PART VI: IMAGE-PROCESSING LABORATORY: SIMULATING LASER BIOEFFECTS,

CREATING COMPLEX STIMULI, AND SUPPORTING PSYCHOPHYSICS

EXPERIMENTS

Modern psychophysical experiments rely on precisely calibrated visual stimuli. Many of these stimuli are simple patterns, such as spots or gratings, that probe fundamental visual function. Investigators of laser effects on aircrew performance are concerned with complex visual tasks and stimuli that are not easily related to fundamental processes. The imageprocessing facility, developed as part of the contract effort, supplies stimuli that are complex and yet have precise mathematical descriptions.

With such stimuli, quantitative psychophysical experiments can be designed that bear a meaningful relationship to operational problems. This facility supports creating and filtering targets, embedding such targets in real world scenes, and tracking experimental subjects' responses to them.

Simulations have also been implemented in order to assess the effects of flashblindness on complex visual tasks. The objective is to produce whatever images are necessary for controlled, mission-relevant psychophysical experiments. Using a Digital Equipment Corporation MicroVAX computer and a Parallax frame buffer, the image-processing laboratory has developed capabilities which support this objective