Subject: Re: device coords to map coords? Try my DRAW_MAP.PRO.
Posted by grunes on Wed, 13 Dec 1995 08:00:00 GMT
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I have had bad luck trying to get map_set to do things right, or even
properly correlating the coordinate grid with the map features, though
I suppose it is possible that problem has been fixed by now.
I wrote my own, that reads the map files that IDL defines, and draws
things in a very simple manner.

After draw_map is called, user coordinates are identical to lat,lon
(degrees north and east) coordinates, so if you want to plot something
on the map, just do
  PLOTS,LATITUDE_ARRAY,LONGITUDE_ARRAY

-------------------------CUT HERE---------------------

; Contains two routines, by Mitchell R Grunes:

; Nice_Tic: Make axis tic intervals nice.
; Draw_Map: Draw a map.

```
 ;------------------------------------------------------------ -----------------
; Routine to make axis tic intervals nice.
 ;------------------------------------------------------------ -----------------
  pro Nice_Tic,xmin,xmax,absmin,absmax, xticks, xtickv
                          ; ---------------INPUT---------------
                          ; xmin and xmax=min,max plot values.
                          ; absmin,absmax=boundaries for ticks--
                          ;  e.g., for latitude, should use -90,90
                          ; xticks=maximum desired # of
                          ;  tick intervals (will be revised).
                          ; ---------------OUTPUT--------------
                          ; xticks, xtickv = the PLOT parameters
                          ;  of the same name.

                          ;By Mitchell Grunes.

  dx=double(xmax-xmin)/xticks   ;Approximate interval length.
  dxlog=alog10(dx)
  dxlog=long(dxlog+100)-100
  scale=10.d0^dxlog
  dx=dx/scale                   ;Scaled to interval [1,10].

  if          dx lt 1.0d0 then begin
    dx=1.0d0
  endif else if dx lt 1.5d0 then begin
    dx=1.5d0
```

```
 endif else if dx le 2.0d0 then begin
   dx=2.0d0
 endif else if dx le 2.5d0 then begin
   dx=2.5d0
 endif else if dx le 3.0d0 then begin
   dx=3.0d0
 endif else if dx lt 5.0d0 then begin
   dx=5.0d0
 endif else begin
   dx=10.d0
 endelse

 xmins=xmin/scale
 if xmins lt absmin/scale then xmins=absmin/scale
 if xmins ge 0 then begin
   xmins= long( xmins/dx+1)*dx
 endif else begin
   xmins=-long(-xmins/dx  )*dx
 endelse

 xmaxs=xmax/scale
 if xmaxs gt absmax/scale then xmaxs=absmax/scale
 if xmaxs ge 0 then begin
   xmaxs= long( xmaxs/dx  )*dx
 endif else begin
   xmaxs=-long(-xmaxs/dx  )*dx
 endelse

 xticks=fix((xmaxs-xmins)/dx)
 if xticks gt 30 then dx=dx*2          ; Do to IDL limits
 xtickv=(indgen(xticks+1)*dx+xmins)*scale
 end

;------------------------------------------------------------ -----------------
; Routine to Draw a map.
;------------------------------------------------------------ -----------------
 pro Draw_Map,latmin,latmax,lonmin,lonmax,title

                ;Draw a map.  It will then be possible to
                ; plot over the map using
                ;       PLOTS,LON,LAT,NOCLIP=0
                ; (LON and LAT are arrays in degrees).

                ;latmin,latmax=minimum,maximum latitude (>0=north)
                ;lonmin,lonmax=minimum,maximum longitude (>0=east)
                ;title=plot title

                ;By Mitchell Grunes.
```

```
                ;Simplified from userlib procedure map_set.pro,
                ; because I could not figure out a way to get
                ; map_set.pro to give a simple rectangular
                ; projection, and because it seemed to be drawing
                ; things in the wrong places.

latmin2=latmin
latmax2=latmax
lonmin2=lonmin
lonmax2=lonmax
                ;Adjust aspect, lat and lon boundaries so that
                ;the lat and lon scales will be the same at map
                ;center.  Approximately valid for default postscript
                ;in landscape mode.
aspect=8.3125/6.125/cos((latmin+latmax)/2.*!pi/180)
if (lonmax-lonmin) lt (latmax-latmin)*(aspect*.98) then begin
  d=(latmax-latmin)*aspect-(lonmax-lonmin)
  lonmin2=lonmin2-d/2
  lonmax2=lonmax2+d/2
endif else if (latmax-latmin) lt (lonmax-lonmin)/(aspect*.98) then begin
  d=(lonmax-lonmin)/aspect-(latmax-latmin)
  latmin2=latmin2-d/2
  latmax2=latmax2+d/2
endif

lonmin3=lonmin2       ;Keep within 360 degree range
lonmax3=lonmax2
if lonmax2-lonmin2 gt 360 then begin
  avg=(lonmin2+lonmax3)/2.d0
  lonmin3=avg-180.01d0
  lonmax3=avg+180.01d0
endif

xticks=15
Nice_Tic,lonmin2,lonmax2,lonmin3,lonmax3, xticks, xtickv
yticks=20
Nice_Tic,latmin2,latmax2,-90,    90,      yticks, ytickv
plot,[lonmin2,lonmin2,lonmax2,lonmax2,lonmin2], $
  [latmin2,latmax2,latmax2,latmin2,latmin2],xstyle=1,ystyle=1, title=title, $
  ticklen=1,xticks=xticks,yticks=yticks,xtickv=xtickv,ytickv=y tickv
close,1
openr,1,FILEPATH('supmap.dat',subdir = "maps"),/xdr,/stream
fbyte = [ 0, 71612L, 165096L]
nsegs = [ 283, 325, 594 ]
ij=2                ;0=course resolution map,1=U.S. only,2=All
point_lun, 1, fbyte(ij)
for i=1,nsegs(ij) do begin
```

```
    npts = 0L
    maxlat=0. & minlat=0. & maxlon=0. & minlon=0.
    readu,1,npts,maxlat,minlat,maxlon,minlon
    npts = npts / 2         ;# of points
    xy = fltarr(2,npts)
    readu,1,xy
    lat = xy(0,*)
    lon = xy(1,*)
                            ; if stuff out of range, skip
                            ;  map segment.
    if maxlat lt latmin2 or minlat gt latmax2 then goto,skip
    if maxlon le lonmin3 then begin
      minlon=minlon+360
      maxlon=maxlon+360
      lon=lon+360
    endif
    if minlon ge lonmax3 then begin
      minlon=minlon-360
      maxlon=maxlon-360
      lon=lon-360
    endif
    if (maxlon lt lonmin3) or (minlon gt lonmax3) then goto,skip
    plots, lon,lat,NOCLIP=0,color=3*!d.n_colors/9
    empty
skip:
  endfor
  end
```