

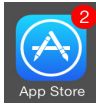
Getting Started with Reyburn CyberTuner for Apple iOS (v7.8.x)

Congratulations on your decision to use Reyburn CyberTuner!

This Getting Started Manual will teach you almost everything you need to know about tuning pianos with RCT for iOS ("iRCT").

To learn more watch the iRCT instructional videos linked from www.cybertuner.com/irctsupport.

iRCT upgrades are included in the CyberCare subscription. Upgrades may contain additional capabilities such as the ability to run on newer versions of iOS or devices, and/or our latest advances in tuning technology. When a new iRCT version is available, the App Store app on your iOS device will display a red "badge" with the number of apps which need updating. Tap the App Store app, then tap "Update" and follow the prompts.



CyberTuner itself will also inform you when a newer version is available with both a dialog box and a red (1) badge on the app icon. Waiting until iRCT recommends updating is best practice.

This Getting Started Manual and other documentation are provided as electronic PDF files on the cybertuner.com web site at www.cybertuner.com/irctsupport

Do this first !

iOS devices such as iPhones, iPods and iPads may come with a very short device manual located in the box. Please read this info completely. Apple has very complete support info on their web site at www.apple.com/support Click the picture of your device, then click "Get Started".

If you are unfamiliar with any of these topics: turning your device on and off, exiting and using apps, or charging the battery, reading the User Guide for your device is the best place to start.



Are you familiar with the procedure to Exit Apps? This is a required iOS skill for using iRCT and your iOS device. See page 4 of this manual for a step-by-step directions.

System Requirements for Installing iRCT

System requirements: Any iPhone, iPod touch or iPad with iOS version 8.0 or later, 16gb memory minimum. iRCT is a Universal app which runs native on iPhone, iPad or iPod touch.

All supported hardware includes a built-in microphone. External mics are supported but are not normally necessary.

iRCT is purchased and installed using an iOS device and the built-in App Store app. An internet connection (wifi or mobile phone) is required.

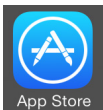
Step-by-step instructions for installing on your iOS device for registered users.

1. Turn on your iOS device (iPhone, iPod touch or iPad). Locate the app named "App Store" and tap the icon. You will need your Apple ID and password for the account previously used to purchase a copy of CyberTuner.

2. On iPhone or iPod touch: Tap the Update icon at the bottom and tap "Purchased".

3. CyberTuner should appear in the list of apps with an "Update" button or iCloud (cloud with arrow) button to download.

If you can't locate CyberTuner, scroll down or do a search, key word "cybertuner", no spaces.



UPDATE



Installing iRCT (continued)



If CyberTuner does not appear in the "purchased" updates, you may not be signed into your Apple ID account, or you may be using the wrong Apple ID. You must be signed into the Apple ID which was used to initially purchase your CyberTuner license.



To sign in to your iTunes account in the App Store tap the "Featured" tab at the bottom left (5 point star). Scroll to the bottom and confirm you are signed in to the correct Apple ID.



If you have an iTunes account issue or need help with your Apple ID please note that RCT support is not able to help other than pointing you to Apple online support or the Apple Store genius bar. For security reasons only Apple can provide direct support for your Apple ID.

If you don't see CyberTuner in the App Store updates section, CyberTuner may already be installed (in another page or folder). At the home page with app icons, swipe right to the Search page, tap on "Search" at top and enter "cybertuner" (no spaces).

Please contact iTunes/Apple ID Support if you need help with your Apple ID or iTunes account.

4. iRCT will download to your iOS device. Tap the iRCT icon to start.



After installing, please tap the About icon and Sign in with your iRCT ID and password.

CyberCare Subscription

Purchase of an iRCT license from the App Store includes a free CyberCare subscription to run iRCT with Premium mode fully enabled for one (1) year. CyberCare includes all new updates and features released during the subscription period, plus access to the CyberCloud for automatic A440 calibration. In subsequent years the CyberCare subscription may be purchased in-app for \$79.99 USD in the USA App Store (price vary in other currencies and countries). If your CyberCare subscription lapses, iRCT will continue to function in limited fashion ("Standard mode"), able to tune only the 13 note temperament from A3 to A4.

Why CyberCare? With professional software such as iRCT, there will always be programming changes necessary for new iOS versions, new features, and new iOS devices that would otherwise entail upgrade fees. With the small yearly subscription, all these are covered including support and you are assured of the most up to date program at all times.

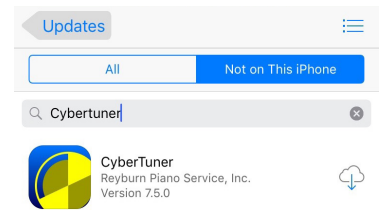
An iRCT license is a single user license which may be used to tune pianos on one iOS device at a time, but may be installed on multiple iOS devices (up to 5 at a time) which you own and control. Multiple concurrent (at the same time) use of an iRCT license is a breach of the terms of the CyberTuner End User License Agreement, and may result in restricting the iRCT software use in Premium mode to a single device at a time or other restrictions.

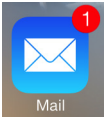
The above is only a synopsis of part of the CyberTuner End User License Agreement (EULA). The entire EULA is linked from the CyberTuner App Store page and is at www.cybertuner.com/ircteula. For more information about your CyberCare auto-renewable subscription see page 24.

A440 Calibration

iRCT automatically calibrates to A440.00 using an internet connection to our CyberCloud. To remain correctly calibrated iRCT needs to connect to CyberCloud at least once a month via wifi or mobile phone connection.

Join CTuner





After registering your iRCT license, you are eligible to join the CTuner internet email list. CTuner is a free email discussion group about RCT and also where we post announcements of new software releases. As a CTuner subscriber, any email you send to the CTuner list will automatically be sent to all other CTuner subscribers. Likewise, email from other CTuner subscribers will automatically be sent to you. To subscribe to CTuner see:

www.cybertuner.com/lists

Most RCT users find CTuner very helpful!



Make friends with the iRCT on-line Help

iRCT has on-line Help for almost every major window. This will provide quick answers to many of your questions. To use iRCT Help on your iOS device, tap the "?" button available in the upper right or left hand corner of most iRCT views.

Link to iRCT support page on the internet

In CyberTuner tap the About icon (lower right), then tap the "Support" button on upper left to link you to the iRCT Support page - including the latest version of this manual in PDF form.

Support About

REYBURN CYBI

iRCT Support

Email support is available to registered users through our Support Request Form at www.cybertuner.com/isupport. If you have "emergency" questions about iRCT, you may email or phone us (see contact info on the last page of this manual). Have your device in hand and be prepared to provide us with your full name, iRCT ID, version number and serial number (tap the About icon in iRCT), iOS device model, and a detailed description of your problem. It may help if a piano or other pitch source are nearby if the issue is tuning related. Contact information is on the last page of this manual.



If you are calling about using iRCT on an iPhone, please don't call using that iPhone if you can avoid it. For questions about your iOS device, iTunes, or non-iRCT software or hardware, please contact Apple or the appropriate vendor.

Before Tuning with iRCT...

Occasionally Chameleon or CyberEar may run slower than expected or behave strangely. This is situation unlikely to be caused by iRCT, it's usually caused by having too many apps running in the background. (or just one app that's a memory/cpu/internet hog).

If you have any trouble with the CyberEar/Chameleon seeming slow, or any spinner issue, **please exit all other apps!**

double tap

1. To exit apps, tap the Home button below the screen to close the currently running app *including CyberTuner!*

2. From the home screen quickly double tap the home button.

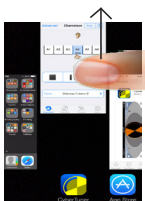
3. Swipe up on the screen for each app to Exit that app.

4. Exit all apps including CyberTuner.

5. If you still have any issue at all, start the Settings app and turn on Airplane mode.

Explanation: Apps running in the background use memory and cpu time. If you have a large number of apps (or just one that's a hog) those apps may leave insufficient resources for Chameleon and/or CyberEar to do its usual excellent job.

Please remember that iRCT has no way to exit other apps by itself, you will have to help it out.



swipe up

Tuning a piano with iRCT

The two modules used for tuning pianos are Chameleon and CyberEar.



Chameleon

Chameleon measures and records five (or six) sample notes, then calculates a tuning record with the correct pitches for all notes on a piano keyboard.



CyberEar

CyberEar helps you tune each string to its correct pitch with a rotating Spinner as a visual aid.

Creating a tuning in Chameleon

To create a new tuning

Turn on your iOS device. Tap the iRCT icon. Set your device on or near the piano.



If you have an iPod or iPhone we recommend you consider a special CyberStand device holder (available on Cybertuner.com). It's designed specifically for piano tuners and can be used on verticals and grands. The CyberStand slides onto any tuning pin, or can be a tripod. The CyberStand makes it easy to keep iRCT in a prime viewing location, and minimizes the chance of accidental falls. The CyberStand doesn't fit iPads. There are a number of commercial solutions for the larger iPad. An iPod touch will need a case to fit the CyberStand.

iRCT automatically opens to Chameleon. The first time you use iRCT, Chameleon will be set to Easy mode, so the following explanations describe Easy mode. Easy mode chooses settings that work very well on all pianos and is recommended for new iRCT users, especially tuners with less experience. Advanced mode, the other Chameleon choice, allows you to customize your tunings (e.g., wider or narrower stretches, various listening partials, etc.). Advanced Mode is described later in this manual.

Easy

Mute the unison of A4 (A above middle C) so only one string is sounding. Tap the Record button (with the red dot) to begin sampling. A finger will point to the note you should play. Play the note with a consistent medium strength (mf) blow. Hold down the note while the rings pulse around the ear (indicating Chameleon is listening) and release the note when the tuning fork spins (indicating Chameleon is calculating and storing).



After playing A4 three times, the actual pitch of A4 will be displayed in Hertz (e.g. 440.1) or cents from 440 (e.g. +0.38¢). To switch between hertz and cents, tap on A4's pitch reading. This feature helps you decide whether the piano needs a Fine Tuning or a Pitch Raise. Generally, if the piano is off by more than .25 Hertz or 1¢, Smart Tune or Pitch Raise mode is recommended. (Much more on changing pitch below.) After sampling A4, you'll sample A3, A2, A1, and A5 (A6 if needed, Advanced Mode only).

A4



mf

Chameleon displays the pitch of each note A1 to A5 as it is recorded. The pitch offset in cents is relative to the tuning which would be calculated with the current Octave Tuning Style, and will change if you change the OTS.

A439.7

-1.30¢

Good

After each note is sampled three times, Good (green), Fair (yellow), or Poor (red) will appear under the note, indicating the variance (consistency) of the note's three samples. Good variance means the three samples were very similar and yields the most accurate tunings. Fair variance is acceptable for one or two notes. But if any note reads Poor, you should redo (resample) it. To redo a sample, tap on its key after the initial 5 or 6 note recording is completed. An ear icon will appear over the note, meaning it's OK to play the note again. To cancel a resample, tap the Stop button.



Fair

The piano doesn't need to be in tune or at correct pitch when you sample. However, it does need to be within 50¢. If the pitch produced by playing the key A4 is more than 50¢ flat, Chameleon will not respond right away. Eventually (after about 30 seconds) Chameleon will display a dialog box suggesting the piano may be very flat or sharp.



Poor

To learn how to sample and tune a piano that's way off pitch, please read the Pitch Raising section later in this manual.




A3

Here are some tips to improve variance (in order of likely effectiveness):

1. Move the device a few notes toward treble or bass.
2. Rotate the device left or right.
3. Play a short-sustaining note twice during sampling (especially A5, A6, and A1).
4. Play the note louder or softer (but never super loud).
5. Choose a cleaner-sounding string (any single string of a bichord or trichord will do).
6. Reduce extraneous noises.
7. Point the microphone directly at the soundboard.
8. Pluck the string.



Poor



Tapping on the Chameleon keyboard area or variance circle is another way to select an A note for resampling. Tap on the note or variance you want to resample.

When resampling a note, the previous sample will be replaced (overwritten) by the new sample only when all three samples are recorded. In other words, during any note's resampling, you can abort the resample and restore the previous sample by using the Left/Right buttons to deselect that note or by tapping Stop.



The Stop button aborts the current recording process and restores samples from the previous sampling session.



The Pause button lets you temporarily stop recording if, for example, you want to explain to the customer how cool iRCT is. Tap Pause again to continue.



Once recording is complete, tap the Calculate button. If Chameleon is set to Easy mode, CyberEar will open and you're ready to tune strings.

We recommend you don't use any Advanced mode functions such as name and save tunings or even bother with the "Tunings" window until you've used iRCT for a while (tuned about 20 pianos) and become more familiar with its operation. To learn how to name and save tuning records, please read the section "Advanced Options" later in the manual.

Tuning strings in CyberEar

CyberEar helps you tune the strings to the 88+ in-tune pitches that Chameleon calculated. (CyberEar accommodates Bösendorfer pianos which have up to 97 notes).

Notes are identified by note name (e.g., A, A#, B, C, C#, etc.) and octave number (0 to 8). Octave numbers change between B and C. Only sharp designations are used (not flats). The lowest notes on an 88 note piano are A0, A#0, B0, C1, C#1, etc. The highest notes on a piano are A7, A#7, B7, and C8. Middle C is C4 and A4 is A440.

A 4

When CyberEar opens, A0 or A4 and Smart Tune will be selected by default. For most notes, CyberEar listens to a higher partial as displayed in the Tune box.

Tune

+ 1.92¢
Partial 2 A 5

FAQ?

Why doesn't A4 show 0 cents in the Tune box? In fact A4 is always calculated to be tuned to exactly 440 hertz or 0.00 cents at its first partial (fundamental). CyberEar normally listens to A4 at its second partial, not the first, because the second partial works best for tuning midrange notes (for aural tuners too). Due to inharmonicity, the second partial is slightly higher than twice the frequency of the first partial, so for most pianos the A4 Tune box will typically display a cents reading between 1.5 and 2.5 cents at the second partial. This pitch for the second partial is carefully calculated from each piano's samples so that the first partial (fundamental) of A4 will be tuned precisely to 0.00 cents or 440.00 hertz. Because inharmonicity varies from one piano to another, especially between different manufacturers and models, their A4 readings will vary too.

Spinner

CyberEar's Spinner looks like a round pie with two opposite slices removed. The Spinner shows you if the selected note is sharp, flat, or in tune. The Spinner rotates clockwise and moves to the right if the note is sharp. It rotates counterclockwise and moves to the left if flat. The Spinner's rotation and movement increases or decreases proportionately to how far out of tune the note is. When a note is close to being in tune, the Spinner will be centered on the black Target and its rotation almost stopped.



spinner

When the note is extremely close to in tune, a faintly colored circle called the Blush will appear inside the Spinner. The Blush starts at half the Spinner's diameter and gets larger as the note gets even closer, until the Blush completely fills the Spinner when the note is essentially perfectly tuned. Generally, we recommend getting at least partial or temporary blush on all strings when using Fine Tune or Smart Tune mode. The better the piano, the more discerning the client, and the more skillful the tuner, the more likely you'll see maximum Blush. But realistically it's impossible (or impractical) to tune all strings on all pianos to a full Blush.



with blush

The first time you open CyberEar, the Spinner is set to rotate at setting 1.7 cents per revolution per second. To adjust the Spinner rate, color, or arc size for the Tuning Mode you are currently using, tap the CyberEar Tuning Mode button, then tap the Spinner gear button. Students may prefer a less sensitive Spinner rate of 2.0 to 3.2 while very skilled tuners may want a faster speed setting closer to 1.0. In Pitch Raise mode, the Spinner is set to 4.0. (Many iRCT users set the Spinner rate to 2.0 for Pitch Raise mode.) Blush sensitivity will automatically adjust to Spinner rate.

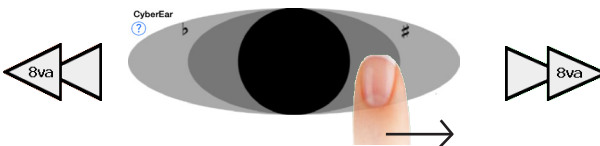
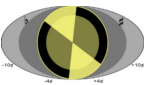
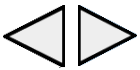


Note Switching

CyberEar's NoteSwitcher "automagically" switches to the next chromatic note up or down when you play it.

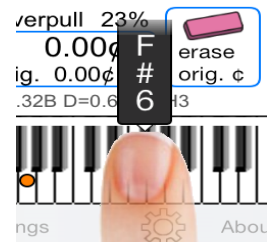
To manually noteswitch chromatically, tap to the left or right of the Spinner's oval.

Swipe left or right anywhere in CyberEar's Spinner oval for octave up or down.



or, when CyberEar is in landscape orientation, the tap on keyboard to select a new note:

(slide or roll finger left or right to change notes) ->



Auto NoteSwitcher hints

If Auto NoteSwitcher has trouble auto-switching to the next note up or down, play the note it's stuck on, then re-play the note you want to switch to.

To auto-switch to a note several half steps distant, play a chromatic run on the piano. NoteSwitcher will follow along about as fast as you can play eighth note runs.



You may change the Automatic NoteSwitcher (ANS) function by tapping on the ANS button in CyberEar. If you wish to limit CyberEar to up-only or down-only, tap the ANS lock button. The button will toggle through four ANS modes in sequence: bi-directional, up-only, down-only and locked (off - no ANS). When ANS is locked, you can still switch manually by tapping or swiping in the spinner area or tapping in the landscape keyboard. The ANS mode is indicated by the picture on the ANS button.



Limiting the ANS function is useful for large pitch raises or noisy situations.

Note order and muting procedure hints

Tuning chromatically from the lowest piano note up to C8 is considered by many experienced tuners to be the most stable and efficient tuning method. Use two rubber mutes (or a split mute, which is easy to make yourself using CA glue) and tune unisons as you go. It's also OK to strip-mute the entire piano, tune a single string for all notes, then tune unisons. If you use a strip mute, make sure the note hasn't drifted when you're tuning its unison.

Always use your ears and your eyes. Listen to aural intervals during and, more importantly, after tuning with any tuning device. By verifying that iRCT did its normal great job, you will also improve your aural skills. Pay special attention to the bass/treble break on short-scale pianos (e.g., spinets, small grands, short consoles) where some notes may benefit from aural refinement.

Changing the pitch of a tuning or a single note

Chameleon creates all its tunings in Equal Temperament at A-440. To tune a piano to another pitch, in CyberEar tap the A440 pitch button (located top right). Select a pitch in Hertz (441, 439, etc...) or cents from 440 Hz. If using cents, a minus symbol "-" means flat, plus "+" means sharp.

In Fine Tune mode, CyberEar's Offset box can also be used to change pitch for a single note or any number of notes. To enter an offset, tap on the Offset box.

The Offset box reading remains (even after note switching) until you change or clear it, or switch to Smart Tune or Pitch Raise mode. We recommend you use the A440 pitch button (upper right) to alter the pitch of an entire tuning and the Offset box to alter the pitch of a few notes. It's OK to use the A440 pitch button and Offset box simultaneously as the pitch offsets are additive.

The Tune box can also be changed by tapping or with the Left Listener Ear button, play the note on the piano, then tap the Tune box and Save button.

After the piano is tuned

When you're finished tuning the piano in CyberEar, press the iOS device's home button (below the center of the screen), or simply push the iOS device's power button.

90% 

A440.0

Offset

0.00¢

Tune

+ 1.92¢
Partial 2 A 5



CyberEar's Listening Ear Buttons

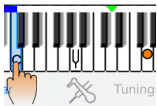
Recording notes with the Left Listener Ear button is most effective in Fine Tune mode.

Tap on the Tune box (Left) Listener Ear then play the note to auto-measure and save a note's pitch with the Save cents button. Saving this reading alters the tuning record to match your aurally approved tweak.

Saving a modified Tune box cents reading into a tuning record will save your aural tweaks for later use. Make sure the tuning record is saved in a tuning file (Advanced mode Name and Save is On) or your tweaks will be lost.

Tap on the Offset box (Right) Listener Ear then play the note to auto-measure how much a note deviates from its in-tune pitch (as displayed in the Tune box.) A reading in the Offset box remains until you clear it, or until you switch to Smart Tune or Pitch Raise mode.

Switching Between Portrait and Landscape Modes



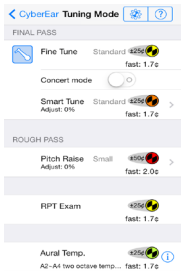
Rotate your iOS device to go from Portrait mode (vertical) to Landscape mode, which displays CyberEar horizontally. The Spinner oval is wider in Landscape. Also, a graphic keyboard appears, helping you see the selected note (highlighted key with hand), its listening partial (colored circle) aid Pitch Raise/Smart tune a progress bar.



If iRCT refuses to switch from portrait to landscape, your device (not just iRCT) is probably locked in portrait mode. To unlock portrait mode, the swipe up from bottom of screen to view the Control Center. Tap the portrait lock/unlock button.

Selecting CyberEar Tuning Modes

Tap the CyberEar Tuning Mode button to view the Tuning Mode window. This window is the control center for the five main tuning modes, showing you info about each mode. The currently active mode is indicated by the blue boxed tuning hammer. The spinner speed, cents range and color for each mode are shown on the right.



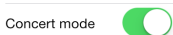
Smart Tune and Pitch Raise show the overpull Adjust % (standard = 0% change). Note the right pointing arrow on these two modes, tapping them leads to a dialog box where mode settings can be changed.

To the left of each spinner icon is the "range" of that tuning mode in cents to help you decide which mode fits each situation best.

RPT Exam mode scores the Piano Technicians' Guild RPT tuning exam. Either the official exam, or a "mock" (practice) exam can be given. See page 22-23.

Aural Temperament mode lets you tune a sequence of up to 25 notes in any order to facilitate learning or practicing aural temperament tuning. See page 26.

Concert Mode



This new iRCT feature is an optional sub-mode for Fine Tune and Smart Tune. Concert Tune sets the spinner to a faster speed and reduces the spinner range from +/-25 cents to +/-10 cents. Use Concert Mode option in either Fine Tune or Smart Tune when the piano is extremely close for the best possible final pass resolution.

Concert Mode can be thought of as a "sub-mode" of Fine Tune and Smart Tune, just as Pitch Raise has sub-modes called Small, Medium and Large. The currently selected sub-mode is shown for each Tuning Mode.

Pitch raising (or lowering) with iRCT is very accurate and fast because every note is automatically measured and overpulled using a customized overpull percentage optimized for each note. The first pitch raise pass usually leaves most notes within a few cents, even for pitch raises of 50¢ or more.

If the piano is off-pitch, you have two main choices for changing the pitch; Smart Tune or Pitch Raise mode. Typically you'd use Smart Tune mode if the piano is from 1 cent to 15 or 20 cents flat (or sharp). Use Pitch Raise mode if the piano is farther out of tune. Many RCT users set Smart Tune to the default start mode, and use it for almost all tunings.

Chameleon's Smart Pitch display shows the pitch of A1 through A5, helping you determine the best pitch changing method for each piano.

What if the piano is very flat (or sharp)?

Of course, the piano need not be already in tune or even at 440 pitch when you sample. However, it does need to be within about 50¢; if not, Chameleon will not begin sampling. Remember, Chameleon has ears but not eyes, and can't see what key you are playing; it can only hear the pitch that's produced. For instance, Chameleon doesn't know, indeed can't know whether you're playing G#4 or a very flat A4. If Chameleon doesn't hear an A4 pitch within 30 seconds of the Record button tap, you'll see a dialog box suggesting that the piano may be very flat. If so, we suggest you don't sample this piano but instead select a "demo" piano: Tap the Piano button and select the demo piano model most similar to what you're tuning: Kimball spinet, Everett console, Kawai UST 7, Yamaha C3E 6' grand, or Steinway D 9' grand. These demo pianos are real pianos which were sampled by us and whose samples are permanently stored in Chameleon. Alternatively, you can use an already-calculated saved tuning record (described below).

In addition to Chameleon's pitch display you can use CyberEar to quickly check the overall pitch of a piano you suspect is very flat or sharp. In Chameleon, tap the "Piano" button to choose a "demo" piano most similar to the one you're tuning, then calculate a tuning. In CyberEar using Fine Tune mode, play some notes (eg...., all the A's or C's), watching the Spinner's location on the oval to gauge the note's pitch. The oval's crescents have cents labels beneath for this very purpose. If the piano is more than 25 cents off, select Pitch Raise mode and Large pitch raise type, which will increase the Spinner's range to plus or minus 200 cents. This is a rough guide but appropriately effective.

To pitch raise with iRCT

Sample the piano in Chameleon. Alternatively, if the piano is off pitch by more than, say, 20¢, don't sample but instead tap the Piano button and choose one of the five "demo" pianos or a piano recorded in a file. Use the piano most similar to the piano you're tuning.

Occasionally, you might want to calculate a tuning from the piano you most recently sampled after choosing a "demo" piano from Chameleon's Piano button. To do so, tap the Piano button and select "Restore last recorded piano" (only available if there is a piano to restore).

Changing pitch with Smart Tune and Pitch Raise mode



Calculating a tuning in Chameleon or selecting a saved tuning in the Tunings window will take you to CyberEar. Tap the Tuning Mode button (which may be set to Fine Tune) and select Smart Tune or Pitch Raise. The Smart Tune or Pitch Raise dialog box will open.

Tune all the strings in the unisons as you go up the piano in Smart Tune and Pitch Raise mode. Tune left and right strings, not just the center string. Tuning just the center string will result in unpredictable and inaccurate pitch raise.

What is Smart Tune?

Smart Tune is an extremely accurate micro pitch raise mode using iRCT's patented pitch raise technology. Even if the piano is a few cents off pitch Smart Tune will predict the overpull so that each note ends up exactly on target. This often avoids an extra pass saving you 20 to 40 minutes per tuning.

Smart Tune Standard 425¢ fast: 2.0c

When should you use Smart Tune mode? If the piano is less than about 25 cents off pitch, Smart Tune Standard is usually the best choice since it gives you the ability to do a one-pass tuning. However, if the piano is more than about 20 to 25 cents off pitch, you will typically need to do two passes, first a Smart Tune Large (or Pitch Raise mode if more than 50 cents change), then a Smart Tune Standard pass.

Definitions:

Bass section: Lowest keyboard 20 to 30 notes. Ends at the note below the bass/tenor plate strut.

(these are for the purpose of CyberEar's tuning modes only).

Temperament: One octave midrange area from F3 to F4, contains middle C. A plate strut in this area can generally be ignored for Smart Tune (exception: D#4 to F4).

Tenor Section: Several octave area containing the temperament. Defined by the note above the bass/tenor plate strut to the first strut above D4.

The Smart Tune dialog box asks for different and additional information than does Pitch Raise:

* Second Treble Strut Note is the note just below the second plate strut above D4.

* First Treble Strut Note is the note just below the first plate strut above D4.

This note must be the same note or higher relative to the Lowest Trichord note.

* Lowest Trichord Note - this lowest group of three strings must be the same or higher than the Lowest Tenor Note. (These can be wound or plain (unwound) strings).

* Tenor Bichord(s): Number of string pairs in the tenor (above Lowest Tenor Note). Be sure to check the "Tenor bichord(s)" number against the *actual piano*.

* Lowest Tenor Note is below the temperament (F3), and is the note just above the plate strut that separates the bass and tenor sections. The LTN must be the same or lower than the Lowest Trichord Note.

* Restore Default notes button; tap to set all notes to original defaults values.

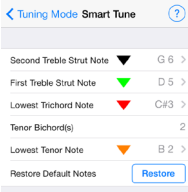
* Colored pointers of matching color appear in CyberEar's keyboard as a reminder of the current settings.

More on Pitch Raise and Smart Tune mode dialog boxes...

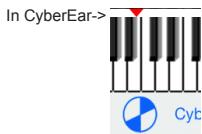
In the Pitch Raise dialog box, select the piano's Lowest Plain Wire Note (unwrapped string). The Lowest Plain Wire Note is identified by note name and octave number. B2 is the default as it is a commonly used Lowest Plain Wire Note.

Smart Tune type: choose Standard (less than 25¢) or Large (25 to 50¢) depending on how far off the piano is from final target pitch. Large ST mode may need another pass.

Pitch Raise type: choose Standard (less than 100¢) or Large (over 100¢) depending on how far your piano needs to be pitch raised. If the piano is less than 50¢ off pitch, using Smart Tune mode is usually a better choice.



In dialog-> ▼ B 2 >



Lowest Plain-Wire Note ▼ B 2 >



Pitch Raise mode is intended to end up slightly sharp, about 2 or 3 cents is optimal. 11 After a large pitch raise, many pianos will benefit by leaving the pitch 2 cents sharp for the second pass. (And leaving the piano slightly sharp will save you effort later).

Smart Tune on the other hand, targets A440.0 exactly, or whatever pitch is selected in CyberEar.

If you need to adjust the overpull or set special safety "caps" to avoid breaking strings, switch "Advanced Controls". Most tuners won't need to adjust these settings.

If either Pitch Raise or Smart Tune mode is consistently a little sharper than preferred, you can reduce the overpull/underpull percentages (not cents) by adjusting the overpulls by between -1% to -5% under Adjust Overpull %. Conversely, if your pitch changes are too flat, adjust +1% to +5%. You can adjust overpull percentages at any time during a pitch raise and as often as you wish.

Tap "Save" to save your preferred settings as your default, or "Reset" to return to original "factory default" settings. The blue pointer above each slider indicates your preferred setting. Your preferred settings are used whenever CyberTuner detects that you've started a new Pitch Raise/Smart Tune pass or a new piano tuning.

The "Underpull" slider lets you make a separate adjustment for pitch lowering. Positive numbers give more Underpull (flatter result) and negative number reduce Underpull.

To help prevent string breakage in Pitch Raise mode, you can lower the Cents Overpull Caps for Bass or Treble. This is a good idea if, for example, the strings are rusty or you see evidence of previous string breakage such as splices or new wire. In CyberEar the Overpull Cents box will appear in **red** if the Cents Overpull Caps are invoked.

To start a new pitch change, tap Start New. To continue a partially completed pitch change, tap Resume. You'll return to CyberEar. If you're starting a new pitch change, A0 will be selected. Play A0 and let it sustain while the Spinner fills in. In other words, don't tune the string until the Spinner fills in completely. (Allowing each note's spinner to fill in before moving the tuning pin lets CyberEar record the original pitch and therefore calculate overpulls accurately.) Then tune A0 so the Spinner stops rotating.

Play the next chromatic note up. NoteSwitcher will auto-noteswitch and measure it, calculate the correct amount of overpull and offset the Spinner's black Target as needed. The offset of the note being measured (how far out of tune) will be displayed in the Overpull Cents box (area labeled as orig:). If you want to re-record any note (because you accidentally struck the wrong note, the dog barked, etc.), select that note, tap the Eraser button near the Overpull box to erase the note's measurement, and replay the note. In Landscape mode, a blue Progress Bar appears over each note after it's been measured and its overpull calculated. In both Landscape and Portrait, the Overpull box turns blue if original cents was recorded

Continue tuning chromatically from A0 up to C8 (or from bottom to top of tenor section then bass section either direction), **tuning each note's unisons as you go**. Tuning all the center strings first and unisons later is not recommended because the tuning will have noticeably less stability, will require more overpull, and be less predictable.

If you prefer to tune down or up from the bass/treble break, iRCT will detect your tuning direction and will calculate the pitch raise appropriately as indicated by the blue progress bar in Landscape CyberEar.

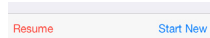
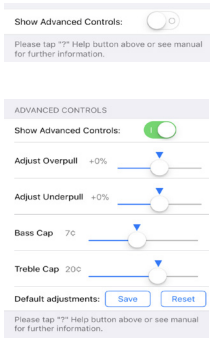
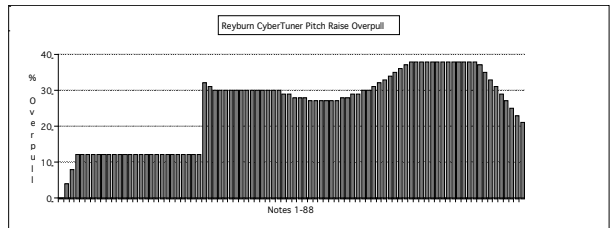


Figure 1



After pitch raising is completed, return to Chameleon by tapping the Chameleon icon. Resample and create a new tuning record. Return to CyberEar, select Smart Tune or Fine Tune mode, and retune as needed.

Overpull amounts

Figure 1 shows the standard overpull percentages used by iRCT in Pitch Raise mode. The overpull percentages jump from 12% to 32% at the break between wound and plain-wire strings, which is why you enter the Lowest Plain Wire Note into the Pitch Raise dialog box. In the example graph above, the lowest plain-wire note is note 28, or C3, which of course will vary from piano to piano. Smart Tune mode uses a similar but more dynamic overpull chart which is customized for each piano depending on the piano size, detected inharmonicity, and user input in the Smart Tune dialog box.

Pitch Raise mode hints



unlocked locked



down-only up-only

When you first use iRCT, the Automatic NoteSwitcher (ANS) is set to bidirectional (unlocked). Lock/unlock ANS by tapping the ANS icon in CyberEar. If pitch raising a piano that's substantially flat or if the piano's tone is of poor quality, ANS might not function reliably; if so, lock ANS and manually note switch by tapping the spinner area. Alternatively you can tap the ANS button to toggle through the four modes and choose up-only or down-only as needed.

Pitch Raise mode (both Standard and Large) automatically set ANS to up-only. (Change to down-only as needed).

If the piano is more than 50¢ flat, use Pitch Raise mode. If NoteSwitching misbehaves, here's a hint: When you're ready to switch up to the next note, play a staccato blow on the note chromatically two notes above the note you just tuned (and one note above the note you want to tune), then immediately play the note you want to tune. This will engage auto NoteSwitcher and (hopefully) not record the pitch of the note two notes up.

Don't worry about getting a Blush when pitch raising, especially if the pitch raise is over 50¢. (This takes practice.)

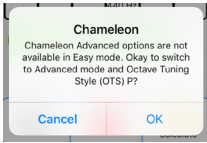
For pitch raises of 20¢ or less, it's worth using Smart Tune mode and tuning each string and unison accurately. This is because Smart Tune's overpull calculations are so smart that most notes end up perfect in a single Smart Tune pass.



Chameleon's Advanced Mode

Advanced Chameleon Easy ?

Chameleon starts off in Easy mode. This mode uses settings that work very well on almost all pianos in almost all situations. If you want more choices, you can use Advanced mode to select a different amount of overall stretch and various tuning partials.



To switch to Advanced mode, tap the Advanced button in Chameleon. Alternatively tap the Easy button and choose any OTS other than "Easy". However, if you're new to RCT, we suggest you stay with Easy mode for the first 20 or so tunings. One important change which happens when you to Advanced mode is the variances are now displayed as numbers instead of "Good/Fair/Poor". The same Red/Yellow/Green circles are still there as a reminder of sample quality.



advanced mode
variance in cents

Advanced mode displays a sampled note's variance in cents (instead of Easy mode's Good, Fair, and Poor). In Advanced mode, Good is any variance below 0.20 cents, Fair is .20 to 0.49 cents and Poor is .50 cents and above. As in golf, lower numbers are better! Always redo variances which are Fair or Poor (yellow or red). Yellow/Fair variances may sometimes be the best you can do, but a tuning produced with a red variance may not sound optimal.

If you import a tuning using iTunes, or if you tap a spinner icon in the "Tunings" window, iRCT will automatically switch to Chameleon's Advanced mode (with OTS P). To return to Chameleon Easy mode, tap "Pure" or "OTS" button and tap "Easy".



Advanced Mode Options

"Tuning Partials" section.

Leaving Smart Partials On is the best choice for almost all pianos and situations. If you must turn SP off, choose "Off 1x" which will turn SP back on for the next piano.

The "Low Bass Smart Partials" option can be set to "Standard" or "Low Stretch". Tap on the ">" for further explanation.

"After Calculating tuning" section.



1. Show Graph. Switch On to view a Graph of a calculated tuning record after calculating it. See Graph section on pages 18-19 for details on the Tuning Graph.

2. Name and Save. Switch this option On if you want the option to name save a calculated tuning record to the currently open tuning file.

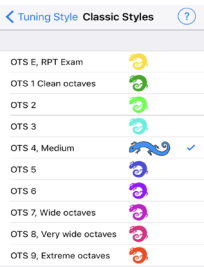
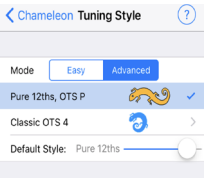
Global A4 pitch lets you choose the pitch used for most of your piano tunings for both CyberEar and Chameleon.

Pure 12ths or OTS "P" tuning style

OTS P tunes zero beat 12ths (octave+fifth) and works very well on all piano sizes from spinet to concert grand by applying a consistent stretch throughout the piano scale. OTS P better integrates the harmonics of large chords spread over the entire keyboard by working *with* inharmonicity instead of against it. At the upper and lower extremes OTS P feathers 12ths to 19ths (2 octaves+fifth) on some larger and/or lower inharmonicity pianos.

Classic Octave Tuning Styles

In Advanced mode you can choose from nine "Classic" graduated levels of overall stretch ranging from very clean (Octave Tuning Style 1) to very stretched (Octave Tuning Style 9). Both OTS P and OTS 4 use a stretch style similar to what most professional tuners (whether using RCT, or tuning aurally) prefer on most pianos, which is why OTS P is automatically selected in Easy Mode. We suggest that tuners new to RCT use Easy mode on a few pianos, listen closely to each tuning and then decide whether you prefer more or less overall stretch.



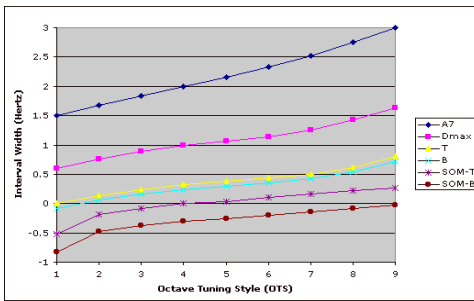


Figure 2

B = Bass control octave (A2 to A3 6:3 octave)

T = Treble control octave (A3 to A4 4:2 octave)

A7 = high treble stretch

(1.0 for pure single octave to 3.0 for pure triple)

SOM T = Treble control octave

Single Octave Minimum

SOM B = Bass control octave

Single Octave Minimum

DMax = Double Octave Maximum

(see below for further explanation)

While OTS P and Easy Mode are very versatile and work well on all pianos, some tuners may wish more control and/or more or less stretch and may want to try out Classic OTS 1~9 or OTS E.

A lower Classic OTS number such as OTS 2 or 3, is preferred by some tuners for low inharmonicity pianos such as Kawai and Yamaha, especially consoles and smaller grands.

Higher-stretched styles such as OTS 6, 7, and 8 are sometimes preferred for large concert grands, most notably a Steinway D in a large concert hall. The tenth is RPT Exam, which emulates a Master Tuning for PTG's Tuning Exam. This is useful for practicing for or taking the RPT exam!

How do you determine which OTS to use? Use your ears(!), your experience, and talk to the customer!

Default Style

Default Style: Pure 12ths

<-- Scroll down to see the Default Style slider

Set the "Default Style" to your most commonly preferred OTS. OTS P is on by default. After you record and calculate a tuning or switch to CyberEar, Chameleon resets the OTS to this default style. This feature prevents mistakenly calculating (and tuning) a piano with an unusual OTS. If you prefer to disable this feature, set the Default Style slider to the far right position labeled "Off".

After Calculating a Tuning

After tuning calculation the OTS is indicated in the tuning header and saved in the tuning record, for example: >P< for Pure 12ths, >E< for RPT Exam or >4< for OTS 4. OTS 1~9 may include and "S" such as ">4S<" indicating the tuning was optimized for a small piano.

Chameleon remembers the current set of A-note samples until you sample another piano, even if you tap the home button or turn off your device. This means you can calculate many tunings for a piano (eg, with different OTS's or tuning partials) without resampling.

High Treble and Low Bass Adjust sliders

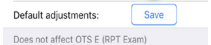
The High Treble ("HT") OTS slider lets you adjust the high treble sharper or flatter than the standard OTS choice. Most of the adjustment is between A6 and C8. For example if your ear tells you that OTS 4 needs to be sharper in the treble similar to OTS 7, move the slider to the +3.0 position. The tuning calculated will be OTS 4 with the high treble of OTS 7 but feathered nice and smooth from A5 to C8. This slider affects only tuning records calculated with numbered OTS 1~9 & P (but not E).



After calculating an OTS 1~9/P tuning with the HT slider set anywhere other than "Standard" (zero change), the piano info will show not only the OTS as usual (eg ">P<") but will show the HT slider setting. For example; ">P+2.0<" where the OTS was P and the HT slider was set to +2 at calculation time.

Save High Treble & Low Bass Adjst as default:

If you find you prefer most or all your tunings' high treble or low bass sharper or flatter than standard, adjust the appropriate slider, then tap the "Save" button. From then on, after calculating a tuning and going to CyberEar, the HT/LB sliders will reset to your preferred setting (indicated by the blue pointer) - even if you change tuning style.



Predicted Beat Rates

When a tuning record is created, the predicted beat rates for B (A2-A3 as a 6:3), T (A3-A4 as a 4:2), and D (double octave A2-A4 as a 4:1) are written into the tuning record's Tuning info field, also visible in CyberEar. This allows you to "pre-listen" to the middle octaves (and know if Clasic OTS DMax and SOM were invoked, see Figure 2 and below for OTS 1~9). The Tuning info can contain up to 35 characters.

Partials

Tap the Chameleon Advanced button to view or select different partials for various sections of the keyboard. The partials selected by Chameleon's Smart Partial feature sound great on almost all pianos. We recommend you use the default partials (or Easy mode) on a few pianos, then decide if you prefer something different.

Automatic compensation for short-scale pianos

Classic Octave Tuning Styles use some very smart guardians: Double Octave Maximum (DMax) and two Single Octave Minimums (SOM Treble and SOM Bass). Together they're called the Limits and their job is to inspect and modify each calculated tuning so every piano will be properly tuned regardless of size or scale design.

Let's assume you've sampled the A notes of your piano. During the fraction of a second after tapping the Calculate button and before you see CyberEar (Easy mode), DMax and the two SOMs "pre-listen" to the tuning and, as necessary make an interactive series of tuning compromises that closely mimic aural techniques.

Did you know? Advanced mode tuning file and record management



It is important to understand the difference between a Tuning Record and a Tuning File. A Tuning Record is used to tune one piano and is what you create when you tap the Calculate button in Chameleon. Tuning Records are managed (named, deleted etc...) in the Tunings window. As many as 2000 Tuning Records are contained inside a Tuning File. Tuning Files are managed (deleted, renamed, etc.) in the Open Files window. (Tap Open button in Tunings).

Tuning files from can be imported from another copy of iRCT, or older RCT on any other platform using iTunes File Share, or by email, see "The Tunings window..." below.

Name and Save Tuning Records

To be able to name and save Tuning Records, you must first tap the Advanced tab in Chameleon then turn on Name and Save. Thereafter, when you sample a piano and tap Calculate, the Piano Identity window will open displaying "Piano make...", a Tuning info" and serial number fields. In the Piano make you can enter anything you'd like (e.g., name of piano or customer) up to a limit of 35 characters. In the Tuning info box the beat rates calculated by Chameleon (B=A2-A3 as a 6:3, T=A3-A4 as a 4:2, D=A2-A4 as a 4:1) will be automatically entered. You can enter info into the Tuning info but you'd have to overwrite the OTS and beat rates, proceed with caution.

Organize your tuning records into the least number files possible. File names should make it immediately obvious which types tuning records are contained within. For instance, create files for geographic areas, by piano or tuning type, or customer name first letter. This lets you take advantage of iRCT's Search feature to quickly locate a specific tuning record. It is especially inefficient and poor practice to create a file for each tuning record. If you have hundreds of files each containing one record, consider consolidating using iRCT's edit functions (copy/cut/paste tuning records between files).

Serial Number

In the serial number box you can enter the piano's serial number or any other data desired. The serial number field accepts up to 16 characters of any kind.



<- Tap to open as current file ->



16 Open and View Tuning Records

To view the Tuning Records contained within the currently open Tuning File, tap the Tunings icon. Tuning Records will be shown sorted alphabetically. The field "Piano make/model/customer", "Tuning info" and serial number (landscape only) will show the data you entered in the Piano Identity window (see File Naming/Saving above). To tune a piano with a specific Tuning Record, tap the Spinner icon on the left. The currently selected Record (open in CyberEar) will have a highlighted Spinner icon and the header will be displayed in CyberEar, just below the various buttons.

Search tunings

Tap the search bar to start search mode. iRCT can search Piano, Info, Serial number or All fields at once.

The "Tunings" window, tuning records and the current file.

This window shows the contents of the currently open iRCT tuning file. The file name and number of tuning records is shown at the top.



<- current tuning record



<- tap to select as current tuning record

If a tuning is calculated, or a tuning file is already open, you will see a small rectangular button (with spinner) on the left of each tuning record. If not, skip to "Calculating and Importing Tunings."

If you touch the rectangular spinner button to the left of the record you want to use, iRCT will load that calculated tuning and go directly to CyberEar where you can start tuning. If you want to change some info in the name, tuning info, or serial number in this record, touch the name or blue icon on the right side of the record and you will be taken to the Piano Identity window. In Piano ID you can make changes and either choose "Save" which will take you back to the Tunings window, or choose "Tune" which will save the info and go to CyberEar to begin tuning.

Tunings window advanced editing functions.

To enable advanced editing functions tap the Edit button. Delete, Copy, Move and Paste are available. Copy, Move and Paste work between tuning files. In other words you can Copy (or Move) one or more tuning records from one tuning file to another. Move is the same as Copy except Move deletes the selected tuning records in addition to placing them in the copy buffer. To paste to another file, tap Open and select the new file (or create a new file and tap Tunings back button), then tap Paste.

Delete (2) Copy (2) Move (2) Paste (1)

Files Button and the Open Files window.

Tap "Files" button at the top right in the Tunings window. Open Files shows all available tuning files which have been created, shared using iTunes, or received by email. To create a new blank tuning file tap the "+" button. The currently open tuning file is shown with a colored spinner document icon. Use "Edit" button to delete, or the blue icon button on the right to rename the file.

Create new blank file

Advanced Editing options->

Edit

+



<-Email current file

Email Tuning File

In Tunings tap the "Files" button at the top right. Tap the email icon at the bottom right corner of the Open Files window. An email opens with the current tuning file as an enclosure. Address the email and tap "Send". iRCT can receive a tuning file as an enclosure using the iOS App "Mail". A single tuning record or any number of tuning records up to 2000 may be copied into a tuning file and emailed.



There are three methods to get tuning records and files into iRCT:

1. **Calculation.**

- A. Record a piano with Chameleon, or tap Piano button and select a demo piano.
- B. If you haven't already, tap Chameleon's Advanced button and turn on "Name and Save".
- C. Tap Chameleon's "Calculate" button (the button with a chameleon), check "Save and tap "Tune".

2. **Import** an RCT Tuning file, User or Aural Temperament file using iTunes.

- A. Connect this iOS device to iTunes using USB or Wifi.
- B. In iTunes select the button with the iOS device's name (for instance "Tuner's iPhone").
- C. Click "Apps" at the top of the window on the right and scroll down to the bottom of this window to where it says "File Sharing". Just below "File Sharing" you will see "Apps" on the left side and "Documents" on the right side. Select "CyberTuner" below the section that says "Apps". Caution: Old tuning file(s) may be erased in the next step unless backed up! (See Exporting... below.)
- D. Drag and drop any RCT file with the extension ".rctx", ".exam", ".hist", or ".aur" into the window on the right that says "Documents". Select the file name and use the Delete key if you need to delete a tuning file.
- E. In the Tunings window tap the "Open" button and choose the name of the tuning file to open.



Any tuning file from any RCT version and platform from after year 2000 will be compatible.

iRCT will not show file extensions such as ".rctx", but extensions will usually appear in iTunes on Mac or Windows. If you have any problem importing or exporting a file, try quitting and restarting iTunes.

Note: iRCT will import and use .exam, .rctx and .hist files from almost any older RCT platform.

3. **Email.** Receive a tuning file by email to the Apple Mail app as an enclosure. After receiving the tuning file, tap on the icon in the email, then tap "Open in CyberTuner". For more help on sending and receiving tunings by email, tap the Open button and "?" for help.

IMPORTANT NOTE: If it is ever necessary to delete CyberTuner from an iOS device, make sure all tuning files are exported first (as directed below), otherwise the files will be lost.

Exporting an RCT Tuning file, User or Aural Temperament file using iTunes.

- A. Connect the iOS device to iTunes using USB or Wifi.
- B. In iTunes select the button with the iOS device's name (for instance "Tuner's iPhone").
- C. Click "Apps" at the top of the window on the right and scroll down to the bottom of this window to where it says "File Sharing". Just below "File Sharing" you will see "Apps" on the left side and "Documents" on the right side. Select "CyberTuner" below the section that says "Apps".
- D. Drag and drop any file from the window on the right that says "Documents" to the computer. Alternatively, you can choose the file in the "Documents" window and choose "Save to..."
- E. The tuning file(s) will then be backed up to your computer.



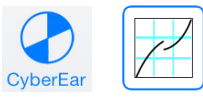
Tuning Graph

The Tuning Graph shows a visual representation of a calculated or recorded piano tuning record.

To view the Graph by default after Calculating, choose the Chameleon icon, then the Advanced button. The turn the option to "Show Graph" on. From that point on, Chameleon will display the Graph after the Calculate button is pressed.

If the "Name and Save" option in Chameleon/Advanced is also On, the Piano Identity window displays first, then the Graph.

In addition to after Calculating a tuning, the Graph can be displayed at any time for any tuning record, here's now:



1. CyberEar Portrait mode (and Landscape on iPhone 5~6/iPod 5~6 & later) will show a Graph button. Tap this button to see a Graph of the current CyberEar tuning record.



2. In the Tunings window, tap the blue "i" disclosure button on the right. There's a Graph button in the Piano Identity window.

In the Graph window tap the Previous or Next buttons (< and >) to page through the tuning records in the currently open tuning file. These buttons will "wrap around" to the start or end of the list.

Alternatively, simply swipe right or left on the graph or header area.

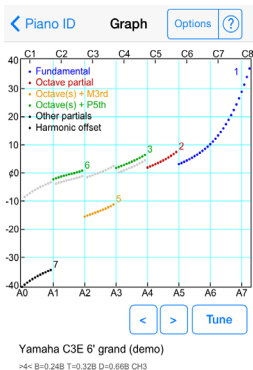
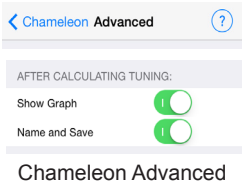
Tap the Options button to adjust the view to your preference. The Options button window has help which explains the options for the colors, lines, dots and curves shown.

The graph Options will automatically (if in Auto mode) resize to fit standard 88 note pianos or Bösendorfer pianos with extra notes (up to 97 notes). However if you prefer the graph be a constant size, choose 88 or 97 notes.

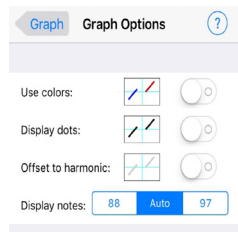
It's a good idea to view the graph and check for anomalies before tuning the piano. It's normal for graphs from different pianos to look very different depending on the quality and type of the piano. In rare cases if Chameleon calculates a piano with bad data input it's possible for the tuning to look unusual or incorrect (and sound incorrect also).

What can you learn about the piano by looking at the graph?

The graph plots cents (.01 part of a semitone) on the y (vertical) axis against the 88 to 97 piano notes C0~A0 to C8 on the x (horizontal) axis. Cents positions are generally sharp (positive) in the treble and flat (negative) in the bass to compensate for the unique inharmonicity in each piano.



Graph of a low-IH large grand



Graph Options remembers your viewing preferences.

There will usually be 5 or 6 curves shown depending on the partials chosen by Chameleon (or the user if Smart Partial option in Chameleon Advanced is turned off). The partial number appears in the same color beside its partial curve.

For calculated tunings, as you progress visually from left to right up the graph, the ending incline of each curve should closely match the beginning incline of the adjacent partial curve above. For very small pianos and/or pianos which are poorly designed, this may not be the case, and the tuning may still sound fine.

Because higher numbered partials have higher levels of inharmonicity, when the partial changes there is a gap between the graph sections. This is normal and expected. Certain partials such as the 5th and 7th have an offset from equal temperament which makes them appear lower than the other partial curves, even though the settings are "in tune". Tap Options button, and tap the "?" help for more help on this subject.

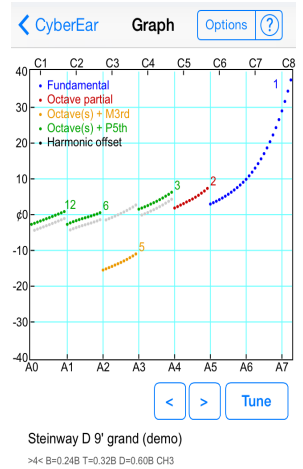
Curves should look graceful and gradual without any significant deviations from a smooth curve.

Tuning record graphs recorded from the piano will not look as beautiful as calculated tunings but that does not necessarily mean the tuning will sound worse to the ear. However, peaks or valleys in the curve can sometimes indicate a "mistake" which can be corrected by checking aural intervals. The ear is the final judge.

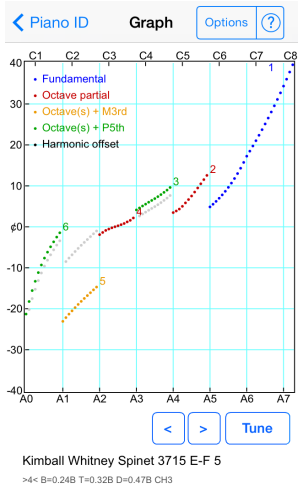
The higher the inharmonicity (IH) of the piano (or section) the steeper the incline from left to right. Some pianos can have high IH in one part of the scale and low IH elsewhere, but well scaled pianos will change gradually.

The tuning graph also highlights the partial set chosen by either Chameleon or an advanced user. Generally higher partials are best in the bass, transitioning to lower partials in the treble, with very high partials such as 10 or 12 used in the low bass on large concert instruments. The most interesting Smart Partial choice is the tuning partial across the bass/treble break. Well scaled instruments usually have the 5th partial in this area, smaller pianos the 4th partial since smaller pianos with higher IH need lower partial matching in that area.

The best way to spot problems is to look at a lot of graphs. After a few dozen you will be able to spot a problem. If you're in doubt, check the Chameleon variance numbers (shown in Chameleon below each A note). Lower is better. Anything 0.15 or less is normally very good. Below .10 cents is usually perfect. Record the piano (or a single A note) again with Chameleon if there's any question.



Very well-scaled
large piano



Poorly-scaled
and/or small piano

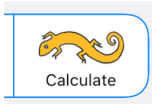


Advanced Chameleon

AFTER CALCULATING TUNING:

Name and Save

Show Graph



tap to see Piano ID

< Chameleon Piano Identity

Piano make/model/customer

>4< B=0.24B T=0.32B D=0.60B CH3

Tuning info

Serial number

Save

Temperament

12 point circle of fifths icon indicates the tuning record's temperament



< Piano ID Temperaments

Di Veroli Jorgensen User ID

Equal Temperament EQT ⓘ

1/3 S.c. Minor 3rds - meantone Me13 ⓘ

2/7 S.c. Extended - meantone Me27 ⓘ

1/4 S.c. Standard - meantone Me14 ⓘ

Vicentino 31-division meantone MeV ⓘ

1/5 S.c. Homogeneous - meantone Me15 ⓘ

3/17 S.c. Riccati - meantone Me31 ⓘ

1/6 S.c. Attenuated - meantone Me16 ⓘ

Pythagorean intonation Pyth ⓘ

Pythagorean-Just intonation PyJu ⓘ

Convert & Tune

"Convert and Tune" button calculates the selected temperament.

Historical and User (custom) Temperaments

To enable iRCT's ability to create Historical or non-equal temperaments, choose the Chameleon icon (lower left), then tap the Advanced button. Turn "Name and Save" switch to "ON". While you're in Chameleon Advanced, set "Show Graph" to "ON" so that you can view the non-equal temperament.

If you're not familiar with the concept of Historical or non-equal temperaments, see the section below entitled "What are Historical or non-equal temperaments?".

Creating a temperament from Chameleon or a recorded tuning record

Tap Chameleon's Calculate button to create a new tuning, or open the "Tunings" window and tap the blue "i" (or ">" iOS 6) button to see the Piano Identity window.

In the Piano ID window is a "Temperament" button. Press it to choose a non-equal temperament. The "Tune" button goes to either the Graph or CyberEar depending upon your settings. The Tune button uses Equal Temperament for a newly calculated tuning, or the currently calculated temperament if you're viewing a saved tuning.

If you're creating a tuning from Chameleon there will be a Save check-box. Check this box if you'd like to save the tuning in the currently open file. iRCT can save or not save tunings, including your temperament choice, depending upon how you work and your personal preferences.

If you are new to non-equal temperaments, start with a mild well temperament such as DiVeroli's "Shifted Vallotti or Young No.2", preferred by many. If you're just trying to get your feet wet, tap "User" and try the "Jim Coleman Sr. #4 Well" temperament. This temperament will result in several pure fifths in common keys, and is especially helpful for very small pianos. In JC#4 (included with User Temperaments) no note has more than a 2 cents deviation from Equal temperament, and sounds close to Equal temperament for modern ears.

The "circle of fifths" icon indicates the current temperament of the tuning record you're working with using, a twelve point star in a circle. You can choose any other temperament and it turns blue, indicating selection. Tap the "Convert & Tune" button to convert directly to the selected temperament, including Equal temperament ("EQT").

Each temperament needs its own unique three or four letter temperament ID so that iRCT can help you keep track of which temperament you're using. The temperament ID is stored in the tuning description inside square brackets such as [VaSH], and embedded in the tuning record along with the 12 offsets for the non-equal temperament.

iRCT can import almost any tuning file with the .rctx extension from older platforms using email or iTunes File Share, even if they've previously been converted to a non-equal temperament. If you used the "User Temperaments" on any older platform, you should also import your "User Temperaments.hist" file using iTunes File Share feature. iRCT will recognize your old User Temperaments converted tuning records as soon as you import this file.

If you use a certain temperament often, it may be convenient to pre-select that temperament. Tap the temperament's blue disclosure button (circled "i") and turn the "Use as default temperament" switch to "ON". When a default temperament is "ON", that temperament will be selected by default after calculating a new tuning, after pressing the Temperaments button. Either Historical or User temperaments may be selected as default.

iRCT includes 56 temperaments from Claudio DeVeroli and 57 temperaments from Owen Jorgensen's publications (see below). In addition, you can add your own "User" or custom temperaments by tapping the "User" button, then tap the plus "+" button at the bottom. Tap the blue disclosure button (circled "i") on the right of the new temperament to enter the description and the 12 cents offsets, one for each note. Calculating these offsets is beyond the scope of this manual.

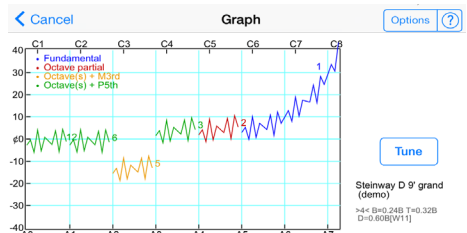
What are Historical or non-equal temperaments?

Historical Temperaments are an alternative tuning method to Equal Temperament. Before the late 19th century, true Equal temperament was not used for keyboard instruments. For instance, JS Bach probably used some variation of "Well" temperament for his "Prelude #1, The Well Tempered Clavichord". Playing Bach, Handel, Mozart and other period music using non-equal temperament can bring the sound closer to the original intent of the composer, if the temperament is chosen carefully with the period in mind. The question of which temperament is best for which music is a very large topic with much debate.

Equal temperament divides an octave into 12 equal parts. In order to work mathematically, intervals in equal temperament are not tuned beatless, but are wide or narrow. For example, fifths are slightly narrow, fourths are wide by about a beat per second, and major thirds are wide with a strong beat. These interval beats and widths cause music to sound quite differently in equal and non-equal temperaments.

For more extensive information on non-equal temperaments we highly recommend Claudio Di Veroli's eBook "[Unequal Temperaments, Theory, History and Practice](http://temper.braybaroque.ie)" available for a reasonable cost at <http://temper.braybaroque.ie>. Another source is Owen Jorgensen's big red book "[Tuning, Containing the Perfection...](#)" which is out of print and expensive, but can be found on amazon.com and other book seller sites. ISBN-10: 0870132903, ISBN-13: 978-0870132902

The graph at the right shows a Jorgensen Vallotti-Young temperament. It's a good idea to view the graph to verify it appears correctly (before tuning the piano).



Using Aural Tutor with a Mock Tuning Exam

Use Aural Tutor and a Mock Exam if you want to improve your aural skills or if you are practicing to take the PTG RPT Tuning Exam.

1. On a good quality piano close to A440, mute the strings so only one string per note is open for the 24 note midrange from C3 to B4.

2. Tap Tunings icon (lower menu bar).



Tap Files (upper right).

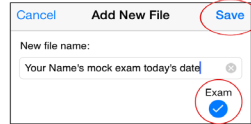


If there's already a prepared exam file with a master tuning, open the file and skip to step 5.

3. Tap the Plus button (lower tool bar).



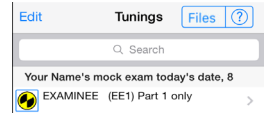
Set Exam to checked. Name this file something like "YourName's Mock Exam Today's Date". Tap Save (upper right).



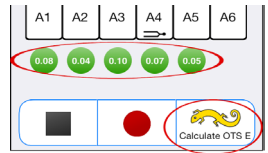
The Open Files window will appear. (Your new file is listed alphabetically and already selected.) Tap Tunings (upper left).



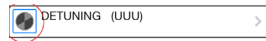
You'll see all the exam tuning records: Examinee Part 1 (EE1), Points (POI), Master (SUP), Detuning (UUU), A4 Pitch, etc... Tap Chameleon icon (lower left).



4. In Chameleon, sample the A's as usual. Try to get low variances, .15 or lower. Use Easy mode or RPT Exam tuning style. Tap Calculate. This new tuning will become your Mock Exam's Master Tuning.



5. If you are studying for the RPT Exam (or the piano is in tune): Tap Tunings icon. Tap the little Spinner icon located to the left of Detuning (UUU). CyberEar will open. Start at C3 and detune up to B4 by tuning each note to match the Spinner.



6. Turn off your iRCT device. Now, aurally tune A4 to your tuning fork and midrange notes C3 to B4. If you're practicing for the RPT Exam's time limit is 45 minutes.

7. When your time is up, turn on your iRCT device. Tap Tunings icon.



Tap the Spinner icon for A4 Pitch.



CyberEar will open with A4 pre-selected. Tap the (left) Listener Ear located near the Tune box which will initiate auto-recording, as indicated by the flashing rings around the Spinner. Play A4, sustaining the note until the Spinner is completely filled in, about three seconds. Your A4 score will be displayed in the Score box (center right). Verify the accuracy of the measurement by playing A4 again; the Spinner should blush. If not, repeat auto-measuring: tap the Listener Ear, play A4, and verify the re-measure. Repeat as needed until you achieve your best blush. It's usually not necessary, but you can manually adjust the Tune Box setting by 0.1 cent by swiping up or down in the Spinner target area. Use a two finger swipe for a 1 cent adjustment.



A. Listen



B. Verify

As your A4 pitch is recorded, CyberEar displays your final pitch score immediately. 80% passes.

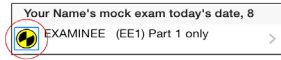


C. Save

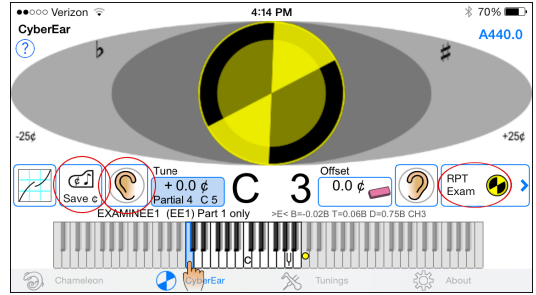
8. Tap Tunings icon.



Tap the Spinner icon next to Examinee (EE1) Part 1.

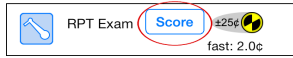


CyberEar will open and C3 will be selected. Tap the left Listener Ear and play the selected note, repeating the procedure as described in step 7 until you get a good blush. When you're satisfied, tap Save Cents (the button with a piano icon and the word "Save", located near the Tune Box's Listener Ear). CyberEar will automatically save the Tune Box reading for the selected note, then switch up to the next note up and initiate auto-measuring. Play the note, verify its auto-measure, and tap Save Cents. Continue up to B4.

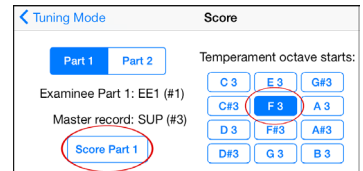


9. After measuring and Saving Cents for all notes, tap the Mode button (it says "RPT Exam").

In the RPT Exam area, tap the Score button.



Select the lowest note of your temperament octave (for most people it's F3).



Select "Part 1: if needed and Tap Score Part 1.

A Chart will open with your Points Off (errors) for each note. To see your final scores, tap Final.

Score Chart

RANGE	BASS	MIDRANGE	TREBLE	H-TR			
OCTAVE	1/3	2/4	3/5	4/5	5/5	6/6	7/7
C							
C#	+1	+1	-2				
D							
D#							
E							+1
F			-1	-1			
F#			-1	-1			
G							-1
G#							+1
A							
A#							
B							

POINTS (P0) PCN=0.2

Points Off Chart

(To pass the real RPT Tuning exam, you need 80% or better in all sections.)

10. Tap Chart. Tap on any note with points off (recommended: Start with the biggest error, highlighted in red).

Final Scores

TUNING AREA	OCTAVES	POINTS	PTS COM-VERSION	SCORE%
1. PITCH	A#0	0.0	100.50PTS	100
2. TEMPT	F3-F4	3	100.25PTS	93
3. MIDRANGE	3.4	5	100.15PTS	93
4. BASS	1.2	7	100.POINTS	93
5. TREBLE	5.6	5	100.POINTS	95
6. HIGH TREBLE	7	2	100.POINTS	98
7. STABILITY	3.4		100.4PTS	
8. UNBOND	3.4		100.2PTS	

POINTS (P0) PCN=0.2

Final Scores

Select Aural Tutor. A customized explanation of the error and three suggested aural checks will appear. Tap each aural check to see an explanation of the note's Problem (what sounds wrong and why), its Solution (which direction to move the note and how the aural check should sound when the note is correct) and the Test Note that's used by the Aural Check Interval.

Chart Aural Tutor

NOTE C#4 SCORES -2 POINTS (FLAT)

1. Octave down (C#3 to C#4)
2. Contiguous M3rds (A3 - C#4 - F4)
3. Contiguous 4ths (G#3 - C#4 - F#4)

Problem: Octave is probably narrow and noisy.

Solution: Sharpen C#4 until the octave is just slightly wide but still fairly clean.

Target: 1/4 bps wide Octave

Test Note: E3 using Inside minor third-Sixth test (6:3). The Sixth (E3-C#4) should beat the same or slightly faster than the minor third(C#3-E3)

11. You can re-tune a few notes and re-score. Re-measure and save only those notes and re-score your tuning.

(Tip: After hitting the Save Cents button, cancel auto-measuring for the next note up by tapping the left Listener Ear.)

12. If you're taking the RPT exam entirely aurally, you should take a Part 2 mock exam also. For more information on Part 2 and giving and taking the official PTG RPT Exam see documentation on the iRCT Support page at www.cybertuner.com/irctsupport.

24 CYBERCARE SUBSCRIPTION

The CyberCare subscription includes the ability to run iRCT for one year in Premium mode (tune all 88 notes) and includes all new version updates and new features released during the subscription period. CyberCare includes access to expert, personalized phone and email support for any iRCT related issue. One year of CyberCare is included with initial iRCT license purchase. Subsequent CyberCare subscriptions may be purchased as an in-app purchase. In iRCT tap About icon, Subscriptions, iRCT Store to purchase a subscription.

Automatic Renewal for CyberCare

CyberCare in iRCT v7.5.5 and later offers the optional convenience of automatic renewal. After the first CyberCare is purchased, AUTO-RENEWAL IS ON BY DEFAULT. Auto-renew subscriptions charge your iTunes account within 24 hours before subscription expiration. You can manage or cancel the auto-renew feature by tapping CyberTuner's About icon / Subscription button / Manage Auto-Renew button and following the links. Turning off auto-renew returns the subscription to a manually renewable subscription which works exactly like previous versions 7.5.4 and older.

All the information needed about your iRCT CyberCare subscription is on the About iRCT and Subscription windows.

The CyberCare page tells you how long ago the CyberCloud was contacted and when your iOS device will next attempt contact. It also lets you know the date your CyberCare subscription will expire, and if your subscription will automatically renew, and when.

iRCT contacts the CyberCloud occasionally for several reasons, including recalibrating and/or confirming that iRCT is tuning exactly at A440.00. The CyberCloud calibration methods are always improving, giving you the latest calibration technology. If Apple releases a new iOS device, iOS software version, or you buy a new iOS device, CyberCloud will automatically calibrate the new model or iOS version.

While re-calibrating, iRCT confirms and updates your CyberCare subscription as needed and makes sure you have the latest CyberTuner technology.

If you use iRCT on an iPhone or iPad with a mobile phone connection, or if you regularly visit a wifi area and open iRCT in that area, iRCT will take care of connecting to the CyberCloud for you. Some wifi areas may require logging into wifi and/or a password.

However, if you have an iPod touch, or an iPad without a mobile phone connection, and don't often visit a wifi area, you may want to contact the CyberCloud manually. (iRCT will tell you when this is needed, or visit the Subscription page in iRCT). Open iRCT, tap About, then Subscription. If you need to contact the server, tap the "Contact CyberCloud" button, it takes only a few seconds.

IF THE CYBERCARE SUBSCRIPTION EXPIRES WITHOUT BEING RENEWED, OR IF iRCT CAN'T CONTACT THE CYBERCLOUD WITHIN ABOUT 30 DAYS (AFTER MANY ATTEMPTS AND WARNINGS), IRCT WILL THEN RUN IN "STANDARD" MODE UNTIL NEXT CYBERCLOUD CONTACT. STANDARD MODE ONLY ALLOWS 13 NOTES FROM A3 TO A4 TO BE TUNED IN CYBEREAREAR. To return iRCT back to Premium mode, tap the "Contact CyberCloud" button when connected to the internet. You may also need to renew your yearly CyberCare subscription (if expired).

To update to the latest iRCT version (or check to see if there is an update) you will need to be connected to the internet via wifi or mobile phone connection.

1. If you have saved tunings, you should synchronize with a computer with iTunes installed and Export your tuning file(s) to your iTunes computer. (See directions above, iRCT does its best to preserve your data, but why take chances.)

2. On your iOS device tap the icon "App Store", tap "Updates" and follow the on-screen prompts.

Managing your iOS device's battery power

To minimize the power used and maximize your battery:

1. Exit all apps. See page 4 for complete step-by-step instructions. Exiting all apps will also allow iRCT to function more quickly and at highest efficiency and accuracy.

2. Adjust your iOS device's Brightness settings at: Settings > Wallpapers & Brightness.

Use the lowest setting you can manage since the screen brightness is the largest user of battery power on an iOS device.

3. Don't leave Chameleon in recording mode (or pause for very long) unless you are actively recording a piano.

4. When tuning with CyberEar, iRCT keeps the screen on as long as it regularly hears a musical note. If you are not actively tuning with CyberEar, either tap the home button or tap one of the other iRCT icons at the bottom of the screen such as Chameleon.

With some iOS versions CyberEar shuts off after 30-40 seconds to save power. However, if CyberEar is someplace where it hears a pitch in the right range, it won't shut off.

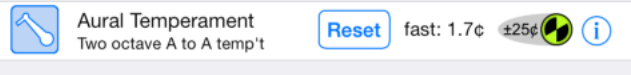
5. If you don't need your mobile phone connection or wifi connection to be active while you are tuning, turning these connections off to save power.

Consider choosing "Airplane mode" in Settings. Not only will it save power, you won't be interrupted while tuning. Incoming phone calls will go to voicemail so you don't miss anything.

However, don't forget to turn Airplane mode Off once you're done tuning so you can receive texts and phone calls. Also, iRCT needs to recalibrate A440 occasionally and needs internet access to do so.

6. In Settings App, turn off Notifications and Location Services, or limit these services only to certain applications.

7. Is your iOS device more than two or three years old? If so it may need replacing or a new battery.



Aural Temperament mode

Aural Temperament mode enables setup of multiple sequences of up to 25 notes (two octaves) to help practice, learn or teach aural tuning of a "temperament" sequence. (A temperament is a central keyboard area of one to two octaves used for starting an aural tuning).

iRCT comes with a complete two octave A to A temperament. The order of the first seven notes in this sequence is crucial to the two octave temperament working correctly. The 8th through 25th notes can be tuned in almost any order since there are numerous aural check notes at that point.

To add a new sequence tap the "+" button on the bottom toolbar.

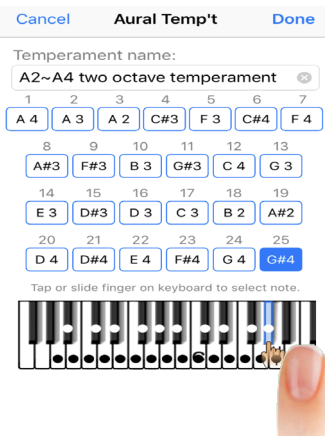
To select a different Aural Temperament sequence out of two or more, tap the spinner icon on the left. CyberEar will appear in Aural Temp. mode with the selected sequence ready to tune.

To edit a sequence, tap the sequence name and edit the name as needed, and enter the notes in sequence by tapping on the piano keyboard. Slide or roll your finger on the piano keys for more accurate control.

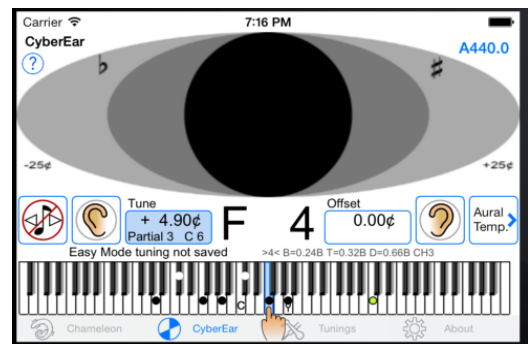
Once you're in Aural Temp't mode in CyberEar, tap the usual note up or down controls to change notes and record that a note has been tuned (tap on the right side of the spinner area to move to the next note, tap the left spinner area to move to the previous note). A dot appear on each note that's been "tuned". To reset the sequence (start again), tap the tuning mode button in CyberEar (says "Aural Temp't"), then tap the Reset button.

To delete a sequence, tap the "Edit" button, tap the red "-" button and tap Delete, then confirm.

All Aural Temperament sequences are stored in a file called "Aural Temperaments.aurl". This file can be backed up using iTunes file share. The file can be emailed to another iRCT user as needed. All aural temperament sequences are included with this file. Only one Aural Temperaments.aurl file can be used at a time. The file name must be spelled exactly for iRCT recognize it.



Setting up
an aural
temperament



Executing
the aural
temperament

Pianalyzer

Pianalyzer (Paz) is a specialized spectrum analyzer designed specifically for pianos. Paz is perfect for visually showing customers what their instrument needs (repairs or voicing), for troubleshooting tuning problems, and for piano tone/string comparisons.

Paz measures pitch, inharmonicity, sustain, and volume for the first 16 partials of any note. Pianalyzer is useful for tone education (for example, educating customers to help sell voicing jobs) and string design research.

To open Pianalyzer, tap the Pianalyzer icon. To start using Paz, select a note using the on-screen arrow buttons or in the display area swipe left/right to move up/down and octave, or tap left/right to move up/down a single note (similar to CyberEar).

Tap the Record button, and play the selected note medium loud, sustaining the note while the ear pulses. After a short time the measurement results will be displayed. Tap the first column's header to switch between partial number (P) and note name (N). Tap the second column's header to switch between Cents and Hertz. Tap the third column's header to switch between Inharmonicity constant (Ic) and sustain in seconds (Sec).

Hit the Stop (black square) button if you want to abort the sampling process.

Tap the headers of the fourth column to adjust the volume bars or display volume numerically (volume units are arbitrary and are not decibels). To set the first partial (fundamental) to 0.00 cents or theoretical hertz frequency, tap the button "Fund=0 ¢". Tap the button "EQ Temp ¢" to switch to/ from "Harmonic c". Tap the "?" button for online help as with most iRCT windows.

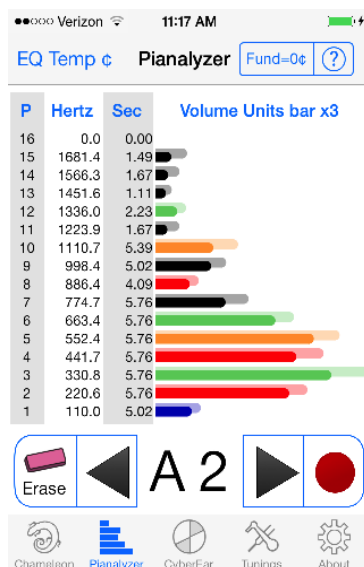
Tap the "Erase" button to delete the data for a single note, or all 88 notes (confirmation dialog is displayed).

Pianalyzer records up to 88 notes in memory (up to 97 notes if you have a Bösendorfer tuning record selected in CyberEar or if 92/97 note piano selected as Chameleon's Piano Size).

After recording the same note a second time, the Volume units column displays both the most recent and previous volume units data. (Previous data is in lighter color).

The volume unit bar colors follow partial chains as follows:

Black - Other partials (non-musical)
 Orange - Octave(s) + Major third
 Green - Octave(s) + Perfect fifth
 Red - Octave(s)
 Blue - Fundamental



RCT support contacts

RCT website: www.cybertuner.com

Support note: using our web forms at www.cybertuner.com/contact is the **fastest** method of obtaining support. All of the iRCT support phone numbers are either answered directly by a PTG Registered Piano Technician, or an RPT is on staff and available. RPT support persons are all working piano tuner-technicians who are also RCT experts!

Please be respectful of our support experts' time by first attempting to locate the answer in this manual, online at www.cybertuner.com/irctsupport or use the "?" help button in almost every iRCT window. That button has help specific to each iRCT window's function.

If the answer can't be located in our documentation, our internet web forms are usually the **fastest** way to get answers:

Press "?" in any iRCT window for fast help!



Tech support web form: www.cybertuner.com/isupport

General support page with the latest version of this Getting Started Manual and how-to videos:

iRCT support page: www.cybertuner.com/irctsupport

USA, Canada and other areas not covered below / English language support:

Reyburn Piano Service, Inc.
2695 Indian Lakes Road
Cedar Springs, MI 49319 USA

Toll free in USA or Canada:
1-888-SOFT-440 USA or Canada
or: (1-888-763-8440) or 1-616-696-0500

French language support:
Marcel Lapointe, RPT
6769 Avenue Royale
L'ange-Gardien, QC CANADA G0A 2K0
phone: (418)-822-3550 fax: (418)-822-3895
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