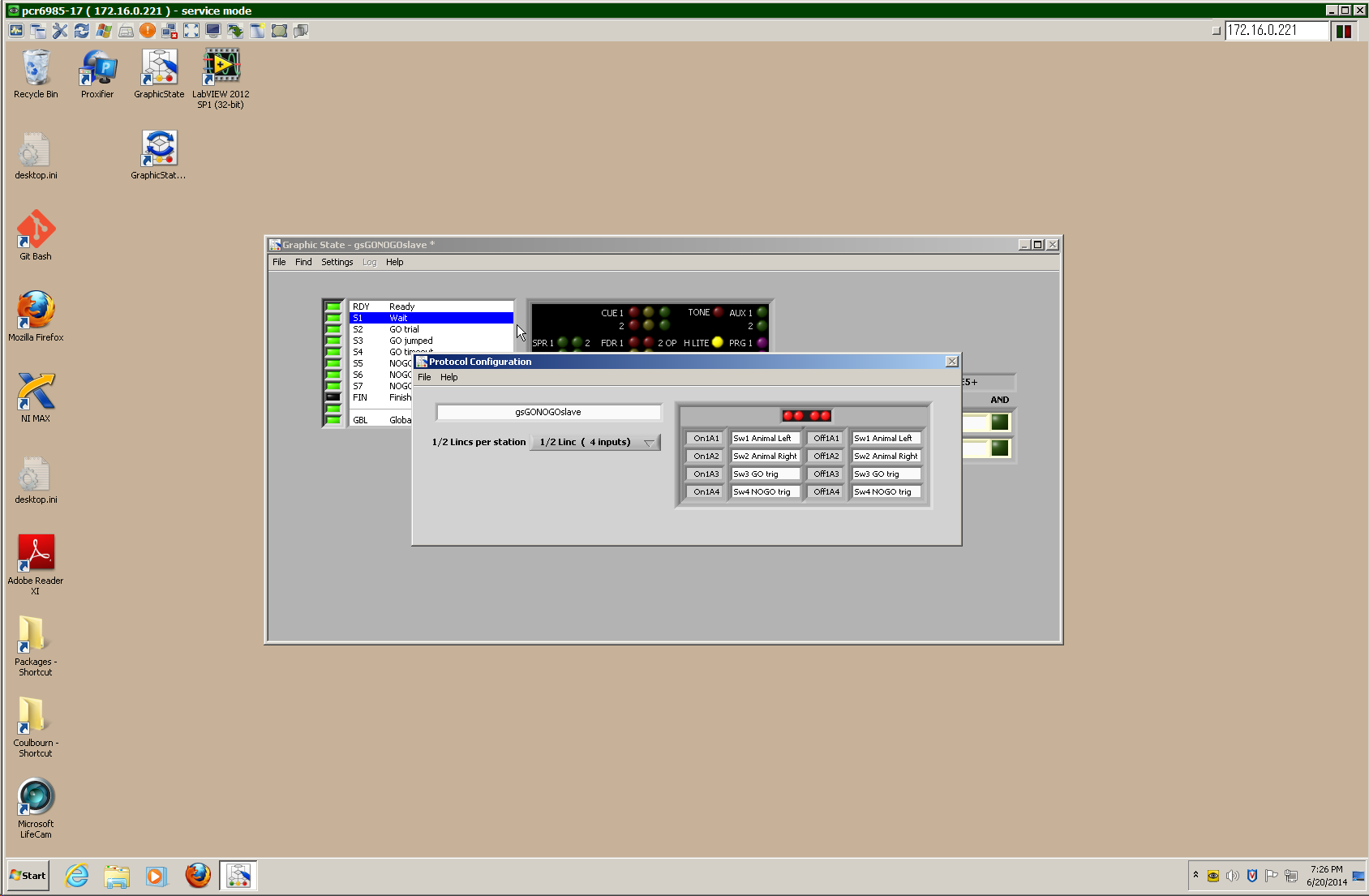
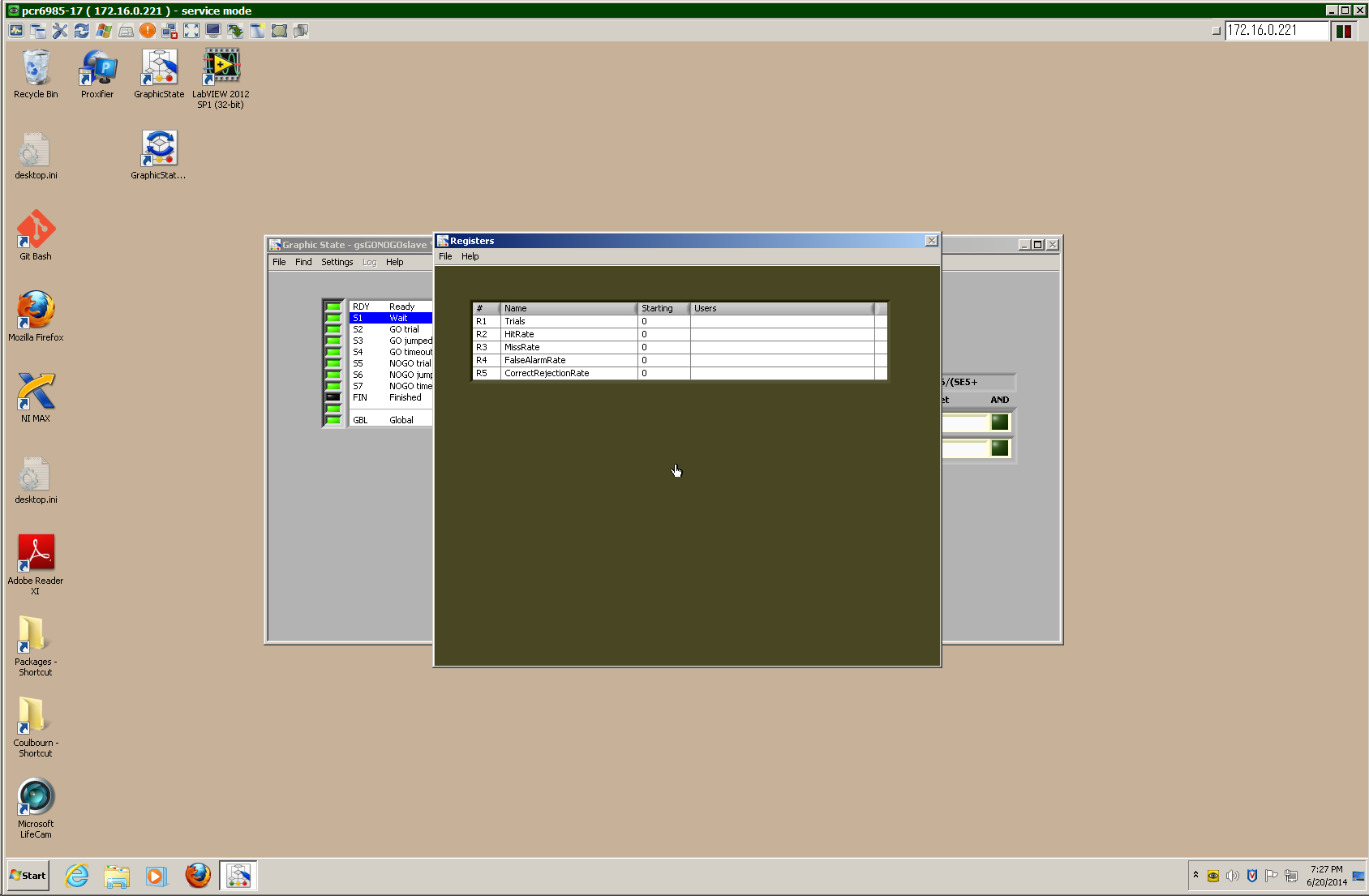
Coulbourn GraphicState4 Program: gsGoNogoTestSlave.gsprt (Kenta)  
Updated KT 2014.10.15

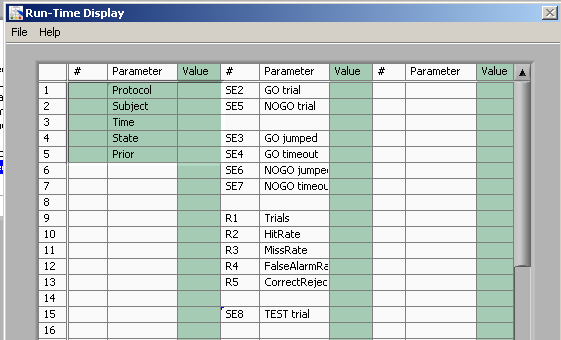
## Protocol Configuration



## Registers



**Run-Time Display**



**Inputs**

Sw3: GO trigger  
Sw4: NOGO trigger  
Sw3 + Sw4: TEST trial trigger

## Outputs

H LITE: Task in progress  
TONE: tone gate (not currently used given 1 FM sweep, can be used in future to gate sweep train for easier training task)  
AUX 1: Shocker

Bit 0 to 2: CUE1-1 to CUE1-3  
Bit 3 to 5: CUE2-1 to CUE2-3  
Bit 6: SPR1  
Bit 7: SPR2

**Flow Chart**

(each state is prepended by an empty state to set the port output to zero)  
(S1 is prepended by >0 ms of S14, S2 by S15, ….)

To S1 or S13

To S1 or S13

To S1 or S13

S4 **[64]**  
GO trial

S5 **[8]**  
GO jumped

S6 **[16]**  
GO timeout

S7 **[128]**  
NOGO trial

S8 **[24]**  
NOGO jumped

S9 **[32]**  
NOGO timeout

S10 **[192]**  
TEST trial

S11 **[40]**  
TEST jumped

S12 **[48]**  
TEST timeout

Sw 3/4

RDY  
Ready

S1 **[1]**  
Wait

S13 **[4]**  
Jumped

S2 **[2]**  
Wait Sw1

S3 **[3]**  
Wait Sw2

# Preparation code

## RDY: "Ready" [Bit code 255 = 11 111 111]

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  |  |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | **R** | **Parameter** | **Comp.** | **Exit Criterion** | **P(%)** | **Target** | **AND** |
| 1 |  | ms | >= | 0 | 100 | 14 |  |

## S1 (pre is S14): "Wait" [Bit code 1 = 00 000 001]

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  |  |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |

SE4+SE7+SE10>>Trials;   
SE5/(SE4+0.000000001)>>HitRate; SE6/(SE4+0.000000001)>>MissRate;  
SE8/(SE7+0.000000001)>>FalseAlarmRate; SE9/(SE7+0.000000001)>>CorrectRejectionRate;

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | **R** | **Parameter** | **Comp.** | **Exit Criterion** | **P(%)** | **Target** | **AND** |
| 1 |  | Sw3 GO trig | >= | 1 | 100 | 23 | [1] |
| 2 |  | Sw4 NOGO trig | >= | 1 | 100 | 23 | [1] |
| 3 | ☒ | Sw3 GO trig | >= | 1 | 100 | 17 |  |
| 4 |  | Sw4 NOGO trig | >= | 1 | 100 | 20 |  |
| 5 | ☒ | Sw1 Animal Left | >= | 1 | 100 | 15 |  |
| 6 |  | Sw2 Animal Right | >= | 1 | 100 | 16 |  |

## S2 (pre is S15): "Wait Sw1" [Bit code 2 = 00 000 010] (Sw1 has been triggered)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  |  |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | | | **R** | | | **Parameter** | | **Comp.** | | **Exit Criterion** | | **P(%)** | | **Target** | | **AND** | |
| 1 | | |  | | | Sw3 GO trig | | >= | | 1 | | 100 | | 23 | | [1] | |
| 2 | | |  | | | Sw4 NOGO trig | | >= | | 1 | | 100 | | 23 | | [1] | |
| 3 | | | ☒ | | | Sw3 GO trig | | >= | | 1 | | 100 | | 17 | |  | |
| 4 | | |  | | | Sw4 NOGO trig | | >= | | 1 | | 100 | | 20 | |  | |
| 6 | |  | | | | Sw1 Animal Left | | >= | | 1 | | 100 | | 15 | | ☐ | |
| 5 | | |  | | Sw2 Animal Right | | | >= | | 1 | | 100 | | 16 | |  | |

## S3 (pre is S16): "Wait Sw2" [Bit code 3 = 00 000 011] (Sw2 has been triggered)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  | ***Records shuttling during wait period*** |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | | **R** | | **Parameter** | | **Comp.** | | **Exit Criterion** | | **P(%)** | | **Target** | | **AND** | |
| 1 | |  | | Sw3 GO trig | | >= | | 1 | | 100 | | 23 | | [1] | |
| 2 | |  | | Sw4 NOGO trig | | >= | | 1 | | 100 | | 23 | | [1] | |
| 3 | | ☒ | | Sw3 GO trig | | >= | | 1 | | 100 | | 17 | |  | |
| 4 | |  | | Sw4 NOGO trig | | >= | | 1 | | 100 | | 20 | |  | |
| 5 | |  | | Sw1 Animal Left | | >= | | 1 | | 100 | | 15 | |  | |
| 6 | |  | | Sw2 Animal Left | | >= | | 1 | | 100 | | 16 | |  | |

# S4/GO trials

## S4 (pre is S17): "GO trial" [Bit code 64 = 01 000 000]

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  |  |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | **R** | **Parameter** | **Comparison** | **Exit Criterion** | **P(%)** | **Target** | **AND** |
| 1 |  | Sw4 NOGO trig: | >= | 1 | 100 | 8 |  |
| 1 |  | Sw1 Animal Left | >= | 1 | 100 | 18 |  |
| 2 |  | Sw2 Animal Right | >= | 1 | 100 | 18 |  |
| 3 |  | sec | >= | 4 | 100 | 19 |  |

# Animal Jumped

## S5 (pre is S18): "GO jumped" (aka Hit) [Bit code 8 = 00 001 000]

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  |  |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | **R** | **Parameter** | **Comparison** | **Exit Criterion** | **P(%)** | **Target** | **AND** |
| 1 |  | Sw1 Animal Left | >= | 1 | 100 | 26 |  |
| 2 |  | Sw2 Animal Right | >= | 1 | 100 | 26 |  |
| 3 |  | ms | >= | 10 | 100 | 14 |  |

# Animal Didn't Jump

## S6 (pre is S19): "GO timeout" (aka Miss) [Bit code 16 = 00 010 000]

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  |  |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | **R** | **Parameter** | **Comparison** | **Exit Criterion** | **P(%)** | **Target** | **AND** |
| 1 |  | Sw1 Animal Left | >= | 1 | 100 | 26 |  |
| 2 |  | Sw2 Animal Right | >= | 1 | 100 | 26 |  |
| 3 |  | sec | >= | 6 | 100 | 14 |  |

# NOGO trials

## S7 (pre is S20): "NOGO trial" [Bit code 128 = 10 000 000]

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  |  |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | **R** | **Parameter** | **Comparison** | **Exit Criterion** | **P(%)** | **Target** | **AND** |
| 1 |  | Sw3 GO trig | >= | 1 | 100 | 8 |  |
| 1 |  | Sw1 Animal Left | >= | 1 | 100 | 21 |  |
| 2 |  | Sw2 Animal Right | >= | 1 | 100 | 21 |  |
| 3 |  | sec | >= | 4 | 100 | 22 |  |

# Animal Jumped

## S8 (pre is S21): "NOGO jumped" (aka False Alarm) [Bit code 24 = 00 011 000]

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  |  |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | **R** | **Parameter** | **Comparison** | **Exit Criterion** | **P(%)** | **Target** | **AND** |
| 1 |  | Sw1 Animal Left | >= | 1 | 100 | 26 |  |
| 2 |  | Sw2 Animal Right | >= | 1 | 100 | 26 |  |
| 3 |  | sec | >= | 6 | 100 | 14 |  |

# Animal Didn't Jump

## S9 (pre is S22): "NOGO timeout" (aka Correct Rejection) [Bit code 32 = 00 100 000]

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  |  |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | **R** | **Parameter** | **Comparison** | **Exit Criterion** | **P(%)** | **Target** | **AND** |
| 1 |  | Sw1 Animal Left | >= | 1 | 100 | 26 |  |
| 2 |  | Sw2 Animal Right | >= | 1 | 100 | 26 |  |
| 3 |  | ms | >= | 10 | 100 | 14 |  |

**TEST trials**

**S10** **(pre is S23): "TEST trial" [Bit code 192 = 11 000 000]**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  |  |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | **R** | **Parameter** | **Comparison** | **Exit Criterion** | **P(%)** | **Target** | **AND** |
| 1 |  | Sw1 Animal Left | >= | 1 | 100 | 24 |  |
| 2 |  | Sw2 Animal Right | >= | 1 | 100 | 24 |  |
| 3 |  | sec | >= | 4 | 100 | 25 |  |

**Animal Jumped**

**S11** **(pre is S24): "TEST jumped" [Bit code 40 = 00 101 000]**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  |  |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | **R** | **Parameter** | **Comparison** | **Exit Criterion** | **P(%)** | **Target** | **AND** |
| 1 |  | Sw1 Animal Left | >= | 1 | 100 | 26 |  |
| 2 |  | Sw2 Animal Right | >= | 1 | 100 | 26 |  |
| 3 |  | ms | >= | 10 | 100 | 14 |  |

**Animal Didn't Jump**

**S12** **(pre is S25): "TEST timeout" [Bit code 48 = 00 110 000]**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  |  |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | **R** | **Parameter** | **Comparison** | **Exit Criterion** | **P(%)** | **Target** | **AND** |
| 1 |  | Sw1 Animal Left | >= | 1 | 100 | 26 |  |
| 2 |  | Sw2 Animal Right | >= | 1 | 100 | 26 |  |
| 3 |  | ms | >= | 10 | 100 | 14 |  |

**Jump Marker**

**S13** **(pre is S26): "Jumped during marker block" [Bit code 4 = 00 000 100]**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  |  |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | **R** | **Parameter** | **Comparison** | **Exit Criterion** | **P(%)** | **Target** | **AND** |
| 1 | ☒ | Sw1 Animal Left | >= | 1 | 100 | 26 | ☐ |
| 2 | ☒ | Sw2 Animal Right | >= | 1 | 100 | 26 | ☐ |
| 3 | ☒ | ms | >= | 10 | 100 | 14 | ☐ |

**Zero reset trials**

## S14: "Pre S1" [Bit code 0 = 00 000 000]

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | **R** | **Parameter** | **Comparison** | **Exit Criterion** | **P(%)** | **Target** | **AND** |
| 1 | ☒ | ms | >= | 10 | 100 | 1 | ☐ |

## S15: "Pre S2" [Bit code 0 = 00 000 000]

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Goto#** | **R** | **Parameter** | **Comparison** | **Exit Criterion** | **P(%)** | **Target** | **AND** |
| 1 | ☒ | ms | >= | 10 | 100 | 2 | ☐ |

## S16: "Pre S3" [Bit code 0 = 00 000 000]

## S17: "Pre S4" [Bit code 0 = 00 000 000]

## S18: "Pre S5" [Bit code 0 = 00 000 000]

## S19: "Pre S6" [Bit code 0 = 00 000 000]

## S20: "Pre S7" [Bit code 0 = 00 000 000]

## S21: "Pre S8" [Bit code 0 = 00 000 000]

## S22: "Pre S9" [Bit code 0 = 00 000 000]

## S23: "Pre S10" [Bit code 0 = 00 000 000]

## S24: "Pre S11" [Bit code 0 = 00 000 000]

## S25: "Pre S12" [Bit code 0 = 00 000 000]

## S26: "Pre S13" [Bit code 0 = 00 000 000]

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | CUE 1 |  |  | TONE |  | AUX 1 |  |  |  | |
|  |  |  | 2 |  |  |  |  | 2 |  |  |  | |
| SPR 1 |  | 2 | FDR 1 |  | 2 OP | H LITE |  | PRG 1 |  |  |  |
| 3 |  | 4 | 1 |  | 2 ML |  |  | 2 |  |  |  |