

Additional file 2

Title: Prior art and parts and settings used for new courtship chambers

Additional Table S2. Publications that first reported a new microphone or amplifier design for recording *Drosophila melanogaster* courtship song, along with several key features of each design.

Publication	Microphone	Amplifier	Bandpass filter	Chamber size
(Shorey 1962)	Altex 21 D condenser	ND	ND	12 mm D x 10 mm H
(Ewing and Bennet-Clark 1968)	Acos 43-1 crystal mic	Low noise preamplifier	10-1500 Hz	40mm D x 5mm H
(Bennet-Clark 1972) – Illustrated at bottom of table	Grampian ribbon mic	Low impedance amplifier, with design (200X)	50-5000 Hz	
(Kyriacou and Hall 1980)	Reslo ribbon mic	Tandberg 10X reel-to-reel tape recorder	ND	20x10x3mm
(Kawanashi and Watanabe 1980)	Dynamic mic			10mm D x 3mm H,
(Crossley and McDonald 1980)	Brüel and Kjaer Type 4145 in sound attenuated room		120-750 Hz	21mm D x 7mm H
(Cowling and Burnet 1981)	Reslo ribbon mic	Tandberg 3600 XD tape recorder	50-500 Hz	30x10x15mm
(Gorczyca and Hall 1987)	Insectavox – modified condenser microphone (Radio Shack #270-090)	LM387	80-1500 Hz + Notch filter (to reduce amplitude of sine song!)	
(Aubin, Rybak et al. 2000)	dual B&K 4176 6cm apart			10mm D x 5mm H

(Tauber and Eberl 2001)	Knowles Acoustics NR-23158 in wall of chamber	741 opamp		9mm D x 6mm H
(Clyne and Miesenbock 2008)	Knowles Acoustics NR-23160	Analog Devices AD620	10,000x	10mm D
(Turner and Miller 2012) 10 recordings in parallel	GRAS Sound and Vibration 40PH array microphone		<1k Hz	

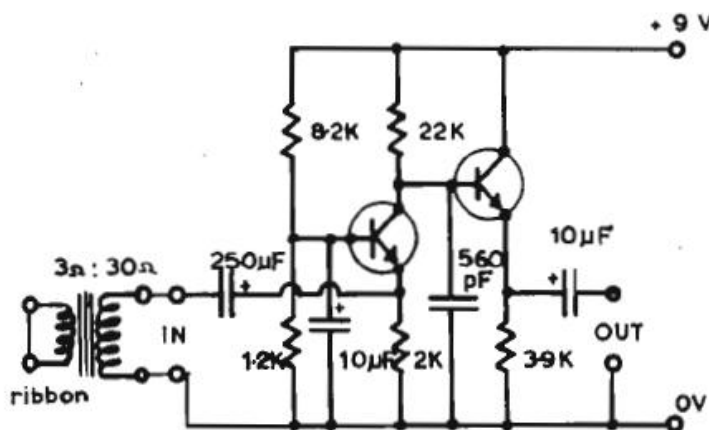


fig.2. LOW IMPEDANCE PRE-AMPLIFIER

References

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- Clyne, J. D. and G. Miesenbock (2008). "Sex-specific control and tuning of the pattern generator for courtship song in *Drosophila*." Cell 133(2): 354-363.
- Cowling, D. E. and B. Burnet (1981). "Courtship songs and genetic control of their acoustic characteristics in sibling species of the *Drosophila melanogaster* subgroup." Anim. Behav. 29: 924-935.
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- Ewing, A. W. and H. C. Bennet-Clark (1968). "The courtship songs of *Drosophila*." Behaviour 31: 288-301.

- Gorczyca, M. and J. C. Hall (1987). "The INSECTAVOX, an integrated device for recording and amplifying courtship songs." Drosophila Information Service 66: 157-160.
- Kawanashi, M. and T. K. Watanabe (1980). "Genetic variation of courtship song of *Drosophila melanogaster* and *D. simulans*." Japan. J. Genetics 55: 235-240.
- Kyriacou, C. P. and J. C. Hall (1980). "Circadian rhythm mutation in *Drosophila melanogaster* affect short-term fluctuation in the male's courtship song." PNAS 77: 6729-6733.
- Shorey, H. H. (1962). "Nature of the Sound Produced by *Drosophila melanogaster* during Courtship." Science 137(3531): 677-678.
- Tauber, E. and D. F. Eberl (2001). "Song production in auditory mutants of *Drosophila*: the role of sensory feedback." Journal of comparative physiology. A, Sensory, neural, and behavioral physiology 187(5): 341-348.
- Turner, T. L. and P. M. Miller (2012). "Investigating Natural Variation in *Drosophila* Courtship Song by the Evolve and Resequence Approach." Genetics.

Additional Table S3. List of parts used in construction of courtship chambers, acrylic platform and acrylic shielding.

	Parts	Vendor	Cat. No.	Item description
Chambers	Chamber top	McMaster-Carr	8490K182	2 mm thick transparent acrylic
	Chamber bottom	McMaster-Carr	8560K192	3 mm thick transparent acrylic
	Screw for a chamber	McMaster-Carr	B000FN68D0	Nylon 6/6 Thumb Screw, Knurled Head
	Chamber divider			0.25mm stainless steel
	Nylon mesh	Small Parts Inc.	B000FMWH6I	Nylon 6 Woven Mesh Sheet, Square Openings 350um
Acrylic platform	Microphone mounting table	McMaster-Carr	8560K219	4.5 mm thick transparent acrylic
	Mounting standoff	McMaster-Carr	93620A199	Male-Female Thread Hex Standoff 1/2" Hex, 2" Length, 1/4"-20 Screw Size
			93505A183	Aluminum Male-Female Threaded Hex Standoff 1/2" Hex, 1/2" Length, 10-32 Screw Size
	Breadboard	Thorlabs	MB1824	Aluminum Breadboard, 18" x 24" x 1/2", 1/4"-20 Threaded
	Vibration absorbing feet	Thorlabs	AV1	1/4"-20 Thread
Acrylic shielding box	Acrylic shielding box	McMaster-Carr	8560K243	12 mm thick transparent acrylic
	Epoxy	Amazon	B000ALJ4NS	Epoxy for General Purpose
	Foam tape	Amazon	B000CSIBCO	High Density Foam Tape
	Clay	Dick Blick	33268-2521	Modeling Clay

Additional Table S4. Settings applied to cut acrylic on UNIVERSAL Laser Systems PLS4.75 laser cutter.

chamber-bottom

line color	power	speed	PPI
red	100%	5%	500
black	100%	14%	1000
blue	100%	5%	500

image density=6

chamber-top

line color	power	speed	PPI
red	100%	7%	500
black	100%	90%	500

density=1

microphone mounting table

line color	power	speed	PPI
red	100%	2.5%	500
black	100%	90%	500

density=6

sound shielding box

line color	power	speed	PPI
red	100%	1%	500
black	100%	90%	500

density=1

nylon mesh

line color	power	speed	PPI
red	100%	80%	500