Frank Chemotti, tuning perspectives, Feb 2020

foreword

this talk is aimed at practical ends for professionals
getting the best results that pianists can appreciate, most efficiently
some ideas here might be not recommended in practice for beginners, but the basic approach should be helpful, at any level

basic perspective on ETDs

advantages:

- having absolute reference for entire piano in high precision
- makes stability issues very apparent (in tuning technique real-time, or environment over time)
- pitch raise / overpull mode
- basically, they can get you very close very fast

pitfalls:

- does not naturally encourage maintenance of aural skills
- precise, yes, but this may give false sense of accuracy (hundredths of a cent: amazing but meaningless)
- if not used with thought, you are letting software developers make all your decisions
- it does not always calculate a good tuning!
- and its good tunings are not completely perfect
- basically, it's too easy to set it and forget it

(example: could not get good calculation for Bosendorfer 275)

my approach

quick summary is:

go through with device once quickly, then go through again and actually listen
(but generally, I do things on a case-by-case basis, each tuning is different)

measuring and calculating:

- RCT uses readings at A4, A3, A2, A1, and A5
- it is important to be close to pitch to get accurate readings, so if you're starting far off and need to calculate a new tuning, there is an easy solution: tune just these 5 strings first, aurally
- check the look of the graph, watch out for kinks around A6
- RCT shows B T D numbers (estimated beat rates) along with each calculation so you can verify the accuracy, but in practice this is difficult to judge

basic procedure for first pass, with overpull:

- start at lowest tenor and go up, finish with bass going down
- tune unisons as you go, this is very important as RCT is anticipating the change due to full tension on all strings
- just follow what the device says, don't bother with checks since things won't match up anyway at this stage due to overpull
- I might do less overpull than RCT suggests at high treble (Schimmel and Yamaha uprights seem to respond less)
- I might listen to octaves a bit when going into the bass, since tenor section is already set, and bass usually does not need much overpull

and second pass, or when fine tuning:

- tune unisons as you go, very important, for stability, and so you can hear what the pianist will hear
- do temperament section first according to device, A4 down to A3
- check A3-A4 octave, check all fifths and fourths
- if you disagree with the device on the sound of a particular interval, at this point, keep the note closer to A4 as tuned, change the note farther from A4
- continue tuning down to low tenor, listening to octaves (mostly), fifths and fourths
- then tune from A4 up to the top, and checking octaves, double octaves, and twelfths, aurally and with device
- when there is a disagreement about an interval according to device check, go check lower note with device and decide what to change
- but important to listen to full unison intervals! and fix bad unsions immediately!
- then tune bass going down, listen to octaves, double octaves

typical tuning disagreements with RCT:

- a few notes above tenor break
- several lowest notes
- several highest notes
- individual notes around octave 5 + 6 need individual tweaks to sound best with octave

interval checks using device
know what partial is being read for the current note
and know what other notes might relate to that

mid treble (A4 - G#5) uses partial 2

- by playing an octave lower, you can immediately see a check of the current note as a 4:2 octave

higher treble (A5 and up) uses partial 1

- so by playing an octave lower, you can see 2:1 octave
- or playing two octaves lower, you can see 4:1 double octave
- or playing a twelfth lower, you can see 3:1 p12th

middle (A3 - G#4) uses partial 3

- you won't see anything if you play an octave above (because 3 is an odd number)
- but if you play a fifth above, you can see 3:2 fifth (interesting, but maybe not so relevant)
- and by playing an octave lower, you can see 6:3 octave

if bass uses partial 5, this is not helpful for visual checks

if bass uses partial 6

- you can play an octave above to see 6:3 octave
- playing an octave below will show 12:6 octave (usually not so helpful)

if bass uses higher partials (7, 10, 12), that is not helpful for visual checks

why does the pattern of the partials that RCT uses match so well with aural checks??
human ears and digital ears have similar limitations and strengths??

other things for stability

yes, you can always use good hammer technique or (careful!*) pounding
but these other things make it all easier

- fix worst strings first, if there are just a few wild ones
- or fix worst section first, if one is much worse than the rest
- unisons as you go! unisons as you go!
- refine unisons immediately if you hear any that need improvement
- two quick passes is better than one slow one

* save the wear on your ears, your body, your customer's ears, and your customer's piano (why does C8 get so worn?)