**PROTOCOL FILES CONTAIN INSTRUCTIONS TO RUN YOUR EXPERIMENT**

In each section, a header (enclosed in brackets ‘[]’) will designate The information required. Note that anything that follows a ‘#’ is a comment for explanatory purposes only and will not be used to run your experiment.

**[EXPERIMENT]** # This is a REQUIRED Header. Place general information about your experiment below.

**EXPT\_NAME = TESTING** # This is the name of your experiment

**EXPT\_PATH** **= C:\Users\ephys-2\Documents\GitHub\py-behav-box\TNEL-pyBox\BehGUI\DATA**

**VI\_TIMES\_LIST\_PATH = E:\py-behav-box\TNEL-pyBox\BehGUI\PROTOCOLS\HAB\_COND\_EXT\_AND\_RECALL\_VIs.txt**

**OPEN\_EPHYS\_PATH = E:\plugin-GUI\Builds\VisualStudio2013\x64\Release64\bin\open-ephys.exe**

**# VI\_TIMES\_LIST\_PATH = C:\Users\ephys-2\Documents\GitHub\py-behav-box\TNEL-pyBox\BehGUI\PROTOCOLS\HAB\_COND\_EXT\_AND\_RECALL\_VIs.txt**

**# OPEN\_EPHYS\_PATH = C:\Users\ephys-2\Documents\GitHub\plugin-GUI-private\Builds\VisualStudio2013\x64\Release64\bin\open-ephys.exe**

If your experiment uses Sounds, specify up to two tones below the headings [TONE1] and [TONE2].

**[TONE1]** # Note: Can have up to two tones, TONE1, TONE2. Specify Duration, frequency and volume.

# Between 0.0 and 1.0. Note that 1.0 is approximately 80dB.

**DURATION(S) = 2** # In seconds

**FREQ(HZ) = 1800** #

**VOLUME(0-1) = 0.3** # 0.0 to 1.0

If your experiment requires shocking the animal, use the [SHOCK] header to specify shock duration, Volts, and Amperes. Only duration will be set by your experiment. VOLTS and AMPS are selected by dials on the Lafayette Instrument Scrambled Grid Generator (SGG).

**[SHOCK]**

**DURATION(S) = 1** # In seconds. Used by program

**VOLTS = 5.5** # Note: for information only. Specify manually on SGG

**AMPS(MA) = 100** # Note: for information only. Specify manually on SGG

If you require FREEZE detection, use the header [FREEZE]. Specify how long the rat must remain motionless (in sec). You must also specify the minimum number of pixels (MIN\_MOVING\_PIX) that must change from video frame to video frame for the system to register motion. The MIN\_THESHOLD specifies the minimum gray level of the image. The ROI specified the region of interest in you video where you will look for motion. You can either specify the coordinates (x,y,width, and Height) or request that you Generate an ROI using the Mouse.

**[FREEZE]**

**MIN\_DURATION(S)= 2 # In seconds**

**MIN\_MOVING\_PIX = 5000 # Min number of moving pixels to un freeze**

**MIN\_THESHOLD = 26 # gray level threshold (0-255)**

**ROI=Generate** # Generate = asks user for ROI, or (x,y,w,h) ex: (644, 10, 633, 485).

# This also starts FREEZE detection FREEZE=TRUE

**[TOUCHSCREEN]**

**IMAGES\_PATH = C:\Users\ephys-2\Documents\GitHub\py-behav-box\TNEL-pyBox\BehGUI\RESOURCES**

# Note: Touchscreen is 1024 x 768. If we discount the deadzone, the

# screen is 1024 x 518. picture size is 240 x 240.

# Image size is controlled in whiskerTouchZMQ.py

**COORDS=(181,14):(181,264):(602,14):(602,264)** # COORDINATES OF THE FOLLOWING IMAGES (separate with ':')

# if more than one coordinate specified, they are chosen at

# random. If RANSOM is used instead of specified cords, then

# locations are chosen at random so they fit on screen

**IMG1= FLOWER\_REAL.bmp** # Image name

#IMG1=SPIDER.bmp:(20,20,20,20,20,20,20,20,20,20,80,80,80,80,80,80,80,80,80,,80,80,80,80,80,80,20,20,20,20,20,80,80,80,80,80)

#IMG2=FLOWER.bmp:(80,80,80,80,80,80,80,80,80,80,80,80,80,80,80,20,20,20,20,20,20,20,20,20,20,80,80,80,80,80,20,20,20,20,20)

# Image names can also be followed by a list of numbers which specify VR for rewards on each trial

# in bandit task. Note you must specify type of bandit task you are using: TOUCH\_BANDIT or BAR\_PRESS\_BANDIT

**# TOUCH\_BANDIT**

If you are just training animals to touch the screen, specify **TRAIN\_TOUCH,** The numbers (=1,100) specify initial Vis. These are increased automatically as animal habitually performs task more than 10 times per min for 10 min.

**TRAIN\_TOUCH =1,100** # note: TRAIN\_TOUCH =a,b.

# a = initial VI for img touch,

# b = initial VI for background touch

Next comes some basic experimental chamber setup specifications. Do you want the fan on (True/or False)? Do you want the cabin light on, the food light on, the camera on, and do you want video and Open-Ephys recording on? Rec=True will turn on both video and Open-Ephys recording on.

**[SETUP] # This is a required entry**

**FAN\_ON=TRUE**

**CAB\_LIGHT=TRUE**

**FOOD\_LIGHT=TRUE**

**CAMERA=TRUE**

**REC=TRUE**

**[BAR\_PRESS] # NOTE: This is an independent process. PELLET GIVEN ON PRESS AFTER VI TIME regardless of**

**# CONDITIONS**

**VI=15 # NOTE: VI=15 is variable interval with meant time of 15.**

**# PELLET GIVEN ON PRESS AFTER VI TIME regardless of CONDITIONS**

Next we specify the specifics of your experimental protocol under the [PROTOCOL] heading. Just like in setup, you can specify whether or not you want the various lights on or off, fan, video recording, Food pellets, shocks, tones, etc.

**[PROTOCOL] # This is a required header**

**START\_LOOP = 3 # Loops are trials ... WRONG(50%,5,10). This is a required entry**

**PAUSE = 2 # in seconds**

**# PAUSE = HABITUATION, CONDITIONING, EXTINCTION, or RECALL or**

**EXTEND\_LEVERS=TRUE**

**CONDITIONS=RANDOM # NOTE: Can be chosen at "RANDOM","SEQUENTIAL"(IN THE ORDER THEY ARE LISTED**

**# BELOW IN CONDITIONS), OR A NUMBER STARTING AT 1**

**EXTEND\_LEVERS=FALSE**

**END\_LOOP # This is a required entry**

**FOOD\_LIGHT=FALSE**

**REC=FALSE**

**CAMERA= FALSE**

**CAB\_LIGHT=FALSE**

**FAN\_ON=FALSE**

**[END PROTOCOL] # This is a required entry**

**[CONDITIONS] #NOTE: RESET = FIXED OR ON\_RESPONSE. ALSO, HERE WE NEED COMMAS.**

**# This is a required entry**

**MAX\_TIME, RESET,L\_CONDITION\_LT, R\_CONDITION\_LT,DES\_L\_LEVER\_PRESS,DES\_R\_LEVER\_PRESS,CORRECT,WRONG, NO\_ACTION**

**2, ON\_RESPONSE, 1, 0, 1, 0, PELLET, TONE1, TONE1**

**2, ON\_RESPONSE, 0, 1, 0, 1, PELLET, TONE1, TONE1**

**Other possibilities for touch training:**

**MAX\_TIME, RESET, CORRECT, WRONG, NO\_ACTION**

**60, ON\_RESPONSE, PELLET\_TOUCHVI1, PELLET\_TOUCHVI2, NONE**

**#BANDIT TOUCH**

**MAX\_TIME, RESET, CORRECT, WRONG, NO\_ACTION**

**60, ON\_RESPONSE, PELLET\_VAR, PELLET\_VAR, NONE**

**Note: here PELLET\_VAR gets variable reward from list next to image names aboue under TOUCHSCREEN**

**Other possibilities for touch training:**

**MAX\_TIME, RESET, CORRECT, WRONG, NO\_ACTION**

**60, ON\_RESPONSE, PELLET80, PELLET20, NONE**