



THE STORY OF

PAN



RAY
LIGHTING

LIGHTING
PANELS
EMITTING A SOFT,
COLORFUL GLOW
THAT IS UNIFORM,
COOL, GLARELESS
...PANELS THAT
CONSUME
LITTLE POWER,
REQUIRE NO
MAINTENANCE
AND OUTLAST
OTHER LIGHTING
DEVICES
BY A WIDE
MARGIN.
DESIGN
POSSIBILITIES?
ALMOST
WITHOUT LIMIT...
THIS IS THE STORY
OF PANELRAY, A
SIGNIFICANT ADVANCE IN
THE USE OF
ELECTROLUMINESCENCE



a significant advance in the use of ELECTROLUMINESCENCE

ELECTROLUMINESCENCE promises many exciting and dramatic applications in lighting. It is an area source of light with illumination evenly distributed across the entire surface. No bulbs, no tubes, no filaments are required in its operation as is the case with incandescent, fluorescent and other types of conventional lighting. This unique lighting system offers the pleasant prospect of facile, soft, colorful lighting effects for home and office; remarkably effective lighting for instrument panels of motor vehicles and aircraft, radio and TV-tuner dials, clock faces, control panels of many kinds, and a host of other home and industrial applications. Informational displays will derive special benefit from the striking color-glo effects that become possible when light is "built into" an exhibit.

FUTURE UNLIMITED

The potential of electroluminescent lighting has barely been tapped. With every passing day, new applications present themselves to the creative designer. The thin, flat shape of electroluminescent devices opens challenging new vistas for flat area lighting, offering to architecture many opportunities for ingenious use of light. Thanks to electroluminescence, light can be designed into walls, stairs, doors, or other parts of a structure. Light may play a greater part in our lives than ever before, contributing to home atmosphere in subtle new ways. The flick of a switch or the turn of a knob will not necessarily be for reading or other utilitarian reasons, but to alter completely the tone, mood, and feeling of a room.



HOW ELECTROLUMINESCENCE WORKS

Reduced to essentials, electroluminescence is light produced by a thin layer of phosphor excited by an alternating electric field. This phenomenon contrasts with luminescence produced by a fluorescent lamp or a television picture tube where the light is also produced by exciting a phosphor. In the case of the fluorescent lamp the phosphor is excited by ultraviolet rays produced in the tube by a gas discharge; in a television picture tube, the phosphor is excited by a beam of high-speed electrons.

In electroluminescent panels the phosphor is suspended in a layer of non-conducting material between two layers of conducting material. When an alternating voltage is applied across the conducting layers, an alternating electric field is produced across the phosphor particles, causing the phosphor to emit light.

Since neither filament nor bulb is required, the lighting source is no longer restricted to conventional sizes and shapes. The extreme thinness of the phosphor layer (two thousandths of an inch) and the thinness of the outer layers (an eighth of an inch) permit flat area lighting never before possible. Take ceilings, for example. While fluorescent lamps require a depth of several inches, electroluminescent lighting would reduce this depth to less than an inch.



THE HISTORY OF ELECTROLUMINESCENCE

One of the first to publicize the phenomenon of electroluminescence was Georges Destriau, who published his findings in 1936. The principle eventually led to intensive research which indicated the enormous potential of electroluminescence.

RCA's entry into the general field of luminescence began almost three decades ago. Since that time RCA has devoted many man-years of basic research to the quest for knowledge in this challenging area, and since 1950, many more man-years of research have been devoted specifically to *electroluminescence*.

Supplementing the work at the RCA David Sarnoff Research Center in Princeton, N. J., the Electron Tube Division's Chemical and Physical Laboratory in Lancaster, Pa., has studied advanced phosphor development techniques for many years. Some five years ago, a highly specialized group was formed at Lancaster to improve electronically active compounds from the standpoint of efficiency, application, and processing. There the progress made at the David Sarnoff Research Center was converted into practical electroluminescent materials for commercial use.



**IN THE
FIELD OF
ELECTROLUMINESCENCE**



LAMPS OFFER:

- ◆ more light with longer life and higher efficiency
- ◆ a wide range of colors
- ◆ smoother, non-grainy glow

ADVANTAGES

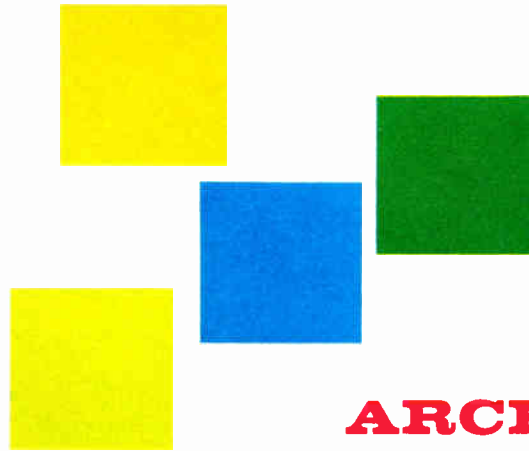
Electroluminescent lighting is an entirely different lighting method . . . an area source of light. The entire surface luminesces, producing an even glow immensely pleasing to the eye.

There is no bulb as in incandescent lighting, no gas-filled tube as in fluorescent lighting, just a flat area of cool, uniform light. Add to this, low power consumption, economy of operation, and long life, and you have a pretty good idea of the desirable qualities of electroluminescent lighting.

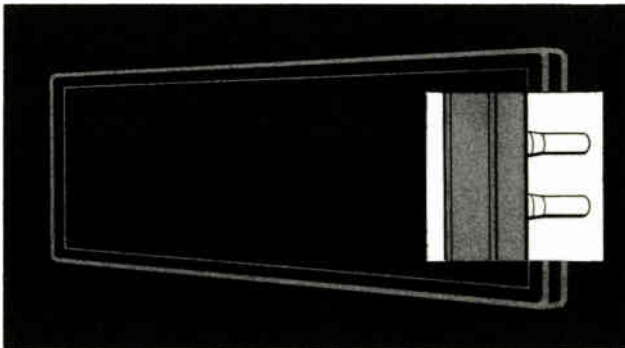
APPLICATIONS

RCA Panelray electroluminescent lamps add a new dimension to panel instrumentation. A Panelray-lighted clock face is really visible; aircraft instrumentation is more easily read with Panelray due to higher contrast. Panelray lighting will bring new visibility to many kinds of dials and scales, control panels, indoor and outdoor information signs, and safety devices. It will open new design concepts for home and office interiors. The whole field of architectural design will feel the impact of this dramatic new lighting method.

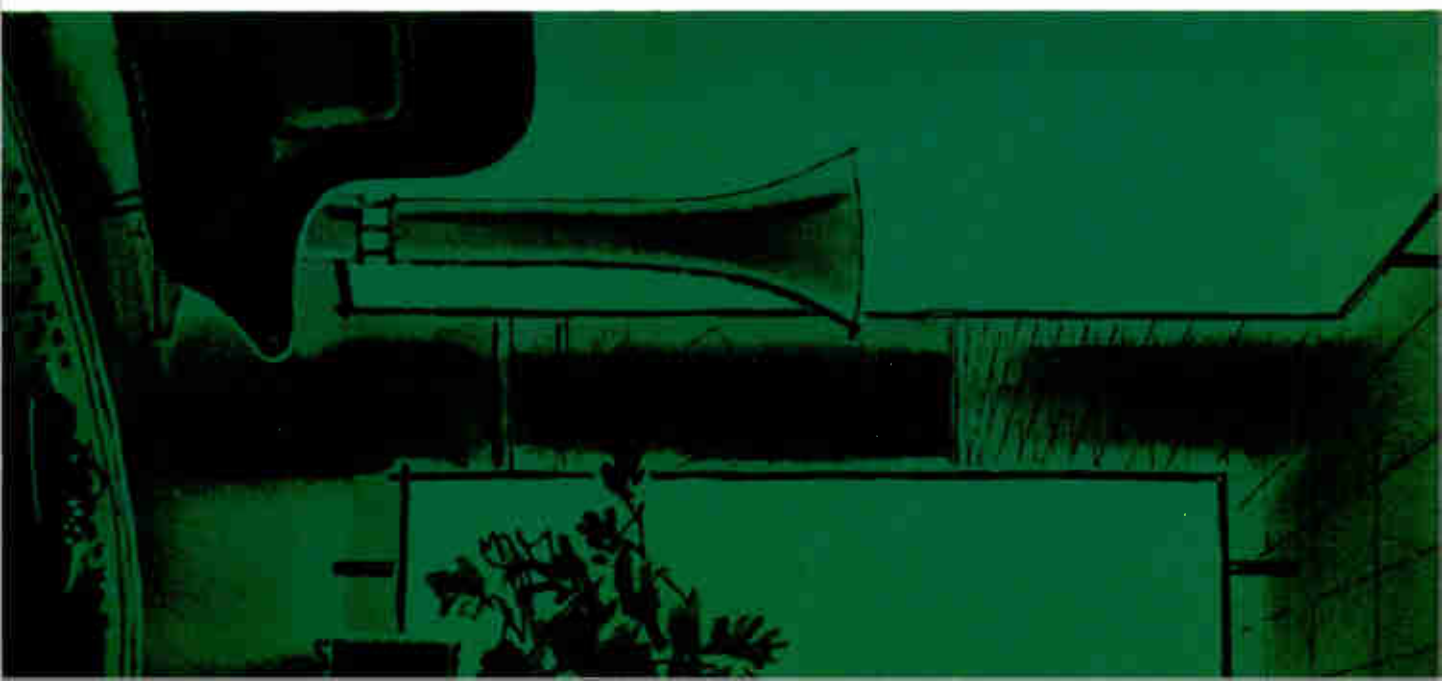




ARCHITECTURAL DESIGN



A particularly promising area for Panelray lighting is the field of architectural design. Here electroluminescent lighting is really expected to come into its own. Walls of light, flights of glo-lighted stairs, ceilings bathing rooms in restful hues of pleasing light . . . these are the dramatic prospects and Panelray lights the way!



BRIGHTNESS CHART

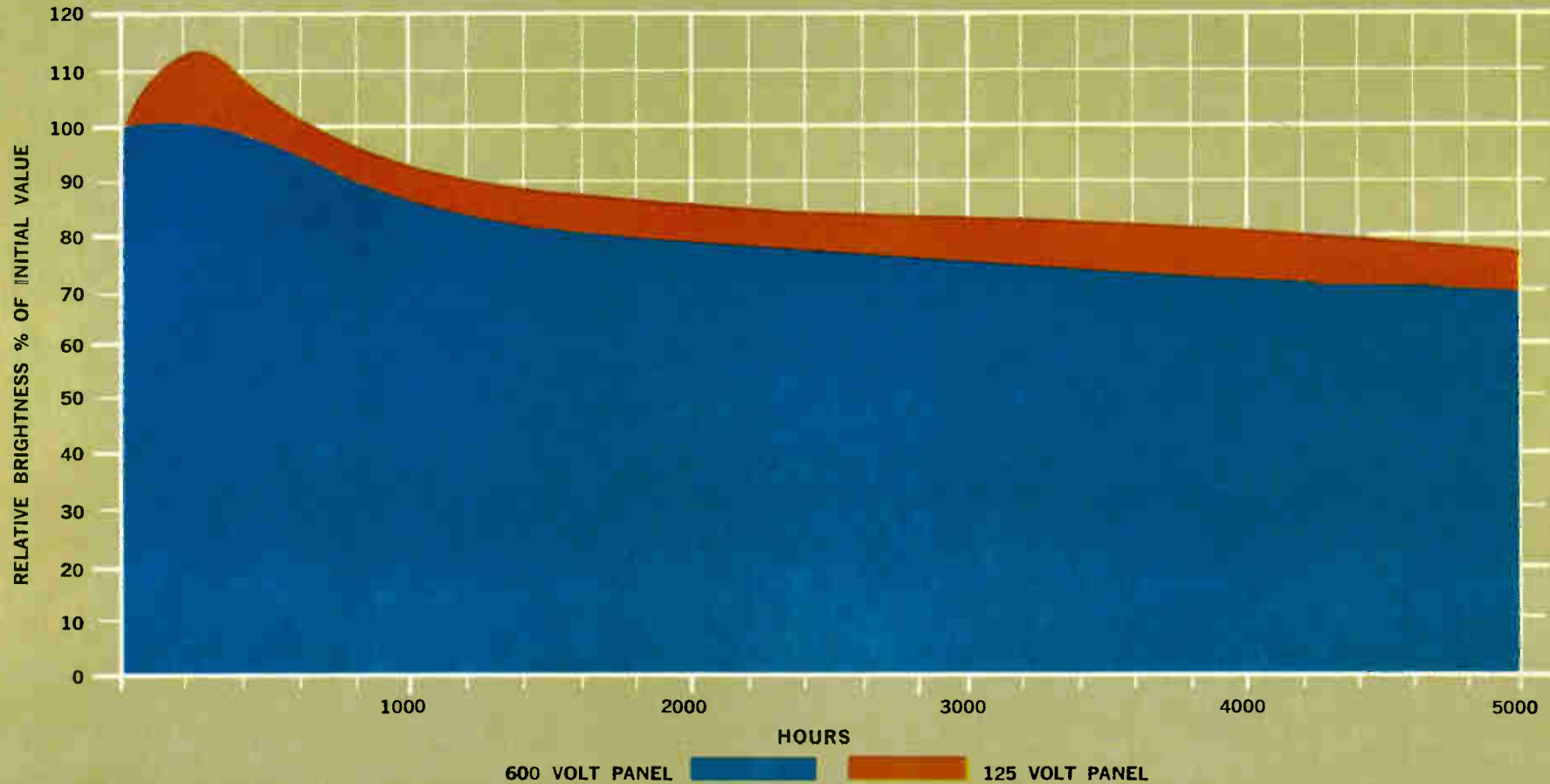
COLOR	VOLTS RMS	AVERAGE BRIGHTNESS FOOTLAMBERTS		
		60 CPS	420 CPS	1000 CPS
BLUE	125	.5	1.9	3.5
	250	1.5	5.6	10
	600	4.5	17	32
GREEN	125	1.3	6.9	13
	250	4.2	22	41
	600	13	68	130
ORANGE	125	0.3	3.0	7.3
	250	1.1	11	26
	600	3.0	30	73
WHITE	125	0.8	4.2	9.2
	250	1.5	10	22
	600	5.0	32	66
YELLOW	125	1.0	6.0	12
	250	2.5	17	34
	600	6.0	42	94

STOCK SIZES

SIZE (Inches)	VOLTS RMS	BLUE	GREEN	ORANGE	WHITE	YELLOW
2 X 2½	125		●			
	250		●			
	600		●			
4 X 5	125	●	●	●	●	●
	250	●	●	●	●	●
	600	●	●	●	●	●
3 X 12	125		●			
	250		●			
	600		●			
5 X 7	125		●			
	250		●			
	600		●			
12 X 12	125		●			
	250		●			
	600		●			

Colors checked are available from stock.
 Combinations not checked available on special order.
 Additional combinations can be made to specifications, on request.

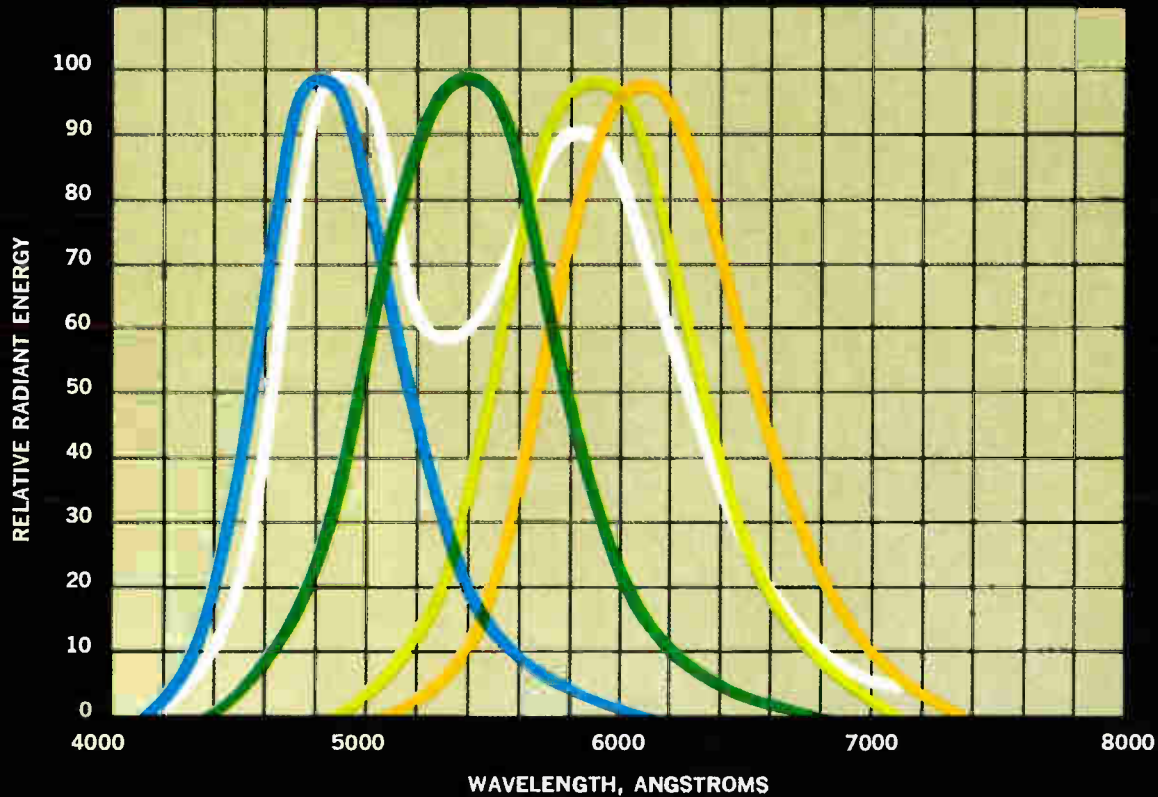
TYPICAL PERFORMANCE CURVES FOR PANELRAY LAMPS FOR 60 CPS OPERATION



ELECTRICAL CHARACTERISTICS

The current drawn by an electroluminescent lamp at rated voltage is approximately 20ma/ft² at 60 cps, 140ma/ft² at 420 cps, 290ma/ft² at 1000 cps. Electroluminescent lamps have a leading phase angle of approx. 70°.

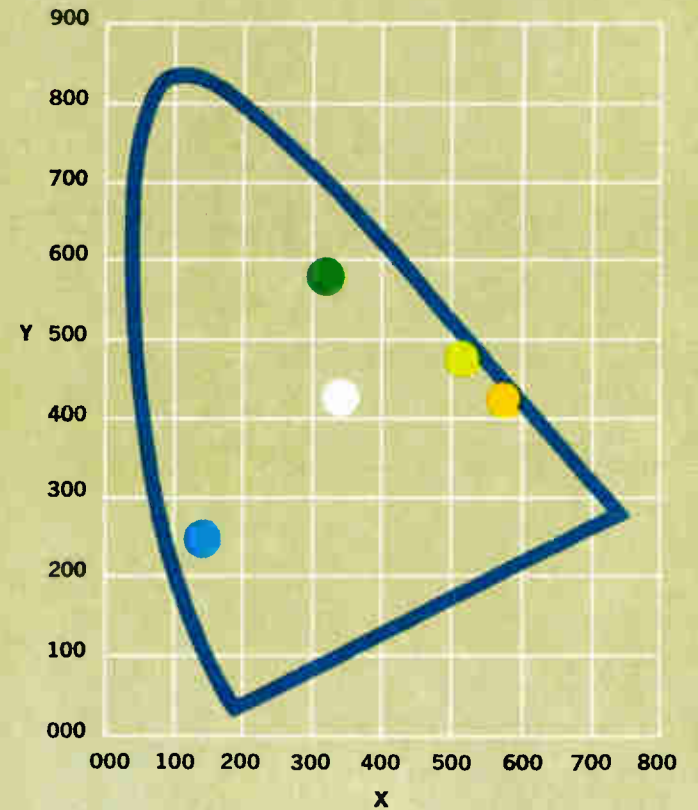
**TYPICAL
SPECTRAL ENERGY
EMISSION CHARACTERISTICS
OF PANELRAY LAMPS AT 60 CPS**



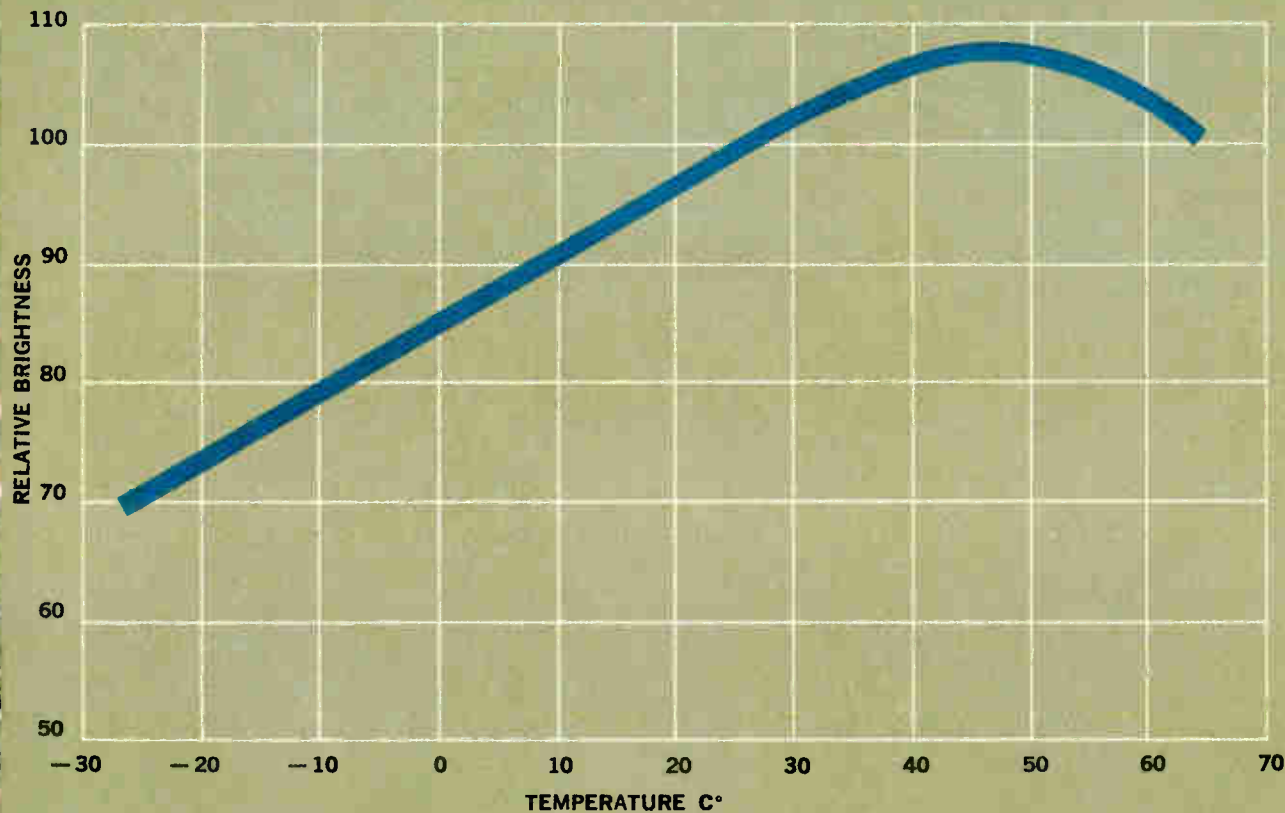
At 420 CPS curves will shift approximately 100 Å towards the blue end of spectrum.



**APPROXIMATE
CIE COORDINATES FOR
PANELRAY LAMPS
OPERATED AT 60 CPS**



**TYPICAL
TEMPERATURE
DEPENDENCE OF
PANELRAY LAMP BRIGHTNESS**



EXPLORE THE
DESIGN AND
APPLICATION
POSSIBILITIES
OF ELECTROLUMINESCENCE
WITH



AVAILABLE IN STOCK SIZES
OR TO CUSTOM ORDER.
CONTACT RCA
ELECTROLUMINESCENCE
SALES, ELECTRON TUBE
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OR GET IN TOUCH WITH
YOUR NEAREST
RCA FIELD OFFICE

ELECTRON TUBE DIVISION

FIELD OFFICES

EAST:

744 Broad Street
Newark 2, N. J.
HUmboldt 5-3900

MIDWEST:

Suite 1154
Merchandise Mart Plaza
Chicago 54, Ill.
WHitehall 4-2900

WEST:

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