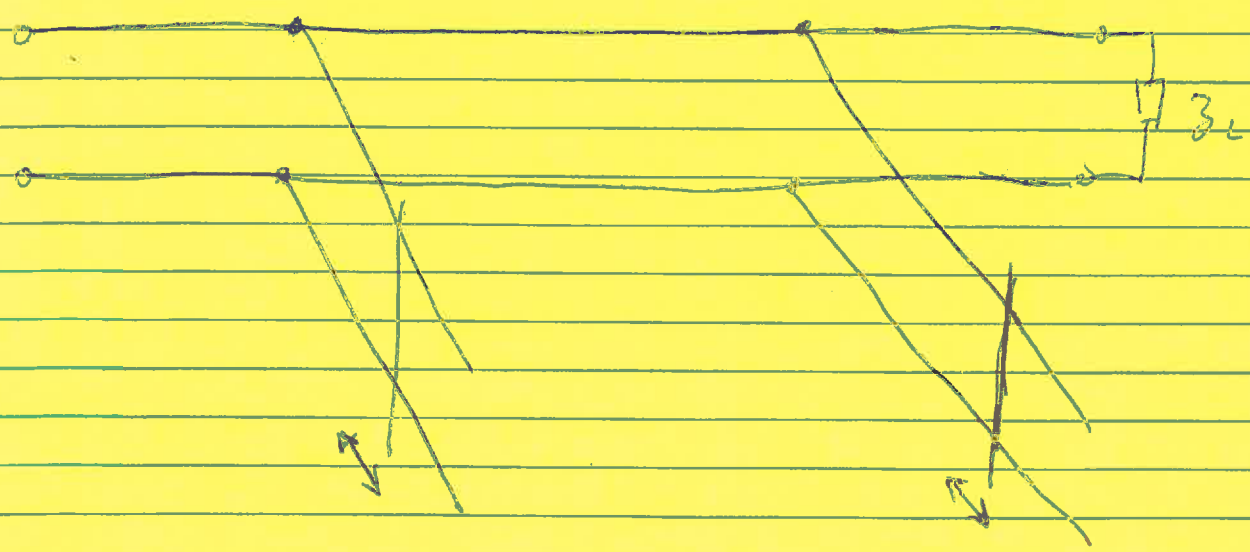
It's not so convenient to connect an inductor or capacitor @ an arbitary position, and adjust this position along the cable.

For the stub, you can have a Tee but it's not so convenient to continuously move the Tee along the cable

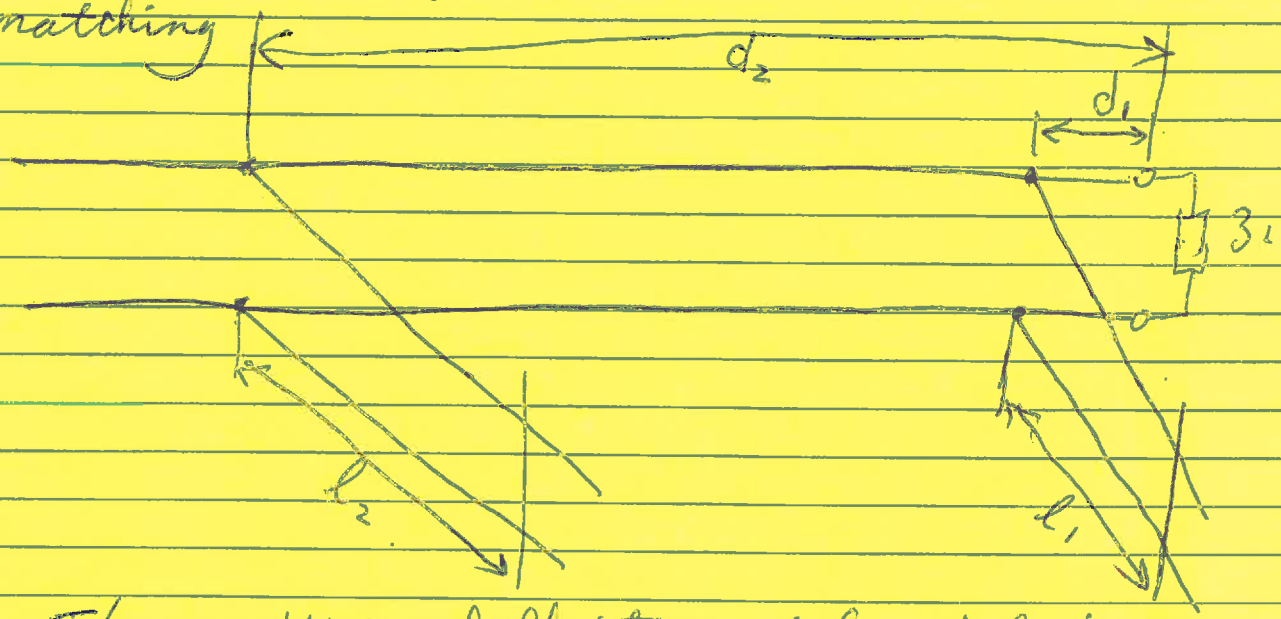
So, we introduce yet another method — the "double stub" matching.



Double Stub Matching

(Take good notes. Content not in textbook.)

Today we are gonna talk about double stub matching



The positions of the two stubs, d_1 & d_2, are fixed. We adjust the 2 stub lengths, l_1 & l_2, to achieve matching.

The general strategy is as follows.

We first adjust l_1 to get

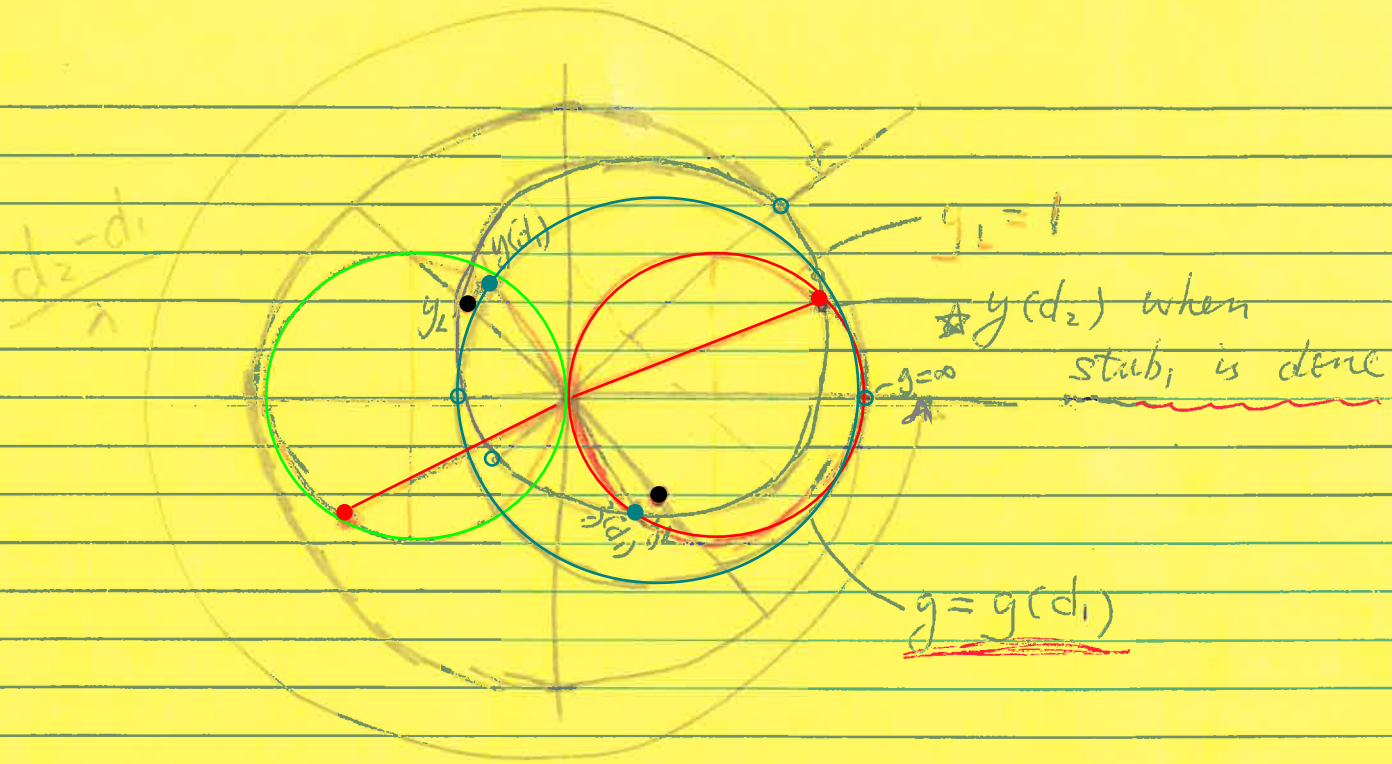
$$y(d_2) = 1 + jb(d_2)$$

Then what do we do?

As before, cancel the reactive part, using the 2nd stub

— you know how to do that

so we are gonna concentrate on the first stub.



When we adjust the length of stub 1, the total ~~impedance~~ admittance @ d_1, including the stub, is

$$y_{total}(d_1) = y(d_1) + y_{stub_1} = \cancel{g(d_1) + jx_{stub_1}}$$

$$g(d_1) + jb(d_1) + jb_{stub_1}$$

because we know the ~~impe~~ admittance of stub 1 is purely reactive.

So, the total admittance @ d_1 is some where on this circle $g = g(d_1)$ #1

Then, what is the admittance @ d_2 (w/o stub 2)?

Each point on this circle is rotated by $(d_2 - d_1)2\beta$.

So, when ~~the~~ we slide the short on stub 1.

$y(d_2)$ is moving on this circle.

This circle must intersect the $g=1$ circle somewhere.

Once you hit the $g=1$ circle, you have finished adjusting stub 1.

You can now lock the short ~~out this~~ position.

Now $y(d_2) = 1 + jb$.

The situation is exactly the same as the single stub matching we talked about last time.

You know what to do next, right?

But, keep in mind that so far we are working with admittances.

Last time, I mentioned that, in the lab, the Network Analyzer displays impedances.

The TA's cover the screen...