

# AI Mode

Updated for CyberTuner v8.6.0 release.

## What is "AI Mode" ?

AI Mode is an optional feature in CyberEar which was released in version CyberTuner 8.1.0. While Chameleon does a great job calculating an excellent tuning, it only has 5 or 6 sample notes. Most pianos have imperfect scale designs. Chameleon calculated tunings need some aural touch-up as inharmonicity jumps unpredictably from one note to another. AI Mode fills the gap by taking up to 30 sample notes from E2 to A4. With those extra samples, AI Mode is able to significantly improve the tuning using aural tuning principles.

## When should AI Mode be used?

Any piano with a challenging bass / treble break is a good candidate. Large pianos such as 7' or 9' concert grands will show smaller improvements since their scales are very predictable for Chameleon. Very poor quality pianos may not be worth the extra time, although the improvement will be significant.

The pianos in between the above two categories, and which are played by discerning pianists are the best candidates. You will have to decide after some experience with AI Mode when it is appropriate to employ this feature.

At what stage in the tuning should you use AI Mode? During the last or next to last pass is the best time. Sampling should be done when the piano is within 10 cents of final pitch, although 5 cents is better. Some sampling can take place during the final tuning. If any notes are missed, or have yellow or red indicators, it's usually best to go back to re-sample those notes later.

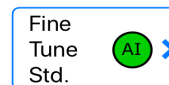
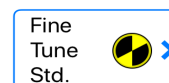
iRCT version 8.6x adds a new feature called "AI Break". This option will record and use only the 6 notes around the bass/treble break. AI Break uses two notes below the Lowest Tenor Note (LTN) and 4 notes above the LTN. Smart Tune already asks for LTN, FT will ask for LTN if Ai Break is on. To use AI Break, tap the CyberEAR Tuning Mode button, tap the Spinner gear (upper right) and choose AI Mode notes, select AI Break. Also, most users should set "Start new, AI Mode" to "Always turn On". AI Break takes very little time and gives the most "bang for the buck" in improving the tuning.

## How do I use AI Mode?

1. Record and calculate a Chameleon tuning for the target piano just as you usually would. Use Easy Mode, Pure 12ths, OTS 1~9 or Custom Equalizer. AI Mode needs a Chameleon 5 calculated tuning as a starting point.

You may want to turn on "Name and Save" in the Chameleon Advanced dialog before proceeding to CyberEar, otherwise the AI Mode changes won't be saved.

2. AI Mode is available when you are using Fine Tune, Smart Tune or Aural Temperament modes. Tap the Tuning Mode button (center right) in CyberEar. Turn on the AI Mode switch.



3. In CyberEar the Tuning Mode button will have a green circle with "AI" to remind you that it is on.



4. Sampling is simpler than Chameleon. Just play the notes between E2 and A4 in any order. A blue circle will fill in around the left listener ear button.

5. If the sample is good quality, a green circle will appear around the ear. If it is a fair quality sample, yellow, if poor, red. The same color scheme is used by Chameleon. Always resample if the indicator is red.



Poor  
(Redo!)

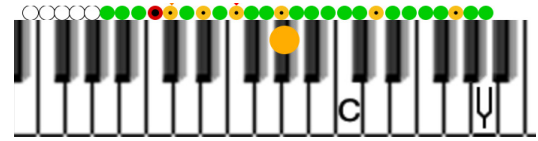


Fair  
Sample



Good  
sample

Above the keyboard you will see dots which represent the notes you have recorded. Dots not yet filled in have not yet been recorded. The small black dots in red and yellow samples help those who are color-blind.



You can try to resample yellow or red samples by simply tapping on the left listener ear button. Move the device around if you have any trouble as, just as with Chameleon (and your ears), mic placement is usually the problem.






To clear a green sample, tap the left listener ear and choose one note or all notes to clear. The Clear function zeros the samples for the notes chosen, and calculated offsets.

6. You will need to record at least 6 notes (AI Break) or 12 notes, up to a maximum of 30. Not all notes need to be recorded, nor do all samples need to be green. If you try two or three times and only get yellow, do not spend any more time as AI Mode is smart enough to average yellow and green samples. Red samples should be resampled if at all possible.

7. Tap the Tuning Mode button in CyberEar, then tap AI Calc button.



In the "AI Calculate" window you will see some info about how AI Mode modified the tuning:

-  Variance; AI Mode uses variances internally, similar to Chameleon.
-  Note with the greatest improvement; This may or may not be the same as the first aural correction.
-  First aural correction note; This is the note that AI Mode found was the worst note and needed fixing first. The worst interval - that is, the interval that most strongly shows this note needs improvement.
-  AI Mode tunes in iterations; After making a correction, it starts over and checks all notes again.
-  Temperament notes recorded; From 6 to AI Mode's maximum 30 note range.

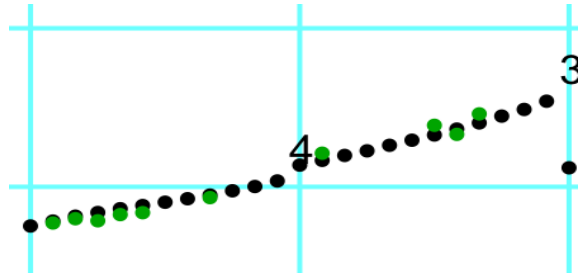
The most interesting info from the above is the "First Aural Correction Note" and the "Worst Interval". The worst interval is essentially the largest aural problem AI Mode found with the Chameleon tuning.

For instance, if you have already tuned the piano to the stock Chameleon tuning, listen to the Worst Interval using the usual tests. This feature not only shows you AI Mode is working, but helps you improve on your aural tuning skills. Checking aural intervals with test notes is such a large subject that it is beyond the scope of this document.

Once you have looked over the info in the AI Calculate window you can retune the piano if desired. If no note was modified more than 0.2 cents or so, then Chameleon's tuning was practically perfect and it may not be worth the time to do any further tuning improvement.

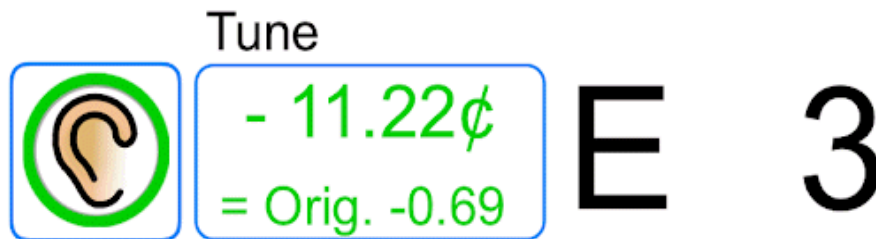
Tap the "Tune" button to start tuning, or the "Graph" button to see a graph of the improvements.

In the graph, the notes which were improved (even by 0.01 cent) are shown in green. The original tuning is shown in black. Tap Options and tap "Display Dots" to better view individual note improvements. ("Dots" option is shown).



Press "Tune" and you will see CyberEar and be ready for tuning.

The "Tune" box shows the cents offset. The actual offset is in green and means AI Mode modified that note from Chameleon's "stock" calculated tuning. The amount that the Tune cents has been modified is below after "= Orig. " and indicates how much AI Mode modified the Chameleon tuning.



## Notes: Using Chameleon and AI Mode (v8.2 & later)

CyberTuner includes an improved Chameleon 5 which is better matched to AI Mode. Even used alone, Chameleon 5 has improved accuracy. Chameleon 5 calculated tunings are required for CyberTuner AI Mode.

CyberTuner includes the ability to Clear the AI Mode data, as long as the tuning was created with Chameleon 5. To see the Clear dialog, tap the left listener ear with a green sample. The Clear data function clears the samples and cents improvements for a single note, or for all notes.

You can still use Chameleon 4 tunings improved with AI Mode from CyberTuner 8.1, but those older tunings can't be modified with AI Mode.

Chameleon samples for A2, A3 and A4 are converted into AI Mode samples for you. You'll notice AI Mode shows these 3 "freebie" notes as green dots above the keyboard.

## Notes on Tuning File Format

CyberTuner version 8.1.0 and later with the AI Mode feature use a new tuning file format. Old tuning files will be automatically converted to the new format.

However, it is not possible to email (or otherwise transfer) a tuning file to another device which has an older version. That older version will simply ignore the newer tuning file which it does not understand.

Conversely, emailing or transferring a tuning file from an older iRCT version to the latest AI mode version works fine. The file will auto-convert to the new format when opened the first time.