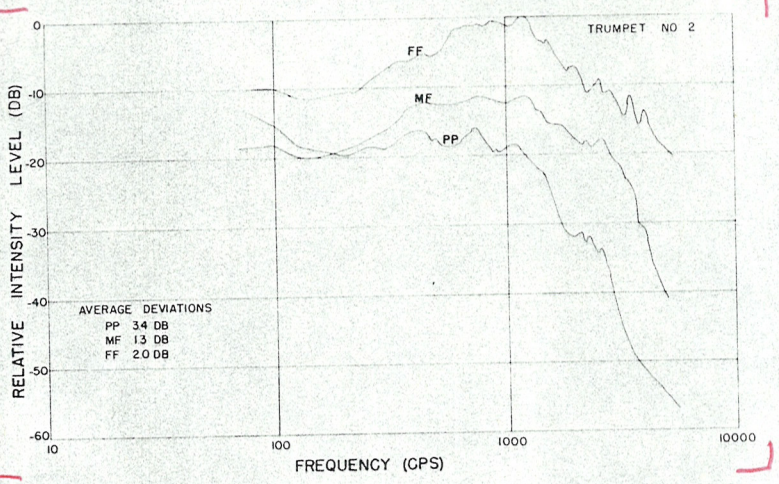

FIG. 3. Spectral envelopes of Trumpet No. 2 at three dynamic markings.

Dia 22/13

and whose frequency response is given by

$$|H(\omega)| = (2/\omega T^*) \sin(\omega T^*/2). \quad (12)$$

The synthesized words were converted to analog form at a rate of 27 777 words/sec, recorded by a professional grade of tape recorder, played back through a high-fidelity amplifier exciting a full-range electrostatic loudspeaker, and audited in a room having good sound diffusion and normal reverberation. It was very difficult to distinguish the original ones in all cases, with the exceptions that follow. All notes of the synthesized violin and viola lacked a bit of brilliance. Because of the many partials involved, occasional notes of the synthesized double bass, the lowest notes of the bassoon, and all notes of the brasses were rough. For

A. Trumpet

We first discuss the characteristics specific to the trumpet:

- In the low registers, the waveform is very impulse-like. If the phase of the fundamental is taken as zero, the relative phase of a partial increases monotonically with an increase in its frequency. The amount of this increase is about 50° per harmonic in the low registers and increases with frequency.

- The duration of the transient time of the fundamental is about 10 msec, independent of the frequency and the dynamic marking at which the note was sounded.

- For partials whose frequency is above 800 cps, the

Luce, D., & Clark, M. Jr. Physical Correlates of Brass-Instrument Tones, Vol. 1967 JASA 42, 1232-1243. [S. 1237]