Subject: Re: ERASING a line
Posted by Andy Loughe on Tue, 08 Oct 1996 07:00:00 GMT
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Can you re-draw the line using color=!p.background

Andrew F. Loughe afl@cdc.noaa.gov
University of Colorado, CIRES http://cdc.noaa.gov/~afl
Campus Box 449 phn:(303)492-0707 fax:(303)497-7013
Boulder, CO 80309-0449 "He who laughs last thinks slowest!"

On Tue, 8 Oct 1996, Mario Noyon wrote:

> I would like to draw a vertical line on a drawing widget and erase it
> afterwards. Just like idl does it with the BOX_CURSOR.
> I watched this routine to see how they did, but my pocedure refuses to
> redraw the line erased.
>
> Does someone has an idea??
>
> Thanks.
>
> --
> NOYON Mario
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>
>

Subject: Re: ERASING a line
Posted by davidf on Wed, 09 Oct 1996 07:00:00 GMT
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Mario Noyon <mnoyon@jmc-luni.u-bordeaux2.fr> writes:

> I would like to draw a vertical line on a drawing widget and erase it
> afterwards. Just like idl does it with the BOX_CURSOR.
> I watched this routine to see how they did, but my procedure refuses to
> redraw the line erased.

> Does someone have an idea?

You should count your blessings. I have just the opposite problem.
My procedures do *exactly* what I tell them to do, but half the

time they produce nonsense. The technical term for this is "recalcitrant procedures".

Andy Loughe suggests one solution. Draw the line over again in the background color.

```
PLOTS, line, color=!P.BACKGROUND
```

This is often an excellent solution, but it is not really "erasing" the box, which you will soon discover if your line crosses anything other than background.

The technique used in the BOX_CURSOR program is to use the exclusive OR graphics function.

```
DEVICE, SET_GRAPHICS_FUNCTION=6   ; XOR mode
PLOTS, line    ; Draw the line
PLOTS, line    ; Erase the line
DEVICE, SET_GRAPHICS_FUNCTION=3   ; Normal mode
```

This works by "flipping" the bits of the underlying pixel values to their "opposite" color. When you draw the second time, the pixels are flipped back to their original values, thereby erasing the line.

Unfortunately, this does not always give satisfactory results either because you can't exactly draw a "green" box, unless you have a private color table in IDL (and who does?). Since I often want to draw lines in green or yellow, or some other pleasant color, I prefer to use a technique called "device copy" in conjunction with pixmap windows.

In this technique, you create a copy of your graphics window as a pixmap window (a window in memory). This has everything your graphics window has in it, except for the line that you drew in the graphics window. When you want to erase the line, you "copy" the contents of the pixmap window into the graphics window. (Sometimes you copy only the portion of the pixmap window necessary to repair the damage in the graphics window, but most of the time this technique is fast enough that I just slam the whole pixmap window over.) This has the effect of erasing the line. It will look something like this:

```
WINDOW, 0, TITLE='Graphics Window', XS=300, YS=300
PLOT, data
OPLOT, moredata
WINDOW, 1, /PIXMAP, XS=300, YS=300
```

```
PLOT, data
OPLOT, moredata

   ; Now draw the line in the graphics window.

WSET, 0
PLOTS, line, COLOR=green

   ; Now erase the line.

DEVICE, COPY=[0, 0, 300, 300, 0, 0, 1]
```

Device copy is extremely fast (*much* faster than just re-doing the graphics). It is the technique I would recommend.

Yours,

David

--
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Subject: Re: ERASING a line
Posted by peter on Wed, 09 Oct 1996 07:00:00 GMT
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Peter Mason (peterm@demsyd.syd.dem.csiro.au) wrote:

: <Lots of good advice about how to draw on displays>

I'd back up Peter's method 2 -- it is reliable (you get control over the color of the line(s)), and certainly fast enough (many 10's of redraws per second, if you want). I've always taken the simple route of copying the entire window to a pixmap and back (especially if you are drawing boxes or more complex shapes rather than lines), and I've found that using normal co-ordinates is 100% reliable and results in short, easy to read code. If you'd like a copy of a box_cursor routine that uses this method, let me know.

Peter

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Phone: (415) 813-3756

Subject: Re: ERASING a line
Posted by Peter Mason on Wed, 09 Oct 1996 07:00:00 GMT
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On Tue, 8 Oct 1996, Mario Noyon wrote:
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Here are two ways to do it:

The first is the easiest; it just involves using "XOR" mode. In XOR mode
you can erase a graphic simply by redrawing it. BOX_CURSOR uses this method.
Here's how:
1] Draw your "main" graphics as usual (e.g., a plot or an image).
2] Wait for some initialisation signal (e.g., a button-down event from your
draw widget).
3] Use DEVICE,GET_GRAPHICS=old,SET_GRAPHICS=6 to enter "xor" drawing mode.
4] Draw your initial line (or box or whatever). It's best if you draw it
using "device" coordinates, as it's possible that "data" coords might not
be established, and "normal" coords can be imperfectly repeatable (well,
I've noticed this once or twice with some older versions of IDL).
5] Wait for the user to update the line's position, or to issue a termination
signal. e.g., Wait for a motion- or button-up event from your draw
widget.
6] Redraw your line in the same position as before - this rubs it out.
7] If you got a position-update (e.g., a motion event) in 5], draw the line
in the new position and go back to 5].
8] Use DEVICE,SET_GRAPHICS=old to restore the graphics mode. (Normally "old"
is 3, meaning "copy".)
Commonly the line (or box...) would be drawn with the highest available
colour (!d.table_size in 8-bit mode). In XOR mode it will only come out in
this colour in areas which are otherwise black (if you're lucky) - in other
areas it'll come out in some arbitrary colour. But it'll usually stand out
against the background. If you want total control over the line's colour,
you have to resort to method 2...

Method 2 is more complicated - it's the hard and thorough way.
Before drawing the line, you save the bits of your graphics window which are
about to be overwritten (by the line) to PIXMAP (invisible) window(s). You
erase the line by restoring the bits from the pixmap window(s).
A pixmap window can be created by:
WINDOW,/FREE,/PIXMAP,XSIZE=xpix,YSIZE=ypix &pixid=!D.WINDOW
The easy way out is to make the pixmap window the same size as your draw

widget. But since graphics memory can be a scarce resource and since you'll
just be "overplotting" a vertical line, xpix=1 and ypix=[your widget's height]
will suffice.
To save a "line's worth" to the pixmap window, use:
    WSET,pixid &DEVICE,COPY=[xpos,ypos,1,ypix,0,0,drawid] &WSET,drawid
where: xpos&ypos are your line-to-be's position in your draw widget (device
    coords); ypix is the height (in pixels) of your draw widget; drawid
    is the "value" of your draw widget; pixid is the window ID of your
    pixmap window.
To restore from the pixmap window, use:
    DEVICE,COPY=[0,0,1,ypix,xpos,ypos,pixid]
So..
Steps 3] and 8] disappear.
Before you draw the line (steps 4] and 7]), save to the pixmap window.
To erase the line (step 6]), just restore from the pixmap window.
This method has an additional complication: you have to destroy and recreate
the pixmap window if the size of your draw widget is changed.

Hope this helps

Peter Mason

Subject: Re: ERASING a line
Posted by David Foster on Thu, 10 Oct 1996 07:00:00 GMT
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Andilu wrote:

> On Tue, 8 Oct 1996, Mario Noyon wrote:
>
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>> afterwards. Just like idl does it with the BOX_CURSOR.
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>> redraw the line erased.

You might try using the XOR drawing mode to allow you to draw and
then erase in a draw widget. Sometimes the results are acceptable,
sometimes not. I have a routine called WINDOW_XOR_LINE.PRO that
pops up a slider widget, and lets you adjust either a vertical or
horizontal line in a draw widget, and returns the X/Y position.
Don't know if this is what you need, but it would at least
illustrate the method. Let me know by email if you'd like a
copy.

Dave

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