QL Cadette

V2.00

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INTRODUCTION

This manual describes the use of QL Cadette and its plotter driver, Plot. Since the manual is in a loose leaf binder, please feel free to reorganise it to your preference. The user is advised to read this manual fully before attempting to use any of the facilities of this complex application.

FILE NAMING CONVENTIONS

Due to the complexity of the file naming conventions of QDOS, the following notation has been adopted throughout to describe file names:-

DEVx_name

where "DEV" is the device (ie FLP & MDV), "x" is it's logical number and "name" is the file's name.

This doesn't mean that you should type "DEVx_name" but should substitute "DEV" and "x" for real devices. For instance, should the files be on a microdrive cartridge, "DEV" should be replaced with "MDV", while if on a floppy disk, "DEV" would become "FLP" (see notes). The "x" should be replaced with a digit (from 1 to 8) indicating the drive's number. Therefore, if the file was on a microdrive cartridge in drive 1 (the slot on the left), "DEVx_name" would become "MDV1_name". For floppy disks, if the file was in drive 1 (refer to disk drive manuals to identify drive 1 if you have more than one disk drive),"DEVx_name" would become "FLP1_name".

BEFORE USING THE SOFTWARE, MAKE A BACKUP COPY OF THE ORIGINAL.

If you have a single drive floppy disk system, refer to your manual for information on making a backup copy otherwise, if there was enough space on the media, we will have provided a SuperBASIC program which should be "LRUN"ed. This program will copy all files from drive 1 to an already formated media in drive 2 (see QL User Guide, Keywords page 25).

When run the program will ask the user for the name of the device that is being used. If this is the microdive, type "mdv" followed by <ENTER>; if floppy disks are being used, type "flp" (also followed by <ENTER>). If the program stops with an error,there could be reasons:-

(1) The device name typed in was incorrect;ie. not a valid QDOS device such as "flp" or "mdv".

(2) The data files to be copied were not in drive 1.

(3) The medium to which the copy is to be transferred is unformatted, write protected or has too little spare space for all the files (in which case use a fresh, newly formatted cartridge or disk).

(4) An attempt to use the program with a single floppy disk system has been made.

The backup program may be started from SuperBASIC using "LRUN" as follows:-

LRUN DEV1_Backup_BAS

Remember to substitute the correct device name for the "DEV".
ie.

For a microdrive system use:-

LRUN MDV1_Backup_BAS

For a dual disk system use:-

LRUN FLP1_Backup_BAS

NOTES

(1) Not all floppy disk systems use the name "flp" to identify a floppy disk drive so it is advisable to refer to the disk manuals if you are new to the system. One of the most common substitutes is "fdk".

It is useful to note that utilities are available to "fool" the computer into accepting a pseudonym for a device name.

(2) If the files are currently on another directory device, "DEV" may be substituted for that device's name;ie. "DEV" could become "RAM" for a RAMdisk.

(3) If your disk drive manual doesn't give any information on making backups with a single drive system, the files may be backed up using the method:-

(A) Write protect the original copy. (move the "switch" on a 3 or 3.5 inch disk or add a sticky tab on a 5.25 inch disk).

(B) Format a fresh disk then remove it from the drive and insert the original.

(C) Put a freshly formatted microdrive cartridge into microdrive 1 or, if you have the facility, open a RAMdisk.

(D) Using SuperBASIC'c COPY command (see QL USER's MANUAL, Keywords, page 10), and copy a file from the disk to the cartridge or RAMdisk.

(E) Swap the disks around then copy the file (on RAMdisk or cartridge) to the disk.

(F) If space is scarce on the cartrige or RAMdisk, delete the copy on it (QL USER GUIDE,Keywords page 17).

(G) Swap the disks around again and if there are still files to copy, continue from (D).

(H) Check that you have copied all the files and if so, you should now have a full backup copy.

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DESCRIPTION OF THE SOFTWARE

QL Cadette is a compact two dimensional drafting tool designed to run on Sinclair QL's including unexpanded 128k machines. The acompanying utility, Plot, allows drawings created with the help of Cadette to be drawn with a plotter, or, with Epson compatible dot matrix printers, fully corrected screen dumps may be generated (ie circles are circles, not ellipses). Both these programs were written in SuperBASIC prior to compilation with Digital Precision's Turbo compiler. Both are capable of being run under QRAM's pointer/window environment & have been found to run with Speedscreen.

RUNNING THE SOFTWARE

There are three ways that Cadette and Plot may be started:-

(1) Place the cartridge (or disc) in drive one, reset the QL and, when prompted, type <F1>. This will load the runtime extensions and provide a front end from which to run the package.

The front end consists of a menu providing three choices: Cadette, Plot, and Quit to SuperBASIC. To choose, type 'C', 'P', or 'Q'.

(2) Running from a front end utility such as QRAM. Follow the normal procedures for activating 'jobs' (executeable files) as outlined in that utility's manual. The files to use are 'Cadette_Exe' & 'Plot_Exe' for Cadette and Plot respectively.

(3) Running from SuperBASIC using EXEC_W (not EXEC unless you have QJUMP's Pointer environment). The files to use are as above. See QL User Manual, Keywords page 21.

The Turbo runtime toolkit provides another keyword with which to run Cadette or Plot; 'EXECUTE_A'. This is syntactically identical to 'EXEC_W' but allows the use of <ALT><SPACE> to terminate the packages runtime. It is useful with Plot when using the Penman Plotter although potentially dangerous when used with Cadette.

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STARTING CADETTE

First run Cadette using one of the methods outlined above.

When first started, Cadette will look on the default drive for the character set file. If found, it will load it into the QL. Should the character set not be found, the QL will 'beep' and display an error message. Pressing any key will allow you to change/edit the name of the character set to suit. Deleting all characters in the name will abort Cadette.

After the character set has been loaded, the next task is to set the amount of memory that is to be used for the data base. Giving the maximum permissable vale as default, Cadette asks the user to enter the size. Should the default size be ok, just type <ENTER>. Entering a value of zero will abort Cadette.

These obstacles safely passed, the user will be presented with the Main menu, with Cadette ready for work.

If an error should occur, consult the manual's chapter on errors to determine the cause and probable remedy.

STARTING PLOT

When first started, Plot will look on the default drive for the character set file. If found, it will load it into the QL. Should the character set not be found, the QL will 'beep' and display an error message. Pressing any key will allow you to change/edit the name of the character set to suit. Deleting all characters in the name will abort Plot.

If an error should occur, consult the manual's chapter on errors to determine the cause and probable remedy.

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USING CADETTE TO PROCESS ANOTHER PROGRAM'S OUTPUT

We recognise the fact that some program authers may wish to use Cadette to process drawings generated by their software. For instance, a structural design package may generate 'sketches' that may form the basis of the design drawing. To aid such developments, we are currently developing a source code 'toolkit' that will allow this. Please enquire.

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HELP LINE

Although the documentaion should provide the answers to any problems encountered through the use of QL Cadette, there is, as a final resort, a help line is available to legitimate users. The telephone number is 09946-370 during the hours of 10am to 5pm, Monday to Saturday. Please try not to use it unnecessarily.

UPDATES AND UPGRADES

Updates (ie. bug fixes) are available, when advertised, for £3 together with the return of the original media. The update itself is free, the charge being to cover postage and handling. This offer covers the UK only, foreign orders being subject to increased postage.

Upgrades to later, more powerful, versions need only pay the difference between the recomended prices. Enquire about prices as the software becomes available.

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BUGS

Although we take great pains to ensure that our software is bug free, it is possible that faults exist within it. Should you discover a bug, please complete the provided 'Bug Report' and post it to us. The software can then be adjusted and released as an update.

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FINAL WORD

QL Cadette is the first package in a range of CAD software for several computers. Due to the restrictions imposed by squeezing Cadette into a 128K QL, several features may appear to work in an odd manner although cause no harmful long term effects. These are not bugs.

CONCEPTS

This section of the manual describes concepts relating to the QL, CAD, and the Cadette package. It is advised that it is read fully before using Cadette and refered to when a new phrase is encountered.

C1 : AREAS OF THE DISPLAY

Screen is in two parts :- (1),"Sheet" and (2), "Action & status"

(1) The sheet window is the largest on the screen and is where the sheet's simulation may be viewed. It may be gridded in one of three grid types and may optionally have a reference section along the top and left edges. If present, each reference window holds three numbers, approximating the co-ordinates of the corners and centre of the displayed sheet area.

(2) The lower part of the display holds three windows :-

The action window which is the larger of the three is where all prompts and user interaction takes place. This window is also the home of the keyboard cursor.

The other two windows, one above and one below the action window hold information as to Cadette's status. The top status window indicates the size of the displayed area (and thus the degree of 'zoom'), the current stepsize, and the origin of the displayed area on the sheet. The lower status window gives the position of the graphics cursor, the physical size of the sheet, whether or not scaling is on and what the scale value is.

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C2 : C.A.D.

C.A.D. or Computer Aided Design is a wide field of computer application used in the process of design and engineering. QL Cadette falls into the sub-category of 2-dimensional drafting and can be used in the designing almost anything from flowcharts to bridges.

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C3 : CARTESIAN CO-ORDINATES

The cartesian coordinate system works as a displacement along the horizontal axis from the origin (the X value) , followed by a displacement along the vertical axis from the origin (the Y value). See Goto entry in chapter on menus.

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C4 : CHARACTER SET

The character set is a file that must be loaded into QL Cadette when started to describe the appearence of text. This approach was adopted in preference to using a plotter's own character set since, no matter which plotter was used, output would be the same. Note that by substituting the file 'CharSet_Bin' with another in the correct format, the character set may be changed.

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C5 : CURSORS

QL Cadette has two distinct cursors:-

(1) Graphics Cursor : This cursor operates within the sheet window and looks a little like a gun's crosshairs. Black is it's normal colour although that may change as it moves over lines on the drawing.

If it is present and there is no keyboard cursor, the graphics cursor may be moved by use of the movement keys. The exception to this case is when editing text. See Editing.

(2) Keyboard Cursor : This is a character sized, blinking box that pperates within the action window, indicating where the next character to be typed will appear. It's appearance precludes use of the cursor movement and action keys.

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C6 : DATABASE

A data base is a set of interrelated data records stored in such a way as to allow retrieval and alteration.

QL Cadette stores sheet information (primitives etc.) in a specially designed database which, when editing, the user is manipulating.

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C7 : EDITING

Editing is a mode of operation whereby shapes may be interactivly altered, replaced, or removed. QL Cadette has two forms of editing:-

(1) Value..... Value editing is usually in force when the keyboard cursor is present. Unless the user is requested to enter specific key-strokes (ie. 'Y' or 'N' in a Yes/No situation), anything typed will replace the default value. If anything is to be added to the end of the default value, type <cursor-left> once and then type whatever is required. Any other editing may be achieved by moving the key board cursor to the necessary location and typing the character/s, using <CTRL><cursor-left> or <CTRL><cursor-right> to delete any unwanted characters. It may sound complex but a with little experimentation it will soon become second nature.

(2) Rubber Bands.. These may be edited interactivly and may make use of Value Editing (see above). See chapter on Editing for further details.

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C8 : FILES

A file is collection of related data items held on a storage device outside of the computer for use at a later date or on another computer. Cadette is held as a FILE on the cartridge/disc that it was bought on.

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C9 : GRIDS

These are drawn on the screen's image of the sheet in order to aid in the location of the graphics cursor. See Environment entry in the Menus chapter.

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C10: INTERACTION

A process of entering data in response to the computer's output. An interactive system allows the user to alter something and see the results immediately, changing them as required.

C11: MENUS

Cadette's menus always appear in the action window and are hierarchical in implementation (that is they can call other menus which, when left, will return control to the menu that called them).

In most cases, choosing an option is simply a matter of typing the number corresponding to that option. Leaving a menu is simply a matter of typing <ESC> although it must be noted that should a menu option that activates the keyboard cursor be chosen, special procedures pertinant to that option may be required. In such a case, refer to this manual's section on the individual menus.

An exception to the above menu structure is used when a major system error occurs. This menu gives you the code of the offending error and prompts you to retry, save, or quit to which may be typed 'R', 'S', or 'Q'. If 'R' is typed, the program will attempt to re-enter Cadette at the main menu. This may or may not be successful. 'S' will enter the 'Save' option of the files menu and is the advised first option should this error occur. 'Q' or alternatively <ESC> will leave Cadette for the calling environment. Please remember that it is possible that the retry and save options may be prevented from functioning by the same error that caused the activation of this menu. Because of this, it is essential that important work is saved at regular intervals.

The usual cause of the 'Retry, Save, Quit' menu is another job within the QL appropriating resources required by Cadette. If possible, removal the offending job from the QL may rectify the situation.

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C12: MOVEMENT & OTHER SPECIAL KEYS

Please note that the following keys will not be available should the keyboard cursor be active.

(1) Cursor Keys.... Allow for movement of the graphics cursor in the indicated direction by multiples of the set step size. Alone, movement is by the stepsize; with <SHIFT>, movement is 10 x Stepsize; with <CTRL>, 50 x Stepsize; and finally, with <CTRL> & <SHIFT> movement is 100 x Stepsize. Note that the graphics cursor may not be moved outside of the sheet's bounds. Should a movement traverse the edge of the displayed area, the display will pan/scroll in the indicated direction by at least one quarter of it's area.

When editing (see editing), if these combinations are used in conjunction with the <ALT> key, the entire rubber band will be moved in the indicated direction. Note that if scaling is on, the distance moved is in millimetres rather than scale units.

(2) Goto..... The Goto menu may be invoked by typing <F5> to allow direct positioning of the graphics cursor. May be used while editing rubber bands.

(3) Pan/Scroll..... Manual panning & scrolling can be forced when Cadette is not in editing mode.The cursor keys when used with <ALT> will pan/scroll by half the display distance. When used with <ALT> & <CTRL>, will pan/scroll by the full distance.

(4) Environment.... This may be called by typing <F2> and allows for the modification of operating parameters such as zoom and step size. See Menus section of manual for further details.

(5) Redraw..... Typing <F4> will redraw the display. This may be required while editing or should another job corrupt the QL's display.

(6) Escape..... Abort the current operation by typing <ESC>

C13: PRIMITIVES

Primitives are the basic building blocks used in the creation of a sheet's image. The primitives supplied by QL Cadette are : Arcs, Boxes, Circles, Ellipses, Lines, Regular Polygons, Text, and Triangles.

Primitives may also be called shapes.

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C14: RELATIVE COORDINATES

Is a system which allows movements using the cartesian system, relative to the initial position. The value given should be a displacement (+/-) along the Horizontal (X) axis, followed by a displacement along the Vertical (Y) axis. See Goto entry in the Menus chapter for further information.

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C15: RUBBER BANDS

A rubber band is a representation of a primitive that may have its shape or location altered interactively. Rubber bands are used when editing primitives. See chapter on editing for further information.

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C16: SCALING

Scaling allows the user to choose a unit length more applicable to the task at hand than millimetres. For instance, should there be a need to draw a line one inch long, select a scale of 25.4 and turn scaling on then draw a line one unit long. When plotted, the line will be one inch long. See chapter on scaling for further details.

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C17: SHEETS

A sheet is an area where the drawing is to take place and may be any size up to 10 metres square. For instance, a sheet may be A4 or A3 sized. The size of the sheet may be set via the Sheets menu.

The sheet window shows an area of the sheet to whatever degree of ZOOM or magnification has been set.

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C18: STEPSIZE

This is the size of the basic unit to be used by the cursor keys. Stepsize may be set via the Environment menu.

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C19: VECTOR MOVEMENT

A vector movement is described by a distance followed by an angle in degrees, clockwise from the vertical. This is opposed to a Polar move which uses an angle, anticlockwise, from the horizontal. See Goto entry in the Menus chapter.

C20: WINDOWS

A window is an area on the QL's display where a distinct form of output may occur. QL Cadette has four windows when references are off and six windows when they are on. See Concepts, page 54 of the 'Sinclair QL User Guide' for more detailed information.

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C21: ZOOMING

Zooming is a method whereby detailed work may take place on a given area of a sheet by magnifying the area to fill the sheet window.

The area of the displayed sheet area is determined via the Environment menu option, Area Displayed. The area displayed is determined by the vertical distance at the X,Y-Origin. The horizontal distance is 1.66x the vertical distance.

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MENUS - Cadette only

The following chapter describes if full the menus used to control Cadette. If required, use Concepts chapter for reference.

M1 : MAIN MENU

This menu has the highest priority and any option may be reached from here. The program starts from this menu and will return here should a major error occur. Options provided:-

(1) *Draw Shapes....* Select Draw Menu (M2) (2) *Alter Shapes..* Select Alter Menu (M3)
(3) *Environment....* Select Environment Menu (M4) (4) *Goto.....* Select Goto Menu (M7)
(5) *Files.....* Select Files Menu (M8) (6) *Sheets.....* Select Sheets Menu (M9)

(7) *Quit.....* Leave Cadette for the calling environment. First of all the user is asked "Are You Sure ?" to which the reply may be 'Y' for "Yes, I do wish to leave" or "N" for "Ooops...No, I don't". If the answer is "no", control is returned to the main menu otherwise the user is then asked; "Save First ?". Again the answer may be "Y" or "N". If "yes" then control is passed to the Files menu option "Save" prior to being asked the final question, "Restart Cadette ?". If "no" then Cadette is removed and control is passed to the calling environment else Cadette is restarted with an empty sheet.

This option may be used to 'clear' or 'zap' a sheet.

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M2 : DRAW SHAPES MENU

This menu is used to add primitives (shapes) to the database. Options:-

1> Arcs 2> Boxes 3> Circles 4> Ellipses 5> Lines 6> Polygons 7> Text 8> Triangles

The selected primitive is presented for editing (see Editing for further details) following which control will be returned to the Draw menu.

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M3 : ALTER SHAPES MENU

This menu is to allow the selection of primitives currently within the database for re-editing or removal. Options:-

1> Arcs 2> Boxes 3> Circles 4> Ellipses 5> Lines 6> Polygons 7> Text 8> Triangles

If one or more of the selected primitives are held within the database, the user is given, within the Action window, the the number of the shape selected, it's statistics (position, radius etc.) and a small menu. In addition, should the selected shape be within the sheet area displayed, it's colour will change to black.

When the statistics of first shape in the given shape list have been sucessfully displayed, the user may now use them as follows:-

(1) Editing the shape....The current shape may be selected for editing by typing 'E'. See 'Editing' for a description on how to continue. Should the edit be aborted by <ESC>, the shape will not be altered. Note that when a text type is edited, it is removed from it's original position and placed at the end of the list. This means that not only does it's own reference number change, the numbers of the individual text

definitions originally following it will be reduced by one.

(2) Goto a shape..... Where the reference number of a given shape is known, it may be selected individually by use of the 'Goto' option, by typing 'G', and entering the number when prompted. Please note that with the exception of text, the first shape of each list is number zero; text is number one.

(3) Next shape.....The next shape in the list may be selected by typing 'N', <cursor-right> or <cursor-down>.

(4) Previous shape.....The previous shape in the list may be selected by typing 'P', <cursor-up> or <cursor-left>.

(5) Deletion.....A shape may be removed by typing 'D', 'Z', or 'R'. The option to confirm or abort the deletion is given. Note that the reference numbers for any shape following that removed will be reduced by one so should there be a need to remove a set of shapes by reference, it should be done in descending order.

(6) Quit.....Return to the Alter menu may be affected by typing <Q> or <ESC>.

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M4 : ENVIRONMENT MENU

From this menu the sheet working parameters may be set or altered. Note that, when there is no keyboard cursor, the environment menu may also be reached by typing <F2>.

Options:-

1> *Area Displayed*... Selects Area Displayed menu (M5)

2> *Step Size*..... Prompts the user to enter a new step size. Note that this is subject to scaling.

3> *Grid Pattern*..... Selects Grid Pattern menu (M6)

4> *References*..... Allows for selection or de-selection of the sheet references with '1' to select them and '2' to de-select them.

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M5 : AREA DISPLAYED MENU

Provides the facilities to 'Zoom' onto any area of the sheet :-

1> *Height*..... Allows for the height of the displayed area to be entered. The smaller the height, the greater the degree of 'zoom'. The value entered is in millimetres if scaling is off otherwise it is in scaled units. Note that the width of the displayed area is 1.66x the Height.

2> *X Origin*..... Allows for the X co-ordinate (distance from the left-most edge of the sheet) of the displayed area to be entered. Again this value is in either millimetres or scaled units.

3> *Y Origin*..... Allows for the Y co-ordinate (distance from the bottom of the sheet) of the displayed area. This value is in millimetres or scaled units.

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M6 : GRID PATTERN MENU

Allows for selection of the grid type, if any, and it's size:-

1> None..... De-selects any grid that is currently in use.

2> Lined..... Selects a lined grid at specified intervals starting from the SHEET origin.

3> Dotted..... Selects a dotted grid at specified intervals starting from the SHEET origin.

4> Iso-metric..... Selects an iso-metric grid starting from the sheet origin.

5> Set Distance... Allows the user to alter the size of the current grid. With lined and dotted grids, this value is the vertical and horizontal interval, whilst with the iso-metric grid, it is the length of each triangle's sides. Please note that this value is scalable.

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M7 : GOTO MENU

Allows the graphics cursor to be accurately positioned at a preordained position on the sheet by any one of three methods:-

1> Cartesian..... Move to a location (on the sheet) referenced by it's X and Y co-ordinates. Entry is in the form of "<X> , <Y>" with the default being the current location.

2> Vector..... Move to a location on a vector from the current position. Entry is in the form of a distance and angle in degrees (clockwise from the vertical):- "<distance> , <angle>". Default is "0,0" which causes no movement.

3> Relative..... Move to a location displaced from the current position. Entry is by a relative horizontal displacement (+/-) and a vertical displacement (+/-):- "<X disp> , <Y Disp>". For instance, "-10,-10" moves the cursor left 10 units and down 10 units while "10,10" moves it up 10 and right 10. Default is "0,0" which causes no mevement.

Note that in all cases, an entry in the required form is required and that an <ESC> will not abort the operation. Should an error occur (ie. attempting to move to a position outside the bounds of the sheet, or an entry of data in an illegal format), the QL will issue a noise and will return the offending entry for re-editing. If it is nessecary to abort the operation with no movement of the graphics cursor, in the case of the cartesian move, enter the current cursor position (see lower Status window), and in the Vector and relative moves, enter '0,0'.

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M8 : FILES MENU

From this menu files may be loaded, saved (to microdrive, disc etc.) or listed to a printer.

Notes

i) Of all the operations within Cadette, the file operations are most likely to cause an error (ie. trying to read a file from the wrong disc etc.). Particular attention must therefore be paid to this manual's chapter on error messages.

ii) In all cases, entry of a null name (ie. everything deleted or all spaces) will abort the operation.

Options:-

1> *Load sheet.....* Allows for an predesigned sheet to be loaded for editing or viewing.

If the drawing currently in the CAD package has been in any way altered, the user will be asked: "Drawing has changed - do you wish to save (Y/N) ? ". If the answer is 'yes' then there will be a detour via the save sheet option (see below) before the user is asked the name of the file to load. If not, the file if it exists will be loaded.

2> *Save sheet.....* Allows the sheet currently being edited to be saved to a file for re-use at a later date or for plotting using the 'Plot' utility.

The user is asked the name of the file to be saved and should a file of that name already exist then option to overwrite is given before the file is written. Should the overwrite be denied, another file name is required.

3> *List database..* Outputs a listing of the database to a printer or file. This is mainly for archival purposes to aid the regeneration of a lost or deleted sheet but has also been found useful in the 'debugging' of sheets. Note that all distances and co-ordinates are always output in millimetres.

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M9 : SHEETS MENU

The physical size of the sheet, the scaling value and whether or not scaling is too be activated are selected here.

Options:-

1> *Sheet Height...* Prompts for the height of the sheet. The current value is given as default. The sheet height is scalable.

2> *Sheet Width....* Prompts for the width of the sheet. The current value is given as default. The sheet width is scalable.

3> *Set Scale.....* Prompts for entry a new scale value. The current value is given as default.

4> *Scaling On.....* Turns scaling on.

5> *Scaling Off....* Turns scaling off.

When scaling is in force, all lengths & co-ordinates input and output (except the references which are always in millimetres) are scaled. For instance, with a scale of 25.4, one unit is 1mm when the scale is off but 1 inch when it is on.

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EDITING

This section describes the rubber band editing of individual primitives, either for the purposes of ALTERation or their initial DRAWing.

In all rubber bands, the following details apply:-

(1) Parameters describing the rubber band appear within the Action window.

(2) The parameter currently being edited has its title highlighted.

(3) Moving the 'highlighting' (and thus opening another parameter for alteration) may be achieved using the <TAB> key. Typing <TAB> will move the highlight to the next parameter to the right, wrapping over to that on the far left should it already have been on the right most. <SHIFT><TAB> moves the highlight to the left, wrapping to the right.

(4) Typing <F5> will allow the user to enter the value directly via the keyboard.

If the parameter is a physical point on the sheet (ie. circle's centre, corner of a triangle etc.), the Goto menu will be called allowing movement by cartesian, vector or relative values.

If the parameter is a single scalar value (ie. radius of circle, width of box etc.), the keyboard cursor will be activated, prompting the user to enter a new value. The current value of the parameter is given as default.

(5) Use of the cursor keys affects the parameter according to its type.

Parameters representing points on the sheet may be 'moved' as normal with the cursor movement keys (ie. up, down, left & right) by the indicated distance (ie. 1x, 10x, 50x & 100x stepsize).

Scalar parameters are increased or decreased by the indicated amount. To increase the value, use <cursor-up> or <cursor-right>; to decrease, use <cursor-down> or <cursor-left>. For example, to increase a value by 50x stepsize, type <CTRL><cursor-up>.

(6) The rubber band itself appears in the sheet window in green.

(7) Abortion of an edit may be accomplished by typing <ESC> at any time when the keyboard cursor is inactive.

(8) Completion of an edit is accomplished by typing <ENTER> at any time when the keyboard cursor is inactive. Note that enter must be typed twice to complete text.

(9) When editing, manual panning and scrolling is not permitted. Instead, use of the <ALT> key with the normal graphics cursor movement combinations (except <F5>) will move the entire rubber band in the given direction, regardless of which parameter is being altered. Note that movement will always be in multiples of one millimetre, regardless of scale value (if any).

The following conditions also apply:-

(1) In all cases except text, the graphics cursor is present if the parameter being edited is a point on the sheet, but not present if the parameter is a scalar value. With text, the graphics cursor is always present since it indicates the point that it should start from.

(2) The Lines & Arcs parameter display also shows the length of the line. This value may not be directly edited.

Now follows a description of each type of rubber band:-

E1 : ARCS & LINES

Arcs and lines are edited using the same parameter list, thereby allowing one to be changed to the other at will.

The parameters given are :-

1> Start..... This is a point on the sheet indicating the start of the line or arc.

2> End..... This is a point indicating the end of the line or arc.

3> Angle..... The angle, in degrees, determines whether the resultant rubber band is an arc or a line. If the angle is zero, the rubber band is a line, otherwise, it is an arc.

Details to remember about arcs are:-

(1) The angle given is that at the centre of the 'circle'. ie. an angle of 90 degrees draws a quadrant, while and angle of 180 degrees draws a semi-circle.

(2) The sign of the angle determines its direction.

'Looking' from the start point to the end point, positive angles arc to the right; negetive angles to the left.

(3) The only way to move the entire Arc/Line without distortion is to use the <ALT> & cursor key combinations. (See E0-9)

--++*++--

E2 : BOXES

A box is described as having width, height and a rotation around its top, left hand corner.

Parameters:-

1> Point..... Point on the sheet representing the top, left hand corner of the box.

2> Width..... Width of the box.

3> Height..... Height of the box.

4> Rot..... Angle of rotation (in degrees) around the top, left hand corner.

Boxes can be used as a memory efficient replacement for multiple lines in some cases.

--++*++--

E3 : CIRCLES

Circles are described as having a centre point and either a point on its circumference or a radius.

1> *Centre*..... Centre of the circle.

2> *Point*..... Point on the circumference.

3> *Radius*..... Radius.

Moving the centre of the circle will change the size of the circle since the point on the circumference remains fixed.

The radius changes to match the distance between the centre and circumference point, but manually altering the radius has no effect upon the others.

The only way to move the circle without distortion is to use the <ALT> & cursor key combinations. See E0-9 above.

--++*++--

E4 : ELLIPSES

Ellipses have a centre, major axis (or radius), an eccentricity and an angle of rotation.

1> *Centre*..... The centre point of the ellipse. Moving this will move the entire rubber band.

2> *Major*..... The length of the major (or longest) axis. Remember that if the eccentricity is greater than one, this will be the smaller of the two axis.

3> *Eccent*..... The eccentricity (known as 'e') of an ellipse describes the ratio of the major axis (see above) to the minor axis. Values of eccentricity describe the shapes :-

0< Eccentricity <1 The minor axis is smaller than the major axis.

Eccentricity > 1 The minor axis is greater than the major axis.

Eccentricity = 1 The minor axis equals the major axis. Produces a circle.

4> *Rot*..... Clockwise rotation in degrees from the vertical. Note that when the rotation is zero, the major axis runs vertically.

For example, an ellipse with an eccentricity of 0.5, a major axis of 50 and a rotation of 0 will be half as wide (25) as it is high. The same ellipse with a rotation of 90 will be half as high as it is wide.

--++*++--

E5 : REGULAR POLYGONS

1> *Centre*..... Centre point of the polygon. Moving this wil move the entire rubber band.

2> *Radius*..... Distance from centre point to each vertex (point,corner) of polygon.

3> *Sides*..... Number of sides. ie. 3 provides a regular triangle; 4 a square; 5 a pentagon etc.

4> *Rot*..... Clockwise rotation around the centre point in degrees. Note that with the rotation at zero, the first vertex to be drawn is vertically above the centre point.

--++*++--

E6 : TEXT

The text type allows the point of origin and size to be set in addition to providing an angle of rotation that allows the line of text to be drawn at any angle. Typing <SHIFT><F5> allows for viewing/alteration of the text itself.

1> *Point*..... The point at which the line of text will begin when drawn. By moving this point, the text string may be moved.

2> *Size*..... Determines the size of the characters to be drawn. The larger the value, the larger the characters. Actual character sizes depend upon the individual character set installed.

3> *Rotation*..... This is the angle (in degrees) at which the text is drawn. Unlike all the other primitives, this angle progresses anticlockwise from the horizontal.

4> *<SHIFT><F5>*... Typing these keys allow for the text itself to be entered and/or altered. See below.

Details to remember while editing text:-

1> The graphics cursor is always present and shouldn't be relied upon to indicate that the start point is being edited.

2> To edit the text string itself, <SHIFT><F5> must be typed. To return to the parameter list, type <ENTER>, with or without any editing having been done.

3> A box, size to cover the area that will be covered by the text when drawn, is used in place of the text itself. No text will be drawn until <ENTER> is typed.

4> To complete drawing of text type <ENTER>. This will remove the box and draw the text in green. Should the user then wish to add this text to the sheet, <ENTER> should be typed for a second time. If more editing is required, any other key (except <ESC> which will abort the edit) should be typed to return to the parameter list.

5> When drawn following the first <ENTER> (see above), there may be some break up of the text characters. This will not occur when fully completed.

6> The character set used is independent of the final plotter output since it is generated in full by Cadette. Note that the standard character set ('CharSet_Bin'), may be replaced with another in a suitable format. Contact Bestmalt Ltd. for further details.

--++*++--

E7 : TRIANGLES

QL Cadette defines triangles as having 3 points:-

1> *Point 1*..... Joined to points 2 & 3.

2> *Point 2*..... Joined to points 1 & 3.

3> *Point 3*..... Joined to points 1 & 2.

Note that the only way to move the entire triangle without distortion is to use the <ALT> & cursor key combinations. See E0-9

--++*++--

SCALING

Construction of scaled drawings may be accomplished by the use of Cadette's scaling facility.

Cadette normally works in length units of one millimetre except when scaling has been activated. Switching scaling off will initiate a return to the use of millimetres.

The system employed to provide scaling depends upon Cadette being given a 'scale value' which is used to multiply any entered value. For instance, if work is to be done in inches, a scale value of 25.4 must be given since there are 25.4 millimetres per inch. See Appendix for a list of standard scales.

Example 1 - work to be done in sixteenths of an inch.

Scale Value = 25.4 / 16 = 1.5875

Example 2 - work to be done at 1 inch to 24 feet.

Scale Value = 1 / 24 * 25.4 = 1.0583333

Remember that the final value must be in millimetres.

Scaling may be controlled via the Sheet menus option (6) of the Main menu.

--++*++--

Zoom

The degree of magnification or zoom is a function of the vertical display distance as mapped over the sheet.

For instance, an area 50 units high has twice the amount of detail of an area 100 units in height. In order to increase zoom, decrease the vertical display height via the Environment menu.

The area to be displayed is decided by the values of the X-Y Origin (again from Environment menu).

Note that the horizontal display distance is 1.66 times the Vertical Display Height.

--++*++--

ERROR MESSAGES - Cadette & Plot

The following chapter describes in full the error messages that both Cadette and Plot may potentially generate. Where applicable, possible corrections are suggested. It is useful to note that some of the file related messages may also be presented with a file name.

ERROR : Already exists

AFFECTS : Cadette & Plot

NOTES : An attempt has been made to create a file of a given name when one of that name already exists. A chance will be given to overwrite to file or to select a new name as required.

--++*++--

ERROR : Bad device name

AFFECTS : Cadette & Plot

NOTES : The selected device is not recoqnised by the QL. Common causes are spelling mistakes when typing the file name.

--++*++--

ERROR : Bad or changed medium

AFFECTS : Cadette & Plot

NOTES : This error usually has one of the two causes:-

(1) The media on which the file is stored has been corrupted for some reason. If this has happened, it may be possible to salvage the file using a 'doctor' utility such as Digital Precision's 'Media Manager' or Talent's 'Cartridge Doctor'. Alternatively our Data Recovery service may be of help. If this is required, give us a ring.

Common causes for corruption are physical distortion, dust, damp, exposure to extreme temparatures (direct sunlight, fires etc.) or stong magnetic fields (electric motors, power supplies, TV tubes etc.). Small animate objects sharpening their teeth on your precious media are another common cause for alarm!!

(2) The media has been removed during a file read/write operation. Although possible that no permanant damage may be done, this fault is potentially the cause of a non-retrievable corruption. The best way of avoiding this fault is to observe strict procedures when removing or replacing media.

The best way to avoid serious problems with loss of data is to make a habit of taking at least two additional or backup copies of any crital data. These backups should be regularly updated and stored in separate, safe locations. As suggested in the 'Media Manager' manual, if you put them in a safe, don't lose the key!!!

REMEMBER THAT IT IS ESSENTIAL TO KEEP BACKUP COPIES OF ANY CRITICAL DATA. DATA LOSS OR

CORRUPTION BEARS NO RELATION TO THE COMPUTER SYSTEM USED OR TO THE EXPERIENCE OF THE OPERATOR. ANYONE MAY BE AFFECTED.

--++*++--.

ERROR : Changed or altered media - Aborting

AFFECTS : Plot

NOTES : Occurs when Plot/Screendump has been directed and the selected file cannot be found. This usually means that the media containing that file has either been removed or replaced. Control is passed to the parameter menu and correction is by replacing the required media.

--++*++--

ERROR : File too long for available area

AFFECTS : Cadette & Plot

NOTES : There is not enough memory available to the program in which to load the sheet file.

With Cadette, if there is enough memory free, restart Cadette (via Main menu option 7) with an increased memory allocation.

Plot itself appropriates the memory it requires when loading the file and thus relies upon that memory being available to it.

Remember that any software utility or toolkit uses memory which may be required by the above programs. If this is the case and this error is encountered, rebooting the QL without these 'extras' will free more memory for use by Cadette and Plot. QRAM, due to the nature of its window management environment is a serious culprit.

--++*++--

ERROR : In use

AFFECTS : Cadette & Plot

NOTES : An attempt has been made to use a file that is already being used by another job. To prevent this error occuring, don't multitask any other jobs within the QL otherwise the only option is to wait until the other job has finished with that file.

--++*++--

ERROR : Not a valid Cadette file

AFFECTS : Plot

NOTES : Plot cannot understand the named file. Since this could be due to corruption, it is another good reason to adopt a strict backup policy.

--++*++--

ERROR : Not enough memory - Aborting Cadette

AFFECTS : Cadette

NOTES : This error may occur at any time when Cadette is first started and can't find enough free memory in which to work. Since Cadette will run on a 128k QL, the two possible causes are that (i) there is a fault in the QL's memory or (ii) other jobs take too much memory. In the latter case, rebooting the QL without these other jobs/toolkits being present should rectify the situation.

NOTE THAT THIS ERROR IS FATAL WITH CONTROL BEING RETURNED TO THE CALLING ENVIRONMENT.

--++*++--

ERROR : No file name

AFFECTS : Plot

NOTES : Plotting/Screendumping has been directed with no sheet file being specified. Control is returned to the parameter menu. Use option 'F' to correct.

--++*++--

ERROR : Not found

AFFECTS : Cadette & Plot

NOTES : The named file can't be found. This could be because (i) the file is not there, (ii) the media has been removed, (iii) the filename has been misstyped, or (iv) the named device doesn't exist (perhaps by misspelling). A chance is given to enter a new name.

--++*++--

ERROR : No plotter name

AFFECTS : Plot

NOTES : Plotting has been directed with no output device being provided. A chance is given to provide one.

--++*++--

ERROR : No printer name

AFFECTS : Plot

NOTES : Screendumping has been directed with no output device being specified. A chance is given to provide one.

--++*++--

ERROR : Out of memory

AFFECTS : Cadette

NOTES : The first task that must be done when this error is encountered is to save the sheet since no further primitives may be added to it.

If this error should occur following the completion of an edit, although that primitive appears to exist (ie it is drawn in white), a forced redraw (type <F4>) will prove that it is not part of the database.

If this error occurs, it is perhaps best to 'break' the sheet into smaller sections (ie. separate databases) before creating it. These separate databases may then be drawn, one over the other, on the same sheet of paper using the Plot utility. This technique is known as layering.

--++*++--

ERROR : Out of memory - can't load Character set

AFFECTS : Cadette & Plot

NOTES : Occurs when first starting the utility and there is not enough space in which to load the character set. Treat as for 'Not enough memory - Aborting Cadette' above.

NOTE THAT THIS ERROR IS FATAL, WITH CONTROL BEING RETURNED TO THE CALLING ENVIRONMENT.

--++*++--

ERROR : Plot aborted

AFFECTS : Plot

NOTES : Plotting has been aborted by the user after a 'No xxxx Name' Error.

--++*++--

ERROR : Plotting has completed

AFFECTS : Plot

NOTES : Not an error but an indication that plotting is complete and that, like a faithful genie, awaits your next command.

--++*++--

ERROR : Screendump aborted

AFFECTS : Plot

NOTES : Screendump has been aborted by the user after a 'No xxxxx name' error.

--++*++--

ERROR : Screendump has completed

AFFECTS : Plot

NOTES : See above entry for 'Plotting has completed'.

--++*++--

ERROR : Too big - try a smaller value

AFFECTS : Cadette

NOTES : When prompted to enter a size for the database, too large a value has been entered. A chance is given to enter a reduced value with zero aborting Cadette. If aborted, control returns to the calling environment.

--++*++--

ERROR : Too large for allocated area

AFFECTS : Cadette

NOTES : The file to be loaded will not fit into the size of memory allocated for the database. If at all possible, restart Cadette with an increased database size.

--++*++--

ERROR : Too little space on media

AFFECTS : Cadette

NOTES : Means that there is not enough space on the media in which to place the database. Try again with another disc/cartridge.

--++*++--

ERROR : Write protected

AFFECTS : Cadette & Plot

NOTES : Means that an attempt has been made to write a file to a protected media. Either deprotect the media or use one that is already unprotected.

Protection varies from media to media :-

(1) Microdrive cartridges have a small tab on their sides. Removing this tab protects the cartridge. They may be deprotected using a small piece of self adhesive tape to replace the missing tab.

(2) 3 inch, 3.25 inch and 3.5 inch discs all have a small 'switch' to allow for protection. Refer to the drive manual for settings.

(3) 5.25 inch discs require that a small, self adhesive tab be applied to their write protect notch in order to protect them. Removal of this tab deprotects.

NOTE THAT DUE TO A FAULT IN QDOS, PROTECTION OF MICRODRIVE CARTRIDGES CAN'T BE DETECTED.

--++*++--

USING PLOT - THE PLOTTER DRIVER

Plot is the plotter driver and screen dump utility designed specifically for use with QL Cadette. The screen dump works on Epson compatible dot matrix printers (MX series and later) and doesn't distort the propotions of the drawing. The plotter driver at time of writing supports the Roland DXY, Penman and Hewlet Packard compatible plotters (using HPGL). Since most modern plotters support the HPGL standard, this package covers a wide range of output devices.

MENUS

Unlike the menus used by QL Cadette which require the user to type a number, those used by Plot require that options be selected by typing the first character of that option's name.

NOTE: Typing <ESC> will quit the current menu. If used with the Main Menu, will quit Plot.

--++*++--

ENTERING FILENAMES

When prompted to enter a filename, remember that if a file or device of said name can't be located, an error is issued followed by a request to re-enter/edit the file name. Should a null value (ie. all spaces or everything deleted) be entered, the chosen option will be aborted.

--++*++--

MAIN MENU

This menu has the highest priority and is the first to be encountered when Plot is activated. It has the following options:-

Enter File Name..... Allows for the name of the Cadette generated file to be dumped/plotted to be entered.

Dump Screen..... Enters the Screen Dump menu. Selects the use of the screen dump driver.

Roland DXY Plotter..... Enters the Plotter Menu, selecting the Roland DXY driver.

HPGL Compat. Plotter..... Enters the Plotter Menu, selecting the HPGL (Hewlet Packard Graphics Language) compatible driver. Most plotters require this option.

Penman Plotter..... Enters the Plotter Menu, selecting the Penman Plotter drivers.

Test Card..... Generate the screen dump 'test card'. This is used when configuring the screen dump driver to the proportions of the user's particular printer.

When selected, the user is prompted to enter the printer's name.

(entering a null name here will abort). When this has been done, the display will clear with a display similar to a gun's cross hairs being drawn. Upon completion of this drawing, the screen will be dumped to the connected plotter. This output is to be used in conjunction with the 'Calculator' option described next.

Calculator..... When used with the '*Test Card*' option (above), this option allows for Plot's screen dump to be configured for a given printer.

Using the output generated by the '*Test Card*' and an accurate ruler, measure along the straight lines and, when prompted, enter the circle's width and height. This being done, Plot will now be able to generate proportionally accurate screen dumps.

Note that due the the natural distortion inherent in using a dot matrix printer to obtain a screen dump when ther is no correction applied, the 'circle' that the user is required to measure is in fact elliptical.

Load Defaults..... Default values previously edited and saved may be re-loaded for use with this option.

Save Defaults..... The values currently set (ie. Plotter name, vertical distance, modifier etc.) may be saved to file for re-use at a later date. These options may be re-loaded using the '*Load Defaults*' option (above).

Quit Plot Utility..... Leaves Plot and returns control to the calling environment. Options to abort this command and/or save the current values as default file are given.

--++*++--

SCREENDUMP MENU

The Screendump menu controls the use of the screen dump driver and has the following options:-

Border..... Allows for a border to be generated around the drawing. Answer 'Y' for yes or 'N' for no.

Borders allow for drawings larger than the possible dump area to be generated by creating a number of dumps that may be 'cut out' along their borders prior to 'pasting' them together.

Density..... Allows for the 'density' of the screen dump to be set to single, double or quad providing that the printer used supports these modes. The higher the density is, the greater the resolution of the screendump produced (although the size is reduced). To select, type 'S', 'D' or 'Q'.

File Name..... Requests the file name of the 'sheet' to dump.

Answering 'Y' to the question 'Load Sheet Statistics ? (Y/N)' will allow the area displayed by Cadette at the time of 'saving' to become the dumped area.

Invert..... Doesn't turn the display upside-down but reverses the printed colours. Normally the lines of the drawing are printed black, with the background remaining white. Selecting 'Y'es at this option reverses these colours.

Modifier..... This is the value that is used to correct the display so that when printed there is no distortion. This value is automatically set by the Main menu option, 'Calculator'.

Printer..... The device or filename that the screen dump is to be directed to.

Vertical Distance..... Determines the size of the area to be dumped. See chapter on Zooming for further details.

'X' Origin Offset..... The 'X' origin of the area to be displayed. See chapter on Zooming for further details.

'Y' Origin Offset..... The 'Y' origin of the area to be displayed. See chapter on Zooming for further details.

Typing <SPACE> will direct Plot to begin the screen dump (if possible) while <ESC> returns control to the Main menu. Note that any options set while within the Screendump menu will be retained although they may potentially be altered or discarded by use of the Main menu.

--++*++--

Plotter Menus

All the plotter drivers use the same menu with the titles indicating which plotter has been selected.

Border..... If selected, allows for a border to be drawn around the sheet.

When the drawing has completed, the user is asked whether or not the border should be drawn and, if so, Plot shall do so. If the border is to be drawn with a different pen, it is at this point that the pen should be changed. If used with the Penman Plotter, be careful no to move the robot.

File Name..... Requests the file name of the 'sheet' to dump.

Answering 'Y' to the question 'Load Sheet Statistics ? (Y/N)' will allow the area displayed by Cadette at the time of 'saving' to become the dumped area.

Plotter..... The device or file name that the plot is to be directed to.

Scaling..... Allows the size of the drawing to be altered. For instance, a value of *0.5* generates a drawing one quarter of its real size while a value of *2* draws itat four times its real size.

'X' Origin Offset..... By setting this value non-zero, the origin (bottom left-hand corner) of the drawing may be offset along the 'X' axis (horizontal). Remember that all distances are measured in millimetres.

'Y' Origin Offset..... This option is the 'Y' Origin partner for "'X' Origin Offset" (see above). This controls vertical displacement.

Typing <SPACE> will direct Plot to begin plotting (if possible) while <ESC> returns control to the Main menu. Note that any options set while within the Plotter menu will be retained although they may potentially be altered or discarded by use of the Main menu.

--++*++--

NOTES:

(1) While representing excellent value for money, the Penman Plotter is very inaccurate. Because of this, it is not recomended for serious drafting work.

(2) Using the 'Scaling', the 'X' & 'Y' offset options can be used to generate drawings of a complexity far greater than available memory allows, by plotting them, one over the other, on the same sheet.

(3) If Plot is started using the Tubo Toolkit command 'EXECUTE_A', <ALT><SPACE> may be used to abort its execution and remove it from the QL's memory. This is the only way that control may be regained should anything 'upset' the plotter. An example of this is the collision of the Penman Plotter with an obstacle.

(4) Some older printers may not be able to cope with all of the density modes. For instance, the Epson MX-100 is incapable of Quad. density graphics.

(5) An A4 sheet of is large enough to hold three screen dumps. Utilising this fact, drawings of this size may be accurately generated by dumping one third at a time, top third first.

CAD PACKAGE

Name..... QL Cadette

Description..... 2-Dimensional Drafting/CAD package for the Sinclair QL (including 128k). Cadette is compatible with QRAM and Speedscreen.

Editing..... Any on-sheet primitive may be selected, moved, deleted or altered by use of an interactive selector & full rubber banding.

Files..... May be loaded, saved or listed. Loading a sheet will return the user the same position in editing as when the file was saved. Note that using this facility, a powerful default system including standard drawing sheets may be implemented.

Grids..... May be Lined, dotted, iso-metric or disabled. Grid type and size may be altered at almost any time.

Movement..... (1) By cursor keys (step size x1, x10, x50 & x100) with auto pan and scroll. Stepsize may be changed at almost any time.

(2) By cartesian, relative or vector moves at virtually any time.

Pan & Scroll..... May be by half or full screen size.

Primitives..... Memory requirement of each item in brackets. Arcs (30 bytes), Boxes (30 bytes), Circles (18 bytes), Ellipses (30 bytes), Lines (24 bytes), Regular Polygons (30 bytes), Text (32 bytes + length of text itself), Triangles (36 bytes).

Scaling..... Affects all lengths/co-ords. and may be switched on/off. Scale may be to any value.

Sheet References... Are optional.

Sheet Size..... Any sheet up to 10 metre square (if you can find a big enough plotter!!)

Zoom..... To any degree and at any position. Available at almost any time.

--++*++-

PLOTTER DRIVER

Name..... Plot
Description..... Combined plotter driver and screendump utility for QL Cadette.

Plotting..... To Hewlet-Packard compat. (using HPGL language), Roland DXY and Penman plotters.

The plot may be offset from the origin of the sheet (+/-) and post-scaled. There is an option to draw a border around the sheet.

Screendump..... To Epson compat. dot matrix printers in single, double or quad. density with no distortion (ie. circles are circles). May be used to plot sheets larger that A4.

--++*++--