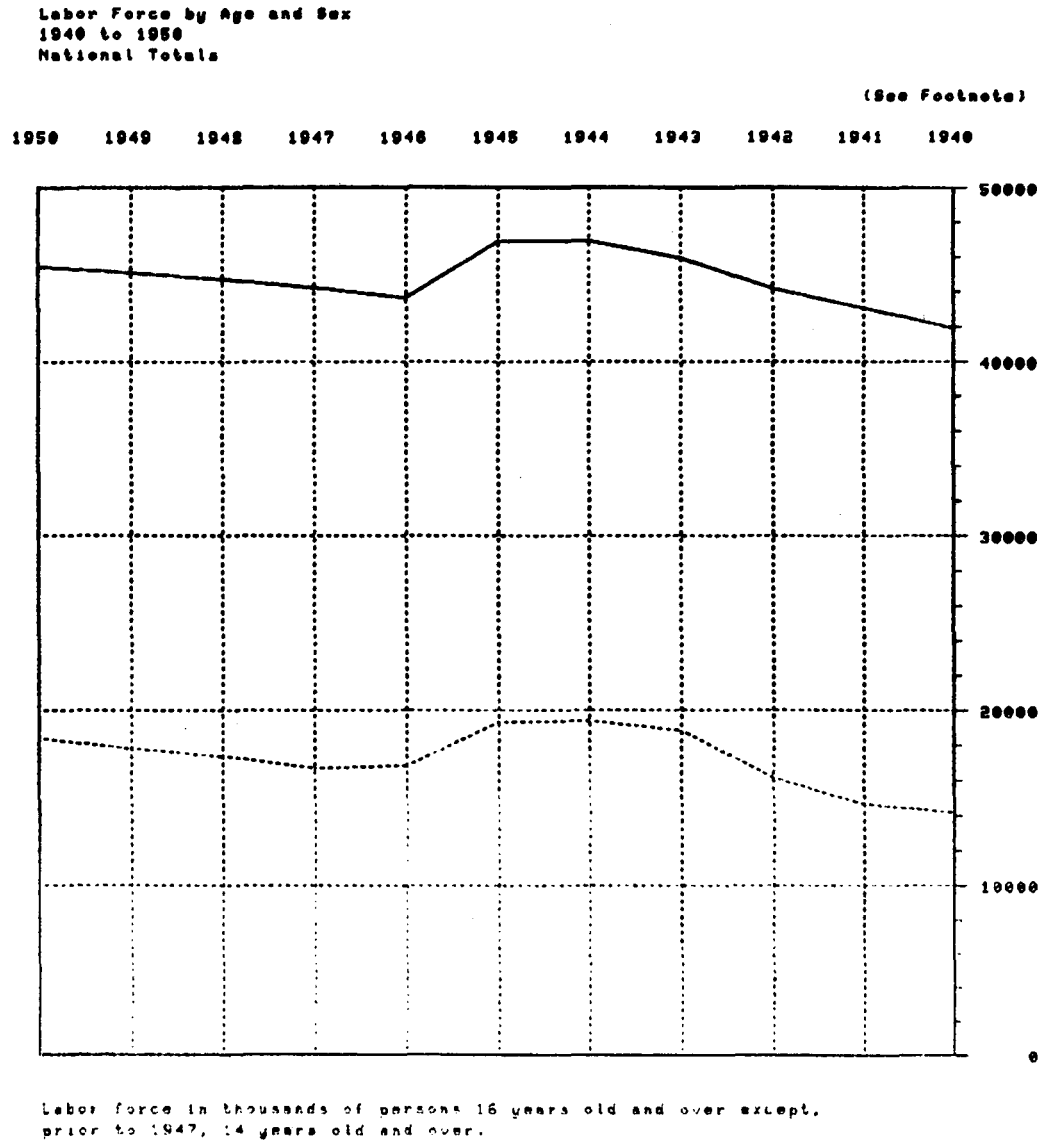
Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

To display a line graph of the transposed table, type: LINE

This graph emphasizes the fluctuations in the size of the labor force over time.

READY
line



Labeling Lines on a Line Graph

The LABEL LINE Command is used to position labels on curves in the lines of a line graph.

You can specify the column position and whether the label is to start or end at that column position (be right or left justified with respect to the specified column).

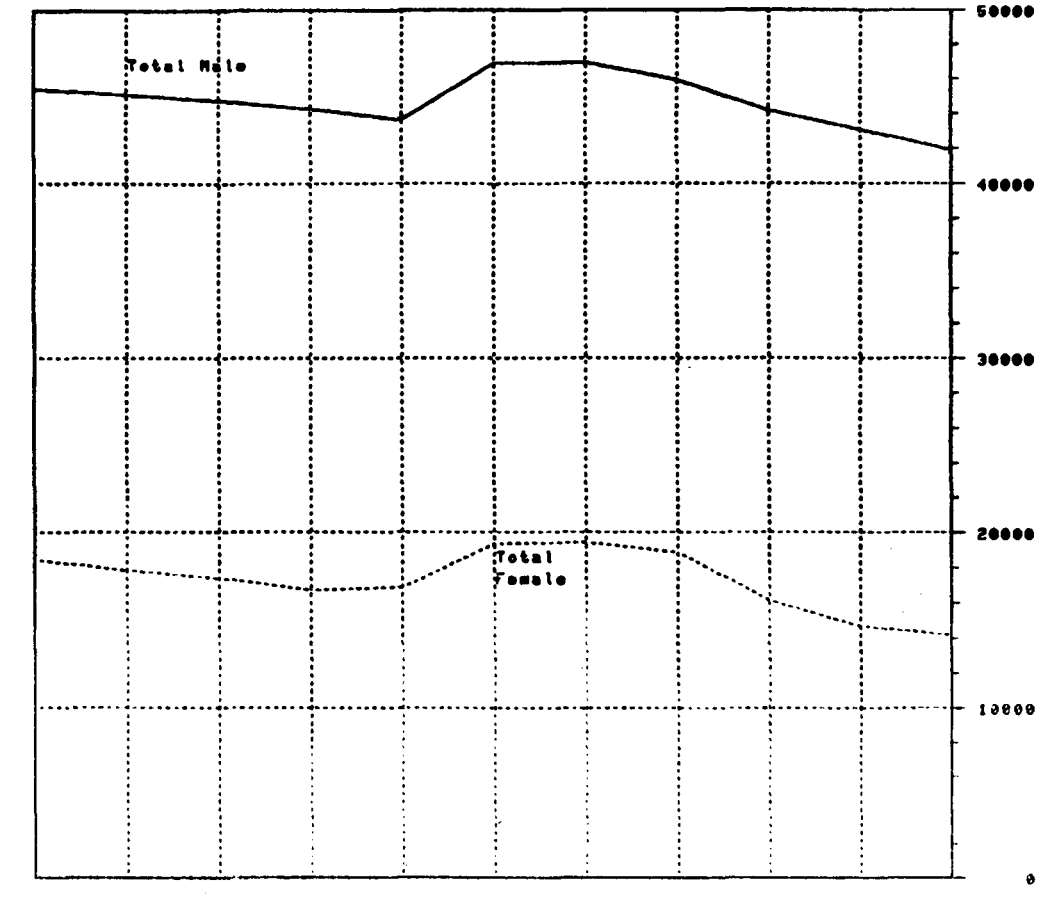
The LABEL LINE Command includes a list of column positions. The list of column positions is used in order. If the number of lines to be labeled exceeds the number of items in the list, the list is reused, as many times as is necessary.

To position a label starting at column 2 on the first line, and another starting at column 6 on the second line, type: LABEL LINE 2 6

READY
label line 2 6

Labor Force by Age and Sex
1940 to 1950
National Totals

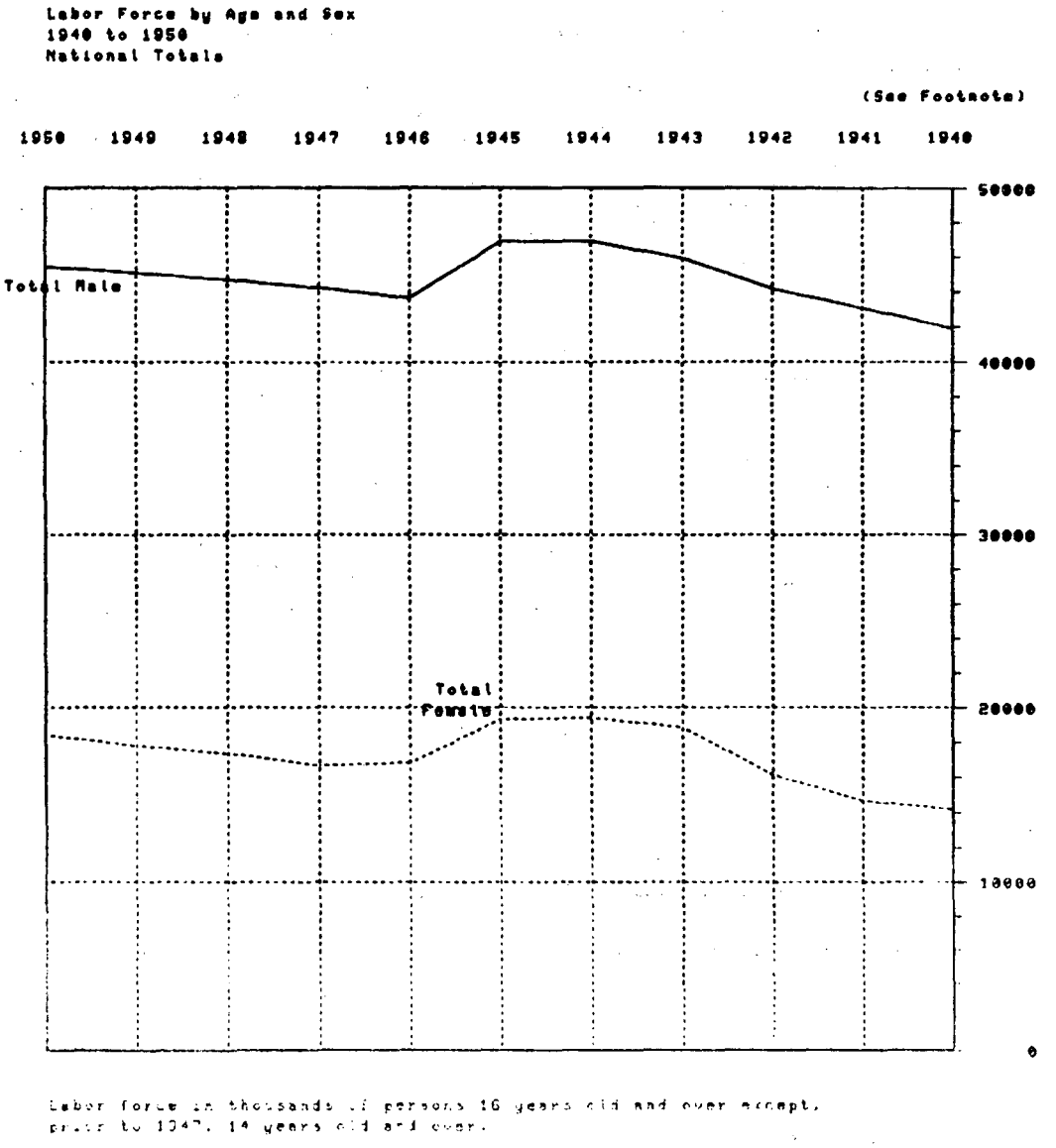
(See Footnote)



Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

A positive number in the list indicates that a label is to begin at the specified column position (be left justified); a negative number indicates that a label is to end at the specified column position. "Column" is used here to mean the column of a Chart table, not the common data processing meaning of "number of character positions from the left margin of the screen."

READY
label line -2 -6



Creating Pie Charts

The PIE Command produces a pie chart. Most available graphics terminals are only capable of displaying a single pie chart at a time.

This example creates a pie chart showing the composition of the labor force for the year 1950. In order to do this we will return to the original table, window in on the 1950 row, and mask out the "Total Male" and "Total Female" columns:

```
READY
backup
READY
plot report

        Labor Force by Age and Sex
        1940 to 1950
        National Totals

                                                                    (See Footnote)
        Total    Male     Male              Total    Female   Female   Female
        Male     16-24    25-64   Male 65+  Female   16-24    25-64    65+

1950    45446    8045     34948   2453      18413    4395     13434    584
1949    45095    8097     34544   2454      17808    4475     12777    556
1948    44730    8119     34226   2385      17352    4556     12282    514
1947    44256    8147     33733   2376      16683    4560     11678    445
1946    43690    8500     32850   2340      16840    4970     11420    450
1945    46910    10460    33990   2460      19300    6030     12780    490
1944    46930    11010    33500   2420      19390    6240     12650    500
1943    45950    10690    32940   2320      18830    6110     12230    490
1942    44200    9760     32250   2190      16130    5280     10450    400
1941    43080    9380     26820   6880      14640    4840     8390     1410
1940    41940    8770     26560   6610      14160    4600     8270     1290

        Labor force in thousands of persons 16 years old and over except,
        prior to 1947, 14 years old and over.

READY
```

READY
window row 1

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Total Male	Male 16-24	Male 25-64	Male 65+	Total Female	Female 16-24	Female 25-64	Female 65+
1950	45446	8045	34948	2453	18413	4395	13434	584

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

READY

READY
mask columns 1 5

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

	Male 16-24	Male 25-64	Male 65+	Female 16-24	Female 25-64	Female 65+
1950	8045	34948	2453	4395	13434	584

Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

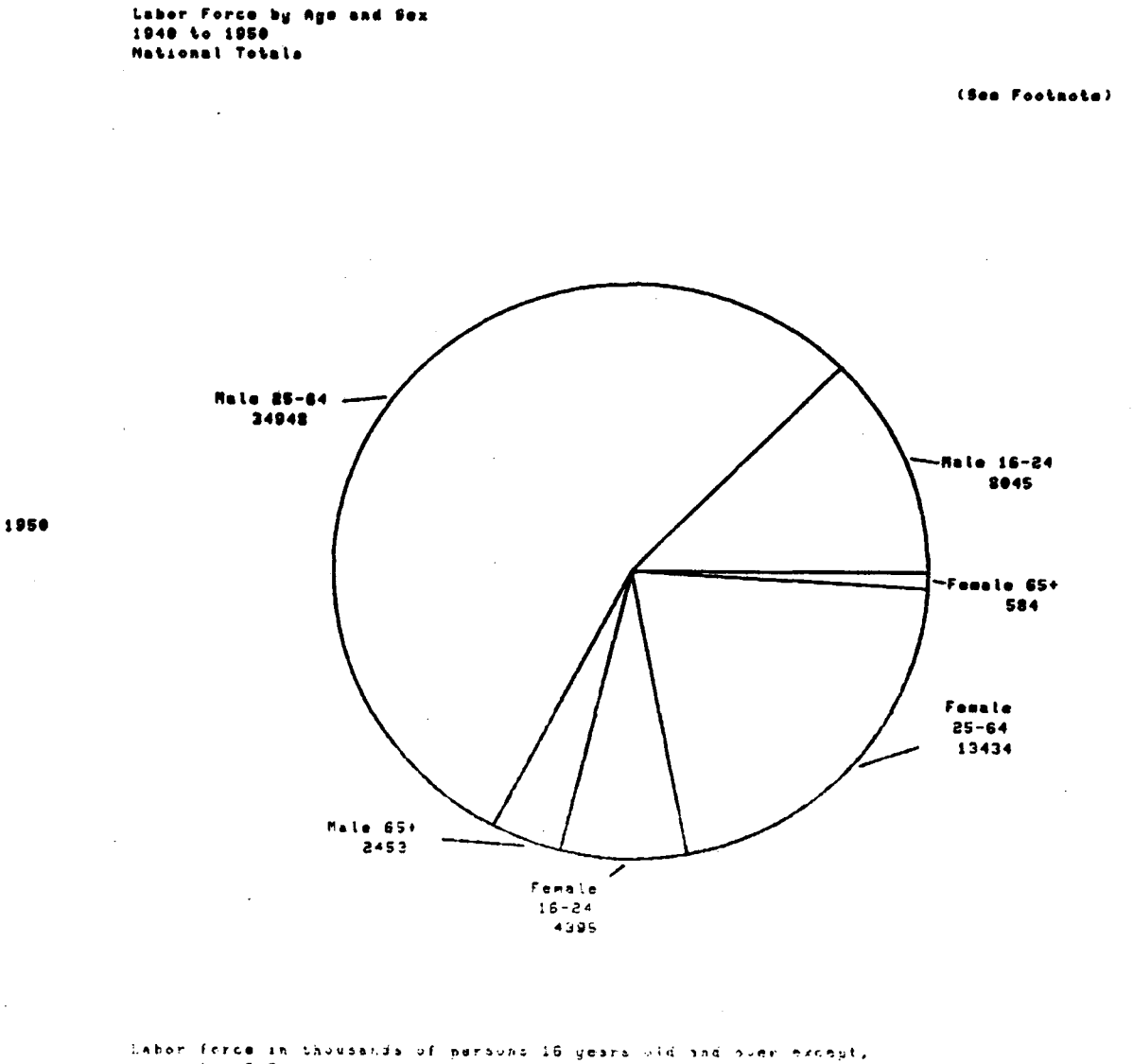
READY

To create a pie chart of this display, type: PIE

Pie charts are useful for displaying the proportion of the total of all data values that each data value represents.

Notice that Chart automatically includes the titles and labels that were part of the current table. It also displays the value or amount that corresponds to each segment of the pie.

READY
pie



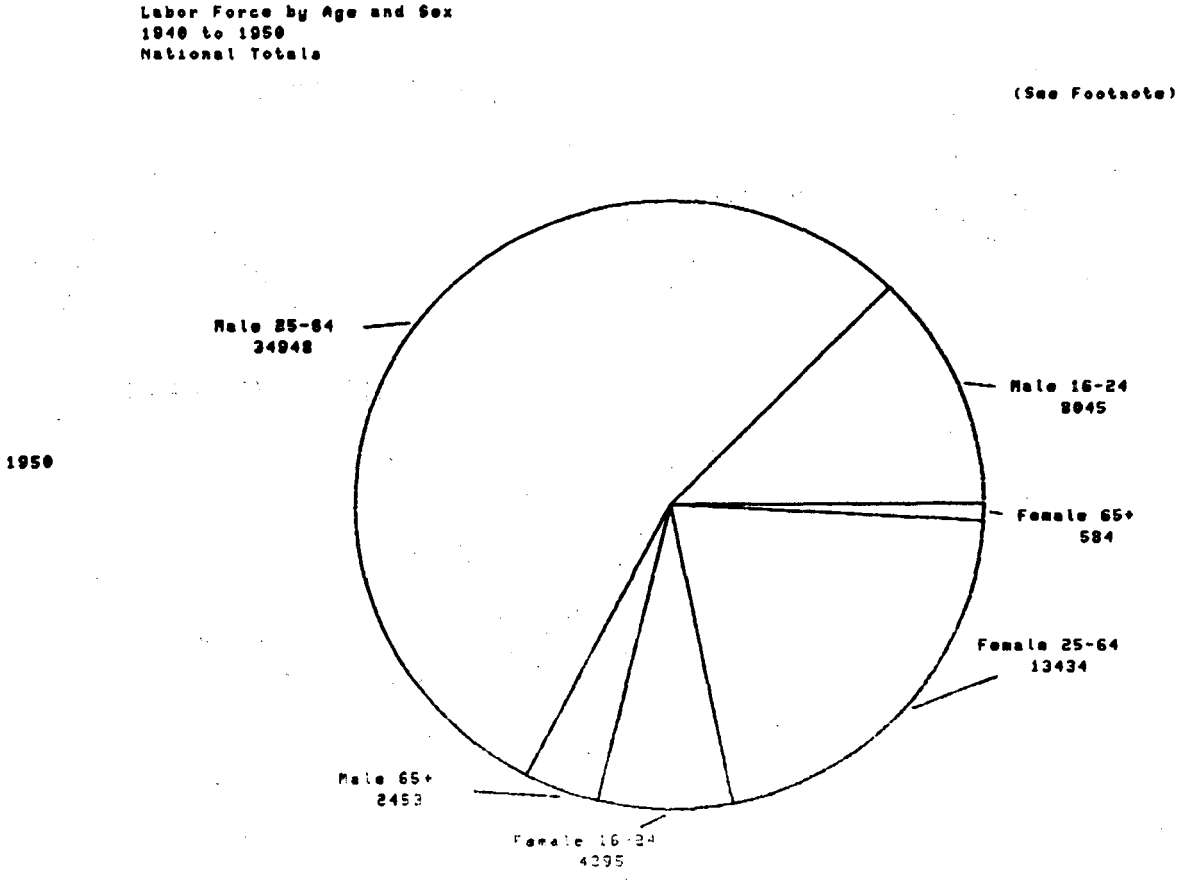
Modifying Display of Labels on Pie and Line Charts

Chart normally displays a two-line label, up to 10 characters long on each segment of a pie chart or on the lines of a line graph. The LABEL BOX Command specifies the number of lines and the maximum number of characters per line for labels inside the Plot Region. To allow labels inside the plot region with up to 12 characters per line, and 2 lines long type: LABEL BOX 12 2

The first number in the LABEL BOX Command specifies the number of characters per line; the second number specifies the maximum number of lines.

The LABEL BOX Command refers only to the label text, not the data values.

READY
label box 12 2



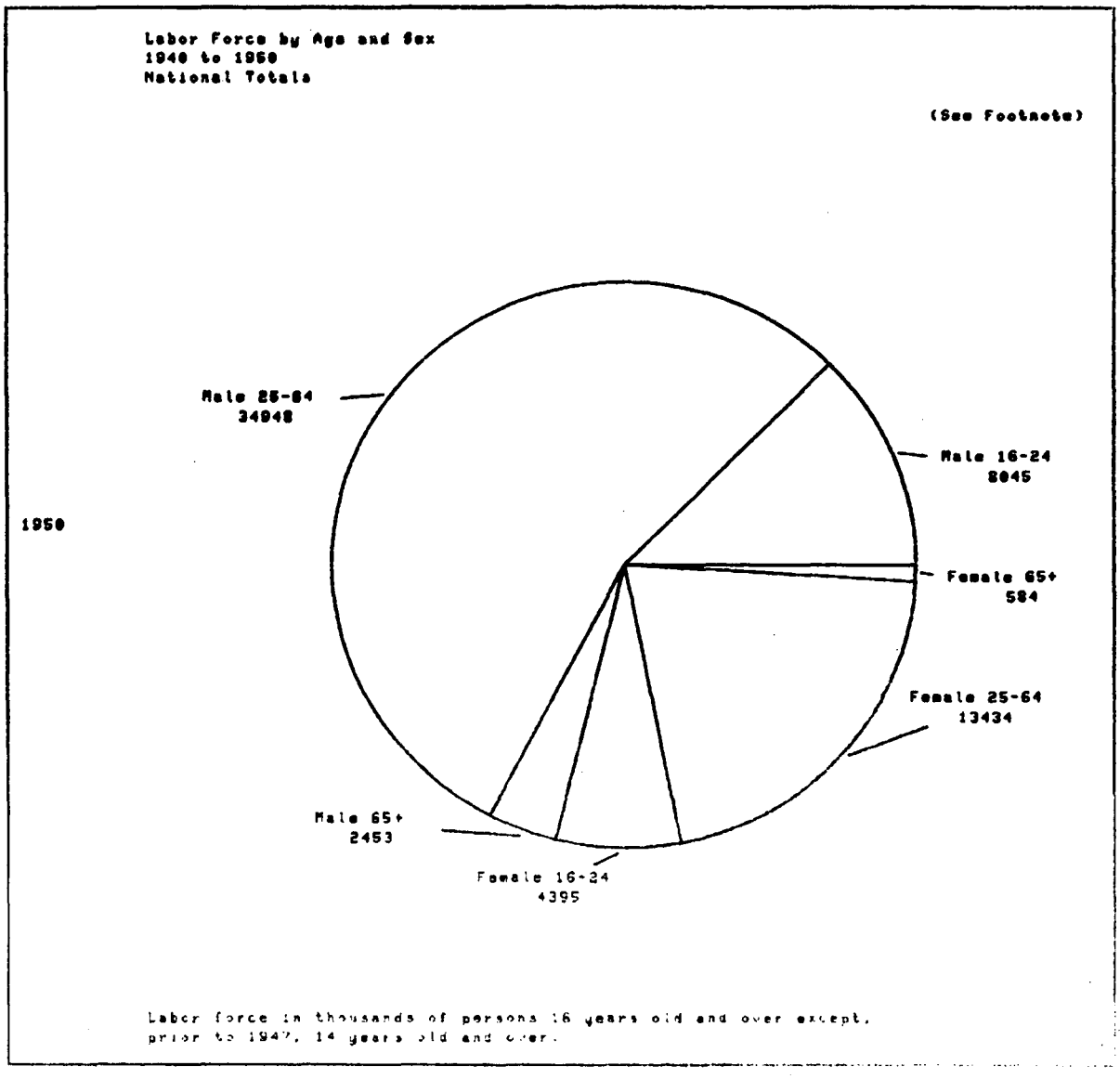
Labor for m in thousands of persons 14 years old and over except, prior to 1947, 14 years old and over.

Drawing a Border Around a Chart

The BORDER Command is used to draw a frame or border around a table or chart. A number following the BORDER Command specifies the width of the border.

For example, to display a border that is one character wide around the pie chart in the current example, type: BORDER 1

READY
border 1



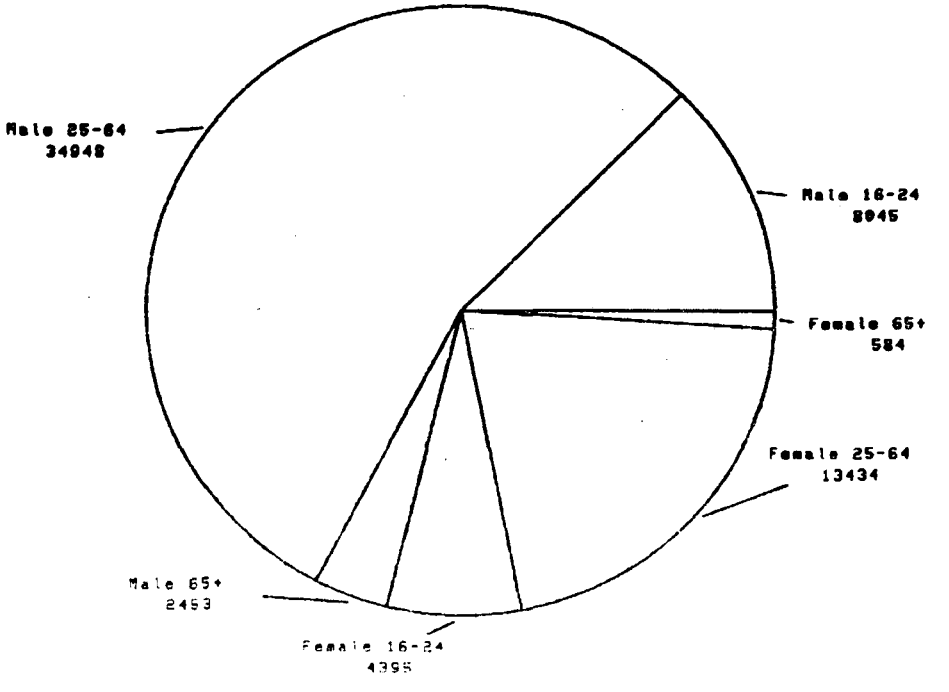
To remove the border, type: BORDER 0

READY
border 0

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

1950



Labor force in thousands of persons 16 years old and over except prior to 1947, 14 years old and over

Modifying the Appearance of a Graph

In This Section:

Several options are available for modifying the appearance of graphic displays. These options can be used both to emphasize particular relationships within the data and to make the finished chart more legible and attractive.

The Shade Command

The SHADE Command fills in specified bars on a bar chart and segments of a pie chart.

The numbers in the shade command specify the density of the shading. The density value is a decimal number between 0 (zero) and 1 (one), with zero being indicating no shading and 1 indicating maximum shading.

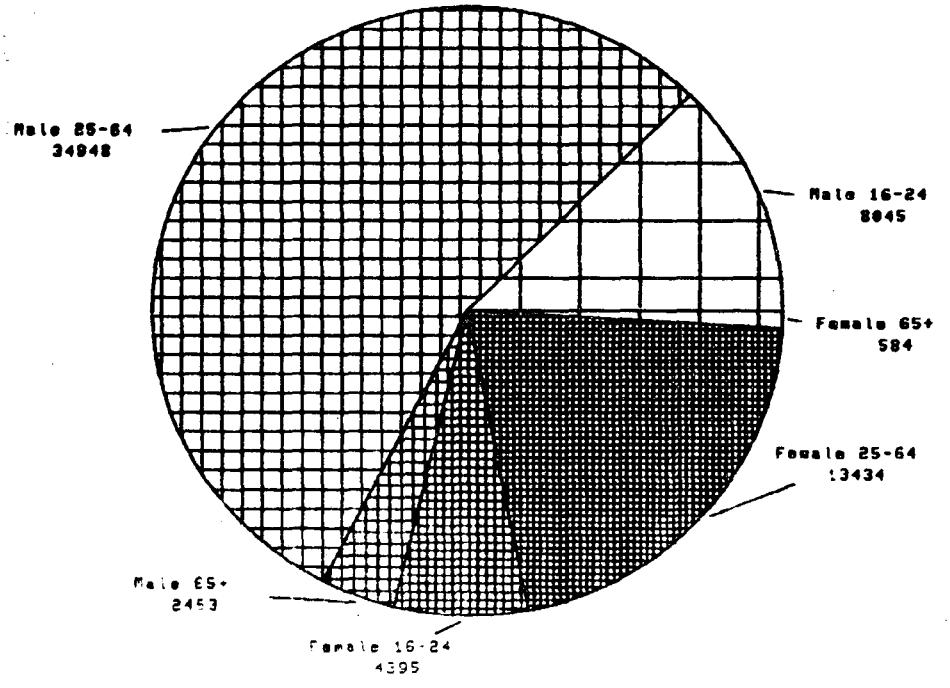
To put shading on the pie chart used in the last example type: SHADE .1 .3 .5 .7 .9

READY

shade .1 .3 .5 .7 .9

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)



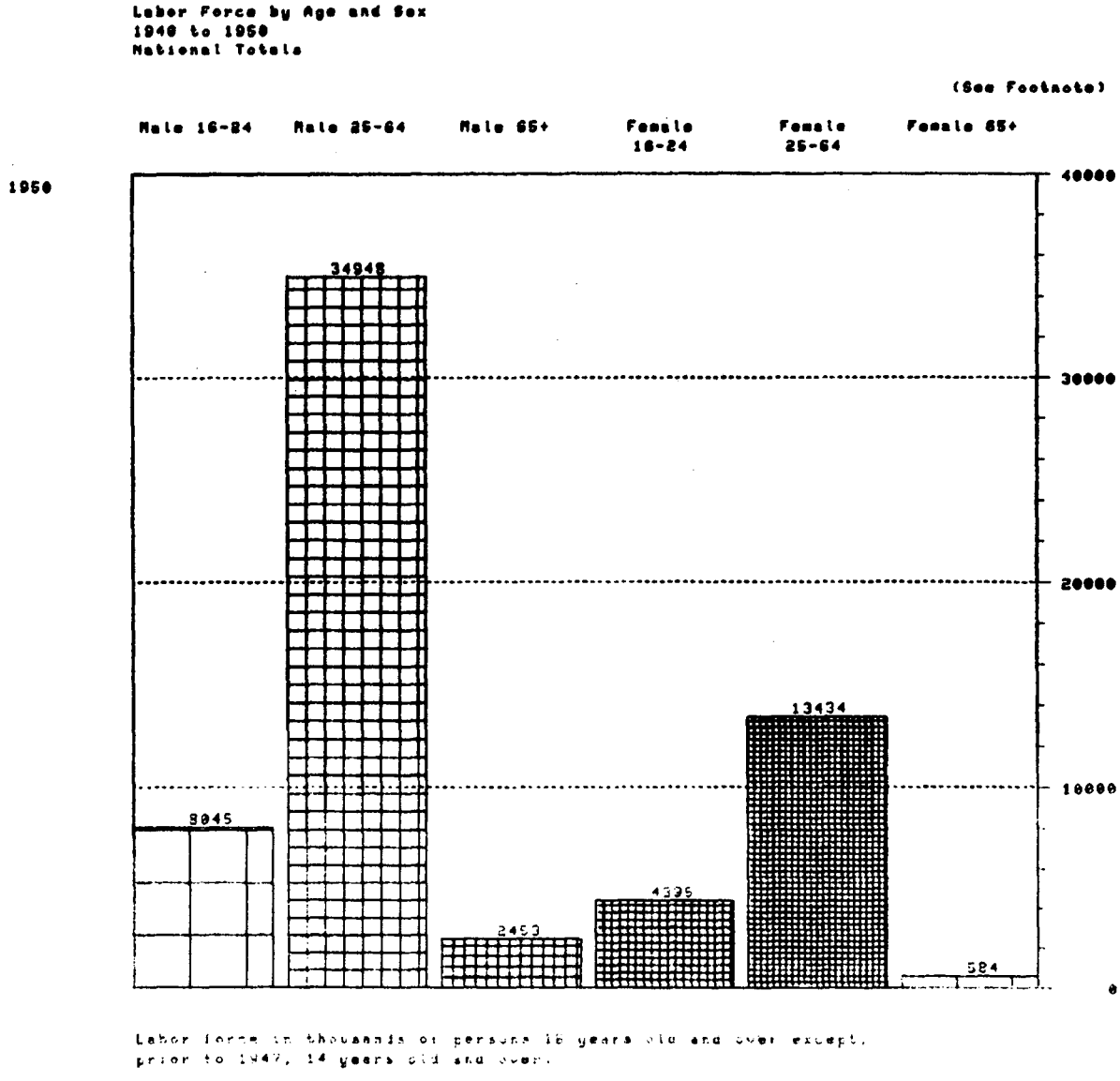
1950

Labor force in thousands of persons 14 years old and over except prior to 1947, 14 years old and over.

In the previous example, a separate density value was specified for each segment of the chart.

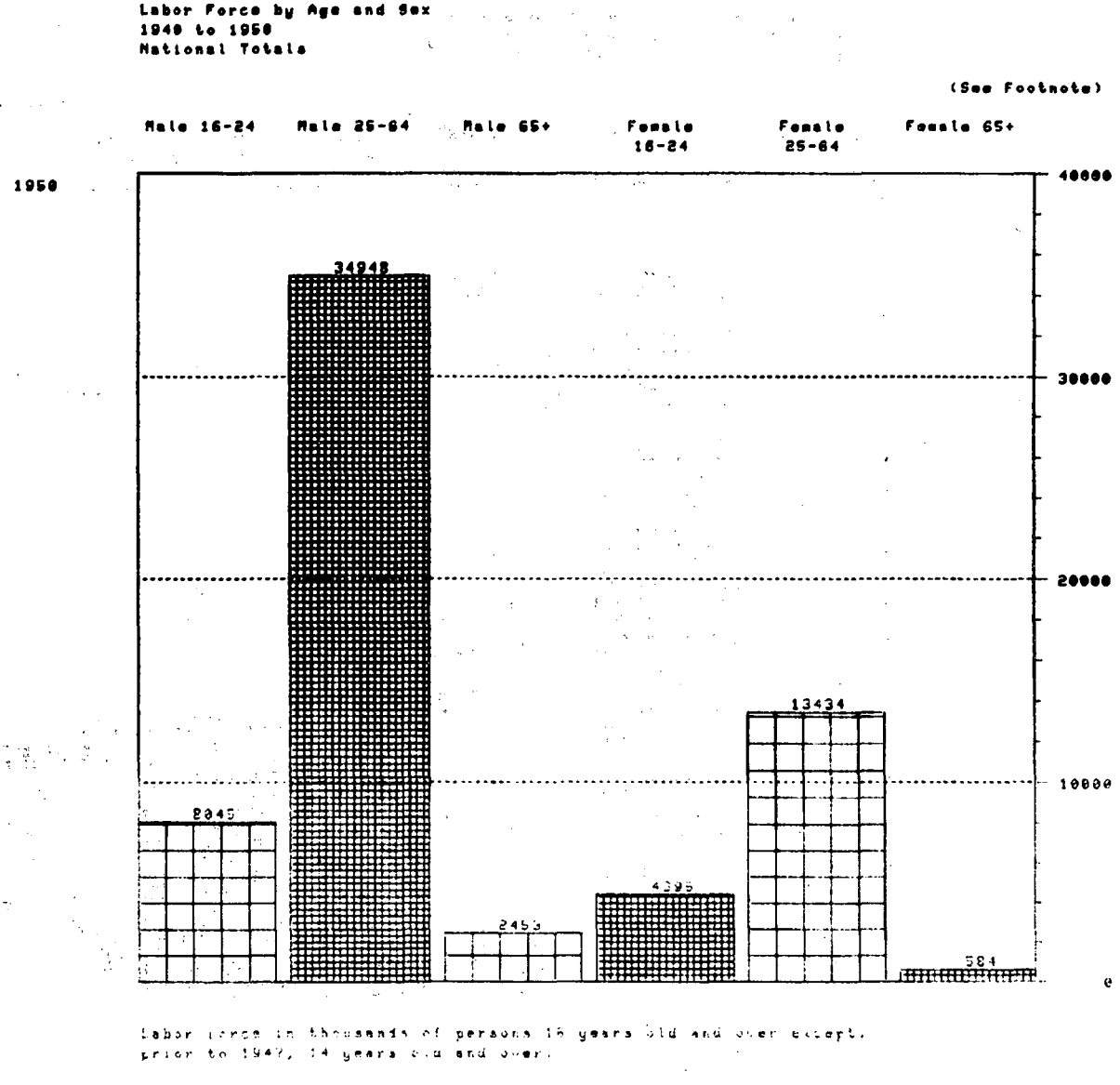
The effects of the shade command are carried over to bar graphs:

READY
bar



If you specify fewer density values than the number of bars or pie segments, Chart repeats the value list, as many times as is necesary. For example, to alternate between two density levels type: SHADE .2 .8

READY
shade .2 .8



The Slope Command

The SLOPE Command changes the angle of the cross hatching used in shading. Varying both the slope and density of the shading provides a large variety of potential textures.

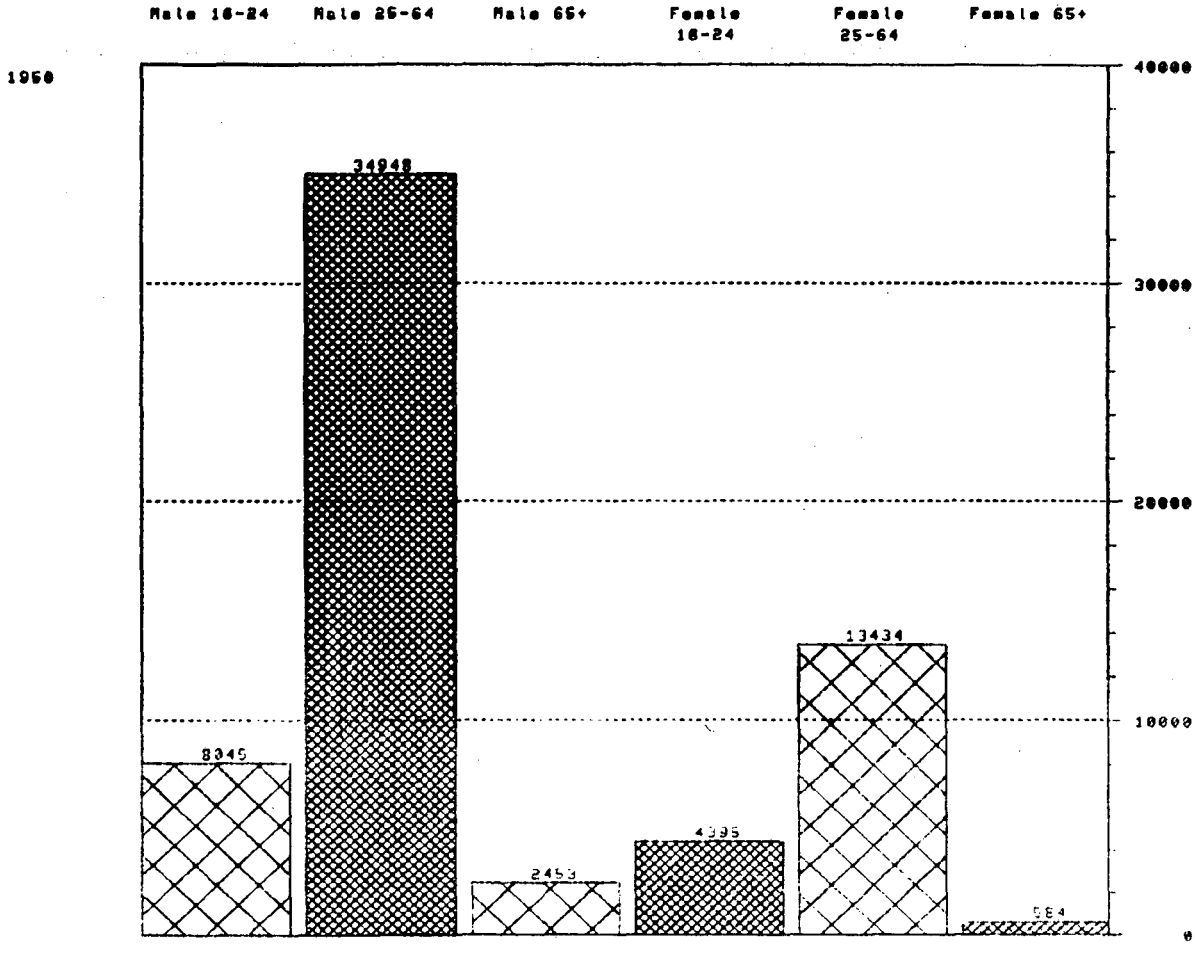
The value specified in the SLOPE Command controls the angle of cross hatching. The slope value ranges from 0 (zero) to 1 (one). Both 0 and 1 produce cross hatching with horizontal and vertical lines. The middle value, .5, produces cross hatching that is diagonal.

To change the angle of the cross hatching used for shading type: SLOPE .5

READY
slope .5

Labor Force by Age and Sex
1940 to 1950
National Totals

(See Footnote)

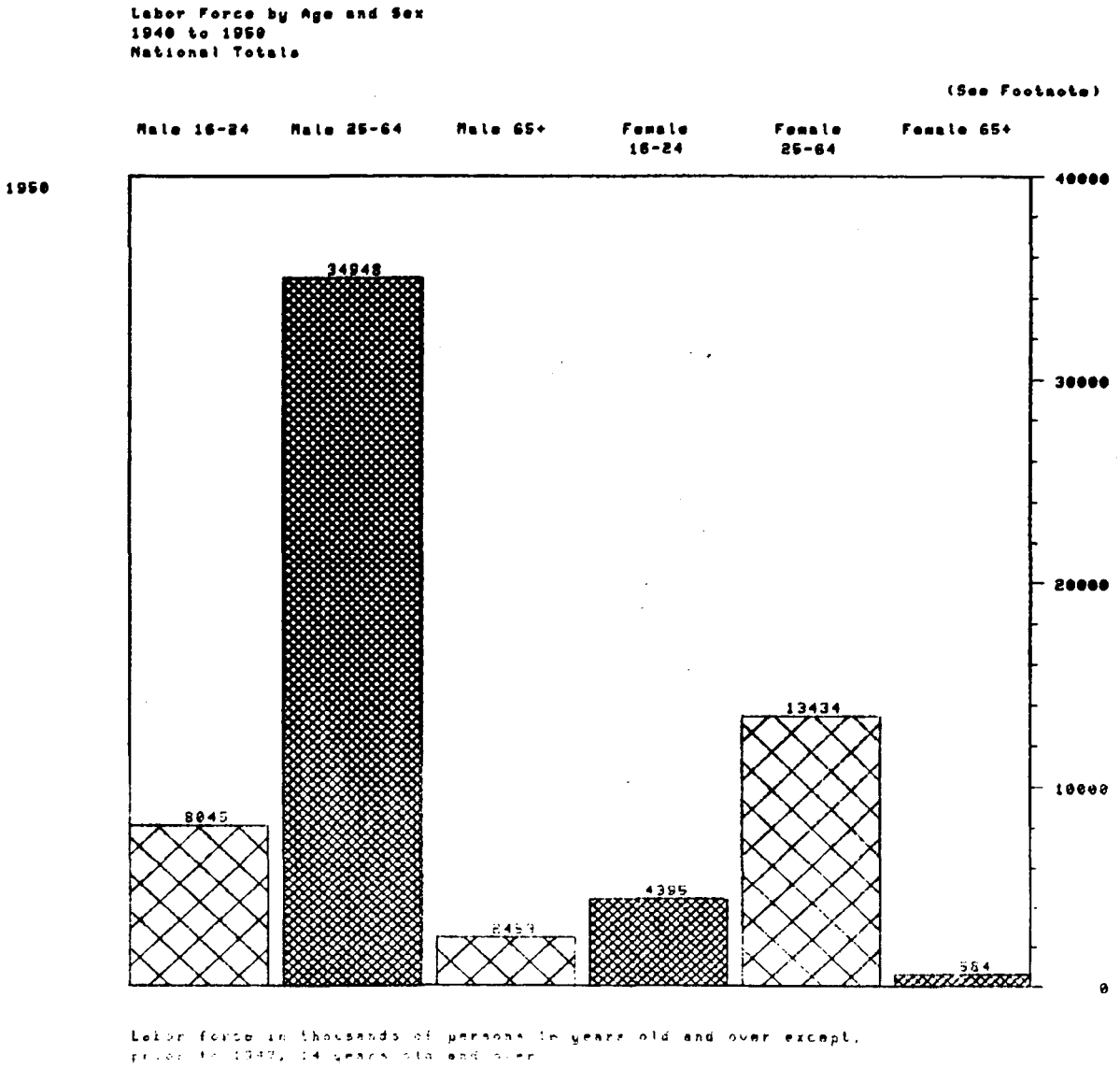


Labor force in thousands of persons 14 years old and over except, prior to 1947, 14 years old and over.

Suppressing the Grid on Line and Bar Charts

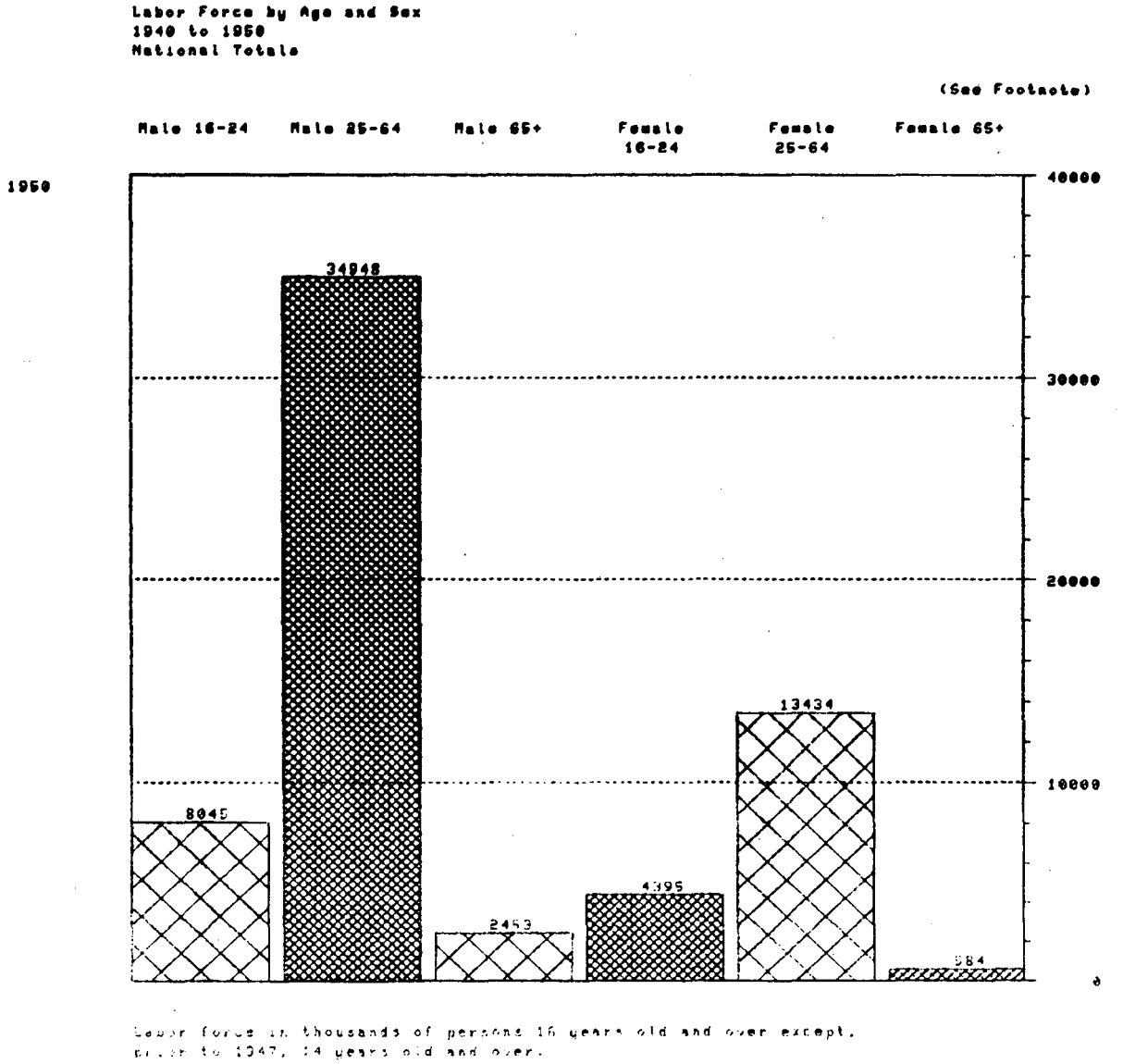
The dotted horizontal lines that run across the graph on line charts and vertical bar charts are called the grid. A grid appears automatically on line and bar charts, but it can be removed by typing: GRID NONE.

READY
grid none



The grid can be restored by typing: GRID SHOW

READY
grid show

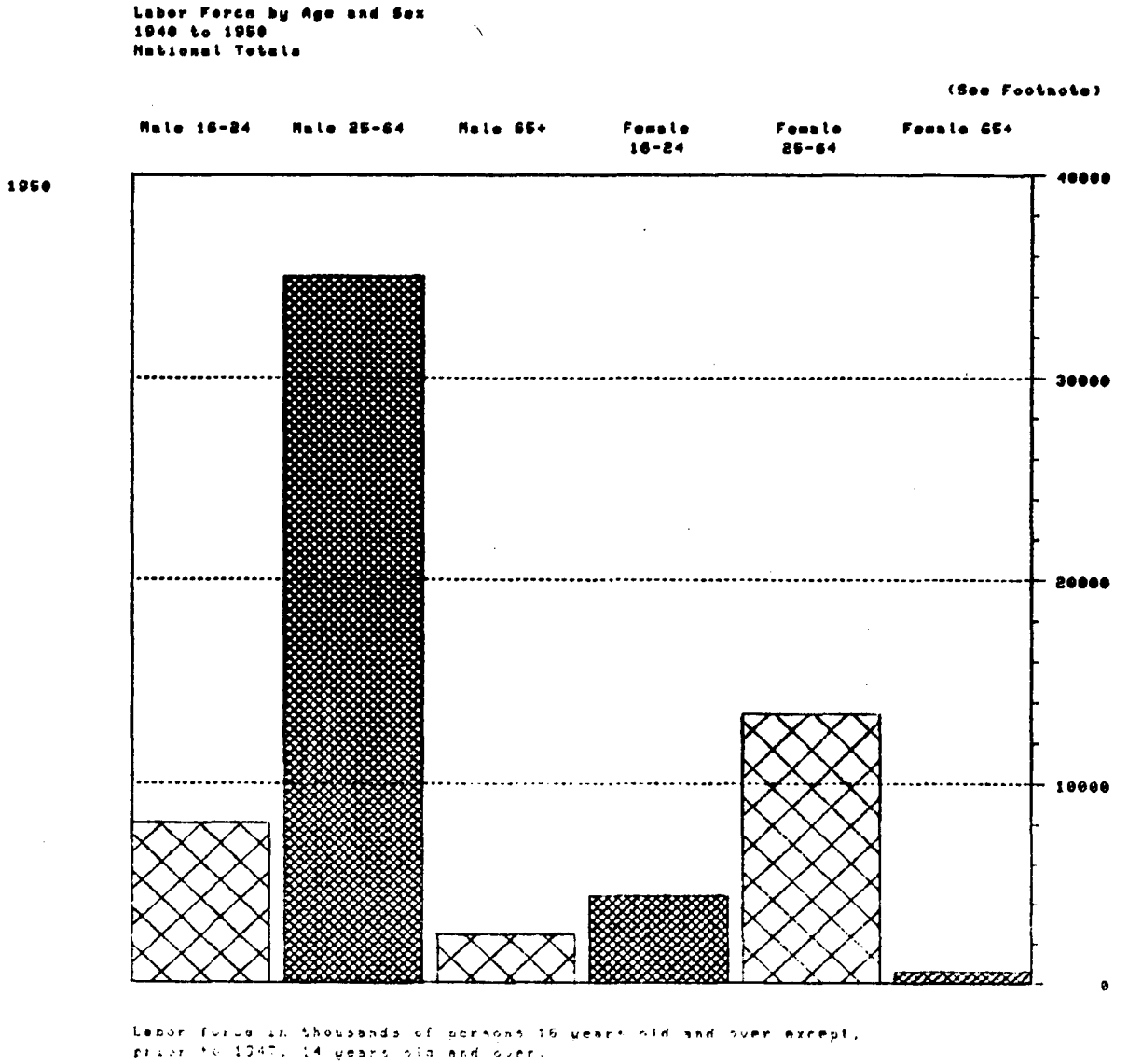


Labor force in thousands of persons 16 years old and over except, prior to 1947, 14 years old and over.

Suppressing Data Values on Bar and Pie Charts

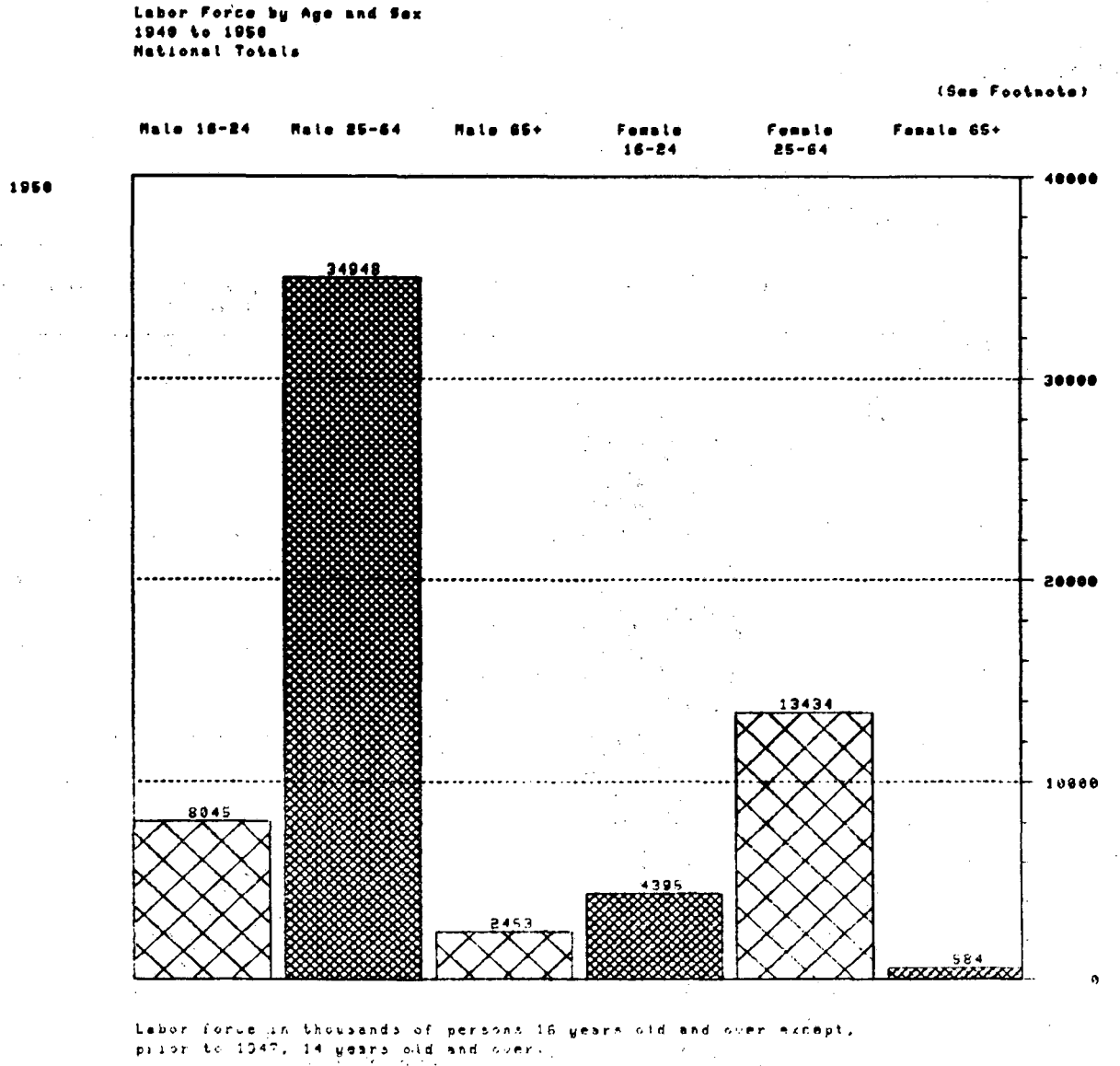
Chart automatically displays the numeric data values at the top of each bar on a bar chart, and next to each segment of a pie chart. Display of these data values can be suppressed by typing: VALUE NONE.

READY
value none



Once suppressed, data values can be restored by typing: VALUE SHOW.

READY
value show



Appendix A - The Tektronix Terminal

In This Section:

Screen Dimming
Clearing the Screen
Correcting Typos
Getting a Printed Copy
Special Keys

Tektronix terminals are designed for a special purpose: displaying graphics. This means that some of the features that the general purpose terminals can provide, such as scrolling, are missing from the Tektronix. Initially, new users may find the absence of these features annoying.

The purpose of this section is to describe the difference between using a general purpose terminal and using a Tektronix terminal to generate graphic displays.

Screen Dimming

The display tube on a Tektronix terminal is very expensive and is easily damaged by having the same image displayed on it for long periods of time. Consequently, the terminal automatically lets the image fade after about 30 seconds, to extend the life of the tube.

The original image can be restored by pushing either the shift key or the space bar. Pushing ANY key will restore the display, but if you push some key other than shift or space, it will display on the screen and be interpreted by Chart as part of the next command.

You should always clear the Tektronix screen after you are through using the terminal and have logged off the DCN machine.

Clearing the Screen

A Tektronix terminal does not automatically clear the screen as a non-graphics terminal does. Graphic displays are usually drawn on the screen in several steps. For example, a program such as Chart might draw a pie chart by first drawing a circle, then adding titles and labels, and finally drawing in the segments of the pie and shading them. In this example, the program draws on the screen three or four times, without clearing the screen in between.

Overlaying images on the screen works fine for doing graphics displays with programs, like Chart, that know to clear the screen before drawing a new picture. But it is often clumsy for other purposes such as word processing, where the user must manually clear the screen so that the text does not become a meaningless jumble.

The RESET PAGE Key is used to manually erase or clear the whole screen.

RESET PAGE must be used when electric power is first turned on. When the terminal has just warmed up, the screen has a large bright spot in the center. Pushing RESET PAGE several times clears the screen and makes it ready for use.

RESET PAGE should be used before displaying a file or a Chart script on the screen. If you don't reset the page, the file or script will be written on top of whatever is currently on the screen.

If you are displaying a file or script that is longer than can be displayed on the screen at one time, you must use RESET PAGE to prevent the screen from being overwritten.

Correcting Typos

If you make a mistake in typing a command on the Tektronix, you can use the RUBOUT key in the same way that you use the DELETE key on other terminals. Each time you push RUBOUT, it deletes one character to the left on the command line. Push RUBOUT 5 times and you have deleted 5 characters. You can use RUBOUT to delete characters from a command line any time prior to pushing RETURN.

Non-graphics terminals remove characters from the screen when you push the DELETE or RUBOUT key. Tektronix terminals are not able to do that; characters remain on the screen even though they are erased from the computer's memory. You are able to tell which characters have been deleted because the cursor moves to the left each time the RUBOUT key is pressed.

After you use the RUBOUT key to delete back to the error, you can retype the rest of the command line. It is sometimes difficult to tell exactly what you have typed because the revised command line is displayed on top of the original.

You can have the revised command line redisplayed by typing Control-R (hold down the CONTROL key while typing R).

Some people remember the function of CONTROL-R by thinking that the "R" stands for RETYPE.

Getting a Printed Copy

Tektronix terminals frequently have printers attached to them. Using an attached printer is the only way to make printed copies of tables or graphic displays generated by Chart. The COPY switch on the terminal prints a paper copy of the image that is on the screen at the time it is pushed.

Tektronix printers have a separate power switch and take about 5 minutes to warm up. Allow enough warm up time before trying to make copies.

Chart scripts that have been written to a file can be printed on the line printer by using the Print Command at the DCL Prompt ($).

Summary of Special Keys on a Tektronix Terminal

Keys	Effect
Shift Key	Restores the current display to a screen that has been dimmed by the tube saver.
RubOut Key	Deletes a character from a command. Characters that have been rubbed-out are not removed from the screen, but are ignored by computer.
Control-R	Retypes the current command line, eliminating characters that have been rubbed-out.
Control-S	Suspends output to the terminal.
Control-Q	Resumes output to the terminal that was suspended by Control-S.
Reset Page Key	Erases the entire screen. Reset Page should be pushed several times before turning off the terminal.
Copy Switch	Prints a paper copy of the image that is on the screen, if a Tektronix printer is attached to the terminal.
Local/Line	Puts the terminal in local or remote mode. The key must be set to "line" in order to communicate with the computer.

Appendix B - Glossary

BACKUP	Restores original data to the table. Also removes the effects of any WINDOW or MASK commands.
BAR	Display present table as a bar graph. Default value includes grid scale and values are shown for each bar.
BORDER	Draws a border around the current display.
CHANGE	Replace a single data value within a table. Most frequently used to correct typographical errors.
DECLARE BACKUP	Creates temporary backup copy of the current table.
FORMAT	Specify the form in which data is to be displayed within the table, e.g., which columns are whole numbers, which are percentages.
GRADE	Same as RANK with the following exceptions: The data within a table is ranked, however, the rows or columns are not reordered. Instead, a number representing the data's RANKING POSITION is assigned, and those numbers are displayed. For example, a table with one column, whose row values are 100 10 1 1000, is GRADED. The resulting display would read 3 2 1 4 showing 1 as the smallest valued (1), 10 as the second smallest (2), 100 as the third (3), and 1000 as the last value (4).
GRID	A series of evenly spaced lines, overlaying a bar chart, or line graph. Used to measure the value of each bar.
GROUP	Visually separate the display into groups. This operation is done by specifying that groups be composed of rows or columns, or both, and the number of rows or columns in each group.
HELP	On-line help. User is asked to specify topic for which help is required.
INSERT	Add new rows or columns of data to the display.
LABEL	A line or set of lines of text used to identify data contained within a row or column.

LINE	Display current table as a line graph.
MASK	Temporarily remove rows or columns of data from the table. (SEE RESTORE)
PAGE	Increase or decrease the areas within which the display will be drawn.
PIE	Display the current table as a pie chart.
PLOT	Used alone, PLOT will simply repeat the last display. Used in conjunction with one of the parameters listed below, will display the type of graph specified. Note: PLOT HORIZONTAL/VERTICAL BAR and PLOT LINE commands will not supply a scale of any type. HORIZONTAL BAR VERTICAL BAR LINE REPORT
RANK	Sort the data in such a way that it is displayed either from smallest data value to largest (RANK) or largest to smallest (RANK DESCENDING).
REPLACE	Change a row or column's label or change the data values for the entire row or column.
RESTORE	Return data previously removed from the table via the MASK command. Data is restored in the ORDER in which is was masked, however, it is placed at the END of the table and not at its ORIGINAL position. RESTORE requires that you specify the QUANTITY of rows or columns to be restored to the table.
SCRIPT	A workspace to which CHART directives and data can be written. When accessed later, CHART reads and processes the commands found on the script as though they were entered directly from the terminal.
SEQUENCE	Change the order in which rows or columns are displayed on the table.
SHADE	Cross hatching used to accentuate differences between values on a bar graph.
SLOPE	The direction in which the lines used to create cross hatching are drawn.
STOP	Exit from the chart program. Data must be written to a VMS file if it is to be used again. (SEE WRITE TO.)

SWITCH	Reverse the placement of any two rows or columns.
TABLE	Enters a set of row and columns labels and data into CHART. Request that column labels be entered first, followed by row labels and data.
TITLE	A line, or several lines, of text describing the contents of the table. Titling may also be used as footnotes. Titles may appear on the top, bottom and left or right sides of the table. Titling placed on the sides of the table will be printed vertically.
TRANSPOSE	Rotate table 180°. Rows become columns and columns become rows.
VALUE	On a bar graph print or do not print data values on top or beside value's corresponding bar.
WINDOW	Zoom in on a portion of the table, either by asking that a single row or column, or a range of row or columns be shown. Rows or columns outside the window are brought back to the table by the BACKUP command.
WRITE	Entire status of the current table will be displayed. Label adjustments, titling, formats, shade, etc., as well as the data will be shown.
WRITE DATA	Writes only the data currently on the table, to the terminal.
WRITE TO FILE NAME	Current display is written to the specified file.
WRITE STATUS	Status of the current table will be displayed. No data will be shown.
?	Prints a list of all commands known to CHART.
COMMAND ?	Prints a list of parameters required by a specific command.

Appendix C - Commands That Work Together

Change	....Replace a single data value within the table.
Declare Backup	....Incorporate changes into the original table.
Grade	....Grades rows or columns according to data values; Replaces data values with grade value.
Backup	....Restores original data to graded rows or columns.
Group #	....Group rows or columns together.
Group	....Separates grouped rows or columns.
Insert	....Add new rows or columns to the table.
Declare Backup	....Incorporate new data into the original table.
Line	....Display table as a line graph.
Label Line	....Position row labels directly on the line graph.
Label row O	....Remove row labels from the side of the graph.
MASK	....Removes row/columns for the display.
Restore	....Returns masked data to the display.

Pie	....Display table as a pie chart.
Label Box	....Adjust labels or pie chart.
Replace	....Replace an entire row or column's values or labels.
Declare Backup	....Incorporate those changes in to the original table.
Shade	....Create cross hatching for a bar chart.
Slope	....Adjust direction for cross hatching.
Title	....Specifies text to be placed on the graph.
Title top, bottom, left, right	....Specifies positions for titles on the graph.
Window	....Zooms in on a portion of the display.
Backup	....Brings back data from outside the window.
Write Script to File name	....Writes Chart commands and data to VMS file.
Script File name	....Reads Chart commands and data from VMS file.

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