Situation 1: SLC cap. 7.94 – 142 pf 12.6 uH 3800 to 15135 kHz Lots of Bunching at the high end.

But very linear between 5 and 6 MHz, even with SLC cap!

Bandspread Calculator

Input Parameters:

Lowest Frequency (kHz): 3800

Highest Frequency (kHz): 15135

Tuning Capacitor C_V Minimum Capacitance (pF): 7.94

Tuning Capacitor C_V Maximum Capacitance (pF): 142

Stray Capacitance C_S (pF):

Allowable Component Ranges:

Trimmer Capacitor C_T (pF): 0 ... 1.08

Padder Capacitor C_P (pF): >= 1044.50 (if present)

Inductor (µH): 12.26 ... 14.03

Exact Value Calculation:

Choose the Known Component: Inductor

Enter Inductance Value (µH): 12.3

Click to Calculate the Unknown Components: Calculate

Trimmer Capacitor C_T (pF): 1.05

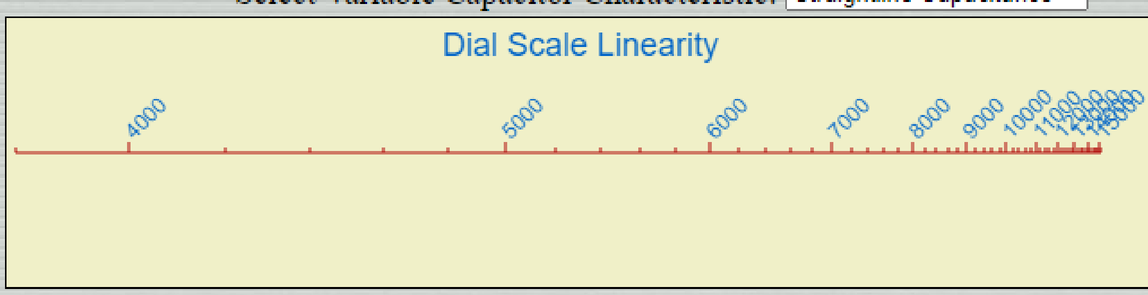
Padder Capacitor C_P (pF): 0.00

Inductor (µH): 12.30

Minimum Net Capacitance (pF): 8.99

Maximum Net Capacitance (pF): 143.05

Select Variable Capacitor Characteristic: Straightline Capacitance



Situation 2: Same parameters, but here using an SLF cap: Really spreads it out. It works well. Note: Tuning range is wide. Almost 4:1 Close to the 3:1 range of the AM broadcast band.

Bandspread Calculator

Input Parameters:

Lowest Frequency (kHz): 3800

Highest Frequency (kHz): 15135

Tuning Capacitor C_V Minimum Capacitance (pF): 7.94

Tuning Capacitor C_V Maximum Capacitance (pF): 142

Stray Capacitance C_S (pF):

Allowable Component Ranges:

Trimmer Capacitor C_T (pF): 0 ... 1.08

Padder Capacitor C_P (pF): >= 1044.50 (if present)

Inductor (µH): 12.26 ... 14.03

Exact Value Calculation:

Choose the Known Component: Inductor

Enter Inductance Value (µH): 12.3

Click to Calculate the Unknown Components: Calculate

Trimmer Capacitor C_T (pF): 1.05

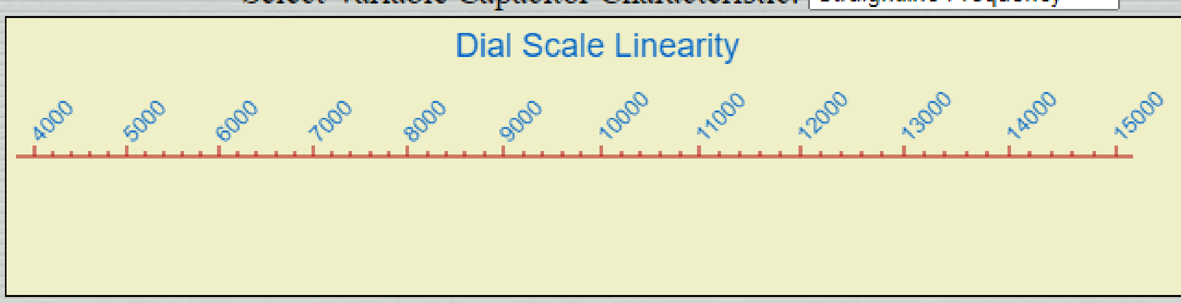
Padder Capacitor C_P (pF): 0.00

Inductor (µH): 12.30

Minimum Net Capacitance (pF): 8.99

Maximum Net Capacitance (pF): 143.05

Select Variable Capacitor Characteristic: Straightline Frequency



Situation 3: Look what happens when I narrow the tuning range. Here we are using the same variable cap and the same coil, but I have narrowed the tuning range from 5 to 5.5 MHz. Even with a standard SLC cap, the frequencies are much more spread out. This is why we often see fairly good tuning linearity even when using SLC caps!

Bandspread Calculator

Input Parameters:

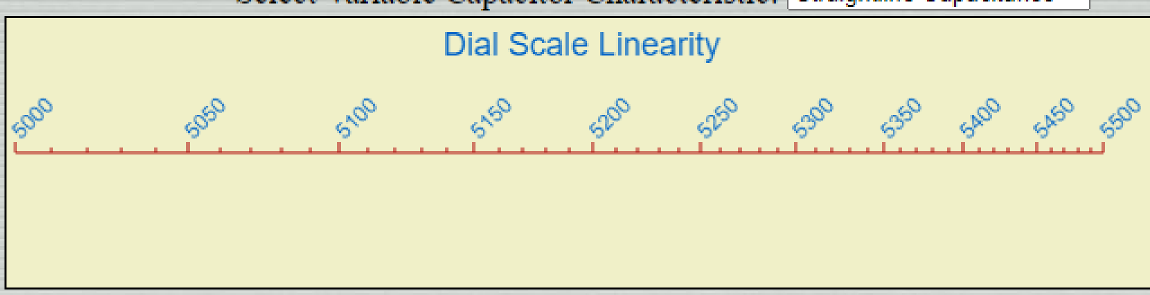
Lowest Frequency (kHz):	5000
Highest Frequency (kHz):	5500
Tuning Capacitor C_V Minimum Capacitance (pF):	7.94
Tuning Capacitor C_V Maximum Capacitance (pF):	142
Stray Capacitance C_S (pF):	

Allowable Component Ranges:

Trimmer Capacitor C_T (pF):	0 ... 630.44
Padder Capacitor C_P (pF):	>= 1.79 (if present)
Inductor (µH):	1.31 ... 573.68

Exact Value Calculation:

Choose the Known Component:	Inductor
Enter Inductance Value (µH):	12.3
Click to Calculate the Unknown Components:	Calculate
Trimmer Capacitor C_T (pF):	163.94
Padder Capacitor C_P (pF):	112.73
Inductor (µH):	12.30
Minimum Net Capacitance (pF):	68.08
Maximum Net Capacitance (pF):	82.37
Select Variable Capacitor Characteristic:	Straightline Capacitance



Situation 4: Surprisingly, under these circumstances switching to an SLF capacitor will make your Linear Tuning MUCH WORSE. Here is what happens when I keep all the parameters the same, but switch to an SLC cap:

Bandspread Calculator

Input Parameters:

Lowest Frequency (kHz): 5000

Highest Frequency (kHz): 5500

Tuning Capacitor C_V Minimum Capacitance (pF): 7.94

Tuning Capacitor C_V Maximum Capacitance (pF): 142

Stray Capacitance C_S (pF):

Allowable Component Ranges:

Trimmer Capacitor C_T (pF): 0 ... 630.44

Padder Capacitor C_P (pF): >= 1.79 (if present)

Inductor (µH): 1.31 ... 573.68

Exact Value Calculation:

Choose the Known Component: Inductor

Enter Inductance Value (µH): 12.3

Click to Calculate the Unknown Components: Calculate

Trimmer Capacitor C_T (pF): 163.94

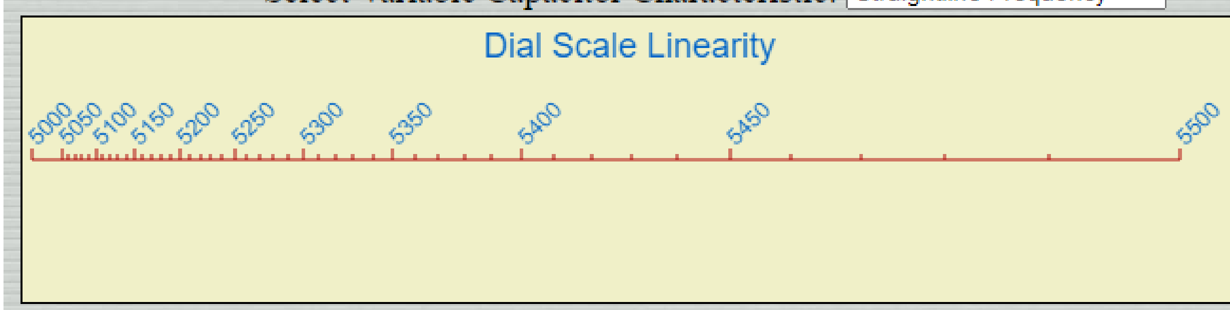
Padder Capacitor C_P (pF): 112.73

Inductor (µH): 12.30

Minimum Net Capacitance (pF): 68.08

Maximum Net Capacitance (pF): 82.37

Select Variable Capacitor Characteristic: Straightline Frequency

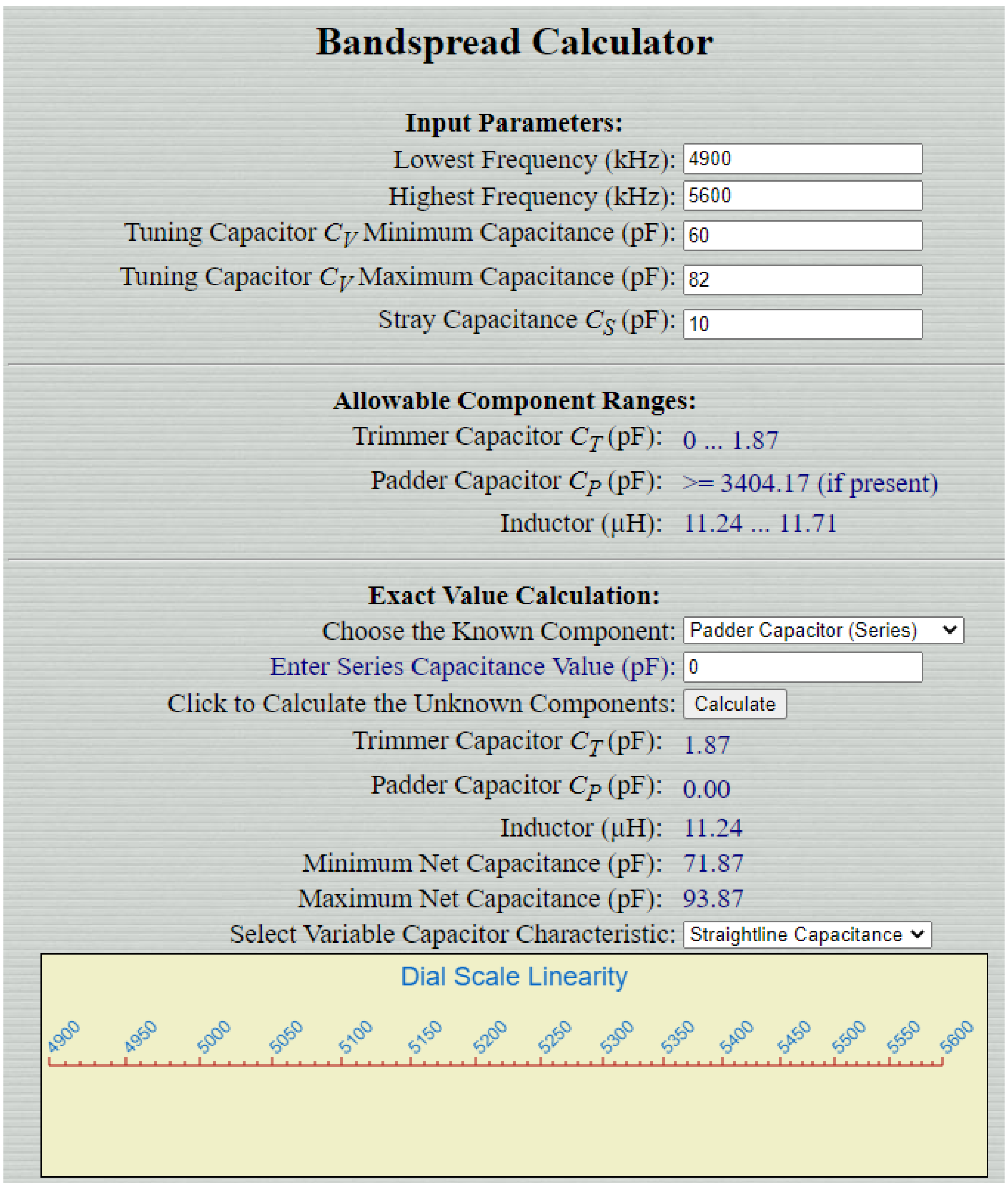


Situation 5. Bob's messages got me thinking about something I did when I was a new homebrewer: When the variable cap that I had on hand had too much C range, I simply pulled off rotor vanes until is was about right! I destroyed a lot of capacitors before I discovered the wonders of padding caps.

But suppose I could get a variable cap just in the range that I needed, and could dispense with the trimmers and the padder. This would probably aid in stability a bit. But what would it do to tuning linearity?

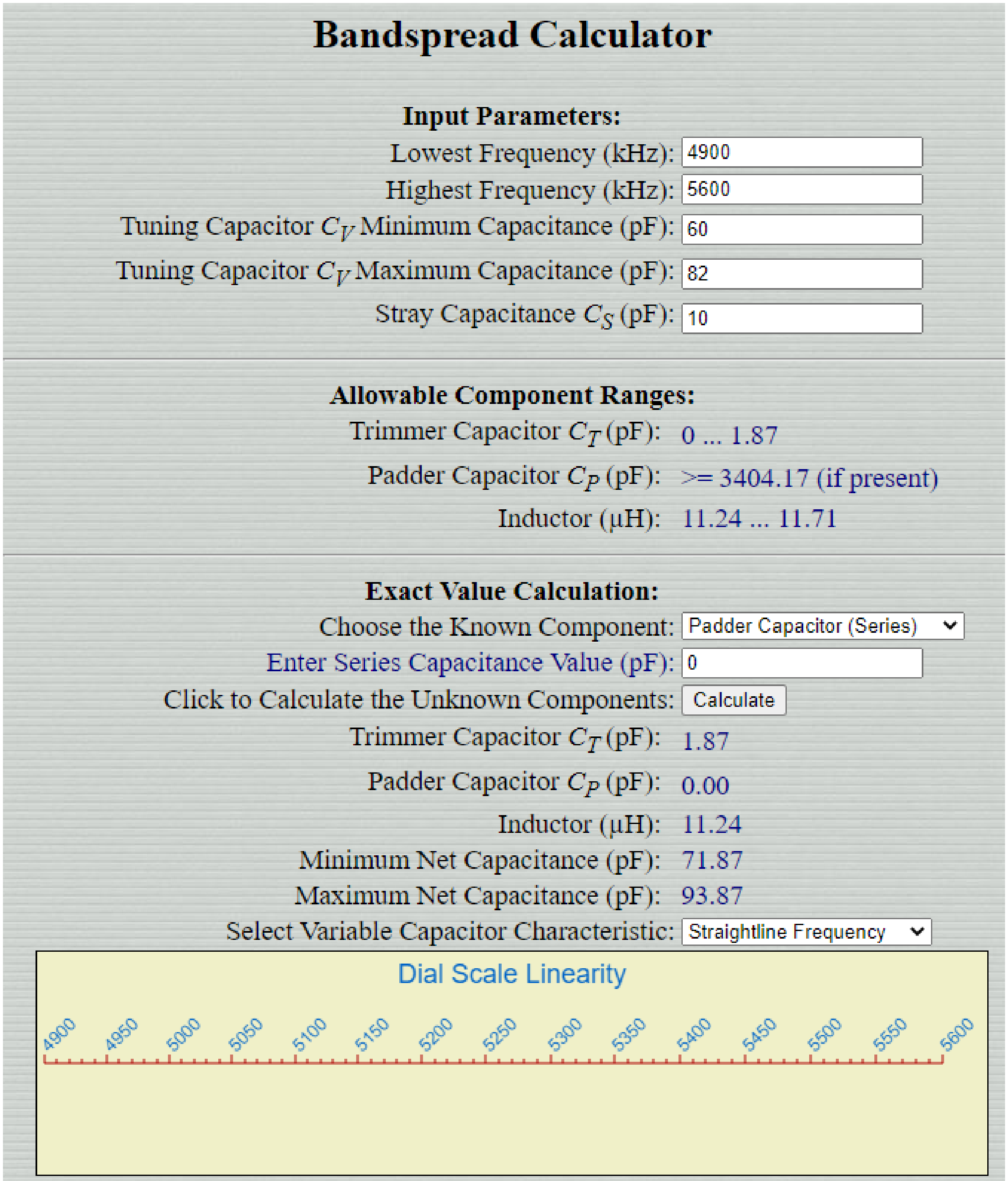
To find out I in effect substituted out the cap I used yesterday (7.94 – 142 pf) for a cap of 60 - 82 pf without the padder and with only a very small trimmer (I had to extend the range a bit to make it work).

Here it is with the ordinary Straightline Capacitance cap:



I think it looks pretty good. But look what happens when I switch to a Straightline Frequency cap:

Situation 6. I think the Straightline Frequency cap is a lot more linear. So in this case, it WOULD be worthwhile to go with an SLF cap.



Situation 7. Oddly, in this situation (smaller variable cap) the Midline/Centerline looks worse than the SLF or the SLC:

Bandspread Calculator

Input Parameters:

Lowest Frequency (kHz):	4900
Highest Frequency (kHz):	5600
Tuning Capacitor C_V Minimum Capacitance (pF):	60
Tuning Capacitor C_V Maximum Capacitance (pF):	82
Stray Capacitance C_S (pF):	10

Allowable Component Ranges:

Trimmer Capacitor C_T (pF):	0 ... 1.87
Padder Capacitor C_P (pF):	>= 3404.17 (if present)
Inductor (μH):	11.24 ... 11.71

Exact Value Calculation:

Choose the Known Component:	Padder Capacitor (Series)
Enter Series Capacitance Value (pF):	0
Click to Calculate the Unknown Components:	Calculate
Trimmer Capacitor C_T (pF):	1.87
Padder Capacitor C_P (pF):	0.00
Inductor (μH):	11.24
Minimum Net Capacitance (pF):	71.87
Maximum Net Capacitance (pF):	93.87
Select Variable Capacitor Characteristic:	Midline/Centerline