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PatchWork

3Dim-disp

Library for tridimensionnal display

Second English Edition, April 1996

IRCAM Centre Georges Pompidou

This manual was written by Mikail Malt, translated into English by J. Fineberg, and was produced under the editorial responsibility of Marc Battier, Marketing Office, Ircam.

Patchwork was conceived and programmed by
Mikael Laurson, Camilo Rueda, and Jacques Duthen.

The 3Dim-disp library was conceived and programmed by Mikael Laurson.

Second English edition of the documentation, April 1996.

This documentation corresponds to version 1.1 of the library, and to version 2.1 or higher of PatchWork.

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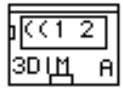
Résumé

Ce manuel présente la librairie 3Dim-disp, qui a été conçue et programmée par Mikael Laurson pour permettre l'affichage de données sous une représentation en trois dimensions.

La librairie est composée d’un unique module PatchWork. Ce module permet l'affichage tridimensionnel de points ou de listes.

Le chargement de la librairie (voir le manuel d'introduction de PatchWork pour le chargement de librairies) additionne un seul module au menu **UserLib**.

Lorsqu'on invoque le module **3DIM**, il se présente comme ci-dessous.



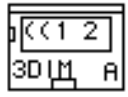
L’emploi du module **3DIM** est riche de potentiel, et vous trouverez dans ce manuel une explication détaillée de ses fonctions.

1 Introduction

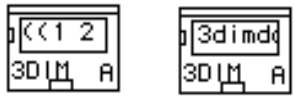
The 3Dim-disp library was conceived and programmed by Mikael Laurson to allow data to be displayed in a three dimensional form. The library possesses a single module: **3DIM**. This module allows points or lists to be displayed in three dimensions.

Loading the library (see the PatchWork Introduction manual for an explanation of how a library is loaded) adds only the item **3dim** to the **UserLib** menu :

When placed in a patch the **3DIM** module appears as seen below :



2 The 3DIM Module Reference



Syntax

(turtle::3dim *3dimdata* **)**

Input

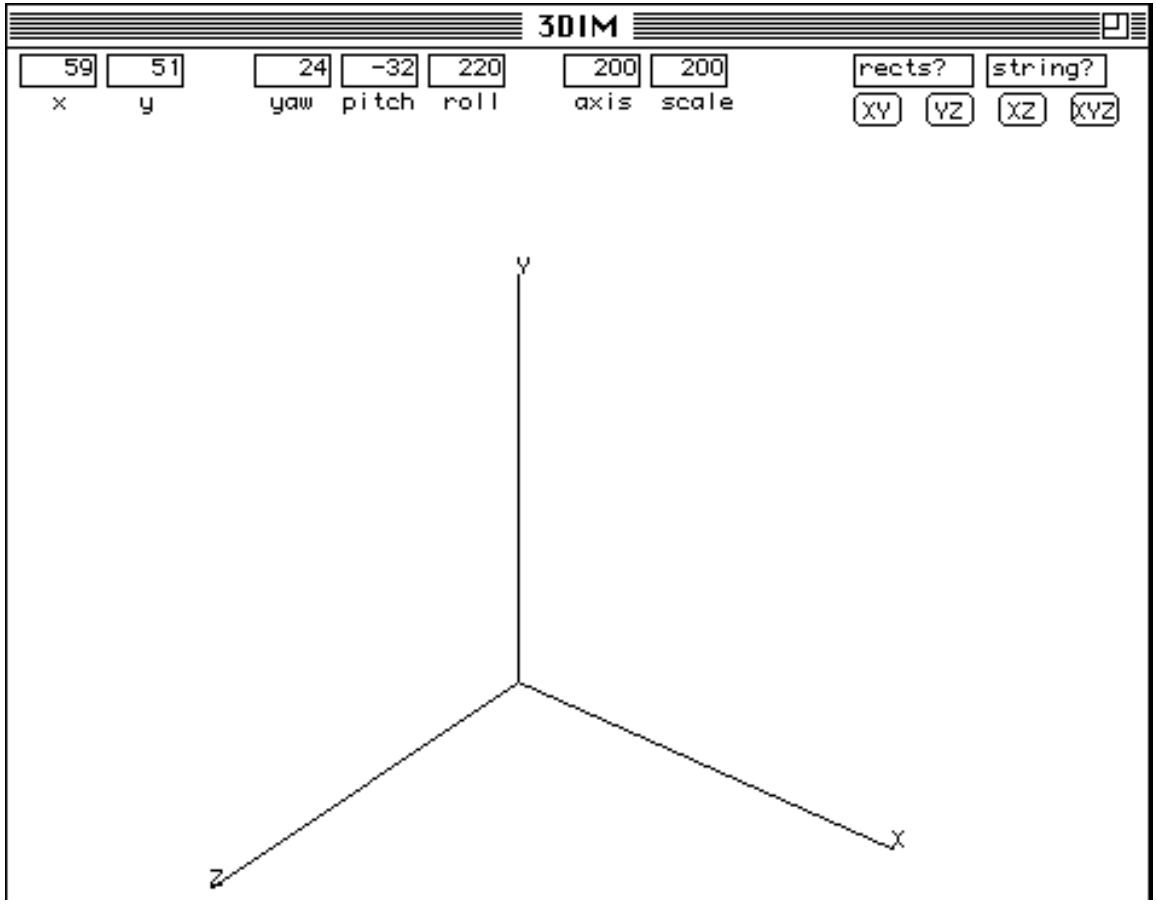
3dimdata A list of coordinate triplets (x, y, z)

3DIM is a module which allows points to be displayed in three dimensions. Its input *3dimdata* accepts coordinate triplets (x, y, z)[1] which define the position of a point in space. A fourth optional parameter may also be given for each point (a string of symbol characters), which allow the user to chose the type of representation given to each point. This parameter may be a character of any sort. For example : (10 20 30 ".") or (10 20 30 1).

If no fourth parameter is given, each point will be designed with the following small three-dimensional object :

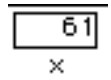
By double clicking on the main body of a **3DIM** module, the module's display window (where the entered coordinates are shown) is opened:

1. The coordinate triplets are formatted as a list of lists: ((x0 y0 z0) (x1 y1 z1) ... (xn yn zn)).

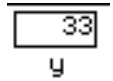


This window does not allow any editing, it is simply for displaying data. It has seven adjustable (roll-down or up) number windows as well as six buttons which allow the user to adjust the representation of the displayed points. Here is the description of each feature.

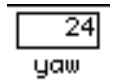
The number windows



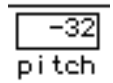
This window is used to control the horizontal position of the system of axes; increasing this value pushes the axes toward the right and decreasing it, toward the left.



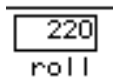
This window is used to control the vertical position of the system of axes; increasing this value pushes the axes toward the bottom of the display and decreasing it, toward the top.



This window is used to rotate the system of axes around the origin (0, 0, 0); increasing this value rotates the axes toward the right and decreasing it, toward the left.

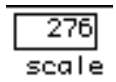


This window is used to rotate the system of axes around an axis perpendicular to the ‘x-axis’; increasing this value rotates the axes toward the right and decreasing it, toward the left.



This window is used to rotate the system of axes around the ‘x-axis’; increasing this value rotates the axes toward the right and decreasing it, toward the left.

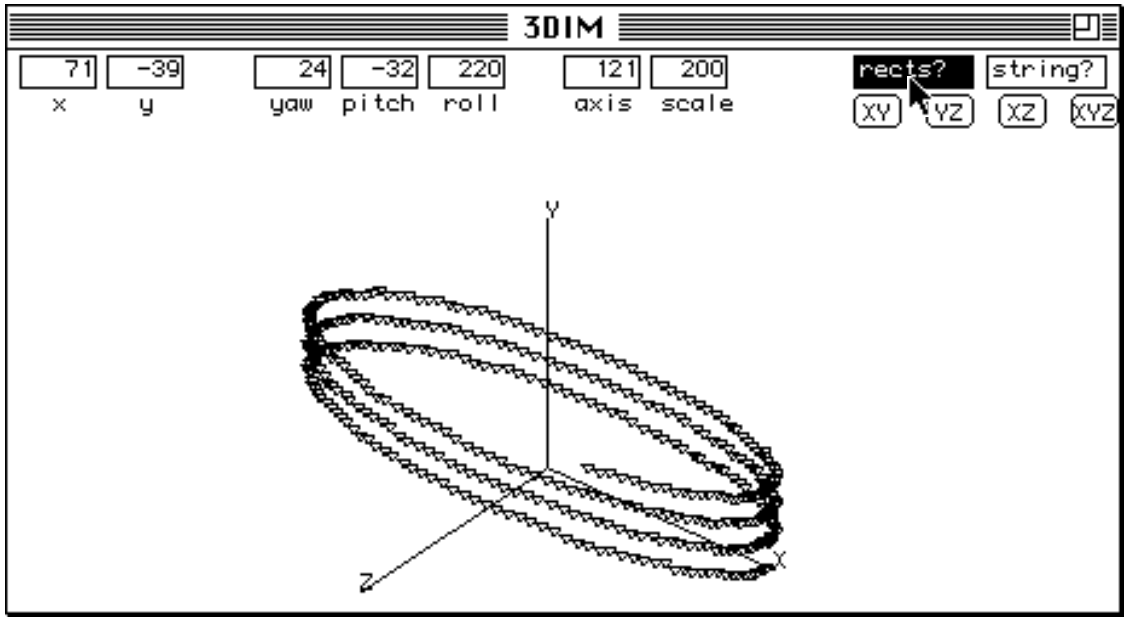
This window is used to enlarge or shrink the system of axes.



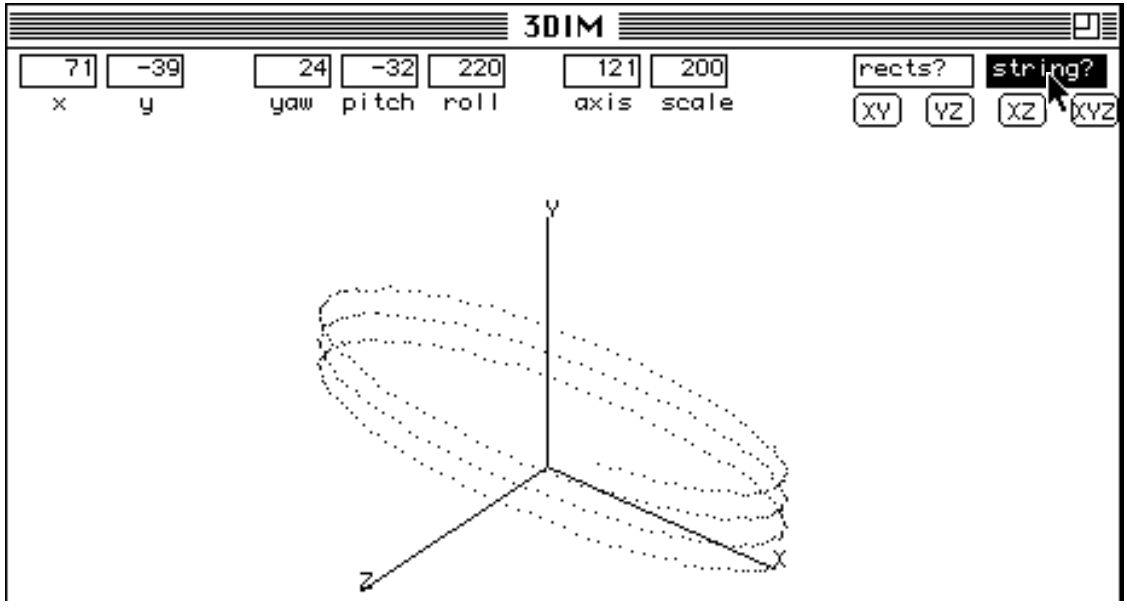
This window is used to scale the image which is represented in the graph; increasing this value enlarges the scale of the graph and decreasing it, reduces the scale.

The buttons

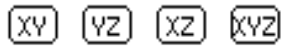
Clicking on *rects?* cause the points to be displayed as small three-dimensional objects.

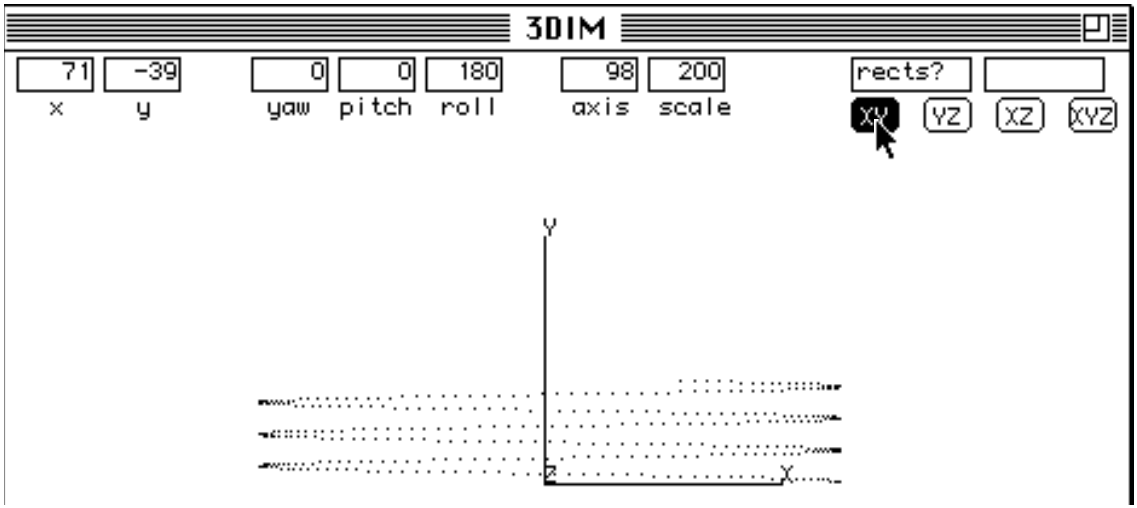


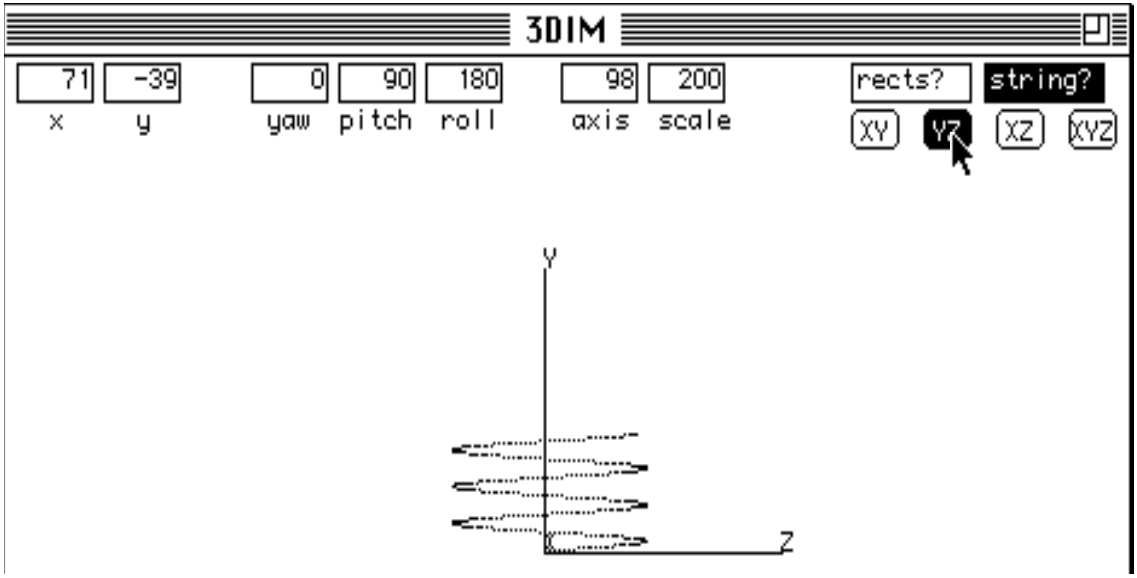
Clicking on *string?* causes the points to be displayed with the optional character given as the fourth parameter, if this parameter was given in the input (otherwise the default character is used). In the following example the fourth parameter *string?* makes use of the character period "."

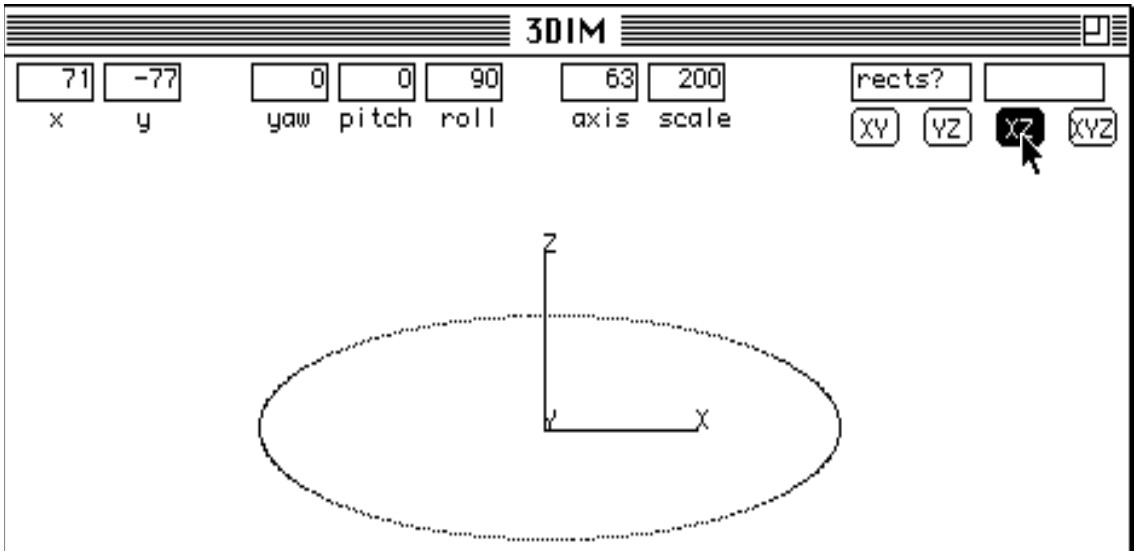


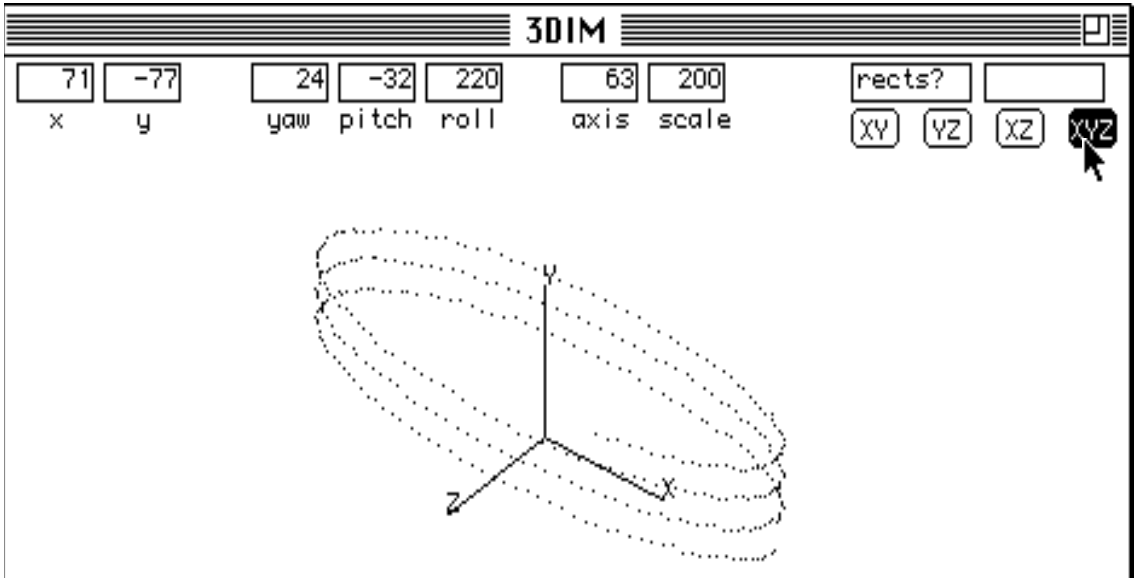
The following four buttons allow the user to display various cross-sections of the displayed graph:





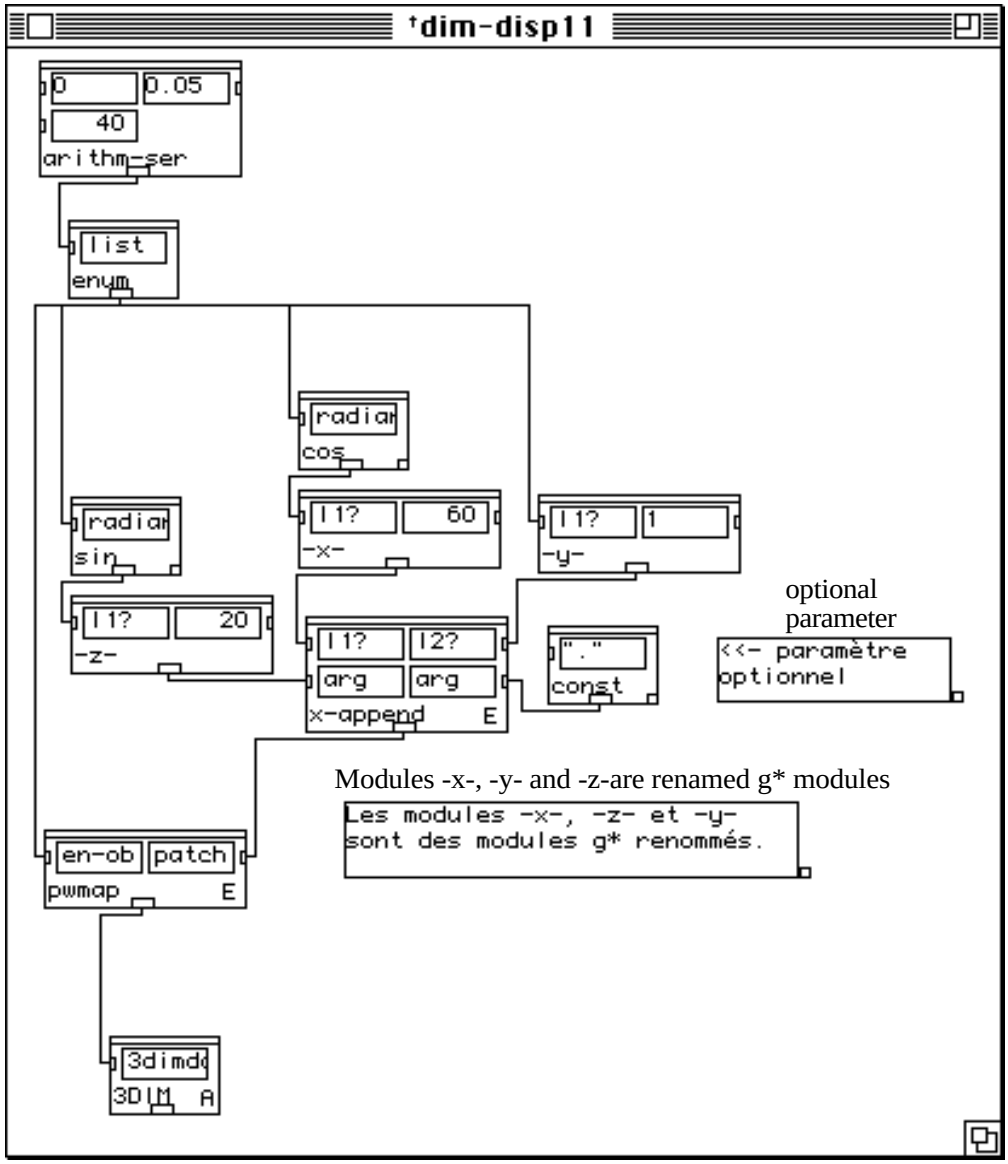



3DIM
71
x
-77
y
0
yaw
0
pitch
90
roll
63
axis
200
scale
rects?
XY
YZ
XZ
XYZ
Z
Y
X

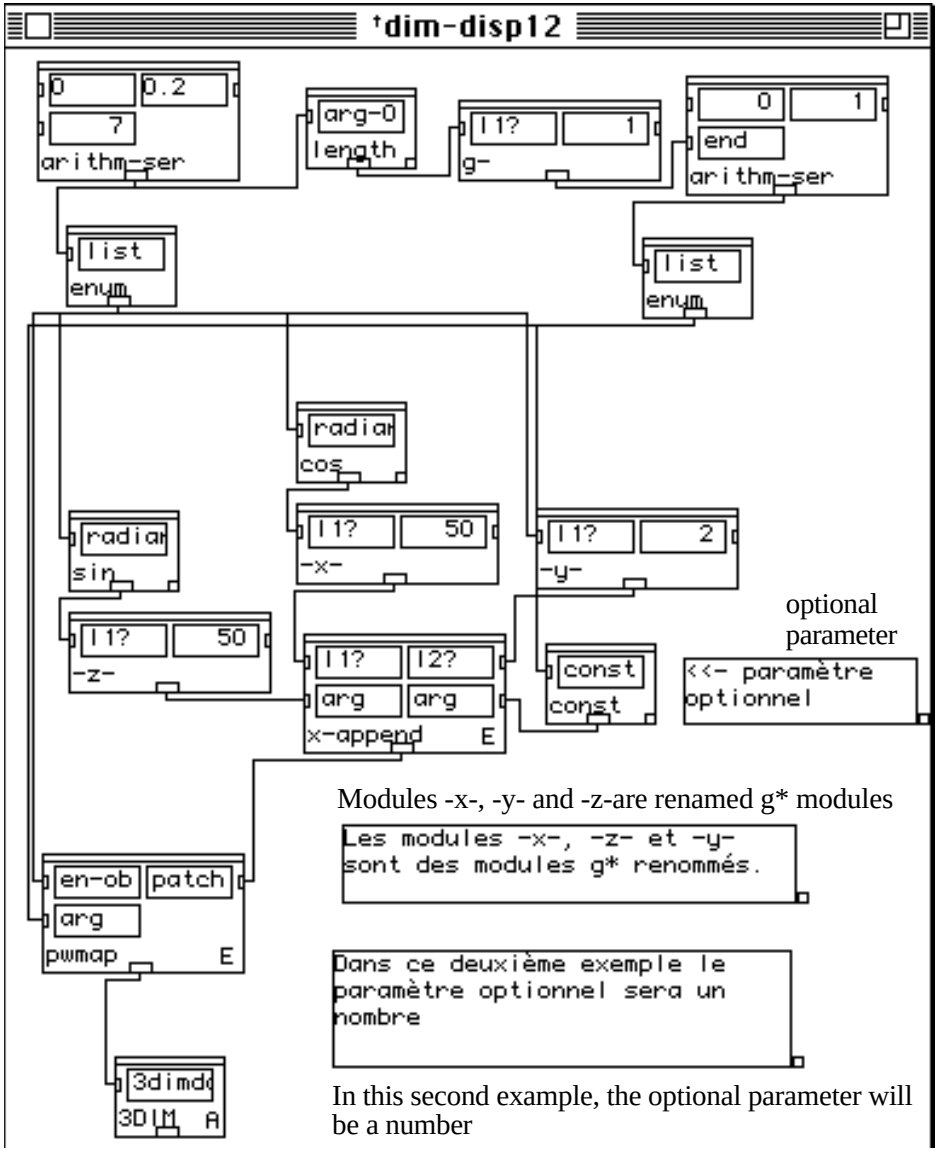

3DIM
71
x
-77
y
24
yaw
-32
pitch
220
roll
63
axis
200
scale
rects?
XY
YZ
XZ
XYZ
Y
Z
X

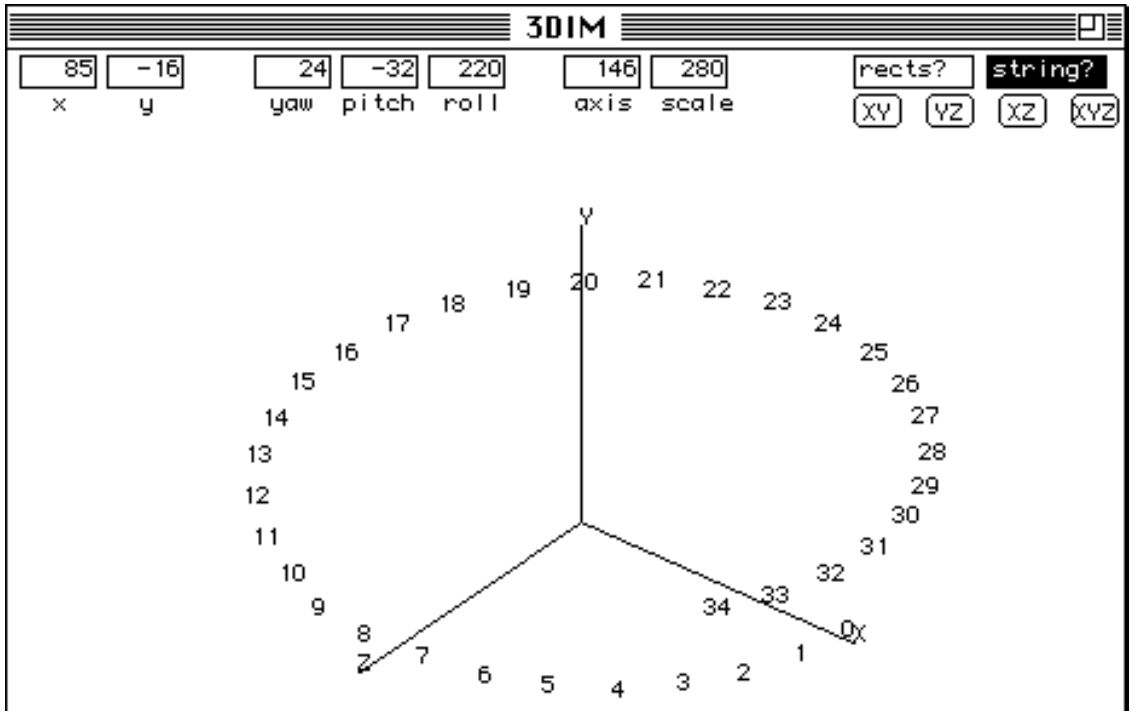
Example Patch

The following is the patch used for the examples.



A slight modification to this patch allows the points to be numbered:




3DIM
85
x
-16
y
24
yaw
-32
pitch
220
roll
146
axis
280
scale
rects?
string?
XY
YZ
XZ
XYZ
Y
X
Z
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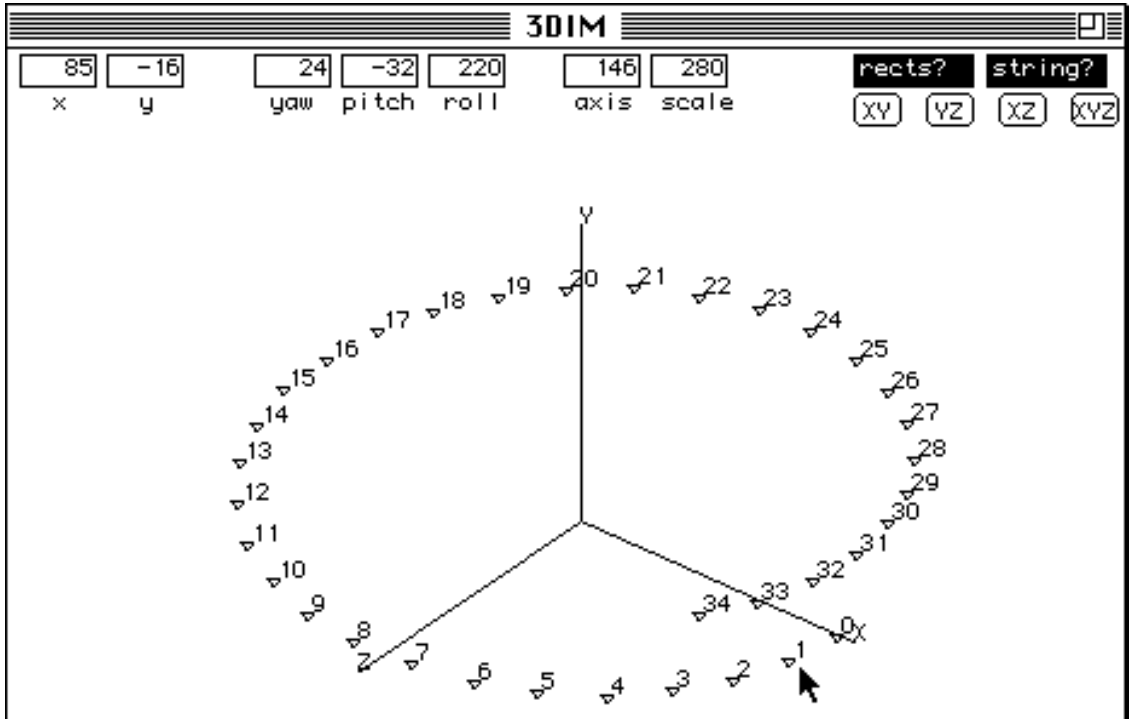
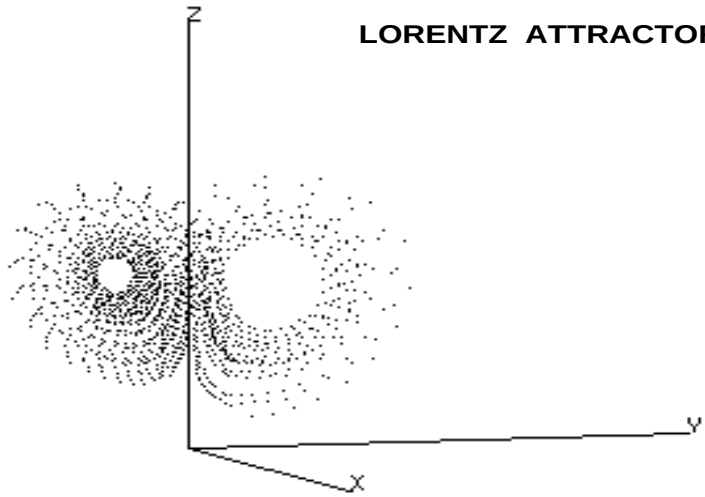
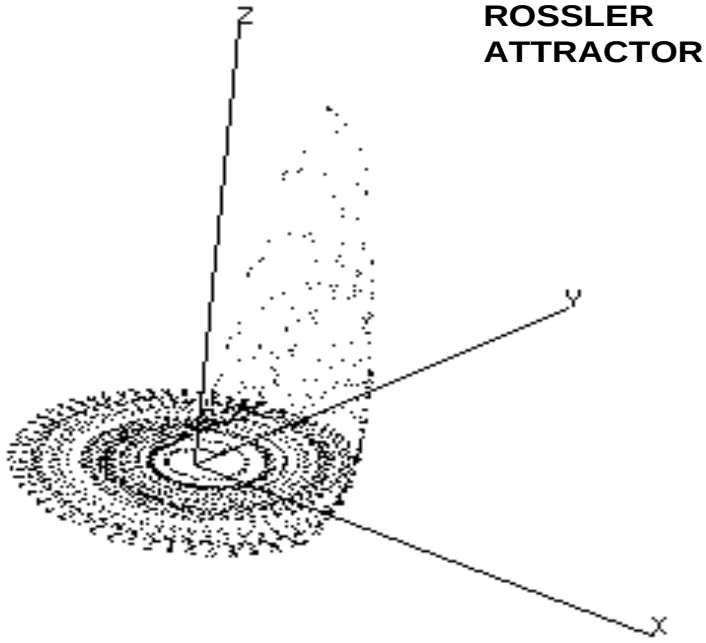
In the above example it would be useful to display both the point and its number :



Using 3Dim-disp with the Chaos library

The following are two images displayed in 3Dim-disp demonstrating functions that have been calculated with the Chaos library, based on a Lorenz attractor and a Rossler attractor:





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