

1985/45. PANTO - a FORTRAN program performing a pantographic drafting function.

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*Abstract*

The program PANTO enables scale change of maps by tracing the original map on the digitiser and plotting at the altered scale on the plotter. Control of digitising is exercised by reference to regions defined relative to the area of interest on the digitiser.

INTRODUCTION

PANTO performs essentially the same function as DIGIT (see Unpublished Report 1985/32). However, the manner in which it functions is entirely different to that in which DIGIT functions. The main operational requirement of a program of this nature is recognition of the user's desire to separate line segments from each other (and from points). This is achieved in DIGIT by changing the single digit tag preceding the output x and y co-ordinate pair. DIGIT interprets different successive tags as an instruction to move from the first point to the second point with the pen up. Sameness of successive tags is interpreted as an instruction to plot from the first point to the second point (that is, to move from the first point to the second point with the pen down).

A twelve-button cursor, a single-button cursor and a stylus are available for digitising. The cursors are easy to use for plotting point to point but the stylus is far superior for tracing curved lines. DIGIT works well and is convenient to use with the twelve-button cursor but requires a relatively awkward procedure to be followed when using the stylus. Therefore a more satisfactory solution for operator ease of use with the stylus required an entirely new approach to the problem (not employing tags as instructions), and consequently a new program, PANTO. PANTO interprets points digitised in regions outside the user-defined digitising area as instructions, and has been found to be fast and convenient in use.

It is expected that PANTO will be normally used in place of DIGIT. However, DIGIT will be retained in its current form for projects where it is desirable to differentiate between tags.

The program PANTO is written in FORTRAN 77 and runs interactively on the Department of Mines Perkin Elmer 8/32 mini-computer.

This report is preliminary because the demand for PANTO has been such that it was necessary to bring out a report before program refining is complete. Therefore the program listing is not appended at this stage, but will be appended to a later report.

RUNNING THE PROGRAM

The interactive running of the program is commenced by typing "PANTO" and entering the scale of the map to be digitised and the scale at which it is to be plotted (in response to the appropriate screen prompts). The user is then prompted to specify whether or not a border is to be drawn around the plot and what style of point is to be plotted. If zero is the integer entered for point style, then the user is able to select and change point style during the digitising session. The user will then be instructed not to exceed a given vertical length on the

digitising tablet, corresponding to the maximum plotter width (36" or 914 mm) after the scale change has been performed.

As with DIGIT, the user is required to define the limits of his area of interest for digitisation by defining four 'corners'. These corners need not be right angle corners and the map need not be oriented so that its vertical and horizontal directions coincide with those of the digitising tablet. However, if the area is made rectangular (or almost rectangular) and the rectangular area is kept approximately 'square on' to the digitising tablet, then PANTO will calculate more quickly. Whether or not this is operationally significant remains to be seen, but should be kept in mind. The corners should be digitised in POINT mode, starting with the bottom left hand corner and rotating clockwise. Figure 4 shows the bottom left hand corner for a normal plot and alternative bottom left hand corners for a very skewed plot.

At this stage the user must confirm or deny that all entries so far are correct and successful. If negative, then the prompts will be repeated, starting with the scale of the map to be digitised. If positive, then digitising may commence.

Once the four 'corners' have been defined, zones on the digitising tablet are automatically defined by the lines joining successive corners. The zones are of two basic classes, corner or side. Each class contains four members. The side members are left, top, right and bottom in clockwise order. The corner members are bottom left, top left, top right and bottom right, again in clockwise order. Each corner and side are internally assigned a number as shown in Figure 1. The side with the same number as a corner joins that corner and the next (in a clockwise sense) corner. Each zone is defined by two numbers as shown in Figure 2.

Figure 3 shows the instruction triggered by digitising a point in a zone. Points in the central zone (defined by the four corners to be the zone of interest for digitisation) are plotted to if the previous point was within the central zone but are moved to if the previous point was outside the central area. This is not true if either POINT or TEXT is currently selected. The top left hand zone is the CANCEL zone and digitising a point in this zone will de-select POINT or TEXT if selected. The top right hand zone is used for terminating the program session. The bottom right hand corner is used for selecting TEXT but this option can not be implemented until a written request specifying full requirements is received from the Drafting Office via the Chief Geologist. The bottom left hand corner selects POINT. The four side zones are used to "break" line segments. Digitising by the user in a side zone is an instruction to "move to" the next point digitised in the defined area of interest. The side zones may also be used as follows: a curve being digitised which lies partly in the area of interest and partly in a side zone may be traced without break, but only those parts of the curve within the area of interest will be plotted.

The finished map may be plotted by preparing the plotter in the usual manner and typing "SPLPLT PANPLT.TMP". The plotfile is overwritten when PANTO is next run. However, users creating large plotfiles would assist file 'housekeeping' by deleting PANPLT.TMP when finished. To do this type "DE PANPLT.TMP".

[20 August 1985]

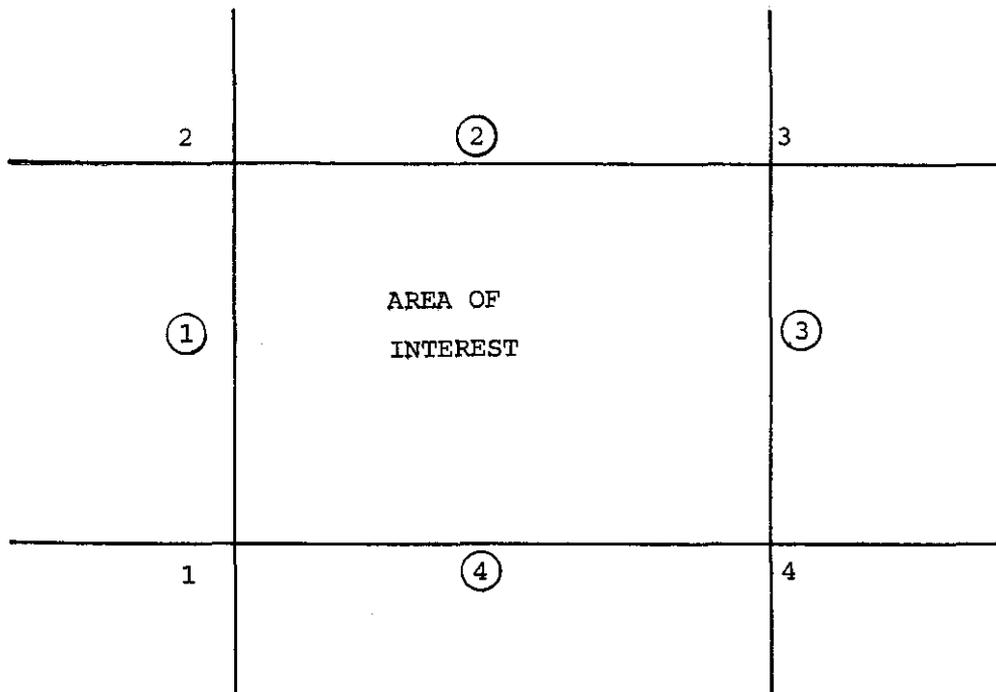


Figure 1. Program internal classification of corners and sides.

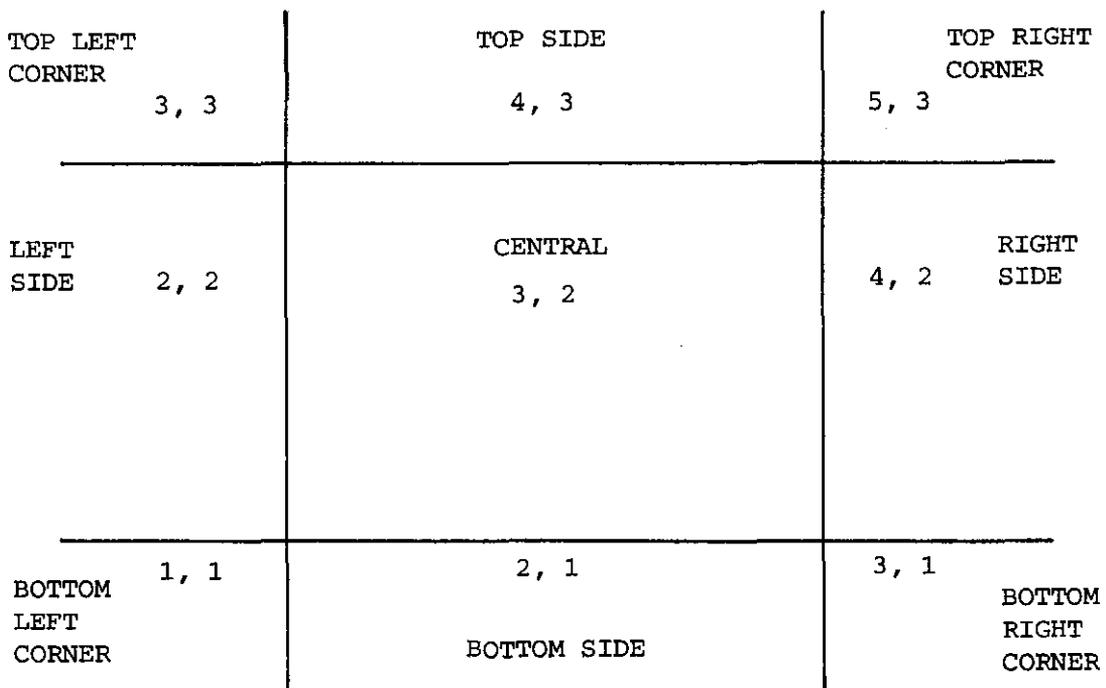


Figure 2. Classification of zones.

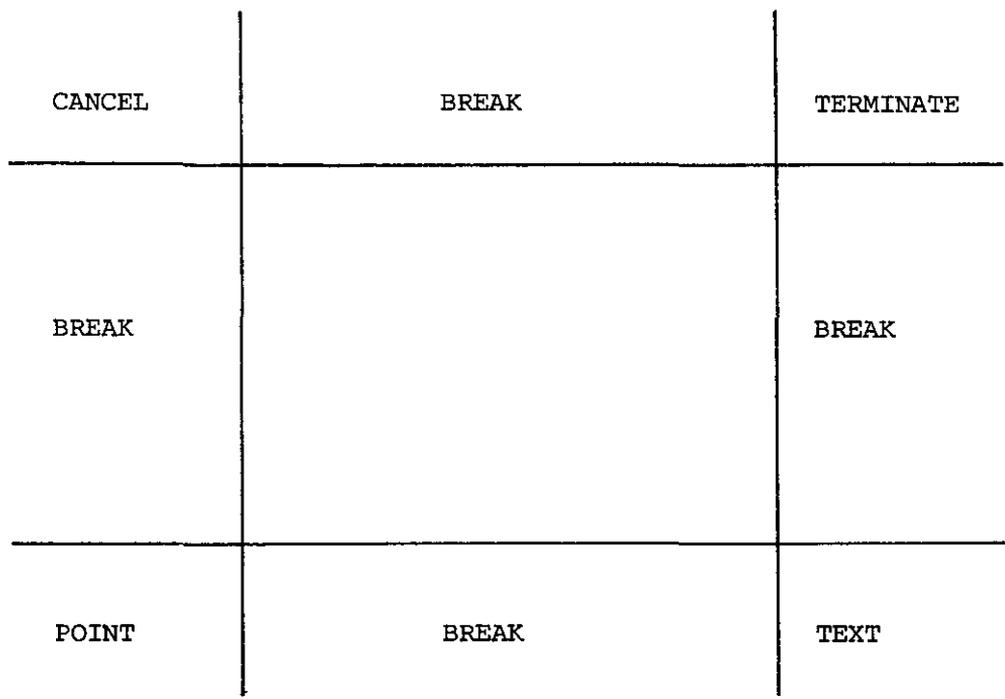


Figure 3. Instruction associated with each zone.

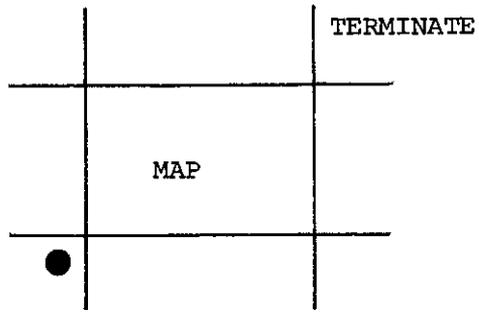


Figure 4a. Bottom left hand corner for normal plot. In this case there is no choice.

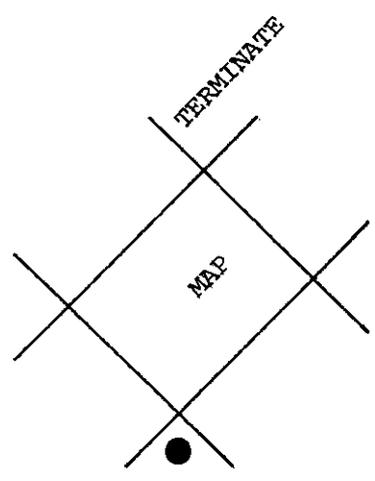
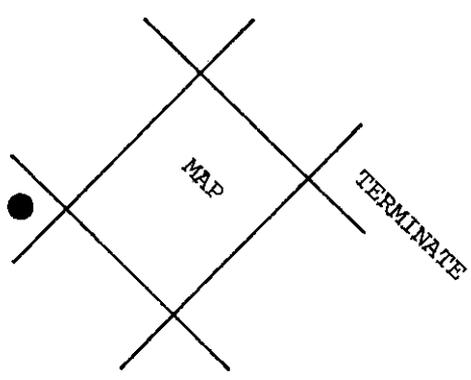


Figure 4b. Alternative bottom left hand corners for a very skewed plot.

The terminate zone is labelled to illustrate how the zones move, depending on how the map/diagram is placed and how the bottom left hand corner is chosen (if there is a choice).