Supporting Information

Bass and Chagnaud 10.1073/pnas.1201886109

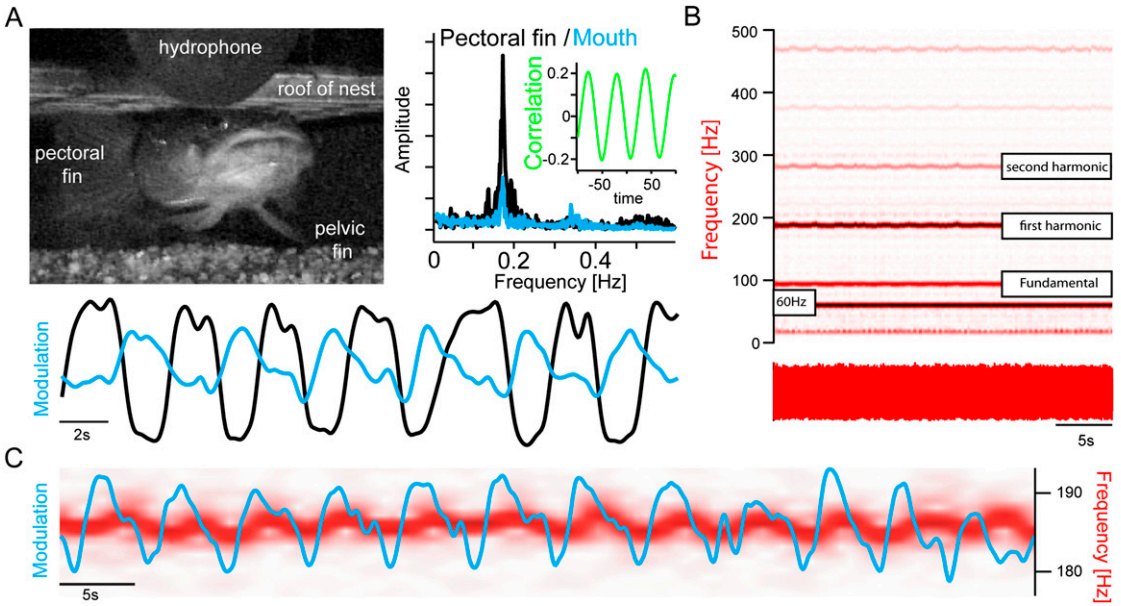

Fig. S1. (*A*) *Upper Left*: Photograph at night of a type I male midshipman in artificial nest (elevated ceramic tile) in aquarium taken from a video sequence in which the fish constantly produces his advertisement "hum" call (courtesy of A. Bass and M. Marchaterre, Cornell University). *Lower*: Superimposed waveforms of modulation rhythm of pectoral fin (black) and mouth (blue) movement during advertisement humming (analyzed by using video tracking). *Upper Right*: Corresponding fast Fourier transforms of both waveform signals show matched modulation frequencies for fin and mouth movement; correlation (*Inset*) shows high temporal matching of both rhythms. (*B*) Sonogram (*Upper*) and waveform (*Lower*) of hydrophone recording of midshipman advertisement call (i.e., hum) recorded simultaneously with the video in *A*. Indicated is the 60-Hz band from the power line, the fundamental frequency, and the first two upper harmonics. (*C*) Overlay of waveform of mouth waveform (blue, approximate breathing rhythm) and modulation hum frequency (red, first harmonic) of simultaneous recorded midshipman hum in *B*. Both modulations are in phase despite call generation in fishes not requiring airflow over a membrane like most terrestrial vertebrates (see text).

Table S1. Summary of intrinsic and network properties exhibited by caudal hindbrain rh8 premotor populations coding for specific behavioral attributes

rh8 system	Intrinsic/network property				
	Inhibitory input	Gap junctional coupling	Pacemaking rhythm	Concomitant firing	Dense input to target
Inferior olive	x	x	x	x	x
Vocal pacemaker	x	x	x	x	x
Pectoral	NA	x	NA	x	x
Oculomotor (eye position)	x	NA	—	x	x
Vocal prepacemaker	x	x	—	x	x
Electromotor pacemaker	NA	x	x	x	x

NA, not available; rh8, rhombomere 8.