

Modification Summary for the 81335A Operant Control

The new 81335A Operant Controller includes all of the features of its predecessor (81335) plus the new ability to support 2 control stimulus (CS) devices (usually lamps). In order to support this new feature, two new switches have been added to the controller. The **Stimulus Mode** switch selects between 'SINGLE' and 'DOUBLE' CS support. In SINGLE mode, the 81335A behaves identically to its predecessor, the 81335. In DOUBLE mode, the 81335A supports two CS devices. The **Stimulus Cross-Connect** switch allows the relative association of CS to RR to be selected. Both switch functions will be discussed in more detail.

Using DOUBLE Mode: The addition of the second CS effects the performance of all program options that actively use the CS in the program. These programs include the following:

1. DISC: Discrimination

The new double CS feature now allows for testing beyond go-no go. In double mode, each CS has a single correct response selected by the experimenter. For example, if you wish to run a simple go-no go paradigm with left-right discrimination based on 2 CS lamps and 2 corresponding press bars, the set-up procedure is as follows:

- a. Refer to the cable connections as outlined on page 9 of the 81335 instruction manual.
- b. The press bar connected to pin #9 of the terminal strip will be referred to as RR1 (reinforced response). Instead of using pin #7 of the terminal strip for the ceiling rod, connect a second press bar. This press bar will be referred to as RR2.
- c. The CS lamp connected to pin #6 of the terminal strip will be referred to as CS1. Connect the second CS lamp to pin #10 and pin #12 of the terminal strip. This CS lamp will be referred to as CS2.
- d. Set the Stand-By/Run/Reset switch to STAND-BY, the Stimulus mode switch to the DOUBLE, and the Program mode to DISC.
- e. Set the Stimulus Cross-Connect switch to the desired value. By setting the switch to ADJACENT, associations between CS1:RR1 and CS2:RR2 will be established. Setting the switch to OPPOSITE establishes CS1:RR2 and CS2:RR1 associations. For this example, ADJACENT setting will be assumed.
- f. Set the Response switch to NORM.

- g. Set the Stand-By/Run/Reset switch to RUN and press the shaping button to begin a trial. You will notice CS1 will light and only a press on RR1 will produce a reward.
- h. Press the shaping button to end trial. Now set the Response switch to RVS.
- i. Press the shaping button to begin a trial. You will notice CS2 will light and only a press on RR2 will produce a reward.
- j. Press the shaping button to end trial. Continue the trials, selecting the desired CS/RR combination with the Response switch.

2. CHAIN: Two Response Chaining for Reinforcement

The new double CS feature now allows for testing adaptability in the chain program by allowing the experimenter to switch the order of the chained responses while providing a CS 'cue' to the animal that an order change in responses is required. For example, you wish to run a chain reversal test. In one instance, the animal activates the ceiling rod, the CS light is turned on, and the press bar is activated to dispense the reward. In the other (reverse) instance, the animal activates the press bar, a CS audio tone is turned on, and the ceiling rod is activated to dispense the reward. The set-up procedure is as follows:

- a. Refer to the cable connections as outlined on page 9 of the 81335 instruction manual.
- b. The press bar connected to pin #9 of the terminal strip will be referred to as RR1. The ceiling rod connected to pin #7 of the terminal strip will be referred to as RR2.
- c. The CS lamp connected to pin #6 of the terminal strip will be referred to as CS1. Connect the second CS (tone sonalert attachment) to pin #10 and pin #12 of the terminal strip. This CS tone will be referred to as CS2.
- d. Set the Stand-By/Run/Reset switch to STAND-BY, the Stimulus mode switch to the DOUBLE, and the Program mode to CHAIN.
- e. Set the Stimulus Cross-Connect switch to the desired value. By setting the switch to ADJACENT, associations between RR2:CS1:RR1 and RR1:CS2:RR2 will be established. Setting the switch to OPPOSITE establishes RR1:CS1:RR2 and RR2:CS2:RR1 associations.
For this example, ADJACENT setting will be assumed.
- f. Set the Response switch to NORM.

- g. Set the Stand-By/Run/Reset switch to RUN and press the shaping button to cue the animal. You will notice CS1 will light and only a press on RR1 (press bar) will produce a reward. With the aid of the prompt, the animal learns to press RR2 to activate this reward sequence.
- h. Set the Response switch to RVS .
- i. Press the shaping button to cue the animal. You will notice CS2 will sound and only a touch on RR2 (ceiling rod) will produce a reward. With the aid of prompt, the animal learns to press RR1 to activate this reward sequence.
- j. Continue running trials, cueing the animal with the shaping button each time the chain order sequence is changed.

3. AVOID: Avoidance

The new double CS feature now allows for testing discrimination ability in an avoidance program. In order for the animal to escape the shock, it must activate the RR that corresponds to the active CS. For example, you wish to run a left-right discrimination-association reversal task where the animal is shocked (5 seconds after the CS is turned on test) if it fails to activate the correct RR. After 10 trials, the association of the CS with the RR is reversed. The set-up procedure is as follows:

- a. Refer to the cable connections as outlined on page 9 of the 81335 instruction manual (WARNING: Always be cautious in programs that use SHOCK!!).
- b. The press bar connected to pin #9 of the terminal strip will be referred to as RR1. The ceiling rod connected to pin #7 of the terminal strip will be referred to as RR2.
- c. The CS lamp connected to pin #6 of the terminal strip will be referred to as CS1. Connect the second CS lamp to pin #10 and pin #12 of the terminal strip. This CS lamp will be referred to as CS2.
- d. Set the Stand-By/Run/Reset switch to STAND-BY, the Stimulus mode switch on the controller to the 'DOUBLE' position and the Program mode to AVOID.
- e. Set the Stimulus Cross-Connect switch to the desired initial value. By setting the switch to ADJACENT, associations between CS1:RR1 and CS2:RR2 will be established. Setting the switch to OPPOSITE establishes CS1:RR2 and CS2:RR1 associations. For this example, ADJACENT initial setting will be assumed.

- f. Set the Ratio Interval thumbwheel switches to the number of seconds of delay after CS initiation until shock is applied. In this example, the setting would be 05.
- f. Set the Response switch to NORM.
- h. Set the Stand-By/Run/Reset switch to RUN. Ten seconds later, CS1 will turn on. The animal must activate RR1 in order to avoid the shock or to turn off the shock.
- i. Run 9 more trial by randomly selecting between CS1:RR1 or CS2:RR2 by changing the Response switch setting. Use the shaping button to reset and begin a new trial.
- j. Set the Stimulus Cross-Connect switch to OPPOSITE. This will set up the new associations of CS1:RR2 and CS2:RR1. This will require the animal to make the reverse response.
- k. Run 10 trials by randomly selecting between CS1:RR2 or CS2:RR1 by changing the Response switch setting. Use the shaping button to reset and begin a new trial.
- l. Continue trials, changing the Stimulus Cross-Connect switch every 10 trials.

If you have any further questions or problems, please refer to the 81335 instruction manual or contact Lafayette Instrument at 1-800-428-7545.