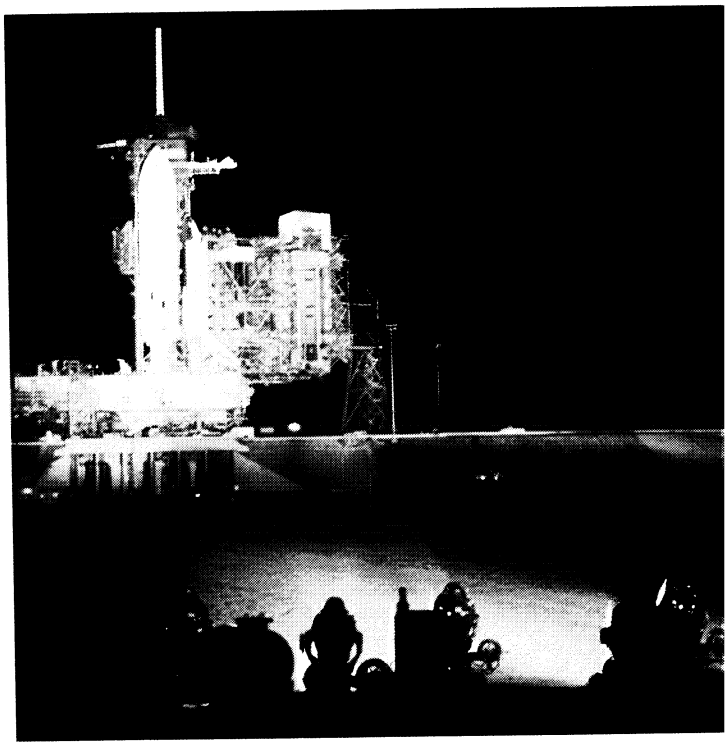
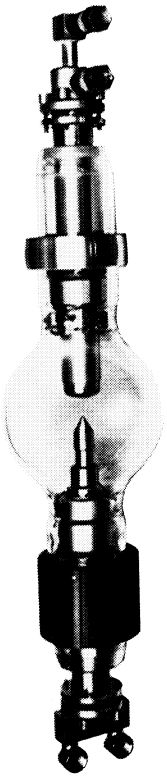
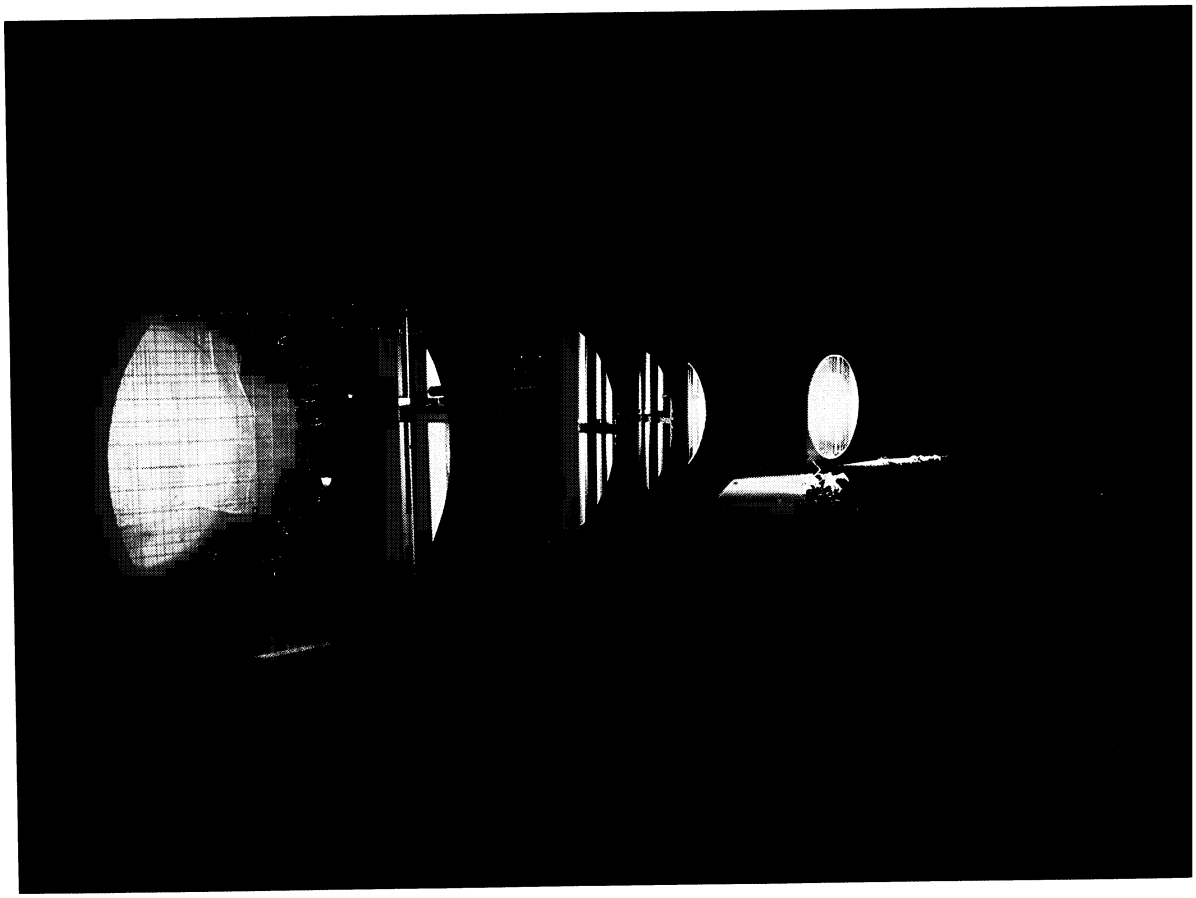
High-intensity Lighting

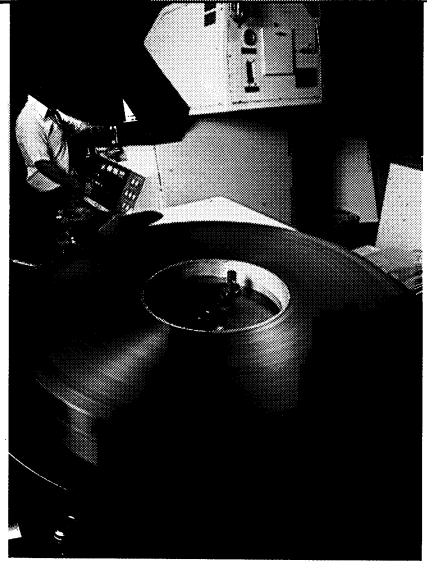


At right is a nighttime view of the Space Shuttle at Kennedy Space Center's (KSC) Launch Complex 39, illuminated by the world's most intense floodlighting system. The system consists of 50 searchlights, each containing a 20,000-watt xenon lamp, one of which is shown in closeup below; the lamp was developed by Duro-Test Corporation, North Bergen, New Jersey. Nighttime illumination is an important part of round-the-clock pre-launch preparations because NASA uses TV and film cameras to monitor each step of the preliminaries and at times to identify the cause of malfunction during countdown. Generating a one billion candlepower beam visible 50 miles away, the lamps provide daylight quality light that eliminates color distortion in film and TV coverage. The lighting system was first used at KSC for the 1968 launch of Apollo 8 and has been employed for all subsequent launches.

Modified versions of this system have found utility in a wide range of spinoff applications. For example, a battery of spotlights with colored filters (bottom) lights up Niagara Falls (right). This system employs a 4,500-watt lamp manufactured by the same techniques perfected in fabrication of the NASA lamp. The 4,500-watt lamps are used extensively in projection systems for outdoor theatres; the increased intensity allows larger screens,







hence greater theatre capacity.

At right, a Smithsonian Institution projectionist at the National Air and Space Museum, Washington, D.C. sets up a 70-millimeter Imax projector for a presentation of the show "Living Planet" on a 48 by 75 foot screen in the museum's auditorium (center). Duro-Test teamed with the projector designer—Imax Entertainment Limited, Canada—to build a 12,000-watt xenon lamp for the system, again based on Duro-Test's work for NASA. The projectors are used at indoor theatres with supersized screens; there are 15 installations in North, South, Central America and Japan. The 20,000-watt version is used in solar simulators operated by several NASA centers, aerospace manufacturers and other research organizations in the U.S. and abroad.

Duro-Test xenon lamps operate on the principle of passing a a high electric current between two tungsten electrodes centered in a quartz bulb filled with xenon gas, which radiates light closely comparable to natural sunlight. The electric current heats the gas to a temperature of about 6,000 degrees Centigrade, thus creating the high intensity radiation. Duro-Test initially developed the 20,000-watt lamp for the Army and refined it under NASA contract to meet demanding specifications required by KSC for its use in launch lighting and in solar simulators. The company is working on advanced lamp designs to meet a demand for solar panel testing and for improving the product line in general.