

Glossary of Song Terms

Thomas E. Moore

- carrier frequency* The frequency of maximum power in cricket songs; often subjectively described as pitch. It is generally set by the rate of movement of the plectrum on one forewing (tegmen) moving against the teeth of the file on the under surface of the opposite tegmen and by tuned physical (skeletal) characteristics of the mirror and harp portions of the tegmina. (See Figs. 8.1, 8.3, and 8.4.)
- chirp* A short, discrete group of simple or complex pulses of sound, usually of less than 0.5 s duration. (See Figs. 6.10 and 8.1; see also *pulse*, *syllable*, and *trill*.)
- chirp interval* Sometimes used for chirp period (see Figs. 9.9, 10.4, and 14.15); chirp period is probably a more appropriate term. (See also *period*.)
- chirp rate* The number of chirps per unit time in a song. (See also *rate*.)
- (dB) (decibel)* See *sound-pressure level*.
- duration* The length of time from the beginning of a sound unit (pulse, syllable, chirp, or song) to the end of the sound in that unit. Duration does not include the interval of silence between units. (See Fig. 8.1.)
- duty cycle* A ratio expressed as a percentage of the total time in a period for the duration of sound (the remaining percentage of a period represents the silent intersound interval). This term is used especially with synthetic test sounds. (See Figs. 9.13, 10.4, 10.6, 14.13, 14.15, and 14.16.)
- file* The regularly toothed, file-like, ventral surface of a stridulatory vein (part of

The following are published or recorded songs of crickets:

- Alexander, R. D. 1960. Sound communication in Orthoptera and Cicadidae. Pages 38–92, Chap. 3, in *Animal Sounds and Communication*, W. E. Lanyon and W. N. Tavolga (eds.). Am. Inst. Biol. Sci. Publ. No. 7, Washington, D.C. [LP record includes sounds of one grylline species.]
- Alexander, R. D., and D. J. Borror. 1956. *The Songs of Insects: Calls of the Common Crickets, Grasshoppers, and Cicadas of the Eastern United States*. Cornell Univ., Ithaca, N.Y. LP phonograph record. [Includes songs of several grylline, nemobiine, and oecanthine crickets.]
- Kettle, R. 1984. A discography of insect sounds. *Recorded Sound* 85:37–61.
- Moore, T. E. 1973. Acoustical behavior of insects. Pages 310–323 (plus slides and sound cassette) in *Syllabus for an Introductory Course in Entomology (Entomological Society of America)*, V. J. Tipton (ed.). Brigham Young Univ. Press, Provo, Utah. [Includes recordings of one grylline and one oecanthine species.]

- Cu_2) in each forewing (tegmen) of most adult male crickets (see Figs. 8.5 and 8.6). It is also found in some female mole crickets (Nickle and Carlysle 1975, Walker and Carlysle 1975).
- harp** A harp-shaped, acoustically tuned area of each forewing (tegmen) of most male crickets, surrounded by parts of veins Cu_1 and Cu_2 . (See Fig. 8.6.)
- interval** The silent time from the end of sound in one sound unit to the beginning of sound in the next similar sound unit. Pulse or chirp intervals are also called interpulse, intersyllable, or interchirp intervals. (See Fig. 8.1; see also *duration*, *period*, and *syllable repetition interval*.)
- kHz (kilohertz)** The measure of sound frequency in thousands of hertz (1 Hz = 1 cycle per second).
- mirror** An acoustically tuned area of each forewing (tegmen) of most male crickets, adjacent and distal to the harp. The mirror is greatly reduced or modified in mole crickets and some others. (See Fig. 8.6.)
- p/ch (pulses/chirp)** The number of pulses in a chirp; generally synonymous with the number of syllables per chirp in crickets. (See Fig. 8.1.)
- period** The time required for any cyclic event in a cricket song; 360° of phase; the reciprocal of rate. (See Figs. 8.1, 9.9, 10.4, 10.6, 14.14, and 14.15; see also *duration*, *interval*, and *syllable repetition interval*.)
- plectrum** See *scraper*.
- pulse** A physical unit of sound; a tone burst in crickets. A pulse is often assumed to be the burst of sound made by one closing stroke of the tegmina. The motor basis of sound production is known only for the calling songs of a very few crickets; it may well not be the same for all species or for all kinds of sounds produced by any one species of cricket. (See Fig. 8.1; see also *syllable*.)
- pulse interval** A term used by physiologists for pulse period, which is probably a more appropriate term. (See also *period*.)
- pulse rate** The number of pulses per unit time. (See also *rate*.)
- rate** The reciprocal of period; the number of song units per unit time, usually measured from the beginning of sound in one sound unit to the beginning of the corresponding sound in the next similar sound unit. The usual units are pulses, chirps, trills, or whole songs. Rates are usually stated as song units per whole unit time even when this actually represents a projected rate based on the time between only two song units (i.e., a single period), or between just a few song units, produced together. Rates vary markedly with temperature (See Fig. 8.3).
- scraper** An upward-directed, sharp edge at the posterior margin of the forewing (tegmen) of most male crickets which rubs against the file teeth on the undersurface of the opposite forewing during sound production. (See Figs. 8.5 and 8.6.)
- singing rate** The number of songs produced per unit time. (See also *rate*.)
- song** Usually a group or sequence of simple or complex chirps or trills, typically repeated in nearly identical form at predictable rates.
- sound pressure level (SPL, in dB)** Acoustic decibels, measured at a stated distance in relation to microbars, or dynes per square centimeter ($0.0002 \mu\text{bar} = 0 \text{ dB}$) in a logarithmic scale. Sound pressure level is sometimes loosely equated with sound intensity and sound power level (these two terms refer to power, watts, rather than pressure) and with loudness. Apparent loudness (or sound intensity), by contrast, varies subjectively, depending especially on carrier frequency, wave form, and sound pressure level.
- sound pulse interval** See *pulse interval*.
- sound unit** Repeated simple or complex elements of songs of crickets; usually pulses, syllables, chirps, trills, or whole songs.

- stridulation* Sound production by rubbing one body part against another; in crickets, sound produced by rubbing a scraper on the upper surface of the under forewing (tegmen) against the teeth of a file on the under surface of the upper forewing.
- syllable* A sound produced by one complete opening and closing cycle of the tegmina; effectively synonymous with pulse in crickets whenever the sound is produced by a single tegminal closing movement and the tegminal opening is silent. (See Figs. 6.10, 8.1, 9.9, 10.4, and 14.15; see also *pulse*.)
- syllable interval* See *period* and *pulse interval*.
- syllable period* See *period* and *pulse*.
- syllable rate* The number of syllables produced per unit time, sometimes also called syllable repetition rate (SRR). (See *rate*.)
- syllable repetition interval (SRI)* Sometimes used for syllable period or pulse period (see Figs. 9.11, 10.4, 10.6, 14.14, and 14.15), either of which is probably a more appropriate term. (See *chirp interval*, *interval*, *period*, and *pulse interval*.)
- tick* Sound pulse of high power and short duration, as made during courtship sound production in some species of *Gryllus* (Nocke 1972).
- trill* A series of pulses produced together, and too long to be termed a chirp. (See Fig. 8.1; see also *chirp*.)

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This book may be purchased at <http://www.cornellpress.cornell.edu/>. The price was \$85 in July 2001.
(ISBN 0-8014-2272-8)

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