

SUBJECT: The Contour File

The following information is provided as a service to our users and customers:

With the advent of IMRT there is often a need to transfer MLC field descriptions from the treatment planning computer to PIPSPRO prior to performing image registration. PIPSPRO does not have an "import" routine for MLC data. Instead, the user needs to prepare suitable contour files which contain the MLC data, and open them in PIPSPRO with the InfoDesk routine.

The contour file (*filename.con*) can be prepared as follows:

1. Manual entry.

Use the EditTool, set to Contour, to place contour points on the image. When completed, the set of contour points can be saved as a *filename.con* file and retrieved as required. If the image contains an outline of the MLC, then placing contour points at intervals along the outline is quite straightforward. If there is no outline, the user will have to consult a printed list of contour point coordinates, and place the contour points on the image while monitoring the location of the cursor in the InfoDesk. The default coordinate system is the Windows system, where the origin is at the left upper corner, x increases to the right, and y increases downwards. If the list of contour point coordinates is in another coordinate system, change the display system using **Feature,Coordinates**.

2. Remote file entry.

In this case the user prepares a contour file outside of the PIPSPRO environment. It must be in the Windows default coordinate system (see previous paragraph). The file structure is given below. Transfer the *filename.con* file to the PIPSPRO computer, and retrieve the contour using EditTool set to Contour.

3. The Contour file structure.

The *filename.con* file is in binary format.

The first 2 bytes store a 16-bit integer indicating the number of contour points and are followed by the actual contour points. Each contour point is a pair of 16-bit integers, x and y. That is, each contour point occupies 4 bytes, with x ahead of y.

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Contour points use the Windows system reference, that is, the origin (0,0) is the upper-left corner of the window. X axis points to right, Y axis goes down.

Here is the pseudo-code for reading the *filename.con* file:

```
read the first 2-bytes into N;  
for (I = 1; I <= N; I ++) {  
    read 2-bytes into X;  
    read 2-bytes into Y;  
    make the Ith coutour;  
}
```

The following is the pseudo-code for writing the *filename.con* file:

```
write the number of contour point N (2-bytes)  
for (I = 1; I <= N; I ++) {  
    write X (2-bytes);  
    write Y (2-bytes);  
}
```