Panlab
Technology for Bioresearch

TÜV CERT
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PASSIVE AVOIDANCE

The inhibition of innate or learned behaviour by association with aversive stimulation has shown to be a very useful tool for researchers working in very different fields. From the study of the interference of drug treatments on a simple learning model to the study of the physiological mechanisms beneath learning or memory, passive avoidance reflexes studies have been used.

Many models have been proposed for these studies. However, among those most widely used, that suggested by Kurtz & Pearl in 1960 (J. Comp Physiol. Phycol. 53:201-6) and later modified by Bures & Buresova (J. Comp. Physiol. Phycol. 56:268-62, 1963) is proven. In this model, sometimes called 'One-trial learning', 'Two-compartment test' or 'Memory test' it is intended to inhibit, by aversive stimulus, the rodents tendency to abandon large, open and brightly illuminated spaces so as to hide in small dark ones.

The model has a set of variables of easy determination and control (i.e. entrance to the small compartment latency), offering, at the same time, an ample parameters spectrum whose effect can be studied (v. gr. the interval between the aversive stimulation and the retention test).

Passive Avoidance studies can be carried out by means of two different types of Experimental Chambers:

A) That comprised of two differently sized enclosures, a big black one and a small white one, according to the original design.

B) The classic Shuttle Box with the addition of a guillotine door

A

Reference	LE 870 (rats)	LE 872 (mice)
Large Compartment	32 x 32 x 27	25 x 25 x 24 (h)
Small Compartment	18 x 12 x 12	13.5 x 7.5 x 7.5
Door	8 x 8	6 x 6

B

Reference	LE 916 (rats)	LE 918 (mice)
Each Compartment	25 x 25 x 27	19 x 19 x 27
Door	8 x 8	7 x 7
Forfuther information See Shutte Box Leaflet		

In both Panlab's types of experimental chambers, the animal's position is detected by using **weight gauges**.This system, which uses high sensitivity weight transducers that range from 10 to 800 grams, provides more effective and reliable detection of animal responses (zones entries) than systems based on photocells beams or on grid floor displacements.

Cages Control

Both models of passive avoidance cages may be controlled either by a Programmer or by Software. The first option is unexpensive and recommended for one single box setups, while the second is suitable for controlling a number of boxes simultaneously.

Typical working protocol involves timing of transitions, i.e. time that the animal takes to move from one zone (white and ample in the traditional shuttle box) to the other, where it will get an electric shock. Under normal conditions, the subject will take longer time to move into this zone, or even it will refuse to enter (memory).

LE 2708 Programmer

This device is used to control one experimental chamber, either a **Shuttle Box** (**as passive or active box**) or the traditional passive cage. It is equipped with a rear panel that lets the user configure a wide variety of protocols. A RS 232 output allows data transfer to a computer (SEDACOM software for communication included) or to a printer with serial port.

LE 2708 has been fitted with an electroshock generator. A typical protocol for passive avoindance using LE 2708 unit may be like this:

A) Exploration time
B) Response time and cut-off time
C) Door control
D) Latency, duration and intensity of shock

Data are transferred to an external printer or computer in the following format:

L.S.I. Letica Scientific Instruments					PROGRAMMER AVOIDANCE			V1.0
	DURATION	TIMER-A		TIMER-B		TIMER-C		
ID.	(Trials)	RESPONSE	NON-RESPONSE	RESPONSE	NON-RESPONSE	RESPONSE	NON-RESPONSE	
1	5	0	4	0	0	0	0	

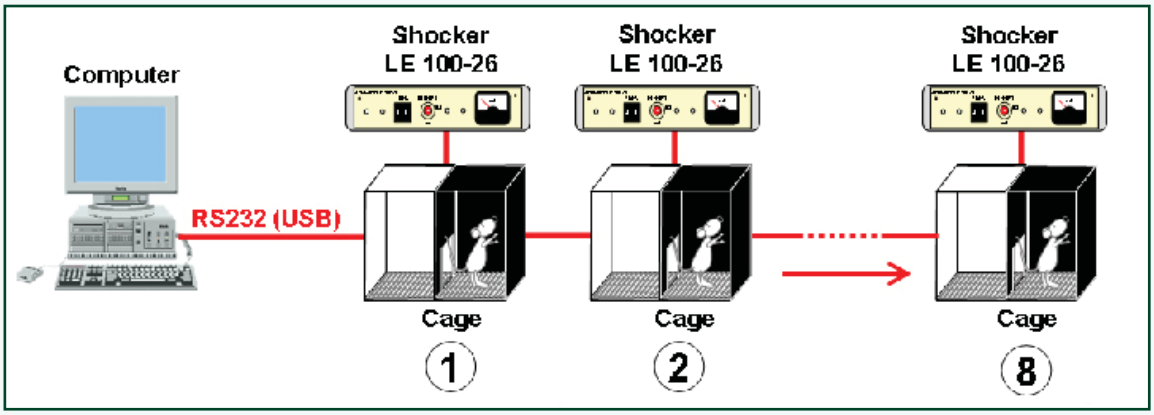
L.S.I. Letica Scientific Instruments					PROGRAMMER AVOIDANCE			V1.0
	DURATION	TIMER-A		TIMER-B		TIMER-C		
ID.	(Trials)	RESPONSE	NON-RESPONSE	RESPONSE	NON-RESPONSE	RESPONSE	NON-RESPONSE	
1	5	1	3	0	1	0	1	
2	5	0	4	0	0	0	0	
3	5	2	2	0	2	0	2	
4	5	1	3	0	1	0	1	
5	5	1	3	0	1	0	1	
6	5	1	3	0	1	0	1	

This device is used in other behavioural tests, such as Operant Behaviour experiments, active conditioning in Shuttle Boxes or Sidman Avoidance Schedules. It is equipped with trials counter and timer and it keeps record of all types of responses per period: spontaneous responses, avoidance or escape responses. In addition, LE 2708 features three independent time counters that let the user define three different periods in which start, stop and reset functions can be programmed at will.

SHOCKER CHARACTERISTICS

- Adjustable intensity source from 0 to 2 mA
- Electronic Scrambler through 6 channels, by scanned pulse shift
- Selectable Time from 0,1 to 99 sec

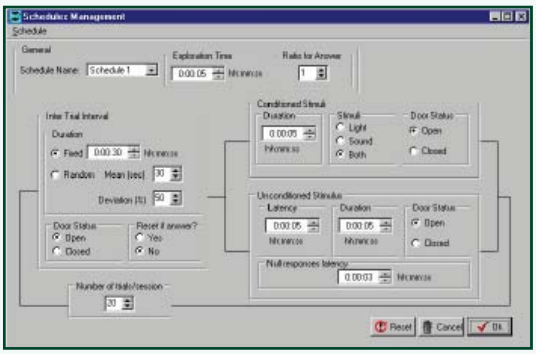
Control by Software



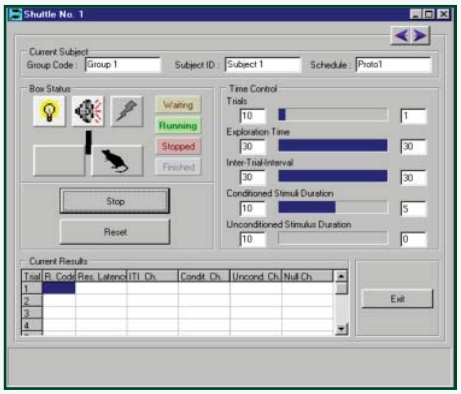
SHUTVOID - 01 Software

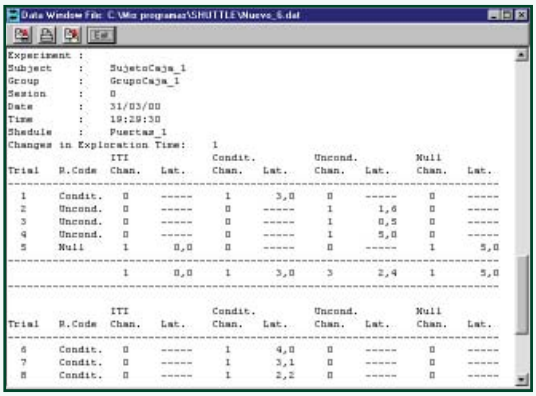
The software controls independently up to eight Passive Cages or Shuttle Boxes, detects changes automatically and activates the corresponding windows.
Unlimited number of protocols to be defined, common or different for each cage:

A) Exploration Time and Inter Trial Interval: the duration can be fixed or randomized (defining in this case Mean Time & % deviation)
B) Response Time: time since the door is opened until the entry of the animal in the Shock zone.
C) Maximum time for responding
D) Unconditioned Stimulus: selection of the Latency Time, Shock duration and intensity
E) The door status (open-closed) can be defined independently in each time of protocol.



- Each Experimental Session is controlled by a Control Window (one for each cage present), where the user can see the information about the running of the session
- Visualization of the position of the animal
- When the animal is introduced in the cage, the progran runs authomatically (independently for each cage)
- Cage performance testing from the keyboard (light, sound..)
- Data can be seen as Archive of Raw Data and as Tabulated Data



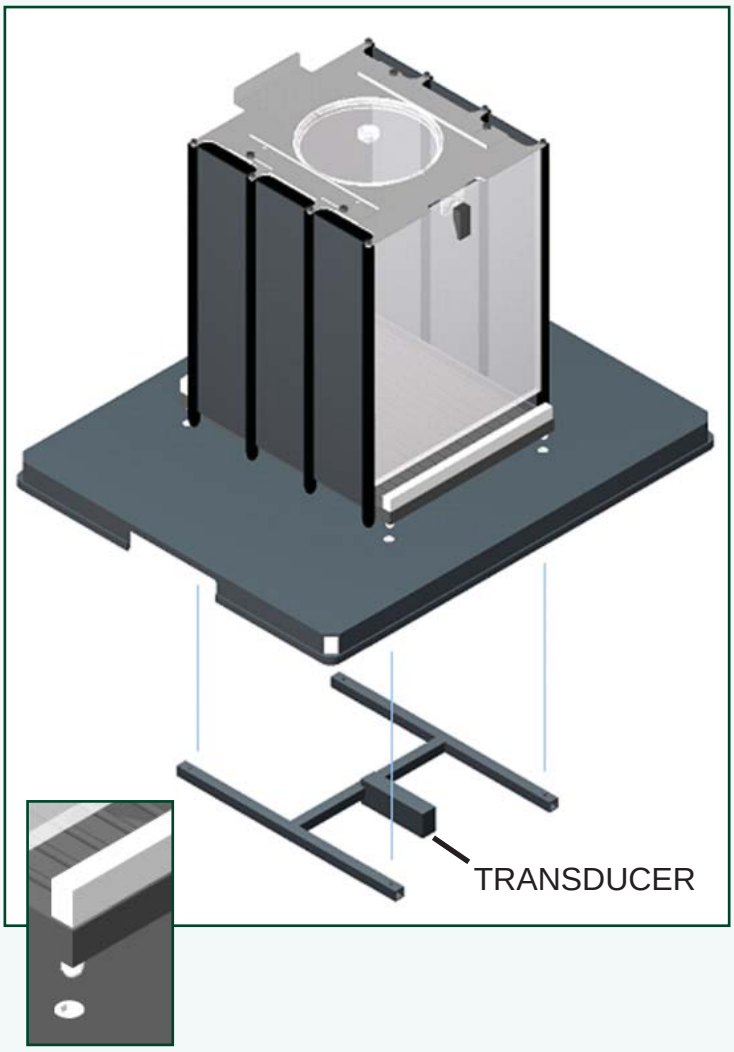


SHOCKER LE 100-26

LE 100-26 Shock Generator supplies the necessary current to electrify the grid floor. Each cage requires one Shock Generator

- Adjustable intensity source from 0 to 2 mA
- Electronic Scrambler through 6 channels, by scanned pulse shift
- Selectable Time from 0,1 to 9 sec or by Software

Features and Applications



The physical system which is implemented in Panlab Cages to detect animal's entry (response) is based on force transducers connected to the grid floor.

Weight detection is the most reliable system currently available. It is not affected by speed changes or sudden movements such as jumps and it covers a wide range of weights. Two chambers cages are fitted with two sensors, one for each zone, in a joint operation set-up that allows quick and efficient detection without artefacts. In addition, this system allows the cages to be used in other applications, such as subjects animal weighing, spontaneous or induced activity measuring, tremor sensor, freezing or Startle-Reflex responses detection.

See figure for operating details. Weight is gauged on the four corners of the grid, so that equally distributed sensitivity is granted.

The grid floor is easy to handle and to fit into the four leaning points, and requires no adjustments.

DISTRIBUTOR

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