Session Command Quick Reference

Using Session Commands

You can use session commands for submitting commands interactively in MINITAB, or you can use session and macro commands for building macros (See Global and Local Macros (%macros)). Submitting session commands directly into MINITAB requires typing the commands one of two places:

- The Session window
- The Command Line Editor

**Session Window**

- Type commands at the MTB> prompt, subcommands at the SUBC> prompt, and data at the DATA> prompt.
- By default, press [Enter] to execute a command and [Ctrl]+[Enter] to insert a blank line (these preferences can be changed).
- If you are unable to type commands in the Session window, command language may be disabled. See Using Session Commands and Macros in **MINITAB User’s Guide 1**.

Blue text denotes commands, subcommands, and arguments new to **MINITAB Release 13**.
MINITAB Release 13 Session Command Quick Reference

Command Line Editor

- Open the Editor with Ctrl+L or Edit ➤ Command Line Editor.
- Type commands at the cursor, then click Submit Commands to execute them.
- You can also use, by default, Ctrl+Enter to execute a command and Enter to insert a blank line (these preferences can be changed).
- Use the Command Line Editor to execute commands used previously in your session:
  - Highlight commands in the Session window or History folder, then open the Command Line Editor. The highlighted commands appear in the editing window.
  - Or, while the Session window or History folder is active, choose Edit ➤ Select All (Ctrl+A). When you open the Editor, all commands used in your current session will appear in the editing window. Since it is so easy to delete and edit commands in the editing window, this is a quick way to re-execute commands.
- Press F3 to clear all commands.
- You can cut, copy, and paste to and from the Command Line Editor, word processors, spreadsheets, and MINITAB windows—including the Data window.
Notation

In this Quick Reference, commands are left justified, subcommands are indented.

K denotes a constant such as 8.3 or K14
C denotes a column such as C12 or 'Height'
E denotes either a constant or column, and sometimes a matrix
M denotes a matrix such as M5
[ ] denotes an optional argument
C...C means you can list one or more columns

Rules for Typing Commands

- You need only type the first four letters of any command. For %macros, type % followed by the full macro name.
- Start each command and subcommand on a new line.
- To use a subcommand, end the line before it with a semi-colon (;). End the last subcommand with a period.
  For example: RANDOM 10 C1;
              BINOMIAL 20 0.3.
- Type the subcommand ABORT to cancel a multi-line session command.
  For example: RANDOM 10 C1;
              BINOMIAL 20 0.3;
              ABORT.
Abbreviate lists of consecutive variables with a dash.
For example: RANDOM 10 C1-C5

Enclose file names with double quotation marks.
For example: SAVE "SALESQ1"

Enclose variable names with single quotation marks.
For example: PLOT 'Sales'='Advertis'

Only type the commands and their arguments (K, C, E, or M as defined above). Text is for explanation only. For example, the syntax for the MEDIAN command is
MEDIAN of the values in C [put into K]
This means that you could type either:
MEDIAN C1 to display the median of C1, or
MEDIAN C1 K1 to display the median of C1 and store it in the constant K1

Interrupting Commands
To stop the display of a command, press Ctrl+Break.
Symbols

*  Missing Value Symbol. An * can be used as data in READ, SET, and INSERT, and in data files. Enclose the * in single quotes in commands and subcommands.

#  Comment Symbol. The symbol # anywhere on a line tells MINITAB to ignore the rest of the line.

&  Continuation Symbol. To continue a command onto another line, end the first line with the symbol &.

Miscellaneous Commands

HELP explains MINITAB session commands, can be Help on a command or a subcommand with its own subcommands
ABORT cancels a multi-line command without executing it
INFO [C…C] summarizes the worksheet (the same information can be found in the Worksheets subfolders)
RESTART begin fresh MINITAB session
STOP ends the current session and exits MINITAB
TYPE "[PATH] FILENAME.EXT" display contents of a file
CD [PATH] change working directory
DIR [PATH] list files
Minitab Release 13 Session Command Quick Reference

**OH** = K number of lines for height of output

**OW** = K number of spaces for width of output

**IW** = K number of spaces for width of input

**BRIEF** = K controls amount of output from ARIMA, BBDESIGN, CCDESIGN, CLUOBS, CLUVERS, DISCRIMINANT, FACTOR, FFDESIGN, GLM, KMEANS, MIXREG, REGRESS, RLINE, RSREG, SCDESIGN, and SLDESIGN. BRIEF 2 is the default; BRIEF 0 suppresses all output for all commands.

**TSHARE** operate interactively

**BATCH** operate in batch mode

---

### Files, Data, and Output Commands

**NAME** for E is 'name' ... for E is 'name'

**NEW** open a new Minitab worksheet

**WORKSHEET** K (worksheet name)

**CLOSE** close a worksheet

**NOPROMPT** do not prompt to save

**CURRENT** make the named worksheet the current worksheet
RENAMES to K or "text"

WOPEN 'filename' - provides functionality of File ➤ Open dialog boxes

FTYPE
MINITAB [K]
EXCEL
PORTABLE
QUATTRO
LOTUS
TEXT
DBASE
SYMPHONY

MERGE
VARIABLE K
NAME K
TEXT
NUMERIC
DATETIME
COLUMN K
DECSEP
COMMA
PERIOD
V NAMES
NONE
<table>
<thead>
<tr>
<th>Command</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROW</td>
<td>K</td>
</tr>
<tr>
<td>FIELD</td>
<td></td>
</tr>
<tr>
<td>TAB</td>
<td>COMMA, SEMICOLON, PERIOD, SPACE, NONE, CUSTOM K</td>
</tr>
<tr>
<td>TDELIMITER</td>
<td>DOUBLEQUOTE, SINGLEQUOTE, NONE, CUSTOM K</td>
</tr>
<tr>
<td>DECSEP</td>
<td>PERIOD, COMMA</td>
</tr>
<tr>
<td>MISSING</td>
<td>TEXT K K</td>
</tr>
<tr>
<td>DATA</td>
<td>FIRST K, NROWS K, IGNOREBLANKROWS</td>
</tr>
</tbody>
</table>

Minitab Release 13 Session Command Quick Reference
WSAVE 'filename' – provides functionality of the File > Save (As) dialog box(es)

**FTYPE**
- MINITAB
- [K]
- EXCEL
- PORTABLE
- QUATTRO
- LOTUS
- TEXT
- DBASE
- SYMPHONY
- NONAMES
- DECSEP
- COMMA
- PERIOD

**FIELD**
- TAB
- COMMA
- SEMICOLON
- PERIOD
- SPACE
- NONE
- CUSTOM
- [K]
- TDELIMITER
- DOUBLEQUOTE
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SINGLEQUOTE</td>
<td>Retrieve the MINITAB saved worksheet [in &quot;filename&quot;]</td>
</tr>
<tr>
<td>NONE</td>
<td>Retrieve a MINITAB portable worksheet</td>
</tr>
<tr>
<td>CUSTOM</td>
<td>Open a MINITAB graph (MGF) file</td>
</tr>
<tr>
<td>MISSING</td>
<td>[K] controls pausing of Graph windows</td>
</tr>
<tr>
<td>TEXT</td>
<td>[K] save a high-resolution graph or graphs</td>
</tr>
<tr>
<td>NumericUpDown</td>
<td>Replace existing file</td>
</tr>
<tr>
<td>RETRIEVE</td>
<td>Do not replace existing file</td>
</tr>
<tr>
<td>PORTABLE</td>
<td>Replace existing file</td>
</tr>
<tr>
<td>GSAVE</td>
<td>Do not replace existing file</td>
</tr>
<tr>
<td>GPAUSE</td>
<td>Open a MINITAB graph (MGF) file</td>
</tr>
<tr>
<td>CSAVE</td>
<td>[K] save a high-resolution graph or graphs</td>
</tr>
<tr>
<td>REPLACE</td>
<td>Replace existing file</td>
</tr>
<tr>
<td>NOREPLACE</td>
<td>Do not replace existing file</td>
</tr>
</tbody>
</table>
### Minitab Release 13 Session Command Quick Reference

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JPEG</td>
<td>save in JPEG format</td>
</tr>
<tr>
<td>PNGB</td>
<td>save in PNG black-and-white format</td>
</tr>
<tr>
<td>PNGC</td>
<td>save in PNG color format</td>
</tr>
<tr>
<td>PNGH</td>
<td>save in PNG high color format</td>
</tr>
<tr>
<td>TIFB</td>
<td>save in TIF black-and-white format</td>
</tr>
<tr>
<td>TIFC</td>
<td>save in TIF color format</td>
</tr>
<tr>
<td>BMPB</td>
<td>save in BMP black-and-white format</td>
</tr>
<tr>
<td>BMPC</td>
<td>save in BMP color format</td>
</tr>
<tr>
<td>BMPH</td>
<td>save in BMP high color format</td>
</tr>
<tr>
<td>SAVE</td>
<td>[in &quot;filename&quot;] a copy of the worksheet</td>
</tr>
<tr>
<td>PORTABLE</td>
<td>save a Minitab portable worksheet</td>
</tr>
<tr>
<td>REPLACE</td>
<td>replace existing file</td>
</tr>
<tr>
<td>NOREPLACE</td>
<td>do not replace existing file</td>
</tr>
<tr>
<td>SINGLE</td>
<td>save in Release 10 (single precision) format</td>
</tr>
</tbody>
</table>

### READ data into C...C

- **FILE** "filename"
- **FORMAT** (format statement)
- **NOBS** = K
- **SKIP** K lines
- **DECIMAL** "." or ","

*With READ; FILE only:*

- **TAB** columns are separated with tabs
- **NONAMES** columns are not named
- **ALPHA** columns are in K...K
### MINITAB Release 13 Session Command Quick Reference

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET</td>
<td>data into C</td>
</tr>
<tr>
<td>FILE</td>
<td>&quot;filename&quot;</td>
</tr>
<tr>
<td>FORMAT</td>
<td>(format statement)</td>
</tr>
<tr>
<td>NOBS</td>
<td>= K</td>
</tr>
<tr>
<td>SKIP</td>
<td>K lines</td>
</tr>
<tr>
<td>DECIMAL</td>
<td>&quot;.&quot; or &quot;,&quot;</td>
</tr>
<tr>
<td>TSET</td>
<td>text data into C</td>
</tr>
<tr>
<td>FILE</td>
<td>&quot;filename&quot;</td>
</tr>
<tr>
<td></td>
<td>list-of-text-constants-and-repeat-factors</td>
</tr>
<tr>
<td>DSET</td>
<td>date/time data into C</td>
</tr>
<tr>
<td>LIST</td>
<td>date/time values K...K or &quot;text&quot; ... &quot;text&quot;</td>
</tr>
<tr>
<td>INSERT</td>
<td>data [between rows K and K] of C...C</td>
</tr>
<tr>
<td>FILE</td>
<td>&quot;filename&quot;</td>
</tr>
<tr>
<td>FORMAT</td>
<td>(format statement)</td>
</tr>
<tr>
<td>NOBS</td>
<td>= K</td>
</tr>
<tr>
<td>SKIP</td>
<td>K lines</td>
</tr>
<tr>
<td>DECIMAL</td>
<td>&quot;.&quot; or &quot;,&quot;</td>
</tr>
<tr>
<td>END</td>
<td>of data (with READ, SET, TSET, DSET, and INSERT)</td>
</tr>
<tr>
<td>PRINT</td>
<td>the data in E...E</td>
</tr>
<tr>
<td>FORMAT</td>
<td>(format statement)</td>
</tr>
<tr>
<td>WRITE</td>
<td>[to &quot;filename&quot;] the data in C...C</td>
</tr>
<tr>
<td>FORMAT</td>
<td>(format statement)</td>
</tr>
<tr>
<td>TAB</td>
<td>separate columns with tabs</td>
</tr>
<tr>
<td>NONAMES</td>
<td>omit column names</td>
</tr>
</tbody>
</table>
MINITAB Release 13 Session Command Quick Reference

**DECIMAL**  "." or ","

**REPLACE** replace existing file

**NOREPLACE** do not replace existing file

**OUTFILE** "filename" put all input and output in file

**OW** = K output width of file

**OH** = K output height of file

**NOTERM** no output to terminal

**NOECHO** display no commands in outfile

**NOOOUTFILE** output to terminal only; ends OUTFILE

**NEWPAGE** start next output on a new page

**JOURNAL** ["filename"] record MINITAB commands in this file

**NOJOURNAL** cancels JOURNAL

**MTITLE** K or "title" (display custom title above output in Session window)

**ODBC (Open Database Connectivity)**

**ODBC**

**CONNECT** "connection string"

**SQLSTRING** "SQL string"

**COLUMNS** C...C
Editing and Manipulating Data

- **LET**  
  C(K) = K  (changes the number in row K of C)

- **DELETE**  
  rows K...K of C...C or C...C

- **ERASE**  
  all data in E...E

- **INSERT**  
  data [between rows K and K] of C...C

- **FILE**  
  "filename"

- **FORMAT**  
  (format statement)

- **NOBS**  
  = K

- **SKIP**  
  K lines

- **DECIMAL**  
  "." or ","

- **COPY**  
  C...C into C...C

- **COPY**  
  C into K...K

- **USE**  
  rows K...K

- **USE**  
  rows where C = K...K

- **OMIT**  
  rows K...K

- **OMIT**  
  rows where C = K...K

- **COPY**  
  K...K into K...K

- **COPY**  
  K...K into C
### MERGE
creates a new worksheet using columns of data from two worksheets
- **NAME** new worksheet K or "text string"
- **WORKSHEET** to be merged is K or "worksheet name" *(must be used twice)*
- **BY** use C...C to match rows in worksheet
- **NOMULTIPLES**
- **NOUNMATCHED**
- **INCLUDE** C...C
- **MISSINGS**
- **VORDER** C...C
- **VALUES** K...K or C
- **WORKSHEET**
- **ALPHABETICAL**

### SUBSET
creates a new worksheet using specified rows of the current worksheet
- **NAME** K
- **INCLUDE**
- **EXCLUDE**
- **BRUSHED**
- **WHERE** expression
- **ROWS** K...K
- **COLUMNS** C...C
- **MATRICES** M...M
- **NOMATRICES**
- **NOCONSTANTS**

### SPLIT
splits a worksheet into multiple new worksheets,
one for each combination of a set of by variables

BY C...C
COLUMNS C...C
MATRICES M...M
NOMATRICES
NOCONSTANTS
MISSINGS
CODE (K...K) to K... (K...K) to K for C...C, put in C...C
TEXT of input column C and output text column into C

Input Data Type: Date/Time
Extract the component from the date/time value:
WKDAY (Sun, Mon, Tue, Wed, Thu, Fri, Sat)
DAY (01, 02, ..., 31)
WEEK (Wk01–Wk53)
MONTH (Jan, Feb, Mar, Apr, May, Jun, Jul, ..., Dec)
QUARTER (Q1, Q2, Q3, Q4)
YEAR (00, 01, ..., 99)
HOUR (00, 01, ..., 23)
MINUTE (00, 01, ..., 59)
SECOND (00, 01, ..., 59)
HUNDREDTH (00, 01, ..., 99)

Input Data Type: Numeric
 MINITAB Release 13 Session Command Quick Reference

**WIDTH** K characters

**MAXWIDTH** K characters

**SIGNIFICANT** K digits

**DECIMALS** K decimal places

**MISSING** (value converted to) "text"

Input Data Type: Text

**WIDTH** K characters

**MAXWIDTH** K characters

**DATE** of input column C and output date column into C

Input Data Type: Text

**FORMAT** (date/time format statement)

Input Data Type: Numeric – no subcommands available

**NUMERIC** of input column C and output numeric column into C

Input Data Type: Date/Time

Extract the component from the date/time value:

**YEAR** (... 1995, 1996, ...)

**QUARTER** (1, 2, 3, 4)

**MONTH** (1, 2, 3, 4, ..., 12)

1. Alternatively, NTOA can be use with these subcommands to provide the same results; see NTOA on page 18.
MINITAB Release 13

Session Command Quick Reference

WEEK (1, 2, ..., 53)
DAY (1, 2, ..., 31)
WKDAY (1, 2, 3, 4, 5, 6, 7)
HOUR (0, 1, ..., 23)
MINUTE (0, 1, ..., 59)
SECOND (0, 1, ..., 59)
HUNDREDTH (0, 1, ..., 99)

Input Data Type: Text – no subcommands available (alternatively, you can use ATON, below)

ATON input text column in C, output numeric column in C
NTOA input numeric column in C, output text column in C
WIDTH K characters
MAXWIDTH K characters
SIGNIFICANT K digits
DECIMALS K decimal places
MISSING (value converted to) "text"
STACK (E...E) on (E...E), put in (C...C)
SUBSCRIPTS into C
### USENAMES
- create subscripts based on variable names

### NEW
- put results in new worksheet

### USENAMES
- create subscripts based on variable names

### NAME
- new worksheet K or "text string"

### USENAMES
- create subscripts based on variable names

### UNSTACK
- (C...C) into (E...E)...(E...E)
- SUBSCRIPTS are in C...C
- MISSINGS include missing as a subscript value
- VARNAMES name unstacked columns based on subscripts
- NEW put results in new worksheet
- NAME new worksheet K or "text string"
- AFTER put results after last column in use

### TRANSPOSE
- C to M or M to C or M to M (no new subcommands supported)
- C...C or M (new arguments and subcommands)
- VARNAMES are in C
- STORE in C...C or M
- LABELS store in C
- NEW put results in new worksheet
- NAME new worksheet K or "text string"
- AFTER put results after last column in use

### %ROWTOC
- stack rows in C...C, put in C
- EXPAND values in C...C
- EXSTORE put in C...C
- SUBSCRIPTS put in C
CONVERT using table in C, the data in C, and put in C
CONCATENATE C...C put in C
SORT C [carry along C...C] put into C [and C...C]
BY C...C
DESCENDING C...C
RANK the values in C, put ranks into C
CENTER the data in C...C put into C...C
LOCATION [subtracting K...K]
SCALE [dividing by K...K]
MINMAX [with K as minimum and K as maximum]

**Arithmetic**

LET E = expression
Expressions may use
- Arithmetic operators + − * / ** (exponentiation)
- Comparison operators = −= or <> > < <= >=
- Logical operators & | ~
and any of the following functions and column operations:
ABSOLUTE SQRT LOGTEN LOGE EXPONENTIATE
ANTILOG ROUND SIN COS TAN
ASIN ACOS ATAN SIGNS NSCORES
PARSUMS PARPRODUCTS COUNT N NMISS
SUM MEAN STDEV MEDIAN MINIMUM
### Simple Arithmetic Operations

**ADD**  
E to E, ..., to E, put into E

**SUBTRACT**  
E from E, put into E

**MULTIPLY**  
E by E, ..., by E, put into E

**DIVIDE**  
E by E, put into E

**RAISE**  
E to the power E, put into E

### Columnwise Functions

**ABSOLUTE**  
Value of E, put into E

**SQRT**  
Of E, put into E

**LOGE**  
Of E, put into E

**LOGTEN**  
Of E, put into E

**EXPONENTIATE**  
E, put into E
### Minitab Release 13 Session Command Quick Reference

#### How to Use

- **ANTILOG** of E put into E
- **ROUND** to integer E put into E
- **SIN** of E put into E
- **COS** of E put into E
- **TAN** of E put into E
- **ASIN** of E put into E
- **ACOS** of E put into E
- **ATAN** of E put into E
- **SIGNS** of E [put into E]
- **PARSUMS** of C put into C
- **PARPRODUCTS** of C put into C

#### Normal Scores

- **NSCORES** of C put into C

#### Columnwise Statistics

- **COUNT** the number of values in C [put into K]
- **N** (number of nonmissing values) in C [put into K]
- **NMISS** (number of missing values) in C [put into K]
- **SUM** of the values in C [put into K]
- **MEAN** of the values in C [put into K]
- **STDEV** of the values in C [put into K]
- **MEDIAN** of the values in C [put into K]
- **MINIMUM** of the values in C [put into K]
MAXIMUM of the values in C [put into K]
RANGE of the values in C [put into K]
SSQ (uncorrected sum of sq.) for C [put into K]

**Rowwise Statistics**
- RCOUNT of E…E put into C
- RN of E…E put into C
- RNMISS of E…E put into C
- RSUM of E…E put into C
- RMEAN of E…E put into C
- RSTDEV of E…E put into C
- RMEDIAN of E…E put into C
- RMINIMUM of E…E put into C
- RMAXIMUM of E…E put into C
- RRANGE of E…E put into C
- RSSQ of E…E put into C

**Indicator Variables**
- INDICATOR variables for subscripts in C, put into C…C

**Matrices**
- READ [from "filename"] into a K by K matrix M
- PRINT M…M
MINITAB Release 13 Session Command Quick Reference

TRANSPOSE C to M or M to C or M to M (no new subcommands supported)
TRANSPOSE C...C or M (new arguments and subcommands)
VARNAMES are in C
STORE in C...C or M
LABELS store in C
NEW put results in new worksheet
NAME new worksheet K or "text string"
AFTER put results after last column in use
INVERT M into M
DEFINE K into K by K matrix M
DIAGONAL is C, put into M
DIAGONAL of M, put into C
COPY C...C into M
COPY M into C...C
COPY M into M
USE rows K...K
OMIT rows K...K
ERASE M...M
EIGEN analysis for M put values into C [vectors into M]

In the following commands E can be either C, K, or M:
ADD E to E, put into E
SUBTRACT E from E, put into E
MULTIPLY E by E, put into E

Distributions and Random Data

RANDOM K observations into C...C
  BERNOULLI trials p = K
  T degrees of freedom = K
  F df numerator = K, df denominator = K
  CHISQUARE df = K

PDF for values in E...E [put results in E...E]
  T degrees of freedom = K
  F df numerator = K, df denominator = K
  CHISQUARE df = K

CDF for values in E...E [put results in E...E]
  F df numerator = K, df denominator = K [K noncentrality param.]
  T degrees of freedom = K [K noncentrality parameter]
  CHISQUARE df = K [K noncentrality parameter]

INVCDF for values in E...E [put results in E...E]
  F df numerator = K, df denominator = K [K noncentrality param.]
  T degrees of freedom = K [K noncentrality parameter]
  CHISQUARE df = K [K noncentrality parameter]

RANDOM, PDF, CDF, and INVCDF have the subcommands:
MINITAB Release 13  Session Command Quick Reference

BINOMIAL  no. of trials = K, probability of success = K
POISSON   µ = K
INTEGER   discrete uniform on integers K to K
DISCRETE  values in C and probabilities in C
NORMAL    [µ = K [σ = K]]
UNIFORM   [continuous on the interval K to K]
CAUCHY    [location = K [scale = K]]
LAPLACE   [location = K [scale = K]]
LOGISTIC  [location = K [scale = K]]
LOGNORMAL [µ = K [σ = K]]
EXPONENTIAL [mean = K]
GAMMA     first shape parameter = K second shape parameter = K
WEIBULL   first shape parameter = K second shape parameter = K
BETA      first shape parameter = K second shape parameter = K
HYPERGEOMETRIC population size=K, number of successes=K, sample size=K
SAMPLE    K rows from C put into C
REPLACE   sample with replacement
BASE      for random number generator = K

Dynamic Data Exchange (DDE)

XDADD     "application" "topic" "item"
APPEND    [C]
Minitab Release 13

REPLACE [C]
ACTIVE
INACTIVE
PERFORM K
COMMAND "command"
PRIORITY K
XDREMOVE "application" "topic" "item"
XDACTIVATE "application" "topic" "item"
XDDEACTIVATE "application" "topic" "item"
XDGET "application" "topic" "item"
APPEND [C]
REPLACE [C]
XDEEXEC "application" "command"

Core Graphs

PLOT C=C or C=C…C=C
JITTER [K K]
NOJITTER
LOGSCALE K

Data Display Subcommands for PLOT:
SYMBOL \[[C...C]\]
   all of its subcommands (see page 51)
CONNECT \[[C...C]\]
   all of its subcommands (see page 51)
PROJECT \[[C...C]\]
   all of its subcommands (see page 51)
AREA \[[C...C]\]
   all of its subcommands (see page 51)
LOWESS \[[C...C]\]
   all of its subcommands (see page 51)

Annotation Subcommands for PLOT:
   TITLE "title"
       all of its subcommands (see page 53)
   FOOTNOTE "footnote"
       all of its subcommands (see page 53)
   TEXT K K "text"
       all of its subcommands (see page 53)
   LINE K K ... K K or C C
       all of its subcommands (see page 53)
   POLYGON K K ... K K or C C
       all of its subcommands (see page 53)
   MARKER K K ... K K or C C
       all of its subcommands (see page 53)
Frame Customization Subcommands for PLOT:

XYSAME
  XYMIN   K
  XYMAX   K
AXIS   K [K K] or C [K K]
      all of its subcommands (see page 56)
TICK   K [K...K or C] or C [K...K or C]
      all of its subcommands (see page 56)
GRID   K or C
      all of its subcommands (see page 56)
REFERENCE   K K...K or K C or C K...K or C C
      all of its subcommands (see page 56)
MARGIN   K K K K
MINIMUM   K K
MAXIMUM   K K
SCFRAME   include ticks and reference lines in scale calculation
SCANNOTATION   include markers, lines, and polygons in scale calculation
TRANSPOSE axes
FRAME   (default)
NOFRAME   [K]

Regions Subcommands for PLOT:

FIGURE   [K K K K]
      all of its subcommands (see page 60)
DATA [K K K K]
   all of its subcommands (see page 60)
LEGEND [K K K K]
   all of its subcommands (see page 60)
NOLEGEND
OVERLAY
SAME K [K]
ASPECT K K

Layouts Commands and Subcommands for PLOT:
LAYOUT
   all of its subcommands (see page 49)
ENDLAYOUT

File I/O Commands and Subcommands for PLOT:
GSAVE save graph in "filename"
REPLACE
NOREPLACE
GVIEW "filename.mgf"
GPAUSE [K]

TSPLT C
   TIME stamp in C
INDEX [K...K]
MINITAB Release 13

Session Command Quick Reference

SECOND [K...K]
MINUTE [K...K]
HOUR [K...K]
DAY [K...K]
MONTH [K...K]
QUARTER [K...K]
YEAR [K...K]
START K [K...K]
TDISPLAY K [K [K]]
LOGSCALE 2

Data Display Subcommands for TSPLOT:
SYMBOL [C...C]
CONNECT [C...C]
PROJECT [C...C]
AREA [C...C]
LOWESS [C...C]

Annotation Subcommands for TSPLOT:

Annotation Subcommands for TSPLOT:
Frame Customization Subcommands for TSPLT:

- **AXIS** K [K K] or C [K K]
  - all of its subcommands (see page 56)
- **TICK** K [K...K or C] or C [K...K or C]
  - all of its subcommands (see page 56)
- **GRID** K or C
  - all of its subcommands (see page 56)
- **REFERENCE** K...K or K C or C K...K or C C
  - all of its subcommands (see page 56)
- **MARGIN** K K K K
- **MINIMUM** K K
Regions Subcommands for TSPLLOT:

FIGURE 
    [K K K K] 
    all of its subcommands (see page 60)
DATA 
    [K K K K] 
    all of its subcommands (see page 60)
LEGEND 
    [K K K K] 
    all of its subcommands (see page 60)
NOLEGEND
OVERLAY
SAME 
    K [K]
ASPECT 
    K K

Layouts Commands and Subcommands for TSPLLOT:

LAYOUT 
    all of its subcommands (see page 49)
ENDLAYOUT

File I/O Commands and Subcommands for TSPLLOT:
GSAVE save graph in "filename"
REPLACE
NOREPLACE
GVIEWS "filename.mgf"
GPAUSE [K]

BOXPLOT C or C*C or C*C*C or C*C…C

Data Display Subcommands for BOXPLOT:
BOX [C]
all of its subcommands (see page 51)
SYMBOL [C]
all of its subcommands (see page 51)
CONNECT [C]
all of its subcommands (see page 51)

Annotation Subcommands for BOXPLOT:
TITLE "title"
all of its subcommands (see page 53)
FOOTNOTE "footnote"
all of its subcommands (see page 53)
TEXT K K "text"
all of its subcommands (see page 53)
LINE K K…K K or C C
all of its subcommands (see page 53)
POLYGON  K K ... K K or C C
    all of its subcommands (see page 53)
MARKER     K K ... K K or C C
    all of its subcommands (see page 53)

Frame Customization Subcommands for BOXPLOT:
AXIS        K [K K] or C [K K]
    all of its subcommands (see page 56)
TICK        K [K...K or C] or C [K...K or C]
    all of its subcommands (see page 56)
GRID        K or C
    all of its subcommands (see page 56)
REFERENCE   K K...K or K C or C K...K or C C
    all of its subcommands (see page 56)
MARGIN      K K  K K
MINIMUM     K K
MAXIMUM     K K
SCFRAME     include ticks and reference lines in scale calculation
SCANNOTATION include markers, lines, and polygons in scale calculation
TRANSPOSE   axes
FRAME       (default)
NOFRAME     [K]

Regions Subcommands for BOXPLOT:
FIGURE [K K K K]
    all of its subcommands (see page 60)
DATA [K K K K]
    all of its subcommands (see page 60)
LEGEND [K K K K]
    all of its subcommands (see page 60)
NOLEGEND
OVERLAY
SAME K [K]
ASPECT K K

Layouts Commands and Subcommands for BOXPLOT:
LAYOUT
    all of its subcommands (see page 49)
ENDLAYOUT

File I/O Commands and Subcommands for BOXPLOT:
GSAVE save graph in "filename"
REPLACE
NOREPLACE
GVVIEW "filename.mgf"
GPAUSE [K]

CONTOURPLOT C*C*C or C*C*C...C*C*C
LEVELS  K...K or C
NLEVELS  K
NMESH   K  K
MESH    K  K...K or K  C
REGULAR
IRREGULAR  [K]

Data Display Subcommands for CONTOURPLOT:
CONNECT   [C...C]
          all of its subcommands (see page 51)
AREA      [C...C]
          all of its subcommands (see page 51)

Annotation Subcommands for CONTOURPLOT:
TITLE     "title"
          all of its subcommands (see page 53)
FOOTNOTE  "footnote"
          all of its subcommands (see page 53)
TEXT      K  K  "text"
          all of its subcommands (see page 53)
LINE      K  K...K  K or C  C
          all of its subcommands (see page 53)
POLYGON   K  K...K  K or C  C
          all of its subcommands (see page 53)
MARKER  K K ... K K or C C
   all of its subcommands (see page 53)

Frame Customization Subcommands for CONTOURPLOT:
AXIS  K [K K] or C [K K]
   all of its subcommands (see page 56)
TICK  K [K...K or C] or C [K...K or C]
   all of its subcommands (see page 56)
GRID  K or C
   all of its subcommands (see page 56)
REFERENCE  K K ... K or K C or C K ... K or C C
   all of its subcommands (see page 56)
MARGIN  K K K K
MINIMUM  K K
MAXIMUM  K K
SCFRAME include ticks and reference lines in scale calculation
SCANNOTATION include markers, lines, and polygons in scale calculation
TRANSPOSE axes
FRAME  (default)
NOFRAME  [K]

Regions Subcommands for CONTOURPLOT:
FIGURE  [K K K K]
   all of its subcommands (see page 60)
MINITAB Release 13 Session Command Quick Reference

DATA [K K K K]
   all of its subcommands (see page 60)
LEGEND [K K K K]
   all of its subcommands (see page 60)
NOLEGEND
OVERLAY
SAME K [K]
ASPECT K [K]

Layouts Commands and Subcommands for CONTOURPLOT:
LAYOUT
   all of its subcommands (see page 49)
ENDDAYOUT

File I/O Commands and Subcommands for CONTOURPLOT:
GSAVE save graph in "filename"
REPLACE
NOREPLACE
GVIEW "filename.mgf"
GPAUSE [K]

MATRIXPLOT C…C
MATRIXPLOT C…C*C…C (Draftsman Plot menu command uses this form)
JITTER [K K]

39
Data Display Subcommands for MATRIXPLOT:

- SYMBOL [C...C]
  all of its subcommands (see page 51)
- CONNECT [C...C]
  all of its subcommands (see page 51)
- PROJECT [C...C]
  all of its subcommands (see page 51)
- AREA [C...C]
  all of its subcommands (see page 51)
- LOWESS [C...C]
  all of its subcommands (see page 51)

Annotation Subcommands for MATRIXPLOT:

- TITLE "title"
  all of its subcommands (see page 53)
- FOOTNOTE "footnote"
  all of its subcommands (see page 53)
Frame Customization Subcommands for MATRIPLOT:
- AXIS  K [K K] or C [K K]
  all of its subcommands (see page 56)
- TICK  K [K...K or C] or C [K...K or C]
  all of its subcommands (see page 56)
- GRID  K or C
  all of its subcommands (see page 56)
- REFERENCE  K K...K or K C or C K...K or C C
  all of its subcommands (see page 56)
- MARGIN  K K K K
- FRAME  (default)
- NOFRAME  [K]

Regions Subcommands for MATRIPLOT:
- FIGURE  [K K K K]
Layouts Commands and Subcommands for MATRIXPLOT:

LAYOUT
   all of its subcommands (see page 49)
ENDLAYOUT

File I/O Commands and Subcommands for MATRIXPLOT:

GSAVE save graph in "filename"
REPLACE
NOREPLACE
GVIEW "filename.mgf"
GPAUSE [K]

CHART C or C*C or C*C...C*C or C...C

Functions for y-axis variable:

COUNT (C)
N (C)
NMISS (C)
SUM (C)
MEAN (C)
STDEV (C)
MEDIAN (C)
MINIMUM (C)
MAXIMUM (C)
SSQ (C)

CLUSTER C [K]
STACK C
INCREASING or
DECREASING
CPERCENT
CUMULATIVE

Data Display Subcommands for CHART:
SYMBOL [C...C]
all of its subcommands (see page 51)
CONNECT [C...C]
all of its subcommands (see page 51)
PROJECT [C...C]
all of its subcommands (see page 51)
AREA [C...C]
all of its subcommands (see page 51)
BAR [C...C]
all of its subcommands (see page 51)

Annotation Subcommands for CHART:
TITLE "title"
all of its subcommands (see page 53)
FOOTNOTE "footnote"
all of its subcommands (see page 53)
TEXT K K "text"
all of its subcommands (see page 53)
LINE K K K or C C
all of its subcommands (see page 53)
POLYGON K K K or C C
all of its subcommands (see page 53)
MARKER K K K or C C
all of its subcommands (see page 53)

Frame Customization Subcommands for CHART:
AXIS K [K K] or C [K K]
all of its subcommands (see page 56)
TICK K [K...K or C] or C [K...K or C]
all of its subcommands (see page 56)
GRID   K or C
all of its subcommands (see page 56)
REFERENCE K K K or K C or C K K K or C C
all of its subcommands (see page 56)
MARGIN K K K K
MINIMUM K K
MAXIMUM K K
SCFRAME include ticks and reference lines in scale calculation
SCANNOTATION include markers, lines, and polygons in scale calculation
TRANSPOSE axes
FRAME (default)
NOFRAME [K]

Regions Subcommands for CHART:
FIGURE [K K K K]
all of its subcommands (see page 60)
DATA [K K K K]
all of its subcommands (see page 60)
LEGEND [K K K K]
all of its subcommands (see page 60)
NOLEGEND
OVERLAY
SAME K [K]
ASPECT K K
## Layouts Commands and Subcommands for CHART:
- **LAYOUT**
  - all of its subcommands (see page 49)
- **ENDLAYOUT**

## File I/O Commands and Subcommands for CHART:
- **GSAVE** save graph in "filename"
- **REPLACE**
- **NOREPLACE**
- **GVIEW** "filename.mgf"
- **GPAUSE** [K]

## HISTOGRAM C or C…C
- **FREQUENCY** or
- **PERCENT** or
- **DENSITY**
- **NINTERVAL** K [K]
- **CUMULATIVE**
- **CUTPOINT** [K…K] or [C]
- **MIDPOINT** [K…K] or [C]

## Data Display Subcommands for HISTOGRAM:
- **SYMBOL** [C…C]
  - all of its subcommands (see page 51)
CONNECT [C...C]
all of its subcommands (see page 51)
PROJECT [C...C]
all of its subcommands (see page 51)
AREA [C...C]
all of its subcommands (see page 51)
BAR [C...C]
all of its subcommands (see page 51)
LOWESS [C...C]
all of its subcommands (see page 51)

Annotation Subcommands for HISTOGRAM:
TITLE "title"
all of its subcommands (see page 53)
FOOTNOTE "footnote"
all of its subcommands (see page 53)
TEXT K K "text"
all of its subcommands (see page 53)
LINE K K ... K K or C C
all of its subcommands (see page 53)
POLYGON K K ... K K or C C
all of its subcommands (see page 53)
MARKER K K ... K K or C C
all of its subcommands (see page 53)
Frame Customization Subcommands for HISTOGRAM:

- **AXIS** K [K K] or C [K K]
  - all of its subcommands (see page 56)
- **TICK** K [K...K or C] or C [K...K or C]
  - all of its subcommands (see page 56)
- **GRID** K or C
  - all of its subcommands (see page 56)
- **REFERENCE** K K...K or K C or C K...K or C C
  - all of its subcommands (see page 56)
- **MARGIN** K K K K
- **MINIMUM** K K
- **MAXIMUM** K K
- **SCFRAME** include ticks and reference lines in scale calculation
- **SCANNOTATION** include markers, lines, and polygons in scale calculation
- **TRANSPOSE** axes

Regions Subcommands for HISTOGRAM:

- **FIGURE** [K K K K]
  - all of its subcommands (see page 60)
- **DATA** [K K K K]
  - all of its subcommands (see page 60)
- **LEGEND** [K K K K]
MINITAB Release 13

all of its subcommands (see page 60)

NOLEGEND
OVERLAY
SAME K [K]
ASPECT K K

Layouts Commands and Subcommands for HISTOGRAM:
LAYOUT
all of its subcommands (see page 49)
ENDLAYOUT

File I/O Commands and Subcommands for HISTOGRAM:
GSAVE save graph in "filename"
REPLACE
NOREPLACE
GVIEW "filename.mgf"
GPAUSE [K]

Core Graphs: Groups and Multiple Graphs

Layouts (for Multiple Graphs in a Window, Text Charts, etc.)
LAYOUT
TITLE "text"
FOOTNOTE "text"
MINITAB Release 13

Session Command Quick Reference

- TEXT K K "text" or C C C
- MARKER K K, ..., K K or C C
- LINE K K, ..., K K or C C
- POLYGON K K, ..., K K or C C
- ASPECT K K
- GSAVE save graph in "filename"
  [other graph commands]
- ENDLAYOUT
## Core Graphs: Displaying Data—Subcommands

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>CONNECT</th>
<th>PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>FONT  K…K or C</td>
<td>TYPE K…K or C</td>
<td>TYPE K…K or C</td>
</tr>
<tr>
<td>TYPE K…K or C or &quot;char…char&quot;</td>
<td>COLOR K…K or C</td>
<td>COLOR K…K or C</td>
</tr>
<tr>
<td>COLOR K…K or C</td>
<td>SIZE K…K or C</td>
<td>SIZE K…K or C</td>
</tr>
<tr>
<td>SIZE K…K or C</td>
<td>STRAIGHT or STEP [K]</td>
<td>STRAIGHT or STEP [K]</td>
</tr>
<tr>
<td>LABELb [&quot;label&quot;…&quot;label&quot; or C]</td>
<td>PLOT only: ORDER K</td>
<td>PLOT only: ORDER K</td>
</tr>
<tr>
<td>TFONT bK</td>
<td>TYPE K…K or C</td>
<td>DIRECTION K</td>
</tr>
<tr>
<td>TCOLOR bK</td>
<td>COLOR K…K or C</td>
<td>BASE K…K or C</td>
</tr>
<tr>
<td>TSIZE bK</td>
<td>SIZE K…K or C</td>
<td></td>
</tr>
<tr>
<td>ANGLE bK</td>
<td>STRAIGHT or STEP [K]</td>
<td></td>
</tr>
<tr>
<td>PLACEMENT bK</td>
<td>BOXPLOT only:</td>
<td></td>
</tr>
<tr>
<td>OFFSET bK</td>
<td>MEDIAN or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>OUTLIER or</td>
<td></td>
</tr>
<tr>
<td></td>
<td>INDIVIDUAL</td>
<td></td>
</tr>
</tbody>
</table>

a. Grouping syntax [C…C] not available for Contour Plots, Response Surface Contour Plots, or Control Charts.
b. Labeling subcommands not available for 3D Graphs or Control Charts.
### Core Graphs: Displaying Data—Subcommands

<table>
<thead>
<tr>
<th>AREA [C...C]</th>
<th>BAR [C...C]</th>
<th>BOX [C] (BOXPLOT only)</th>
<th>LOWESS [C...C]</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TYPE</strong></td>
<td><strong>COLOR</strong></td>
<td><strong>ETYPE</strong></td>
<td><strong>TYPE</strong></td>
</tr>
<tr>
<td><strong>K...K or C</strong></td>
<td><strong>K...K or C</strong></td>
<td><strong>K...K or C</strong></td>
<td><strong>K...K or C</strong></td>
</tr>
<tr>
<td><strong>DIRECTION K</strong></td>
<td><strong>BASE</strong></td>
<td><strong>ETYPE</strong></td>
<td></td>
</tr>
<tr>
<td><strong>K...K or C</strong></td>
<td><strong>K...K or C</strong></td>
<td><strong>K...K or C</strong></td>
<td></td>
</tr>
<tr>
<td><strong>ETYPE</strong></td>
<td><strong>ECOLOR</strong></td>
<td><strong>ESIZE</strong></td>
<td></td>
</tr>
<tr>
<td><strong>K...K or C</strong></td>
<td><strong>K...K or C</strong></td>
<td><strong>K...K or C</strong></td>
<td></td>
</tr>
<tr>
<td><strong>ESIZE</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>K...K or C</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STRAIGHT or</strong></td>
<td><strong>CHART</strong></td>
<td><strong>PROPORTIONAL[K]</strong></td>
<td><strong>TYPE</strong></td>
</tr>
<tr>
<td><strong>STEP [K]</strong></td>
<td><strong>only:</strong></td>
<td></td>
<td><strong>K...K or C</strong></td>
</tr>
<tr>
<td></td>
<td><strong>WIDTH</strong></td>
<td></td>
<td><strong>K...K or C</strong></td>
</tr>
<tr>
<td></td>
<td><strong>K...K or C</strong></td>
<td><strong>CI [K] or</strong></td>
<td><strong>WIDTH</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>CI [K] or</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>RANGE [K]</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>RANGE [K]</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>IQRANGE (default)</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>WHISKER or</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>NOWHISKER</strong></td>
</tr>
</tbody>
</table>
### Core Graphs: Annotating—Subcommands

<table>
<thead>
<tr>
<th>Subcommand</th>
<th>TITLE &quot;text&quot;</th>
<th>FOOTNOTE &quot;footnote&quot;</th>
<th>TEXT K K &quot;text&quot; or C C C</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEFT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CENTER</td>
<td>●</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIGHT</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>TFONT K</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>TCOLOR K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>TSIZE K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>ANGLE K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>PLACEMENT K K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>OFFSET K K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>TYPE K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>COLOR K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>SIZE K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>ETYPE K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>ECOLOR K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>ESIZE K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
</tbody>
</table>
### Core Graphs: Annotating—Subcommands Continued

<table>
<thead>
<tr>
<th>Subcommand</th>
<th>LINE K...K or C C</th>
<th>POLYGON K...K or C C</th>
<th>MARKER K...K or C C</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEFT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CENTER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RIGHT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TFONT K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCOLOR K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TSIZE K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ANGLE K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLACEMENT K K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OFFSET K K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TYPE K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>COLOR K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>SIZE K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>ETYPE K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ECOLOR K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESIZE K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical Placement (2nd argument)</td>
<td>Horizontal Placement (1st argument)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>-1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1</td>
<td>String</td>
<td>String</td>
<td>String</td>
</tr>
<tr>
<td>0</td>
<td>String</td>
<td>String</td>
<td>String</td>
</tr>
<tr>
<td>-1</td>
<td>String</td>
<td>String</td>
<td>String</td>
</tr>
</tbody>
</table>
## Core Graphs: Customizing the Frame—Subcommands

<table>
<thead>
<tr>
<th>Subcommand</th>
<th>AXIS</th>
<th>TICK</th>
<th>REFERENCE</th>
<th>GRID</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>K [K K] or C [K K]</td>
<td>K [K...K or C] or C [K...K or C]</td>
<td>K...K or K C or C</td>
<td>K or C</td>
</tr>
<tr>
<td>SIDE K</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>LABEL [&quot;label&quot;...] or [C]a</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>TFONT K</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>TCOLOR K</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>TSIZE K</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>ANGLE K</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>PLACEMENT K K</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>OFFSET K K</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>TYPEb K or K [K]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>COLORb K or K [K]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>SIZEb K or K [K]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>NUMBER K [K]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>LENGTH K [K]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
<tr>
<td>ORIENTATION K [K]</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td></td>
</tr>
</tbody>
</table>

a. Argument(s) are not optional for REFERENCE.
b. Use K with AXIS and REFERENCE; use K [K] with TICK and GRID.
Core Graphs: Customizing the Frame—Subcommands Continued

FRAME (default)
NOFRAME [K]
MARGIN K K K K
MINIMUM K K
MAXIMUM K K
SCFRAME include ticks and reference lines in scale calculation
SCANNOTATION include markers, lines, and polygons in scale calculation
TRANSPOSE axes

Consult the tables of how the SIDE and PLACEMENT subcommands interact when using AXIS [AXIS with SIDE and PLACEMENT on page 58], TICK [TICK with SIDE and PLACEMENT on page 58], and REFERENCE [REFERENCE with SIDE and PLACEMENT on page 59].
### AXIS with SIDE and PLACEMENT

<table>
<thead>
<tr>
<th>AXIS K</th>
<th>SIDE K</th>
<th>Default for PLACEMENT K K</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0 -1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0 1</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>0 1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0 -1</td>
</tr>
</tbody>
</table>

### TICK with SIDE and PLACEMENT

<table>
<thead>
<tr>
<th>TICK K</th>
<th>SIDE K</th>
<th>Default for PLACEMENT K K</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0 -1&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0 1&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>-1 0</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1 0</td>
</tr>
</tbody>
</table>

*a. For MATRIXPLOT, ticks on the bottom x-axis (TICK 1; SIDE 1) use PLACEMENT -1 1 (text to the lower right of the reference point).

*b. For MATRIXPLOT, ticks on the top x-axis (TICK 1; SIDE 2) use PLACEMENT 1 1 (text to the upper right of the reference point).
### REFERENCE with SIDE and PLACEMENT

<table>
<thead>
<tr>
<th>REFERENCE K</th>
<th>SIDE K</th>
<th>Default for PLACEMENT K K</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0 -1</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>0 1</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>-1 0</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>1 0</td>
</tr>
</tbody>
</table>
### Core Graphs: Controlling Regions—Subcommands

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE K</td>
<td>●</td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>COLOR K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>ETYPE K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>ECOLOR K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>ESIZE K</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>CLIP</td>
<td>(default)</td>
<td>(default)</td>
<td>●</td>
</tr>
<tr>
<td>NOCLIP</td>
<td>●</td>
<td>●</td>
<td>(default)</td>
</tr>
<tr>
<td>TFONT K</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>TCOLOR K</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>TSIZE K</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>ANGLE K</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>PLACEMENT K</td>
<td></td>
<td></td>
<td>●</td>
</tr>
<tr>
<td>OFFSET K K</td>
<td></td>
<td></td>
<td>●</td>
</tr>
</tbody>
</table>

Core Graphs: Controlling Regions—Subcommands Continued

- NOLEGEN
- OVERLAY
- SAME K K
- ASPECT K K
3D Graphs

PLTX C*C*C

Data Display Subcommands for PLTX:
- SYMBOL [C...C]
  all of its subcommands except LABEL (see page 51)
- PROJECT [C...C]
  all of its subcommands (see page 51)

Annotation Subcommands for PLTX:
- TITLE "title"
  all of its subcommands (see page 53)
- FOOTNOTE "footnote"
  all of its subcommands (see page 53)

Regions Subcommands for PLTX:
- LEGEND [K K K K]
  all of its subcommands (see page 60)
- NOLEGEND
- ASPECT K K

Layouts Commands and Subcommands for HISTOGRAM:
- LAYOUT
  all of its subcommands (see page 49)
- ENDLAYOUT
3D Effects (Graph Viewing Tools) Subcommands for PLTX:

VPOSITION K K K
VTARGET K K K
VUP K K K
VFIELD K K
VPROJECTION K
VASPECT [K K K]
VBOX K

3D Lighting and Rendering Tools Subcommands for PLTX:

HSREMOVAL K

File I/O Commands and Subcommands for PLTX:

GSAVE save graph in "filename"
REPLACE
NOREPLACE
GVIEW "filename.mgf"
GPAUSE [K]

SURFACEPLOT C=C=C (3D Wireframe menu command with different settings)
REGULAR
IRREGULAR [K]
NMESH K K
MESH K K...K or K C
SURFACE
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE K</td>
<td></td>
</tr>
<tr>
<td>COLOR K</td>
<td></td>
</tr>
<tr>
<td>ETYYPE K</td>
<td></td>
</tr>
<tr>
<td>ECOLOR K</td>
<td></td>
</tr>
<tr>
<td>ESIZE K</td>
<td></td>
</tr>
<tr>
<td>SYMBOL [C...C]</td>
<td>all of its subcommands (see page 51)</td>
</tr>
<tr>
<td>PROJECT [C...C]</td>
<td>all of its subcommands (see page 51)</td>
</tr>
<tr>
<td>TITLE &quot;title&quot;</td>
<td>all of its subcommands (see page 53)</td>
</tr>
<tr>
<td>FOOTNOTE &quot;footnote&quot;</td>
<td>all of its subcommands (see page 53)</td>
</tr>
<tr>
<td>VPOSITION K K K</td>
<td>3D Effects (Graph Viewing Tools) Subcommands for SURFACEPLOT:</td>
</tr>
<tr>
<td>VTARGET K K K</td>
<td></td>
</tr>
<tr>
<td>VUP K K K</td>
<td></td>
</tr>
<tr>
<td>VFIELD K K</td>
<td></td>
</tr>
<tr>
<td>VPROJECTION K</td>
<td></td>
</tr>
</tbody>
</table>
VASPECT [K K K]
VBOX K

3D Lighting and Rendering Tools Subcommands for SURFACEPLOT:
HSREMOVAL K
LSHADING K [K]
LIGHT K K K
COLOR K
VISIBILITY K
LBRIGHT K

File I/O Commands and Subcommands for SURFACEPLOT:
GSAVE save graph in "filename"
REPLACE
NOREPLACE
GVIEW "filename.mgf"
GPAUSE [K]
## Make Mesh Data

%MESH C K K C K K
NXMESH K
NYMESH K
FUNCTION K to create z data, store in C
PARAMS for function are K...K

For %MESH’s FUNCTION subcommand 1st argument (K):

<table>
<thead>
<tr>
<th>Function Number</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>1001</td>
<td>Bivariate Normal</td>
</tr>
<tr>
<td>1002</td>
<td>Bowl</td>
</tr>
<tr>
<td>1003</td>
<td>Cone</td>
</tr>
<tr>
<td>1004</td>
<td>Cowboy Hat</td>
</tr>
<tr>
<td>1005</td>
<td>Egg Carton</td>
</tr>
<tr>
<td>1006</td>
<td>Hemisphere</td>
</tr>
<tr>
<td>1007</td>
<td>Hill and Dale</td>
</tr>
<tr>
<td>1008</td>
<td>Saddle</td>
</tr>
<tr>
<td>1009</td>
<td>Wave</td>
</tr>
</tbody>
</table>
Specialty Graphs (%graphs)

%DOTPLOT C...C
   BY C
   ONEPAGE 'string'
   TITLE K
   SIZE K [session command only]
   GSAVE filename [session command only]

%PIE C
   COUNTS C
   START K
   EXPLODE K...K
   ORDER K
   COMBINE K
   NOMISS K
   LABEL K
   LINES C
   TYPES C
   COLORS C
   NOCOLOR C
   TITLE "text"
   GSAVE "file"
%MARGPLOT C C
  OPTION K
  MARGIN K
  XLABEL "label"
  YLABEL "label"
  XTICK K...K
  YTICK K...K
  YBIN K...K
  XBIN K...K
  YMIN K
  YMAX K
  XMIN K
  XMAX K
  TYPE K
  COLOR K
  SIZE K
  LABEL K
  XANGLE K
  XOFFSET K
  TITLE "text"
  GSAVE "file"
%QQPLOT C...C
FREQUENCY are in C...C
BY C

**Probability Plot Options**

- **MKM**: plot positions determined by modified Kaplan-Meier method
- **KM**: plot positions determined by Kaplan-Meier method
- **HJ**: plot positions determined by Herd-Johnson method
- **ALLPT**: plot all points when there are tied failure times
- **AVEPT**: plot average (median) of tied points when there are tied failure times
- **MAXPT**: plot maximum of tied points when there are tied failure times

**Distributions**

- **WEIBULL**: distribution
- **EXTVALUE**: (extreme value) distribution
- **EXPONENTIAL**: distribution
- **LOGISTIC**: distribution
- **LLOGISTIC**: (loglogistic) distribution
- **NORMAL**: distribution
- **LGNEXP**: (lognormal base EXP) distribution
- **LGNTEN**: (lognormal base TEN) distribution
**Estimation Options**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MLE</strong></td>
<td>maximum likelihood</td>
</tr>
<tr>
<td><strong>LSXY</strong></td>
<td>least squares (failure time (X) versus rank (Y))</td>
</tr>
<tr>
<td><strong>PTILES</strong></td>
<td>are in K...K</td>
</tr>
<tr>
<td><strong>CONFIDENCE</strong></td>
<td>level is K</td>
</tr>
<tr>
<td><strong>CI</strong></td>
<td>display confidence intervals on plot</td>
</tr>
<tr>
<td><strong>TABLE</strong></td>
<td>display percentiles in Session window</td>
</tr>
<tr>
<td><strong>TITLE</strong></td>
<td>for graph is &quot;text&quot;</td>
</tr>
<tr>
<td><strong>GSAVE</strong></td>
<td>save graph in &quot;file&quot;</td>
</tr>
</tbody>
</table>

**Other %Graphs on page**

<table>
<thead>
<tr>
<th>Command</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>%DESCRIBE</td>
<td>89</td>
</tr>
<tr>
<td>%NORMPLOT</td>
<td>94</td>
</tr>
<tr>
<td>%FITLINE</td>
<td>97</td>
</tr>
<tr>
<td>%RESPLT</td>
<td>101</td>
</tr>
<tr>
<td>%ANOM</td>
<td>102</td>
</tr>
<tr>
<td>%BANOM</td>
<td>102</td>
</tr>
<tr>
<td>%PANOM</td>
<td>103</td>
</tr>
<tr>
<td>%VARTEST</td>
<td>106</td>
</tr>
<tr>
<td>%INTPLOT</td>
<td>106</td>
</tr>
<tr>
<td>%MAIN</td>
<td>107</td>
</tr>
<tr>
<td>%INTERACT</td>
<td>108</td>
</tr>
</tbody>
</table>
%TREND  117
%DECOMP  117
%MA  118
%SES  119
%DES  120
%WINTMULT  120
%WINTADD  121
%ACF  122
%PACF  122

Quality Control:
%RRUN  129
%PARETO  129
%FISHBONE  130
%MULTVAR  130
%SYM PLOT  131
%GAGEAOV  131
%GAGEXBR  132
%GAGERUN  132
%GAGENEST  133
%GAGELIN  133
%RXBARR  137
%RXBARS  137
%IMRCHART  139
<table>
<thead>
<tr>
<th>Command</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>%RCUSUM</td>
<td>141</td>
</tr>
<tr>
<td>%RZONE</td>
<td>142</td>
</tr>
<tr>
<td>%ZMRCHART</td>
<td>143</td>
</tr>
<tr>
<td>%WBCHART</td>
<td>143</td>
</tr>
<tr>
<td>%RCAPA</td>
<td>156</td>
</tr>
<tr>
<td>%BWCAPA</td>
<td>160</td>
</tr>
<tr>
<td>%WCAPA</td>
<td>161</td>
</tr>
<tr>
<td>%RSIXPACK</td>
<td>161</td>
</tr>
<tr>
<td>%BWSIXPAC</td>
<td>163</td>
</tr>
<tr>
<td>%WSIXPAC</td>
<td>163</td>
</tr>
<tr>
<td>%BCAPA</td>
<td>164</td>
</tr>
<tr>
<td>%PCAPA</td>
<td>164</td>
</tr>
<tr>
<td>%LDOVIEW</td>
<td>165</td>
</tr>
<tr>
<td>%LDOVIEWA</td>
<td>166</td>
</tr>
<tr>
<td>%LDIDENT</td>
<td>167</td>
</tr>
<tr>
<td>%LDIDENTA</td>
<td>170</td>
</tr>
<tr>
<td>%FFMAIN</td>
<td>188</td>
</tr>
<tr>
<td>%FFINT</td>
<td>188</td>
</tr>
<tr>
<td>%FFCUBE</td>
<td>189</td>
</tr>
<tr>
<td>%GFMAIN</td>
<td>189</td>
</tr>
</tbody>
</table>
### Commands for Saving and Displaying Graphs

(any graph command)

<table>
<thead>
<tr>
<th>Command</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>GSAVE</td>
<td>189</td>
</tr>
<tr>
<td>REPLACE</td>
<td>210</td>
</tr>
<tr>
<td>NOREPLACE</td>
<td>212</td>
</tr>
<tr>
<td>GVIEW</td>
<td>213</td>
</tr>
<tr>
<td>GPAUSE</td>
<td>215</td>
</tr>
<tr>
<td>%PREDICT</td>
<td>217</td>
</tr>
</tbody>
</table>

- **GSAVE** ["filename"] (a subcommand of all graph commands)
- **REPLACE** (not available for %graphs)
- **NOREPLACE** (not available for %graphs)
- **GVIEW** ["filename.mgf"] (if filename is not specified, display "Minitab.mgf")
- **GPAUSE** in multiple graph command, pause display of each graph until user presses a key [or for K seconds]

### Printing Graphs

- **GPRINT** with no arguments print the newest Graph window
# Standard Argument Values

<table>
<thead>
<tr>
<th>Symbol Types</th>
<th>0 None</th>
<th>1 □</th>
<th>2 ○</th>
<th>3 ×</th>
<th>4 □</th>
<th>5 (dot)</th>
<th>6 ●</th>
<th>7 ◌</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>8 ♦</td>
<td>9 □</td>
<td>10 ♦</td>
<td>11 □</td>
<td>12 □</td>
<td>13 □</td>
<td>14 ♦</td>
<td>15 ♦</td>
</tr>
<tr>
<td></td>
<td>16 ◆</td>
<td>17 ◆</td>
<td>18 ◆</td>
<td>19 ◆</td>
<td>20 ◆</td>
<td>21 ◆</td>
<td>22 ◆</td>
<td>23 ◆</td>
</tr>
<tr>
<td></td>
<td>24 ▲</td>
<td>25 ▲</td>
<td>26 ▲</td>
<td>27 ▲</td>
<td>28 ▲</td>
<td>29 ▲</td>
<td>30 ▲</td>
<td>31 ▲</td>
</tr>
</tbody>
</table>
### Colors

<table>
<thead>
<tr>
<th>Code</th>
<th>Color Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>null (background color)</td>
</tr>
<tr>
<td>1</td>
<td>black (foreground color)</td>
</tr>
<tr>
<td>2</td>
<td>red</td>
</tr>
<tr>
<td>3</td>
<td>green</td>
</tr>
<tr>
<td>4</td>
<td>blue</td>
</tr>
<tr>
<td>5</td>
<td>cyan</td>
</tr>
<tr>
<td>6</td>
<td>magenta</td>
</tr>
<tr>
<td>7</td>
<td>yellow</td>
</tr>
<tr>
<td>8</td>
<td>dark red</td>
</tr>
<tr>
<td>9</td>
<td>dark green</td>
</tr>
<tr>
<td>10</td>
<td>dark blue</td>
</tr>
<tr>
<td>11</td>
<td>dark cyan</td>
</tr>
<tr>
<td>12</td>
<td>dark magenta</td>
</tr>
<tr>
<td>13</td>
<td>dark yellow</td>
</tr>
<tr>
<td>14</td>
<td>dark gray</td>
</tr>
<tr>
<td>15</td>
<td>light gray</td>
</tr>
</tbody>
</table>

### Fill Types

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>null (transparent)</td>
</tr>
<tr>
<td>1</td>
<td>solid background</td>
</tr>
<tr>
<td>2</td>
<td>right hatch foreground</td>
</tr>
<tr>
<td>3</td>
<td>left hatch foreground</td>
</tr>
<tr>
<td>4</td>
<td>right &amp; left hatch foreground</td>
</tr>
<tr>
<td>5</td>
<td>horizontal hatch foreground</td>
</tr>
<tr>
<td>6</td>
<td>vertical hatch foreground</td>
</tr>
<tr>
<td>7</td>
<td>horizontal &amp; vertical hatch foreground</td>
</tr>
<tr>
<td>8</td>
<td>grid foreground</td>
</tr>
<tr>
<td>9</td>
<td>squared foreground</td>
</tr>
</tbody>
</table>
### Fonts

<table>
<thead>
<tr>
<th>Value</th>
<th>Font Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>Times New Roman</td>
</tr>
<tr>
<td>2</td>
<td>Arial</td>
</tr>
<tr>
<td>3</td>
<td>Courier New</td>
</tr>
<tr>
<td>4</td>
<td>Symbol</td>
</tr>
<tr>
<td>5</td>
<td>Wingdings</td>
</tr>
<tr>
<td>6</td>
<td>all installed TrueType fonts (in alphabetical order)</td>
</tr>
</tbody>
</table>

### Line Types

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>null (invisible)</td>
</tr>
<tr>
<td>1</td>
<td>solid</td>
</tr>
<tr>
<td>2</td>
<td>dash</td>
</tr>
<tr>
<td>3</td>
<td>dot</td>
</tr>
<tr>
<td>4</td>
<td>dash 1-dot</td>
</tr>
<tr>
<td>5</td>
<td>dash 2-dots</td>
</tr>
<tr>
<td>6</td>
<td>dash 3-dots</td>
</tr>
<tr>
<td>7</td>
<td>long dashes</td>
</tr>
</tbody>
</table>
Figure/Page Unit Coordinate Grid
Character Graphs

Character (or typewriter-style) graphs display in the Session window and do not use any of the graphics subcommands described previously. You can save character graphs by saving the Session window contents; to save, make the Session window active and choose File ➤ Save Window As.

In the Session window or Command Line Editor, type the command GSTD (standard graphics) to enable character graphs. To re-enable high-resolution (professional graphics) commands, type GPRO. DOTPLOT and STEM-AND-LEAF character graphs are available in GSTD and GPRO mode. When you produce graphs through the menus, MINITAB switches modes automatically.

GSTD enable character graphics
GPRO enable high-resolution graphics

HISTOGRAM C...C
  INCREMENT = K
  START at K [end at K]
  BY C
  SAME scales for all columns

DOTPLOT C...C
  INCREMENT = K
  START at K [end at K]
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BY C</td>
<td>Scales for all columns</td>
</tr>
<tr>
<td>SAME</td>
<td></td>
</tr>
<tr>
<td>STEM-AND-LEAF C</td>
<td>Display of C...C</td>
</tr>
<tr>
<td>TRIM</td>
<td>Outliers</td>
</tr>
<tr>
<td>INCREMENT = K</td>
<td></td>
</tr>
<tr>
<td>BY C</td>
<td></td>
</tr>
<tr>
<td>BOXPLOT for C</td>
<td></td>
</tr>
<tr>
<td>INCREMENT = K</td>
<td></td>
</tr>
<tr>
<td>START at K [end at K]</td>
<td></td>
</tr>
<tr>
<td>BY C</td>
<td></td>
</tr>
<tr>
<td>LINES = K</td>
<td></td>
</tr>
<tr>
<td>NOTCH [K% confidence] sign c.i.</td>
<td></td>
</tr>
<tr>
<td>LEVELS K...K</td>
<td></td>
</tr>
<tr>
<td>PLOT C vs. C</td>
<td></td>
</tr>
<tr>
<td>SYMBOL = 'symbol'</td>
<td></td>
</tr>
<tr>
<td>TITLE = 'text'</td>
<td></td>
</tr>
<tr>
<td>FOOTNOTE = 'text'</td>
<td></td>
</tr>
<tr>
<td>YLABEL = 'text'</td>
<td></td>
</tr>
<tr>
<td>XLABEL = 'text'</td>
<td></td>
</tr>
<tr>
<td>YINCREMENT = K</td>
<td></td>
</tr>
<tr>
<td>YSTART at K [end at K]</td>
<td></td>
</tr>
<tr>
<td>XINCREMENT = K</td>
<td></td>
</tr>
<tr>
<td>XSTART at K [end at K]</td>
<td></td>
</tr>
</tbody>
</table>

Note: Single quotes must be used around text strings with these subcommands.
MPLOT C vs. C, and C vs. C, and... C vs. C
TITLE = 'text' FOOTNOTE = 'text' YLABEL = 'text' XLABEL = 'text'
YINCREMENT = K YSTART at K [end at K] XINCREMENT = K XSTART at K [end at K]

Note Single quotes must be used around text strings with these subcommands.

L PLOT C vs. C using tags in C
TITLE = 'text' FOOTNOTE = 'text' YLABEL = 'text' XLABEL = 'text'
YINCREMENT = K YSTART at K [end at K] XINCREMENT = K XSTART at K [end at K]

Note Single quotes must be used around text strings with these subcommands.

T PLOT y in C vs. x in C vs. z in C
TITLE = 'text' FOOTNOTE = 'text' YLABEL = 'text' XLABEL = 'text'
YINCREMENT = K

Note Single quotes must be used around text strings with these subcommands.
YSTART at K [end at K]
XINCREMENT = K
XSTART at K [end at K]

TS PLOT [period K] of C
 ORIGIN = K
 INCREMENT = K
 START at K [end at K]
 TSTART at K [end at K]

MTS PLOT [period K] of C…C
 ORIGIN = K
 ORIGIN = K for C…C … origin K for C…C
 INCREMENT = K
 START at K [end at K]
 TSTART at K [end at K]

GRID C [from K to K] C [from K to K]

CONTOUR C vs. C and C
 BLANK bands between letters

YSTART = K [up to K]
YINCREMENT = K

WIDTH of all character plots is K spaces globally
HEIGHT of all character plots is K lines globally
Global and Local Macros (%macros)

Global and local macros use the default file extension MAC and are invoked using the symbol %. You can include a path statement after %.

To execute a global macro, type
  %filename (e.g. %mymacro or %c:\research\mymacro)

To execute a local macro, type
  %filename arguments;
  subcommandname arguments;
  ...
  subcommandname arguments.
## Global Macro Format

<table>
<thead>
<tr>
<th>Format Elements</th>
<th>Example of ANALYZE.MAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>GMACRO command</td>
<td>GMACRO</td>
</tr>
<tr>
<td><strong>template</strong> (macro name, usually the same as the macro file name)</td>
<td>Analyze</td>
</tr>
<tr>
<td>body of macro</td>
<td>NAME C1 = ‘Yield’ C2 = ‘Chem1’ &amp; C5 = ‘Ln.Yield’ REGRESS C5 2 C1 C2</td>
</tr>
<tr>
<td>ENDMACRO command</td>
<td>ENDMACRO</td>
</tr>
<tr>
<td>Invoked by typing...</td>
<td>%ANALYZE</td>
</tr>
</tbody>
</table>
### Local Macro Format

<table>
<thead>
<tr>
<th>Format Elements</th>
<th>Example of GEN2.MAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>MACRO command</td>
<td>MACRO</td>
</tr>
<tr>
<td>template</td>
<td>GEN2 MEDIANS;</td>
</tr>
<tr>
<td></td>
<td>OBS M.</td>
</tr>
<tr>
<td>declaration statements</td>
<td>MCOLUMN X.1-X.M MEDIANS</td>
</tr>
<tr>
<td></td>
<td>MCONSTANT M</td>
</tr>
<tr>
<td>DEFAULT statement (to be used if user does not enter a value for an argument)</td>
<td>DEFAULT M = 5</td>
</tr>
<tr>
<td>body of macro</td>
<td>RANDOM 100 X.1-X.M</td>
</tr>
<tr>
<td></td>
<td>RMEDIAN X.1-X.M MEDIANS</td>
</tr>
<tr>
<td>ENDMACRO statement</td>
<td>ENDMACRO</td>
</tr>
<tr>
<td>Invoked by typing...</td>
<td>%GEN2 C1-C5;</td>
</tr>
<tr>
<td></td>
<td>OBS 10.</td>
</tr>
</tbody>
</table>
Declaration Statements for Local Macros

MCONSTANT  list of variables that are constants
MCOLUMN    list of variables that are columns
MMATRIX    list of variables that are matrices
MFREE      list of variables, type determined when macro executed
DEFAULT    argument = value … argument = value

Variables in Local Macros

KKCAT       K K K  (combine the text in the first two K's, store combined text in the third K; all K's are text constants)
KKNAME      K C, K C, … (store the text constant K in column C)
KKSET       K "text", K "text", … (store the text in the text constant K)
MTYPE       variablename K (local macros only: if variable is a constant returns K = 1; if a column K = 2; if a matrix K = 3)
DTYPE E K returns the data type of a column or constant
LET function version:
   LET K1 = DTYPE(K2) stores the type for K2 in K1

Control Statements for Global and Local Macros

IF         logical expression (same as for LET)
ELSEIF     logical expression
ELSE       logical expression
ENDIF      logical expression
DO         K = list of numbers
MINITAB Release 13

Session Command Quick Reference

ENDDO
WHILE logical expression
ENDWHILE
NEXT transfers control to beginning of DO or WHILE loop
BREAK goes to the command that follows a DO or WHILE loop
GOTO number
MLABEL number
CALL template (calls a subroutine in the same file)
RETURN ends subroutine and returns control to main macro
EXIT stop macro, return to MINITAB session
PAUSE transfers control from macro to keyboard
RESUME returns control to the macro

Using DOS Commands
CD [path] change directory
DIR [path] list file names
TYPE "[path]filename.ext" displays a file

Labeling Output of Global and Local Macros
TITLE (default; displays output titles in Session window)
NOTITLE suppress output titles in Session window
WTITLE "title" for Graph window
Debugging Tools for Global and Local Macros

- **ECHO** displays macro commands in Session window during execution
- **NOECHO** (default)
- **DEBUG** tells how the macro is processing
- **NODEBUG** (default)
- **TYPE** "[path]filename.ext" displays a file
- **PAUSE** transfers control from macro to keyboard
- **RESUME** transfers control from keyboard back to macro

Handling Errors in Macros

- **PLUG** macro keeps going when it finds an error
- **NOPLUG** (default)
- **MRESET** restore environment settings after macro runs
- **INFO** displays summary of local worksheet
- **SWAP** fit macro into available memory
- **NOSWAP** (default)

Additional Local Macro Features

- **WRITE** ["filename"] C...C stores indicated local worksheet columns in a text file
- **INFO** displays summary of local worksheet
Commands that Affect Output

BRIEF = K controls amount of output from ARIMA, BBDESIGN, CCDESIGN, CLUOBS, CLUVARs, DISCRIMINANT, EVDESIGN, FACTOR, FFACtorIAL, FFDESIGN, GLM, KMEANS, LREGRESSION, LTABLE, LTEST, MIXREG, OPTDES, PROBIT, REGRESS, RLINE, RSREG, SCDesign, and SLDESIGN.

OH K (default = 0; controls pausing of output in Session window)

GPAUSE [K]

GPRINT with no arguments prints the newest Graph window.

GScale K = minimum data value K = maximum data value

Nminimum K = minimum number of ticks to use

Nmaximum K = maximum number of ticks to use

NTICKS store number of ticks in K

Tminimum store minimum tick value in K

Tmaximum store maximum tick value in K

Tincrement store distance between ticks in K

Sminimum store minimum scale value in K

Smaximum store maximum scale value in K

any graphics command

NOBRUSH disable brushing on the resulting graph
Communicating with Macro Users
READ, SET, or INSERT
FILE "TERMINAL"
NOTE [comment] (displays blank lines or messages)
YESNO K (returns K = 1 if user responds "Yes", K = 0 for "No")
PAUSE transfers control from macro to keyboard
RESUME transfers control from keyboard back to macro

Execs
Execs use the default file extension MTB and are invoked using the command EXECUTE.

EXECUTE ["filename"] [K times] (default filename = MINITAB.MTB)
ECHO display the commands that follow
NOECHO do not display the commands that follow (default)
YESNO store response ("Yes" = 1, "No" = 0) in K

Looping Through Columns and Matrices
Use the CK syntax to use a constant to specify a column number. If K1 = 3, then CK1 = C3; if K2 = 16, then CK2 = C16. Specify a matrix using the MK syntax.
Here is an example of an Exec called PLOTS.MTB that uses CK:
PLOT C21 * CK1
LET K1 = K1 + 1

Start the Exec and generate 20 plots by typing:
LET K1 = 1
EXECUTE "PLOTS" 20

Canceling a %Macro or Exec

To cancel Press Ctrl+BREAK.

Basic Statistics

DESCRIBE variables in C...C
  BY levels in C
  GHISTOGRAM display histogram for each variable
  GNHISTOGRAM display histogram with a normal curve for each variable
  GDOTPLOT display dotplot for each variable
  GBOXPLOT display boxplot for each variable

%DESCRIBE variables in C...C
  BY levels in C
  CONFIDENCE level is K
  TITLE for graph is "text"
  GSAVE save graph in "filename"
MINITAB Release 13
Session Command Quick Reference

STATS [C...C]

Control of the grouping:
BY C...C
NOEMPTY
MISSINGS

Storage of group information:
GLABELS C...C
GVALUES C...C
GIDS C...C

Storage of statistics:
MEAN C...C
SEMEAN C...C
STDEVIATIONS C...C
VARIANCE C...C
QONE C...C
MEDIAN C...C
QTHREE C...C
IQRANGE C...C
sums C...C
MINIMUMS C...C
MAXIMUMS C...C
RANGE C...C
MINITAB Release 13  
Session Command Quick Reference

N C...C
NMISSING C...C
COUNT C...C
CUMN C...C
PERCENT C...C
CUMPERCENT C...C
SSQ C...C
SKEWNESS C...C
KURTOSIS C...C
MSSD C...C
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ONEZ</strong></td>
<td>C one-sample Z-test and confidence interval</td>
</tr>
<tr>
<td>SIGMA</td>
<td>K</td>
</tr>
<tr>
<td>TEST</td>
<td>K</td>
</tr>
<tr>
<td>ALTERNATIVE</td>
<td>= K</td>
</tr>
<tr>
<td>CONFIDENCE</td>
<td>K</td>
</tr>
<tr>
<td>GHISTOGRAM</td>
<td>display histogram for each variable</td>
</tr>
<tr>
<td>GDOTPLOT</td>
<td>display dotplot for each variable</td>
</tr>
<tr>
<td>GBOXPLOT</td>
<td>display boxplot for each variable</td>
</tr>
<tr>
<td><strong>ONET</strong></td>
<td>C one-sample t-test and confidence interval</td>
</tr>
<tr>
<td>TEST</td>
<td>K</td>
</tr>
<tr>
<td>ALTERNATIVE</td>
<td>= K</td>
</tr>
<tr>
<td>CONFIDENCE</td>
<td>K</td>
</tr>
<tr>
<td>GHISTOGRAM</td>
<td>display a histogram</td>
</tr>
<tr>
<td>GDOTPLOT</td>
<td>display a dotplot</td>
</tr>
<tr>
<td>GBOXPLOT</td>
<td>display a boxplot</td>
</tr>
<tr>
<td><strong>TWOSAMPLE</strong></td>
<td>test and c.i. [K% confidence] samples in C C</td>
</tr>
<tr>
<td>ALTERNATIVE</td>
<td>= K</td>
</tr>
<tr>
<td>POOLED</td>
<td>procedure</td>
</tr>
<tr>
<td>GDOTPLOT</td>
<td>display a dotplot</td>
</tr>
<tr>
<td>GBOXPLOT</td>
<td>display a boxplot</td>
</tr>
<tr>
<td><strong>TWOT</strong></td>
<td>test and c.i. [K% confidence] data in C, groups in C</td>
</tr>
<tr>
<td>ALTERNATIVE</td>
<td>= K</td>
</tr>
<tr>
<td>POOLED</td>
<td>procedure</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>GDOTPLOT</td>
<td>display a dotplot</td>
</tr>
<tr>
<td>GBOXPLOT</td>
<td>display a boxplot</td>
</tr>
<tr>
<td>PAIR</td>
<td>C C</td>
</tr>
<tr>
<td></td>
<td>CONFIDENCE K</td>
</tr>
<tr>
<td></td>
<td>ALTERNATIVE = K</td>
</tr>
<tr>
<td></td>
<td>TEST K</td>
</tr>
<tr>
<td></td>
<td>GHISTOGRAM display a histogram</td>
</tr>
<tr>
<td></td>
<td>GDOTPLOT display a dotplot</td>
</tr>
<tr>
<td></td>
<td>GBOXPLOT display a boxplot</td>
</tr>
<tr>
<td>PONE</td>
<td>C…C or K K…K</td>
</tr>
<tr>
<td></td>
<td>CONFIDENCE K</td>
</tr>
<tr>
<td></td>
<td>ALTERNATIVE = K</td>
</tr>
<tr>
<td></td>
<td>TEST K</td>
</tr>
<tr>
<td></td>
<td>USEZ</td>
</tr>
<tr>
<td>PTWO</td>
<td>C C or K K K K</td>
</tr>
<tr>
<td></td>
<td>CONFIDENCE K</td>
</tr>
<tr>
<td></td>
<td>ALTERNATIVE = K</td>
</tr>
<tr>
<td></td>
<td>TEST K</td>
</tr>
<tr>
<td></td>
<td>STACKED procedure</td>
</tr>
<tr>
<td></td>
<td>POOLED procedure</td>
</tr>
<tr>
<td>%VARTEST</td>
<td>test C C for equal variances</td>
</tr>
<tr>
<td>UNSTACKED</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CONFIDENCE level is K</td>
</tr>
</tbody>
</table>
MINITAB Release 13

STDEVS store in C
VARIANCES store in C
UPPER store in C
LOWER store in C
NOTABLE suppress table of standard deviations and confidence limits
TITLE for graph is K or "text"
GSAVE save graph in K or "filename"

CORRELATION between C...C [put into M]
NOPVALUES suppresses display of p-values
COVARIANCE between C...C [put into M]
%NORMPLOT C
PROBS C
SWTEST Ryan-Joiner goodness-of-fit test (sim. to Shapiro-Wilk)
KSTEST Kolmogorov-Smirnov goodness-of-fit test
TITLE for graph is "text"
GSAVE save graph in "filename"

Regression

REGRESS C on K predictors C...C
CONSTANT fit y-intercept (default)
NOCONSTANT do not fit y-intercept
WEIGHTS are in C
SRESIDUALS put into C
FITS put into C
MSE put into K
COEFFICIENTS put into C
XPXINV put into M
RMATRIX put into M
HI put into C (leverage)
RESIDUALS put into C (observed - fit)
TRESIDUALS put into C (deleted Studentized)
COOKD put into C (Cook's distance)
DFITS put into C
PREDICT for E...E
CONFIDENCE level is K
PFITS put fits into C
PSDFITS put standard deviation of fits into C
CLIMITS put confidence limits into C C
PLIMITS put prediction limits into C C
VIF display variance inflation factor
DW display Durbin-Watson statistic
PURE perform pure error lack-of-fit test
XLOF perform experimental lack-of-fit test
RTYPE plot residual type K
GHISTOGRAM display histogram of residuals
GNORMAL display normal plot of residuals
### MINITAB Release 13 Session Command Quick Reference

**GFITS** plot residuals versus fits  
**GORDER** plot residuals versus order  
**GVARIABLE** plot residuals versus C\_\_C  
**TOLERANCE** K [K]  
**BRIEF** output code K  
**STEPWISE** regress C on predictors C\_\_C  
**CONSTANT** fit y-intercept (default)  
**NOCONSTANT** do not fit y-intercept  
**FENTER** = K (default is 4)  
**FREMOVE** = K (default is 4)  
**FORCE** C\_\_C  
**ENTER** C\_\_C  
**REMOVE** C\_\_C  
**BEST** K alternative predictors  
**STEPS** = K (default depends on output width)  
**FORWARD** sets F-to-remove to 0 and alpha-to-remove to 1  
**BACKWARD** F-to-enter to 10**18 and alpha-to-enter to 0  
**AENTER** K alpha-to-enter  
**AREMOVE** K alpha-to-remove  
**BREG** C on predictors C\_\_C  
**CONSTANT** fit y-intercept (default)  
**NOCONSTANT** do not fit y-intercept  
**INCLUE** predictors C\_\_C in all models
BEST  K models
NVARS  [up to K]
NOWARN suppress warning for model with many predictors
%FITLINE regress y in C on the predictor in C
POLY  order of polynomial is K
LOGY  use log transformation on response
LOGX  use log transformation on predictor
LOGSCALE display log scale for transformed variables
FITS  put fits into C
RESIDUALS put residuals into C
LFITS  put log-transformed fits into C
LRES  put residuals of log-transformed response into C
COEFFICIENTS put regression coefficients into C
CI  display confidence bands
PI  display prediction bands
CONFIDENCE level is K
TITLE for graph is "text"
GSAVE save graph in "filename"
CONSTANT fit y-intercept in REGRESS, STEPWISE, and BREG commands that follow
NOCONSTANT do not fit y-intercept in REGRESS, STEPWISE, and BREG commands that follow
BRIEF output code K
BLOGISTIC model

FREQUENCY are in C
ST response is number of successes and trials
SF response is number of successes and failures
FT response is number of failures and trials
LOGIT link function
NORMIT link function
GOMPIT link function
FACTORS are in C...C
REFERENCE level or event for C is K, ..., C K
GPDCHISQUARE plot delta chi-square vs event probability
GPDEViance plot delta deviance vs event probability
GPDSBETA plot delta beta (standardized) vs event probability
GPDBETA plot delta beta vs event probability
GHDCHEISQUARE plot delta chi-square vs leverage
GHDEViance plot delta deviance vs leverage
GHDSBETA plot delta beta (standardized) vs leverage
GHDBETA plot delta beta vs leverage
PRESIDUALS put in C
SPRESIDUALS put in C
DRESIDUALS put in C
DCHISQUARE put in C
DDEViance put in C
DSBETA put in C
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DBETA</td>
<td>put in C</td>
</tr>
<tr>
<td>HI</td>
<td>put in C</td>
</tr>
<tr>
<td>EPROBABILITY</td>
<td>put in C [C]</td>
</tr>
<tr>
<td>NOCCUR</td>
<td>put in C [C]</td>
</tr>
<tr>
<td>NTRIALS</td>
<td>put in C</td>
</tr>
<tr>
<td>COEFFICIENTS</td>
<td>put in C</td>
</tr>
<tr>
<td>SECOEFFICIENTS</td>
<td>put in C</td>
</tr>
<tr>
<td>XPWXINVERSE</td>
<td>put in M</td>
</tr>
<tr>
<td>LOGLIKELIHOOD</td>
<td>put in K</td>
</tr>
<tr>
<td>HOSMER</td>
<td>number of groups is K</td>
</tr>
<tr>
<td>BRIEF</td>
<td>output code K</td>
</tr>
<tr>
<td>STEP</td>
<td>display log-likelihood for each iteration</td>
</tr>
<tr>
<td>ITERATION</td>
<td>maximum number is K</td>
</tr>
<tr>
<td>START</td>
<td>values in C</td>
</tr>
<tr>
<td>CTOLERANCE</td>
<td>convergence criteria is K K</td>
</tr>
<tr>
<td>TOLERANCE</td>
<td>level is K [K]</td>
</tr>
<tr>
<td>OLOGISTIC</td>
<td>model</td>
</tr>
<tr>
<td>FREQUENCY</td>
<td>counts are in C</td>
</tr>
<tr>
<td>LOGIT</td>
<td>link function</td>
</tr>
<tr>
<td>NORMIT</td>
<td>link function</td>
</tr>
<tr>
<td>GOMPIT</td>
<td>link function</td>
</tr>
<tr>
<td>FACTORS</td>
<td>are in C</td>
</tr>
<tr>
<td>REFERENCE</td>
<td>level or event for C is K, ..., C K</td>
</tr>
</tbody>
</table>
ORDER of response levels is C or K...K
EPROBABILITY put in C...C
CUMPROBABILITY put in C...C
NOCCUR put in C...C
NTRIALS put in C
COEFFICIENTS put in C
SECOEFFICIENTS put in C
XPWXINVERSE put in M
LOGLIKELIHOOD put in K
BRIEF output code K
STEP display log-likelihood for each iteration
ITERATION maximum number is K
START values in C
CTOLERANCE convergence criteria is K K
TOLERANCE level is K [K]
NLOGISTIC model
FREQUENCY counts are in C
FACTORS are in C...C
REFERENCE level or event for C is K, ..., C K
EPROBABILITY put in C...C
NOCCUR put in C...C
NTRIALS put in C
COEFFICIENTS put in C
MINITAB Release 13 Session Command Quick Reference

SECOEFFICIENTS put in C
XPWXINVERSE put in M
LOGLIKENOHD put in K
BRIEF output code K
STEP display log-likelihood for each iteration
ITERATION maximum number is K
START values in C
CTOLERANCE convergence criteria is K K
TOLERANCE level is K [K]
%RESPLOTS residuals in C, fits in C
TITLE for graph is "text"
GSAVE save graph in "filename"

Analysis of Variance
AOVONEWAY aov on samples in C...C
GDOTPLOT display a dotplot
GBOXPLOT display a boxplot
ONEWAY aov on data in C, levels in C [put residuals in C [fits in C]]
GDOTPLOT display a dotplot
GBOXPLOT display a boxplot
GHISTOGRAM display a histogram of the residuals
GNORMAL display normal probability plot of the residuals
GFITS  plot residuals vs fitted values
GORDER  plot residuals vs order of the data
GVARIABLE  plot residuals vs C...C
TUKEY  [family error rate K]
FISHER  [individual error rate K]
DUNNETT  [family error rate K] for control group K
MCB  [family error rate K] best is K
TWOWAY aov on data in C, levels in C C [put residuals in C [fits in C]]
ADDITIVE  model
MEANS  for the factors C [C]
GHISTOGRAM  display histogram of residuals
GNORMAL  display normal probability plot of residuals
GFITS  display plot of residuals vs fits
GORDER  display plot of residuals vs order
GVARIABLE  display plot of residuals vs C...C
%ANOM analysis of means on data in C, levels in C [C]
ALPHA  level is K
TABLE  display table of statistics
TITLE  for graph is "text"
GSAVE  save graph in "filename"
%BANOM analysis of means on binomial data in C, sample size K
ALPHA  level is K
TABLE  display table of statistics
TITLE  for graph is "text"
MEET MTB

CONTENTS

GSAVE save graph in "filename"

%PANOM analysis of means on Poisson data in C

ALPHA level is K

TITLE for graph is "text"

GSAVE save graph in "filename"

ANOVA model

RANDOM C...C

EMS print table of expected mean squares, estimated variance components, and error term in each F-test

FITS put into C...C

RESIDUALS put into C...C

MEANS for termlist

TEST for termlist / errorterm

RESTRICT use restricted model

GHISTOGRAM display histogram of residuals

GNORMAL display normal probability plot of residuals

GFITS display plot of residuals vs fitted values

GORDER display plot of residuals vs order of data

GVARIABLE display plot of residuals vs C...C

MANOVA [termlist [/ errorterm]]

SSCP print hypothesis matrix and error matrix

EIGEN print table of eigenvalues and eigenvectors

PARTIAL print matrix of partial correlations
<table>
<thead>
<tr>
<th>MINITAB Release 13</th>
<th>Session Command Quick Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOUNIVARIATE</td>
<td>suppress univariate output</td>
</tr>
<tr>
<td>ANCOVA</td>
<td>model</td>
</tr>
<tr>
<td>COVARIATES</td>
<td>are in C…C</td>
</tr>
<tr>
<td>FITS</td>
<td>put into C…C</td>
</tr>
<tr>
<td>RESIDUALS</td>
<td>put into C…C</td>
</tr>
<tr>
<td>MEANS</td>
<td>for termlist</td>
</tr>
<tr>
<td>TEST</td>
<td>for termlist / errorterm</td>
</tr>
<tr>
<td>GHISTOGRAM</td>
<td>display histogram of residuals</td>
</tr>
<tr>
<td>GNORMAL</td>
<td>display normal probability plot of residuals</td>
</tr>
<tr>
<td>GFITS</td>
<td>display plot of residuals vs fitted values</td>
</tr>
<tr>
<td>GORDER</td>
<td>display plot of residuals vs order of data</td>
</tr>
<tr>
<td>GVARIABLE</td>
<td>display plot of residuals vs C…C</td>
</tr>
<tr>
<td>GLM</td>
<td>model</td>
</tr>
<tr>
<td>COVARIATES</td>
<td>are in C…C</td>
</tr>
<tr>
<td>WEIGHTS</td>
<td>are in C</td>
</tr>
<tr>
<td>FITS</td>
<td>put into C…C</td>
</tr>
<tr>
<td>RESIDUALS</td>
<td>put into C…C</td>
</tr>
<tr>
<td>SRESIDUALS</td>
<td>put into C…C</td>
</tr>
<tr>
<td>TRESIDUALS</td>
<td>put into C…C</td>
</tr>
<tr>
<td>HI</td>
<td>put into C</td>
</tr>
<tr>
<td>COOKD</td>
<td>put into C…C</td>
</tr>
<tr>
<td>DFITS</td>
<td>put into C…C</td>
</tr>
<tr>
<td>XMATRIX</td>
<td>put into M</td>
</tr>
</tbody>
</table>

104
MINITAB Release 13
Session Command Quick Reference

CONTENTS

HOW TO USE

COEFFICIENTS put into C...C
MEANS for termlist
TEST for termlist / errorterm
MANOVA [termlist [/ errorterm]]
RANDOM C...C
SSQUARES K
EMS
INTERACT C...C
SMEANS store means in C...C
PAIRWISE terms
TUKEY
BONFERRONI
SIDAK
CONFIDENCE K
NOTEST
NOCI
CONTROL terms
LEVELS K K ...K
ALTERNATIVE K
DUNNETT
BONFERRONI
SIDAK
CONFIDENCE K
NOTEST
**NOCI**
- SSCP: print hypothesis matrix and error matrix
- EIGEN: print table of eigenvalues and eigenvectors
- PARTIAL: print matrix of partial correlations
- NOUNIVARIATE: suppress univariate output
- RTYPE: plot residual type K
- GHISTOGRAM: display histogram of residuals
- GNORMAL: display normal probability plot of residuals
- GFITS: display plot of residuals vs fitted values
- GORDER: display plot of residuals vs order of data
- G VARIABLE: display plot of residuals vs C...C
- BRIEF: output code K
- TOLERANCE: K [K]

%VARTEST: response in C factors in C...C

**UNSTACKED**
- CONFIDENCE: level is K
- STDEVS: store in C
- VARIANCES: store in C
- UPPER: store in C
- LOWER: store in C
- NOTABLE: suppress table of standard deviations and confidence limits
- TITLE: for graph is K or "text"
- GSAVE: save graph in K or "filename"

%INTPLOT: C C
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE</td>
<td>K</td>
</tr>
<tr>
<td>CONSTANT</td>
<td>K</td>
</tr>
<tr>
<td>SIDE</td>
<td>K</td>
</tr>
<tr>
<td>SHOWBAR</td>
<td>POOL</td>
</tr>
<tr>
<td>YLABEL</td>
<td>&quot;label&quot;</td>
</tr>
<tr>
<td>XLABEL</td>
<td>&quot;label&quot;</td>
</tr>
<tr>
<td>STYPE</td>
<td>K</td>
</tr>
<tr>
<td>SCOLOR</td>
<td>K</td>
</tr>
<tr>
<td>SSIZE</td>
<td>K</td>
</tr>
<tr>
<td>LTYPE</td>
<td>K</td>
</tr>
<tr>
<td>LCOLOR</td>
<td>K</td>
</tr>
<tr>
<td>LSIZE</td>
<td>K</td>
</tr>
<tr>
<td>BTYPE</td>
<td>K</td>
</tr>
<tr>
<td>BETYPE</td>
<td>K</td>
</tr>
<tr>
<td>BCOLOR</td>
<td>K</td>
</tr>
<tr>
<td>BECOLOR</td>
<td>K</td>
</tr>
<tr>
<td>BESIZE</td>
<td>K</td>
</tr>
<tr>
<td>BBASE</td>
<td>K</td>
</tr>
<tr>
<td>TITLE</td>
<td>&quot;text&quot;</td>
</tr>
<tr>
<td>GSAVE</td>
<td>&quot;file&quot;</td>
</tr>
<tr>
<td>%MAIN</td>
<td>main effects plots for factors in C...C</td>
</tr>
<tr>
<td>RESPONSE</td>
<td>data in C</td>
</tr>
<tr>
<td>LSMEANS</td>
<td>data in C</td>
</tr>
</tbody>
</table>
MINITAB Release 13 Session Command Quick Reference

YMIN y-axis minimum is K
YMAX y-axis maximum is K
TITLE for graph is "text"
GSAVE save graph in "filename"

%INTERACT interaction plots for factors in C...C
RESPONSE data in C
LSMEANS data in C
FULL display full matrix of plots
NOCENTER remove center points from factor level columns
YMIN y-axis minimum is K
YMAX y-axis maximum is K
TITLE for graph is "text"
GSAVE save graph in "filename"

% RESPLOTS see %RESPLOTS under Regression, page 101

Multivariate Analysis

DISCRIMINANT groups in C, predictors in C...C
QUADRATIC use quadratic discriminant analysis
PRIORS are in K...K
LDF coefficients put in C...C
FITS put in C [XVAL fits in C]
XVAL use cross-validation
MINITAB Release 13 Session Command Quick Reference

`PREDICT` for `E...E`
`BRIEF` output code `K`

`PCA` principal component analysis of `C...C`
`COVARIANCE` matrix
`NCOMP` number of components is `K`
`COEFFICIENTS` put into `C...C`
`SCORES` put into `C...C`
`GSCREE` display a scree plot
`GSCORE` plot scores for first two components

`FACTOR` `[C...C]`
`CORRELATION` factor the correlation matrix `[M]`
`COVARIANCE` factor the covariance matrix `[M]`
`NFACTORS` extract `K` factors
`ML` use maximum likelihood (default is PCA)
`PRIORS` use `C` as initial communality estimates in ML
`MAXITERATIONS` maximum number of iterations for ML is `K`
`CONVERGENCE` criterion for convergence in ML is `K`
`INLOADINGS` input `C...C` as loadings
`SORT` sort loadings, [print all loadings less than `K` as 0.0]
`VMAX` use varimax rotation
`QMAX` use quartimax rotation
`EMAX` use equamax rotation
`OMAX` use orthomax rotation with `γ = K`
### EIGEN
- Store eigenvalues in C, eigenvectors in M

### LOADINGS
- Store loadings in C

### COEFFICIENTS
- Store factor score coefficients in C

### SCORES
- Store factor scores in C

### RESIDUAL
- Store residual matrix in M

### ROTMAT
- Store rotation matrix in M

### GSCREE
- Display a scree plot

### GSCORE
- Plot scores for first two factors

### GLOADING
- Plot loadings for first two factors

### BRIEF
- Output code K

### CLUOBS
- Cluster observations in C or M

#### Cluster Distances
- **EUCLIDEAN**: Use Euclidean distance (default)
- **SQUEUCLIDEAN**: Use squared Euclidean distance
- **PEARSON**: Use Pearson distance
- **SQPEARSON**: Use squared Pearson distance
- **MANHATTAN**: Use Manhattan distance
- **SINGLE**: Use single linkage (default)
- **AVERAGE**: Use average linkage
- **COMPLETE**: Use complete linkage
- **MCQUITTY**: Use McQuitty linkage
- **CENTROID**: Use centroid linkage
- **MEDIAN**: Use median linkage
- **WARD**: Use Ward linkage
### Contents

- **Standardize** variables before clustering
- **Number** cut dendrogram to obtain K clusters
- **Cut** cut dendrogram at K similarity level
- **Dendrogram** display dendrogram
  - **Type** line type for each cluster is K...K
  - **Color** line color for each cluster is K...K
  - **Size** line size for each cluster is K...K
  - **Title** for dendrogram is "text"
  - **Gsave** save dendrogram in "filename"
  - **Ydistance** use distance on y-axis, default is similarity
  - **Multipage** display each cluster in a separate window
- **Dmatrix** save the distance matrix in M
- **Membership** save cluster membership in C
- **Distance** save distance between observations and centroids in C...C
- **Brief** output code K
- **Cluvars** cluster variables in C...C or M
- **Correlation** use correlation to measure distance (default)
  - **Abscorrelation** use absolute correlation to measure distance
  - **Single** use single linkage (default)
  - **Average** use average linkage
  - **Complete** use complete linkage
  - **Mcquitty** use McQuitty linkage
  - **Centroid** use centroid linkage
MEET MTB

CONTENTS

HOW TO USE

MEDIAN use median linkage
WARD use Ward linkage
NUMBER cut dendrogram to obtain K clusters
CUT cut dendrogram at K similarity level
DENDROGRAM display dendrogram
  TYPE line type for each cluster is K...K
  COLOR line color for each cluster is K...K
  SIZE line size for each cluster is K...K
  TITLE for dendrogram is "text"
  GSAVE save dendrogram in "filename"
  YDISTANCE use distance on y-axis, default is similarity
  MULTIPAGE display each cluster in a separate window
DMATRIX save the distance matrix in M
BRIEF output code K
KMEANS cluster observations in C...C
STANDARDIZE variables before clustering
NUMBER extract K clusters
INITIAL use the initial partition in C
MEMBERSHIP save cluster membership in C
DISTANCE save distances between observations and centroids in C...C
BRIEF output code K
Nonparametrics

RUNS test [above and below K] on C...C
STEST sign test [median = K] on C...C
ALTERNATIVE = K
SINTERVAL sign c.i. [K% confidence] on C...C
WTEST Wilcoxon one-sample rank test [median = K] on C...C
ALTERNATIVE = K
WINTERVAL Wilcoxon c.i. [K% confidence] on C...C
MANN-WHITNEY two-sample rank test and c.i. [K% confidence] on C C
ALTERNATIVE = K
KRUSKAL-WALLIS test for data in C, subscripts in C
MOOD median test, data in C, levels in C [put res. in C [fits in C]]
FRIEDMAN data in C, treatment in C, blocks in C [put res. in C [fits in C]]
WALSH averages for C, put into C [put indices into C C]
WDIFF for C and C, put into C [put indices into C C]
WSLOPE y in C, x in C, put slopes into C [put row indices into C C]
Tables

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TALLY</td>
<td>the data in C...C</td>
</tr>
<tr>
<td>COUNTS</td>
<td>display frequencies</td>
</tr>
<tr>
<td>PERCENTS</td>
<td>display percentage of total nonmissing values</td>
</tr>
<tr>
<td>CUMCOUNTS</td>
<td>display cumulative counts</td>
</tr>
<tr>
<td>CUMPERCENTS</td>
<td>display cumulative percents</td>
</tr>
<tr>
<td>ALL</td>
<td>display all four statistics above</td>
</tr>
<tr>
<td>STORE</td>
<td>in C...C</td>
</tr>
<tr>
<td>CHISQUARE</td>
<td>test on table stored in C...C</td>
</tr>
<tr>
<td>TABLE</td>
<td>the data classified by C...C</td>
</tr>
<tr>
<td>MEANS</td>
<td>for C...C</td>
</tr>
<tr>
<td>MEDIAN</td>
<td>for C...C</td>
</tr>
<tr>
<td>SUMS</td>
<td>for C...C</td>
</tr>
<tr>
<td>MINIMUMS</td>
<td>for C...C</td>
</tr>
<tr>
<td>MAXIMUMS</td>
<td>for C...C</td>
</tr>
<tr>
<td>STDEV</td>
<td>for C...C</td>
</tr>
<tr>
<td>STATS</td>
<td>for C...C</td>
</tr>
<tr>
<td>DATA</td>
<td>for C...C</td>
</tr>
<tr>
<td>N</td>
<td>for C...C</td>
</tr>
<tr>
<td>NMISS</td>
<td>for C...C</td>
</tr>
<tr>
<td>PROPORTION</td>
<td>of cases = K [through K] for C...C</td>
</tr>
<tr>
<td>COUNTS</td>
<td>include total obs. count in each cell</td>
</tr>
</tbody>
</table>
ROWPERCENTS include row percent in each cell
COLPERCENTS include column percent in each cell
TOTPERCENTS include total percents in each cell
CHISQUARE analysis [output code = K]
MISSING level for classification variable C...C
NOALL in margins
ALL for C...C
FREQUENCIES are in C
LAYOUT K rows by K columns
CA simple correspondence analysis of variables in C...C
CONTINGENCY input consists of columns of a contingency table
RNAMES are in C
C NAMES are in C
NCOMPONENTS are K
RCROSS cross the first two variables to form the rows
CCROSS cross the last two variables to form the columns
RSUPPLEMENTARY are in C...C
CSUPPLEMENTARY are in C...C
SRNAMES are in C
SCNAMES are in C
CTABLE print the contingency table
RPROFILES print the row profiles
CProfiles print the column profiles
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXPECTEDS</td>
<td>print table of expected cell frequencies</td>
</tr>
<tr>
<td>DIFFERENCES</td>
<td>print table of (observed-expected) in each cell</td>
</tr>
<tr>
<td>CHISQUARE</td>
<td>print table of chi-square value in each cell</td>
</tr>
<tr>
<td>INERTIAS</td>
<td>print table of relative inertia in each cell</td>
</tr>
<tr>
<td>R PLOT</td>
<td>display a row plot</td>
</tr>
<tr>
<td>C PLOT</td>
<td>display a column plot</td>
</tr>
<tr>
<td>S PLOT</td>
<td>display a symmetric plot of the rows and columns</td>
</tr>
<tr>
<td>AR PLOT</td>
<td>display an asymmetric row plot</td>
</tr>
<tr>
<td>A C PLOT</td>
<td>display an asymmetric column plot</td>
</tr>
<tr>
<td>AXES</td>
<td>for plots are K K, ..., K K</td>
</tr>
<tr>
<td>SUPPLEMENTARY</td>
<td>display supplementary points in each plot</td>
</tr>
<tr>
<td>RPCOORDINATES</td>
<td>put row principal coordinates into C...C</td>
</tr>
<tr>
<td>RSCOORDINATES</td>
<td>put row standardized coordinates into C...C</td>
</tr>
<tr>
<td>CPCOORDINATES</td>
<td>put column principal coordinates into C...C</td>
</tr>
<tr>
<td>CSCOORDINATES</td>
<td>put column standardized coordinates into C...C</td>
</tr>
<tr>
<td>SVT B</td>
<td>put the contingency table into C...C</td>
</tr>
<tr>
<td>MCA</td>
<td>multiple correspondence analysis of variables in C...C</td>
</tr>
<tr>
<td>INDICATORS</td>
<td>columns on MCA are indicator variables</td>
</tr>
<tr>
<td>C NAMES</td>
<td>are in C</td>
</tr>
<tr>
<td>CSUPPLEMENTARY</td>
<td>are in C...C</td>
</tr>
<tr>
<td>SC NAMES</td>
<td>are in C</td>
</tr>
<tr>
<td>NCOMPONENTS</td>
<td>are K</td>
</tr>
<tr>
<td>ITABLE</td>
<td>print table of indicator variables</td>
</tr>
<tr>
<td>BURT</td>
<td>print Burt table</td>
</tr>
</tbody>
</table>
AXES for plots are K K ... K K
SUPPLEMENTARY display supplementary points in all plots
C PLOT display column plot
COORDINATES put into C...C

Time Series

%TREND analysis for the data in C
QUADRATIC use quadratic trend model
GROWTH use exponential growth trend model
SCURVE use Pearl-Reed logistic trend model
PRIORS use coefficients K K [K]
WEIGHTS to compute smoothed coefficients are K K [K]
FORECASTS generate K forecasts
ORIGIN begin forecasts from time K
RESIDUALS store the residuals in C
FITS store the fits in C
FSTORE store the forecasts in C
NOPLOT suppress the plot
TABLE display additional output
TITLE for graph is "text"
GSAVE save graph in "filename"
%DECOMP analysis for the data in C with seasonal length K
MULTIPLICATIVE model (default)
ADDITIVE model
NOTREND do not include a trend component
START initial seasonal period is K
FORECASTS generate K forecasts
ORIGIN begin forecasts from time K
TREND store the trend component values in C
DETREND store the detrended data in C
SEASONAL store the seasonal component values in C
DESEASONAL store the deseasonalized data in C
FSTORE store the forecasts in C
RESIDUALS store the residuals in C
FITS store the fits in C
NOPLOT suppress all plots
TABLE display additional output
TITLE for graph is "text"
GSAVE save graph in "filename"
%MA for data in C, with a moving average of length K
CENTER the moving averages
FORECASTS generate K forecasts
ORIGIN generate forecasts from time K
AVERAGES store the moving averages in C
FITS store the fits in C
RESIDUALS store the residuals in C
### MINITAB Release 13 Session Command Quick Reference

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FSTORE</td>
<td>store the forecasts in C</td>
</tr>
<tr>
<td>UPPER</td>
<td>store the upper prediction limits in C</td>
</tr>
<tr>
<td>LOWER</td>
<td>store the lower prediction limits in C</td>
</tr>
<tr>
<td>SMPLLOT</td>
<td>plot smoothed values vs actual data</td>
</tr>
<tr>
<td>NOPLOT</td>
<td>suppress the plot</td>
</tr>
<tr>
<td>TABLE</td>
<td>display additional output</td>
</tr>
<tr>
<td>TITLE</td>
<td>for graph is &quot;text&quot;</td>
</tr>
<tr>
<td>GSAVE</td>
<td>save graph in &quot;filename&quot;</td>
</tr>
<tr>
<td>%SES</td>
<td>single exponential smoothing for the data in C</td>
</tr>
<tr>
<td>WEIGHT</td>
<td>to use to smooth the data is K</td>
</tr>
<tr>
<td>INITIAL</td>
<td>smooth value is average of first K values</td>
</tr>
<tr>
<td>FORECASTS</td>
<td>generate K forecasts</td>
</tr>
<tr>
<td>ORIGIN</td>
<td>generate forecasts from time K</td>
</tr>
<tr>
<td>SMOOTHD</td>
<td>store the smoothed data in C</td>
</tr>
<tr>
<td>FITS</td>
<td>store the fits in C</td>
</tr>
<tr>
<td>RESIDUALS</td>
<td>store the residuals in C</td>
</tr>
<tr>
<td>FSTORE</td>
<td>store the forecasts in C</td>
</tr>
<tr>
<td>UPPER</td>
<td>store the upper prediction limits in C</td>
</tr>
<tr>
<td>LOWER</td>
<td>store the lower prediction limits in C</td>
</tr>
<tr>
<td>SMPLLOT</td>
<td>plot smoothed values vs actual data</td>
</tr>
<tr>
<td>NOPLOT</td>
<td>suppress the plot</td>
</tr>
<tr>
<td>TABLE</td>
<td>display additional output</td>
</tr>
<tr>
<td>TITLE</td>
<td>for graph is &quot;text&quot;</td>
</tr>
<tr>
<td>GSAVE</td>
<td>save graph in &quot;filename&quot;</td>
</tr>
</tbody>
</table>
MINITAB Release 13 Session Command Quick Reference

%DES double exponential smoothing for the data in C
WEIGHTS for level component are K, for trend component are K
FORECASTS generate K forecasts
ORIGIN generate forecasts from time K
SMOOTHED store the smoothed data in C
LEVEL store the level component values in C
TREND store the trend component values in C
FITS store the fits in C
RESIDUALS store the residuals in C
FSTORE store the forecasts in C
UPPER store the upper prediction limits in C
LOWER store the lower prediction limits in C
SMOLOT plot smoothed values vs actual data
NOPLOT suppress the plot
TABLE display additional output
TITLE for graph is "text"
GSAVE save graph in "filename"

%WINTMULT multiplicative seasonal expo. smoothing for data in C with seasonal length K
WEIGHTS for level component = K, for trend component = K, for seasonal component = K
FORECASTS generate K forecasts
ORIGIN generate forecasts from time K
SMOOTHED store the smoothed data in C
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEVEL</td>
<td>store the level component values in C</td>
</tr>
<tr>
<td>TREND</td>
<td>store the trend component values in C</td>
</tr>
<tr>
<td>SEASONAL</td>
<td>store the seasonal component values in C</td>
</tr>
<tr>
<td>RESIDUALS</td>
<td>store the residuals in C</td>
</tr>
<tr>
<td>FITS</td>
<td>store the fits in C</td>
</tr>
<tr>
<td>FSTORE</td>
<td>store the forecasts in C</td>
</tr>
<tr>
<td>UPPER</td>
<td>store the upper prediction limits in C</td>
</tr>
<tr>
<td>LOWER</td>
<td>store the lower prediction limits in C</td>
</tr>
<tr>
<td>SMPLOT</td>
<td>plot smoothed values vs. actual data</td>
</tr>
<tr>
<td>NOPLOT</td>
<td>suppress the plot</td>
</tr>
<tr>
<td>TABLE</td>
<td>display additional output</td>
</tr>
<tr>
<td>TITLE</td>
<td>for graph is &quot;text&quot;</td>
</tr>
<tr>
<td>GSAVE</td>
<td>save graph in &quot;filename&quot;</td>
</tr>
<tr>
<td>%WINTADD</td>
<td>additive seasonal expo. smoothing for the data in C with seasonal length K</td>
</tr>
<tr>
<td>WEIGHTS</td>
<td>for level component = K, for trend component = K,</td>
</tr>
<tr>
<td></td>
<td>for seasonal component = K</td>
</tr>
<tr>
<td>FORECASTS</td>
<td>generate K forecasts</td>
</tr>
<tr>
<td>ORIGIN</td>
<td>generate forecasts from time K</td>
</tr>
<tr>
<td>SMOOTHED</td>
<td>store the smoothed data in C</td>
</tr>
<tr>
<td>LEVEL</td>
<td>store the level component values in C</td>
</tr>
<tr>
<td>TREND</td>
<td>store the trend component values in C</td>
</tr>
<tr>
<td>SEASONAL</td>
<td>store the seasonal component values in C</td>
</tr>
<tr>
<td>RESIDUALS</td>
<td>store the residuals in C</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>FITS</td>
<td>store the fits in C</td>
</tr>
<tr>
<td>FSTORE</td>
<td>store the forecasts in C</td>
</tr>
<tr>
<td>UPPER</td>
<td>store the upper prediction limits in C</td>
</tr>
<tr>
<td>LOWER</td>
<td>store the lower prediction limits in C</td>
</tr>
<tr>
<td>SMPLLOT</td>
<td>plot smoothed values vs. actual data</td>
</tr>
<tr>
<td>NOPLOT</td>
<td>suppress the plot</td>
</tr>
<tr>
<td>TABLE</td>
<td>display additional output</td>
</tr>
<tr>
<td>TITLE</td>
<td>for graph is &quot;text&quot;</td>
</tr>
<tr>
<td>GSAVE</td>
<td>save graph in &quot;filename&quot;</td>
</tr>
<tr>
<td>DIFFERENCES</td>
<td>[of lag K] for data in C, put into C</td>
</tr>
<tr>
<td>LAG</td>
<td>[by K] for data in C, put into C</td>
</tr>
<tr>
<td>ACF</td>
<td>[up to K lags] for series in C [put into C]</td>
</tr>
<tr>
<td>PACF</td>
<td>[up to K lags] for series in C [put into C]</td>
</tr>
<tr>
<td>%ACF</td>
<td>for series in C</td>
</tr>
<tr>
<td>MAXLAG</td>
<td>maximum number of lags is K</td>
</tr>
<tr>
<td>CORR</td>
<td>store autocorrelations in C</td>
</tr>
<tr>
<td>TSTATS</td>
<td>store t-statistics in C</td>
</tr>
<tr>
<td>LBQ</td>
<td>store Ljung-Box Q statistics in C</td>
</tr>
<tr>
<td>TITLE</td>
<td>for graph is &quot;text&quot;</td>
</tr>
<tr>
<td>GSAVE</td>
<td>save graph in &quot;filename&quot;</td>
</tr>
<tr>
<td>%PACF</td>
<td>for series in C</td>
</tr>
<tr>
<td>MAXLAG</td>
<td>maximum number of lags is K</td>
</tr>
<tr>
<td>CORR</td>
<td>store partial autocorrelations in C</td>
</tr>
</tbody>
</table>
TSTATS  store t-statistics in C
TITLE  for graph is "text"
GSAVE  save graph in "filename"
CCF  [up to K lags] between series in C and C
ARIMA  p = K, d = K, q = K [P = K, D = K, Q = K, S = K] data in C
        [put residuals in C [predicted values in C [parameters in C]]]
CONSTANT  fit y-intercept (default)
NOCONSTANT  do not fit y-intercept
STARTING  values are in C
FORECAST  [origin = K] up to K leads [forecasts in C [limits in C C]]
GSERIES  display time series plot
GACF  plot autocorrelation function for residuals
GPACF  plot partial autocorrelation function for residuals
GHISTOGRAM  display histogram of residuals
GNORMAL  display normal probability plot of residuals
GFITS  plot residuals vs fitted values
GORDER  plot residuals vs order of data
GVARIABLE  plot residuals vs C…C
BRIEF  output code K

Exploratory Data Analysis
LVALS  of C [put letter values in C [mids in C [spreads in C]]]
MPOLISH  C, rows in C, columns in C [put residuals in C [fits in C]]
COLUMN  start iteration with column medians
ITERATIONS = K
EFFECTS  put commons into K, rows into C, columns into C
COMPARISONS values, put into C
RLINE    y in C, x in C [put residuals in C [fits in C [coefficients in C]]]
MAXITERATIONS maximum number of iterations = K
BRIEF    output code K
RSMOOTH  C, put rough into C, smooth into C
SMOOTH   by 3RSSH, twice
C PLOT   condensed plot of y in C vs x in C
LINES    = K
CHARACTERS = K
XBOUNDS  = from K to K
YBOUNDS  = from K to K
CTABLE   coded table data in C, row levels in C, column levels in C
MAXIMUM  value in each cell should be coded
MINIMUM  value in each cell should be coded
ROOTOGRAM [data in C [use bin boundaries in C]]
BOUNDARIES put in C
DRRS     put in C
FITTED   values, put in C
MINITAB Release 13 Session Command Quick Reference

COUNTS put in C
FREQUENCIES are in C [bin boundaries are in C]
MEAN = K
STDEV = K

Power and Sample Size

POWER
ZONE

Specify two of DIFFERENCE, SAMPLE, and POWER. MINITAB solves for the other.

ALPHA = K
SIGMA = K
ALTERNATIVE = K
DIFFERENCE = K...K
SAMPLE = K...K
POWER = K...K
SSAMPLE = C
SDDIFFERENCE = C
SPOWER = C
TONE

Specify two of DIFFERENCE, SAMPLE, and POWER. MINITAB solves for the other.
<table>
<thead>
<tr>
<th>Command</th>
<th>K</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALPHA</td>
<td>( \alpha )</td>
<td></td>
</tr>
<tr>
<td>SIGMA</td>
<td>( \sigma )</td>
<td></td>
</tr>
<tr>
<td>ALTERNATIVE</td>
<td>( \theta )</td>
<td></td>
</tr>
<tr>
<td>DIFFERENCE</td>
<td>( \delta )</td>
<td></td>
</tr>
<tr>
<td>SAMPLE</td>
<td>( n )</td>
<td></td>
</tr>
<tr>
<td>POWER</td>
<td>( \beta )</td>
<td></td>
</tr>
<tr>
<td>SSAMPLE</td>
<td>( s^2 )</td>
<td></td>
</tr>
<tr>
<td>SDIFFERENCE</td>
<td>( \sigma^2 )</td>
<td></td>
</tr>
<tr>
<td>SPOWER</td>
<td>( \sigma )</td>
<td></td>
</tr>
<tr>
<td>TTESTO</td>
<td>( \alpha )</td>
<td></td>
</tr>
<tr>
<td>PONE</td>
<td>( \alpha )</td>
<td>( \alpha' )</td>
</tr>
<tr>
<td>PNUNLI</td>
<td>( \alpha )</td>
<td></td>
</tr>
<tr>
<td>PALTRENT</td>
<td>( \theta' )</td>
<td>( \theta' )</td>
</tr>
</tbody>
</table>
MINITAB Release 13

MEET MTB

CONTENTS

HOW TO USE

SAMPLE K...K
POWER K...K
SSAMPLE C
SPALTERNATIVE C
SPOWER C
PTWO
ALPHA K
PRONE K...K
PRTWO K
ALTERNATIVE K
SAMPLE K...K
POWER K...K
SSAMPLE C
SPRONE C
SPOWER C
ONEWAY K
ALPHA K
SIGMA K
SSQMEANS K...K
MEANS K...K
MAKDIFERENCE K...K
SAMPLE K...K
POWER K...K
<table>
<thead>
<tr>
<th>Command</th>
<th>Arguments</th>
</tr>
</thead>
<tbody>
<tr>
<td>SSAMPLE</td>
<td>C</td>
</tr>
<tr>
<td>SSSQMEANS</td>
<td>C</td>
</tr>
<tr>
<td>SPOWER</td>
<td>C</td>
</tr>
<tr>
<td>FFDESIGN</td>
<td>K K</td>
</tr>
<tr>
<td>ALPHA</td>
<td>K</td>
</tr>
<tr>
<td>SIGMA</td>
<td>K</td>
</tr>
<tr>
<td>EFFECT</td>
<td>K...K</td>
</tr>
<tr>
<td>CPBLOCK</td>
<td>K...K</td>
</tr>
<tr>
<td>FITC</td>
<td></td>
</tr>
<tr>
<td>FITB</td>
<td></td>
</tr>
<tr>
<td>BLOCKS</td>
<td>K</td>
</tr>
<tr>
<td>REPLICATES</td>
<td>K...K</td>
</tr>
<tr>
<td>POWER</td>
<td>K...K</td>
</tr>
<tr>
<td>OMIT</td>
<td>K terms from model</td>
</tr>
<tr>
<td>SREPLICATES</td>
<td>C</td>
</tr>
<tr>
<td>SEFFECT</td>
<td>C</td>
</tr>
<tr>
<td>SPOWER</td>
<td>C</td>
</tr>
<tr>
<td>SCPBLOCK</td>
<td>C</td>
</tr>
<tr>
<td>PBDESIGN</td>
<td>K K</td>
</tr>
</tbody>
</table>

Specify three of EFFECT, CPBLOCK, REPLICATES, and POWER. MINITAB solves for the other.
MINITAB Release 13

FITC
REPLICATES K...K
POWER K...K
SREPLICATES C
SEFFECT C
SPOWER C
SCPBLOCK C

Quality Planning Tools

%RRUN draw run chart with tests for randomness based on runs
RSUB data in rows of C...C (each row is a subgroup)
CSUB data in C, subgroup size is E
MEANS plot subgroup means (default)
MEDIANS plot subgroup medians
TITLE for graph is "text"
GSAVE save the graph in "filename"
%PARETO generate Pareto chart for C
OTHERS group cumulative percent over K into "Others"
COUNTS are in C
BY C
SEPARATE charts
INDEPEND charts
TITLE for graph is "text"
GSAVE save the graph in "filename"

%FISHBONE generate fishbone (cause-and-effect) diagram
BR1 branch 1 list of causes in C
BR2 branch 2 list of causes in C
BR3 branch 3 list of causes in C
BR4 branch 4 list of causes in C
BR5 branch 5 list of causes in C
BR6 branch 6 list of causes in C
NOEMPTY suppress empty branches
NAM1 branch 1 name is "text"
NAM2 branch 2 name is "text"
NAM3 branch 3 name is "text"
NAM4 branch 4 name is "text"
NAM5 branch 5 name is "text"
NAM6 branch 6 name is "text"
NOLABELS suppress default branch labels
EFFECT name of effect is "text"
TITLE for diagram is "text"
GSAVE save the diagram in "filename"

%MULTIVAR Multi-Vari chart
RESPONSE C
FACTORS C...C
DATAON display individual observations, just means
MU1ON  turn on connect lines between means for factor 1
MU2ON  turn on connect lines between means for factor 2
MU3ON  turn on connect lines between means for factor 3
TITLE 'string'

%SYM PLOT symmetry plot of data in C…C
TITLE 'string'

Measurement Systems Analysis

%GAGEAOV gage R&R using ANOVA method
PARTS in C
OPERS in C
RESPONSE in C
STUDYVAR is K
SIGMA is K
TOLER is K
NOPCONTRIBUTION no percent contribution output
NOPSTUDYVAR no percent study var. output
SEPARATE graphs
TITLE for graph is "text"
GAGE name is "text"
DATE is "text"
USER is "text"
GTOL is "text"
MISC comments are "text"
%GAGEXBR gage R&R analysis using Average and Range Method
PARTS in C
OPERS in C
RESPONSE in C
STUDYVAR is K
SIGMA is K
TOLER is K
NOPCONTRIBUTION no percent contribution output
NOPSTUDYVAR no percent study var. output
SEPARATE graphs
TITLE for graphs is "text"
GAGE name is "text"
DATE is "text"
USER is "text"
GTOL is "text"
MISC comments are "text"
%GAGERUN plot response values by operator and part number
PARTS in C
OPERS in C
TRIAL numbers in C
RESPONSE in C
MU is K
MINITAB Release 13 Session Command Quick Reference

For gage R&R:

%GAGENEST nested gage R&R

- PARTS in C
- OPERS in C
- RESPONSE in C
- STUDYVAR multiplier = K
- SEPARATE page for graphs
- SIGMA = K
- TOLER = K
- GAGE K (for on graph(s))
- DATE K (for on graph(s))
- USER K (for on graph(s))
- MISC K (for on graph(s))
- GTOL K (for on graph(s))
- TITLE for graph is K or "text string"
- NOPCONTRIBUTION no percent contribution output
- NOPSTUDYVAR no percent study var. output

For gage linearity and accuracy study:

%GAGELIN gage linearity and accuracy study

- PARTS in C
MASTER in C
RESPONSE in C
SIGMA is K
TITLE for graphs is "text"
GAGE name is "text"
DATE is "text"
USER is "text"
GTOL is "text"
MISC comments are "text"

Variables Control Charts
DEFTEST for test number K, test element is K, ..., K K
%BOXCOX transformation for non-normal data
RSUB data in rows of C...C (each row is a subgroup)
CSUB data in C, subgroup size is E
LAMBDK is K
STORE transformed data in C (with CSUB)
STORE transformed data in C...C (with RSUB)
XBARCHART [data in C, subgroup size is E]
RSUB data in rows of C...C (each row is a subgroup)
MU = K
SIGMA = K
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBAR</td>
<td>base $\sigma$ estimate on average of subgroup ranges</td>
</tr>
<tr>
<td>SBAR</td>
<td>base $\sigma$ estimate on average of subgroup standard deviations</td>
</tr>
<tr>
<td>MMR</td>
<td>base $\sigma$ estimate on median of the moving range</td>
</tr>
<tr>
<td>RSPAN</td>
<td>length of moving range = $K$ (default = 2)</td>
</tr>
<tr>
<td>ESTIMATE</td>
<td>parameters based on subgroups $K$ ... $K$ or $C$</td>
</tr>
<tr>
<td>BOXCOX</td>
<td>$K$</td>
</tr>
<tr>
<td>HPROCESS</td>
<td>historical stages in process data $C$</td>
</tr>
<tr>
<td>VALUES</td>
<td>$K$ ... $K$ or $C$ from parameter estimate calculations</td>
</tr>
<tr>
<td>OMIT</td>
<td>$K$ ... $K$ or $C$ from parameter estimate calculations</td>
</tr>
<tr>
<td>TEST</td>
<td>use tests $K$ ... $K$ or $C$ (all 8 tests)</td>
</tr>
<tr>
<td>SUBGROUP</td>
<td>size = $K$ to calculate control limits and center line</td>
</tr>
<tr>
<td>STAMP</td>
<td>$C$</td>
</tr>
<tr>
<td>SLIMITS</td>
<td>$[K ... K]$</td>
</tr>
<tr>
<td>UPPER</td>
<td>$K$</td>
</tr>
<tr>
<td>LOWER</td>
<td>$K$</td>
</tr>
</tbody>
</table>

Graphics Subcommands for Variables Control Charts (see page 146)

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RCHART</td>
<td>[data in $C$, subgroup size is $E$]</td>
</tr>
<tr>
<td>RSUB</td>
<td>data in rows of $C$ ... $C$ (each row is a subgroup)</td>
</tr>
<tr>
<td>SIGMA</td>
<td>$K$</td>
</tr>
<tr>
<td>RBAR</td>
<td>base $\sigma$ estimate on average of subgroup ranges</td>
</tr>
<tr>
<td>ESTIMATE</td>
<td>parameters based on subgroups $K$ ... $K$ or $C$</td>
</tr>
<tr>
<td>BOXCOX</td>
<td>$K$</td>
</tr>
<tr>
<td>HPROCESS</td>
<td>historical stages in process data $C$</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>VALUES</td>
<td>K or C</td>
</tr>
<tr>
<td>OMIT</td>
<td>K or C from parameter estimate calculations</td>
</tr>
<tr>
<td>TEST</td>
<td>use tests K or C (first 4 tests only)</td>
</tr>
<tr>
<td>SUBGROUP</td>
<td>size = K to calculate control limits and center line</td>
</tr>
<tr>
<td>STAMP</td>
<td>C</td>
</tr>
<tr>
<td>SLIMITS</td>
<td>[K, K]</td>
</tr>
<tr>
<td>UPPER</td>
<td>K</td>
</tr>
<tr>
<td>LOWER</td>
<td>K</td>
</tr>
</tbody>
</table>

Graphics Subcommands for Variables Control Charts (see page 146)

SCHART [data in C, subgroup size is E]
RSUB data in rows of C...C (each row is a subgroup)
SIGMA = K
SBAR base σ estimate on average of subgroup st.devs.
ESTIMATE parameters based on subgroups K or C
BOXCOX K
HPROCESS historical stages in process data C
VALUES K or C
OMIT K or C from parameter estimate calculations
TEST use tests K or C (first 4 tests only)
SUBGROUP size = K to calculate control limits and center line
STAMP C
SLIMITS [K, K]
UPPER K
<table>
<thead>
<tr>
<th>Subcommand</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOWER K</td>
<td>Graphics Subcommands for Variables Control Charts (see page 146)</td>
</tr>
<tr>
<td>%RXBARR</td>
<td>RSUB data in rows of C...C (each row is a subgroup)</td>
</tr>
<tr>
<td></td>
<td>CSUB data in C, subgroup size is E</td>
</tr>
<tr>
<td></td>
<td>MU = K</td>
</tr>
<tr>
<td></td>
<td>SIGMA = K</td>
</tr>
<tr>
<td></td>
<td>RBAR base ( \sigma ) estimate on average of subgroup ranges</td>
</tr>
<tr>
<td></td>
<td>BOXCOX K</td>
</tr>
<tr>
<td></td>
<td>HPROCESS historical stages in process data C</td>
</tr>
<tr>
<td></td>
<td>VALUES K...K or C</td>
</tr>
<tr>
<td></td>
<td>OMIT K...K from parameter estimate calculations</td>
</tr>
<tr>
<td></td>
<td>TEST use tests K...K (all 8 tests)</td>
</tr>
<tr>
<td></td>
<td>SUBGROUP size = K to calculate control limits and center line</td>
</tr>
<tr>
<td></td>
<td>STAMP C</td>
</tr>
<tr>
<td></td>
<td>TITLE for graph is &quot;text&quot;</td>
</tr>
<tr>
<td></td>
<td>GSAVE save graph in &quot;filename&quot;</td>
</tr>
<tr>
<td>%RXBARS</td>
<td>RSUB data in rows of C...C (each row is a subgroup)</td>
</tr>
<tr>
<td></td>
<td>CSUB data in C, subgroup size is E</td>
</tr>
<tr>
<td></td>
<td>MU = K</td>
</tr>
<tr>
<td></td>
<td>SIGMA = K</td>
</tr>
<tr>
<td></td>
<td>SBAR base ( \sigma ) estimate on average of subgroup st.devs.</td>
</tr>
<tr>
<td></td>
<td>BOXCOX K</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>HPROCESS</td>
<td>historical stages in process data C</td>
</tr>
<tr>
<td>VALUES</td>
<td>K...K or C</td>
</tr>
<tr>
<td>OMIT</td>
<td>K...K from parameter estimate calculations</td>
</tr>
<tr>
<td>TEST</td>
<td>use tests K...K (all 8 tests)</td>
</tr>
<tr>
<td>SUBGROUP</td>
<td>size = K to calculate control limits and center line</td>
</tr>
<tr>
<td>STAMP</td>
<td>C</td>
</tr>
<tr>
<td>TITLE</td>
<td>for graph is &quot;text&quot;</td>
</tr>
<tr>
<td>GSAVE</td>
<td>save graph in &quot;filename&quot;</td>
</tr>
<tr>
<td>ICHART</td>
<td>data in C</td>
</tr>
<tr>
<td>MU</td>
<td>= K</td>
</tr>
<tr>
<td>SIGMA</td>
<td>= K</td>
</tr>
<tr>
<td>MMR</td>
<td>base φ estimate on median of the moving range</td>
</tr>
<tr>
<td>RSPAN</td>
<td>length of moving range = K (default = 2)</td>
</tr>
<tr>
<td>ESTIMATE</td>
<td>parameters based on subgroups K...K or C</td>
</tr>
<tr>
<td>BOXCOX</td>
<td>K</td>
</tr>
<tr>
<td>HPROCESS</td>
<td>historical stages in process data C</td>
</tr>
<tr>
<td>VALUES</td>
<td>K...K or C</td>
</tr>
<tr>
<td>OMIT</td>
<td>K...K or C from parameter estimate calculations</td>
</tr>
<tr>
<td>TEST</td>
<td>use tests K...K or C (all 8 tests)</td>
</tr>
<tr>
<td>STAMP</td>
<td>C</td>
</tr>
<tr>
<td>SLIMITS</td>
<td>[K...K]</td>
</tr>
<tr>
<td>UPPER</td>
<td>K</td>
</tr>
<tr>
<td>LOWER</td>
<td>K</td>
</tr>
</tbody>
</table>
Graphics Subcommands for Variables Control Charts (see page 146)

MRCHART data in C
SIGMA = K
MMR base σ estimate on median of the moving range
RSPAN length of moving range = K (default = 2)
ESTIMATE parameters based on subgroups K…K or C
BOXCOX K
HPROCESS historical stages in process data C
VALUES K…K or C
OMIT K…K or C from parameter estimate calculations
TEST use tests K…K (first 4 tests only)
STAMP C
SLIMITS [K…K]
UPPER K
LOWER K

Graphics Subcommands for Variables Control Charts (see page 146)

%IMRCHART C
MU = K
SIGMA = K
MMR base σ estimate on median of the moving range
RSPAN length of moving range = K (default = 2)
BOXCOX K
HPROCESS historical stages in process data C
VALUES K...K or C
OMIT K...K or C from parameter estimate calculations
TEST use tests K...K (all 8 tests)
STAMP C
TITLE for graph is "text"
GSAVE save graph in "filename"

EWMACHART [data in C, subgroup size is E]
RSUB data in rows of C...C (each row is a subgroup)
MU = K
SIGMA = K
RBAR base σ estimate on average of subgroup ranges
SBAR base σ estimate on average of subgroup st.devs.
MMR base σ estimate on median of the moving range
RSPAN length of moving range = K (default = 2)
ESTIMATE parameters based on subgroups K...K or C
BOXCOX K
OMIT K...K or C from parameter estimate calculations
SUBGROUP size = K to calculate control limits and center line
WEIGHT = K in EWMA (default = 0.2)
STAMP C
SLIMITS [K...K]
UPPER K
LOWER K
### Graphics Subcommands for Variables Control Charts (see page 146)

#### MACHART
- **[data in C, subgroup size is E]**
- **RSUB** data in rows of C...C (each row is a subgroup)
- **MU** = K
- **SIGMA** = K
- **RBAR** base σ estimate on average of subgroup ranges
- **SBAR** base σ estimate on average of subgroup st.devs.
- **MMR** base σ estimate on median of the moving range
- **RSPAN** length of moving range = K (default = 2)
- **ESTIMATE** parameters based on subgroups K...K or C
- **BOXCOX** K
- **OMIT** K...K or C from parameter estimate calculations
- **SUBGROUP** size = K to calculate control limits and center line
- **SPAN** length of moving averages = K (default = 3)
- **STAMP** C
- **SLIMITS** [K...K]
- **UPPER** K
- **LOWER** K

#### %RCUSUM
- **RSUB** data in rows of C...C (each row is a subgroup)
- **CSUB** data in C, subgroup size is E
- **SIGMA** = K
RBAR base σ estimate on average of subgroup ranges
SBAR base σ estimate on average of subgroup st.devs.
MMR base σ estimate on median of the moving range
RSPAN length of moving range = K (default = 2)
OMIT K...K from parameter estimate calculations
TARGET specification = K (default = 0)
FIR initialize CUSUMs at K σ’s above and below 0
RESET CUSUMs to initial values when out-of-control
PLAN h = K k = K (defaults: h = 4 k = 0.5)
VMASK center V-mask on subgroup K
TITLE for graph is "text"
GSAVE save graph in "filename"

RSUB data in rows of C...C (each row is a subgroup)
CSUB data in C, subgroup size is E
MU = K
SIGMA = K
RBAR base σ estimate on average of subgroup ranges
SBAR base σ estimate on average of subgroup st.devs.
MMR base σ estimate on median of the moving range
RSPAN length of moving range = K (default = 2)
OMIT K...K from parameter estimate calculations
WEIGHT K K K K (defaults = 0 2 4 8)
RESET cumulative score to zero when out of control
### Minitab Release 13 - Session Command Quick Reference

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SCORES</strong></td>
<td>put cumulative zone scores in C</td>
</tr>
<tr>
<td><strong>DISPLAY</strong></td>
<td>K standardized observations (default = 25)</td>
</tr>
<tr>
<td><strong>TITLE</strong></td>
<td>for graph is &quot;text&quot;</td>
</tr>
<tr>
<td><strong>GSAVE</strong></td>
<td>save graph in &quot;filename&quot;</td>
</tr>
<tr>
<td><strong>%ZMRCHART</strong></td>
<td>data in C, part/product name/number in C</td>
</tr>
<tr>
<td>CENTER</td>
<td>using data in C</td>
</tr>
<tr>
<td>SIGMAS</td>
<td>in C to standardize data</td>
</tr>
<tr>
<td>SEPARATE</td>
<td>σ estimate for each run independently (default)</td>
</tr>
<tr>
<td>POOLED</td>
<td>σ estimate</td>
</tr>
<tr>
<td>EQUAL</td>
<td>pool all data (across runs and parts) to estimate σ</td>
</tr>
<tr>
<td>PROP</td>
<td>method to estimate σ</td>
</tr>
<tr>
<td><strong>DISPLAY</strong></td>
<td>K standardized observations (default = 25)</td>
</tr>
<tr>
<td><strong>STAMP</strong></td>
<td>C</td>
</tr>
<tr>
<td><strong>TITLE</strong></td>
<td>for graph is &quot;text&quot;</td>
</tr>
<tr>
<td><strong>GSAVE</strong></td>
<td>save graph in &quot;filename&quot;</td>
</tr>
<tr>
<td><strong>%WBCHART</strong></td>
<td>3-way chart using both between-subgroup and within-subgroup variations</td>
</tr>
<tr>
<td>RSUBS</td>
<td>data in rows of C...C (each row is a subgroup)</td>
</tr>
<tr>
<td>MU</td>
<td>C</td>
</tr>
<tr>
<td>RSPAN</td>
<td>C</td>
</tr>
<tr>
<td>MMR</td>
<td>base σ estimate on median of the moving range</td>
</tr>
<tr>
<td>RBAR</td>
<td>base σ estimate on average of subgroup ranges</td>
</tr>
<tr>
<td>HPROCESS</td>
<td>historical values in process data C</td>
</tr>
<tr>
<td>VALUES</td>
<td>K...K or C</td>
</tr>
</tbody>
</table>
### Attributes Control Charts

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCHART</td>
<td>data in C, subgroup size is E</td>
</tr>
<tr>
<td>HPROCESS</td>
<td>historical values in process data C</td>
</tr>
<tr>
<td>VALUES</td>
<td>K...K</td>
</tr>
<tr>
<td>OMIT</td>
<td>K...K or C from parameter estimate calculations</td>
</tr>
<tr>
<td>ESTIMATE</td>
<td>parameters based on subgroups K...K or C</td>
</tr>
<tr>
<td>P</td>
<td>process proportion defective = K</td>
</tr>
<tr>
<td>SUBGROUP</td>
<td>size = K to calculate control limits and center line</td>
</tr>
<tr>
<td>TEST</td>
<td>use tests K...K or C</td>
</tr>
</tbody>
</table>

### Graphics Subcommands for Attributes Control Charts (see page 146)

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPCHART</td>
<td>C E</td>
</tr>
<tr>
<td>HPROCESS</td>
<td>historical values in process data C</td>
</tr>
<tr>
<td>VALUES</td>
<td>K...K</td>
</tr>
<tr>
<td>OMIT</td>
<td>K...K or C from parameter estimate calculations</td>
</tr>
</tbody>
</table>
MINITAB Release 13 Session Command Quick Reference

- **ESTIMATE** parameters based on subgroups K...K or C
- **P** process proportion defective = K
- **SUBGROUP** size = K to calculate control limits and center line
- **TEST** use tests K...K or C

Graphics Subcommands for Attributes Control Charts (see page 146)

**CCHART**
- **C** historical values in process data C
- **VALUES** K...K
- **OMIT** K...K or C from parameter estimate calculations
- **ESTIMATE** parameters based on subgroups K...K or C
- **MU** = K
- **TEST** use tests K...K or C

Graphics Subcommands for Attributes Control Charts (see page 146)

**UCHART**
- **C E** historical values in process data C
- **VALUES** K...K
- **OMIT** K...K or C from parameter estimate calculations
- **ESTIMATE** parameters based on subgroups K...K or C
- **MU** = K
- **SUBGROUP** size = K to calculate control limits and center line
- **TEST** use tests K...K or C

Graphics Subcommands for Attributes Control Charts (see page 146)
Graphics Subcommands for Variables and Attributes
Control Charts (not %graphs)

Data Display Subcommands:

SYMBOL
  FONT K...K or C
  TYPE K...K or "char"..."char" or C
  COLOR K...K or C
  SIZE K...K or C
  ANGLE K
  PLACEMENT K K
  OFFSET K K
  CONNECT
    TYPE K...K or C
    COLOR K...K or C
    SIZE K...K or C
    STRAIGHT

Annotation Subcommands:

  TITLE "text"
    all of its subcommands (see page 53)
  FOOTNOTE "footnote"
    all of its subcommands (see page 53)
Frame Customization Subcommands:

- AXIS 
  - K [K K] or C [K K]
  - all of its subcommands (see page 56)
- TICK 
  - K [K...K or C] or C [K...K or C]
  - all of its subcommands (see page 56)
- GRID 
  - K or C
  - all of its subcommands (see page 56)
- REFERENCE 
  - K [K...K or C] or C [K...K or C]
  - all of its subcommands (see page 56)
- MINIMUM 
  - K K
- MAXIMUM 
  - K K
- SCFRAME 
  - include ticks and reference lines in scale calculation
- SCANNOTATION 
  - include markers, lines, and polygons in scale calculation
- STAMP 
  - C
- LABEL 
  - ["text" or C]
Regions Commands and Subcommands:

FRAME (default)

File I/O Commands and Subcommands:

GSAVE save graph in "filename"
REPLACE
NOREPLACE
GVIEW "filename.mgf"
GPAUSE [K]
Character Control Charts

These are character (typewriter-style, or standard) graphics commands. From the Session window or the Command Line Editor, type the command GSTD to enable these commands. To re-enable high-resolution (professional) graphics commands, type GPRO. These charts are available as high-resolution graphics commands with the same names and with many more options. Character control charts are not available via the menus.

GSTD enable character (standard) graphics
GPRO enable high-resolution (professional) graphics

XBARCHART for C...C, subgroups are in E
MU = K
SIGMA = K
RBAR use R̄ to estimate \( \sigma \)
RSPAN = K
TEST K...K
SUBGROUP size is K
SLIMITS are K...K
HLINES at E...E
ESTIMATE using just samples K...K
YLABEL = 'text'
XLABEL = 'text'
YINCREMENT = K

Note Single quotes must be used around text strings with these subcommands.
### MINITAB Release 13 Session Command Quick Reference

**YSTART** at K [end at K]

**XSTART** at K [end at K]

**TITLE** = 'text'

**FOOTNOTE** = 'text'

**RCHART** for C...C, subgroups are in E

- **SIGMA** = K
- **RBAR** use $\overline{R}$ to estimate $\sigma$
- **SUBGROUP** size is K
- **SLIMITS** are K...K
- **HLINES** at E...E
- **ESTIMATE** using just samples K...K
- **YLABEL** = 'text'
- **XLABEL** = 'text'
- **YINCREMENT** = K
- **YSTART** at K [end at K]
- **XSTART** at K [end at K]
- **TITLE** = 'text'
- **FOOTNOTE** = 'text'

**SCHART** for C...C, subgroups are in E

- **SIGMA** = K
- **RBAR** use $\overline{R}$ to estimate $\sigma$
- **SUBGROUP** size is K
- **SLIMITS** are K...K

**Note** Single quotes must be used around text strings with these subcommands.
MINITAB Release 13

Session Command Quick Reference

**HLINES** at E...E
**ESTIMATE** using just samples K...K
**YLABEL** = 'text'
**XLABEL** = 'text'
**YINCREMENT** = K
**YSTART** at K [end at K]
**XSTART** at K [end at K]
**TITLE** = 'text'
**FOOTNOTE** = 'text'

**ICHART** for C...C
**MU** = K
**SIGMA** = K
**RSPAN** = K
**TEST** = K...K
**SLIMITS** are K...K
**HLINES** at E...E
**ESTIMATE** using just samples K...K
**YLABEL** = 'text'
**XLABEL** = 'text'
**YINCREMENT** = K
**YSTART** at K [end at K]
**XSTART** at K [end at K]
**TITLE** = 'text'

*Note* Single quotes must be used around text strings with these subcommands.
MEET MTB

CONTENTS

FOOTNOTE = 'text'

MACHART for C...C, subgroups are in E
  MU = K
  SIGMA = K
  RBAR  use R to estimate \( \sigma \)
  SPAN = K
  RSPAN = K
  SUBGROUP size is K
  SLIMITS are K...K
  HLINES at E...E
  ESTIMATE using just samples K...K
  YLABEL = 'text'
  XLABEL = 'text'
  YINCREMENT
  YSTART at K [end at K]
  XSTART at K [end at K]
  TITLE = 'text'
  FOOTNOTE = 'text'

EWMACHART for C...C, subgroups are in E
  MU = K
  SIGMA = K
  RBAR  use R to estimate \( \sigma \)
  WEIGHT = K

Note Single quotes must be used around text strings with these subcommands.
RSPAN = K
SUBGROUP size is K
SLIMITS are K…K
HLINES at E…E
ESTIMATE using just samples K…K
YLABEL = 'text'
XLABEL = 'text'
YINCREMENT = K
YSTART at K [end at K]
XSTART at K [end at K]
TITLE = 'text'
FOOTNOTE = 'text'

MRCHART for C…C
SIGMA = K
RSPAN = K
SLIMITS are K…K
HLINES at E…E
ESTIMATE using just samples K…K
YLABEL = 'text'
XLABEL = 'text'
YINCREMENT = K
YSTART at K [end at K]
XSTART at K [end at K]

Note Single quotes must be used around text strings with these subcommands.
**PCHART**

number of nonconformities are in C...C, sample size = E

- \( P = K \)
- \( \text{TEST} = K...K \)
- \( \text{SUBGROUP} \) size is K
- \( \text{SLIMITS} \) are K...K
- \( \text{HLINES} \) at \( E...E \)
- \( \text{ESTIMATE} \) using just samples K...K

**Note** Single quotes must be used around text strings with these subcommands.

**NPCHART**

number of nonconformities are in C...C, sample size = E

- \( P = K \)
- \( \text{TEST} = K...K \)
- \( \text{SUBGROUP} \) size is K
- \( \text{SLIMITS} \) are K...K
- \( \text{HLINES} \) at \( E...E \)
- \( \text{ESTIMATE} \) using just samples K...K
Note Single quotes must be used around text strings with these subcommands.

Note Single quotes must be used around text strings with these subcommands.
MINITAB Release 13 Session Command Quick Reference

**CONTENTS**

- HOW TO USE
- SUBGROUP size is K
- SLIMITS are K...K
- HLINES at E...E
- ESTIMATE using just samples K...K
- YLABEL = 'text'
- XLABEL = 'text'
- YINCREMENT = K
- YSTART at K [end at K]
- XSTART at K [end at K]
- TITLE = 'text'
- FOOTNOTE = 'text'

**Process Capability**

%RCAPA
- RSUB data in rows of C...C (each row is a subgroup)
- CSUB data in C, subgroup size is E
- WITHIN use within-subgroup variation (Cp, Cpk)
- BETWEEN use between-subgroup variation (Pp, Ppk)
- MU = K
- SIGMA = K
- RBAR base \( \sigma \) estimate on average of subgroup ranges
- SBAR base \( \sigma \) estimate on average of subgroup st.devs.

*Note* Single quotes must be used around text strings with these subcommands.
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMR</td>
<td>base σ estimate on median of the moving range</td>
</tr>
<tr>
<td>RSPAN</td>
<td>length of moving range = K (default = 2)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>estimate σ using overall standard deviation</td>
</tr>
<tr>
<td>MINMAX</td>
<td>min = K max = K for capability histogram</td>
</tr>
<tr>
<td>PERCENT</td>
<td>in place of parts-per-million</td>
</tr>
<tr>
<td>STORE</td>
<td>in C...C statistics specified on HOARD</td>
</tr>
<tr>
<td>HOARD</td>
<td>store K...K (see arguments below) in cols. specified on STORE</td>
</tr>
</tbody>
</table>
1 = variable name
2 = USL (or UB)
3 = USL* (or UB*)
4 = Target
5 = Target*
6 = LSL (or LB)
7 = LSL* (or LB*)
8 = Mean
9 = Mean*
10 = Sample N
11 = StDev (Within)
12 = StDev* (Within)
13 = StDev (Overall)
14 = StDev* (Overall)
15 = Cp
16 = CPU
17 = CPL
18 = Cpk
19 = Cpm
20 = Pp
21 = PPU
22 = PPL
23 = Ppk
24 = Observed PPM < LSL (or < LB) (or %)
25 = Observed PPM > USL (or > UB) (or %)
26 = Observed PPM Total (or %)
27 = Expected Within PPM < LSL (or < LB or < LSL* or < LB* or > LSL* or > LB*) (or %)
28 = Expected Within PPM > USL (or > UB or > USL* or > UB* or < USL* or < UB*) (or %)
29 = Expected Within PPM Total (or %)
30 = Expected Overall PPM < LSL (or < LB or < LSL* or < LB* or > LSL* or > LB*) (or %)
31 = Expected Overall PPM > USL (or > UB or > USL* or > UB* or < USL* or < UB*) (or %)
32 = Expected Overall PPM Total (or %)

BIASED do not use unbiasing constants
SRMSSD base $\sigma$ estimate on the square root of half of the mean of the squared successive differences when all subgroup sizes = 1
ZBENCH replace capability statistics with benchmark $Z$’s
BOXCOX C
USPEC K [K] (second K is flag for “hard” specification)
LSPEC K [K] (second K is flag for “hard” specification)
TARGET specification = K
TOLER = K (default = 6)
TITLE for graph is "text"
GSAVE save graph in "filename"
USPEC and LSPEC are the specification limits. You must use at least one of these.

<table>
<thead>
<tr>
<th>%BWCAPA</th>
<th>capability analysis for between/within</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSUBS</td>
<td>data in C...C, subgroup size is E</td>
</tr>
<tr>
<td>RSUBS</td>
<td>data in rows of C...C (each row is a subgroup)</td>
</tr>
<tr>
<td>USPEC</td>
<td>K [K] (second K is flag for “hard” specification)</td>
</tr>
<tr>
<td>LSPEC</td>
<td>K [K] (second K is flag for “hard” specification)</td>
</tr>
<tr>
<td>TARGET</td>
<td>specification = K</td>
</tr>
<tr>
<td>MU</td>
<td>= K</td>
</tr>
<tr>
<td>BSIG</td>
<td>= K</td>
</tr>
<tr>
<td>WSIG</td>
<td>= K</td>
</tr>
<tr>
<td>BOXCOX</td>
<td>K</td>
</tr>
<tr>
<td>TOLER</td>
<td>= K (default = 6)</td>
</tr>
<tr>
<td>RBAR</td>
<td>base σ estimate on average of subgroup ranges</td>
</tr>
<tr>
<td>SBAR</td>
<td>base σ estimate on average of subgroup st.devs.</td>
</tr>
<tr>
<td>MMR</td>
<td>base σ estimate on median of the moving range</td>
</tr>
<tr>
<td>SRMSSD</td>
<td>base σ estimate on the square root of half of the mean of the</td>
</tr>
</tbody>
</table>
MINITAB Release 13 Session Command Quick Reference

squared successive differences when all subgroup sizes = 1

RSPAN length of moving range = K (default = 2)

TITLE for graph is "text string"

GSAVE save graph in "filename"

WITHIN use within-subgroup variation (Cp, Cpk)

OVERALL use between-subgroup variation (Pp, Ppk)

MINMAX capability histogram minimum = K maximum = K

PERCENT in place of parts-per-million

BIASED do not use unbiasing constants

HOARD store K...K (see arguments on page 157) in cols. specified on STORE

STORE in C...C statistics specified on HOARD

NOCHART do not display graph

%WCAPA capability report, assuming data from Weibull distribution

CSUBS data in C

RSUBS data in rows of C...C

USPEC K [K] (second K is flag for "hard" specification)

LSPEC K [K] (second K is flag for "hard" specification)

TARGET specification = K

SHAPE K

SCALE K

TOLER = K

TITLE for graph is K or "text"

GSAVE save graph in "filename"

%RSIXPACK
### RSUB data in rows of C…C (each row is a subgroup)

- **CSUB** data in C, subgroup size is E
- **MU** = K
- **SIGMA** = K
- **RBAR** base $\sigma$ estimate on average of subgroup ranges
- **SBAR** base $\sigma$ estimate on average of subgroup st.devs.
- **MMR** base $\sigma$ estimate on median of the moving range
- **RSPAN** length of moving range = K (default = 2)
- **TOTAL** estimate $\sigma$ using overall standard deviation
- **BIASED** do not use unbiasing constants
- **SRMSSD** base $\sigma$ estimate on the square root of half of the mean of the squared successive differences when all subgroup sizes = 1
- **TARGET** = K
- **BOXCOX** C
- **USPEC** K
- **LSPEC** K
- **TOLER** = K (default = 6)
- **BREAKOUT** K subgroups or observations to display in run chart
- **TEST** use tests K…K
- **TITLE** for graph is "text"
- **GSAVE** save graph in "filename"
CSUBS data in C, subgroup size is E
RSUBS data in rows of C...C (each row is a subgroup)
USPEC K
LSPEC K
TARGET K
MU = K
BSIG K
WSIG
BOXCOX K
TOLER = K
RBAR base σ estimate on average of subgroup ranges
SBAR base σ estimate on average of subgroup st.devs.
MMR base σ estimate on median of the moving range
SRMSSD base σ estimate on the square root of half of the mean of the squared successive differences when all subgroup sizes = 1
RSPAN length of moving range = K (default = 2)
TITLE for graph is "text string"
GSAVE save graph in "filename"
BIASED do not use unbiasing constants
TEST K...K
CSUBS data in C, subgroup size is K
RSUBS data in rows of C...C (each row is a subgroup)
<table>
<thead>
<tr>
<th>Command/Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>USPEC</td>
<td>K</td>
</tr>
<tr>
<td>LSPEC</td>
<td>K</td>
</tr>
<tr>
<td>SHAPE</td>
<td>K</td>
</tr>
<tr>
<td>SCALE</td>
<td>K</td>
</tr>
<tr>
<td>TOLER</td>
<td>= K</td>
</tr>
<tr>
<td>BREAKOUT</td>
<td>K subgroups or observations to display in run chart</td>
</tr>
<tr>
<td>TITLE</td>
<td>for graph is “text”</td>
</tr>
<tr>
<td>GSAVE</td>
<td>save graph in &quot;filename&quot;</td>
</tr>
<tr>
<td>%BCAPA</td>
<td>capability report, assuming data from binomial distribution</td>
</tr>
<tr>
<td>DEFECTS</td>
<td>C</td>
</tr>
<tr>
<td>SAMPLEN</td>
<td>C or K</td>
</tr>
<tr>
<td>P</td>
<td>K</td>
</tr>
<tr>
<td>TEST</td>
<td>K...K</td>
</tr>
<tr>
<td>TARGET</td>
<td>specification = K</td>
</tr>
<tr>
<td>BW</td>
<td></td>
</tr>
<tr>
<td>FCOLOR</td>
<td></td>
</tr>
<tr>
<td>TITLE</td>
<td>for graph is “text”</td>
</tr>
<tr>
<td>%PCAPA</td>
<td>capability report, assuming data from Poisson distribution</td>
</tr>
<tr>
<td>DEFECTS</td>
<td>C</td>
</tr>
<tr>
<td>SAMPLEN</td>
<td>C or K</td>
</tr>
<tr>
<td>MU</td>
<td>= K</td>
</tr>
<tr>
<td>TEST</td>
<td>K...K</td>
</tr>
<tr>
<td>TARGET</td>
<td>specification = K</td>
</tr>
</tbody>
</table>
**FCOLOR**
**TITLE** for graph is "text"

**Distribution Analysis**

 `%LDOVIEW` C...C
**FREQUENCY** are in C...C
**BY** C

*Probability Plot Options*

**MKM** plot positions determined by modified Kaplan-Meier method
**KM** plot positions determined by Kaplan-Meier method
**HJ** plot positions determined by Herd-Johnson method
**ALLPT** plot all points when there are tied failure times
**AVEPT** plot average (median) of tied points when there are tied failure times
**MAXPT** plot maximum of tied points when there are tied failure times

*Censoring Options*

**CENSOR** indicators are in C...C
**CVALUE** censoring values K
**UPTIME** upper limit for failure time is K
**UPFAIL** upper limit for number of failures is K
Estimation Options

KM  Kaplan-Meier method
INTBY specify intervals from 0 to K1 by K2 (Actuarial method)
MLE  maximum likelihood
LSXY least squares (failure time (X) versus rank (Y))

Distributions

WEIBULL distribution
EXTVALUE (Extreme Value) distribution
EXPONENTIAL distribution
LOGISTIC distribution
LLOGISTIC (loglogistic) distribution
NORMAL distribution
LGNEXP (lognormal base EXP) distribution
LGNTEN (lognormal base TEN) distribution

TITLE for graph is "text"
GSAVE save graph in "file"

%LDOVIEWA C...C
FREQUENCY are in C...C
BY C

Probability Plot Options
TURNBULL plot positions are determined by Turnbull method
ACTUARIAL plot positions are determined by Actuarial method

Estimation Options
MLE maximum likelihood
LSXY least squares (failure time (X) versus rank (Y))

Distributions
NORMAL distribution
WEIBULL distribution
LGNEXP (lognormal base EXP) distribution
LGNENT (lognormal base TEN) distribution
EXPO exponential distribution
EXTVALUE (Extreme Value) distribution
LOGISTIC distribution
LLOGISTIC (loglogistic) distribution
TITLE for graph is "text"
GSAVE save graph in "file"

%LDIDENT C...C (changed subcommands)
FREQUENCY are in C...C
Probability Plot Options

MKM  plot positions determined by modified Kaplan-Meier method
KM   plot positions determined by Kaplan-Meier method
Hj   plot positions determined by Herd-Johnson method
Allpt plot all points when there are tied failure times
Avept plot average (median) of tied points when there are tied failure times
Maxpt plot maximum of tied points when there are tied failure times

Censoring Options

Censor indicators are in C...C
Cvalue censoring values K
Uptime upper limit for failure time is K
UFAIL upper limit for number of failures is K

Estimation Options

MLE maximum likelihood
LSXY least squares (failure time (X) versus rank (Y))
Ptiles percentiles for K...K

Distributions

Normal distribution
Weibull distribution
LGNEXP  (lognormal base EXP) distribution
LGNTEN  (lognormal base TEN) distribution
EXPO    exponential distribution
EXTVALUE (Extreme Value) distribution
LOGISTIC distribution
LLOGISTIC (loglogistic) distribution
TITLE   for graph is "text"
GSAVE   save graph in "file"
%LDIDENT C...C
FREQUENCY are in C...C
BY C

Estimation Options
PTILES K...K
MLE maximum likelihood
LSXY least squares (failure time (X) versus rank (Y))

Probability Plot Options
TURNBULL plot positions are determined by Turnbull method
ACTUARIAL plot positions are determined by Actuarial method

Distributions
NORMAL distribution
WEIBULL distribution
LGNEXP (lognormal base EXP) distribution
LGNSEN (lognormal base TEN) distribution
EXPO exponential distribution
EXTVALUE (Extreme Value) distribution
LOGISTIC distribution
LLOGISTIC (loglogistic) distribution
TITLE for graph is "text"
GSAVE save graph in "file"
LTTEST C...C
FREQUENCY are in C...C
BY C
COMSHAPE assume common shape parameter
COMSCALE assume common scale parameter
LOWCI lower confidence band
UPCI upper confidence band
TWOCl two-sided confidence interval
TVSS test shape or scale = K
TVSL test scale or location = K
TESS test for equal shape or scale
TESL test for equal scale or location

Graph Options:
XMINIMUM x-axis scale minimum = K
XMAXIMUM x-axis scale maximum = K
XLABEL x-axis label = K or "text string"
PPLOT does a probability plot
MKM plot positions determined by mod. Kaplan-Meier method
KM plot positions determined by Kaplan-Meier method
HJ plot positions determined by Herd-Johnson method
ALLPT plot all points when there are tied failure times
AVEPT plot average (median) of tied points when there are tied failure times
MINITAB Release 13 Session Command Quick Reference

MAXPT plot maximum of tied points when there are tied failure times
CI display confidence intervals on probability and survival plot
SPLT does a survival plot
HPLOT does a hazard plot

Censoring Options
CENSOR indicators are in C...C (if you have multiply right censored data)
CVALUE censoring value K
UPTIME value is K (if you have Type I censoring on the right)
UPFAIL value is K (if you have Type II censoring on the right)

Distributions
WEIBULL distribution
EXTVALUE (extreme value) distribution
EXPONENTIAL distribution
LOGISTIC distribution
LLOGISTIC (loglogistic) distribution
NORMAL distribution
LGNEXP (lognormal base EXP) distribution
LGNTEN (lognormal base TEN) distribution
Estimation Options

MLE  maximum likelihood
LSXY  least squares (failure time (X) versus rank (Y))
TIMES  are K...K or C
STIME  put in C
SURVPROBABILITY put in C...C
CLSURVPROBABILITY put in C...C
PTILES  are K...K or C
KM  Kaplan-Meier method
SURVPROBABILITY put in C...C
STIME  put in C...C
SESURVPROBABILITY put in C...C
CLSURVPROBABILITY put in C...C
HAZARD  put in C...C
HTIME  put in C...C
INTBY  specify intervals from 0 to K1 by K2 (Actuarial method)
SURVPROBABILITY put in C...C
STIME  put in C...C
SESURVPROBABILITY put in C...C
CLSURVPROBABILITY put in C...C
HAZARD  put in C...C
HTIME  put in C...C
INTENDPOINTS  are K...K or C (Actuarial method)
SURVPROBABILITY put in C...C
STIME put in C...C
SESSURVPROBABILITY put in C...C
CLSURVPROBABILITY put in C...C
HAZARD put in C...C
HTIME put in C...C
CONFIDENCE level is K
NOPARAMETRIC suppress all parametric estimation

Storage of Fitted Distribution
PPERCENTS put in C
PERCENTILE put in C...C
SEPERCENTILE put in C...C
CLPERCENTILE put in C...C

Storage of Estimates
PARAM put in C...C
SEPARAM put in C...C
CLPARAM put in C...C
VCPARAM put in M...M
LOGLIKELIHOOD put in K...K

Algorithm Options
ITERATION maximum number is K
START values in C or C...C
SETSHAPE value is K or K...K
SETSCALE value is K or K...K
Session Window Subcommand Only
CTOLERANCE convergence criteria is K K
Output Options
BRIEF output code K
STEP display log-likelihood for each iteration
LTABLE C...C
FREQUENCY are in C...C
BY C
MINITAB Release 13 Session Command Quick Reference

- **COMSHAPE**: assume common shape parameter
- **COMSCALE**: assume common scale parameter
- **LOWCI**: lower confidence band
- **UPCI**: upper confidence band
- **TWOIC**: two-sided confidence interval
- **TVSS**: test shape or scale = K
- **TVSL**: test scale or location = K
- **TESS**: test for equal shape or scale
- **TESL**: test for equal scale or location

**Graph Options**
- **XMINIMUM**: x-axis minimum = K
- **XMAXIMUM**: x-axis maximum = K
- **XLABEL**: x-axis label = K "text string"
- **PPLOT**: plot positions are determined by Turnbull method
- **ACTUARIAL**: plot positions are determined by Actuarial method
- **SPLT**: does a survival plot
- **HPLOT**: does a hazard plot
- **CI**: display confidence intervals on probability and survival plot

**Distributions**
- **WEIBULL**: distribution
- **EXTVALUE**: (extreme value) distribution
- **EXPONENTIAL**: distribution
<table>
<thead>
<tr>
<th>Distribution</th>
<th>Command</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOGISTIC</td>
<td>(LOGISTIC)</td>
</tr>
<tr>
<td>LLOGISTIC (loglogistic)</td>
<td>Distribution</td>
</tr>
<tr>
<td>NORMAL</td>
<td>Distribution</td>
</tr>
<tr>
<td>LGNEXP</td>
<td>(lognormal base EXP) distribution</td>
</tr>
<tr>
<td>LGNTEN</td>
<td>(lognormal base TEN) distribution</td>
</tr>
</tbody>
</table>

**Estimation Options**

- **MLE** maximum likelihood
- **LSXY** least squares (failure time (X) versus rank (Y))
- **TIMES** are K...K or C
  - STIME put in C
  - SURVPROBABILITY put in C...C
  - CLSURVPROBABILITY put in C...C
- **PTILES** are K...K or C
- **TURNBULL** calculate the Turnbull estimates
  - SURVPROBABILITY put in C...C
  - STIME put in C...C
  - SESURVPROBABILITY put in C...C
  - CLSURVPROBABILITY put in C...C
- **ACTUARIAL** calculate the actuarial estimates
  - SURVPROBABILITY put in C...C
  - STIME put in C...C
  - SESURVPROBABILITY put in C...C
  - CLSURVPROBABILITY put in C...C
HAZARD put in C...C
HTIME put in C...C
CONFIDENCE level is K
NOPARAMETRIC suppress all parametric estimation

Storage of Fitted Distribution
PPERCENTS put in C
PERCENTILE put in C...C
SEPERCENTILE put in C...C
CLPERCENTILE put in C...C

Storage of Estimates
PARAM put in C...C
SEPARAM put in C...C
CLPARAM put in C...C
VCPARAM put in M...M
LOGLIKELIHOOD put in K...K

Algorithm Options
ITERATION maximum number is K
START values in C or C...C
SETSHAPE value is K or K...K
SETSscale value is K or K...K
MINITAB Release 13 Session Command Quick Reference

Session Window Subcommand Only
CTOLERANCE convergence criteria is K K

Output Options
BRIEF output code K
STEP display log-likelihood for each iteration

Regression with Life Data
LREGRESSION C...C = model
FREQUENCY are in C...C

Graph Options
R PLOT does a relation plot
PTILES are in K...K or C
PFAILURES plot uncensored values or midpoint of interval for interval censored values
DVALUE include design value K on relation plot
ALLCI include c.i.'s on all percentiles in relation plot
ONECI include c.i.'s on the middle percentile in relation plot
SP PLOT does a probability plot for the standardized residuals
EP PLOT does an exponential probability plot for the Cox-Snell residuals
CI include confidence intervals on probability plots
### AFPPLOT
- probability plot based on fitted model

### ONECI
- place conf. intervals on design value fitted line if given

### ALLCI
- place confidence intervals on all fitted lines

### DVALUE
- enter design value to be placed on plot

### AIPPLOT
- probability plot based on individual fits

#### Censoring Options
- **CENSOR**: indicators are in C...C
- **CVALUE**: censoring value K
- **SEND**: response variables are in an arbitrary censoring format

#### Model Options
- **REFERENCE**: level of C is K, ..., C K
- **FACTORS**: are in C...C

*These subcommands only work with a model which has one covariate:*

#### Scales
- **ARRHENIUS**: scale
- **INVTEMP**: scale
- **LOGE**: scale
- **LOGTEN**: scale

#### Distributions
- **WEIBULL**: distribution
- **EXTVALUE**: (extreme value) distribution
- **EXPONENTIAL**: distribution
LOGISTIC distribution
LLOGISTIC (loglogistic) distribution
NORMAL distribution
LGNEXP (lognormal base EXP) distribution
LGNTEN (lognormal base TEN) distribution

Estimation Options
ESTIMATE percentiles or survival probabilities for [C…C] or [K…K] or for the predictor values in the data set [No arguments]

TIMES are in K…K or C
PTILES are in K…K or C
PERCENTILE put in C…C
SEPERCENTILE put in C…C
CLPERCENTILE put in C…C
SURVPROBABILITY put in C…C
CLSURVPROBABILITY put in C…C
CONFIDENCE level is K

Storage of Residuals
RESIDUAL put in C…C
SRESIDUAL put standardized residuals in C…C
CSREDISDUAL put Cox-Snell residuals in C…C

Storage of Estimated Equation
COEFFICIENT put in C…C
**SECOEFFICIENT** put in C...C
**CLCOEFFICIENT** put in C...C
**VCCOEFFICIENT** put in M...M
**LOGLIKELIHOOD** put in K...K

**Algorithm Options**

- **ITERATION** maximum number is K
- **START** values are in C...C
- **SETSCALE** value is K or K...K
- **SETSHAPE** value is K or K...K

**Session Window Subcommands Only**

- **CTOLERANCE** convergence criteria is K K
- **TOLERANCE** level is K [K]

**Output Options**

- **BRIEF** output code K
- **STEP** display log-likelihood for each iteration

**Probit Analysis**

- **PROBIT** C [C] = C [C]
- **FREQUENCY** are in C
- **ST** response is in a success trial format
Session Window Subcommands Only

SF response is in a success failure format
FT response is in a failure trial format

Graph Options

PPLOT does a probability plot
SPLOT does a survival plot
CI display confidence intervals on probability and survival plot
PPEARSON plot Pearson residuals versus probability
PDEVIANCE plot deviance residuals versus probability

Model Options

FACTOR is in C
REFERENCE level or event of C is K, ..., C K

Distributions

WEIBULL distribution
EXTVALUE (extreme value) distribution
LOGISTIC distribution
LLOGISTIC (loglogistic) distribution
NORMAL distribution
LGEXP (lognormal base EXP) distribution
LGNTEN (lognormal base TEN) distribution
Estimation Options

PTILES are K...K or C
STRESS values are K...K or C
SSTRESS put in C
SURVPROBABILITY put in C...C
CLSURVPROBABILITY put in C...C
HOSMER number of groups is K
NAPPROXIMATION normal approximation confidence intervals
CONFIDENCE level is K

Storage

PRESIDUAL put in C
DRESIDUAL put in C
PPERCENT put in C
PERCENTILE put in C...C
SEPERCENTILE put in C...C
CLPERCENTILE put in C...C
EPROBABILITY put in C [C]
COEFFICIENT put in C
SECOEFFICIENT put in C
NATRESPONSE put in K
SENATRESPONSE put in K
VCCOEFFICIENT put in M
LOGLIKELIHOOD put in K
Algorithm Options

- **ITERATION**: maximum number is K
- **START**: values are in C
- **SETC**: set natural response to K
- **OPTC**: optimize natural response

Session Window Subcommand Only

- **CTOLERANCE**: convergence criteria is K K

Output Options

- **BRIEF**: output code K
- **STEP**: display log-likelihood for each iteration

Factorial Designs

- **FFDESIGN**: K factors [K runs]
  - **BLOCKS**: number is K or termlist
  - **REPLICATES**: for each point are K
  - **CPBLOCK**: add K center points to each block
  - **FRACTION**: use K
  - **FOLD**: design on [fact...fact]
  - **ADD**: to design fact = term ... fact = term
  - **ALIAS**: print interactions up to order K
  - **RANDOMIZE**: [using base K]
XMATRIX put in C...C
LEVELS are in K K, ..., K K or C
TERMS put in C
SORDER put in C C
BRIEF output code K
FDESIGN K...K
BLOCK
REPS K
LEVELS K...K ... K...K
RANDOMIZE [K]
SORDER C C
XMATRIX C...C
PBDESIGN K factors [K runs]
REPLICATES are K for each point
CENTER add K points
RANDOMIZE [using base K]
XMATRIX put in C...C
LEVELS are K K, ..., K K or C
SORDER put in C C
FFACTORIAL model
BLOCKS C
INUNIT K (K = 0 if design is in coded form; 1 if uncoded form)
LEVELS are K K, ..., K K or C
CTPT C
FITC fits the center point column as a term in the model
COVARIATES are in C...C
SMEANS store means C...C
SSD store standard deviations C...C
EFFECTS put in C...C
COEFFICIENTS put in C...C
FITS put in C...C
RESIDUALS put in C...C
SRESIDUALS put in C...C
TRESIDUALS put in C...C
HI put in C
COOKD put in C...C
DFITS put in C...C
XMATRIX put in M
MEANS for termlist
GEFFECTS draw normal plot of effects
GPARETO draw Pareto chart of effects
RTYPE plot residual type K
GHISTOGRAM display histogram of residuals
GNORMAL display normal plot of residuals
GFITS plot residuals vs fits
GORDER plot residuals vs worksheet order [or vs order specified in C]
GVARIABLE plot residuals vs C...C
MINITAB Release 13 Session Command Quick Reference

ALIAS [information up to order K]
TOLERANCE K [K]
BRIEF output code K
%FFMAIN main effects plots for factors in C...C
   MIXTURE treat the factors as process variables in a mixture design
   RESPONSE data in C...C
   YMIN y-axis minimum(s) is K [...K]
   YMAX y-axis maximum(s) is K [...K]
   INUNIT K (0 if design is in coded units, 1 if uncoded units)
   CTPT column that identifies the center point rows is C
   LSMEANS are in C...C (cannot be used with MIXTURE subcommand)
   LEVELS for the uncoded units are K K, ..., K K
   TITLE for graph is "text"
%FFINT interaction plots for factors in C...C
   MIXTURE treat the factors as process variables in a mixture design
   RESPONSE data in C...C
   FULL display full matrix of plots
   YMIN y-axis minimum(s) is K [...K]
   YMAX y-axis maximum(s) is K [...K]
   INUNIT K (0 if design is in coded units, 1 if uncoded units)
   CTPT column that identifies the center point rows is C
   LSMEANS are in C...C (cannot be used with MIXTURE subcommand)
   LEVELS for the uncoded units are K K, ..., K K
   TITLE for graph is "text"
%FFCUBE  cube plot for factors in C...C
  MIXTURE  treat the factors as process variables in a mixture design
  RESPONSE data in C...C
  INUNIT  K (0 if design is in coded units, 1 if uncoded units)
  CTPT  column that identifies the center point rows is C
  LSMEANS are in C...C (cannot be used with MIXTURE subcommand)
  LEVELS for the uncoded units are K K, ..., K K
  TITLE for graph is "text"

%GFMAIN  main effects plots for factors in C...C
  RESPONSE data in C...C
  YMIN  y-axis minimum(s) K [...K]
  YMAX  y-axis maximum(s) K [...K]
  LSMEANS are in C...C
  TITLE "text"

%GFINT  interaction plots for factors in C...C
  RESPONSE data in C...C
  LSMEANS are in C...C
  YMIN  y-axis minimum(s) K [...K]
  YMAX  y-axis maximum(s) K [...K]
  FULL displays the full matrix of plots
  TITLE "text"

%FORM  C C C
  BLOCK C
Response Surface Designs

BBDESIGN  K factors
  BLOCKS  block the design
  CENTER  add K points
  RANDOMIZE [using base K]
  XMATRIX  put in C...C
  LEVELS  are in K K, ..., K K or C
  SORDER  put in C C
  BRIEF  output code K

CCDESIGN  K factors
  HALF  use a one-half fraction design
  ALPHA  = K
  BLOCKS  total number is K
  CENTER  add K to cube [add K points to axial block]
  RANDOMIZE [using base K]
  XMATRIX  put in C...C
  LEVELS  are in K K, ..., K K or C
  INSCRIBE
  SORDER  put in C C
  BRIEF  output code K

RSREG  C...C = ...C
  BLOCKS  in C
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FITS</td>
<td>put in C…C</td>
</tr>
<tr>
<td>RESIDUALS</td>
<td>put in C…C</td>
</tr>
<tr>
<td>SRESIDUALS</td>
<td>put in C…C</td>
</tr>
<tr>
<td>TRESIDUALS</td>
<td>put in C…C</td>
</tr>
<tr>
<td>HI</td>
<td>put in C</td>
</tr>
<tr>
<td>COOKD</td>
<td>put in C…C</td>
</tr>
<tr>
<td>DFITS</td>
<td>put in C…C</td>
</tr>
<tr>
<td>COEFFICIENTS</td>
<td>put in C…C</td>
</tr>
<tr>
<td>XMATRIX</td>
<td>put in M</td>
</tr>
<tr>
<td>QUADRATIC</td>
<td>put in C…C</td>
</tr>
<tr>
<td>RTYPE</td>
<td>plot residual type K</td>
</tr>
<tr>
<td>GHISTOGRAM</td>
<td>display histogram of residuals</td>
</tr>
<tr>
<td>GNORMAL</td>
<td>display normal plot of residuals</td>
</tr>
<tr>
<td>GFITS</td>
<td>plot residuals vs fits</td>
</tr>
<tr>
<td>GORDER</td>
<td>plot residuals vs order</td>
</tr>
<tr>
<td>GVARIABLE</td>
<td>plot residuals vs C…C</td>
</tr>
<tr>
<td>BRIEF</td>
<td>K</td>
</tr>
<tr>
<td>TOLERANCE</td>
<td>K [K]</td>
</tr>
<tr>
<td>RSCONTOUR</td>
<td>C C</td>
</tr>
<tr>
<td>.factorial</td>
<td></td>
</tr>
<tr>
<td>INUNIT</td>
<td>input units = K, output units = K</td>
</tr>
</tbody>
</table>
(0 = coded units, 1 = uncoded units)

**FLEVELS**

nominal factor levels are K K ... K K

**HIGH**

**LOW**

**MIDDLE**

**HOLD**

K ... K

**ALLPAIRS**

**SINGLE**

C C

**LEVELS**

K ... K or C

**NLEVELS**

K

**NMESH**

K K

Data Display Subcommands for RSCONTOUR:

**CONNECT**

**TYPE**

K ... K or C

**COLOR**

K ... K or C

**SIZE**

K ... K or C

**AREA**

**TYPE**

K ... K or C

**COLOR**

K ... K or C

**DIRECTION**

K

**BASE**

K ... K or C

Annotation Subcommands for RSCONTOUR:
MINITAB Release 13
Session Command Quick Reference

TITLE "title"
all of its subcommands (see page 53)

FOOTNOTE "footnote"
all of its subcommands (see page 53)

TEXT K K "text"
all of its subcommands (see page 53)

LINE K K ... K K or C C
all of its subcommands (see page 53)

POLYGON K K ... K K or C C
all of its subcommands (see page 53)

MARKER K K ... K K or C C
all of its subcommands (see page 53)

Frame Customization Subcommands for RS CONTOUR:

AXIS K [K K] or C [K K]
all of its subcommands (see page 56)

TICK K [K...K or C] or C [K...K or C]
all of its subcommands (see page 56)

GRID K or C
all of its subcommands (see page 56)

REFERENCE K ... K or K C or C K ... K or C C
all of its subcommands (see page 56)

MINIMUM K K

MAXIMUM K K
Regions Commands and Subcommands for RSContour:

- LAYOUT
- ENDLAYOUT
- FIGURE [K K K K]
- DATA [K K K K]
- ASPECT K K

File I/O Commands and Subcommands for RSContour:

- GSsave save graph in "filename"
- REPLACE
- NOREPLACE
- GVIEW "filename.mgf"
- GPAUSE [K]

RSSurface C C (RS Wireframe menu command with different settings.)

- FACTORIAL
  - INUNIT K
  - FLEVELS K K ... K K
  - HIGH
  - LOW
MIDDLE
HOLD   K...K
ALLPAIRS
SINGLE  C C
NMESH   K K
SURFACE
  TYPE   K
  COLOR  K
  ETYPE  K
  ECOLOR K
  ESIZE  K

Data Display Subcommands for RSSURFACE:
  SYMBOL
      all of its subcommands (see page 51)
  PROJECT
      all of its subcommands (see page 51)

Annotation Subcommands for RSSURFACE:
  TITLE   "title"
      all of its subcommands (see page 53)
  FOOTNOTE "footnote"
      all of its subcommands (see page 53)

3D Effects (Graph Viewing Tools) Subcommands for RSSURFACE:
VPOSITION  K K K
VTARGET   K K K
VUP       K K K
VFIELD    K K
VPROJECTION K
VASPECT   [K K K]
VBOX      K

3D Lighting and Rendering Tools Subcommands for RSSURFACE:
HSREMOVAL K
LSHADING  K [K]
LIGHT    K K K
COLOR    K
VISIBILITY  K
LBRIGHT  K

File I/O Commands and Subcommands for RSSURFACE:
GSAVE    save graph in "filename"
REPLACE  
NOREPLACE
GVIEW    "filename.mgf"
GPAUSE   [K]
Mixture Designs

SCDESIGN simplex centroid design for K components
AUGMENT augment design with axial points halfway between each vertex and centroid
AXIAL augment design with axial points halfway between each vertex and centroid
ALLREP replicate all points in the design K times
REPS K K ... K K in each pair first value is point type; second is number of replicates
TOTAL mixture totals are K[K...K] or C
LOWER lower bounds for components are K[K...K or C
UPPER upper bounds for components are K[K...K or C
PROC K process variables [fraction = K [fraction ID = K]]
LEVELS low and high levels for each process variable are K[K
RANDOM randomize order [using base = K]
XMATRIX store design matrix in C...C
SORDER store standard order in C; store run order in C
PTTYPE store point type = C (0 = center point, 1 = vertex, 2 = edge

%FFMAIN see Factorial Designs on page 185
%FFINT see Factorial Designs on page 185
%RESPLOTS see Regression on page 94
centroid, 3 = face centroid
STOTAL store one or more totals in C
SLOWER store component lower bounds in C
SUPPER store component upper bounds in C
PSEUDO display and store design in L-pseudo components
PROPORTION display and store design in proportions
BRIEF output code K
SLDESIGN simplex lattice design for K components, degree of lattice = K
AUGMENT augment design with center point and axial points halfway between each vertex and centroid
DEGREE of lattice = K
CENTER augment design with center point
AXIAL augment design with axial points halfway between each vertex and centroid
ALLREP replicate all points in the design K times
REPS K K … K K in each pair first value is point type; second is number of replicates
TOTAL mixture totals are K [K…K] or C
LOWER lower bounds for components are K…K or C
UPPER upper bounds for components are K…K or C
PROC K process variables [fraction = K [fraction ID = K]]
LEVELS low and high levels for each process variable are K…K
RANDOM randomize order [using base = K]
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>XMATRIX</td>
<td>store design matrix in C</td>
</tr>
<tr>
<td>SORDER</td>
<td>store standard order in C, store run order in C</td>
</tr>
<tr>
<td>PTTYPE</td>
<td>store point type = C (0 = center point, 1 = vertex, 2 = edge centroid, 3 = face centroid)</td>
</tr>
<tr>
<td>STOTAL</td>
<td>store one or more totals in C</td>
</tr>
<tr>
<td>SLOWER</td>
<td>store component lower bounds in C</td>
</tr>
<tr>
<td>SUPPER</td>
<td>store component upper bounds in C</td>
</tr>
<tr>
<td>PSEUDO</td>
<td>display and store design in L-pseudo components</td>
</tr>
<tr>
<td>PROPORTION</td>
<td>display and store design in proportions</td>
</tr>
<tr>
<td>BRIEF</td>
<td>output code K</td>
</tr>
<tr>
<td>EVDESIGN</td>
<td>extreme vertices design for K components</td>
</tr>
<tr>
<td>AUGMENT</td>
<td>augment design with center point and axial points halfway between each vertex and centroid</td>
</tr>
<tr>
<td>CENTER</td>
<td>augment design with center point</td>
</tr>
<tr>
<td>DEGREE</td>
<td>of design = K</td>
</tr>
<tr>
<td>AXIAL</td>
<td>augment design with axial points halfway between each vertex and centroid</td>
</tr>
<tr>
<td>ALLREP</td>
<td>replicate all points in the design K times</td>
</tr>
<tr>
<td>REPS</td>
<td>K K ... K K in each pair first value is point type; second is</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>TOTAL</td>
<td>mixture totals are $K_{[K...K]}$ or $C$</td>
</tr>
<tr>
<td>LOWER</td>
<td>lower bounds for components are $K_{[K...K]}$ or $C$</td>
</tr>
<tr>
<td>UPPER</td>
<td>upper bounds for components are $K_{[K...K]}$ or $C$</td>
</tr>
<tr>
<td>LINEAR</td>
<td>linear constraint is $K_{[K...K]}$ or $C$</td>
</tr>
<tr>
<td>PROC</td>
<td>$K$ process variables [fraction = $K$ [fraction ID = $K$]]</td>
</tr>
<tr>
<td>LEVELS</td>
<td>low and high levels for each process variable are $K_{[K...K]}$</td>
</tr>
<tr>
<td>RANDOM</td>
<td>randomize order [using base = $K$]</td>
</tr>
<tr>
<td>XMATRIX</td>
<td>store design matrix in $C_{[C...C]}$</td>
</tr>
<tr>
<td>SORDER</td>
<td>store standard order in $C$, store run order in $C$</td>
</tr>
<tr>
<td>PTTYPE</td>
<td>store point type = $C$, 0 = center point, 1 = vertex, 2 = edge</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>centroid, 3 = face centroid</td>
<td></td>
</tr>
<tr>
<td>STOTAL</td>
<td>store one or more totals in C</td>
</tr>
<tr>
<td>SLOWER</td>
<td>store component lower bounds in C</td>
</tr>
<tr>
<td>SUPPER</td>
<td>store component upper bounds in C</td>
</tr>
<tr>
<td>SLINEAR</td>
<td>store linear constraints in C...C</td>
</tr>
<tr>
<td>PSEUDO</td>
<td>display and store design in L-pseudo components</td>
</tr>
<tr>
<td>PROPORTION</td>
<td>display and store design in proportions</td>
</tr>
<tr>
<td>BRIEF</td>
<td>output code K</td>
</tr>
<tr>
<td>SIMPLEX</td>
<td>simplex design plot, components of the design are in C...C</td>
</tr>
<tr>
<td>TOTAL</td>
<td>mixture totals are K[K...K] or C</td>
</tr>
<tr>
<td>LOWER</td>
<td>lower bound of components are K...K or C</td>
</tr>
<tr>
<td>UPPER</td>
<td>upper bound of components are K...K or C</td>
</tr>
<tr>
<td>LINEAR</td>
<td>linear constraint is K...K or C</td>
</tr>
<tr>
<td>SINGLE</td>
<td>plot with components C C C</td>
</tr>
<tr>
<td>ALLTRIPLETs</td>
<td>multiple plots to show all component triplets</td>
</tr>
<tr>
<td>PROPORTION</td>
<td>proportion unit for the component axes on the plot</td>
</tr>
<tr>
<td>PSEUDO</td>
<td>pseudocomponent unit for the component axes on the plot</td>
</tr>
<tr>
<td>PROCESS</td>
<td>process variables in C...C</td>
</tr>
<tr>
<td>AMOUNT</td>
<td>mixture amount variable in C</td>
</tr>
<tr>
<td>LABEL</td>
<td>design points with replicates [or with values in C]</td>
</tr>
<tr>
<td>CLOW</td>
<td>set values of all components not on plot to their lower bound</td>
</tr>
<tr>
<td>CHIGH</td>
<td>set values of all components not on plot to their upper bound</td>
</tr>
<tr>
<td>CHOLD</td>
<td>set all components not on plot to K...K</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>FLOW</td>
<td>set levels of all process variables at low level (= -1)</td>
</tr>
<tr>
<td>FHIGH</td>
<td>set levels of all process variables at high level (= 1)</td>
</tr>
<tr>
<td>FHOLD</td>
<td>set levels of process variables K...K</td>
</tr>
<tr>
<td>A Hold</td>
<td>set mixture amount at K</td>
</tr>
<tr>
<td>MINIMUM</td>
<td>value of simplex coordinate K (1, 2, or 3) is K</td>
</tr>
<tr>
<td>GRID</td>
<td>draw grid lines on each axis [at K intervals]</td>
</tr>
<tr>
<td>TITLE</td>
<td>for graph is &quot;text&quot;</td>
</tr>
</tbody>
</table>

**MIXREG**

- **C...C = TERMS**
- **BLOCKS** blocking variable in C
- **PROC** process variables in C...C
- **AMOUNT** mixture amount in C
- **PSEUDO** fit model in pseudocomponents
- **MODEL** store model term codes in C...C
- **STEPWISE** model selection procedure
- **FORWARD** model selection procedure
- **BACKWARD** model selection procedure
- **FORCE** TERMS to be forced in model
- **ENTER** TERMS in starting model
- **A ENTER** $\alpha = K$ to enter term in model
- **A REMOVE** $\alpha = K$ to remove term from model
- **BEST** K alternative terms
- **FIT S** put in C...C
- **RESIDUALS** put in C...C
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRESIDUALS</td>
<td>put in C…C</td>
</tr>
<tr>
<td>TRESIDUALS</td>
<td>put in C…C</td>
</tr>
<tr>
<td>HI</td>
<td>put in C</td>
</tr>
<tr>
<td>COOKD</td>
<td>put in C…C</td>
</tr>
<tr>
<td>DFITS</td>
<td>put in C…C</td>
</tr>
<tr>
<td>MODEL</td>
<td>put mixture models in C…C</td>
</tr>
<tr>
<td>COEFFICIENTS</td>
<td>put in C…C</td>
</tr>
<tr>
<td>XMATRIX</td>
<td>put in M</td>
</tr>
<tr>
<td>RTYPE</td>
<td>plot residual type K</td>
</tr>
<tr>
<td>GHISTOGRAM</td>
<td>plot histogram of residuals</td>
</tr>
<tr>
<td>GNORMAL</td>
<td>plot normal plot of residuals</td>
</tr>
<tr>
<td>GFITS</td>
<td>plot residuals vs fits</td>
</tr>
<tr>
<td>GORDER</td>
<td>plot residuals vs order</td>
</tr>
<tr>
<td>G VARIABLE</td>
<td>plot residuals vs variables in C…C</td>
</tr>
<tr>
<td>TOLERANCE</td>
<td>for collinear and constant predictors are K [K]</td>
</tr>
<tr>
<td>BRIEF</td>
<td>output code K</td>
</tr>
</tbody>
</table>
**TRACE**
- response trace plot with response in C, model in C

**TOTAL**
- mixture total in K \([K \times K]\) or C

**LOWER**
- lower bound of components \(= K \ldots K\) or C

**UPPER**
- upper bound of components \(= K \ldots K\) or C

**LINEAR**
- linear constraint on components \(= K \ldots K\) or C

**PIEPEL**
- trace plot along Piepel directions

**XREFERENCE**
- K (row ID of reference blend)

**XREFERENCE**
- \(K \ldots K\) (coordinates of reference blend)

**FLOW**
- set levels of all process variables to low \((-1)\)

**FMIDDLE**
- set levels of all process variables to average \((0)\)

**FHIGH**
- set levels of all process variables to high \((1)\)

**FHOLO**
- set process variables to levels \(K \ldots K\)

**AHOLO**
- set mixture amount to \(K\)

**CURVE**
- line type of trace curves \(= K \ldots K\) (default = all solid)

**COLOR**
- line color of trace curves \(= K \ldots K\) (default = different colors)

**NOHLEGEND**
- do not display hold legend

**Generic plot subcommands available**

**TICK**
- draw ticks at \(K \ldots K\)

**GRID**
- \(K\)

**TEXT**
- \(K \times \text{"text"}\)

**TITLE**
- for graph is \"text\"

**FOOT**
- footnote for graph is \"text\"
DATA     K K K K
LEGEND   K K K K
NOLEGEND do not display curve legend
MINIMUM  minimum value
MAXIMUM  maximum value of axis K is K
MIXSURFACE mixture surface plot with response in C, model in C
TOTAL    mixture total in K [K...K] or C
LOWER    lower bound of components = K...K or C
UPPER    upper bound of components = K...K or C
LINEAR   linear constraint on components = K...K or C
SINGLE   plot for components or process variables C C [C]
ALLTRIPLETs multiple plots to show all component triplets
ALLPAIRS multiple plots to show all numerical process variable pairs
PROPORTION component axes displayed in proportion unit
PSEUDO   component axes displayed in pseudocomponent unit
SURFACE
EColor   wireframe color = K (default = 1)
COLOR    surface color = K (default = 0)
NMESH    number of mesh points in horizontal dir. is K, in vertical dir. is K
CLow     set levels of all components not on plot at lower bound
CMIDDLE  set levels of all components not on plot at average of lower and
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHIGH</td>
<td>set levels of all components not on plot at upper bound</td>
</tr>
<tr>
<td>CHOLD</td>
<td>set levels of all components not on plot at K…K</td>
</tr>
<tr>
<td>FLOW</td>
<td>set levels of all process variables to low (−1)</td>
</tr>
<tr>
<td>FMIDDLE</td>
<td>set levels of all process variables to average (0)</td>
</tr>
<tr>
<td>FHIGH</td>
<td>set levels of all process variables to high (1)</td>
</tr>
<tr>
<td>FHOLD</td>
<td>set process variables to levels K…K</td>
</tr>
<tr>
<td>AHOLD</td>
<td>set mixture amount to K</td>
</tr>
<tr>
<td>NOHLEGEND</td>
<td>do not display hold legend</td>
</tr>
<tr>
<td>MINIMUM</td>
<td>minimum value of axis K is K</td>
</tr>
<tr>
<td>MAXIMUM</td>
<td>maximum value of axis K is K</td>
</tr>
<tr>
<td>TITLE</td>
<td>for graph is &quot;text&quot;</td>
</tr>
<tr>
<td>WTITLE</td>
<td>title for window is &quot;text&quot;</td>
</tr>
<tr>
<td>TEXT</td>
<td>K K &quot;text&quot;</td>
</tr>
<tr>
<td>FOOT</td>
<td>footnote for graph is &quot;text&quot;</td>
</tr>
<tr>
<td>FIGURE</td>
<td>K K K</td>
</tr>
<tr>
<td>DATA</td>
<td>K K K</td>
</tr>
<tr>
<td>LEGEND</td>
<td>K K K</td>
</tr>
<tr>
<td>NOLEGEND</td>
<td>do not display legend</td>
</tr>
<tr>
<td>MIXCONTOUR</td>
<td>mixture contour plot with response in C, model in C</td>
</tr>
<tr>
<td>TOTAL</td>
<td>mixture total in K [K…K] or C…C</td>
</tr>
<tr>
<td>LOWER</td>
<td>lower bound of components = K…K or C…C</td>
</tr>
<tr>
<td>UPPER</td>
<td>upper bound of components = K…K or C…C</td>
</tr>
</tbody>
</table>
LINEAR  linear constraint on components = K...K or C...C
SINGLE plot for components or process variables C C [C]
ALLTRIPLETS multiple plots to show all component triplets
ALLPAIRS multiple plots to show all numerical process variable pairs
PROPORTION component axes displayed in proportion unit
PSEUDO component axes displayed in pseudocomponent unit
NLEVELS number of contour levels = K
LEVELS values of contour levels = K...K
NMESH number of mesh points in horizontal dir. is K, in vertical dir. is K
CONNECT or AREA
  TYPE of contour lines or areas = K...K
  COLOR of contour lines or areas = K...K
CLOW set levels of all components not on plot at lower bound
CMIDDLE set levels of all components not on plot at average of lower and
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHIGH</td>
<td>set levels of all components not on plot at upper bound</td>
</tr>
<tr>
<td>CHOLD</td>
<td>set levels of all components not on plot at K...K</td>
</tr>
<tr>
<td>FLOW</td>
<td>set levels of all process variables to low (-1)</td>
</tr>
<tr>
<td>FMIDDLE</td>
<td>set levels of all process variables to average (0)</td>
</tr>
<tr>
<td>FHIGH</td>
<td>set levels of all process variables to high (1)</td>
</tr>
<tr>
<td>FHOLD</td>
<td>set process variables to levels K...K</td>
</tr>
<tr>
<td>AHOME</td>
<td>set mixture amount to K</td>
</tr>
<tr>
<td>MINIMUM</td>
<td>minimum value of axis K is K</td>
</tr>
<tr>
<td>MAXIMUM</td>
<td>maximum value of axis K is K</td>
</tr>
<tr>
<td>GRID</td>
<td>place grid lines at intervals K</td>
</tr>
<tr>
<td>POINTS</td>
<td>display design points on plot</td>
</tr>
<tr>
<td>NOHLEGEND</td>
<td>do not display hold legend</td>
</tr>
<tr>
<td>TITLE</td>
<td>for graph is &quot;text&quot;</td>
</tr>
<tr>
<td>WTITLE</td>
<td>title for window is &quot;text&quot;</td>
</tr>
<tr>
<td>TEXT</td>
<td>K K &quot;text&quot;</td>
</tr>
<tr>
<td>FOOT</td>
<td>footnote for graph is &quot;text&quot;</td>
</tr>
<tr>
<td>FIGURE</td>
<td>K K K K</td>
</tr>
<tr>
<td>DATA</td>
<td>K K K K</td>
</tr>
<tr>
<td>LEGEND</td>
<td>K K K K</td>
</tr>
<tr>
<td>NOLEGEND</td>
<td>do not display contour legend</td>
</tr>
</tbody>
</table>

**Optimal Designs**
### Multiple Response Optimization

**MROPT**  
C...C

---

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPTDES</td>
<td>K optimal design points [design columns are in C...C]</td>
</tr>
<tr>
<td>MIXMODEL</td>
<td>TERMS (these are model term arguments)</td>
</tr>
<tr>
<td>RESMODEL</td>
<td>TERMS (these are model term arguments)</td>
</tr>
<tr>
<td>AUGMENT</td>
<td>[design specified by indicator column C]</td>
</tr>
<tr>
<td>EVALUATE</td>
<td>[design specified by indicator column C]</td>
</tr>
<tr>
<td>BLOCK</td>
<td>blocking variable in C</td>
</tr>
<tr>
<td>PROCESS</td>
<td>process variables in C...C</td>
</tr>
<tr>
<td>AMOUNT</td>
<td>mixture amount in C</td>
</tr>
<tr>
<td>PSEUDO</td>
<td>model fitted in pseudocomponent unit</td>
</tr>
<tr>
<td>GENERATE</td>
<td>K percent of initial design randomly [do K trials [use random number seed K]]</td>
</tr>
<tr>
<td>SEQUENTIAL</td>
<td>method to generate initial design</td>
</tr>
<tr>
<td>EXCHANGE</td>
<td>K design point in improving the initial design</td>
</tr>
<tr>
<td>FEDOROV</td>
<td>method for improving the initial design</td>
</tr>
<tr>
<td>INDICATOR</td>
<td>store selected point indicator in C</td>
</tr>
<tr>
<td>XMATRIX</td>
<td>store optimal design matrix in C...C</td>
</tr>
<tr>
<td>CARRY</td>
<td>additional columns (C...C) from old worksheet to columns (C...C) in new worksheet</td>
</tr>
<tr>
<td>BRIEF</td>
<td>output code K</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
</tr>
<tr>
<td>QUADRATICS</td>
<td>C...C</td>
</tr>
<tr>
<td>MINACCEPT</td>
<td>K...K or C</td>
</tr>
<tr>
<td>MAXACCEPT</td>
<td>K...K or C</td>
</tr>
<tr>
<td>TARGET</td>
<td>K...K or C</td>
</tr>
<tr>
<td>GOAL</td>
<td>K...K or C</td>
</tr>
<tr>
<td>UTWEIGHTS</td>
<td>K...K or C</td>
</tr>
<tr>
<td>IMPORTANCE</td>
<td>K...K or C</td>
</tr>
<tr>
<td>START</td>
<td>K...K</td>
</tr>
<tr>
<td>FACTORIAL</td>
<td>C...C</td>
</tr>
<tr>
<td>INUNIT</td>
<td>K (0 = coded units, 1 = uncoded units)</td>
</tr>
<tr>
<td>FLEVELS</td>
<td>nominal factor levels are K K ... K K</td>
</tr>
<tr>
<td>COVARIATES</td>
<td>K...K</td>
</tr>
<tr>
<td>MIXTURE</td>
<td>model C...C</td>
</tr>
<tr>
<td>LINEAR</td>
<td>K...K</td>
</tr>
<tr>
<td>TOTAL</td>
<td>amount of mixture components is C</td>
</tr>
<tr>
<td>INUNIT</td>
<td>K (0 = coded units, 1 = uncoded units)</td>
</tr>
<tr>
<td>FLEVELS</td>
<td>nominal factor levels are K K ... K K</td>
</tr>
<tr>
<td>DSTORE</td>
<td>C</td>
</tr>
<tr>
<td>OPTIPLT</td>
<td></td>
</tr>
<tr>
<td>%OVERCONT</td>
<td>overlaid contour plot for multiple responses</td>
</tr>
<tr>
<td>RESPONSES</td>
<td>C...C</td>
</tr>
<tr>
<td>QUADRATICS</td>
<td>C...C</td>
</tr>
<tr>
<td>SINGLE</td>
<td>C C</td>
</tr>
<tr>
<td>HOLD</td>
<td>K...K</td>
</tr>
</tbody>
</table>
INUNIT  input units = K, output units = K
       (0 = coded units, 1 = uncoded units)
FLEVELS  nominal factor levels are K K ... K K
LV1      K K
LV2      K K
LV3      K K
LV4      K K
LV5      K K
LV6      K K
LV7      K K
LV8      K K
LV9      K K
LV10     K K
YMIN     K
YMAX     K
XMIN     K
XMAX     K
TITLE    "text"
%FACTORVY overlaid contour plot for multiple responses of factorial designs
RESPONSE variables C...C
QUADRATICS in C...C
INUNIT factor values = K, plot display = K (0 = coded, 1 = uncoded)
FLEVELS K...K
SINGLE x-axis = C, y-axis = C
HOLD extra factors and covariates at K...K
LV1 contours for first response variable = K K
LV2 contours for second response variable = K K
LV3 contours for third response variable = K K
LV4 contours for fourth response variable = K K
LV5 contours for fifth response variable = K K
LV6 contours for sixth response variable = K K
LV7 contours for seventh response variable = K K
LV8 contours for eighth response variable = K K
LV9 contours for ninth response variable = K K
LV10 contours for tenth response variable = K K
YMIN y-axis minimum = K
YMAX y-axis maximum = K
XMIN x-axis minimum = K
XMAX x-axis maximum = K
CLEANUP remove model info. cols. from worksheet after plot is drawn
TITLE for graph is "text"
%MIXOVER  overlaid contour plot for multiple responses of mixture models
### Minitab Release 13 Session Command Quick Reference

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RESPONSE</td>
<td>in C...C</td>
</tr>
<tr>
<td>MODEL</td>
<td>in C...C</td>
</tr>
<tr>
<td>MMERGE</td>
<td>merge mixture model C...C</td>
</tr>
<tr>
<td>STORE</td>
<td>in C...C</td>
</tr>
<tr>
<td>LV1-10</td>
<td>contours = K K</td>
</tr>
<tr>
<td>TOTAL</td>
<td>mixture amounts = K [K...K]</td>
</tr>
<tr>
<td>LOWER-10</td>
<td>bound of components = K...K</td>
</tr>
<tr>
<td>UPPER-10</td>
<td>bound of components = K...K</td>
</tr>
<tr>
<td>LN1-7</td>
<td>linear constraint = K...K</td>
</tr>
<tr>
<td>LN8-14</td>
<td>linear constraint = K...K</td>
</tr>
</tbody>
</table>

214
### Contents

- LN8: linear constraint = K...K
- LN9: linear constraint = K...K
- LN10: linear constraint = K...K
- PSEUDO: component scale for plot
  - PROPORTION: axis scale is in proportion
- SINGLE: components or process variables C C [C] for 2D plot
- CHOLD: components not on plot = K...K
- FHOLD: extra process variables not on plot = K...K
- AHOOLD: mixture amount = K
- XMIN: x-axis minimum = K
- YMIN: y-axis minimum = K
- ZMIN: z-axis minimum = K
- XMAX: x-axis maximum = K
- YMAX: y-axis maximum = K
- CLEANUP: remove model info. cols. from worksheet after plot is drawn
- TITLE: for graph is "text"

### Taguchi Designs

- %ROBUST: analyze an inner-outer array design
  - RESPONSE: data from the outer array are in C...C
  - INNER: array factors are in C...C
<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DYNAMIC</td>
<td>signal in C</td>
</tr>
<tr>
<td>YREF</td>
<td>response reference value = K</td>
</tr>
<tr>
<td>SREF</td>
<td>signal reference value = K</td>
</tr>
<tr>
<td>NOREF</td>
<td>do not use reference values for the regression, estimate a separate regression intercept for each run</td>
</tr>
<tr>
<td>SLOPES</td>
<td>put in C</td>
</tr>
<tr>
<td>INTERCEPTS</td>
<td>put in C</td>
</tr>
<tr>
<td>LSTDEVS</td>
<td>put loge of standard deviations in C</td>
</tr>
<tr>
<td>GSLOPES</td>
<td>generate plots for regression slopes</td>
</tr>
<tr>
<td>INTMAT</td>
<td>generate interaction plot matrix for C C ... C C</td>
</tr>
<tr>
<td>INTSEP</td>
<td>generate a separate interaction plot for C C ... C C</td>
</tr>
<tr>
<td>TMEANS</td>
<td>generate a response table for means</td>
</tr>
<tr>
<td>TSN</td>
<td>generate a response table for signal-to-noise ratios</td>
</tr>
<tr>
<td>TSTDVS</td>
<td>generate a response table for standard deviations</td>
</tr>
<tr>
<td>TSLOPES</td>
<td>generate a response table for slopes</td>
</tr>
<tr>
<td>SCATTER</td>
<td>generate scatter plots of data with fitted lines</td>
</tr>
<tr>
<td>SNRATIO</td>
<td>put s/n ratios in C</td>
</tr>
<tr>
<td>MEANS</td>
<td>put means in C</td>
</tr>
<tr>
<td>STDEVS</td>
<td>put standard deviations in C</td>
</tr>
<tr>
<td>CV</td>
<td>put coefficients of variation in C</td>
</tr>
<tr>
<td>NOM1</td>
<td>bases s/n ratio on standard deviations only</td>
</tr>
<tr>
<td>NOM2</td>
<td>bases s/n ratio on means and st.devs. (default)</td>
</tr>
<tr>
<td>LOWER</td>
<td>s/n ratio models lower is better</td>
</tr>
<tr>
<td>HIGHER</td>
<td>s/n ratio models higher is better</td>
</tr>
</tbody>
</table>
### MINITAB Release 13 Session Command Quick Reference

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOGSTD</td>
<td>do a log_e transformation on the standard deviations</td>
</tr>
<tr>
<td>GSN</td>
<td>plot s/n ratios</td>
</tr>
<tr>
<td>GMEAN</td>
<td>plot means</td>
</tr>
<tr>
<td>GSTD</td>
<td>plot standard deviations</td>
</tr>
<tr>
<td>TITLE</td>
<td>for plot is &quot;text&quot;</td>
</tr>
</tbody>
</table>

#### %PREDICT

| INNER       | array factors C...C                                                         |
| CHARACTERISTICS | to be predicted in C...C                                                  |
| LABELS      | for predictions "text" ... "text"                                         |
| LEVELS      | new levels where predictions are to be calculated are E...E                |
| INTERACTIONS | C C ... C C                                                               |
| PFITS       | put predicted values in C...C                                             |
| UNITS       | inner array = K, units of LEVELS = K (0 = coded, 1 = uncoded)             |
| NLEVELS     | number of levels = K...K                                                   |
| FLEVELS     | uncoded levels K...K                                                       |

#### Oadesign

<p>| Taguchi orthogonal array design K runs with K levels for K factors |</p>
<table>
<thead>
<tr>
<th>[K levels for K factors]</th>
</tr>
</thead>
<tbody>
<tr>
<td>XMATRIX</td>
</tr>
<tr>
<td>LEVELS</td>
</tr>
<tr>
<td>COLUMNS</td>
</tr>
<tr>
<td>INTERACTIONS</td>
</tr>
<tr>
<td>SIGNAL</td>
</tr>
</tbody>
</table>