A TECHNIQUE FOR INSTALLING NEW STIMULI IN GRASON-STADLER IN-LINE READOUT PROJECTORS

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Discrimination and learning studies often use in-line readout projectors to present stimuli to subjects. In Grason-Stadler units the 12 stimuli are designed for permanent mounting. However, it is possible to change or replace the stimulus figures if reasonable care is exercised. Do-it-yourself replacement saves considerable time and money and provides great flexibility which is especially useful in pairing stimuli for equal difficulty levels. The procedure described takes from 6 to 8 hr and costs about \$7.00 per unit. As experience is gained, time and material costs usually can be halved. Grason-Stadler does not supply parts or replacement stimuli for readout units; an entire projector must be purchased for \$35.00 (42 day delivery). If original stimuli are desired, the cost rises to \$110 (90 day delivery). Other manufacturers may sell units designed for replacement of stimuli and, if new equipment can be purchased, this may be a feasible alternative. Often, however, the need for flexibility cannot be foreseen, and adaptation of existing units may provide a useful solution. Modification of units within the guarantee period (one year) is probably not advisable.

Disassembly of Readout Unit

Figure 1 illustrates the disassembled unit. Removal of screws and tapping unit on palm allows easy removal of the bulb socket mounting, bulb guide, bulb guide retainer plates, glass heat shield and expansion gaskets. With a sharp knife delicately chip away at each interior corner of the plastic case the melted black plastic which keeps the lens plate and locator plate in place. Using needlenosed pliers, grasp the protruding retainer strap tab on the lens plate and pull the lens plate gently

from the case. Do not scratch the plastic lenses in this operation. Tap the case on palm to remove locator plate. Remove the manufacturer's original negative by carefully bending up one of the end tabs of the retainer strap.

Preparation of New Stimuli

The stimulus figures (of any design) should be drawn within 2 in. diameter circles on white poster cardboard using India inked lines at least $\frac{3}{32}$ in. wide. The circles should be positioned in a 3 by 4 pattern with centers $4\frac{3}{4}$ in. apart on the short dimension and $5\frac{1}{8}$ in. apart on the long dimension. Placement and orientation of new individual stimulus figures should correspond to figures on the original negative unless some rewiring of the apparatus is acceptable.

The completed stimuli should be photographed using a high-contrast negative material with which the light portions will be transparent and the dark portions completely

Fig. 1. Disassembly of Readout Unit. Light bulb socket mounting not shown.

¹Reprints may be obtained from the author, Division of Community Services for the Mentally Retarded, Maryland State Department of Health, 301 West Preston Street, Baltimore, Maryland 21201.

Fig. 2. New Stimulus Negative Shape After Trimming. Circles indicate location of stimuli.

opaque. Professional photographers can supply the special film needed and should do the work, since precision is important. The film used by the author was Kodalith Ortho Type 3, but other films may be appropriate. The photographer should be given the stimulus locator plate (see Fig. 1) and told that the stimulus figures on the negative should be centered exactly over the holes in the locator plate. When this is done, the size of the figures will be automatically correct. Have two negatives made to allow for possible errors in first-time installation. The stimuli will be projected inverted in white on a black background.

Mounting New Stimulus Negative

The original stimulus negative is convex in shape to fit the concavity of the lens plate. This aspect of design cannot be duplicated by replacement negatives, but can be approximated. To prepare a new negative for mounting, hold it against the lens plate (shiny side out) and cut it so that all stimuli are centered

on the 12 lenses. Some trial-and-error may be involved. Do not trim excessively. After cutting the new negative to the basic rectangular shape, trim with small sharp scissors to the shape shown in Fig. 2. Do not trim too close to figures or light leakage may result. The "V" slots around the negative allow conformity to the concavity of the lens plate. Further attempts to maximize congruency have not been successful. Mount the new negative on the lens plate and replace the retainer strap. Slight ($\frac{1}{32}$ in.) adjustments are possible after mounting to assure centering. Black plastic tape in narrow strips should be used to hold the edges of the negative to the lens plate. The tape serves to anchor the negative and provides a snug fit when the lens plate is reinserted in the casing. Glue or adhesive will not be necessary.

If colored stimuli were originally provided, the colored plastic glued to the locator plate can be removed or relocated as desired.

It is also possible to mount individual stimulus figure negatives on the lens plate by using tape. This allows combining figures from one or more new negatives without redrawing the figures for a complete new 12-stimuli negative.

Reassemble the unit in reverse order, being sure that all parts are seated squarely and firmly in place.

Testing and Illumination

Before mounting the unit in other apparatus, it should be tested. Some stimuli initially may be slightly out of focus, but this is usually a problem of the bulbs themselves rather than the mounting technique. Exchanging the offending bulb, rotating it 90 degrees in the socket or inserting a washer between the bulb socket mounting and the case usually improves projection. Trial-and-error adjustments may be necessary, but poor focus nearly always can be improved. Indeed, some of the manufacturer's units exhibited this same problem before being disassembled.