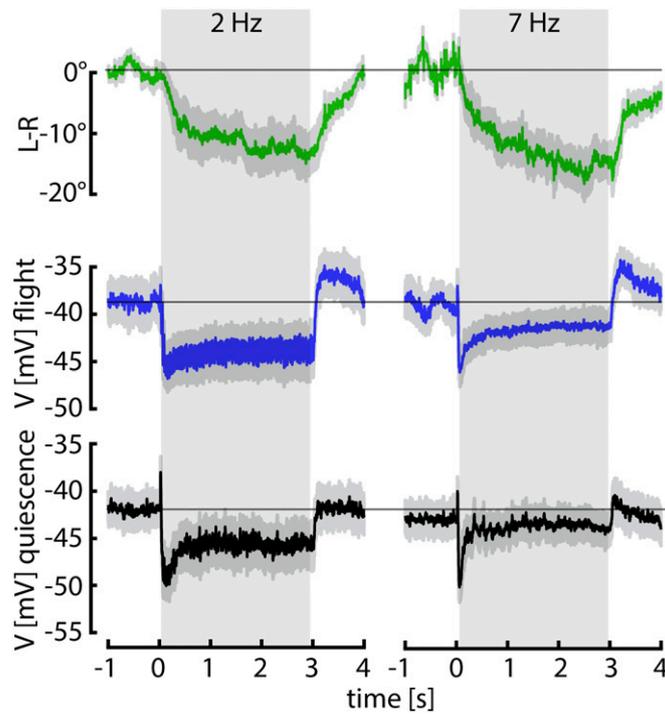
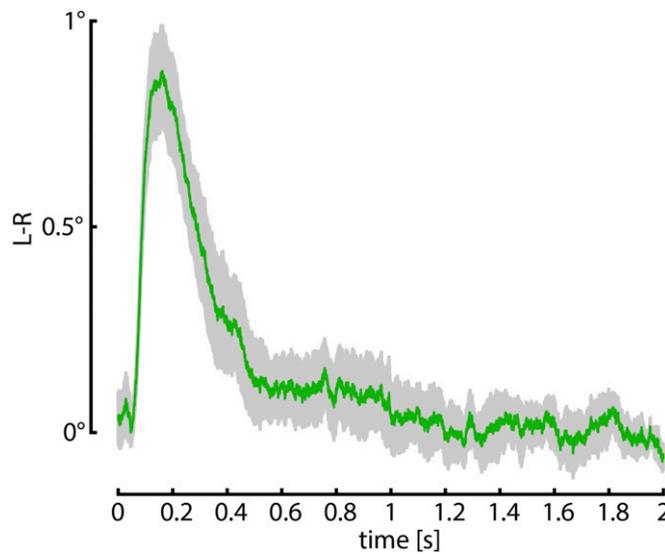


# Supporting Information

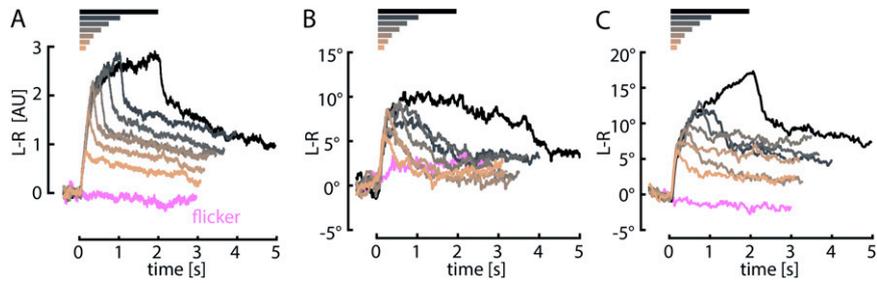
Schnell et al. 10.1073/pnas.1400698111



**Fig. S1.** Responses to different temporal frequencies as in Fig. 1D, but for null direction (ND) motion. Mean and SEM (gray envelopes) of behavioral (L-R, green) and neuronal responses during flight (blue) and quiescence (black) of 11 flies for temporal frequencies of 2 and 7 Hz. Light gray areas indicate time of stimulus motion.

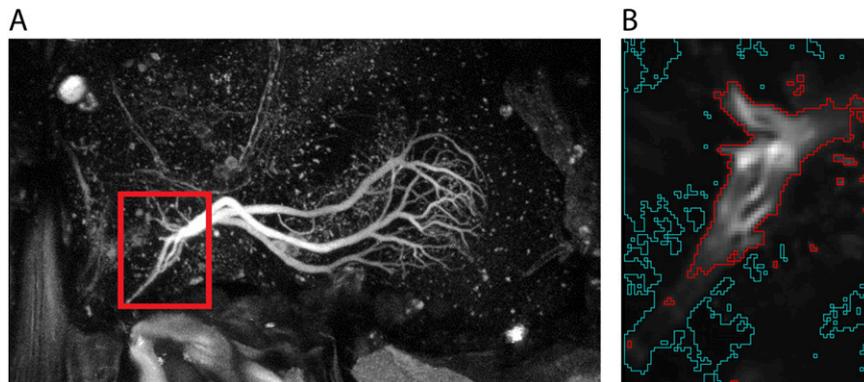


**Fig. S2.** Mean behavioral impulse response obtained during HS cell recordings with a 10th-order m sequence as in Fig. 2 ( $n = 5$ ). SEM is indicated in gray.



**Fig. 53.** Behavioral responses (L-R) to stimuli of varying duration during flight as in Fig. 3 obtained in a traditional flight arena by using a wing beat analyzer (1, 2) and during HS cell recordings. (A) Flight arena data in response to rotation in the frontal half field. (B) Data from whole-cell patch-clamp experiments of Fig. 3B. (C) Data from two-photon calcium imaging experiments of Fig. 3D.

1. Götz KG (1987) Course-control, metabolism and wing interference during ultralong tethered flight in *Drosophila melanogaster*. *J Exp Biol* 128:35–46.
2. Tammero LF, Frye MA, Dickinson MH (2004) Spatial organization of visuomotor reflexes in *Drosophila*. *J Exp Biol* 207(Pt 1):113–122.



**Fig. 54.** (A) Maximal intensity projection of the Gal4-line R27B03 driving expression of GCaMP6f obtained with the two-photon microscope. Red box indicates imaged region. (B) Mean image from HS cell terminal region obtained during recordings from one fly illustrating the calculation of the region of interest (outlined in red) and the background (cyan).