How to convert Ackermann

Joystick commands $\mathbf{X_j}$ and $\mathbf{Y_j}$

into **FWD**, **STR**, and **RCW**

holonomic commands

$FWD = -Y_j$

$STR = -X_j \cdot sign(Y_j)$

$RCW = STR \cdot sqrt(L^2+W^2)/L$

(see following page for derivation)
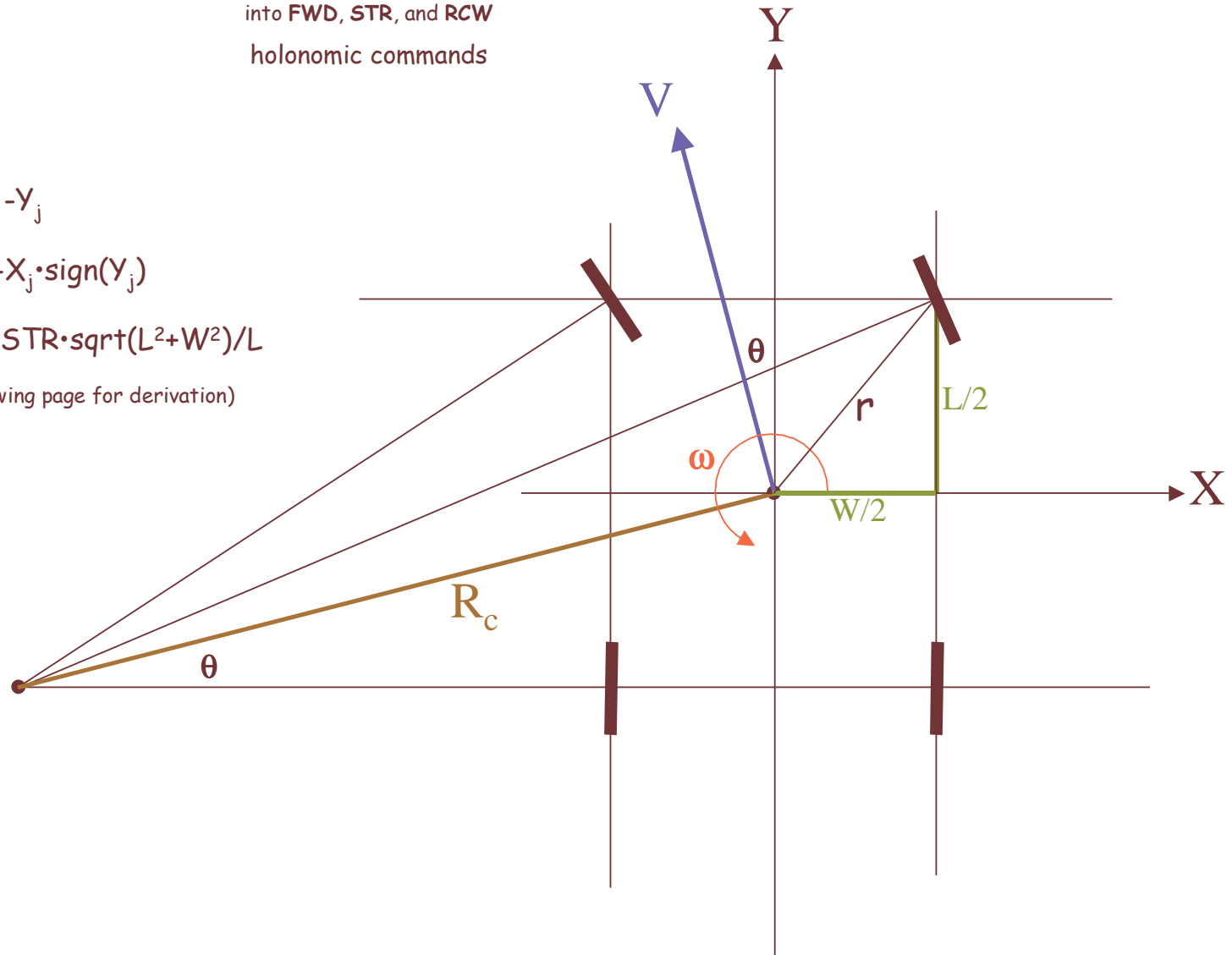
$$\boxed{FWD = -Yj}$$

$$\boxed{STR = -\, Xj \cdot SIGN(Yj)}$$

$$RCW = \omega \cdot r$$

$$\omega := \frac{V}{Rc} \cdot SIGN(STR)$$

$$RCW = \frac{V \cdot r \cdot SIGN(STR)}{Rc}$$

$$V := Rc \cdot \frac{|STR|}{\dfrac{L}{2}}$$

$$RCW = \frac{2 \cdot STR \cdot r}{L}$$

$$r := \frac{1}{2} \cdot \sqrt{(L^2 + W^2)}$$

$$\boxed{RCW = \frac{STR \cdot \sqrt{(L^2 + W^2)}}{L}}$$

FWD, STR, and RCW are the forward, strafe_right, and rotate_right commands, respectively, presented in the file attachment "Calculate Swerve Wheel Speeds and Steering angles.pdf". The equations circled in red on the left show how to map the Xj, Yj Ackermann joystick commands into the FWD, STR, and RCW holonomic commands.