Tele.Solutions™ 80

Word Processing
Business Planning
Business Graphics

◆ TeleVideo Systems, Inc.

TELEVIDEO® SYSTEMS, INC.

TeleSolutions-80

TeleVideo Part Number 2527800 Rev. B

1 September 1983

INTRODUCTION

Welcome to the world of TeleSolutions. With this one software
package, you can create memos and letters, convert notes into
short reports, create a spreadsheet on your screen, and do
mathematical calculations and manipulation. You can take the
information you have gathered from your business charts and
format and print the data in the form of a pie chart, bar chart,
line chart or a mixture of bar and line charts.

The TeleSolutions package has been divided up into three programs
with complete manuals for your convenience. TeleSolutions consists
of TeleWrite, TeleCalc, and TeleChart.*

TeleWrite is an easy word processing program. In no time at all,
you will be able to write down your thoughts, highlight the
important ideas, move text around and organize the material for a
professional presentation.

TeleCalc is your accounting program. It allows you to create a
spreadsheet, adjust the columns, and manipulate the figures right
on the screen.

TeleChart takes the information from your spreadsheet and enables
you to choose the presentation that is best for your needs.
Through the creation of pie charts, line charts, bar charts, or a
mixture of bar and line charts, you have the ability to finish
off your presentation with style.

Keyboard Customization

TeleSolutions has been customized to operate with the special
keys on your keyboard. Special keys include arrow keys, tab
keys, editing keys, and the print and clear keys. With
TeleSolutions, these keys are used to

* Provide an alternate way of handling the TeleSolutions
control commands; instead of typing a series of control
commands, you press one special key

* Add additional commands for TeleWrite

* Simplify multiple keystroke commands to a single
keystroke

*TeleChart is optional with 16-bit systems.

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The following tables show which program commands are sent to the computer when a special key is pressed. The commands sent differ with each program.

Table 1
TeleWrite Special Keys 1

Key	Description
Home	Go to beginning of document
Up Arrow	Go up one line
Down Arrow	Go down one line
Left Arrow	Go left one character
Right Arrow	Go right one character
Backspace	Go left one character
DEL	Delete previous character
Print	Print document (˜XP)
Clear Space	Abort command (˜Z)
Back Tab	Move backward word

The following keys have both regular and shifted functions.

Table 2
TeleWrite Special Keys 2

Key	Normal Function	Shifted Function
Char Insert	Open paragraph (˜O)	Close paragraph (˜C)
Line Insert	Open paragraph	Close paragraph
Char Delete	Delete next char (˜T)	---
Line Delete	Delete next word	Delete previous word
Line Erase	switch window (˜XS)	---

Function Keys

The function keys across the top of the keyboard have been customized as follows. TeleVideo has included for your convenience a Function Keyboard Chart of the following commands.

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Table 3
TeleWrite Function Keys

Key	Unshifted Function	Shifted Function
F1	Forward (`F)	Reverse (`R)
F2	Forward Delete (`D)	Reverse Delete (`Y)
F3	Word object (`W)	----
F4	Line object	----
F5	Sentence object (`N)	----
F6	Paragraph object (`P)	----
F7	End of document (`B)	Beginning of document
F8	Next page (`J)	Previous page (`J)
F9	Justify paragraph (`Q)	Read file (`XXR)
F10	Next menu (`X)	Write file (`XXW)
F11	Undelete/Paste (`U)	Clear document (`XC)
F12	Next document (`G)	Exit editor (`XE)
F13	Forward search (`S)	Reverse search (`S)
F14	Toggle mode (`XXT)	Toggle menu (`XXM)
F15	Move to marker (`XXG)	Set marker (`XXS)
F16	Delete to marker (`XXD)	Copy to marker (`XXC)

Table 4
TeleCalc and TeleChart Function Keys

Keys	Unshifted Function	Shifted Function
TeleCalc		
F1	Bottom	Home
F2	Column Title	Row Title
F3	Select Column	Select Row
F4	Entry	Enter
F5	Cumulate	Sum
F6	Change	Compute
F7	Stop	Help
F8	Options	Titles
F9	Column Range	Row Range
F10	Redisplay	Set Drive
F11	Save Table	Load Table
F12	Set Up	Set CRT
F13	Clear Data	Reset

TeleChart (optional in the 16 bit system)

Keys	Unshifted Function	Shifted Function
F14	Display	Option
F15	Reset Chart	Select
F16	Save Chart	Load Chart

NOTE! The TS 800, 801, and 802 do not support function keys
F12 through F16.

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Please note that you do not need to use these special keys in
order to implement command functions. You can still type the
entire program command instead of pressing one special key.

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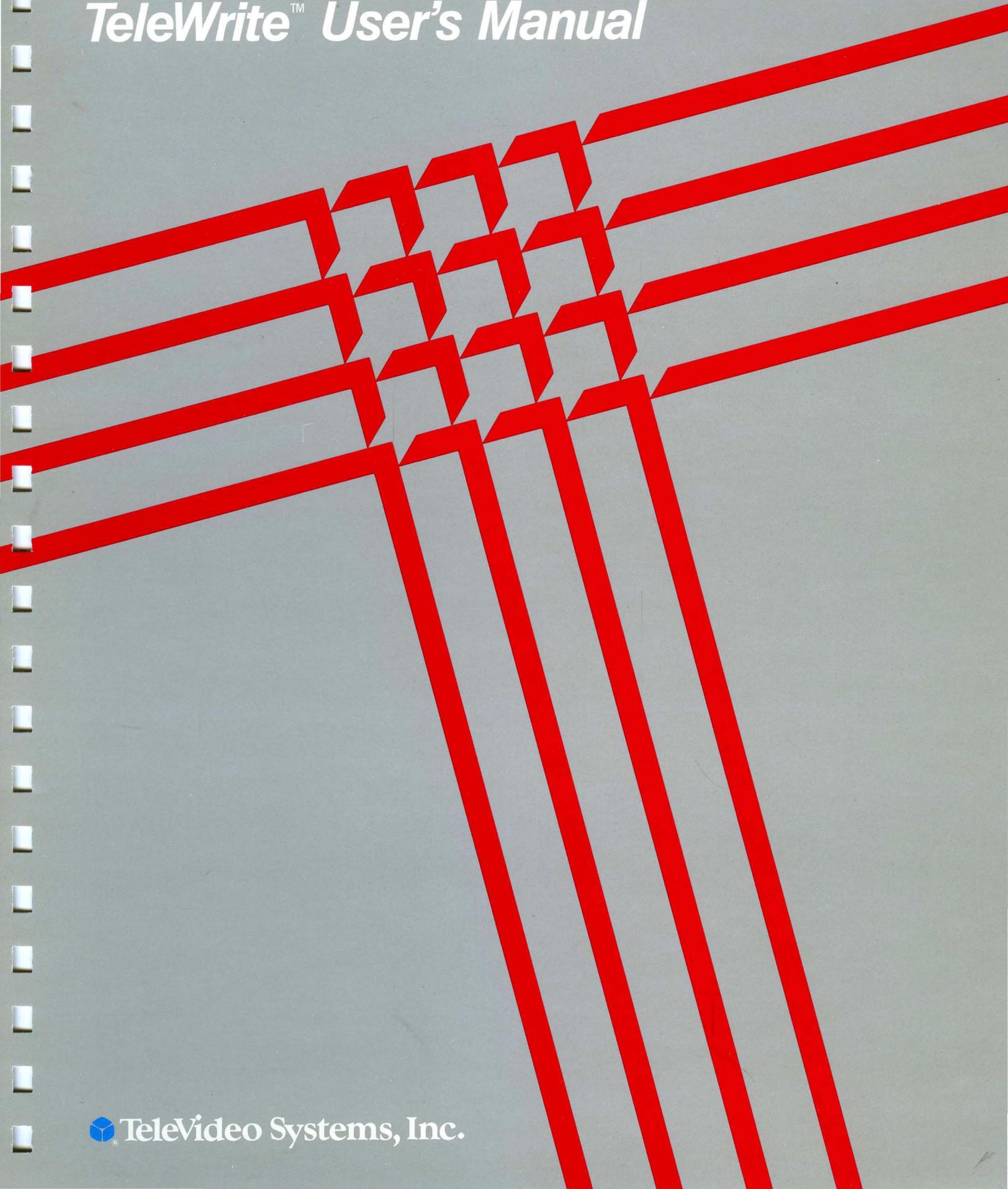
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TELEWRITE T.M. **USER'S MANUAL**

TeleVideo Part Number 2513600 Rev. B

1 September 1983

Disclaimer

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TELEWRITE TABLE OF CONTENTS

1.   INTRODUCTION

INTRODUCTION

You want to communicate but you may not want to become a word processing expert. TeleWrite is designed for you.

TeleWrite is a memo writer designed to help you get your work done. With TeleWrite you can create memos directly on the computer and save your time for more important tasks. You can create letters, leave notes for yourself, or convert those notes into short reports.

This TeleWrite manual is short so that you don't have to spend a lot of time learning a complex program. At the same time, it is a complete guide to learning and using TeleWrite--TeleWrite is just that easy.

TeleWrite has features to let you easily reorganize your thoughts and change your ideas. You can move text, highlight ideas, and get your work done quickly and effectively.

TeleWrite has several features that make it a unique program. For example, if your computer fails, you do not lose your work. TeleWrite automatically puts every word on your diskette for safe keeping. TeleWrite also has a split-screen feature that allows you to see and work on two files at once. With TeleWrite, you can have your outline on half the screen and the text on the other half.

TeleWrite works the way you work--on several projects at the same time. Priorities can change by the minute and TeleWrite keeps up by tracking each project. A single command gets you from one project to the next--instantly.

INSTALLATION OF TELEWRITE

Your computer store personnel can help you to install TeleWrite into your TeleVideo computer system and your printer. See Appendix A for basic installation instructions.

HOW TO USE THIS MANUAL

This manual is organized so that there is a short lesson in each chapter. Chapter 1, besides giving you an overview of the program, also tells you how to install the program on your computer system. Chapters 2 through 5 get you started with creating and changing documents. Chapters 6 through 7 discuss working with documents, including how to use the multi-document mode. Chapters 8, 9, and 10 cover special topics such as underlining, searching and replacing, and printer controls. Information about Recover and Error messages, a command reference, and print options are explained in the Appendices.

TeleWrite makes writing a breeze for everyone. No more difficult programs and no more bulky manuals--just a clear-cut solution to your memo writing problems.

Notes to Users of This Manual

Throughout this manual, many symbols are used to communicate a specific message to the user of TeleWrite. Table 1-1 lists these messages.

Table 1-1
Manual Messages

Symbol	Key	Explanation
<CR>	<RETURN>, <ENTER> (carriage return)	This symbol indicates that you are to press the <RETURN> or the <ENTER> key.
<UPPERCASE>		Indicates a particular key.
UPPERCASE		Indicates a particular command.
^	<CTRL>(control)	Press the <CTRL> key simultaneously with the key that follows. For example, ^G indicates to press the <CTRL> and the <G> keys at the same time.
<BAR>	<SPACEBAR>	Press the <SPACEBAR>.
boldface characters		Indicates, when used in a command, the user action. The user is supposed to enter the boldfaced part of the command.

| _ | <UNDERLINE> | Indicates, in an example, the location of the cursor. |

WORKING WITH DISKETTES

You received a master diskette for TeleWrite that contains all the programs to make the program work. We recommend that before running TeleWrite that you make a working copy of the master diskette. Use the working copy every day and store the master copy to back up the working copy.

To make a working copy of the TeleWrite master diskette, follow the directions in Appendix A.

2.   GETTING STARTED

INTRODUCTION

TeleWrite is a complete memo writer that allows you to think and work directly on a computer. This chapter describes a few concepts that should ease your transition from doing things in a manual mode to working in the computerized mode with TeleWrite.

Chapter 2 also teaches you how to use TeleWrite to do a simple memo. You will learn to start TeleWrite, enter a memo, and print the memo.

GETTING STARTED

To get started with TeleWrite, do the following:

1.   Bring up your system using the TeleWrite working diskette.*
      The CP/M operating system will prompt you with an A>.

2.   Type **TW<CR>**.

In a few seconds, your screen should look like the following:

```
^X   Menu              ^XE Exit editor        ^XP Print
^S   Find              ^U  Undelete           ^G  Next document
^Z   Abort operation   ^Q  Adjust paragraph   ^XC Clear document
------------------------------------------------------------------
__
```

          TeleWrite x.x (Justify) NAME.ME -0%-   Forward

The first three lines at the top of the screen contain the main menu. This menu shows you the important commands in TeleWrite. The middle of the screen is your typing area.

Finally, the bottom two lines are used by TeleWrite to display certain status information. This information includes the current mode (enclosed in parentheses), the current CP/M filename (more about this later), the position of the cursor in your document (expressed in % terms) and the direction status (Forward or Reverse).

*See Appendix A for instructions to make a working diskette.

The blinking square is called a **cursor** and it indicates where the characters that you type on the keyboard will appear on the screen.

Menus For Step-by-Step Support

TeleWrite contains a series of menus that guide you through your work step-by-step. The commands on the main menu are the most frequently used commands.

```
-----------------------------------------------------------------
^X   Menu                ^XE Exit editor         ^XP Print
^S   Find                ^U  Undelete            ^G  Next document
^Z   Abort operation     ^Q  Adjust paragraph    ^XC Clear document
-----------------------------------------------------------------
```

You can look at a sub-menu by entering the MENU (^X) command.
Press **^X**. This menu is displayed:

```
-----------------------------------------------------------------
Exit editor          Clear document      Ruler line
Print                One window          Underline on/off
                     Two window          Next Page
Global replace       Switch window       X-eXtra commands
Query replace        Move other view     Z-exit menu
-----------------------------------------------------------------
```

These commands perform more advanced tasks which will be explained in the following lessons.

If you enter **^X** again, you will see another menu of extra commands as shown below. These commands are explained in later lessons.

REMOVING THE MENU FROM THE SCREEN

Once you have learned TeleWrite, you can remove the TeleWrite menu from the screen to give yourself more room to see your documents. This is particularly useful in the two-window mode.

The **^XXM** command is a menu on/off toggle switch. When you enter **^XXM**, the menu disappears. When you enter **^XXM** again, the menu reappears. Try it.

```
-----------------------------------------------------------------
Set marker           Read file           Enlarge window
Go to marker         Write file          Toggle mode
Copy to marker       Position report     Menu on/off
Delete to marker     Line count          Quote character
Horiz center         Update display      Z - exit menu
-----------------------------------------------------------------
```

Once you have learned TeleWrite, you will find that if you enter commands fast enough, TeleWrite will skip the menus and execute the commands as soon as you give them.

Many commands use ^X followed by other letters. The trailing
letters are TeleWrite sub-menu choices. After typing ^X, you can
wait for TeleWrite to prompt you for the next choice, or press ^Z
to return to your text.

Recovering From Mistakes

Everyone makes mistakes. It's good to know that TeleWrite is very
forgiving. No single keystroke will cause catastrophic results.

To help recover from errors, TeleWrite provides several protective
measures:

1. If you accidentally enter a wrong command, use the ^Z, abort
    operation, command to cancel the command or error message.
    ANYTIME YOU NEED TO CANCEL AN ACTION, USE ^Z. With this
    command, you can never get "trapped" in a TeleWrite command.

2. If you accidentally erase some text, TeleWrite's **UNDELETE**
    (^U) command lets you recover the last item you erased.
    This can be a comfort for fast-fingered typists.

3. If your computer fails for some reason (such as a power
    blackout or tripping over the power cord), DON'T WORRY!
    TeleWrite saves your text as you type it. Therefore, the
    RECOVER program will recover your work. A more detailed
    discussion of the **RECOVER** command can be found in Appendix
    B.

The following overview gives you the general idea of what the
program is like. The best way to learn it however is to use it.
Let's begin by typing a memo.

TYPING A MEMO

You can type your letter, memo, or document just as if you were
typing on a typewriter. The following differences should be
noted:

1. The <DEL> key erases the last character you entered.

    The <DEL> key works just like the correction key on
    advanced typewriters. It erases the previous character
    entered.

    To delete the last letter in this phrase, place the cursor
    to the right of it.

    Now is the time for all b_

Then press <DEL>.

2. The **<RETURN>** (<CR>) key is the same as a carriage return on a typewriter. Both position you at the beginning of the next line.

   TeleWrite automatically handles carriage returns in a paragraph. When you reach the end of a line, TeleWrite moves the carriage to a new line for you. You need to adjust to the automatic return because, as you will see later, extra returns will cause unintended results.

3. The <TAB> key allows you to indent paragraphs and move to the next tab stop. (Margins and tab settings are discussed further in Lesson 4.)

4. A typewriter space bar moves the element to the right. In TeleWrite, the space bar actually types a space. To move to the right without typing a space press -> or the ^L key.

Try typing the following one page memo using TeleWrite, for practice. Don't worry about errors in previous lines, for now. A ^XC command will clear any text on your screen, if you have already entered other text into TeleWrite.

> To: Marketing**<CR>**
> From: DJA**<CR>**
> Date: Today**<CR>**
> Re: Productivity**<CR>**
> **<CR>**
> I have noticed substantial productivity improvements.
> Response time on all aspects of our operations have
> improved.**<CR>**
> **<CR>**
> Several customers have noticed the improved response time.
> Jerry has eliminated the typing backlog. And I received
> this month's advertising, sales, and order summary--ON
> TIME.**<CR>**
> **<CR>**
> Keep up the good work.**<CR>**

PRINTING TEXT

To print a copy of your text, press ^XP. TeleWrite requests print options. Just press <CR> for now. TeleWrite then asks you to check that your printer is turned on. Make sure that your printer is indeed on and press "Y" for Yes. (See Chapter 10 for details on print options.)

In a few seconds, you have a copy of your memo. TeleWrite automatically returns to your text for more changes or to handle another project.

STOPPING

TeleWrite always keeps your text safely on disk, AUTOMATICALLY. If you accidentally turn off your machine, nothing is lost. TeleWrite allows you to recover your document using the **RECOVER** program explained in Appendix B. TeleWrite will then automatically show you the last document.

THE COMMAND TO CORRECTLY RETURN TO CP/M IS ^XE FOR EXIT. When you receive the CP/M **A>** prompt, open the floppy drive door and safely turn off your computer.

Congratulations! You have just produced the first of many documents using TeleWrite.

3. EDITING DOCUMENTS

INTRODUCTION

Chapter 3 shows you how to edit and make changes to your documents.

BEGINNING THE LESSON

Let's make some corrections to your memo. Of course, if you are perfect and made no errors, we'll have to make changes just for practice.

From the CP/M prompt, type **TW<CR>** to bring TeleWrite up on the screen. Notice that your document is still in TeleWrite.

The Cursor

The flashing square on the screen is your **cursor.** Whenever you make a change, you need to position the cursor on the spot where the change is to be made.

There are many ways to move the cursor. First, note the keys on your keyboard with arrows on them. These are cursor control keys. Press the up arrow key and the cursor moves up one line. Press the left arrow key and the cursor moves left one character. The down and right arrow keys work in the same way.

For keyboards without arrow keys, you can to use the ^K for up, ^V for down, ^L for right, and ^H for left movement of the cursor.

Figure 3-1
Cursor Keys

Arrow Key	Control (^) Key	Function
Up	^K	Moves the cursor up
Down	^V	Moves the cursor down
Right	^L	Moves the cursor to the right
Left	^H	Moves the cursor to the left

When you position the cursor at the right edge of a line and press the right cursor key, the cursor moves to the beginning of the next line. Similarly, the left cursor key moves the cursor to the end of the previous line.

Try moving the cursor around in the memo you typed in Chapter 2.

Because your screen can only display up to 18 lines at a time, the up and down cursor keys may cause your screen to scroll. If the cursor is positioned on the last line visible on your screen and you press the down cursor key, TeleWrite shows you additional lines as necessary.

Of course, when you position the cursor on the first line of text in your document, the up cursor key does nothing. Similarly, when you position the cursor on the last line of text, the down cursor key does nothing.

MOVING BY BLOCKS

As you use the cursor keys, note the word **Forward** in the bottom right corner of the screen.

        TeleWrite X.X (Justify)   NAME.ME   Forward

When you press the up or left cursor key, the word changes to **Reverse**. When you press the down or right cursor key, it switches back to **Forward**. This indicates the direction of the cursor movement.

You can change the direction of movement with ^R and ^F as well. Press ^R and note the word changes to **Reverse**. Press ^F and note the word changes to **Forward** again. You will use these keys frequently.

Jumping by Word

Set the direction to **Reverse** by pressing ^R. Then press ^W for a word. The cursor leaps to the beginning of a word each time you press ^W. Notice that you can keep one finger on the <CTRL> key and press the W key repeatedly to move back several words. Also note that when you reach the beginning of a line, pressing ^W causes the cursor to jump to the last word of the previous line.

In the forward direction, ^W makes the cursor jump to the end of the word.

Jumping to Line Edges

The ^E command moves to either the left (reverse) or right (forward) edge of a line.

Jumping by Sentence

Try ^N for sentence jumping in the reverse direction. Each time, the cursor jumps to the beginning of the previous sentence. If you try it in the forward direction, the cursor jumps to the end of the next sentence.

mping by Paragraph and Screen

e ¨P key moves the cursor by paragraph; ¨J scrolls your cursor
e length of your screen, or an entire view. The ¨J command is
rticularly useful for scanning a document one screenful at a
me.

mping to Beginning and End

ıu can use the ¨B command to move the cursor to the beginning or
.e end of your document. The direction of these moves depends
 the direction indicated in the lower right corner of your
reen. You can change this direction by pressing ¨F for forward
 ¨R for reverse.

.th very little practice, you can use these commands to easily
 an long documents and to position the cursor anywhere on your
:xt.

mping to Next Page of Printout

.N moves the cursor to the beginning of the next page of your
¨intout. This command enables you to find out where the page
`eaks will occur and how many pages your printout will be.

:LETING TEXT

ı TeleWrite, deletions are simple. You can delete a character, a
ırd, whole paragraphs, or whole sections of text.

:leting Characters

ı delete a character, position the cursor on the space or
ıaracter **following** the undesirable character. Use the <DEL> key
ı delete the previous character. Note that the line to the
.ght of the current cursor moves left as you press the <DEL>
:y. Each time you press the <DEL> key, one character is
:leted.

ı delete the "n" in "conme" in the following sample sentence,
.ace the cursor on the character to the right of the "n."

     Now is the time for all good men to conme to the

`ess <DEL>.

:leting Words

ıu can also delete words. Position the cursor at the beginning
: the word to delete. Then press ¨D¨W. The following word is
:leted and the line to the right closes in. Again, each ¨D¨W
:letes the next word so you can rapidly delete sections of a
:ntence.

To delete "lazy" in this sentence, move the cursor to the first letter of "lazy."

The quick brown fox jumped over the lazy dog.

Press ^D^W.

Deleting Sentences

You can delete sentences, and paragraphs just as easily. Position the cursor at the beginning of a sentence or paragraph. Then press ^D^N to delete a sentence or a ^D^P to delete a paragraph.

Deleting to the End of the Line

You can also delete from the current cursor position to the end of a line using ^D^E (DELETE TO EDGE command).

To delete the words after "This July," move the cursor to the next character.

This July, we will attempt to overcome the pro

Then press ^D^E.

Deleting to the End of the Document

You can delete from the current cursor position to the end of the document by pressing ^D^B.

NOTE!   Notice that to avoid accidental erasures, deletions
            require pressing the <CTRL> key twice.

Deleting in Reverse

If you prefer, you can delete words, sentences, lines, paragraphs in reverse by using the ^Y, Yank command. To use reverse delete, position your cursor at the end of the word you wish to delete. Then press ^Y^W. Sentences (^N) and paragraphs (^P) can be deleted using the ^Y command. You can even reverse delete from the current cursor position to the edge of a line by entering ^Y^E or to the beginning of the document using ^Y^B.

INSERTING TEXT

Insertions are just as simple as deletions. You can insert characters in one of two ways. To enter short amount of text, move the cursor to the point of insertion. Start typing. As you type, the characters to the right of the cursor moves out of the way to allow you to enter more text.

r example, to add "mainly" to this sentence, move the cursor to
ere you want to insert it.

The rain in Spain falls on the plain.

pe **mainly.**

serting Using the OPEN Command

en you enter several sentences or paragraphs at one time,
isting text is pushed to the right. This can cause confusion.
 simplify this, TeleWrite supplies an Open line, ^O, command and
Close line, ^C, command for inserting large sections of text.

 use these commands, position the cursor where you want to
sert text and press ^O. This command takes the text on the
ght of the cursor and places it on the next line. You can now
pe in any additional text.

en your insertions are completed, press ^C to close the
ragraph. ^C automatically formats the remaining paragraph.

 add text in this sentence, place the cursor where you want to
d text.

Mr. Robert Brink_has joined XYZ Corporation as their

en press ^O to open the paragraph for insertions. The text to
e right of the cursor moves to the next line.

Mr. Robert Brink_
has joined XYZ Corporation as their

en type any insertions.

Mr.RobertBrink, of Dearborn, Michigan,_
has joined XYZ Corporation as their

ess ^C to close the paragraph.

Mr. Robert Brink, of Dearborn, Michigan, has joined XYZ
Corporation as their ...

JUSTING PARAGRAPHS

tice that as you do deletions and insertions, the right margin
 no longer right justified. This is easy to correct. Position
e cursor anywhere in the unjustified paragraph and press ^Q.
 a few seconds, your paragraph is right justified.

sition the cursor on another paragraph and press ^Q again to
stify the right margin. This is called **adjusting a paragraph.**

Because TeleWrite uses carriage returns as paragraph endings, extra carriage returns that you manually enter into a paragraph prevents TeleWrite from correctly adjusting paragraphs. When you have carriage returns in a paragraph, TeleWrite will format only the part of the paragraph up to a carriage return.

Some Hints

Some adjustments can be confusing at first. Here are some hints to simplify usage.

Task	User Action
Deleting a blank line	Position cursor on the blank line and press <DEL>.
Inserting a blank line	Position cursor at the beginning of the next line and press **<CR>** for carriage return.
Combining two paragraphs	Position cursor at the end of the first paragraph and press **^C**.
Adding text at the end of a document	Position the cursor on the last line by pressing **^F^B**, then start typing.
Adding text at the beginning of a document	Position the cursor on the first line by pressing **^R^B**, open a line with **^O**, and start typing.
Inserting a paragraph.	Position cursor in between two paragraphs and press **^O** to open a new line.
Update or redisplay screen	To get rid of any garbage that may have appeared on your screen, press **^XXU** to update screen.

4.   LAYOUT AND FORMATTING

INTRODUCTION

TeleWrite helps you to create quality documents to your specifications. TeleWrite has features to center text, indent text using variable tabs and margins, and justify every line of text. This chapter covers these features.

CENTER TEXT

To center any line of text between the left and right margin settings, type the line and then, before pressing <CR>, press ^XXH. Your text will be centered automatically. To center a line of text that has already been entered, place your cursor on the line you wish to center, and press ^XXH.

The centering of text depends on the ruler settings discussed below. After changing the ruler settings, you may need to center your text again. Just position the cursor anywhere on that line and press ^XXH. Your text will be centered according to the new margins.

MARGINS AND TABS

You can set indentations, tab stops, and carriage line widths using the ruler command ^XR. When you enter this command, this sub-menu and a ruler line is displayed.

```
------------------------------------------------------------------
Indent column          Line length           Tab interval
                                              Z-exit
Current Settings:
Indent column: 0       Line length: 65       Tab interval: 8

<-------T--------T-------T-------T-------T-------T-------T--->
```

You can select the **I** (INDENT), **L** (LINE LENGTH), or **T** (TAB INTERVAL) subcommands to change the settings. TeleWrite then prompts you for new values.

The **I** (INDENT) command controls the left margin of your document. When you type lists, sub-topics, and other itemized text, the indentation allows you to alter the left margin for subsequent text that you type.

The **L** (line length) command controls the right margin. Normally
TeleWrite automatically does a <CR> if your line exceeds 65
characters. If you set the line length to 70, then you can enter
lines up to 70 characters long before the automatic carriage
return takes over.

The **T** (tab interval) command controls the action of the <TAB> or
<T> key. When you press the <TAB> key, TeleWrite tabs to the next
tab stop.

The tab interval has been set to 8, making tab stops every 8
spaces. Let's set the tab interval to 10 spaces using the **T**
command.

Press **T** and type **10.**

Now when you press the <TAB> key, TeleWrite jumps to the new tab
settings.

The **I** and **L** commands only affect new text that you enter or
paragraphs that you adjust using ^Q. Old text is not changed
unless you explicitly change it using ^Q. The **T** command affects
all previous tabs as well.

To return to the main menu, press ^Z.

POSITION AND LINE COUNT

TeleWrite has two commands that show you the position and line
count of the cursor.

Line Count Command

The ^XXL command shows the line position of the cursor as
follows:

Line 9 (Page 1, Line 9) Total Pages 6

In the above example, page refers to how many pages are in the
printout; there are 6 pages.

When printing, TeleWrite will break your text on or about line 5!
TeleWrite will not, however, allow a single line to be printed on
a page by itself. TeleWrite will automatically adjust the page
length to incorporate the single line.

Position Count Command

The ^XXP command shows the position report as follows:

Point 758   Length 895 Column 4   Mark 0

These values are measured in characters. The point is the cursor
position, the length indicates the length of the document, column
is the column position and mark is the position of the marker.
(See Chapter 9 for more about markers.)

JUSTIFY, FILL, OVERWRITE, AND NORMAL MODES

As you type, TeleWrite automatically scans your text, knows when
you have typed more than one line of text and can automatically
break the text into multiple lines--right justifying each line as
you type. This is the **JUSTIFY** mode.

Sometimes, you need other modes of operation. For example, the
FILL mode automatically breaks long paragraphs into multiple
lines. However, in the FILL mode, TeleWrite does not right justify
the text. This paragraph, for example, is typed in the FILL
mode.

The third mode is the **OVERWRITE** mode. Normally, TeleWrite always
inserts any new text in a document, pushing existing text to the
right or down. In the OVERWRITE mode, any text entered
overwrites the existing text in the document. This mode is
useful for preparing tabular reports and for replacing large
sections of text with new words.

Finally, the **NORMAL** text entry mode supports computer programmers
and data entry. It is also useful as a margin release if you
need to type an extra long line. The NORMAL mode does not
provide automatic carriage returns.

The **^XXT** command takes you through the various modes. The
current mode is always displayed on the bottom line of your
screen.

      TeleWrite V1.1 (Justify)   NAME.ME   Forward

Every time you enter **^XXT** a new mode appears on the
bottom line. Entering **^XXT** four times returns you to the same
mode.

You can use the adjust paragraph **^Q** command to reformat
paragraphs according to the current mode. Right justified
paragraphs can be unjustified, and vice versa.

5.   MOVING TEXT

INTRODUCTION

This lesson shows you how to move sentences, paragraphs, and blocks of text.

MOVING SENTENCES AND PARAGRAPHS

Moving text to reorganize your thoughts is simple. Position your cursor at the beginning of a sentence. Press ^D for delete and ^N to indicate a sentence. Move the cursor to where you would like your sentence to appear and press ^U for undelete. Your sentence will reappear.

To move the second sentence to another position in this example, place the cursor on the first character of the sentence.

     A for always. B for better. C for change. R for reorder.

Press ^D^N. The sentence is deleted. Now place the cursor where you want the sentence to appear.

     A for always. C for change. R for reorder.

Press ^U to undelete sentence.

     A for always. C for change. B for better. R for reorder.

Undelete, ^U, recovers the most recently deleted text. Therefore, if you delete a paragraph with ^D^P, this command recovers the paragraph and places it wherever you would like it to be positioned. Of course, you can move words this way as well by deleting with the command ^D^W and undeleting with ^U.

MOVING BLOCKS

Sometimes you might want to move a phrase, part of a paragraph, or several paragraphs. You can mark a block to move as follows:

1.   Position the cursor at the beginning of the block to be moved. Press ^XXS to set a marker.

2.   Position the cursor at the end of the block to be moved. Press ^XXD to delete the entire block.

3.   Now position the cursor on the spot where you wish to move. Press ^U to undelete the entire text.

COPYING BLOCKS OF TEXT

If you want to make a copy of a section, rather than moving it, follow these steps.

1. Position the cursor at the beginning of the block to be copied. Press **^XXS** to set a marker.

2. Move the cursor to the end of the block. Press **^XXC** to copy the entire block instead of deleting it.

3. Move the cursor where you want the block copied and press **^U**.

REPEATING TEXT

You can use **^U** to make multiple copies of text. TeleWrite always remembers the last deleted text and recovers it with the **^U** command. Therefore, if you press **^U** three times in a row, the last deleted text will appear three times.

6. WORKING WITH DOCUMENTS

INTRODUCTION

TeleWrite can maintain several documents at the same time. Your
letters and memos are automatically saved until you clear the
document. The number of documents depends on the computer you
are using. Of course, there is no limit to the number of
documents you can create since you can store and retrieve all
documents as CP/M files.

This chapter explains how you can create multiple active
documents, and how to load and save CP/M files.

CREATING A NEW DOCUMENT

In the last lesson, you created a document. Let's create a new
document. Type **TW** again if you have exited the program, and
notice that your old document is still there.

To start a new document, press ¨G to go to the next document.
When you press ¨G, you see an empty screen for you to start
working on a new document.

TeleWrite automatically keeps track of five documents. The
specific number of documents varies with your setup and
installation (see Appendix A). Each time you press ¨G, TeleWrite
goes to the next document. Press ¨G five times, and TeleWrite
returns to your original document. Try and see if you can get
back to the document from Chapter 2.

You can use this circular system to keep track of your current
activities. Your first document may be a monthly report to
management, the second is a to-do list, the third is a letter to
a client, and so on.

This system allows you to work concurrently on several projects.
If you are interrupted on one task, simply move to the next
activity with a ¨G.

TeleWrite keeps track of your position in all the documents. When
you come back, the cursor will be positioned on the same spot to
let you continue.

CLEARING DOCUMENTS

Once a document is completed, and you have a printed copy, you can delete the document to allow room for another task. The ~XC command clears the current document from memory.

TeleWrite prompts for confirmation on the clear command. Just respond with a **Y** for yes or **N** for no.

SAVING DOCUMENTS AS CP/M FILES

TeleWrite has space for only five active documents. Should you want to edit a document other than the five active files, you need to save the original five active documents as CP/M files. It takes only a few seconds to save a typical document.

To save data, type **~XXW.** This is the WRITE command, since you are writing the document to a file on CP/M. TeleWrite then asks you for a filename. Each CP/M file stores one document. You create these files to keep documents for future reference, to provide document backup, and to free space in TeleWrite.

Each CP/M file has a filename that identifies the document. The name has three parts:

        B:FILENAME.TYP

B: An optional disk drive identification character, followed by a colon.

FILENAME A name of up to 8 characters.

TYP   An optional type extension of the filename of up to three characters preceded by a period.

CP/M disk drives are assigned names such as drive A, and B. If you supply a drive name, then you need to enter the colon character as well. In most cases, CP/M files should be saved on your B drive as **B:filename.**

The name can be any convenient name as long as the first character is an alphabet character and not a numeral or symbol. Lower-case characters are automatically converted to upper-case.

The filename extension (TYP) is for your convenience. It can help you to identify types of documents. Some examples include .LET for letters, .MEM for memos, .TEM for templates and .DOC for long documents.

The following are all valid filenames:

        HP.LET   TO-DO.MEM   MAILER.TEM
        GEORGE   CHAP1.DOC   APP-A.DOC

After you save a document to a CP/M file, TeleWrite maintains a copy of the text until you clear it from TeleWrite. You can continue to make changes. When you have finished making changes, be sure to save the document again to CP/M before clearing it from TeleWrite. Clear the document by typing ˜XC, or load another document over the current document.

READING CP/M FILES

You can read old files into TeleWrite for more changes. Old files can be brought into TeleWrite using the ˜XXR (READ) command. TeleWrite asks for the CP/M filename. If your current document has something in it, TeleWrite asks if you wish to replace the current document with the contents of the new file.

Notice that the **read** command does not affect other documents in TeleWrite. Only the current document is replaced.

Whenever a CP/M file is read from or written to a floppy disk, the name of the file is displayed on the status line. This helps you to remember the filename for the current document.

DOCUMENT BACKUP

TeleWrite has its own method of making back-up copies of your documents. This method is best explained in several diagrams.

Whenever a document is created, it is stored in TeleWrite. Suppose you have just created the document WEEKLY.

```
 _____
|                 |
|     WEEKLY      |
|                 |
|    (vers. 1)    |
|_____|
```
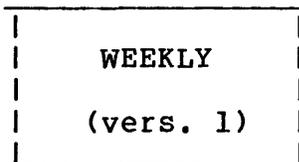
If you decide to save WEEKLY.RPT as a CP/M file, two copies of WEEKLY.RPT will exist, one in the CP/M file (stored as WEEKLY.RPT), and one in TeleWrite.

```
 _____                        _____
|                 |                      |                 |
|     WEEKLY      |     ˜XXW             |   WEEKLY.RPT    |
|                 |--------------------->|                 |
|    (vers. 1)    |                      |    (vers. 1)    |
|_____|                      |_____|
```
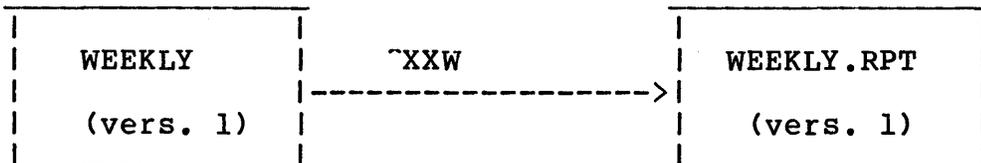
The next day you edit the WEEKLY document in TeleWrite. You now
have a different version of the same document.

```
 _____
|                |
|  WEEKLY        |
|                |
|  (vers. 2)     |
|_____|
```
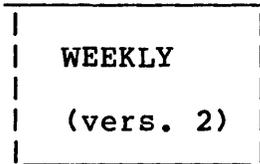
You write the new version (2) of the document to the CP/M file
WEEKLY.RPT. This updates the existing CP/M file which contains
version 1 of WEEKLY.RPT. To make sure you have a copy of version
1, a CP/M .BAK file that contains version 1 is automatically
created.

```
 _____          _____          _____
|                |        |                |        |                |
|  WEEKLY        |  "XXW  |  WEEKLY.RPT    |        |  WEEKLY.BAK    |
|                |------->|                |------->|                |
|  (vers. 2)     |        |  (vers. 2)     |        |  (vers. 1)     |
|_____|        |_____|        |_____|
```
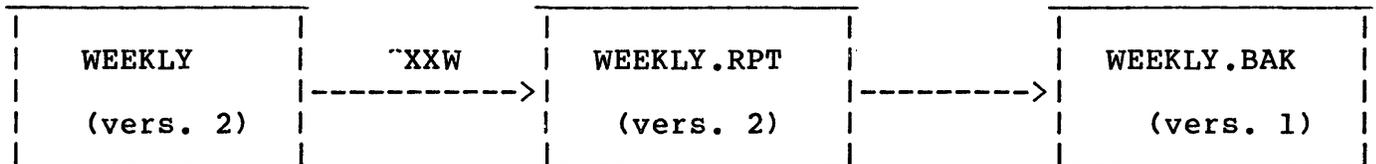
You now have three copies of the same document in various stages:
two copies of WEEKLY version 2, and one copy of WEEKLY version 1.

If you revise version 2 of WEEKLY to create version 3, and write
version 3 to the CP/M file WEELY.RPT, the file WEEKLY.BAK will
contain version 2 of the document.

```
 _____          _____          _____
|                |        |                |        |                |
|  WEEKLY        |  "XXW  |  WEEKLY.RPT    |        |  WEEKLY.BAK    |
|                |------->|                |------->|                |
|  (vers. 3)     |        |  (vers. 3)     |        |  (vers. 2)     |
|_____|        |_____|        |_____|
```
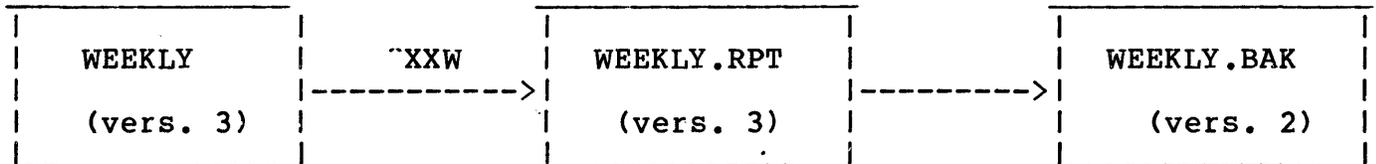
In summary, whenever you save a document as a CP/M file, you have
two copies of that document: the copy in TeleWrite and the CP/M
file. If you revise the document in TeleWrite and save the
revision under the same CP/M filename, a third back-up file is
automatically created. This third file, a .BAK file, contains
the first version of the document. You have two copies of the
latest version and one copy of the prior version.

7. WORKING WITH TWO DOCUMENTS

INTRODUCTION

Lesson 7 shows you the split-window mode. You learn to work with two documents and to move text from one document to another.

WORKING WITH THE WINDOW MODE

TeleWrite allows you to display two documents at the same time using the WINDOW command.

First you need to create two documents so that you can more easily learn how to use this feature. Let's start by typing this outline in one file.

        Outline for report
        I. current year highlight
              revenue growth 15.2% from $12.3M to $14.7
              profit growth of 17% from $3.1M to $3.9

        II. new products
              crazy glue
              economy package

        III. new people

Now you are ready to experiment with the split-screen feature. Suppose you want to display your outline on the top half of the screen and your report in the bottom half. You can activate the split window feature by entering ^XT for two windows. A line is drawn through your document splitting it into two pieces.

Now enter ^G to go to the next document. Now type this section into the new file.

        Highlights
        1983 has been another record year for the household
        products division._

Notice that only one part of your screen has changed. In fact, you are working on one document in the first window and viewing a different document in the second window.

Press ^XS to switch to the other window. Notice how the cursor has jumped into the other window. Press ^XS again and go back to the first window. You can start to enter text at any time.

As you enter text, you can still scroll the outline in the other

window by entering ^XM. Depending on the direction indicated in the lower-right corner of your screen, you can scroll forward or backward.

If you wish to have one window larger than the other, put your cursor into the window you want to enlarge and enter the ^XXE (ENLARGE WINDOW) command. To return to the one-window mode, use the ^XO command.

MOVING TEXT BETWEEN DOCUMENTS

You can move text from one document to another just as easily as moving text within the same document. For example, to move a sentence from one document to the other:

1.   Make sure the two documents have been loaded into TeleWrite using ^XXR to read CP/M files.

2.   Set the two-window mode with ^XT. Use ^G to put one document in one window and the other document in the second window.

3.   Position the cursor at the beginning of the sentence you wish to move. Then press ^D^N to delete the sentence.

4.   Switch windows using ^XS. Position the cursor at the beginning of a sentence where you want the old sentence to reappear. Press ^U to recover the sentence.

You can move paragraphs, words, blocks, and even entire documents in the same way.

8. UNDERLINING

INTRODUCTION

Chapter 8 shows you how you can underline sections of your report.

UNDERLINING

Underlining is turned on and off using the ^XU command.
Note the **U** character in the middle of the last line on your screen indicating whether the underline is on or off.

TeleWrite Vx.x (Justify) filename -0% -U   Forward

After turning the underlining on, all of the next characters that you type are dimmed. This dimmed portion will be underlined when your document is printed. Press **^XU** to end the underlining.

To underline part of this sentence, follow these directions.
Type the sentence and enter the commands in parentheses.

And to further emphasize, (^XU) no tardiness (^XU) will be tolerated.

Underline Delete

To remove any underlining, delete the underlined text and retype it.

• SEARCHING AND REPLACING

INTRODUCTION

Chapter 9 tells you how to set place markers in your document for easier editing and to use them to search for and/or replace words or phrases throughout your document.

SETTING A MARKER

You can set a marker in TeleWrite using the **^XXS** command. This marker was used in Lesson 5 to mark the block of text for copying and moving. You can also use the **^XXS** command as a place marker. This means you can edit your work and return to a particular spot using the GO TO MARKER (^XXG) command.

SEARCHING

Suppose you want to find a word quickly. Rather than scanning your document page by page, you can supply TeleWrite with a key word. TeleWrite searches your document for the word.

The SEARCH (^S) command prompts you for a word or phrase. Be sure to end your key word or phrase by pressing the <ESC> key.

After you press the <ESC> key, TeleWrite scans your document and brings the text you want to your attention. If it is not the location that you were looking for, you can press **^T.**

The **^T** command tells TeleWrite to continue its search and find the next place in your document that contains the key word. If you prefer to give TeleWrite another key word, type **^S.**

Using **^S** you can search forward or backward through your document by setting the direction with the **^F** and **^R** commands.

TeleWrite does have some rules about searching for capitalized words. Lower-case letters in the key word match with both upper- and lower-case letters. An upper-case letter, however, can only match with upper-case letters. Here are some examples.

Write	Matches
capital	capital, Capital and CAPITAL
Capital	Capital and CAPITAL
CAPITAL	CAPITAL

REPLACING WRITES

TeleWrite allows you to search for words and replace them with
other words. For example, you can replace the word "find" with
"search" throughout this section. Using the Global replace ^XG
command, you can let TeleWrite make all the changes automatically.
Replace works in the forward direction only.

With the outline as the cureent document, enter ^XG. TeleWrite
then prompts for the search words:

>   Replace <ESC>:   **year<ESC>**

After pressing <ESC>, TeleWrite prompts for the replacement
word:

>   With <ESC>:   **month<ESC>**

TeleWrite automatically makes all the changes in your document.

Should you wish TeleWrite to find each word and confirm prior to
any changes, use the QUERY REPLACE (^XQ) command. This command
is the same as the ^XG command except that it stops at each
potential change and asks

>   Replacing 'old' with 'new' - (OK)?

In response, you have the following choices:

"Y"	(Yes)	Make the change
"N"	(No)	Do not make the change
"T"	(Try it)	Ask yes or no to confirm the replace
"A"	(All)	Yes, and replace all following changes automatically
"E" (Exit query)		Exit command

The SEARCH, QUERY, and REPLACE commands are advanced commands
that can save a great deal of time in working with longer
documents.

PRINTING DOCUMENTS

RODUCTION

 can print several copies of your document, start printing
n a specific page number, or pause between pages of printing.
ɔter 10 explains all the options available when you request
iting of documents.

NT OPTIONS

ì you choose ^XP to print your document, TeleWrite asks you for
ions. Type any combination of options after the TeleWrite
ɾy "Print Options <CR>:". Notice that each option is
ɔeeded by the "-" (hyphen) character and separated from other
it options by a space. You can choose from the following
ions:

-n	Number of copies. For example, -4 for printing four copies.
-P	Pause between pages to allow you to manually load paper.
-PAGE n	Start printing from page n. For example, -PAGE 5 says start with page 5.
-Q	The quiet mode to avoid the prompt that occurs right before printing.
-L n	This tells TeleWrite to leave a left margin of n spaces. For example, -L 10 means to leave a left margin of ten spaces.
-DEV devicename	If you have several printers, you may find this option useful. This option allows you to choose which printer to use. The device name is the name assigned to that type of printer by TeleWrite (See Appendix A).

You can specify any combination of options. For example, after
typing ^XP to print your document, you can respond as follows:

    Print Options: -2 -Page 2 -Q

This tells TeleWrite to print two copies of the document beginning
with page 2, and to leave out all the status messages to the
console while printing.

PRINTING SPECIAL CHARACTERS

TeleWrite uses control characters as commands. To insert control
characters as text to be printed, you use the ^XXQ command
followed by the control character. The control character is then
displayed on the screen with the character in front of it.

For example, you can control page breaks in TeleWrite by entering
a printer page feed command as ^XXQ ^L. On the screen, the ^L
character is displayed. This instructs the printer to feed the
paper to the top of a new page.

INTERMEDIATE PRINT FILE

TeleWrite creates an intermediate CP/M file when printing. The
file is given the name **TW.T$$** to avoid name conflicts with your
other files.

You need to make sure you have sufficient space on your system
diskette for this file. The size of the file varies with your
document. Typically, a one page document will need 1K of file
space. If your disk is full and there is not enough room for the
intermediate print file, you receive an error message indicating
a **DISK WRITE ERROR.**

If TeleWrite does not find the space to create this file, you need
to erase files from your system diskette to make room.
Alternatively, you can break your document into two pieces and
print each piece separately.

PRINTING DOCUMENTS FROM CP/M

You can start the TeleWrite print processor to print copies of
your CP/M files from CP/M without entering TeleWrite.

NOTE!   When you are typing in the filename followed by an
             ·optionlist, it is very important that you leave a space
             between the filename and the optionlist.

At the A> prompt, type:

    TWP filename -optionlist

is command is useful for printing extra copies of documents
at you have saved as CP/M files (using the command ^XXW).

rP is the name of TeleWrite print processor. You need to
pply the name of your CP/M file and the print options you wish
incorporate.

addition to the print options listed above, you can specify
ditional options at the CP/M command level. They include:

-NH   Files printed from CP/M to have a header line
           included with every page. This header includes
           the filename on the left and the page number on
           the right. -NH option turns off the header
           option.

-NM   TeleWrite provides margins to center documents on
           an 8.5" page. The -NM option says to leave no
           left or right margin.

-NS   TeleWrite normally skips over page breaks. This
           option tells TeleWrite to type over the page
           breaks.

-T title   This option supplies a title for the headers on
           each page. The title cannot contain any blanks.

-TAB n   This option sets the tab stops.

CONTROLS DURING PRINTING

en TeleWrite is printing, you can interrupt by using one of the
llowing commands:

^Z   Exits printing and clears the printer.

^C   Exits printing and TeleWrite program. Takes you
           back to the operating system.

^S   Pause momentarily. Press any character to continue
           with print.

^G   Quits printing a file and takes you back to
           TeleWrite to your current file.

APPENDIX A   INSTALLATION

To create a TeleWrite system disk on systems with two floppy
drives, do the following:

1.   Insert the computer system diskette in drive A.
     Insert a blank diskette in drive B.

2.   Follow the instructions that are in the User's Manual
     for your system to format the blank diskette.

3.   Make the diskette in drive B bootable by using the
     SYSGEN utility program.

4.   Copy the CP/M PIP.COM file onto your new diskette in
     drive B by entering

     PIP b:=pip.com<CR>

5.   Remove the system diskette and store it in a safe
     place.

6.   Remove your new diskette from drive B and insert it i
     drive A. Insert the master TeleWrite diskette in dri
     B.   Press ˆC, and type:

     PIP A:=B:*.*[V]<CR>

7.   When the file is copying and the A> prompt appears
     remove the TeleWrite master diskette from drive B and
     put it away for safe keeping. Label the new diskette
     in drive A as your TeleWrite working diskette.

You can now use the TeleWrite working diskette in drive A and
store your files on a formatted diskette in drive B.

Systems with Limited Diskette Space (8-Bit Systems)

Your system may have limited space for files on a diskette. To
make room for your documents, the following is a list of the
files that **MUST** reside on the TeleWrite system disk. They are:

     TW.COM   28K   TeleWrite command file.
     TW.OVL   24K   TeleWrite overlay.
     TW.SWP   *   TeleWrite swap file for active documents.
     CONFIG.DAT   10K   Configuration data for terminals & printe

* Recommended 64K - can be as small as 16K.

With these files you can do all editing, but cannot print using
the ^XP command. To enable ^XP, you need the following files:

TWP.COM	26K	TeleWrite print command.
TWP.OVL	12K	TeleWrite print command overlay. (optional)
TW.T$$	*	Temporary print file. (optional)

* Depends on size of document - generally less than 10K

The following TeleWrite files do not have to be on the system
disk. Instead, create a separate TeleWrite utility diskette
with the following files:

RECOVER.COM	18K	Recover swap file.
CONFIG.COM	22K	Configuration program.

SELECTING THE TERMINAL

**This section is only for nonTeleVideo terminals. TeleWrite has
already been configured for your TeleVideo System.** If your CRT
is built into your computer, then you can skip this section.
TeleWrite has already been customized for your CRT. Otherwise,
customize TeleWrite for your terminal by using the **CONFIG** program
as follows.

If you have the TeleWrite CONFIG.COM program on a separate
utility disk, you need to do the following to configure your
terminal:

1.   Insert your TeleWrite system disk in drive A and your
      utility disk in drive B.

2.   Type **B:<CR>**.

3.   Type **CONFIG<CR>** and follow the instructions given above.

4.   Type **A:<CR>** to return to the system disk.

If none of the available options work with your terminal or you
are only partially successful with your installation, you may
need to contact your computer store for support.

Type **CONFIG<CR>**. Your screen will show the following:

1.	AAAmbassador	2.	ADDS Viewpoint
3.	ADM31	4.	ADM3A
5.	Bantam	6.	Haz1500
7.	HDSSC100	8.	HP2621A
9.	HP2645	10.	MicroAngelo
11.	*TeleVideo Ts 803/TS 1603	12.	SuperBrain
13.	Teleray1061	14.	TVI9xx
15.	VT52	16.	VT100
17.	ZenithZ19		

       *Displays the model you are using.

If you do not want to change the current CRT type, press **<CR>**. A
list of printer names will appear on your screen; skip to the
next section for further instructions.

If you want to change the current CRT type, type in the number
that corresponds to your CRT, and then press **<CR>**. If your
terminal is not in the available list, try a selection that is
similar to your terminal. Many terminals emulate each other.

After you make your selection, the CONFIG program continues with
a list of printers.

Selecting Your Printer Type

Now that you have selected your CRT type, it is time to select
your printer. The following list of printers is displayed on
your screen:

1.	Vanilla	2.	Plain
3.	Epson	4.	Pro10
5.	Pro12	6.	ProPS
7.	Diablo10	8.	Diablo12
9.	DiabloPS	10.	Spin10
11.	Spin12	12.	SpinPS
13.	IDS10	14.	IDS12
15.	IDSPS	16.	Qume935
17.	RSDaisy II	18.	Cent737
19.	CentPS	20.	File
21.	Console		

The default printer type is Plain. Most printers other than the
ones listed above work with the Plain or Vanilla selection. If
you do not want to change the current printer type, press **<CR>**
and refer to the next section.

If you want to change the current printer type, select the
printer from this list by typing the appropriate number and press
<CR>. Refer to the next section for more instructions.

After you make your printer selection, you see the message:

       Do you wish to see the default parameters menu?

Type **N** to skip the menu. This terminates the CONFIG.COM program,
and you return to CP/M.

If you want to change the menu, type **Y**. This part of the program
is designed for advanced features and fine tuning. If you do not
know the necessary data for this section, DO NOT MAKE ANY
CHANGES. Contact your computer store if you need help.

Making TeleWrite Compatible to WordStar

TeleWrite has the option to provide WordStar compatibility at the control key level. This allows users who are familiar with WordStar's Control key conventions to use the same control keys, while gaining the advantage of TeleWrite's multiple document, split window, auto save, and other advanced features.

To set up your TeleWrite disk for WordStar compatibility, enter the following CP/M commands:

```
REN TW.800=TW.OVL<CR>
REN TW.OVL=TW.WS<CR>
```

In addition, for the 16-bit systems you need to enter the following CP/M commands:

```
REN TWA.CMD=TW.CMD<CR>
REN TW.CMD=TWW.CMD<CR>
REN TWA.OVL=TW.OVL<CR>
REN TW.OVL=TW.WS<CR>
```

These commands change the TeleWrite control keys to do the following WordStar functions:

Key	Compatible Function
^Q	Main menu
^W	Move reverse word
^E	Move cursor up one line
^R	Scroll previous page
^T,^Y	Delete word
^I	Tab key
^O	Toggle on/off screen menu
^P	Main menu
^A	-not implemented--use ^W above
^S	Move reverse character
^D	Move forward character
^F	Move forward word
^G	Delete current character
^H	Move backward character
^K	Main (block) menu
^L	Locate (search) command
^X	Move cursor down one line
^C	Scroll next page
^V	Toggle format mode
^B	Justify (reformat) paragraph
^M	Return key

The following control keys are unique TeleWrite commands which have either been retained or adapted to provide an important TeleWrite feature:

Key   **Function**

^Z   Abort Command
^N   Go to next document (in swap file)
^U   Undelete command

The function keys remain the same. However, the cursor keys are now different from the normal TeleWrite, since they are now compatible with WordStar cursor keys.

INSTALLING TELEWRITE WITH MmmOST

TeleWrite can be installed on the TS 806/20 and TS 816/40 under MmmOST.   Install TeleWrite on the common drive B for all users as follows:

1.   Insert TeleWrite in the floppy drive.

2.   Copy all files to drive B as follows:

      B:PIP B:=C:*.*[v]<CR>

3.   Erase the TeleWrite swap file from drive B by entering:

      ERA B:TW.SWP<CR>

Each user should have their individual TeleWrite swap file for managing their documents. Therefore, make sure you do not have a swap file on the common drive (drive B). If two users access the same swap file on drive B at the same time, the results may be unpredictable.

Each user should have a swap file on their private drive (drive A). This swap file can be created by each user using the following commands:

      A>B:RECOVER —CREATE <swap file size>
      B>TW

More information about Swap Files is given in Appendix B.

Now, if you want to invoke TeleWrite type:

      A>B:<CR>
      B>TW<CR>

TeleWrite automatically finds the right swap file at each user station.

Printing under MmmOST

If you have only one printer on your system, please note the following. TeleWrite does not support automatic release of printers in the current version (1.0). This means only one user can access the printer at any time. The first user has control of the printer until exiting from TeleWrite.

If another user attempts to print, their reports are queued inside MmmOST. Their results will be printed only after the first user releases the printer.

Before printing with TeleWrite, you can use the MmmOST PRNT command to check for printer availability. The PRNT D command allows you to have the printer for your exclusive use. Finally, the PRNT X command allows you to release the printer.

If you have multiple printers, TeleWrite allows each user to configure their station for different printers. For example, station A can use an Okidata printer with highlighting features while station B uses a letter-quality printer.

In order to assign different printer types, do the following:

1.   Log on to drive B (public drive)

2.   Enter

     PIP A:=B:CONFIG.DAT<CR>

Each user must execute the command for their own system.

To erase CONFIG.DAT on drive B enter:

     ERA CONFIG.DAT<CR>

Each user can now modify their CONFIG.DAT by entering:

     CONFIG<CR>

APPENDIX B   RECOVER AND ERROR MESSAGES

If you turn off your computer before exiting TeleWrite with the ^XE command, the next time you use TeleWrite, you may see the following message:

Swap file is invalid, please run RECOVER.

If this message appears, enter **RECOVER<CR>** at the A> prompt.

The TeleWrite swap file (TW.SWP) is the file that contains your five active documents. By running the **RECOVER** program, TeleWrite verifies that your document area has a problem, corrects it, and displays some messages on the screen. These messages describe the length of each of your documents in the swap file and the errors encountered. After the **RECOVER** program is complete, and your swap file recovered, enter **TW<CR>** to get started again.

If you have the TeleWrite **RECOVER.COM** file on a separate utility disk, insert the TeleWrite system disk in drive A and the utility disk in drive B. Type **B:RECOVER<CR>**.

SETTING DOCUMENT SPACE

You can also use the **RECOVER** program to create a new document space for your system. If you are using a hard disk or a floppy diskette with more capacity, you should set aside as much space as possible for TeleWrite documents.

The alternative use of **RECOVER** is as follows:

RECOVER —CREATE size [documents]

size   is the number of pages reserved for TeleWrite
            documents. It can be any value from 16 to 248 pages.
            Each page corresponds to 1K of storage and
            approximately 1 page of text.

documents   is the number of concurrent documents active in
            TeleWrite. You can choose any value from 1 to 7
            documents. If omitted, TeleWrite allows five concurrent
            documents.

For example, if your floppy diskette holds 330K, we recommend the following:

RECOVER —CREATE 64

This command reserves 64 pages of space for your active documents with five concurrent documents.

For a hard disk system, you might choose:

RECOVER –CREATE 128 7

NOTE!   **RECOVER with the CREATE option erase all active documents in TeleWrite.** Therefore, save any documents as CP/M files or set up a new TeleWrite system diskette prior to using **RECOVER** in the **CREATE** mode.

UNKNOWN COMMAND

When you press a strange key, TeleWrite displays this message:

Unknown command

Press **^Z** to clear the message and continue with your work. If you accidentally enter a wrong command, use the **^Z** command to cancel the action. ANYTIME YOU NEED TO CANCEL AN ACTION, USE **^Z.**

APPENDIX C   REFERENCE SECTION

CURSOR CONTROL

Up arrow, ^K	up
Down arrow, ^V	down
Right arrow, ^L	right
Left arrow, ^H	left
^F	forward
^R	reverse

^W	Word
^E	Edge of a line
^N	seNtence
^P	Paragraph
^J	Jump (screen page)
^B	Jump to begin/end of document

 DELETION

\<DEL\>	Delete character
^D	Delete forward
	^D^W word
	^D^E edge of line
	^D^P paragraph
	^D^N sentence
	^D^B document

^Y	Delete reverse
	^Y^W word
	^Y^E edge of line
	^Y^P paragraph
	^Y^N sentence
	^Y^B beginning of document

^U	Undelete (last deleted item)

OTHERS

^T	Search again
^G	(Go to) Next document
^S	Search (find)
^X	Menu
^Z	Exit operation, return to main menu

INSERTION

^O	Open line
^C	Close
^Q	Adjust paragraph

EXTENDED COMMAND MENU

```
-----------------------------------------------------
Exit editor      Clear document        Ruler line
Print            One window            Underline on/off
                 Two window
Global replace   Switch window         X-eXtra commands
Query replace    Move other window     Z-exit menu
-----------------------------------------------------
```

Command	Description	Arguments
^XE	Exit from TeleWrite (editor)	
^XP	Print (current document)	-optionlist Y/N
^XC	Clear document	verify?
^XG	Global replace of text	old<ESC> new<ESC>
^XQ	Query replace of text	old<ESC> new<ESC>
^XO	One window mode	
^XT	Two window mode	
^XS	Switch window	
^XM	Move other window	
^XN	Jump to next page of printout	
^XR	Ruler settings	
	I Indent	number of columns
	L Line width	number of columns
	T Tab interval	number of columns
^XU	Underline on/off	
^X^X	Extra commands	

Keys

<DEL>	Delete. Erases the last character you entered.
<CR>	<RETURN> key. Is the same as a carriage return key on a typewriter.
<TAB>	Indents paragraphs and moves to the next tab stop.
<SPACEBAR>	Enters a space.

Adding Text

^F^B	Add text at end of document
^R^B^O	Add text at beginning of document

EXTRA COMMANDS MENU

```
-----------------------------------------------------------
Set marker          Read file           Enlarge window
Go to marker        Write file          Toggle mode
Copy to marker      Position report     Menu on/off
Delete to marker    Line count          Quote character
Horiz. center       Update display      Z-exit menu
-----------------------------------------------------------
```

Command	Description	Arguments
^XXS	Set marker at cursor	
^XXG	Go to marker	
^XXC	Copy block from cursor to marker	
^XXD	Delete block from cursor to marker	
^XXH	Center the current line (horizontally)	
^XXR	Read CP/M file	filename
^XXW	Write CP/M file	filename
^XXP	Position report	
^XXL	Line count	
^XXU	Update screen	
^XXE	Enlarge window	
^XXT	Toggle mode (see Modes)	
^XXM	Menu on/off	
^XXQ	Quote next character (for inserting control characters in text)	

Controls During Printing

^Z	Exits printing and clears printer
^C	Exits printing and TeleWrite program. Takes you back to operating system.
^S	Pauses momentarily. Press any character to continue print
^G	Quits printing a file and takes you back to TeleWrite to your current file.

Modes

DEFAULT	Moves text to right when inserting new text
JUSTIFY	Automatically right justifies paragraphs
FILL	Leaves a ragged right edge to paragraphs
OVERWRITE	Allows you to type over characters
NORMAL	Does not provide automatic carriage returns

TeleVideo®
TeleCalc™ User's Manual

TELEVIDEO SYSTEMS, INC.

TELECALC USER'S MANUAL

TeleVideo Part Number 2287000 Rev. A

15 August 1983

Disclaimer

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TELECALC TABLE OF CONTENTS

1. INTRODUCTION

TeleCalc is an accounting software program that allows you to create a spreadsheet on the screen and do mathematical calculation and manipulation. TeleCalc also takes the figures that you enter into the spreadsheet and produces a pie, bar, or line chart to give a picture of the figures. Both the spreadsheet and the chart can then be output to a printer for a hard-copy.

TeleCalc is capable of handling many of your accounting needs and graphic presentations of your figures.

Some of the capabilities of TeleCalc include:

    Cashflow planning
    Budget preparation
    Variance reporting
    Product pricing analysis
    Financial report preparation
    Manufacturing planning
    Private investment counseling
    Merger and acquisition pro-formas
    Capital budgeting
    Sales forecasting
    Graphic presentations of all forms

TeleCalc addresses all levels of computation. The command menu and fully-prompting format with built-in formulas simplify the most complex computations. Using Telechart, you can compute 5-year projections, generate tables, develop customized models, do financial computations, and figure cashflow and balance sheet forecasting. TeleCalc also does "what-if" analysis to further enhance financial forecasting. The complete report generator then makes your presentations more effective.

TeleCalc can solve your problems in financial planning from the simplest table to the most advanced financial analysis. It requires no typing skills and, in addition to the command menu, it has a HELP command.

NOTATION CONVENTIONS

In this manual, certain words and symbols indicate actions to be used in TeleCalc. These conventions are in Table 1-1.

Table 1-1
Notation Conventions

Symbol	Key	Action
<CR>	RETURN (Carriage return)	This symbol indicates that you are to press the <RETURN> key.
<HOME>	HOME	Use your HOME key to cancel a command if the <CR> has been entered and you realize that you have entered an incorrect command.
		The <HOME> key can also be used to move from some sub-menus or from a chart display back to the main menu.
^	CTRL (Control)	This symbol indicates that you are to press the <CTRL> key simultaneously with the key that follows the symbol.
<DEL>	DEL	Use the <DEL> (delete) key to correct typing errors if you have not yet pressed <CR>.
	Arrow keys	Indicates keys that direct the movement of the cursor. Are Also called **cursor keys**.

COMMAND FORMAT

The format used in this manual for entering commands consists of two or three columns. The headings are boldfaced and can be labeled:

System Display	**User Action**	**Command**
System Display	**User Action**	**Comment**
System Display	**User Action**	

The directions under these headings are described here:

System Display	Command line display. This is where your command will be entered.
User Action	You either type the command or follow the directions. The User Action is **boldfaced**.

Command	The name of the command is listed here. For example, you might type the command 7 (under User Action), and the name of the command, HELP, will be listed under Command.
Comment	A comment is listed to give a brief explanation of the User Action.

For example, the directions for entering the HELP (7) command would be presented this way:

System Display	User Action	Command
ENTER COMMAND:	7<CR>	HELP

2. GETTING STARTED

INTRODUCTION

This chapter is an introduction to the fundamentals of TeleCalc.
Before you build your first spreadsheet there are things about
the general operation of TeleCalc that you need to know. The
chapter reviews the importance of having a working copy of the
master diskette, how to load it into your computer, what the
TeleCalc screen looks like and how to read it, how to use the
menu, how to move around in the table, how to get HELP, caring
for diskettes, and how to exit from TeleCalc.

MAKING A WORKING COPY OF TELECALC

You should keep the original diskette issued by TeleVideo as a
back-up diskette. Make a copy of TeleCalc for your daily work.
Use this copy so that you will always have the master disk as a
back up in case your working disk fails due to wear or accidental
erasure. Make a back-up working copy for your TeleCalc
diskette by following these instructions.

1.   Follow the instructions in the User's Manual that came with
       your TeleVideo computer to format a blank diskette. Make
       sure you include the operating system on the diskette.

2.   On CP/M systems, make sure you have the program PIP.COM on
       your newly formatted diskette. (i.e. PIP b:=pip.com)

3.   Insert your noew system diskette in drive A and the master
       TeleCalc diskette in drive B. Enter ^C, andissue the
       following command:

       PIP A:=B:*.*[V]

4.   Put the TeleCalc master diskette away for safe keeping.
       Label the new diskette as your TeleWrite system diskette.

LOADING TELECALC

To install TeleCalc on your system follow these directions.
Boldfaced words indicate what the user is to type, or enter.

USER: 1.   Be sure your computer is turned on.

          2.   Insert your TeleCalc system diskette in drive A
               (the upper drive).

          3.   Enter

               TC<CR>

               (Type TC and press the <RETURN> key.)

SYSTEM: 4.   Displays after a few seconds the main menu of
               TeleCalc.

THE TELECALC SCREEN

When TeleCalc comes up on the screen, the screen is divided
into several sections: the table, the status line, the data
pointer, the command line, and the main menu.

TeleCalc Table

The major portion of the screen displays the TeleCalc table.

Figure 2-1
TeleCalc Table

ROW

	----1----	----2----	----3----	----4----	----5----
1	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0

Each row of the table has been labeled with row numbers on the left side of the screen. TeleCalc has 12 blank spaces following each row number that are used to display row description. Row descriptions can be up to 40 characters in length.

Each column of the table is also labeled with column numbers, with dashes on both sides. You can enter a two-line column description for each column that can vary from 4 to 20 characters for each line.

Status Line

The **Status Line** gives you information about TeleCalc's current mode, the current computing order, and the current row and column ranges.

        MODE=NORMAL   ORDER=R/C   ROW=1-50   COL=1-20

Unless you set it up otherwise, these options default to the **NORMAL** mode; a computing order of **rows before columns (R/C)**; and a range of **50 rows and 20 columns.**

Data Pointer

The **Data Pointer** tells you the row or column to be used to store the results of your next computation.

        ROW 1 <--

In this manual, the row or column that is shown by the data pointer is referred to as the **CURRENT** row or column.

Command Line

The **Command Line** prompts you for a command number.

        ENTER COMMAND:

Enter the command number that you wish to use and press the <RETURN>(<CR>) key. The command is automatically entered and you are prompted for any additional information that is needed.

CHOOSING COMMANDS

TeleCalc works by responding to commands in the form of numbers. For every command that you need to execute, there is a corresponding built-in TeleCalc command.

In addition to using the command numbers, TeleCalc also responds to alpha characters that are codes for the regular numeric commands. So, if it is easier for you, simply use the "+" for the ADD (41) command, an "F" for the FORMULA (35) command, or any other single-keystroke codes.

The Menu

The TeleCalc menu is always showing on the right side of your screen for easy reference. The main menu that you see when you bring TeleCalc up on the screen is organized into several groups. These groups follow the logical order used to build a TeleCalc table. All commands followed by colons (:) have a related sub-menu.

```
 1 format:
 2 data:
 3 math:
 4 graphics:*
 5 print:
 6 status:
 7 HELP
 8
 9 STOP
10 utility:
11
12 HOME
13 BOTTOM
14
15
16 format:
17 INSERT
18 DELETE
19    rows:
20 ROW TITLE
```

*The graphics command only applies to the TeleCalc-80. It is an optional item in the TeleCalc-86.

If you wish to see the commands in any of the sub-menus, enter the number of the group for which you want to see a sub-menu and press <CR>. For example, if you want to see the available commands under the math heading, enter 3 and press <CR>. A new set of commands appear in the menu on the screen. Try it.

System Display	User Action	Command
ENTER COMMAND:	3<CR>	Math

TeleCalc responds with the menu shown below.

```
40  math:
41 ADD
42 SUB
43 MULT
44 DIV
45 NEGATE
46 INVERSE
47 INTEGER
48 ROUND
49 CUMULATE
50 ABSOLUTE
51 ADD K
52 SUB K
53 MULT K
54 DIV K
55 SUM
56 GET
57 FLOOR
58 CEILING
59
```

To get back to the main menu, press <CR>. When you press <CR> without a command, TeleCalc returns to the original menu.

MOVING AROUND IN THE TELECALC TABLE

TeleCalc usually displays 17 rows and 5 columns on the screen at one time even though your actual table size is much larger. Physical limitations of the screen allow only a portion of the table to be displayed at any one time.

TeleCalc automatically moves the screen to show other parts of your table. This means that the cursor position is always showing on your screen. You can move one column, one row, or you can move to any section of your table that you need to view by using the arrow keys to position your display.

Arrow Keys

Use your arrow keys to switch from the row mode to the column mode and vice versa. The right or left arrow keys put you in the column mode, and the up or down arrow keys switch you back to the row mode. In short, with the use of your arrow keys, you can move to any part of your worksheet with the press of a key.

Commands

You can also use the SELECT ROW (33) or SELECT COL (34) commands to quickly move to any part of the screen. The SELECT ROW (33) command allows you to position your cursor on a specific row; SELECT COL (34) lets you go to a specific column. The HOME (12) command allows you to move to the beginning of the table and the BOTTOM (13) command moves you to the bottom of your table.

Use the GOTO (36) command to position the screen at a specific
portion of the table. For example, to see the results at row 30,
column 10 of the table, you can use the GOTO (36) command and
specify row 30, column 10. TeleCalc positions row 30, column 10
in the upper-left corner of the table.

HELP MENU

If at any time you need on-screen help for one of the TeleCalc
commands, enter the HELP (7) command. The HELP (7) command
prompts you for the command for which you need help. Enter the
command number or the corresponding mnemonic command and press
<CR>.

For example, if you need help for the ROW TITLE (20) command, you
would enter the **7** (HELP) command, press <CR>, then enter **20** (ROW
TITLE), and <CR>. A brief explanation of command 20 appears at
the bottom of your screen as shown below.

        20 ROW TITLE title ... HOME   (DOWN, UP, HOME)
        Enter or change row titles. Each title entered is placed in
        the current row. The cursor keys move the current row pointer.

The HELP command gives you a three-line description of the
commands. For a more comprehensive description, consult the
Command Reference Section of the Appendices.

CARING FOR DISKETTES

Floppy diskettes are destructable and should be handled with
care. In most cases diskettes prove to be surprisingly sturdy
and will give you dependable service if you treat them properly.

*   PROTECT your diskettes by keeping them in their protective
        envelope when not in use.

*   DO NOT BEND diskettes.

*   INSERT DISKETTES CAREFULLY into your disk drives. Never
        force a diskette into the disk drive.

*   NEVER TOUCH THE DISKETTE SURFACE. Fingerprints and dust can
        destroy data. Always handle diskettes by their protective
        covering.

*   DO NOT STORE DISKETTES NEAR A HEAT SOURCE. Like phonograph
        records, diskettes can warp or crack if exposed to extreme
        temperatures. For best results, store diskettes in a
        moderate temperature range.

*   DO NOT EXPOSE DISKETTES TO MAGNETS. Magnetic fields can
        damage data stored on your diskettes. Be aware of possible
        magnetic fields from sources such as X-rays and other
        electronic equipment.

Backing up Diskettes

Accidents do happen. Just when you least expect it, a power failure or a defective diskette can cause you to lose your data. Unfortunately, no one is immune from this aspect of working with computers, but you can prevent losing information by making back-up copies of your diskettes.

Back-up copies are as important as your data. If the data is not essential, you might feel that making back-up copies is a waste of time. If, however, you have data on your diskettes that is critical to your work, we strongly recommend that you make frequent back-up copies of your data and store them separately in a safe place. Consult the User's Manual for instructions on making back-up copies of your data diskettes. THE CHOICE AND RESPONSIBILITY FOR MAKING BACK-UP COPIES ARE YOURS.

SAVING AND EXITING TELECALC

Whenever you are through using TeleCalc and want to exit to the operating system, do the following:

USER: 1.   Save any work you wish to keep by using the UTILITY (10) command and then saving the part of your file that you wish. For example, if you wish to save both the entire file and the chart, you would use the SAVE ALL (107) command.
       2.   When all work is saved, you are ready to exit to the operating system.

System Display	User Action	Command
ENTER COMMAND:	**9<CR>**	STOP
VERIFY (Y OR N):	**Y<CR>**	

TeleCalc returns you to the system prompt of the operating system.

3. DOING A SAMPLE REPORT

INTRODUCTION

In this chapter you learn the basic steps associated with building a table. These steps include entering row titles and table data and then doing some simple calculations. You produce a Five-Year Sales Forecast, make a change in your data and do a "what-if" analysis, and print a report.

THE FIVE-YEAR SALES FORECAST

Let's assume you have a business and want to do a sales and gross profit forecast for the next five years. Let's base the forecast on the following assumptions:

SALES:	Start with a base of $1,000 and grow 10% per period.
COST OF GOODS:	Constant 45% of sales figures.
SALES AND ADMINISTRATION:	Constant 20% of sales figures.
RESEARCH AND DEVELOPMENT:	A flat $300 per year.
TOTAL COSTS:	The sum of all costs (Cost of Goods, Sales and Administration, and Research and Development).
GROSS PROFIT:	Sales less total costs.

1. The first step in building the sample table is to enter titles for each row using the ROW TITLE (20) command.

System Display	User Action	Command
ENTER COMMAND:	20<CR>	ROW TITLE

2. Follow the prompts on your screen and type the description for row 1, SALES.

System Display	User Action	Comment
:	SALES<CR>	row 1 title

3.   Notice that after you press <CR>, the title is displayed
      on row 1 and the prompt continues for the row 2 titles.

System Display	User Action	Comment
:	**COST OF GOODS<CR>**	row 2 title
:	**SALES AND ADMINISTRATION<CR>**	row 3 title

4.   The prompts continue to ask for row descriptions. Notice
      that ADMINISTRATION has not totally appeared on your screen.
      Don't worry. The screen is set to display only 15
      characters for each title. The full description is
      remembered for later use. Later you will learn how you can
      adjust the screen to correspond to your needs.

System Display	User Action	Comment
:	**RESEARCH AND DEVELOPMENT<CR>**	row 4 title
:	**TOTAL COSTS<CR>**	row 5 title
:	**GROSS PROFIT<CR>**	row 6 title

This is the last row title. To cancel the ROW TITLE (20)
command, press <HOME>.

This is what your screen should now display.

```
    ROW
    --------------
   1 SALES
   2 COST OF GOODS
   3 SALES AND ADM
   4 RESEARCH AND
   5 TOTAL COSTS
   6 GROSS PROFIT
   7
   8
   .
   .
   .
   17
```

5.   The data pointer and cursor are now back on row 1. The
      command line is prompting you for your next command.

      According to our assumptions, SALES will start at $1,000 and
      grow at 10% per year.

Let's start with the ENTER (31) command which allows you to choose the method of data entry.

System Display	**User Action**	**Command**
ENTER COMMAND:	31<CR>	ENTER

You now have four ways that you can enter data. Choosing Option "0" you can enter data individually, value by value Choose Option "1" to enter a constant value for the entire line. The "2" option lets you enter a base value and have it grow by a certain percentage, and option "3" lets you enter a base value and have it increment by a certain amount.

6. For our example, choose the GROW option (2).

System Display	**User Action**
CHOOSE (VALUE=0, CONSTANT=1, GROW=2, INCR=3):	2<CR>

7. The command line prompts for the base value. Type in 1000. Notice that dollar signs and commas are not entered.

System Display	**User Action**
BASE VALUE:	1000<CR>

8. The prompt is now asking for the percentage rate. Type in **10**. Notice that the percent signs are not entered. After you press <CR>, notice that row 1 contains the computed sales. The values start with 1,000 and grow by 10% per year.

System Display	**User Action**
RATE:	10<CR>

9. The cursor and data pointer are now on row 2. According to our assumptions, the cost of goods is a constant 45% of sales, so you use the MULT K (53) command.

System Display	**User Action**	**Command**
ENTER COMMAND:	53<CR>	MULT K
VALUE:	.45<CR>	

10. The prompt now asks for a row number. Type in 1 to indicate that the sales figures in row 1 should be used in the constant percent calculation.

System Display	User Action
ROW (1-50):	1<CR>

Again notice that the cursor and data pointer have automatically moved to row 3, SALES AND ADMINISTRATION.

11. Now let's assume that sales and administrative costs are a constant 20% of our sales. Again use the MULT K (53) command and the sales figures in row 1.

System Display	User Action	Command
ENTER COMMAND:	53<CR>	MULT K
VALUE:	.20<CR>	
ROW (1-50):	1<CR>	

12. For row 4, we will assume that RESEARCH AND DEVELOPMENT is a constant cost of $300 each year. Choose the "constant" (1) option for the ENTER (31) command.

System Display	User Action	Command
ENTER COMMAND:	31<CR>	ENTER
CHOOSE (VALUE=0, CONSTANT=1, GROW=2, INCR=3):	1<CR>	

13. The command line now prompts you for the constant base value. Type in 300.

System Display	User Action
BASE VALUE:	300<CR>

Notice that row 4 shows the value of 300 in all columns.

14. The data pointer and cursor now indicate row 5. To calculate the TOTAL COSTS in row 5, sum beginning with row 2 and ending with row 4 using the SUM (55) command.

System Display	User Action	Command
ENTER COMMAND:	55<CR>	SUM
ROW BEGIN (1-50):	2<CR>	
END (2-50):	4<CR>	

Notice that the sum for each column of the table is computed and the result is displayed on row 5.

15. Finally, calculate the GROSS PROFIT in row 6 as SALES, row 1, minus TOTAL COSTS, row 5, using the SUB (42) command.

System Display	User Action	Command/Comment
ENTER COMMAND:	42<CR>	SUB
ROW (1-50):	1<CR>	first row number
ROW (1-50):	5<CR>	row number to subtract

After you enter the figures, TeleCalc calculates the GROSS PROFITS and displays the results in row 6.

16. You have now completed your first Five-Year Forecast. The screen should look like the following:

```
ROW
--------------     ----1----  ----2----  ----3----  ----4----  ----5----
1 SALES            1,000.0    1,100.0    1,210.0    1,331.0    1,464.1
2 COST OF GOODS      450.0      495.0      544.5      599.0      658.8
3 SALES AND ADM      200.0      220.0      242.0      266.2      292.8
4 RESEARCH AND       300.0      300.0      300.0      300.0      300.0
5 TOTAL COSTS        950.0    1,015.0    1,086.5    1,165.2    1,251.7
6 GROSS PROFIT        50.0       85.0      123.5      165.9      212.4
7
8
```

As you prepared the Five-Year Forecast, not only were the figures computed, but the commands required to create the table were memorized.

17. Let's take a look at the corresponding command logic using the SHOW ROWS (22) command.

System Display	User Action	Command
ENTER COMMAND:	22<CR>	SHOW ROWS

Your screen should show the following:

ROW	TYPE	UNDER LINE	BLANK LINES	DEC SIZ	FOR MAT	COMMAND	PARAMETERS
1 SALES	data		-	-	-		
2 COST OF GOODS	data		-	-	-	MULT K	K=0,45 ROW=1
3 SALES AND ADM	data		-	-	-	MULT K	K=0,2 ROW=1
4 RESEARCH AND	data		-	-	-		
5 TOTAL COST	data		-	-	-	SUM	ROWS 2 - 4
6 GROSS PROFIT	data		-	-	-	SUB	ROW=1 ROW=5
7	data		-	-	-		
8	data		-	-	-		
9	data		-	-	-		
10	data		-	-	-		
11	data		-	-	-		
12	data		-	-	-		
13	data		-	-	-		
14	data		-	-	-		
15	data		-	-	-		
16	data		-	-	-		
17	data		-	-	-		

To recover your display, press any arrow key.

"WHAT-IF" ANALYSIS

Let's make changes to our data and watch the entire Five-Year Forecast be recalculated based on some new assumptions.

Let's do a "what-if" analysis with the new assumption that the first year of RESEARCH AND DEVELOPMENT expenses row 4, column 1 will be $500 instead of $300. You need to begin with the CHANGE (32) command to indicate the new figures and then use the COMPUTER (98) command to see the effect of the new assumption.

System Display	User Action	Command
ENTER COMMAND:	32<CR>	CHANGE
ROW (1-50):	4<CR>	
COL (1-20):	1<CR>	
VALUE:	500<CR>	
ENTER COMMAND:	98<CR>	COMPUTE

In only a few seconds, the new Five-Year Forecast shows the following:

ROW	----1----	----2----	----3----	----4----	----5----
1 SALES	1,000.0	1,100.0	1,210.0	1,331.0	1,464.1
2 COST OF GOODS	450.0	495.0	544.5	599.0	658.8
3 SALES AND ADM	200.0	220.0	242.0	266.2	292.8
4 RESEARCH AND	500.0	300.0	300.0	300.0	300.0
5 TOTAL COSTS	1,150.0	1,015.0	1,086.5	1,165.2	1,251.7
6 GROSS PROFIT	-150.0	85.0	123.5	165.9	212.4

GENERATING A REPORT

Now that you have built your table, let's print the report. Be sure your printer is connected and turned on, and your paper adjusted. You will first want to enter titles of your chart using the TITLES (82) command which begins by prompting you for the date and the row and column range that you want printed. The title for your chart can be up to three lines long. The last prompt begins the printing.

System Display	User Action	Command
ENTER COMMAND:	82<CR>	TITLES
PAGE NUMBER (0-999):	1<CR>	
DATE (YEAR AS YY):	83<CR>	
MONTH (1-12):	1<CR>	
DAY (1-31):	1<CR>	
ROW-RANGE BEGIN (1-50):	1<CR>	
END (1-50):	6<CR>	
COL-RANGE BEGIN (1-20):	1<CR>	
END (1-20):	5<CR>	
TITLE 1:	SAMPLE 5-YEAR PROJECTION<CR>	
TITLE 2:	<CR>	
TITLE 3:	<CR>	

Pressing <CR> by itself indicates that there are no titles for the second and third lines.

System Display	User Action
SET PAPER; HIT RETURN	<CR>

The TITLES (82) command sends your Five-Year Forecast table to the printer to generate the following report.

(date)   PAGE 1
SAMPLE 5-YEAR PROJECTION

-----------------	----1----	----2----	----3----	----4----	----5---
1 SALES	1,000.0	1,100.0	1,210.0	1,331.0	1,464.1
2 COST OF GOODS	450.0	495.0	544.5	599.0	658.8
3 SALES AND ADMINIS	200.0	220.0	242.0	266.2	292.8
4 RESEARCH AND DEVE	500.0	300.0	300.0	300.0	300.0
5 TOTAL COSTS	1,150.0	1,015.0	1,086.5	1,165.2	1,251.7
6 GROSS PROFIT	-150.0	85.0	123.5	165.9	212.4

SAVING YOUR TABLE

You should now save your table on disk with the SAVE TBL (112) command for future use. The FORECAST table will be used in some of the following chapters as examples. If you wish to save your table on a different drive, first use the SET DRIVE (108) command.

System Display	User Action	Command
ENTER COMMAND:	108	SET DRIVE
DRIVE (A-P):	(enter drive name)	
ENTER COMMAND:	112<CR>	SAVE TBL
TABLE NAME:	FORECAST<CR>	

ENDING THE LESSON

Congratulations, you have just completed your first report! To end the lesson and return to the operating system, use the STOP (9) command.

System Display	User Action	Command
ENTER COMMAND:	9<CR>	STOP
VERIFY (Y OR N):	Y<CR>	

Use the ENTER (31) command and option 3 (INCR) to enter values
for column 3. The base value is 10 and you want it to increment
by 10.

System Display	User Action	Command
ENTER COMMAND:	31<CR>	ENTER
CHOOSE (VALUE=0, CONSTANT=1,GROW=2, INCR=3):	3<CR>	
BASE VALUE:	10<CR>	
RATE:	10<CR>	

Your display will show the changes in column 3. Notice that
the data pointer has automatically changed to **COL 4 <--** and is
ready for your next entry.

```
      COL 4   <--
ENTER COMMAND:
```

ROW	----1----	----2----	----3----	----4----	----5----
1	0.0	0.0	10.0	0.0	0.0
2	0.0	0.0	20.0	0.0	0.0
3	0.0	0.0	30.0	0.0	0.0
4	0.0	0.0	40.0	0.0	0.0
5	0.0	0.0	50.0	0.0	0.0
6	0.0	0.0	60.0	0.0	0.0
7	0.0	0.0	70.0	0.0	0.0
8	0.0	0.0	80.0	0.0	0.0
9	0.0	0.0	90.0	0.0	0.0
10	0.0	0.0	100.0	0.0	0.0
11	0.0	0.0	110.0	0.0	0.0
12	0.0	0.0	120.0	0.0	0.0
13	0.0	0.0	130.0	0.0	0.0
14	0.0	0.0	140.0	0.0	0.0
15	0.0	0.0	150.0	0.0	0.0
16	0.0	0.0	160.0	0.0	0.0
17	0.0	0.0	170.0	0.0	0.0

ENTERING INDIVIDUAL VALUES

If you prefer, you can enter values one at a time by using the
ENTRY (30) command. With this command, you can go directly to a
data entry position without having to go through the options
offered in the ENTER command.

With the ENTRY command you can use the arrow keys to move the data pointer to the cell position of the value you wish to enter. This position is highlighted on your display. For example, suppose you want to enter the following data into column 4.

	-1-	-2-	-3-	-4-	-5-	-6-	-7-
COLUMN 4:	100	100	100	0	100	300	300

Use the ENTRY (30) command and then enter each value. Notice that when you press <CR> for a value, the value from the previous row is repeated.

System Display	User Action	Command/Comment
ENTER COMMAND:	30<CR>	ENTRY
VALUE:	100<CR>	column 4, row 1
VALUE:	<CR>	column 4, row 2
VALUE:	<CR>	column 4, row 3
VALUE:	0<CR>	column 4, row 4
VALUE:	100<CR>	column 4, row 5
VALUE:	300<CR>	column 4, row 6
VALUE:	<CR>	column 4, row 7

This is the last value to be entered in this row, so press the <HOME> key to cancel the ENTRY (30) command.

System Display	User Action
VALUE:	<HOME>

Notice that while in the ENTRY (30) mode, each <CR> causes the data pointer and the cursor to automatically move to the next row or column.

Because of the different methods available for entering data, you should determine the best way based on your particular application. In order to save time, you should also decide whether to use the row mode or the column mode before you begin entering your data.

CLEARING THE TABLE

To clear the table so that you can continue to the next section, use the CLR DATA (113) command in the Utility Menu. See the section, Your Screen Display, in Chapter 8 for more information.

System Display	User Action	Command
ENTER COMMAND:	113<CR>	CLR DATA
VERIFY (Y OR N)	Y<CR>	

DOING A SAMPLE INVENTORY TABLE

To illustrate the formatting and data entry commands used in this chapter, let's prepare a sample inventory table.

Assume that you need an inventory report to include three items: desks, chairs, and shelves. For each of these items, you want to show a unit cost, quantity, and total cost. You also want to show a grand total for all three items' cost. Let's start by setting up the table size for your Inventory example.

Setting Table Size

Table sizes can be changed to accommodate a variety of applications. For example, by choosing a 5-column format, you can have up to about 200 available rows. This format could handle a full income statement, cash flow, and balance sheet in a single table. With 60 columns in your table, you can do a five-year, monthly projection of cash flows for a real estate development project.

The potential size of each table is determined by the RAM (Random Access Memory) capacity of your computer. Based on a system with 64K (kilobytes) of RAM, your table can be up to 99 columns, OR up to 250 rows, with a total of approximately 1000 data cells. The SET UP (109) command will automatically calculate the maximum number of columns and rows to let you know how large your table can be. Let's use the SET UP (109) command to build a sample inventory table that is 5 columns by 15 rows.

NOTE!   In an 8 bit system the the minimum number of rows you can have is one but in a 16 bit system the minimum number is 17.

If you use SET UP (109) to display less than the default number of columns (5), you must then use SET CRT (86) to increase your columns back to default size for a 16 bit system.

The SET UP (109) command allows you to select table sizes. When you bring your program up on your screen, the table that you see on the screen is 50 rows by 20 columns. The initial table size will always default to 50 rows by 20 columns unless you use the SET UP (109) command to specify another size.

System Display	User Action	Command
ENTER COMMAND:	**109<CR>**	SET UP
VERIFY (Y OR N):	**Y<CR>**	

Notice that answering "yes" (Y) to the SET UP verification query clears the data from your screen. If you do not want the data cleared, respond with an "N" for no.

Now you enter the number of columns and the number of rows. You want to have 5 columns in the table but you could have up to 99. You want 15 rows but could have up to 161 rows.

System Display	User Action
NUMBER OF COLUMNS (1-99):	**5<CR>**
ROWS (1-161):	**15<CR>**
VERIFY (Y OR N):	**Y<CR>**

The size of the table on the screen, the CURRENT table size, is shown in the upper-right corner of your screen (ROW=1-15 COL=1-5). The table will now be reset to show a table that is 5 columns by 15 rows.

ENTERING ROW AND COLUMN DESCRIPTIONS

Row and column titles are easy to enter. Using the ROW TITLE (20) command, you can enter titles of up to 40 alpha or numeric characters for each row. Each title entered is placed in the current row as indicated by the data pointer and the highlighted block. You can use the arrow keys to position the data pointer to the row in which you want to enter a title. Let's enter row titles for the Inventory table.

System Display	User Action	Command/Comment
ENTER COMMAND:	**20\<CR>**	ROW TITLE
:	**ITEM\<CR>**	Row 1 title
:	**DESKS\<CR>**	Row 2 title
:	**CHAIRS\<CR>**	Row 3 title
:	**SHELVES\<CR>**	Row 4 title
:	**TOTAL\<CR>**	Row 5 title

This is the last row title to be entered, so use the HOME command to cancel the ROW TITLE (20) command.

System Display	User Action
:	**\<HOME>**

Now enter the column descriptions for your inventory table using the COL TITLE (25) command. Columns are allowed 2-line descriptions of up to 20 characters. Each line of the title is automatically right justified in the column. If only one line of description is needed, press \<CR> to indicate that a second line is not necessary. If only one line is used, it is always printed on the lower of the two lines of titles.

System Display	User Action	Command/Comment
ENTER COMMAND:	**25\<CR>**	COL TITLE
1:	**UNIT\<CR>**	Column 1 first title
2:	**COST\<CR>**	Column 1 second title
1:	**QUANTITY\<CR>**	Column 2 title
2:	**\<CR>**	
1:	**TOTAL\<CR>**	Column 3 first title
2:	**COSTS\<CR>**	Column 3 second title

This is the last column title to be entered, so press the \<HOME> key to cancel the COL TITLE command.

System Display	User Action
:	**\<HOME>**

Your screen should show the following:

```
        ROW 1 (ITEM) <--
ENTER COMMAND:
                        UNIT                    TOTAL
        ROW             COST    QUANTITY        COSTS
        --------------- ----1---- ----2---- ----3---- ----4---- ----5----
         1 ITEM          0.0       0.0       0.0       0.0       0.0
        2 DESKS          0.0       0.0       0.0       0.0       0.0
        3 CHAIRS         0.0       0.0       0.0       0.0       0.0
        4 SHELVES        0.0       0.0       0.0       0.0       0.0
        5 TOTAL          0.0       0.0       0.0       0.0       0.0
        6               0.0       0.0       0.0       0.0       0.0
        7               0.0       0.0       0.0       0.0       0.0
        8               0.0       0.0       0.0       0.0       0.0
        9               0.0       0.0       0.0       0.0       0.0
        10              0.0       0.0       0.0       0.0       0.0
        11              0.0       0.0       0.0       0.0       0.0
        12              0.0       0.0       0.0       0.0       0.0
        13              0.0       0.0       0.0       0.0       0.0
        14              0.0       0.0       0.0       0.0       0.0
        15              0.0       0.0       0.0       0.0       0.0
```

The ROW TITLE (20) and COL TITLE (25) commands can also be used to change row and column descriptions. They can be used to correct typing errors or to supply new titles. The new descriptions you supply replace the old descriptions in the table.

Entering Data

Using the data entry commands discussed earlier in this section, you can now enter data into the inventory table. Use your arrow keys to position your cursor on column 1. You begin by using the ENTRY (30) command and then entering the data. You end by using the MULT (43) command to get the total cost of the Inventory table.

Row 1 is a heading and should not have values. The cursor will automatically go to column 1, row 2 ready for your next entry.

System Display	User Action	Command/Comment
ENTER COMMAND:	30<CR>	ENTRY
VALUE:	0<CR>	row 1 value
VALUE:	300<CR>	row 2 (desks) value
VALUE:	150<CR>	row 3 (chairs) value
VALUE:	200<CR>	row 4 (shelves) value

This is the last value to be entered here, so press the <HOME> key to cancel the ENTRY command.

System Display	User Action
VALUE:	**<HOME>**

The data pointer and the cursor automatically move to the next column ready for your next command. Let's use the ENTRY (30) command again to enter data in column 2.

Use the arrow keys to move to column 2.

System Display	User Action	Command
ENTER COMMAND:	**30<CR>**	ENTRY
VALUE:	**0<CR>**	row 1 value
VALUE:	**10<CR>**	row 2 (desks) value
VALUE:	**20<CR>**	row 3 (chairs) value
VALUE:	**5<CR>**	row 4 (shelves) value

This is the last value to be entered, so press the <HOME> key to cancel the ENTRY command.

System Display	User Action
VALUE:	**<HOME>**

To get the total costs of the Inventory table, use the MULT(43) command to multiply column 1 by column 2.

System Display	User Action	Command
ENTER COMMAND:	**43<CR>**	MULT
ROW (1-5):	**1<CR>**	
ROW (1-5):	**2<CR>**	

Your screen should show the following:

```
        ROW 1 (ITEM)  <--
ENTER COMMAND:
```

ROW	UNIT COST	QUANTITY	TOTAL COSTS		
	----1----	----2----	----3----	----4----	----5----
1 ITEM	0.0	0.0	0.0	0.0	0.0
2 DESKS	300.0	10.0	3,000.0	0.0	0.0
3 CHAIRS	150.0	20.0	3,000.0	0.0	0.0
4 SHELVES	200.0	5.0	1,000.0	0.0	0.0
5 TOTAL	0.0	0.0	0.0	0.0	0.0
6	0.0	0.0	0.0	0.0	0.0
7	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0
11	0.0	0.0	0.0	0.0	0.0
12	0.0	0.0	0.0	0.0	0.0
13	0.0	0.0	0.0	0.0	0.0
14	0.0	0.0	0.0	0.0	0.0
15	0.0	0.0	0.0	0.0	0.0

SAVING AND LOADING TABLES

After you have created a table, you will probably want to save
the table for future use. You will also need to know how to
reload tables from your diskette onto your computer so that you
can change or update data. To see the commands associated with
saving and loading tables, enter command 10 (UTILITY) and press
<CR>.

You can save tables on diskettes and load the tables again using
the SAVE TBL (112) and LOAD TBL (111) commands. Each table is
identified by an 8-character name. You can direct the tables to
be saved or loaded from any of the disk drives of your computer.

To save tables on a specific disk drive, use the SET DRIVE (108)
command to specify the drive name. That drive will be used as
the data drive for all subsequent load and save operations until
you change the drive with the SET DRIVE (108) command or by
exiting the program.

To illustrate the save and load commands, let's save the table on
our screen as an inventory table example named INVENT on drive B,
reset the table, and then load the saved Inventory table back
from the disk. You will use this version of the INVENT table in
later chapters as an example.

If you wish to save the table on a different drive, you will
begin with the SET DRIVE (108) command followed by the SAVE TBL
(112) command.

System Display	**User Action**	**Command**
ENTER COMMAND:	108<CR>	SET DRIVE
DRIVE (A-P):	B<CR>	
ENTER COMMAND:	112<CR>	SAVE TBL
TABLE NAME:	INVENT<CR>	

When your table has been saved, you will see the message, **saved,** in the upper-left corner of your screen.

Now clear your screen using the RESET (114) command. Then reload the table using the LOAD TBL (111) command.

System Display	**User Action**	**Command**
ENTER COMMAND:	114<CR>	RESET
VERIFY (Y OR N):	Y<CR>	
ENTER COMMAND:	111<CR>	LOAD TBL

A directory is kept of all the tables that you save. After entering a load or save command, a message at the top of the screen will direct you to "Hit RETURN to see available tables or programs". If you wish to see the names of the tables in the directory, simply press <CR>. Continue pressing <CR> to view additional tables.

System Display	**User Action**
TABLE NAME:	INVENT<CR>

Each table will save the following information:

1. Report options and titles

2. Range settings and compute order

3. Row descriptions, options, and commands

4. Column descriptions, options, and commands

5. Table values

In general, all relevant parameters are saved so that you can continue from one session to another without worrying about losing data.

See Chapter 8, File Maintenance, for further information on maintaining files.

ENLARGING TABLES

The SET UP (109) command can also be used to enlarge a table--as long as you remain within the size limitations of your RAM. To enlarge a table, first set the current table to the new dimension you need. Then load your table to be enlarged into the CURRENT table.

Let's enlarge our current table from 5 columns by 15 rows to 20 columns by 50 rows. Begin with the SET UP (109) command to set the size and then use the LOAD TBL (111) command to display the current table.

System Display	User Action	Command
ENTER COMMAND:	109<CR>	SET UP
VERIFY (Y OR NO):	Y<CR>	
NUMBER OF COLUMNS (1-99):	20<CR>	
ROWS (1-54):	50<CR>	
VERIFY (Y OR N):	Y<CR>	

The current table will be set up to the new dimensions. The CURRENT table size is displayed in the upper-right corner of your screen (ROW=1-50 COL=1-20).

System Display	User Action	Command
ENTER COMMAND:	111<CR>	LOAD TBL
TABLE NAME:	INVENT<CR>	

TeleCalc displays this message on the screen:

New table is smaller than current table dimensions. Enlarge?
NEW=15x5   CURRENT=50x20

System Display	User Action
CHOOSE (NEW=0, CURRENT=1):	1<CR>

Your Inventory table will be loaded into the enlarged matrix. If for some reason you decide not to enlarge the table, choose "0" in the above prompt, signifying that you wish your new table to remain the same size.

Let's save the enlarged Inventory table using the SAVE TBL (112) command.

System Display	User Action	Command
ENTER COMMAND	112<CR>	SAVE TBL
TABLE NAME:	INVENT<CR>	

You will receive a message saying:

Your file already exists. Continue with save?

System Display	User Action
VERIFY (Y OR N):	Y<CR>

By answering "yes" to the verification, you have indicated that you want to write over the existing file called INVENT. Because you now have an updated version of INVENT, you will want to save the new version instead of the old.

INSERTING LINES

You can insert a new row or column using the INSERT (17) command. For example, let's insert a new row into the Inventory table.

Use the arrow key to move to row 5, then:

System Display	User Action	Command
ENTER COMMAND:	17<CR>	INSERT

NOTE!   **In the 16 bit system if your table is already filled to the last row/column then INSERT (17) will insert a new line and it will delete the last row/column of your existing table**

An empty row or column will automatically be inserted on the line indicated by your cursor. In reality, the row being inserted is the last row or column of your current table. Data in that row or column will be carried to the new location.

DELETING LINES

To delete a row or column, put your cursor on the row or column you wish to delete and use the DELETE (18) command. The command line will issue a prompt asking you to verify the deletion. A "Y" response to the prompt clears the data from the deleted line.

For example, delete the line we just inserted into the Inventory table above.

Use your arrow keys to move the cursor back to row 5 and then use the DELETE (18) command.

System Display	User Action	Command
ENTER COMMAND:	18<CR>	DELETE
VERIFY (Y OR N):	Y<CR>	

Row 5 has been deleted and your table adjusted.

REORDERING ROWS AND COLUMNS

You can change the order of your rows using the REORDER (28) command. In the same way, the REORDER (28) command will let you reorder columns. Using these commands, you can change the order of rows and columns in already existing tables. For example, let's switch the order of columns 2 and 3 in our Inventory table using the REORDER (28) command.

System Display	User Action	Command
ENTER COMMAND:	28<CR>	REORDER
OLD NUMBER (1-20):	3<CR>	
NEW NUMBER (1-20):	2<CR>	

Your screen should show the following.

```
        ROW 1 (ITEM)  <--
ENTER COMMAND:
                      UNIT      TOTAL
ROW                   COST      COSTS  QUANTITY
---------------- ----1---- ----2---- ----3---- ----4---- ----5----
1 ITEM               0.0       0.0       0.0       0.0       0.0
2 DESKS            300.0     3,000.0    10.0       0.0       0.0
3 CHAIRS           150.0     3,000.0    20.0       0.0       0.0
4 SHELVES          200.0     1,000.0     5.0       0.0       0.0
5 TOTAL              0.0       0.0       0.0       0.0       0.0
6                    0.0       0.0       0.0       0.0       0.0
7                    0.0       0.0       0.0       0.0       0.0
8                    0.0       0.0       0.0       0.0       0.0
9                    0.0       0.0       0.0       0.0       0.0
10                   0.0       0.0       0.0       0.0       0.0
11                   0.0       0.0       0.0       0.0       0.0
12                   0.0       0.0       0.0       0.0       0.0
13                   0.0       0.0       0.0       0.0       0.0
14                   0.0       0.0       0.0       0.0       0.0
15                   0.0       0.0       0.0       0.0       0.0
```

By using the REORDER (28) command you can make adjustments to your table without having to re-enter data. Of course, when you insert or reorder a line, command references for existing rows and columns are automatically retained.

DESIGNING ON-SCREEN FORMATS

Your screen will normally show 5 columns and 17 rows. Each cell has one decimal place, each column is 10 spaces wide, and each row title uses 15 spaces. Zero values are displayed on the screen.

The SET CRT (86) command allows you to change the display parameters for on-screen viewing. These changes are not reflected on the printed copy. For example, let's change the screen to show columns, each 20 spaces wide with 3 decimal places, and with 15 spaces for row titles.

System Display	User Action	Command
ENTER COMMAND:	86<CR>	SET CRT
DECIMAL PLACES (0-3):	3<CR>	
ROW TITLE WIDTH (5-30):	15<CR>	
COLUMN WIDTH (4-20):	20<CR>	
DISPLAY ZERO VALUES (NO=0, YES=1):	<CR>	

Pressing <CR> after an option causes it to default to the current setting.

TeleCalc User's Manual

Your screen should show the following:

ENTER COMMAND:

ROW	UNIT COST	TOTAL COSTS
	----------1----------	----------2----------
1 ITEM	0.000	0.000
2 DESKS	300.000	3,000.000
3 CHAIRS	150.000	3,000.000
4 SHELVES	200.000	1,000.000
5 TOTAL	0.000	0.000
6	0.000	0.000
7	0.000	0.000
8	0.000	0.000
9	0.000	0.000
10	0.000	0.000
11	0.000	0.000
12	0.000	0.000
13	0.000	0.000
14	0.000	0.000
15	0.000	0.000
16	0.000	0.000
17	0.000	0.000

You can change the on-screen parameters to allow financial reports to show up to trillion dollar figures with penny accuracy. Computations are accurate to 14 precision digits.

You can also design the display to show columns that are 3 characters wide. This displays more columns, but each number has to be less than three digits wide. Large numbers that require more space are displayed as three asterisks (***).

For an 80 column screen, 65 spaces are available for the table area. After subtracting the space required for the row title, the number of columns shown on-screen is calculated depending on the size of the columns. Note that although all columns are the same size on the screen, your printed report can have different widths for each column.

The SET CRT (86) command does not change any of the values in the table. Therefore, feel free to experiment with this command to design screens to suit your needs.

ENDING THE LESSON

The original INVENT table without these last changes will be used in other chapters as an example. The original INVENT table has already been saved. You do not want to save the changes.

To end the lesson and exit to the operating system, press **9<CR>**, the STOP command.

5. MATH AND FORMULAS

INTRODUCTION

Chapter 5 explains how to use the mathematical commands in
TeleCalc. You will see how easy it is to do common calculations
with TeleCalc's built-in commands. In addition, you will learn
how to enter formulas, how to use TeleCalc's handy PLUG command,
and how to calculate your results with surprising speed. To see
the TeleCalc mathematical commands on your screen enter command **3**
and then <CR>.

SIMPLE MATHEMATICAL FUNCTIONS

TeleCalc performs mathematical computations on rows and columns
of your table. Let's go through some of the more common
commands. Make sure your table on the screen is cleared. If
not, use the RESET (114) command.

System Display	User Action	Command
ENTER COMMAND:	114<CR>	RESET
VERIFY (Y OR N):	Y<CR>	

The RESET (114) command clears the entire screen and redisplays
the TeleCalc table.

In this example you will enter commands from a row mode. If you
prefer, you can also enter the mathematical commands in columns.

Entering Data

First, you must enter some numerical amounts in the first rows of
your table so that you can learn how to add, subtract, multiply,
and divide rows as well as how to manipulate them for other
mathematical formulas. Use the ENTER (31) command.

TeleCalc User's Manual

System Display	User Action	Command
ENTER COMMAND:	31<CR>	ENTER
CHOOSE (VALUE=0, CONSTANT=1, GROW=2, INCR=3):	1<CR>	
BASE VALUE:	20<CR>	
ENTER COMMAND:	31<CR>	ENTER

CHOOSE (VALUE=0, CONSTANT=1, GROW=2, INCR=3): 1<CR>

System Display	User Action	Command
BASE VALUE:	10<CR>	

ADD (41) Command

Now you are ready to use the math commands. The cursor and data pointer are on row 3 indicating that TeleCalc is ready to enter data or put results on that row. Let's start with the ADD (41) command and add rows 1 and 2. Make sure your data pointer is pointing to row 3.

System Display	User Action	Command
ENTER COMMAND:	41<CR>	ADD
ROW (1-50):	1<CR>	
ROW (1-50):	2<CR>	

The ADD command adds any two rows or columns in a table and puts the results in the row or column indicated by the cursor and data pointer. For example:

Row 1 + Row 2 = Row 3

SUBTRACT (42) Command

Now let's subtract row 2 from row 1 and put the difference in row 4 using the SUBTRACT (42) command. Make sure your cursor is on row 4, then:

System Display	User Action	Command
ENTER COMMAND:	42<CR>	SUB
ROW (1-50):	1<CR>	
ROW (1-50):	2<CR>	

The SUBTRACT (42) command subtracts any two rows or columns of values and puts the results in the row or column indicated by the cursor and data pointer.

Row 1 - Row 2 = Row 4

MULTIPLY (43) Command

Using the MULTIPLY (43) command, multiply row 1 by row 2 and put the results in row 5.

System Display	User Action	Command
ENTER COMMAND:	43<CR>	MULT
ROW (1-50):	1<CR>	
ROW (1-50):	2<CR>	

The multiply command multiplies any two rows or columns of values in a table and puts the results in the row or column indicated by the cursor and data pointer. For example:

Row 1 x Row 2 = Row 5

DIVISION (44) Command

Use the DIV (44) command to divide row 1 by row 2 and put the results in row 6.

System Display	User Action	Command
ENTER COMMAND	44<CR>	DIV
ROW (1-50):	1<CR>	
ROW (1-50):	2<CR>	

The divide command divides any two rows or columns of values in a table and puts the results in the row or column indicated by the cursor and data pointer. For example, Row 1/Row 2 = Row 6.

Your screen should show the following:

ENTER COMMAND:

ROW	----1----	----2----	----3----	----4----	----5----
1	20.0	20.0	20.0	20.0	20.0
2	10.0	10.0	10.0	10.0	10.0
3	30.0	30.0	30.0	30.0	30.0
4	10.0	10.0	10.0	10.0	10.0
5	200.0	200.0	200.0	200.0	200.0
6	2.0	2.0	2.0	2.0	2.0
7					
8					
9					

17

The other TeleCalc mathematical commands are used in the same manner as the commands described above. Try experimenting with some of the commands on your own. For more information about a specific command, consult the Command Reference Appendix.

CUMULATE (49) Command

The CUMULATE (49) command is helpful in situations where you need a cumulative total over a period of time. Let's use the CUMULATE (49) command to calculate the cumulative total for the data in row 5 and put the results in row 7. Make sure your cursor is on row 7, then:

System Display	User Action	Command
ENTER COMMAND:	49<CR>	CUMULATE
VALUE:	100<CR>	
ROW (1-50):	5<CR>	

The CUMULATE (49) command computes cumulative totals for a row or column of a table. After entering the command, the first prompt will ask for an initial or base value. This is especially useful for balance-forward types of calculations that have an ending balance to be carried forward. There must always be a base value entered when using the CUMULATE (49) command. If you have no previous balance value, a "0" must be entered.

SUM (55) Command

The SUM (55) command is one of the most frequently used of the mathematical commands. Use the SUM (55) command to total the data in each column of row 1 through row 6 and put the results in row 8. Put your cursor on row 8, then:

System Display	User Action	Command/Comment
ENTER COMMAND:	55<CR>	SUM
ROW BEGIN (1-50):	1<CR>	(Number of row to begin summing)
END (1-50):	6<CR>	(Last row to be included in the sum)

The SUM (55) command lets you add any number of consecutive rows or columns. Like the other TeleCalc mathematical commands, you can position your results wherever you need to have them appear. The results appear in the row or column indicated by your data pointer and cursor.

GET (56) Command

The GET (56) command copies data from one row or column to another. Use the GET (56) command to put the values from row 5 into row 9. Put your cursor on row 9, then:

System Display	User Action	Command
ENTER COMMAND:	56<CR>	GET
ROW (1-50):	5<CR>	

The GET (56) command allows you to retrieve data from any row and put it anywhere in your current table. Of course, the same thing can be done with columns in the column mode.

FLOOR AND CEILING COMMANDS

The FLOOR (57) and CEILING (58) commands in TeleCalc can be used to answer basic "if-then" questions about an existing row or column of values.

FLOOR (57) Command

Let's use the FLOOR (57) command to analyze the data in row 7 and put the results in row 10. Your data pointer should be pointing to row 10.

When using the FLOOR command, you set a minimum value, or floor and then compare each value in your row or column. If a value in that line is greater than the minimum value you have specified, then that value will remain unchanged. If a value is less than or equal to the minimum value, then TeleCalc will give you the minimum value.

System Display	User Action	Command/Comment
ENTER COMMAND:	57<CR>	FLOOR
VALUE:	700<CR>	(minimum value)
ROW (1-50):	7<CR>	(Row to compare to the minimum value)

In our example, every value in row 7 that was less than 700 became 700. Values greater than 700 remained unchanged.

CEILING (58) Command

The CEILING (58) command works the same way as the FLOOR (57) command, only in reverse. With the CEILING (58) command, you set a maximum value or ceiling. When you compare a line with your maximum value, anything greater than or equal to the ceiling value will become that value; anything less than that maximum value will stay the same.

Now use the CEILING (58) command to compare row 7 with a maximum value of 700. Put the results in row 11.

System Display	User Action	Command/Comment
ENTER COMMAND:	58<CR>	CEILING
VALUE:	700<CR>	(Maximum value)
ROW (1-50):	7<CR>	(Row to compare to maximum value)

In our example, all values in row 7 that were greater than 700 were changed to 700. Other values were not changed.

Your screen showing the examples used above should look like the following:

ENTER COMMAND:

ROW	----1----	----2----	----3----	----4----	----5----
1	20.0	20.0	20.0	20.0	20.0
2	10.0	10.0	10.0	10.0	10.0
3	30.0	30.0	30.0	30.0	30.0
4	10.0	10.0	10.0	10.0	10.0
5	200.0	200.0	200.0	200.0	200.0
6	2.0	2.0	2.0	2.0	2.0
7	300.0	500.0	700.0	900.0	1,100.0
8	272.0	272.0	272.0	272.0	272.0
9	200.0	200.0	200.0	200.0	200.0
10	700.0	700.0	700.0	900.0	1,100.0
11	300.0	500.0	700.0	700.0	700.0
12	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0

SHOW COMMANDS

TeleCalc displays the current print options and commands for
each row shown on the screen with the SHOW ROWS (22) command. To
see the command logic for columns, use the SHOW COLS (27)
command. If you want to change the command for a particular row
or column, you can overwrite the original command by entering a
new command. The new logic is reflected when you use the SHOW
ROWS (22) or SHOW COLS (27) commands.

Use the SHOW ROWS (22) command to see the table logic for each of
the commands you just used.

System Display	User Action	Command
ENTER COMMAND:	22<CR>	SHOW ROWS

Your screen should show the following:

ENTER COMMAND:

	TYPE	UNDER LINE	BLANK LINES	DEC SIZ	FOR MAT	COMMAND	PARAMETERS
1	data		-	-	-		
2	data		-	-	-		
3	data		-	-	-	ADD	ROW=1 ROW=2
4	data		-	-	-	SUB	ROW=1 ROW=2
5	data		-	-	-	MULT	ROW=1 ROW=2
6	data		-	-	-	DIV	ROW=1 ROW=2
7	data		-	-	-	CUMULATE	K=100 ROW=5
8	data		-	-	-	SUM	ROWS 1 - 6
9	data		-	-	-	GET	ROW=5
10	data		-	-	-	FLOOR	K=700 ROW=7
11	data		-	-	-	CEILING	K=700 ROW=7
12	data		-	-	-		
13	data		-	-	-		
14	data		-	-	-		
15	data		-	-	-		
16	data		-	-	-		
17	data		-	-	-		

Press any arrow key to get back to your table.

NULLIFY (39) Command

If you want to delete a command from your table entirely, you must use the NULLIFY (39) command to nullify the logic associated with the command. The NULLIFY (39) command does not affect the data currently in your table.

USING FORMULAS

Although TeleCalc supplies many built-in formulas, it may be necessary for you to enter your own formulas for specialized computations. TeleCalc has two commands that let you enter formulas into your tables. The FORMULA (35) command applies your formula to an entire row or column, and the PLUG (37) command lets you use a formula on a single value, or cell. With these two commands you can do cell-by-cell calculations in addition to doing calculations on an entire row or column at a time.

When using the FORMULA (35) or PLUG (37) commands you will probably need to reference data already in your table. You can reference any row or column by preceding the row or column number with the letter "L". For example, you would reference row 7 as L7 or column 19 as L19. TeleCalc automatically distinguishes between row and column references by looking at the data pointer. If the data pointer points to a row, then all line references are to rows. If the data pointer points to a column, then all line references are to columns.

You can also reference single values in the table. Single value references are formed by preceding the row and column number with the letter "V". For example, to reference the value in row 1, column 1, enter V1,1 as part of your formula. To reference row 8, column 19, you would enter V8,19 as your reference. Notice that in a single value reference, the row number must precede the column number. Also, you must use a comma to separate the two values.

Of course, you can always use constants in your formulas. Constants are numbers such as .45 and 300. Notice that negative numbers such as -1.0 cannot be used in TeleCalc. To use negative numbers, enter them as an expression such as (0-1).

Writing Formulas

You can combine table references and constants with mathematical operators to form formulas. The valid operations consist of addition (+), subtraction (-), multiplication (*), and division (/). TeleCalc allows you to use up to 40 characters in each formula.

Sample formulas include:

L1	Equivalent to the GET command
L1-L2-L3	Subtract lines 2 and 3 from line 1
L3/L2*100	Equivalent to the RATIO command
L3/V3,1*100	Calculate line 3 as a percent of the value in the first column of row 3.
V1,1	Set current row or column to the value in row 1, column 1.

In a complex formula, multiplication and division are performed prior to addition and subtraction. For example, in the formula **L3 + 2 * L1,** line 1 will be multiplied by 2 before adding the values from line 3.

If your intent is to add 2 to every value of L3 before multiplying by the values in line 1, you can use parentheses. The following example would clearly specify your intent:

(L3 + 2) * L1

The easiest way to learn is by doing. Try the examples above in TeleCalc. Be sure to enter the FORMULA (35) command before entering each formula.

System Display	User Action	Command
ENTER COMMAND	35<CR>	FORMULA
:	L3+2*L1<CR>	
ENTER COMMAND	35<CR>	FORMULA
:	(L3+2)*L1<CR>	

After entering the formulas, the table should look similar to the following:

ENTER COMMAND:

ROW	----1----	----2----	----3----	----4----	----5----
1	20.0	20.0	20.0	20.0	20.0
2	10.0	10.0	10.0	10.0	10.0
3	30.0	30.0	30.0	30.0	30.0
4	10.0	10.0	10.0	10.0	10.0
5	200.0	200.0	200.0	200.0	200.0
6	2.0	2.0	2.0	2.0	2.0
7	300.0	500.0	700.0	900.0	1,100.0
8	272.0	272.0	272.0	272.0	272.0
9	200.0	200.0	200.0	200.0	200.0
10	700.0	700.0	700.0	900.0	1,100.0
11	300.0	500.0	700.0	700.0	700.0
12	0.0	0.0	0.0	0.0	0.0
13	70.0	70.0	70.0	70.0	70.0
14	640.0	640.0	640.0	640.0	640.0
15	0.0	0.0	0.0	0.0	0.0
16	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0

Using the FORMULA (35) Command

Let's experiment using the FORMULA (35) command in the following
example. Suppose that your COST OF GOODS has a fixed and
variable component. COST OF GOODS is 45% of sales plus a $300
constant expense. If row 1 contains sales data, you can enter
the formula **.45 * L1 + 300** to calculate the desired results.

First, clear your screen using the RESET (114) command. Then,
enter some sales data into row 1 of the table using the enter
(31) command. Be sure your cursor is on row 1.

System Display	User Action	Command
ENTER COMMAND:	114<CR>	RESET
VERIFY (Y OR N):	Y<CR>	
ENTER COMMAND:	31<CR>	ENTER
CHOOSE (VALUES=0, CONSTANT=1,GROW=2, INCR=3):	3<CR>	
BASE VALUE:	1000<CR>	
RATE:	100<CR>	

Your cursor and data pointer are now pointing to row 2.

System Display	User Action	Command
ENTER COMMAND:	35<CR>	FORMULA
:	.45*L1+300<CR>	

Check your results against the following.

ENTER COMMAND:

```
ROW
----------------   ----1----  ----2----  ----3----  ----4----  ----5----
1                   1,000.0    1.100.0    1,200.0    1,300.0    1,400.0
2                     750.0      795.0      840.0      885.0      930.0
3                       0.0        0.0        0.0        0.0        0.0
4                       0.0        0.0        0.0        0.0        0.0
```

Using the PLUG (37) Command

Sometimes it is useful to relate various entries of your table in a formula and store the single value result in a specific cell location on your table.

PLUG (37) formulas are similar to the regular formulas described above, however, these formulas cannot have references to an entire row or column. In other words, you cannot use line references (L1 or L19) in the PLUG (37) formulas. The PLUG (37) formulas can only reference individual table values (V1,1 or V2,19) or constants.

The results from the PLUG (37) command can be placed anywhere on your table. It is not necessary to enter the PLUG (37) command on the same row or column that your results will go. In other words, you can enter the PLUG (37) command on an unused row or column, say row 50, and have it place its calculated results in any cell, for example row 2, column 1.

To illustrate the use of PLUG (37), bring up the Forecast Table that you prepared with Chapter 3 by using the LOAD TBL (111) command. Suppose you want to do a special weighted profit margin. The formula is the sum of profits for the first three years divided by the sales for the first three years. The following commands show how to do this calculation:

System Display	User Action	Command/Comment
ENTER COMMAND:	111<CR>	LOAD TBL
TABLE NAME:	FORECAST<CR>	
ENTER COMMAND:	33<CR>	SELECT ROW
ROW (1-50):	50<CR>	(Select empty row)
ENTER COMMAND:	37<CR>	PLUG
ROW (1-50):	50<CR>	(Row for plug result display)
COL (1-20):	1<CR>	(Column for plug result display)
:	(V6,1+V6,2+V6,3)/(V1,1+V1,2+V1,3)*100<CR>	

The calculated result would be displayed in row 50, column 1.

Notice that TeleCalc allows you to put only one command per row or column. If you enter one command over another, the initial command will be overwritten. For example, if you enter your PLUG (37) command on the same row as a SUM (55) command, the PLUG (37) command overrides the SUM (55) command. You can use the SHOW ROWS (22) command to check the logic for your table.

Using the COMPUTE (98) Command

As you enter data in your TeleCalc table, TeleCalc memorizes all the commands you used to calculate the values for a row or column. When all your data and mathematical commands have been entered, issue the COMPUTE (98) command. In seconds, the table will be updated to reflect your changes.

In Chapter 3, you used the CHANGE (32) command to ask a "what-if" question. In fact, you can do many types of "what-if" analysis including:

1. Change entire rows or columns of the table using the ENTER (31) command.

2. Change the commands used to compute a row or column.

3. Change the values associated with commands.

4. Extend the model with more rows or columns.

Each command you enter replaces any command that was previously entered in that row or column. The new commands are used to compute new values, replacing the previous command.

Doing a "what-if" analysis with TeleCalc is simple. The following steps outline the procedures you need to perform a "what-if" analysis on any of your TeleCalc tables.

1. Select the row or column you want to change by moving the data pointer.

2. Issue the commands to perform the desired calculation or to enter the new data values.

3. When all changes have been completed, use the COMPUTE (98) command to instantly update your table.

To illustrate more advanced uses of TeleCalc's "what-if" capability, load the five-year Forecast example table by using the following steps:

System Display	User Action	Command/Comment
ENTER COMMAND:	111<CR>	LOAD TBL
TABLE NAME:	FORECAST<CR>	(table name)

Suppose your COST OF GOODS in line 2 should be 42.5% of SALES instead of 45%. To ask this "what-if" question, use the MULT K (53) command again--but this time, use the new percentage.

System Display	User Action	Command
ENTER COMMAND:	**33<CR>**	SELECT ROW
ROW (1-50):	**2<CR>**	(select row 2)
ENTER COMMAND:	**53<CR>**	MULT K
VALUE:	**.425<CR>**	(new percentage)
ROW (1-50):	**1<CR>**	
ENTER COMMAND:	**98<CR>**	COMPUTE

Use the COMPUTE (98) to update your table.

In a few seconds, you would get the following:

ENTER COMMAND:

```
ROW
------------------ ----1---- ----2---- ----3---- ----4---- ----5----
1 SALES            1,000.0   1,100.0   1,210.0   1,331.0   1,464.1
2 COST OF GOODS      425.0     467.5     514.3     565.7     622.2
3 SALES AND AD       200.0     220.0     242.0     266.2     292.8
4 RESEARCH AND       500.0     300.0     300.0     300.0     300.0
5 TOTAL COSTS      1,125.0     987.5   1,056.3   1,131.9   1,215.1
6 GROSS PROFIT      -125.0     112.5     153.8     199.1     249.0
```

As a second example, suppose COST OF GOODS starts at 45% of SALES and drops to 41% by year five. To make this change, enter the COST OF GOODS percentages as row 10 of the table and calculate COST OF GOODS using the percentages in row 10.

System Display	User Action	Command
ENTER COMMAND:	**33<CR>**	SELECT ROW
ROW (1-50):	**4<CR>**	
ENTER COMMAND:	**31<CR>**	ENTER
CHOOSE (VALUES=0, CONSTANT=1,GROW=2, INCR=3):	**3<CR>**	
BASE VALUE:	**700<CR>**	
RATE:	**-100<CR>**	
ENTER COMMAND:	**98<CR>**	COMPUTE

The screen will show the following:

ENTER COMMAND:

ROW	----1----	----2----	----3----	----4----	----5----
1 SALES	1,000.0	1,100.0	1,210.0	1,331.0	1,464.1
2 COST OF GOODS	425.0	467.5	514.3	565.7	622.2
3 SALES AND AD	200.0	220.0	242.0	266.2	292.8
4 RESEARCH AND	700.0	600.0	500.0	400.0	300.0
5 TOTAL COSTS	1,325.0	1,287.5	1,256.3	1,231.9	1,215.1
6 GROSS PROFIT	-325.0	-187.5	-46.3	99.1	249.0
7	0.0	0.0	0.0	0.0	0.0
8	0.0	0.0	0.0	0.0	0.0
9	0.0	0.0	0.0	0.0	0.0
10	0.0	0.0	0.0	0.0	0.0

6. DESIGNING AND PRINTING REPORTS

INTRODUCTION

This chapter explains how to design presentation-quality reports using TeleCalc's report generator. You can print reports that are 80 columns wide or reports that are 99 columns wide. The report width is limited by the printer and is controllable through TeleCalc options. You will learn how to set printing options for individual rows and columns as well as how to set global options for your entire report.

PRINT OPTIONS

TeleCalc has three different commands that let you set options for a printed report:

```
OPTIONS (81) command
SET TYPE (21) command for rows
SET TYPE (26) command for columns
```

These commands set options only for printed reports. They do not show up on the screen.

The OPTIONS (81) command sets global or overall print options that apply to your entire report. Some of the options you can set with this command include overall row title widths, column widths, number of columns per page, and page controls. The OPTIONS (81) command also provides top and left margin options to support printers with automatic paper feeds. The global print options are the lowest level of print options in the options hierarchy, and is overridden by both the row and column SET TYPE (21, 26) commands.

The row SET TYPE (21) command sets print options for individual rows. Options include setting row types, underlining, and the number of decimal places for each row. The row SET TYPE (21) options overrides the global options, but is overridden by the column SET TYPE (26) command.

The column SET TYPE (26) command sets print options for individual columns. Options under this command include column widths and number of decimal places for each column. The column SET TYPE (26) options are the highest in the options hierarchy, and override both the global and row SET TYPE (21) option settings. Once set, the column options cannot be changed.

To illustrate the formatting and printing capabilities, let's use
your Inventory table.

System Display	User Action	Command
ENTER COMMAND:	111<CR>	LOAD TBL
TABLE:	INVENT<CR>	

Your screen should show the following table:

```
    ROW 1 (ITEM)  <--
ENTER COMMAND:
                     UNIT                TOTAL
ROW                  COST   QUANTITY     COSTS
---------------- ----1---- ----2---- ----3---- ----4---- ----5----
  1 ITEM              0.0       0.0        0.0       0.0       0.0
2 DESKS             300.0      10.0    3,000.0       0.0       0.0
3 CHAIRS            175.0      20.0    3,000.0       0.0       0.0
4 SHELVES           200.0       5.0    1,000.0       0.0       0.0
5 TOTAL               0.0       0.0        0.0       0.0       0.0
```

SETTING ROW OPTIONS

In TeleCalc you can specify a row as a heading, subtitle,
footnote, or as a normal data row. You can also underline a row,
insert trailing blank lines, specify the number of decimal places
for row values, and specify if you want "$" or "%" signs with
your values. For the Inventory report, let's assume that you
want to designate rows 1, 4, and 5 as follows:

Row 1 ITEM:	Heading only; no data assigned to row.
Row 4 SHELVES:	Last item before TOTAL; need single underline.
Row 5 TOTAL:	Total figures; need double underline.

To specify these row print options, use the SET TYPE (21) command.

System Display	User Action	Command/Comment
ENTER COMMAND:	21<CR>	SET TYPE
ROW (1-50):	1<CR>	(Specify options for row 1)
TYPE (DATA=0,SUBT=1, HEADING=2,NOTE=3, OMIT=4):	2<CR>	

Each row can be identified as a row of numeric data; a subtitle
that centers the corresponding row title in your report; a
heading that leaves the area to the right of the row title blank;
or a footnote that puts the row title at the the bottom of the
page. If you prefer, the entire row can be omitted on the
printed report.

Select option "2" to designate row 1 as a heading for the
Inventory report. If you had pressed the <CR> key by itself, the
option would have defaulted to the current setting of "0,"
meaning a data row. When you designate a row as a heading
subtitle, or footnote, TeleCalc displays your entire row title
text--up to 40 characters--on your screen. Once options have
been selected, TeleCalc remembers the option settings you have
chosen and saves them as part of your table until they are
changed.

System Display   **User Action**

UNDERLINE (NO=0,[-]=1,[=]=2,[_]=3):   <CR>

Each row can be underlined with dashes, double underlined using
equal signs, or underlined with a true single underline. By
pressing the <CR> key by itself, the option setting defaults to
the current setting of "0", no underline. If you had selected
option "3" at an earlier date, then the current setting in the
upper right corner would say CURRENT=3. A single <CR> would
leave the "3" setting intact.

System Display   **User Action**

TRAILING BLANK LINES (NEW PAGE=9):   <CR>

Each row can have up to 8 blank lines trailing a particular row.
A value of "9" tells TeleCalc to start a new page following
this row. This option must be set to indicate the position of
page breaks in multi-page reports. By pressing the <CR> key by
itself, the option defaults to "0," trailing blank lines.

System Display   **User Action**

DECIMAL PLACES (0-3 OFF=4):   <CR>

Each row can have from 0 to 3 decimal places. By pressing the
<CR> key by itself, the option defaults to 1 decimal place.

System Display   **User Action**

FORMAT (NO=0,[%]=1,[$]=2,NO,=3):   <CR>

Each row in TeleCalc can have "%" or "$" signs with each value.
By pressing the <CR> key by itself, the option setting defaults
to "0" where no signs are placed with the values.

The sign format is the last prompt for row 1. TeleCalc automatically prompts you to set the options for another row. Continue to set the print options for rows 4 and 5 with the following commands.

System Display	User Action	Comment
ROW (1-50):	4<CR>	(Specify options for row 4)
TYPE (DATA=0,SUBT=1, HEAD=2,NOTE=3, OMIT=4):	<CR>	(Leave option at current setting)
UNDERLINE (NO=0, [-]=1,[=]=2, [_]=3):	3<CR>	(Underline row 4 with a single true underline)
TRAILING BLANK LINES (New Page=9):	<CR>	(Leave option at current setting)
DECIMAL PLACES (0-3 OFF=4):	<CR>	(Leave option at current setting)
FORMAT (NO=0,[%]=1, [$]=2,NO,=3):	<CR>	(Leave option at current setting)
ROW (1-50):	5<CR>	(Specify options for row 5)
TYPE (DATA=0,SUBT=1, HEAD=2,NOTE=3, OMIT=4):	<CR>	
UNDERLINE (NO=0, [-]=1,[=]=2, [_]=3):	2<CR>	(Specify a double underline)
TRAILING BLANK LINES (NEW PAGE=9):	<CR>	
DECIMAL PLACES (0-3 OFF=4):	<CR>	
FORMAT (NO=0,[%]=1, [$]=2,NO,=3):	<CR>	

Press the <HOME> key to cancel the SET TYPE (21) command. You can display a summary of the row options that you have just set with the SHOW ROWS (22) command.

System Display	User Action	Command
ENTER COMMAND:	**22<CR>**	SHOW ROWS

The SHOW ROWS (22) command displays the option settings as well as the commands that have been specified for each row. Note that if you have a table longer than the 17 rows that show on your screen, you must show the other portion of the table on screen before using the SHOW ROWS (22) command. Your screen shows the following:

```
        ROW 1 (ITEM) <--
ENTER COMMAND:
                    UNDER BLANK DEC FOR
ROW            TYPE LINE  LINES SIZ MAT COMMAND  PARAMETERS
------------   ----  ----  ----- --- --- -------  ----------
 1 ITEM        head              -   -   -
 2 DESKS       data              -   -   -
 3 CHAIRS      data              -   -   -
 4 SHELVES     data  _____       -   -
 5 TOTAL       data  ====        -   -   -
 6             data              -   -   -

17             data              -   -   -
```

To recover your display, press any of the arrow keys.

Setting Column Options

You can format each column by using the column SET TYPE (26) command. With this command you can control individual column widths, specify the number of decimal places, and indicate whether or not you want "$" or "%" signs with your values. Note that column options will always override previously set row options.

Let's format column 2 (QUANTITY) of the Inventory table so that is has no decimal places.

System Display	User Action	Command/Comment
ENTER COMMAND:	**26<CR>**	SET TYPE
COL (1-20):	**2<CR>**	(Specify options for column 2)
COLUMN WIDTH (4-20):<CR>		(Select current setting)

Each column can have a different width, ranging from 4 to 20 characters (including commas and decimals). By pressing the <CR> key by itself, the column width defaults to the current setting of 10 spaces.

System Display   **User Action**

DECIMAL PLACES (0-3 OFF=4):   **0<CR>**

Each column can have from 0 to 3 decimal places. By pressing the <CR> key by itself, the number of decimal places defaults to the current setting of 1 decimal place. For the Inventory report, set the number of decimal places in column 2 to "0."

System Display   **User Action**

FORMAT (NO=0,[%]=1,[$]=2,NO,=3):   **<CR>**

Each column can have "%" or "$" signs with each value. By pressing the <CR> by itself, the option defaults to the current setting of "0," and no signs are placed with the values.

Press the <HOME> key to cancel the SET TYPE (26) command. You can see a summary of the column options that you have just set with the SHOW COLS (27) command.

System Display   **User Action**   **Command**

ENTER COMMAND: **27<CR>**   SHOW COLS

The SHOW COLS (27) column displays the option settings as well as the commands that have been specified for each column. Note that if you have a table wider than the 5 columns that show on your screen, you must show the other portion of the table on screen before using the SHOW COLS (27) command. Your screen displays the following.

```
        ROW 1 (ITEM) <--
ENTER COMMAND:
```

ROW	COLUMN WIDTH	DEC SIZ	FOR MAT	COMMAND	PARAMETERS
1 UNIT COST	10	1	-		
2 QUANTITY	10	0	-		
3 TOTAL COSTS	10	1	-	MULT	COL=1 COL=2
4	10	1	-		
5	10	1	-		
6	10	1	-		
17	10	1	-		

To recover the Inventory table display press any of the arrow keys.

PRINTING REPORTS

After setting print options for individual row and column formats, you will want to finish your report design by setting options for the overall report. These global report options include row description, width, column width settings, number of columns per page, number of decimal places, and other features that affect the overall report. These options do not show on the screen--only on the printed report. Let's set the global print options for the Inventory report.

System Display	User Action	Command
ENTER COMMAND:	81<CR>	OPTIONS
TOP MARGIN (0-50):	<CR>	
LEFT MARGIN (0-50):	<CR>	

The two options above support printers with automatic paper feeds. If your printer does not have an automatic paper feeder press <CR>. The options default to the current settings which are listed in the upper-right corner of the screen.

System Display	User Action
ENHANCEMENT (0-3):	<CR>

This option gives TeleCalc the ability to take advantage of special printer features such as bold print, expanded print, and compressed print. Your dealer can assist you in accessing these options with your printer.

System Display	User Action
ROW TITLE WIDTH (4-40):	10<CR>

Row descriptions can have from 4 to 40 alphanumeric characters. By pressing the <CR> key by itself, the row title width option will default to the current setting of 20 characters. For the Inventory report, set the row title width to 10 characters.

System Display	User Action
COLUMN WIDTH (4-20):	<CR>

The columns can have from 4 to 20 numeric characters. By pressing the <CR> key by itself, the column width defaults to the current setting of 10 characters.

System Display   **User Action**

COLUMNS PER
PAGE (1-20):   **<CR>**

You can print up to 20 columns per page depending on your
printer. By pressing the <CR> key by itself, the number of
columns per page defaults to the current setting of 10 columns per
page. For example, if you have more than 10 columns in your
table to print, TeleCalc will print the first 10 columns on page
1 and continue to print the second 10 columns on page 2.
TeleCalc automatically repeats row titles, report titles, and
column titles on each page.

System Display   **User Action**

DECIMAL PLACES
(0-3):   **<CR>**

Each value in your table can have from 0-3 decimal places in the
printed report. By pressing the <CR> key by itself, the number
of decimal places defaults to the current setting of one decimal
place.

System Display   **User Action**

OMIT ZERO ROWS
(NO=0,YES=1):   **<CR>**

Any rows that have all zero values can be eliminated from the
printed report. By pressing the <CR> key by itself, the omit
zero rows option defaults to the current setting of "0" which
will print zero values.

System Display   **User Action**

SUPPRESS ZERO VALUES
(NO=0,[-]=1,[ ]=2): **2<CR>**

Zero values in rows and columns can be printed with zeros,
identified with a "-" sign, or left blank. By pressing the <CR>
key by itself, the suppress zero values option defaults to the
current setting of printing zero values as zeros.

System Display   **User Action**

PRINT ROW TITLE
AFTER WHICH COLUMN
(0-9):   **<CR>**

Row titles can be printed between any two columns up through the
middle of the table. By pressing the <CR> key by itself, the
option defaults to "0", printing the row titles on the left side
of the report, in front of column 1.

System Display   User Action

NEGATIVE NUMBERS
(-N=0,N-=1,(N)=2):   <CR>

Negative numbers can be displayed with a minus (-) sign preceding
the number, or, for accounting purposes, they may be shown with a
trailing minus sign, or in parenthesis. By pressing the <CR>
key by itself, the option defaults to the current option of
"0," printing minus signs in front of the numbers.

System Display   User Action

PAGE CONTROL
(OFF=0,FEED=1,
PAUSE=2):   <CR>

For reports longer than a page, the printer can be set to the
desired page control. The form feed option issues a page break
command so that each page appears on a new sheet of paper. The
pause option instructs the printer to break between pages to
allow a new sheet of paper to be inserted into the printer. By
pressing the <CR> key by itself, the page control option defaults
to a continuous print without intervention. TeleCalc
automatically skips three blank lines between pages.

Before using the feed and pause page control options, you must
use the trailing blank line option in the SET TYPE (21) for rows
command to identify page breaks.

System Display   User Action

OMIT COMMAS (NO=0,
YES=1):   <CR>

To accommodate wide reports, the comma option can be turned off
to save space. By pressing the <CR> key by itself, the omit
commas option defaults to printing all numbers with commas
separating every three digits of large numbers.

System Display   User Action

DOUBLE SPACE (NO=0,
YES=1):   <CR>

Data rows can be single- or double-spaced. By pressing the <CR>
key by itself, the double-space option defaults to the current
setting of "0" indicating single spacing.

System Display   User Action

OMIT LINE NUMBERS
(NO=0, YES=1):   <CR>

Row and column numbers can be printed or eliminated on your final report. By pressing the <CR> key by itself, the omit line numbers option defaults to "0," printing the row and column numbers.

After completing the global options for your report, you will want to set the title information, report ranges, and print a final report using the TITLES (82) command. Each TITLE option identifies the default settings. However, if the TITLE option has been set before, the CURRENT setting will reflect the previous setting.

System Display	User Action	Command
ENTER COMMAND:	82<CR>	TITLES
PAGE NUMBER (0-999):	<CR>	

A page number can be printed in the upper-right corner of the report if you desire. By pressing the <CR> key by itself, the page number defaults to the "OFF" position and the report pages are not numbered.

System Display	User Action
DATE (YEAR AS YY):	83<CR>

Date information can be printed in the upper-left corner of the report. By pressing the <CR> key by itself, the date defaults to the "OFF" position, and no date is printed. If you enter the year as YY and <CR>, TeleCalc will prompt you for the month and date as follows. If no year number is entered, then the month and day options are skipped.

System Display	User Action
MONTH (1-12):	1<CR>

Months January through December are identified by corresponding numbers 1 through 12. By pressing the <CR> key by itself, the month option defaults to the "OFF" position, and no date is printed.

System Display	User Action
DAY (1-31):	1<CR>

Days of the month are identified by the numbers 1-31. By pressing the <CR> key by itself, the day option defaults to the "OFF" position and no date is printed.

System Display	**User Action**
ROW-RANGE BEGIN (1-50):	1<CR>
END (1-50):	5<CR>

You can print only a few rows of your table by using the row ranges print option. By pressing the <CR> key by itself, the row range defaults to printing all of the rows in the table.

System Display	**User Action**
COL-RANGE BEGIN (1-20):	1<CR>
END (1-20):	3<CR>

Indicate the columns to print in your report using the column range option. By pressing the <CR> key by itself, the column range defaults to printing all of the columns in the table.

Setting row and column ranges with the TITLES (82) command sets the row and column ranges for the entire table. To change the row and column ranges back to their original settings use the ROW RANGE (92) and COL RANGE (93) commands.

System Display	**User Action**
TITLE 1:	**TAKING INVENTORY**<CR>
TITLE 2:	**SAMPLE PROBLEM**<CR>
TITLE 3:	<CR>

TeleCalc reports are allowed up to three title lines, with a maximum of 40 alphanumeric characters each. Report titles are centered at the top of each page of the report. Pressing the <CR> key by itself tells TeleCalc that there is no title for that line.

If you want to print your report, check to see that the printer is connected and turned on, and your paper adjusted.

System Display	**User Action**
SET PAPER; HIT RETURN:	<CR>

Your printed Inventory report should look like the following:

1/1/83

                            TAKING INVENTORY
                             SAMPLE PROBLEM

                    UNIT   TOTAL
                    COST   QUANTITY   COSTS
        -------- ----1---- ----2---- ----3----

    1 ITEM
    2 DESKS   300.0   10   3,000.0
    3 CHAIRS   175.0   20   3,000.0
    4 SHELVES   200.0   5   1,000.0
    5 TOTAL
                  ========= ========= =========

To show the overall report options for your Inventory report on
screen, use the SHOW OPTIONS (84) command.

System Display	User Action	Command
ENTER COMMAND:	84<CR>	SHOW OPTS

Your screen should show the following:

	UNIT		TOTAL		
ROW	COST	QUANTITY	COSTS		
----------------	----1----	----2----	----3----	----4----	----5----

          REPORT OPTIONS
DATE: 83/1/1   PAGE NUMBER: 0
TITLE 1: TAKING INVENTORY
TITLE 2: SAMPLE PROBLEM
TITLE 3:

TOP MARGIN: 0   LEFT MARGIN: 0
ROW TITLE WIDTH: 10
COLUMN WIDTH: 10   OMIT COMMAS: NO
COLUMNS PER PAGE: 10   DOUBLE SPACE: NO
DECIMAL PLACES: 1   OMIT LINE NUMBERS: NO
OMIT ZERO ROWS (NO=0,YES=1): 0
SUPPRESS ZERO VALUES (NO=0,[-]=1,[[=2): 2
PRINT ROW TITLE AFTER WHICH COLUMN: 0
NEGATIVE NUMBERS (-N=0,N-=1,(N)=2): 0
PAGE CONTROL (OFF=0,FEED=1,PAUSE=2): 0

Press any of the arrow keys to recover the table.

If you do not want to print your report at this time, you can
either save the table by using the SAVE TBL (112) command or
cancel the report by pressing the <HOME> key.

RINTING TABLES AND REPORTS

o get a printed copy of your table, complete with row settings,
ow commands, column settings, column commands, report options,
nd title information, use the PRINT TBL (118) command.

eleCalc reports can be printed without going through the TITLES
82) command. After you have set the report OPTIONS with command
1, you can send the report straight to the printer with the
EPORT (83) command. You can also use the REPORT (83) command to
rint tables that have already been saved on disk.

ANCELLING REPORTS

eports that have started printing can be stopped by pressing the
HOME> key. TeleCalc will stop the printing and print a message
n the screen that the report has been cancelled.

7. ADDITIONAL TELECALC COMMANDS

INTRODUCTION

This chapter covers the different modes available in TeleCalc.
It also discusses other commands that are helpful in using
TeleCalc's more advanced functions.

MODES

Chapter 2 discussed the mode indicator on TeleCalc's status
line. In the course of using TeleCalc, you use several
different modes or states of operation. For example, when you
use the COMPUTE (98) command, TeleCalc goes in and out of the
Compute Mode automatically.

Mode	Definition
COMPUTE	The COMPUTE (98) command starts computing rows and columns using the math and formula commands you have entered into your table.
PROTECT	The PROTECT (101) command turns the Protect Mode on and off. When the Protect Mode is on, a "P" is displayed in the top right corner of your screen. With Protect Mode is on, all formulas and row and column relationships you have established in your table are protected from tampering. With TeleCalc in the Protect Mode, you can make changes to data in your table without the fear of disturbing the underlying logic. This is useful in keeping unsophisticated users from disrupting your table.

SETTING ROW AND COLUMN RANGES

You can limit your data entry and your computations to a
particular section of your table by using the ROW RANGE (92) and
COL RANGE (93) commands. The right top corner of the screen
shows the current row and column ranges. Unless otherwise
specified, the range settings will default to the size of your
current table. The default table size and range settings are 50
rows by 20 columns.

In Chapter 4, you saw how the SET UP (109) command is used to redimension the table size. This command should not be confused with the ROW RANGE (92) and COLUMN RANGE (93) commands. The SET UP (109) command affects the physical size of the entire table. The ROW (92) and COLUMN (93) RANGE commands are temporary "working" range limitations that give you flexibility in your data entry, computations, and printing.

There are many ways to use the row and column range settings. For example, consider a table with budget columns and actual columns. In the budget columns you may have set up COST OF SALES as a percentage of SALES, or FRINGE BENEFITS as a percentage of SALARY EXPENSES. When the actual numbers are inserted in place of budget numbers to do rolling forecasts, you do not want to tamper with the actual COST OF SALES and FRINGE BENEFITS because of their mathematical relationship to SALES and SALARY EXPENSES respectively.

By setting the row and column ranges, you can limit the recalculations to affect only the budget columns, leaving the actual columns intact.

COMPUTING ORDER

When the COMPUTE (98) command is used, TeleCalc does computations for all rows of the row range and then for all columns of the column range, depending on the current computing order displayed on the TeleCalc status line. Initially, the computing order is displayed as "ORDER=R/C" signifying that TeleCalc will compute rows and then columns.

Suppose you have added a total column to the five-year projection. You want TeleCalc to compute this total every time you use the COMPUTE (98) command. TeleCalc lets you change the computational order by using the ORDER (102) command.

ORDER (102) allows you to choose among four options:

ROW/ONLY	Compute only rows.
COL/ONLY	Compute only columns.
ROW/COL	Compute all rows; then all columns. This is the default order.
COL/ROW	Compute all columns; then all rows.

Let's use the five-year forecast from Chapter 3 to illustrate th
ORDER (102) command.

System Display	User Action	Command
ENTER COMMAND:	111<CR>	LOAD TBL
TABLE NAME:	INVENT<CR>	

Now position your cursor on row 5 and use the SUM (55) command t
get a total for each of your three columns.

System Display	User Action	Command
ENTER COMMAND:	55<CR>	SUM
ROW BEGIN (1-50):	2<CR>	
END (1-50):	4<CR>	

Use the ORDER (102) command to change the computing order to
compute columns first and then rows.

System Display	User Action	Comment
ENTER COMMAND:	102<CR>	ORDER
(ROW/ONLY=1, COL/ONLY=2, ROW/COL=3, COL/ROW=4):	4<CR>	

After choosing option 4, TelePlan performs computations for all
columns and then for all rows. Notice that the computing order
on the status line at the top of your screen is now set to
ORDER=C/R.

Now make a change in your data, and compute your table according
to the new computing order.

System Display	User Action	Command/Comment
ENTER COMMAND:	32<CR>	CHANGE
ROW (1-50):	3<CR>	
COL (1-20):	1<CR>	
VALUE:	175<CR>	
ENTER COMMAND:	98<CR>	COMPUTE

Your screen should show the following:

DONE.
```
      ROW 6 <--
ENTER COMMAND:
```

ROW	UNIT COST ----1----	QUANTITY ----2----	TOTAL COSTS ----3----	----4----	----5----
1 ITEM					
2 DESKS	300.0	10.0	3,000.0	0.0	0.0
3 CHAIRS	675.0	50.0	10,125.0	0.0	0.0
4 SHELVES	200.0	5.0	1,000.0	0.0	0.0
5 TOTAL	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0

Save your new Inventory table using the SAVE TBL (112) command.

System Display	User Action	Command/Comment
ENTER COMMAND:	112<CR>	SAVE TBL
TABLE NAME:	**INVENT<CR>**	

A message appears telling you that the table INVENT already
exists and asking if you want to continue with the save. Enter a
"Y" to indicate that you do want to overwrite the existing INVENT
table with the new INVENT table.

System Display	User Action	Command/Comment
VERIFY (Y OR N):	Y<CR>	

USING THE FIX COMMAND

The FIX (38) command recalculates only the current row or column
without computing other rows or columns. It allows you to
manually recalculate a single row or column. Sometimes, the
calculation order required to correctly update values is more
complex than a simple row/column order permitted by the ORDER
(102) command. FIX (38) can be used to manually supplement these
calculations.

For example, if you also add a PERCENTAGE PROFIT row to the five-
year FORECAST example, then none of the compute ORDER (102)
options correctly calculate the percentage profit for the total
column. Let's try it.

System Display	User Action	Command
ENTER COMMAND:	111<CR>	LOAD TBL
TABLE NAME:	FORECAST<CR>	
ENTER COMMAND:	20<CR>	ROW TITLE

Use the arrow keys to position your cursor on row 7.

System Display	User Action	Comment
:	PROFIT RATIO<CR>	
:	<HOME>	[cancel the ROW TITLE (20) command]

Use the arrow keys to put the cursor back on row 7.

System Display	User Action	Command/Comment
ENTER COMMAND:	44<CR>	DIV

Take ratio of GROSS PROFIT to SALES.

System Display	User Action	Comment
ROW (1-50):	6<CR>	(row 6 is GROSS PROFITS)
ROW (1-50):	1<CR>	(row 1 is SALES)

Row 7 now contains the ratio of the five years' GROSS PROFITSto SALES.

Now let's put a TOTAL column in column 5 to get the total for each of the four quarters. Enter the new column title and then recompute your results using the following commands.

System Display	User Action	Command
ENTER COMMAND	25<CR>	COL TITLE

Use the arrow keys to position the cursor on column 5.

System Display	User Action
1:	TOTAL<CR>
2:	<CR>
	<HOME>

The second <CR> indicates that there is no second title for this column. Since this is the only column title we want to enter, press the <HOME> key to cancel the COL TITLE (25) command.

Use the arrow keys to position the cursor back on column 5.

System Display	User Action	Command
ENTER COMMAND:	55<CR>	SUM
COL BEGIN (1-20):	1<CR>	
END: (1-20):	4<CR>	
ENTER COMMAND:	98<CR>	COMPUTE

Your screen should show the following. Unfortunately, it is not what we wanted to do.

```
DONE.
     ROW 6 <--
ENTER COMMAND:
```

ROW	----3----	----4----	TOTAL ----5----	----6----	----7----
1 SALES	1,210.0	1,331.0	1,464.1	1,610.5	1,771.6
2 COST OF GOODS	544.5	599.0	658.8	724.7	797.2
3 SALES AND ADM	242.0	266.2	292.8	322.1	354.3
4 RESEARCH AND	300.0	300.0	300.0	300.0	300.0
5 TOTAL COSTS	1,086.5	1,165.2	1,251.7	1,346.8	1,451.5
6 GROSS PROFIT	123.5	165.9	212.4	263.7	320.0
7 PROFIT RATIO	0.1	0.1	0.2	0.2	0.2
17	0.0	0.0	0.0	0.0	0.0

What we want to do is to calculate the combined ratio of the four quarters and the total, not the total of ratios for the four quarters. The correct order is to do rows first, then columns including the TOTAL column, and finally the row of profit margins. To do this, use these steps.

1.   Position the data pointer to the profit ratio row (row 7).

2.   Use the FIX (38) command to recalculate the profit margins.

System Display	User Action	Command
ENTER COMMAND:	38<CR>	FIX(R/C)

Your new screen should show:

```
FORECAST
     ROW 7 (PROFIT RATIO) <--
ENTER COMMAND:
```

ROW			TOTAL		
---------------- ----3----	----4----	----5----	----6----	----7----
1 SALES	1,210.0	1,331.0	1,464.1	1,610.5	1,771.
2 COST OF GOODS	544.5	599.0	658.8	724.7	797.
3 SALES AND ADM	242.0	266.2	292.8	322.1	354.
4 RESEARCH AND	300.0	300.0	300.0	300.0	300.
5 TOTAL COSTS	1,086.5	1,165.2	1,251.7	1,346.8	1,451.
6 GROSS PROFIT	123.5	165.9	212.4	263.7	320.
7 PROFIT RATIO	0.1	0.1	0.1	0.0	0.
17	0.0	0.0	0.0	0.0	0.

End the lesson by entering the STOP (9) command.

System Display	User Action	Command
ENTER COMMAND:	9<CR>	STOP

8.   TABLE MAINTENANCE

INTRODUCTION

This chapter discusses how to maintain and manipulate the tables
that you create using TeleCalc. How to name files, to change
disk drives, and to interface with word processors, are all
included. The last section shows you the various ways that you
can clear your screen.

MAINTAINING TABLES

As you have seen, all the tables you save are automatically put
into a TeleCalc directory. Whenever you use a load or save
command, you have the option to examine the contents of a
diskette by pressing <CR> in response to the request for a
filename.

By issuing a series of <CR> keys, you can see the names of the
tables on disk, one table at a time. The TeleCalc directory
displays the names of available tables, the report title
information, and the table size information on line two of your
screen. This helps you keep track of your tables.

You can use the LIST TBLS (116) command to print a list of all
the tables on a particular disk. If you want to erase a table
from your diskette, use the ERASE TBL (117) command. A prompt on
the command line asks you for the filename of the table to be
erased. The table is then deleted from your disk and the
TeleCalc directory.

Naming Your Table

TeleCalc table names can be up to eight alphanumeric characters.
All table names must start with an alpha character and may not
include the following characters: . ? " / or a **space**. Lower-
case characters are automatically converted to upper-case.

All CP/M filenames are constructed from three parts:

        A:FILENAME.EXT

where

        A: An optional disk drive identification character,
                  followed by a colon

        FILENAME A filename of up to eight characters

        .EXT   An optional filename extension of up to three
                  characters preceded by a period.

CP/M disk drives are assigned names such as disk drive A: or B:
and so on. If you supply a drive name, then you need to enter
the colon character as well. In most cases, CP/M files should be
saved on drive B. You can change drives in TeleCalc using the
SET DRIVE (108) command.

Changing Disk Drives

To save tables on a specific disk drive, use the SET DRIVE (108)
command to specify the drive name. That drive will be used as
the data drive for all subsequent load and save operations until
you change the drive with the SET DRIVE (108) command or until
you exit TeleCalc.

The SET DRIVE (108) command also allows you to change diskettes
during a working session. Whenever you change diskettes, you
should always issue a SET DRIVE (108) command to initialize your
new diskette.

INTERFACING WITH WORD PROCESSORS

You can save TeleCalc reports in a file for combining with text
produced on your word processing software. The SAVE REP (85)
command allows you to print reports into a file instead of to a
printer.

The SAVE REP (85) command is similar to the REPORT (83) command
in that all options and titles are included in the report. By
saving the report in a file, you can include TeleCalc reports in
the body of text from a word processor, enhance reports using a
word processor editor, or spool reports to printers.

The SAVE REP (85) command does not save your table in TeleCalc.
To save a table for future use in TeleCalc, use the SAVE TBL
(112) command.

YOUR SCREEN DISPLAY

TeleCalc has several commands that allow you to clear your
screen. These commands are explained below.

Table 8-1
CLEAR Commands

Command	Description
CLR DATA (113)	Allows you to clear the data from your current table within the current row or column ranges. It does not disturb the table logic, row or column titles, or print options. This command lets you use a master table, complete with print options to make duplicate tables.
RESET (114)	Clears all table information from memory.
REDISPLAY (115)	Refreshes your screen if it distortes. No changes are made to your data.

APPENDIX A ALTERNATE COMMAND KEYS

TeleCalc will respond to alpha characters that are codes for the
regular numeric commands. So, if it is easier for you, simply
use a "+" for the ADD (41) command, a "F" for the FORMULA (35)
command, or any of the other single keystroke codes. Of course,
the regular TeleCalc menu will still be available to provide you
with a constant reference.

Command	Alternative
ADD	+
SUBTRACT	–
MULTIPLY	*
DIVIDE	/
GET	=
CUMULATE	$
ADD K	A
SUB K	B
MULT K	C
DIV K	D
ENTRY	E
FORMULA	F
GOTO	G
INVERSE	I
NULLIFY	N
PLUG	P
CHANGE	Q
SUM	S
FIX	X

This memo assists dealers in customizing TeleCalc, version 4, to specific systems. Features supported include:

1. Display attributes, table sizes, and identification

2. CRT feature control

3. Keyboard customization

4. Function key customization

TCSETUP.FIL

TCSETUP.FIL is a CP/M file used to store customized parameters for TeleCalc. The TCSETUP.FIL is one of the files on the TeleCalc system diskette. It contains numbers that allow you to customize TeleCalc to your microcomputer system and terminal.

Normally, TCSETUP.FIL is created by the TeleCalc CUSTOM program. If your system is listed on the CUSTOM menu, you simply select that system to get started. Otherwise, you need to change the contents of the TCSETUP.FIL to match your system. These numbers can be changed using any CP/M editor or word processor.

Technically, the contents of the TCSETUP.FIL are a series of numbers. These numbers must be separated be commas or placed on individual lines of the TCSETUP.FIL. These numbers are used to tell TeleCalc what specific features are available on the hardware and how to use them.

The following is a sample printout of the TCSETUP.FIL:

```
TeleCalc
50,20
15,10,1""
0,0,0
"TELEVIDEO 803"
2,80,24
2,27,0,0,0,61,32
0,0,0,0,0,0
27,46,48,0
27,40,27,46,49,0
27,41,0
0
0
27,40,0
0
0
27,40,32,0
0
0
27,89,0
27,84,0
11,22,12,8,30
0,127,13
"COMMAND KEY"
37
65,51,66,52,67,53,68,54,69,30,70,35,71,36,72,79,73,46,74,79
75,71,76,138,77,135,78,39,79,79,80,37,81,32,82,67,83,55,84,68
85,79,86,137,87,79,88,38,89,79,90,79,43,41,45,42,42,43,47,44
61,56,37,70,36,49,94,139,62,73,60,72,64,74
"FUNCTION KEY SELECTION"
1,-1,32
64,12,65,20,66,33,67,31,68,55,69,98,70,7,71,82,72,92,73,108
96,13,97,25,98,34,99,32,100,49,101,32,102,9,103,81,104,93,105,115
74,111,75,86,76,114,77,63,78,62,79,120
106,112,107,109,108,113,109,61,110,123,111,121
```

SETUP PARAMETERS

This section controls the initial TeleCalc table size, the row title display area, the column sizes, the number of decimal places, handling of zeroes and print page margins.

```
TeleCalc
ROW.N, COL.N
ROW.SIZE, COL.SIZE, DEC.SIZE, DATA.DRIVE
OMIT.ZERO, TOP.MARGIN, LEFT.MARGIN
```

Example:

```
TeleCalc
50, 20
15, 10, 1
0, 0, 0
```

ROW.N and COL.N are the initial table size for TeleCalc. Normally, these are set at 50 rows and 20 columns. They can be set to smaller values for small machines or larger values for 16-bit machines with larger memory capacity. In 8-bit CP/M systems, TeleCalc can normally accommodate approximately 1000 entries (i.e. 50 times 20 equals 1000) per table. Of course, the TeleCalc SETUP command allows the user to dynamically set the table sizes.

ROW.SIZE is the row title display area. Normally, 15 spaces are used. You can set it to any value from 5 to 40.

COL.SIZE is the size for each column. 10 is the default.

DEC.SIZE is the number of decimal places. 1 is the default.

DATA.DRIVE is the name of the drive for storing TeleCalc tables. If this value is set to select drive "B:," then TeleCalc will automatically store and retrieve TeleCalc tables from drive B.

OMIT.ZERO is treatment of zero values on the screen. A value of -1 says to display zeroes as blanks. 0 is the default.

TOP.MARGIN is the number of lines to skip at the top of a page.

LEFT.MARGIN is the number of columns to skip at the left side of a page. (Top and left margins support printers with single page sheet feeders.)

CRT CONTROL FEATURES

This section describes the CRT interface for TeleCalc. Specific features include cursor control, highlighting, screen clear, and line clear.

Normally, for an application like TeleCalc to instruct the CRT to clear the screen, a special command is sent by TeleCalc to the CRT. This command might be the number 5 or a string of numbers starting with a 27 followed by an 89. Unfortunately, this command varies for each system and terminal. However, you can look up the appropriate commands in your system or terminal CRT interface section and enter the commmand sequence into TCSETUP.FIL.

Screen Size

       "Terminal/System Name"
       CRT.TYPE, CRT.WIDTH, CRT.LENGTH

Example:

       TELEVIDEO 803"
       2, 80, 24

CRT.TYPE is used to identify specific terminals that may require
special adjustments. Use 1 for Hazeltine terminals. Otherwise,
any value is acceptable.

CRT.WIDTH and CRT.LENGTH control the screen size. Most terminals
display 80 columns by 24 rows. 132 column screens are fully
supported.

Cursor Addressing

FORMAT, LEAD.IN, LEAD.IN-2, LEAD.IN-3, DELIMITER, ADDR.CURSOR, ADDR.OFFSE

Example:

       2, 27, 0, 0, 0, 61, 32

These numbers control positioning of the cursor at specific
locations on the screen. TeleCalc supports 3 techniques for
cursor addressing. They are

       0. Hazeltine x, y format
       1. ANSI standard
       2. y,x format (most popular)

The Hazeltine format uses the following command structure for
cursor addressing:

       ESC ADDR.CURSOR   x-value   y-value

In TCSETUP.FIL, the numbers would be set as follows:

       Setting   Description

       FORMAT = 0   Select Hazeltine format
       LEAD.IN = 27   Use ESC for lead-in
       LEAD.IN-2 = 0   Second lead-in set to null
       LEAD.IN-3 = 0
       DELIMITER   Set to null
       ADDR.CURSOR = 17   Address cursor command
       ADDR.OFFSET = 96   Address offset

You can use the Hazeltine format for any terminal that closely
matches the Hazeltine format by substituting the correct values.
For example, if your terminal uses the x,y format, but uses a
different command for cursor addressing, the correct value may
be entered into TCSETUP.FIL in place of the original value.

The ANSI standard uses the following command structure:

LEAD.IN LEAD.IN-2 LEAD.IN-3   y-value DELIMITER x-value ADDR.CURSOR

For example, the HP-2621A would use the following settings:

Setting	Description
FORMAT = 1	Select ANSI standard
LEAD.IN = 27	Use ESC for lead-in
LEAD.IN-2 = 38	Second lead-in character
LEAD.IN-3 = 97	Third lead-in character
DELIMITER = 121	Delimiter
ADDR.CURSOR = 67	Address cursor command
ADDR.OFFSET = 0	Address offset

If your terminal follows the ANSI standards, you can use this format by changing selected values to suit your terminal. If your terminal uses less than 3 lead-in characters, then the remaining values should be set to zero.

The most popular format is the abbreviated y,x format:

    ESC   ADDR.CURSOR   y-value   x-value

For example, the TeleVideo would use the following values:

Setting	Description
FORMAT = 2	Select y, x format
LEAD.IN = 27	Use ESC for lead-in
LEAD.IN-2 = 0	Second lead-in character
LEAD.IN-3 = 0	Third lead-in character
DELIMITER = 0	Delimiter
ADDR.CURSOR = 61	Address cursor command
ADDR.OFFSET = 32	Address offset

As with all three methods for cursor addressing, you can set the individual values to suit your system or terminal.

Printer Features

Printer features are supported. You can implement an initialization, a termination, and four enhancements for any printer. These features can be used to select compressed, expended, or alternate fonts to issue paper feed messages and for other printer control uses.

PRINTER.INIT	0	Initialization string
PRINTER.END	0	Termination string
ENHANCE.0	0	Zeroth enhancement
ENHANCE.1	0	First enhancement
ENHANCE.2	0	Second enhancement
ENHANCE.3	0	Third enhancement

Each line can contain as many numbers as necessary and must be terminated by a zero. At minimum, each line must contain a zero.

The initialization sequence and one of the enhancement choices
are sent to the printer at the beginning of every command that
uses the printer. The end sequence is sent to the printer at the
end of every command that uses the printer. The choice of
enhancement is set in the OPTIONS command.

Initialization is used to send special paper load instructions or
LPI commands. Each enhancement generally controls various CPI
choices. The end sequence resets the printer to its original
state.

Highlighting

You can highlight each portion of the TeleCalc display screen
using features available in your system. For example, you can
display the titles and the TeleCalc menu in reverse video and
blink the status line.

Example for ADDS:

INITIAL	27, 91, 48, 0	CRT initialization
END.SET	0	CRT ending set
DEF.SET	14, 0	Default setting
PROMPT.ON	0	Not used
STATUS.ON	15, 0	TeleCalc status line
MESSAGE.ON	15, 0	Message line
ROW.ON	0	Not used
TBL.ON	15, 0	Row and column title area
POINTER.ON	14, 32, 0	Row/column pointer
DATA.ON	0	Data area
DPOINTER.ON	15, 32, 0	Data pointer
NEGATIVE.ON	0	Negative values
MENU.ON	15, 0	Menu area

Each line can contain as many numbers as necessary and must be
terminated by a zero. A minimum, each line must contain a zero.

The numbers are commands that are sent to the CRT to select
specific features such as reverse, blink, underline, color or
other highlighting activities.

The INIT.SET sequence is sent to the CRT at the beginning of
every TeleCalc session. The END.SET sequence is sent to the CRT
at the end of every TeleCalc session. Other sequences are sent
to the CRT prior to displaying that section of the TeleCalc
screen. The DEF.SET sequence is sent to the CRT at the
completion of any display on the CRT.

For example, whenever a message is printed on line 1 of the CRT,
TeleCalc will send the MESSAGE.ON sequence to the CRT, followed
by the message and the DEF.SET sequence.

For POINTER.ON and DPOINTER.ON, a space (32 decimal or 20H) needs to be inserted. If the highlighting feature used to distinguish the data pointer already occupies a space on the CRT, then the space should be omitted.

Clear screen and Line

CLEAR.SCREEN	27, 84, 0
CLEAR.LINE	27, 89, 0

The clear screen and clear to end of line sequence is handled the same way as highlighting. A sequence of numbers is sent to the CRT to clear the screen or to clear the line. These sequences must be terminated by a zero value.

KEYBOARD CUSTOMIZATION

TeleCalc allows single keystroke cursor control. In addition, you can customize the alphabetic portion of the keyboard to generate specific TeleCalc commands. You can match specific keys to functions in TeleCalc by looking up the values generated by a key and entering the values into TCSETUP.FIL as follows.

Cursor Control

UP.KEY, DOWN.KEY, RIGHT.KEY, LEFT.KEY, CANCEL.KEY

Example:

5, 24, 4, 19, 1

Cursor control allows the user to move the TeleCalc data pointer. Most keyboards have a set of keys with arrows on them that point in the up, down, right, left, and home positions. You can customize TeleCalc to respond to these arrow keys by entering the values generated by these keys into TCSETUP.FIL.

The above example allows the user to use CRTL-E, CTRL-X, CTRL-D, CTRL-S, and CTRL-A for the above actions.

Backspacing

ESC.KEY, BACKSPACE, CR.KEY

Example:

27, 127, 9

Backspacing is used to correct typing errors. Different keys are used on different systems to handle backspacing. For example, you can choose the BACK key, the DEL key, or the RUBOUT key depending on your keyboard. (If not defined for other uses, 8H is always used as the backspace key. In the current example, both 8H and the DEL key would perform backspacing.)

ESC.KEY can be used to capture a two character cursor key. In other words, if the cursor keys generate 2 ASCII characters, ESC.KEY should be set to the value of the first key.

The CR.KEY is an alternate carriage return key. 0CH by default, is always the carriage return key. CR.KEY defines an alternate key (TAB in the example).

Command Key Synonyms

This section allows you to map any alphabetic keystroke into specific TeleCalc commands. This provides each TeleCalc with an alphabetical synonym. For example, the S key can be trained to map into the SUM command (55) in TeleCalc. Normally, the S key generates a decimal 83 (or 53H). In the example below, it has been mapped into a 55 for SUM.

```
"Command key section"
COUNT
KEY1, COMMAND 1
       .
       :
KEYN, COMMANDN
```

Example:

```
"Command key section"
```

3	3 keys
43, 41	+ key, TeleCalc ADD (41)
45, 42	- key, TeleCalc SUB (42)
83, 55	S key, TeleCalc SUM (55)

You can specify as many keys as you wish. Note that only alphabetic keys can be used since numeric keys interfere with normal TeleCalc command entry conventions.

FUNCTION KEY SECTION

Please set as follows:

```
"Function key section"
1, -1, 32

FUNCTION.INIT
FUNCTION.END          (true = -1 or false = 0)
#-OF-KEYS
```

You can change the function keys in the same way as you change the command keys.

APPENDIX C COMMAND REFERENCE

INTRODUCTION

The Command Reference Section is a convenient, quick reference that provides you with a detailed explanation for each TeleCalc command. The reference section outlines the prompts and defaults associated with each command. In addition, the command reference section will help you locate related information in the preceeding tutorial sections.

How to use this Reference

The TeleCalc commands are organized by their menu grouping. The command number, command name, screen prompts, defaults, and a description are given for each command.

TeleCalc memorizes your commands for "what-if" analysis. In the NORMAL mode, commands are stored in your table logic for recalculation. In the PROGRAM mode, commands that can be programmed are stored in your program logic file.

Throughout the following section, the notation below is used to describe how TeleCalc handles each command:

     T   Means this command can be stored in your tables.

     P   Means this command can be stored in your program.

     PT   Means this command can be stored in tables and programs.

If neither letter is given, TeleCalc does not store that command in either tables or programs.

TeleCalc User's Manual

MAIN MENU

1 format:

Display format commands: enter row and column titles, set row
and column print options, look at options, insert and delete
and columns, and reorder rows and columns.

2 data:

Display data entry commands: enter data, select row and
column modes, fix, nullify, and go to commands.

3 math:

Display math commands: arithmetic functions, formula, plug,
cumulate, negate, get, ceiling, floor, and row and column
summation commands.

4 graphics: (optional for the 16 bit system)

Display finance commands: depreciation, mortgages, internal
rate of return, ratios, percentages, growth, and tax schedule
commands.

5 print:

Display print commands: set report titles and options, and
print reports, models, and programs, list table and program
directories, and send reports to printer or disk files.

6 status:

Display status commands: range settings, mode selection, and
computing order.

7 HELP

   WHICH COMMAND (1-200):

Gives brief on-screen description for each command by entering
command number or command alpha code. Description will appear at
the bottom of the screen.

9 STOP (P)

   OK TO ERASE CURRENT DATA?
   VERIFY (Y OR N):

Exit to operating system. The current table logic and program, if
any, are **NOT** automatically saved.

10 utility:

Display utility commands: save and load tables, enlarge table size, select drive, reset, and redisplay screen.

12 HOME:

Positions your cursor at row 1 and column 1.

13 BOTTOM

Positions your cursor at the last row and last column.

FORMAT COMMANDS

16 format:

Display format commands: enter row and column titles, set row and column print options, look at options, insert and delete rows and columns, and reorder rows and columns.

17 INSERT

Insert row or column by moving last row/column of the current table to the row or column indicated by the data pointer. Any logic reference is automatically maintained. For the 16 bit system INSERT will delete the last line and insert a new line where the cursor is resting.

18 DELETE

   VERIFY (Y OR N):

Delete row or column indicated by the data pointer by moving it to the last row or column of the current table. Requires positive verification before deleting. Any logic reference is automatically maintained.

19 rows:

Row section of format commands.

20 ROW TITLE

   Use cursor keys to select a row (UP, DOWN, CANCEL)

Enter or change row titles. Each title entered is placed in the row indicated by the data pointer. Continues prompting for sequential titles until command is cancelled. Use cursor keys to select the desired row.

Can enter up to 40 characters for each row title. The quote mark
(") is an illegal character and should not be used in row title
descriptions. Notice that if you have more than 15 characters,
in your row title, the description will be truncated on the
screen to the 15 character default. Use the SET CRT (86) command
to adjust the screen format. The entire row description will be
remembered for use in printing.

21 SET TYPE

   row option ... HOME

Allows you to specify the type of row, underlining, decimal
places, spacing and special formatting for each row.

22 SHOW ROWS

Display the current options for each row. Also shows the
commands stored for each row.

23 REORDER   old-row new-row

Move old-row into the position new-row. Use this command to
insert new rows or delete rows from your table.

24 cols:

Column section of format commands.

25 COL TITLE titlel title2 ... HOME (RIGHT, LEFT, HOME)

Enter or change col titles. Each title entered is placed in
the current col. The cursor keys move the current col pointer.

26 SET TYPE   column option ... HOME

Allows you to specify the column width, decimal places and
special column formatting for each column.

27 SHOW COLS

Display the current options for each column. Also shows the
commands stored for each column.

28 REORDER   old-column new-column
Move old-column into the position new-column. Use this command
to insert new columns or delete columns from your table.

29 data :

Display data entry commands. Enter data, move the data pointer
fix, nullify and goto commands.

30 ENTRY   value ... HOME (UP, DOWN, RIGHT, LEFT, HOME)

Enter values into table. Cursor keys allow movement to any cell in the current table range settings.

31 ENTER   value ... HOME (UP, DOWN, RIGHT, LEFT, HOME)

Enter values into table. Constant, grow and increase options allow quick entry. Cursor keys allow individual data entry.

32 CHANGE   row, column <-- value

Change one value in your table.

33 SELECT ROW row

Move the data pointer to a new row of the table. Also, use the up and down cursor keys to move the data pointer.

34 SELECT COL column

Move the data pointer to a new column of the table. Also, use the right and left cursor keys to move the data pointer.

35 FORMULA   RESULT <-- formula

Use a formula. Formulas may reference a row or column (Ln), values (Vr,c) or positive constants in the formula.

36 GOTO   row column

Position the display screen with row,column in the upper left corner of your terminal.

37 PLUG   row, column <-- formula

Use a formula to calculate results for a particular cell. The formula may reference table values (Vr,c) or constants.

38 FIX

Re-computes the current row or column. Use cursor keys to move the data pointer to the right row or column before using FIX.

39 NULLIFY   row/col

Nullify command associated with a row or column. The data in the table is not affected.

40 math:

Display math commands. Arithmetic, cumulate, negate, get, floor, ceiling and row and column summations.

41 ADD   RESULT <-- row/col1 + row/col2

Add two rows or columns of values.

42 SUBTRACT   RESULT <-- row/col1 - row/col2

Subtract the second row/col from the first row/col.

43 MULTIPLY   RESULT <-- row/col1 * row/col2

Multiply two rows or columns of values.

44 DIVIDE   RESULT <-- row/col1 / row/col2
Divide the first row/col by the second row/col.

45 NEGATE   RESULT <-- - (row/col)

Negate a row or column of values.

46 INVERSE   RESULT <-- 1 / (row/col)

Compute the inverse for a row or column of values.

47 INTEGER   RESULT <-- INT(row/col)

Compute the integer part of a row or column of values by
dropping the fractional portion of a number.
48 ROUND   RESULT <-- INT(row/col + 0.5)
Round a row or column of values to the nearest whole number.

49 CUMULATE   RESULT(t) <-- RESULT(t-1) + row/col(t)

Compute cumulative sums for a row or column. Cumulate prompts
for year zero value. Use for ending balance calculations.

50 ABSOLUTE   RESULT <-- ABS(row/col)

If a value is negative, the result is positive. If the value
is positive, the result is positive.

51 ADD K   RESULT <-- row/col + value

Add a constant amount to a row or column.

52 SUB K   RESULT <-- row/col - value

Subtract a constant amount from a row or column.

53 MULT K   RESULT <-- row/col * value

Multiply a row or column by a constant amount.

54 DIV K   RESULT <-- row/col / value
Divide a row or column by a constant amount.

55 SUM   RESULT <-- SUM(row/col1 THROUGH row/col2)

Sum a group of rows or a group of columns.

56 GET   RESULT <-- row/col

Get the values from a row or column.

57 FLOOR   RESULT <-- MAX(row/col, value)

If row/col is less than value, then the RESULT is value.
Otherwise RESULT is row/col.

58 CEILING   RESULT <-- MIN(row/col, value)

If row/col is greater than value, then the RESULT is value.
Otherwise RESULT is row/col.

60 graphics:

Display graphics commands. Select, display, and print
chart. Options include bar, line and pie charts.

61 DISPLAY

Display the chart. Use SELECT to choose the rows and columns
to display. Options include bar, line and pie charts.

62 SELECT   row/col (line/bar/pie) ... HOME

Allow selection of rows or columns to display. Option include
lines, bars and pie charts. Use HOME key to end.

63 OPTION submenu   HOME

Define chart titles, stack option. Specify X data type and
scaling control of Y axis. Print chart.

80 print:

Display print commands. Set report options, titles and print
reports. Reports can be sent to disk files.

81 OPTIONS   option ...

Global report options. Row title width, column width, number
of columns, negative numbers, commas, line numbers, zeros, etc

82 TITLES   page date row-range col-range 3-line-title

Set page number, dates, row and column ranges and a 3 line
title. A report will follow.

83   REPORT

Print report on your printer.   Report options, title should be
set prior to printing report.

84   SHOW OPTS

Display report options and title information.

85   SAVE REP   filename

Print report to a disk file. Interface with word processors,
or spool output to printer.

86   SET CRT   row-width   col-width   decimal-places

Set display parameters. You can control the row title area,
the column widths, and the number of decimal places.

90   status:

Display status commands. Range settings, mode selection, and
selection of compute order.

91   range:

Range selection commands for rows and columns.

92   ROW RANGE   row1 TO row2

Set row range on status line (top line). Impacts calculations,
printed reports, and general data manipulation.

93   COL RANGE   row1 TO row2

Set column range on status line (top line). Impacts
calculations, printed reports and general data manipulation.

95   mode:

Mode selection commands. (top line)

98   COMPUTE

Set mode to compute. Re-compute your table to update for any
changes in the data.

101   PROTECT

Toggles the protect mode on & off.   In protect mode, data can
be changed, but the model logic will not change.

102 ORDER   option

Set the computing order for your table. Select ROW/ONLY,
COL/ONLY, ROW/COL or COL/ROW.

105 utility:

Display utility commands. Load, save, list, print, erase,
clear and reset tables. Also redisplay screen.

106 LOAD ALL filename (optional for the 16 bit system)

Load table and chart options file with the same name.
On prompting for filename, the available files will be shown.

107 SAVE ALL filename (optional for the 16 bit system)

Save table and chart options to disk for permanent storage.

108 SET DRIVE drive

Select drive for saving and loading your files. Normally, the
current drive is used for saving and loading files.

109 SET UP   number-of-columns number-of-rows

Redimension tables to a different number of rows and columns.
Generally, each table can have up to about 1000 entries.

110 tables:

Display table commands. Load, save, list, reset, and clear
tables.

111 LOAD TBL filename

Load your table from your diskettes. On prompting for file-
names, the available files will be shown.

112 SAVE TBL filename

Save your table on diskettes. The descriptions, data, logic,
and all print options will be saved as part of the file.

113 CLR DATA verify

Clear all data in table range. Row and column titles, and
table logic will be maintained.

114 RESET   verify

Reset table values, row and column titles, and table logic.

115 REDISPLAY

Clear the screen and redisplays your table, menu and status information. No data will be changed.

116 LIST TBLS

Print a list of the tables you have on your current diskette. Listing will go to the printer.

117 ERASE TBL filename

Erase a table from your current diskette.

118 PRINT TBL

Print a description of your model. Listing will include row titles, options, table commands and global options.

119 chart: (optional for the 16 bit system)

Display chart utility commands. Load, save, clear, and erase chart option files.

120 LOAD CHT filename (optional for the 16 bit system)

Load chart options from your disk into the computer.

121 SAVE CHT filename (optional for the 16 bit system)

Save chart options to disk for permanent storage.

122 ERASE CHT filename (optional for the 16 bit system)

Erase a chart file from your current disk.

123 RESET CHT verify (optional for the 16 bit system)

Reset all chart options to default values.

124 LIST CHT (optional for the 16 bit system)

Print a list of charts you have on your current diskette. Listing will go to the printer.

APPENDIX D   ERROR MESSAGE

The following tables list possible error messages, their cause
and how they can be corrected.

Table D-1
CP/M Error Messages

Error Message	Cause	Correction
BDOS ERROR ON d*: BAD SECTOR	Operating system cannot get information from diskette because disk being accessed is not correctly formatted.	Format disk correctly according to operating system manual.
	Operating system cannot get information from diskette because disk has physical defect (dust, finger prints, manufacturer's defect)	Press "R" to re-try command. If error persists, reboot system and re-try command. If error persists and is on data diskette, format new diskette and re-try command. If error is on systems disk make new working disk from master and re-try command. If error still occurs check disk drive for malfunction.
BDOS ERROR ON d: SELECT	Drive does not exist.	Reboot system and designate correct disk drive. Check to make sure that disk drive cables are properly connected.
BDOS ERROR ON d: READ ONLY (R/O)	Newly inserted diskette was accessed without ¨C command being issued to clear the drive.	Press and key to recover. Press ¨C and then re-try command.

| | Operating system is trying to write disk that has been designated as "read only." | Press any key to recover from error. Check diskette for write protect tab: remove tab to make diskette read/write. |
| DISK WRITE ERROR | Operating system is trying to write to disk that has been designated as "read only" with the CP/M STAT command. | Change disk designation with STAT command. |

*d = drive name

Table D-2
Execution Error Messages

Error Message	Cause	Correction
CM ERROR	The program file specified in a chaining statement could not be found in the directory.	Problem with systems disk. Use master diskette to make new systems disk. If error persists, contact your dealer.
DW ERROR	Disk full. No diskette space left.	Check available diskette space. Most likely an additional diskette will be needed to provide more storage space.
DZ ERROR	A division by zero was attempted.	Check logic and correct.
ME ERROR	Diskette directory is full causing an error while attempting to save a file.	Check available diskette directory space. Most likely an additional diskette will be needed to provide more storage space.

OE ERROR	Open file error. Has no effect on program.	Enter next command to clear error message on screen.
OF ERROR	Arithmetic over-flow. A number used in a calculation was to large.	Locate number causing overflow and correct. Re-try calculation.
OM ERROR	System has insufficient memory to complete action.	Break up action causing problem (table size, program, calculation) into smaller pieces.

Table D-3
TeleCalc Error Messages

Error Message	Cause	Correction
"The contents of this file are incorrect. (e.g. old version)"	Table was not saved properly due to full or defective diskette.	Resave table. Check operating system directory to confirm save. Use new data diskette if necessary.
"New table is smaller than current table dimensions. Enlarge?" 0=New, 1=Current	Table being loaded (new Table) has smaller matrix than table shown on the screen (current table).	Decide which table size is desired, then answer TeleCalc query with an "0" for new table or "1" for the current table.
"No help files available."	Due to limited disk space on this machine format, help files have been deleted.	Informative error message--no corrective action necessary.

TeleVideo®
TeleChart™ User's Manual

TeleVideo Systems, Inc.
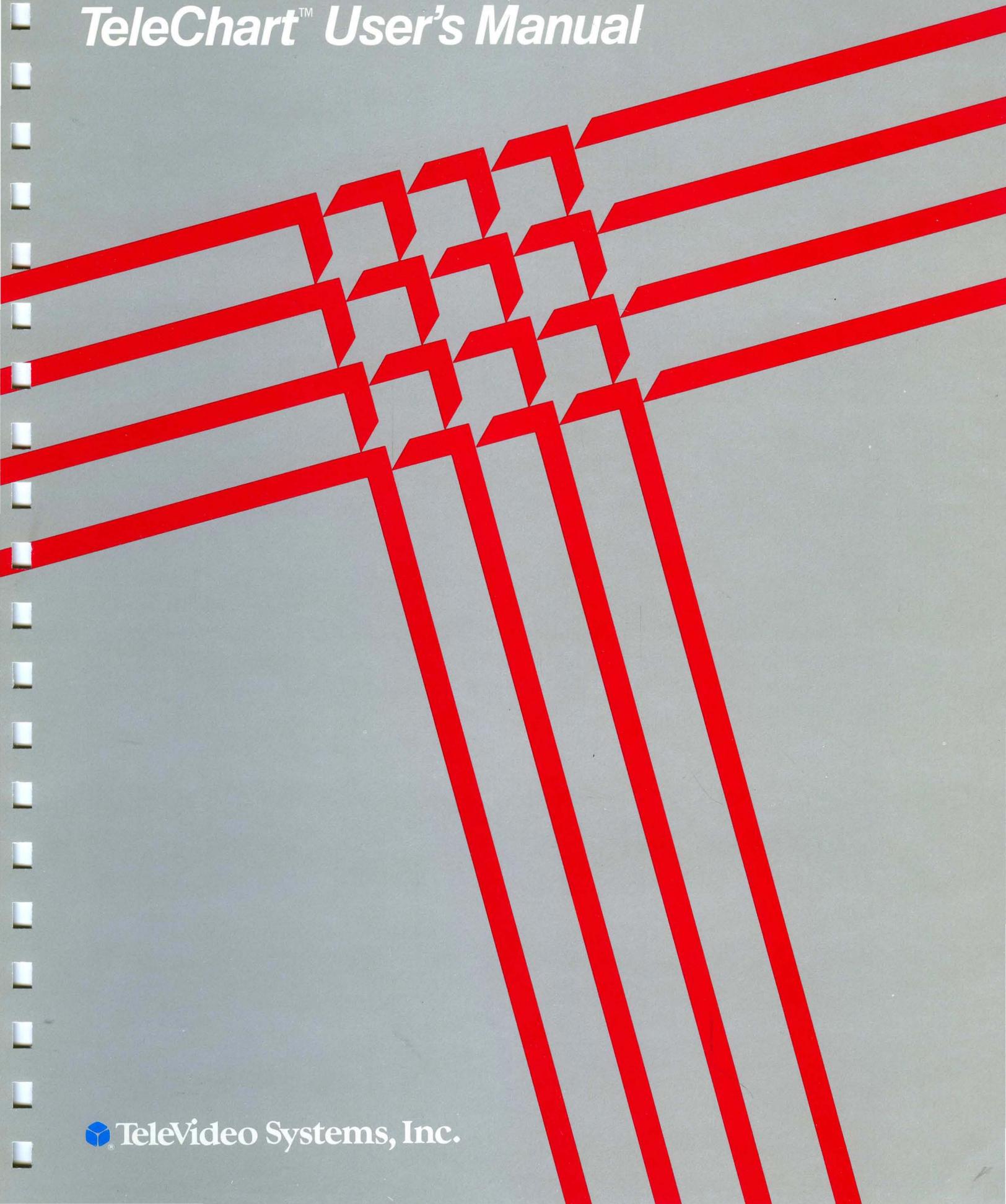
TELEVIDEO® SYSTEMS, INC.

TELECHART T.M. USER'S MANUAL

TeleVideo Part Number 2512900 Rev. B

1 September 1983

TELECHART TABLE OF CONTENTS

BUSINESS GRAPHICS

INTRODUCTION

The business graphics capability of TeleChart is a graphical data analysis program that allows you to quickly and easily design, display, and print presentation-quality business charts drawn from information that you have entered in a data table.

You can manually enter data to be displayed into the TeleChart table. Once the data is entered into the TeleChart table, you can edit it, perform mathematical computations and what-if analysis. You can immediately display the new data using the chart format you have defined as a pie chart, bar chart, line chart or a mixture of bar and line chart.

Chart option menus are provided to allow you to specify the way you want to display your chart. You can specify the type of chart (bar, line, or pie). You have a choice of two data types on your X-axis : text and dates. You can adjust the scaling and control the settings of the grids and the spacing of the tics on the Y-axis. If you prefer to use default options, TeleChart will automatically scale your axes, and assign sensible defaults to the appearance of your charts.

You can save the data in your table as a table file. You can also save the chart options that you have defined as a chart file on your diskette for use at a later time. Once the chart options are saved as a file, you can retrieve or remove the chart.

Finally, you can print your chart on a printer.

FEATURES AND CAPABILITIES

*   Manual data entry into a 50 by 20 table. It also provides
        editing, mathematical computation, and what-if analysis of
        data.

*   Display of the following types of charts:

        Pie Chart   Maximum of eight segments per pie
                        Eight different shading patterns
                        Print percentages

Line Chart   Display up to six line graphs per chart.

        Each line graph can have up to 50 data
        points. Display up to 100 data points along
        the X-axis.

        Six different symbols

        A choice of text, or dates on the X-axis

        Automatic scaling of Y axis

        Options to adjust the scaling and the
        settings of tics and grid lines on the Y-axis

Bar Chart   Display up to six bar graphs per chart. Each
        bar graph up to 50 data points. Maximum of
        100 data points (bars) displayed across X-axis

        Six different shading patterns

        Bar graphs can be stacked or compared

        Choice of text or dates on the X-axis

        Automatic scaling of Y-axis

        Options to adjust the scaling and control the
        settings of tics and grid lines on the Y-axis

Bar and   Combine up to six bar graphs and line graphs on
Line Chart   one chart

        Similar options as described for Bar Chart
        and Line Chart

* Supports a variety of dot matrix graphics printers. You can
print your chart in normal size (approximately 5" by 4"), or
rotate it and expand it to fill an 8" by 11" page.

COMMANDS, TABLES, AND THE DATA POINTER

When you first load TeleChart, you will notice **graphics:** on the
main menu along the right side of the screen.

Figure 1
Main Menu

```
 1 format:
 2 data:
 3 math:
 4 graphics:
 5 print:
 6 status:
 7 HELP
 8
 9 STOP
10 utility:
11
12 HOME
13 BOTTOM
14
15
16 format:
17 INSERT
18 DELETE
19    rows:
20 ROW TITLE
```

The menu that is offered when you enter GRAPHICS (4) allows you
to create graphs using the table that you have already created.
Let's look at the graphics menu.

System Display	User Action	Command
ENTER COMMAND:	**4<CR>**	graphics:

Figure 2
Graphics Menu

```
60  graphics:
61 DISPLAY
62 SELECT
63 OPTIONS
```

The DISPLAY (61) command is used to activate, display, execute,
and create the actual chart after all the data has been entered
in the table and all of the appropriate chart options have been
selected.

The SELECT (62) command allows you to specify how many rows or
columns of data in the table are to be used in your chart and
what type chart (bar, line, or pie) you want displayed.

The OPTIONS (63) command allows you to display your chart, define the chart options and axes options, and print a chart.

Let's load one of our tables so that you can create some charts.

System Display	User Action	Command
ENTER COMMAND:	111<CR>	LOAD TBL
TABLE NAME:	FORECAST<CR>	

By setting the values of row and column ranges, you can define the portion of the table you want to display. TeleChart only displays data values that are within the range settings. Data values that are outside the range settings are ignored.

For example, suppose you only want to see the data from column 1 through column 5. You should first use the Column Range (93) command to set the starting column to 1 and the ending column to 5.

System Display	User Action	Command
ENTER COMMAND:	93<CR>	COL RANGE
COL BEGIN (1-20):	1<CR>	
END (1-20)	5<CR>	

Now let's assign a title to each column using the COL TITLE (25) command.

System Display	User Action	Command
ENTER COMMAND:	25<CR>	COL TITLE
1:	1983<CR>	
2:	<CR>	
1:	1984<CR>	
2:	<CR>	
1:	1985<CR>	
2:	<CR>	
1:	1986<CR>	
2:	<CR>	

1:	1987<CR>
2:	<CR>
1:	<HOME>

You should have your Forecast table on the screen. Figure 3 shows our table. Your figures do not have to match this example.

Figure 3
Example Forecast Table

```
        ROW 1 (SALES)  <--
ENTER COMMAND:
```

ROW	1983	1984	1985	1986	1987
	----1----	----2----	----3----	----4----	----5----
1 SALES	1,000.0	1,100.0	1,210.0	1,331.0	1,464.1
2 COST OF GOODS	450.0	495.0	544.5	599.0	658.8
3 SALES AND ADM	200.0	220.0	242.0	266.2	292.8
4 RESEARCH AND	500.0	300.0	300.0	300.0	300.0
5 TOTAL COSTS	1,150.0	1,015.0	1,086.5	1,165.2	1,251.7
6 GROSS PROFIT	-150.0	85.0	123.5	165.9	212.4
7	0.0	0.0	0.0	0.0	0.0
17	0.0	0.0	0.0	0.0	0.0

SELECT (62) COMMAND

The SELECT (62) command allows you to specify up to 6 rows or columns of data in the table to be used for your chart. You can reference any row or column of the table by entering the row or column number. You can also specify the graph type (bar, line, pie) for the referenced row or column.

For example, let's display data from row 1 as bar graph, and row 2 data as line graph.

Use the arrow keys to move to row 1, SALES.

System Display	User Action	Command
ENTER COMMAND:	62<CR>	SELECT
Enter Row(1-50) for Graph 1:	1<CR>	
Choose (Bar=1, Line=2, Pie=3) for Graph 1:	1<CR>	
Enter Row (1-50) for Graph 2:	2<CR>	
Enter (Bar=1, Line=2, Pie=3) for Graph 2:	2<CR>	
Enter Row (1-50) for Graph 3:	<HOME>	

If you type in a zero value for the row number, no row assignment is given for the graph. TeleChart treats it as an empty graph. Notice that TeleChart displays the current settings of row or column numbers or both for each graph.

For example, if Graph 1 has been assigned row 2 data and bar type, TeleChart displays the message "Current=row 2,bar" on the second line of the display. If no assignment has been given, it will display the message "Current=?,bar" to indicate that Graph 1 is undefined.

TeleChart automatically distinguishes between row and column reference by looking at the current setting of the data pointer. If the data pointer points to a row, then all the numbers you have entered are references to rows. If the data pointer points to a column, then all the numbers are references to columns.

DISPLAY (61) COMMAND

The display chart command allows you to quickly display the data in the table as a bar, line, or pie chart. TeleChart displays the chart according to any specifications that you have entered in the SELECT (62) command, the current settings of data pointer and row/column range, and the chart options menus. Once a chart is displayed on the screen, you can send a copy of the chart to your printer.

If the current data pointer points to row (the table operates in row mode), TeleChart displays row data. If the current data pointer points to column, it displays column data.

Now let's see the bar and line graphs that we selected.

System Display	User Action	Command
ENTER COMMAND:	61<CR>	DISPLAY

Chart 1
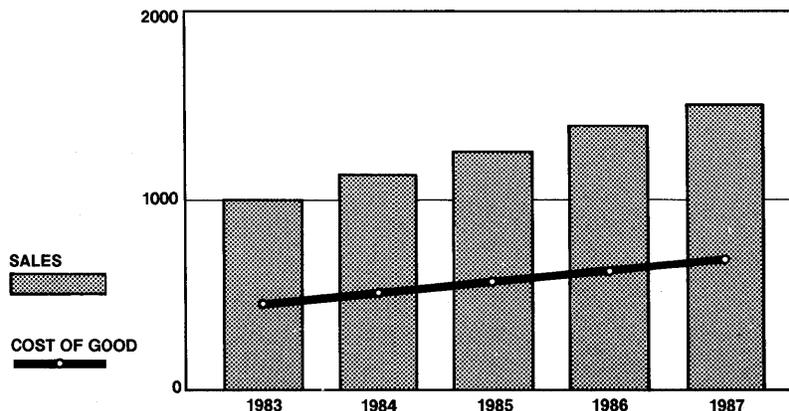
Press the <MODE> key to toggle back and forth between your table and the chart.

Notice that the column titles (1983 - 1987) are used to label the X axis, the values from column 1 through column 5 of row 1 are used as the Y axis data, and the row 1 title (SALES) is used as the legend identifier for graph 1.

Let's change the data pointer to column mode (without changing the settings for graph 1), and display the chart again.

Press <HOME> and use the arrow keys to move to column 1.

| System Display	User Action	Command
ENTER COMMAND:	61<CR>	DISPLAY

Your screen should look like this.

Chart 2
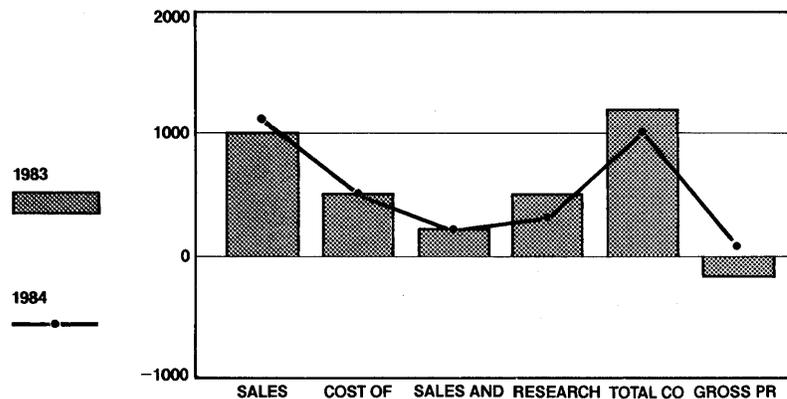
Let's save the table and chart using the SAVE ALL (107) command. First press the <HOME> key.

System Display	User Action	Command
ENTER COMMAND:	107<CR>	SAVE ALL
TABLE NAME:	FORECAST	

Your file already exists. Continue with save?

| VERIFY (Y OR N): | Y<CR> | |

OPTIONS (63) COMMAND

The OPTIONS (63) command has a sub-menu that allows you four
options: to display a chart, to define chart options, to define
axes options, and to print a chart.

Display Chart (1) Selection

This option is the same as the DISPLAY (61) command.

Define Chart Options (2) Selection

This selection allows you to specify up to 6 rows or 6 columns of
data from the TeleChart table to be displayed as a bar graph, line
graph, pie graph, or a mixture of bar and line graphs. You can
provide a main title for the chart and both axes. You can also
stack the individual graphs on top of each other.

The following screen shows all the options with their default
values in the Define Chart Options (2) selection.

System Display	User Action	Command
ENTER COMMAND:	**63<CR>**	OPTIONS
Enter Selection:	**2<CR>**	

Define Chart Options

ENTER DATA:

```
              Main Title    _____
              X Axis Title
              Y Axis Title


                                        Type
              Graph    Row/Col      (Bar/Line/Pie)
              -----    -------      --------------
                1        1          Bar
                2        2          Line
                3                   Bar
                4                   Bar
                5                   Bar
                6                   Bar

          Stack (Y/N)......................N
```

If you want to exit from the Define Chart Options selection,
press <HOME>. TeleChart will return you to the Chart Options
menu.

This is a brief description for each option and its default value
in the Define Chart Options menu:

Table 1
Define Chart Options Menu

Screen	Explanation
Main Title X Axis Title YAxis Title	Enter titles for the chart. Each title can be up to 40 characters long. Default: blank
(1,2,...6)	Identifies the six possible bar/line/pie graphs in the chart.
Row/Col	Enter the row or column number for the selected graph. If the Y data is contained in rows, you should enter an integer value between 1 and 50. If the Y data is contained in columns, you should enter an integer value between 1 and 20. You can also change the Row/Col value using the SELECT (62) command. Default: Graph 1 is assigned a value of '1', Graph 2 through Graph 6 are unassigned.
Type (Bar/Line/Pie)	Enter B(Bar), L(Line) or P(Pie) to determine the type of graph. You can also change the type assignment using the SELECT (62) command. Default: Bar
Stack (Y/N)..	Enter Y to stack the bar/line graphs on top of each other. Default: N

Adding Titles to the Chart

The Main Title, X-Axis Title and Y-Axis Title allows you to add descriptive information to the chart. The Main Title is centered above the chart. The X-Axis Title is centered below the X axis. The Y axis is centered and is placed below the Main Title. The following chart shows the location of the Main Title, X-Axis Title, and Y-Axis Title:

<div align="center">
Main Title

Y-Axis Title
</div>

```
    _____
   |                                        |
   |                                        |
   |                                        |
   |                                        |
   |                                        |
   |                                        |
   |_____|
```

<div align="center">
X-Axis Title
</div>
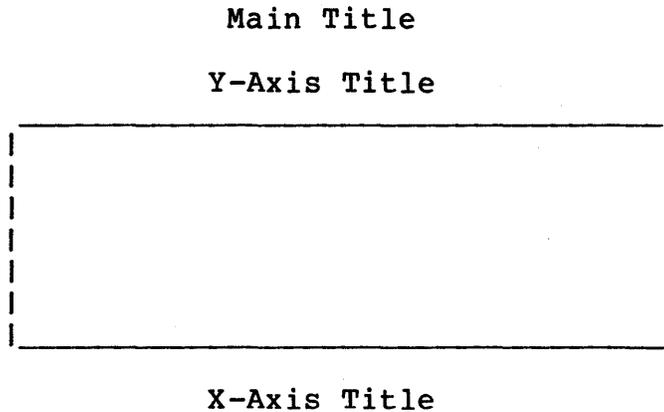
For a pie chart, the X-Axis Title is placed below the Main Title and the Y-Axis Title is ignored.

Choosing a Graph Type

TeleChart offers a choice of three basic graph types: bar, line, and pie. Bar graphs are best for showing quantitative information and is particularly useful for showing comparisons between groups of data.

Let's load the Forecast table and chart and compare Sales and Administration cost with Research and Development cost. First press <HOME><HOME> to get back to the main menu.

System Display	User Action	Command
ENTER COMMAND:	106<CR>	LOAD ALL
TABLE NAME:	FORECAST<CR>	

Now use RESET CHT <123> to reset the previous chart.

ENTER COMMAND:	123<CR>	RESET CHT
verify (Y/N):	Y<CR>	
ENTER COMMAND	63<CR>	OPTIONS
ENTER SELECTION	2<CR>	

To get a comparative bar chart, you should set the Row/Col option
for graph 1 and graph 2 in the Define Chart Options menu to the
following values:

| | | Type |
Graph	Row/Col	(Bar/Line/Pie)
1	3	Bar
2	4	Bar

To do this, do the following:

| System Display	User Action	Comment
ENTER DATA:	Press the down arrow key until the first number under Row/Col is highlighted.	
ENTER DATA:1	3<CR>	The Type of chart will now be highlighted.
ENTER DATA:B	Press the down arrow key until the second number under Row/Col is highlighted.	
ENTER DATA:	4<CR>	
ENTER DATA:	B<CR>	
ENTER DATA:	<HOME>	
Enter Selection:	1<CR>	

When you display the chart, the screen should look like this:

Chart 3
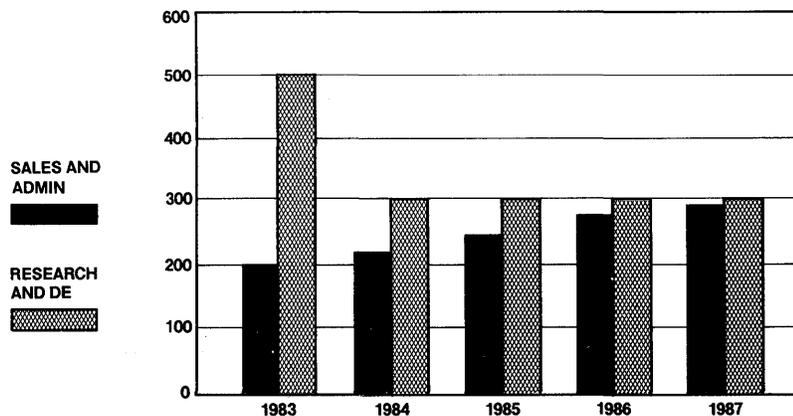
Line graphs are best for showing trends or changes in data over time.

Let's compare sales with the total costs. This time, set the options to the following values:

Graph	Row/Col	Type (Bar/Line/Pie)
1	1	Line
2	5	Line

To do this, first press <HOME> to get to the main menu.

| System Display	User Action	Command
ENTER COMMAND:	63<CR>	OPTIONS
Enter Selection:	2<CR>	
ENTER DATA:	Press the down arrow key until the first number under Row/Col is highlighted.	
ENTER DATA:3	1<CR>	
ENTER DATA:B	L<CR>	
ENTER DATA:4	5<CR>	
ENTER DATA:B	L<CR>	
ENTER DATA:	<HOME>	
Enter Selection:	1<CR>	

Your chart should look like this:

Chart 4
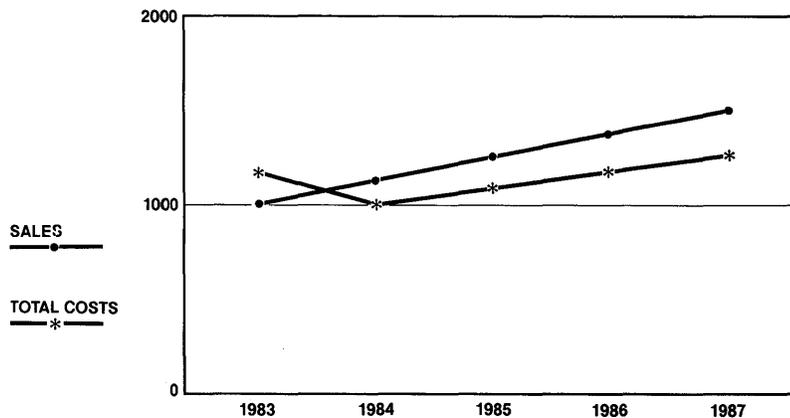
Press <HOME> to get back to the main menu.

The pie chart is best for showing proportions, especially for representing quantitative data as a percent of the total. Let's find out the percent breakdown of the total expenses for 1983.

System Display	User Action	Command
ENTER COMMAND:	34<CR>	SELECT COL
COL (1-20):	1<CR>	
ENTER COMMAND:	92<CR>	ROW RANGE
ROW BEGIN (1-50):	2<CR>	
END (2-50):	4<CR>	
ENTER COMMAND:	63<CR>	OPTIONS
Enter Selection:	2<CR>	

To get a pie chart from our table, you should set the 'Row/Col' and the 'Type' option in the Define Chart Options selection to the following values:

Graph	Row/Col	Type (Bar/Line/Pie)
1	1	Pie

Press the down arrow key so that the first selection under Type is highlighted.

System Display	User Action
ENTER DATA:L	P<CR>
ENTER DATA:5	<HOME>
Enter Selection:	1<CR>

Your chart should look like this:

Chart 5
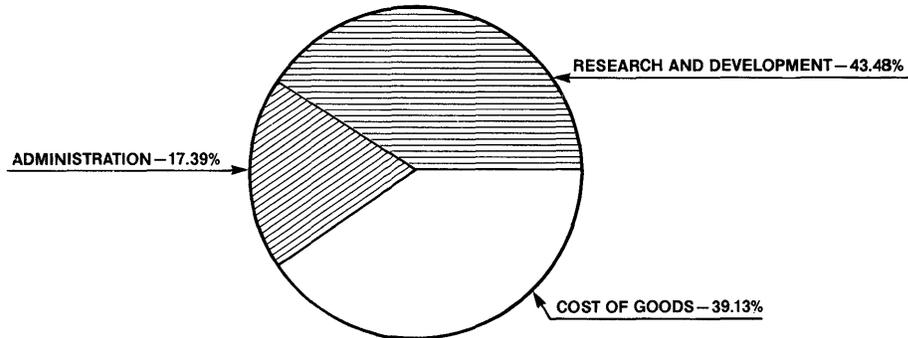
This pie chart gives a clear picture of the expenses that had the greatest proportion of total costs.

Press <HOME> to get back to the main menu.

CHOOSING GRAPH TYPES

There are a few things to consider when choosing graph types.

Pie Chart

TeleChart can display eight or less segments.

If you have selected a row or column data that has more than eight data points, TeleChart will display the first eight nonzero values.

If the table is in row mode, the column titles will be used to label the pie segments. If the table is in column mode, the row titles will be used to label the pie segments.

Since it takes the entire screen to display a pie chart, TeleChart does not allow you to mix pie charts with other type of graphs. Pie charts always take higher display priority than bar and line graphs. For example, suppose you have specified the following values for the 'Type' option in the Define Chart Options menu:

Graph	Row/Col	Type (Bar/Line/Pie)
1	1	Bar
2	2	Pie
3	3	Line

When you display the chart, only a pie chart will be displayed using Row 2 data.

Bar Chart

Up to 100 bars can be displayed side by side. However, if the bars are not stacked, this limits the total number of data points for all graphs in the chart to 100.

If you have six bar graphs in the chart, it means that each bar graph can only have 16 data points. This limitation can be avoided by stacking the bar graphs or changing one or more bar graphs to Line graph(s).

Assigning Shading Patterns and Symbols

If your display is not in color, TeleChart provides six shading patterns (for bar graphs), six symbols (for line graphs) and eight shading patterns (for pie graphs) to identify data from each graph in the chart. The shading patterns and symbols for bar and line graphs are shown below in Figure 4.

Figure 4
Shading Patterns and Symbols
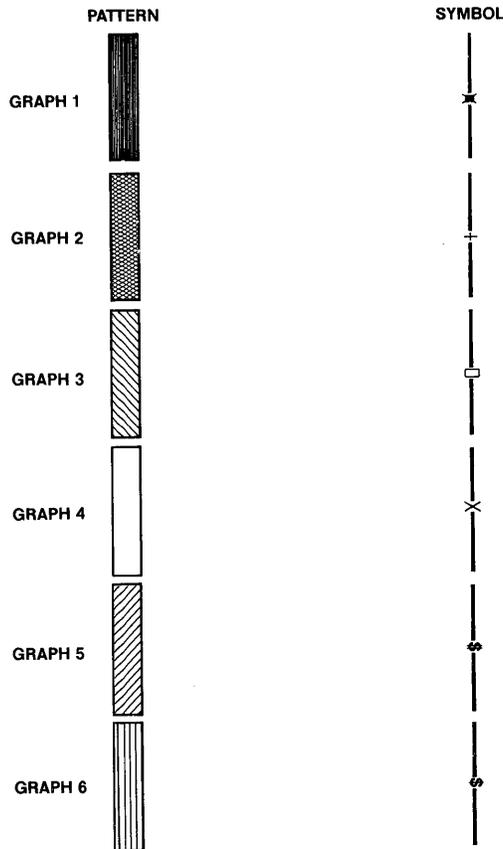
The eight shading patterns for eight segments of a pie graph are shown in Chart 6.

Chart 6

SEG 6—12.50%
SEG 7—12.50%
SEG 5—12.50%
SEG 8—12.50%
SEG 4—12.50%
SEG 1—12.50%
SEG 3—12.50%
SEG 2—12.50%
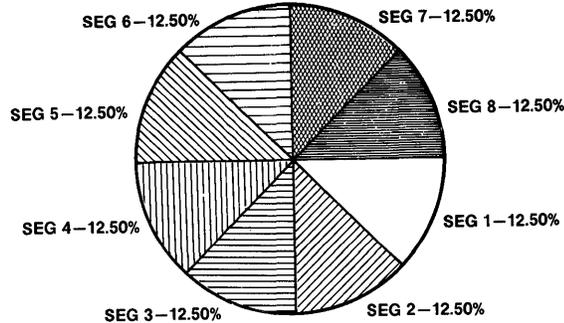
Stacking the Graphs in the Chart

The 'stack' option is useful when you want to see how each graph contributes to the total, and is most effective when working with a bar chart.

If you want to compare the total costs of expenses on a year-by-year basis, you should set the Row/Col, Type, and Stack options to the following values:

Graph	Row/Col	Type (Bar/Line/Pie)
1	2	Bar
2	3	Bar
3	4	Bar

Stack (Y/N)........................N

Use the arrow key to move to the Row mode.

System Display	User Action	Comment
ENTER COMMAND:	63<CR>	OPTIONS
Enter Selection:	2<CR>	
ENTER DATA:	<DOWN ARROW><DOWN ARROW><DOWN ARROW>	
ENTER DATA:1	2<CR>	
ENTER DATA:P	B<CR>	
ENTER DATA:5	3<CR>	

```
ENTER DATA:L          B<CR>

ENTER DATA:           4<CR>

ENTER DATA:B          <HOME>

Enter Selection:      1<CR>
```

Your chart should look like this:

Chart 7
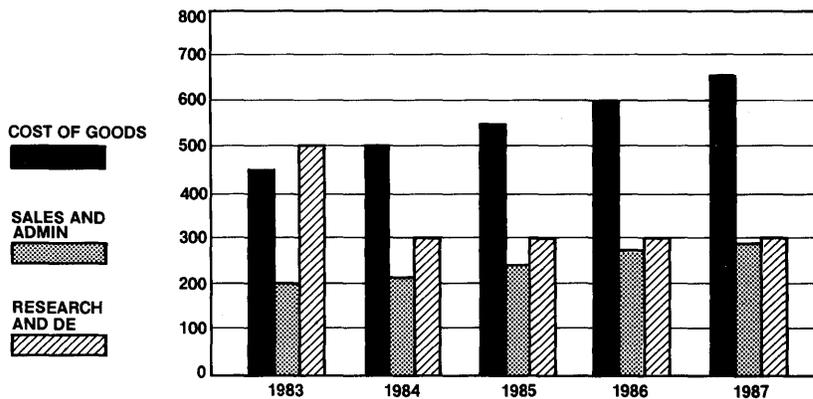
However, if you want to emphasize the total costs for each year in the five-year period, you should 'stack' the bar graphs on top of each other by setting the 'Stack' option to 'Y' (Yes).

| System Display	User Action	Command
(Displays chart)	<HOME>	
ENTER COMMAND:	63<CR>	OPTIONS
Enter Selection:	2<CR>	
	Press the down arrow key until the N next to Stack (Y/N).... is highlighted.	
ENTER DATA:N	Y<CR>	
ENTER DATA:	<HOME>	
Enter Selection:	1<CR>	

Your chart should look like this:

Chart 8

2000

COST OF GOODS

SALES AND
ADMIN

1000

RESEARCH
AND DE

0

 1983 1984 1985 1986 1987
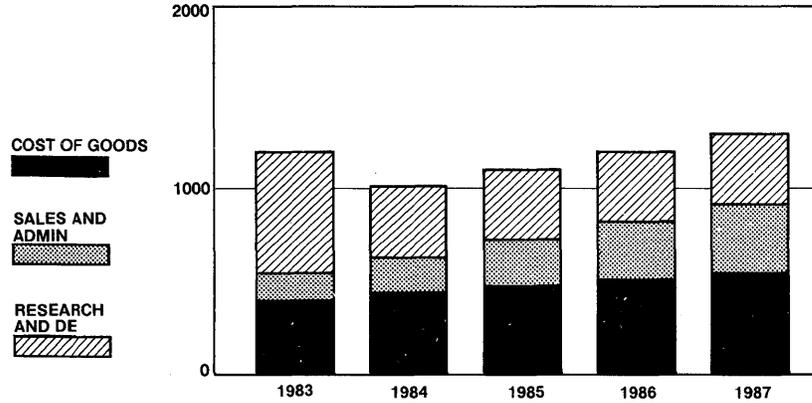
Note that you can also stack line graphs. When stacking line
graphs, each data point in graph 2 will use the corresponding
data point from graph 1, and graph 3 will use graph 2, and so on.
Let's change the "Type" option of the above example to "Line."

System Display	User Action	Comment
(displays graph)	<HOME>	
ENTER COMMAND:	63<CR>	
Enter Selection:	2<CR>	

Use the arrow key to move to the "Type" column. Change the type
from "bar" to "line" for each of the first three options.

| System Display	User Action	Comment
ENTER DATA:B	L<CR>	
ENTER DATA:B	L<CR>	
ENTER DATA:B	L<CR>	
ENTER DATA:	<HOME>	
Enter Selection:	1<CR>	

Your chart should look like this:

Chart 9
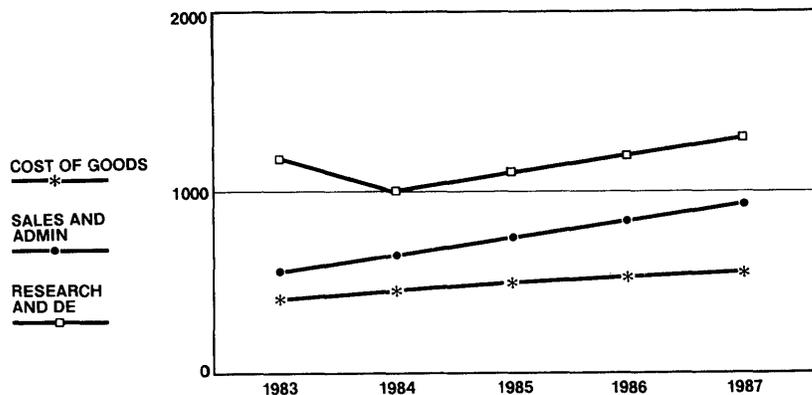
Press <HOME> to get back to the main menu.

Define Axis Options Selection

This selection allows you to specify whether you want your X-axis to be text or date. You can adjust the Y-axis to a different scale and you can also determine the number of labeled units and tics on the Y-axis.

The options in the Define Axes Options menu have no effect on the pie chart.

Let's look at the options.

System Display	User Action	Comment
ENTER COMMAND:	63<CR>	OPTIONS
Enter Selection:	3<CR>	

You should see these options with their default values in the Define Axes Options menu.

Define Axes Options

ENTER DATA:T

```
          X Axes Type (T-Text,D-Date).................T
          Date Type (W,M,Q,Y,MY,QY).....................
          Date Start....................................

                                          Y Axis
                                          ---------------
          Auto Scaling (Y/N)..........Y
          Minimum.....................
          Maximum.....................
          Number of Major Div (1-10)..
          Number of Minor Tics (0-5)..0
          Draw Grid Lines (Y/N).......Y
```

This a brief description for each option and its default value in
the Define Axes Option menu.

Table 2
Axes Options

Axes Option	Description
X Data Type (T,D)	Enter T if you want the X axis to be labeled with the row titles or column titles from the table. If your table is in row mode, your X axis will be labeled with column titles. If your table is in column mode, your X axis will be labeled with row titles. Enter D if you want date labels on your X axis. TeleChart allows you to label your X axis as days, months, quarters, years, and as date combinations such as month/year and quarter/year. Default: T (text)
Date Type (W,M,Q,Y MY,QY)	If you have entered D (Date) in the "X Data Type" option, you can now specify whether you want weekdays (W), months (M), quarters (Q), years (Y), a combination of months and years (MY), or a combination of quarters and years (QY) on your X axis. If you have entered T (Text) or for the 'X Data Type' option, this option and the following 'Date Start' option will be ignored.

Date Start   If you have entered W (weekdays) in the 'Date
                  Type' option, TeleChart will ask you for the
                  starting day of the week. The message "Starting
                  weekday(1-7)?" will appear on the second line of
                  the menu. If you want the X-axis to be labeled by
                  weekday beginning with Tuesday, you should enter 2
                  for this option.

                  If you have entered M (months) in the "Date Type"
                  option, TeleChart will ask you for the starting
                  month. The message "Starting month(1-12)?" will
                  appear on the second line of the menu. If you
                  want the X-axis to be labeled by month beginning
                  with January, you should enter 1 for this option.

                  If you have entered Q (quarters) in the "Date
                  Type" option, TeleChart will ask you for the
                  starting quarter. The message "Starting
                  quarter(1-4)?" will appear on the second line of
                  the menu. If you want the X axis to be labeled by
                  quarter beginning with the first quarter, you
                  should enter 1 for this option.

                  If you have entered Y (years) in the "Date Type"
                  option, TeleChart will ask you for the starting
                  year. The message "Starting year(1-9999)?" will
                  appear on the second line of the menu.

                  If you have entered MY (months/years) in the "Date
                  Type" option, TeleChart will first ask you for the
                  starting month and then the starting year.

                  If you have entered QY (quarters/years) in the
                  "Date Type" option, TeleChart will first ask you
                  for the starting quarter and then the starting
                  year.

Auto Scaling   Enter Y if you want TeleChart to calculate the
(Y/N)   minimum and maximum values from your data and
                  scale them accordingly. Enter N if you want to
                  control the scaling of your axis.

                  The "Minimum", "Maximum" and "Number of Major
                  Divisions" options are ignored by TeleChart unless
                  you have specified "N" in this option.

                  Default: Y

Minimum	Enter values to adjust the scaling of the axis.
Maximum	"Minimum" option sets the minimum value of the
Number of	axis that will appear on the chart. "Maximum"
Major	option sets the maximum value; and the "Number of
Divisions	Major Divisions" options defines the number of
	divisions on your axis.

The maximum allowed value of "Number of Major Division" is 10.

Number of	Enter the number of minor tics to be placed
Minor	between the major divisions on the axis. Note
Divisions	that the maximum allowed value is 5.

Default: 0

Draw Grid	Enter Y if you want grid lines to be drawn at
Lines	major divisions.

Default: Y for Y axis, and N for X axis.

Choosing X Data Type

TeleChart allows two kinds of data types on your X-axis text and dates.

If you want your X-axis to be labeled with row/column titles, you should select "Text" type for your X-axis. The Text X-Axis Type is already selected as indicated by the T on that line.

For example, suppose you want to show the sales figures for the years 1983 to 1987. You must go back to the OPTIONS menu and redefine the chart options.

System Display	User Action	Command
ENTER COMMAND:	111<CR>	LOAD TBL
TABLE NAME:	FORECAST	
ENTER COMMAND	123<CR>	RESET CHT
verify (Y/N):	Y<CR>	
ENTER COMMAND:	61<CR>	GRAPH

Your chart should look like this:

Chart 10
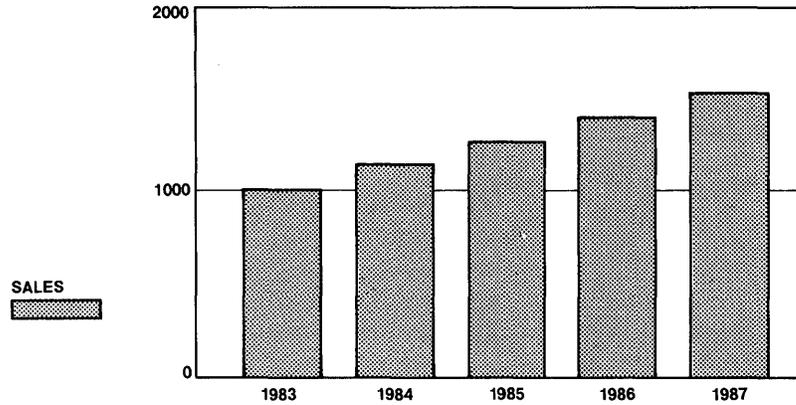
If you have many data points in the selected row/column, it is advisable to abbreviate the row/column titles so that they can fit nicely on the X-axis. This is especially true for the row titles since only one line is allowed for the description.

The "Date" option is very useful if you want date labels on your X-axis regardless of what you have entered for your row/column titles. TeleChart offers a very flexible, date labeling capability.

You might want to create a chart that shows yearly sales beginning in 1983. To do this, your should set the "X Data Type", "Date Type", and "Date Start" options to the following values:

```
        X Axis Type (T-Text,D-Date,).................D
        Date Type (W,M,Q,Y,MY,QY)....................Y
        Date Start...................................1983
```

Press <HOME> to get back to the main menu.

System Display	User Action	Command
ENTER COMMAND:	93<CR>	COL RANGE
COL BEGIN (1-20):	1<CR>	
END (1-20):	10<CR>	
ENTER COMMAND:	63<CR>	OPTIONS
Enter Selection:	3<CR>	
ENTER DATA:T	D<CR>	
ENTER DATA:	Y<CR>	

ENTER DATA: 1983<CR>

ENTER DATA:Y   <HOME>

Enter Selection: 1<CR>

Your chart should look like this:

Chart 11
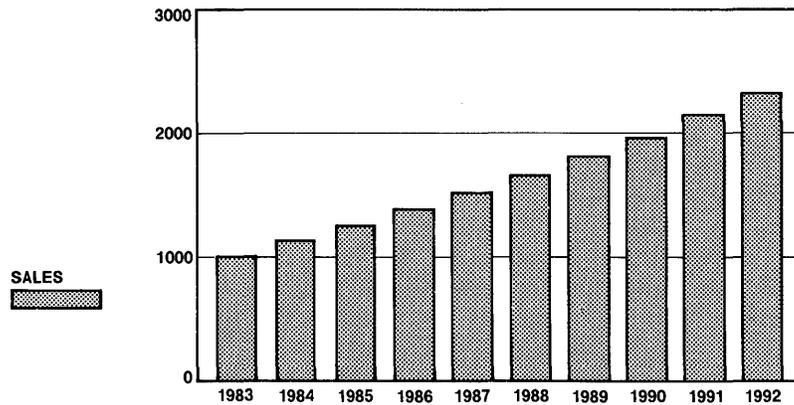
If you want to display this example as monthly profit, set the "Date Type" and "Date Start" options in the Axis Options to the following values:

        X Axis Type (T-Text,D-Date,...................D
        Date Type (W,M,Q,Y,MY,QY).....................M
        Date Start....................................1

System Display   **User Action**

(chart displayed)   <HOME>

ENTER COMMAND: 63<CR>

Enter Selection: 3<CR>

ENTER DATA:D   <CR>

ENTER DATA:Y   M<CR>

ENTER DATA: 1<CR>

ENTER DATA: <HOME>

Enter Selection: 1<CR>

Your chart should look like this:

Chart 12
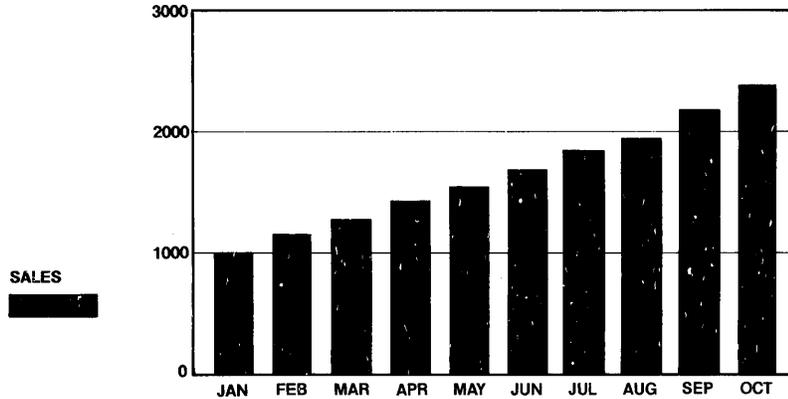
Press <HOME> to return to the main menu.

Adjust the Scale of the Axis

TeleChart automatically scales your chart according to the values in the selected rows/columns. However, there are times you might want to adjust the scaling of the chart so that TeleChart only displays data that is within a specified range, or you might want to emphasize a certain part of the chart in order to show more detail. To turn off automatic scaling mode, set the "Auto Scaling" option to "N" (No).

For example, suppose you have the interest rate the bank charges the customer for the past 12 months in the table below:

ROW	INTEREST RATE
1	16
2	17
3	18
4	17
5	18.5
6	20
7	21
8	20.5
9	20
10	18.5
11	17
12	17.5

System Display	User Action	Command
ENTER COMMAND:	114<CR>	RESET
VERIFY (Y OR N):	Y<CR>	
ENTER COMMAND:	25<CR>	COL TITLE
1:	INTEREST<CR>	
2:	RATE<CR>	
1:	<HOME>	
ENTER COMMAND:	34<CR>	SELECT COL
COL (1-20):	1<CR>	
ENTER COMMAND:	30<CR>	ENTRY
VALUE:	16<CR>	
VALUE:	17<CR>	
VALUE:	18<CR>	
VALUE:	17<CR>	
VALUE:	18.5<CR>	
VALUE:	20<CR>	
VALUE:	21<CR>	
VALUE:	20.5<CR>	
VALUE:	20<CR>	
VALUE:	18.5<CR>	
VALUE:	17<CR>	
VALUE:	17.5<CR>	
VALUE:	<HOME>	
ENTER COMMAND:	123<CR>	RESET CHT
VERIFY (Y OR N):	Y<CR>	
ENTER COMMAND:	62<CR>	SELECT
Enter Col(1-20) for Graph 1:	1<CR>	

Choose (Bar=1, Line=2,
Pie=3) for Graph 1:   **2<CR>**

Enter Col(1-20) for
Graph 2:   **<HOME>**

ENTER COMMAND: **61<CR>**   DISPLAY

Your chart should look like this:

Chart 13
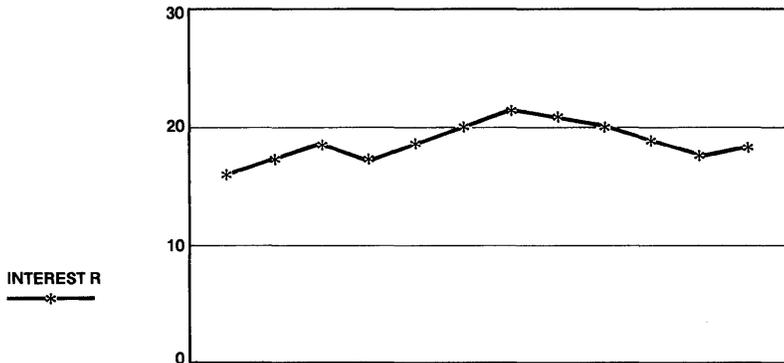
Press <HOME> to return to the main menu.

Let's set the "Auto Scaling," "Minimum," "Maximum," and "Number
of Major Divisions" options to the following values:

```
    Axes Specification              Y Axis
                                    --------------
    Auto Scaling (Y/N)...........N
    Minimum......................16
    Maximum......................21
    Number of Major Divisions....6
    Number of Minor Tics.........0
    Draw Grid Lines (Y/N)........Y
```

System Display	User Action
ENTER COMMAND:	63\<CR\>
Enter Selection:	3\<CR\>
ENTER DATA:D	**Press the \<CR\> key until the selection on the Auto Scaling line is highlighted.**
ENTER DATA:Y	N\<CR\>
ENTER DATA:	16\<CR\>
ENTER DATA:	21\<CR\>
ENTER DATA:	6\<CR\>
ENTER DATA:0	0\<CR\>
ENTER DATA:Y	Y\<CR\>
ENTER DATA:D	\<HOME\>
Enter Selection:	1\<CR\>

Your chart should look like this:

Chart 14
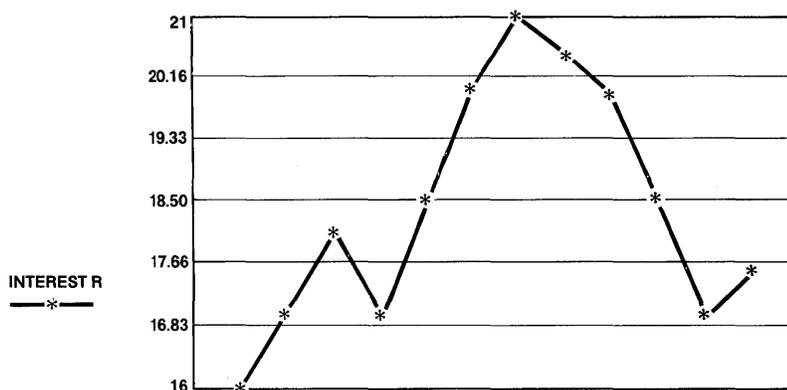
TeleChart User's Manual

Notice that you must enter both the minimum and maximum values in
order for TeleChart to do the rescaling. Also, the maximum value
must be greater than the minimum value. TeleChart will return to
auto scaling mode if you do not specify both values or the
maximum value is not greater than the minimum value.

If you wish to save this chart alone, you may do so by using SAVE
CHART (121). Later you can use this chart to compare two or more
similar tables.

Print Chart (4) Option

You can print your chart by choosing the Print Chart (4)
selection on the OPTIONS (63) command menu.

System Display	User Action	Command
ENTER COMMAND:	**4<CR>**	graphics:
ENTER COMMAND:	**63<CR>**	OPTIONS
Enter Selection:	**4<CR>**	Print Chart
Do you want to enlarge your chart(Y/N)?	**N<CR>**	
SET PAPER; HIT RETURN.	**<CR>**	

The program will return to the main menu after the chart is
printed.