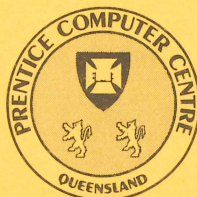


PRENTICE COMPUTER CENTRE

UNIVERSITY OF QUEENSLAND, ST. LUCIA, QUEENSLAND, AUSTRALIA. 4067.



NEWSLETTER

N-289

June 1984

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1. Newsletter Summary

- This issue is mainly concerned with plotting. There are enhancements to ZPlot, an interactive program for producing graphs on the Calcomp pen plotter. We are warned that there is a fault with ASPEX, a program which generates 3-D images. Plots no wider than 287mm can be typeset on the Compugraphic 8400 Phototypesetter. A major development has been to provide plotting processors common to TOPS 10, VMS and RSX11-M to support the CALCOMP plotters, HP plotters, Tektronix terminals and plotters and the GIGI graphics terminal. As the new plotting routines support two types of personal plotters (Tektronix 4662 and HP7475) some recommendations are provided on how to set up these plotters. The quality of the final plot depends on the quality of paper and pens and the options available are explained. VUEPLOT replaces a number of preview programs previously available on the system.
- The Prentice Computer Centre was recently registered as a typesetter for the purposes of the Bounty (Book) Act 1969. There are a complex set of conditions associated with eligibility to claim and you are advised to seek advice. Some new commands for JUSTIF, the program which prepares files for output to the Phototypesetter are announced.
- A reminder of changes made to 1022 date formats is included.
- Information is provided on courses available from the Centre.

*Director
extension 2189*

2. Availability of the VAX 11/780

The VAX is now available 24 hours a day, 7 days a week, except on Mondays when it will be down between the hours of 7am and 2pm for maintenance and weekly backup.

*Sandra Campbell
extension 3471*

3. Book Bounty

Recently the premises of the Centre were registered, by the Department of Industry and Commerce, under Section 11 of the Bounty (Book) Act 1969. In essence this means that the bounty/subsidy can be claimed on the bountiable production costs of eligible books produced on the Centre's equipment, in particular the phototypesetter.

As the definitions of eligible/ineligible books and bountiable/non-bountiable costs are long and involved, I will not attempt to outline them fully in this article. However, I have available a publication entitled "Facts about Book Bounty" which explains the applicable definitions in some detail. This publication will be available for perusal at the Hawken Batch Station.

*Denis Antonellie
extension 3963*

4. New JUSTIF Commands

JUSTIF is a program which prepares .LST files for output to a photo-typesetter.

Input is usually in the form of a .TYP file. The content and format of the .TYP file is explained in MNT-7 "TYPESETTING MANUAL". JUSTIF will now accept two additional commands from the .TYP file. These commands cause horizontal carriage movement and have the form [GL?] and [GR?] where ? denotes the amount to move the carriage in points . hundredths of a point. [GR?] advances the carriage to the right, thus causing white space. [GL?] moves the carriage to the left. These commands do not cause a word break and can thus be used for positioning characters beside each other without the usual white space.

Porl Gordon
extension 2953

5. New Facilities in JUSTIF

JUSTIF is the document preparation program for the Photo-typesetter. A new version which will perform Vertical Justification is up and running. To support this wonderful new feature, 5 new commands are available. These commands allow the user to define a *block* with a specified vertical depth. JUSTIF expands the *spacebands* within the *block* until the *block* exactly fills the vertical space specified.

1. BLOCK SETUP

Format: [B]
Function: Tells JUSTIF that Vertical Justification will be used.

2. BEGIN BLOCK

Format: [BBx]
where x is the vertical depth (in points) of the *block* that follows.
Function: Defines the begining of a vertically justified *block* and the length of the *block* in points.

3. END BLOCK

Format: [BE]
Function: Signifies the end of a vertically justified *block*.

4. VERTICAL SPACEBAND

Format: [BS]
Function: Inserts a *spaceband* at the current place in the text. When the defined *block* is expanded to fit the specified vertical space, additional leading may be inserted at each *spaceband*.

5. SET SPACEBAND MINIMUM

Format: [BDx]
where x is the *spaceband* minimum, in points.

Example

source file contains:

```
[*CG8400]
line one/
[b][bb144]
line two/
line three/
[bs]
line four/
line five/
```


[bs]
line six/l
[be]
line seven/l
Output appears:
line one
line two
line three

line four
line five

line six
line seven

These commands have actually been available for some time but a *slight technical problem* has prevented them from working — thus they are not documented in the Typesetting Manual (MNT-7).

It must be realized that although the *slight technical problem* has been removed, the vertical justification has not been tested fully, so please report any problems/bugs to me.

Porl Gordon
extension 2953

6. Facelift for ZPLOT

ZPLOT, an interactive program for producing graphs on the Centre's Calcomp pen-plotters, has recently received some enhancements. Users of the program will need to be aware of the changes because the new version of ZPLOT is not compatible with the old version. The enhancements are:

- *Better Facilities for error recovery.* Plotting with ZPLOT can become very involved, and very frustrating if a slip of concentration means retyping everything from the start. The new version of ZPLOT allows for recovery for errors in three ways. In all commands except TEST, nothing is written to the plot file until after all of the prompts have been answered. If you notice an error before completing the prompts for a particular routine, you can skip back over the prompt sequence with ↑Z to rectify the error. Alternatively, most of the prompts will now accept QUIT error. Alternatively, most of the prompts will now accept QUIT to abort the current routine. If you make an error that is not noticed until you collect the plot, there is also a backup system, in the form of a MIC file, that enables the error to be easily corrected and the plot to be re-run (some unfortunate bugs present in the old version of this backup system have been fixed).
- A new command RUN is now implemented to enable command sequences stored in disk files, to be called up and used by ZPLOT. This facility is very useful if you have custom designed figures or axes that are likely to be used often, but which involve many keystrokes to construct from scratch.
- DEVS now plots standard Dice and Leraas figures showing the mean, 95% confidence limits (optional), the range, and the sample size (optional).
- FUNCTION now calculates and plots a least-squares regression of Y on X using data previously input using DATA or FETCH.
- TEXT can now optionally retain trailing spaces in text strings.
- Default values are now adopted by many of the prompts when the user re-

sponds with a <cr>. Provided the default values are suitable to your needs, their use can speed up plotting considerably, particularly when constructing standard axes.

On the negative side, the CALENDER command, which never did work well, has been deimplemented.

Note that the .MIC files created by the old version of ZPLOT do not work with the new version.

Persons wishing to continue their use of ZPLOT should re-read the document file DOC:ZPLOT.DOC and the help file HLP:ZPLOT.HLP, both of which have been substantially modified.

Complaints should be directed to Mark Williams, extension 2921.

Happy plotting.

Arthur Georges
Canberra C.A.E.

7. Problems with some aspects of ASPEX

Danger! Warning! Go Slow! All is not smooth sailing with the ASPEX program.

You probably know that ASPEX is a wonderful, marvellous program for generating 3-D images from matrices of data. The images can be plotted in a number of projections, with the viewing point selected by the user. It comes from the Harvard Graduate School of Design, in Cambridge, Mass. Currently it is available on node UQKL10.

A slight problem was recently brought to my attention. A great, protuberant, jagged, glaring discontinuity can occur in the plot. It only seems to happen when more than 130 columns are used in the input data matrix. (The documentation says that up to 500 columns may be used!) In chasing up a possible solution to the problem, the little information that Harvard will allow to trickle out says that they won't admit to knowing of any bugs.

So, until I can come up with some fix for this, or Harvard supplies us with one, I can only advise — *DON'T* use ASPEX with more than 130 columns! And apologies to all those inconvenienced by this.

While still pursuing the subject of ASPEX, who is interested in having it available on the UQVAX? (Physics department — I already know you want it!) If it would be useful to you, why not drop me a line, or phone, just to show your interest. With enough response, it might be possible to get it.

Mark Williams
extension 2921

8. Plotting on the Photo-typesetter

Limited plotting capabilities are now available on the Compugraphic 8400 Photo-typesetter. You must have a plot file in HP.GL format (Calcomp files can be converted to HP.GL format by running PLO:VUEPLT) and the plot must not be wider than 287mm (good number hey?). The program to create the file suitable for photo-typesetting is called PTSPLT and available on PLO: thus it can be run by issuing the monitor command:

.R PLO:PTSPLT

There is a help file available by typing the command:

.HELP PTSPLT

And yet more information is available on DOC:
viz.

.PRINT DOC:PTSPLT.DOC

The program is not cheap to run, and the resultant .LST file takes a long time to typeset (hours), but if you want it, its there.

Any problems or want more info:- call me on the number below.

Porl Gordon
extension 2953

9. Reminder about Handling of Dates in 1022

The default value of the system variable SYSEURODAT was recently changed in late November 1983 from 0 to 1 on the standard version of 1022 (115B). With this setting, 1022 assumes dates to be in Day-Month-Year format for input, and similarly, default output (i.e. with no format specification) is also in the order Day-Month-Year. All other print formats, viz. d1 to d5 and picture specifications, will continue to produce US-style output. (The effect of the previous setting of SYSEURODAT was that 1022 assumed dates to be input and output in Month-Day-Year format).

The updating of this system variable has implications for users of 1022 who manipulate date variables. For example, to input the date 4th January 1984, this may now be entered as 4/1/84, whereas previously if entered this way, it would have been interpreted as 1st April 1984.

If you wish to continue to input dates in the American format you must, for use of 1022 directly, reset the system variable by executing the following command (either interactively or in a command file):

* LET SYSEURODAT EQ 0

This enforces the previous setting until an exit command is given. This adjustment could be made semi-permanent by entering the command instead in an AUTO.DMC file, which executes whenever the .R 1022 command is issued.

If you have FORTRAN or COBOL programs that interface to 1022 and you wish to continue to input dates in American format, you must include a call to DBYSU like

CALL DBYSU('SYSEURODAT',1,0)

and recompile and link your programs.

The updating of the system default was intended to bring us into line with the Australian and European date standard, and the long term benefits of this change-over should offset any conversion problems.

For further information, contact Brett Peterson (x2836) or Marie Bultreys (x2835).

Marie Bultreys
extension 2835

10. New version of CROSS

For those of you who work with microprocessors, there is a new version of CROSS on MXI:. CROSS is a cross-assembler which runs on the KL-10 and cross-assembles

code for 6502, 6800, 6801, 6805, 6809, 8080, 8085, MCS-48 (8035, 8048), Z80 and 1802 microprocessors. There is also some documentation for it (finally!). The definitive work is MXI:CROSS.DOC, with some basic info also in MXI:CROSS.HLP.

Chris Barker
extension 3940

11. The 'NEW WAVE' Plotting System

For several months now, software to drive the CALCOMP-936 plotter has been available on node UQVAX. We've held off making any public announcement of this, pending the arrival of the HP plotters. Now, we're ready to present you with a *fait accompli*, covering the new software and devices that it supports.

Let's look at the plotting subroutines we're supplying. We have taken the old plotting programs from the PDP-10 and re-written them in a reasonable machine-independent FORTRAN-77. A few changes were dictated by language constraints, or conformity with original CALCOMP software. More on this later.

One of the most exciting features of the new subroutines is the support for varying output devices. The same subroutines will produce output for CALCOMP plotters, HP plotters, Tektronix terminals and plotters, plus the GIGI graphics terminals. How about that!

And, to top that off, these subroutines are available for the PDP-10, VMS, or even RSX-11 systems. Wow!

Hasn't all this been worth waiting for?

Now for some earthy, solid information to satisfy you.

The 'BASIC SOFTWARE' and 'FUNCTIONAL SUBROUTINES' are available. So are the 'CONTOR' and 'SURFAS' subroutines. (The one exception is the PLOTI subroutine, rendered superfluous through the demise of the CALCOMP-565 plotter – also known as PLT0.) These routines are described in manual MNT-11, available from the Hawken Batch station.

There should be few difficulties in converting to the new routines, though a couple of differences do exist. Here are the details. Read them while referring to MNT-11, otherwise you might get a bit confused.

Text and the plotting subroutines

Character variables (one of the advances of FORTRAN-77) are now used for all text in the plotting subroutines. This means that you should use literals (text enclosed by single quotes) or variables declared with the CHARACTER statement. Do NOT use Hollerith constants or text stored in numeric variables! This applies to the following subroutines –

PLOTIN	SYMBOL	CRVPT	LABEL	SETPEN	PLOTOPR
AXIS	AXISI	AXISB	AXISC	LBAXS	LGAXS

A valid use of one of these subroutines – say, SYMBOL – would be something like this:

```
CALL SYMBOL(XPAGE,YPAGE,HEIGHT,'This is text',ANGLE,12)
```

or

```
CHARACTER*12 TEXT  
TEXT='This is text'  
CALL SYMBOL(XPAGE,YPAGE,HEIGHT,TEXT,ANGLE,12)
```

Incorrect uses would be these two examples:


```
CALL SYMBOL(XPAGE,YPAGE,HEIGHT,12HThis is text,ANGLE,12)
```

or

```
DIMENSION TEXT(3)
TEXT(1) = 4HThis
TEXT(2) = 4H is
TEXT(3) = 4Htext
CALL SYMBOL(XPAGE,YPAGE,HEIGHT,TEXT,ANGLE,12)
```

And why are these two wrong? The first uses a Hollerith constant (the "12HThis is text"), and the second uses a numeric variable (the array TEXT).

Incorrect uses can produce run-time errors (well, at least under VMS!) such as 'Variable mismatch', and cause your program to abort.

There's an exception to every rule, and the above rule about text is no exception. With subroutines SYMBOL, NUMBER, and CENTRE, you sometimes want the characters to continue from the current pen position. The only acceptable way to achieve this is by specifying the characters CONT in place of XPAGE or YPAGE. Do this by using a Hollerith constant (4HCONT), or a real variable containing these characters. FORTRAN-77's tight variable type-checking causes this apparent anomaly, since XPAGE and YPAGE are real variables.

So, what you should do to continue text from the current position is:

```
CALL SYMBOL(4HCONT,4HCONT,HEIGHT,TEXT,ANGLE,NCHAR)
```

or, alternatively,

```
REAL CONTIN
CONTIN = 4HCONT
CALL SYMBOL(CONTIN,CONTIN,HEIGHT,TEXT,ANGLE,NCHAR)
```

You should definitely not do something like this . . .

```
CHARACTER*4 CONTIN
CONTIN = 'CONT'
CALL SYMBOL(CONTIN,CONTIN,HEIGHT,TEXT,ANGLE,NCHAR)
```

since the variable CONTIN is typed as CHARACTER. It won't work!

Drawing Centred Symbols

We've made a new subroutine, called CENTRE, to be used exclusively for the 'special' calls to SYMBOL. Again, this is necessitated by close type-checking of variables. The new subroutine is identical to the 'special' call to SYMBOL, as described in MNT-11, merely the name has changed. Subroutine CENTRE is also used instead of SYMBOL for cases where NCHAR is zero.

So, the golden rule is — where you once used SYMBOL, keep using it if NCHAR (or ICODE) is greater than or equal to 1. Otherwise, use CENTRE.

Factoring

The FACTOR subroutine behaves in a *slightly* different manner to the old version. The new version is believed to give what the original CALCOMP software intended to do. The *actual* X and Y co-ordinates are now factored (rather than the *change* in position). This may help to lessen problems in converting foreign programs to a local system. Additionally, this interpretation of FACTOR seems to be less confusing and more logical than the previous.

In reality, only people who change factors without first returning to the origin will notice any difference at all.

Subroutine PLOTIN

Changes, alterations, additions and a general facelift to this subroutine will have the highest impact on you, the user. So it's worthwhile describing PLOTIN in detail. Pay attention! This bit is important!

You know that PLOTIN is the very first plotting subroutine that you must call. It tells the plotting software

- (a) what your output filename is to be, and
- (b) what the output device is, along with any device-particular switches.

The basic call to PLOTIN now looks like this:

```
CALL PLOTIN(file,device)
```

which is a lot simpler than it once was. Now we'll describe what both those variables are, and what you can put in them.

FILE is a CHARACTER variable, or a literal. It is used to give a name to the output file. The final plot file left on your area will be called `file.PLT`, i.e. giving **FILE** a value of 'FRED' results in 'FRED.PLT'.

DEVICE is a CHARACTER variable, or a literal. It contains details of the output device, your selected paper size, whether you want bounds checking, and so on. Here's the list of recognized devices:

- PLT1 — the CALCOMP 936, at the Computer Centre
- PLT3 — the HP7585, at the Computer Centre
- PLT4 — the HP7475, at the Computer Centre
- PLT5 — the HP7475, at Griffith University
- HP — any of the HP plotters (takes the next one free)
- HP7585 — a HP7585 plotter, (possibly in series with your terminal)
- HP7475 — a HP7475 plotter, (possibly in series with your terminal)
- TEK4010 — a Tektronix 4010 terminal (or lookalike)
- TEK4014 — a Tektronix 4014 terminal
- TEK4015 — a Tektronix 4015 terminal
- TEK4662 — a Tektronix 4662 plotter, in series with your terminal
- GIGI — a GIGI terminal

Extra information can be supplied through switches following the device name. Usually they are device dependent. All are optional. The switches are fully detailed in another article, otherwise this one would get just too boring. As was mentioned before, the really wonderful thing is that you can output to any of these devices, just by changing the device name! No need to link with different subroutines or anything nasty like that! You get everything for the same, all-inclusive price! If you're smart enough to make the device name a variable, your program could ask the user for the output device — so that they can select it at run-time. Now for a few examples of calls to PLOTIN.

To write to PLT4 (the Computer Centre's HP7475 plotter), you can quite happily get away with:

```
CALL PLOTIN('FRED','PLT4')
```

This gives an output file called `FRED.PLT`, and produces a file for PLT4. That was easy, wasn't it?

But if you have a HP7475 in series with your terminal, and want the output on your plotter, the PLOTIN call would be:

```
CALL PLOTIN('FRED','HP7475/TERMINAL')
```


this time it tells the plotting software what type of plotter, and the extra switch (the "/TERMINAL" bit!) says that you want the output directed to your terminal.

The final example is for people who want to choose the output device, as the program is running. It asks for the device, then calls PLOTIN with the answer.

```
CHARACTER*80 DEVICE
TYPE 10
10  FORMAT(' Output device, please ?',$)
    ACCEPT 20, DEVICE
20  FORMAT(a)
    CALL PLOTIN('PLOT',DEVICE)
```

Don't forget to read 'PLOTIN : The Fine Print', plus 'Personal Plotters and You'.

Two all-new Subroutines – TERMON and TERMOF

These are only useful to people who will be using plotters connected directly to terminals, or Tektronix terminals. One routine – TERMON – suspends output to the graphics device, so you can do normal input and output with the terminal. TERMOF performs the opposite – it turns off the normal I/O with the terminal, and continues in the plotting state.

Why would you want these routines? Because when you're plotting to an on-line plotter or graphics terminal, it usually gobbles up all output and treats it as graphics information. If your program types something, that too is taken as graphics information. This can cause some really weird effects.

Calling TERMON 'turns on' normal output to the terminal, and TERMOF 'turns off' the terminal and returns to the graphics state.

General Considerations and Watchits

These plotting routines are meant for use from FORTRAN-77 programs. This won't cause VMS FORTRAN users any problems, as that's the only version of FORTRAN they have to use. But for PDP-10 programmers, there is a choice of three different FORTRANs! To use these plotting routines, you must use FORTRAN-77. To ensure that you get it, simply give the monitor command ".PATH /NEW". From then on, you'll be using FORTRAN-77. Things are a bit too complicated to explain about RSX-11 FORTRANs – if you're interested, please phone us.

The plotting routines reserve the right to use FORTRAN unit 1 for their own purposes at all times. It's best if your programs leave this unit alone. Our apologies if it upsets some of your programs – but that's the breaks.

Using the "/TERMINAL" switch in PLOTIN means that the plotting instructions are directed out to your terminal. This usually sets the graphics device into a peculiar "graphics mode", where all characters coming from the computer are interpreted as graphics commands by your terminal (or plotter). In this case, you should always call subroutine TERMON before attempting to write to the terminal. Forgetting to do this may mean that your typeout appears as total gobbledygook, or even can disappear entirely!

Call TERMOF when you're ready to continue with the plotting.

Special Notes for Users of TEKTRONIX Terminals

A trap that often catches even experienced users of the Tektronix terminal is forgetting to set the proper line characteristics. You must do this after logging in, before running a program that draws to the Tektronix.

On UQKL10, you need to give the command –

```
.SET TTY FORM NO CRLF
```

and on UQVAX, the corresponding command is –

`$ SET TERM /FORM/NOWRAP`

Without this simple command, the screen won't clear properly, and plots are often overwritten by garbage characters.

Whenever a plot is being sent to a Tektronix terminal, and the plot is closed off, the program will always stop and wait for you to type a "RETURN". Why? To give you time to examine the plot on the screen, and get a hard copy if you want one. Without this wait, the text "FORTRAN STOP" or something else equally horrible appears over the top of your beautiful plot. So don't be alarmed if it just sits there, press "HARD COPY" if you want, and push "RETURN" when you're ready to continue.

Over to You . . .

Well, now it's up to YOU. The plotting software is there, its available – let's see you make some use of it! And all those new devices.

(This text is also available from UQKL10 on DOC:CALF77.DOC, and UQVAX on SYS\$HELP:CALF77.DOC.)

I feel confident that you'll let me know of any problems you strike!

Mark Williams
extension 2921

12. PLOTIN: The Fine Print

Making the PLOTIN Subroutine work for You

No doubt you've already read how the PLOTIN subroutine has been radically altered from its previous form. Now it has only two arguments – which might not seem very much. Adding switches to the device name will let you specify all that you had before - plus much, much more!

You'll know by now that the basic call to PLOTIN is –

`CALL PLOTIN(file, device)`

where *file* is a CHARACTER type variable, containing the file name to use. *Device* is also a CHARACTER type variable, holding the device name to generate instructions for. The extra information is supplied by adding a switch to that device name, either to the contents of the variable, or in any literal string used.

The switches are usually device dependant, so that what is useful to one plotter is totally irrelevant to another. Any device will just ignore all switches that it isn't specifically interested in. Remember, all switches are optional – you don't really need any to produce some kind of plot.

For device PLT1

- Switch '/BOUNDS' indicates that bounds checking is to be performed. An out of bounds condition will halt the program with an error. Omitting the switch indicates that the program will continue to run, regardless of any out of bounds condition, if the pen ever comes back within bounds.
- Switch '/XMAX:nnn' sets a maximum paper length. The value *nnn* is an integer number of millimetres. A default of 1000 is taken.

For devices PLT4, PLT5

- Switch '/FORMS:xxxxxx' tells the operator to put in a specific size and type of paper. For these plotters, only sizes A3 and A4 will fit. Paper types of NOR-

MAL, TRACING, and TRANSPARENCY will be available. To make a valid forms name, take the size and append the type to it. This means that you get something like 'A3NORMAL', or 'A3TRACING', or 'A4TRANSPARENCY'. Don't forget to check if the Computer Centre actually has that paper – our stocks are listed in 'Still More Plotting : Stationery'.

For device PLT3

- Switch '/HEADER' ensures that you get an identifying name on the plotter page. This is the default condition.
- Switch '/NOHEADER' indicates that NO identifying name is to appear on the paper. This might be necessary for very special plots, on particular types of paper. Don't go using it all the time, otherwise the Computer Centre will have a large pile of plots without any owners!
- Switch '/FORMS:xxxxxx' tells the operator to put in a specific forms size and type. Valid sizes are A4 up to A0. Types are NORMAL, TRACING, and TRANSPARENCY. To make an acceptable forms name, take the size, and append onto that the forms type. You get something like 'A1NORMAL', or 'A0TRACING'. Then check with the list of stationery to make sure that we'll be stocking it.
- Switch '/CAROUSEL:xxxx' is used to get the operator to change to the specified type of carousel. Types are roller, fibre, and drafting. All pens in the standard carousel of that type are immediately available to you. Read more about what's in these carousels, by reading the article about stationery.

For devices HP 7475, HP 7585

- Switch '/TERMINAL' indicates that the plotting instructions are to be sent directly to your terminal, to be interpreted by an on-line plotter. Omitting this switch gives you a perfectly good plot file, which can be sent to PLT3, PLT4, or PLT5. Or, it can be kept, and the previewing program VUEPLT can be used to draw it to your plotter at some later date.

For device HP

This is a 'cover-all' and can mean any of PLT3, PLT4, PLT5, HP7475, or HP7585. Any of the switches listed for those plotters can be quite happily applied, plus a couple of others.

- Switch '/PLOTTER:xxxxxx' indicates that the plot is to ONLY go to a specific model of plotter. Our only two models are – yes, you guessed it, a HP7475 and a HP7585. Using this switch is analagous to specifying PLT4 or PLT3 as the output device.
- Switch '/NPENS:n' lets the plotting software know how many pens your plot needs. Both types of HP plotter can handle six or less pens, but if you specify seven or eight, it must be destined for PLT3. The plot spooler on the system takes care of this for you.

For devices TEK4010, TEK4014, TEK4015, TEK4662

- Switch '/BAUD:nnnn' is used to tell the software what baud rate (or speed) your terminal is running at. It's needed to set a suitable delay after clearing the screen, before it attempts to draw anything. If you want to store a file for later display to your Tektronix, why not generate (say) a file for PLT3, then use the preview program VUEPLT to display it?

For device GIGI

- Switch '/TERMINAL' indicates that the output is to go directly out to your GIGI (or other REGIS device). Omitting this switch gives you a disk file, contain-

ing all the REGIS commands. You can then modify this file with the Graphics Editor, or use the Slide Projection System to display it.

Examples

Suppose you wanted to use PLT3, with tracing paper of size A1, and the drafting pen carousel. You could call PLOTIN like this –

```
CALL PLOTIN(file,'PLT3/FORMS:A1TRACING/CAROUSEL:DRAFTING')
```

which is exactly equivalent to doing this –

```
CHARACTER*38 DEVICE  
DEVICE = 'PLT3/FORMS:A1TRACING/CAROUSEL:DRAFTING'  
CALL PLOTIN(file,DEVICE)
```

Another time you might want to send the plot to PLT1, (the CALCOMP 936 drum plotter). Perhaps your plot will be 2500 millimetres long, so you need to specify an XMAX of (let's say) 3000 millimetres. You could use –

```
CALL PLOTIN(file,'PLT1/XMAX:3000')
```

or, alternatively,

```
CHARACTER*14 DEVICE  
DEVICE = 'PLT1/XMAX:3000'
```

Round-up

That's the current list of useful switches. You can put in whatever ones you like, since the device ignores any it isn't looking for.

We'll let you know when we come up with some more. Who knows – we might even come up with one to put the output onto something silly, like a line-printer!

Mark Williams
extension 2921

13. Personal Plotters and You

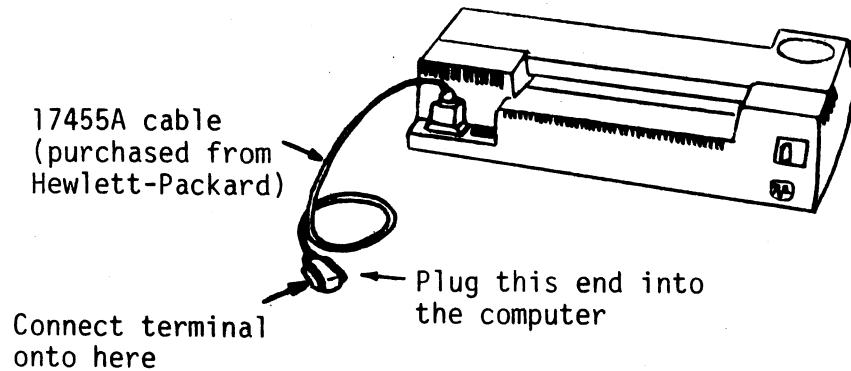
Personal Plotters and the new Graphics routines

There's an ever-growing number of people who have a plotter of their own. Most are connected into the terminal line, between the computer and the terminal. Our new plotting routines support two types of personal plotters, the old, faithful Tektronix 4662, and the newer Hewlett-Packard 7475 plotters.

It's important to have your plotter set up in the way that the software expects. Otherwise, who knows what might happen? Read on, to find out our recommended recipe.

HP 7475 plotter

This plotter needs a special cable to connect it between the computer and the terminal. It's sold by Hewlett-Packard as part number 17455A. Plug everything together as in this diagram:



CONNECTING THE HP 7475 PLOTTER

That's the easy bit. Now for the little row of switches on the back of your plotter. Set switches B1 to B4 to be the same speed that your terminal is running at.

That's OK.

Next you have to set the paper size switches, labelled "A3/A4" and "US/MET". This is up to you — it depends on which size of paper is going to be most commonly used. For example, if A3 size paper was going to be used all the time, you'd set the switches to "MET" and "A3".

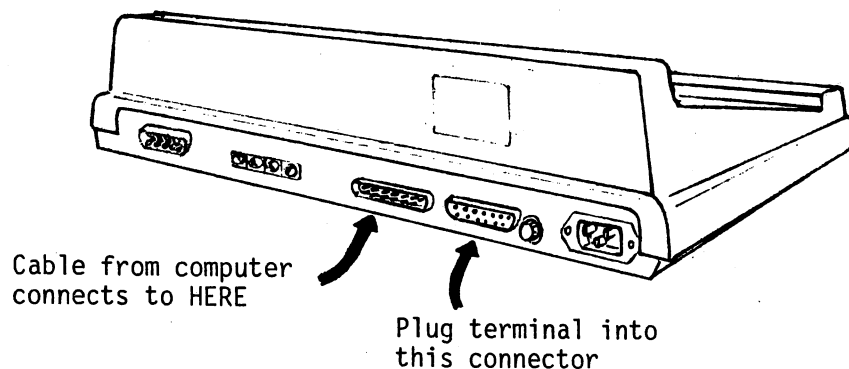
The next switches have to be set in a certain way. The switch labelled "D/Y" should be set to "Y". Switches S1 and S2 need to be both set to zero.

That's all there is! So now your HP7475 plotter is ready to be used by the plotting software. And to make the software actually produce output on your plotter, put the string 'HP7475/TERMINAL' as the device, when calling the PLOTIN subroutine. Don't forget that the plotter must be turned on to use your terminal.

For a description of the back-panel switches on your plotter, look in the "Operation and Interconnection Manual", pages 2-21 and 2-22.

Tektronix 4662 plotter

The 4662 has two connectors of interest on the back panel. One is marked 'MODEM', the other 'TERMINAL'. Plug your terminal into the one marked 'TERMINAL', and the line coming from the computer into the one marked 'MODEM'. Here's the connection diagram:



CONNECTING THE TEKTRONIX 4662 PLOTTER

And now for the switches. These are funny little rotary things, next to the 'MO-

DEM' connector. They need to be adjusted with a screwdriver — but be gentle! They're not meant for rough treatment.

Our selected switch settings are —

- Switch A — set to 1
- Switch B — set to 1
- Switch C — set to 6
- Switch D — set to 3

The value we've given for switch 'D' assumes a speed of 1200 baud. Changing switch 'D' changes the plotter baud rate — but only use values of 0,1,2,3, or 4. And remember, the plotter speed has to be the same as your terminal!

One problem I have noticed is that the poor little 4662 sometimes can't keep up with a 1200 baud data rate. It fills up its buffer, then bleeps at you because it's got indigestion. Just about the only cure for this is to run at a slower speed. If you suffer from this problem, try dropping the speed on the plotter and terminal.

The 4662 interactive digital Plotter User's Manual contains more information on connections and switches. Read pages 2-28 and 4-10, if you're interested.

Other Plotters

We haven't yet played with one of the small HP plotters (HP 7470), so we don't know precisely what switches it has to set. If you get one, let us know about it, and we'll find out exactly what you need. In fact, if you have any plotter that understands one of HP-GL, REGIS, or Tektronix data, you should be able to use it with the new CALF77 routines. Call us, and we'll see about getting it set up for your use.

Mark Williams
extension 2921

14. Recipes for Running Plots

The Plotters Cookbook — New Recipes for Linking and Plotting

Those of you still awake after reading all the other plotting articles have seen that we've changed just about everything, so far. So why should the Linking commands be any exception?

For UQKL10 users

The library file for the new plotting software is now PLO:CALF77. To use these routines with your program, the commands would be —

`.EXECUTE program, PLO:CALF77/LIBRARY`

which will link your program with the CALF77 library, then start running your program. Alternatively, you can use —

`.LOAD program, PLO:CALF77/LIBRARY`

to link your program and the CALF77 library, *without* starting it running.

Amazingly, the PLOT command is still the same. Our imaginations couldn't think up something different. The usual —

`.PLOT filename`

command will send the plot file off, and it will arrive on the correct plotter without your having to think further about it.

BEWARE!! The new software doesn't generate a random name, like QKZ1.plt, unlike its predecessor. It always gives a file with the name specified in the call to

PLOTIN.

Oh, and the old version of CALF77 is still available – for a while – on OLD: CALF77.

(Note that devices PLT3, PLT4, and PLT5 – the HP plotters – aren't available on UQKL10 yet. We'll let you know when they're ready for use.)

For UQVAX users

You can find the CALF77 library in SYS\$LIBRARY:CALF77. To use the routines with your program, the command is –

\$ LINK program, SYS\$LIBRARY:CALF77/LIBRARY

A 'RUN program' command can then be used.

The next step is to send your plot file to the plotter. The command is –

\$ PLOT filename

where filename is the name you specified in the call to PLOTIN. Since you've already told PLOTIN which plotter you want to use, you don't have to give that name again. The machine works out what to do with your plot. Smart little beast, isn't it? (Devices PLT3, PLT4 and PLT5 aren't in regular use on UQVAX yet. Watch for information in a subsequent newsletter).

STOP PRESS --- --- ---

A new story has just come to hand. The plotter PLT2 (the CALCOMP at Griffith University) recently went in to the repair shop, and died on the operating table. This plotter no longer exists. The only plotter available at G.U. is PLT5 (a HP 7475).

Mark Williams
extension 2921

15. Still More Plotting: Stationery We'll Stock

What's Available in Paper & Pens

With new plotters arriving, and new horizons to our flexibility and functionality, we've had to decide on some reasonable procedures for supplying plotter stationery. We can't stock everything you might want, but a good range of materials will be available. Here's a look at what we hope to supply, for each of the plotters.

PLT1 (a CALCOMP 936)

Yes, the good old PLT1 still survives! Not much has altered here, as there aren't many alternatives.

Paper – White, sprocket fed, roll paper. There are NO alternatives.

Pens – Default of black biro in pens 1, 2, 3.

Other Biros : Blue, Red, and Green.

Drafting (or wet ink) pens : sizes of 0.25mm, 0.35mm, 0.4mm, 0.5mm, 0.6mm, 0.7mm, 0.8mm are available.

These defaults have applied since April. If they make you terribly unhappy, contact Sandra Campbell (Operations Manager, 3471), and grumble to her.

PLT5, at Griffith University (a HP 7475)

One of the new plotters, to replace PLT2 (a CALCOMP 1012) previously there. It uses single sheet paper, up to A3 size, and has six pens.

Paper – A3 size, normal paper is the only media available.

Pens – Fibre pens (sometimes called felt pens) are the only kind to be used. Default colours and sizes are:

- Pen 1 – Black, 0.3mm
- Pen 2 – Red, 0.3mm
- Pen 3 – Blue, 0.3mm
- Pen 4 – Green, 0.3mm
- Pen 5 – Black, 0.7mm
- Pen 6 – Red, 0.7mm

Other pens : Blue, 0.7mm, and Green, 0.7mm

Contact Ian Robertson (7561) if you have any special needs – he'll see you right!

PLT4 at Prentice Computer Centre (a HP 7475)

Another of our new toys. It's exactly the same model as the one at Griffith University, but we'll be offering a wider selection of media and pens.

Paper – Default to A3 size, normal paper.

Other options:

- A3 tracing paper
- A4 overhead transparency film

Pens – Default to Fibre pens, exactly the same colours and size as for the G.U. plotter.

Other options:

- in 0.3mm size, we have colours orange, lime, gold, turquoise, violet and brown
- in 0.7mm size, colours blue and green
- in 0.6mm OH transparency pens, colours black, red, blue, green

Now, can't you draw some really pretty pictures using those colours?

PLT3 at Prentice Computer Centre (a HP 7585)

Our new pride and joy. It takes single-sheet media from A4 up to a massive A0 size, uses eight pens (stored in carousels), and accelerates the pen at 4g to give plotting speeds of about 600 mm/sec.

Paper – Defaults to A3 size, normal paper.

Other options:

- sizes A2, A1, and A0 in normal paper,
- sizes A3, A2, A1, A0 in tracing paper,
- size A4 in overhead transparency film.

Pens – The default carousel for PLT3 will be –
Roller carousel, containing –

- Pen 1, Black
- Pen 2, Red
- Pen 3, Blue
- Pen 4, Green
- Pen 5, Black
- Pen 6, Red
- Pen 7, Blue
- Pen 8, Green.

(Roller pens are only available in 0.3mm)

Other Carousels

The HP plotters hold their pens in a carousel. It's very easy to change carousels, so a carousel is usually dedicated to one specific type of pen. These pen types are –

Roller (like biros),
Fibre, and
Drafting.

We'll be supplying carousels of each type, with a 'standard' set of pen colours and sizes for each. The other carousels are –

Fibre carousel, containing –

Pen 1, Black 0.3mm
Pen 2, Red, 0.3mm
Pen 3, Blue, 0.3mm
Pen 4, Green, 0.3mm
Pen 5, Black, 0.7mm
Pen 6, Red, 0.7mm
Pen 7, Blue, 0.7mm
Pen 8, Green, 0.7mm

and –

Drafting carousel, containing –

Pen 1 – 0.35mm
Pen 2 – 0.5mm
Pen 3 – 0.7mm
Pen 4 – 0.25mm

Other pens available can be loaded into a special carousel, reserved for user-specified pen combinations. The remaining pen types that you can use on PLT3 are as for PLT4, plus any of the drafting pens available for PLT1.

Selecting non-default pens

Everybody likes to be an individualist. You don't have to use our default pen settings. A different carousel can be selected for PLT3, or individual pen types selected for any pen in any plotter. Both procedures are absolutely easy – even I can do it!

Carousels can be selected by adding the '/CAROUSEL:type' switch to the device name, when calling PLOTIN. As an example, to use the fibre carousel in PLT3, the PLOTIN call would be –

call PLOTIN(file,'PLT3/CAROUSEL:FIBRE')

You'd then be able to use the eight fibre pens in that carousel.

Individual pens for all plotters can be set up using the SETPEN subroutine. This is described in MNT-11. It's usage still is –

CALL SETPEN(n, type, size, colour)

On the new plotters – PLT3 and PLT4 – you'll be using a fresh carousel if SETPEN is called. There will be no pens other than the ones you specify in SETPEN. The operators set up a carousel especially for you, with your own choice of pens. So, if you call SETPEN once, you'll need to call it for every pen you want to use.

A word to the wise. To help YOU get faster turnaround – use the '/CAROUSEL' switch in preference to calling SETPEN. It's a lot less messing around, and there's a smaller chance of problems occurring through incompatibility of pens in carousels.

Selecting non-default media

Soon you'll want to know how to get plots produced on something besides the default size and type of paper. (Remember that the good ol' PLT1 has only one paper type — so this section applies only to PLT3, PLT4, and PLT5.) Your choices of paper are normal and drafting, in sizes A3, A2, A1, and A0, plus A4 overhead transparency film.

Your paper size and type are easily specified using the switch '/FORMS:xxxx'. This are added to the device name, in the call to PLOTIN. And to avoid confusion, can you try to stick to these names —

normal paper — use 'NORMAL'

tracing paper — use 'TRACING'

overhead transparencies — use 'TRANSPARENCY'

A concrete example would be to ask for an A0 size sheet of normal paper. The Plotin call would be —

CALL PLOTIN(file,'PLT3/FORMS:A0NORMAL')

Another request, this time for A3 size tracing paper, would be —

CALL PLOTIN(file,'PLT3/FORMS:A3TRACING')

Hopefully, this should let you select whatever type and size of media you need. If you have a special type of media, contact Sandra Campbell to make arrangements about using it.

Compatibility guide to paper & pens

The HP plotters came with some very definite suggestions (should we say, commandments?) about what sort of paper goes with various pen types. To help YOU get the best results, here's a paraphrase of the nine pages they devote to this.

Pen Type

MEDIA TYPE	FIBRE	ROLLER	DRAFTING
NORMAL PAPER	Best	Good	Poor
TRACING PAPER	Good	Best	Good
VELLUM	Poor	Poor	Best
POLYESTER FILM	Poor	Poor	Best

To this end, and to preserve the equipment (along with giving you plots that have a reasonable chance of turning out well), it's been thought best to make some restrictions on the combinations of pen & paper. The plotting software won't allow you to select a drafting carousel with normal paper. And we ask you not to use fibre or roller pens on vellum or polyester film. Come and talk with Sandra Campbell if you want further advice.

And for the future?

Our defaults seem pretty reasonable to us. They're based on what we think would be most useful to you, the end user of the plotter. If you don't ever tell us what would be better, don't expect to get things changed! So if there's a more useful, easier set of defaults, let Sandra Campbell know. No guarantees are given — but if

we get sufficient interest in something different, we'll see about changing to it.

Mark Williams
extension 2921

and now ...

for the programmer who has everything ...

16. Introducing VUEPLT --

The Plot Preview Program available on both the KL-10 and the VAX

There have been quite a conglomeration of preview programs stored on the various systems, each performing slightly different functions -- although nobody seems quite sure what all these slightly different functions are. This seems unnecessary and is actually very confusing. So the versatile VUEPLT program supersedes VPLOT, VIEWPL, and TEKPLO. Now there is no decision as to which program to use. If you want to output a previously generated HP plot file (with HP.GL format), or Calcomp plot file (PLT1), to either a graphics terminal or to a different plotter, then USE VUEPLT. In particular, VUEPLT supports a number of output devices including Tektronix terminals and plotters, HP plotters, Calcomp plotters, plus the GIGI graphics terminals.

Using VUEPLT

The program VUEPLT is very straightforward for the user. It is invoked as follows, on the KL-10:

```
.RUN PLO:VUEPLT
```

on the Vax:

```
$ RUN SYS$UTI:VUEPLT
```

Thereafter, the information requested is independent of the machine. That is, VUEPLT requests the following information:

Output device, please?
Plot file?
Factor?

What Devices Can I Output my Plot File to?

The output devices that VUEPLT understands are all those valid in a call to the PLOTIN subroutine. It even understands the PLOTIN device switches. So, if you have either a HP or Calcomp plot file, you can output it to any one of the following devices:

PLT1	the Calcomp-936, at the Computer Centre
PLT3	the HP7585B plotter at the Computer Centre
PLT4	the HP7475A plotter at the Computer Centre
PLT5	the HP7475A plotter at Griffith University
HP	either HP plotter at the Computer Centre
HP7475/term	a HP7475 plotter, in series with your terminal
TEK4010	a Tektronix 4010 terminal (or lookalike)
TEK4014	a Tektronix 4014 terminal
TEK4015	a Tektronix 4015 terminal
TEK4662	a Tektronix 4662 plotter, in series with your terminal
GIGI/term	a GIGI terminal

In addition,

Exit	exits from the program
/Help	types out a short help text

The output device can also contain SWITCHES — again valid switches are those that are valid to the PLOTIN subroutine. Especially important is the switch "/TERMINAL". It is used to specify that the output device is either your terminal or otherwise a device connected in series with your terminal.

Examples:

```
HP7475/terminal
TEK4014/terminal
```

If the output is not to be sent to a terminal, it will be stored in the file, VUEPLT.PLT. Additional output devices will be available whenever PLOTIN understands different devices.

Reference:

on the KL-10,	.PRINT DOC:CALF77.DOC
on the Vax,	\$ PRINT SYS\$HELP:CALF77.DOC

Defaults

Vueplt can be used to preview as many files as the user wishes. By typing <cr> to any of the questions asked, the user indicates that the corresponding previously validated response is required again.

Additional Information

For additional information on VUEPLT, refer to the help and documentation files, i.e.

on the KL-10:

```
.HELP VUEPLT
```

and

```
.PRINT DOC:VUEPLT.DOC
```

on the Vax:

```
$ HELP GRAPHICS VUEPLT
```

and

```
$ PRINT SYS$HELP:VUEPLT.DOC
```

If any difficulties are encountered or perhaps you have suggestions as to how VUEPLT could be made more useful, please refer them to me.

Noela Meier
extension 3023

17. Information Concerning Courses

Synopses of IBM Courses

IBM Introduction

This course centres on basic operations and procedures for the IBM 3083 system, viz. logging on and off, file-management, simple utilities, use of the editor XEDIT and the construction and use of simple EXEC (command) files. No prior knowledge is expected, although it is envisaged that, at this stage, the majority of those attending will be current users of the PDP-10 system.

SQL

SQL provides a means of storing and managing information which can be accessed

easily by queries. The results of such interrogations can then be formatted and presented in reports. A knowledge of computers is not necessary to use SQL, although it is strongly recommended that new IBM users should attend a prior IBM Introductory Course.

SCRIPT

SCRIPT is a text-processing package available on the IBM system. Current RUNOFF users will have little trouble adapting to it, since the ideas are very similar, but a number of additional functions are available, providing greater flexibility.

Course Schedule June—July

June

Introduction to PDP-10	June 4-7 4 half days 9-12 each day
Introduction to IBM	June 4-6 3 half days 1-4 each day
CAD/CAM	June 12-15 4 half days 9-12 each day
SCRIPT	June 18-22 5 half days 9-12 each day
1022	June 25-29 5 half days 9-12 each day
Introduction to IBM	June 25-27 3 half days 1-4 each day

July

Introduction to PDP-10	July 2-5 4 half days 9-12 each day
SQL	July 2-5 4 half days 1-4 each day
Introduction to IBM	July 9-11 3 half days 9-12 each day
RUNOFF	July 9-13 5 half days 1-4 each day
FORTTRAN	July 16-20 5 full days 9-12 + 1-4

Notes:

1. All of the above courses will be held in Room G13A — Hawken Building (except for the CAD/CAM course and those designated GU, which will be held in the AES Terminal Laboratory).
2. Enrolments for all courses may be made by phoning extension 3018.

Barry Maher
extension 3021

18. Departmental Equipment for Sale The results of such a survey by groups easily by queries. A knowledge of computers is not necessary to use SQL, although it is strongly recommended that new IBM users should attend a prior IBM introductory course.

2 x VT55 for sale — contact Ron Farmer, Chemistry Department (ext. 2650). Any good offers.

1970 mobile teletype — contact Mr J.D. Condon, Veterinary Science Faculty (ext. 2102).

Maralyn Kenley
extension 3938

Course schedule June-July

June

Introduction to BDP-10	June 4-7
	4 half days 9-12 each day
Introduction to IBM	June 4-6
	3 half days 1-4 each day
CAD/CAM	June 12-13
	4 half days 9-12 each day
SCRIPT	June 18-23
	5 half days 9-12 each day
FORTRAN	June 25-30
	5 half days 9-12 each day
Introduction to IBM	June 23-27
	3 half days 1-4 each day

July

Introduction to BDP-10	July 2-5
	4 half days 9-12 each day
SQL	July 3-5
	4 half days 1-4 each day
Introduction to IBM	July 9-11
	3 half days 9-12 each day
RUNOFF	July 9-13
	5 half days 1-4 each day
FORTRAN	July 16-20
	5 full days 9-12 + 1-4

Notes:

1. All of the above courses will be held in Room G13A — Hawken Building (except for the CAD/CAM course and those designated GU which will be held in the A2S Terminal Laboratory).
2. Arrangements for all courses may be made by phoning extension 3018.

Barry Mahor
extension 3021