Subject: Re: Q: Labeling axes when using MAP_SET
Posted by afl on Tue, 09 May 1995 07:00:00 GMT
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This procedure performs labeling of lat/lon points around the
edge of a map. It is pretty specific to the way I prefer things,
but it may help you with your problem as well. Good luck with it.
It is a bit verbose, but seems to do the job with a variety of
map projections...

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;  Procedure to label the lat/lon values around the boundary of a map.
;
;  Originator:  Andrew F. Loughe  (2/22/95)

pro map_label, color=color, charsize=charsize, $
               lhs=lhs, rhs=rhs, $
               latdel=latdel, londel=londel, $
               nudgex=nudgex, nudgey=nudgey, help=help

;  Print a help message to the IDLTERM.
if (n_elements(help) gt 0) then begin
   message, '  map_label, color=color, charsize=charsize,' + $
            ' lhs=lhs, rhs=rhs, latdel=latdel, londel=londel,' + $
            ' nudgex=nudgex, nudgey=nudgey, help=help'
endif

;  Set some defaults
if (n_elements(color) eq 0) then color = !p.color
if (n_elements(charsize) eq 0) then charsize = 0.8

lhs = keyword_set (lhs)
rhs = keyword_set (rhs)
if (lhs eq 0 and rhs eq 0) then lhs = 1

if (n_elements(latdel) eq 0) then latdel = 30
if (n_elements(londel) eq 0) then londel = 30

if (n_elements(nudgex) eq 0) then nudgex=0
if (n_elements(nudgey) eq 0) then nudgey=0

on_error, 2

;  Get lat/lon boundaries of the map.
lonmin  = !map.out(2)
lonmax  = !map.out(3)
latmin  = !map.out(4)
latmax  = !map.out(5)
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if (lonmin eq lonmax) then lonmax = lonmin + 360.
DX = abs (lonmax - lonmin)

;  Determine character height and width.  Apply charsize.
char_ht = convert_coord([0,!d.y_ch_size],/device,/to_norm)
char_ht = char_ht(1) * 1.0
if (!d.name ne 'X' and charsize gt 1.) then $
    char_ht = char_ht * charsize

char_wd = convert_coord([0,!d.x_ch_size],/device,/to_norm)
char_wd = char_wd(1)

;  Nudging factor (convert from data to normalized)
y_avg   = .5*(latmin + latmax)
nudgex1 = convert_coord( [nudgex,y_avg], /data, /to_norm )
nudgex2 = convert_coord( [nudgex+nudgex,y_avg], /data, /to_norm )
nudgex  = nudgex2 - nudgex1
nudgex  = nudgex(0)

x_avg   = .5*(lonmin + lonmax)
nudgey1 = convert_coord( [x_avg,nudgey], /data, /to_norm )
nudgey2 = convert_coord( [x_avg,nudgey+nudgey], /data, /to_norm )
nudgey  = nudgey2 - nudgey1
nudgey  = nudgey(1)


;  Test to see how close the lower longitude points are.
;  If they are too close, then place longitude labels along EQ.
xypos1 = convert_coord([lonmin, latmin], /data, /to_norm)
xypos2 = convert_coord([lonmin+DX/2., latmin], /data, /to_norm)
bottom = 'yes'
if ( abs(xypos1(0) - xypos2(0)) lt .2 ) then bottom='no'

;  Plot longitude labels along BOTTOM boundary of the map.
for i = fix(lonmin), fix(lonmax) do begin
   if ( (i mod londel) eq 0 ) then begin
      ii = fix(abs(i))
      if (i gt 180) then ii = abs(360 - ii)

;  Determine text of longitude label.
      append = ''
      if (i gt 0   and i lt 180) then append='E'
      if (i lt 0   or  i gt 180) then append='W'
      if (i gt 360 and i lt 540) then append='E'
      if (i gt 540 and i lt 720) then append='w'
      if ( (abs(i) mod 180) eq 0 ) then append=''
      if ( (abs(i) mod 360) eq 0 ) then ii='0'
      label = strcompress(string(ii), /rem) + append
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;  Determine where to place longitude label.
      xypos = convert_coord([i, latmin], /data, /to_norm)
      x = xypos(0)
      y = !y.window(0) - (char_ht)*1.2 + nudgey

;  Some projections have longitude labels at EQ.
      if ( bottom eq 'no' ) then begin
        xypos = convert_coord([i, .5], /data, /to_norm)
        x = xypos(0)
        y = xypos(1)
         if ( x ge !x.window(0)+char_wd*2.   and  $
              x le !x.window(1)-char_wd*2.   and  $
              y ge !y.window(0)+char_ht   and  $
              y le !y.window(1)-char_ht ) then $
            xyouts,x,y,label,charsize=charsize,color=color,align=.5,/nor m

      endif else begin

;  Plot longitude labels at bottom of the map.
         if ( x ge !x.window(0)+char_wd*2.   and  $
              x le !x.window(1)-char_wd*2. ) then $
            xyouts,x,y,label,charsize=charsize,color=color,align=.5,/nor m
      endelse
   endif

endfor   ; i



;  Plot latitude labels along LEFT or RIGHT boundary of the map.

for i = latmin, latmax do begin
   if ( (i mod latdel eq 0) ) then begin
      ii = fix(abs(i))

;  Determine text of latitude label.
      append=''
      if (i lt 0) then append='S'
      if (i gt 0) then append='N'
      if (i eq 0) then ii='EQ'
      label = strcompress(string(ii), /rem) + append



;  Determine where to place latitude label.

;  Work in from the far left to find the y position.
      if (lhs eq 1) then begin
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        for x1 = lonmin-10., lonmax, .1 do begin
          xypos = convert_coord( [x1, i], /data, /to_norm)
          xypos2 = xypos
          xypos2(0) = xypos2(0) - char_wd
          xypos2(1) = xypos2(1) + char_ht
          if (xypos2(0) ge !x.window(0) and xypos2(1) ge $
            !y.window(0) and xypos2(1) le !y.window(1)) $
            then goto, jump2
        endfor

;  Work in from the far right to find the y position.
      endif else begin
        for x1 = lonmax+10., lonmin, -.1 do begin
          xypos = convert_coord( [x1, i], /data, /to_norm)
          xypos2 = xypos
          xypos2(0) = xypos2(0) + char_wd
          xypos2(1) = xypos2(1) + char_ht
          if (xypos2(0) le !x.window(1) and xypos2(1) ge $
            !y.window(0) and xypos2(1) le !y.window(1)) $
            then goto, jump2
        endfor
      endelse
jump2: y = xypos(1) - (char_ht*.25)


;  Move end latitudes around a bit.
     if (i eq  latmax) then y = xypos(1) - (char_ht * .2)
     if (i eq  latmin) then y = xypos(1)

;  Find lefthand or righthand side of the plot boundary.
     if (lhs eq 1) then x = !x.window(0) - (char_wd*.5) + nudgex
     if (rhs eq 1) then x = !x.window(1) + (char_wd) + nudgex

;  Plot latitude label.
     xyouts, x, y, label, charsize=charsize, color=color, $
           align=(lhs eq 1), /norm

  endif
endfor   ; i


end
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