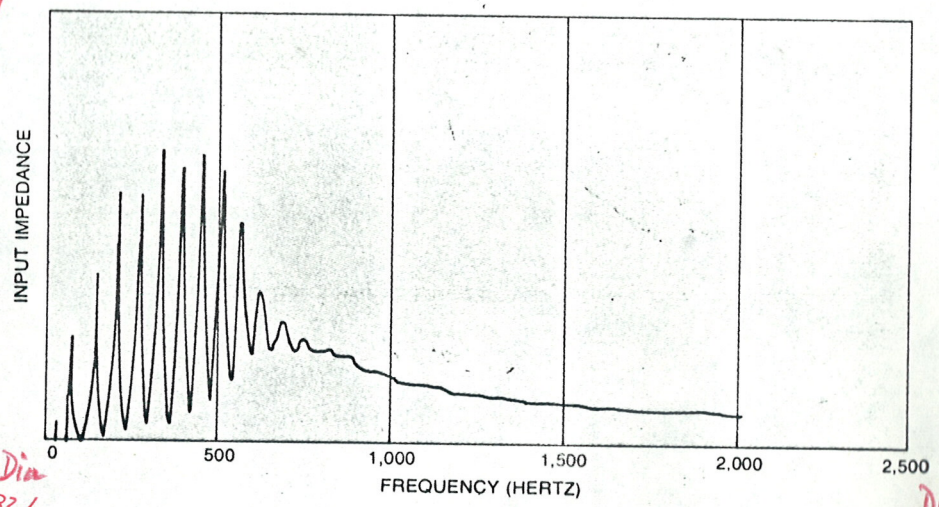


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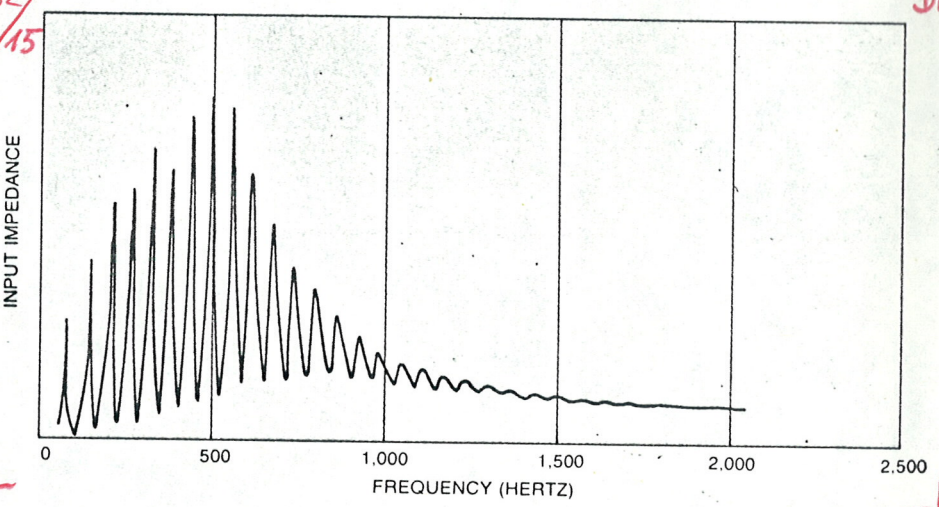
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PLACING HAND IN BELL OF FRENCH HORN is a well-known technique for extending the frequency range of the instrument. The curve at the top shows the input impedance response of a valveless prototype for the B-flat half of a standard French horn when measured without the player's hand in the bell. There are essentially no resonance peaks above 750 hertz. If the player tries to reach a note such as G_5 (783 hertz), all he gets is a wobbly scream because there is little or no feedback of acoustic energy from the bell of the instrument to stabilize a note of higher frequency. Notes in the octave below G_5 would also be weak and characterless for lack of a strong feedback. The curve at the bottom shows the additional resonance peaks produced when the musician points his flattened hand into the bell until he feels a slight tingling at his fingertips and then bends his palm slightly. The instrument now produces peaks well beyond a frequency of 1,000 hertz, making it possible for the musician to play the note G_5 quite dependably and even a few higher notes when he is pressed.