

Relative Humidity & Piano Pitch

By Don Galt, former Editor of the *Piano Technicians Guild JOURNAL*

It is common knowledge that piano pitch tends to rise during the summer and fall during the winter in most temperate zone environments, due to upward and downward trends in indoor relative humidity. Less well known is the fact that piano pitch is also affected by changes in humidity occurring over a few days.

The correlation between such humidity changes and the pitch of your piano is revealed graphically in the accompanying chart. To obtain these data, a 45-inch studio upright piano of good quality was kept under surveillance over a period of nearly three years. **The piano stood idle in a studio in the Music Building at the University of Washington. During this time, it was neither played nor tuned. The piano simply sat**

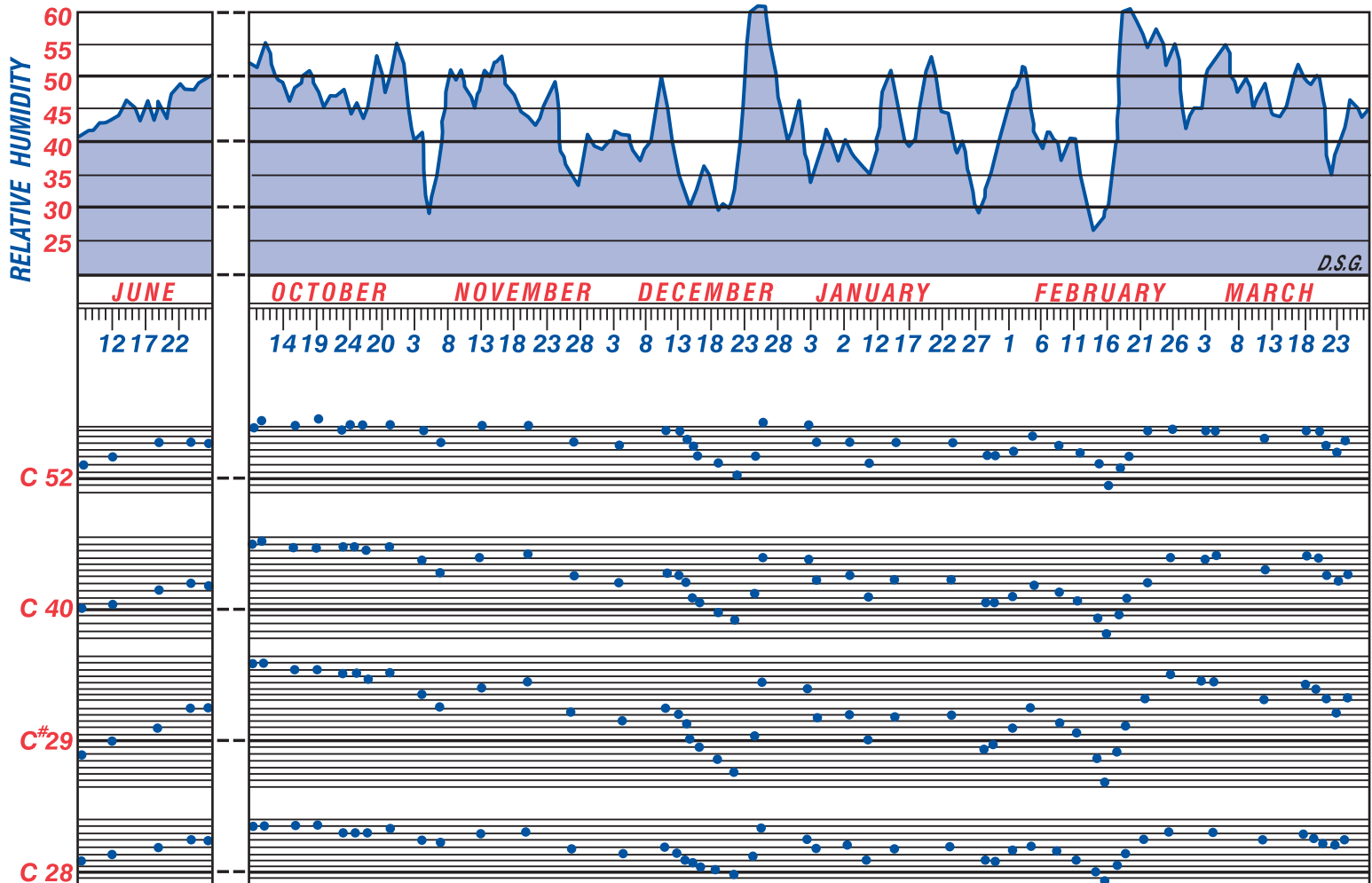
there, responding naturally to the ambient atmospheric conditions. A recording hygrometer placed on top of the piano made a continuous record of the relative humidity. Periodic pitch readings were made on all of the C's and of C#29 (the first note above the bass-tenor break in this instrument). These readings were made with a Strobeconn.

The chart covers a representative part of the three-year period. The pitch data on the other C's (not shown) are similar, and are omitted for simplicity. During the period covered by the June through October gap in the chart, both the humidity and the pitch curves were relatively smooth, tending generally upward, with a few humidity excursions into the upper 50's.

How large are the pitch fluctuations

shown by the chart? Each space represents 1 cent (i.e., one one-hundredth of a semitone). During the period shown, C52 varied between 9 cents sharp and 1 cent flat. This 10-cent spread is about 3 Hz (cycles per second). C#29 varied from 12 cents sharp to 6-1/2 cents flat (i.e., 18-1/2 cents, or nearly double the variation of C52). This amounts to 1-1/2 Hz at this pitch. C28, at 7 cents sharp to 1-1/2 cents flat, varied less than half as much as its neighbor above the bass break.

In terms of "how it sounds," if the piano had been tuned in early June, it would have been pretty bad by October. Had the piano been tuned in October, it would have sounded atrocious on December 22, would have recovered dramatically (though



unevenly) by the day after Christmas, would have been even worse on February 16, and by March 1 would have been ready for a good solid tuning.

Humidity fluctuations are the most **Piano Technicians Guild JOURNAL**

persistent enemy of pitch stability in the piano, operating relentlessly whether the instrument is used or not. Whatever sort of humidity curve you have in your area, you can expect this sort of correlation between

humidity and piano pitch. In the Puget Sound area, where this study was made, the indoor relative humidity is usually between 30 and 60 percent. A wider range will mean greater fluctuations in piano pitch. ■

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