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The influence of control parameters and physical parameters on reed instruments playing

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An attempt to summarize the influence of both control and physical parameters on production and radiation of sound of reed instruments is given. Some parameters, such as the shape of the resonator, are fixed by the instrument maker, or chosen by the instrumentalist itself : the the reed, and the fixation of the reed on the mouthpiece. These parameters, named physical parameters, are fixed when playing. The second kind of parameters can be totally or partially controlled when playing : the fingering is an obvious one, then the way the reed is pinched by the lip, with an effect on both the reed opening and the reed dynamics, finally the mouth pressure and the shape of the vocal tract. The influence of these parameters is discussed with respect to several attributes of the sound : the various thresholds (normal sound at pianissimo level, extinction at fortissimo level), the control of different regimes, the shape of transients, the playing frequency, the spectrum. The state of present knowledge is given, with emphasis of further research that should be done, and a comparison with the cases of sound controllers and artificial mouth is discussed.