



5CSRT Test Systems and Components



Five Choice Serial Reaction Time (5CSRT)

Overview

The Task

The 5CSRT task is a test of sustained and selective attention and reaction time, which has been well characterized in the rat and mouse to show clinical validity in a variety of settings. Clinical models showing impairment in this area include Alzheimer's, Depression, Huntington's, Schizophrenia, ADHD and OCD. The neural systems that have been implicated include Prefrontal cortex, basal forebrain, cholinergic (accuracy), serotonin (impulsivity), noradrenalin (distraction), and dopamine (motivation). It is one of the oldest of operant based tests in mice designed to exploit molecular genetics methods in unraveling the genetic contribution to complex psychological and behavioral processes. The standard application packages provided by Lafayette Instrument Company and Campden Instruments Ltd. include nine separate schedules for the rat and eleven for the mouse to test the hardware, calibrate the reward (liquid only), train the animal, and run basic and advanced forms of the 5CSRT Task. The individually written schedules are written with multiple user set options and include extensive data analysis and reporting.

The Chamber

These carefully designed rat and mouse 5/9 Hole Test Chambers retain all the features of the box defined in over 60 published papers by T.W. Robbins and others. Not a detail has been overlooked including the floor, pan, reward area, nose pokes, house lights, speaker, and more. Chambers are fully integrated into the sound cubicle.

The Sound Attenuating Cubicle

All 5/9 Hole Test Chambers are shipped mounted to a slide out shelf that slides easily in and out of a durable light, sound attenuating cubicle, designed for easy cleaning and maintenance. The core of the walls are a medium density composite. The walls are first treated with an opaque anti mold fungicide and then coated with an acrylic protective finish to provide an impact and abrasion barrier, and to resist urine, water, alcohol, heat or other staining. The cubicle includes a ventilation fan, external connectors for all power and control, and an observation optic.

The Hardware

Both the Behavior Network Control (BNC) hardware and ABET 2G Interface permit independent control of a number of operant chambers. Selection depends on the number of chambers needed and other considerations.

The Software

All standard applications are written in ABET II Standard or ABET II Touch schedule format. This format provides for easy user modification and includes complete data analysis sets. Those who choose to do so may also create unique schedules from scratch.

Complete Rat 5/9 Hole Box with Pellet

Model 80600A-CP

Complete Rat 5/9 Hole Box with Liquid

Model 80600A-CL

Complete Mouse 5/9 Hole Box with Liquid

Model 80610A-CL

The complete 5/9 Hole Rat and Mouse Test Chambers include integrated ambulatory photobeams, white noise distraction and dimming functions along with a deluxe reward area, pellet (or liquid) dispenser, and sound attenuating chamber. These chambers may be connected to the BNC Hardware via a single 37 way cable, or to the ABET Interface via two 25 way cables. The complete 9 hole plus dimming and white noise configuration uses 16 inputs and 16 outputs from a single BNC I/O card or ABET Interface module. Alternative programmable configurations are possible to make I/O available for 5 Hole, dimming, white noise and levers.

Dimensions

Sound Cubicle Exterior

Rat: 580H x 490W x 490D (mm)
22.83" x 19.29" x 19.29"

Mouse: 450H x 450W x 420D (mm)
17.72" x 17.72" x 16.54"

Sound Cubicle Interior

Rat: 520H x 430W x 425D (mm)
20.47" x 16.93" x 16.73"

Mouse: 390H x 390W x 355D (mm)
15.35" x 15.35" x 13.97"



Model 80600A-CP Rat Chamber



Model 80610A-CL Mouse Chamber

Weight (complete)

Rat: 40.5Kg (89.3 lb)

Mouse: 33Kg (72.75 lb)

Features at a glance

- Sound/Light Attenuating Cubicle
- Ventilation Fan
- Stainless steel and Polycarbonate Test Chamber
- Grid Floor and removable tray on baseboard (Rat) or Perforated Stainless Steel Floor (Mouse)
- Removable slide out base
- Pellet or Liquid Dispenser
- Reinforcement Tray
- Nine Holes with Stimulus LED's
- IR-Beam detection of nose poke
- Electronic Brightness control
- Houselight and loudspeaker
- 10m cable
- IR activity monitoring

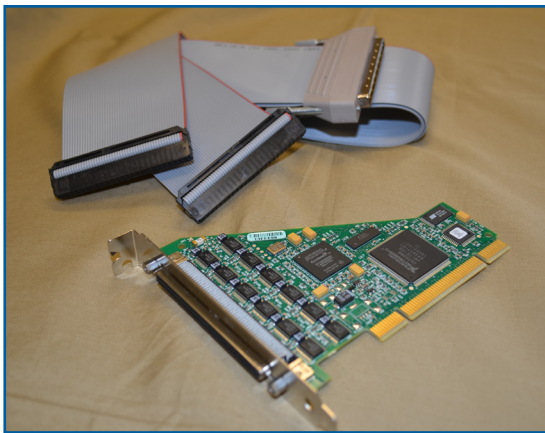
The ABET II Control System

The ABET 2G Interface modules are ideal for smaller installations. They require a smaller start up cost and take up less space with the same functionality of the larger BNC system.

ABET 2G Starter Interface

Model 81501-NL

This base unit may be used to support one 5/9 Hole Test Station. This unit has been recently updated with more robust output drivers, additional resettable fusing and software controlled safety relays to shut off the 28 V DC when not actively controlled. The non latched functionality of the inputs provides easy monitoring of both states of the nose poke response (open and closed) from a single control line.



ABET 2G NI PCI Interface Card and Cable

Model 81504

A single computer PCI circuit board with 100 pin connector. The split ribbon cable that makes up the second part of this package now connects directly to the ABET 2G Interface to support from 1 – 8 test chambers. The BNC interface package described below is recommended for 6 or more test chambers running on a single computer. The driver box and additional cables used in older systems have now been eliminated.

ABET 2G Expansion Interface

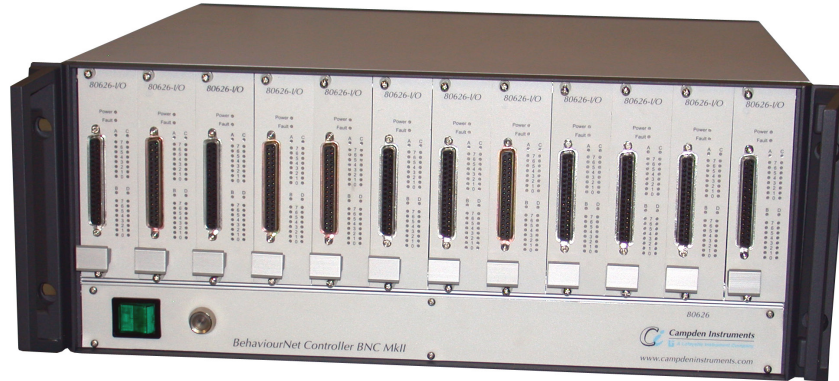
Model 81502

This unit stacks on top of the 81501 to support additional chambers. There are no cards to install or cables to connect between modules. Standard DB-25 cables connect between the interface and the chamber I/O connection panel on the cubicle. The ABET Interface is generally recommended for labs running 6 or fewer chambers on a single computer.



The BNC MKII Control System

The BNC Control System can comfortably handle 12 test chambers on a single computer, and is recommended for systems running 6 or more chambers on a single computer. The rack mount cabinet and power supply houses an individual interface modules for each test chambers. Modules may be purchased as needed.



Model 80626-3 BNC MKII Interface shown
with (12) Model 80626-I/O Modular I/O Cards

BNC MKII Interface with Internal Power Supply

Model 80626-3

This unit is ideal for larger installations of the 5/9 Hole Test Chambers as it will hold up to twelve Model 80626-I/O I/O Modules. The DC Power supply is rated at 24 V DC 14A with circuits that are overload protected against power surges. The rack mounted cabinet can sit on a desk or counter or it can be installed in a standard 19 inch rack or equipment cabinet. For other applications, this cabinet provides a potential capacity of up to 1,920 lines with the flexibility of configurable control lines in blocks of 8 inputs or 8 outputs. This permits independent control of any number of operant chambers with the appropriate software.

BNC MK II Modular I/O Card

Model 80626-I/O

Install one Modular I/O Cards in the BNC MK II Interface Cabinet for each 5/9-Hole Test Chamber needed. An indicator LED for each input or output indicates the function and state of the line. 12 I/O Cards are shown in the above photo.

Advantec I/O PCI Interface Card and Cable

Model 80626-CARD

Use this Interface Card and cable to connect a Windows PC to the BNC Interface.

Bussey-Saksida Touch Screen Chambers (5CSRT)

In addition to the nose poke chambers described previously, the 5CSRT task may be run on these flexible touch screen chambers. This also opens the possibility of running a wide range of standardized applications for cognitive evaluation.

The most efficient configuration of these chambers is in groups of four. The Easy Installation Kit places four chambers on a mobile space saving base and keeps the control computer, interface and wiring as neat and tidy as possible to get you up and running quickly and conveniently. Contact Lafayette Instrument Company for additional information on the complete line of products.

Bussey-Saksida Rat Touchscreen Chamber Package

Model 80604

A unique fully validated approach to chamber design. The Standard Rat Chamber is provided with a 45mg pellet dispenser (liquid reward on request) and integrated sound isolation cubicle. This chamber also includes a ceiling mounted house light and speaker for auditory stimuli, and I/R beams to meet schedule requirements and record ambulatory activity. A camera system may be added to view test animals in the chamber.



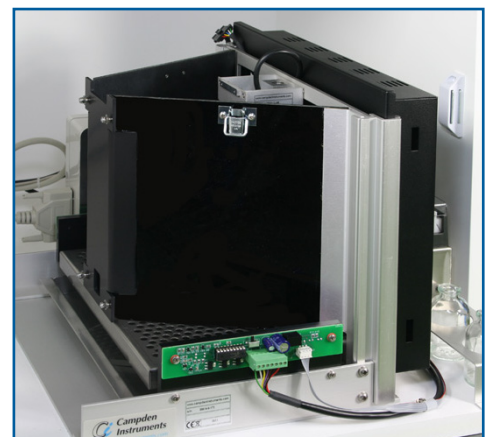
Model 80604 Rat Touchscreen Chamber

- The Bussey-Saksida Touch Screen Chamber has a unique trapezoidal wall shape to focus the animal's attention and is made from machined parts that simply slot together.
- Designed to run both pavlovian (autoshaping) and a variety of operant tasks, with a reward module that can be moved in seconds.
- Not just a touch screen. Slide in masks are designed for high throughput. For example, run Visual Discrimination and Reversal in the morning and Five Choice Serial Reaction Time Task in the afternoon
- This chamber can be taken apart and reassembled in seconds for easy cleaning and exceptionally high throughput.

Bussey-Saksida Mouse Touchscreen Chamber Package

Model 80614

This chamber is very similar to the one described for rat testing. In addition to being smaller in size, the chamber also features a peristaltic pump for liquid reward as standard. A 14 mg or 20 mg dispenser is available on request.



Model 80614 Mouse Touchscreen Chamber

ABET II Software for Operant Control

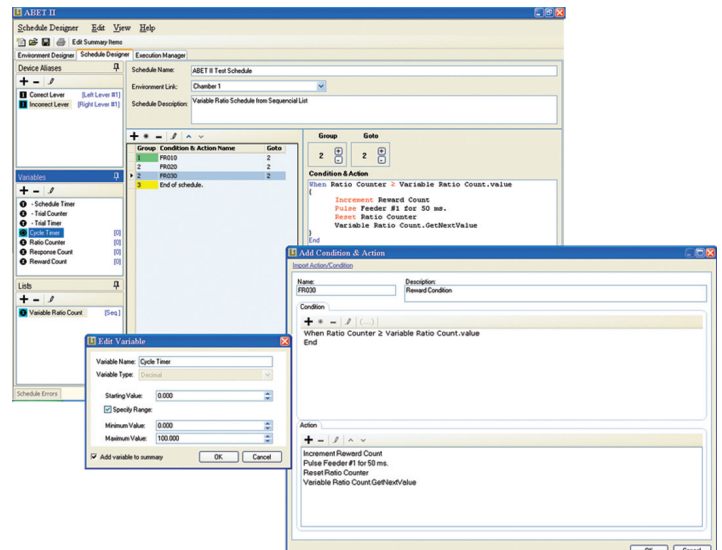
ABET II Standard
Model 89501

ABET II for Touch Screen
Model 89505

There are several interface systems and behavioral control software packages on the market, however, only ABET II offers a system that can be user customized and programmed with no user interface design experience.

Our preprogramed schedules (including the 5CRST Task) allow you to easily change the program and write your own schedule. Every effort has been made to make this easy enough to use for those with minimal operant conditioning experience, yet powerful enough to run complex schedules for the experimental analysis of behavior. If you can conceptualize your experiment in a flow chart or a spreadsheet, you can create the conditions and actions needed for virtually any scheduled task. The following components are provided.

- Environment Designer
- Schedule Designer
- Execution Manager
- Data Viewer
- Analysis Set Designer
- Virtual Interface
- Image Grid Designer (Model 89505 only)
- Control image placement and record screen touch (Model 89505 only)



Model 89501 ABET II Standard Screenshot

Whisker® Multimedia

ABET II Touch relies on the **Whisker®** operating system to control the advanced graphical output on multiple screens, and touch screen input from multiple chambers when running the Bussey-Saksida Rat and Mouse Test Chambers. This is the same underlying platform used in the CANTAB test stations. This product has been cited in over 142 publications across more than 34 journals.



Contact us for a quotation or more information!



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