Subject: Single Pixel Wide Straight Lines
Posted by devilsclaw on Fri, 14 Oct 2022 14:15:04 GMT
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So if I use Draw directly from the Paint function parameter I can draw Straight lines that are a single pixel wide.

If I use PaintingPainter, ImageBuffer BufferPainter combo, or DrawPainter Nearly all lines that are supposed to be single pixel wide are two pixels with fading effects applied to them. this is with MODE_ANTIALIASED, MODE_NOAA, MODE_SUBPIXEL as well. The reason why I say nearly all is because in some cases when I do a grid some lines are actually single lines but most are not.

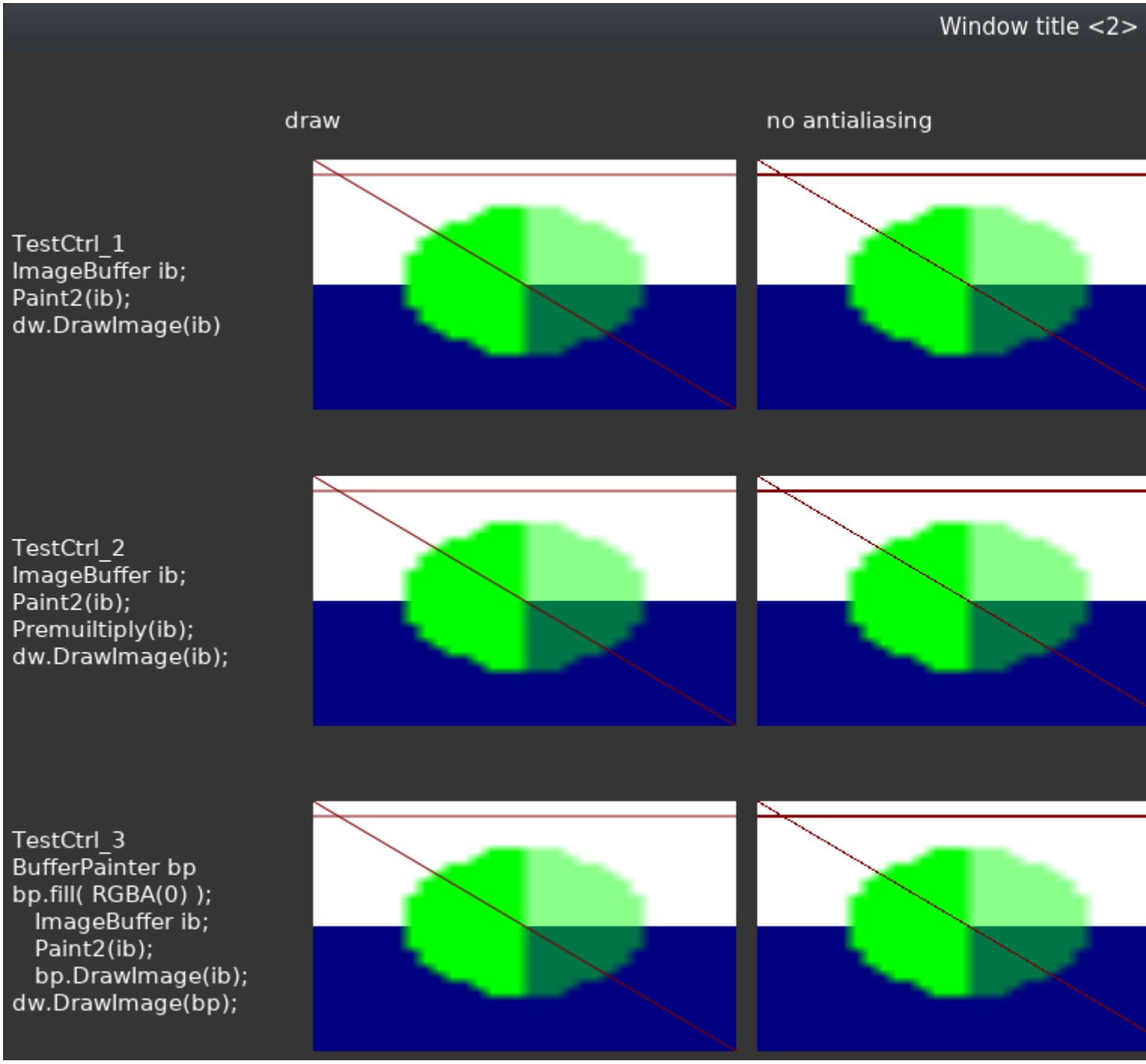
The reason I can;t just use Draw is because I need the ability to draw in the same place twice and have them show both sort of mixed together.

Is there a way to draw single pixel wide straight lines or is there a way to paint pixels in an array or buffer or something so I can do that my self.

Subject: Re: Single Pixel Wide Straight Lines
Posted by devilsclaw on Fri, 14 Oct 2022 14:19:07 GMT
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This is an example of what I mean about it being 2 pixels when its supposed to be one.

File Attachments
1) Screenshot_2022-10-14_07-16-49.png, downloaded 544 times



Subject: Re: Single Pixel Wide Straight Lines
Posted by devilsclaw on Fri, 14 Oct 2022 17:04:03 GMT
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Fist Picture is an example where it sometimes is a single pixel line but most the time 2

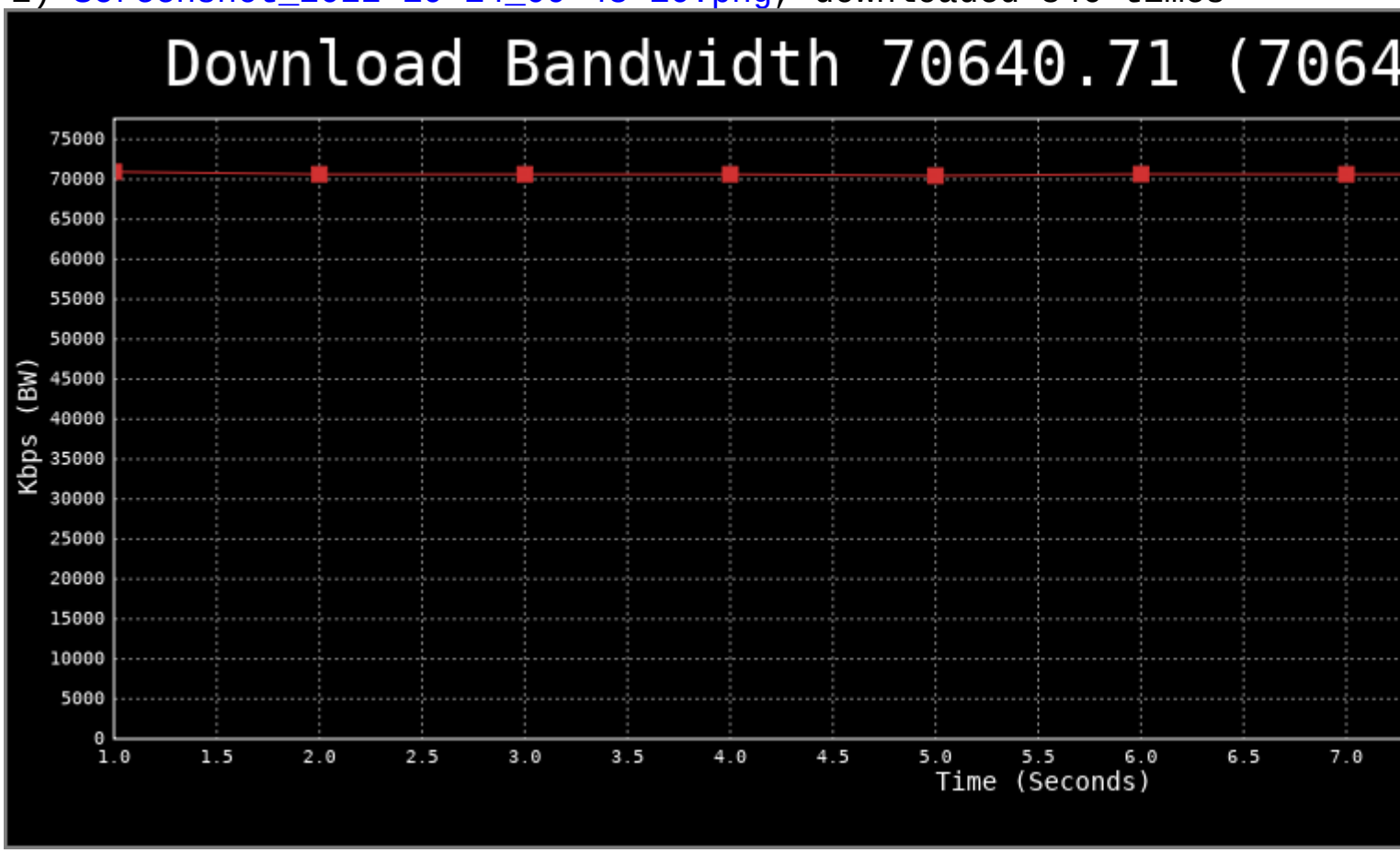
Second picture is where I use Draw directly from paint and single pixel lines work but as you see no green at the bottom to do it being not blended in.

Third picture is the same as second picture just using

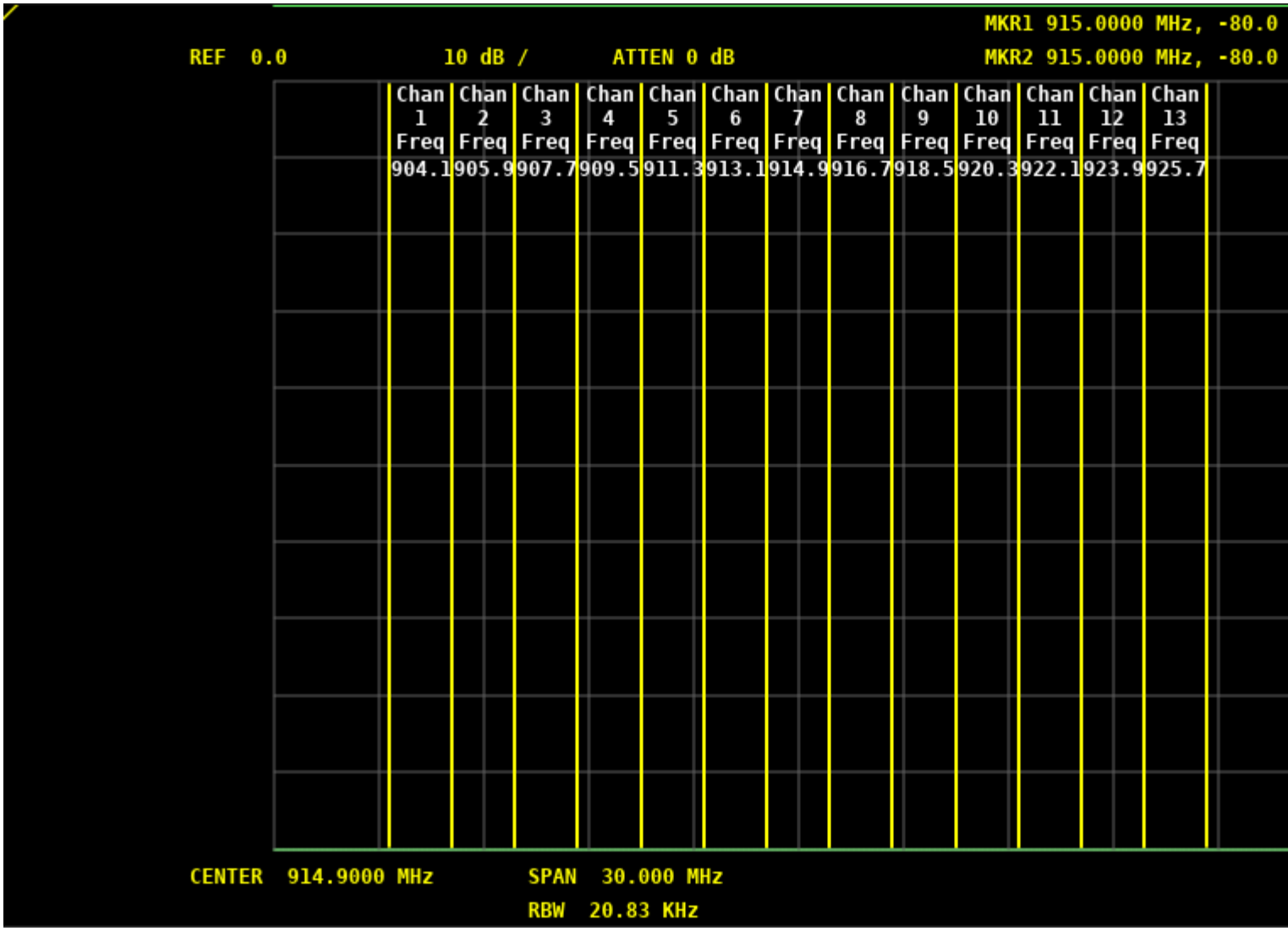
```
ImageBuffer ib(sz);
BufferPainter sw(ib, MODE_ANTIALIASED);
w.DrawImage(sz, ib);
```

File Attachments

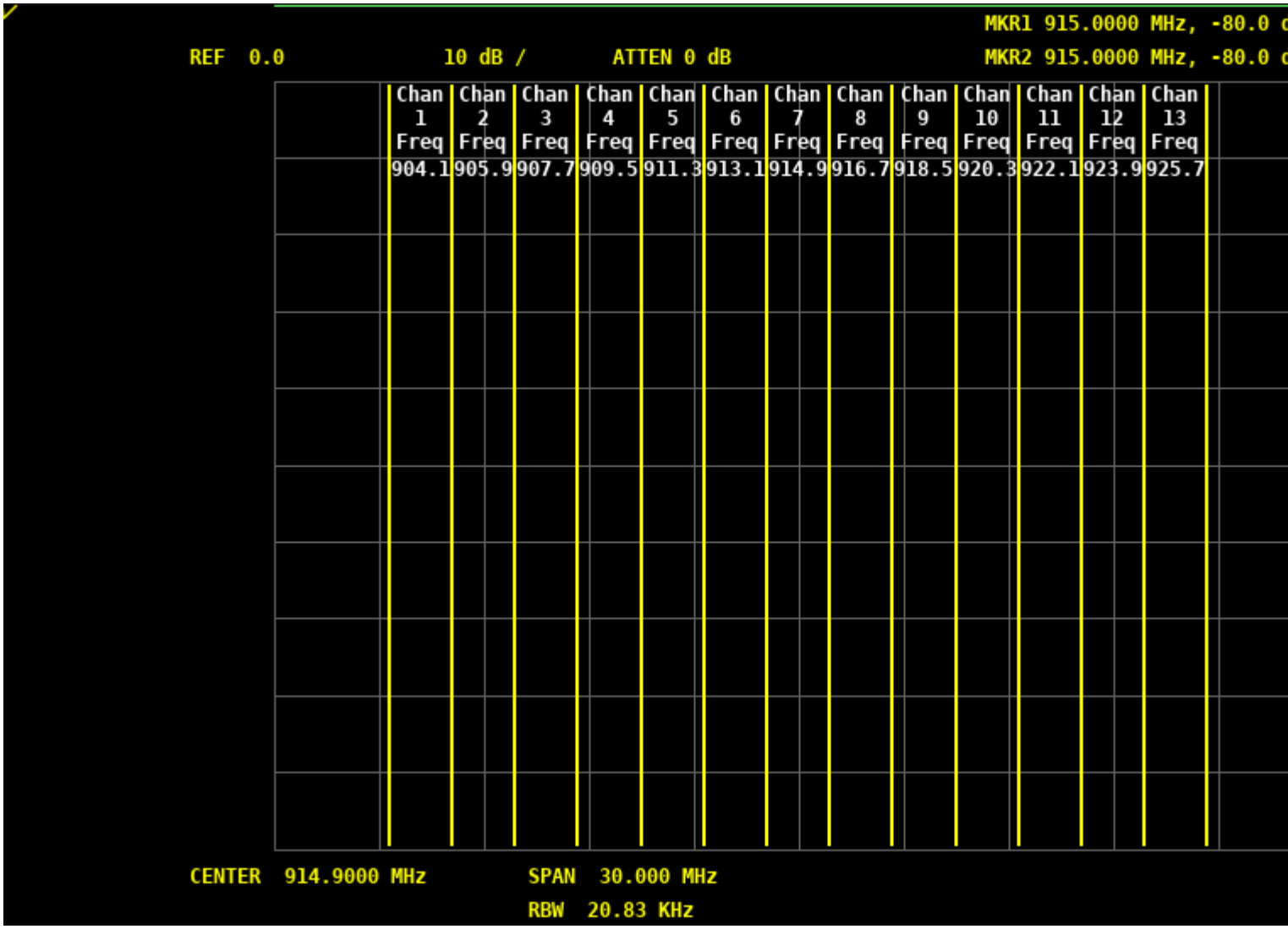
1) Screenshot_2022-10-14_09-48-10.png, downloaded 846 times



2) Screenshot_2022-10-14_09-53-20.png, downloaded 874 times



3) Screenshot_2022-10-14_09-54-42.png, downloaded 849 times



Subject: Re: Single Pixel Wide Straight Lines
Posted by dolik.rce on Fri, 14 Oct 2022 17:55:23 GMT
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Hi devilsclaw,

It looks like you're actually drawing single pixel lines that do not "fit in the pixel". The engine actually draws half of it into one pixel and the other half to the adjacent one... This is not usually a problem, but it produces ugly results for vertical and horizontal lines. Try moving the horizontal lines 0.5 pixel up or down and similarly vertical lines 0.5px left or right

The only weird thing is that it does produce fuzzy effect even with NO_AA. I'd expect that without antialiasing, the coordinates would be rounded to the nearest pixel.

Best regards,
Honza

Subject: Re: Single Pixel Wide Straight Lines
Posted by devilsclaw on Fri, 14 Oct 2022 18:05:10 GMT
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I am using DrawLine which only allows integers to draw so how can it be half a pixel at that point ?.

I can try using Move + Line again and shift pixels.

The throughput is using Move + Line which would explain the half pixel thing there but none of the others are.

Subject: Re: Single Pixel Wide Straight Lines
Posted by devilsclaw on Fri, 14 Oct 2022 18:46:25 GMT
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So I tried what you suggested moved it by 0.5 of a pix which moved it from 10 to 10.5 and then the line was a single pixel. But that is not possible to do with DrawLine since its integer. This to me feels like a bug that you have to be half a pixel off to get a pixel line width.

Subject: Re: Single Pixel Wide Straight Lines
Posted by devilsclaw on Fri, 14 Oct 2022 21:33:49 GMT
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So I figured out what is going on. Lines are painted from the center / origin of the point so if you say line is at y coord 10 and have a line width of 3 it will be 1.5 pixels below and above instead of starting the line at 10 and having 3 lines going down from the starting point.

This means all odd line sizes as in 1,2,5,7,9 etc will be the incorrect size with any integer based drawing on everything except Draw its self it seems. I believe this is the wrong way to draw a line it should not be center radial.

This code example shows it working and clean lines

```
void Paint(Draw &w) {
  Size sz = GetSize();
  ImageBuffer ib(sz);
  BufferPainter sw(ib, MODE_ANTIALIASED);

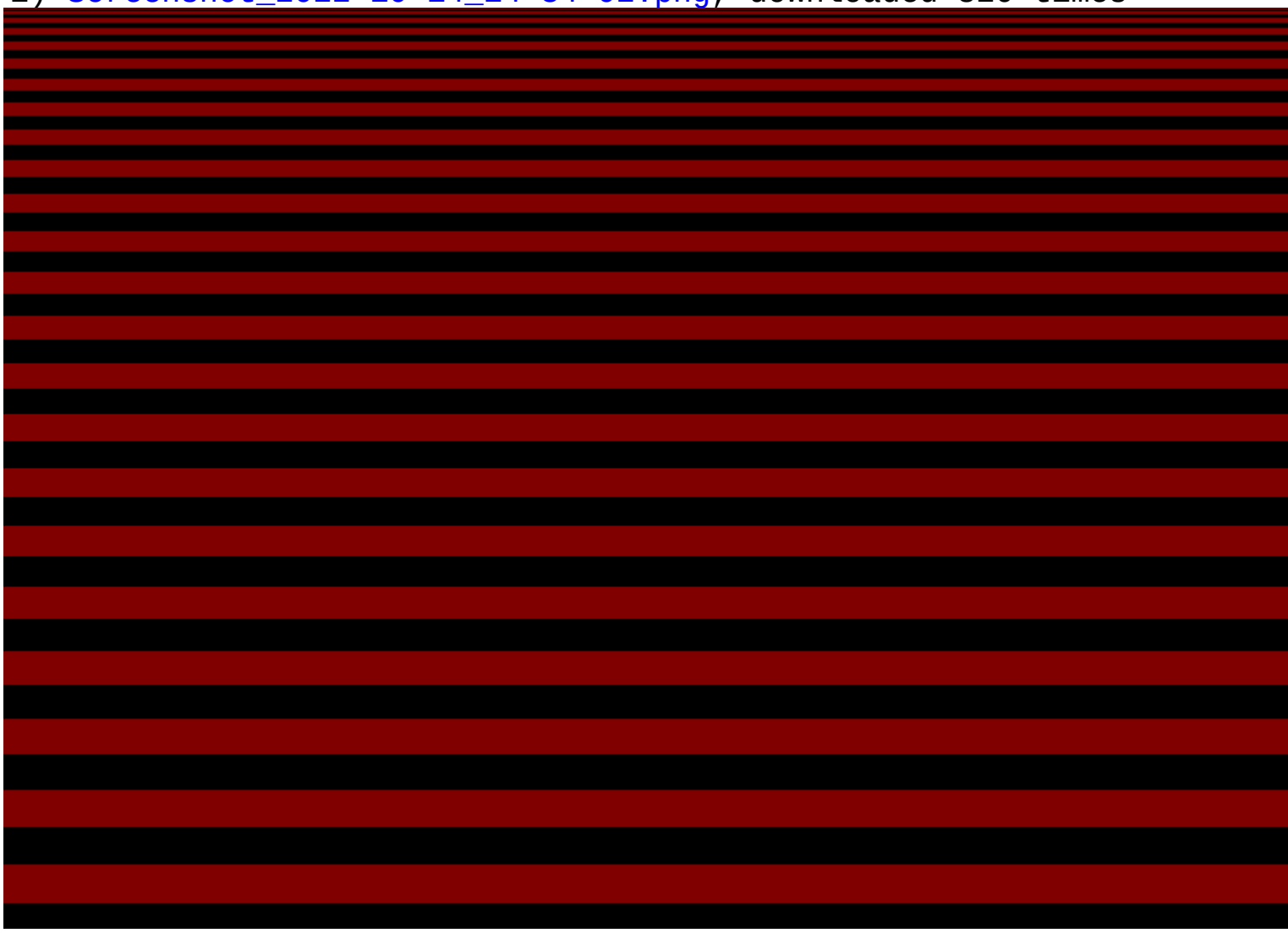
  sw.DrawRect(sz, Black());

  int pos_y = 0;
  for(int stroke = 1; true; stroke += 1) {
    double center_of_line = stroke / 2.0;
    sw.Move( 0, pos_y + center_of_line).Line(sz.cx, pos_y + center_of_line).Stroke(stroke, Red());
```

```
    pos_y += (stroke * 2);
    if(pos_y >= sz.cy) {
     break;
    }
   }
}
```

File Attachments

1) Screenshot_2022-10-14_14-34-02.png, downloaded 820 times



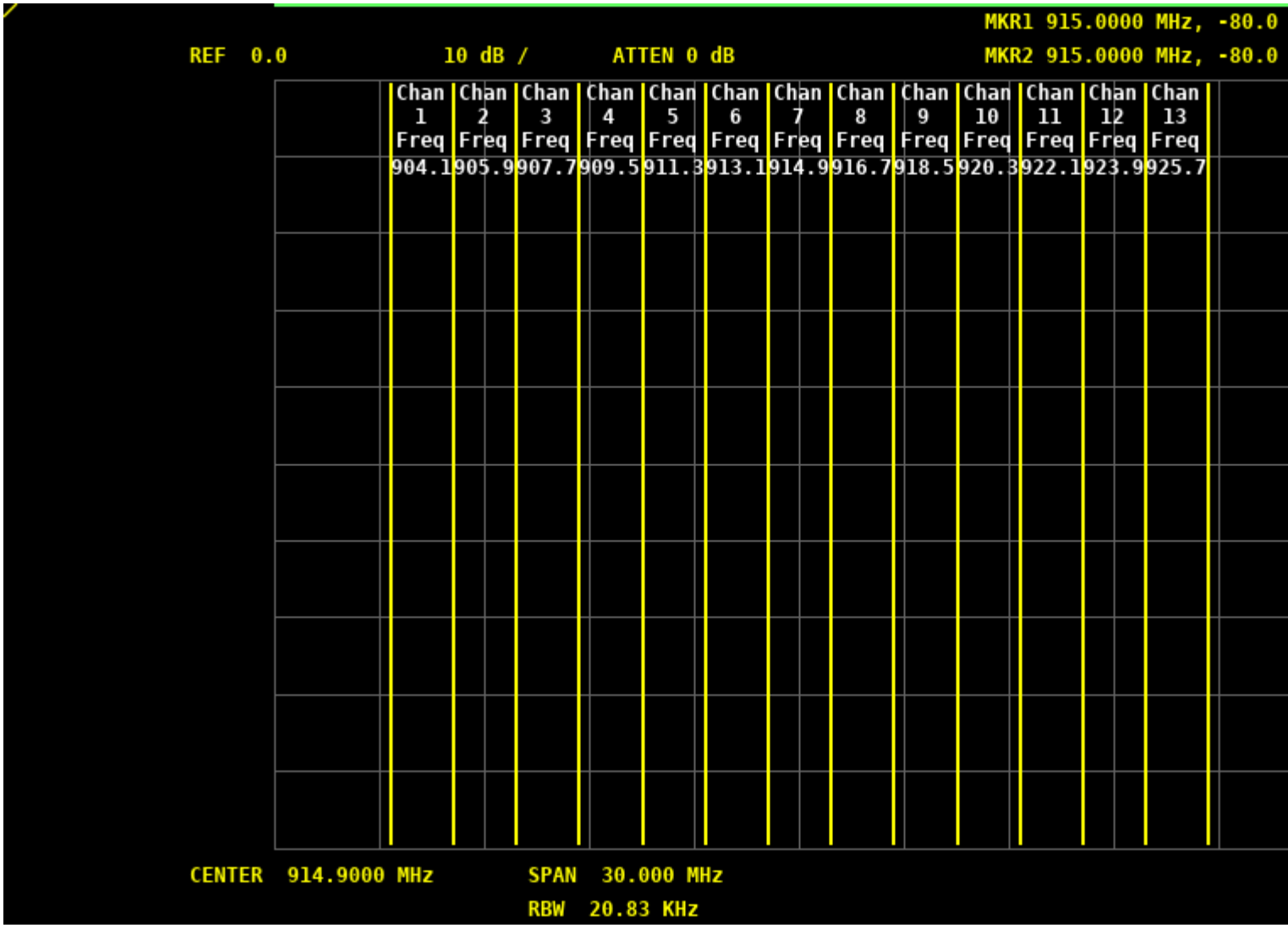
Subject: Re: Single Pixel Wide Straight Lines
Posted by devilsclaw on Fri, 14 Oct 2022 21:58:22 GMT
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To fix the below I ended up doing this.

```
void DrawLine(BufferPainter* bp, int x1, int y1, int x2, int y2, double stroke, Color color) {
  double center_of_line_x = 0;
  double center_of_line_y = 0;
  if(x1 == x2) {
    center_of_line_x = stroke / 2.0;
  }
  if(y1 == y2) {
    center_of_line_y = stroke / 2.0;
  }
  bp->Move(x1 + center_of_line_x, y1 + center_of_line_y).Line(x2 + center_of_line_x, y2 +
center_of_line_y).Stroke(stroke, color);
}
```

File Attachments

1) Screenshot_2022-10-14_14-54-49.png, downloaded 852 times



Subject: Re: Single Pixel Wide Straight Lines
Posted by Oblivion on Sat, 15 Oct 2022 07:23:44 GMT
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Quote:is there a way to paint pixels in an array or buffer or something so I can do that my self.

Yes. ImageBuffer allows direct access to its RGBA buffer.

e.g:

```
 void Paint(Draw& w) override
 {
  Size sz = GetSize();
  w.DrawRect(sz, Black());
  ImageBuffer canvas(sz);
```

```
 for(int y = 0; y < sz.cy; y++) {
  for(int x = 0; x < sz.cx; x++) {
   if((y % 16 == 0) || (x % 16 == 0))
    canvas[y][x] = White();
  }
 }
 w.DrawImage(0, 0, canvas);

}
```

is possible.

Best regards,
Oblivion

Subject: Re: Single Pixel Wide Straight Lines
Posted by mirek on Sat, 17 Dec 2022 07:42:43 GMT
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Obvious trick here is to do Translate(0.5, 0.5) at the beginning.

Subject: Re: Single Pixel Wide Straight Lines
Posted by devilsclaw on Sat, 17 Dec 2022 15:19:06 GMT
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Actually that would not work as you think since the problem is that that lines are drawn from there radial center and if you just shift everything by .5 then the even number lines will be messed up like the current odd line are. sure if the line is old then shift by 0.5 might be easier.
