

The Power™
of:

MultiPlan Applications



FIGURE 7

- Invoicing ■ Accounts Receivable ■ Cost Recovery ■ Checkbook Ledger ■ Inventory
- Manufacturing Estimating ■ Accounts Payable ■ Payroll ■ Scheduling ■ Commissions

USA \$12.95

The Power™ Of: Multiplan™

by
Robert E. Williams

The logo for Management Information Source, Inc. features three horizontal lines of varying lengths on the left, followed by the lowercase letters 'mis' in a bold, sans-serif font. The 'i' has a dot, and the 's' has a tail that extends to the right.
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One of a series of instructional manuals on the use and application of computer programs.

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Edited by: Estelle Phillips

PREFACE

The Power Of: Multiplan is a training book of exercises designed especially for users and potential users of the Multiplan computer program. By performing these simple step-by-step exercises, you will rapidly gain an ability to utilize the broad range of Multiplan capabilities that make it a most powerful software program available for personal size computers.

Better than an instruction book, The Power Of: Multiplan demonstrates the use of Multiplan features through specific application samples.

The Power Of: Multiplan will show you how to expand your use of Multiplan, no matter what your application. These ten easy-to-follow exercises are designed to help you understand and use Multiplan operations. Business owners, accountants, financial analysts, homeowners, manufacturers, engineers, educators, scientists, architects, students, or anyone with a problem that can be solved using a computer, will find The Power Of: Multiplan an invaluable companion to their Multiplan program.

No special training is needed to benefit from the exercises in The Power Of: Multiplan. All instructions are in plain English. The logic of each step is clearly spelled out, so you can later apply the information to your specific needs. The Power Of: Multiplan will become your most valuable reference book as you expand your use of Multiplan.

***IF YOU OWN, OR ARE THINKING OF OWNING, MULTIPLAN,
YOU SHOULD OWN THIS BOOK!***

INTRODUCTION

The exercises in this book have been purposely designed to provide an opportunity to easily follow the logic of Multiplan functions, and then apply those functions to specific problem-solving situations. Each exercise is self-contained. Each demonstrates some special ability or abilities we have used in solving clients' problems.

The Multiplan format is arranged on the computer screen in columns and rows. The Multiplan format is illustrated in Figure 1. The columns and rows are identified by number designations. Each position where a column and row intersect is a cell, or location, as on a street map. The relationships between values in these cells are determined by simple instructions entered into the cells in the form of algebraic formulas. (Don't get panicky; that just means $(a + b)$ and other similar expressions.) Visualizing the street map image and following the exercises, you will easily and quickly catch on to the power of Multiplan and how it can work for you.

	1	2	3	4	5	6	7	8	9	10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										
17										
18										
19										
20										

Figure 1

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ACCOUNTS PAYABLE

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INVOICING FROM INVENTORY**DESCRIPTION**

This exercise is an invoice worksheet which uses an item number to select the proper description and price for a particular item from a set of tables.

First we calculate the subtotal, determine the discount percentage from a table, then calculate the discount, the net and the sales tax, and the total invoice amount. We then do a salesperson commission report, which reports the salesperson's name and invoice number, and figures the commission for the invoice based on a graduated scale.

OPERATIONS PERFORMED

Setting Up Worksheet Format

Naming Cells

Entering Mathematical Formulas

Making Additional Entries

FUNCTIONS USED

LOOKUP

MAX

MIN

SUM

COMMANDS USED

ALPHA

COPY

FORMAT

NAME

PRINT

VALUE

SETTING UP WORKSHEET FORMAT

Using the following directions, set up your worksheet by copying Figure 1 exactly as it is illustrated, retaining exact row and column locations of all information.

NOTE

Before starting any command, you must have displayed on the bottom of the screen the COMMAND: descriptions. If you do not, just press the escape key and it will clear whatever is being done and display the COMMAND: descriptions.

The Multiplan worksheet format contains columns of ten characters wide when it is first entered into the computer. In this exercise, however, you will need to expand the column to 14 characters wide to accommodate the row and column labels.

Place your cursor on any cell and type:

F	starts FORMAT command
W	selects WIDTH option
14	number of characters in the column
[TAB]	moves cursor to COLUMN:
1	column to start in
[TAB]	moves cursor to THROUGH:
5	column to end in
RETURN	executes the command

The next operation is to type in your row and column labels and the tables.

NOTE

Before typing in labels, you must first type:

A starts ALPHA command which prepares the cell for labeling information

Then type in the label.

RETURN enters label

1	2	3	4	5	6	7	8
1	INVOICE NUMBER						
2	CUSTOMER NAME						
3	ADDRESS						
4	CITY						
5	STATE						
6	ZIP CODE						
7	SALESPERSON						
8							
9	QUANTITY	ITEM NO.	DESCRIPTION	UNIT COST	TOTAL COST		
10	-----						
11							
12							
13							
14							
15							
16	=====						
17				SUB TOTAL			
18				DISCOUNT			
19				NET			
20				SALES TAX			
21					=====		
22				GRAND TOTAL			
23							
24							
25	SALESPERSON COMMISSION RPT						
26	-----						
27	SALESPERSON						
28	INVOICE NUMBER						
29	COMMISSION						
30							
31	-----						
32	PRICING TABLE		DESCRIPTION TABLE		DISCOUNT TABLE		
33	ITEM NUMBER	PRICE	ITEM NUMBER	DESCRIPTION	AMOUNT	PERCENT	
34	-----						
35	0	0	0		0	0	
36	110	1.25	110	PAPER CUPS	100	0.1	
37	120	0.35	120	GLASS CUPS	200	0.12	
38	130	3.56	130	PAPER TOWELS	300	0.15	
39	140	5.89	140	GLASS PLATES	500	0.18	
40	150	1.29	150	GLASS BOTTLE			

Figure 1

1 EXERCISE

Labels are automatically left-justified in the column. To enter a numeric value, just type the number and RETURN.

Numbers are automatically right-justified in the column.

NOTE

After typing in your label, you may enter label by moving the cursor to the next typing location, and the label will be entered and left-justified. The location the cursor is on will be ready for Alpha information.

After typing in the labels in column 1, between rows 1 and 7, you will want to right-justify them.

Place your cursor on R1C1, and type:

F	starts FORMAT command
C	selects CELLS option and displays R1C1, first cell to format from
:	colon-indicates from-to
R7C3	last cell to format to
[TAB]	moves cursor to ALIGNMENT:
R	justifies right
RETURN	executes the command

Now type in the labels in row 9.

Then we will center the labels in the columns.

Place your cursor on any cell and type:

F	starts FORMAT command
C	selects CELLS option
R9C1	first cell to format from
:	colon-indicates from-to
R9C5	last cell to format to
[TAB]	moves cursor to ALIGNMENT: options
C	selects CTR (Center) option
RETURN	executes the command

Now let's put the dashed line across row 10.

First place your cursor on R10C1, and type:

A	starts ALPHA command
-----	14 dashes
RETURN	enters the dashes

Now copy the dashes just entered in R10C1, using the COPY command.

Leave your cursor on R10C1, and type:

C	starts COPY command
R	selects RIGHT option
4	number of cells to copy into
RETURN	executes the command

The dashed line will now appear extended across the number of columns you have indicated. To enter a double-dashed line on row 16, repeat the operation above, but just exchange the symbol - (dash sign) for the = (equal sign)

Format part of column 5 to display the values in dollars and cents under Total Cost.

Place your cursor on R11C5, and type:

F	starts FORMAT command
C	selects CELLS option and displays R11C5, first cell to format from
:	colon-indicates from-to
R22C5	last cell to format to
[TAB] [TAB]	moves cursor to FORMAT CODE: options
\$	selects DOLLAR SIGN option
RETURN	executes the command

Now type in the labels in column 4, rows 17 through 23; then justify right as we did for row 1 through 8, using the new row and column address.

1 EXERCISE

Now we need to type in the label for row 25, with a label which is wider than the column. This is no problem because Multiplan lets us connect as many adjacent cells as needed to display the entire label.

Place your cursor on R25C1, and type:

A starts ALPHA command, which prepares the cell for labeling information

Type in label.

RETURN enters the label

Leave your cursor on R25C1 and type:

F starts FORMAT command

C selects CELLS option, and displays R25C1, first cell to format from

: colon-indicates from-to

R25C2 last cell to format to

(TAB) (TAB) moves cursor to FORMAT CODE: options

C selects Cont (continuous) option

RETURN executes the command

Now finish typing in the remaining labels and the three tables.

NAMING CELLS

Now that the labels and tables are typed in and the worksheet is formatted, we will need to name some of the cells and groups of cells to make it easier when using them in formulas.

First cell to be named is to the immediate right of Invoice Number.

Place your cursor on R1C2 and type:

N starts NAME command

INVNO name of cell

RETURN executes the command

Second cell to be named is to the immediate right of Salesperson.

Place your cursor on R7C2 and type:

N	starts NAME command
SALESPER	name of cell
RETURN	executes the command

Third cell to be named is to the immediate right of Sub Total.

Place your cursor on R17C5 and type:

N	starts NAME command
SUBTOTAL	name of cell
RETURN	executes the command

Fourth cell to be named is to the immediate left of Discount.

Place your cursor on R18C3, and type:

N	starts NAME Command
PERCENT	name of cell
RETURN	executes the command

Fifth cell to be named is to the immediate left of Sales Tax.

Place your cursor on R20C3, and type:

N	starts NAME command
TAX	name of cell
RETURN	executes the command

Sixth cell to be named is to the immediate right of Net.

Place your cursor on R19C5, and type:

N	starts NAME command
NET	name of cell
RETURN	executes the command

1 EXERCISE

Now we will need to name a group of cells which make up a table.

First group of cells to be named is the Pricing Table.

Place your cursor on R35C1 and type:

N	starts NAME command
PRICE	name of cells
[TAB]	moves cursor to TO REFER TO: and displays R35C1, upper left- hand cell of table to be named
:	colon-indicates from-to
R40C2	last lower right-hand cell of table to be named
RETURN	executes the command

Second group of cells to be named is the Description Table.

Place your cursor on R35C4 and type:

N	starts NAME command
DESCRIP	name of cells
[TAB]	moves cursor to TO REFER TO: and displays R35C4, upper left- hand cell of table to be named
:	colon-indicates from-to
R40C5	lower right-hand cell of table to be named
RETURN	executes the command

Third group of cells to be named is the Discount Table.

Place your cursor on R35C7, and type:

N	starts NAME command
DISCOUNT	name of cells
[TAB]	moves cursor to TO REFER TO: and displays R35C7, upper left- hand cell of table to be named

:	colon-indicates from-to
R39C8	lower right-hand cell of table to be named
RETURN	executes the command

ENTERING MATHEMATICAL FORMULAS

You will now begin entering mathematical formulas that will establish the relationships between column and row positions. The formulas and their locations are illustrated in Figure 2.

Formula one, in the DESCRIPTION column, looks up the item number in the Description Table, in order to find the corresponding description.

Place your cursor on R11C3, and type:

V	starts VALUE command, which prepares the cell for a numeric value or formula
LOOKUP(	starts LOOKUP function
LEFT ARROW	moves the cursor to Item Number, which will be the value to be looked up, and displays RC[-1]
,	comma-separates values to be looked up from table
DESCRIP	table name
)	closes LOOKUP function
RETURN	enters the formula

Formula two, in the Unit Cost column, looks up the item price in the Pricing Table, in order to find the corresponding price.

Place your cursor on R11C4, and type:

V	starts VALUE command
LOOKUP(	starts LOOKUP function
LEFT ARROW LEFT ARROW	moves the cursor to Item Number which will be the value looked up, and displays RC[-2]

1 EXERCISE

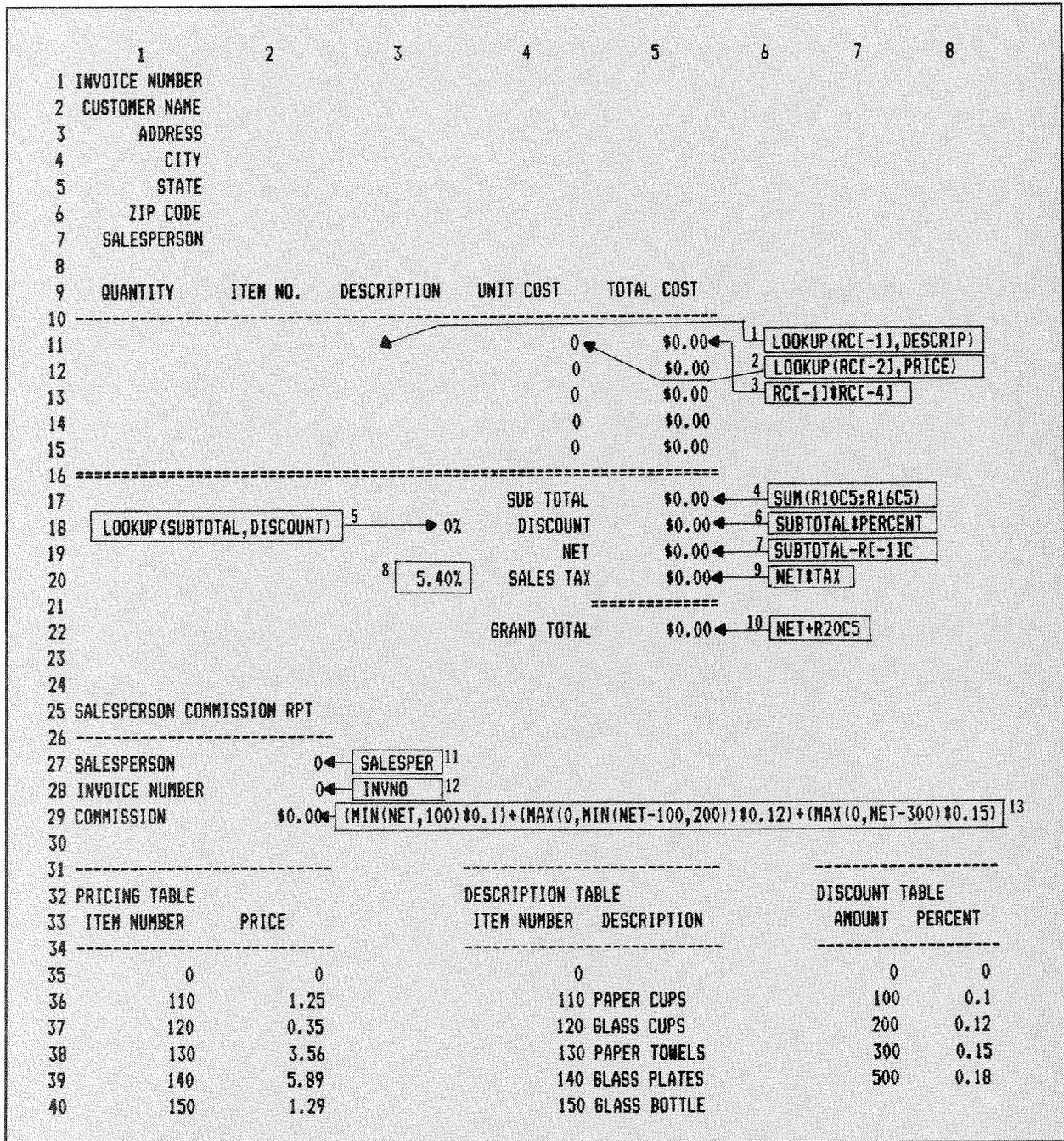


Figure 2

,	comma-separates value to be looked up from table
PRICE	name of table
)	closes LOOKUP function
RETURN	enters the formula

Formula three, in the Total Cost column, multiplies Unit Cost by Quantity.

Place your cursor on R11C5, and type:

V	starts VALUE command
LEFT ARROW	moves cursor to Unit Cost and displays RC[-1]
*	multiplies
LEFT ARROW LEFT ARROW LEFT ARROW LEFT ARROW	moves cursor to Quantity, and displays RC[-4]
RETURN	enters the formula

Your next operation will be to copy the formulas just entered in row 11 down through row 15 in the appropriate columns.

Place your cursor on R11C3, and type:

C	starts COPY command
F	selects FROM option and displays R11C3, first cell to copy
:	colon-indicates from-to
R11C5	last cell to copy
(TAB)	moves cursor to TO CELLS: and displays R11C3, first cell to copy to
:	colon-indicates from-to
R15C3	last cell to be copied into
RETURN	executes the command

1 EXERCISE

Formula four, to the immediate right of Sub Total, adds the values in the Total Cost column between the single dashed and double dashed line.

Place your cursor on R17C5, and type:

V	starts VALUE command
SUM(	adds values in the following list
R10C5	first entry in list
:	colon-indicates from-to
R16C5	last entry in list
)	closes the list
RETURN	enters the formula

Formula five, to the immediate left of Discount, looks up the Sub Total amount in the Discount Table and displays the appropriate discount in a percentage format.

Place your cursor on R18C3, and type:

V	starts VALUE command
LOOKUP(	starts LOOKUP function
SUBTOTAL	name of cell containing value to look up
,	comma-separates value from table
DISCOUNT	table name
)	closes LOOKUP function
RETURN	enters the formula

Next operation is to format the cell to display the value in a percent format.

Leave your cursor on R18C3, and type:

F	starts FORMAT command
C	selects CELL option
{TAB} {TAB}	moves cursor to FORMAT CODE: options

% selects PERCENT SIGN option

RETURN executes the command

Formula six, to the immediate right of Discount, multiplies Discount percentage by Sub Total amount.

Place your cursor on R18C5, and type:

V starts VALUE command

SUBTOTAL name of cell

* multiplies

PERCENT cell name containing percentage amount

RETURN enters the formula

Formula seven, to the immediate right of Net, subtracts Sub Total from Discount amount.

Place your cursor on R19C5, and type:

V starts VALUE command

SUBTOTAL name of cell

- subtracts

UP ARROW moves cursor to Discount amount and displays R(-1)

RETURN enters the formula

Formula eight, to the immediate left of Sales Tax, enters the sales tax percentage, and displays it in a percentage format.

Place your cursor on R20C3, and type:

.054 sales tax percentage

RETURN enters the value

F starts FORMAT command

C selects CELLS option

[TAB] [TAB] moves cursor to FORMAT CODE: options

% selects PERCENT SIGN option

1 EXERCISE

(TAB) moves cursor to # OF DECIMALS:
2 number of decimal places to display
RETURN executes the command

Formula nine, to the immediate right of Sales Tax, multiplies NET amount by the sales tax percentage.

Place your cursor on R20C5, and type:

V starts VALUE command
NET name of cell
* multiplies
TAX name of cell
RETURN executes the command

Formula ten, to the immediate right of Grand Total, adds the Net amount to the Sales Tax.

Place your cursor on R22C5, and type:

V starts VALUE command
NET name of cell
+ adds
R20C5 cell containing Sales Tax amount
RETURN enters the formula

Formula eleven, to the immediate right of Salesperson, on row 27, displays the Salesperson's name which is entered on row 7.

Place your cursor on R27C2, and type:

V starts VALUE command
SALESPER cell name containing
Salesperson's name
RETURN enters the formula

Formula twelve, to the immediate right of Invoice Number on line 28, displays the Invoice number which is entered on row 1.

Place your cursor on R28C2, and type:

V	starts VALUE command
INVNO	cell name containing Invoice Number
RETURN	enters the formula

Formula thirteen, to the immediately right of Commission on row 29, calculates the sales commission by determining the net value against a set of graduated values, then multiplying the net value by the appropriate commission percentages. Commission rates used in this example are: 10 percent on the first \$100, 12 percent on the next \$200, and 15 percent on amounts over \$300. The commission amount will be displayed in a dollar and cent format.

Place your cursor on R29C2, and type:

(	opens expression
MIN(	selects minimum value of the following list
NET	cell name containing Net value
,	comma-separates values in list
100	value
)	closes list
*	multiplies
.10	percent amount
)	closes expression
+	adds
(	opens expression
MAX(	selects maximum value of the following list
0	value
,	comma-separates values in list

1 EXERCISE

MIN(	selects minimum value of the following list
NET	cell name containing net value
—	subtracts
100	value
,	comma-separates values in list
200	value
)	closes second list
)	closes first list
*	multiplies
.12	percent amount
)	closes expression
+	adds
(	opens expression
MAX(	selects maximum value in the following list
0	value
,	comma-separates values in list
NET	cell name containing Net value
—	subtracts
300	value
)	closes list
*	multiplies
.15	percent amount
)	closes expression
RETURN	enters the formula
F	starts FORMAT command
C	selects CELLS option

[TAB] [TAB]	moves cursor to FORMAT CODE: options
\$	selects DOLLAR SIGN option
RETURN	executes the command

Your invoice worksheet is now ready for invoice entries, as illustrated in Figure 3.

You may wish to print the entire worksheet for filing or distribution.

Place your cursor on any location and type:

P	starts PRINT command
RETURN	executes the command

You may also wish to print only a portion of the worksheet, so as not to show the work area or tables, or for other practical reasons.

Place your cursor on any cell and type:

P	starts PRINT command
O	selects OPTIONS option
R1C1	upper left-hand corner of worksheet to be printed
:	colon-indicates from-to
R29C5	lower right-hand corner of worksheet to be printed
RETURN	prepares for another option selection
P	selects PRINT option, and prints

1 EXERCISE

1	2	3	4	5	6	7	8
1	INVOICE NUMBER	100					
2	CUSTOMER NAME	TYLER					
3	ADDRESS	12 SW OAK					
4	CITY	PORTLAND					
5	STATE	OREGON					
6	ZIP CODE	97232					
7	SALESPERSON	TIFFANY					
8							
9	QUANTITY	ITEM NO.	DESCRIPTION	UNIT COST	TOTAL COST		
10	-----						
11	50	120	GLASS CUPS	0.35	\$17.50		
12	250	110	PAPER CUPS	1.25	\$312.50		
13				0	\$0.00		
14				0	\$0.00		
15				0	\$0.00		
16	=====						
17				SUB TOTAL	\$330.00		
18			15%	DISCOUNT	\$49.50		
19				NET	\$280.50		
20			5.40%	SALES TAX	\$15.15		
21	=====						
22				GRAND TOTAL	\$295.65		
23							
24							
25	SALESPERSON COMMISSION RPT						
26	-----						
27	SALESPERSON	TIFFANY					
28	INVOICE NUMBER	100					
29	COMMISSION	\$31.66					
30							
31	-----						
32	PRICING TABLE		DESCRIPTION TABLE		DISCOUNT TABLE		
33	ITEM NUMBER	PRICE	ITEM NUMBER	DESCRIPTION	AMOUNT	PERCENT	
34	-----						
35	0	0	0		0	0	
36	110	1.25	110	PAPER CUPS	100	0.1	
37	120	0.35	120	GLASS CUPS	200	0.12	
38	130	3.56	130	PAPER TOWELS	300	0.15	
39	140	5.89	140	GLASS PLATES	500	0.18	
40	150	1.29	150	GLASS BOTTLE			

Figure 3

ACCOUNTS RECEIVABLE**DESCRIPTION**

This exercise is an accounts receivable ageing worksheet, which allows you to age your accounts receivable over 30, 60 or 90 days, or more. At the end of each month, you update the worksheet, which allows you to accumulate all bills owing over 90 days.

OPERATIONS PERFORMED

Setting Up The Worksheet Format

Naming Cells

Entering Mathematical Formulas

Making Worksheet Entries

Updating The Worksheet

FUNCTIONS USED

SUM

COMMANDS USED

ALPHA
BLANK
COPY
EDIT
FORMAT
LOCK
NAME
PRINT
TRANSFER
VALUE
XTERNAL

2 EXERCISE

SETTING UP WORKSHEET FORMAT

Using the following directions, set up your worksheet by copying Figure 1 exactly as it is illustrated, retaining exact row and column locations of all information.

NOTE

Before starting any command, you must have displayed on the bottom of the screen the COMMAND: descriptions. If you do not, just press the escape key and it will clear whatever is being done and display the COMMAND: descriptions.

	1	2	3	4	5	6	7	8
1	CUSTOMER	CURRENT	OVER 30	OVER 60	OVER 90	TOTAL	WORK AREA	
2	NAME	BILLING	DAYS	DAYS	DAYS	DUE	OLD 60	OLD 90
3	-----							
4								
5								
6								
7								
8								
9								
10								
11								
12	=====							

Figure 1

The Multiplan worksheet format contains columns of ten characters wide when it is first entered into the computer. In this exercise, however, you will need to expand column 1 to 14 characters wide to accommodate label information.

Place your cursor on column 1 and type:

- F starts FORMAT command
- W selects WIDTH option
- 14 number of characters in the column
- RETURN executes the command

The next operation is to type in your column labels.

NOTE

Before typing in labels, you must first type:

A starts ALPHA command, which prepares the cell for labeling information

Then type in the label.

RETURN enters label

Labels are automatically left-justified in the column.

To enter a numeric value, just type the number and RETURN.

Numbers are automatically right-justified in the column.

NOTE

After typing in your label, you may enter the label by moving the cursor to the next typing location, and the label will be entered and left-justified. The location the cursor is on will be ready for Alpha information.

To center the labels you have typed on rows 1 and 2, leave your cursor on any location and type:

F	starts FORMAT command
C	selects CELL options
R1C1	first cell to format from
:	colon-indicates from-to
R2C8	last cell to format to
(TAB)	moves cursor to ALIGNMENT:
C	selects CTR (center) option
RETURN	executes the command

2 EXERCISE

Now let's put the dashed line across row 3.

First place your cursor on R3C1, and type:

A	starts ALPHA command
-----	14 single dashes
RETURN	enters the dashes

Now copy the dashes just entered in R3C1, using the COPY command.

Leave your cursor on R3C1, and type:

C	starts COPY command
R	selects RIGHT option
7	number of cells to copy into
RETURN	executes the command

The dashed line will now appear extended across the number of columns you have indicated. To enter a double-dashed line on row 12, repeat the operation above, but just exchange the single dash (-) for the double dash (=).

Now we want to format the columns to display their amounts in dollars and cents.

Leave your cursor on any cell, and type:

F	starts FORMAT command
C	selects CELLS option
R4C2	first cell to format from
:	colon-indicates from-to
R13C6	last cell to format to
[TAB] [TAB]	moves cursor to FORMAT CODE: options
\$	selects DOLLAR SIGN option
RETURN	executes the command

NAMING CELLS

Now that the labels are typed in and the worksheet is formatted, we will need to name some of the cells and groups of cells to make it easier when using them in formulas and when updating.

First group of cells to be named is Current Billing and Over 30 Days columns between the single and double dash line.

Place your cursor on R4C2, and type:

N	starts NAME command
CURRENT	name of cells
[TAB]	moves cursor to TO REFER TO: and displays R4C2, first cell to be named
:	colon-indicates from-to
R11C3	last cell in column to be named
RETURN	executes the command

The second group of cells to be named is the Over 60 Days column and Over 90 Days columns between the single and double dash line.

Place your cursor on R4C4, and type:

N	starts NAME command
OVER60	name of cells
[TAB]	moves cursor to TO REFER TO: and displays R4C4, first cell to be named
:	colon-indicates from-to
R11C5	last cell in columns to be named
RETURN	executes the command

2 EXERCISE

ENTERING MATHEMATICAL FORMULAS

You will now begin entering mathematical formulas that will establish the relationship between column and row positions. The formulas and their locations are illustrated in Figure 2.

	1	2	3	4	5	6	7	8
1	CUSTOMER	CURRENT	OVER 30	OVER 60	OVER 90	TOTAL	WORK AREA	
2	NAME	BILLING	DAYS	DAYS	DAYS	DUE	OLD 60	OLD 90
3	-----							
4		2	RC[+2]+RC[+3]		\$0.00	\$0.00	3 SUM(RC[-1];RC[-4])	
5					\$0.00	\$0.00		
6					\$0.00	\$0.00		
7					\$0.00	\$0.00		
8					\$0.00	\$0.00		
9					\$0.00	\$0.00		
10					\$0.00	\$0.00		
11					\$0.00	\$0.00		
12	=====							
13		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00		
14	SUM(RC[-1];RC[-10])							

Figure 2

Formula one, at the bottom of Current Billing column, adds the amount of the Current Billing between the double dash and single dash line.

NOTE

We include within the formula the double dash and single dash lines so that later, when we add or delete lines between them, the formulas will expand or contract properly to include the new rows.

Place your cursor on R13C2, and type:

V

starts VALUE command, which prepares the cell for a numeric value or formula

SUM(

adds values in the following list

UP ARROW moves cursor to double dashed line
and displays R(-1)C

: colon-indicates from-to

UP ARROW
UP ARROW

moves cursor to single dashed line
and displays R(-10)C

) closes the list

RETURN enters the formula

The next operation is to copy the formula just entered across the row in columns Over 30 Days, Over 60 Days, Over 90 Days, and Total Due.

Leave your cursor on R13C2, and type:

C starts COPY command

R selects RIGHT option

4 number of cells to copy across

RETURN executes the command

Formula two, in the Over 90 Day column, adds the amounts in Work Area: Old 60 and Old 90.

Place your cursor on R4C5, and type:

V starts VALUE command

RIGHT ARROW
RIGHT ARROW

moves cursor to Old 60 and
displays RC(+2)

+ adds

RIGHT ARROW
RIGHT ARROW
RIGHT ARROW

moves cursor to Old 90 and
displays RC(+3)

RETURN enters the formula

2 EXERCISE

Formula three, in the Total Due column, adds the Current Billing, Over 30 Days, Over 60 Days and Over 90 Days columns.

Place your cursor on R4C6, and type:

V	starts VALUE command
SUM(	adds values in the following list
LEFT ARROW	moves cursor to Over 90 Days and displays RC[-1]
:	colon-indicates from-to
LEFT ARROW	
LEFT ARROW	
LEFT ARROW	
LEFT ARROW	moves cursor to Current Billing and displays RC[-4]
)	closes the list
RETURN	enters the formula

The next operation will be to copy the formulas just entered down the appropriate columns.

Place your cursor on R4C5, and type:

C	starts COPY command
F	selects FROM option and displays R4C5, first cell to copy
:	colon-indicates from-to
R4C6	last cell to copy
(TAB)	moves cursor to TO CELLS: and displays R4C5, first cell to copy to
:	colon-indicates from-to
R11C5	last cell to copy to
RETURN	enters the formula

Now that the formulas and labels have been entered in the appropriate columns, we will want to lock them so that someone doing input to the worksheet won't accidentally type into their locations and wipe them out.

Next operation is to lock all the formulas and labels on the worksheet.

Leave your cursor on any cell, and type:

- L starts LOCK command
- F selects FORMULA option
- Y to confirm

MAKING WORKSHEET ENTRIES

Your Accounts Receivable worksheet is now set up. Once a month, all you have to do is perform the update process, described in the next section, and make current billing entries. To perform the following series of exercises, type in the entries illustrated in Figure 3. For this example, entries have been selected to illustrate a worksheet in operation more than 90 days.

NOTE

The amount to be displayed in Over 90 Days column has to be typed into the Work Area column Old 60 or Old 90. It will then be displayed by the formula in the Over 90 Day column.

	1	2	3	4	5	6	7	8
	CUSTOMER	CURRENT	OVER 30	OVER 60	OVER 90	TOTAL	WORK AREA	
	NAME	BILLING	DAY	DAYS	DAYS	DUE	OLD 60	OLD 90
4	TYLER & CO	\$120.00	\$200.00	\$100.00	\$400.00	\$820.00		400
5	TIFFANY'S	\$300.00		\$500.00	\$0.00	\$800.00		
6	RK WILLIAMS	\$450.00			\$0.00	\$450.00		
7	ESTELLE CO	\$9000.00	\$450.00	\$2000.00	\$0.00	\$11450.00		
8					\$0.00	\$0.00		
9					\$0.00	\$0.00		
10					\$0.00	\$0.00		
11					\$0.00	\$0.00		
12	=====							
13		\$9870.00	\$650.00	\$2600.00	\$400.00	\$13520.00		

Figure 3

WORKSHEET UPDATING

To perform the updating process, you will first save the worksheet onto disk. Then we will blank Current Billing, Over 30 Days and Over 60 Days columns on the worksheet and move the various columns, which we named earlier, back onto the worksheet into the appropriate updating columns. We will move Current Billing into Over 30 Days column, and the Over 30 Days into the Over 60 Days column. Then we will move the Over 60 Days and Over 90 Days columns into the Work Area: Old 60 and Old 90 columns, which will allow the accumulation of amounts in the Work Area to be displayed in the Over 90 Days column.

The worksheet, after being updated, is illustrated in Figure 4.

1	2	3	4	5	6	7	8
CUSTOMER	CURRENT	OVER 30	OVER 60	OVER 90	TOTAL	WORK AREA	
NAME	BILLING	DAYS	DAYS	DAYS	DUE	OLD 60	OLD 90
4 TYLER & CO		\$120.00	\$200.00	\$500.00	\$820.00	100	400
5 TIFFANY'S		\$300.00		\$500.00	\$800.00	500	0
6 RK WILLIAMS		\$450.00		\$0.00	\$450.00		0
7 ESTELLE CO		\$9000.00	\$450.00	\$2000.00	\$11450.00	2000	0
8				\$0.00	\$0.00		0
9				\$0.00	\$0.00		0
10				\$0.00	\$0.00		0
11				\$0.00	\$0.00		0
12	=====						
13	\$0.00	\$9870.00	\$650.00	\$3000.00	\$13520.00		

Figure 4

First operation, after values have been entered, will be to save the entire worksheet onto disk.

NOTE

For the following operations, we will assume the user to be using the default disk drive on the computer.

Leave your cursor on any cell and type:

T starts TRANSFER command

S	selects SAVE option
RECEIVE	filename
RETURN	executes the command

Now we will need to blank the Current Billing, Over 30 Days, Over 60 Days, Old 60 and Old 90 columns between the single dash and double dash lines.

Place your cursor on R4C2, and type:

B	starts BLANK command and displays R4C2, first cell in group to be blanked
:	colon-indicates from-to
R11C4	last cell in group to be blanked
,	comma-separates groups
R4C7	first cell in group to be blanked
:	colon-indicates from-to
R11C8	last cell in group to be blanked
RETURN	executes the command

Next operation will be to move the individual named columns from disk into the appropriate updating columns on the worksheet.

The first columns to update will be Over 30 Days and Over 60 Days.

Place your cursor on R4C3, and type:

X	starts XTERNAL command
C	selects COPY option
RECEIVE	filename
[TAB]	moves cursor to NAME:
CURRENT	name of cells
[TAB] [TAB]	moves cursor to LINKED:
N	selects NO option
RETURN	executes the command

2 EXERCISE

The second columns to update will be Work Area columns, Old 60 and Old 90.

Place your cursor on R4C7, and type:

X	starts XTERNAL command
C	selects COPY option
RECEIVE	filename
{TAB}	moves cursor to NAME:
OVER60	name of cells
{TAB} {TAB}	moves cursor to LINKED:
N	selects NO option
RETURN	executes the command

Now your worksheet is updated and is ready for the new current billing amounts.

MAKING MONTHLY WORKSHEET ENTRIES

Monthly worksheet entries will take one of two forms: payments and current billings.

To make current billing entries, type them directly into the Current Billings column.

To make payment entry into the Over 30 Days or the Over 60 Days columns, place your cursor on the amount you wish to deduct from, and type:

E	starts EDIT command and displays the amount
—	subtracts

Type in payment amount.

RETURN	executes the command and displays the new amount
--------	-----------------------------------------------------

To make a payment entry into the Over 90 Days column, place your cursor on the appropriate amount in the Work Area and use the EDIT command, as described above.

You may wish to print the entire worksheet for filing or distribution.

Place your cursor on any location and type:

P starts PRINT command

RETURN executes the command

You may also wish to print only a portion of the worksheet, so as not to show the work area or tables, or for other practical reasons.

Place your cursor on any cell and type:

P starts PRINT command

O selects OPTIONS option

R1C1 upper left-hand corner of worksheet
to be printed

: colon-indicates from-to

R13C6 lower right-hand corner of worksheet
to be printed

RETURN prepares for another option
selection

P selects PRINT option, and prints

COST RECOVERY**DESCRIPTION**

This exercise is a cost recovery worksheet, which is set up to determine the investment balance still owing on a purchased item. Once a month the worksheet is updated with rental income received, which reduces the original purchase balance. After the balance has been recovered, we then report the profit being made on the item. We also record the number of months the item has been in service.

OPERATIONS PERFORMED

Setting Up The Worksheet Format

Naming Cells

Entering Mathematical Formulas

Making Worksheet Entries

Updating The Worksheet

FUNCTIONS USED

ABS
MAX
MIN
SUM

COMMANDS USED

ALPHA
BLANK
COPY
FORMAT
LOCK
NAME
PRINT
TRANSFER
XTERNAL
VALUE

3 EXERCISE

SETTING UP WORKSHEET FORMAT

Using the following directions, set up your worksheet by copying Figure 1 exactly as it is illustrated, retaining exact row and column locations of all information.

	1	2	3	4	5	6	7	8	9
1	ITEM	PURCHASE	RENT	INVEST	MTHS IN	PROFIT	WORK AREA		
2	NAME	PRICE	REC'D	BALANCE	SERVICE	MARGIN	BALANCE	SERVICE	MARGIN
3	-----								
4									
5									
6									
7									
8									
9									
10									
11	-----								

Figure 1

NOTE

Before starting any command, you must have displayed on the bottom of the screen the COMMAND: descriptions. If you do not, just press the escape key and it will clear whatever is being done and display the COMMAND: descriptions.

The Multiplan worksheet format contains columns of ten characters wide when it is first entered into the computer. In this exercise, however, you will need to expand column 1 to 14 characters wide, and contract column 5 to 7 characters wide to accommodate their labeling information.

Place your cursor on column 1 and type:

- | | |
|--------|------------------------------------|
| F | starts FORMAT command |
| W | selects WIDTH option |
| 14 | number of characters in the column |
| RETURN | executes the command |

Now place your cursor on column 5 and type:

F	starts FORMAT command
W	selects WIDTH option
7	number of characters in the column
RETURN	executes the command

The next operation is to type in your row and column labels.

NOTE

Before typing in labels, you must first type:

A	starts ALPHA command, which prepares the cell for labeling information
---	------------------------------------------------------------------------

Then type in the label.

RETURN	enters label
--------	--------------

Labels are automatically left-justified in the column.

To enter a numeric value, just type the number and RETURN.

Numbers are automatically right-justified in the column.

NOTE

After typing in your label, you may enter the label by moving the cursor to the next typing location, and the label will be entered and left-justified. The location the cursor is on will be ready for Alpha information.

To center the labels you have typed on rows 1 and 2, leave your cursor on any location and type:

F	starts FORMAT command
C	selects CELL options

3 EXERCISE

R1C1	first cell to format from
:	colon-indicates from-to
R2C9	last cell to format to
(TAB)	moves cursor to ALIGNMENT:
C	selects CTR (center) option
RETURN	executes the command

Now let's put the dashed line across row 3.

First place your cursor on R3C1, and type:

A	starts ALPHA command
-----	14 dashes
RETURN	enters the dashes

Now copy the dashes just entered in R3C1, using the COPY command.

Leave your cursor on R3C1, and type:

C	starts COPY command
R	selects RIGHT option
8	number of cells to copy into
RETURN	executes the command

The dashed line will now appear extended across the number of columns you have indicated. To enter a double-dashed line on row 11, repeat the operation above, but just exchange the symbol - (dash sign) for the = (equal sign).

Now we want to format the columns to display their amounts in dollars and cents.

Leave your cursor on R4C2, and type:

F	starts FORMAT command
C	selects CELLS option and displays R4C2, first cell to format from
:	colon-indicates from-to
R12C6	last cell to format to

(TAB) (TAB) moves cursor to FORMAT CODE:
options

\$ selects DOLLAR SIGN option

RETURN executes the command

Next operation will be to format Mths In Service column to read its value as an integer.

Place your cursor on R4C5, and type:

F starts FORMAT command

C selects CELLS option
and displays R4C5, first
cell to format from

:

R12C5 last cell to format to

(TAB) (TAB) moves cursor to FORMAT CODE:
options

I selects INT option, and
displays amount as an integer

RETURN executes the command

NAMING CELLS

Now that the labels are typed in and the worksheet is formatted, we will need to name some of the cells and groups of cells to make it easier when using them in formulas and in updating the worksheet.

The group of cells to be named is in the Invest Balance, Mths In Service and Profit Margin columns.

Place your cursor on R4C4, and type:

N starts NAME command

UPDATE name of cells

(TAB) moves cursor to TO REFER TO:
and displays R4C4, first cell in
column to be named

:

3 EXERCISE

R10C6

last cell in column to be named

RETURN

executes the command

ENTERING MATHEMATICAL FORMULAS

You will now begin entering mathematical formulas that will establish the relationships between column and row positions. The formulas and their locations are illustrated in Figure 2.

1	2	3	4	5	6	7	8	9	10	11
1	ITEM	PURCHASE	RENT	INVEST	MTHS IN	PROFIT	WORK AREA			
2	NAME	PRICE	REC'D	BALANCE	SERVICE	MARGIN	BALANCE	SERVICE	MARGIN	
3	-----									
4				\$0.00	1	\$0.00	0	MAX(0,RC[+3]-RC[-1]) ²		
5				\$0.00	1	\$0.00	0	1+RC[+3] ³		
6				\$0.00	1	\$0.00	0	ABS(MIN(0,RC[+1]-RC[-3]))+RC[+3] ⁴		
7				\$0.00	1	\$0.00	0	RC[-5] ⁵		
8				\$0.00	1	\$0.00	0			
9				\$0.00	1	\$0.00	0			
10				\$0.00	1	\$0.00	0			
11	-----									
12		\$0.00	\$0.00	\$0.00		\$0.00				
13	SUM(RC[-1]C:RC[-9]C) ¹									
14										
15										
16										

Figure 2

NOTE

We include within the formula the double dash and single dash lines so that later, when we add or delete lines between them, the formulas will expand or contract properly to include the new rows.

Formula one, at the bottom of Purchase Price column, adds the amount of the purchase prices between the double dash and single dash line.

Place your cursor on R12C2, and type:

V	starts VALUE command, which prepares the cell for a numeric value or formula
SUM(	adds values in the following list
UP ARROW	moves cursor to double dash line and displays R(-1)C
:	colon-indicates from-to
UP ARROW	
UP ARROW	moves cursor to single dash line and displays R(-9)C
)	closes the list
RETURN	enters the formula

The next operation is to copy the formula just entered across the row in columns Rent Rec'd, Invest Balance, and Profit Margin.

Leave your cursor on R12C2, and type:

C	starts COPY command
F	selects FROM option
C	selects CELLS option and displays R12C2
[TAB]	moves cursor to TO CELLS: and displays R12C2, first cell in group to copy to
:	colon-indicates from-to
R12C4	last cell in group to copy to

3 EXERCISE

, comma-separates groups
R12C6 cell to copy to
RETURN enters the formula

Formula two, in the Invest Balance column, will provide a means for the Invest Balance column to display the unrecovered purchase cost of each item listed. When the full purchase cost of each piece of equipment is recovered, the Invest Balance column will display \$0.00 opposite that item.

Place your cursor on R4C4, and type:

V starts VALUE command
MAX(selects maximum value
in the following list
0 value
, comma-separates values in list
RIGHT ARROW
RIGHT ARROW
RIGHT ARROW moves cursor to Work Area: Balance
and displays RC(+3)
— subtracts
LEFT ARROW moves cursor to Rent Rec'd and
displays RC(-1)
) closes the list
RETURN enters the formula

Formula three, in the Mths In Service column, advances the months in service by one each time the updating operation is performed.

Place your cursor on R4C5, and type:

1 value
+ adds
RIGHT ARROW
RIGHT ARROW
RIGHT ARROW moves cursor to Work Area Service
and displays RC(+3)
RETURN enters the formula

Formula four, in the Profit Margin column, displays accumulated gross profits when purchase price of item has been recovered.

Place your cursor on R4C6, and type:

V	starts VALUE command
ABS(	displays amount as a positive number
MIN(	selects minimum value in the following list
0	value
,	comma-separates values in list
RIGHT ARROW	moves cursor to Work Area Balance and displays RC[+ 1]
—	subtracts
LEFT ARROW LEFT ARROW LEFT ARROW	moves cursor to Rent Rec'd and displays RC{-3}
))	closes expressions
+	adds
RIGHT ARROW RIGHT ARROW RIGHT ARROW	moves cursor to Work Area Margin and displays RC{-3}
RETURN	enters the formula

Formula five, in the Work Area Balance column, displays the original purchase price. This is only used when first setting up the worksheet. The formula will be automatically deleted when updated with the Investment Balance amount.

Place your cursor on R4C7, and type:

V	starts VALUE command
---	----------------------

3 EXERCISE

LEFT ARROW
LEFT ARROW
LEFT ARROW
LEFT ARROW
LEFT ARROW
LEFT ARROW

moves cursor to Purchase
Price and displays RC[-5]

RETURN enters the formula

The next operation will be to copy the formulas just entered down the appropriate columns.

Place your cursor on R4C4, and type:

C starts COPY command
F selects FROM option and displays R4C4, first cell to copy from
: colon-indicates from-to
R4C7 last cell to copy
(TAB) moves cursor to TO CELLS: and displays R4C4, first cell to copy into
: colon-indicates from-to
R10C4 last cell to copy into
RETURN enters the formula

Now that the formulas and labels have been entered in the appropriate columns, we will want to lock them so that someone doing input to the worksheet won't accidentally type into their locations and wipe them out.

Next operation is to lock all the formulas and labels on the worksheet.

Leave your cursor on any cell, and type:

L starts LOCK command
F selects FORMULA option
Y to confirm

Now that we have locked all the cells, we need to go back and unlock all the cells in the Work Area: Balance column, so that we can update it later.

Place your cursor on R4C7, and type:

L starts LOCK command
 C selects CELLS option
 and displays R4C7, first
 cell to unlock
 : colon-indicates from-to
 R10C7 last cell to unlock
 (TAB) moves cursor to STATUS
 options
 U selects UNLOCKED option
 RETURN executes the command

MAKING WORKSHEET ENTRIES

Your Cost Recovery worksheet is now set up. Once a month, all you have to do is perform the update process, described in the next section, and make current Rent Rec'd entries. To get your worksheet operational, type in the entries in the Item Name, Purchase Price and Rent Rec'd columns in Figure 3 exactly as they are illustrated.

	1	2	3	4	5	6	7	8	9
1	ITEM	PURCHASE	RENT	INVEST	MTHS IN	PROFIT	WORK AREA		
2	NAME	PRICE	REC'D	BALANCE	SERVICE	MARGIN	BALANCE	SERVICE	MARGIN
3	-----								
4	HAMMER	\$25.00	\$5.00	\$20.00	1	\$0.00	25		
5	SHOVEL	\$75.00	\$15.00	\$60.00	1	\$0.00	75		
6	TRAILER	\$1250.00	\$75.00	\$1175.00	1	\$0.00	1250		
7	BIKE	\$550.00	\$25.00	\$525.00	1	\$0.00	550		
8	TRUCK	\$5500.00	\$150.00	\$5350.00	1	\$0.00	5500		
9	MOTOR	\$125.00	\$8.00	\$117.00	1	\$0.00	125		
10	AX	\$125.00	\$5.00	\$120.00	1	\$0.00	125		
11	-----								
12		\$7650.00	\$283.00	\$7367.00		\$0.00			

Figure 3

3 EXERCISE

WORKSHEET UPDATING

To perform the updating process, you will first save the worksheet onto disk. Then we will blank the Rent Rec'd column on the worksheet and move the various columns which we named earlier back onto the worksheet into the appropriate updating columns. We will move Invest Balance, Mths In Service, and Profit Margin columns into the Work Area columns: Balance, Service and Margin, which will allow for the proper updating of the Invest Balance, Mths In Service and Profit Margin.

The worksheet, after being updated, is illustrated in Figure 4.

	1	2	3	4	5	6	7	8	9
1	ITEM	PURCHASE	RENT	INVEST	MTHS IN	PROFIT	WORK AREA		
2	NAME	PRICE	REC'D	BALANCE	SERVICE	MARGIN	BALANCE	SERVICE	MARGIN
3	-----								
4	HAMMER	\$25.00		\$20.00	2	\$0.00	20	1	0
5	SHOVEL	\$75.00		\$60.00	2	\$0.00	60	1	0
6	TRAILER	\$1250.00		\$1175.00	2	\$0.00	1175	1	0
7	BIKE	\$550.00		\$525.00	2	\$0.00	525	1	0
8	TRUCK	\$5500.00		\$5350.00	2	\$0.00	5350	1	0
9	MOTOR	\$125.00		\$117.00	2	\$0.00	117	1	0
10	AX	\$125.00		\$120.00	2	\$0.00	120	1	0
11	-----								
12		\$7650.00	\$0.00	\$7367.00		\$0.00			

Figure 4

First operation will be to save the entire worksheet onto disk.

NOTE

For the following operations, we will assume the user to be using the default disk drive on the computer.

Leave your cursor on any cell and type:

- T starts TRANSFER command
- S selects SAVE option

RENTAL	filename
RETURN	executes the command

Now we will need to blank the Rent Rec'd and the Work Area: Balance columns between the single dash and double dash lines.

Place your cursor on R4C3, and type:

B	starts BLANK command and displays R4C3, first cell in group to be blanked
:	colon-indicates from-to
R10C3	last cell in group to be blanked
,	comma-separates groups
R4C7	first cell in group to be blanked
:	colon-indicates from-to
R10C7	last cell in group to be blanked
RETURN	executes the command

Next operation will be to move the named columns from disk into the appropriate updating columns on the worksheet.

The Work Area columns will be updated.

Place your cursor on R4C7, and type:

X	starts XTERNAL command
C	selects COPY option
RENTAL	filename
[TAB]	moves cursor to NAME:
UPDATE	name of cells
[TAB] [TAB]	moves cursor to LINKED:
N	selects NO option
RETURN	executes the command

Now your worksheet is updated and is ready for the new Rent Received amounts, as illustrated in Figure 5.

3 EXERCISE

1	2	3	4	5	6	7	8	9	
1	ITEM	PURCHASE	RENT	INVEST	MTHS IN	PROFIT	WORK AREA		
2	NAME	PRICE	REC'D	BALANCE	SERVICE	MARGIN	BALANCE	SERVICE	MARGIN
3									
4	HAMMER	\$25.00	\$21.00	\$0.00	2	\$1.00	20	1	0
5	SHOVEL	\$75.00	\$25.00	\$35.00	2	\$0.00	60	1	0
6	TRAILER	\$1250.00	\$100.00	\$1075.00	2	\$0.00	1175	1	0
7	BIKE	\$550.00	\$600.00	\$0.00	2	\$75.00	525	1	0
8	TRUCK	\$5500.00	\$225.00	\$5125.00	2	\$0.00	5350	1	0
9	MOTOR	\$125.00	\$135.00	\$0.00	2	\$18.00	117	1	0
10	AX	\$125.00	\$12.00	\$108.00	2	\$0.00	120	1	0
11									
12		\$7650.00	\$1118.00	\$6343.00		\$94.00			

Figure 5

You may wish to print the entire worksheet for filing or distribution.

Place your cursor on any location and type:

P starts PRINT command

RETURN executes the command

You may also wish to print only a portion of the worksheet, so as not to show the work area or tables, or for other practical reasons.

Place your cursor on any cell and type:

P starts PRINT command

O selects OPTIONS option

R1C1 upper left-hand corner of worksheet to be printed

:

colon-indicates from-to

R12C6 lower right-hand corner of worksheet to be printed

RETURN prepares for another option selection

P selects PRINT option, and prints

CHECKBOOK LEDGER**DESCRIPTION**

This exercise is a checkbook ledger worksheet which totals the posted amounts to determine the amount of a check, and determines the checkbook balance amount. It then calculates cash on hand in the checking and savings accounts, and once a month the worksheet is updated to allow for the year-to-date totalling of deposits, checks written, and monthly balance.

OPERATIONS PERFORMED

Setting Up The Worksheet Format

Naming Cells

Entering Mathematical Formulas

Making Worksheet Entries

Updating The Worksheet

FUNCTIONS USED

IF
SUM

COMMANDS USED

ALPHA
BLANK
COPY
FORMAT
LOCK
NAME
PRINT
TRANSFER
VALUE
XTERNAL

5 number of characters in the column

RETURN executes the command

Now place your cursor on column 3 and type:

F starts FORMAT command

W selects WIDTH option

14 number of characters in
the column

RETURN executes the command

The next operation is to type in your row and column labels.

NOTE

Before typing in labels, you must first type:

A starts ALPHA command, which
prepares the cell for labeling
information

Then type in the label.

RETURN enters label

Labels are automatically left justified in the column.

If a label is wider than the column, this is no problem because Multiplan lets the label expand across as many cells as needed to display the entire label with the FORMAT CONTINUOUS option.

To demonstrate this capability with the label in row 1,

Place your cursor on R1C1, and type:

A starts ALPHA command

Then type in the label.

RETURN enters the label

Leave your cursor on R1C1, and type:

F starts FORMAT command

C selects CELLS option
and displays R1C1, first
cell to be continuous

4 EXERCISE

:	colon-indicates from-to
R1C3	last cell to be continuous
[TAB] [TAB]	moves cursor to FORMAT CODE: options
C	selects CONT (continuous) option
RETURN	executes the command

NOTE

To enter a numeric value, just type the number and RETURN.
Numbers are automatically right-justified in the column.

NOTE

After typing in a label, you may enter the label by moving the cursor to the next typing location, and the label will be entered and left-justified. The location the cursor is on will be ready for Alpha information.

Now let's put the dash line across row 2.

First place your cursor on R2C1, and type:

A	starts ALPHA command
-----	14 dashes
RETURN	enters the dashes

Now copy the dashes just entered in R2C1, using the COPY command.

Leave your cursor on R2C1, and type:

C	starts COPY command
R	selects RIGHT option
11	number of cells to copy into
RETURN	executes the command

The dashed line will now appear extended across the number of columns you have indicated. To enter a double-dashed line on row 14, repeat the operation above, but just exchange the single dash (-) for the double dash (=).

To center the labels you have typed on rows 3 and 4, leave your cursor on any location and type:

F	starts FORMAT command
C	selects CELL options
R3C1	first cell to format from
:	colon-indicates from-to
R4C12	last cell to format to
(TAB)	moves cursor to ALIGNMENT:
C	selects CTR (center) option
RETURN	executes the command

Now we want to format some of the columns to display their amounts in dollars and cents.

Place your cursor on R1C4, and type:

F	starts FORMAT command
C	selects CELLS option and displays R1C4, first cell in group to format
:	colon-indicates from-to
R1C12	last cell in group to format
,	comma-separates groups
R6C4	first cell in group to format
:	colon-indicates from-to
R16C12	last cell in group to format
(TAB) (TAB)	moves cursor to FORMAT CODE: options
\$	selects DOLLAR SIGN option
RETURN	executes the command

NAMING CELLS

Now that the labels are typed in and the worksheet is formatted, we will need to name some of the cells and groups of cells to make it easier when using them in formulas and updating.

The cell to be named is in the Check Book Balance column above the first dashed line.

Place your cursor on R1C6 and type:

N	starts NAME command
YTDAMT	name of cell
RETURN	executes the command

The first group of cells to be named is in row 16 between Deposit and Misc columns.

Place your cursor on R16C4, and type:

N	starts NAME command
YTD	name of cells
(TAB)	moves cursor to TO REFER TO: and displays R16C4, first cell in row to be named
:	colon-indicates from-to
R16C12	last cell in row to be named
RETURN	executes the command

The second group of cells to be named is Last Month's YTD Total: row, Date through Deposit and Rent through Misc columns, between the single dash and the double dash lines.

Place your cursor on R6C1, and type:

N	starts NAME command
NEW	name of cells
(TAB)	moves cursor to TO REFER TO:
R1C4	first cell in group to be named
:	colon-indicates from-to

R1C12 last cell in group to be named
 , comma-separates groups to be named
 R6C1 first cell in group to be named
 : colon-indicates from-to
 R13C4 last cell in group to be named
 , comma-separates groups to be named
 R6C9 first cell in group to be named
 : colon-indicates from-to
 R13C12 last cell in group to be named
 RETURN executes the command

ENTERING MATHEMATICAL FORMULAS

You will now begin entering mathematical formulas that will establish the relationships between column and row positions. The formulas and their locations are illustrated in Figure 2.

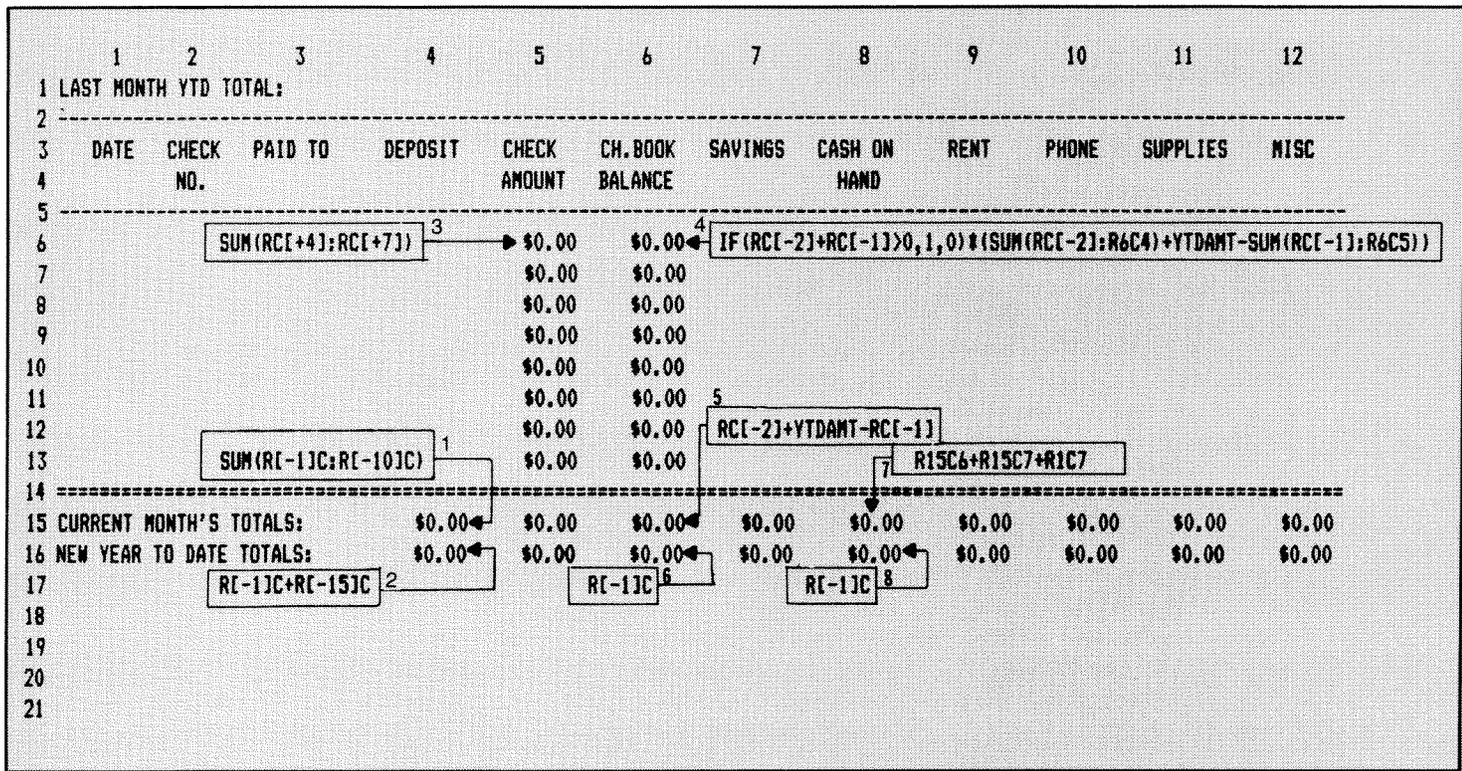


Figure 2

4 EXERCISE

Formula one, at the bottom of Deposit column, adds the amount of the deposit between the double dash and single dash line.

NOTE

We include within the formula the double dash and single dash lines so that later, when we add or delete lines between them, the formulas will expand or contract properly to include the new rows.

Place your cursor on R15C4, and type:

V	starts VALUE command, which prepares the cell for a numeric value or formula
SUM(	adds values in the following list
UP ARROW	moves cursor to double dash line and displays R[-1]C
:	colon-indicates from-to
UP ARROW	
UP ARROW	moves cursor to single dash line and displays R[-10]C
)	closes the list
RETURN	enters the formula

Formula two, in the Deposit column immediately under the previous formula, adds Last Month's YTD Total in the Deposit column to the Current Month's Total in the same column to provide the New Year To Date Total.

Place your cursor on R16C4, and type:

V	starts VALUE command
UP ARROW	moves cursor to CURRENT MONTH'S TOTAL, and displays R[-1]C
+	adds

UP ARROW
 UP ARROW

moves cursor to Last Month's
 YTD Total and displays R(-15)C

RETURN

enters the formula

The next operation is to copy the formulas just entered across the rows between Check Amount and Purchase.

Place your cursor on R15C4, and type:

C starts COPY command
 F selects FROM option and displays
 R15C4, first cell to copy from
 : colon-indicates from-to
 R16C4 last cell to copy
 (TAB) moves cursor to TO CELLS:
 and displays R15C4, first
 cell to copy into
 : colon-indicates from-to
 R15C12 last cell to copy into
 RETURN enters the formula

Formula three, in the Check Amount column, adds the amounts between Rent and Purchase columns.

Place your cursor on R6C5, and type:

V starts VALUE command
 SUM(adds values in the following list

4 EXERCISE

RIGHT ARROW
RIGHT ARROW
RIGHT ARROW
RIGHT ARROW

moves cursor to Rent and
displays RC(+ 4)

:

colon-indicates from-to

RIGHT ARROW
RIGHT ARROW
RIGHT ARROW
RIGHT ARROW
RIGHT ARROW
RIGHT ARROW

moves cursor to Misc and
displays RC(+ 7)

)

closes the list

RETURN

enters the formula

Formula four, in the Checkbook Balance column, determines the Ch. Book Balance. The first half of calculation in the formula uses the conditional expression IF to select the value 1 if an amount greater than 1 is listed in the Check Amount column, and zero if the value is zero or less than zero. The result of this calculation is used to enter zeros in rows where no entries have yet been made. The second half of the formula adds the Deposit listing to previous month's Ch. Book Balance and subtracts any Check Amount listed on that row. The resulting value is multiplied by the zero or the 1 selected in the first calculation. The result, displayed in the Ch. Book Balance column, will be the algebraic sum of the previous month's Ch. Book Balance plus new deposits, minus the Check Amount entry on that row or, on rows where no entries have been made, zero.

Place your cursor on R6C6, and type:

V

starts VALUE command

IF(

starts IF logic function

LEFT ARROW
LEFT ARROW

moves cursor to Deposit
and displays RC(-2)

+

adds

LEFT ARROW

moves cursor to Check Amount
and displays RC(-1)

>	LOGICAL OPERATOR, compares the first value against the second value, and results in the logic value of true or false
0	value to be compared against in the first expression
,	comma-separates expressions
1	second expression which will be selected if the first expression is true
,	comma-separates expressions
0	third expression which will be selected if the first expression is false
)	closes IF logic function
*	multiplies
(	opens numeric expression
SUM(	adds values in the following list
LEFT ARROW LEFT ARROW	moves cursor to Deposit and displays RC[-2]
:	colon-indicates from-to
LEFT ARROW LEFT ARROW	moves cursor to Deposit and displays RC[-2]
@	converts RC[-2] to an absolute reference and displays R6C4
)	closes the list
+	adds
YTDAMT	name of cell
—	subtracts
SUM(	adds values in the list
LEFT ARROW	moves cursor to Check Amount and displays RC[-1]

4 EXERCISE

:	colon-indicates from-to
LEFT ARROW	moves cursor to Check Amount and displays RC[-1]
@	converts RC[-1] to an absolute reference and displays R6C5
)	closes the list
RETURN	enters the formula

Your next operation will be to copy the formulas just entered down the appropriate columns.

Place your cursor on R6C5, and type:

C	starts COPY command
F	selects FROM option and displays R6C5, first cell to copy from
:	colon-indicates from-to
R6C6	last cell to copy
[TAB]	moves cursor to TO CELLS: and displays R6C5, first cell to copy into
:	colon-indicates from-to
R13C5	last cell to copy into
RETURN	enters the formula

Formula five, in the Ch. Book Balance column, first cell under the double dash line, calculates the Current Month's Totals for the check book balance.

Place your cursor on R15C6 and type:

V	starts VALUE command
LEFT ARROW LEFT ARROW	moves cursor to Deposit and displays RC[-2]
+	adds
YTDAMT	name of cell
—	subtracts

4 EXERCISE

Now that the formulas and labels have been entered in the appropriate columns, we will want to lock them so that someone doing input to the worksheet won't accidentally type into their locations and wipe them out.

Next operation is to lock all the formulas and labels on the worksheet.

Leave your cursor on any cell, and type:

L starts LOCK command
 F selects FORMULA option
 Y to confirm

MAKING WORKSHEET ENTRIES

You may now begin making entries in your worksheet to observe its operation. Sample entries are shown in Figure 3. You may use them if you wish, to check the operation of your worksheet against the illustration.

	1	2	3	4	5	6	7	8	9	10	11	12
1	LAST MONTH YTD TOTAL:											
2	-----											
3	DATE	CHECK	PAID TO	DEPOSIT	CHECK	CH. BOOK	SAVINGS	CASH ON	RENT	PHONE	SUPPLIES	MISC
4		NO.			AMOUNT	BALANCE		HAND				
5	-----											
6	JUN 20,82			\$5000.00	\$0.00	\$5000.00						
7	JUN 21,82	100	TYLER & CO		\$500.00	\$4500.00			\$500.00			
8	JUN 21,82	101	TIFFANY		\$350.00	\$4150.00						\$350.00
9	JUN 25,82	102	KAREN & CO		\$400.00	\$3750.00					\$400.00	
10	JUN 22,82			\$1000.00	\$0.00	\$4750.00						
11					\$0.00	\$0.00						
12					\$0.00	\$0.00						
13					\$0.00	\$0.00						
14	=====											
15	CURRENT MONTH'S TOTALS:			\$6000.00	\$1250.00	\$4750.00	\$0.00	\$4750.00	\$500.00	\$0.00	\$400.00	\$350.00
16	NEW YEAR TO DATE TOTALS:			\$6000.00	\$1250.00	\$4750.00	\$0.00	\$4750.00	\$500.00	\$0.00	\$400.00	\$350.00

Figure 3

WORKSHEET UPDATING

To perform the monthly updating process, you will first save the worksheet onto disk. Then we will blank the Date through Deposit columns and Rent through Purchase columns between the single and double dash lines. Then we will copy from disk the named cells back onto the worksheet into the appropriate updating columns. We will move New Year To Date Totals row into the Last Month's YTD Totals row.

First operation will be to save the entire worksheet onto disk.

NOTE

For the following operations, we will assume the user to be using the default disk drive on the computer.

Leave your cursor on any cell and type:

T	starts TRANSFER command
S	selects SAVE option
CHECK	filename
RETURN	executes the command

Second operation will be to blank the cells named NEW.

Place your cursor on any cell, and type:

B	starts BLANK command
NEW	name of cells
RETURN	executes the command

Next operation will be to move the named cells from disk into the appropriate updating row on the worksheet.

The Last Month's YTD Total row will be updated.

Place your cursor on R1C4, and type:

X	starts XTERNAL command
C	selects COPY option
CHECK	filename
{TAB}	moves cursor to NAME:

4 EXERCISE

YTD	name of cells
(TAB) (TAB)	moves cursor to LINKED:
N	selects NO option
RETURN	executes the command

Now your worksheet is updated and is ready for the new Check Book information, as illustrated in Figure 4.

	1	2	3	4	5	6	7	8	9	10	11	12
1	LAST MONTH YTD TOTAL:			\$6000.00	\$1250.00	\$4750.00	\$0.00	\$4750.00	\$500.00	\$0.00	\$400.00	\$350.00
2	-----											
3	DATE	CHECK	PAID TO	DEPOSIT	CHECK	CH. BOOK	SAVINGS	CASH ON	RENT	PHONE	SUPPLIES	MISC
4		NO.			AMOUNT	BALANCE		HAND				
5	-----											
6					\$0.00	\$0.00						
7					\$0.00	\$0.00						
8					\$0.00	\$0.00						
9					\$0.00	\$0.00						
10					\$0.00	\$0.00						
11					\$0.00	\$0.00						
12					\$0.00	\$0.00						
13					\$0.00	\$0.00						
14	=====											
15	CURRENT MONTH'S TOTALS:			\$0.00	\$0.00	\$1250.00	\$0.00	\$1250.00	\$0.00	\$0.00	\$0.00	\$0.00
16	NEW YEAR TO DATE TOTALS:			\$6000.00	\$1250.00	\$1250.00	\$0.00	\$1250.00	\$500.00	\$0.00	\$400.00	\$350.00

Figure 4

You may wish to print the entire worksheet for filing or distribution.

Place your cursor on any location and type:

P starts PRINT command

RETURN executes the command

You may also wish to print only a portion of the worksheet, so as not to show the work area or tables, or for other practical reasons.

Place your cursor on any cell and type:

P	starts PRINT command
O	selects OPTIONS option
R1C1	upper left-hand corner of worksheet to be printed
:	colon-indicates from-to
R16C12	lower right-hand corner of worksheet to be printed
RETURN	prepares for another option selection
P	selects PRINT option, and prints

MANUFACTURING ESTIMATING**DESCRIPTION**

This exercise is a manufacturing estimating worksheet. It has been set up for a steel pipe manufacturer. Following entries of material grade, quantity, length and diameter of a pipe, the worksheet calculates, from tables, the machine to use, total square feet needed, manufacturing time, manufacturer's cost, material cost, and then determines the total cost of the job.

OPERATIONS PERFORMED

Setting Up Worksheet Format

Naming Cells

Entering Mathematical Formulas

Making Worksheet Entries

FUNCTIONS USED

IF
INT
LOOKUP
PI
SUM

COMMANDS USED

ALPHA
FORMAT
LOCK
NAME
VALUE

SETTING UP WORKSHEET FORMAT

Using the following directions, set up your worksheet by copying Figure 1 exactly as it is illustrated, retaining exact row and column locations of all information.

NOTE

Before starting any command, you must have displayed on the bottom of the screen the COMMAND: descriptions. If you do not, just press the escape key and it will clear whatever is being done and display the COMMAND: descriptions.

Your first operation will be to type in row and column labels and tables.

NOTE

Before typing in labels, you must first type:

A	starts ALPHA command, which prepares the cell for labeling information
---	------------------------------------------------------------------------

Then type in the label.

RETURN	enters label
--------	--------------

Labels are automatically left justified in the column.

To right justify the label, type:

A	starts ALPHA command
---	----------------------

Then type in the label.

RETURN	enters the label
--------	------------------

F	starts FORMAT command
---	-----------------------

C	select CELLS option
---	---------------------

[TAB]	selects RIGHT option
-------	----------------------

RETURN	executes the command
--------	----------------------

1	2	3	4	5	6	7	8
1 MATERIAL GRADE:*****							
2 QUANTITY :*****							
3 LENGTH, FEET:*****							
4 DIAMETER, INCHES:*****							
5							
6 MACHINE TO USE=							
7 TOTAL SQ. FT. NEEDED							
8 MANUFACTURE TIME							
9 MANUFACTURE COST							
10 MATERIAL COST							
11		*****					
12 TOTAL JOB COST							
13							
14							
15 TABLE A							
16 -----							
17 1							
18 2							
19							
20 MACHINE TABLE 1							
21 DIAMETER MACHINE #							
22 -----							
23 1 1							
24 2 2							
25 3 3							
26 4 4							
27 5 7							
28							
29							
30 HOURLY MACHINE							
31 COST TABLE							
32 MACHINE # PRICE/HR							
33 -----							
34 1 25.65							
35 2 30.55							
36 3 20.35							
37 4 41.25							
38 5 56.34							
39 6 18.55							
40 7 125.25							

MACHINE TABLE 2		PERCENT OF COST	
LENGTH	MACHINE #	MARKUP TABLE	
-----	-----	QUANTITY	COST
		-----	-----
0	4	0	2.15
20	5	100	2.25
25	6	300	1.75
		500	1.25
		1000	0.75

MACHINE PRODUCTION		MATERIAL GRADE	
RATE TABLE		COST TABLE	
MACHINE #	SQFT/HR	SQ. FT.	COST
-----	-----	-----	-----
1	36	100	9.55
2	25	150	6.35
3	45	200	5.65
4	12	250	7.85
5	70	300	6.75
6	78		
7	95		

Figure 1

5 EXERCISE

NOTE

If a label is wider than the column, this is no problem because Multiplan lets the label expand across as many cells as needed to display the entire label with the **FORMAT CONTINUOUS** option.

To demonstrate this capability with the label in row 1,

Place your cursor on R1C1, and type:

A starts ALPHA command

Then type in the label.

RETURN enters the label

Leave your cursor on R1C1, and type:

F starts FORMAT command

C selects CELLS option
and displays R1C1, first
cell to be continuous

: colon-indicates from-to

R1C2 last cell to be continuous

[TAB] [TAB] moves cursor to **FORMAT CODE:**
options

C selects **CONT (continuous)**
option

RETURN executes the command

NOTE

To enter a numeric value, just type the number and **RETURN**.

Numbers are automatically right-justified in the column.

NOTE

After typing in your label, you may enter the label by moving the cursor to the next typing location, and the label will be entered and left-justified. The location the cursor is on will be ready for Alpha information.

NAMING CELLS

Now that the labels and the tables are typed in and the worksheet is formatted, we will need to name some of the cells and groups of cells to make it easier when using them in formulas.

The first cell to be named is to the immediate right of Material Grade.

Place your cursor on R1C3, and type:

N	starts NAME command
MG	name of cell
RETURN	executes the command

The second cell to be named is to the immediate right of Quantity.

Place your cursor on R2C3, and type:

N	starts NAME command
QU	name of cell
RETURN	executes the command

The third cell to be named is to the immediate right of Length, Feet.

Place your cursor on R3C3, and type:

N	starts NAME command
LF	name of cell
RETURN	executes the command

The fourth cell to be named is to the immediate right of Diameter, Inches.

5 EXERCISE

Place your cursor on R4C3, and type:

N	starts NAME command
DIA	name of cell
RETURN	executes the command

The fifth cell to be named is to the immediate right of Machine To Use.

Place your cursor on R6C3, and type:

N	starts NAME command
MU	name of cell
RETURN	executes the command

The sixth cell to be named is to the immediate right of Total Square Feet needed.

Place your cursor on R7C3, and type:

N	starts NAME command
SQFT	name of cell
RETURN	executes the command

The seventh cell to be named is to the immediate right of Manufacture Time.

Place your cursor on R8C3, and type:

N	starts NAME command
MT	name of cell
RETURN	executes the command

The eighth cell to be named is to the immediate right of Manufacture Cost.

Place your cursor on R9C3, and type:

N	starts NAME command
MC	name of cell
RETURN	executes the command

The ninth cell to be named is to the immediate right of Material Cost.

Place your cursor on R10C3, and type:

N	starts NAME command
MATC	name of cell
RETURN	executes the command

The next group of cells to be named will be the tables.

The first table to be named will be Table A.

Place your cursor on R17C1, and type:

N	starts NAME command
TA	name of cells
(TAB)	moves cursor to TO REFER TO: and displays R17C1, first cell in column to be named
:	colon-indicates from-to
R18C2	last cell in column to be named
RETURN	executes the command

The second table to be named will be Machine Table 1.

Place your cursor on R23C1, and type:

N	starts NAME command
MT1	name of cells
(TAB)	moves cursor to TO REFER TO: and displays R23C1, first cell in column to be named
:	colon-indicates from-to
R27C2	last cell in column to be named
RETURN	executes the command

The third table to be named will be Machine Table 2.

Place your cursor on R23C4, and type:

N	starts NAME command
MT2	name of cells

5 EXERCISE

[TAB]	moves cursor to TO REFER TO: and displays R23C4, first cell in column to be named
:	colon-indicates from-to
R25C5	last cell in column to be named
RETURN	executes the command

The fourth table to be named will be Percent Of Cost Markup Table.

Place your cursor on R24C7, and type:

N	starts NAME command
PCT	name of cells
[TAB]	moves cursor to REFER TO: and displays R24C7, first cell in column to be named
:	colon-indicates from-to
R28C8	last cell in column to be named
RETURN	executes the command

The fifth table to be named will be Hourly Machine Cost Table.

Place your cursor on R34C1, and type:

N	starts NAME command
HMCT	name of cells
[TAB]	moves cursor to TO REFER TO: and displays R34C1, first cell in column to be named
:	colon-indicates from-to
R40C2	last cell in column to be named
RETURN	executes the command

The sixth table to be named will be Machine Production Rate Table.

Place your cursor on R34C4, and type:

N	starts NAME command
---	---------------------

MPRT	name of cells
[TAB]	moves cursor to TO REFER TO: and displays R34C4, first cell in column to be named
:	colon-indicates from-to
R40C5	last cell in column to be named
RETURN	executes the command

The seventh table to be named will be Material Grade Cost Table.

Place your cursor on R34C7, and type:

N	starts NAME command
MGCT	name of cells
[TAB]	moves cursor to TO REFER TO: and displays R34C7, first cell in column to be named
:	colon-indicates from-to
R38C8	last cell in column to be named
RETURN	executes the command

ENTERING MATHEMATICAL FORMULAS

You will now begin entering mathematical formulas that will establish the relationships between column and row positions. The formulas and their locations are illustrated in Figure 2.

Formula one, to the immediate right of Machine To Use, makes a final selection of which machine to use in the manufacturing operation from the alternatives listed in Table A. It employs a LOOKUP function to make the selection from Table A, determined by the results of an IF and an AND function, working in sequence to determine the value to look up.

The formula tells the computer IF the diameter of the pipe is greater than 3 AND less than 7, looks up the value 2 in Table A. IF either or both of the diameter questions is false, then looks up the value 1 in Table A. The machine selections opposite the LOOKUP values in Table A have already been listed by the first two formulas. The selected machine number will be displayed opposite Machine To Use, where the third formula is entered.

5 EXERCISE

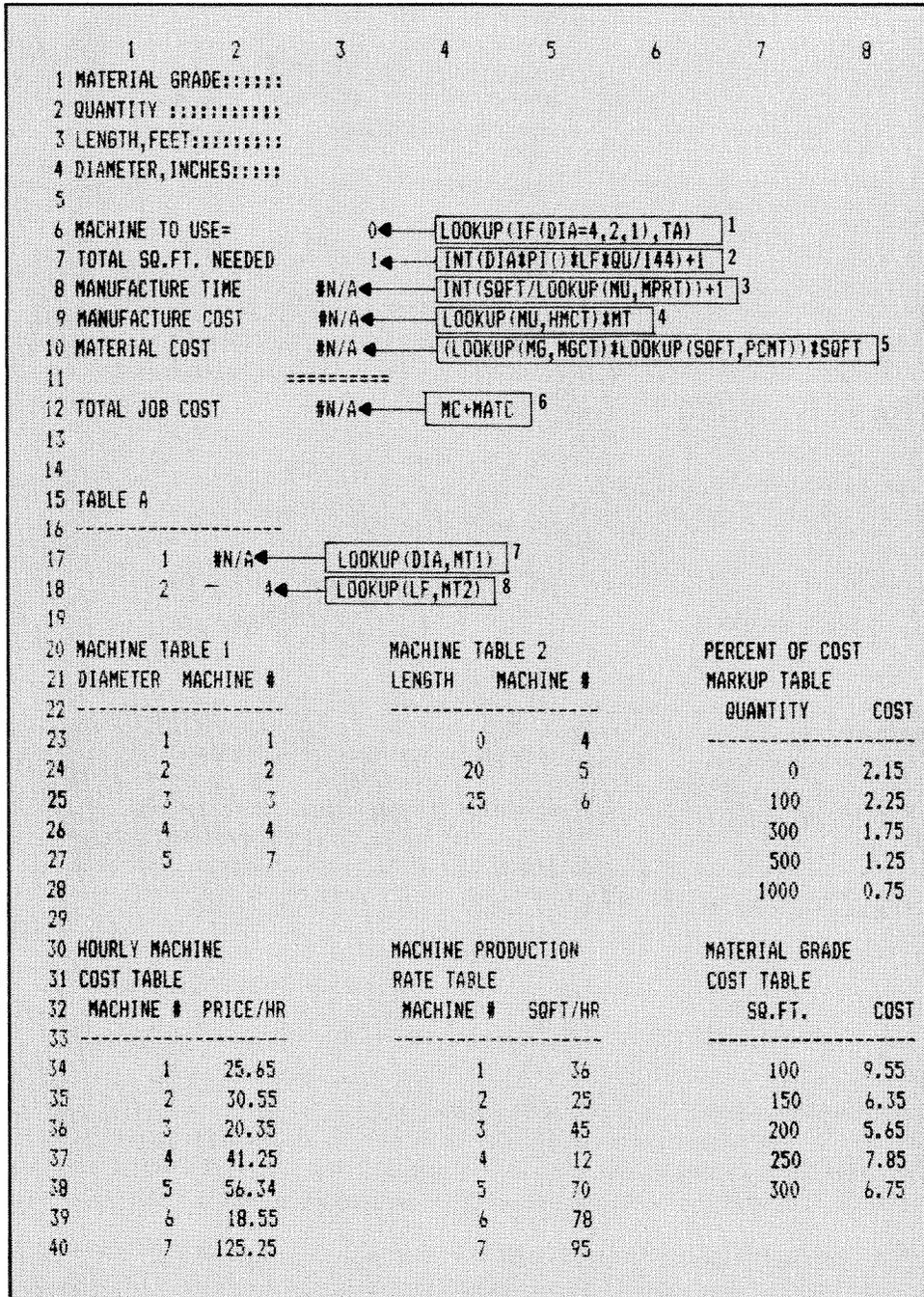


Figure 2

To enter formula one,

Place your cursor on R6C3, and type:

V	starts VALUE command, which prepares the cell for a numeric value or formula
LOOKUP(	starts LOOKUP function
IF(	starts IF function
DIA	name of cell, first value to be compared
=	LOGICAL OPERATOR, compares the first value against the second value and results in the logical value of true or false
4	second value to be compared
,	comma-separates expressions
2	second expression which will be selected if the first expression is true
,	comma-separates expressions
1	second expression which will be selected if the first expression is false
)	closes IF function
,	comma-separates value from table
TA	name of table
)	closes LOOKUP function
RETURN	enters the formula

Formula two, to the immediate right of Total Sq. Ft. Needed, uses the pipe diameter, length and quantity entered to determine the amount of flat material required to manufacture the pipe. The formula first determines the pipe circumference in inches by multiplying the diameter times PI (3.14 carried to 16 significant digits). The circumference is then multiplied by the pipe length to find the material in one piece. The result is multiplied by the quantity to determine the total amount of material needed, then divided by 144 to convert the answer to square feet. The final quantity is carried to the next square foot by adding one, and using the INTEGER function to select only the whole number to the left of the decimal place.

5 EXERCISE

Place your cursor on R7C3, and type:

V	starts VALUE command
INT(	starts INTEGER function
DIA	name of cell
*	multiplies
PI()	returns the value 3.141592
*	multiplies
LF	name of cell
*	multiplies
QU	name of cell
/	divides
144	value
)	closes INTEGER function
+	adds
1	value
RETURN	enters the formula

Formula three, to the immediate right of Manufacture Time, determines the manufacturing time to produce the number of pipes indicated by dividing the square feet of material by the number of square feet per hour the selected machine will process. The LOOKUP function is used to find the production rate of the selected machine in the Machine Production Rate Table. To round to the next whole hour, one is added to the number produced by the INTEGER function, which is used to select only the whole number to the left of the decimal point.

Place your cursor on R8C3, and type:

V	starts VALUE command
INT(	starts INTEGER function
SQFT	name of cell
/	divides
LOOKUP(	starts LOOKUP function
MU	name of cell
,	comma-separates name of cell from table
MPRT	name of table
)	closes LOOKUP function
)	closes INTEGER function
+	adds
1	value
RETURN	enters the formula

NOTE

After the return, #N/A will appear in the cell because the formula is divided by 0. Formula 7 and 8 provide the non-zero value to be divided in the formula, and, after they have been entered, the #N/A will disappear.

Formula four, to the immediate right of Manufacture Cost, uses the LOOKUP function to select the hourly cost rate of the machine being used from the Hourly Machine Cost Table. It then multiplies that rate times the hours listed for Manufacture Time to obtain the Manufacture Cost.

Place your cursor on R9C3, and type:

V	starts VALUE command
LOOKUP(	starts LOOKUP function
MU	name of cell
,	comma-separates name of cell from table
HMCT	name of table

5 EXERCISE

)	closes LOOKUP function
*	multiplies
MT	name of cell
RETURN	enters the formula

NOTE

After the return, #N/A will appear in the cell because it picks up the #N/A already present in the cell named MU, and will disappear when that cell has been corrected.

Formula five, to the immediate right of Material Cost, first uses the LOOKUP function to determine the material purchase cost from the Material Grade Cost Table. A second LOOKUP function is used to determine the percentage rate of the pricing markup from the Percent of Cost Markup Table. The resulting values from these two LOOKUP functions are multiplied, and the answer multiplied by the Total Sq. Ft. Needed value to obtain the Material Cost.

Place your cursor on R10C3, and type:

(	opens numeric expression
LOOKUP(	starts LOOKUP function
MG	name of cell
,	comma-separates cell name from table
MGCT	name of table
)	closes LOOKUP function
*	multiplies
LOOKUP(	starts LOOKUP function
SQFT	name of cell
,	comma-separates cell name from table
PCT	name of table
)	closes LOOKUP function
)	closes numeric expression

*	multiplies
SQFT	name of cell
RETURN	enters the formula

NOTE

After the return, #N/A will appear until the proper Material Grade number has been entered.

Formula six, to the immediate right of Total Job Cost, totals Manufacture Cost and Material Cost, to determine the Total Job Cost.

Place your cursor on R12C3, and type:

V	starts VALUE command
MC	name of cell
+	adds
MATC	name of cell
RETURN	enters the formula

NOTE

After the return, #N/A will appear in the cell until the previous #N/As have been corrected.

The next operation will be to format the last three formulas to display their amounts in dollars and cents.

Place your cursor on R9C3 and type:

F	starts FORMAT command
C	selects CELL options and displays R9C3, first cell to format
:	colon-indicates from-to
R12C3	last cell to format
(TAB) (TAB)	moves cursor to FORMAT CODE: options
\$	selects DOLLAR SIGN option
RETURN	executes the command

5 EXERCISE

The last two formulas will generate values for Table A. These values will indicate the machines to be used in the manufacturing operation, according to length and diameter capabilities. The length and diameter parameters entered at the head of the worksheet are used by the LOOKUP function in the formulas to select the appropriate machines from Machine Table 1 and Machine Table 2. The resulting selections will appear in Table A, and will be used in a later calculation.

Formula seven, first value in Table A, uses a LOOKUP function to compare the diameter of the pipe to be made to the diameter listings in Machine Table 1. When it detects a number greater than the one called for, it will select the next lower reading in the table, and enter the machine number to the right of that number into Table A.

Place your cursor on R17C2, and type:

V	starts VALUE command
LOOKUP(	starts LOOKUP function
DIA	name of cell
,	comma-separates cell to be looked up from the table
MT1	name of table
)	closes LOOKUP function
RETURN	enters the formula

NOTE

After the return, #N/A will appear until the Diameter, Inches value has been entered.

Formula eight, second value in Table A, uses a LOOKUP function to compare the length of the pipe to be made to the length listings in Machine Table 2. When it detects a number greater than the one called for, it will select the next lower reading in the table, and enter the machine number to the right of that number into Table A.

Place your cursor on R18C2, and type:

V	starts VALUE command
LOOKUP(	starts LOOKUP function
LF	name of cell

,	comma-separates cell to be looked up from the table
MT2	name of table
)	closes LOOKUP function
RETURN	enters the formula

Now the worksheet is complete, with labels, tables and formulas, and to protect them from being accidentally wiped out as you input onto your worksheet, you will lock the cells containing formulas, labels and values.

Place your cursor on any cell, and type:

L	starts LOCK command
F	selects FORMULAS option
Y	confirms

MAKING WORKSHEET ENTRIES

Your worksheet is now complete and ready to have entries made into it. To observe its operation, enter the Material Grade, Quantity, Length, Feet, and Diameter, Inches, as illustrated in Figure 3.

5 EXERCISE

1	2	3	4	5	6	7	8
1	MATERIAL GRADE:.....	100					
2	QUANTITY :.....	250					
3	LENGTH, FEET:.....	10					
4	DIAMETER, INCHES:.....	5					
5							
6	MACHINE TO USE=	7					
7	TOTAL SQ.FT. NEEDED	273					
8	MANUFACTURE TIME	3					
9	MANUFACTURE COST	\$375.75					
10	MATERIAL COST	\$5866.09					
11		=====					
12	TOTAL JOB COST	\$6241.84					
13							
14							
15	TABLE A						
16	-----						
17	1	7					
18	2	4					
19							
20	MACHINE TABLE 1		MACHINE TABLE 2			PERCENT OF COST	
21	DIAMETER MACHINE #		LENGTH MACHINE #			MARKUP TABLE	
22	-----		-----			QUANTITY COST	
23	1 1		0 4			-----	
24	2 2		20 5			0 2.15	
25	3 3		25 6			100 2.25	
26	4 4					300 1.75	
27	5 7					500 1.25	
28						1000 0.75	
29							
30	HOURLY MACHINE		MACHINE PRODUCTION			MATERIAL GRADE	
31	COST TABLE		RATE TABLE			COST TABLE	
32	MACHINE # PRICE/HR		MACHINE # SQFT/HR			SQ.FT. COST	
33	-----		-----			-----	
34	1 25.65		1 36			100 9.55	
35	2 30.55		2 25			150 6.35	
36	3 20.35		3 45			200 5.65	
37	4 41.25		4 12			250 7.85	
38	5 56.34		5 70			300 6.75	
39	6 18.55		6 78				
40	7 125.25		7 95				

Figure 3

You may wish to print the entire worksheet for filing or distribution.

Place your cursor on any location and type:

P starts PRINT command

RETURN executes the command

You may also wish to print only a portion of the worksheet, so as not to show the work area or tables, or for other practical reasons.

Place your cursor on any cell and type:

P starts PRINT command

O selects OPTIONS option

R1C1 upper left-hand corner of
worksheet to be printed

: colon-indicates from-to

R12C3 lower right-hand corner of
worksheet to be printed

RETURN prepares for another option
selection

P selects PRINT option, and prints

DAILY INVENTORY**DESCRIPTION**

This exercise is a Daily Inventory Worksheet which calculates each day's total number of cases in inventory, by adding the previous day's cases on hand to the cases received and subtracting the cases sold for the day. Then it gives you the total cost of inventory and tells you when it is time to reorder a particular item.

OPERATIONS PERFORMED

Setting Up The Worksheet

Naming Cells

Entering Mathematical Formulas

Making Worksheet Entries

Updating The Worksheet

FUNCTIONS USED

IF
MAX
SUM

COMMANDS USED

ALPHA
BLANK
COPY
FORMAT
NAME
PRINT
SORT
TRANSFER
VALUE
XTERNAL

6 EXERCISE

SETTING UP WORKSHEET FORMAT

Using the following directions, set up your worksheet by copying Figure 1 exactly as it is illustrated, retaining exact row and column locations of all labels.

NOTE

Before starting any command, you must have displayed on the bottom of the screen the COMMAND: descriptions. If you do not, just press the escape key and it will clear whatever is being done and display the COMMAND: descriptions.

	1	2	3	4	5	6	7	8	9
1	ITEM	REORDER	COST	CASES	CASES	YESTERDAY	TODAY	TOTAL	REORDER
2	NUMBER	QUANTITY	PER CASE	REC'D	SOLD	ON HAND	ON HAND	COST	TIME
3	-----								
4									
5									
6									
7									
8	=====								

Figure 1

First operation is to copy in your row and column labels.

NOTE

Before typing in labels, you must first type:

A starts ALPHA command, which prepares the cell for labeling information

Then type in the label.

RETURN enters label

Labels are automatically left justified in the column.

NOTE

To enter a numeric value, just type the number and RETURN.

Numbers are automatically right justified in the column.

NOTE

After typing in your label, you may enter the label by moving the cursor to the next typing location, and the label will be entered and left justified. The location the cursor is on will be ready for Alpha information.

To center the labels you have typed on rows 1 and 2, leave your cursor on any location and type:

F	starts FORMAT command
C	selects CELL options
R1C1	first cell to format from
:	colon-indicates from-to
R2C9	last cell to format to
{TAB}	moves cursor to ALIGNMENT:
C	selects CTR (Center) option
RETURN	executes the command

Now let's put the dash line across row 3.

First place your cursor on R3C1, and type:

A	starts ALPHA command
-----	10 dashes
RETURN	enters the dashes

6 EXERCISE

Now copy the dashes just entered in R3C1, using the COPY command.

Leave your cursor on R3C1, and type:

C	starts COPY command
R	selects RIGHT option
8	number of cells to copy into
RETURN	executes the command

The dashed line will now appear extended across the number of columns you have indicated. To enter a double-dashed line on row 8, repeat the operation above, but just exchange the single dash (-) for the double dash (=).

Next operation will be to format Cost Per Case column to display its amounts in dollars and cents.

Place your cursor on R4C3 and type:

F	starts FORMAT command
C	selects CELL option and displays R4C3, first cell to format
:	colon-indicates from-to
R7C3	last cell to format to
(TAB) (TAB)	moves cursor to FORMAT CODE: options
\$	selects DOLLAR SIGN option
RETURN	executes the command

NAMING CELLS

Now that the labels are typed in, and the worksheet is formatted, we will need to name some groups of cells which will be used later on in the worksheet for updating purposes.

The first group of cells to be named is in the Cases Rec'd, Cases Sold, Yesterday On Hand columns, between the single and double dash line.

Place your cursor on R4C4, and type:

N	starts NAME command
---	---------------------

- NEW name of cells
- {TAB} moves cursor to TO REFER TO:
and displays R4C4
- :
- R7C6 last cell to name
- RETURN executes the command

The second group of cells to be named is in the Today on Hand column, between the single and double dash line.

Place your cursor on R4C7, and type:

- N starts NAME command
- INV name of cells
- {TAB} moves cursor to TO REFER TO:
and displays R4C7
- :
- R7C7 last cell to name
- RETURN executes the command

ENTERING MATHEMATICAL FORMULAS

You will now begin entering mathematical formulas that will establish the relationships between column and row positions. The formulas and their locations are illustrated in Figure 2.

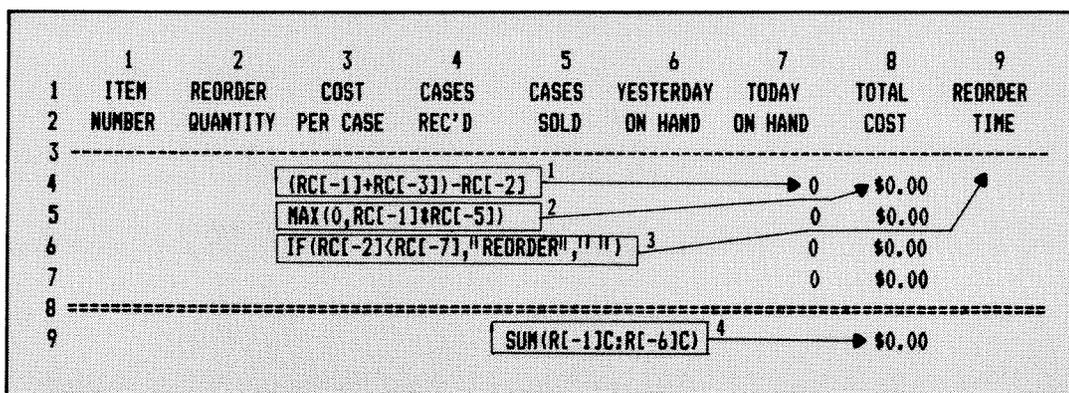


Figure 2

6 EXERCISE

Formula one, in Today On Hand column, adds, in the same row, the Cases Rec'd and the Yesterday On Hand, and, from that total, subtracts the Cases Sold.

Place your cursor on R4C7, and type:

(	opens numeric expression
LEFT ARROW	moves cursor to Yesterday On Hand and displays RC{-1}
+	adds
LEFT ARROW LEFT ARROW LEFT ARROW	moves cursor to Cases Rec'd and displays RC{-3}
)	closes numeric expression
—	subtracts
LEFT ARROW LEFT ARROW	moves cursor to Cases Sold and displays RC{-2}
RETURN	enters the formula

Formula two, in the Total Cost column, determines the total cost of cases for each inventory item. The MAX logic function is used so that a zero value will be displayed if the item is out of stock.

Place your cursor on R4C8, and type:

V	starts VALUE command, which prepares cell for a numeric value or formula
MAX(	starts MAXIMUM function which selects the maximum value of the following list
0	value
,	comma-separates values in list
LEFT ARROW	moves cursor to Today On Hand and displays RC{-1}
*	multiplies

LEFT ARROW	
LEFT ARROW	moves cursor to Cost Per Case and displays RC[-5]
)	closes MAXIMUM function
RETURN	enters the formula

Next operation will be to format the formula just entered to display in dollars and cents.

Leave your cursor on R4C8, and type:

F	starts FORMAT command
C	selects CELLS option
[TAB] [TAB]	moves cursor to FORMAT CODE: options
\$	selects DOLLAR SIGN option
RETURN	executes the command

Formula three, in the Reorder Time column, uses the IF logic function to determine if it is time to reorder an item. If it is time to reorder, it will display the word REORDER. If it is not, it will display a blank.

NOTE

IF logic function contains three expressions separated by commas. The first expression generates a true or false value as a result of a logical operation. If the value is true, the IF selects the value generated by the second expression. If the value is false, the IF selects the value generated by the third expression.

Place your cursor on R4C9, and type:

V	starts VALUE command
IF(	starts IF logic function
LEFT ARROW	
LEFT ARROW	moves cursor to Today on Hand and displays RC[-2], first value to be compared

Formula four, at the bottom of the Total Cost column, immediately under the double dash line, adds the total cost of inventory.

Place your cursor on R9C8, and type:

V	starts VALUE command
SUM(	starts SUM function
UP ARROW	moves cursor to double dash line and displays R{-1}C
:	colon-indicates from-to
UP ARROW	
UP ARROW	moves cursor to single dash line and displays R{-6}C
)	closes SUM function
RETURN	enters the formula

Next operation will be to format the just entered formula to display in dollars and cents.

Leave your cursor on R9C8, and type:

F	starts FORMAT command
C	selects CELLS option
{TAB} {TAB}	moves cursor to FORMAT CODE: options
\$	selects DOLLAR SIGN option
RETURN	executes the command

6 EXERCISE

MAKING WORKSHEET ENTRIES

You are now ready to make entries to your daily inventory worksheet, as illustrated in Figure 3.

1	2	3	4	5	6	7	8	9
ITEM	REORDER	COST	CASES	CASES	YESTERDAY	TODAY	TOTAL	REORDER
NUMBER	QUANTITY	PER CASE	REC'D	SOLD	ON HAND	ON HAND	COST	TIME
325	10	\$10.55	35	5		30	\$316.50	
260	15	\$12.55	12	5		7	\$87.85	REORDER
125	12	\$10.00	20	2		18	\$180.00	
250	8	\$15.00	10	4		6	\$90.00	REORDER
							\$674.35	

Figure 3

Now that you have made the worksheet entries as illustrated in Figure 3, and the worksheet is complete for the day, you will need to save the entire worksheet onto disk.

Leave your cursor on any cell, and type:

T	starts TRANSFER command
S	selects SAVE option
INVENTORY	filename
RETURN	executes the command

UPDATING THE WORKSHEET

To update the worksheet we will first need to blank Cases Rec'd and Cases Sold columns, which we previously named NEW and then we will copy, from disk, the amounts from the Today on Hand column, which are under the name of INV, before entering the next day's inventory amounts to allow the accumulation of accurate totals in the Today on Hand column of the new Daily Inventory worksheet.

Place your cursor on any cell, and type:

B	starts BLANK command
---	----------------------

NEW	name of cells
RETURN	executes the command
Place your cursor on R4C6, and type:	
X	starts XTERNAL command
C	selects COPY option
INVENTORY	name of SHEET on disk
[TAB]	moves cursor to NAME:
INV	name of cells
[TAB] [TAB]	moves cursor to LINKED:
N	selects NO option
RETURN	executes the command

Now your worksheet is updated and is ready for the daily input, as illustrated in Figure 4.

	1	2	3	4	5	6	7	8	9
1	ITEM	REORDER	COST	CASES	CASES	YESTERDAY	TODAY	TOTAL	REORDER
2	NUMBER	QUANTITY	PER CASE	REC'D	SOLD	ON HAND	ON HAND	COST	TIME
3	-----								
4	325	10	\$10.55			30	30	\$316.50	
5	260	15	\$12.55			7	7	\$87.85	REORDER
6	125	12	\$10.00			18	18	\$180.00	
7	250	8	\$15.00			6	6	\$90.00	REORDER
8	=====								
9								\$674.35	

Figure 4

6 EXERCISE

The next operation, before inputting the next day's information, will be to sort the Item Number column, between the single and double dash line, into numeric order.

Place your cursor on R4C1 and type:

S starts SORT command

(TAB) moves cursor to BETWEEN ROWS:

4 row to start sort in

(TAB) moves cursor to AND:

7 last row to sort to

RETURN executes the command

The result is illustrated in Figure 5.

1	2	3	4	5	6	7	8	9	
ITEM	REORDER	COST	CASES	CASES	YESTERDAY	TODAY	TOTAL	REORDER	
NUMBER	QUANTITY	PER CASE	REC'D	SOLD	ON HAND	ON HAND	COST	TIME	
4	125	12	\$10.00		18	18	\$180.00		
5	250	8	\$15.00		6	6	\$90.00	REORDER	
6	260	15	\$12.55		7	7	\$87.85	REORDER	
7	325	10	\$10.55		30	30	\$316.50		
8	=====								
9							\$674.35		

Figure 5

You may wish to print the entire worksheet for filing or distribution.

Place your cursor on any location and type:

P starts PRINT command

RETURN executes the command

You may also wish to print only a portion of the worksheet, so as not to show the work area or tables, or for other practical reasons.

Place your cursor on any cell and type:

P starts PRINT command

O selects OPTIONS option

R1C1 upper left-hand corner of worksheet
to be printed

: colon-indicates from-to

R9C9 lower right-hand corner of
worksheet to be printed

RETURN prepares for another option
selection

P selects PRINT option, and prints

ACCOUNTS PAYABLE**DESCRIPTION**

This exercise is an Accounts Payable Worksheet which calculates the date you must pay an invoice in order to receive a discount. It determines the discount amount and the discounted net amount. It also determines the cost of borrowing money to pay the discounted net amount and calculates the discount amount vs the interest on the borrowed money, to see if borrowing the money is to your advantage.

OPERATIONS PERFORMED

Setting Up The Worksheet

Naming Cells

Entering Mathematical Formulas

Making Worksheet Entries

Updating The Worksheet

FUNCTIONS USED

IF
LOOKUP
SUM

COMMANDS USED

ALPHA
COPY
FORMAT
NAME
PRINT
VALUE

7 EXERCISE

SETTING UP WORKSHEET FORMAT

Using the following directions, set up your worksheet by copying Figure 1 exactly as it is illustrated, retaining exact row and column locations of all labels.

NOTE

Before starting any command, you must have displayed on the bottom of the screen the COMMAND: descriptions. If you do not, just press the escape key and it will clear whatever is being done and display the COMMAND: descriptions.

1	2	3	4	5	6	7	8	9	10	11	12	13	14
1			INVOICE DATE				DATE PAYABLE TO GET DISCOUNT				INTEREST=		
2			-----				-----					COST OF	DISC
3	INVOICE	INVOICE	MONTH	DAY	YEAR	DISC	DAYS FOR	MONTH	DAY	YEAR	DISC	DISC'D	BORROWED
4	NUMBER	AMOUNT				PERCENT	DISC				AMOUNT	NET	MONEY
5													VS
6													BORROW
7													
8													
9													
10													
11													
12													
13													
14													
15													
16	DAYS IN MONTHS TABLE												
17	-----												
18	0	1	2	3	4	5	6	7	8	9	10	11	12
19	0	31	28	31	30	31	30	31	31	30	31	30	31

Figure 1

First operation is to type in your row and column labels and the table.

NOTE

Before typing in labels, you must first type:

A starts ALPHA command, which prepares the cell for labeling information

Then type in the label.

RETURN enters label

Labels are automatically left-justified in the column.

NOTE

To enter a numeric value, just type the number and RETURN.
Numbers are automatically right-justified in the column.

NOTE

After typing in your label, you may enter the label by moving the cursor to the next typing location, and the label will be entered and left-justified. The location the cursor is on will be ready for Alpha information.

NOTE

When typing in a label which is wider than the column, it is no problem because Multiplan lets you connect as many adjacent cells as needed to display the entire label.

To demonstrate this, place your cursor on R1C4, and type:

A	starts ALPHA command
INVOICE DATE	name of label
RETURN	enters the label

Leave your cursor on R1C3, and type:

F	starts FORMAT command
C	selects CELLS option and displays R1C3, first cell to format
:	colon-indicates from-to
R1C4	last cell to format
[TAB] [TAB]	moves cursor to FORMAT CODE: options
C	selects CONT (continuous) option
RETURN	executes the command

7 EXERCISE

To center the labels you have typed on rows 3 and 4, leave your cursor on any location and type:

F	starts FORMAT command
C	selects CELL options
R3C1	first cell to format from
:	colon-indicates from-to
R4C14	last cell to format to
(TAB)	moves cursor to ALIGNMENT:
C	selects CTR (Center) option
RETURN	executes the command

Now let's put the dash line across row 5.

First place your cursor on R5C1, and type:

A	starts ALPHA command
-----	10 dashes
RETURN	enters the dashes

Now copy the dashes just entered in R5C1, using the COPY command.

Leave your cursor on R5C1, and type:

C	starts COPY command
R	selects RIGHT option
13	number of cells to copy into
RETURN	executes the command

The dashed line will now appear extended across the number of columns you have indicated. To enter a double-dashed line on row 12, repeat the operation above, but just exchange the single dash (-) for the double dash (=).

Now we will want to format the Invoice Amount column to display in dollars and cents.

Place your cursor on R6C2, and type:

F	starts FORMAT command
---	-----------------------

C	selects CELLS option and displays R6C2, first cell to format
:	colon-indicates from-to
R13C2	last cell to format
[TAB] [TAB]	moves cursor to FORMAT CODE: options
\$	selects DOLLAR SIGN option
RETURN	executes the command

The next operation is to format Disc Percent to Disc Vs Borrow columns to display in dollars and cents.

Place your cursor on R6C11, and type:

F	starts FORMAT command
C	selects CELLS option and displays R6C11, first cell to format
:	colon-indicates from-to
R13C14	last cell to format
[TAB] [TAB]	moves cursor to FORMAT CODE: options
\$	selects DOLLAR SIGN option
RETURN	executes the command

NAMING CELLS

Now that Mabel has the labels and tables typed in, and the worksheet is formatted, we will need to name some groups of cells which will be used later on in the worksheet for use in formulas.

The first cell to be named is to the immediate right of Interest.

Place your cursor on R1C13, and type:

N	starts NAME command
INT	name of cells
RETURN	executes the command

7 EXERCISE

The second group of cells to be named will be the Days In Months Table.

Place your cursor on R18C1, and type:

N starts NAME command
 DMT name of cells
 (TAB) moves cursor to TO REFER TO:
 and displays R18C1, first cell
 of table
 : colon-indicates from-to
 R19C13 last cell of table
 RETURN executes the command

ENTERING MATHEMATICAL FORMULAS

You will now begin entering mathematical formulas that will establish the relationships between column and row positions. The formulas and their locations are illustrated in Figure 2.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	
2	INVOICE DATE				DATE PAYABLE TO GET DISCOUNT				INTEREST=		18.5			
3	INVOICE	INVOICE	MONTH	DAY	YEAR	DISC	DAYS FOR	MONTH	DAY	YEAR	DISC	DISC'D	COST OF	DISC
4	NUMBER	AMOUNT				PERCENT	DISC				AMOUNT	NET	BORROWED	VS
5													MONEY	BORROW
6	IF (RC[-4]+RC[-13]<=LOOKUP (RC[-5],DMT),RC[-5],IF (RC[-5]+RC[-13]=13,1,RC[-5]+1)) ¹													
7	IF (RC[-5]+RC[-21]<=LOOKUP (RC[-6],DMT),RC[-5]+RC[-21],RC[-5]+RC[-21]-LOOKUP (RC[-6],DMT)) ²													
8	IF (RC[-6]+RC[-33]<=LOOKUP (RC[-7],DMT),RC[-5],IF (RC[-7]+1=13,RC[-5]+1,RC[-5])) ³													
9	RC[-9]+RC[-5] ⁴													
10	RC[-10]+RC[-1] ⁵													
11	INT(365*(LOOKUP (RC[-5],DMT)-RC[-4])*(RC[-1] ⁶ -(RC[-3]-RC[-1] ⁷)))													
12	=====													
13	SUM (RC[-13]:RC[-8]) ⁸ → \$0.00													
14														
15														
16	DAYS IN MONTHS TABLE													
17	-----													
18	0	1	2	3	4	5	6	7	8	9	10	11	12	
19	0	31	28	31	30	31	30	31	31	30	31	30	31	

Figure 2

Formula one, in the Month column of the Date Payable To Get Discount columns, utilizes the IF logic function and the LOOKUP function to determine the month in which the payment must be paid to enable you to take the discount.

NOTE

IF logic function contains three expressions separated by commas. The first expression generates a true or false value as a result of a logical operation. If the value is true, the IF selects the value generated by the second expression. If the value is false, the IF selects the value generated by the third expression. In the following formula, the value of the third expression is generated by the use of a second IF statement.

Place your cursor on R6C8, and type:

V	starts VALUE command, which prepares the cell for a numeric value or formula
IF(	starts IF function
LEFT ARROW LEFT ARROW LEFT ARROW LEFT ARROW	moves the cursor to Day in Invoice Date columns and displays RC[-4]
+	adds
LEFT ARROW	moves cursor to Days For Disc column and displays RC(-1)
< =	LOGICAL OPERATORS, compare the first value against the second value and result in the logical value of true or false
LOOKUP(	starts LOOKUP function, which generates the second value to be compared
LEFT ARROW LEFT ARROW LEFT ARROW LEFT ARROW LEFT ARROW	moves the cursor to Month in Invoice Date columns, and displays RC[-5], which contains value to be looked up
,	comma-separates value from table
DMT	name of table

7 EXERCISE

)	closes LOOKUP function
,	comma-separates expressions
LEFT ARROW	
LEFT ARROW	moves cursor to Month in Invoice Date columns, and displays RC[-5], second expression which is selected if the first expression is true
,	comma-separates expressions
IF(	starts IF logic function, which generates the value for the third expression, which is selected if the first expression is false
LEFT ARROW	
LEFT ARROW	moves the cursor to Month in Invoice Date columns, and displays RC[-5]
+	adds
1	value
=	LOGICAL OPERATOR, compares the first value against the second value and results in the logical value of true or false
13	the second value to be compared
,	comma-separates expressions
1	second expression which is selected if the first expression is true
,	comma-separates expressions
LEFT ARROW	
LEFT ARROW	moves the cursor to Month in Invoice Date column and displays RC[-5]

+	adds
1	value NOTE: RC[-5] +1 generates the third expression which is selected if the first expression is false
)	closes second IF logic function
)	closes first IF logic function
RETURN	enters the formula

Formula two, in the Day column, of the Date Payable To Get Discount columns, utilizes the IF logic function and the LOOKUP function to determine the day that the payable must be paid to allow you to take the discount.

Place your cursor on R6C9, and type:

V	starts VALUE command
IF(	starts IF logic function
LEFT ARROW	moves cursor to Day in Invoice Date columns, and displays RC[-5]
LEFT ARROW	
+	adds
LEFT ARROW	moves cursor to Days For Discount, and displays RC[-2]
LEFT ARROW	
< =	LOGICAL OPERATORS, compare the first value against the second value and result in the logical value of true or false
LOOKUP(	starts LOOKUP function, generates second value to be compared

7 EXERCISE

LEFT ARROW
LEFT ARROW
LEFT ARROW
LEFT ARROW
LEFT ARROW
LEFT ARROW

moves the cursor to Month in Invoice Date columns, and displays RC[-6], which contains value to be looked up

,

comma-separates value from table

DMT

name of table

)

closes LOOKUP function

,

comma-separates expressions

LEFT ARROW
LEFT ARROW
LEFT ARROW
LEFT ARROW
LEFT ARROW

moves cursor to Days in Invoice Date columns and displays RC[-5]

+

adds

LEFT ARROW
LEFT ARROW

moves cursor to Days For Discount and displays RC[-2],
NOTE: RC[-5] + RC[-2] generates second expression which is selected if the first expression is true

,

comma-separates expressions

LEFT ARROW
LEFT ARROW
LEFT ARROW
LEFT ARROW
LEFT ARROW

moves cursor to Days in Invoice Date columns and displays RC[-5]

+

adds

LEFT ARROW
LEFT ARROW

moves cursor to Days For Discount and displays RC[-2]

—

subtracts

LOOKUP(

starts LOOKUP function

LEFT ARROW	
LEFT ARROW	moves the cursor to Month in Invoice Date columns, and displays RC[-6], which contains value to be looked up
,	comma-separates value from table
DMT	name of table
)	closes LOOKUP function NOTE: Third expression has been generated by the preceding formula and is selected if the first selection is false
)	closes IF logic function
RETURN	enters the formula
<p>Formula three, in the Year column, of the Date Payable To Get Discount columns, utilizes the IF logic function and the LOOKUP function to determine the year in which the payable must be paid to allow you to take the discount.</p> <p>Place your cursor on R6C10, and type:</p>	
V	starts VALUE command
IF(	starts IF logic function
LEFT ARROW	
LEFT ARROW	moves cursor to Day in Invoice Date columns, and displays RC[-6]
+	adds
LEFT ARROW	
LEFT ARROW	
LEFT ARROW	moves cursor to Days For Discount, and displays RC[-3]
< =	LOGICAL OPERATORS, compare the first value against the second value and result in the logical value of true or false

7 EXERCISE

LOOKUP(	starts LOOKUP function, generates second value to be compared
LEFT ARROW	
	moves the cursor to Month in Invoice Date columns, and displays RC[-7], which contains value to be looked up
,	comma-separates value from table
DMT	name of table
)	closes LOOKUP function
,	comma-separates expressions
LEFT ARROW	
	moves cursor to Year in Invoice Date columns and displays RC[-5] second expression which is selected if first expression is true
,	comma-separates expressions
IF(	starts IF logic function, which generates the value for the third expression, which is selected if the first expression is false
LEFT ARROW	
	moves the cursor to Month in Invoice Date columns, and displays RC[-7]
+	adds
1	value
=	LOGICAL OPERATOR, compares the first value against the second value and results in the logical value of true or false

13 the second value to be compared

,

comma-separates expressions

LEFT ARROW

LEFT ARROW

LEFT ARROW

LEFT ARROW

LEFT ARROW

moves the cursor to Month in Invoice Date column and displays RC[-5]

+

adds

1

value NOTE: RC[-5] + 1 generates the second expression which is selected if the first expression is true

,

comma-separates expressions

LEFT ARROW

LEFT ARROW

LEFT ARROW

LEFT ARROW

LEFT ARROW

moves cursor to Year in Invoice Date columns and displays RC[-5], third expression which is selected if first expression is true

)

closes second IF logic function

)

closes first IF logic function

RETURN

enters the formula

Formula four, in the Disc Amount column, multiplies Invoice Amount times Disc Percent.

Place your cursor on R6C11, and type:

V

starts VALUE command

LEFT ARROW

moves the cursor to Invoice Amount and displays RC[-9]

7 EXERCISE

*	multiplies
LEFT ARROW	
	moves the cursor to Discount Percent and displays RC[-5]
%	converts value in RC[-5] to a percent
RETURN	enters the formula

Formula five, in the Disc'd Net column, subtracts Disc Amount from Invoice Amount.

Place your cursor on R6C12, and type:

V	starts VALUE command
LEFT ARROW	
	moves the cursor to Invoice Amount and displays RC[-10]
—	subtracts
LEFT ARROW	moves the cursor to Disc Amount and displays RC[-1]
RETURN	enters the formula

Formula six, in the Cost of Borrowed Money column, makes the following assumptions: that all bills are received on the first day of the month and are due on the last day of the month; that all discounted bills are paid on the date payable to get discount; that the money to pay the discounted bills does not come from cash flow, but is borrowed from the bank on the date payable to get discount, and is paid back on the last day of the month. This formula calculates the cost of borrowing the money from the date payable to get discount through the last day of the month.

Place your cursor on R6C13, and type:

V	starts VALUE command
---	----------------------

INT	name of cell containing interest
%	converts INT to a percentage
/	divides
365	number of days in year
*	multiplies
(	opens numeric expression
LOOKUP(	starts LOOKUP function
LEFT ARROW LEFT ARROW LEFT ARROW LEFT ARROW LEFT ARROW	moves cursor to Month in Date Payable columns and displays RC{-5}, contains value to be looked up
,	comma-separates value from table
DMT	name of table
)	closes LOOKUP function
—	subtracts
LEFT ARROW LEFT ARROW LEFT ARROW LEFT ARROW	moves cursor to Day in Date Payable columns, and displays RC{-4}
)	closes expression
*	multiplies
LEFT ARROW	moves cursor to Disc'd Net and displays RC{-1}
RETURN	enters the formula

Formula seven, in the Disc VS Borrow column, subtracts the cost of the borrowed money from the amount of discount received. This enables you to see whether you have actually gained or lost money by borrowing the money necessary to pay the bill.

Place your cursor on R6C14, and type:

7 EXERCISE

V	starts VALUE command
LEFT ARROW LEFT ARROW LEFT ARROW	moves cursor to Disc Amount and displays RC[-3]
—	subtracts
LEFT ARROW	moves cursor to Cost of Borrowed Money and displays RC[-1]
RETURN	enters the formula

The next operation will be to copy the formulas just entered down their appropriate columns between the single and double dash lines.

Place your cursor on R6C8, and type:

C	starts COPY command
F	selects FROM option and displays R6C8, which is first cell to copy from
:	colon-indicates from-to
R6C14	last cell to copy
[TAB]	moves cursor to TO CELLS: and displays R6C8, first cell to copy to
:	colon-indicates from-to
R6C11	last cell to copy to
RETURN	executes the command

Formula eight, in the Invoice Amount column, immediately below the double dash line, adds the amounts between the single and double dash lines.

Place your cursor on R13C2, and type:

V	starts VALUE command
SUM(	starts SUM function
UP ARROW	moves cursor to double dash line and displays R[-1]C
:	colon-indicates from-to

UP ARROW	
	moves cursor to single dash line and displays R{-8}
)	closes SUM function
RETURN	enters the formula

The next operation will be to copy the formula just entered across columns, from Disc Amount to Disc Vs Borrow columns.

Leave your cursor on R13C2, and type:

C	starts COPY command
F	selects FROM option and displays R13C2
[TAB]	moves cursor to TO CELLS:
R13C11	first cell to copy to
:	colon-indicates from-to
R13C14	last cell to copy to
RETURN	executes the command

MAKING WORKSHEET ENTRIES

Now that the worksheet is complete and is ready for entries, you will need to first enter the interest percentage to the immediate right of Interest = .

Place your cursor on R1C13 and type:

18.5	interest percentage
RETURN	enters the value

Now you are ready to type into Invoice Number through Days for Disc columns, as illustrated in Figure 3.

7 EXERCISE

1	2	3	4	5	6	7	8	9	10	11	12	13	14
INVOICE DATE					DATE PAYABLE TO GET DISCOUNT					INTEREST= 18.5			
3	4	5	6	7	8	9	10	11	12	13	14	15	16
INVOICE	INVOICE	MONTH	DAY	YEAR	DISC	DAYS FOR	MONTH	DAY	YEAR	DISC	DISC'D	BORROWED	DISC
NUMBER	AMOUNT				PERCENT	DISC				AMOUNT	NET	MONEY	VS
													BORROW
6	100 \$25000.00	3	15	82	2	10	3	25	82	\$500.00	\$24500.00	\$74.51	\$425.49
7	101 \$45000.00	3	16	82	3	15	3	31	82	\$1350.00	\$43650.00	\$0.00	\$1350.00
8	102 \$10000.00	3	16	82	2.5	10	3	26	82	\$250.00	\$9750.00	\$24.71	\$225.29
9								0	0	0	\$0.00	\$0.00	\$0.00
10								0	0	0	\$0.00	\$0.00	\$0.00
11								0	0	0	\$0.00	\$0.00	\$0.00
12	-----												
13	\$90000.00									\$2100.00	\$77900.00	\$99.22	\$2000.78
14													
15													
16	DAYS IN MONTHS TABLE												
17													
18	0	1	2	3	4	5	6	7	8	9	10	11	12
19	0	31	28	31	30	31	30	31	31	30	31	30	31

Figure 3

You may wish to print the entire worksheet for filing or distribution.

Place your cursor on any location and type:

P starts PRINT command

RETURN executes the command

You may also wish to print only a portion of the worksheet, so as not to show the work area or tables, or for other practical reasons.

Place your cursor on any cell and type:

P starts PRINT command

O selects OPTIONS option

R1C1 upper left-hand corner of worksheet to be printed

:

R13C14 lower right-hand corner of worksheet to be printed

RETURN prepares for another option selection

P selects PRINT option, and prints

PAYROLL**DESCRIPTION**

This exercise contains two worksheets: monthly payroll and a quarterly payroll worksheet. The monthly payroll worksheet calculates the gross pay for regular hours, overtime hours, double time hours, figures each employee's FICA up to \$32,400 gross pay, and calculates the net pay.

The quarterly worksheet is updated with information from the monthly worksheet, and accumulates the monthly totals and calculates total FICA due by employer.

OPERATIONS PERFORMED

Setting Up The Monthly Payroll Worksheet

Naming Cells

Entering Mathematical Formulas

Making Worksheet Entries

Setting Up The Quarterly Payroll Worksheet

Updating Quarterly Worksheet

Updating Monthly Worksheet

FUNCTIONS USED

MAX
MIN
SUM

COMMANDS USED

ALPHA
BLANK
COPY
FORMAT
LOCK
NAME
PRINT
TRANSFER
VALUE
XTERNAL

SETTING UP WORKSHEET FORMAT

Using the following directions, set up your worksheet by copying Figure 1 exactly as it is illustrated, retaining exact row and column locations of all labels.

NOTE
 Before starting any command, you must have displayed on the bottom of the screen the COMMAND: descriptions. If you do not, just press the escape key and it will clear whatever is being done and display the COMMAND: descriptions.

	1	2	3	4	5	6	7	8	9	10	11
1	EMPLOYEE	HOURLY	REG	OT	DT	GROSS	MISC	FED	FICA	NET	YTD
2	NAME	RATE	HRS	HRS	HRS	PAY	W/H	W/H		PAY	GROSS
3	-----										
4											
5											
6											
7											
8											
9											
10	=====										

Figure 1

The Multiplan worksheet format contains columns of ten characters wide when it is first entered into the computer. In this exercise, however, you will need to expand column 1 to 14 characters wide, and contract columns 3 through 5 to be 5 characters wide to accommodate their labelling information.

Place your cursor on column 1 and type:

- F starts FORMAT command
- W selects WIDTH option
- 14 number of characters in the column
- RETURN executes the command

Now place your cursor on column 3 and type:

F	starts FORMAT command
W	selects WIDTH option
5	number of characters in the column
[TAB] [TAB]	moves cursor to THROUGH:
5	column to format through
RETURN	executes the command

Next operation is to type in your row and column labels.

NOTE

Before typing in labels, you must first type:

A	starts ALPHA command, which prepares the cell for labeling information
---	------------------------------------------------------------------------

Then type in the label.

RETURN	enters label
--------	--------------

Labels are automatically left justified in the column.

NOTE

To enter a numeric value, just type the number and RETURN.

Numbers are automatically right justified in the column.

NOTE

After typing in your label, you may enter the label by moving the cursor to the next typing location, and the label will be entered and left justified. The location the cursor is on will be ready for Alpha information.

8 EXERCISE

To center the labels you have typed on rows 1 and 2, leave your cursor on any location and type:

F	starts FORMAT command
C	selects CELL options
R1C1	first cell to format from
:	colon-indicates from-to
R2C11	last cell to format to
(TAB)	moves cursor to ALIGNMENT:
C	selects CTR (center) option
RETURN	executes the command

Now let's put the dash line across row 3.

First place your cursor on R3C1, and type:

A	starts ALPHA command
-----	14 dashes
RETURN	enters the dashes

Now copy the dashes just entered in R3C1, using the COPY command.

Leave your cursor on R3C1, and type:

C	starts COPY command
R	selects RIGHT option
10	number of cells to copy into
RETURN	executes the command

The dashed line will now appear extended across the number of columns you have indicated. To enter a double-dashed line on row 10, repeat the operation above, but just exchange the single dash (-) for the double dash (=).

Now we want to format Hourly Rate and Gross Pay through YTD Gross columns to display in dollars and cents.

Place your cursor on R4C2, and type:

F	starts FORMAT command
---	-----------------------

C	selects CELLS option and displays R4C2, first cell in group to be formatted
:	colon-indicates from-to
R9C2	last cell in group to be formatted
,	comma-separates groups of cells
R4C6	first cell in group to be formatted
:	colon-indicates from-to
R11C11	last cell in group to be formatted
(TAB) (TAB)	moves cursor to FORMAT CODE: options
\$	selects DOLLAR SIGN option
RETURN	executes the command

The next operation is to format the entire screen to display a comma after the thousands in a dollar-formatted cell (\$1,000.00).

Place your cursor on any cell and type:

F	starts FORMAT command
O	selects OPTIONS: option
Y	COMMAS: Yes
RETURN	executes the command

NAMING CELLS

Now that the labels are typed in and the worksheet is formatted, we will need to name groups of cells, which will be used later for updating.

The first group of cells to be named will be Reg Hrs through DT Hrs, Misc W/H and FED W/H columns, between the single and double dash lines.

Place your cursor on R4C3, and type:

N	starts NAME command
HOURS	name of cells

8 EXERCISE

(TAB)	moves cursor to TO REFER TO: and displays R4C3, first cell in group to be named
:	colon-indicates from-to
R9C5	last cell in group to be named
,	comma-separates groups
R4C7	first cell in group to be named
:	colon-indicates from-to
R9C8	last cell in group to be named
RETURN	executes the command

The second group of cells to be named will be the Employee Name column between the single and double dash lines.

Place your cursor on R4C1, and type:

N	starts NAME command
NAMES	name of cells
(TAB)	moves cursor to TO REFER TO: and displays R4C1, first cell in column to be named
:	colon-indicates from-to
R9C1	last cell in column to be named
RETURN	executes the command

The third group of cells to be named will be Gross Pay through YTD Gross between the single and double dash lines.

Place your cursor on R4C6, and type:

N	starts NAME command
PAY	name of cells
(TAB)	moves cursor to TO REFER TO:
R4C6	first cell to name
:	colon-indicates from-to
R9C10	last cell in column to be named
RETURN	executes the command

ENTERING MATHEMATICAL FORMULAS

You will now begin entering mathematical formulas that will establish the relationships between column and row positions. The formulas and their locations are illustrated in Figure 2.

1	2	3	4	5	6	7	8	9	10	11	
	EMPLOYEE	HOURLY	REG	DT	GROSS	MISC	FED	FICA	NET	YTD	
2	NAME	RATE	HRS	HRS	PAY	W/H	W/H		PAY	GROSS	
3											
4		(RC[-4]*RC[-3])+(RC[-4]*RC[-2]*1.5)+(RC[-4]*RC[-1]*2)			\$0.00			\$0.00	\$0.00		
5		.067*MAX(0,MIN(32400-RC[+2],R			\$0.00			\$0.00	\$0.00		
6		RC[-4]-RC[-3]-RC[-2]-RC[-1]			\$0.00			\$0.00	\$0.00		
7					\$0.00			\$0.00	\$0.00		
8					\$0.00			\$0.00	\$0.00		
9					\$0.00			\$0.00	\$0.00		
10											
11		SUM(RC-8JC:RC-11C)				\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Figure 2

Formula one, in the Gross Pay column, figures total gross pay by first taking the total number of regular hours worked, and multiplying that times the hourly rate. It then takes the number of overtime hours worked and multiplies that one and one-half times the hourly rate. It then takes the number of double time hours worked and multiplies the total by two times the hourly rate. It then adds the three totals together.

Place your cursor on R4C6, and type:

(	starts numeric expression
LEFT ARROW	
LEFT ARROW	
LEFT ARROW	
LEFT ARROW	moves cursor to Hourly Rate and displays RC[-4]
*	multiplies
LEFT ARROW	
LEFT ARROW	
LEFT ARROW	moves cursor to Reg Hrs and displays RC[-3]
)	closes expression
+	adds
(	opens expression

8 EXERCISE

LEFT ARROW LEFT ARROW LEFT ARROW LEFT ARROW	moves cursor to Hourly Rate and displays RC{-4}
*	multiplies
LEFT ARROW LEFT ARROW	moves cursor to OT Hrs and displays RC{-2}
*	multiplies
1.5	value
)	closes expression
+	adds
(	opens expression
LEFT ARROW LEFT ARROW LEFT ARROW LEFT ARROW	moves cursor to Hourly Rate and displays RC{-4}
*	multiplies
LEFT ARROW	moves cursor to DT Hrs and displays RC{-1}
*	multiplies
2	value
)	closes expression
RETURN	enters the formula

Formula two, in the FICA column, calculates the amount to be paid to FICA, up to a gross pay amount of \$32,400. This formula uses a MAX function to select a fixed value, or the value generated from a list by the MIN function.

Place your cursor on R4C9, and type:

.067	value
*	multiplies
MAX	selects maximum value of the following list

(	opens list
0	value
,	comma-separates values in the list
MIN	selects minimum value of the following list, and generates a value for the first list
(	opens list
32400	value
—	subtracts
RIGHT ARROW RIGHT ARROW	moves cursor to YTD Gross and displays RC{+2}
,	comma-separates values in list
LEFT ARROW LEFT ARROW LEFT ARROW	moves cursor to Gross Pay and displays RC{-3}
)	closes list
)	closes list
RETURN	enters the formula

Formula three, in the NET PAY column, subtracts the amounts in the FED W/H, FICA, and MISC. W/H columns from the GROSS PAY amount to arrive at a NET PAY figure.

Place your cursor on R4C10 and type:

V	starts VALUE command, which prepares the cell for a numeric value or formula
LEFT ARROW LEFT ARROW LEFT ARROW LEFT ARROW	moves the cursor to Gross Pay and displays RC{-4}
—	subtracts

8 EXERCISE

LEFT ARROW LEFT ARROW LEFT ARROW	moves the cursor to Misc W/H and displays RC{-3}
—	subtracts
LEFT ARROW LEFT ARROW	moves the cursor to Fed W/H and displays RC{-2}
—	subtracts
LEFT ARROW	moves cursor to FICA and displays RC{-1}
RETURN	enters the formula

Next operation is to copy the formulas just entered down their appropriate columns between the single and double dash line.

Place your cursor on R4C6, and type:

C	starts COPY command
F	selects FROM option and displays R4C6, first cell to copy from
:	colon-indicates from-to
R4C10	last cell to copy
[TAB]	moves cursor to TO CELLS: and displays R4C6, first cell to copy into
:	colon-indicates from-to
R9C6	last cell to copy into
RETURN	enters the formula

Formula four, in the Gross Pay column, immediately below the double dash line, adds the total amounts of gross pay.

Place your cursor on R11C6, and type:

V	starts VALUE command
SUM(	adds values in the following list

UP ARROW
 UP ARROW

moves cursor to single dash line
 and displays R(-8)C

:

colon-indicates from-to

UP ARROW

moves cursor to double dash line
 and displays R(-1)C

)

closes SUM function

RETURN

enters the formula

Next operation is to copy the formula just entered across the row from Misc W/H through Gross Pay columns.

Leave your cursor on R11C6, and type:

C

starts COPY command

R

selects RIGHT option

5

number of cells to copy into

RETURN

executes the command

Now that the formulas and labels are all entered, you will want to protect them from someone accidentally typing into their locations.

Leave your cursor on any cell, and type:

L

starts LOCK command

F

selects FORMULAS option

Y

confirms

SAVING

Now that the monthly worksheet is complete, enter the payroll information, as illustrated in Figure 3.

8 EXERCISE

1	2	3	4	5	6	7	8	9	10	11	
1	EMPLOYEE	HOURLY	REG	OT	DT	GROSS	MISC	FED	FICA	NET	YTD
2	NAME	RATE	HRS	HRS	HRS	PAY	W/H	W/H		PAY	GROSS
3	-----										
4	TYLER	\$5.50	40	2		\$236.50	\$10.00	\$23.00	\$15.85	\$187.65	
5	TIFFANY	\$6.00	40	1		\$249.00	\$20.00	\$25.00	\$16.68	\$187.32	
6	ROBERT	\$4.00	40		4	\$192.00	\$20.00	\$19.00	\$12.86	\$140.14	
7	ESTELLE	\$5.00	40		8	\$280.00	\$20.00	\$28.00	\$18.76	\$213.24	
8	KAREN	\$5.50	40	3		\$244.75	\$15.00	\$24.00	\$16.40	\$189.35	
9						\$0.00			\$0.00	\$0.00	
10	=====										
11						\$1,202.25	\$85.00	\$119.00	\$80.55	\$917.70	\$0.00

Figure 3

NOTE

For the following operations, we will assume the user to be using the default disk drive.

Leave your cursor on any cell and type:

- T starts TRANSFER command
- S selects SAVE option
- PAYROLL filename
- RETURN executes the command

You may wish to print the worksheet for filing or distribution.

Place your cursor on any location and type:

- P starts PRINT command
- RETURN executes the command

SETTING UP THE SECOND WORKSHEET FORMAT

Prior to setting up the second worksheet, you must first clear the first worksheet out of memory.

Place your cursor on any cell, and type:

T starts TRANSFER command
 C selects CLEAR option
 Y confirm

Using the following directions, set up your worksheet by copying Figure 4 exactly as it is illustrated, retaining exact row and column locations of all information.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	QUARTERLY PAYROLL REPORT													
2	-----													
3	FIRST MONTH				SECOND MONTH				YEAR TO DATE					
4	-----													
5	EMPLOYEE	GROSS	MISC	FED	FICA	GROSS	MISC	FED	FICA	GROSS	MISC	FED	FICA	TOTAL
6	NAME	PAY	W/H	W/H		PAY	W/H	W/H		PAY	W/H	W/H		FICA
7	-----													
8														
9														
10														
11														
12														
13														
14	-----													

Figure 4

NOTE

Before starting any command, you must have displayed on the bottom of the screen the COMMAND: descriptions. If you do not, just press the escape key and it will clear whatever is being done and display the COMMAND: descriptions.

For purposes of demonstration, we are going to use only two months in the quarter.

8 EXERCISE

The Multiplan worksheet format contains columns of ten characters wide when it is first entered into the computer. In this exercise, however, you will need to expand column 1 to 14 characters wide, to accommodate its labelling information.

Place your cursor on column 1 and type:

F	starts FORMAT command
W	selects WIDTH option
14	number of characters in the column
RETURN	executes the command

The next operation is to type in your row and column labels.

NOTE

Before typing in labels, you must first type:

A	starts ALPHA command, which prepares the cell for labeling information
---	------------------------------------------------------------------------

Then type in the label.

RETURN	enters label
--------	--------------

Labels are automatically left justified in the column.

NOTE

To enter a numeric value, just type the number and RETURN.

Numbers are automatically right justified in the column.

NOTE

After typing in your label, you may enter the label by moving the cursor to the next typing location, and the label will be entered and left justified. The location the cursor is on will be ready for Alpha information.

The first label to type in on row 1 is wider than the column. This is no problem because Multiplan lets us connect as many adjacent cells as needed to display the entire label.

Place your cursor on R1C1, and type:

A starts ALPHA command

Type in label.

RETURN enters the label

Leave your cursor on R1C1 and type:

F starts FORMAT command

C selects CELLS option and displays
R1C1, first cell to format

: colon-indicates from-to

R1C4 last cell to format

[TAB] [TAB] moves cursor to FORMAT CODE: options

C selects CONT (continuous) option

RETURN executes the command

Repeat the above procedure when needed.

Now let's put the dash line across row 4.

First place your cursor on R3C1 and type:

A starts ALPHA command

----- 14 dashes

RETURN enters the dashes

Now copy the dash just entered in R3C1, using the COPY command.

Leave your cursor on R4C1, and type:

C starts COPY command

R selects RIGHT option

13 number of cells to copy into

RETURN executes the command

8 EXERCISE

The dashed line will now appear extended across the number of columns you have indicated. To enter a double-dashed line on row 14, repeat the operation above, but just exchange the symbol - (dash sign) for the = (equal sign).

To center the labels you have typed on rows 5 and 6, leave your cursor on any location and type:

F	starts FORMAT command
C	selects CELL options
R5C1	first cell to format to
:	colon-indicates from-to
R6C14	last cell to format to
[TAB]	moves cursor to ALIGNMENT:
C	selects CTR (center) option
RETURN	executes the command

Now we want to format the entire worksheet to display in dollars and cents.

Place your cursor on any cell, then type:

F	starts FORMAT command
D	selects DEFAULT option
C	selects CELLS option
[TAB]	moves cursor to FORMAT CODE: options
\$	selects DOLLAR SIGN option
RETURN	executes the command

NAMING CELLS

Now that the labels are typed in and the worksheet is formatted, we will need to name a group of cells, which will be used later for updating.

The group of cells to be named will be in the Year To Date, FICA columns, between the single and double dash line.

Place your cursor on R8C13 and type:

N starts NAME command
 FICA name of cells
 [TAB] moves cursor to TO REFER TO:
 and displays R8C13, first cell in
 column to be named
 : colon-indicates from-to
 R13C13 last cell in column to be named
 RETURN executes the command

ENTERING MATHEMATICAL FORMULAS

You will now begin entering mathematical formulas that will establish the relationships between column and row positions. The formulas and their locations are illustrated in Figure 5.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	QUARTERLY PAYROLL REPORT													
2	-----													
3	FIRST MONTH				SECOND MONTH				YEAR TO DATE					
4	-----													
5	EMPLOYEE	GROSS	MISC	FED	FICA	GROSS	MISC	FED	FICA	GROSS	MISC	FED	FICA	TOTAL
6	NAME	PAY	W/H	W/H		PAY	W/H	W/H		PAY	W/H	W/H		FICA
7	-----													
8										\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
9										\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
10										\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
11										\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
12										\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
13										\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
14										\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
15		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00

Figure 5

Formula one, in the Year To Date, Gross Pay column, totals the amount of gross pay in the first and second months.

Place your cursor on R8C10 and type:

V starts VALUE command

8 EXERCISE

LEFT ARROW
LEFT ARROW

moves cursor to Gross Pay in First
Month and displays RC(-8)

+

adds

LEFT ARROW
LEFT ARROW
LEFT ARROW
LEFT ARROW

moves cursor to Gross Pay in Second
Month and displays RC(-4)

RETURN

enters the formula

Next operation is to copy the formula just entered down its column between the single and double dash line.

Leave your cursor on R8C10 and type:

C

starts COPY command

D

selects DOWN option

5

number of cells to copy into

RETURN

enters the formula

The next operation is to copy the formulas just copied down the column across the Year To Date, Misc. W/H through FICA columns.

Leave your cursor on R8C10 and type:

C

starts COPY command

F

selects FROM option, and displays
R8C10, first cell to copy from

:

colon-indicates from-to

R13C10

last cell to copy from

(TAB)

moves cursor to TO CELLS: and
displays R8C10, first cell to
copy to

:

colon-indicates from-to

R8C13 last cell to copy to

RETURN executes the command

Formula two, in the Total FICA column, calculates the employer's total FICA due.

Place your cursor on R8C14 and type:

2 value

* multiplies

LEFT ARROW moves cursor to FICA and displays RC[-1]

RETURN enters the formula

Next operation is to copy the formula just entered down its column, between the single and double dash line.

Leave your cursor on R8C14, and type:

C starts COPY command

D selects DOWN option

5 number of cells to copy into

RETURN executes the command

Formula three, in the First Month Gross Pay column, totals the amounts of gross pay between the single and double dash line.

Place your cursor on R15C2 and type:

V starts VALUE command, which prepares the cell for a numeric value or formula

SUM(starts SUM function

UP ARROW

moves the cursor to single dash line and displays R[-8]

:

colon-indicates from-to

8 EXERCISE

UP ARROW	moves the cursor to double dash line and displays R(-1)C
)	closes SUM function
RETURN	enters the formula

The next operation is to copy the formula just entered across the row from Misc. W/H through Total FICA columns.

Leave your cursor on R15C2, and type:

C	starts COPY command
R	selects RIGHT option
12	number of cells to copy into
RETURN	executes the command

Now that the formulas and labels are all entered, you will want to protect them from someone accidentally typing into their locations.

Leave your cursor on any cell, and type:

L	starts LOCK command
F	selects FORMULAS option
Y	confirms

Now that the quarterly worksheet is complete and is now ready to be updated with the monthly payroll information, we will first update the Employee Name column with the names from the payroll worksheet and update Gross Pay through Net Pay from the Payroll worksheet.

Place your cursor on R8C1 and type:

X	starts XTERNAL command
C	selects COPY option
PAYROLL	file name of sheet
(TAB)	moves cursor to NAME:
NAMES	name of cells
(TAB) (TAB)	moves cursor to LINKED: option

- N selects NO option
- RETURN executes the command
- To update the Gross Pay through Net Pay columns, place your cursor on R8C2 and type:
- X starts XTERNAL command
- C selects COPY option
- PAYROLL file name of sheet
- (TAB) moves cursor to NAME:
- PAY name of cells
- (TAB) (TAB) moves cursor to LINKED: option
- N selects NO option
- RETURN executes the command

Now that the Quarterly payroll has been updated, as illustrated in Figure 6, you will need to save the report out onto disk until you need to update it next month.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1	QUARTERLY PAYROLL REPORT													
2	-----													
3	FIRST MONTH				SECOND MONTH				YEAR TO DATE					
4	-----													
5	EMPLOYEE	GROSS	MISC	FED	FICA	GROSS	MISC	FED	FICA	GROSS	MISC	FED	FICA	TOTAL
6	NAME	PAY	W/H	W/H		PAY	W/H	W/H		PAY	W/H	W/H		FICA
7	-----													
8	TYLER	\$236.50	\$10.00	\$23.00	\$15.85					\$236.50	\$10.00	\$23.00	\$15.85	\$31.69
9	TIFFANY	\$249.00	\$20.00	\$25.00	\$16.68					\$249.00	\$20.00	\$25.00	\$16.68	\$33.37
10	ROBERT	\$192.00	\$20.00	\$19.00	\$12.86					\$192.00	\$20.00	\$19.00	\$12.86	\$25.73
11	ESTELLE	\$280.00	\$20.00	\$28.00	\$18.76					\$280.00	\$20.00	\$28.00	\$18.76	\$37.52
12	KAREN	\$244.75	\$15.00	\$24.00	\$16.40					\$244.75	\$15.00	\$24.00	\$16.40	\$32.80
13		\$0.00			\$0.00					\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
14	-----													
15		\$1,202.25	\$85.00	\$119.00	\$80.55	\$0.00	\$0.00	\$0.00	\$0.00	\$1,202.25	\$85.00	\$119.00	\$80.55	\$161.10

Figure 6

8 EXERCISE

Place your cursor on any location and type:

T	starts TRANSFER command
S	selects SAVE option
QUARTERLY	filename
RETURN	executes the command

Next we will assume one month has gone by and we are ready to make monthly entries to our payroll worksheet. First we will need to clear memory, and then load in the payroll worksheet.

Next operation is to load payroll worksheet. (A loading worksheet will clear memory and overwrite an existing worksheet.)

Place your cursor on any cell and type:

T	starts TRANSFER command
L	selects LOAD option
PAYROLL	filename
RETURN	executes the command

Before making our payroll entries, we will first need to blank last month's Hourly Rate through DT Hours, Misc W/H and FED W/H columns, between the single and double dash lines.

Place your cursor on any cell and type:

B	starts BLANK command
HOURS	name of cells
RETURN	executes the command

Before making monthly payroll entries, you will need to load FICA YTD totals from the Quarterly worksheet, so that the FICA for each employee will accumulate properly as illustrated in Figure 7.

Place your cursor on R4C11 and type:

- X starts XTERNAL command
- C selects COPY option
- QUARTERLY filename of sheet
- [TAB] moves cursor to NAME:
- FICA name of cells
- [TAB] [TAB] moves cursor to LINKED: option
- N selects NO option
- RETURN executes the command

1	2	3	4	5	6	7	8	9	10	11	
1	EMPLOYEE	HOURLY	REG	OT	DT	GROSS	MISC	FED	FICA	NET	YTD
2	NAME	RATE	HRS	HRS	HRS	PAY	W/H	W/H		PAY	GROSS
3	-----										
4	TYLER	\$5.50				\$0.00			\$0.00	\$0.00	\$15.85
5	TIFFANY	\$6.00				\$0.00			\$0.00	\$0.00	\$16.68
6	ROBERT	\$4.00				\$0.00			\$0.00	\$0.00	\$12.86
7	ESTELLE	\$5.00				\$0.00			\$0.00	\$0.00	\$18.76
8	KAREN	\$5.50				\$0.00			\$0.00	\$0.00	\$16.40
9						\$0.00			\$0.00	\$0.00	\$0.00
10	=====										
11						\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$80.55

Figure 7

Your worksheet is ready for the monthly payroll entries and for starting the updating process all over again.

CONSOLIDATION OF PLANT PRODUCTION SCHEDULES

DESCRIPTION

This exercise is about a company that has two plants which make Tiffany lamps. Each day they look at the production for two weeks for each plant, and consolidate the two weeks for both plants, so they can see what the total output production will be for the two plants. They also need to be able to move jobs from one week to the next, if one week has too many hours of production in it.

This exercise contains three worksheets. The first worksheet contains the scheduling information for Plant 1. The second worksheet contains the scheduling information for Plant 2. The third worksheet is used to consolidate the scheduling information for Plants 1 and 2.

OPERATIONS PERFORMED

Setting Up The Worksheet for Plant 1

Naming Cells

Entering Mathematical Formulas

Setting Up The Worksheet for Plant 2

Making Worksheet Entries To Both Worksheets

Setting Up The Worksheet for Consolidation

Updating the Consolidation Worksheet

FUNCTIONS USED

SUM

COMMANDS USED

ALPHA
COPY
FORMAT
MOVE
NAME
PRINT
TRANSFER
VALUE
WINDOW
XTERNAL

	1	2	3	4	5
1	PLANT ONE	WEEK ONE			
2					
3	JOB	PATTERN	CUT	ASSEMBLE	TOTAL
4	NUMBER	MAKING	GLASS		HOURS
5					
6					
7					
8					
9					
10	=====				
11	TOTALS				
12					
13	WEEK TWO				
14					
15	JOB	PATTERN	CUT	ASSEMBLE	TOTAL
16	NUMBER	MAKING	GLASS		HOURS
17					
18					
19					
20					
21					
22	=====				
23	TOTALS				
24					
25	SUMMARY				
26					
27		PATTERN	CUT	ASSEMBLE	TOTAL
28		MAKING	GLASS		HOURS
29					
30	WEEK ONE				
31	WEEK TWO				
32	=====				
33	TOTALS				

Figure 1

9 EXERCISE

To center all of the labelling information on the worksheet, place your cursor on any cell and type:

F	starts FORMAT command
D	selects DEFAULT option
C	selects CELLS option
C	selects CTR (center) option
RETURN	executes the command

Now let's put the dash line across row 2.

First place your cursor on R2C1, and type:

A	starts ALPHA command
-----	10 dashes
RETURN	enters the dashes

Now copy the dashes just entered in R2C1, using the COPY command.

Leave your cursor on R2C1, and type:

C	starts COPY command
R	selects RIGHT option
4	number of cells to copy into
RETURN	executes the command

The dashed line will now appear extended across the number of columns you have indicated. To enter a double-dashed line on row 10, repeat the operation above, but just exchange the single dash (-) for the double dash (=).

NAMING CELLS

Now that the labels are typed in and the worksheet is formatted, we will need to name groups of cells, which will be used later in formulas and for consolidation.

The first group of cells to be named will be Week One Totals.

Place your cursor on R11C2, and type:

N	starts NAME command
---	---------------------

P1WK1	name of cells
(TAB)	moves cursor to TO REFER TO: and displays R11C2, first cell in group to be named
:	colon-indicates from-to
R11C5	last cell in group to be named
RETURN	executes the command

The second group of cells to be named will be the Week Two Totals.

Place your cursor on R23C2, and type:

N	starts NAME command
P1WK2	name of cells
	Note: Multiplan remembers what the last name cell locations were and changes them relative to the cursor position
RETURN	executes the command

The third group of cells to be named will be Summary Totals.

Place your cursor on R33C2, and type:

N	starts NAME command
P1SUM	name of cells
RETURN	executes the command

ENTERING MATHEMATICAL FORMULAS

You will now begin entering mathematical formulas that will establish the relationship between column and row positions. The formulas and their locations are illustrated in Figure 2.

Formula one, in the Week One Total Hours column, adds Pattern Making, Cutting Glass and Assemble columns.

Place your cursor on R6C5, and type:

V	starts VALUE command, which prepares the cell for a numeric value or formula
---	------------------------------------------------------------------------------------

9 EXERCISE

	1	2	3	4	5
1	PLANT ONE	WEEK ONE			
2	-----				
3	JOB	PATTERN	CUTTING	ASSEMBLE	TOTAL
4	NUMBER	MAKING	GLASS		HOURS
5	-----				
6					0
7					0
8					0
9					0
10	=====				
11	TOTALS	0	0	0	0
12	-----				
13	WEEK TWO				
14	-----				
15	JOB	PATTERN	CUTTING	ASSEMBLE	TOTAL
16	NUMBER	MAKING	GLASS		HOURS
17	-----				
18					0
19					0
20					0
21					0
22	=====				
23	TOTALS	0	0	0	0
24	-----				
25	SUMMARY				
26	-----				
27		PATTERN	CUTTING	ASSEMBLE	TOTAL
28		MAKING	GLASS		HOURS
29	-----				
30	WEEK ONE	0	0	0	0
31	WEEK TWO	0	0	0	0
32	=====				
33	TOTALS	0	0	0	0

Annotations:

- Cell 6:5: SUM(RC[-3]:RC[-1])¹
- Cell 11:5: SUM(RC[-6]C:RC[-1]C)²
- Cell 30:2: P1WK1³
- Cell 31:2: P1WK2⁴
- Cell 33:5: P1WK1+P1WK2⁵

Figure 2

SUM(	adds values in the following list
LEFT ARROW LEFT ARROW LEFT ARROW	moves the cursor to Pattern Making and displays RC(-3)
:	colon-indicates from-to
LEFT ARROW	moves the cursor to Assemble and displays RC(-1)
)	closes list
RETURN	enters the formula

The next operation is to copy the formula just entered down the column between the single and double dash line.

Leave your cursor on R6C5 and type:

C	starts COPY command
D	selects DOWN option
3	number of cells to copy into
RETURN	executes the command

Formula two, in the Week One Totals row, totals Pattern Making through Total Hours columns, between the single and double dash line.

Place your cursor on R11C2 and type:

V	starts VALUE command
SUM(	adds value in the following list
UP ARROW UP ARROW UP ARROW UP ARROW UP ARROW UP ARROW	moves cursor to single dash line and displays R(-6)
:	colon-indicates from-to
UP ARROW	moves cursor to double dash line and displays R(-1)C
)	closes the list
RETURN	enters the formula

9 EXERCISE

The next operation is to copy the formula just entered across the row between Cutting Glass and Total Hours columns.

Leave your cursor on R11C2 and type:

C	starts COPY command
R	selects RIGHT option
3	number of cells to copy into
RETURN	executes the command

The next operation will be to copy the formulas just entered in Week One into Week Two.

Place your cursor on R6C2 and type:

C	starts COPY command
F	selects FROM option, and displays R6C2, first cell to copy
:	colon-indicates from-to
R11C5	last cell to copy
(TAB)	moves cursor to TO CELLS:
R18C2	first cell to start copying into
RETURN	executes the command

Formula three, in the Summary, Week One, Pattern Making column, displays Pattern Making for Week One totals.

Place your cursor on R30C2 and type:

V	starts VALUE command
P1WK1	name of cell
RETURN	enters the formula

Formula four, in the Summary, Week Two, Pattern Making column, displays Pattern Making for Week Two totals.

Place your cursor on R31C2 and type:

V	starts VALUE command
P1WK2	name of cell
RETURN	enters the formula

Formula five, in the Summary Totals, Pattern Making column, totals Week One and Two totals.

Place your cursor on R33C2 and type:

V	starts VALUE command
P1WK1	name of cells
+	adds
P1WK2	name of cells
RETURN	enters the formula

Next operation is to copy the three formulas just entered across the rows in the Summary, Cutting Glass to Total Hours columns.

Place your cursor on R30C2 and type:

C	starts COPY command
F	selects FROM option and displays R30C2, first cell to copy
:	colon-indicates from-to
R33C2	last cell to copy
[TAB]	moves cursor to TO CELLS: and displays R30C2, first cell to copy into
:	colon-indicates from-to
R30C5	last cell to copy into
RETURN	executes the command

Now that the worksheet is complete for Plant 1, we will save it onto disk for later use.

Place your cursor on any cell and type:

T	starts TRANSFER command
S	selects SAVE option
PLANT1	filename
RETURN	executes the command

SETTING UP WORKSHEET FOR PLANT 2

To save time in the setting up of the Plant 2 worksheet, since Plant 2 worksheet is identical to Plant 1 worksheet, except for the naming of the cells, we will leave Plant 1's worksheet in memory and just modify it, as illustrated in Figure 3.

First operation is to change the plant number in R1C1 to read Plant 2.

Place your cursor on R1C1 and type:

- | | |
|-----------|----------------------|
| A | starts ALPHA command |
| PLANT TWO | label |
| RETURN | enters the formula |

NAMING CELLS

Now all we have to do is change the name of the cells so they will apply to Plant 2. The first name to change will be P1WK1 to be P2WK1.

Leave your cursor on any cell and type:

- | | |
|------------|---------------------------------------------------------------------------------------------------------|
| N | starts NAME command |
| LEFT ARROW | scrolls the names already present.
Press left arrow until P1WK1 appears
on the Defined Name: line |
| BACKSPACE | backspace until you have deleted
the entire word P1WK1 |
| P2WK1 | new name of cells |
| RETURN | executes the command |

The next cells to be renamed will be P1WK2 to P2WK2.

Leave your cursor on any cell and type:

- | | |
|------------|---------------------------------------------------------------------------------------------------------|
| N | starts NAME command |
| LEFT ARROW | scrolls the names already present.
Press left arrow until P1WK2 appears
on the Defined Name: line |
| BACKSPACE | backspace until you have deleted
the entire word P1WK2 |

	1	2	3	4	5
1	PLANT TWO WEEK ONE				
2	-----				
3	JOB	PATTERN	CUTTING	ASSEMBLE	TOTAL
4	NUMBER	MAKING	GLASS		HOURS
5	-----				
6					0
7					0
8					0
9					0
10	=====				
11	TOTALS	0	0	0	0
12	-----				
13	WEEK TWO				
14	-----				
15	JOB	PATTERN	CUTTING	ASSEMBLE	TOTAL
16	NUMBER	MAKING	GLASS		HOURS
17	-----				
18					0
19					0
20					0
21					0
22	=====				
23	TOTALS	0	0	0	0
24	-----				
25	SUMMARY				
26	-----				
27		PATTERN	CUTTING	ASSEMBLE	TOTAL
28		MAKING	GLASS		HOURS
29	-----				
30	WEEK ONE	0	0	0	0
31	WEEK TWO	0	0	0	0
32	=====				
33	TOTALS	0	0	0	0

SUM(RC[-3]:RC[-1])

SUM(R[-6]C:R[-1]C)

P2WK1 1

P2WK2 2

P2WK1 + P2WK2 3

Figure 3

9 EXERCISE

P2WK2 new name of cells

RETURN executes the command

The next cell to be renamed will be P1SUM to P2SUM.

Leave your cursor on any cell and type:

N starts NAME command

LEFT ARROW scrolls the names already present.
Press left arrow until P1SUM appears
on the Defined Name: line

BACKSPACE backspace until you have deleted
the entire word P1SUM

P2SUM new name of cells

RETURN executes the command

ENTERING MATHEMATICAL FORMULAS

Formula one, in the Summary, Week One, Pattern Making column, displays Week One Totals for Pattern Making.

Place your cursor on R30C2 and type:

V starts VALUE command

P2WK1 name of cell

RETURN enters the formula

Formula two, in the Summary, Week Two, Pattern Making column, displays Pattern Making for Week Two totals.

Place your cursor on R31C2 and type:

V starts VALUE command

P2WK2 name of cell

RETURN enters the formula

Formula three, in the Summary Totals, Pattern Making column, totals Week One and Two totals.

Place your cursor on R33C2 and type.

V starts VALUE command

P2WK1 name of cells

+	adds
P2WK2	name of cells
RETURN	enters the formula

Next operation is to copy the three formulas just entered across the rows in the Summary, Cutting Glass to Total Hours columns.

Place your cursor on R30C2 and type:

C	starts COPY command
F	selects FROM option and displays R30C2, first cell to copy
:	colon-indicates from-to
R33C2	last cell to copy
[TAB]	moves cursor to TO CELLS: and displays R30C2, first cell to copy into
:	colon-indicates from-to
R30C5	last cell to copy into
RETURN	executes the command

Now that the worksheet is complete for Plant 2, make the worksheet entries as illustrated in Figure 4.

When the entries are complete, you will need to save the worksheet onto disk. Leave your cursor on any location and type:

T	starts TRANSFER command
S	selects SAVE option
PLANT2	filename
RETURN	executes the command

Now we will need to make entries to Plant 1 worksheet, so we will need to load it back into memory.

Leave your cursor on any location and type:

T	starts TRANSFER command
---	-------------------------

9 EXERCISE

	1	2	3	4	5
1	PLANT TWO	WEEK ONE			
2	-----				
3	JOB	PATTERN	CUTTING	ASSEMBLE	TOTAL
4	NUMBER	MAKING	GLASS		HOURS
5	-----				
6	20	45	56	67	168
7	21	50	21	54	125
8	22	70	75	80	225
9	23	32	54	65	151
10	=====				
11	TOTALS	197	206	266	669
12	-----				
13	WEEK TWO				
14	-----				
15	JOB	PATTERN	CUTTING	ASSEMBLE	TOTAL
16	NUMBER	MAKING	GLASS		HOURS
17	-----				
18	24	23	45	67	135
19	25	12	32	54	98
20	26	90	70	80	240
21	27	50	50	30	130
22	=====				
23	TOTALS	175	197	231	603
24	-----				
25	SUMMARY				
26	-----				
27		PATTERN	CUTTING	ASSEMBLE	TOTAL
28		MAKING	GLASS		HOURS
29	-----				
30	WEEK ONE	197	206	266	669
31	WEEK TWO	175	197	231	603
32	=====				
33	TOTALS	372	403	497	1272

Figure 4

L selects LOAD option

PLANT1 filename

RETURN executes the command

Now make your worksheet entries as illustrated in Figure 5.

Next operation is to save the worksheet back onto disk after the entries have been made.

Leave your cursor on any cell and type:

T starts TRANSFER command

S selects SAVE option and displays
PLANT1, filename to be saved

RETURN executes the command

	1	2	3	4	5
1	PLANT ONE WEEK ONE				
2	-----				
3	JOB	PATTERN	CUTTING	ASSEMBLE	TOTAL
4	NUMBER	MAKING	GLASS		HOURS
5	-----				
6	1	12	13	15	40
7	2	23	34	54	111
8	3	34	45	65	144
9	4	45	75	45	165
10	=====				
11	TOTALS	114	167	179	460
12					
13	WEEK TWO				
14	-----				
15	JOB	PATTERN	CUTTING	ASSEMBLE	TOTAL
16	NUMBER	MAKING	GLASS		HOURS
17	-----				
18	5	54	45	61	160
19	6	14	21	12	47
20	7	23	45	50	118
21	8	15	25	30	70
22	=====				
23	TOTALS	106	136	153	395
24					
25	SUMMARY				
26	-----				
27		PATTERN	CUTTING	ASSEMBLE	TOTAL
28		MAKING	GLASS		HOURS
29	-----				
30	WEEK ONE	114	167	179	460
31	WEEK TWO	106	136	153	395
32	=====				
33	TOTALS	220	303	332	855

Figure 5

SETTING UP WORKSHEET FOR CONSOLIDATION

Before setting up the consolidated worksheet, we will first need to clear memory of the existing worksheet.

Leave your cursor on any cell and type:

- T starts TRANSFER command
- C selects CLEAR option
- Y confirms

Enter your labels for the consolidated worksheet, as illustrated in Figure 6, retaining exact row and column locations of all information, using the instructions previously described earlier in this exercise.

9 EXERCISE

	1	2	3	4	5
1	CONSOLIDATED REPORT				
2		PATTERN	CUTTING	ASSEMBLE	TOTAL
3	PLANT ONE	MAKING	GLASS		HOURS
4	-----				
5	WEEK ONE				
6	WEEK TWO				
7	=====				
8	TOTALS				
9	-----				
10		PATTERN	CUTTING	ASSEMBLE	TOTAL
11	PLANT TWO	MAKING	GLASS		HOURS
12	-----				
13	WEEK ONE				
14	WEEK TWO				
15	=====				
16	TOTALS				
17	-----				
18	SUMMARY OF PLANT ONE AND TWO				
19	-----				
20		PATTERN	CUTTING	ASSEMBLE	TOTAL
21		MAKING	GLASS		HOURS
22	-----				
23	WEEK ONE				
24	WEEK TWO				
25	=====				
26	TOTALS				

Figure 6

NOTE

When typing in a label which is wider than the column, it is no problem because Multiplan lets you connect as many adjacent cells as needed to display the entire label.

To demonstrate this, place your cursor on R1C1 and type:

A	starts ALPHA command
CONSOLIDATED REPORT	label
RETURN	enters the label

Leave your cursor on R1C1 and type:

- F starts FORMAT command
- C selects CELLS option and displays R1C1, first cell to format
- :
- R1C2 last cell to format
- (TAB) (TAB) moves cursor to FORMAT CODE: options
- C selects CONT (continuous) option
- RETURN executes the command

ENTERING MATHEMATICAL FORMULAS

The formulas and their locations are illustrated in Figure 7.

	1	2	3	4	5	
1	CONSOLIDATED REPORT					
2		PATTERN	CUTTING	ASSEMBLE	TOTAL	
3	PLANT ONE	MAKING	GLASS		HOURS	
4	-----					
5	WEEK ONE	114	167	179	460	[PLANT1 P1WK1]
6	WEEK TWO	106	136	153	395	[PLANT1 P1WK2]
7	-----					
8	TOTALS	220	303	332	855	SUM(R[-4]C:R[-1]C)
9	-----					
10		PATTERN	CUTTING	ASSEMBLE	TOTAL	
11	PLANT TWO	MAKING	GLASS		HOURS	
12	-----					
13	WEEK ONE	197	206	266	669	[PLANT2 P2WK1]
14	WEEK TWO	175	197	231	603	[PLANT2 P2WK2]
15	-----					
16	TOTALS	372	403	497	1272	
17	-----					
18	SUMMARY OF PLANT ONE AND TWO					
19	-----					
20		PATTERN	CUTTING	ASSEMBLE	TOTAL	
21		MAKING	GLASS		HOURS	
22	-----					
23	WEEK ONE	311	373	445	1129	R[-18]C+R[-10]C
24	WEEK TWO	281	333	384	998	R[-18]C+R[-10]C
25	-----					
26	TOTALS	592	706	829	2127	SUM(R[-4]C:R[-1]C)

Figure 7

9 EXERCISE

Formula one in the Plant 1 Totals, Pattern Making column, totals the Week One and Two totals, between the single and double dash line.

Place your cursor on R8C2 and type:

V	starts VALUE command
SUM(	adds values in the following list
UP ARROW	
UP ARROW	
UP ARROW	
UP ARROW	moves cursor to single dash line and displays R(-4)C
:	colon-indicates from-to
UP ARROW	moves cursor to double dash line and displays R(-1)C
)	closes list
RETURN	enters the formula

Your next operation is to copy the formula just entered across the row between Cutting Glass and Total Hours.

Leave your cursor on R8C2 and type:

C	starts COPY command
R	selects RIGHT option
3	number of cells to copy into
RETURN	executes the command

The next operation is to copy the formulas just entered across the row into Plant 2 Totals row.

Leave your cursor on R8C2 and type:

C	starts COPY command
F	selects FROM option and displays R8C2, first cell to copy
:	colon-indicates from-to
R8C5	last cell to copy
[TAB]	moves cursor to TO CELLS:

9 EXERCISE

UP ARROW
UP ARROW

location of Plant Two First Week
Pattern Making, and displays R(-10)

RETURN enters the formula

The next operation will be to copy the formula just entered into the Summary Week Two Pattern Making column.

Leave your cursor on R23C2 and type:

C starts COPY command
D selects DOWN option
1 number of cells to copy into
RETURN executes the command

The following operation will be to copy the two formulas just entered across their two rows, from Cutting Glass to Total Hours.

Place your cursor on R23C2 and type:

C starts COPY command
F selects FROM option and displays
R23C2, first cell to copy from
: colon-indicates from-to
R24C2 last cell to copy from
(TAB) moves cursor to TO CELLS: and
displays R23C2, first cell to
copy into
: colon-indicates from-to
R23C5 last cell to copy into
RETURN executes the command

CONSOLIDATING THE TWO WORKSHEETS

Now that the worksheet has the formulas and the labels entered, we will consolidate the information from Plant One worksheet and Plant Two worksheet into our consolidated worksheet.

The first consolidating operation will be to bring Week One totals from Plant 1 worksheet and place it in the Plant 1, Week One, row.

Place your cursor on R5C2 and type:

X	starts XTERNAL command
C	selects COPY option
PLANT1	sheet to copy from
[TAB]	moves cursor to NAME :
P1WK1	name of cells
RETURN	executes the command

The second consolidating operation will be to bring Week Two totals from Plant 1 worksheet and place it in the Plant 1, Week Two, row.

Place your cursor on R6C2 and type:

X	starts XTERNAL command
C	selects COPY option
PLANT1	sheet to copy from
[TAB]	moves cursor to NAME :
P1WK2	name of cells
RETURN	executes the command

The third consolidating operation will be to bring Week One totals from Plant 2 worksheet and place it in the Plant 2, Week One row. Place your cursor on R13C2 and type:

X	starts XTERNAL command
C	selects COPY option
PLANT2	sheet to copy from

9 EXERCISE

(TAB)	moves cursor to NAME :
P2WK1	name of cells
RETURN	executes the command

The fourth consolidating operation will be to bring Week Two totals from Plant 2 worksheet and place it in the Plant 2, Week Two row.

Place your cursor on R14C2 and type:

X	starts XTERNAL command
C	selects COPY option
PLANT2	sheet to copy from
(TAB)	moves cursor to NAME :
P2WK2	name of cells
RETURN	executes the command

Now to demonstrate how the three sheets will work in conjunction with one another, we will first save the consolidated worksheet onto disk. Then we will load Plant 1 worksheet and make some adjustments to the worksheet, and then save it back onto disk. Next we will reload consolidated worksheet back into memory and watch how it is automatically updated with the adjustments that were made to the Plant 1 worksheet.

The first operation will be to save the consolidated worksheet onto disk.

Leave your cursor on any cell and type:

T	starts TRANSFER command
S	selects SAVE option
CONSOL	filename
RETURN	executes the command

Second operation is to load Plant 1 worksheet into memory.

Leave your cursor on any cell and type:

T	starts TRANSFER command
L	selects LOAD option

PLANT1 filename
 RETURN executes the command

The adjustment which will be made to Plant 1 worksheet will be to move Job Number 2 from Week One and place it into Week Two, between Job Number 6 and 7. Since the worksheet is larger than the screen, we will split the screen into two screens using the WINDOW command, so that when we move the job from one week to the next we will be able to watch the summary information change, as illustrated in Figure 8.

Place your cursor on R34C1. This will place the summary information on the screen.

Place your cursor on R25C1 and type:

W starts WINDOW command
 S selects SPLIT option
 H selects HORIZONTAL option
 RETURN executes the command

Next operation is to move the cursor from Window #2 back into Window #1 by typing ; (semi-colon).

Place your cursor on R7C1 in Window #1 and type:

M starts MOVE command
 R selects ROW option
 (TAB) moves cursor to TO BEFORE ROW:
 20 row number
 RETURN executes the command

Before saving the worksheet onto disk, we will put the worksheet back into one screen.

Leave your cursor on any location and type:

W starts WINDOW command
 C selects CLOSE option
 2 window to close
 RETURN executes the command

9 EXERCISE

#1	1	2	3	4	5
4	NUMBER	MAKING	GLASS		HOURS
5	-----				
6	1	12	13	15	40
7	2	23	34	54	111
8	3	34	45	65	144
9	4	45	75	45	165
10	=====				
11	TOTALS	114	167	179	460
12	-----				
#2	1	2	3	4	5
24	-----				
25	SUMMARY				
26	-----				
27		PATTERN	CUTTING	ASSEMBLE	TOTAL
28		MAKING	GLASS		HOURS
29	-----				
30	WEEK ONE	114	167	179	460
31	WEEK TWO	106	136	153	395
32	=====				
33	TOTALS	220	303	332	855

Before the move

#1	1	2	3	4	5
4	NUMBER	MAKING	GLASS		HOURS
5	-----				
6	1	12	13	15	40
7	3	34	45	65	144
8	4	45	75	45	165
9	=====				
10	TOTALS	91	133	125	349
11	-----				
12	WEEK TWO				
#2	1	2	3	4	5
24	-----				
25	SUMMARY				
26	-----				
27		PATTERN	CUTTING	ASSEMBLE	TOTAL
28		MAKING	GLASS		HOURS
29	-----				
30	WEEK ONE	91	133	125	349
31	WEEK TWO	129	125	146	346
32	=====				
33	TOTALS	220	258	271	695

After the move

Figure 8

The third operation is to save the worksheet back onto disk.

Leave your cursor on any cell and type:

- T starts TRANSFER command
- S selects SAVE option and displays PLANT1 filename to be saved
- RETURN executes the command
- Y overwrites existing file

The fourth and final operation will be to load the consolidated worksheet into memory, and it will have the adjustments made to Plant 1 worksheet in it, as illustrated in Figure 9.

	1	2	3	4	5
1	CONSOLIDATED REPORT				
2		PATTERN	CUTTING	ASSEMBLE	TOTAL
3	PLANT ONE	MAKING	GLASS		HOURS
4	-----				
5	WEEK ONE	91	133	125	349
6	WEEK TWO	129	125	146	346
7	=====				
8	TOTALS	220	258	271	695
9	-----				
10		PATTERN	CUTTING	ASSEMBLE	TOTAL
11	PLANT TWO	MAKING	GLASS		HOURS
12	-----				
13	WEEK ONE	197	206	266	669
14	WEEK TWO	175	197	231	603
15	=====				
16	TOTALS	372	403	497	1272
17	-----				
18	SUMMARY OF PLANT ONE AND TWO				
19	-----				
20		PATTERN	CUTTING	ASSEMBLE	TOTAL
21		MAKING	GLASS		HOURS
22	-----				
23	WEEK ONE	288	339	391	1018
24	WEEK TWO	304	322	377	949
25	=====				
26	TOTALS	592	661	768	1967

Figure 9

9 EXERCISE

Leave your cursor on any cell and type:

T	starts TRANSFER command
L	selects LOAD option
CONSOL	filename
RETURN	executes the command

As illustrated in Figure 9, your consolidated worksheet is now updated with the adjustments that were made to the Plant 1 Worksheet.

You may wish to print the entire worksheet for filing or distribution.

Place your cursor on any location and type:

P	starts PRINT command
RETURN	executes the command

CALCULATING COMMISSION USING THE ITERATION OPTION

This exercise is designed specifically to show you how the ITERATION option works within Multiplan. We have set up a small problem which will allow you to observe how the ITERATION option is used to solve extended problems. We will calculate a commission of 10% based on the net amount. Then we will calculate the net amount based on the commission subtracted from the gross amount.

The labels and the formulas for the exercise are illustrated in Figure 1. First enter the label, retaining exact row and column locations.

NOTE: Before entering a label, type A to start the Alpha command which will prepare the cell for labeling information. Now enter your three labels in column 1.

NOTE: Before starting any command, you must have displayed on the bottom of the screen the COMMAND: descriptions. If you do not, just press the escape key and it will clear whatever is being done and display the COMMAND: descriptions.

	1	2	
1	GROSS AMT		
2	COMMISSION	\$0.00	R[+1]C#10%
3	NET AMT	\$0.00	R[-2]C-R[-1]C

Figure 1

Now that the labels are entered, we will want to format column 2 to display amounts in dollars and cents. Type:

F	starts FORMAT command
C	selects CELLS option
C2	column to format
[TAB] [TAB]	moves cursor to FORMAT CODE: options
\$	selects DOLLAR SIGN option
RETURN	executes the command

Formula one to the immediate right of Commission, calculates the commission based on the Net Amt. Place your cursor on R2C2 and type:

V	starts VALUE command
DOWN ARROW	moves cursor to Net Amt and displays R(+1)C

10 EXERCISE

*	multiplies
10%	commission percentage
RETURN	enters the formula
Formula two, to the immediate right of Net Amt, subtracts the Commission from the Gross Amt. Place your cursor on R3C2 and type:	
V	starts VALUE command
UP ARROW	moves the cursor to Gross Amt and
UP ARROW	displays R(-2)C
—	subtracts
UP ARROW	moves the cursor to Commission
	and displays R(-1)C
RETURN	enters the formula

Now that the formulas are entered we will now enter the Gross Amt, 2500, in R1C2, as illustrated in Figure 2. Note that when you make the entry the work sheet does not do any calculations, but it does display under the COMMAND: description lines: UNRESOLVED CIRCULAR REFERENCES error message, which means an extended problem needs to be solved.

	1	2
1	GROSS AMT	\$2500.00
2	COMMISSION	\$0.00
3	NET AMT	\$0.00

Figure 2

To calculate the formulas on the work sheet you must turn on the ITERATION option to solve this extended problem. Type:

O	starts OPTION command
Y	RECALC: YES
[TAB] [TAB]	moves cursor to ITERATION:
Y	ITERATION: YES

Now watch the work sheet calculate the Commission and the Net Amt, as illustrated in Figure 3.

	1	2
1	GROSS AMT	\$2500.00
2	COMMISSION	\$227.27
3	NET AMT	\$2272.73

Figure 3

INDEX OF FUNCTIONS AND COMMANDS

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MAX	5,16,40,90,124
MIN	15,16,41,125
SUM	12,24,26,39,54,55,57,93,114,126,135,158

COMMANDS USED

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