

MULTIPLY

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Contents

1	MULTILOT	1
1.1	Multiplot XLN-S Guide	1
1.2	Introduction	2
1.3	Registration and distribution	2
1.4	Legal Disclaimer	3
1.5	Summary	4
1.6	Requirements	4
1.7	Installation	5
1.8	The PLT: Device	5
1.9	PLT: Device Summary	6
1.10	The Zounds! Auditory Cuing System	6
1.11	Starting Multiplot	7
1.12	Workbench Startup Options	7
1.13	CLI Startup Options	10
1.14	Windows Available in Multiplot	13
1.15	The Introduction Window	13
1.16	The Plot Window	13
1.17	The Data Selection Window	15
1.18	The Custom Plot Window	16
1.19	The Axis Window	18
1.20	The Edit Point Window	19
1.21	The Edit Text Window	19
1.22	The Print Set-up Window	20
1.23	The Data Entry Window	21
1.24	The Co-ordinates Window	22
1.25	The Description Window	22
1.26	The Percentiles Window	22
1.27	The One Sample t Test Window	23
1.28	The Two Sample t Test Window	23
1.29	The Mann-Whitney U Test Window	23

1.30 The Contingency Table Window	24
1.31 The Fisher's Exact Test Window	24
1.32 The Goodness of Fit Test Window	25
1.33 The About Multiplot Window	25
1.34 The About StatPack Window	25
1.35 The Pull Window	25
1.36 The Ask Window	26
1.37 The Message Window	26
1.38 Menus Available in Multiplot	26
1.39 The Project Menu	26
1.40 The Open File Menu Option	27
1.41 The Add File Menu Option	27
1.42 The New Graph Menu Option	27
1.43 The Swap Graph Menu Option	27
1.44 The Exit Graph Menu Option	27
1.45 The Save Menu Option	28
1.46 The Save As Menu Option	28
1.47 The Defaults Menu Option	28
1.48 The Print Preview Menu Option	29
1.49 The Print Setup Menu Option	29
1.50 The Print Menu Option	29
1.51 The About Multiplot Menu Option	29
1.52 The About StatPack Menu Option	29
1.53 The Quit Menu Option	30
1.54 The Edit Menu	30
1.55 The Undelete Menu Option	30
1.56 The CUT Menu Option	30
1.57 The Copy Menu Option	30
1.58 The Paste Menu Option	31
1.59 The Delete Menu Option	31
1.60 The View Data Menu Option	31
1.61 The Add Menu Option	31
1.62 The Actions Menu	32
1.63 The Mouse Action Menu	32
1.64 The Redraw Menu	33
1.65 The Update Menu	33
1.66 The Full Plot Menu	33
1.67 The Redefine Plot Menu	33
1.68 The Align Vertical Menu	33

1.69 The Align Horizontal Menu	33
1.70 The Options Menu	34
1.71 The Graph Type Menu Option	34
1.72 The Cross Hair Menu Option	34
1.73 The Coordinates Menu Option	35
1.74 The Axes Menu Option	35
1.75 The Right Margin Menu Option	35
1.76 The Palette Menu Option	35
1.77 The Significant Figures Menu Option	35
1.78 The Error Bars Menu Option	36
1.79 The Axis Scale Locks Menu	36
1.80 The Axis Values Lock Menu	36
1.81 The Functions Menu	37
1.82 The Sort Data Menu Option	37
1.83 The Smooth data Menu Option	37
1.84 The Linear Fit Menu Option	38
1.85 The Polynomial Fit Menu Option	38
1.86 The ARexx Macro Menu Option	38
1.87 The Statistics Menu	38
1.88 The Description Menu Option	39
1.89 The Percentiles Menu Option	39
1.90 The One Sample t Test Menu Option	39
1.91 The Two Sample t Test Menu Option	39
1.92 The Mann-Whitney U Test Menu Option	40
1.93 The Contingency Table Menu Option	40
1.94 The Fisher's Exact Test Menu Option	40
1.95 The Goodness of Fit Test Menu Option	40
1.96 Menu Command Keyboard Shortcuts	40
1.97 Using The PLT: Device	41
1.98 Multiplot's ARexx Interface	42
1.99 Global ARexx Commands	43
1.100ARexx Example 1	44
1.101The Message Window ARexx Commands	44
1.102The Ask Window ARexx Commands	44
1.103The Data Selection Window ARexx Commands	45
1.104The Plot Window ARexx Commands	45
1.105rexxexample2	51
1.106rexxexample3	52
1.107rexxexample4	52

1.108	rexxexample5	52
1.109	The Custom Plot Window ARexx Commands	53
1.110	Example 6	54
1.111	The Edit Axis Window ARexx Commands	55
1.112	The Edit Point Window ARexx Commands	57
1.113	The Data Entry Window ARexx Commands	57
1.114	The Edit Text Window ARexx Commands	58
1.115	Example 7	58
1.116	The Print Set-up Window ARexx Commands	59

Chapter 1

MULTILOT

1.1 Multiplot XLN-S Guide

- Registration
- Introduction
- Requirements
- Installation

- Starting Multiplot
 - Workbench Startup Options
 - CLI Startup Options

- Windows
 - The Introduction Window
 - The Data Selection Window
 - The Plot Window
 - The Custom Plot Window
 - The Data Entry Window
 - The Edit Axis Window
 - The Edit Point Window
 - The Edit Text Window
 - The Print Set-up Window
 - The Co-ordinates Window
 - The Description Window
 - The Percentiles Window
 - The One Sample t Test Window
 - The Two Sample t Test Window
 - The Mann-Whitney U Test Window
 - The Contingency Table Window
 - The Fisher's Exact Test Window
 - The Goodness of Fit Test Window
 - The About Multiplot Window
 - The About StatPack Window
 - The Pull Window
 - The Ask Window
 - The Message Window

- Menus
 - The Project Menu
 - The Edit Menu
 - The Actions Menu

- The Options Menu
- The Functions Menu
- The Statistics Menu

Keyboard Shortcuts

ARexx Commands

- Global ARexx Commands
- The Ask Window ARexx Commands
- The Message Window ARexx Commands
- The Data Selection Window ARexx Commands
- The Plot Window ARexx Commands
- The Custom Plot Window ARexx Commands
- The Data Entry Window ARexx Commands
- The Print Set-up Window ARexx Commands
- The Edit Point Window ARexx Commands
- The Edit Axis Window ARexx Commands
- The Edit Text Window ARexx Commands

1.2 Introduction

This is the 7th version of Multiplot XLN which is the premier data plotting program for the Commodore Amiga. It is used in over 30 Universities world wide and Multiplot graphs have been published in peer reviewed science journals and presented at international scientific meetings.

Multiplot XLN-S is Shareware. All rights to the source code, programs and text belong to, and copyrights are held by, Alan Baxter.

Centenary Institute of Cancer Medicine and Cell Biology,
Locked bag #6, Newtown, NSW 2042, Australia
Fax: (international) 61-2-5656103

StatPack is a link library of statistical functions and is available for licence. It is copyright Scientific Programming of Interactive Applications, Olivia Wüthrich-Martone and Charles Wüthrich.
email: wuethri@amiga.icu.net.ch

- Summary
- Registration and Distribution Conditions
- Legal Disclaimer

1.3 Registration and distribution

Multiplot is not in the public domain. It is now (from XLNe) shareware and a shareware fee is requested.

Two versions are currently available.

Multiplot XLN-S provides both graphing facilities and statistical analysis and can be registered for \$40 USD, #30 UK or \$50 ASD.

Multiplot XLNg provides the same graphing facilities, but does not contain the StatPack library functions. It can be registered for \$30 USD, #23 UK or \$35 ASD.

Registrations should be sent to:

Dr Alan Baxter,
Centenary Institute of Cancer Medicine and Cell Biology,
Locked bag #6, Newtown, NSW 2042, Australia,

Personal cheques are accepted when drawn on Australian, British or US national banks. Payments drawn on other foreign banks are not accepted due to excessive banking charges.

The shareware fee entitles the licensee to the most recent version of Multiplot, on-line hypertext documentation, an ARexx Companion Disk containing extra utilities and a tutorial on using ARexx with Multiplot, free bug fixes and discount upgrades. The ARexx Companion Disk and the Amiga Guide documentation are not Shareware, and may not be copied or distributed without the author's permission.

Multiplot may be freely distributed, but not included in a commercial package without express consent of the author. It is periodically released to Mr Fred Fish, who is licensed to distribute it in any form he sees fit providing the distribution package contains documentation and examples. This package may then be compressed and posted on any electronic distribution service.

1.4 Legal Disclaimer

These programs are in no way designed or intended for professional use. Any damages or losses resulting from inappropriate application of any or all of this distribution whether accidental or intentional, are not the responsibility of the author, his wife, son, agent, mother or (much missed) labrador; and should not, under any circumstances, be compounded by attempting long and fruitless legal action.

All rights to the documentation, source code and programs are reserved.

The inclusion of the PLT: Device with Multiplot in no way implies any change in, or affects the distribution conditions of that package. Please read the documentation provided with PLT: for further information.

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The StatPack functions are included with the permission of Olivia Wüthrich-Martone and Charles Wüthrich of Scientific Programming of Interactive Applications.

1.5 Summary

Multiplot XLN is professional standard fully intuitive data plotting program. It plots data points as (x,y) co-ordinates with or without x or y error bars.

It can plot an unlimited number of sets with any number of data points using colour, line type, line weight, point shape and point size to represent the different sets. A set may be joined by a line or plotted as discrete points. Data may be impulse plotted, scatter plotted, or shown as a histogram or step graph. Additions to the data may be made in the form of lines of best fit (logarithmic, exponential, linear and polynomial) and data smoothing utilising modified open b-splines or averaging filtration. The input file for Multiplot is a simple textfile and may be created in any ASCII text editor or saved from any spreadsheet. Multiplot supports the clipboard, and data input may be achieved solely through it.

Multiplot has a full ARexx interface which provides potential for a wide variety of data manipulations including statistical analysis.

Multiplot fully supports on-line Amiga Guide documentation and the 'Help' key.

Output may be in any of the following formats: IntroCAD, Draw, mCAD, IFF, Revised Hewlett-Packard Graphics Language (HPGL/2), Encapsulated Postscript (EPSF) or Postscript. The graph can be printed to any workbench printer by transparent use of the PLT: Device. Multiplot directly supports the HP LaserJet III and Postscript laser printers such as the Apple Laser printer.

1.6 Requirements

*Workbench 2.0 (or higher) including:
Maths libraries,
Assignment of ENV:, T:, and CLIPS:.
The C: directory must contain the files c:mount and
c:type.

*The PLT: Device is necessary for printing.
It consists of:
-PLT:-handler in the L: directory
-The mountlist entry for PLT: added to the
devs:mountlist (WB2.0) OR The device driver to
be placed in the storage/dosdrivers directory
(> WB2.0).
-Assignment of the PLTDATA: directory containing
PLT fonts.

*The PLT: device requires that a printer has been selected
in the printer preferences window and the printer choice
saved. The "Generic" printer driver is sufficient, but must
be selected and the selection saved from within the printer
preferences program. Trying to use PLT: without defining a
printer will result in a software error (number 80000005).

*At least 1Mb RAM.

*The directory which contains Multiplot must contain a
subdirectory called "MPlot_support" (without the quotes)
which must contain the files "intro.img", "txt_2_icad",
"plot2draw" and "HPGL2PS" (without the quotes).

*The file "MPlot.def" should either be in the
"MPlot_support" directory, or in the S: directory.

*Zounds! requires that the files "say.znd",
"ask.znd", "ding.znd" and "zounds.img" be in the
"MPlot_support" directory.

* ARexx support requires that rexxmast be running, and RC
be in the SYS:rexc directory.

1.7 Installation

Multiplot must be installed from the Workbench using the
Install utility which is provided on the installation
disk. This program will prompt for a directory in which
you wish to store Multiplot. As several system files are
copied during installation, it is important that the
computer has been booted up on the Workbench you intend
to use when running Multiplot.

1.8 The PLT: Device

PLT: is a file-handler that emulates a plotter by accepting HP-GL commands, creating a raster image, and then dumping it to any Preferences supported graphics printer. Both Multiplot's Workbench printing and the Print Preview menu option are mediated by PLT: interpretation of HP-GL commands.

- Summary
- Legal restrictions
- Requirements
- Installation
- Using The PLT: Device

1.9 PLT: Device Summary

PLT: is a file-handler that emulates a plotter by accepting HP-GL commands, creating a raster image, and then dumping it to any Preferences supported graphics printer. The current resolution set with preferences is used, allowing PLT: to make full use of a printer's capability.

PLT: accepts virtually all of the standard HP-GL commands, including scaling and text. The commands that were not implemented are those which are generally contained in an extended graphics cartridge, such as: circles, arcs, filled regions, etc.

1.10 The Zounds! Auditory Cuing System

Auditory cuing systems (ACS) are standard interfaces of sounds triggered by actions within application programs. The sounds are used to inform the user of a change in status of the program. Particular sounds are used to identify specific changes and become part of the user interface helping to orient the user.

Zounds! is a state of the art ACS developed for the Amiga. It is available for license to other developers and its incorporation into other application programs is encouraged by the author. It provides a set standard alerting sounds that are triggered whenever the program unexpectedly has something to tell the user. Sounds are not triggered directly as a result of user selection of icons, objects or menu selections. A message requester triggers a sound like "Didlepom"; a falling tone not dissimilar to the falling tones used in speech when stating fact. A rising tone, "Bombidit" is triggered by requesters that are asking for a response from the user. The rising tones reflect those used in speech

when asking a question.

The Zounds! volume is set at application start-up either in the command line when the application is started from the CLI or by setting the tool types appropriately in the icon when using the Workbench. If the volume is set to 0 at start-up, Zounds! is disabled.

Example:

```
From the CLI      >Multiplot VOLUME=0
From the Workbench, set Tool Types to  VOLUME=0
```

Zounds! is completely user configurable. The sound samples used by Zounds! have names ending in the post fix .znd, are stored in a support directory (MPlot_support), and are in the standard Amiga 8SVX IFF format. These samples may be replaced by sounds chosen by the user.

1.11 Starting Multiplot

Multiplot can be started from either the Workbench or from the Command Line Interface (CLI). The same options are available either as Workbench tool types or as command line options.

Workbench Startup Options
CLI Startup Options

1.12 Workbench Startup Options

The workbench start-up options are defined in the Multiplot icon and are set as tool types. The following options are available:

SCREENMODE Keyword to be followed by one of the following:

HIRES	Indicates 640 pixel wide (+ overscan) mode.
SUPER	Indicates 1280 pixel wide (+ overscan) mode.
PRODUCT	Indicates VGA compatible mode.
LACE	May be or'ed () with any of the above modes to double the vertical resolution
A2024	Supports the Commodore A2024 monitor.
TENHERTZ	May be or'ed () with A2024 to

indicate sync speed.

FIFTEENHERTZ May be or'ed (|) with A2024 to
indicate sync speed.

If the SCREENMODE tooltype is not included, Multiplot will clone the characteristics of the Workbench screen.

Example: SCREENMODE=HIRES|LACE produces 640 x
400/512 screen.

SCREENDEPTH Keyword to be followed by screen depth in planes. Currently only 1 to 4 planes are available in HIRES and 1 to 2 planes in productivity. One bit plane provides 2 colours, 2 bit planes provides 4 colours, 3 bit planes provides 8 colours and 4 bit planes provides 16 colours.

Example: SCREENDEPTH=3 produces an 8 colour screen.

SCREENWIDTH Keyword to be followed by width of screen in pixels. Screens wider than the current visible size are opened as autoscroll screens.

Example: SCREENWIDTH=720 produces maximum horizontal overscan for a hires screen.

SCREENHEIGHT Keyword to be followed by height of screen in pixels. Screens taller than the current visible size are opened as autoscroll screens.

Example SCREENHEIGHT=484 produces maximum vertical overscan for an NTSC interlaced screen.

STARTPRI Keyword to be followed by priority the Multiplot process should be run at. In general, priority should be between -5 and 5 to avoid conflicts with other currently active processes. Multiplot must be run at a lower priority than the PLT: Device to avoid a scheduling lock-out.

Example: STARTPRI=3 results in slightly faster execution.

PUBSCREEN Keyword to be followed by the name of a public screen for Multiplot to open on. Note that the public screen name need only include the first word of the screens name, and that the name is case sensitive. For example Workbench is recognised but WORKBENCH is not.

Example: PUBSCREEN=Workbench results in Multiplot running on the workbench instead of its own screen.

STARTUP Keyword to be followed by name of an ARexx macro to be run from The Data Selection Window at start-up.

Example: STARTUP=Rexx/Loadtable.mpt runs macro on start-up.

PORTNAME Keyword to be followed name for ARexx port when opened. The default name is MULTILOT.nn where nn is the lowest available number producing a unique port name.

Example: PORTNAME=TAWNY Names the ARexx port for Multiplot "TAWNY"

SETTINGS Keyword to be followed by the name of a file containing initial settings. If not set, the file MPlot_support/MPlot.def is read. The defaults file defines the screen colours, printed pen thicknesses, axes (number, type, range), grid and tics, plot labels and locks.

Example: SETTINGS=s:MyNiceColours Loads settings from named file.

QUIET Prevents opening of the introduction WINDOW. It is useful for remote start-up of Multiplot especially if invoked from an ARexx macro, or if you are just sick of seeing the introduction WINDOW.

Example: QUIET

VOLUME Sets the volume of Zounds! Auditory Cuing System to a value between 0 and 64. Setting a volume of 0 switches off Zounds! completely.

Example: VOLUME=0 Switches off Zounds! Auditory Cuing System.

PSFONT Sets the postscript output font to that named. The keyword PSFONT must be followed by one of:

- Times-Roman
- Helvetica
- Helv-Narrow
- AvantGarde
- Bookman
- Palatino
- ZapfChancery
- Courier

Example: PSFONT=Times-Roman Switches both postscript printed output and EPSF output fonts to Times-Roman

PSPAGE Sets the postscript printed page size, ensuring correct placement of graphs on pages with different aspect ratios. The keyword PSPAGE must be followed by one of:

- A Sets USA page size A
- 4 Sets to international standard A4 page size

Example: PSPAGE=A Sets postscript page size to USA page size A.

1.13 CLI Startup Options

The CLI start-up options are defined on the command line and are summarised in the template:

```
Multiplot FILES, QUIET/S, PUBSCREEN/K, PORTNAME/K,
STARTUP/K, SETTINGS/K, SCREENDDEPTH/N,
SCREENWIDTH/K/N, SCREENHEIGHT/K/N, SCREENMODE/K,
STARTPRI/K/N, VOLUME/K/N, PSPAGE/K, PSFONT/K
```

Where:

```
, (comma) indicates no arguments or separates
           arguments,
/K         indicates the keyword is required,
/S         indicates a switch keyword, and
/N         indicates a numerical argument is required.
```

These keywords provide the following options:

FILES Keyword to be followed by name of file to be loaded on invocation. If file was written by Multiplot it will be autoloaded. If this argument is used together with the **QUIET** argument, Multiplot will open a Plot window on start-up.

Example: Multiplot FILES Data/Eric.dat

SCREENDDEPTH Keyword to be followed by screen depth in planes. Currently only 1 to 4 planes are available in **HIRES** and 1 to 2 planes in **productivity**. One bit plane provides 2 colours, 2 bit planes provides 4 colours, 3 bit planes provides 8 colours and 4 bit planes provides 16 colours.

Example: Multiplot SCREENDDEPTH 3 produces an 8 colour screen.

SCREENWIDTH Keyword to be followed by width of screen in pixels. Screens wider than the current visible size are opened as autoscroll screens.

Example: Multiplot SCREENWIDTH 720 produces maximum horizontal overscan for a hires screen.

SCREENHEIGHT Keyword to be followed by height of screen in pixels. Screens higher than the current visible size are opened as autoscroll screens.

Example: Multiplot SCREENHEIGHT 484 produces maximum vertical overscan for an NTSC interlaced screen.

SCREENMODE Keyword to be followed by one of the following:

HIRES	Indicates 640 pixel wide by 200/256 high (+ overscan) mode.
HIRESLACE	Indicates 640 pixel wide by

	400/512 high (+ overscan) mode.
SUPER	Indicates 1280 pixel wide by 200/256 high (+ overscan) mode.
SUPERLACE	Indicates 1280 pixel wide by 400/512 high (+ overscan) mode.
VGAPROD	Indicates VGA compatible mode.
VGAPRODUCTLACE	Indicates interlaced VGA compatible mode.
A2024TENHERTZ	Supports the Commodore A2024 monitor at sync speed of 10Hz.
A2024FIFTEENHERTZ	Supports the Commodore A2024 monitor at sync speed of 15Hz.

If the SCREENMODE keyword is not included, Multiplot will clone the characteristics of the Workbench screen.

Example: SCREENMODE HIRESLACE produces 640 x 400/512 screen.

STARTPRI Keyword to be followed by priority the Multiplot process should be run at. In general, priority should be between -5 and 5 to avoid conflicts with other currently active processes. Multiplot must be run at a lower priority than the PLT: Device to avoid a scheduling lock-out.

Example: Multiplot STARTPRI 3 results in slightly faster execution.

PUBSCREEN Keyword to be followed by the name of a public screen for Multiplot to open on. Note that the public screen name need only include the first word of the screens name, and that the name is case sensitive. For example Workbench is recognised but WORKBENCH is not.

Example: Multiplot PUBSCREEN Workbench results in Multiplot running on the workbench instead of its own screen.

STARTUP Keyword to be followed by name of an ARexx macro to be run from The Data Selection Window at start-up.

Example: Multiplot STARTUP Rexx/LoadTable.mpt runs macro on start-up.

PORTNAME Keyword to be followed name for ARexx Port when opened. The default name is MULTILOT.nn where nn is the lowest available number producing a unique port name.

Example: Multiplot PORTNAME TAWNY Names the ARexx port for Multiplot "TAWNY"

SETTINGS Keyword to be followed by the name of a defaults file containing initial settings. If not set, the file MPlot_support/MPlot.def is read. The defaults file defines the screen colours, printed pen thicknesses, axes (number, type, range), grid and tics, plot labels and locks.

Example: Multiplot SETTINGS s:MyNiceColours Loads settings from named file.

QUIET Prevents opening of introduction WINDOW. Useful for remote start-up of Multiplot especially if invoked from an ARexx macro, or if you are just sick of seeing the introduction WINDOW.

Example: Multiplot QUIET

VOLUME Sets the volume of Zounds! Auditory Cuing System to a value between 0 and 64. Setting a volume of 0 switches off Zounds! completely.

Example: VOLUME 0 Switches off Zounds! Auditory Cuing System.

PSFONT Sets the postscript output font to that named. The keyword PSFONT must be followed by one of:

Times-Roman
Helvetica
Helv-Narrow
AvantGarde
Bookman
Palatino
ZapfChancery
Courier

Example: Multiplot PSFONT Times-Roman Switches both postscript printed output and EPSF output fonts to Times-Roman

PSPAGE Sets the postscript printed page size, ensuring correct placement of graphs on pages with different aspect ratios. The keyword PSPAGE must be followed by one of:

A Sets USA page size A
4 Sets to international standard A4 page size

Example: Multiplot PSPAGE A Sets postscript page size to USA page size A.

1.14 Windows Available in Multiplot

Interaction with Multiplot achieved through menu, gadget, keyboard or ARexx control of individual windows. Each window has its own specialised purpose, options, keyboard shortcuts, and ARexx commands. The windows available are:

- The Introduction Window
- The Plot Window
- The Data Selection Window
- The Custom Plot Window
- The Edit Axis Window
- The Edit Point Window
- The Edit Text Window
- The Print Set-up Window
- The About Window
- The Pull Window
- The Ask Window
- The Message Window

1.15 The Introduction Window

This window opens on start-up. It may be closed by clicking either mouse button or hitting any key on the keyboard.

This window may be prevented from opening by using the QUIET start-up option. It is important that the QUIET option be used if Multiplot is invoked from an ARexx script, as this window does not have an ARexx interface.

ARexx Commands are not supported.

1.16 The Plot Window

This window opens on starting Multiplot. While it is active, an extensive range of Menu Selections are available from the menu bar at the top of the screen.

Data can be entered by starting Multiplot with a project file to plot, by loading a file from The Data Selection Window, or by entering the data by hand in The Data Entry Window.

If a data file has been loaded at startup, it will be visible as either a default plot of your data or in the previously saved format (if loaded from a Multiplot File Format 2 file). The default plot will show lines and points with a different colour and point type for each data set.

The Plot Window contains 5 regions. The central area is where the data is represented. The left margin contains the Y values and Y axis label of any left hand Y axes. The

right margin contains the Y values and Y axis label of any right Y axes as well as any plot legends. The lower margin contains the X values and the X axis label and the top margin may contain the plot title.

On starting Multiplot, the pointer action is set to SELECT. In this mode it is possible to select objects to alter their characteristics. A data set may be selected by clicking the left mouse button near one of its points. A legend may be selected by clicking the left mouse button on it. In this mode, double clicking on an object will call up an edit window to change some feature of the object. Double clicking on a point in a data set will call up The Custom Plot Window, and allow you to change line type, colour, point type and point size of the data set. It will also allow you to skip rendering that set or delete it completely.

Double clicking on a legend will call The Edit Text Window, to allow you to edit the text in the legend. Double clicking in the top margin will call up The Edit Text Window to allow you to edit or add a title. Double clicking on an axis tic value allows you to edit the text of that value. This text will be reset on rescaling the axis unless the axis values lock is set in The Edit Axis Window.

Double clicking the left mouse button beneath the X Axis calls up the The Edit Axis Window to edit the X Axis, while double clicking to the right of a right hand Y Axis or to the left of a left hand Y Axis produces The Edit Axis Window to edit the appropriate Y AXIS. The Edit Axis Window allows you to set the minimum and maximum tic values, the number colour and type of tics, and edit the axis label.

In the SELECT mode, it is possible to move text around the screen by pressing the left mouse button while the pointer is over the text, holding it down, and dragging the text to the desired location. If the movement is small, a screen refresh may need to be forced by selecting The Redraw Menu Option. Several blocks of text can be moved together, without changing their relationship to each other by group selecting them. Click on one block of text, hold down the shift key and select the others, then without releasing the left mouse button, drag the blocks of text to their new location. To move text vertically without any horizontal movement, select (or group select) the text, and while still holding down the left mouse button, press and hold down the 'v' key on the keyboard. Then drag the text to its new location. To move text horizontally without any vertical movement, select (or group select) the text, and while still holding down the left mouse button, press and hold down the 'h' key on the keyboard. Then drag the text to its new location. To return Axis values to their default positions (sometimes necessary if changes to margins or other formatting has displaced the value labels from the tics on the axes) select The Update Menu Option.

Single data points can be moved in a similar manner. To select a data point, click the left mouse button over it while holding down the Ctrl key. Several data points may be group selected by holding down the shift key as well as the Ctrl key while selecting the points. To move data points vertically without any horizontal movement, select (or group select) the points, and while still holding down the left mouse button, press and hold down the 'v' key on the keyboard. Then drag the points to their new location. To move points horizontally without any vertical movement, select (or group select) the points, and while still holding down the left mouse button, press and hold down the 'h' key on the keyboard. Then drag the points to their new location.

Multiple items of different natures may be group selected together. It is possible to select whole data sets, single points and text in one go. Note however that only data points and text can be moved. Objects can be aligned by group selecting the objects to be aligned and then choosing the The Align Vertical Menu Option or The Align Horizontal Menu Option.

A curve reader is also available in the SELECT mode. If the Alt key is held down when the left mouse button is pressed, the co-ordinates of the point indicated will be given. The curve reader automatically compensates for log axes, zooming and sliding.

The pointer action can be set to ZOOM or SLIDE by selecting these subitems from the Pointer Action option in The Edit Menu. The action of the pointer in these modes is described in CHAPTER 4.

The menus available from The Plot Window are Project which relates to the loading, saving and printing of plots, Edit which allows you to delete, copy, paste, import and export data and text, Actions which allows modification of the plot, resizing, shifting and zoom, Options which changes the screen palette, axes, and cross hairs; Functions which allows special actions like data smoothing, line fitting and data sorting and provides access to ARexx macros; and Statistics which provides functions for describing and comparing data sets.

Global and Custom Plot Window ARexx Commands are supported.

1.17 The Data Selection Window

This window is for indicating the location and format of a data file to be input into Multiplot.

The Data Selection Window may be opened by selecting The Open File Menu Option, The Add File Menu Option or The New Graph Menu Option. The following is a list of the

major buttons within The Data Selection Window and their functions.

The FILE NAME box contains the name of the data file to be plotted. The text within this box can be edited by clicking the left mouse button while the pointer is over the box, and then typing the new file name. If the FILE NAME box does not contain a file name, then Multiplot will open a new graph with no data loaded. Data can then be entered manually or pasted from the clipboard.

The PATH button will call up a file requester to help with browsing through directories trees looking for wanted data files. The selected file name is pasted into the FILE NAME box when the requester is closed.

The NONE button will clear the FILE NAME box.

The CONTINUE button accepts current settings, closes The Data Selection Window and loads the data from the file indicated in the FILE NAME box into The Plot Window for rendering the default graph.

Beneath the file selection box are six other boxes to indicate what column the X, Y and Error values are in. A '0' indicates value is absent. For example if the Y Error box has a '0', no error bars will be plotted. If the X box has a '0', the X values will be assumed to start at 0 and increase by 1 with each data point. If the Low Error box has a '0' but the Error box contains a valid column number, the error bars will be assumed to be symmetrical about the data point. If however, the Low Error column is defined, asymmetrical error bars may be plotted. When satisfied with the file and column specification, hit the return key or click on the CONTINUE button and the selected data file will be checked to ensure it has the number of columns required, and loaded if suitable.

If the file you identified when invoking Multiplot has previously been written by Multiplot, it will autoload without presenting you with The Data Selection Window.

Global and Data Selection Window ARexx Commands are supported.

1.18 The Custom Plot Window

This window can be invoked either by double clicking the left mouse button while the pointer is over any of the data set's points and Multiplot is in SELECT mode, or by selecting The Redefine Plot Menu Option.

The Custom Plot Window allows you to select plot colours, line type, Y-axis and whether data is plotted as a line, series of points, both, a histogram, or a step plot.

If points are drawn, the point size and point type can be

selected.

The COLOUR bar displays the data set colour. The colour is selected by clicking the left mouse button over the COLOUR bar which then cycles through the available options. Note that in monochrome output, the line thickness of each colour (or "pen") can be set from within The Print Set-up Window. This enables the user to assign different pen weights to either different data sets or different graph elements. For example, the axis tick marks could be in the finest pen, the data sets in a medium weight pen, and the axes in the thickest pen.

The POINT SIZE box displays the current point size which can be changed either by clicking the left mouse button over either the up or down arrows, or by clicking within the POINT SIZE box to edit the value directly. If the pointsize is set to '0', each point will print as the smallest possible point achievable by the output device. For example a point of size '0' would print on an Apple LaserPrinter as a dot 1/300th inch in diameter.

The LINE TYPE box displays the current line type that data set is rendered in. The line type is selected by clicking the left mouse button over the LINE TYPE box which then cycles through the available options.

The PLOT TYPE selection is highlighted in the array of options. Data may be plotted as points, lines, points and lines, step graph (with or without points) and impulse plots. The step graph is of the form change in X followed by change in Y. The point type may be selected from the panel of six mutually exclusive buttons on the right of the window.

The POINT TYPE selection is highlighted in the array of options. The point type is selected by clicking the left mouse button over the button displaying the desired point type.

The AXIS box defines the Y axis the data set will be plotted in. If the current graph has only a single Y Axis, this box will be blank. Otherwise, the Y Axis is indicated by moving the marker within the box.

The CONTINUE button will accept changes and proceed to the Plot window where the plot is rendered.

The SKIP button will skip the data set, so that it will not be plotted when The Plot Window is updated. The missing data set can then be recalled by selecting The Redefine Plot Menu Option, and pushing the CONTINUE button when presented with the data set.

The KILL button is similar to the SKIP button but its effects are permanent. A single level of undelete is supported and dead data set can be revived with

The Undelete Menu Option option providing nothing else has been deleted subsequently. The STOP button closes the Custom Plot window without accepting any changes. If the window was opened by selecting The Redefine Plot Menu Option, the STOP button will also skip all remaining data sets without presenting the Custom Plot window for them.

Global and Custom Plot Window ARexx Commands are supported.

1.19 The Axis Window

This window can be called by double clicking the left mouse button over the axis to be edited with the Mouse Action menu option set to SELECT mode. It allows the following characteristics of the axis to be edited:

- *Position (RIGHT or LEFT) of the graph may be set if there are more than one Y axes and the current axis being edited is any Y axis other than the first one. To add a right hand Y axis to a graph, select The Add Menu Option Axis selection, then edit the new (upper) Y axes by double clicking over its left margin, and set the position to the right side by activating the RIGHT position button.

- *Minimum and maximum axis values. The axis scale may be reversed by placing the higher value in the minimum value box and the lower value in the maximum value box. This results in mirror image reversal of the data.

- *The number of major tics/grid lines. The number of major subdivisions may vary from 1 to 20.

- *Colour of major tics/grid lines. Note that in monochrome output, the line thickness of each colour (or "pen") can be set from within The Print Set-up Window. This enables the user to assign different pen weights to different graph elements. For example, the axis tic marks could be in the finest pen, the data sets in a medium weight pen, and the axes in the thickest pen.

- *Line type of major tics/grid lines.

- *The number of minor tics/grid lines. The number of minor subdivisions may vary from 1 to 10.

- *Colour of minor tics/grid lines. Note that in monochrome output, the line thickness of each colour (or "pen") can be set from within The Print Set-up Window. This enables the user to assign different pen weights to either different data sets or different graph elements. For example, the axis tic marks could be in the finest pen, the data sets in a medium weight pen, and the axes in the thickest pen.

*Line type of minor tics/grid lines.

*Axis scale type. The axes may be set as linear or logarithmic independently allowing log/lin, lin/log, log/log and lin/lin plots.

*The axis label.

*Scale Lock. A lock may be set preventing rescaling of the axis.

*Values Lock. A lock may be set preventing overwriting of the axis values.

Note that the current axis settings are taken into account for linear fits of data. For example, if the Y axis is logarithmic and the X axis linear, an exponential fit is produced (a straight line on a lin/log scale). If the X axis is logarithmic and the Y axis linear, a log fit is produced (a straight line on a log/lin scale). Log/log and true linear fits are also available.

Global and Edit Axis Window ARexx Commands are supported.

1.20 The Edit Point Window

This window may be called up for any data point by holding down the Ctrl key and double clicking the left mouse button over the desired data point with the Mouse Action menu option set to SELECT mode. This window allows the X and Y values of a point to be individually set, and the X and Y error bars to be altered. Note that the error bars need not be symmetrical, and one direction error bars are supported.

Global and Edit Point Window ARexx Commands are supported.

1.21 The Edit Text Window

This window is called mode by double clicking the left mouse button over some text or selecting some text and activating The Add Menu Option Text selection while the mouse action is in SELECT; or by clicking the left mouse button on the LABEL button in The Edit Axis Window.

It allows the alteration and creation of the plot title, axis labels and values, data set legends and added text.

The TEXT Box displays the text and allows direct editing by clicking the left mouse button within the TEXT box and typing in the new text.

The FONT button calls up a font requester to allow browsing of available fonts and to preview them before use.

The FONT box describes the current font selection and allows direct changes to be made without opening the font requester.

The POINT SIZE box describes the current font size selection and allows direct changes to be made without opening the font requester.

The CONTINUE button accepts current changes and closes The Edit Text Window.

The STOP button rejects current changes and closes The Edit Text Window.

Global and Edit Text Window ARexx Commands are supported.

1.22 The Print Set-up Window

This window is called by selecting The Print Setup Menu Option.

It allows the selection of print orientation, size and position of the current graph.

The SIZE slide bar sets the size of the plot on the printed page. The default setting is for the plot to fill the page. Clicking within the slider's run allows changes in size from 10% to 100% in 10% increments. Dragging the slider allows finer control of the plot size.

The ORIENTATION button controls the orientation of the plot. Default is for the plot to be printed in landscape (with the page lying down). Orientation may be toggled between landscape and portrait by clicking the left mouse button over the icon which represents the current setting.

The position of the plot on the page can be set by dragging the square within the POSITION box. The square represents the plot and the border of the box represents the full page.

Pen descriptions for the PLT: Device may be defined from this window. Each pen is described by the COLOUR bar on the right hand side of The Print Set-up Window.

The pen currently being edited is identified by its colour and may be chosen by clicking the left mouse button over the COLOUR bar to cycle through all the pens available. The number shown immediately below the COLOUR bar indicates the pen thickness. The pen thickness may be set for each pen, will be used when printing via PLT:, and is saved in the defaults file. This enables the user to assign different pen weights to different graph elements. For example, the axis tic marks could be in the finest pen, the data sets in a medium weight pen, and the axes in the thickest pen.

The SPOOL button toggles on and off the print spool which allows printing to continue in the background while you return to editing a new plot. Once the print spool has been started, Multiplot may even be quit without interrupting printing. To stop printing a spooled file, click the left mouse button on the "close gadget" (top left corner) of the PLT: window on the WorkBench.

The PRINT button selects which of the currently open graphs should be printed on the page when The Print Menu Option. Only graphs in which the PRINT button is highlighted in The Print Set-up Window will print. A graph may be "turned off" by deselecting this button.

Global and Print Set-up Window ARexx Commands are supported.

1.23 The Data Entry Window

This window may be opened by selecting the Add DataSet subitem of The Add Menu Option or by selecting an existing data set and then choosing the The View Data Menu Option.

This window is for entering X and Y data values of an individual data set. The central area of the window contains a display of the points already entered in the data set, with a scroll bar at the right hand side of the box to scroll rapidly through a large data set. The row of text entry boxes below this area is for entering new values. Activate the left hand text entry box first by clicking the left mouse button once while the pointer is over it, to enter an X value.

Hitting the return key will automatically move between the text entry boxes, and will accept the new data point when it has been entered.

Above the data display area, on the right hand side, are two cycle buttons which determine what error values are required to be entered – and which are displayed in the display area. By making the appropriate selection, symmetrical or asymmetrical errors in X and Y can be entered.

The CONTINUE button at the bottom of the window will accept any changes, and replot the graph while the STOP button will abort any alterations, returning you to the original plot.

Global and Data Entry Window ARexx Commands are supported.

1.24 The Co-ordinates Window

This window may be opened by selecting The Coordinates Menu Option. It displays the pixel location of the pointer within the currently activated Plot Window.

ARexx Commands are not supported.

1.25 The Description Window

This window is opened by selecting a data set while the Graph Type is either Scattergram or Box Plot, and choosing The Description Menu Option. It describes the following attributes of the selected data set:

Count
Range
Minimum
Maximum
Mean
Median,
Variance
Standard Deviation
Standard Error
Coefficient of Variation
Sum
Sum of squares
Corrected sum of squares
Skewness
Kurtosis

ARexx Commands are not supported.

1.26 The Percentiles Window

This window is opened by selecting a data set while the Graph Type is either Scattergram or Box Plot, and choosing The Percentiles Menu Option.

This window displays the count, minimum and maximum values of the selected data set as well as a spread of five centile values and the number of points which exceed the highest centile or fall below the lowest. By default, the centiles calculated are: 10th, 25th, 50th (the median), 75th and the 90th. The centiles calculated may be edited to those of interest by clicking within any of the text entry boxes displaying the centile to be calculated.

ARexx Commands are not supported.

1.27 The One Sample t Test Window

This window is opened by selecting a data set while the Graph Type is either Scattergram or Box Plot, and choosing The One Sample t Test Menu Option.

This window displays the mean and variance of the selected data set. The population mean may be entered into the text entry box, and the t value, degrees of freedom and two-tailed probability calculated by the One Sample t Test.

ARexx Commands are not supported.

1.28 The Two Sample t Test Window

This window is opened by selecting two data sets while the Graph Type is either Scattergram or Box Plot, and choosing either the paired or unpaired subitems of The Two Sample t Test Menu Option. Select the two data sets by selecting the first one (single click of the left mouse button while the pointer is over a data point from the data set), and then holding down the shift key while selecting the second set.

Paired t Test

The Paired t Test can only be used to compare two data sets of equal numbers of points in which each pair corresponds to pairs of measurements. It calculates the number of pairs, the degrees of freedom, the mean of the differences between each pair of values, the variance of the differences between each pair of values, the t value and the two-tailed probability.

Unpaired t Test

The Unpaired t Test can be used to compare two data sets of unequal sizes. It calculates the mean, variance and standard error for each of the selected data sets as well as the degrees of freedom, the t value and the two-tailed probability.

ARexx Commands are not supported.

1.29 The Mann-Whitney U Test Window

This window is opened by selecting two data sets while the Graph Type is either Scattergram or Box Plot, and choosing The Mann-Whitney U Test Menu Option. Select the two data sets by selecting the first one (single click of the left mouse button while the pointer is over a data point from the data set), and then holding down the shift key while selecting the second set.

This window displays the number of points and the sum of the ranks for the two data sets selected as well as the number of tied ranks, the U and U', Z and corrected Z statistics and the two-tailed probability.

ARexx Commands are not supported.

1.30 The Contingency Table Window

This window is opened by selecting the The Contingency Table Menu Option.

This window provides a four-fold table of text entry boxes in which the frequencies of two mutually exclusive events (A and B) are entered for two samples (1 and 2). The following values are calculated: the sums of the numbers of events in each row and column, the total number of events; the expected frequency, row percentage, column percentage and global percentage of each cell; the Chi-square and probability values with and without Yate's correction; and the Woolf G, Pearson and Phi Coefficients.

ARexx Commands are not supported.

1.31 The Fisher's Exact Test Window

This window is opened by selecting the The Fisher's Exact Test Menu Option.

This window provides a four-cell table of text entry boxes in which the frequencies of two mutually exclusive events (A and B) are entered for two samples (1 and 2). The two-tailed probability is calculated using the Fisher's Exact Test.

ARexx Commands are not supported.

1.32 The Goodness of Fit Test Window

This window is opened by selecting the The Goodness of Fit Test Menu Option.

This window contains a large display area in which the pairs of values ('observed' and 'expected') entered may be viewed. To the right of the display box is a scroll bar which enables rapid navigation of large sets of values. Beneath this area are two text entry boxes in which the new data may be entered.

Activate the left hand text entry box first by clicking the left mouse button once while the pointer is over it, to enter an 'observed' value. Hitting the return key will automatically move between the 'observed' and 'expected' entry boxes, and will accept the new data pair when it has been entered.

The box on the right hand side of the window displays the Chi-squared value, probability and degrees of freedom.

ARexx Commands are not supported.

1.33 The About Multiplot Window

This window is opened by selecting The About Multiplot Menu Option. It contains the name and address of the author and information about registering Multiplot.

ARexx Commands are not supported.

1.34 The About StatPack Window

This window is opened by selecting The About StatPack Menu Option. It displays information about the authors of StatPack and other statistical functions they can provide.

ARexx Commands are not supported.

1.35 The Pull Window

This window is opened by using the 'PULL' ARexx command. It returns to the ARexx environment any text variable entered by the user. It may be used to obtain information or values from the user from an ARexx script.

ARexx Commands are not supported.

1.36 The Ask Window

This window may be opened by Multiplot in response to a user selection or may be called from an ARexx script or macro. It is used to obtain a simple Affirmative/Negative response from the user.

Global and Ask Window ARexx Commands are supported.

1.37 The Message Window

This window may be opened by Multiplot in response to a user selection or may be called from an ARexx script or macro. It is used to inform the user of an error, to warn of a change in status or to communicate some other message.

Global and Message Window ARexx Commands are supported.

1.38 Menus Available in Multiplot

Pull-down menus are available from the The Plot Window and control many of the functions available within Multiplot. Menu selections are available under the following major categories:

- The Project Menu
- The Edit Menu
- The Actions Menu
- The Options Menu
- The Functions Menu
- The Statistics Menu

Many of the pull down menu options also have Keyboard Shortcuts

1.39 The Project Menu

The Project Menu contains menu selection which are concerned with opening and closing files and windows, saving data and graphs and loading and saving default settings. The options available are:

- The Open File Menu Option
- The Add File Menu Option
- The New Graph Menu Option
- The Swap Graph Menu Option
- The Exit Graph Menu Option

- The Save Menu Option
- The Save As Menu Option
- The Defaults Menu Option
- The Print Preview Menu Option
- The Print Setup Menu Option
- The Print Menu Option
- The About Multiplot Menu Option
- The About StatPack Menu Option
- The Quit Menu Option

1.40 The Open File Menu Option

Returns you to The Data Selection Window for loading a new file, erasing all open graphs.

Keyboard Shortcut: (Right-Amiga O)

1.41 The Add File Menu Option

Opens the The Data Selection Window for loading a new data file. All data sets and text described in that file will be added to the current graph.

Keyboard Shortcut: (Right-Amiga A)

1.42 The New Graph Menu Option

Opens The Data Selection Window for loading a new data file, which will be loaded onto a fresh graph in a new window.

Keyboard Shortcut: (Right-Amiga N)

1.43 The Swap Graph Menu Option

Brings the indicated Plot Window to the front and sizes it to fill the screen.

No keyboard shortcut.

1.44 The Exit Graph Menu Option

Closes the current graph without quitting the program. If there are no other graphs open, it will open the The Data Selection Window to select a new graph.

Keyboard Shortcut: (Right-Amiga E)

1.45 The Save Menu Option

Saves data, formatting and text as a Multiplot file format 2 (FF2) file, overwriting original data file.

Keyboard Shortcut: (Right-Amiga S)

1.46 The Save As Menu Option

Saves plots in any of the following formats: IFF (loads into DPaint), Draw (loads into Draw2000 etc), IntroCAD (an excellent CAD program), mCAD (a PD CAD program), HPGL plotter language, Encapsulated Postscript and Postscript.

No keyboard shortcut.

1.47 The Defaults Menu Option

Saves and loads current axes, tics and grid markings, pen thickness, font and palette selections. The default file used is MPlot_support/MPlot.def unless defined as another file with the SETTINGS start-up option or loaded by selecting The Defaults Menu Option Load.

Load:

Loads a new default file and reformats the currently active plot with the new settings.

No keyboard shortcut.

Save:

Saves default file with current name.

No keyboard shortcut.

Save As:

Opens a file requester to save the default file under a new name.

No keyboard shortcut.

1.48 The Print Preview Menu Option

Print preview is achieved via the transparent use of the PLT: Device. The PLT-handler must be in your l: directory, and the PLT: mountlist must be added to your Devs:mountlist. You do not need to mount the device as Multiplot will mount PLT: automatically if it is not already mounted.

No keyboard shortcut.

1.49 The Print Setup Menu Option

Opens The Print Setup Window which allows the selection of print orientation, size and position of the graph on the page as well as selecting between colour and black and white printing. The print spooler can be toggled on or off from this window.

No keyboard shortcut.

1.50 The Print Menu Option

Printing is achieved via the transparent use of the PLT: Device.

Keyboard Shortcut: (Right-Amiga P)

1.51 The About Multiplot Menu Option

Opens The About Multiplot Window displaying information about the author and registration of Multiplot XLN and Multiplot XLN-S.

No keyboard shortcut.

1.52 The About StatPack Menu Option

Opens The About StatPack Window displaying information about the authors of StatPack and other statistical functions they can provide.

No keyboard shortcut.

1.53 The Quit Menu Option

Exits the program without saving any changes.

Keyboard Shortcut: (Right-Amiga Q)

1.54 The Edit Menu

The Edit menu contains options to cutting, pasting adding or deleting data sets, points, axes or text from a graph. The options available are:

- The Undelete Menu Option
- The Cut Menu Option
- The Copy Menu Option
- The Paste Menu Option
- The Delete Menu Option
- The View Data Menu Option
- The Add Menu Option

1.55 The Undelete Menu Option

Replaces the last blocks of text or data sets deleted. Only a single level of undelete is maintained, but it may contain multiple items if, for example, several data sets were group selected and deleted.

Keyboard Shortcut: (Right-Amiga Z)

1.56 The CUT Menu Option

Deletes the selected data sets or text blocks and places an IFF FTXt text copy of in the clip board for transfer to another plot or program, and then deletes it from the current plot.

Keyboard Shortcut: (Right-Amiga X)

1.57 The Copy Menu Option

Places an IFF FTXt text copy of the selected data sets or text blocks in the clip board for transfer to another plot or program.

Keyboard Shortcut: (Right-Amiga C)

1.58 The Paste Menu Option

Reads the clipboard and adds its contents to the current graph if possible.

Keyboard Shortcut: (Right-Amiga V)

1.59 The Delete Menu Option

Removes currently selected point(s), data set(s) or block(s) of text.

Keyboard Shortcut: (Delete key)

1.60 The View Data Menu Option

Opens The Data Entry Window displaying the selected data set.

No keyboard shortcut.

1.61 The Add Menu Option

Text

Opens The Edit Text Window to edit the prose, font and font size of text which is added to the current plot and may be moved to the desired location. If the option is chosen while a data set is selected, it will add a legend to the data set.

Data Set

Adds a data set to the end of the current open plot.

Opens The Custom Plot Window to set the type and colour of the data set, and then opens The Data Entry Window to enter the data values. After the last data point has been entered, entry is terminated by selecting the CONTINUE button which results in the new data set being plotted, or abandoned, by selecting the STOP button.

Point

Adds a point to the end of the currently selected data set. Opens The Edit Point Window to edit the point values.

Axis

Adds a new Y Axis above the last Y Axis rendered. The axis may then be moved to the right side or changed by calling up The Edit Axis Window by double clicking to the

left of the new axis.

No keyboard shortcut.

1.62 The Actions Menu

The Actions Menu contains options which perform particular changes to the current graph. The options available are:

- The Mouse Action Menu Option
- The Redraw Menu Option
- The Update Menu Option
- The Full Plot Option
- The Redefine Plot Menu Option
- The Align Vertical Menu Option
- The Align Horizontal Menu Option

1.63 The Mouse Action Menu

Allows the user to select the mode in which the mouse works. The options are:

Select

The select mode allows the editing of data sets or axes by double clicking the left mouse button over them and allows the movement of points and text by click-dragging, and selection of text or data sets for manipulation.

Keyboard Shortcut: (Right-Amiga-Shift !)

Zoom

Allows close-up views of areas of the data, and to adjust the axes to desired values. After selecting ZOOM from the menu, the mouse may be used to draw a box on the screen to indicate the area of the plot to be enlarged. This is achieved by clicking and holding the left mouse button, dragging the mouse, and releasing the left mouse button. The maximum limit of enlargement is 1,600 times. Zooming out to reduce the size of the plot by one half is achieved by double clicking the left mouse button.

Keyboard Shortcut: (Right-Amiga-Shift #)

Slide

After selection the mouse may be used to draw a vector on the screen to indicate the direction and amount the plot should be moved. This is achieved by clicking and holding the left mouse button, dragging the mouse, and releasing the left mouse button.

Keyboard Shortcut: (Right-Amiga-Shift ^)

1.64 The Redraw Menu

Redraws the currently active Plot Window. It should be used to repair the screen of unwanted rendering, or an incomplete refresh.

Keyboard Shortcut: (Right-Amiga R)

1.65 The Update Menu

Redraws the currently active Plot Window recalculating all text positions and correcting minor displacements resulting from resizing The Plot Window.

Keyboard Shortcut: (Right-Amiga U)

1.66 The Full Plot Menu

Redraws the currently active Plot Window at the default scale. This plot will show all data points and the extremes of any error bars unless the X or Y scales are locked.

Keyboard Shortcut: (Right-Amiga F)

1.67 The Redefine Plot Menu

Presents the user with The Custom Plot Window for each data set in succession.

Keyboard Shortcut: (Right-Amiga D)

1.68 The Align Vertical Menu

Aligns the selected points and text by their:

- Left Edges
- Centres
- Right Edges

No keyboard shortcut.

1.69 The Align Horizontal Menu

Aligns selected points and text by their:

Tops
Centres
Bottoms

No keyboard shortcut.

1.70 The Options Menu

The Options Menu contains selections which affect the current state of the running of Multiplot. The options available are:

- The Graph Type Menu Option
- The Cross Hair Menu Option
- The Coordinates Menu Option
- The Axes Menu Option
- The Right Margin Menu Option
- The Palette Menu Option
- The Significant Figures Menu Option
- The Error Bars Menu Option
- The Axis Scale Lock Menu Option
- The Axis Values Lock Menu Option

1.71 The Graph Type Menu Option

Selects what plot mode is used for the currently active graph. Options are:

Plot

Renders data points on X/Y axes.

Scatter

Plots Y values in a vertical scattergram. Automatically separates overlying points laterally. Selecting this plot mode enables the menu options for statistics describing or comparing the Y values of data sets.

Box Plot

Produces box plots of Y values. Selecting this plot mode enables the menu options for statistics describing or comparing the Y values of data sets.

No keyboard shortcuts.

1.72 The Cross Hair Menu Option

Provides a cross hair for the cursor to assist with zooming, sliding and movement of points and text blocks.

Keyboard Shortcut: (Right-Amiga L)

1.73 The Coordinates Menu Option

Opens the COORDINATES WINDOW providing the pixel location of the pointer over the currently active Plot Window.

No keyboard shortcut.

1.74 The Axes Menu Option

Allows the selection of a box frame, X and Y axes or no axes marked.

X and Y Keyboard Shortcut: (Right-Amiga Y)

Box Keyboard Shortcut: (Right-Amiga B)

None No keyboard shortcut.

1.75 The Right Margin Menu Option

Toggles the right margin space for legends.

Keyboard Shortcut: (Right-Amiga M)

1.76 The Palette Menu Option

The screen palette may be altered by calling this requester. The only non obvious feature of the requester is that by clicking the left mouse button on the RGB characters, the requester is converted to a hue/saturation/lightness requester for those who think that way.

No keyboard shortcut.

1.77 The Significant Figures Menu Option

Allows the number of significant figures of axis values and formulae to be set independently. This option only applies to values calculated subsequent to its selection. To change values already on screen, it is necessary to force a recalculation. For axis values this can be achieved by selecting The Full Plot Option or The Redefine Plot Menu Option.

To alter legends of line fits, the line fit needs to be deleted and recalculated.

No keyboard shortcut.

1.78 The Error Bars Menu Option

Toggles the X and Y error bars on and off. If a data set is loaded without error bars, and error data is added later via The Edit Point Window, it will be necessary to select this option to get them rendered. If error bars are unimportant, this option should be turned off to speed screen refresh times. This option is set and saved as part of the plot defaults file and the new Multiplot File Format 2 data file format.

No keyboard shortcut.

1.79 The Axis Scale Locks Menu

Allows either the X or Y dimension to be frozen while the other is zoomed or rescaled and allows arrangement of the scale of the plot to best advantage. The sub item "X Region" will lock the amount of zoom in the X axis. The lock may be turned off by reselecting the sub item. The same applies for the "Y Region" selection. The "Both Locks On" selection will lock both axes. They can be both turned off with "Both Locks Off". Unless locked, the following options will reset the view of your data: Full Plot, Linear Fit, Smooth and Logarithmic Fit.

1.80 The Axis Values Lock Menu

Allows either the X or Y axis values to remain unchanged despite rescaling of the axis. This option allows the editing of axis values to create text labels without having them moved or overwritten.

1.81 The Functions Menu

The Functions Menu contains options which perform specific transformations to data – smoothing, line fits etc, or allow access to ARexx scripting and macro commands which can be used to transform data. The options available are:

- The Sort Data Menu Option
- The Smooth Data Menu Option
- The Linear Fit Menu Option
- The Polynomial Fit Menu Option
- The ARexx Macro Menu Option

1.82 The Sort Data Menu Option

This option will place the data points in order of ascending X value. This allows other manipulations of the data which require this format.

No keyboard shortcut.

1.83 The Smooth data Menu Option

Select a data set by clicking the left mouse button near one of its points, and then select one of the subitems from this menu option.

Filter

A new data set will be created in which each Y value is set to the mean of the surrounding Y values from the original data set. A requester will appear enabling you to enter the number of values each side of the point for the mean to be taken over. This option is most suitable for smoothing data sets containing large numbers of points.

No keyboard shortcut.

Interpolate

A new data set will be created in which intermediate data points are added to create a smooth curve tracking the original data. This option is most suitable for smoothing data sets with relatively few points. It is sometimes useful to provide intermediate points before filtering to provide a smoother curve.

No keyboard shortcut.

1.84 The Linear Fit Menu Option

A new data set will be created which will represent a straight line fit of the selected data set. The formula of the line is shown in the legend. The current axis settings are taken into account for linear fits of data. For example, if the Y axis is logarithmic and the X axis linear, an exponential fit is produced (a straight line on a lin/log scale). If the X axis is logarithmic and the Y axis linear, a log fit is produced (a straight line on a log/lin scale). Similarly, log/log and true linear fits are also available.

No keyboard shortcut.

1.85 The Polynomial Fit Menu Option

Creates a new data set displaying a polynomial fit of the selected data set. A window allows selection of the order of fit. High order fits may require extended calculation times. A new data set will be created which will represent the fit of the data. The formula of the line will be displayed as its legend if there is sufficient room.

No keyboard shortcut.

1.86 The ARexx Macro Menu Option

Opens the file requester to select an ARexx macro for execution.

Keyboard Shortcut: (Right-Amiga G)

1.87 The Statistics Menu

The Statistics Menu provides statistical functions which allow the description or comparison of values as well as the Fisher's exact test, contingency table analysis and the Chi-squared Goodness of Fit test. The options available are:

- The Description Menu Option
- The Percentiles Menu Option
- The One Sample t Test Menu Option
- The Two Sample t Test Menu Option
- The Mann-Whitney U Test Menu Option
- The Contingency Table Menu Option
- The Fisher's Exact Test Menu Option
- The Goodness of Fit Test Menu Option

1.88 The Description Menu Option

This menu option may be chosen after selecting a data set while the Graph Type is either Scattergram or Box Plot.

It will open The Description Window.

No keyboard shortcut.

1.89 The Percentiles Menu Option

This menu option may be chosen after selecting a data set while the Graph Type is either Scattergram or Box Plot.

It will open The Percentiles Window.

No keyboard shortcut.

1.90 The One Sample t Test Menu Option

This menu option may be chosen after selecting a data set while the Graph Type is either Scattergram or Box Plot.

It will open The One Sample t Test Window.

No keyboard shortcut.

1.91 The Two Sample t Test Menu Option

This menu option may be chosen after selecting two data sets while the Graph Type is either Scattergram or Box Plot. Select the two data sets by selecting the first one (single click of the left mouse button while the pointer is over a data point from the data set), and then holding down the shift key while selecting the second set.

It will open The Two Sample t Test Window.

No keyboard shortcut.

1.92 The Mann-Whitney U Test Menu Option

This menu option may be chosen after selecting two data sets while the Graph Type is either Scattergram or Box Plot. Select the two data sets by selecting the first one (single click of the left mouse button while the pointer is over a data point from the data set), and then holding down the shift key while selecting the second set.

It will open The Mann-Whitney U Test Window.

No keyboard shortcut.

1.93 The Contingency Table Menu Option

This menu option will open The Contingency Table Window.

No keyboard shortcut.

1.94 The Fisher's Exact Test Menu Option

This menu option will open The Fisher's Exact Test Window.

No keyboard shortcut.

1.95 The Goodness of Fit Test Menu Option

This menu option will open The Goodness of Fit Test Window.

No keyboard shortcut.

1.96 Menu Command Keyboard Shortcuts

Multiplot fully supports keyboard shortcuts using the right Amiga key. A full list of shortcuts and mnemonics is listed below:

Key	Command	Mnemonic
A	PROJECT/Add file	<A>dd File
B	OPTIONS/Axes/Box	ox
C	EDIT/Copy	<C>opy
D	ACTIONS/ReDefine Plot	Re<D>efine Plot
E	PROJECT/Exit Graph	<E>xit Graph

F	ACTIONS/Full Plot	<F>ull Plot
G	FUNCTIONS/ARexx Macro	<G>o ARexx
H	PROJECT/Save as/HPGL	<H>PGL
I	PROJECT/Save as/ILBM	<I>LBM
J	not used	
K	PROJECT/Save as/DrawSave	<K>AD format
L	OPTIONS/Cross Hair	Hair <L>ines
M	OPTIONS/Right Margin	<M>argin
N	PROJECT/New Graph	<N>ew Graph
O	PROJECT/Open File	<O>pen
P	PROJECT/Print	<P>rint
Q	PROJECT/Quit	<Q>uit
R	ACTIONS/Redraw	<R>edraw
S	PROJECT/Save	<S>ave
T	PROJECT/SaveAs/IntroCAD	In<T>roCAD
U	ACTIONS/Update	<U>pdate
V	EDIT/Paste	Commodore guidelines
W	PROJECT/Save as/Data	<W>rite data
X	EDIT/Cut	Commodore guidelines
Y	OPTIONS/Axes/X and Y	X and <Y>
Z	EDIT/Undelete	Commodore guidelines

Please note that there are three other keyboard shortcuts that allow you to swap between mouse actions. These also require that the right Amiga key is held down.

Shift-1 (!)	ACTION/Mouse Action/Select
Shift-3 (#)	ACTION/Mouse Action/Zoom
Shift-6 (^)	ACTION/Mouse Action/Slide

The Escape and Delete keys are supported:

Esc	PROJECT/Quit
Del	EDIT/Delete

The Alt key is used to activate the curve reader. Holding down the Alt key while clicking the left mouse button while in SELECT mode will result in a window that displays the X and Y co-ordinates of the pointer.

The Shift key activates group selection when in SELECT mode.

The Ctrl key allows selection of a single data point instead of a whole data set when in SELECT mode.

The 'v' key restricts movement of selected items to vertical.

The 'h' key restricts movement of selected items to horizontal.

1.97 Using The PLT: Device

- 1) The PLT-handler must be in your l: directory, and the mountlist entry for PLT: added to the devs:mountlist (WB2.0) or The device driver to be placed in the storage/dosdrivers directory (WB2.1).
- 2) A printer MUST be chosen within the Printer Preferences program. Failure to do this courts certain disaster!
- 3) You do not need to mount the device. Multiplot will mount PLT: automatically if it is not already mounted.
- 4) PLT: opens its own window on the WorkBench when it starts up. This window relays information about how much of the image has been printed and the remaining system memory. It also provides a "close gadget" (The square with a dot in it for closing windows) which will abort the print. Use the left-Amiga-M and left-Amiga-N key combinations to switch between Multiplot's screen and the WorkBench or else run Multiplot on the WorkBench screen using the PUBSCREEN=Workbench start-up option.
- 5) Multiplot checks for the presence of the PLT-handler in the L: directory before attempting to mount PLT:. If this file is not present, Multiplot will not print, even if the PLT: device has been mounted by some other mechanism.
- 6) The PLT: device checks the print resolution requested in preferences. If you want the nicest possible quality print-outs from Multiplot, set your printer density setting to "7".
- 7) PLT: currently has a bug which prevents it from handling two tasks simultaneously. Do not attempt to print preview while printing or print two files at once.
- 8) PLT: is unable to be used while the printer is engaged in any task.

1.98 Multiplot's ARexx Interface

The best way of learning any programming language is by example. The ARexx Macro Examples disk includes all the examples below as well as a collection of useful macros for manipulating data and performing simple statistical analysis.

STARTING OUT

Multiplot will automatically open an ARexx port on start-up providing it can open the rexsyslib.library library and ARexx is running. The port will be named MULTILOT.nn unless defined otherwise using PORTNAME start-up options. This port may be used as a user interface to control all of Multiplot's functions.

An ARexx macro interacting with Multiplot must contain a comment line at the start. It must then set the command address to Multiplot's port. Then any lines following will be sent to Multiplot for interpretation.

Example 1

Multiplot has ARexx "modes" which are the equivalents of the currently open windows or requesters. You can ask Multiplot which window is currently receiving ARexx commands by sending a 'QUERY' command. Multiplot will then return a string stating its current mode. Commands that result in a message requester do not generate an ARexx message. The requester will, however, answer a 'QUERY' and reply with the error message. System requesters (such as the "Insert disk X:" requester) do not support ARexx and must be either disabled or dealt with individually.

Each mode supports a subset of commands and if a command is received that is not supported, Multiplot will return an error code. Neither The About Window nor The Introduction Window uses the ARexx port. As they both require input by mouse or keyboard to clear, neither window should be opened from an ARexx script. To avoid The Introduction Window, use the QUIET start-up option. The About Window cannot be opened by ARexx command and does not require any special handling to avoid.

The ARexx commands available from within Multiplot are:

- Global ARexx Commands
- The Ask Window ARexx Commands
- The Message Window ARexx Commands
- The Data Selection Window ARexx Commands
- The Plot Window ARexx Commands
- The Custom Plot Window ARexx Commands
- The Print Set-up Window ARexx Commands
- The Edit Point Window ARexx Commands
- The Edit Axis Window ARexx Commands
- The Edit Text Window ARexx Commands

1.99 Global ARexx Commands

The following commands are available in all windows with the few exceptions noted below.

QUERY Returns a value describing the currently active window and often provides other useful information. The exact format of the returned value depends on the current window and is described for each window individually below.

ERROR N Returns text describing the error resulting in the error code supplied where N is the error code.

ASK <text> Opens The Ask Window to query the user and returns the text of the reply, either "OKAY" or "CANCEL". This option is not available from The Ask Window or The Message Window.

SAY <text> Opens The Message Window to notify the user of <text>. This option is not available from The Ask Window or The Message Window.

PULL <text> Opens a PULL WINDOW to query the user for a value and returns that text.

1.100 ARexx Example 1

```
/* This is a simple example script to get past
The Data Selection Window */
address MULTILOT.01
/* The above line tells ARexx that you want to control
Multiplot */
'FILE'
/* The above line clears the file name */
'CONTINUE'
/* The above line closes The Data Selection Window */
/* End script */
```

1.101 The Message Window ARexx Commands

This window is used to inform the user of errors, warnings or to pass other messages. The supported commands are:

QUERY Returns "MESREQ <message>"

CONTINUE Closes The Message Window, acknowledging the message.

STOP Closes The Message Window, acknowledging the message.

1.102 The Ask Window ARexx Commands

This window asks the user a question which must be answered by either confirming or negating the question. The supported commands are:

QUERY Returns "ASKREQ <question>"

POSTEXT Returns text describing the positive option.

NEGTEXT Returns text describing the negative option.

CONFIRM Closes The Ask Window, accepting positive option.

CONTINUE Closes The Ask Window, accepting positive option.

DENY Closes The Ask Window accepting negative option.

STOP Closes The Ask Window accepting negative option.

1.103 The Data Selection Window ARexx Commands

This window provides a way of setting the input file name and the column numbers to be read for data within that file. The supported commands are:

QUERY Returns "DATSEL filename"

CONTINUE Closes window, accepting current settings, continuing on to the Plot window.

QUIT Closes window rejecting changes and quits Multiplot if there is no open Plot Window.

STOP Closes window rejecting changes and quits Multiplot if there is no open Plot Window.

FILE [<filename>] If no file name is defined, clears the file name field allowing a blank plot to be opened. If file name is defined, loads that name into the FILE box of the window.

REQ Opens the file requester to assist with locating a data file for input.

COLUMN N XCOL|YCOL|ECOL|EDWN|XERR|XEDN Sets column number for a data type. Requires 2 arguments. The first (N) is numerical and is the column number. The second defines the data type, and must be one of the following:

XCOL X values

YCOL Y values

ECOL Error in Y values

EDWN Low error in Y values for asymmetrical errors

XERR Error in X Values

XEDN Low error in X values for asymmetrical errors

1.104 The Plot Window ARexx Commands

These windows (multiple windows may be open at a time) are used to render graphs. The currently active window is chosen with the 'ACTIVATE' command. To take the place of mouse controlled object and group selection is the 'SELECT' command. In order to make this command as flexible as possible, object selection involves multiple actions.

Example 2

Both legends and individual points are regarded as being part of a data set that must be selected first. Therefore selecting a point involves 4 steps: 1) Select data set, 2) Select point, 3) Confirm selection, and 4) Launch selection:

Example 3

Multiple objects can be selected by using 'SELECT ADD' to add them to the selection list. A group selection can be aborted by using the 'SELECT ABORT' command or by using 'SELECT REPLACE' to replace the current selection list with the most recently selected object.

Example 4

Data may be exchanged between Multiplot and the ARexx script using the PEEK, POKE and PULL commands which work through the REXX Variables Interface. The PEEK command copies data from Multiplot and places it in specially named variables. ARexx scripts may "PEEK" at either a single point or at all the values from a data set. The POKE command copies data from the ARexx script and places it within a selected point or data set. Again the data transferred is copied from a specially named variable. The PULL command is available from all windows and was described above in the section on Global Commands.

Below is a full list of supported ARexx commands:

QUERY Returns "PLOWIN <filename> N" Where <filename> is the current plot and N is the number of data sets within that graph.

PEEK N [NOVALS|XVALS|YVALS|EVALS|EDWN|XEVALS|XEDWN]

Copies data from the Nth selected item to be stored with in the ARexx program as a variable with the same name as the selected option. If a point is peeked at (ie the Nth selection is a selected point) then the option key word is not used and the point's values are stored in an ARexx variable named POINTVALS as text containing six words describing the X, Y, high error in X, low error in X, high error in Y and low error in Y in that order. If a data set is peeked at (ie the Nth selection is a selected data set) then the following key words effect the response by Multiplot:

NOVALS Stores a single word describing the number of values in the data set in an ARexx value called "NOVALS".

XVALS Stores a text string with all the X values of the data set in a value called "XVALS".

YVALS Stores a text string with all the Y values of the data set in a value called "YVALS".

EVALS Stores a text string with all the high error in Y values of the data set in a value called "EVALS".

EDWN Stores a text string with all the low error in Y values of the data set in a value called "EDWN".

XEVALS Stores a text string with all the high error in X values of the data set in a value called "XEVALS".

XEDWN Stores a text string with all the low error in X values of the data set in a value called "XEDWN".

POKE N

[NOVALS|XVALS|YVALS|EVALS|EDWN|XEVALS|XEDWN] Copies data to the Nth selected item from an ARexx program variable with the same name as the selected option. If a point is poked at (ie the Nth selection is a selected point) then the option key word is not used and the point's values are read from an ARexx variable named POINTVALS as text containing six words describing the X, Y, high error in X, low error in X, high error in Y and low error in Y in that order. If a data set is poked at (ie the Nth selection is a selected data set) then the following key words effect the response by Multiplot:

NOVALS Ensures that the selected data set has NOVALS number of values in it ready to receive that number of data points on a subsequent POKE command where NOVALS is the name of a variable set within the ARexx script. If a data set has too few values, it will be enlarged to hold NOVALS number of points.

XVALS Reads a text string stored in an ARexx variable called "XVALS" and copies the values to the selected data set's X values.

YVALS Reads a text string stored in an ARexx variable called "YVALS" and copies the values to the selected data set's Y values.

EVALS Reads a text string stored in an ARexx variable called "EVALS" and copies the values to the selected data set's high error in Y values.

EDWN Reads a text string stored in an ARexx variable called "EDWN" and copies the values to the selected data set's low error in Y values.

XEVALS Reads a text string stored in an ARexx variable called "XEVALS" and copies the values to the selected data set's high error in X values.

XEDWN Reads a text string stored in an ARexx variable called "XEDWN" and copies the values to the selected data set's low error in X values.

OPEN Closes all open plots and provides The Data Selection Window to select a new data file.

ADDFILE Opens The Data Selection Window, to add data file selected to the currently active Plot Window.

NEWGRAPH Opens The Data Selection Window, to load data file selected into a new Plot Window.

ACTIVATE N Activates (selects) the Nth Plot Window.

CLOSEGRAPH Closes currently activated Plot Window.

SAVE Saves data file with current file name.

HPGLSAVE <filename> Saves all open plots as an HPGL file.

MCADSAVE <filename> Saves currently active Plot Window as a MCAD file.

ILBMSAVE <filename> Saves screen as an IFF ILBM file.

DRAWSAVE <filename> Saves all open plots as a DRAW file.

PSCRSAVE <filename> Saves all open plots as a Postscript file.

EPSFSAVE <filename> Saves all open plots as an encapsulated Postscript file.

ICADSAVE <filename> Saves currently active Plot Window as an IntroCAD file.

DATSAVE <filename> Saves currently active Plot Window as a Multiplot data file.

SADEF Saves default settings.

PREVIEW Provides print preview.

PROPT Allows setting print options via the The Print Set-up Window.

PRINT Prints all open graphs.

QUIT Closes all Plot Windows and quits Multiplot.

SELECT ABORT|REPLACE|ADD|(SET N)|(TEXT [N])|(POINT N)

Selects the indicated object. Is the ARexx equivalent of "single clicking" the left mouse button in the indicated object. Note above explanation of the use of SELECT and its options. The supported modifiers are:

ABORT Cancels selection in process

REPLACE Accepts selection, replacing previously selected objects

ADD Accepts selection, adding it to previously selected objects

SET N Selects the Nth data set.

TEXT [N] If data set selected but not confirmed, this option modifies selection to indicate the legend of the selected data set. If no data set is selected, it selects the Nth additional text in the currently activated Plot Window.

POINT N Used to modify selection of a data set to indicate the Nth point of that set.

UNSELECT Dumps list of selected objects.

LAUNCH Launches selected objects. Is the ARexx equivalent of "double clicking" the left mouse button.

UNDELETE Replaces any deleted selections.

CUT Copies currently selected objects to clip board then deletes them from currently activated Plot Window.

COPY Copies currently selected objects to clip board.

PASTE Pastes clipboard contents to currently activated Plot Window.

DELETE Deletes currently selected objects.

TEXTADD <String> Adds string as an additional text label.

SETADD Opens The Custom Plot Window and subsequent Edit Point Windows to permit addition of a new data set to the currently active Plot Window.

POINTADD Opens The Edit Point Window to define an additional point which is added to the currently selected (and confirmed) data set.

AXISADD Adds a new Y Axis.

EDAXIS YAXIS|XAXIS [N] Opens The Edit Axis Window to open the indicated axis. If the YAXIS modifier is used, the

optional numerical modifier indicates that the Nth Y axis is to be edited.

EDTITLE Opens The Edit Text Window to modify the title text.

FULLPLOT Resets axis dimensions and replots current graph to fit within new axes.

REDRAW Refreshes graph rendering.

RELOT Recalculates text positions and scaling, then redraws graph.

DEFINEPLOT Sequentially opens an Custom Plot window for each data set in current graph.

COORDWINDOW Opens the Coordinate window which displays current pixel locations of the mouse pointer.

FUNCTION SORT|FILTER|INTERP|SLINE|POLY N Performs one of the following functions on the currently selected data set.

SORT Sorts the points into ascending X values.

FILTER Smooths data set by a rolling mean method producing a new data set displaying the result.

INTERP Smooths data set by an open B-spline interpolation method producing a new data set displaying the result.

SPLINE Calculates a best straight line fit of data by the least squares method producing a new data set displaying the result.

POLY N Calculates a polynomial to the Nth order (where N must be an integer from 1 to 5) best fit of data using a Gauss-Seidel iterative technique producing a new data set displaying the result.

SFIGS VAL|FORM Sets the number of significant figures used in calculating the following:

VAL Axis tic values.

FORM Values used in formulae produced from functions.

YERRBARS ON|OFF Sets the display of Y error bars (if data is present) to:

ON; or

OFF.

XERRBARS ON|OFF Sets the display of X error bars (if data is present) to:

ON; or

OFF.

RMARGIN ON|OFF Switches display of the right margin in which data set legends may be displayed to:

ON; or

OFF.

XHAIR ON|OFF Switches between normal mouse pointer and cross- hair cursor.

ON Displays cross-hair.

OFF Displays mouse pointer.

ALIGN (VERTICAL LEFT|CENTRE|RIGHT) | (HORIZONTAL TOP|CENTRE|BOTTOM) Aligns selected items either vertically or horizontally.

	VERTICAL	Aligns selected items vertically
LEFT		By their left edges.
CENTRE		By their centres.
RIGHT		By their right edges.

	HORIZONTAL	Aligns selected items horizontally
TOP		By their tops.
CENTRE		By their centres.
BOTTOM		By their bottoms.

FORMAT XANDY|BOX|NONE Sets the format of the axes. The possible selections are:

XANDY Stem and leaf (X and Y) axes.

BOX Box axes.

NONE No axes.

Example 5

1.105 rexxexample2

Example 2:

To select and edit a data set requires 3 steps: 1) Select data set, 2) Confirm selection and 3) Launch selection:

```
/* This is a simple example script to open
The Custom Plot Window for the first data set in a graph
once on screen */
```

```
address MULTILOT.01
'SELECT SET 1'
'SELECT ADD'
'LAUNCH'
/* End script */
```

1.106 rexxexample3

```
/* This is a simple example script to open
The Edit Point Window for the fifth point
in the first data set in a graph */
address MULTILOT.01
'SELECT SET 1'
'SELECT POINT 5'
'SELECT ADD'
'LAUNCH'
/* End script */
```

1.107 rexxexample4

The following is an example in which the legend, and first two points are deleted from a currently displayed data set:

```
/* This is a simple example script to delete the legend and
first two points first data set in a graph */
address MULTILOT.01
/* simple so far */
'SELECT SET 1'
'SELECT TEXT'
'SELECT ADD'
/* The above 3 lines selects the legend from the first data
set */
'SELECT SET 1'
'SELECT POINT 1'
'SELECT ADD'
/* The above 3 lines selects the first point from the first
data set and adds it to the existing selection */
'SELECT SET 1'
'SELECT POINT 2'
'SELECT ADD'
/* The above 3 lines select the second point from the first
data set and adds it to the previous selection */
'CUT''
/* The above line cuts the selection to clipboard */
/* End script */
```

1.108 rexxexample5

```
/* Hi Let's try this one */
address MULTILOT.01
'FILE DATA/PLOTME.DAT'
/* The above line sets the input file */
'COL 1 XCOL'
'COL 2 YCOL'
'COL 3 ECOL'
'COL 4 EDWN'
'COL 3 XERR'
'COL 4 XERR'
/* The above 6 lines set the data columns for the input
file */
'CONTINUE'
/* The above line closes The Data Selection Window */
'YERR OFF'
'XERR OFF'
/* The above 2 lines turn off the rendering of error bars */
'FULLPLOT'
/*The above line replots the graph at the largest size that
just fits within the axes. */
/* end script */
```

1.109 The Custom Plot Window ARexx Commands

This window allows the user to choose how each data set is represented: the colour, line type, point type and size, which Y axis it is rendered on and the type of plot (points, line, both, bar, impulse, step).

The supported ARexx commands are:

QUERY Returns "CUSTPLOT Set number N" Where N is the set number.

POINT N [SQUARE|PLUS|STAR|TIMES|DIAMOND|TRIANGLE]

Sets point size to N and the point shape to one of:

SQUARE

PLUS

STAR

TIMES

DIAMOND

TRIANGLE

LINETYPE N Sets line type to line pattern number N.

COLOUR N Sets colour of data set to colour number N.

YAXIS N Sets the data set to be plotted in the Nth Y Axis.

PLOT POINT|LINE|BOTH|STEP|IMPULSE|BAR Sets the data set to be plotted as one of the following:

POINT A series of points in the current colour, point type and size.

LINE A line rendered in current colour and line type.

BOTH A series of points in the current colour, point type and size joined by a line rendered in current colour and line type.

STEP A stepped line rendered in current colour and line type.

IMPULSE A series of lines rendered in current colour and line type that extend from points rendered in the current colour, point type and size to the X Axis.

BAR A series of bars rendered in current colour and line type that extend to the X Axis.

CONTINUE Accepts current changes, closes the custom plot window and replots the graph.

STOP Cancels any changes, closes the custom plot window and replots the graph.

SKIP Closes the custom plot window and replots the graph without rendering the currently selected data set.

KILL Closes the custom plot window and replots the graph after deleting the currently selected data set.

Example 6

1.110 Example 6

/* This ARExx script formats Plotme.dat into two stacked Y axes and selects points and line types for the data sets. */

```
address MULTILOT.01
'FILE DATA/PLOTME.DAT'
'COL 1 XCOL'
'COL 2 YCOL'
'CONTINUE'
/* The above 4 lines set the filename and data columns, then
load data */
'AXISADD'
/* The above line adds a second Y axis stacked above the
first */
'SELECT SET 1'
'SELECT ADD'
'LAUNCH'
```

```
/* The above 3 lines open The Custom Plot Window to edit
the first data set */
'PLOT POINT'
'POINT 12 STAR'
'YAXIS 2'
'COLOUR 1'
'CONTINUE'
/* The above 5 lines set the data set to be plotted in
colour 1 as 12 pixel high points shaped like stars in the
second (upper) Y Axis */
'SELECT SET 3'
'SELECT ADD'
'LAUNCH'
/* The above 3 lines open The Custom Plot Window to edit
the third data set */
'PLOT LINE'
'LINETYPE 1'
'YAXIS 2'
'COLOUR 1'
'CONTINUE'
/* The above 5 lines set the data set to be plotted in
colour 1 solid lines in the second (upper) Y Axis */
'SELECT SET 2'
'SELECT ADD'
'LAUNCH'
'PLOT POINT'
'POINT 12 TRIANGLE'
'YAXIS 1'
'COLOUR 2'
'CONTINUE'
/*****/
'SELECT SET 4'
'SELECT ADD'
'LAUNCH'
'PLOT LINE'
'LINETYPE 2'
'YAXIS 1'
'COLOUR 2'
'CONTINUE'
/*****/
'FULLPLOT'
/* end script */
```

1.111 The Edit Axis Window ARexx Commands

This window allows the user to set the minimum and maximum values, the tic numbers, types, colours, line patterns, as well as the axis text label, type, and position.

The supported ARexx commands are:

QUERY Returns "EDAXIS ? Axis N" Where ? is either X or Y, and N is an integer indicating the Y axis number.

LABEL Opens The Edit Text Window to add or change the axis label.

GRID BIG|SMALL [N1 [N2 [N3]]] Sets characteristics of the grid or tics on the axis. The following arguments may be used:

BIG Switch keyword indicating that the big tics will be affected by changes.

SMALL Switch keyword indicating that the small tics will be affected by changes.

N1 An integer indicating the new number of subdivisions.

N2 An integer indicating the sort of subdivision marking. If is '0', indicates that tic marks should be used. Otherwise a value from 1 - 6 indicates line type for grid lines.

N3 An integer indicating the number of the colour for the grid or tics to be rendered in.

SCALE MIN|MAX N Sets the minimum or maximum axis values where:

MIN Is a switch keyword which sets the minimum axis value.

MAX Is a switch keyword which sets the maximum axis value.

N is a decimal value.

TYPE LIN|LOG|CAT Sets the axis type to one of the following:

LIN Linear

LOG Logarithmic

CAT Category

POSITION RIGHT|LEFT Sets the position of the Y axis to either the right or the left.

RIGHT Sets position to the right of the plot.

LEFT Sets the position to the left of the plot.

LOCKS SCALE|VALUES ON|OFF Sets the axis locks on or off.

SCALE Switch keyword indicating the axis scale lock.

VALUES Switch keyword indicating the axis values lock.

ON Turns lock on.

OFF Turns lock off.

CONTINUE Closes The Edit Axis Window, accepting current changes.

STOP Closes The Edit Axis Window, discarding current changes.

KILL Deletes current Y axis if more than one Y axis present.

1.112 The Edit Point Window ARexx Commands

This window allows the user to set the values of an individual point. Supported ARexx commands are:

QUERY Returns the string "POINTED Point number N1 of set number N2" where the point is the N1st point of the N2nd data set.

SET N XVAL|YVAL|EVAL|EDWN|XERR|XEDN Sets a point value to N where N is a decimal number.

XVAL Sets X value.

YVAL Sets Y value.

EVAL Sets high error in Y value.

EDWN Sets low error in Y value.

XERR Sets high error in X value.

XEDN Sets low error in X value.

CONTINUE Closes The Edit Point Window, accepting current changes.

STOP Closes The Edit Point Window, discarding current changes.

1.113 The Data Entry Window ARexx Commands

This window allows the user to set the values of the points within a data set. Supported ARexx commands are:

QUERY Returns the string "DE"

SET N XVAL|YVAL|EVAL|EDWN|XERR|XEDN Sets a point value to N where N is a decimal number.

XVAL Sets X value.

YVAL Sets Y value.

EVAL Sets high error in Y value.

EDWN Sets low error in Y value.

XERR Sets high error in X value.

XEDN Sets low error in X value.

NEXT Moves the cursor from the point currently being edited to the next point.

PREVIOUS Moves the cursor from the point currently being edited to the previous point.

CONTINUE Closes The Data Entry Window, accepting current changes.

STOP Closes The Data Entry Window, discarding current changes.

1.114 The Edit Text Window ARexx Commands

This window allows the user to set the text, font and point size of text.

Supported ARexx commands are:

QUERY Returns the string "TEXTED <text>"

TEXT <text> Sets the text to <text>. If <text> is not defined, clears text from the text box.

FONT Sets the font to .

SIZE N Sets font size to N pixels in height.

CONTINUE Closes The Edit Text Window, accepting current changes.

STOP Closes The Edit Text Window, discarding current changes.

Example 7

1.115 Example 7

```
/* This example ARexx script demonstrates the use of some of
the ARexx commands available for manipulating
The Edit Axis Window and The Edit Text Window. */
address MULTILOT.01
'FILE DATA/PLOTME.DAT'
'COL 1 XCOL'
```



```
'COL 2 YCOL'
'CONTINUE'

'AXISADD'
'EDAXIS Y 1'
'SCALE MIN 10'
'SCALE MAX 60'
'GRID BIG 5 1 2'
'GRID SMALL 2 2 2'
'LABEL'
'TEXT LEFT'
'CONTINUE'
'CONTINUE'

'EDAXIS Y 2'
'SCALE MIN 30'
'SCALE MAX 50'
'GRID BIG 5 1 2'
'GRID SMALL 2 2 2'
'POSITION RIGHT'
'LABEL'
'TEXT RIGHT'
'CONTINUE'
'CONTINUE'

'FORMAT BOX'
'SELECT SET 3'
'SELECT ADD'
'LAUNCH'
'YAXIS 2'
'PLOT LINE'
'CONTINUE'

'SELECT SET 4'
'SELECT ADD'
'LAUNCH'
'PLOT LINE'
'CONTINUE'

'SELECT SET 1'
'SELECT REPLACE'
'SELECT SET 2'
'SELECT ADD'
'DELETE'

'REPLOT'
/* end script */
```

1.116 The Print Set-up Window ARexx Commands

This window allows the user to alter global printing settings as well as control the printing of plots individually. The supported ARexx commands are:

QUERY Returns the string "SETPRINT"

PEN N1 [N2] Sets the N1st pen to N2 points wide. Multiplot uses the pen concept borrowed from pen plotters in which each pen can be set with an individual colour and pen width.

GRAPH ON|OFF Controls the rendering of the currently active graph.

ON Ensures the currently active graph is printed when the PROJECT/Print menu option is selected.

OFF Prevents the currently active graph being printed.

SPOOL ON|OFF Switches on or off the print spool.

MODE COLOUR|COLOR|B&W Sets the print out to either colour or black and white.

COLOUR Prints in colour.

COLOR Prints in colour.

B&W Prints in black and white.

CONTINUE Closes The Print Set-up Window, accepting current changes.
