

IEEE Milestone Supporting Materials  
Outdoor large-scale color display system, 1980

Mitsubishi Electric Corporation

# Outdoor large-scale color display system

Mitsubishi Electric developed the world's first outdoor large-scale color display system and installed at Dodger Stadium, USA in 1980 with original lighting tube based on CRT technology.

Large-scale color display system at Dodger Stadium



Outdoor large-scale color display system at Dodger Stadium innovated the concept of the system from single color message display to full color video display. The breakthrough was low power lighting tubes and realized high contrast image under sunshine applying colored glass with dye moreover newly developed glass to block reflection at phosphor.

Lighting Tube and the Improvement



Sample of lighting tube



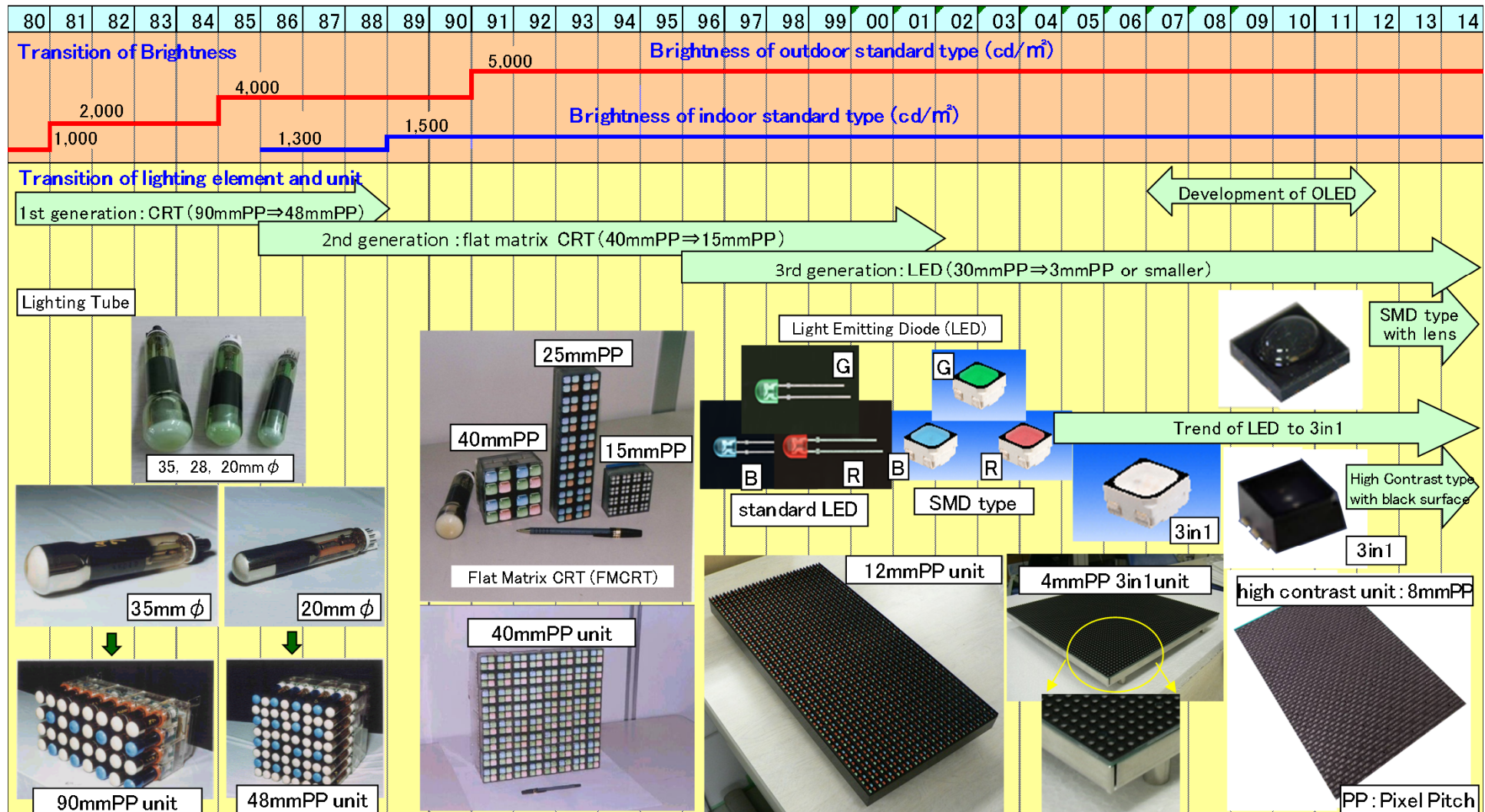
Lighting tube with colored glass



Lighting tube with new glass

# Technical transition of lighting tube to flat matrix CRT and LED

The large-scale color display arranged the lighting tubes as pixel in a matrix at Dodger Stadium. The lighting tube was developed into flat matrix CRT and furthermore newly developed LED matrix.



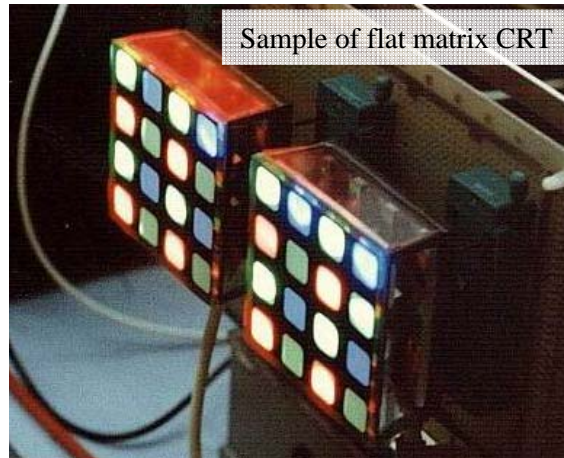


# Design of pixel at Dodger Stadium and further innovation

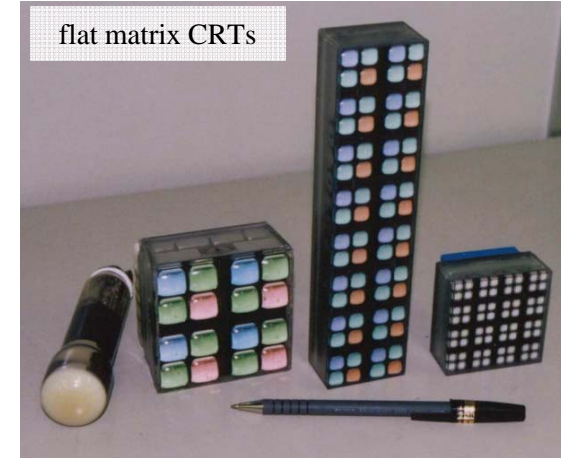
The system at Dodger Stadium created a new market; the original design was suitable to innovate lighting tube to flat matrix CRT which contributed to expand the market for the next generation system with LED.



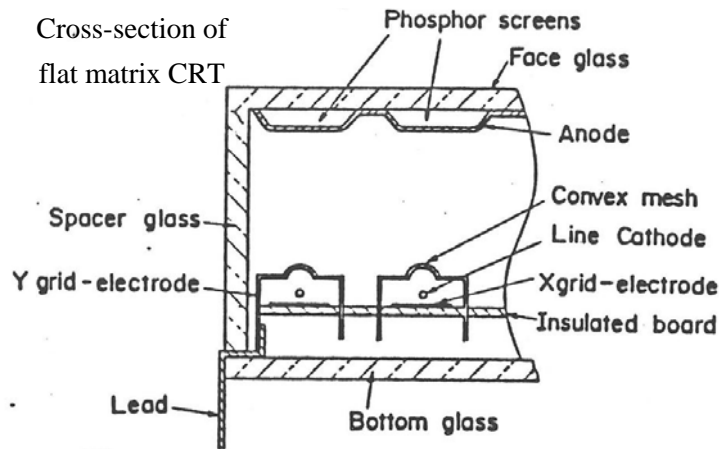
Design of pixel RGBG quad was first application for display in practical use.



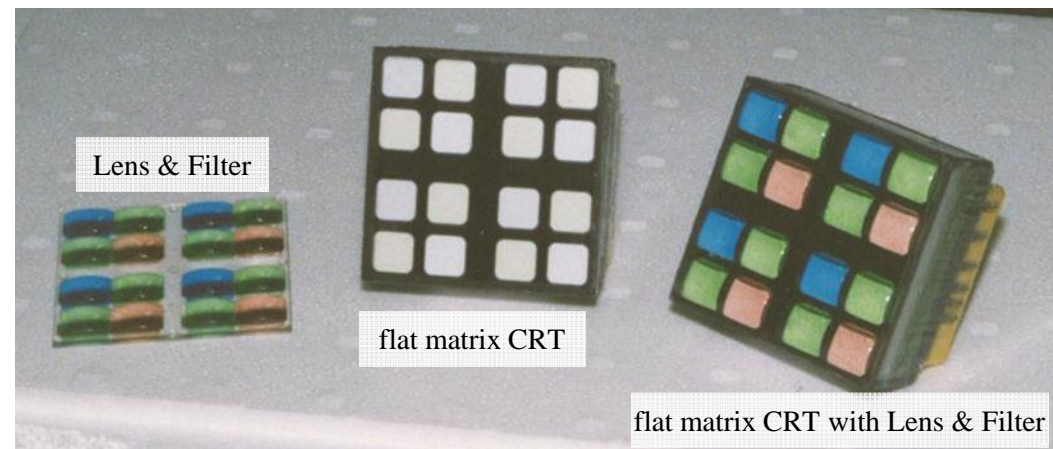
Further innovation of lighting tube was flat matrix CRT with RGBG quad.



Flat matrix CRTs applied color filter with lens and simplified electrodes.



RGBG quad was suitable to simplify metal parts of flat matrix CRT with printed electrodes (X-grid etc).



RGBG quad was suitable to apply color filter with lens on each sub-pixel to block reflection at phosphor and pass color emission.

# Example of Recent Installation with LED etc. (1/2)

Display was one of main applications of newly developed blue LED. Many companies entered into market with LED and the large-scale display system had been getting larger in size and higher in resolution.

*Tokyo Race Course Opening: Oct. 2006*



## SCREEN SPEC.:

Screen Size :11.2m (H) × 66.4m (W) 744m<sup>2</sup>

Display Device :high bright LED (pixel pitch 12.5mm)

## FEATURE:

World's largest (at 2006) television display.

Freeboard to display full-color video and odds etc. on a screen.

*Dallas Cowboys (US) Opening: Jun. 2009*



## SCREEN SPEC.:

Screen Size of Center Hung Displays

Sideline 21.8m(H) x 48.3m (W) 1052.9m<sup>2</sup> x 2sets

End-zone 8.7m(H) x 15.4m (W) 133.7m<sup>2</sup> x 2sets

Display Device :high bright LED (pixel pitch 20mm, 16mm)

Size of Ribbon Board 1.1m(H) × 609.0m (W)

0.9m(H)x253.1m (W)

## FEATURE:

World's Largest (at 2009) 1080p HDTV LED Displays



## Example of Recent Installation with LED etc. (2/2)

*Geo-Cosmos in Miraikan Opening: Jun. 2011  
(National Museum of Emerging Science and Innovation)*



### SCREEN SPEC:

Size: 6-Meter Globe with 10,362pcs of panels (Pixel pitch 3mm)

Display Device: OLED (organic LED), Panel size 96mm x 96mm

In addition to Mitsubishi Electric, which created the OLED system, three other companies helped to make the OLED Geo-Cosmos display: Dentsu Inc. undertook project planning, Go and Partners, Inc. developed the image-processing and transmission system, and GK Tech Inc. created the spheroid design.

### FEATURE:

World's first large-scale spherical OLED screen

*Marriott Marquis Hotel Opening: Oct. 2014*



### SCREEN SPEC:

Screen Size: 23.68m(H) x 100.48m(W; total extension) 2,379.36m<sup>2</sup>

Display Device: 3-in-1 surface mount LED, Pixel pitch 10mm

### FEATURE:

World's Largest (at 2009) High Definition Video Display with Real Black LED technology, which exceeds 4K resolution.

The origin of large-scale color displays is the system at Dodger Stadium in 1980. The application was expanded and diversified in the world and impacted on society, global market and technology.