

A world map with a dark blue background. Numerous red arcs connect various points across the globe, primarily concentrated in the Northern Hemisphere. Small blue triangles are scattered across the map, some pointing upwards and others downwards. The text is overlaid on the map.

WHAT ARE ALL THESE COLORS?

Understanding Color Codes in dbpick & dbevents_pre

Presented by Mathias Franke | AUG Meeting at AEC, Fairbanks, Aug 17-19 2016



KINEMATICS

Advancement Through Innovation

Introduction

New color codes in Antelope 5.6

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In order to support the network operator and analyst Antelope 5.6 introduces a number of new color codes for events, station icons and great-circle paths between epicenter and stations within `dbevents_pre`.

In this contents it is worthwhile to review the color-coding of the arrival flags of `dbpick` visualizing the contribution of an arrival for a particular origin.

dbpick

Hardwired Defaults

The hardwired defaults of `dbpick` are defined in the file
`$ANTELOPE/include/gpl.h`

```
/*
 * Following are GatherPlot attribute "hardwired" default
 * value:
 */
#define GPL_TRACE_PLOT_MODE_DEF GPL_WIGGLE
#define GPL_TRACE_TIME_RESIZE_DEF GPL_FIT
#define GPL_TRACE_UVAR_RESIZE_DEF GPL_FIT
#define GPL_GPL_WIN_X_FR_DEF 0.0
#define GPL_GPL_WIN_Y_FR_DEF 0.0
#define GPL_GPL_WIN_W_FR_DEF 1.0
#define GPL_GPL_WIN_H_FR_DEF 1.0
#define GPL_TRACE_PANE_X_FR_DEF 0.0
#define GPL_TRACE_PANE_Y_FR_DEF 0.0
#define GPL_TRACE_PANE_W_FR_DEF 0.0
#define GPL_TRACE_PANE_H_FR_DEF 0.0
#define GPL_TRACE_PANE_L_MARGIN_DEF 0
#define GPL_TRACE_PANE_R_MARGIN_DEF 0
#define GPL_TRACE_PANE_T_MARGIN_DEF 0
#define GPL_TRACE_PANE_B_MARGIN_DEF 0
#define GPL_T0_DEF 0.0
#define GPL_TWIN_DEF 60.0
#define GPL_UVAR0_DEF 1.0
#define GPL_UVARWIN_DEF -2.0
#define GPL_AMP0_DEF 0.0
#define GPL_AMPWIN_DEF 0.0
#define GPL_TRACE_HEIGHT_DEF 0.9
#define GPL_TRACE_BACK_HUE_DEF 0.0
#define GPL_TRACE_BACK_LIT_DEF 0.9

#define GPL_TRACE_BACK_LIT_DEF 0.9
#define GPL_TRACE_BACK_SAT_DEF 0.2
#define GPL_TRACE_FORE_HUE_DEF 0.0
#define GPL_TRACE_FORE_LIT_DEF 0.3
#define GPL_TRACE_FORE_SAT_DEF 0.8
#define GPL_LABEL_FORE_HUE_DEF 0.0
#define GPL_LABEL_FORE_LIT_DEF 0.0
#define GPL_LABEL_FORE_SAT_DEF 0.0
#define GPL_LABEL_BACK_HUE_DEF 240.0
#define GPL_LABEL_BACK_LIT_DEF 0.9
#define GPL_LABEL_BACK_SAT_DEF 0.2
#define GPL_ARRIVAL_FORE_HUE_DEF 0.0
#define GPL_ARRIVAL_FORE_LIT_DEF 0.0
#define GPL_ARRIVAL_FORE_SAT_DEF 0.0
#define GPL_ARRIVAL_BACK_HUE_DEF 240.0
#define GPL_ARRIVAL_BACK_LIT_DEF 0.9
#define GPL_ARRIVAL_BACK_SAT_DEF 0.2
#define GPL_DEFINING_ARRIVAL_FORE_HUE_DEF 0.0
#define GPL_DEFINING_ARRIVAL_FORE_LIT_DEF 0.0
#define GPL_DEFINING_ARRIVAL_FORE_SAT_DEF 0.0
#define GPL_DEFINING_ARRIVAL_BACK_HUE_DEF 120.0
#define GPL_DEFINING_ARRIVAL_BACK_LIT_DEF 0.9
#define GPL_DEFINING_ARRIVAL_BACK_SAT_DEF 0.2
#define GPL_ASSOCIATED_ARRIVAL_FORE_HUE_DEF 0.0
#define GPL_ASSOCIATED_ARRIVAL_FORE_LIT_DEF 0.0
#define GPL_ASSOCIATED_ARRIVAL_FORE_SAT_DEF 0.0
#define GPL_ASSOCIATED_ARRIVAL_BACK_HUE_DEF 60.0
#define GPL_ASSOCIATED_ARRIVAL_BACK_LIT_DEF 0.9
#define GPL_ASSOCIATED_ARRIVAL_BACK_SAT_DEF 0.2

#define GPL_MAGNITUDE_ARRIVAL_FORE_HUE_DEF 0.0
#define GPL_MAGNITUDE_ARRIVAL_FORE_LIT_DEF 0.0
#define GPL_MAGNITUDE_ARRIVAL_FORE_SAT_DEF 0.0
#define GPL_MAGNITUDE_ARRIVAL_BACK_HUE_DEF 300.0
#define GPL_MAGNITUDE_ARRIVAL_BACK_LIT_DEF 0.9
#define GPL_MAGNITUDE_ARRIVAL_BACK_SAT_DEF 0.2
#define GPL_SEL_ARRIVAL_FORE_HUE_DEF 240.0
#define GPL_SEL_ARRIVAL_FORE_LIT_DEF 0.9
#define GPL_SEL_ARRIVAL_FORE_SAT_DEF 0.2
#define GPL_SEL_ARRIVAL_BACK_HUE_DEF 0.0
#define GPL_SEL_ARRIVAL_BACK_LIT_DEF 0.0
#define GPL_SEL_ARRIVAL_BACK_SAT_DEF 0.0
#define GPL_PRED_ARRIVAL_FORE_HUE_DEF 240.0
#define GPL_PRED_ARRIVAL_FORE_LIT_DEF 0.9
#define GPL_PRED_ARRIVAL_FORE_SAT_DEF 1.0
#define GPL_DETECTION_FORE_HUE_DEF 0.0
#define GPL_DETECTION_FORE_LIT_DEF 0.7
#define GPL_DETECTION_FORE_SAT_DEF 1.0
#define GPL_TIMEMARK_FORE_HUE_DEF 0.0
#define GPL_TIMEMARK_FORE_LIT_DEF 1.0
#define GPL_TIMEMARK_FORE_SAT_DEF 0.0
#define GPL_TRACE_MOUSE_MODE_DEF GPL_TIME_SCROLL
#define GPL_TRACE_FONT_NAME_DEF "-adobe-helvetica-  
bold-r-normal--12-120-75-75-p-70-iso8859-1"

(...)
```

The hardwired defaults of `dbpick` are defined as follows

- **Red** flags -> This is the default color for arrival phases and magnitude measurements.
- Within the context of `dbloc2`, `dbevents` and `dbevents_pre` additional colors are shown for a particular origin.
 - **Blue** arrival flag -> Arrival phase was used to locate the current origin.
 - **Green** arrival flag -> Arrival phase was not used to locate the current origin but was associated to the event.
 - **Red** arrival flag -> Remaining arrivals in the given time window (not associate with current origin).
 - **Dark Purple** magnitude flag -> Stations magnitude was used for current origin.
 - **Red** magnitude flag -> Magnitude was not used for current origin.

The program `dbpick` was written before the advent of Antelope parameter files. To modify color settings use

- the file `.dbpickrc` located in the user's home directory or the working directory
- or the command line options.
- The color can be given either in the normal X-window fashion (e.g., for red: `#ff348a`), or as a hue-lightness-saturation floating point triad (e.g., pure blue: `240.0 0.5 1.0`).
- The respective *Resource Names* and *Command Line Arguments* are:
 - Default arrival flag -> `dbpick.arrival.background`; `-bga`
 - Defining arrival flag -> `dbpick.definingArrival.background`
 - Associated arrival flag -> `dbpick.associatedArrival.background`
 - Use magnitude flag -> `dbpick.magnitudeArrival.background`

dbevents_pre

General Information

The program `dbevents_pre` has two modes:

- In the default mode the program makes two windows, one window with QT maps of recent seismic events and one window showing tables of recent hypocenters and events as well as metadata for the chosen event.
- If the `-noqt` option is specified, the program displays old-style maps directly in a single window along with spreadsheets and metadata.

The program `dbevents_pre` allows to define symbol type, size and color for stations and epicenters in the parameter file. Cool new feature is color coding by author!

Currently the user cannot control within the parameter file:

- Age fading
- Depth coding

dbevents_pre

Size and shapes

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The parameter file defines:

- station_symbol triangle
 also allowed: point | cross | x | square | circle | star | diamond

Overview map:

- overview_station_size in pixels, e.g., 4
- overview_event_size in pixels, e.g., 2
- overview_event_bb_size in pixels, e.g., 8
- overview_event_symbol beachball | square

Event view:

- focus_station_size in pixels, e.g., 8
- focus_event_size in pixels, e.g., 16
- focus_event_bb_size in pixels, e.g., 16
- focus_event_symbol beachball | star

dbevents_pre

Colors

colors &Arr{

```
    activebackground      darkgray
    activeforeground      red
    default                \#e0e0e0
    background_evenrows   \#f0f0ff
    background_eventbanner chartreuse
    background_infopanel_focus white
    background_oddrows     white
    background_selected    chartreuse
    background_statusbar   \#ffe0e0
    background_scrollbar   lightblue
    boundaries_national     red
    boundaries_minor        \#ff00ff
    boundaries_provincial   \#00a000
    fill_land                \#fff2e5
    fill_water              \#e0e0ff
    focus_event_bb_fill     yellow
    focus_event_fill        chartreuse
    focus_event_outline     black
```

```
}
```

```
overview_event_bb_fill  yellow
overview_event_fill     blue
overview_event_outline  black
rowedit_warning         red
station_assoc_fill     lightgreen
station_defining_fill blue
station_fill            gray
station_outline         black
USGS                    wheat
Antelope                alice blue
SCSN                    seashell
NCSN                    honeydew
CERI                    ivory
GSC                     pink
NBE                     light yellow
LCSN                    mint cream
MTECH                   light coral
UUSS                    light salmon
warning_editable        orange1
```



```
author_translations &Arr{
#   Regex      Short-name      Long-name
   Ot.*        Antelope        Antelope Real-time System
   USGS.*      USGS            U.S. Geological Survey
   SCSN.*      SCSN            Southern California Seismic Network
   NCSN.*      NCSN            Northern California Seismic Network
   CERI.*      CERI            Center for Earthquake Research and Information
   GSC.*       GSC             Geological Survey of Canada
   NBE.*       NBE             Nevada Seismological Laboratory
   LCSN.*      LCSN            Lamont-Doherty Cooperative Seismographic Network
   MTECH.*     MTECH           Montana Tech
   UUSS.*      UUSS            University of Utah
}
```

For calculated origins:

1. Station with a phase -> station and great circle as define for Antelope in color array (alice blue)
2. Station with defining phase -> station filled with purple and great circle is purple
3. Station with associated phase -> station filled with orange and great circle is orange

For associated origins:

1. Associated origin -> station and great circle as define for author in color array (e.g., USGS = wheat)
2. Associated stations -> station filled with orange and great circle is orange



THANK YOU



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