

# XREC (Rêver en couleurs)

## User guide

### Version 5.4

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## Introduction

XREC is a visualization program used to display 2D meteorological fields stored in the RPN standard file format. This program has been developed by the "Section Informatique" of RPN, to provide RPN scientists an efficient tool to browse through the voluminous data sets produced by numerical models and analyses.

The origins of XREC date from summer 1990. In its first release the program offered only black and white contouring of the data. The user interface was coded with the Athena widgets, and the program was known as "xquicklook". Color capability and basic animation were added in the fall of 1990, and the name "xrec" was chosen. The user interface was converted to the "Motif" toolkit in spring 1991, and the "Contour", "Geography" and "Palette" panels were added in the summer of 1991. A common toolkit library was also built in collaboration with the Graphics sections of CMC, which was starting work on "MAX" (Météorologie Appliquée sous XWindows), the "designed-for-operations" cousin of "xrec". The Interactive vertical cross section capability was introduced in spring 1992 and the "Animation" panel, in fall 1992. The program then entered a dormancy period that went into summer 1994. A brief wake-up occurred in summer 1993, in Toulouse where the "Attributes" panel and the topography mask were introduced, the code was ported to HP platforms. The "Vector Field" panel was introduced in summer 1994. At the same time NCSA color palettes were introduced in the "Palette" panel, augmenting the number of available palettes from 8 to 54.

The program, now in version 5.4, offers the following features:

- Motif graphical user interface, floating control panels
- line and half-tone contouring of 2-D fields
- zoom/pan capability
- display of grid point values
- overlay of up to 32 different fields
- animation of time series or vertical levels
- display of vertical profiles or cross-sections, in static or scan mode
- simple arithmetic on pairs of superimposed fields
- up to 124 RPN standard files opened simultaneously
- a choice of 50 color palettes and 2 sliders to modify the color enhancement curve
- Display of horizontal winds using wind barbs, arrows, animated streamlines and LIC (Line Integral of Convolution)
- modification of grid point values for a given field
- integrated geographical navigation, with support of lat-lon and polar stereographic projections
- display of fields containing point values
- customization of graphical attributes of fields and geography (line thickness, line style, color, vector length and density)
- selection of a contour interval for a given field
- user definition of a personal dictionary of variables

## Hardware and software requirements

At the present time, "xrec" runs on the following platforms:

- Silicon Graphics (IRIX 6.4)
- Linux (on i386 architectures - Red Hat 5.2 or better, Mandrake 7.0 or better).

"xrec" is capable of displaying on most UNIX workstations equipped with 16- or 24 bit depth displays, or personal computers equipped with an X emulator.

## Environment variables

The program requires four environment variables:

|                  |   |
|------------------|---|
| <b>\$ARMNLIB</b> | containing the path of data files used by the programs                              |
| <b>\$DISPLAY</b> | to establish the X connection   |
| <b>\$CMCLNG</b>  | containing the language preferred by the user ( <b>english</b> or <b>français</b> ) |
| <b>\$TMPDIR</b>  | used to store scratch files   |

Normally, the user should be responsible for setting the correct values for DISPLAY and CMCLNG. The value of ARMNLIB should be set by the system administrator. This document assumes that the reader has a basic knowledge of RPN standard files. If this is not the case, the document "An introduction to RPN standard files", by the author, is available. A basic knowledge of UNIX and window management under X is also assumed.

## Calling arguments

```
xrec [-imflds file1 file2 file3 ... file124]
      [-ar full/grid/none/square]
      [-v]
      [-ozsrt output-file]
```

- imflds** used to specify the names of the RPN standard files to be visualized. A maximum of 124 files can be opened simultaneously. If this option is not used when invoking the program, a file selector will appear on screen, asking the user to select one or more RPN standard files.
- ar** specifies the aspect/ratio of the display window. By default, the display window can take any proportion. The "**square**" option will force the display window to adopt a square shape. The "**grid**" option will force the display window to have the same aspect-ratio as the ni/nj ratio of the first field appearing in the record selector (e.g. if the first field appearing has a dimension of 240x120, the display window will be twice as large as high). The "**full**" option will make the display window fill the entire screen. Finally, the "**none**" option will allow the user to freely size the dimensions of the display window to any aspect ratio. In that mode, the grid points are distorted to take the aspect ratio of the display window. By default the grid points are restrained to a square shape.
- v** flag that sets on verbose mode. In that mode, diagnostics messages from the program will appear on screen. This option is useful to detect any error messages that may be present when the program loads the user dictionary.
- ozsrt** specifies the name of a target RPN standard file. This option is useful only when the field editing panel is activated.