PiaTune

Professional Piano Tuning Application for iPhone*

*Will work on iPad in 2x mode. iPhone and iPad are registered trademarks of Apple Inc.

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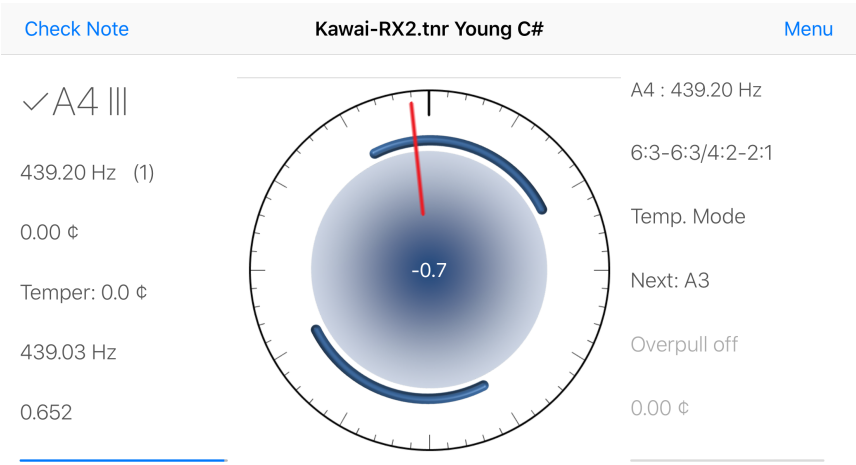
Introduction

PiaTune is a piano tuning application for professional tuners. The free version is fully functional except one limitation. The application will be paused for 2 minutes every 12 notes after reaching the number of note changes allowed on first install. The number of remaining notes is displayed on the main screen in the free version.This limitation can be removed by upgrading to paid version through In App Purchase. On first launch, application asks permission for microphone and **Main Screen** is displayed.

Main Screen



Main screen consists of top bar, left, center and right screen sections.

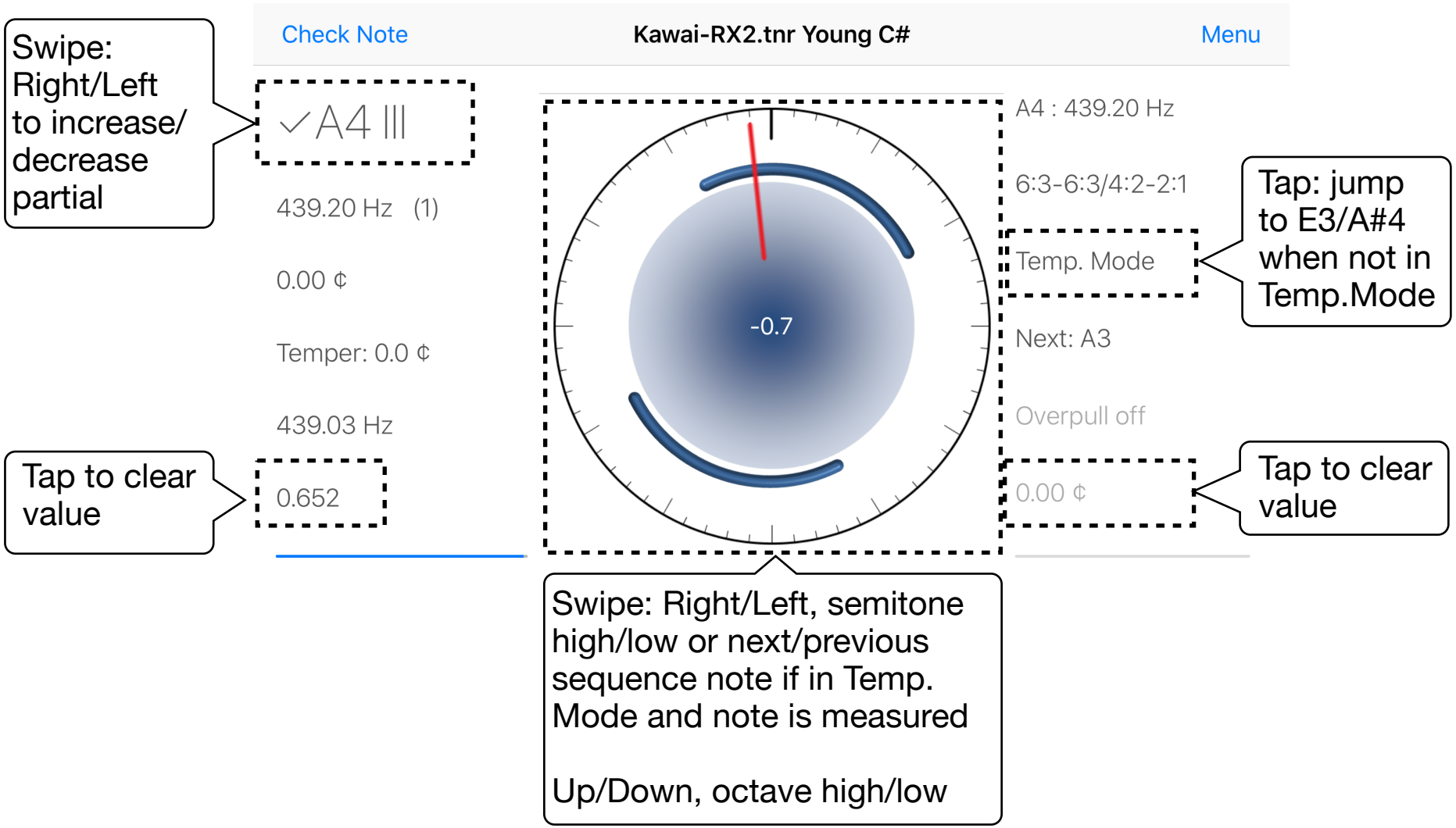
Top bar holds **Check Note** and **Menu** items and information about tuning file name, selected temperament and transposing if an unequal temperament is selected.

Left section shows various information about the current note.

Center section displays how close is the current note to the target.

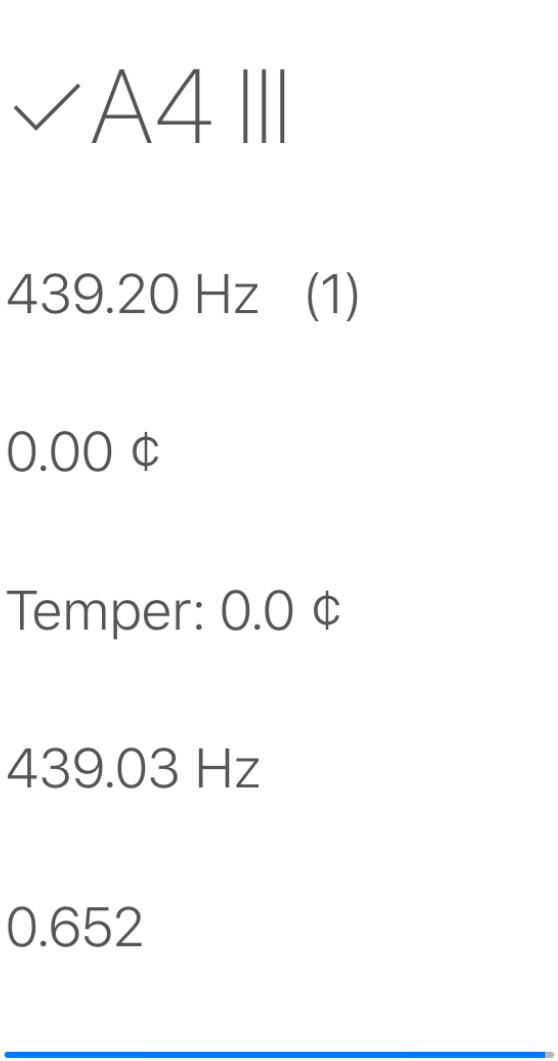
Right section holds information on various settings and over pull.

Navigation on the Main Screen



Main screen left section

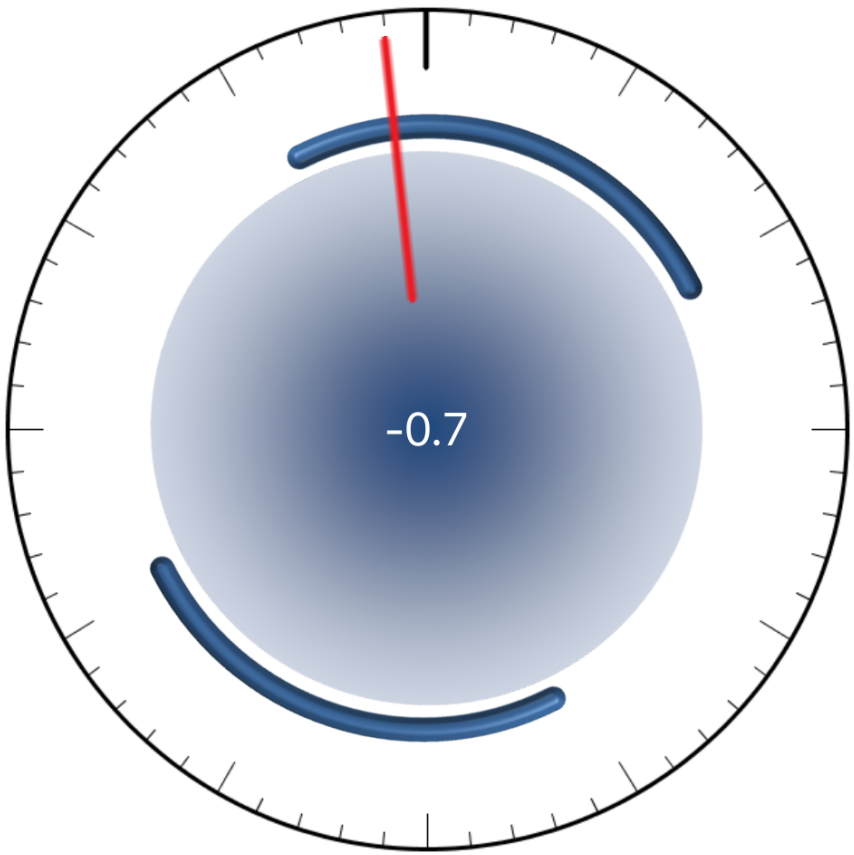
When in Temp. Mode (setting the temperament) note names have one of “III” or “I” suffixes. “III” means that this is the final measurement and the note can be fine tuned. “I” means only the inharmonicity is being measured and the note will be revisited. It can be rough tuned if necessary or not tuned at all if it is not too off. A check mark appears when measurement is complete. It is not possible to switch to the next note in the temperament sequence before the measurement is complete.



Target frequency and the current partial is shown in the second row.
Third row shows the target value in cents.
Fourth row displays the cents value that the note will be shifted if an unequal temperament is selected.
Fifth row shows the measured frequency of the current note depending on which partial is being measured.
Sixth row displays the measured inharmonicity value. **Measurements must be taken always on single strings, the other string(s) of the unison being muted.** If an erroneous measurement is made due to noise or other reason, tapping on the value will clear the value and the note can be measured again. **It is important that neighboring notes do not have values that differ too much from each other.** The last octave is not measured
The bottom row displays the inharmonicity measurement progress bar. When the bar is full, measurement is complete and a check mark appears on the note name. Notes without a check are not saved in the tuning file. All notes (but last octave) must have a check mark.

Main screen center section

When a note is played and if the level of the sound is high enough to trigger the measurement sequence, two half arcs and a shadowed area are displayed.



If nothing is displayed upon playing a note, it might be necessary to adjust the **microphone start level** from the settings screen. The measurement is stopped and the display is blanked when the sound level drops below the **microphone end level** value.
The value in the center of the display indicates the current note's plus or minus cent difference from the target value.
If the note is flat the value is minus and the half arcs turn left. With a positive value the note is sharp and the arcs turn right.
When the average of last ten measurements are within 1 cent of the target value, a red dial indicator is displayed showing the average value. The instantaneous value shown in the center and dial indicator value need not be the same.
The goal is to stop the arcs and make the dial indicator as close to zero value as possible.
It is recommended that the tuning of a single string of a unison is done according to the indicator and the remaining strings of the unison tuned aurally.

Main screen right section

A4 : 439.20 Hz

6:3-6:3/4:2-2:1

Temp. Mode

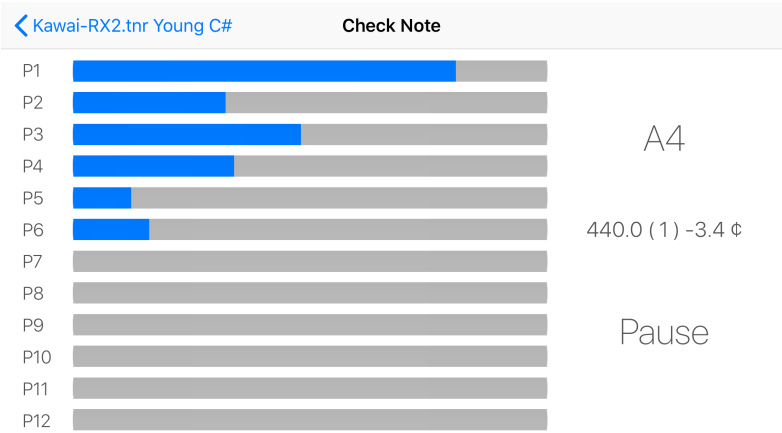
Next: A3

Overpull off

0.00 ¢

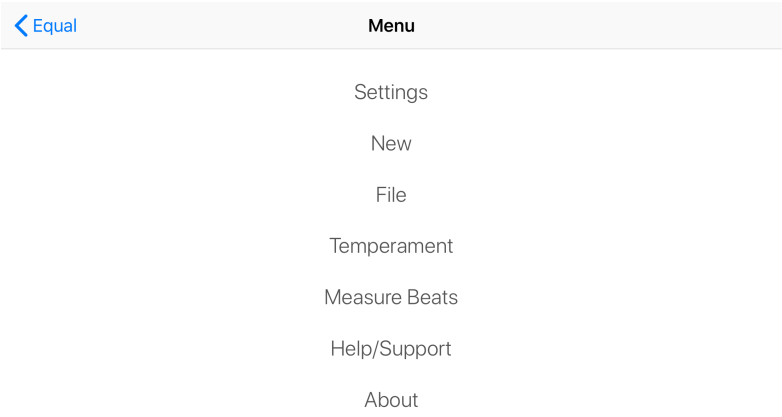
The frequency of the A4 is set from the settings screen and is displayed on the first row. The frequency can be set from 392 Hz to 467 Hz.
Second row displays the set stretch values for the bass, middle and treble sections set from the settings screen.
Third row displays the current mode. There are 3 modes. Temp. Mode, Manual Mode and Auto Mode. A new tuning starts with the Temp. Mode and switches to Manual Mode when the setting of the temperament is completed. Auto Mode can be set from the settings screen and will allow automatic note change to the neighboring 3 semitones.
When in Temp. Mode the next note in the sequence is shown in the fourth row.
Over pull can be activated from the settings screen. The status is shown in the fifth row.
When over pull is active, the over pull value of the sounding note is calculated according to the difference between the target and measured values and is shown in the sixth row. The value is determined according to the over pull percentages set in the settings screen and whether the note is in the bass, tenor or treble section. Tapping on the value will clear the value and a new measurement can be done.
The seventh row displays the over pull measurement progress.

Check Note



Check note screen dynamically displays the relative strengths of partials of the selected note. It also displays how far the note is from reference frequency. The display freezes when the Pause button is pressed. Pressing the button again will resume the measurement. Swiping on the note name to left, right, down, up will change the note a semitone low, high and an octave low, high. Swiping on the frequency to left, right will decrease, increase the measured partial.
The information might be used for voicing and checking the piano.

Menu Screen



From the menu screen, Settings, New, File, Temperament, Measure Beats, Help and About screens can be activated.
Settings screen is used to set various tuning parameters.
New item is used to start a new tuning. **All unsaved values are lost when a new tuning is started.**
Temperament screen is used to create a new unequal temperament or edit an existing temperament.
Measure Beats is used to measure temperament related beats.
Help screen provides user's manual and support information.
Version, copyright information and **In App Purchase option** is displayed at the About page.

Settings Screen

Settings screen contains 4 sections. Tuning Preferences, Microphone Settings, Over pull Settings and Miscellaneous Settings.

Tuning Preferences

A4 Frequency (Hz)

With this setting the frequency of A4 can be between 392 Hz and 467 Hz with 0.01 Hz increments.

Bass/Mid/Treble

This setting is used to select the stretch sizes for the bass, midrange and treble sections of the piano. For the bass section 4 settings are available: Spn, 6:3, 8:4 and 10:5. Spn setting is for spinet or similar pianos where all bass octaves tuned to 6:3 might be beneficial. 6:3, 8:4 or 10:5 octave sizes can be selected according to the desired stretch and piano size. 10:5 setting will have the widest stretch whereas 6:3 might be suitable for most medium sized grands and uprights.
There are 2 settings for the midrange. 4:2 and 6:3/4:2. 4:2 setting will set the octave size to 4:2 whereas 6:3/4:2 setting will employ a compromise between a 4:2 and 6:3 octave.
Treble setting has 2 options, 2:1 and 4:1. If 2:1 single octaves are preferred for the last octave 2:1 option can be selected. Otherwise 4:1 option might be suitable for most pianos.
The default setting is 6:3-6:3/4:2-2:1

Temperament
The default setting is Equal temperament. **1/4 Meantone, Kirnberger III, Valotti, Werckmeister III and Young** unequal temperaments are available. Additional temperaments can be added to the list via the **Temperament Screen.**

Transpose
If an unequal temperament is selected, the key that the temperament will be transposed can be selected from here. The default is C. All unequal temperaments are adjusted such that A4 is at 0.0 cents.

Last Wound Note
The last wound note can be selected between E2 and F#3. This setting is used for over pull calculations to determine where the bass break is. If not set over pull mode cannot be activated.

Microphone Settings
Different devices might have different microphone sensitivities. Also it might be necessary to make some adjustments according to the ambient noise.

Start Level
This is the sound level at which the measurement of a note will be triggered. Default value is 50. It can be set from 30 to 70. Increase this value if ambient noise is high and measurements take place even though a note has not been played. Lower this value if the played note sound is weak and a measurement is not triggered. This might be the case especially in the high treble area.
End Level
This is the sound level below which the measurement is stopped. Default value is 18 and it can be set between 8 and 28. Note that maximum end level is below minimum start level. If the sound decay is

too quick then lowering this value might be beneficial. If only the attack sound is preferred for the measurements increasing this value might be appropriate.

Over pull Settings

Overpull
This switch activates/deactivates over pull setting. It is not possible to activate over pull if Last Wound Note is not set.

Bass (%)
Sets the percentage that will be applied to the notes between A0 and the last wound note. Default value is 10%.

Midrange (%)
Sets the percentage that will be applied to the notes between last wound note and treble break. Default value is 25%.

Treble (%)
Sets the percentage that will be applied to the notes between treble break and C8. Default value is 35%.

Miscellaneous Settings

Auto Partial (below E2)
If activated this setting will force the strongest partial to take effect for notes below E2. Default value is off.

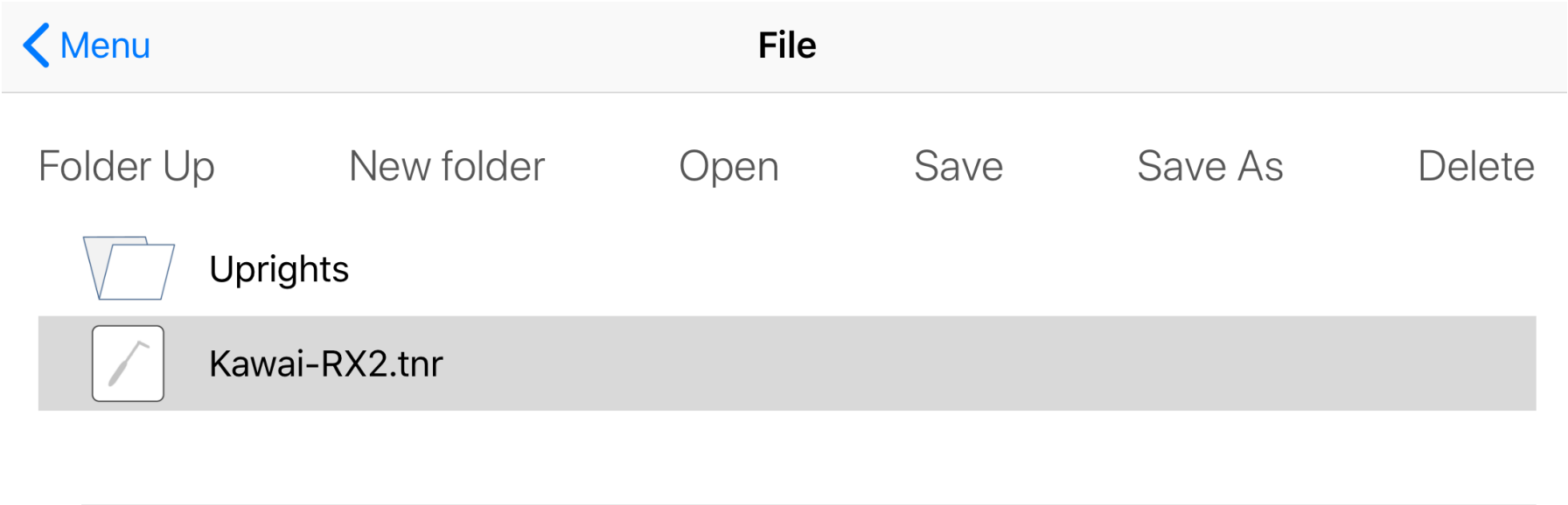
Auto Note
When activated automatic note switching within the neighboring 3 semitones of the current note will take place when a note is played. Default value is off.

Calibration (cents)
Entering the cents difference between a trusted sound source for 440 Hz and the displayed value will calibrate the sound system. Default is 0.0. -0.9 to 0.9 cents can be selected with 0.1 cents steps.

To save the settings **Done** button is clicked. To exit without saving click left side item at the top bar to return to the Menu screen.

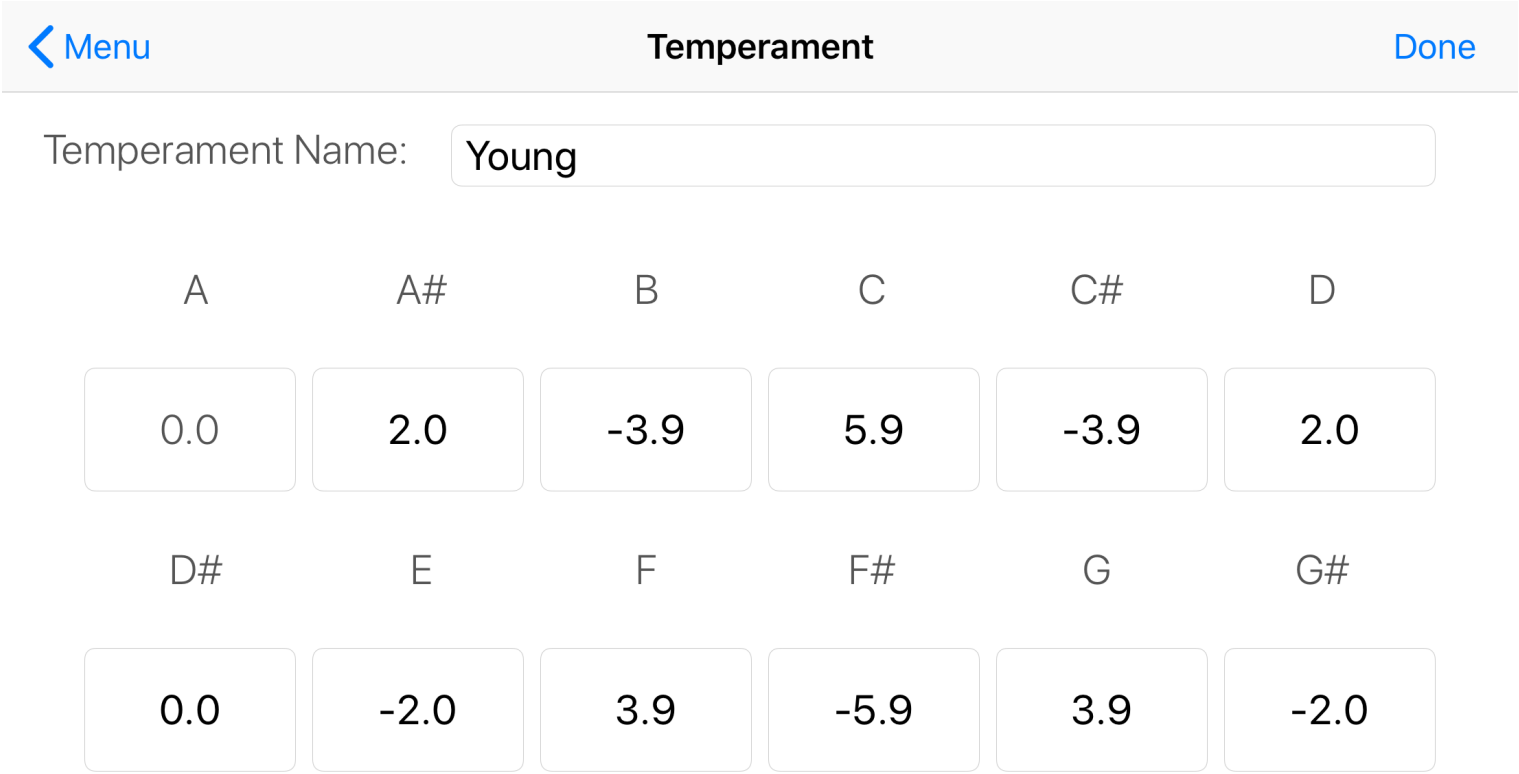
The settings under Tuning Preferences and Microphone Settings are saved to the tuning file when the file is saved.

File Screen



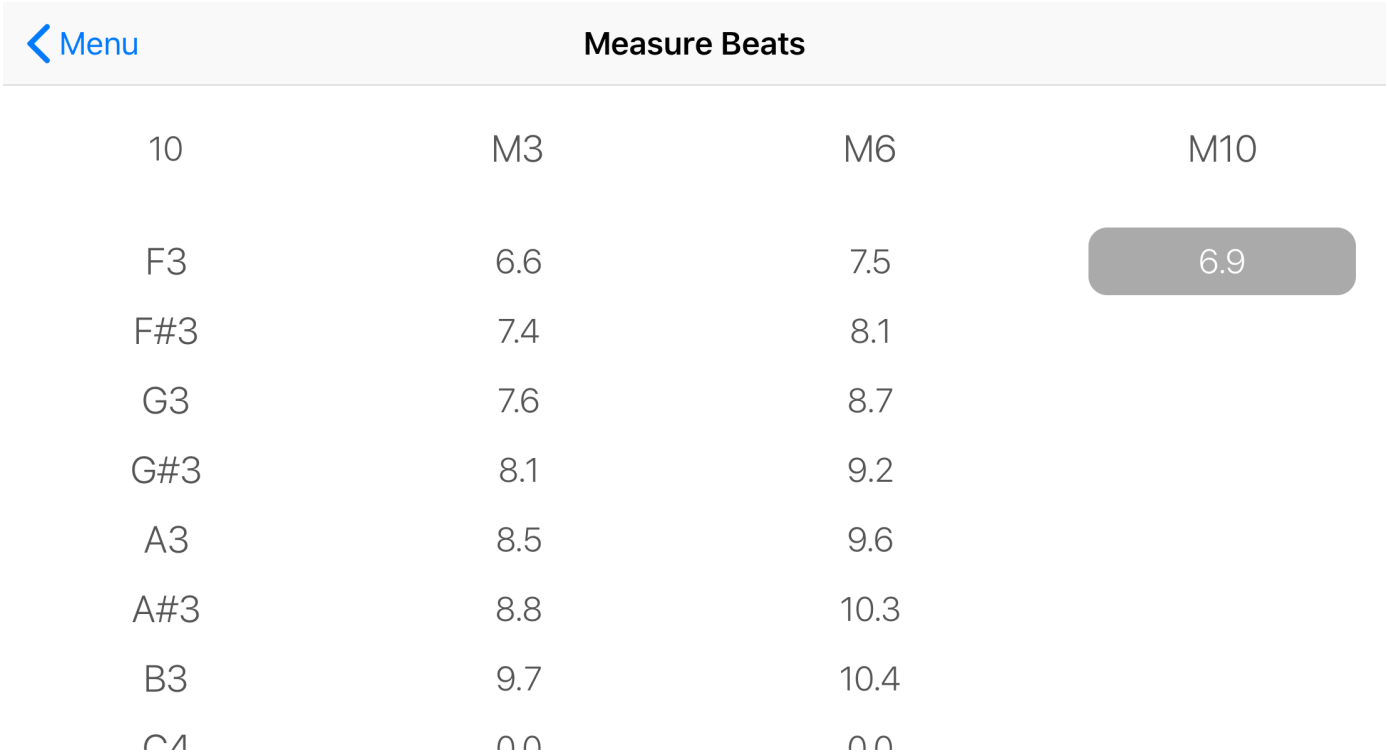
File screen is used for file operations. When a tuning is saved for the first time select Save As and enter a file name without any extension. “tnr” extension is automatically added to the file name. Successive saves of the same file can be done with Save. Loading a saved file by selecting file name and pressing Open will erase the current values and the loaded file will take effect. Single click selects folders and files. Double clicking on a folder opens folder contents. New Folder creates a new folder. Folder Up switches to the parent folder. Delete will delete files and folders. **The contents of a folder is deleted along with the folder itself.** Inharmonicity data and the settings under Tuning Preferences and Microphone settings are saved in the tuning file.

Temperament Screen



Temperament screen is used to create a new temperament or edit an existing one. Entering the name of an existing temperament and hitting return key will bring the values of that temperament. After editing/entering the values clicking Done will the add the temperament to temperaments list at the settings screen. To activate the new temperament it selected from the settings screen. **Remember that temperaments added cannot be removed later.**

Measure Beats Screen



Actual beat rates of major thirds, sixths and tenths intervals can be measured in this screen. Select the note name and interval name. The related value is highlighted. Play the interval and wait until the dark background turns to light gray indicating the measurement is finished. You might tap on the the screen at any time to pause/resume measuring. This can be used to play other intervals such as fourths or fifths without disturbing the already measured values. Intervals range from G#2 to F4. Using test notes the beats rates of fourths, fifths and 4:2 octaves within the temperament can be calculated.

Tuning Procedure

Tuning procedure to follow depends on whether it is a **new tuning** or a **saved tuning**.

New Tuning

PiaTune starts in Temp. Mode, that is the **temperament is set first** like in aural tuning and then the **bass and treble sections are expanded** from this temperament.

PiaTune does not store target frequencies but continually calculates them as the tuning progresses. Just like an aural tuner does every note is calculated with respect to the previous note(s) measured. Before beginning a new tuning a few parameters have to be set and fixed. Because changing them in the middle of a tuning will cause all the notes to be recalculated and the notes tuned up to that point would have to be tuned again.

There are 3 parameters that must be set before beginning to tune. **A4 Frequency**, **Bass/Mid/Treble** stretches and the **Temperament** (and transpose if the temperament is unequal). These parameters are in the Tuning Preferences section of the **Settings Screen**.

The piano can be checked by using the Check Note screen agains standard pitch to decide whether a single pass is sufficient or whether a **pitch raise** is needed. If pitch raise is to be applied then **Last Wound Note**, **Bass(%)**, **Midrange(%)**, **Treble(%)** parameters should be set and **Overpull** should be activated from the **Settings Screen**.

Setting the Temperament

Piatune uses an F3 - A4 temperament. The temperament is set by forming contiguous M3rds similar to an aural tuning. Then the notes in between are calculated numerically for an even progression of major thirds and fourths.

The temperament sequence consists of 24 steps. Since 17 notes are to be tuned that means 7 notes are visited twice. These are F3, F4, F#3, G3, G#3, A#3 and B3 and they have “I” suffix on the first visit. On the second visit the suffix changes to “III” to indicate that this is the final fine tuning for that note.

The temperament sequence is tuned as follows:
Only **single strings** of a unison must be measured and tuned. The completion of a measurement is indicated by a check mark (✓) on the note name. Pay attention that there isn’t any misreadings due to extraneous noise and the inharmonicity coefficient is zero before the measurement. The notes are tuned along with the inharmonicity measurements. There is no need to wait until the measurement is complete.

Play A4, while playing the note several times and observing the inharmonicity value simultaneously fine tune until the arcs stop and the red dial indicator is as close to zero as possible. Swipe right to go to the next sequence note, A3. Notice that the next sequence note to be tuned is shown on the right side as “Next A3”.

Similarly play A3 and tune as described above. Swipe right and proceed to F3. Notice that F3 has the “I” suffix instead of “III”. This means that this note will be visited again. Therefore you can play the

note without tuning to complete the measurement. If the note is far off it is better to roughly tune the note at this time to get a better inharmonicity measurement. Swipe right to go to F4.

Measure (and rough tune) F4 as described above for F3. Swipe right and proceed to C#4.

C#4 has “III” suffix. Therefore fine tune C#4. Swipe right to proceed to F4 again.

Fine tune F4. Swipe right and proceed to F3 again. Fine tune F3 and proceed to F#3 by swiping right.

Measure (and rough tune) notes from F#3 to B3. note that A3 is skipped since it has already been tuned.

Fine tune C4. Continue the sequence by right swipes and fine tune notes form B3 to F#3.

Continue with right swipes to fine tune F#4, G4, G#4, D4, D#4 and E4.

E4 is the last note in the temperament sequence. **Swipe right once more to exit Temp. mode**. The mode changes to Manual Mode.

At this point it is recommended that you save the tuning. **Menu>File>Save As.**

Further saves of the current tuning file as the tuning progresses can be done with **Menu>File>Save.**

At this point you can either expand the temperament to bass or treble. Tapping on Manual Mode will switch the note to E3. If you tap once more the note jumps to A#4.

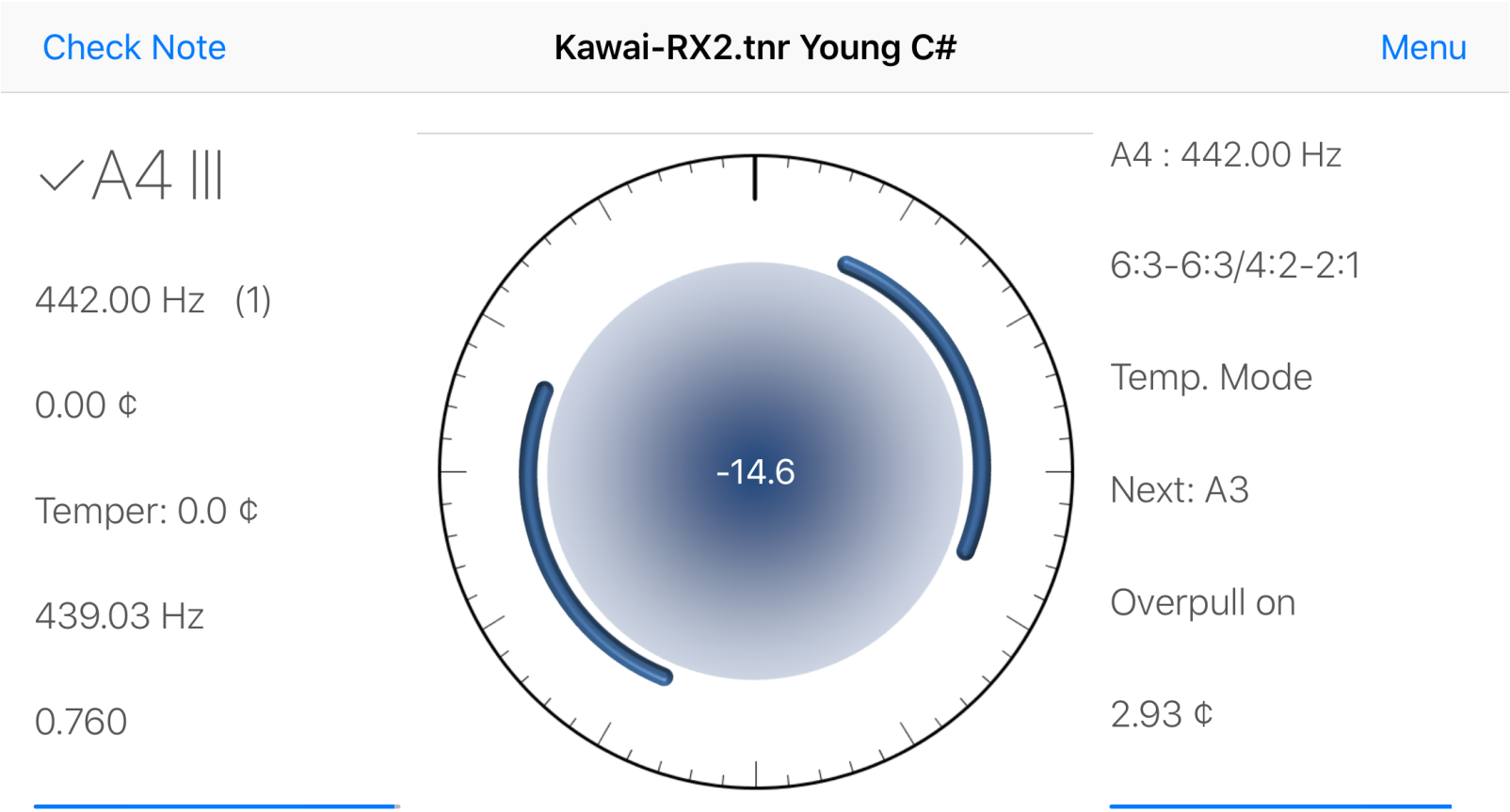
Expanding the temperament

It is recommended to **tune single strings to the target frequency and tune the other strings of the unison aurally**.
In Manual Mode swipe right to go a semitone high or left to go a semitone low. Swiping up or down will change to one octave high or low respectively. Alternatively you can activate Auto Note (**Menu>Settings>Auto Note**). In this mode the note switches to the played note automatically, provided it is within the 3 neighboring semitones of the current note.
For new tunings It is recommended that the notes are tuned chromatically from E3 to A0, or from A#4 to C8. **It is important not to proceed to the next note until the measurement is complete. Otherwise that note's inharmonicity value will not be saved in the tuning file.** Notice that after C7 inharmonicity is not measured.
Since the targets are calculated with respect to previously tuned notes, a warning message might appear if the note is not calculated yet. In such a situation the note switches to the required note automatically. When you reach A0 or C8, remember that tapping Manual Mode toggles a quick jump to E3/A#4. It is recommended to **frequently save** the tuning file by **Menu>File>Save** to avoid any data loss.

Saved Tuning

To tune a previously tuned piano go to **Menu>File** select file and click **Open.** The A4 Frequency, Temperament, Bass/Mid/Treble stretches, Last Wound Note and Microphone Settings are automatically loaded. Make any changes required before beginning to tune.
Saved tunings can be carried out in any order since all the targets are calculated already.

Over Pull


Check Note
Kawai-RX2.tnr Young C#
Menu
✓A4 |||
442.00 Hz (1)
0.00 ¢
Temper: 0.0 ¢
439.03 Hz
0.760
-14.6
A4 : 442.00 Hz
6:3-6:3/4:2-2:1
Temp. Mode
Next: A3
Overpull on
2.93 ¢

Over pull is activated from **Menu>Settings>Overpull.** Over pull will not take effect if **Last Wound Note** has not been selected. Last Wound Note can be selected by **Menu>Settings>Last Wound Note.** Default is not selected and it can be selected between E2 and F#3.

In over pull mode **it is important that the note must be briefly measured before being tuned**.

Play the note and observe that the over pull progress bar is full and the over pull offset is not being updated any more. If you think that the over pull offset is measured properly, you can tune the note to the indicator as usual. Otherwise tap on the value to reset and measure the over pull value again.

The value of over pull offset is determined by multiplying the over pull percentage set for the region the note belongs and the difference between target frequency and measured frequency. Then this value is added (or subtracted) to the value shown at the indicator to apply an over pull to that note.

Over pull percentages are applied as follows:

A0 - Last Wound Note	Bass (%)	default is 10%
Last Wound Note - F5	Midrange(%)	default is 25%
F5 - C8	Treble (%)	default is 35%

Contact

For further information:

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