Chapter 6
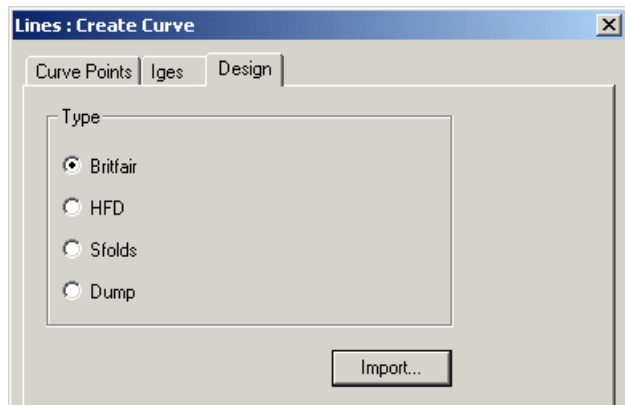
6 Fitting & fairing the initial sections

6.1 Fitting the sections

6.1.1 Importing the data file

To import the section data, use the **Design** tab of the **Create** dialogue.

Britfair	select to import a britfair format section file (default)
HFD	select to import an HFD format section file
Sfolds	select to import an sfolds section file
Dump	select to import a dump file, used to transfer Lines designs between operating systems that are not binary compatible

Import   press to bring up the file handling dialogue and select the input data file

The recommended format of design data is Britfair, in which case this can be used as the design basis by selecting **FILE > USE > OFFSET DATA.**

The initial section data is stored in an area of the design referred to as the Design directory.

The data in the design directory is only used to fit the initial sections. The initial sections are then stored in the Section directory, this is the directory where all interpolated sections are stored and the sections in this directory are used to interpolate any intersecting curves. The design data is therefore only used to create the initial sections and is not overwritten unless a new data file is imported.

6.1.2 Fitting the data

The sections are fitted using the **Fairing** dialogue.

6.1.2.1   Fit

used to automatically interpolate, fit and store a specified group of orthogonal curves.

Curve type   specifies the type of orthogonal curves to interpolate, **Section**, **Waterline** or **Buttock**

Selection   defines which curves of the specified type to interpolate

        All   all currently stored curves that are switched on

        Series   a specified list of curves, enter the values in the "series" input field separated by spaces

        Range   a specified incremental range of curves

            From   the start value

            To   the end value

            Inc   the increment between successive curves

Interpolation   specifies which orthogonal curves to interpolate the data from, choose any combination by checking the relevant boxes

                      when fitting sections, checking Design will automatically grey out the other options. Design used in conjunction with the selection option All, will fit all of the data in the design directory and store the curves in the section directory

Accept   check to automatically store the curves, if not checked the curves are only drawn in the current graphics view

Show   displays the points used to fit each curve

Close   closes the curves by joining the end point up to the start point

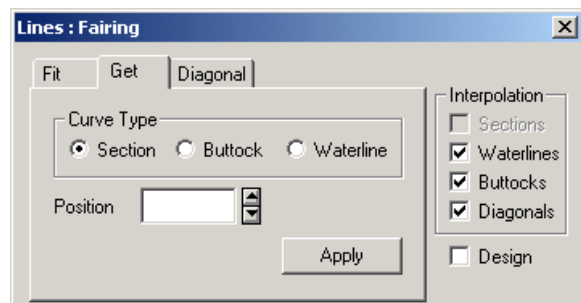**Apply**   press to generate the curves
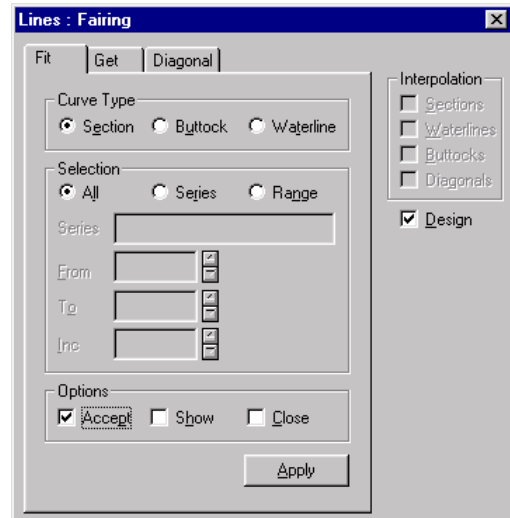
6.1.2.2   Get

Used to interpolate a set of data points for an individual orthogonal curve, these are presented to the user as the currently active curve.

As for the Fit tab except

Position   the orthogonal curve to interpolate

6.2   Fairing the sections

Generally the initial sections will be faired using automatic fairing. However the user can also manually fair the sections using various methods.

To fair a section it must first be activated by using Modify.

6.2.1   Point manipulation

Most of the point functions are modal, i.e. they operate until cancelled. To cancel the operation of a function press the r.m.b.

Remove   delete one or more points selected using the cursor, digitise each succesive point

Move   move one or more points by the selected method

          Cursor   indicate the point to move then its new position

          Absolute   specify the U, V coordinates to move The point to, indicate the point to move using the cursor

          Relative   specify the required U, V movement from the current location, indicate the point to move using the cursor

**Insert**   insert a new point into the curve

          Before   insert the point before an indicated point

          After   insert the point after an indicated point

          Cursor   specify the position of the new point using the cursor

          Coord   specify the position of the new point by ***U***, ***V*** coordinates in the case of an orthogonal curve or ***X***, ***Y***, ***Z*** coordinates in the case of a 3D curve

Interp Insert   Insert a point into the curve by interpolating the curve at the specified ***U*** or ***V*** ordinate
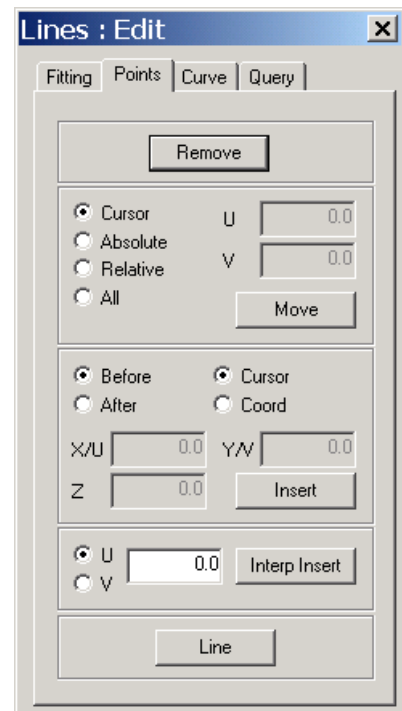
ⓘ   *Line and the All option of Move were covered in chapter 3*

6.2.2   Curve manipulation

As with the point manipulation functions, the curve manipulation functions are mostly modal.

Offset vertex   move an indicated vertex by the selected method

> *Cursor* indicate the vertex then its
>   new position

> *Coord* move an indicated vertex the
>   specified U, V distance from
>   its existing location

Align Vertices   make a sequence of vertices co-linear,
indicate the start and end vertex of the
sequence

Insert   insert a knot into the curve by the selected method

> *Cursor* indicate the position using the
>   cursor, the knot will be inserted on
>   the curve at the minimum distance
>   from the cursor

> *U*   insert the knot at the specified U ordinate

> *V*   insert the point at the specified V ordinate

Remove   delete knots by the selected method

> *Auto to tol*   remove as many knots as possible, ensuring that the curve does not
>   deviate from its existing shape by more than the specified tolerance

> *Manual*   indicate the knots to remove with the cursor
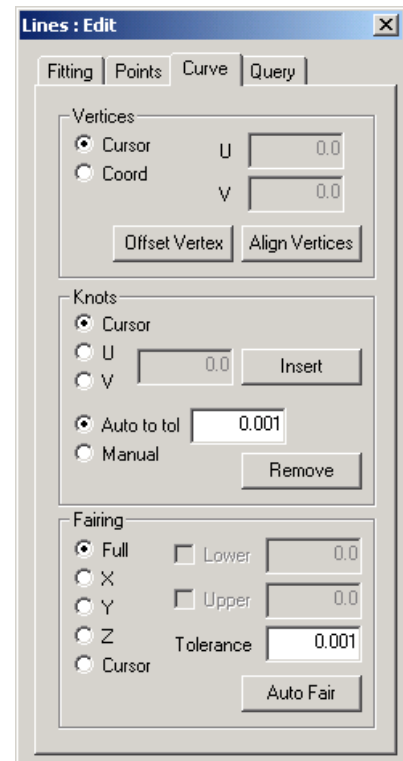
ⓘ   *when manually removing knots, large changes can occur in the curve*

6.2.3   Comparing the fairness of multiple curves

It is useful to compare the curvature curves of a group of curves to see if there are any common problem areas. This can be done by entering the following command in the command line;

> DISPLAY   SECTION   *start* THR *end increment* /KURVATURE
>   WATERLINE
>   BUTTOCK

Where

Start	is the position of the first curve
End	is the position of the last curve
Increment	is the increment between succesive curves

For example to display the curvate of sections at an increment of 5 starting from 0 and ending at section 50

DISPLAY SECTION 0 THR 50 5 /KURVATURE

This may be abbreviated to

DISP SEC 0 THR 50 5 /KU

ⓘ *Not all the curves in the range need exist, the system will output a warning if a curve is missing and continue*

6.2.4 Automating the fairing

At this preliminary stage of fairing, the user may decide simply to apply the auto fairing to all curves. By using a macro, this can be done very easily.

Macros are created using the **macro editor** dialogue.

This example uses a numeric variable "ii", as a counter in a do loop that applies the auto fairing to each section in turn.

To execute the macro, press the **Execute** button.

Macro's are covered in detail in the Appendix.