



**October 6, 2018**

Off-Season Event @ Hatboro-Horsham HS

Maximum 40 Teams

Inspire your new team members

[team708.org/havoc](http://team708.org/havoc)

[havoc@team708.org](mailto:havoc@team708.org)



hatboro-horsham educational foundation  
**WHEP**



**TEAM 708**

**HATTERS**  
**ROBOTICS**

## Hatters Robotics 2019 Tour

Week 1 - Hatboro-Horsham District

Week 3 - Springside-Chestnut Hill District

Week 5 - Bensalem District

Week 6 - FIRST Mid-Atlantic District

Championship

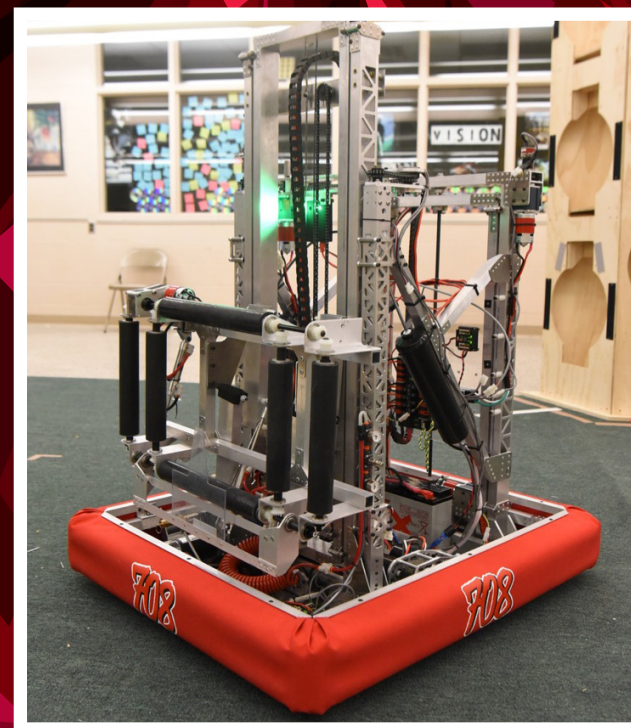
Week 9 - FIRST Championship Detroit

Hatboro-Horsham High School  
Robotics Department  
attn: Eric Zygmunt

899 Horsham Road  
Horsham, PA 19044

Contact us at:  
[info@team708.org](mailto:info@team708.org)

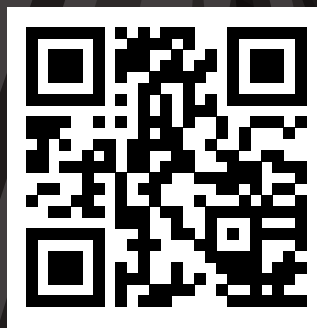
## Hatters Robotics 2019



**December 9th, 2018**

All FIRST Programs under one roof

**Qualifier Events**



[www.team708.org](http://www.team708.org)



# TEAM 708 - 2018 ROBOT

Horsham, PA



## ELEVATOR

Two-stage cascading elevator  
with four-bar arm  
Extends at 70 in/sec

## FRONT LIFT

Two separate lead screws connected  
on one common gearbox  
16:1 gear ratio in a 57 sport gear  
box on a 775 motor

## BALL MANIPULATOR

Funnels balls into elevator with 3  
rollers  
Run on a single AM red line motor  
with a 4.88:1 reduction  
Miter gears to ensure all rollers  
spin in the same direction

## HATCH MANIPULATOR

Attached to ball manipulator  
piston actuated center grabber

## CAMERA & SENSORS

Cameras identify retroreflective  
tape to align the robot, locate  
and follow cargo  
Preset buttons that raise the  
elevator to correct heights

## LIFT SYSTEM

System of 3 lead screws lift at  
rate of 9.5 in/sec raises 23  
inches off the ground

## REAR LIFT

one single lead screw with a 16:1  
gear ratio in a 57 sport gear  
box on a 775 motor

## DRIVE TRAIN

Two-speed custom shifting drive  
chain in tube that transfers  
power to the three wheels in  
the tube  
Powered by two neo-brushless  
motors on each side  
high gear - 16.7 ft/sec  
low gear - 7.8 ft/sec

