

# *WGS/SpreadSheet™ User's Guide*

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*Version 2.0*

*Volume 2*

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This chapter describes how to use the WGS/Spreadsheet functions. *Functions* are built-in formulas that perform standard calculations. So, before you create a formula, check to see if a function for the formula already exists.

For a complete discussion on entering formulas, refer to Chapter 3, "Entering and Editing Spreadsheet Information."

The functions are discussed in the following order:

- Arithmetic and Statistical
- Date
- Financial
- Logical
- Lookup, Choose, and Index
- Text and Labels
- Trigonometric
- Database

## Function Format Notation

The format of the functions described in this chapter is as follows:

`@FUNCTION(arguments)`

Although the at sign (@) precedes the function name in functions shown throughout this chapter, it is not required. If the function is at the beginning of a formula, however, it must be preceded by one of the following symbols:

`@ + - $ (`

Not all functions require arguments. If a function does not require an argument, the format does not show one.

Arguments can be values, labels, cell references, ranges, or lists. In this chapter, the description of a function notes any requirements about the function's arguments. If a specific type of argument is required, that is noted in the format as follows:

- x        Indicates an argument that evaluates to a number
- y        Indicates an argument that evaluates to a number
- n        Indicates an argument that evaluates to a number; the argument usually represents a count
- list     Indicates a list of arguments, separated by commas
- range    Indicates a range of cells: cell address (a1..a10) or a range name (sales)
- term     The argument may be shown in the format as a term (offset, criterion, payment, interest) defined in the function's description

## Typing Functions

You type functions the same way you type formulas. (Refer to Chapter 3 for details about entering formulas.)

Remember that the at sign (@) preceding the function name is optional, unless the function is the start of a formula. In such cases, you must precede the function name with one of the following: @ + - \$ (

Function arguments are *always* separated by a comma. Type a function's arguments in the order they appear in the format shown for that function.

As with any formula, a function can contain other functions, for example,

@AVG(SUM(a1..a10),55,c15,c16)

## Arithmetic and Statistical Functions

The following paragraphs describe arithmetic and statistical functions. The worksheet below provides the values for the examples.

	a	b	c	d	e	f	g
1		January	February	March	Averages		
2	Rent:	\$500.00	\$500.00	\$500.00	\$500.00		
3	Income:	\$1,200.00	\$1,200.00	\$1,200.00	\$1,200.00		
4	Misc:	\$435.00	\$170.00	\$750.00	\$451.67		
5							
6	Savings:	\$265.00	\$530.00	(\$50.00)	\$248.33		
7							
8							
9							
10							
11							
12							
13							
14							
15							

433.5-1

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---

@ABS(x)

---

The @ABS function returns the absolute value of the number specified in the argument. The argument must evaluate to a single number.

### Example

@ABS(d6) = 50

Even though the value of cell d6 contains a negative value, the function returns a positive number.

---

@AVG(list)

---

The @AVG function returns the average value of the arguments in the list. Each argument in the list must evaluate to a number.

The average is calculated by totaling the numbers and dividing the total by the count.

Blank cells are not counted in the average.

Labels use a value of zero and are counted in the average.

### Examples

@AVG(b4,c4,d4) = \$451.67

Returns the average of the values in cells b4, c4, and d4.

@AVG(a4..d4) = \$338.75

Returns the average of the values in cells a4 through d4. Notice the difference the label makes to the average.

---

@BLANK(range)

---

The @BLANK function returns the number of blank cells in the given range.

**Example**

@BLANK(a1..e6) = 6

Returns the number of blank cells in the range.

---

@COL

---

The @COL function returns the column number of the formula. The @COL function is 1-based, not 0-based, for example, col a = 1.

---

## @COUNT(list)

---

The @COUNT function returns the number of nonblank cells in the list. If the list contains a range of cells, the function counts all nonblank cells in the range.

### Example

@COUNT(a1..e6) = 24

Returns the number of nonblank cells in the range.



---

## @EXP(x)

---

The @EXP function returns the exponential value for the argument. The argument must evaluate to a number.

The exponential value is the value of the mathematical constant  $e$  raised to the power specified by the argument. The constant  $e$  is equal to 2.718281828.

*NOTE: The argument should be a number less than or equal to 230; the spreadsheet cannot display the result of a greater argument.*

The @EXP function is the reciprocal of the @LN function.

### Examples

@EXP(230) = 7.7220185e+99

@EXP(231) = ERR

The second example returns an ERR because the value of the argument is greater than 230.

---

@INT(x)

---

The @INT function returns the integer value of the argument. The argument must evaluate to a number.

The result is calculated by truncating the decimal places.

To round a number up or down as appropriate, use the @ROUND function.

### Examples

@INT(54.9453) = 54

@INT(-12.75) = -12

@INT(17.3) = 17

---

## @LN(x)

---

The @LN function returns the natural logarithm (base  $e$ ) of the numerical expression. The argument must evaluate to a number. If the value of the argument is less than or equal to zero, an ERR results.

The @LN function is the reciprocal of the @EXP function.

### **Example**

$$\text{@LN}(20.08553) = 3$$

---

## @LOG(x)

---

The @LOG function returns the logarithm (base 10) of the expression. The argument must evaluate to a number. If the value of the argument is less than or equal to zero, an ERR results.

### Example

$$\text{@LOG}(3.4) = 0.531479$$

---

## @MAX(list)

---

The @MAX function returns the maximum value of all arguments in the list. Label arguments use a value of zero.

Blank cells within a range are ignored.

When single cells are listed (even as a range), blank cells use the value of zero.

### Examples

$$\text{@MAX}(a2..a7,b5,d4) = 750$$

$$\text{@MAX}(a2..a6) = 0$$

---

@MIN(list)

---

The @MIN function returns the minimum value of all arguments in the list. Label arguments use a value of zero.

Blank cells within a range are ignored.

When single cells are listed (even as a range), blank cells use the value of zero.

### Examples

@MIN(a2..a7,b5,d4) = 0

@MIN(b4..d4) = 170

---

@MOD(x,y)

---

The @MOD function returns the remainder (modulus) of the first argument (x) divided by the second (y).

Both arguments must evaluate to a number. The arguments can be positive, negative, or mixed. If mixed, the sign of the first argument (x) determines the sign of the result. If the second argument (y) evaluates to zero, an ERR results.

The function is calculated using the following formula:

$$x - (y * @INT(x/y))$$

### Examples

$$@MOD(416,83) = 1$$

$$@MOD(83,416) = 83$$

---

## @RAND

---

The @RAND function generates random numbers between 0.0 and 1.0. A different value appears each time the spreadsheet is recalculated.

### Example

@RAND = .1757202

@RAND = .3086243



---

## @ROUND(x,n)

---

The @ROUND function rounds the first argument ( $x$ ) to the precision specified by the second ( $n$ ). The  $n$  argument must be between -15 and 15, inclusive; the function automatically converts the  $n$  argument to an integer.

The first argument ( $x$ ) is rounded as follows:

- If  $n$  equals 0, the value of  $x$  is rounded to an integer.
- If  $n$  is positive, the value of  $x$  is rounded to that number of decimal places.
- If  $n$  is negative, the value of  $x$  is rounded to the specified power of ten.

Label arguments use a zero value.

### Examples

$$\text{@ROUND}(555.46,0) = 555$$

$$\text{@ROUND}(555.46,1) = 555.5$$

$$\text{@ROUND}(555.46,2) = 555.46$$

$$\text{@ROUND}(555.46,-1) = 560$$

$$\text{@ROUND}(555.46,-2) = 600$$

---

## @ROW

---

The @ROW function returns the row number of the formula.

---

## @SIGN(x)

---

The @SIGN function returns a number that represents the sign of the argument ( $x$ ), as follows:

1 if  $x$  is positive.

0 if  $x$  is zero or blank.

-1 if  $x$  is negative.

Label arguments use a zero value.

@SIGN(a3) = 0

@SIGN(d6) = -1

@SIGN(1) = 1

---

## @SORT(x,list)

---

The @SORT function sorts the arguments in the list in ascending order, and then returns the value corresponding to the value of the first argument (x): If the value of x equals 0, the function returns the lowest value in the list; if the value of x is 1, the function returns the second lowest value in the list, and so on.

Label arguments use a zero value.

The worksheet below provides the values for the following examples:

	a	b	c	d	e	f	g	h
1		SCORES						
2								
3	B. Dill	416						
4	J. Sloe	614						
5	S. Blue	333						
6	P. Grolly	242						
7	J. Row	254						
8	R. Bly	222						
9	J. Limb	113						
10	S. Lamb	654						
11	S. Fally	222						
12	R. Lon	354						
13	A. Mallox	432						
14	C. Dory	333						
15								

433.5-2

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### Examples

@SORT(a6,b3..b14) = 113

@SORT(1,b3..b14) = 222

@SORT(5,b3..b14) = 333

---

@SQRT(x)

---

The @SQRT function returns the square root of the argument ( $x$ ). The argument ( $x$ ) must be positive.

Label arguments use a zero value.

**Example**

$$\text{@SQRT}(23.5) = 4.847680$$

---

## @STD(list)

---

The @STD function returns the standard deviation of the values in the list or range. Blank cells in the list are ignored. Label arguments use a zero value.

The standard deviation is the degree to which each value in the list varies from the average of all values in the list.

The standard deviation is calculated by taking the square root of @VAR. The @STD function uses this formula:

$$\sqrt{\frac{\sum (V_i - \text{AVG})^2}{n}}$$

where:

$n$  = number of items in the list

$V_i$  = the  $i$ th item in the list

AVG = the average of the values in the list

The @STD function should be used when you are working with a complete set of figures (for example, all the test scores for all the students in a school). This is called *population* statistics.

---

@STD(list)

(continued)

---

The worksheet shown below provides the values for the following examples:

The screenshot shows a spreadsheet window with the title "scores - Spreadsheet" and a "READY" status in the top right corner. The spreadsheet contains a table with two columns: names in column 'a' and scores in column 'b'. The rows are numbered 1 through 15. The data is as follows:

	a	b	c	d	e	f	g	h
1		SCORES						
2								
3	B. Dill	416						
4	J. Sloe	614						
5	S. Blue	333						
6	P. Grolly	242						
7	J. Row	254						
8	R. Bly	222						
9	J. Limb	113						
10	S. Lamb	654						
11	S. Fally	222						
12	R. Lon	354						
13	A. Mallox	432						
14	C. Dory	333						
15								

433.5-3

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### Example

$$\text{@STD}(b3..b14) = 153.7294$$

If there is too much data to collect, you must work with a representative sample and use *sample* statistics. To compute a sample standard deviation, use the following formula:

$$\text{@SQRT}(\text{@COUNT}(\text{list})/(\text{@COUNT}(\text{list})-1)) \\ * \text{@STD}(\text{list})$$

---

@SUM(list)

---

The @SUM function returns the sum of the arguments in the list.

Blank cells and label cells are ignored.

**Example**

@SUM(15,22) = 37



---

@VAR(list)

---

The @VAR function returns the population variance of arguments in the list. Blank cells in the list are ignored. Label arguments use a zero value.

*Variance* is the degree to which each item in the list differs from the average of all items in the list. The @VAR function uses the following formula to calculate variance:

$$\frac{\sum (V_i - \text{AVG})^2}{n}$$

where:

$n$  = number of items in the list

$V_i$  = the  $i$ th value in the list

AVG = the average of the values in the list

The @VAR function should be used with a complete set of figures (for example, all the test scores for all the students in a school). This is called population statistics.

---

@VAR(list)

(continued)

---

The worksheet shown below provides the values for the following examples:

The screenshot shows a spreadsheet window titled "scores - Spreadsheet" with a status bar at the top right that says "READY". The spreadsheet has columns labeled a through h and rows numbered 1 through 15. The data is as follows:

	a	b	c	d	e	f	g	h
1		SCORES						
2								
3	B. Dill	416						
4	J. Sloe	614						
5	S. Blue	333						
6	P. Grolly	242						
7	J. Row	254						
8	R. Bly	222						
9	J. Limb	113						
10	S. Lamb	654						
11	S. Fally	222						
12	R. Lon	354						
13	A. Mallox	432						
14	C. Dory	333						
15								

433.5-4

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### Example

$$@\text{VAR}(b3..b14) = 23632.74$$

If there are too many figures to collect, you must work with a representative sample and use sample statistics. To compute a sample standard deviation, use the following formula:

$$((@COUNT(list)/(@COUNT(list)-1))*@VAR(list))$$

## Date Functions

Date functions use and return serial numbers for dates. WGS/Spreadsheet can use date serial numbers in calculations, so you can perform calculations with dates: For example, you can calculate the age of accounts receivable.

When you want to use a date in a calculation, you can type the date serial number, or you can use the @DATE function to convert the date (like 10/19/85--October 19, 1985) into a date serial number (31339). A date serial number represents the number of days elapsed between December 31, 1899 and the specified date.

You can format cells to display date serial numbers as dates that you can read. Refer to Chapter 6, "Using Worksheet Commands," and Chapter 7, "Using Range Commands," for information about formatting spreadsheet cells.

---

@YEAR(x)

---

The @MONTH function returns the year from a date serial number argument. The number returned is between 0 (for 1900) and 199 (for 2099).

### Examples

@YEAR(1) = 0

@YEAR(20378) = 55

@YEAR(31445) = 86

### Financial Functions

All financial function descriptions below assume the following:

- Cash is paid or received at the beginning of each period.
- Interest rates match the time period under consideration. If cash flows occur on a monthly basis, use a monthly interest rate; if cash flows occur on an annual basis, use an annual interest rate.

---

@FV(payment,interest,n)

---

The @FV function calculates the future value of an annuity based on a payment, interest rate, and number of payment periods, using the following formula:

$$\text{pmt} \frac{(1 + \text{int})^n - 1}{\text{int}}$$

where:

pmt = payment amount per period

int = interest rate per payment period

n = number of payment periods

The worksheet below provides the values for the following example:

	a	b	c	d	e	f	g
10	Annual deposit:	\$2,000.00					
11	Interest rate:	0.12					
12	Years to repay:	6					
13							
14	Future value:	\$16,230.38					
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							

433.5-6

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---

@FV(payment,interest,n)

---

(continued)

### **Example**

@FV(b10,b11,b12) = 16230.38

Calculates the future value of a \$2,000 deposit made at the beginning of each year into an account for 6 years at a 12 percent annual interest rate.

---

@IRR(guess,range)

---

The @IRR function calculates the approximate internal rate of return for a series of cash receipts and payments made at regular intervals.

The internal rate of return can be defined as the discount rate at which the net present value (NPV) of the cash flow equals zero.

In order to perform the calculation, you must start with an initial estimate at the correct answer. The estimation argument can be any number between 0 and 1.

The spreadsheet uses an iterative scheme for calculating the internal rate of return. If, within 40 iterations, convergence to within .0000001 is not reached, ERR is returned.

Enter the spreadsheet data as follows:

- Cash payments are negative numbers.
- Cash receipts are positive numbers.
- The estimated discount rate is a decimal number.

@IRR(guess,range)

(continued)

The worksheet below provides the values for the following example:

	a	b	c	d	e	f	g	h
1	Payments	Guess						
2	-1000	0.14						
3	500							
4	400							
5	200							
6	100							
7		IRR	0.102213					
8								
9								
10								
11								
12								
13								
14								
15								

433.5-7

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### Example

$$@IRR(b2,a2..a6)) = 0.102213$$



---

@NPV(interest,range)

---

The @NPV function uses the following formula to calculate the net present value of a series of cash flows

$$\sum \frac{V_i}{(1 + \text{int})^i}$$

where:

$V_i \dots V_n$  = series of cash flows

int = interest rate

$n$  = number of cash flows

$i$  = current iteration

@NPV assumes that the first cash flow occurs at the end of the first period.

By converting future cash flows to present day dollars, you can use @NPV to compare different investments against the required investment amounts.

@NPV(interest,range)

(continued)

The worksheet below provides the values for the following examples:

	a	b	c	d	e	f	g
30	Machine costs:	\$20,000.00					
31	Desired return %:	0.11					
32	Cash flow:						
34	Year 1:	\$5,500.00					
35	Year 2:	\$5,500.00					
36	Year 3:	\$5,500.00					
37	Year 4:	\$5,500.00					
38	Year 5:	\$5,500.00					
40	NPV:	\$20,327.43					

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## Examples

$$@NPV(b31,b34..b38) = 20,327.43$$

Calculates the NPV of a machine, costing \$20,000. Anticipated savings is \$5,500 annually for the next five years, and 11 percent annual return on investment is a goal.

The following formula balances the cost of the machine against its net present value:

$$@NPV(b31,b34..b38)-b30 = 327.43$$

---

@PMT(principal,interest,n)

---

The @PMT function returns the payment per period for a given principal amount, at a specified interest rate per period, and for a specified number of periods. The following formula is used:

$$\text{PMT} = \text{principal} * \frac{i}{1 - (1 + i)^{-n}}$$

*pmt* = payment amount per period

*i* = interest rate per payment period

*n* = number of payment periods

The worksheet below provides the values for the following example:

loans - Spreadsheet						READY
b5 (C2) @PMT(b1,b2,b3)						
	a	b	c	d	e	f
1	Loan amount:	\$11,000.00				
2	Interest rate:	0.01				
3	Months to repay:	48				
4						
5	Monthly payment:	\$289.67				
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

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GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW |

---

@PMT(principal,interest,n)

---

(continued)

### Example

@PMT(b1,b2,b3) = 289.6721

Calculates the monthly payment amount on a new car with a loan amount of \$11,000, at a 1 percent monthly interest rate for 4 years.

---

@PV(payment,interest,n)

---

The @PV function calculates the present worth of an ordinary annuity. You can use this function to calculate the outstanding balance of loans and to compare different investments in terms of their equivalents in today's dollars.

The PV function uses the following formula:

$$PV = pmt * \frac{1 - (1 + i)^{-n}}{i}$$

*pmt* = payment amount per period

*i* = interest rate per payment period

*n* = number of payment periods

The worksheet below provides the values for the following example:

Loans - Spreadsheet							
b49	(C2)	@PV(b45,b46,b47)				READY	
	a	b	c	d	e	f	g
45	Monthly payment:	\$361.80					
46	Interest rate:	0.81					
47	Months to repay:	36					
48							
49	Laon balance:	\$10,892.90					
50							
51							
52							
53							
54							
55							
56							
57							
58							
59							

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GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW |

---

@PV(payment,interest,n)

---

(continued)

### Example

@PV(b45,b46,b47) = 10,892.90

Calculates the balance of the loan.

## Logical Functions

This discussion of logical functions begins with a description of the @IF function, the logical operators that can be used with it, and examples of how to use it.

Other logical functions are described following the @IF function description.

The logical operators and logical functions are most frequently used within the @IF function, but can also be used by themselves.

---

@IF(argument,tvalue,fvalue)

---

The @IF function tests an argument to determine if it is true (1) or false (0). If the argument is true, the specified *tvalue* argument is assigned; if the argument is false, the specified *fvalue* argument is assigned.

You can think of this function in the following terms: If argument 1 is true (1), then *tvalue*, else *fvalue*.

The @IF function uses the following operators to test the argument:

<	True (1) if the first operand is less than the second operand
>	True (1) if the first operand is greater than the second operand
=	True (1) if the first operand is equal to the second operand
<=	True (1) if the first operand is less than or equal to the second operand
>=	True (1) if the first operand is greater than or equal to the second operand
<>	True (1) if the two operands are not equal

---

@IF(argument,tvalue,fvalue)

---

(continued)

#AND#	True (1) if both arguments are true; false (0) if one or both expressions are false.
#OR#	True (1) if either argument is true; false (0) if both arguments are false.
#NOT#	True (1) if the argument is false; false (0) if the argument is true.

The @IF function arguments can be:

- numbers
- cell references
- formulas

### Example

@IF(c15=250,15,25)

If the value in cell c15 equals 250, assign the value 15; otherwise, assign the value 25.

@IF(c15<250,b10,b11)

If the value in cell c15 is less than 250, assign the value in b10; otherwise, use the value in b11.

@IF(c15\*10>=250,b10,b11/5)

If the value in cell c15 multiplied by 10 is greater than or equal to 250, assign b10; otherwise, assign the value of the formula b11 divided by 5.



@IF(c15>=70,"Pass","Fail")

If the value in cell c15 is greater than or equal to 70, assign the value "Pass"; otherwise, assign the value "Fail."

@IF(a5>900#AND#a7<>0,b10,b11)

If the value in cell a5 is greater than 900 *and* the value in cell a7 does not equal 0, assign the value in b10; otherwise, assign the value in b11.

@IF(a5>900#NOT#a7=0,b10,b11)

If the value in cell a5 is greater than 900 *and* the value in cell a7 does *not* equal 0, assign the value in b10; otherwise, assign the value in b11. (Notice that this function has the same meaning as the preceding one.)

@IF(a5>900#OR#c15>=250#OR#d12<>0,b10,b11)

If the first, the second, *or* the third argument is true, assign the value in b10; otherwise, assign the value in b11.

---

@AND(list)

---

The @AND function is similar to the #AND# operator, except that it can compare more than two values. The @AND function is included for compatibility with Multiplan.

### Example

@IF(@AND(a5>900,a7<>0,d12<>0),"True","False")

If the value in cell a5 is less than 900, *and* the value in cell a7 does not equal 0, *and* the value in cell d12 does not equal 0, assign the value "True"; otherwise, assign the value "False."

---

## @ERR

---

The spreadsheet places the value ERR in a cell if there is an error in arithmetic.

You can use the @ERR function to enter the value ERR in a cell, for example, to flag an unacceptable cell entry.

### Example

@IF(b9>100#OR#b9<0,@ERR,b9)

Assume this function is entered into cell b10. If the value of cell b9 is greater than 100 or less than 0, display ERR; otherwise, display the value of cell b9.

---

## @FALSE

---

The @FALSE function returns the value of 0. It is commonly used to replace the false value argument in the @IF function. If the argument in the @IF function is false, this function returns the value of 0.

### Example

@IF(c2>20,@TRUE,@FALSE)

@IF(c2>20,1,0)

The above @IF functions are equivalent: both return a value of 1 (true) if the value of cell c2 is greater than 20; both return a value of 0 (false) if the value of cell c2 is not greater than 20.

---

**@ISERR(cell)**

---

The **@ISERR** function checks the value of a specified cell to determine if the cell contains an error (ERR). The function returns a value of 1 (true) if the value of the cell is ERR; if the value of the cell is not ERR, the function returns a value of 0 (false).

This function is commonly used to test whether another function produces an error.

### **Example**

**@IF(@ISERR(64/c2),0,64/c2)**

If 64 divided by the value of cell c2 yields an error, assign the value 0; otherwise, assign the value of 64 divided by the value of cell c2.

---

## @ISNA(cell)

---

The @ISNA function checks the value of a specified cell to determine if the cell contains NA. The function returns a value of 1 (true) if the value of the cell is NA; if the value of the cell is not NA, the function returns a value of 0 (false).

The @NA function, like @ISERR, is commonly used to keep errors from creeping through a spreadsheet.

### Example

@IF(@ISNA(c2),0,64/c2)

If the value of cell c2 is NA, assign the value 0; otherwise, assign the value of 64 divided by the value of c2.

@ISNA(c2)

If the value of cell c2 is NA, assign 1; otherwise, assign 0.

---

## @NA

---

You can enter the @NA function into a blank cell instead of leaving the cell blank. The @NA function assigns NA to the cell, indicating that a value for the cell is currently *not available*, and makes it clear that a number needs to be supplied when it becomes available.

If the values of other cells in the spreadsheet depend on a cell containing NA, those cells contain ERR until a value is entered in this cell.

---

@NOT(x)

---

The @NOT function performs a similar job to the #NOT# operator, except that the format is different. The @NOT function is included for compatibility with Multiplan.

### Example

The formula,

@IF(@NOT(a5<0),"0 or greater","Less than 0")

performs the same comparison as the formula,

@IF(#NOT#a5<0,"0 or greater","Less than 0")

If the value of cell a5 is *not* less than 0, assign the phrase "0 or greater"; otherwise, assign the phrase "Less than 0."



---

@OR(list)

---

The @OR function performs a similar job to the #OR# operator, except that the @OR function compares a list of values or statements, whereas the #OR# operator compares two operands to see if one is true.

### Example

```
@IF(@OR(a5=1,a7=1,a5<a7),"True","All false")
```

If *any* of the comparisons are true (a5 equals 1, *or* a7 equals 1, *or* a5 equals a7), assign the value "True"; otherwise, assign the value "All false."

---

## @TRUE

---

The @TRUE function returns the value 1. It is commonly used to replace the *tvalue* argument in the @IF function.

### Example

```
@IF(c2>20,@TRUE,@FALSE)
```

```
@IF(c2>20,1,0)
```

The above @IF functions are equivalent: both return a value of 1 if the value of cell c2 is greater than 20; both return a value of 0 if the value of cell c2 is not greater than 20.

## Lookup, Choose, and Index Functions

The functions described on the following pages search a specified range for a value.

---

## @CHOOSE(x,list)

---

The @CHOOSE function tests logical expressions and performs short table lookups.

The @CHOOSE function converts the first argument (**x**) into an integer, and then finds the cell whose position in the table range matches that integer. (Note that this function takes a variable number of arguments.)

If the integer value of an **x** argument is less than zero or greater than the number of items in the list, an ERR results.

*NOTE: @CHOOSE starts counting at the number 0, not the number 1. To locate the third item in the cell list, the **x** argument must evaluate to the integer 2.*

---

@HLOOKUP(x,table range,row offset)

---

(continued)

---

Enter the spreadsheet data and the function with the following rules in mind:

- The table must contain more than one row.
- The row offset argument must be a positive number.
- The row offset argument must be less than or equal to the number of rows in the table range.
- The values in the top row of the table should appear in ascending order.
- No two numbers in the top row of the table should share the same value.
- The smallest number in the first row of the table should be *smaller* than any expected expression.

The worksheet below provides the values for the following example:

	a	b	c	d	e	f	g	h	i	j
1										
2	ZONE:	1	2	3	4	5	6	7	8	9
3	FEE:	\$6.00	\$7.00	\$8.00	\$9.00	\$10.00	\$11.00	\$12.00	\$13.00	\$14.00
4										
5	Delivery zone:		3							
6	Delivery fee:		\$8.00							
7										
8										
9										
10										
11										
12										
13										
14										
15										

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---

@HLOOKUP(x,table range,row offset)

---

(continued)

### Example

@HLOOKUP(c5,b2..j3,1) = \$8.00

Determines the value of cell c5, and searches the specified range for the first value equal to or greater than the value in cell c5. The function then counts down one row below the first row, as specified by the offset argument 1, and returns the value in that cell.

---

**@INDEX(range,row number,col number)**

---

The **@INDEX** function works the same way the Multiplan **@INDEX** function works: it returns a cell value based on its location as defined by the row number and column number arguments in the specified range.

If the range argument specifies a single row, the row number argument is not needed; if the range argument specifies a single column, the column number argument is not needed.

The **@INDEX** function returns an ERR if the index exceeds the limits of the range.

*NOTE: @INDEX starts counting at the number 1. This is different than the @CHOOSE, @HLOOKUP, or @VLOOKUP functions, which use the offset value of a row or column and start counting at the number 0.*

---

@INDEX(range,row number,col number)

---

(continued)

The worksheet below provides the values for the following example:

	a	b	c	d	e	f	g	h	i	j
1										
2	ZONE:	1	2	3	4	5	6	7	8	9
3	FEE:	\$6.00	\$7.00	\$8.00	\$9.00	\$10.00	\$11.00	\$12.00	\$13.00	\$14.00
4										
5	Delivery zone:		3							
6	Delivery fee:		\$8.00							
7										
8										
9										
10										
11										
12										
13										
14										
15										

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GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW

### Example

@INDEX(b2..j3,2,3)

Returns the value in cell d3: the second row of the range is row 3, and the third column is column d.

---

@LOOKUP(x,tablerange)

---

This function works the same way the @LOOKUP function works in

---

@VLOOKUP(x,table range,column offset)

---

The @VLOOKUP performs a *vertical table lookup* on a vertical table, with more columns than rows.

The function searches the first column of the table for the first value equal to or greater than the argument value.

Once the function finds the value in the table, it counts over the number of columns specified by the offset argument and returns the value found.

The first (leftmost) column of the table is offset 0; the second column is offset 1; and so on. So, if the offset is 2, the function counts over two columns to the right of the first column.

Enter the spreadsheet data and the function with the following rules in mind:

- The table must contain more than one column.
- The column offset argument must be a positive number.
- The column offset argument must be less than or equal to the number of columns in the table range.
- The values in the first column of the table should appear in ascending order.
- No two numbers in the first column of the table should share the same value.
- The smallest number in the first column of the table should be *smaller* than any expected expression.



---

@VLOOKUP(x,table range,column offset)

---

(continued)

The worksheet below provides the values for the following example:

savez - Spreadsheet  
c34 (C2) @VLOOKUP(c33,a22..c31,1) READY

	a	b	c	d	e	f	g	h	i	j
21		ZONE	FEE							
22		1	\$6.00							
23		2	\$7.00							
24		3	\$8.00							
25		4	\$9.00							
26		5	\$10.00							
27		6	\$11.00							
28		7	\$12.00							
29		8	\$13.00							
30		9	\$14.00							
31		10	\$15.00							
32										
33		Delivery zone:		3						
34		Delivery fee:		\$8.00						
35										

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GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW |

### Example

@VLOOKUP(c33,a22..c31,1)

Determines the value of cell c33, and searches the first column of the table for the first value equal to or greater than the value in cell c33. The function then counts one column right of the first column, as specified by the offset argument 1, and returns the value in that cell.

## Text and Label Functions

The following functions accept strings as arguments or convert values to strings.

Keep in mind that you cannot perform calculations with numbers that have been converted to labels. You must first use the @VALUE function to change the label back to a number.

*NOTE: You can use the **Range Format** command to format numbers as currency without changing them to a label. The **Range Format** command only affects the display of the number; it does not change the stored value of the number, so you can still use it in calculations. Refer to Chapter 7, "Using Range Commands," for details.*

---

## @DOLLAR(x)

---

The @DOLLAR function changes the argument from a value to a text string, with a dollar sign and two decimal places. Negative numbers are enclosed in parentheses.

The argument must evaluate to a number. Cells containing labels evaluate to zero.

### Examples

@DOLLAR(2.715) = \$2.72

@DOLLAR(.15) = \$0.15

@DOLLAR(-1) = (\$1.00)

---

@MID(argument,x,n)

---

The @MID function returns a substring of the first argument starting at the position specified by the second argument (*x*) and consisting of the number of characters specified by the third argument (*n*).

The first argument must evaluate to a label or string. The *n* and *x* arguments must evaluate to numbers. Labels evaluate to zero.

### Examples

@MID("abcdefghijklmnop",1,8) = "abcdefgh"

@MID("1200.45",2,4) = "200."

---

@REPT(argument,n)

---

The @REPT function repeats the first argument for the number of repetitions specified by the second argument (*n*). This function is useful for creating bar graphs or repeating patterns to separate different areas of the spreadsheet.

The first argument must evaluate to a label or string; *n* must evaluate to a number. Labels evaluate to zero.

### Examples

@REPT("\*",80)

Returns a string of 80 asterisks.

@REPT("\$",a15/100)

Returns a string of dollar signs that is as long as the value of cell a15 divided by 100. If cell a15 contained total sales for a salesperson, this formula would draw a bar that could be compared to the sales of other salespeople in the company.

---

@VALUE(argument)

---

The @VALUE function converts a label argument to a value. Once the label is converted to a value, it can be used in calculations.

The argument must evaluate to a label that displays a number. This number can contain a decimal point or can be shown in scientific notation. It can have leading or trailing blank spaces, a leading dollar sign, a leading minus sign, or can be enclosed in parentheses.

### Example

@VALUE("\$333.00") = 333

## Trigonometric Functions

The trigonometric functions are described on the following pages. All trigonometric functions require value arguments.

---

## @ACOS(x)

---

The @ACOS function returns the arc cosine of the argument. The arc cosine is the angle in radians whose cosine is the argument.

If the value of the argument is between -1 and 1, the value of the @ACOS function is between 0 and  $\pi$ . If the value of the argument is not between -1 and 1, the function returns ERR.

### Example

$$\text{@ACOS}(.5) = 1.047198$$

---

## @ASIN(x)

---

The @ASIN function returns the arc sine of the argument. The arc sine is the angle in radians whose sine is the argument.

If the value of the argument is between  $-1$  and  $+1$ , the result of the @ASIN function is between  $-\pi/2$  and  $+\pi/2$ . If the value of the argument is not between  $-1$  and  $+1$ , the function returns ERR.

### Example

$$\text{@ASIN}(0.5) = 0.523599$$



---

@ATAN(x)

---

The @ATAN function returns the arc tangent of the argument. The arc tangent is the angle in radians whose tangent is the argument.

The function value is always between  $-\pi/2$  and  $+\pi/2$ .

**Example**

$$@ATAN(.5) = 0.463648$$

$$@ATAN(416) = 1.568392$$

$$@ATAN(-4) = -1.32582$$

---

## @ATAN2(x,y)

---

The @ATAN2 function returns the arc tangent of the first argument ( $x$ ) divided by the second argument ( $y$ ). The arc tangent of the arguments is the angle in radians whose tangent is  $y/x$ .

The @ATAN2 function considers the signs of the arguments separately, so it takes on values for all quadrants, from  $-\pi$  to  $\pi$ .

### Examples

$$@ATAN2(-2.12,.3) = 3.001017$$

$$@ATAN2(4,16) = 1.325818$$

---

@COS(x)

---

The @COS function returns the cosine of the argument.

The argument is interpreted as an angle in radians.

**Example**

$$\text{@COS}(2.12) = -0.52201$$

$$\text{@COS}(416) = 0.258073$$

---

@PI

---

The @PI function returns the value  $\pi$ , 3.141592653589794.

This function does not use an argument.

### Example

Use the @PI function to convert degrees to radians for argument in the @COS, @SIN, and @TAN functions.

Radians are calculated using the following formula:

1 degree = @PI/180

@TAN(45\*(@PI/180)) = 1

---

@SIN(x)

---

The @SIN function returns the sine of the argument. The argument is interpreted as an angle in radians.

**Example**

$$\text{@SIN}(2.12) = 0.852940$$

---

@TAN(x)

---

The @TAN function returns the tangent of the argument. The argument is interpreted as an angle in radians.

### Example

$$\text{@TAN}(2.12) = -1.63396$$

## Database Functions

WGS/Spreadsheet provides seven database functions. Before using any of these functions, you must set up a database and a criterion range in the spreadsheet. The database function selects records that match the specified criterion and performs calculations on values in those fields.

If you have not yet set up a database and criterion range, see Chapter 11, "Using Data Commands."

All database functions follow the same format:

@DFUNCTION(input range,offset,criterion range)

- The *input range* indicates the area of the database you want to examine. The input range must include the field names of all columns in the input range.
- The *offset* value indicates the column that contains the fields you want to use in the calculations. The offset value 0 indicates the first column in the input range, 1 is the second column from the left, 2 is the third column from the left, and so on.

The offset argument must evaluate to a number.

- The *criterion range* specifies the fields to select from the input range. The criterion range must contain the same field names as the input range. It must include the criteria directly below each field name.

The spreadsheet below provides the data for the examples of the database functions on the following pages.

Database - Spreadsheet											
al 'Sort										READY	
	a	b	c	d	e	f	g	h	i	j	k
1	Sort	ID	First	Last	Area	Phone	Terr.	Score		CRITERION:	
2	1	10	rolly	crolly	234	567-4000	west	345		Terr.	
3	2	44	ry	high	678	898-4098	nowest	645		nowest	
4	3	7	rob	bob	123	798-7987	so	897			
5	4	76	sue	blue	123	798-9887	so	700		Score	
6	5	12	olly	rolly	998	123-5678	no	123		+h2>800	
7	6	8	polly	crolly	678	123-2534	nowest	564			
8	7	85	jack	black	665	123-4672	soeast	634			
9	8	67	e.	peterson	123	799-9012	so	423			
10	9	33	e.	pederson	444	222-4444	west	355			
11	10	44	elsa	petersen	577	899-3333	east	356			
12	11	9	drew	who	123	671-0231	noeast	333			
13	12	22	joan	stone	567	890-4956	east	456			
14	13	5	joan	stone	999	890-2114	no	946			
15	14	51	joan	stone	678	890-1225	nowest	31			

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---

@DAVG(input range,offset,criterion range)

---

The @DAVG function returns the average value of those values meeting the criterion.

Input range, offset, and criterion range are described earlier, under "Database Functions." That discussion also presents the spreadsheet that provides the data for the following example as well as for the rest of the database function examples.

### Example

@DAVG(a1..h25,7,j2..j3) = 413.3333

In the input range of cells a1 through h25, calculates the average score (offset 7) of employees in the Northwest Territory (criterion range j2 through j3).



---

@DCOUNT(input range,offset,criterion range)

---

The @DCOUNT function returns the number of records that meet the criterion.

**Example**

@DCOUNT(a1..h25,7,j5..j6) = 3

In the input range of cells a1 through h25, returns the number of employees with test scores (offset 7) higher than 800 (criterion range j5 through j6).

---

**@DMAX(input range,offset,criterion range)**

---

The **@DMAX** function returns the maximum value that meets the criterion.

### **Example**

**@DMAX(a1..h25,7,j2..j3) = 645**

In the input range of cells a1 through h25, returns the maximum value (645) of the scores (offset 7) of employees in the Northwest Territory (criterion range j2 through j3).

---

`@DMIN(input range,offset,criterion range)`

---

The `@DMIN` function returns the minimum value that meets the criterion.

### **Example**

`@DMIN(a1..h25,7,j2..j3) = 31`

In the input range of cells a1 through h25, returns the minimum value of the scores (offset 7) of employees in the Northwest Territory (criterion range j2 through j3).

---

@DSTD(input range,offset,criterion range)

---

The @DSTD function returns the standard deviation of the values that meet the criterion.

### Example

@DSTD(a1..h25,7,j2..j3) = 272,3654

In the input range of cells a1 through h25, returns the standard deviation of the test scores (offset 7) of employees in the Northwest Territory (criterion range j2 through j3).

---

@DSUM(input range,offset,criterion range)

---

The @DSUM function returns the sum of the values that meet the criterion.

**Example**

@DSUM(a1..h25,7,j2..j3) = 1240

In the input range of cells a1 through h25, returns the total of the test score values (offset 7) of employees in the Northwest Territory (criterion range j2 through j3).

---

**@DVAR(input range,offset,criterion range)**

---

The @DVAR function returns the variance of those values that meet the criterion.

### **Example**

**@DVAR(a1..h25,7,j2..j3) = 74182.89**

In the input range of cells a1 through h25, returns the variance of the test scores (offset 7) of employees in the Northwest Territory (criterion range j2 through j3).

---

## Using Worksheet Commands

Worksheet commands help you set standards for the way the current spreadsheet looks and works.

<b>Global</b>	Set defaults for the current spreadsheet.
<b>Insert</b>	Inserts blank columns and rows.
<b>Delete</b>	Deletes columns and rows.
<b>Column-Width</b>	Changes the width of a column.
<b>Erase</b>	Clears information in a range of cells.
<b>Titles</b>	Defines a specified column or row as a title in the worksheet. Spreadsheet titles make it easier to read the spreadsheet on the screen. Note that Spreadsheet titles are not printed.
<b>Window</b>	Splits the worksheet into two windows, horizontally or vertically, and removes a window split.
<b>Status</b>	Displays the current spreadsheet's default settings; you can modify settings from the <i>Worksheet Status</i> form.

To display the Worksheet commands:

1. Make sure the spreadsheet is in Ready mode.
2. Type *fw*

The *Worksheet Commands* menu is displayed.

## Using Worksheet Global Commands

When you start a new spreadsheet, the Spreadsheet Preferences settings (described in Chapter 4, "Spreadsheet Preferences") determine how the spreadsheet looks and works.

Use the Worksheet Global commands to override Spreadsheet Preferences and set defaults for the *current* spreadsheet. To change settings for specific cells in the current spreadsheet, use the Range commands, described in Chapter 7, "Using Range Commands." Range Command settings override the Worksheet Global command settings. Range commands take precedence over Worksheet commands and Spreadsheet Preferences.

Each Worksheet Global command is briefly described here, and then described in detail later in this chapter.

<b>Global Format</b>	Determines the way values appear in worksheet cells in the current window.
<b>Global Label-Prefix</b>	Aligns all labels to the left, right, or center of the cell.
<b>Global Column-Width</b>	Changes the width of columns in the current spreadsheet window.
<b>Global Recalculation</b>	Controls the recalculation mode and order in which formulas in the spreadsheet are recalculated when changes to the spreadsheet are made.
<b>Global Protection</b>	Enables or disables protection of the contents of all cells in the spreadsheet.
<b>Global Default</b>	Defines printer settings to be used with every spreadsheet.

To display the Worksheet Global commands:

1. Make sure the spreadsheet is in Ready mode.
2. Type `/wg`

The *Global Commands* menu is displayed.

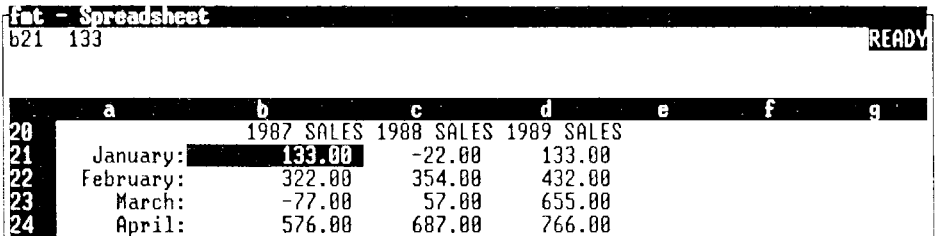


## Setting a Global Format for Values (/wgf)

The **Worksheet Global Format** command specifies how values appear in the current spreadsheet window.

You can use select any of the following displays:

*Fixed* Displays values with a fixed number of decimal places (0-15), which you specify.

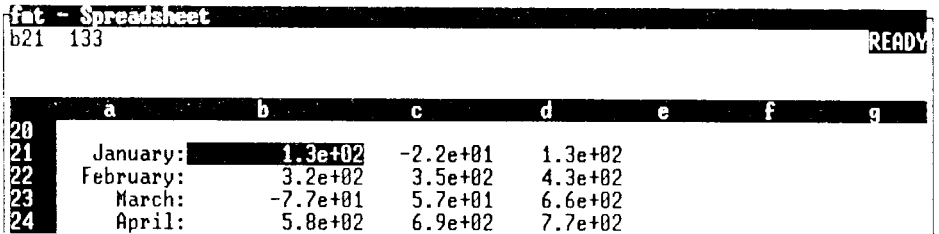


The screenshot shows a spreadsheet window titled "fat - Spreadsheet" with a status bar "b21 133" and "READY". The data is displayed in a table with columns labeled a through g. The rows are numbered 20 through 24. The data is as follows:

	a	b	c	d	e	f	g
20		1987 SALES	1988 SALES	1989 SALES			
21	January:	133.00	-22.00	133.00			
22	February:	322.00	354.00	432.00			
23	March:	-77.00	57.00	655.00			
24	April:	576.00	687.00	766.00			

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*Scientific* Displays values in exponential format, with up to 15 decimal places, and with an exponent of 10 from -99 to 99.



The screenshot shows a spreadsheet window titled "fat - Spreadsheet" with a status bar "b21 133" and "READY". The data is displayed in a table with columns labeled a through g. The rows are numbered 20 through 24. The data is as follows:

	a	b	c	d	e	f	g
20							
21	January:	1.3e+02	-2.2e+01	1.3e+02			
22	February:	3.2e+02	3.5e+02	4.3e+02			
23	March:	-7.7e+01	5.7e+01	6.6e+02			
24	April:	5.8e+02	6.9e+02	7.7e+02			

433.6-2

*Currency* Displays values in monetary form, with a dollar sign (\$x,xxx.xx), parenthesizing negative numbers. You specify the number of decimal places.

fmtcur - Spreadsheet							READY
b34 @AUG(b21..b32)							
	a	b	c	d	e	f	g
20		1987 SALES	1988 SALES	1989 SALES			
21	January:	\$133.00	(\$22.00)	\$133.00			
22	February:	\$322.00	\$354.00	\$432.00			
23	March:	(\$77.00)	\$57.00	\$655.00			
24	April:	\$576.00	\$687.00	\$766.00			

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, (comma) Inserts commas and parenthesizes negative values.

fmtcur - Spreadsheet							READY
b21 133							
	a	b	c	d	e	f	g
20		1987 SALES	1988 SALES	1989 SALES			
21	January:	133.00	(22.00)	133.00			
22	February:	322.00	354.00	432.00			
23	March:	(77.00)	57.00	655.00			
24	April:	576.00	687.00	766.00			

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*General* Does not display trailing zeroes. Values longer than 15 (initial setting) digits, or values equal to or longer than the column width, appear in scientific (exponential) format: x.xxE+xx). If a value is still too long for the column, the cell is filled with asterisks (\*).

fmtcur - Spreadsheet							READY
b21 133							
	a	b	c	d	e	f	g
20		1987 SALES	1988 SALES	1989 SALES			
21	January:	133	-22	133			
22	February:	322	354	432			
23	March:	-77	57	655			
24	April:	576	687	766			

433.6-5

+/-

Displays the number of plus signs (+) represented by a positive number, and the number of minus signs (-) represented by a negative number.

fat - Spreadsheet								
b21	-5						READY	
	a	b	c	d	e	f	g	h
20		1987 SALES	1988 SALES	1989 SALES				
21	January:	-----	++	+++				
22	February:	--	-	---				
23	March:	----	-----	++++				
24	April:	+++++	++	++++				
25	May:	+++	++++	+++				
26	June:	++++	++++	+++++				
27	July:	+++++	++++	+++++				
28	August:	++	+++++	+++++				
29	September:	+++	+++++	++++				
30	October:	++++	++++	++++				
31	November:	++++	++++	++++				
32	December:	+++++	+++++	+++++				
33								
34	Sales Avg:	++	++++	+++				

433.6-6

GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW |

Percent

Displays values in percent form, followed by a percent sign (%). You specify the number of decimal places (0-15).

fat - Spreadsheet							
b20	^1896 SALES					READY	
	a	b	c	d	e	f	g
20		1896 SALES	1987 SALES	1988 SALES			
21	January:	13300.0%	-2200.0%	13300.0%			
22	February:	32200.0%	35400.0%	43200.0%			
23	March:	-7700.0%	5700.0%	65500.0%			
24	April:	57600.0%	68700.0%	76600.0%			
25	May:	43300.0%	21100.0%	87700.0%			
26	June:	51100.0%	99900.0%	98800.0%			
27	July:	77700.0%	123300.0%	100000.0%			
28	August:	65000.0%	111100.0%	123400.0%			
29	September:	70000.0%	133200.0%	134500.0%			
30	October:	59800.0%	145200.0%	156700.0%			
31	November:	77800.0%	222300.0%	299900.0%			
32	December:	100000.0%	300000.0%	322000.0%			
33							
34	Sales Avg:	53341.7%	105308.3%	126800.0%			

433.6-7

GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW

*Date* Displays dates as serial numbers in one of three formats: day-month-year; day-month; or month- year.

Date #1 Format      Date #2 Format      Date #3 Format

accts - Spreads		accts - Spreads		accts - Spreadsheet	
a1 @TODAY		a1 @TODAY		a1 @TODAY	
	a		a	a	b
1	22-MAY-87	1	22-MAY	1	MAY-87
2		2		2	
3	Date Due	3	Date Due	3	Date Due      Account Name
4	04-NOV-87	4	04-NOV	4	NOV-87      Smith & Co.
5	12-DEC-87	5	12-DEC	5	DEC-87      A.R. Trucking
6	02-JAN-87	6	02-JAN	6	JAN-87      Perfect Pools
7	25-JAN-87	7	25-JAN	7	JAN-87      Sam's Kitchen

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*NOTE:* The date formats show the day and month as three characters each. If the year is under 2000, it is shown as two numbers (87); if the year is over 2000, it is shown as four numbers (2525).

*Text*                    Displays the text of a formula instead of the value.

The screenshot shows a spreadsheet window titled "fmt - Spreadsheet" with a "READY" status in the top right corner. The spreadsheet contains a table with columns labeled 'a' through 'g'. Row 20 is the header row: 'a' is blank, 'b' is '1896 SALES', 'c' is '1987 SALES', 'd' is '1988 SALES', 'e' is blank, 'f' is blank, and 'g' is blank. Rows 21-32 list months from January to December with corresponding sales values for each year. Row 33 is blank. Row 34 contains the formula 'Sales Avg: @AVG(b21..b32) @AVG(c21..c)@AVG(d21..d32)'. The formula bar at the bottom of the window shows the active cell's formula: '@AVG(b21..b32) @AVG(c21..c)@AVG(d21..d32)'.

	a	b	c	d	e	f	g
20		1896 SALES	1987 SALES	1988 SALES			
21	January:	133	-22	133			
22	February:	322	354	432			
23	March:	-77	57	655			
24	April:	576	687	766			
25	May:	433	211	877			
26	June:	511	999	988			
27	July:	777	1233	1000			
28	August:	650	1111	1234			
29	September:	700	1332	1345			
30	October:	598	1452	1567			
31	November:	778	2223	2999			
32	December:	1000	3000	3220			
33							
34	Sales Avg:	@AVG(b21..b32)	@AVG(c21..c)	@AVG(d21..d32)			

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GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW |

### Command Selection: /wgf

**Command Procedure:** To change the global format:

1. Make sure the spreadsheet is in Ready mode.
2. Type /wgf
3. Press the key corresponding to the first character of the format you want to use.
4. If prompts appear, type your responses, or press **Enter** to accept a suggested response.

For example, if you choose *Percent* in step 3, you see this prompt:

*Enter number of decimal points: 0*

**Command Notes:** Use the **Range Format** command to change the format for a cell or group of cells. Refer to Chapter 7, "Using Range Commands," for details. Any formats set with the Range commands override Global commands.

For information about displaying existing global format settings for the current spreadsheet, see "Displaying and Changing Worksheet Status," later in this chapter.

### Setting a Global Alignment for Labels (/wgl)

The **Worksheet Global Label-Prefix** command aligns labels in the current spreadsheet at the left, right, or center of the cell.

A label-prefix character appears with the cell contents in the command panel to indicate the alignment of the cell. The label-prefix character does not appear in the worksheet cell.

You can choose from the following label prefixes:

- |              |   |
|--------------|---|
| ' (Left)     | Indicates that the label starts at the left edge of the cell and extends into unused cells at the right if the label is longer than column width. |
| " (Right)    | Indicates that the label starts at the right edge of the cell and extends into unused cells at the left if the label is longer than column width. |
| ^ (Centered) | Indicates that the label is centered in the cell and extends into unused adjacent cells if the label is longer than column width.                 |

#### Command Selection: /wgl

**Command Procedure:** To select a worksheet global label-prefix:

1. Make sure the spreadsheet is in Ready mode.
2. Type /wgl
3. Press the key (**l**, **r**, or **c**) corresponding to the first character of the label prefix you want to use. ( ' aligns at left, " aligns at right, ^ aligns in center.)

## Setting Worksheet Global Protection (/wgp)

The **Worksheet Global Protection** command enables (turns on) or disables (turns off) protection of cell contents in the spreadsheet.

If protection is enabled, the contents of every cell in the spreadsheet is locked. You cannot modify any cell of a protected spreadsheet without first unlocking that particular cell or a range that contains it. A good reason to globally protect a spreadsheet is so it can't be inadvertently changed while being viewed.

When you want to make changes in a protected spreadsheet, you can either use the **Worksheet Global Protection** command to disable protection of the entire spreadsheet, or use the **Range Unprotect** command to unprotect certain cells. See "Protecting Cells (/rp)" and "Unprotecting Cells (/ru)," in Chapter 7, for information about protecting and unprotecting ranges.

### Command Selection: /wgp

**Command Procedure:** To enable or disable global protection:

1. Make sure the spreadsheet is in Ready mode.
2. Type **/wgp**
3. To turn on global protection, press **e** to select *Enable*.

or

To turn off global protection, press **d** to select *Disable*.

The desired protection is selected.

**Command Notes:** When global protection is enabled, you cannot delete or insert entire rows or columns, unless you first unprotect the area of the spreadsheet in which you want to delete or insert rows or columns.



## Setting Global Printer Configurations (/wgd)

The **Worksheet Global Default** command lets you create and update printer configuration information.

The command displays the *Worksheet Global Default Commands* menu, with the following selections:

*Printer.* Displays the following default printer configuration settings for modification.

<i>Auto-LF</i>	Specifies whether the printer performs an automatic line feed after each carriage return. Select <i>Yes</i> if your printer performs auto line-feeds; select <i>No</i> if it does not. The initial setting is <i>No</i> . Select <i>Line Feed</i> if you want line-feed characters in your file to remain simple line-feeds and not be converted into either carriage returns or carriage return/line feeds.
<i>Left</i>	Sets a default left margin, from 0 to 240 columns. The initial left margin setting is column 4.
<i>Right</i>	Sets a default right margin, from 0 to 240 columns. The initial right margin setting is column 76.
<i>Top</i>	Sets a default top margin, from 0 to 10 lines. The initial top margin setting is 2 lines.
<i>Bottom</i>	Sets a default bottom margin, from 0 to 10 lines. The initial bottom margin setting is 2 lines.
<i>Page-Length</i>	Sets default page length, from 20 to 100 lines per page. The initial setting is 66 lines per page.
<i>Setup</i>	Lets you type a setup string containing the printer control characters used to perform various printer tasks, such as putting a dot-matrix printer into compressed print mode. See your printer manual for a list of setup strings.

*Extensions* Enables or disables the advanced printing feature. When you use the Extensions option, you need not use a setup string; the advanced printing feature communicates with the printer. See Chapter 10, "Printing a Spreadsheet," for details about using advanced printing.

*Quit* Accepts the modifications and returns to the *Worksheet Global Default Commands* menu. Select *Quit* after you set all the printer default configuration settings you want to modify.

*Update.* Accepts modified printer configuration settings in a configuration file, and then returns to the *Worksheet Global Commands* menu.

*Quit.* Returns to *Worksheet Global Commands* menu, without accepting the modifications to the printer configuration settings.

### **Command Selection: /wgd**

**Command Procedure:** To modify global printer default settings:

1. Make sure the spreadsheet is in Ready mode.
2. Type **/wgdp**
3. Press the key (**a**, **l**, **r**, **t**, **b**, **p**, **s**, or **e**) corresponding to the first character of the printer setting you want to change.

Respond to additional command choices and prompt messages; press **Enter**, if necessary, after typing a response.

4. Repeat step 3 as many times as needed.
5. Press **q** to return to the *Worksheet Global Default* menu.

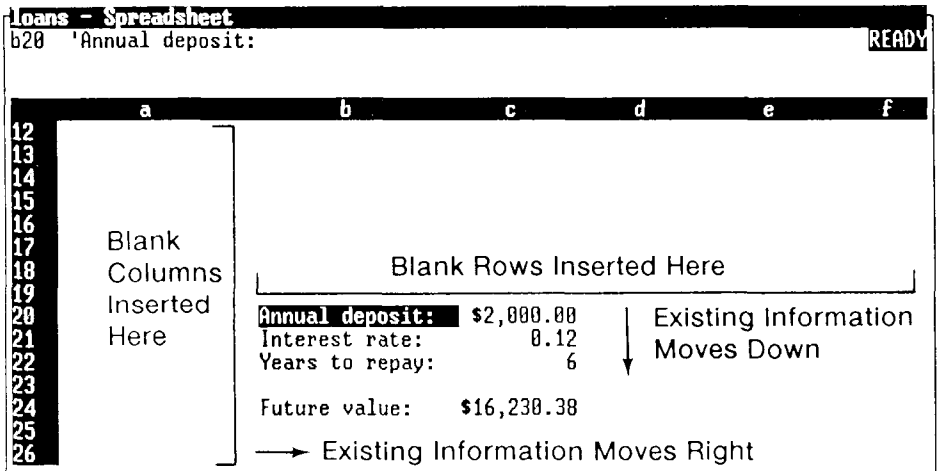
The settings take effect for the current work session, but are lost when you exit that spreadsheet.

6. If you want the settings to be saved with the spreadsheet, press **u** to select *Update* from the *Worksheet Global Default* menu.
7. When you are ready to return to the spreadsheet, press **q** to quit the *Worksheet Global Default* menu.

**Command Notes:** See the manual that comes with your printer for more information on printer setup strings and control characters. See Chapter 10, "Printing a Spreadsheet," for details about using advanced printing.

## Inserting Columns and Rows (/wi)

The **Worksheet Insert** command inserts blank rows or columns into the spreadsheet. Blank rows are inserted above the worksheet cursor; blank columns are inserted to the left of the worksheet cursor.



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## Command Selection: /wi

**Command Procedure:** To add blank columns or rows:

1. Make sure the spreadsheet is in Ready mode.
2. Move the cursor to the column to the right of the location where you want to insert columns, or below the location where you want to insert rows.
3. Type **/wi**
4. If you want to insert columns, press **c** to select *Column*.  
or  
If you want to insert rows, press **r** to select *Row*.
5. If you want to add more than one row or column, specify a range that indicates the number of rows or columns you want to insert. For example, to indicate the insertion of four rows, type **c3..c6**.
6. Press **Enter**.

**Command Notes:** Relative cell references in formulas are adjusted to refer to the new addresses of the cells they originally referred to.

The inserted blank columns and rows use the global default settings, such as label prefix, format, and column-width.

Any named ranges of cells are adjusted to include all the cells originally included, as well as intervening cells from the newly-inserted columns or rows.

If rows or columns are inserted at the location of a named range's beginning endpoint, that named range moves right or down the number of columns or rows that were inserted. The named range does not include the inserted columns or rows.

## Deleting Columns and Rows (/wd)

The **Worksheet Delete** command deletes entire rows and columns from the spreadsheet. Columns to the right of the deleted column move left; rows beneath deleted rows move up.

zones - Spreadsheet  
d5 'zone0' READY

	a	b	c	d	e	f	g	h
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								

Columns Deleted Here

Rows Deleted Here

zone0 \$6.00  
aone1 \$7.00  
zone2 \$8.00  
zone3 \$9.00  
zone4 \$10.00  
zone5 \$11.00  
zone6 \$12.00  
zone7 \$13.00  
zone8 \$14.00  
zone9 \$15.00

Existing Information Moves Up

Existing Information Moves Left

GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW

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**Command Selection:** /wd

**Command Procedure:** To delete columns or rows:

1. Make sure the spreadsheet is in Ready mode.
2. Move the worksheet cursor to the column or row you want to delete.
3. Type /wd
4. If you want to delete columns, press **c** to select *Column*.

or

If you want to delete rows, press **r** to select *Row*.

5. To delete more than one row or column, specify a range that indicates the number of rows or columns you want to delete. For example, type **e3..e6** to indicate the deletion of four rows.
6. Press **Enter**.

**Command Notes:** Formulas containing cell references to the deleted range may no longer be valid, or may contain errors.

As long as the columns and rows to be deleted do not contain endpoints of a range, deleting the columns and rows shrinks named ranges that formerly contained them. If the deleted columns or rows contain cells that were endpoints of a range, the range shrinks and any formula referring to that range refers to the new range.

## Changing the Width of a Single Column (/wc)

The **Worksheet Column-Width** command changes the width of a single column by setting a new width or by resetting its width to the default global column width.

**Command Selection:** /wc

**Command Procedure:** To change the width of a single column:

1. Make sure the spreadsheet is in Ready mode.
2. Move the cursor to the column you want to change.
3. Type /wc
4. To return to global column width, press **r** to select *Reset*.

or

To enter a new column width, press **s** to select *Set*.

5. If you select *Set*, you are prompted to enter a new column width.

Type the new column width.

or

Press **Forward** or **Back** to make the column wider or narrower, respectively, until it is the width you want. As you press the key, you see the column grow or shrink.

6. Press **Enter**.

**Command Notes:** The **Advanced Width** command changes the width of a range of selected columns simultaneously.

## Erasing the Entire Spreadsheet (/we)

The **Worksheet Erase** command erases the contents of the current spreadsheet and restores the global default settings.

If you have saved the spreadsheet, this command does not affect the saved copy stored on the hard disk.

You might want to use this command after you save your current spreadsheet and before you start on a new spreadsheet, as follows:

1. Use the **File Save** command to save the current spreadsheet with a new name.
2. Use the **Worksheet Erase** command to erase the contents of the spreadsheet.
3. Then start the new spreadsheet.

This way, you don't have to exit a spreadsheet and then create a new one.

**Caution:** *Never use the **Worksheet Erase** command on a spreadsheet that you want to keep, unless you have saved the spreadsheet. If you erase a spreadsheet that you have not saved, you lose all your work on that spreadsheet.*

## Comman Selection: /we

**Command Procedure:** To erase the entire spreadsheet and restore global defaults:

1. Make sure the spreadsheet is in Ready mode.
2. Type /we
3. Press **y** to select *Yes* to erase the spreadsheet.

The spreadsheet is erased, and you see a blank spreadsheet. You can now start a new spreadsheet.

**Command Notes:** If you accidentally erase the current spreadsheet contents before you save the spreadsheet, you can exit without saving changes. Refer to Chapter 14, "The Unexpected," for the best method of recovery.

To delete the copy of the spreadsheet stored on the hard disk, open the folder that contains the spreadsheet, and use the **Delete** command. Refer to the *WGS/Desktop Manager User's Guide* for details about deleting a spreadsheet.

You can use the **File Retrieve** command to erase the current spreadsheet and replace it with another spreadsheet. See "Retrieving a Spreadsheet File (/fr)" in Chapter 9, "Using File Commands," for more information.

## Creating Titles (/wt)

The **Worksheet Titles** command defines column(s) and/or row(s) of labels that you want to appear along the top and/or left edge of the spreadsheet window when you scroll the spreadsheet. Titles do not print.

Title columns and rows can contain headings that define the contents of the spreadsheet cells that follow, or they can contain cell values that you want to compare to more distant columns or rows.



**d18 - Spreadsheet**  
d18 (P0) 0.23 READY

	d	e	f	g	h
1					
2	Interest	12 MONTHS	24 MONTHS	36 MONTHS	48 MONTH
18	23%	\$917.81	\$459.43	\$386.64	\$238.24
19	24%	\$917.86	\$459.48	\$386.69	\$238.29
20	25%	\$917.91	\$459.53	\$386.73	\$238.34
21	26%	\$917.96	\$459.58	\$386.78	\$238.39
22	27%	\$918.01	\$459.62	\$386.83	\$238.43
23	28%	\$918.06	\$459.67	\$386.88	\$238.48
24	29%	\$918.11	\$459.72	\$386.92	\$238.53
25	30%	\$918.16	\$459.77	\$386.97	\$238.57
26					
27					
28					
29					
30					

Row Title Labels Cells Below

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**GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW**

**d4 - Spreadsheet**  
d4 (P0) 0.08 READY

	d	e	f	g	h
1					
2	Interest	12 MONTHS	24 MONTHS	36 MONTHS	48 MONTH
4	8%	\$917.06	\$458.72	\$305.93	\$229.54
5	9%	\$917.11	\$458.76	\$305.98	\$229.59
6	10%	\$917.16	\$458.81	\$306.03	\$229.63
7	11%	\$917.21	\$458.86	\$306.07	\$229.68
8	12%	\$917.26	\$458.91	\$306.12	\$229.73
9	13%	\$917.31	\$458.95	\$306.17	\$229.78
10	14%	\$917.36	\$459.00	\$306.22	\$229.82
11	15%	\$917.41	\$459.05	\$306.26	\$229.87
12	16%	\$917.46	\$459.10	\$306.31	\$229.92
13	17%	\$917.51	\$459.15	\$306.36	\$229.96
14	18%	\$917.56	\$459.19	\$306.40	\$230.01
15	20%	\$917.66	\$459.29	\$306.50	\$230.10
16	21%	\$917.71	\$459.34	\$306.55	\$230.15

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Column Title Labels Cells to Right

**GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW**

Once you set a title, you cannot scroll the cell pointer into the title column or row. You can, however, press **F1** (Go To) to move into or past the title. If the spreadsheet is in Point mode, you can move the cell pointer beyond titles.

You can choose from the following title selections:

- Both*                Defines a column title and a row title. The column used is the column to the left of the cursor; the row used is the row above the cursor.
- Horizontal*        Defines the row above the cursor as the title row.
- Vertical*            Defines the column left of the cursor as the title column.
- Clear*               Removes titles from the current spreadsheet.

**Command Selection:** */wt*

**Command Procedure:** To define titles:

1. Make sure the spreadsheet is in Ready mode.
2. Move the cell pointer to the column to the right of the column you want to use as a title column, and/or to the row below the row you want to use as the title row.

If you are using column and row titles, move the worksheet cursor to the cell to the right of the column and below the row you want to use as titles.

3. Type */wt*
4. Press the key corresponding to the first letter (**b**, **h**, or **v**) of the type of title you want to use, or press **c** to remove all titles.

**Command Notes:** You can set titles for split-screen windows by following the above procedure for each window. For more information, see "Splitting the Spreadsheet into Windows," later in this chapter.

## Splitting the Spreadsheet Into Windows (/ww)

The **Worksheet Window** command lets you split the spreadsheet screen into two separate windows so you can enter data into one portion of the spreadsheet and see the effects on another portion of the spreadsheet at the same time.

*NOTE: The **Worksheet Windows** command does not switch between Desktop windows. For information about windowing in and out with Desktop windows, refer to the WGS/Desktop Manager User's Guide.*

You can scroll the separate spreadsheet windows independently or synchronously. Press **F8** (Window) to move the worksheet cursor between windows.

The *Worksheet Windows Commands* menu displays the following Windows selections:

*Horizontal* Splits the screen horizontally between the row above the cell pointer and the cell pointer's current position.

The screenshot shows a spreadsheet application window titled "801s - Spreadsheet" with a status bar indicating "READY". The spreadsheet is split horizontally between row 6 and row 7. The top window shows the following data:

	f	g	h	i	j
1	Loan amount:	\$11,000			
2	Interest	1%			
3	Months to repay	48			
4					
5	Monthly payment	\$289.67			
6					

The bottom window shows the following data:

	f	g	h	i	j
7	Interest				
8	\$0.00	12	24	36	48
9	1.00%	\$977.34	\$517.81	\$365.36	\$289.67
10	1.25%	\$992.84	\$533.35	\$381.32	\$306.14
11	1.50%	\$1,008.48	\$549.17	\$397.68	\$323.12
12	1.75%	\$1,024.25	\$565.24	\$414.43	\$340.62
13	2.00%	\$1,040.16	\$581.58	\$431.56	\$358.62
14	2.25%	\$1,056.19	\$598.18	\$449.88	\$377.11

At the bottom of the application, a menu bar contains the following options: **GO TO**, **RECALC**, **EDIT**, **NAME**, **ALT**, **END**, **ABS**, **WINDOW**.

*Vertical* Splits the screen vertically between the column to the left of the cell pointer and the current position of the cell pointer.

	b	c	d	e	f
9					
10	Loan amount:	\$11,000	Interest	12 MONTHS	24
11	Annual interest:	12%	\$0.00	12	
12	Months to repay:	24	8%	\$917.06	\$4
13			9%	\$917.11	\$4
14	Monthly payment:	\$458.91	10%	\$917.16	\$4
15			11%	\$917.21	\$4
16			12%	\$917.26	\$4
17			13%	\$917.31	\$4
18			14%	\$917.36	\$4
19			15%	\$917.41	\$4
20			16%	\$917.46	\$4
21			17%	\$917.51	\$4
22			18%	\$917.56	\$4
23			20%	\$917.66	\$4

↑ Vertical Split

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*Sync* Specifies that the contents of both windows scroll in the same direction. Newly-created split windows always scroll synchronously until you select *Unsync*.

*Unsync* Specifies that the contents of each window scroll independently of each other.

*Clear* Removes the split.

**Command Selection: /ww**

**Comand Procedure:** To create worksheet windows:

1. Make sure the spreadsheet is in Ready mode.
2. Move the worksheet cursor to the row below or the column to the right of the split position.

3. Type `/ww`

4. Press **h** (horizontal) or **v** (vertical) to select the direction of the split.

The spreadsheet splits into two windows that scroll synchronously.

To unsynchronize the scrolling of split windows,

Type `/wwu`

To synchronize the scrolling of split windows,

Type `/wws`

To clear the split windows and return to one spreadsheet window,

Type `/wwc`

**Command Notes:** For synchronized horizontal windows: when you scroll one window horizontally, the other scrolls in the same direction, keeping the same columns displayed in both windows. Vertical scrolling in one of the windows does not affect the display in the other window.

For synchronized vertical windows: When you scroll one window vertically, the other window scrolls in the same direction, keeping the same rows displayed in both windows. Horizontal scrolling in one window does not affect the display in the other window.

You can set different global formats and column width in each window. After clearing the split-window, the formats and column width used in the top or left split-window are used for the entire spreadsheet.

If you save the spreadsheet while using split windows, the split and the separate formats are all saved. However, if you write the spreadsheet to a SYLK file, the split and the separate formats are not saved.

## Displaying and Changing Worksheet Status (/ws)

The **Worksheet Status** command displays the *Worksheet Status* form, which shows the default global settings for the current spreadsheet. You can use the *Worksheet Status* form to change any of the global settings.

<i>Recalc mode</i>	Specifies whether spreadsheet recalculation is automatic or manual.
<i>Recalc order</i>	Determines the order of recalculation: <i>Natural</i> , <i>Column</i> , or <i>Row</i> .
<i>Label-Prefix</i>	Determines the default label-prefix character used for labels: ', ", or ^.
<i>Decimal places</i>	Determines the number of decimal places, from 0 to 15.
<i>Column-Width</i>	Determines the width of worksheet cells, from 1 to 72 characters. The initial setting is 9 characters.
<i>Format</i>	Determines how values appear in the worksheet cells: <i>Fixed</i> , <i>Scientific</i> , <i>Currency</i> , <i>Comma</i> (,), <i>General</i> , <i>+/-</i> , <i>Percent</i> , <i>Day-Month-Year</i> , <i>Day-Month</i> , <i>Month-Year</i> , or <i>Text</i> format. Note that formatting does not affect the stored value of a cell.
<i>Global Protection</i>	Specifies whether global protection is enabled or disabled.

To set up automatic global settings for every new spreadsheet, use the Spreadsheet Preferences, described in Chapter 4, "Spreadsheet Preferences." For information about individual global default settings, see "Using Worksheet Global Commands," earlier in this chapter.

**Command Selection:** /ws

**Command Procedure:** To display the Worksheet Status form:

1. Make sure the spreadsheet is in Ready mode.
2. Type /ws

The following *Worksheet Status* form is displayed:

<b>Spreadsheet Status</b>	
Recalc mode:	<b>-Automatic</b>
Recalc order:	Natural
Label-Prefix:	Left
Format:	General
Global Protection:	No
Decimal places:	2
Column width:	9

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To change a status setting, move the cursor to the appropriate field, then type or select the new setting. When you have changed all the settings you want to change, press **Enter**.

**Command Notes:** Any settings changed in the *Worksheet Status* form affect only those cells that used the previous default settings.





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## Using Range Commands

This chapter describes the Range commands, which help you name and work with ranges of cells. A range is one or more contiguous cells treated as a unit.

For more details about ranges, and for information about selecting a range of cells, refer to "Indicating a Cell Range" in Chapter 2, "Basics." For information about using ranges in formulas, refer to "Range References in Formulas" in Chapter 3, "Entering and Editing Spreadsheet Information."

<b>Range Format</b>	Determines how values appear in the worksheet cell.
<b>Range Label-Prefix</b>	Aligns labels to left, right, or center in the cell.
<b>Range Erase</b>	Erases the contents of cells.
<b>Range Name</b>	Assigns a name to a range of cells or deletes name(s) assigned to ranges.
<b>Range Justify</b>	Rearranges a long label into a column resembling a paragraph.
<b>Range Protect</b>	Protects unprotected cells.
<b>Range Unprotect</b>	Removes cell protection.
<b>Range Input</b>	Restricts the cell pointer to unprotected cells.

To display the Range commands, with the spreadsheet in Ready mode, type **/r**

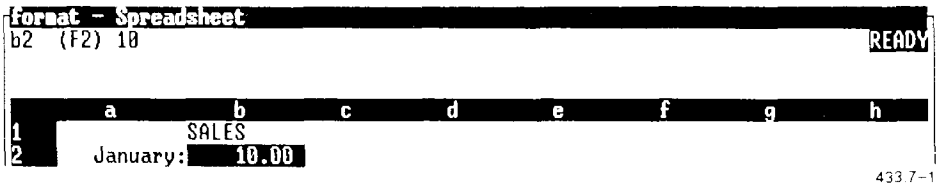
## Setting a Value Format for a Range (/rf)

Use the **Range Format** command to change the way values are displayed in any given range of the spreadsheet.

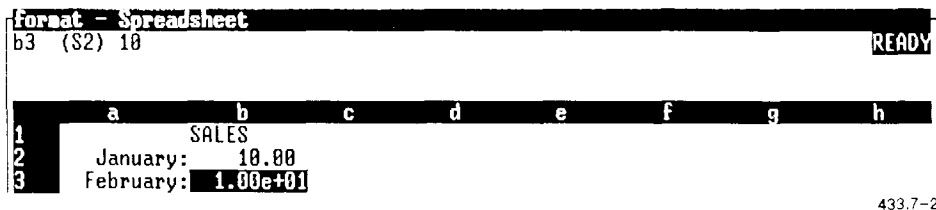
The formats selected with this command override the global format of the spreadsheet.

You can choose from the following formats:

*Fixed*                Displays values with a fixed number of decimal places (0-15), which you specify.



*Scientific*            Displays values in exponential format, with up to 15 decimal places, and with an exponent of 10 from -99 to 99.



*Currency* Displays values in monetary form, with a dollar sign, parenthesizing negative numbers. You specify the number of decimal places.

```
format - Spreadsheet
b4 (C2) 10 READY

a b c d e f g h
1 SALES
2 January: 10.00
3 February: 1.00e+01
4 March: $10.00
```

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, (comma) Inserts commas and parenthesizes negative values.

```
format - Spreadsheet
b21 (,2) 133 READY

a b c d e f g h
20 1986 SALES
21 January: 133.00
```

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*General* (initial setting) Does not display trailing zeroes. Values longer than 15 digits, or values equal to or longer than the column width appear in scientific (exponential) format: x.xxE+xx. If a value is still too long for the column, the cell is filled with asterisks (\*).

```
format - Spreadsheet
b6 (G) 10 READY

a b c d e f g h
1 SALES
2 January: 10.00
3 February: 1.00e+01
4 March: $10.00
5 April: 10.00
6 May: 10
```

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+/-                    Displays the number of plus signs (+) represented by a positive number and the number of minus signs (-) represented by a negative number.

**format - Spreadsheet** READY

b7 (+) 10

	a	b	c	d	e	f	g	h
1		SALES						
2	January:	10.00						
3	February:	1.00e+01						
4	March:	\$10.00						
5	April:	10.00						
6	May:	10						
7	June:	+++++++						
8	July:	-----						

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*Percent*                Displays values in percent form, followed by a percent sign (%). You specify the number of decimal places (0-15).

**format - Spreadsheet** READY

b9 (P2) 10

	a	b	c	d	e	f	g	h
1		SALES						
2	January:	10.00						
3	February:	1.00e+01						
4	March:	\$10.00						
5	April:	10.00						
6	May:	10						
7	June:	+++++++						
8	July:	-----						
9	August:	1000.00%						

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*Text* Displays the text of a formula instead of its value.

Format - Spreadsheet									READY
b10 (T) +b9+2		a	b	c	d	e	f	g	h
1			SALES						
2		January:	10.00						
3		February:	1.00e+01						
4		March:	\$10.00						
5		April:	10.00						
6		May:	10						
7		June:	+++++++						
8		July:	-----						
9		August:	1000.00%						
10		September:	+b9+2						

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*Date* Displays dates as serial numbers in one of three formats: Day-Month-Year; Day-Month; or Month-Year.

Format - Spreadsheet									READY
b11 (D1) 10		a	b	c	d	e	f	g	h
1			SALES						
2		January:	10.00						
3		February:	1.00e+01						
4		March:	\$10.00						
5		April:	10.00						
6		May:	10						
7		June:	+++++++						
8		July:	-----						
9		August:	1000.00%						
10		September:	10						
11		October:	10-JAN-00	10-JAN	JAN-00				

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*NOTE:* The date formats show the day and month as three characters. If the year is under 2000, it is shown as two numbers (87); if the year is over 2000, it is shown as four numbers (2525).

**Command Selection: /rl**

**Command Procedure:** To select a range label prefix:

1. Make sure the spreadsheet is in Ready mode.
2. Type **/rl**
3. Press the key (**l**, **r**, or **c**) corresponding to the first character of the label prefix you want to use.

The cells in the range are aligned as you have specified.

**Command Notes:** You can also specify a label prefix when you type the label. See Chapter 3 for details.

The **Range Label-Prefix** command does not affect values.

**Erasing the Contents of a Range (/re)**

The **Range Erase** command erases the contents of a cell or group of cells.

Depending on the Advanced Default Blank Format Spreadsheet Preference setting, the **Range Erase** command erases only cell contents, or it can erase cell format, label prefix, and protection settings as well. Refer to Chapter 4 for details about the Advanced Default Blank Format setting.

**Command Selection: /re**

**Command Procedure:** To erase the contents of a range of cells:

1. Make sure the spreadsheet is in Ready mode.
2. Move the pointer to the first cell of the range you want to erase.
3. Type **/re**

You are prompted to specify the range you want to erase.

4. Select the range of cells whose contents you want to erase.
5. Press **Enter**.

**Command Notes:** If global protection is enabled, you cannot erase a range-protected cell.

If you erase the contents of cells referred to in a formula, the formula may be in error.

## **Attaching a Name to a Range (/rn)**

A range name lets you refer to a group of cells by name instead of by cell addresses. This eliminates the need to type cell addresses for frequently-used ranges and makes your formulas easier to read.

The **Range Name** command lets you create, modify, delete, and label named ranges.

## **Creating/Modifying a Range Name (/rnc)**

The **Range Name Create** command attaches a name to a range of cells. The command also lets you modify a previously-named cell range by assigning the name to a different cell range.

It is important to know that you can implicitly modify a named range with the **Move**, **Copy**, **Worksheet Delete**, and **Worksheet Insert** commands. You may not even know that you have modified the named range, but any references to the named range are affected. For information about how each command affects a named range, refer to the discussion of the command.

## **Command Selection: /rnc**

**Command Procedures:** To create or modify a named range:

1. Make sure the spreadsheet is in Ready mode.
2. Move the cell pointer to the first cell in the range you want to name.

3. Type **/rnc**

All named ranges for the current spreadsheet appear in the command panel. If all the names do not fit in the command panel, use the cursor keys to scroll the cursor right to display the rest of the names.

4. To create a new range, type a name (up to 15 characters) for the range, and press **Enter**.

To make changes to an existing range, select its name instead of typing a new name.

You are prompted to enter a range. If you are modifying an existing range, that range appears with the prompt message.

5. Select the range of cells you want to be included in the named range you are creating or modifying.

6. Press **Enter**.

**Command Notes:** If you modify an existing named range, formulas that depend on the range now use the value of the changed range, unless the range is a single cell.

### **Deleting a Range Name (/rnd)**

The **Range Name Delete** command deletes the name attached to a range of cells.

#### **Command Selection: /rnd**

**Command Procedures:** To delete a range name:

1. Make sure the spreadsheet is in Ready mode.
2. Type **/rnd**

All named ranges for the current spreadsheet appear in the command panel. If all the names do not fit in the command panel, use the cursor keys to scroll the cursor right to display the rest of the names.

You are prompted to enter the range name you want to delete.



3. Move the cell pointer to the range name you want to delete, or type the range name, and press **Enter**.

The range name is deleted. Note that the cells in the named range are not deleted.

**Command Notes:** Formulas that referred to the deleted range name are still valid: The named range in the formula is replaced with the cell addresses that define that range of cells.

### **Deleting all Range Names (/rnr)**

The **Range Name Reset** command deletes all range names associated with the spreadsheet.

*Do not use this command unless you want to erase all range names.* Use the **Range Name Delete** command to remove individual named ranges.

### **Command Selection: /rnr**

**Command Procedures:** To delete all range names:

1. Make sure the spreadsheet is in Ready mode.
2. Type **/rnr**

All range names are deleted.

**Command Notes:** When you reset named ranges, formulas that use those ranges are still valid; the range names in the formulas are replaced with the cell addresses that define those ranges.

## Assigning a Range Label (/rnl)

---

### Command Selection: /rj

**Command Procedure:** To justify labels into a specific space:

1. Make sure the spreadsheet is in Ready mode.
2. Move the cell pointer to the cell containing the first long label.
3. If you want to justify several consecutive labels that exist in this column, use the cursor keys to move the cell pointer and highlight those labels.
4. Type /rj
5. Use the cursor keys to move the cell pointer and highlight the range of cells that should contain the justified text.
6. Press **Enter**.

If the range you have selected is too small, a message informs you that the message is too large. Press **Enter** or **Cancel** to clear the message, and then try the command with a larger range.

Note that using the command in this way allows you to see whether a label will wrap into a given space without moving other elements down in the process.

**Command Notes:** The **Range Justify** command justifies text in one column only; it does not justify text contained in consecutive columns.

If you try to use the **Range Justify** command with a range that is protected, you are notified that the cells are locked.

**Range Justify** does not split words to fit the column width. If a word is too long to fit in the column width of the cells in the justified range, it spills into adjacent cells, if they are empty.

## Protecting Cells (/rp)

Cell protection ensures that cells cannot be modified. If global protection is enabled, you cannot modify protected cells. By default, all cells are protected when they are created. So, if global protection is enabled and you want to modify a cell, you can use the **Range Unprotect** command, described later in this chapter, to unprotect the cell so you can modify.

The **Range Protect** command reinstates protection of cells unprotected with the **Range Unprotect** command.

### Command Selection: /rp

**Command Procedure:** To reinstate protection of an unprotected cell or range:

1. Make sure the spreadsheet is in Ready mode.
2. Move the cell pointer to the first cell of the unprotected range you want to protect.
3. Type **/rp**

You are prompted to enter the range you want protected.

4. Select the range of cells you want to protect.
5. Press **Enter**.

**Command Notes:** Use the **Range Unprotect** command to unprotect protected cells.

## Unprotecting Cells (/ru)

The **Range Unprotect** command unprotects a cell so it can be modified. Keep in mind that all cells are protected until they are unprotected; protection is not in effect, however, unless global protection is enabled.

**Command Selection:** /ru

**Command Procedure:** To unprotect protected cells:

1. Make sure the spreadsheet is in Ready mode.
2. Move the cell pointer to the first cell in the range that you want to unprotect.
3. Type /ru
4. Select the range you want to unprotect, and press **Enter**.

**Command Notes:** Use the **Range Protect** command to reinstate protection of unprotected cells.

## Restricting the Pointer to Unprotected Cells (/ri)

The **Range Input** command restricts movement of the cell pointer to unprotected cells within a given input range on the worksheet. This is useful when you want data-entry personnel to update only certain cells in the worksheet without changing other data.

Once the input range is defined, you can perform the following operations on the unprotected cells in the range: edit or type over the cells, press **F2** (Recalc), press **Help**, and execute macros. You cannot display command menus or move, copy, or delete the cells.

**Command Selection:** `/ri`

**Command Procedure:** To use the **Range Input** command:

1. Make sure the spreadsheet is in Ready mode.
2. Type `/ri`

You are prompted to enter a data input range.

3. Select the input range, within which the cell pointer will be restricted.
4. Press **Enter**.

The worksheet moves so that the beginning of the data input range occupies the upper-left corner of the worksheet window. The specified range is now the input range, and the cell pointer can move only to unprotected cells in that range.

**Command Notes:** Global protection need not be enabled for you to use the **Range Input** command.

When you open a spreadsheet containing a data input range, the cell pointer automatically moves to the beginning of the data input range. Pressing any cursor key moves the cell pointer between the cells in the data input range only.

You can use the **Range Input** command in macros.



This chapter describes how to copy and move one or more cells from one part of a spreadsheet to another part of the spreadsheet. When you copy or move cells referred to in other parts of the spreadsheet, unexpected results can sometimes occur; this chapter describes what to expect.

### **Using the Copy Command (/c)**

The **Copy** command copies existing spreadsheet entries *from* a cell or group of cells *to* another location.

The information copied by the **Copy** command depends on the default Copy Value setting. Copy values can be set to copy values only, or to copy values and formulas. Use the **Advanced Default** command or the Spreadsheet Preferences to set copy values. The **Advanced Default** command setting prevails over the Preference setting. Refer to Chapter 12, "Using Advanced Commands," and Chapter 4, "Spreadsheet Preferences," for details.

It is important to be aware of what happens when you copy formulas containing references to other cells or ranges: the results of the copied formulas are usually affected.

For example, if you copy a formula containing relative references, those references adjust to the formula's new location. The following example shows an error condition that can arise if the copied relative references become meaningless.

In the worksheet below, the formula in cell d14 contains relative references to cells c3 through c12. When you copy cell d14 to cell f3, the relative cell references in the formula change to e? through e1.

scores - Spreadsheet								
F3		=AVG(e?..e1)				READY		
	a	b	c	d	e	f	g	h
1		MIDLAND SCORES			AVERAGES			
2								
3		B. Dill	416		Midland	ERR		
4		J. Sloe	614		Highland	447		
5		S. Blue	333		Loyalley	745		
6		P. Crollly	242		Pixley	555		
7		J. Row	254		Mayberry	444		
8		R. Bly	222					
9		J. Limb	113		AVERAGE SCORE:		ERR	
10		S. Lamb	654					
11		S. Fally	222					
12		R. Lon	354					
13								
14		AVERAGE SCORE:		342.4				
15								

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GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW

**Command Selection:** /c (or Copy key)

**Command Procedure:** To copy a cell or group of cells:

1. Make sure the spreadsheet is in Ready mode.
2. Move the cell pointer to the cell (or to the beginning of a range of cells) you want to copy.
3. Type /c (or press Copy).

You are prompted to enter the range you want to copy. A suggested range appears with the prompt message.

4. Select the range you want to copy, and press **Enter**.

You are prompted to enter the range to which you want the information copied. A suggested single-cell range appears with the prompt message.



You need only specify the first cell in a range to copy to: The spreadsheet copies the information, starting at the specified cell, taking as much room as needed.

5. Select the range to copy to, or the first cell of the range, and press **Enter**.

**Command Notes:** The **Copy** command overwrites the contents of cells in the To range. If the To range is smaller than the From range, the From range overwrites cells outside the To range.

If the From range is smaller than the specified To range, the contents of the From range are repeated to fill the entire To range.

If the From range is a column and the To range is a row, the column in the From range is copied to each column the To range's row:

sell - Spreadsheet								READY
b21 (,2) 133								
	a	b	c	d	e	f	g	h
20		1986 SALES						
21	January:	133.00	Column	133.00	133.00	133.00	133.00	13
22	February:	322.00	Range	322.00	322.00	322.00	322.00	32
23	March:	77.00		77.00	77.00	77.00	77.00	7
24	April:	576.00	b21..b32	576.00	576.00	576.00	576.00	57
25	May:	433.00	Copied	433.00	433.00	433.00	433.00	43
26	June:	511.00	to this	511.00	511.00	511.00	511.00	51
27	July:	777.00	Row	777.00	777.00	777.00	777.00	77
28	August:	650.00	Range	650.00	650.00	650.00	650.00	65
29	September:	700.00		700.00	700.00	700.00	700.00	70
30	October:	598.00		598.00	598.00	598.00	598.00	59
31	November:	778.00		778.00	778.00	778.00	778.00	77
32	December:	1,000.00		1,000.00	1,000.00	1,000.00	1,000.00	1,00
33								
34	Sales Avg:	546.25						

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Likewise, if the From range is a row and the To range is a column, the row in the From range is copied to each column in the To range.

Do not select a To range that is part of the From range. You could unexpectedly overwrite cells in the From range.

## Using the Move Command (/m)

The **Move** command removes values and labels *from* a cell or group of cells and moves the values or labels *to* another location.

It is important to be aware of what happens when you move information to cells referred to in formulas: The results of the formulas are affected by the new cell values.

When you move cells referred to in a formula, the value of the formula is rarely affected: the formula is adjusted to refer to the new cell addresses. Even absolute cell addresses are adjusted.

Sometimes, however, moving a cell referred to in a formula has an effect on the result of the formula.

For example, if you move a cell that is an endpoint of a named range, the named range is expanded to contain all the cells between the new endpoint and the other original endpoint. Formulas containing references to the named range are affected by the new cells contained in the named range.

Before b5 Moved to c5

worksheet - Spreadsheet POINT  
 b5 99  
 Enter name: jan Enter range: b3..b5

	a	b	c	d	e	f	g	h	
1			JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY
2									
3	JONES	300	22	16	16	25	999	653	
4	SMITH	12	45	789	16	245	1	3	
5	JOHNSON	99	34	65	16	33	2	4	
6									
7		411	101	870	48	303	1002	660	
8									
9									
10									
11									
12									
13									
14									
15									

GO TO RECALC EDIT NAME ALT END ABS WINDOW

After b5 Moved to c5

worksheet - Spreadsheet POINT  
 c5 99  
 Enter name: jan Enter range: b3..c5

	a	b	c	d	e	f	g	h	
1			JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY
2									
3	JONES	300	22	16	16	25	999	653	
4	SMITH	12	45	789	16	245	1	3	
5	JOHNSON		99	65	16	33	2	4	
6									
7		478	166	870	48	303	1002	660	
8									
9									
10									
11									
12									
13									
14									
15									

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GO TO RECALC EDIT NAME ALT END ABS WINDOW

**Command Selection:** */m* (or **Move** key)

**Command Procedure:** To move a cell or group of cells:

1. Make sure the spreadsheet is in Ready mode.
2. Move the cell pointer to the cell (or first cell of the range) you want to move.
3. Type */m* (or press **Move**)

You are prompted to enter the range you want to move. A suggested range appears with the message.

4. Select the range you want to move, and press **Enter**.

You are prompted to enter the range to which you want the information moved. A suggested single-cell range appears with the message.

You need only specify the first cell in a range to move to: The spreadsheet moves the information, starting at the specified cell, taking as much room as needed.

5. Select the range to move to, or the first cell of the range, and press **Enter**.

**Command Notes:** The **Move** command overwrites the contents of cells in the To range. If the To range is smaller than the From range, the From range overwrites cells outside the To range.

This chapter describes how to use the File commands, which help you manage your spreadsheet files. Each command is briefly described below, and then described in detail later in this chapter.

- File Retrieve** Erases the current spreadsheet and reads in another spreadsheet.
- File Save** Saves the current spreadsheet with a name you supply.
- File Combine** Combines cells from another spreadsheet into the current spreadsheet. The incoming values can replace, be added to, subtracted from, multiplied by, or divided by the values of existing cells. Spreadsheets can also make greater-than and less-than comparisons between incoming cell values and existing values, and choose whichever you specify.
- File Xtract** Copies a selected range from the current spreadsheet into another spreadsheet.
- File Import** Lets you use information from another spreadsheet (including Lotus 1-2-3 worksheets), a text file, or a Multiplan SYLK file in the current spreadsheet.

To display the File commands:

1. Make sure the spreadsheet is in Ready mode.
2. Type *ff*

## Saving a Spreadsheet (/fs)

The **File Save** command saves a spreadsheet file to the hard disk. It is important to save a spreadsheet frequently as you work on it. Until you save the current spreadsheet, all your work is temporarily stored in memory and could be lost in the case of a power failure or some other malfunction. When you save a spreadsheet, you store the recent work (since the last save) on the hard disk.

It's a good idea to save your spreadsheet about every 15 minutes.

You can save a spreadsheet to a file with the same file name, or to a different file. Saving to a different file name creates a new hard disk copy of the spreadsheet under the new name. The original spreadsheet with the original name still exists, but its file on the hard disk is not updated until you save the spreadsheet with the original file name.

### Command Selection: /fs

**Command Procedure:** To save the current spreadsheet:

1. Make sure the spreadsheet is in Ready mode.
2. Type /fs

You are prompted to enter the name of the file to which you want the spreadsheet saved. The existing spreadsheet name appears with the prompt message.

3. Press **Enter** to save the spreadsheet with the existing name,

or

Type another file name, and press **Enter**. If the named file exists, you are notified that the save will overwrite the contents of the existing file. Press **r** to overwrite the file; press **c** to cancel the overwrite. If you cancel the overwrite, you are prompted for the file name. Repeat step 3 until you specify the correct name.

**Command Notes:** When you save to a different file name, be careful about the name you choose. If you specify an existing file name, a message informs you that the file exists. You can press **Replace** to overwrite the existing file with the new spreadsheet information or, if you do not want to overwrite the existing spreadsheet file, you can press **Cancel** to cancel the save to that file. If you press **Cancel**, you are prompted again to type a file name.

## Retrieving a Spreadsheet File (/fr)

The **File Retrieve** command clears the current spreadsheet from your screen (without saving it) and lets you open another spreadsheet.

**Caution:** *It is a good idea to save the current spreadsheet (so you have a copy on the hard disk) before executing the **File Retrieve** command, since the command clears the spreadsheet without saving it.*

### Command Selection: /fr

**Command Procedure:** To clear the current spreadsheet and retrieve another spreadsheet:

1. Make sure the spreadsheet is in Ready mode.
2. Type /fr

You are prompted to type the name of the spreadsheet you want to open. The prompt message includes the name of the directory that contains your current spreadsheet.

3. If the spreadsheet is contained in the current directory, type the name of the spreadsheet,

or

Press **Enter** to display the files contained in the current directory, select the spreadsheet, and then press **Enter**.

If the spreadsheet is contained in another directory within the current directory, type the name of the other directory; then press **Enter**, select the spreadsheet, and press **Enter** again.

If the spreadsheet is contained in the directory that contains your current directory, type a double period (..), a slash (/), and then the name of the spreadsheet:

`../spreadsheetname`

4. Press **Enter**.

The previous spreadsheet is cleared, and the new spreadsheet appears.

**Command Notes:** When prompted to enter the name of the spreadsheet you want to retrieve, you can type the full pathname to the spreadsheet.

## Combining Spreadsheets (/fc)

The **File Combine** command combines cells from an existing spreadsheet with your current spreadsheet.

**Caution:** *It is a good idea to save the current spreadsheet (so you have a copy on the hard disk) before executing the **File Combine** command; if this command is used incorrectly, it can produce unexpected results.*

There are seven ways to combine spreadsheets:

<i>Copy</i>	Replaces existing cell values (including formula, label, and blank cell values) in the current spreadsheet with the values from incoming cells.
<i>Add</i>	Adds the values of incoming cells to numbers and empty cells in the current spreadsheet. Nothing is added to cells that contain formulas or labels; the values of incoming cells to formula or label cells are not used.



<i>Subtract</i>	Subtracts the values of incoming cells from cells that contain numbers. The values of incoming cells are added to blank cells. Nothing is subtracted from cells that contain formulas or labels; the values of incoming cells to formula or label cells are not used.
<i>Less-Than</i>	Replaces values of existing cells in the current spreadsheet, on a cell-by-cell basis, if the incoming cell values are less than the values of existing cells.
<i>Greater-Than</i>	Replaces values of existing cells in the current spreadsheet, on a cell-by-cell basis, if the incoming cell values are greater than the values of existing cells.
<i>Multiply</i>	Multiplies number values in cells in the current spreadsheet by the values of incoming cells. Cells in the current spreadsheet that contain formulas or labels are not affected. Incoming cells containing zero values or blanks generate zero values in the current spreadsheet.
<i>Divide</i>	Divides values of existing cells by the value of incoming cells. In the current spreadsheet, cells containing zero values generate ERR.

For example, two monthly spreadsheets used to calculate monthly budgets can be combined, using the Add method, to calculate a budget for the two-month period, as shown below:

janbu1 - Spreadsheet					febbu1 - Spreadsheet				
a1	a	b	c	d	a1	a	b	c	d
1					1				
2		JANUARY BUDGET			2		FEBRUARY BUDGET		
3					3				
4		rent:		\$450.00	4		rent:		\$450.00
5		utilities:		\$38.00	5		utilities:		\$32.00
6		food:		\$280.00	6		food:		\$133.00
7		tuition:		\$120.00	7		tuition:		\$120.00
8		books:		\$20.00	8		books:		\$135.00
9		car:		\$320.00	9		car:		\$50.00
10		medical:		\$0.00	10		medical:		\$0.00
11		phone:		\$85.00	11		phone:		\$98.00
12		credit cards:		\$300.00	12		credit cards:		\$210.00
13		entertainment:		\$200.00	13		entertainment:		\$100.00
14					14				
15					15				

febbu1 - Spreadsheet								
a1	a	b	c	d	e	f	g	h
1								READY
2		FEBRUARY BUDGET				JAN/FEB		
3								
4		rent:		\$450.00		\$900.00		
5		utilities:		\$32.00		\$70.00		
6		food:		\$133.00		\$333.00		
7		tuition:		\$120.00		\$240.00		
8		books:		\$135.00		\$155.00		
9		car:		\$50.00		\$370.00		
10		medical:		\$0.00		\$0.00		
11		phone:		\$98.00		\$183.00		
12		credit cards:		\$210.00		\$510.00		
13		entertainment:		\$100.00		\$300.00		
14								
15								

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**Command Selection:** /fc

**Command Procedure:** To combine spreadsheets or ranges:

1. Make sure the spreadsheet is in Ready mode.
2. Move the cell pointer to the cell in the upper-left corner of the area to receive the incoming cells.

3. Type **/fc**

You see a menu of combine methods (each method is described earlier in this discussion).

4. Press the key corresponding to the first letter ( **c**, **a**, **s**, **l**, **g**, **m**, **d**) of the combine method you want to use.

You are prompted to specify whether you want to combine the values of the entire spreadsheets or a named range.

5. If you want to combine the values of both spreadsheets, type **e**,

or

If you want to combine values from a range, type **n**. You are prompted to enter a range name. Specify the range of incoming cells.

You are prompted to enter the name of the combine spreadsheet, which contains the cells to combine with the current spreadsheet cells. The current directory appears with the prompt message.

6. If the combine spreadsheet you want to use is contained in the current directory, just type the name of the spreadsheet,

or

Press **Enter** to display and select from spreadsheets contained in the current directory, or type another directory name, and then press **Enter**.

A list of files contained in the named directory appears.

7. Move the cursor to the name of the spreadsheet that contains the cells you want to combine, and press **Enter**.

## Copying Cells to Another File (/fx)

The **File Xtract** command copies part (or all) of the current spreadsheet to another spreadsheet file. You can copy to an existing file or create a new file to contain the copied portion of the spreadsheet.

The extracted cells remain in the current spreadsheet, as well as being copied to the other spreadsheet file.

The **File Xtract** command offers the following options:

<i>Formulas</i>	Extracts everything in the specified cells, including formulas and formats.
<i>Values</i>	Extracts everything except formulas.
<i>123-Worksheet</i>	Extracts the specified cell information from the current worksheet, translates the information into Lotus 1-2-3 Worksheet format, and saves it as a Lotus 1-2-3 file.
<i>Multiplan SYLK</i>	Extracts the specified cell information from the current worksheet, translates the information into Multiplan SYLK format, and saves it as a Multiplan SYLK file.

### Command Selection: /fx

**Command Procedure:** To copy cell information to another spreadsheet:

1. Make sure the spreadsheet is in Ready mode.
2. Move the cell pointer to the beginning of the group of cells you want to extract.
3. Type /fx

A menu of extract options is displayed (each option is described earlier in this discussion)

4. Press the key corresponding to the first character (**f**, **v**, **1**, **m**) of the extract option you want to use.

You are prompted to enter the name of the export file, to which the cell information is copied.

5. Type a file name and press **Enter**.

If the named file exists, you are prompted to overwrite the existing file, or cancel the overwrite. Press **r** to overwrite the file; press **c** to cancel the overwrite. If you cancel the overwrite you are prompted for the file name. Repeat step 5 until you specify the correct name.

You are prompted to enter the range of cells to extract.

6. Select the cells you want to extract, and press **Enter**.

or

If you want to extract a named range that exists in your current spreadsheet, press **F4** (Name), highlight the desired named range, and press **Enter**.

The selected cell information is extracted to the selected spreadsheet. A new spreadsheet containing only the extracted portion of the spreadsheet is created if you supplied a new name for the extract file name.

**Command Notes:** The extracted range contains all the information and settings contained in the original range.

## Importing Data From Other Files (/fi)

The **File Import** command copies information from a standard file to your spreadsheet. The **File Import** command does not accept information from any document containing special characters used in word processing formats. The command accepts information from standard mode documents, standard files, or documents created in "non-document" mode only.

*NOTE: Imported information overwrites the area of the spreadsheet into which it is placed. Before selecting the **File Import** command, Make sure the spreadsheet has enough room for the imported information.*

The **File Import** command offers the following options:

<i>Text</i>	Imports text from a standard text file.
<i>Numbers</i>	Imports numbers from a standard file.
<i>Multiplan-SYLK</i>	Imports information from a Multiplan SYLK format file.

### **Command Selection: /fi**

**Command Procedure:** To use text and numbers from standard files in the current spreadsheet:

1. Make sure the spreadsheet is in Ready mode.
2. Move the cell pointer to the beginning of the area where you want to put the imported information.
3. Type **/fi**
4. If you want to import text from a standard text file, press **t**,

or

If you want to import numbers from a standard file, press **n**.

If you want to import information from a Multiplan SYLK file, move the cursor to Multiplan-SYLK, press **m**, and then press **Enter**.

You are prompted to enter the name of the import file, from which information is copied. The current directory name appears with the message prompt.

5. If the import file is contained in the current directory, type the file name.

or

Press **Enter** to display the files contained in the current directory, select the import file, and press **Enter**.

If the import file is contained in another directory within the current directory, type the name of the other directory, and then repeat step 5.

If the import file is contained in the directory that contains your current directory, type a double period (.), a slash (/), and then the file name:

**../filename**

6. If the selected import file contains non-ASCII characters, you are notified that the file is not a text file.

To return to the file name prompt, press **Enter**; to start over from the *Import File Options* menu, press **Cancel**.

Imported numbers are copied into cells beginning at the cell pointer's current position; text is copied to the cell pointer's current position as a single cell with a very long label.

3. The *Print Commands* menu is displayed.
4. If you want to define a new print range, press **r** to select **Range**.

You are prompted to select the range you want to print. If you have used a print range before, that range is highlighted.

Note that if you never set a print range, or if you clear the present range, the default print range is the entire spreadsheet.

5. If you want to use the existing range, press **Enter**.

If you want to use a different print range, press **Cancel**, select the range you want to print, and then press **Enter**.

The *Printer Commands* menu is redisplayed.

6. Press **g** to select **Go**.
7. Press **q** to select **Quit** to start printing.

The selected range is sent to the print queue, where it waits its turn to be printed. A message informs you when the spreadsheet range is printed.

**Command Notes:** Before you select the **Go** and **Quit** commands, you can cancel any print ranges by selecting the **Clear** print command.

## Creating a Print Output File (/pf)

The **Print File** command sends the information you want printed to a standard file that you can print later.

Once you create and name the print output file, it appears in the directory that contains the spreadsheet you were using.



## Command Selection: /pf

**Command Procedure:** The following procedure shows you how to create a print output file that contains a single spreadsheet range to print, without any special settings or options. For more information on using printer options, see "Selecting Printer Options," later in this chapter.

1. Make sure the spreadsheet is in Ready mode.
2. Type **/pf**

You are prompted to type a name for the print file.

3. Type a file name and press **Enter**.
4. The *Print Commands* menu is displayed.
5. If you want to define a new print range, press **r** to select *Range*.

You are prompted to select the range you want to print. If you have used a print range before, that range is highlighted.

Note that if you never set a print range, or if you clear the present range, the default print range is the entire spreadsheet.

6. If you want to use the existing range, press **Enter**.

If you want to use a different print range, press **Cancel**, select the range you want to print, and then press **Enter**.

The *Printer Commands* menu is redisplayed.

7. Press **g** to select *Go*.
8. Press **q** to select *Quit* and start the print process.

The selected print range is sent to the output file. The print output file name appears in the current directory.

**Command Notes:** Before you select the **Go** and **Quit** commands, you can cancel any ranges by selecting the **Clear** print command.

## Printing the Output File

To print the output file:

1. Open the directory that contains the print file.
2. Move the cursor to the file name.
3. Press **Command** to display the *Commands* menu.
4. Move the cursor to *Print* and press **Enter**.

The *Print File* form is displayed.

5. If you want to select another printer to use, move the cursor to the *Printer Name* field, and then press any key to display a list of printers. Move the cursor to the printer you want to use, and press **Enter**.
6. If you want to print more than one copy, move the cursor to the *Number of Copies* field, and type the number of copies.
7. When you complete the *Print File* form, press **Enter** to print the file.

The output file is sent to the print queue, where it waits its turn to be printed. A message informs you when the file is printed.

## Using Print Commands

The Print commands let you specify how much of the spreadsheet you want to print and how you want the printed copy of the spreadsheet to look.

To display the Print commands:

1. Make sure the spreadsheet is in Ready mode.
2. If you want to print to a file, type **/pf**, enter a file name for the output file, and press **Enter**,

or

If you want to print directly to the printer, type **/pp**, select the printer you want to use, and then press **Enter**.

The *Print Commands* menu is displayed.

**Command Notes:** The **Worksheet Global Default** command lets you update a default printer configuration file, add some special printing commands to control printer output, and enable or disable the advanced printing feature. For information about updating the default printer configuration file, see Chapter 6, "Using Worksheet Commands."

## Range

The **Range** print command identifies the cells to print. If you don't specify a range, the entire spreadsheet is printed.

You can print several different ranges in a single print command, and then use the **Line** or **Page** command to separate the ranges.

## Line

The **Line** print command advances the paper one line before printing. When you print more than one range, you can separate each range with a blank line.

## Page

The **Page** print command advances the paper to the top of the page before printing. When you print more than one range, you can separate each range with a blank page.

Header or Footer Line: Perfect Pools|Page #|@

pools						
Perfect Pools		Page 1		Thu May 21 12:04 PDT 1987		
Sort ID	First Last	AreaPhone	Terr.	Score	CRITERION	
1 10	rolly croll	234 567-4000	west	345	Terr.	

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Header or Footer Line: JCP||@

jcp					
JCP			Thu May 21 12:04 PDT 1987		
Sort ID	First Last	AreaPhone	Terr.	Score	CRITERION

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*NOTE: You can temporarily turn off the printing of headers and footers by selecting the **Options Other Unformatted** print command. To reinstate the printing of headers and footers, use the **Options Other Formatted** print command.*

## Margins

The *Margins* option defines the amount of blank space on the left, right, top, and bottom of each page. You select the margin you want to set (left, right, top, or bottom), and you define its size.

## Borders

The *Borders* option lets you use specified spreadsheet columns and/or rows as a spreadsheet border in the printed spreadsheet. Borders make it easier to read printed spreadsheets. Without borders, multiple pages of columns and rows of figures can look confusing.

You can use a column border, which appears at the left of every printed page, or a row border, which appears at the top of every the printed page. The border column or row should contain information that describes the printed range: months of the year for example. When you select *Column* or *Row*, you are prompted for the specific column you want to use.

### **Setup**

The *Setup* option lets you specify special printer information associated with an individual printer. For example, you can type a setup string that instructs a printer to print in compressed mode, using boldface print.

Printer setup strings can be up to 240 characters long. See your printer manual for information on setup strings.

### **Page Length**

The *Page-Length* option sets the numbers of lines on the page. It is important to set the correct page length for the paper you use.

The default page length is 66 lines; this is the proper setting for 11-inch-long paper and a printer that prints 6 lines per inch.

### **Other**

The *Other* option provides additional ways to format your printout. You can choose from the following:

- As-displayed*      Prints the cell range as is appears in the spreadsheet.
- Cell-Formulas*      Prints the formulas rather than the values calculated by the formulas. Each cell's formula is printed on a separate line, exactly as it appears in the command panel.
- Formatted*      Prints current headers, footers, and page breaks.
- Unformatted*      Ignores headers, footers, and page breaks when printing.

## **Copies**

The *Copies* option defines the number of copies to print. Choose from 1 to 99.

## **Quit**

The *Quit* option returns the *Printer Commands* menu to the screen.

## **Clear**

The **Clear** print command resets some or all of the current print selections. You can choose from the following options:

<i>All</i>	Clears all current print settings and restores the defaults.
<i>Range</i>	Clears the current print range.
<i>Borders</i>	Clears the current borders.
<i>Format</i>	Clears any current margins, page length settings, and setup strings, and restores defaults.

## **Align**

The **Align** print command resets the printer to the top of the page. Use **Align** only when you change paper position.

## **Go**

The **Go** print command sends the information to the printer or the file. Use **Go** *after* you select the print range and desired print options, if you are selecting any.

*NOTE: It may appear that nothing happens when you select the **Go** command because the print process does not actually start until you select the **Quit** command. Do not select **Go** repeatedly; each time you select **Go**, you send the information to the printer or file.*

## Extensions

The **Extensions** print command specifies whether or not to use advanced printing. The advanced printing feature takes the place of the setup string. With advanced printing enabled, you can print 8-bit characters and you can select the print pitch, which determines the number of characters per inch.

Also, with advanced printing enabled, a spreadsheet prints in landscape (horizontal) or portrait (vertical) mode automatically, depending on which is appropriate for the spreadsheet. For example, if the print range is wider than it is long, it prints in portrait mode, sideways on the page; if the print range is longer than it is wide, it prints in landscape mode, horizontally across the page.

You can choose from the following options:

<i>Enable</i>	Specifies that you want to use advanced printing. Any setup string you have defined is not used. Remember, advanced printing allows you to print 8-bit characters.
<i>Disable</i>	Specifies that you do not want to use advanced printing. Any setup string you have defined is used instead. With advanced printing disabled, you may not be able to print 8-bit characters.
<i>Pitch</i> (characters per inch)	Determines the print pitch for printable characters. Advanced printing must be enabled if you want to select a <i>pitch</i> . When you select Pitch, you see a choice of 15, 12, 10, or 8 pitch. When you select a pitch, the Extensions menu returns.
<i>Quit</i>	Exits the <i>Extensions</i> menu and returns to the <i>Print Commands</i> menu.

## Quit

The **Quit** command exits the Print Commands menu, returns to Ready mode, and starts the print operation.





This chapter describes how to use the following Data commands to manage information in your spreadsheet:

<b>Fill</b>	Automatically enters a sequence of numbers into a range of cells.
<b>Table</b>	Helps you perform What-If? analysis.
<b>Sort</b>	Rearranges the order of information in a database.
<b>Query</b>	Provides commands that find, display, delete, and copy specified database information.
<b>Distribution</b>	Calculates the frequency of distribution of database values.
<b>RDB</b>	Lets you examine databases created with the UNIFY database program and copy data into a spreadsheet from a UNIFY database. (The <b>RDB</b> command is available only if you have UNIFY installed.)

To display the Data Commands menu:

1. Make sure the spreadsheet is in Ready mode.
2. Type **/d**

## Creating a Fill Range (/df)

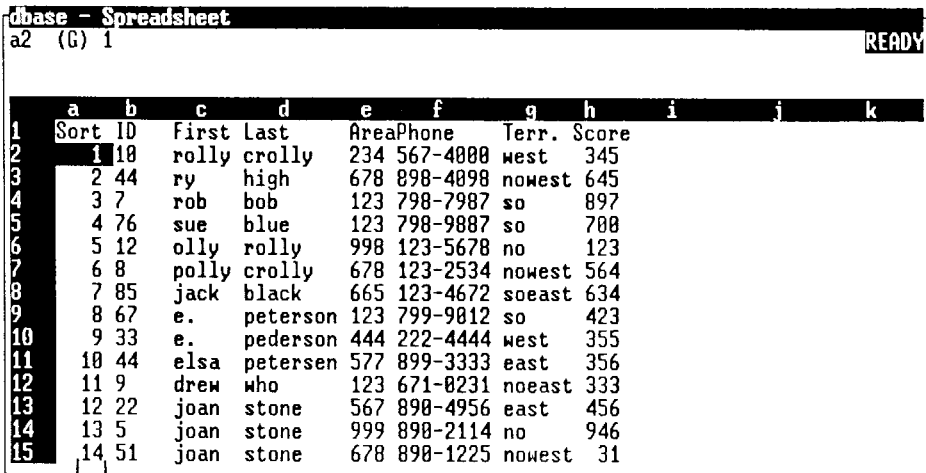
The **Data Fill** command fills a selected range of cells with consecutive numbers. You specify the range to be filled, the starting number, the increment, and the ending number.

The *start value* is the first number in the series of consecutive numbers.

The *step value* is the increment between each numbered cell in the fill range. A step value of 1 increases each value in the fill range by one; a step value of -2 decreases each value in the fill range by two. So, the fill range can be filled in ascending (lowest to highest) or descending (highest to lowest) order.

The *stop value* is the last number in the group of numbered cells.

You can use the **Data Fill** command to create a column of consecutive numbers identifying the original order of information in a database. Then once you sort the database, you can return the information to its original order by sorting the database by those consecutive numbers.



	a	b	c	d	e	f	g	h	i	j	k
1	Sort	ID	First	Last	Area	Phone	Terr.	Score			
2	1	10	rolly	crolly	234	567-4000	west	345			
3	2	44	ry	high	678	898-4098	nowest	645			
4	3	7	rob	bob	123	798-7987	so	897			
5	4	76	sue	blue	123	798-9887	so	700			
6	5	12	olly	rolly	998	123-5678	no	123			
7	6	8	polly	crolly	678	123-2534	nowest	564			
8	7	85	jack	black	665	123-4672	soeast	634			
9	8	67	e.	peterson	123	799-9812	so	423			
10	9	33	e.	pederson	444	222-4444	west	355			
11	10	44	elsa	petersen	577	899-3333	east	356			
12	11	9	drew	who	123	671-0231	noeast	333			
13	12	22	joan	stone	567	898-4956	east	456			
14	13	5	joan	stone	999	898-2114	no	946			
15	14	51	joan	stone	678	898-1225	nowest	31			

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Data Fill Numbers

GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW |

## **Command Selection: /df**

**Command Procedure:** To create a fill range:

1. Make sure the spreadsheet is in Ready mode.
2. Move the cell pointer to the top-left corner of the range of cells you want to fill. (Make sure the fill range does not contain information you want to save, as it will be overwritten.)
3. Type **/df**

If you have previously set up a data fill range, the existing range is highlighted.

4. Press **Enter** to use the existing fill range.

If you want to use a different fill range, press **Cancel**, select the fill range, and press **Enter**.

5. Type a start value and press **Enter**.
6. Type a step value and press **Enter**.
7. Type a stop value and press **Enter**.

Each cell in the fill range is filled with a number. The start value appears in the top-left cell, followed by numbers increased or decreased by the step value, up to the cell that contains the stop value (the end of the fill range).

**Command Notes:** Fill values can be formulas, positive or negative integers, or nonintegers.

The fill values overwrite any cell values in the specified fill range.

## Creating and Using Data Tables

Data tables help you perform sophisticated What If? analysis. You already know how to perform manual What If? tests without using data tables: You change one or two variables, view the results, change the variables again, view the results again, and so on.

Once you create a data table, you need not manually change variables to see how the change affects other data. When you execute the **Data Table** command, the spreadsheet uses the information in the data table to calculate the results you need.

Just as you change one or two variables in manual What If? tests, you can create data tables that use one or two sets of variables. The spreadsheet cell that contains the variable is called the *input cell*. A data table using one set of variables is called a *one-input-cell* data table; a table using two sets of variables is called a *two-input-cell* data table.

### Creating a One-Input-Cell Data Table

You can create a data table to calculate different monthly payment amounts for an \$11,000.00 loan using different interest rates. The data table uses one input cell, which contains the interest variable.

The payment spreadsheet below calculates the monthly payment for a loan of \$11,000.00, based on a 48-month loan term and a one percent monthly interest rate.

d1 - Spreadsheet					
b5 (C2) @PMT(b1,b2,b3) <span style="float: right;">READY</span>					
	a	b	c	d	e
1	Loan amount:	\$11,000			
2	Monthly interest:	1%			
3	Months to repay:	48			
4					
5	Monthly payment:	\$289.67			
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

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GO TO RECALC EDIT NAME ALT END ABS WINDOW

Use the following formula to figure how much worksheet space you'll need for the data table:

- One column for the list of variables, plus one column for each formula you want recalculated with the variables
- One row for each variable, plus one row for the formula cell(s) at the top of the table and one blank row at the bottom of the table

	a	b	c	d	e	f	g	h
1								
2								
3			blank cell	formula	formula	...	...	
4			var.1					
5			var.2					
6			var.3					
7			var.4					
8			var.5					
9			var.6					
10			.					
11			.					
12			.					
13			b l a n k	r o w				
14								
15								

433.11-3

GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW

To create a one-input-cell data table for the loan spreadsheet shown earlier:

1. Make sure the spreadsheet is in Ready mode; move the cell pointer to an unoccupied portion of the worksheet.
2. Leave the first cell in the first column blank. Below the blank cell, type one variable per row of column one. (In this example, use interest rates).

	a	b	c	d	e
1	Loan amount:	\$11,000	Interest		
2	Monthly interest:	1%	Blank →		
3	Months to repay:	48		1.00%	
4				1.25%	
5	Monthly payment:	\$289.67		1.50%	
6				1.75%	
7				2.00%	
8				2.25%	
9				2.50%	
10				2.75%	
11				3.00%	
12				3.25%	
13				3.50%	
14				3.75%	
15					

433.11-4

GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW |

3. In the first cell of the second column, type the cell reference to the formula that calculates the results. (In this example, cell b5).
4. Type cell references to additional formulas (if you are using any) across the top row of the table.
5. Leave at least one blank row at the bottom of the table.

dt1 - Spreadsheet  
d2 (C2) +b5 READY

	a	b	c	d	e
1	Loan amount:	\$11,000	Interest	Payment	
2	Monthly interest:	1%		\$289.67	
3	Months to repay:	48	1.00%		
4			1.25%		
5	Monthly payment:	\$289.67	1.50%		
6			1.75%		
7			2.00%		
8			2.25%		
9			2.50%		
10			2.75%		
11			3.00%		
12			3.25%		
13			3.50%		
14			3.75%		
15					

Blank Row at  
← Bottom of Table

433.11-5

GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW |

When the Data Table command is executed, the data table looks like this:

dt1 - Spreadsheet  
c2 READY

	a	b	c	d	e
1	Loan amount:	\$11,000	Interest	Payment	
2	Monthly interest:	1%		\$289.67	
3	Months to repay:	48	1.00%	\$289.67	
4			1.25%	\$306.14	
5	Monthly payment:	\$289.67	1.50%	\$323.12	
6			1.75%	\$340.62	
7			2.00%	\$358.62	
8			2.25%	\$377.11	
9			2.50%	\$396.07	
10			2.75%	\$415.49	
11			3.00%	\$435.36	
12			3.25%	\$455.66	
13			3.50%	\$476.37	
14			3.75%	\$497.49	
15					

Completed  
Data Table

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GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW |



7. Press **s** to select the **SQL** command.

You are prompted to enter the SQL query. If you have used an SQL query since the last time you saved the spreadsheet, that query appears with the prompt.

8. Type the following query to copy all records in the **manf** relation to the cell pointer's current location in the current spreadsheet:

```
select * from manf/
```

If you need to edit the query, use the cursor keys **Delete** and **Backspace** to move the cursor.

9. Press **Return**.

10. Press **g** to start the query.

The data matching the query is copied into the current spreadsheet at the cell pointer's position.



---

## *Using Advanced Commands*

This chapter describes how to use the following Spreadsheet Advanced commands. (The **Advanced Record-Macro** command is described in Chapter 13, "Using Macros.")

<b>Link</b>	Connects data between spreadsheets. (You can use this command to take advantage of WGS/Spreadsheet's compatibility with Multiplan and Lotus 1-2-3.)
<b>Goal-Seeking</b>	Helps you perform What If? analysis.
<b>Move</b>	Moves multiple spreadsheet columns and rows.
<b>Cut and Paste</b>	Help you copy information between spreadsheets and other applications, so you can integrate your spreadsheet data into other spreadsheets and other types of files.
<b>Automatic</b>	Lets you specify whether or not the cell pointer moves automatically when you press <b>Enter</b> to enter cell information.
<b>Default</b>	Establishes certain default spreadsheet settings.
<b>Width</b>	Sets the column width for multiple columns or rows.

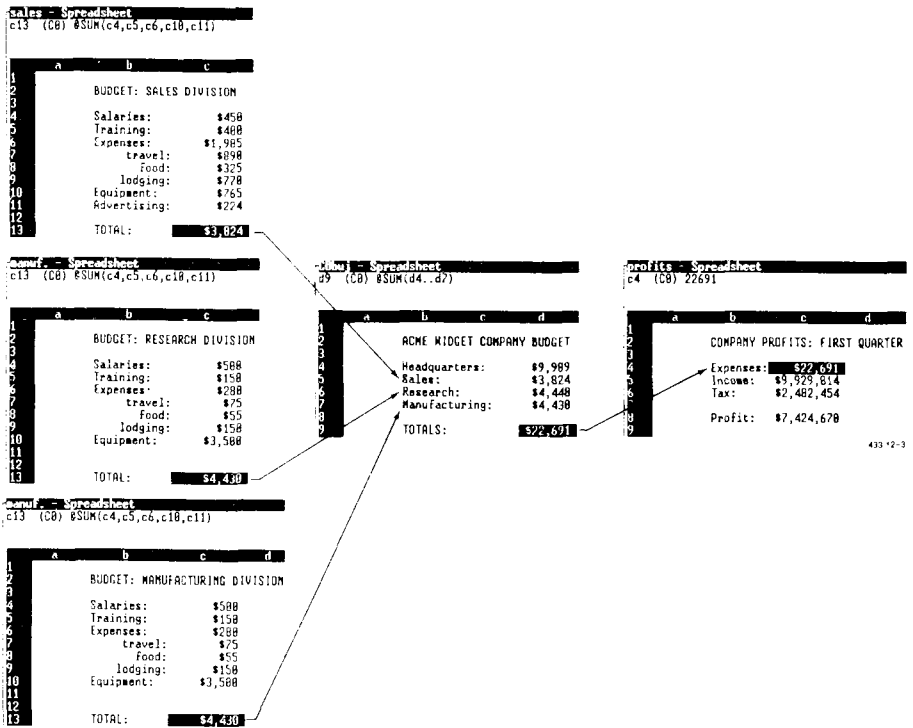
## Dependent and Supporting Links

When the current spreadsheet uses information linked from an external spreadsheet, the contents of the cells in the current spreadsheet depend on data received through the link with the external spreadsheet. The current spreadsheet is *dependent* on the external spreadsheet. When the external spreadsheet file is changed or updated, the contents of dependent cells in the dependent spreadsheet are updated when the external spreadsheet is opened.

The external spreadsheet that sends data to the dependent spreadsheet is called the *supporting* spreadsheet. Data in the supporting spreadsheet supports the data in the dependent spreadsheet linked to it.

In the example shown earlier, the company budget spreadsheet is dependent on the three division budget spreadsheets. The three division budget spreadsheets support the company budget spreadsheet.

One spreadsheet can contain both dependent and supporting links. For example, the company budget spreadsheet shown earlier is dependent on three division budget spreadsheets. The same company budget spreadsheet can provide information to another spreadsheet that calculates profits, thus supporting that other spreadsheet.



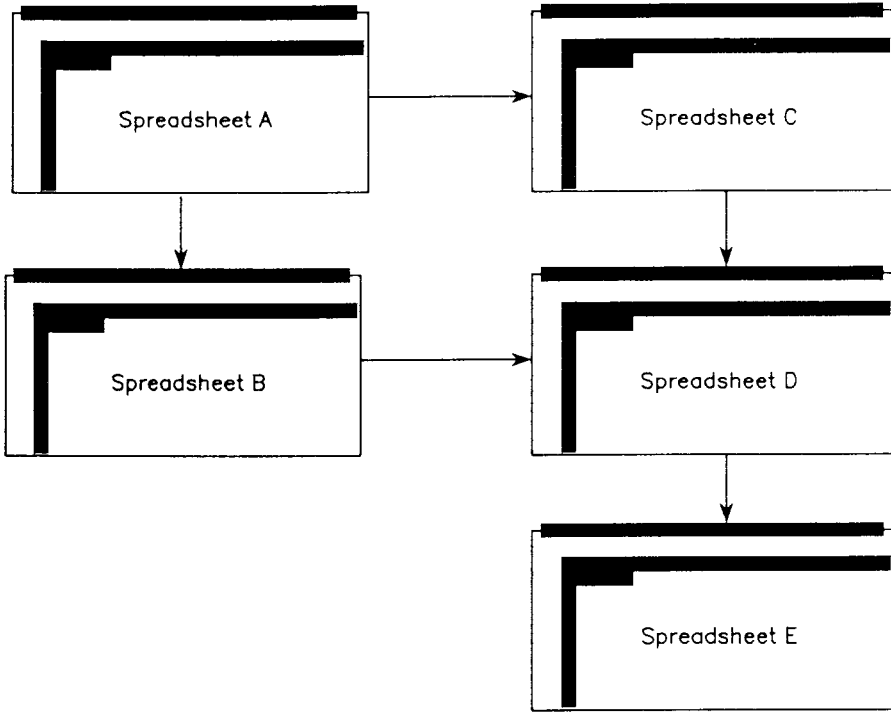
## Updating Links

Links are not updated when you make changes in the supporting file. They are updated the next time you open the dependent file and are not stored on the hard disk unless you then save the dependent file.

For example, if you make changes to the research budget spreadsheet, those changes are not reflected in the dependent company budget spreadsheet until you open and save the company spreadsheet.

If you create a series of linked files, it is a good idea to keep a diagram of supporting and dependent relationships. Check the diagram from time to time against the supporting and dependent file lists of each spreadsheet; then you know the order in which to open and save dependent files after updating a supporting file so that all files are updated accurately.

For example, the diagram below shows the order of dependencies among five spreadsheets: A, B, C, D, and E. If information is updated in A, you must open and save B or C in order to update the dependent cells in D. Similarly, you must open and save D to update the dependent cells in E.



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*NOTE: Spreadsheet File commands such as **File Combine** or **File Save (to a new name)** preserve spreadsheet links. However, if you use **Desktop** or **CTIX** commands to copy or move a file to another directory or rename a file, all links with those files are lost.*

As you work on a given file, you can view a list of its dependent or supporting files. For details, see "Listing Supporting Links (*/als*)" and "Listing Dependent Links (*/ald*)," later in this chapter.

## Using the Advanced Link Commands (/al)

WGS/Spreadsheet provides the following Advanced Link commands:

<b>Copy</b>	Copies information from a source area in an external spreadsheet to a target area in the current spreadsheet.
<b>Supporting</b>	Displays a list of external spreadsheets that send information to the current spreadsheet.
<b>Dependent</b>	Displays a list of external spreadsheets that receive information from the current spreadsheet.
<b>Quit</b>	Exits the <i>Advanced Link Commands</i> menu and returns the spreadsheet to Ready mode.

To display the Advanced Link commands:

1. Make sure the spreadsheet is in Ready mode.
2. Type `/al`

## Adding External Links to the Spreadsheet (/alc)

The **Advanced Link Copy** command lets you add an external link to the current spreadsheet.

*NOTE: You can create links between WGS/Spreadsheet files, Multiplan SYLK files, and 1-2-3 Worksheet files. 1-2-3 Worksheet files, however, cannot depend on other spreadsheet files.*

## **Command Selection: /alc**

**Command Procedure:** To add an external link to a spreadsheet.

1. Make sure the spreadsheet is in Ready mode.
2. Type **/alc**

You are prompted to specify the name of the external spreadsheet that contains the information you want to copy. The name of the current directory appears with the prompt message.

3. Press **Enter** to display a list of files in the current directory.
4. Move the cursor to the name of the external file you want to link to, and press **Enter**.

You are prompted to select a range.

5. Select the source range (in the external spreadsheet) that contains the information you want to receive.
6. Press **Enter**.

You are prompted to select the target area to which the linked information to be copied.

7. Type the cell address of the upper left cell in the target range or, if the target range is a named range, type its name.

The data from the source range is copied into the target range in the current spreadsheet. Every time the current spreadsheet is opened, the linked cells are copied from the external spreadsheet.

**Command Notes:** The **Advanced Link Copy** command copies cell values only, not formulas.

The target area should be large enough to contain the number of cells in the source area. Any data in cells within the target area is overwritten and lost.



## Listing/Changing/Deleting Supporting Links (/als)

The **Advanced Link Supporting** command displays a list of all supporting links to the current spreadsheet. The command also lets you modify or delete the supporting links.

### Command Selection: /als

**Command Procedure:** To look at a list of supporting links to the current spreadsheet and then modify or delete the link:

1. Make sure the spreadsheet is in Ready mode.
2. Type /als

You see a list of supporting external links. The list includes the name, file type, source area, and target area for each link. Notice that new screen key labels appear to let you modify or delete supporting links.

CObuj - Spreadsheet  
d9 (C0) @SUM(d4..d7) MENU  
Copy Supporting Dependent Quit  
Copy a range from an external spreadsheet

Sheet Name	Sheet Type	Source	Destination
-sales	Spreadsheet	C13	d5
research	Spreadsheet	C13	d6
manuf.	Spreadsheet	C13	d7

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DELETE EDIT

To modify a link:

1. With the *Supporting Link* list on the screen, press **F4** (Edit).

You are prompted to enter the name of the spreadsheet containing the link you want to modify. The name of the currently linked spreadsheet appears with the prompt message.

2. To select the suggested spreadsheet, press **Enter**; if you want to modify a link in a different spreadsheet, type the appropriate file name.

Prompts lead you through the same steps you use to create a link. The suggested responses to the prompts consist of the current information.

To delete a link:

1. With the *Supporting Link* list on the screen, move the command panel cursor to the link you want to delete, or mark several files if you want to delete several links at once.
2. Press **F2** (Delete).

The link is deleted. The contents of the target cell are deleted.

### **Listing Dependent Links (/ald)**

The **Advanced Link Dependent** command displays a list of all dependent links to the current spreadsheet.

*NOTE: If you use Desktop or CTIX commands to copy, move, or rename files that are dependent on the current spreadsheet, the names of those files do not appear on the list, unless you have opened and saved the files since using non-WGS/Spreadsheet commands on them.*

## **Command Selection: /ald**

**Command Procedure:** To look at a list of dependent links to the current spreadsheet:

1. Make sure the Spreadsheet is in Ready mode.
2. Type **/ald**

You see a list of dependent links. The list includes the file name and file type of spreadsheets that contain dependent links to the current spreadsheet.

## **Goal Seeking (/ag)**

This section shows you how to use the **Advanced Goal-Seeking** command to determine what you need to do to reach a specific known goal.

The **Advanced Goal-Seeking** command requires that you specify a variable cell and a target cell.

- The *variable cell* contains a number that the goal-seeking command adjusts to reach your goal. This cell must contain a number, not a formula or a label.
- The *target cell* represents your goal. This cell must contain a formula that either uses the variable cell or a cell affected by the variable cell.

For example, if you make a deposit of \$10,000, you can use goal seeking to figure the annual interest rate you need to increase that amount to \$20,000 in 10 years.

## Selecting Spreadsheet Information to Copy (/ac)

Use the **Advanced Cut** command to select information you want to paste into another location in the spreadsheet or to another spreadsheet or document file. The command copies the selected information into a paste buffer, where it waits to be pasted. The original information remains in the current spreadsheet.

Use the **Advanced Paste** command, described later in this chapter, to copy the information into the other file.

### Command Selection: /ac

**Command Procedure:** To use the **Advanced Cut** command:

1. Make sure the spreadsheet is in Ready mode.
2. Move the cell pointer to the beginning of the information you want to cut (copy).
3. Type **/ac**

You are prompted to select the range you want to cut (copy).

4. Select the cell or range you want to cut, and press **Enter**.

A message at the bottom of the screen prompts you to move the cursor to the destination location and paste the information.

The information in the selected cut range is temporarily stored in the paste buffer, waiting for you to paste it in another position in the current spreadsheet, or into another spreadsheet or document.

5. If you want to paste the selected range into another location in the current spreadsheet, move the cell pointer to that position.

If you want to paste the selected range into another file (another spreadsheet or a word processing document), press **Control-z** to display the Window function key labels. Press **F8 (Menu)** to display a list of available windows, and then select the window containing the file into which you want to paste the information.

Note that although it is a good idea to paste the information into the new location fairly soon, you don't have to do it right away; the information remains in the paste buffer until you copy more information to the buffer.

6. For information about copying the information in the paste buffer to another file, refer to the following discussions: "Pasting Information into Another Spreadsheet (/ap)," or "Pasting Information into a Word Processor Document," later in this chapter.

## **Pasting Information into Another Spreadsheet (/ap)**

Use the **Advanced Paste** command to copy information from the paste buffer into a spreadsheet or document file. (You use the **Advanced Cut** command, described earlier, to copy information from the spreadsheet to the paste buffer.)

When you paste information into a spreadsheet, you can specify that you want to copy everything (including global range and format settings), just formulas, or just values.

### **Command Selection: /ap**

**Command Procedure:** To paste into another spreadsheet:

1. Make sure the information you want to paste is in the paste buffer. Refer to "Selecting Spreadsheet Information to Copy (/ac)," above.
2. If you haven't already, open the spreadsheet into which you want to paste the information.
3. Move the cell pointer to the location where you want to paste the information in the destination spreadsheet.

Choose the destination range carefully; the pasted information overwrites existing cells in the destination spreadsheet.

4. Make sure the destination spreadsheet is in Ready mode.

5. Type **/ap**

You are prompted to specify whether you want to copy everything (**e**), formulas (**f**), or values (**v**).

*Everything* copies all global and range format settings associated with the spreadsheet; *Formulas* copies just formulas; *Values* copies just values.

If you are copying just a few cells, you probably don't want to select *Everything*, since settings from the entire spreadsheet will accompany those few cells.

6. Press the character corresponding to the first letter of the copy option you want to select.

**Command Notes:** The **File Xtract** and **File Import** commands work very much like the **Advanced Cut** and **Paste** commands. See Chapter 9, "Using File Commands," for more information about the File commands.

## Pasting Information into a Word Processor Document

The following procedure shows you how to paste spreadsheet information from the paste buffer into a WGS/Word Processor document. The spreadsheet information is copied as text; any formulas are copied as numbers (the formulas are evaluated before they are pasted into the document).

The column width information in the spreadsheet is transferred as tab stop information in the document, so the information remains in columns.

**Command Procedure:** To paste spreadsheet information from the paste buffer into a WGS/Word Processor document:

1. Use the **Advanced Cut** command to copy the information to the paste buffer. Refer to "Selecting Spreadsheet Information to Copy (**/ac**)," earlier in this chapter, for details.
2. Open the document into which you want to copy the information in the paste buffer.

3. Move the cursor to the area of the document where you want to paste the information.
4. Press **F8** (Paste).

The spreadsheet information is inserted into the document, preceded and followed by format lines that keep the cell spacing that was established in the spreadsheet.

## Using Automatic Cursor Movement (/aa)

The **Advanced Automatic** command lets you enable or disable automatic cursor movement. Automatic cursor movement specifies that, instead of remaining on the current cell, the cell pointer automatically moves to the next cell (up, down, left, or right) when you press **Enter** to enter a cell entry.

The direction the cell pointer moves depends on the most recently used cursor key.

Automatic cursor movement is useful when you are typing long columns or rows of numbers into a new spreadsheet.

### Command Selection: /aa

**Command Procedure:** To set automatic cursor movement:

1. Make sure the spreadsheet is in Ready mode.
2. Type /aa

You are prompted to specify whether you want to change the cell pointer position after you press **Enter**.

3. If you want to use automatic cursor movement, press **y** (*Yes*); to turn off the automatic cursor movement, press **n** (*No*).

**Command Notes:** You can also use the *Spreadsheet Preferences* form to set up automatic cursor movement. For more information about preference settings, see Chapter 4, "Spreadsheet Preferences."

## Setting Advanced Defaults (/ad)

This section shows you how to use the **Advanced Defaults** command to establish some advanced defaults associated with specific spreadsheet commands.

The **Advanced Default** command provides the following options:

- Copy-Values*        Sets the **Copy** command to copy both formulas and values, or values only. *No*, the initial setting, specifies formulas and values; *Yes* specifies values only.
- Align-Columns*     Sets or removes an automatic, one-space gutter to the right of each spreadsheet column. This gutter makes the spreadsheet more readable: positive and negative numbers formatted with the *Currency* and *Comma* formats are aligned with each other. *Yes*, the initial setting, specifies that you want the spreadsheet to display the single-space gutter; *No* specifies that no space appears to the right of each column.
- Blank Format*        Sets the **Range Erase** command to erase cell contents, format, and attributes, or cell contents only. *Yes*, the initial setting, specifies that the **Range Erase** command erases all cell information; *No* specifies that values, formulas, and labels are erased, but not format settings, protection settings, and label-prefixes.

### Command Selection: /ad

**Command Procedure:** To set the advanced defaults options:

1. Make sure the spreadsheet is in Ready mode.
2. Type **/ad**
3. Press the key corresponding to the first character (**c**, **a**, or **b**) of the default option you want to change.
4. Press **y** or **n** to select *Yes* or *No*, respectively, for the option.

The selected default setting is changed. The new default setting does not affect any previous commands. For example, any cells previously erased with the **Range Erase** command are not affected by the new setting.



**Command Notes:** You can use the Spreadsheet Preferences to change these default options. For details, refer to Chapter 4.

## Setting Column Width for Ranges (/aw)

The **Advanced Width** command described here, sets the width for multiple columns.

The **Worksheet Global Column-Width** command sets column width for the entire current spreadsheet; the **Worksheet Column-Width** command sets the column width for a single column. Both commands are described in Chapter 6, "Using Worksheet Commands."

### Command Selection: /aw

**Command Procedure:** To set the width of a range of columns, or return the width to the global setting:

1. Make sure the spreadsheet is in Ready mode.
2. Type /aw
3. To return to global column width, press **r** (to select Reset).

or

To enter a new column width, press **s** (to select Set).

You are prompted to select the range. A suggested range appears with the prompt message.

4. Select the range for which you want to change the column width, and press **Enter**.

If you selected Reset, the selected columns are set to the global column width.

If you selected Set, you are prompted to enter a new column width.

5. Type the new column width.

or

Press **Forward** or **Back** to make the column wider or narrower, respectively, until it is the width you want.

6. Press **Enter**.



This chapter describes how to create and use macros. A macro is a stored sequence of keystrokes that you can execute with a single command. Macros save time by providing a shortcut for multiple keystrokes and commands that you use frequently, for example, formatting new spreadsheets, typing repeated labels and formulas, or printing selected portions of your spreadsheet.

This chapter also describes the advanced macro commands (/X commands), which help you create complex custom macros that are like miniprograms.

### **What Is a Macro?**

A *macro* is a sequence of keystrokes entered as labels in a single column in the current spreadsheet. Macro cell entries can contain commands, functions, labels, values, keystrokes—any cell entry.

For example, a macro to set the width for two adjacent columns to 15 would contain the following cell entries:

```

acro - Spreadsheet
b8 '{right}
Enter name: \c          Enter range: b3..b8
+-----+-----+-----+-----+-----+
| a       | b       | c       | d       | e       | f       |
+-----+-----+-----+-----+-----+
1 | MACROS |         |         |         |         |         |
2 |         |         |         |         |         |         |
3 |         |         |         |         |         |         |
4 | \c     | /ucs   | start  |         |         |         |
5 |         | 15~   | col-width set |         |         |         |
6 |         | {right}| command;  |         |         |         |
7 |         |         | set width to 15; |         |         |         |
8 |         |         | press Go;  |         |         |         |
9 |         |         |         |         |         |         |
10|         |         |         |         |         |         |
11|         |         |         |         |         |         |
12|         |         |         |         |         |         |
13|         |         |         |         |         |         |
14|         |         |         |         |         |         |
15|         |         |         |         |         |         |

```

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GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW

When you create a macro you give it a one-character name. Then, to execute the macro, you specify that one-character name; WGS/Spreadsheet reads the cell entries for the macro, beginning with the first cell, and continuing to cells below until it reaches a blank cell, a **Macro Finish** command, or an invalid macro entry.

You can create interactive macros that pause for user input, and then continue once the user presses **Enter**. See "Interactive Macros," later in this chapter, for details about interactive macros.

## Where Do You Create and Store Macros?

You enter a macro in a single column of cells in the current spreadsheet. The macro is part of the spreadsheet, just like any other information in worksheet cells. When you save the spreadsheet to the hard disk, the macro is saved too.

You can enter a macro in any unused area of the spreadsheet. Because inserting or deleting rows or columns can destroy a macro, you should keep macros where they won't be disturbed by any such command. You may want to keep macros at the beginning of the spreadsheet, where you can see them; on the other hand, you may want to store macros at the end of the spreadsheet, at the far bottom-right, where they won't get in the way.

Macros entered into a spreadsheet can be used with that spreadsheet only. You can enter more than one macro in a single spreadsheet. It is a good idea to stack multiple macros vertically in one area, leaving a blank row beneath each one.

If you use the **Range Name** command to name the spreadsheet area containing macros, you can use **F1** (Go To) to move there quickly to view or edit the macros.

## Creating Macros

There are two ways to create a macro. You can

- use the **Advanced Record-Macro** command to let the spreadsheet automatically record each command and keystroke as you perform the sequence,
- or
- enter each command and keystroke of the macro yourself by typing them as labels in the appropriate cells

Whichever method you use, the contents of the macro must indicate *every* step in a sequence of commands.

If you are new to macros, you'll find it easier to create your first few macros using the **Advanced Record-Macro** command. Once you become familiar with creating and using macros, you can use the typing method to create macros that are more sophisticated than those that can be recorded automatically.

## Using the Advanced Record-Macro Command (/ar)

The following example shows you how to use the macro recorder to create a simple macro to set the width of a column to 15, and then move the cell pointer one column right.

*NOTE: When you use the Advanced Record-Macro command, always select menu commands by typing the slash (/) and the initial character of each command, instead of using the cursor to move to and select commands.*

### Command Selection: /ar

**Command Procedure:** The following procedure creates a macro, named **c**, to set the column width to 15:

1. Move the cell pointer to the location in the spreadsheet where you want to put the macro. (Remember that the best location for macros is an unused area.)
2. Make sure the spreadsheet area contains enough blank cells to accommodate the macro.

This example uses three consecutive rows for the macro and three adjacent columns (one for the macro name, one for the macro, and one for the macro comments).

3. Make sure the spreadsheet is in Ready mode.
4. Type **/ar**

You are prompted to enter a macro name.

5. Type one letter to name the macro.

It is a good idea to name a macro with a letter that reminds you of the macro's purpose. This example macro is named with the letter **c**, because its purpose is to set column width.

You are prompted to enter the macro range.

6. Type the address of the cell or cells in the first row of the macro range.

If you specify only a single row of the macro range, the macro recorder uses as many rows as it needs to contain the command sequence.

If you specify a complete range, the range must be large enough to contain the macro. If the range is too small, you are notified when you try to finish out of the macro, and the macro is not recorded.

This example specifies cell b3 as the first cell in the macro's first row.

7. Press **Enter**.

The spreadsheet is now in Record Ready mode, ready to record all keystrokes and commands that you enter.

8. Enter the keystrokes that make up the macro.

You can perform editing operations (like pressing **Backspace**) as you create the macro, but keep in mind that the macro recorder records each keystroke you make, so every edit operation is included in the macro. The edited macro will operate correctly, but will contain the extra edit keystrokes.

It is best to wait to edit the macro until after it is created, so it won't contain extra notations. See "Editing Macros," at the end of this chapter, for details on editing a macro.

This example uses the **Worksheet Column-Width Set** command, so type `/wcs`

Any prompts normally associated with the commands you enter appear as the spreadsheet records the macro.

In this example, you are prompted to enter the new column width.

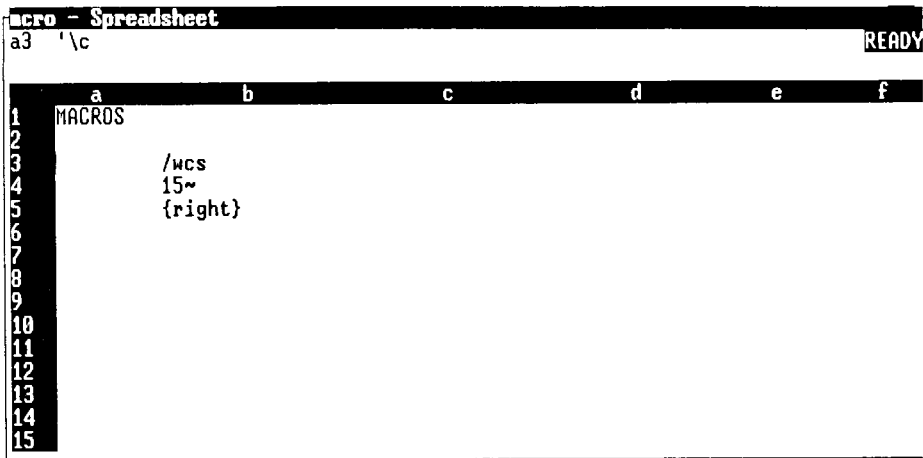
9. Type **15** and press **Enter**.

10. Now you want to include the action of moving the cell pointer one column right: press **Forward**.

The cell pointer moves one column right.

11. To end the macro, press **F5** (Alt), and then press **Finish**.

The spreadsheet returns to Ready mode. The macro sequence is recorded and appears in cell b3, as shown below:



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## Creating a Macro by Typing

Although there is no difference in the way you play back or use macros created by the two methods, the typing method of creating macros lets you create ones that are more complex than automatically-recorded macros. When you type a macro, you can use special macro notation for commands that aren't accessible by ordinary keyboard commands.

When you create a macro by typing, it is good practice to plan it out first. This ensures that you don't miss any steps.

## Planning Your Macro

Start by taking notes while you do a practice run through the sequence of commands and keystrokes you want to use in the macro. Be sure to write down each step, including notes for the explanatory comments.



Notes for commands used to create the macro in the previous procedure might look like this:

/	Display <i>Spreadsheet Command</i> menu
w	Select <i>Worksheet Commands</i>
c	Select <i>Column-Width</i>
s	Select <i>Set</i>
15	Enter new column width
-	Press <b>Enter</b> to complete the command
{right}	Move the cell pointer one column right

You type menu commands in a macro the same way you type them for normal use: a slash (/) followed by the first character of the command word.

*NOTE: Any typed macro entries beginning with characters that indicate values or commands must be preceded by a label-prefix character. When you use the **Advanced Record-Macro** command, the label-prefix character is automatically added.*

When you used the **Advanced Record-Macro** command to record this macro, you didn't have to worry about what special notation to use to indicate pressing **Enter** or **Forward**: the macro-recorder entered the special notation for you.

The following list shows the macro notation for keyboard keys (other than letter keys), screen keys, and macro operators when you type a macro. Not all keys are supported by both WGS/Spreadsheet and Lotus 1-2-3; separate lists for those keys supported by WGS/Spreadsheet only and Lotus 1-2-3 only follow this list.

## Keys Common to WGS/Spreadsheet and Lotus 1-2-3

Key, Command, Symbol	Notation
Enter	-
Down	{down}
Up	{up}
Back	{left}
Forward	{right}
Previous	{bigleft}
Next	{bigright}
Begin	{beg}
Next page	{pgup}
Prev page	{pgdn}
Backspace	{backspace}
Cancel	{escape} {esc}
DelChar	{delchar} {del}
F1 (Go To)	{goto}
F2 (Recalc)	{calc}
F3 (Edit)	{edit}
F4 (Name)	{name}
F6 (End)	{end}
F7 (Abs)	{abs}
F8 (Window)	{window}
-	{ }
{	{{}
}	{}}
?	:?

## Keys Unique to WGS/Spreadsheet

<b>Key, Command, Symbol</b>	<b>Notation</b>
Home	{home}
Shift-Home	{shift-home}
End	{end}
Mark	{mark}
Exit	{exit}
Command	{cmd}
Move	{move}
Copy	{copy}
Print	{print}
Create	{creat}
Delete (column or row)	{workdel}
Control U	{undo}
Help	{help}
ClearLine	{clearline}
Break	{break}

## Keys Unique to Lotus 1-2-3

<b>Key, Command, Symbol</b>	<b>Notation</b>
Query	{query}
Table	{table}
Graph	{graph}

To name a macro:

1. Move the cell pointer to the first cell containing the macro commands and keystrokes.
2. Type **/rnc**

You are prompted to enter the range name.

3. Type a backslash (\) to inform the spreadsheet that you are naming a macro; then type a letter for the macro name, and press **Enter**. Although you only have one letter to work with, try to make it meaningful.

This example uses the letter *c* to name the macro that changes column width: **\c**

You are prompted to select the range you are naming.

4. You need only indicate the first cell in the macro column. With the cell pointer positioned on the first command cell of the macro, press **Enter**.

The macro command is named **c** and is ready to use.

## Commenting a Macro

After you create a macro, you should enter comments in the column next to the macro commands. Macro comments explain what each command does.

To enter comments about a macro:

1. Position the cell pointer on the cell to the right of the first macro command cell. In this example, enter comments to the right of the macro cells.
2. Type your comments.

```

macro - Spreadsheet
b5 '{right}
Enter name: \c          Enter range: b3..b5
POINT

```

	a	b	c	d	e	f
1	MACROS					
2						
3	\c					
4		/mcs	start col-width set command;			} Comments
5		15~	set width to 15; press Go;			
6		{right}	move cell pointer one column right			
7						
8						
9						
10						
11						
12						
13						
14						
15						

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GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW

## Interactive Macros

You can create a macro that pauses for user input and then continues executing macro commands; such a macro is called an *interactive macro*.

For example, you can create a macro that moves to cell a1 and then waits for the user to type a city name. Once the user types the city name and presses **Enter**, the macro continues to execute.

Note that when the user presses **Enter** after typing the input, the macro does not enter the input; the user's **Enter** instructs the macro to continue reading macro keystrokes. You must include a tilde (~) to instruct the macro to enter the user's input.

Use the following notation to instruct the macro to pause for user input:  
{?}

The /X commands, described later in this chapter under "Using Advanced Macro Programming Commands," provide other ways to instruct the macro to pause for user input.

## Stepping Through a Macro to Test It

Always test a macro after creating it to make sure it does what you intended.

One way to test a macro is to step through it, one action at a time, so you can see whether each action does what you want. This method of testing helps you pinpoint any problems. This is especially useful with complex or long macros.

To step through a macro:

1. Press **F5** (Alt) and press **Help**.

Notice the SSTEP READY mode indicator in the command panel. The spreadsheet is in Single-Step mode.

2. Press **F5** (Alt), then type the single-character name of the macro you want to test.

The first keystroke, or step, of the macro is executed, and you can see if it does what you expect it to do.

3. Press the **Spacebar**, or any key, when you are ready for the next keystroke of the macro to be executed.
4. Repeat step 3 for each step you want to examine.
5. When you finish stepping through the macro and want to exit Single-Step mode, press **F5** (Alt), and then press **Help**.

## Using a Macro

Another way to test a macro is to use it. The macro should carry out the command, and you can see if the results are as you expect.

To use a macro:

1. Press **F5** (Alt).
2. Press the key corresponding to the macro name character.

*NOTE: Do not type the backslash. It is needed for naming the macro, but not for using the macro command.*

The macro is executed, and you can see if it does what you expect it to do.

## **Editing a Macro**

Sometimes you need to change the contents of a macro, for example,

- if you made a mistake while creating the macro
- if you tested the macro and it didn't work the way you expected it to work
- if you want to add steps to a macro

You can use the regular spreadsheet Edit mode to make changes to cell contents of a macro.

1. Move the cell pointer to the cell you want to edit.
2. Press **F3** (Edit).

The cell contents appear in the control panel.

3. Make the changes you want to make.

Refer to "Editing Cell Contents" in Chapter 3, "Entering and Editing Spreadsheet Information," for details about Edit mode.

4. When you finish editing the macro, press **Enter** to confirm your changes.
5. Test the edited macro, just as you would a new macro.

## Using Advanced Macro Programming Commands

This section introduces the Advanced Macro Programming commands, also known as the /X commands. These commands let you create complex macros that make decisions and take automatic actions on a larger scope than regular keyboard macro commands.

Careful thought, planning, and testing is especially important when you create macros with the /X commands, because there is a lot of room for things to happen that you do not anticipate. Remember, the macros will do *exactly* what you instruct; make sure that your instructions do exactly what you want.

### The /X Commands

Although they are “slash” (/) commands like the other spreadsheet commands, the /X commands are not available for use in regular spreadsheet work. /X commands can only be typed into a macro, and they only affect how the macro is executed.

There are two basic divisions of /X commands: programming commands and pause-for-user-input commands.

#### Programming commands

<b>/XIfcondition</b> ~	If-Then function
<b>/XGlocation</b> ~	Go To command
<b>/XClocation</b> ~	Subroutine call
<b>/XR</b>	Subroutine return
<b>/XQ</b>	Quit

#### Pause-for-user-input commands

<b>/XLmessage</b> ~ <b>location</b> ~	Pause: label input
<b>/XNmessage</b> ~ <b>location</b> ~	Pause: number input
<b>/XMlocation</b> ~	Pause: menu choice



Each command is described below.

*NOTE: In the list below, if a command contains a tilde (~) following an argument (condition, location, and so forth), you must use the tilde (~) when formulating the command.*

### **Programming Commands**

The following /X commands provide basic programming tools. You specify worksheet cells (cell reference, range reference, range name) as the arguments. For clarity, it is a good idea to use range names with the /X commands.

#### **/Xlcondition~**

If the condition is true (<>0), continue reading macro commands in the current cell.

If the condition is false (=0), move to the cell below and start reading macro commands.

#### **/XGlocation~**

Go to specified location and read macro commands there.

#### **/XClocation~**

Go to the specified location and read macro commands. Return to this point at the next /XR command.

#### **/XR**

Return to the location where the last /XC command was given, and continue reading macro commands there.

Each **/XR** command must be preceded by a **/XC** command; otherwise an ERR results.

Up to 16 levels of nested subroutines are allowed.

## **/XQ**

Return to Ready mode.

## **Pause-For-User-Input Commands**

The following commands instruct the macro to pause for user input. You specify the prompt message and worksheet cell addresses (cell reference, range reference, range name) as arguments. For clarity, it is a good idea to use range names with the **/X** commands.

### **/XLmessage ~location~**

The spreadsheet displays the specified message (up to 39 characters long) in the control panel and pauses for the user to type a label and press **Enter**.

When the user presses **Enter**, the label is entered into the location as follows:

- If no location is specified, the label is entered in the current cell.
- If the location is a single cell, the label is entered into that cell.
- If the location is a range, the label is entered into the first cell in that range.

The spreadsheet is not recalculated after a **/XL** command. If you want the spreadsheet recalculated, include a **{CALC}** instruction in the macro.

### **/XNmessage location**

The spreadsheet displays the specified message (up to 39 characters long) in the control panel and pauses for the user to type any number or formula (including range names and functions), and press **Enter**.

When the user presses **Enter**, the spreadsheet enters the resulting value in the specified location, as follows:

- If no location is specified, the number is entered in the current cell.
- If the location is a single cell, the number is entered into that cell.
- If the location is a range, the number is entered into the first cell in that range.

The spreadsheet is not recalculated after a **/XN** command. If you want the spreadsheet recalculated, include a **{CALC}** instruction in the macro.

If a user entry does not result in a numeric value, an error message appears. The user can press **Enter** or **Cancel** and try again.

### **/XMlocation**

This command lets you create a customized menu, containing up to eight choices, with prompts and helpful comments, just like a regular WGS/Spreadsheet menu.

The menu is stored in the specified location, which can be a cell address, a range, or a range name.

In the menu each cell in the top row contains a menu choice; each cell in the second row contains a description of the menu choice above it; cells below the first and second rows contain macro commands to execute the menu choice above.

```

mac - Spreadsheet
b10 'Add item
READY

a      b      c      d      e      f
8      \m      /XMb10~      display inventory menu
9
10     Add item Delete item Quit ← Menu Choices
11     Enter part number Enter part number Return to Ready mode
12     {goto}a25~      {goto}b25~      /XQ
13     {?}~
14     {goto}b30~      /dqib30.b150
15     /wir~      cb24.b25~
16     /ca25~b30~      ddq
17     /rea25~      /reb25~
18     /XGb8~      /XGB8~
19
20 Menu
21 Choice
22 Descriptions

```

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To create a custom menu:

- Do not use more than eight cells as menu items. The command panel can display only eight choices.
- Leave one empty cell to the right of the last menu item.
- Leave no empty cells between menu items.
- Keep menu items small so the menu fits, or comes close to fitting, in the command panel.
- Try to create menu items that begin with different characters so the user can select a menu choice with one key.

The /XM command works as follows:

1. The macro pauses.
2. The macro goes to the location to find the custom menu, and displays the menu in the command panel.

3. The user selects a choice, just like selecting a choice from any other spreadsheet menu, by moving the cursor to the selection and pressing **Enter**, or pressing the key that corresponds to the first character of the choice.
4. The macro continues reading keystrokes for that menu choice.

## Sample Macro: Inventory Menu

The sample macro shown below, named `\m`, uses the `/XM` macro command to display a menu that lets a user add or delete an item from an inventory list, or quit the menu.

```

mac - Spreadsheet
a8 \m
READY

```

	a	b	c	d	e	f
7						
8	\m	/XMb18~	display inventory menu			
9						
10		Add item	Delete item	Quit		
11		Enter part number	Enter part number	Return to Ready mode		
12		{goto}a25~	{goto}b25~	/XQ		
13		{?}~	{?}~			
14		{goto}b30~	/dqib30.b150			
15		/wir~	cb24.b25~			
16		/ca25~b30~	ddq			
17		/rea25~	/reb25~			
18		/XGb8~	/XGb8~			
19						
20						
21						

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GO TO | RECALC | EDIT | NAME | ALT | END | ABS | WINDOW

The */XM* command directs spreadsheet control to cell b10, where the menu definition begins. Looking at the menu definition, starting in cell b10, notice that

- Cell b10 contains the first menu entry, *Add item*; cell b11 contains the brief description of the *Add item* menu entry. Cells below b11 contain macro commands to carry out the *Add item* menu entry. The last macro command under the *Add item* entry returns to cell b8, which contains the */XM* command to display the menu.
- Cell c10 contains the second menu entry, *Delete item*; the cells below it contain a brief description of the entry, and macro commands to carry out the entry. The last macro command under the *Delete item* entry returns to cell b8, which contains the */XM* command to display the menu.
- Cell d10 contains the third menu item, *Quit*, which returns the spreadsheet to Ready mode. The last command under this entry ends the macro; the cell pointer returns its location before the macro was executed.

When the *\m* macro is executed, the menu appears in the command panel.

The user can select *Add item* to add an item to the inventory list, *Delete item* to delete an item from the inventory list, or **Quit** to return the spreadsheet to Ready mode. Once the item is added to or deleted from the inventory list, the menu returns to the screen until the user selects **Quit**.

This chapter describes what to do when something unexpected happens in a spreadsheet. In most cases, the spreadsheet displays messages to guide you through unexpected situations. For example, if the **File Save** command is going to overwrite the contents of an existing file, the spreadsheet displays a prompt to let you (a) cancel the command so you can specify another file, or (b) go ahead with the command to replace the existing contents of the file.

### **Helpful Information**

When a command menu appears on the screen, the bottom line of the command panel contains a brief line of helpful information. If you need more information about a command, press **Help**. Help information is available throughout WGS/Spreadsheet. (See Chapter 2, "Basics," for details about Spreadsheet Help and for other basic information about using WGS/Spreadsheet.)

If you need help entering information into a cell, see Chapter 3, "Entering and Editing Spreadsheet Information." For details about entering and using functions, see Chapter 5, "Using Functions."

## Stopping a Command Before Execution

If you decide that you do not want to execute a command, you can cancel it *before* you perform the final step to execute the command. *Once you execute a command, you cannot cancel it.*

To cancel a command, press **Cancel** or **ClearLine**.

- **Cancel** moves back one step in the command. You can press **Cancel** as many times as you need to return to a specific step in the command, or to remove the command menu from the screen and return the spreadsheet to Ready mode.
- **ClearLine** removes the command menu from the screen and returns the spreadsheet to Ready mode.

## Stopping a Command During Execution

Sometimes a command takes a while to execute, and you might decide to cancel the command instead of waiting. For example, importing a large amount of data from a UNIFY database, or printing several copies of a spreadsheet can take some time.

Other times the spreadsheet seems frozen on the screen (you cannot move the cursor or cancel out of a command). If the spreadsheet remains inactive for an unusually long time, something might be wrong.

In either case, if you don't want to wait for the spreadsheet to finish a task, you can interrupt it; this is called a user interrupt. A *user interrupt* cancels spreadsheet operations and closes the spreadsheet without saving data.

To give a user interrupt:

1. Press **Control-Cancel**.

A confirm message appears to ensure that you want to cancel the operation and close the spreadsheet.

2. Move the cursor to *Yes*, and press **Enter**.



**Caution:** *Some spreadsheet operations take a long time, especially if the spreadsheet is very large. Make sure you allow enough time for a task to execute before you give a user interrupt.*

*The user interrupt is not a good way to cancel a command. Give the user interrupt only as a last alternative. Remember, a user interrupt finishes the spreadsheet without saving changes.*

## Undoing the Effects of a Command

Three commands can be undone after they have been executed: **Advanced Move**, **Data Delete**, and **Data Sort**. When you undo a command, the spreadsheet is restored to the condition it was in before the command was executed. So, any changes you have made to the spreadsheet since executing the command are also undone.

To undo a command:

1. Press **Undo**.

A confirm message appears to ensure that you want to restore the spreadsheet to its condition before you gave the command.

2. Press **Enter**.

## When a Spreadsheet Gets Too Large

When a spreadsheet gets too large, a message informs you that the spreadsheet contains too much data. When you see the message, try to reduce the size of the spreadsheet before you exit it. Some suggestions follow; use the method you prefer.

- Use the **Advanced Cut** and **Advanced Paste** commands to break up the spreadsheet up into smaller spreadsheets.
- Use the **File Xtract** command to copy some cells to another spreadsheet; then delete the cells in the original spreadsheet and use the **Advanced Link** commands to link the data between the spreadsheets.

## When Spreadsheet Data Is Damaged

If you have accidentally erased or incorrectly modified spreadsheet data, you might want to return to the last-saved version of the spreadsheet. If you save the spreadsheet frequently, the last-saved version will be fairly recent. To return to the last-saved version of the spreadsheet, exit the spreadsheet without saving changes. When you open the spreadsheet again, you get the last-saved version.

If you have entered a lot of information since the last time you saved the spreadsheet, the last-saved version of the spreadsheet is not up to date. If you exit without saving changes, you could spend a lot of time entering all the information to update the last-saved version.

Instead, you might want to follow the procedure below to get two versions of the spreadsheet, and then cut and paste the two to get a good updated version of the spreadsheet.

1. Use the **File Save** command to save the up-to-date version of the spreadsheet (with the damaged data) *to a different file name*.
2. Exit the current spreadsheet without saving changes; this gives you the last-saved version of the spreadsheet.

You now have two versions of the same spreadsheet: one is the last-saved version, without the damaged data and without your recent work; the other is the current version of the spreadsheet, with the damaged data and with your most recent changes.

3. Use the **Advanced Cut** and **Advanced Paste** commands to copy the recent changes from the current version to the last-saved version, which does not include the damaged data.
4. Once you update the last-saved version of the spreadsheet, delete the version containing the damaged data.

*Appendixes*

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# A

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## *Keyboard Tables*

This appendix lists the preconfigured terminal types supported with this release of WGS. The preconfigured terminals listed provide keys that help you take full advantage of the WGS features.

Since this release of WGS supports several terminal types (and, therefore, several different keyboards), this guide refers to keys by virtual key names. For example, where this manual reads **Enter**, you might press **Go** or **Linefeed**, depending on the type of terminal you use.

This appendix provides key tables for the standard preconfigured terminals. Use the appropriate key table to determine the actual keys on your keyboard that match the virtual key names given in this guide.

If you use a nonstandard terminal that is not configured with WGS keys, you can type key sequences to perform many of the WGS functions. Refer to "Generic Keyboard," later in this appendix, for a list of key sequences to type for the virtual keys.

### **Preconfigured Terminal Types**

This release of WGS supports the following preconfigured terminals:

- PT and GT (with RS-422 and RS-232-C connections)
- Wyse 85
- DEC VT-100 compatibles
- DEC VT-102
- DEC VT-220
- T0-235

## Generic Keyboard

The following table translates virtual key names into keystroke sequences for a generic (dumb) terminal keyboard.

<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>	<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>
Back	Escape bw	F8	Escape 8
BackSpace	BackSpace	F9	Escape 9
BackTab	Escape Tab	F10	Escape 0
Begin	Escape bg	Help	Escape ?
Break	Break	Home	Escape hm
Cancel	Control-X	InputMode	Escape im
Clear	Escape ce	Mark	Escape mk
ClearLine	Escape ci	Message	Escape ms
Close	Escape cl	Move	Escape mv
Command	Control-C	Next	Escape nx
Copy	Escape cp	Open	Escape op
Create	Escape cr	Options	Escape ot
Delete	Escape dl	Page	Escape pg
Delete Character	Delete	PF1	Escape f1
Down	Escape dn	PF2	Escape f2
End	Escape en	PF3	Escape f3
Enter	LineFeed	PF4	Escape f4
Exit	Control-D	PF5	Escape f5
Escape	ESC	PF6	Escape f6
Find	Escape fi	PF7	Escape f7
Forward	Escape fw	PF8	Escape f8
F1	Escape 1	PF9	Escape f9
F2	Escape 2	PF10	Escape f0
F3	Escape 3	PF11	Escape f-
F4	Escape 4	PF12	Escape f=
F5	Escape 5	Previous	Escape pv
F6	Escape 6	Print	Escape pr
F7	Escape 7	Redo	Escape ro

<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>	<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>
Ref	Escape re	Shift-Message	Escape MS
Replace	Escape rp	Shift-Move	Escape MV
Restart	Escape rs	Shift-Next	Escape NX
Resume	Escape rm	Shift-Options	Escape OT
Return	Return	Shift-Page	Escape PG
Save	Escape sa	Shift-Previous	Escape PV
Scroll Up	Escape ru	Shift-Print	Escape PR
Scroll Down	Escape dn	Shift-Redo	Escape RO
Select	Escape sl	Shift-Replace	Escape RP
Shift-Back	Escape BW	Shift-Resume	Escape RM
Shift-Beginning	Escape BG	Shift-Save	Escape SV
Shift-Cancel	Escape CX	Shift-Undo	Escape UD
Shift-ClearLine	Escape Cl	Shift-F1	Escape !
Shift-Command	Escape CM	Shift-F2	Escape @
Shift-Copy	Escape RP	Shift-F3	Escape #
Shift-Create	Escape CR	Shift-F4	Escape \$
Shift-Delete Character	Escape DC	Shift-F5	Escape %
Shift-End	Escape EN	Shift-F6	Escape Control
Shift-Exit	Escape EX	Shift-F7	Escape &
Shift-Find	Escape FI	Shift-F8	Escape *
Shift-Forward	Escape FW	Shift-F9	Escape (
Shift-Help	Escape HL	Shift-F10	Escape )
Shift-Home	Escape HM	Undo	Escape ud
Shift-InputMode	Escape NJ	Up	Escape up

## PT/GT Keyboard

The following table translates the virtual key names used in this guide to actual keys on the PT/GT terminal keyboard.

<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>	<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>
Back	Left Arrow	Mark	Mark
BackTab	Control-Tab	Move	Move
Begin	Control-Up Arrow	Next	Shift-Right Arrow
Break	Cancel	Page	Next Page
Cancel	Cancel	Previous	Shift-Left Arrow
Clear	Control-F7	Print	Control-F4
ClearLine	Shift-Cancel	Redo	Control-F2
Close	Control-F6	Replace	Control-F3
Command	Control-C	Save	Control-F1
Copy	Copy	Scroll Up	Scroll Down
Delete	Control-Delete	Scroll Down	Scroll Up
Delete Character	Delete	Shift-Back	Control-Left Arrow
Down	Down Arrow	Shift-Copy	Shift-Copy
End	Control-Down Arrow	Shift-Delete Character	Shift-Delete
Enter	Go	Shift-Exit	Shift Finish
Exit	Finish	Shift-Forward	Control-Right Arrow
Escape	Control-E	Shift-Help	Shift-Help
Forward	Right Arrow	Shift-Home	Shift-Down Arrow
F1	F1	Shift-Move	Shift-Move
F2	F2	Shift-Page	Prev Page
F3	F3	Shift-F1	Shift-F1
F4	F4	Shift-F2	Shift-F2
F5	F5	Shift-F3	Shift-F3
F6	F6	Shift-F4	Shift-F4
F7	F7	Shift-F5	Shift-F5
F8	F8	Shift-F6	Shift-F6
F9	F9	Shift-F7	Shift-F7
F10	F10	Shift-F8	Shift-F8
Help	Help	Shift-F9	Shift-F9
Home	Shift-Up Arrow	Shift-F10	Shift-F10
InputMode	Overtyping	Up	Up Arrow



## VT-100 Keyboard

The following table translates the virtual key names used in this guide to actual keys on the VT-100 terminal keyboard or to keystroke sequences. (Note that the **+** sign, as used below, indicates a second instance of a key mapping for a particular virtual key name, for example, **+F1** is a second **F1** key.)

<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>	<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>
Back	Left Arrow	F6	Escape 6
BackSpace	BackSpace	F7	Escape 7
BackTab	Escape Tab	F8	Escape 8
Begin	Escape bg	F9	Escape 9
Break	Break	F10	Escape 0
Cancel	Control-X	+F1	Pf1
Clear	Escape ce	+F2	Pf2
ClearLine	Escape ci	+F3	Pf3
Close	Escape cl	+F4	Pf4
Command	Control-C	Help	Escape ?
Copy	Escape cp	Home	Escape hm
Create	Escape cr	InputMode	Escape im
Delete	Escape dl	Mark	Escape mk
Delete Character	Delete	Message	Escape ms
Down	Down Arrow	Move	Escape mv
End	Escape en	Next	Escape nx
Enter	LineFeed	Open	Escape op
Exit	Control-D	Options	Escape ot
Escape	ESC	Page	Escape pg
Forward	Right Arrow	PF1	Escape f1
F1	Escape 1	PF2	Escape f2
F2	Escape 2	PF3	Escape f3
F3	Escape 3	PF4	Escape f4
F4	Escape 4	PF5	Escape f5
F5	Escape 5	PF6	Escape f6

<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>	<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>
PF7	Escape f7	Shift-Forward	Escape FW
PF8	Escape f8	Shift-Help	Escape HL
PF9	Escape f9	Shift-Home	Escape HM
PF10	Escape f0	Shift-InputMode	Escape NJ
PF11	Escape f-	Shift-Message	Escape MS
PF12	Escape f=	Shift-Move	Escape MV
Previous	Escape pv	Shift-Next	Escape NX
Print	Escape pr	Shift-Options	Escape OT
Redo	Escape ro	Shift-Page	Escape PG
Ref	Escape re	Shift-Previous	Escape PV
Replace	Escape rp	Shift-Print	Escape PR
Restart	Escape rs	Shift-Redo	Escape RO
Resume	Escape rm	Shift-Replace	Escape RP
Return	Return	Shift-Resume	Escape RM
Save	Escape sa	Shift-Save	Escape SV
Scroll Up	Escape ru	Shift-Undo	Escape UD
Scroll Down	Escape dn	Shift-F1	Escape !
Select	Escape sl	Shift-F2	Escape @
Shift-Back	Escape BW	Shift-F3	Escape #
Shift-Beginning	Escape BG	Shift-F4	Escape \$
Shift-Cancel	Escape CX	Shift-F5	Escape %
Shift-ClearLine	Escape CI	Shift-F6	Escape Control
Shift-Command	Escape CM	Shift-F7	Escape &
Shift-Copy	Escape RP	Shift-F8	Escape *
Shift-Create	Escape CR	Shift-F9	Escape (
Shift-Delete Character	Escape DC	Shift-F10	Escape )
Shift-End	Escape EN	Undo	Escape ud
Shift-Exit	Escape EX	Up	Up Arrow
Shift-Find	Escape FI		

## VT-220 Keyboard

The following table translates the virtual key names used in this guide to actual keys on the VT-220 terminal keyboard or to keystroke sequences.

<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>	<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>
Back	Left Arrow	F7	F18
BackSpace	BackSpace	F8	F19
BackTab	Escape Tab	F9	F20
Begin	Escape bg	F10	Escape 0
Break		Help	Help
Cancel	Control-X	Home	Escape hm
Clear	Escape ce	InputMode	Insert-Here
ClearLine	Escape ci	Mark	Select
Close	Escape cl	Message	Escape ms
Command	Control-C	Move	Escape mv
Copy	Escape cp	Next	Escape nx
Create	Escape cr	Open	Escape op
Delete	Remove	Options	Escape ot
Delete Character		Page	Escape pg
Down	Down Arrow	PF1	Escape f1
End	Escape en	PF2	Escape f2
Enter	Do	PF3	Escape f3
Exit	Control-D	PF4	Escape f4
Escape	ESC	PF5	Escape f5
Find	Find	PF6	Escape f6
Forward	Right Arrow	PF7	Escape f7
F1	F6	PF8	Escape f8
F2	F7	PF9	Escape f9
F3	F8	PF10	Escape f0
F4	F9	PF11	Escape f-
F5	F10	PF12	Escape f=
F6	F17	Previous	Escape pv

<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>	<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>
Print	Escape pr	Shift-InputMode	Escape NJ
Redo	Escape ro	Shift-Message	Escape MS
Ref	Escape re	Shift-Move	Escape MV
Replace	Escape rp	Shift-Next	Escape NX
Restart	Escape rs	Shift-Options	Escape OT
Resume	Escape rm	Shift-Page	Escape PG
Return	Return	Shift-Previous	Escape PV
Save	Escape sa	Shift-Print	Escape PR
Scroll Up	Escape ru	Shift-Redo	Escape RO
Scroll Down	Escape dn	Shift-Replace	Escape RP
Select	Escape sl	Shift-Resume	Escape RM
Shift-Back	Escape BW	Shift-Save	Escape SV
Shift-Beginning	Escape BG	Shift-Undo	Escape UD
Shift-Cancel	Escape CX	Shift-F1	Escape !
Shift-ClearLine	Escape Cl	Shift-F2	Escape @
Shift-Command	Escape CM	Shift-F3	Escape #
Shift-Copy	Escape RP	Shift-F4	Escape \$
Shift-Create	Escape CR	Shift-F5	Escape %
Shift-Delete Character	Escape DC	Shift-F6	Escape Control
Shift-End	Escape EN	Shift-F7	Escape &
Shift-Exit	Escape EX	Shift-F8	Escape *
Shift-Find	Escape FI	Shift-F9	Escape (
Shift-Forward	Escape FW	Shift-F10	Escape )
Shift-Help	Escape HL	Undo	Escape ud
Shift-Home	Escape HM	Up	Up Arrow

## WYSE-85 Keyboard

The following table translates the virtual key names used in this guide to actual keys on the Wyse-85 keyboard or to keystroke sequences to be typed from the Wyse-85 keyboard.

<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>	<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>
Back	<X]	F7	F18
BackSpace	BackSpace	F8	F19
BackTab	Escape Tab	F9	F20
Begin	Escape bg	F10	Escape 0
Break	Break	Help	Help
Cancel	Control-X	Home	Home
Clear	Escape ce	InputMode	Insert-Here
ClearLine	Escape ci	Mark	Select
Close	Escape cl	Message	Escape ms
Command	Control-C	Move	Escape mv
Copy	Escape cp	Next	Escape nx
Create	Escape cr	Open	Escape op
Delete	Remove	Options	Escape ot
Delete Character	Shift-<X]	Page	Escape pg
Down	Down Arrow	PF1	Escape f1
End	Escape ot	PF2	Escape f2
Enter	Do	PF3	Escape f3
Exit	Control-D	PF4	Escape f4
Escape	ESC	PF5	Escape f5
Find	Find	PF6	Escape f6
Forward	Right Arrow	PF7	Escape f7
F1	F6	PF8	Escape f8
F2	F7	PF9	Escape f9
F3	F8	PF10	Escape f0
F4	F9	PF11	Escape f-
F5	F10	PF12	Escape f=
F6	F17	Previous	Escape pv

<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>	<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>
Print	Escape pr	Shift-InputMode	Escape NJ
Redo	Escape ro	Shift-Message	Escape MS
Ref	Escape re	Shift-Move	Escape MV
Replace	Escape rp	Shift-Next	Escape NX
Restart	Escape rs	Shift-Options	Escape OT
Resume	Escape rm	Shift-Page	Escape PG
Return	Return	Shift-Previous	Escape PV
Save	Escape sa	Shift-Print	Escape PR
Scroll Up	Escape ru	Shift-Redo	Escape RO
Scroll Down	Escape dn	Shift-Replace	Escape RP
Select	Escape sl	Shift-Resume	Escape RM
Shift-Back	Escape BW	Shift-Save	Escape SV
Shift-Beginning	Escape BG	Shift-Undo	Escape UD
Shift-Cancel	Escape CX	Shift-F1	Escape !
Shift-ClearLine	Escape CI	Shift-F2	Escape @
Shift-Command	Escape CM	Shift-F3	Escape #
Shift-Copy	Escape RP	Shift-F4	Escape \$
Shift-Create	Escape CR	Shift-F5	Escape %
Shift-Delete Character	Escape DC	Shift-F6	Escape Control
Shift-End	Escape EN	Shift-F7	Escape &
Shift-Exit	Escape EX	Shift-F8	Escape *
Shift-Find	Escape FI	Shift-F9	Escape (
Shift-Forward	Escape FW	Shift-F10	Escape )
Shift-Help	Escape HL	Undo	Escape ud
Shift-Home	Escape HM	Up	Up Arrow

## T0-235 Keyboard

The following table translates the virtual key names used in this guide to actual keys on the T0-235 keyboard or to keystroke sequences. (Note that the **+** sign, as used below, indicates a second instance of a key mapping for a particular virtual key name, for example, **+Cancel** is a second **Cancel** key.)

<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>	<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>
Back	Left Arrow	F2	F2
BackSpace	Back Space	F3	F3
BackTab	Control Tab	F4	F4
Begin	Control Up	F5	F5
Break	Control ]	F6	F6
Cancel	Control-X	F7	F7
+Cancel	F20	F8	F8
Clear	Control F7	F9	F9
ClearLine	Shift F20	F10	F10
Close	Control F6	Help	Help
Command	Control-C	Home	Shift-Up
+Command	F13	InputMode	Insert-Here
Copy	F11	Mark	Select
Create	***	Message	Escape MS
Delete	Remove	Move	F12
Delete Character	<X	Next	Shift-Right
Down	Down Arrow	Open	Control-F5
End	Control-Down	Options	Escape ot
Enter	Do	Page	Next Screen
Exit	Control-D	Shift Page	Previous Screen
+Exit	F14	Previous	Shift-Left
Escape	ESC	Print	F19
Find		Redo	Control-F2
Forward	Right Arrow	Ref	
F1	F1	Replace	Control-F3

<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>	<b>When You See This Key Name</b>	<b>Type This Key Sequence</b>
Restart	Escape vs	Shift-Next	Escape NX
Resume	Escape rm	Shift-Options	Escape OT
Return	Return	Shift-Page	Prev Page
Save	Control-F1	Shift-Previous	Escape PV
Scroll Up	Prev Screen	Shift-Print	Escape PR
Scroll Down	Next Screen	Shift-Redo	Escape RO
Shift-Back	Control-Left	Shift-Replace	Escape RP
Shift-Beginning	Escape BG	Shift-Resume	Escape RM
Shift-Cancel	Escape CX	Shift-Save	Escape SV
Shift-ClearLine	Escape cl	Shift-Undo	Escape VD
Shift-Command	Escape CM	Shift-F1	Shift-F1
Shift-Copy	Shift-F11	Shift-F2	Shift-F2
Shift-Creat	Escape CR	Shift-F3	Shift-F3
Shift-Delete Character	Control-<X	Shift-F4	Shift-F4
Shift-End	Escape EN	Shift-F5	Shift-F5
Shift-Exit	Shift-F14	Shift-F6	Shift-F6
Shift-Find	Escape fi	Shift-F7	Shift-F7
Shift-Forward	Control-Right	Shift-F8	Shift-F8
Shift-Help	Shift-Help	Shift-F9	Shift-F9
Shift-Home	Shift-Down	Shift-F10	Shift-F10
Shift-InputMode	Escape NJ	Undo	Control-U
Shift-Message	Escape MS	Up	Up Arrow
Shift-Move	Shift-F12		



## **WGS/Spreadsheet, Lotus 1-2-3, and Multiplan**

WGS/Spreadsheet contains all the features and functions of Lotus 1-2-3 and Multiplan. If you have been using Lotus 1-2-3 or Multiplan, you'll catch on to WGS/Spreadsheet quickly. In fact, if you are a Lotus 1-2-3 user, you'll be able to start using WGS/Spreadsheet immediately.

You can use WGS/Spreadsheet to share spreadsheet information with colleagues who use 1-2-3 and Multiplan. You can copy existing 1-2-3 Worksheet files and Multiplan SYLK files into a Desktop filecabinet and use WGS/Spreadsheet to update or change them.

Because WGS/Spreadsheet supports features that Lotus 1-2-3 and Multiplan do not, it's a good idea to read this appendix and check the charts to determine the differences between the applications and see how those differences affect your work.

This appendix lists commands and functions, but does not duplicate procedures and details that are explained earlier in the guide. If you need more information about a particular feature, refer to the appropriate chapter.

## File Compatibility

WGS/Spreadsheet can read and use 1-2-3 and Multiplan spreadsheet files without converting them to WGS/Spreadsheet files, and can write WGS/Spreadsheet spreadsheets as either 1-2-3 or Multiplan files. This file compatibility lets you share files with someone working in one of the other applications. Be aware that there are some issues that might affect your spreadsheet in ways you don't expect. Follow the suggestions below.

Try to use commands and features that are common to both spreadsheets. The charts in this appendix compare commands and functions among the three applications.

To read a Multiplan or 1-2-3 file into WGS/Spreadsheet:

1. From the Desktop, open the directory that contains the Multiplan or 1-2-3 spreadsheet, then open the spreadsheet.
2. Use the **File Save** command (*/fs*) to save the updated spreadsheet file in WGS/Spreadsheet file format.

A copy of the original file in its original format (Multiplan SYLK or 1-2-3 Worksheet) remains on the hard disk.

To write a WGS/Spreadsheet file to 1-2-3 or Multiplan SYLK, use the **File Xtract** command (*/fx*) to convert the WGS/Spreadsheet file to one of the other formats.

Refer to Chapter 9, "Using File Commands," for details.

## Formula Arguments

You *can* use text strings as arguments in WGS/Spreadsheet; you *cannot* in 1-2-3.

## Cell and Range References in Formulas

Be aware that WGS/Spreadsheet and 1-2-3 treat cell references differently than Multiplan. You might have problems with formulas containing references as you move files between Multiplan and WGS/Spreadsheet.

## Operators in Formulas

WGS/Spreadsheet supports the string operator "&" that is used in Multiplan, but not in 1-2-3. The string operator "&" concatenates strings.

The comma (,) intersection operator indicates how cells in intersecting ranges are to be counted. WGS/Spreadsheet and Lotus 1-2-3 count duplicate cells in range intersections. Multiplan does not count duplicate cells in intersecting ranges. Refer to the discussion of operators in Chapter 3, "Entering and Editing Spreadsheet Information," for details about the operator.

WGS/Spreadsheet and Lotus 1-2-3 make use of three logical operators, #AND#, #OR#, and #NOT#, that Multiplan does not use. The three logical operators are similar in operation to the functions @AND, @OR, and @NOT, used by all three applications. Refer to Chapter 5, "Using Functions," for details about the functions.

## Cell Protection

Cells or ranges that are protected in WGS/Spreadsheet lose protected status in Multiplan; cells or ranges that are protected in Multiplan lose protected status in WGS/Spreadsheet.

## Range Names

WGS/Spreadsheet uses the same range naming conventions as 1-2-3, as follows:

- Up to 15 characters
- All alpha characters are uppercase (but do not have to be entered as such)
- Numbers, and the characters \_, #, and % are valid.

Because Multiplan recognizes both uppercase and lowercase letters and allows longer names, certain changes take place when you read Multiplan SYLK files in WGS/Spreadsheet: names are converted to uppercase letters; names that are not valid are replaced with cell references.

When you delete a range name, WGS/Spreadsheet and 1-2-3 substitute the range reference; when you delete a range name in Multiplan, errors are created in the formulas containing them.

WGS/Spreadsheet does not retain Multiplan's names of range intersections; they are converted to regular cell references.

## **Row and Column Format**

Multiplan supports the ability to format whole rows and columns that exist in Multiplan. When translating spreadsheets with entire rows and columns formatted from Multiplan to WGS/Spreadsheet, only the cells up to the last one used (rightmost in a row, highest row number in a column) are formatted. Because the spreadsheet is so large (512 columns by 8192 rows), this avoids using memory space for formats in empty cells that might never be used.

## **Split Window Spreadsheets**

If you save a WGS/Spreadsheet file with split windows as a 1-2-3 Worksheet, the split and any separate formats set in them are saved. If you save a WGS/Spreadsheet file with split windows as a Multiplan SYLK file, the split and the separate formats are not saved.

## **Comparison of Functions and Commands**

The following three tables help you compare the features of WGS/Spreadsheet with those of Multiplan and Lotus 1-2-3.

Table B-1 compares the functions of all three applications. The comparison is especially useful if you want to work on spreadsheets that must be read in one of the other two applications. Use Table B-1 to see what WGS/Spreadsheet functions are missing from the other application (and, if used, would create errors when the spreadsheet is read in the other application).

Table B-2 compares Multiplan and WGS/Spreadsheet commands. Table B-3 compares WGS/Spreadsheet and Lotus 1-2-3 commands.

## Comparison of Functions

Arguments for each function are shown in parentheses. In Multiplan, you *must* include the parentheses, even if a function has no arguments.

Refer to Chapter 5, "Using Functions," for details about function format notation and how to type functions.

WGS/Spreadsheet provides all 1-2-3 functions and all Multiplan functions except DELTA and ITERCNT. Where Multiplan uses a different spelling for a function, WGS/Spreadsheet accepts either spelling.

**Table B-1. Function Comparison**

(Page 1 of 5)

<b>WGS/Spreadsheet</b>	<b>Lotus 1-2-3</b>	<b>Multiplan</b>
ABS(x)	ABS(x)	ABS(x)
ACOS(x)	ACOS(x)	<b>use</b> PI()/2ATAN (n/SQRT(1-n*n))
AND(list)		AND(list)
ASIN(x)	ASIN(x)	<b>use</b> ATAN(n/SQRT (1-n*n))
ATAN(x)	ATAN(x)	ATAN(x)
ATAN2(x,y)	ATAN2(x,y)	<b>use</b> ATAN(n/SQRT (1-n*n))
ATAN2(x,y)	ATAN2(x,y)	<b>use</b> ATAN(n/SQRT (1-n*n))
AVG(list)	AVG(list)	AVERAGE(list) or AVERAGE
BLANK(range)		

**Table B-1. Function Comparison**

(Page 2 of 5)

<b>WGS/Spreadsheet</b>	<b>Lotus 1-2-3</b>	<b>Multiplan</b>
CHOOSE(x,table range)	CHOOSE(x,table range)	
COL or COLUMN		COLUMN()
COS(x)	COS(x)	COS(x)
COUNT(list)	COUNT(list)	COUNT(list)
DATE(year, month,day)	DATE(year, month,day)	
DAVG(input, offset, criterion)	DAVG(input, offset, criterion)	
DAY(x)	DAY(x)	
DCOUNT(input, offset, criterion)	DCOUNT(input, offset, criterion)	
		DELTA()
DMAX(input, offset, criterion)	DMAX(input, offset, criterion)	
DMIN(input, offset, criterion)	DMIN(input, offset, criterion)	
DOLLAR(x)		DOLLAR(x)
DSTD(input, offset, criterion)	DSTD(input, offset, criterion)	
DSUM(input, offset, criterion)	DSUM(input, offset, criterion)	

**Table B-1. Function Comparison**

(Page 3 of 5)

<b>WGS/Spreadsheet</b>	<b>Lotus 1-2-3</b>	<b>Multiplan</b>
DVAR(input, offset, criterion)	DVAR(input, offset, criterion)	
ERR	ERR	
EXP(x)	EXP(x)	EXP(x)
FALSE	FALSE	FALSE()
FIXED(x,n)	FIXED(x,n)	
FV(payment, interest,n)	FV(payment, interest,n)	
HLOOKUP(x, table range, row offset)	HLOOKUP(x, table range, row offset)	
IF(x,tvalue, fvalue)	IF(x,tvalue, value)	IF(x,tvalue, fvalue)
INDEX(range, row number, column number)		INDEX(area, subscripts)
INT(x)	INT(x)	INT(x)
IRR(guess, range)	IRR(guess, range)	
ISERR(cell) or ISERROR(x)	ISERR(cell)	ISERROR(value)
ISNA(cell)	ISNA(cell)	ISNA(cell)
		ITERCNT()
LEN(argument)		LEN(argument)

**Table B-1. Function Comparison**

(Page 4 of 5)

<b>WGS/Spreadsheet</b>	<b>Lotus 1-2-3</b>	<b>Multiplan</b>
LN(x)	LN(x)	LN(x)
LOG(x) or LOG10(x)	LOG(x)	LOG10(x)
LOOKUP(x,table range)		LOOKUP(argument, table)
MAX(list)	MAX(list)	MAX(list)
MID(argument, x,n)		MID(argument, x,n)
MIN(list)	MIN(list)	MIN(list)
MOD(x,y)	MOD(x,y)	MOD(x,y)
MONTH(x)	MONTH(x)	
NA	NA	NA()
NOT(x)		NOT(x)
NPV(interest, range)	NPV(interest, range)	NPV(interest, range)
OR(list)		OR(list)
PI	PI	PI()
PMT(principal, interest,n)	PMT(principal, interest,n)	
PV(payment, interest,n)	PV(payment, interest,n)	
RAND	RAND	
REPT(argument, x,n)		REPT(argument, x,n)



**Table B-1. Function Comparison**

(Page 5 of 5)

<b>WGS/Spreadsheet</b>	<b>Lotus 1-2-3</b>	<b>Multiplan</b>
ROUND(x,n)	ROUND(x,n)	ROUND(x,n)
ROW		ROW()
SIGN(x)		SIGN(x)
SIN(x)	SIN(x)	SINE(x)
SORT(x,list)		
SQRT(x)	SQRT(x)	
STD(list) or STDEV	STD(list)	STDEV(list)
SUM(list)	SUM(list)	SUM(list)
TAN(x)	TAN(x)	TAN(x)
TODAY	TODAY	
TRUE	TRUE	TRUE()
VALUE(argument)		VALUE(argument)
VAR(list)	VAR(list)	
VLOOKUP (x,tablerange, column offset)	VLOOKUP (x,tablerange, column offset)	
YEAR(x)	YEAR(x)	

## Comparison of Multiplan and Spreadsheet Commands

If you are accustomed to using Multiplan commands, use Table B-2, below, to find WGS/Spreadsheet equivalents.

**Table B-2. Multiplan and WGS/Spreadsheet Commands**

(Page 1 of 2)

Multiplan	WGS/Spreadsheet
ALPHA	You can enter text whenever the spreadsheet is in Ready mode
BLANK	/Range Erase
COPY key Right Down	/Copy (prompts ask for ranges) Fromor use <b>Copy</b>
DELETE Row Column	/Worksheet Delete Row Column
EDIT	Use <b>F3</b> (Edit) key to enter Edit mode
FORMAT Cells Default Options Width	/Range Format /Worksheet Global Format /Worksheet Column-Width
GOTO Row-Col Name	Use <b>F1</b> (Go To) key and follow prompts
INSERT Row Column	/Worksheet Insert Row Column
HELP	Use <b>Help</b> keyboard key
LOCK Cells Formulas	/Range Protect or /Range Unprotect /Worksheet Global Protect

**Table B-2. Multiplan and WGS/Spreadsheet Commands**

(Page 2 of 2)

<b>Multiplan</b>	<b>WGS/Spreadsheet</b>
MOVE Move key Right	/Move (prompts ask for Fromranges) or use
NAME	/Range Name Create or /Range Name Delete or /Range Name Label or /Range Name Reset
OPTIONS Recalc	/Worksheet Global Recalc (for settings) Use <b>F2</b> (Recalc) for manual recalc
Mute	Use Desktop Manager
PRINT	/Print
QUIT	/Quit or <b>Finish</b> keyboard key
SORT	/Data Sort
TRANSFER Load Save Clear Delete Options Rename	/File Retrieve /File Save /Worksheet Erase Use Desktop Manager /File Xtract (for file formats) Use Desktop Manager
WINDOW Split Horiz Vert Titles Close Home Border	/Worksheet Windows  Horizontal Vertical /Worksheet Titles /Worksheet Windows Clear
XTERNAL Copy	/File Import (to copy from external file) /Advanced Link Copy or /File Combine
List Dependent Use	/Advanced Link Supporting or /Advanced Link

## Comparison of Spreadsheet and Lotus 1-2-3 Commands

If you are used to working with Lotus 1-2-3, notice that most commands have the same names and work the same way in WGS/Spreadsheet. For both WGS/Spreadsheet and Lotus 1-2-3, Table B-3 shows all the commands in all levels of the command menus; any differences are noted throughout the table. The following notation is used:

- A slash (/) and letters you type to use a command appear in **boldface**.
- Main menu commands appear in all caps, boldface, for example, **/WORKSHEET COMMANDS**.
- Second level commands appear in all caps, for example, **/W GLOBAL**.
- Third level commands appear in initial caps, under the second level commands, for example, **/W G Format**.
- The next level of command choices appears to the right, and any additional choices appear in parentheses ( ).

## Table B-3. Lotus 1-2-3 and WGS/Spreadsheet Commands

(Page 1 of 6)

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### /Worksheet Commands

---

**/W GLOBAL**

**/W G Format** Fixed, Scientific, Currency, ,(comma), General, +/-, Percent, Date(1,2,3), Text

**/W G Label-Prefix** Left, Right, Center

**/W G Column-Width**

**/W G Recalculation** Natural, Columnwise, Rowwise, Automatic, Manual, Iteration

**/W G Protection** Enable Disable

**/W G Defaults**

Printer

\*Interface, Auto-LF(Yes No), Left, Right, Top, Bottom, Page-Length

Wait(Yes No), Setup, Quit

\*Directory

\*None, A, B, C, D, E, F, G

\*Status

Update

Quit

**/W INSERT**

**/W I Column**

**/W I Row**

**/W DELETE**

**/W D Column**

---

\* Lotus 1-2-3 commands that do not exist as commands in WGS/Spreadsheet, but are more appropriately handled by your system software or screen keys. Because these are commands in 1-2-3, they are listed on the chart, but they are not menu commands in WGS/Spreadsheet.

## Table B-3. Lotus 1–2–3 and WGS/Spreadsheet Commands

(Page 2 of 6)

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### **/Worksheet Commands**

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**/W D Row**

**/W COLUMN-WIDTH**

**/W C Set**

**/W C Reset**

**/W ERASE**

**/W E No**

**/W E Yes**

**/W TITLES**

**/W T Both**

**/W T Horizontal**

**/W T Vertical**

**/W T Clear**

**/W WINDOWS**

**/W W Horizontal**

**/W W Vertical**

**/W W Sync**

**/W W Unsync**

**/W W Clear**

**/W STATUS**

---

**Table B-3. Lotus 1-2-3 and WGS/Spreadsheet Commands**

(Page 3 of 6)

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**/Range Commands**

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<b>/R FORMAT</b>	<b>Fixed, Scientific, Currency, ,(comma), General, +/-, Percent, Date(1,2,3), Text, Reset, **Invisible, **Visible</b>
<b>/R LABEL-PREFIX</b>	<b>Left, Right, Center</b>
<b>/R ERASE</b>	
<b>/R NAME</b>	<b>Create, Delete Labels(Rt,Dn,Left,Up) Reset</b>
<b>/R JUSTIFY</b>	
<b>/R PROTECT</b>	
<b>/R UNPROTECT</b>	
<b>/R INPUT</b>	

**/COPY COMMAND**

**/MOVE COMMAND**

---

\* Lotus 1-2-3 commands that do not exist as commands in WGS/Spreadsheet, but are more appropriately handled by your system software or screen keys. Because these are commands in 1-2-3, they are listed on the chart, but they are not menu commands in WGS/Spreadsheet.

\*\*WGS/Spreadsheet commands that do not exist in Lotus 1-2-3.

## Table B-3. Lotus 1–2–3 and WGS/Spreadsheet Commands

(Page 4 of 6)

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### /FILE COMMANDS

---

**/F RETRIEVE**

**/F SAVE**

**/F COMBINE** Copy, Add, Subtract, \*Less-Than,  
\*\*Greater-Than, \*\*Multiply Divide

**/F XTRACT** Formulas, Values, \*\*123-Worksheet,  
\*\*Multiplan-SYLK

**/F ERASE\*** Worksheet, Print

**-/F LIST\*** Worksheet, Print

**/F IMPORT** Text, Numbers, \*\*Multiplan-SYLK

**/F DIRECTORY\***

### /PRINT COMMANDS

**/P PRINTER**

**/P P Range**

**/P P Line**

**/P P Page**

**/P P Options** Header, Footer, Margins, Borders(Rows,Cols),  
Setup, Page-Length,  
Other(As-Displayed,Cell-Formulas,  
Formatted,Unformatted), Quit

---

\* Lotus 1-2-3 commands that do not exist as commands in WGS/Spreadsheet, but are more appropriately handled by your system software or screen keys. Because these are commands in 1-2-3, they are listed on the chart, but they are not menu commands in WGS/Spreadsheet.

\*\*WGS/Spreadsheet commands that do not exist in Lotus 1-2-3.



**Table B-3. Lotus 1-2-3 and WGS/Spreadsheet Commands**  
(Page 5 of 6)

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**/PRINT COMMANDS**

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<b>/P P Clear</b>	<b>All, Range, Borders, Format</b>
<b>/P P Align</b>	
<b>/P P Go</b>	
<b>/P P Quit</b>	
<b>/P FILE</b>	
<b>/P F Range</b>	
<b>/P F Line</b>	
<b>/P F Page</b>	
<b>/P F OptionsHeader</b>	<b>Footer, Margins, Borders(Rows,Cols), Setup, Page-Length, Other(As-Displayed,Cell-Formulas, Formatted,Unformatted), Quit</b>
<b>/P F Clear</b>	<b>All, Range, Borders, Format</b>
<b>/P F Align</b>	
<b>/P F Go</b>	
<b>/P F Quit</b>	

**/DATA COMMANDS**

<b>/D FILL</b>	
<b>/D TABLE</b>	<b>1, 2, Reset</b>
<b>/D SORT</b>	<b>Data-Range, Primary-Key, Secondary-Key, Reset, Go, Quit</b>

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**\*\* WGS/Spreadsheet command that does not exist in Lotus 1-2-3.**

## Table B-3. Lotus 1–2–3 and WGS/Spreadsheet Commands

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### /DATA COMMANDS

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**/D QUERY**                      Input, Criterion, Output, Find, Extract, Unique, Delete, Reset, Quit

**/D DISTRIBUTION**

**/D RDB\*\***

### /ADVANCED COMMANDS

*NOTE: The Advanced commands are not available in, or compatible with Lotus 1-2-3. Avoid using them in a spreadsheet that you want to use with Lotus 1-2-3.*

**/A RECORD-MACRO**

**/A LINK**                              Copy, Supporting, Dependent, Quit

**/A GOAL-SEEKING**

**/A MOVE**                              Column, Row

**/A CUT/A PASTE**                      Everything, Cell-Contents

**/A AUTOMATIC**                      Yes, No

**/A DEFAULT**                          Copy-Values, Align-Columns, Blank-Format

**/A WIDTH**                              Set, Reset

**/QUIT COMMAND**

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## *Using WGS/Spreadsheet from the CTIX Shell*

Sometimes you may work from the CTIX shell instead of using the Desktop Manager. This appendix shows you how to open or create a spreadsheet from the shell command line. You can also open Spreadsheet Preferences from the shell; the procedure is given here as well.

### **Opening WGS/Spreadsheet from the Shell**

If your search path includes the **/usr/local/bin** path name, use the following procedure to open a new or existing spreadsheet from the shell:

Type **ss spreadsheetname**

where

**spreadsheetname** is the file name for a new spreadsheet, or the file name of the existing spreadsheet you want to open.

If your search path does not include **/usr/local/bin**:

Type **/usr/local/bin/ss spreadsheetname**

If you do not specify a spreadsheet name, a blank spreadsheet appears on the screen, but it is unnamed. You can use the unnamed spreadsheet, but when you close it, it is not saved.

Use the **File Save** command (**/fs**) to name and save the spreadsheet file. Refer to Chapter 9, "Using File Commands," for details about using the **File Save** command.

## Opening Spreadsheet Preferences from the Shell

If your search path includes the `/usr/local/bin` pathname, use the following procedure to open Spreadsheet Preferences from the CTIX shell:

Type `ssprefs`

If your search path does not include `/usr/local/bin`:

Type `/usr/local/bin/ssprefs`

**/X commands.** Commands that provide programming capabilities in macros. See also **macro**.

**absolute reference.** In a formula, a citation to another cell based the row and column addresses of the other cell. An absolute reference ignores the positional relationship between the cells involved. The dollar sign (\$) indicates an absolute reference.

**active cell.** The cell on which the cell pointer is positioned. The active cell's contents appear in the top line of the command panel.

**address.** See **cell address**.

**advanced commands.** Commands that help you take advantage of the following features: macros, data links between spreadsheets, goal seeking, moving data from a spreadsheet file to another file, automatic cursor movement, copy command definition, and range column width.

**alignment.** The way a cell's contents appear in the cell. Cell contents can be aligned at the cell's left or right edge, or centered in the cell.

**argument.** The information you provide to a function.

**arithmetic operator.** Symbols that perform addition, subtraction, multiplication, division, exponentiation, and negation on operands.

**border.** See **spreadsheet border**.

**cell.** The intersection of a column and a row, where spreadsheet data is stored. Each cell is identified by a cell address, which consists of a column letter followed by a row number.

**cell address.** The name by which a cell is identified. The cell address consists of a column letter (*a* through *sr*) followed by a row number (1 through 512). For example, the cell in the first column and first row in the spreadsheet is called cell *a1*.

**cell pointer.** The bar cursor in the worksheet area of the spreadsheet that points to and highlights the active cell.

**cell reference.** A citation to the contents of another cell or range of cells. See also **absolute reference**, **relative reference**.

**character.** A symbol that can be displayed on the screen. Characters include letters, digits, punctuation, space, and special characters like the dollar sign (\$), percent sign (%), and at sign (@).

**circular reference.** A formula containing a reference to a cell whose value depends on that formula in the referring cell.

**clear.** To erase a setting.

**column.** A vertical line of cells down the worksheet. The worksheet contains 512 columns, with letter names *a* through *sr*.

**column width.** The number of characters in a worksheet column.

**columnwise recalculation.** A method of recalculating the values in a spreadsheet: starting at the top of the first column and continuing down, then starting at the top of the next column and continuing down, and so on through the spreadsheet. See also **recalculation order**, **recalculation mode**.

**command.** An instruction for the spreadsheet to perform a task (for example, move or copy cells, or change column width).

**command panel.** The area at the top of the spreadsheet, separated from the worksheet by the worksheet border, which displays the column letters. The command panel shows the active cell's contents, format, protection status, the spreadsheet's current mode, commands, and command information. See also **command**, **contents**, **format**, **mode**, and **worksheet**.

**contents (of a cell).** The information stored in a cell. If the cell contains no information, the cell contents are blank.

**copy.** To duplicate the contents of a cell in another cell.

**criteria.** Conditions for selecting records from a database.

**CTIX system.** The operating system that underlies the Desktop Manager.

**current cell.** See **active cell**.

**current spreadsheet.** The spreadsheet that is open on the screen, in which you are currently working.

**cursor.** The blinking line in the command panel. The cursor moves as you type and edit cell contents.

**cursor keys.** The keys (**Up, Down, Forward, Back**) that move the cursor or the cell pointer. The cursor keys work differently in Point mode, Edit mode, and Ready, Value, and Label modes. See the appropriate discussion in this guide for details.

**Data commands.** Commands that help you manage information in your spreadsheet.

**database.** A collection of related information (data) logically arranged in a particular manner for ease of access. In a spreadsheet database, data is arranged in columns of related information organized under specific headings: each row of data is a record; each piece of data in a record is a field.

**date format.** A way of displaying a date as a serial number. There are three date formats: day-month-year; day-month; or month-year.

**default.** The initial setting.

**dependent spreadsheet.** A spreadsheet that uses data from another spreadsheet. The data is shared through a link between the two spreadsheets; you use the **Advanced Link Copy** command (**/alc**) to establish the link. The spreadsheet that provides the data to the dependent spreadsheet is called the supporting spreadsheet. See also **link** and **supporting spreadsheet**.

**Desktop.** The first directory you enter (the default directory) when you log in to the Desktop Manager. The Desktop is your main directory, and it can be used to create objects such as spreadsheets, documents, and additional directories. See also **default**.

**directory.** An object that contains files and other objects.

**display format.** Determines how cell contents appear in the worksheet.



**edit.** To modify cell contents. You can replace or erase cell contents, or you can use Edit mode to edit cell contents. See also **Edit mode**.

**Edit mode.** A spreadsheet mode that lets you edit cell information. You can edit as you type, or you can edit existing cell contents. To enter Edit mode, press **F3** (Edit).

**entry.** The contents of a cell.

**field.** (1) An item to be completed in a form. (2) In a database, a unit of a record. See also **database**.

**file.** A named unit of data stored on disk. When you save a spreadsheet, it is written to a file. (Not all files are saved worksheets; for example, a file can be a document.) All files that contain spreadsheets can be loaded or linked to other worksheets.

**File commands.** Commands that help you store and retrieve spreadsheet information to and from the hard disk.

**filename.** The name by which you refer to a file.

**format.** Defines how cell contents appear in the worksheet. Use the **Range Format** command (*/rf*) to specify a format for a particular cell or group of cells; use the **Worksheet Global Format** command (*/wgf*) to specify a default format for an entire spreadsheet.

**formula.** An instruction for the spreadsheet to perform a calculation. You can enter a formula into a cell.

**function.** A built-in formula that performs a standard calculation. When you enter the function name into a cell, the formula is calculated.

**function key.** The keys at the top of the keyboard, **F1** through **F10**, that correspond to function key labels at the bottom of the screen. You can use the function keys to execute the commands shown on the function key labels. See also **function key label**.

**function key label.** The labels that appear as shaded boxes at the bottom of the screen. You can execute a command shown in a function key label by pressing the corresponding function key. See also **function key**.

**global.** Affecting the entire spreadsheet or the entire spreadsheet window.

**Global commands.** Commands that set defaults for the current spreadsheet.

**Help.** Online information about the spreadsheet. Press **Help** to look at Help information.

**highlight.** A shaded screen area.

**intersection (of a range).** The set of all cells common to the ranges. See also **intersection operator** and **range**.

**intersection operator.** The space character, used as an operator between ranges in a list to specify cells common to both ranges.

**iteration recalculation.** A method of recalculating a spreadsheet a specified number of times. See also **recalculation order**, **recalculation mode**.

**justify.** To rearrange the contents of a column into paragraph style.

**label.** Any cell entry that begins with a label–prefix character or a letter. Labels cannot be used in calculations.

**Label mode.** How the spreadsheet functions when you are entering a label. See also **mode**, **mode indicator**.

**label–prefix.** A character used at the beginning of a cell entry to align a label (left, right, centered, or repeating) in the cell or to identify a cell entry as a label. The spreadsheet uses the first characters of a cell entry to determine whether the entry is a value or a label.

**link.** Connects data to the current spreadsheet from another spreadsheet. See also **dependent spreadsheet** and **supporting spreadsheet**.

**logical operator.** A symbol used to evaluate the truth value of an operand. See also **operand**, **operator**.

**macro.** A named, stored sequence of keystrokes. To execute a macro, press **F5** (Alt), and then type the one–letter macro name.

**macro notations.** Special notations you use to indicate keystrokes when you type a macro. See also **macro**.

**macro recorder.** Records and stores keystrokes as a macro. The macro recorder lets you create macros without having to type special macro notations. See also **macro**.

**menu.** A list of choices. You can select a choice from a menu in one of two ways: move the cursor to the item and press **Enter**, *or* type the first character of the choice you want to select.

**Menu mode.** The way the spreadsheet functions when you type a slash to display a command menu, or when you execute a command. See also **mode**, **mode indicator**.

**mixed cell reference.** In a formula, a cell reference containing a relative row or column number and an absolute column or row number: \$a4, a\$4, a4..\$a\$4. See also **cell reference**, **absolute reference**, **relative reference**.

**mode.** The state of the spreadsheet. For example, in Point mode, the spreadsheet waits for you to move the cell pointer to a cell. See also **Edit mode**, **Label mode**, **Menu mode**, **Point mode**, **Ready mode**, **Value mode**.

**mode indicator.** In the upper right corner of the command panel, the word that indicates the spreadsheet's mode. See also **mode**.

**operand.** A value acted on in an operation. For example, in the operation #NOT#1, the operand is 1. See also **operator**.

**operator.** Symbols that indicate the action or operation to take place. See also **arithmetic operator**, **intersection operator**, **logical operator**.

**Point mode.** The state of the spreadsheet when you are using the cell pointer to make a cell reference. See also **mode**, **mode indicator**.

**pointer.** See **cell pointer**.

**prompt.** A character or a statement that appears on the screen to instruct you to do something.

**range.** The smallest rectangle of continuous cells treated as one unit. A range can be a single cell, part of a row or column, or a block of cells.

**Range commands.** Commands that let you determine settings for a group of cells. See also **range**.

**range name.** A name assigned to a cell or group of cells. You can use the range name anywhere you would use a range or cell reference.

**Ready mode.** The state of the spreadsheet when it pauses for you to type a cell entry or type a slash to display the commands menu. See also **mode, mode indicator.**

**recalculation mode.** Determines how often formulas in the spreadsheet are calculated: automatically (when you edit any cell), or when you press **F2** (Recalc). See also **recalculation order.**

**recalculation order.** The order in which the spreadsheet calculates formulas. Natural recalculation calculates values used in formulas before calculating those dependent on formulas. See also **columnwise recalculation, rowwise recalculation, iteration recalculation.**

**record.** (1) A unit of information that can be stored in and retrieved from a relation of a database. A record contains one element of data for each field in a relation. (2) As a verb, record means to store. The macro recorder stores your keystrokes as a macro. See also **macro.**

**reference.** See **cell reference.**

**relation.** A collection of information, or data, arranged in a series of rows and columns, like those of a table in a book.

**relative reference.** A citation to another cell based on its position to the referring cell. For example, from cell d5, a relative reference to cell d4 is remembered as "the cell above this cell." See also **cell reference, absolute reference.**

**repeating label.** A label that repeats as many times as it will fit in a cell. A repeating label is created by using the backslash (\) label-prefix character.

**reset.** See **clear.**

**row.** A horizontal line of cells across the worksheet. WGS/Spreadsheet contains 8192 rows, numbered 1 through 8192. See also **column**, **worksheet**.

**rowwise recalculation.** A method of recalculating spreadsheet values starting at the beginning of the first row in the spreadsheet and continuing across, then going to the beginning of the next row and continuing across, and so on through the spreadsheet. See also **recalculation order**, **recalculation mode**.

**save.** The operation that writes a permanent copy of the current spreadsheet to a file.

**scroll.** To move one or more windows across the worksheet, one row or column at a time. The cursor keys (**Up**, **Down**, **Forward**, and **Back**) control scrolling. For example, if you press **Forward** until the cell pointer reaches the right edge of the screen, and then you press **Forward** again, the worksheet scrolls one column to the left.

**setup string.** A series of characters that sets up a printer to act a certain way. Refer to your printer documentation for complete details.

**spreadsheet border.** The dark line that surrounds the spreadsheet and that shows the name of the spreadsheet and, sometimes, the state indicator. See also **state indicator**.

**state indicator.** A word, in the spreadsheet border, that displays the status of a spreadsheet operation. See also **spreadsheet border**.

**supporting spreadsheet.** The spreadsheet that provides data to another spreadsheet. The data is shared through a link between the two spreadsheets; you use the **Advanced Link Copy** command (**/alc**) to establish the link. The spreadsheet that depends on data from the supporting spreadsheet is called the dependent spreadsheet. See also **link** and **dependent spreadsheet**.

**text.** A string of characters that can be used for titles or labels in the worksheet. Certain formulas can perform operations on text.

**title.** A label that appears along the top or left edge of the spreadsheet window at all times. You cannot scroll the cell pointer past a title; you can, however, press **F1** (Go To) to move the cursor beyond a title.

**value.** A number or formula entered into a cell.

**Value mode.** The state of the spreadsheet when you enter a value. See also **mode**, **mode indicator**.

**window.** The rectangular portion of the screen within which the spreadsheet appears.

**worksheet.** The grid of spreadsheet cells, 512 columns across and 8192 rows long.

**Worksheet commands.** Commands that determine how the current spreadsheet looks and works.





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