

TuneLab Used in the PTG Tuning Exam

Robert Scott
Real-Time Specialties (734) 434-2412
info@tunelab-world.com

This document describes the functions of TuneLab that pertain to the preparation, recording, and scoring of the Piano Technicians Guild Tuning Exam. It is to be used in conjunction with the appropriate TuneLab manual, which can be downloaded from tunelab-world.com.

Matching the Pitch of a Note (Locking On)

This function is used in the recording of both the master tuning and the examinee's tuning. Matching the pitch of a note means adjusting the offset in TuneLab until the tuning indicators (the phase display and/or the spectrum display) indicate an in-tune condition. In the case of the phase display, this means that the moving boxes are brought to a stop. In the chapter on "Calibration", the TuneLab manual describes two methods of accomplishing this goal. One method is to manually adjust the offset until the phase display is stopped. The other method is to use the automatic locking function, which is also described in the TuneLab manual.

In using Locking Mode, an understanding of the characteristics of this mode may be helpful. When Locking Mode is enabled, TuneLab will initially begin waiting for a trigger before becoming active. A trigger is a sudden rise in volume, caused by the playing of the note. A trigger can also be forced by pressing the space bar on the keyboard, or by tapping on the Lock icon a second time in TuneLab Pocket. Once triggered, TuneLab begins automatically adjusting the offset according to how fast the phase display is moving. The adjustments are made in such a way as to make the phase display stop moving. This forms a feedback loop. The gain of this loop is defined by how much the offset is changed for a given amount of tuning error. Initially after a trigger, this gain is quite high, resulting in large and fast adjustments to the offset. But after a few seconds, the feedback loop gain is reduced in order to permit more delicate and gradual adjustments. If another trigger event should occur after the initial trigger (such as playing the same note again), the feedback loop gain will rise slightly, but not as high as it was after the first trigger. Pressing the period ('.') key or tapping on the Lock icon a second time will reset the feedback gain to its highest level again.

The most important thing the user must do when using Locking Mode is to decide when to end it. Locking Mode is turned off by pressing the ESC key in TuneLab Pro or by tapping on the Current Note display in TuneLab Pocket. Since noise of pressing the key or tapping the display may cause some disruption to the locking process, provisions have been made for ignoring this disruption. When Locking Mode is turned off, the automatic adjustments made to the offset in a previous half second will be undone. The effective offset remaining after Locking Mode is turned off is the same as it was a half second before it was turned off. In any case, after Locking Mode is turned off, it is

important to make a final check of the accuracy of the lock by playing the note once more and verifying that the phase display is sufficiently stopped.

However it is obtained, the offset is a temporary measurement in TuneLab. Therefore, when recording a master tuning or an examinee's tuning, as soon as an offset has been established for a given note, that offset should be recorded into the current tuning file by pressing the F9 key in TuneLab Pro, or by tapping on the Exam Mode Offset display in TuneLab Pocket. This will transfer the temporary offset into the custom stretch for the current note.

Recording a Master Tuning

The first step in administering the Tuning Exam is to develop a master tuning on the piano that is to be used for the exam. Typically this is done only once for a specific piano. The recorded master tuning can be used as a standard for several years, provided no significant changes are made to the piano that might affect its inharmonicity, such as replacing strings. While it is not the purpose of this document to give detailed instructions for this process, the development of the master tuning is generally carried out by a committee of tuning examiners. Sometimes the piano is initially tuned using an electronic tuning aid, such as TuneLab. But the tuning is always carefully evaluated and modified by the committee before it is declared to be a master tuning. In order to minimize the risk that the piano will drift before its master tuning can be measured, the committee will sometimes measure and record small sections of the tuning as it is developed, instead of waiting until the entire scale has been tuned.

Since the PTG Tuning Exam specifies certain partials to be used for each note, it is important to enter into Exam Mode before recording a master tuning. Enter Exam Mode from the View menu in TuneLab Pocket, or from the Modes menu in TuneLab Pro. Placing TuneLab into Exam Mode does several things. In addition to forcing the selection of the proper partials, it also causes the offset to be rounded to the nearest 0.1 cents when it transferred to the custom stretch using the F9 key. The rounded offset is also shown in a special Exam Mode Offset status box in a large font for use in manual recording.

After all the notes have been recorded in this fashion, the current tuning file should be saved under a name that indicates that it is a master tuning. It would be a good idea to backup this file in some way, so that in the event of a computer failure, the committee's efforts in developing the master tuning file would not have been wasted.

Preparation for Examinee's Tuning

Before the piano is used for an examinee's tuning, the piano should be de-tuned in order not to give the examinee the benefit of the existing tuning. The PTG has specified a pattern of de-tuning offsets that results in a minimal impact on the overall string tension. This spares the examinee the additional burden of doing a pitch raise. These de-tuning offsets are enabled from the Edit menu in TuneLab Pro, or from the View menu in

TuneLab Pocket. When de-tuning offsets are enabled, the normal function of the temporary offset is replaced by the de-tuning offset. The exam piano can be prepared by loading the master tuning, and then enabling de-tuning offset. If the piano is roughly tuned using this setup, the piano can then be tuned by the examinee.

Recording and Scoring of the Examinee's Tuning

After the examinee has tuned the exam piano, the tuning can be recorded in the same way as the master tuning was recorded. It is not absolutely necessary to store the examinee's tuning in a tuning file, but it is a good idea to do so for purposes of record-keeping. Record the examinee's tuning in Exam Mode, just as the master tuning was recorded. That way the same partials will be used between the two tunings. In addition to recording the tuning, there is one additional measurement that should be made - the tuning of A4-440Hz to a reference, such as a tuning fork. This is a separate part of the PTG Tuning Exam, and it is the only part of the exam that is based on an absolute reference. The A4 test specifies that the fundamental should be used. The Exam Mode partial for A4 is the second partial. Therefore, this test must be done by temporarily overriding the partial using the F3 key in TuneLab Pro, or the Lower Partial toolbar button in TuneLab Pocket. After forcing the fundamental on A4, match the examinee's tuning for A4 just as you would when recording any other note in the test. But after the offset has been adjusted for a stopped phase display, do not store this offset in the tuning file. Instead, press Ctrl-R in TuneLab Pro, or tap the Exam Mode Offset display box in TuneLab Pocket to record this setting of A4. This recording is temporarily stored in program memory, and is not stored if the tuning file is saved. But the value measured will be used in the subsequent scoring of the examinee's tuning, in the generation of the report. It is permissible to make this measurement of A4 before recording the rest of the tuning, if that makes more logical sense for the test sequence.

After the examinee's tuning has been recorded, and the special measurement for A4 has been made, the examinee's tuning can now be scored. From the View menu, select "Exam Scoring". Select the temperament octave. This octave will be used as specified by the PTG to normalize the rest of the tuning (but not the special A4 measurement, which is absolute). Finally, select the master tuning file. This will create a report file, which you will be prompted to name. It will open that report file in Notepad or Pocket Word. In the case of Pocket Word, the report will appear in proper rows and columns if you select Edit, Select All, Edit, Format, Courier New font, View, uncheck Wrap to Window. The report shows the offsets that were recorded in the examinee's tuning and in the master tuning for octaves 1-7. Then it shows the difference between these two tunings, and the number of penalty points assigned to each difference. The normalization correction is also shown as well as the selected temperament octave. Finally, the results of the special A4 measurement is shown at the bottom of the report. In addition to viewing the report, you can save or print the report file from Notepad.