SONY CORPORATION

PRESS RELEASE

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Tokyo, Japan

SONY Discloses "Chromatron" Color Television

SONY CORPORATION of Tokyo, Japan announces that it has finished the development of "Chromatron" tube and circuitry engineering and demonstrates the new Chromatron color television set to the press today.

SONY is carrying on with pilot production of "Chromatron" tube before it starts mass production at the new factory, which is under construction at Osaki, Tokyo.

SONY says it is not quite certain when SONY will put this new Chromatron color television sets on the market, because the color TV market in Japan is still not very active, but it will not be before next spring because at least that much time is required to ready the new factory.

"Chromatron" system is completely different from the current system and SONY has put in several years' work in research and development of this new Chromatron color system. The color television set SONY has disclosed here today is the first of the many different types of Chromatron color television system that SONY intends to bring out to the market. Its retail price in Japan will be less than 200,000 yen. It is a 19-inch set using a newly
developed single gun Chromatron tube with a new re-encoding system developed after many years of SONY's own research and engineering, based on the dot-sequential color display system. Although the new Chromatron color TV set works basically on the Chromatron patents of the Paramount Pictures Corp. of U.S.A., SONY has applied many of its own inventions and patents developed by SONY's engineering.

Chromatron color TV picture is much brighter than the current color TV and is almost as bright as black and white TV. Chromatron color picture has great picture brilliancy and high color fidelity. SONY says a room need not be darkened when watching Chromatron color TV sets. With the Chromatron system, it is possible to produce very high class TV sets emphasizing brilliant brightness and high color fidelity, and also simpler color TV sets at popular price. SONY is carrying on the development of both high class and popular class color TV.

SONY will sell Chromatron color TV sets in Japan first and will not export in the beginning until its production reaches a certain quantity and its after-service system is completely worked out. The same sales pattern when SONY's first transistor television sets were marketed will be adopted with the Chromatron color television sets.
The "Chromatron" Color Television

"Chromatron" was invented in 1951 by Dr. E. Lawrence, a Nobel Prize Winner, of University of California, U.S.A. Although its basic concept is outstanding and feasible, no company could succeed to develop it for commercial use. Sony made an agreement in 1962 with the Paramount Pictures Corp. who owns "Lawrence" patents and has been working on its development.

Chromatron color picture tube is completely different from shadow-mask type tube which is used in almost all conventional color TV.

Shadow-mask type tube has three electron-guns, a three-color phosphor screen and a metal plate which has numerous tiny holes, so-called shadow-mask. The electron beams projected from three electron-guns have to pass one hole of shadow-mask simultaneously and hit three different spots on the phosphor picture screen. Each of three primary color phosphor, red, green, and blue, is painted on the picture screen in a dotted form to correspond to the spot where each electron beam hits, so that each electron beam excites each primary color phosphor to emit three colors.

Unlike this system, the Chromatron tube shown today has one gun and no shadow-mask. Instead, there is a Color Selecting Grid, a lattice made of minute wires, in place of shadow-mask and this grid focuses the electron beam on the phosphor screen painted in vertical
stripes with three different colors and aims the entire electron flow to any desired color stripe to form correct coloring. In other words, a Chromatron Color Selecting Grid forms electron-lens between three-color phosphor screen and the grid itself, and gives "Post Accelerating and Focusing" effect which is one of the Chromatron's significant features.

The electron beam projected from the electron-gun at first moves in a bundle and is deflected. Since Chromatron has a peculiar electrostatic potential distribution inside its tube, the deflection angle of the beam is magnified with "Scan Magnification" effect. After the beam passes the grid, the beam sharply converges itself into high density beam by the effect of electron lens and is accelerated and focused to hit the color phosphor screen at high speed.

With such a system Chromatron has greater deflection efficiency, and brighter picture of higher resolution is obtained.

Brightness of a color television picture depends not on the number of electron-guns, but on the efficiency of electron beams reaching the phosphor screen accelerated by the high voltage supplying power. The ratio of the amount of electrons emitted from the electron-gun and the amount of electrons reaching the phosphor picture screen is the most important factor to get bright color picture.
The Chromatron tube, which incorporates Color Selecting Grid, instead of metal plate shadow-mask, operates at very high efficiency because there is no shielding element in Chromatron. Chromatron Grid does not absorb electron beams like shadow-mask does, and thus produces high luminous intensity even with one electron gun.

It is easy to tell the difference of transparency between Chromatron Grid and Shadow-mask. (See photo)

Features of Chromatron color television sets.

a) Bright picture:

As mentioned above, Chromatron tube has very high utility of its projected electron flow in comparison with the current color picture tube and thus presents highly luminant picture, enabling the viewers to enjoy beautiful color television pictures in a bright room.

The Chromatron tube makes it possible to produce color television with pictures of very high brightness and very high color fidelity or more simpler and high efficiency color sets.

b) No color mis-convergence.

In a shadow-mask type tube, each of three electron beams must always be converged, but in a one-gun Chromatron tube, naturally there is no need for convergence.
c) Less trouble from earth magnetic flux.

Even though the electron beam is moved vertically by the earth magnetic flux, the Chromatron has no color change because the Chromatron phosphor screen has vertical color stripes.

d) Good color-fidelity

The NTSC color signal system adopted in Japan and U.S.A. for color telecasting is so arranged to be received even with black and white television sets and it was said that, under this NTSC system, Chromatron color television would meet difficulty to obtain satisfactory color reproduction. However, Sony has solved this problem completely by developing a new circuitry based on dot-sequential color display system, called re-encoding system (a system that will first disintegrate the color signal and then reintegrate into condition that will give the best color-fidelity when reproduced.) This new circuitry coupled with a one-gun Chromatron tube makes it possible to present a color picture of not only brilliant brightness but also high color-fidelity as well as colorfulness.

e) Self-decoding function.

Chromatron tube has a characteristic that de-codes color signal by itself. With this self-decoding feature, it is possible to produce simplified Chromatron color television sets with about the same or less number of vacuum tubes as black and white television sets.
f) Multi-gun Chromatron.

With the Chromatron principle, it is possible to make multi-gun Chromatron tubes which produce an extremely luminant picture that will further increase color-fidelity and colorfulness.

Sony's new Chromatron color television system having so many different features has great latitudes for designing different types of color TV sets to meet different requirements, ranging from delux color TV sets requiring high performance and picture of high color-fidelity and colorfulness to simpler and popular color TV receivers of low cost.
COLOR-TV STATION

COLOR TELEVISION SYSTEMS

COLOR-TV CAMERA SYSTEM

COLOR-TV SIGNAL STANDARD SYSTEM

COLOR PICTURE DISPLAY SYSTEM

CHROMATRON (Single Gun Type Multi-Gun Type)
(DEVELOPED BY SONY)

SHADOW-MASK TYPE

ROTATED COLOR-FILTER METHOD

THREE PICTURE TUBES METHOD

COLOR-TV RECEIVER

NORMAL TYPE CTV-SET

MECHANICAL COLOR-SWITCHING METHOD

OPTICAL SYNTHESIS METHOD WITH THREE PICTURE TUBES & TWO DICHROIC MIRRORS
(A) 3 Gun SHADOW-MASK System
("SIMULTANEOUS" Method)

(B) 1 Gun CHROMATRON System
("DOT-SEQUENTIAL" Method)

COMPARISON between "SHADOW-MASK" SYSTEM & "CHROMATRON" SYSTEM
COLOR-SELECTING OPERATIONS in 2 Types
COLOR PICTURE TUBES

(A) SHADOW MASK TYPE

(B) CHROMATRON TYPE
Dotted TRI-COLOR PHOSPHORS

(A) "SHADOW-MASK"
BEAM-EFFICIENCY: 15%

"SHADOW-MASK" STEEL-SHEET

(B) "CHROMATRON"
BEAM-EFFICIENCY: 80% over

COLOR-SELECTING OPERATIONS in 2 Types
COLOR PICTURE TUBES
SPECIFICATION OF SONY "CHROMATRON" COLOR TV RECEIVER

1. Picture Tube
   Tube type ............ 480AB22 (CES)
   Sony Triple Gun "CHROMATRON"
   Tube Shape .......... 19" Diagonal, Super Rectangular, Cylindrical Face.
   Deflection Method .... Magnetic
   Convergence Method ... Magnetic
   Deflection Angle ..... 90 Degrees
   Color Screen ......... Vertically Striped Tri-Color Phosphors, Aluminized.
   Color Selection ...... Post-Deflection Focusing Method.
   Electron Guns, Three.. Blue, Green, Red
   Focusing Method ...... Electro-static
   Electron Beam Efficiency ..... Approx. 90%

2. Received TV-Signal Standard
   NTSC Color Signal and/or B&W Signal

3. Picture Brightness
   Luminance Output ..... Approx. 150 ft-L on White Peak Point

4. Picture Resolution
   Vertical ............... Approx. 400 Lines
   Horizontal ............. Approx. 320 Lines
   Tri-Color Phosphor Stripes..... Approx. 410 lines

5. Picture Contrast Ratios
   In a Quite Dark Room ..... Approx. 30 times
   In a Well-lighted Room ... 10 - 20 times

6. Raster Distortion Correction ... Pincushion Distortion Compensation Circuit

7. Color Purity Alignment ... TME System (Twist Magnetic Field Equalizer)

8. External Light Protection ... Intensified Smoked Glass

9. High Tension Voltage ... $22^kV$
TENTATIVE SPECIFICATIONS OF

SONY "CHROMATRON" COLOR TV RECEIVER

1. Picture Tube

   Tube Type ---------- "1-gun CHROMATRON"

   Tube Shape ----------- 19" diagonal, Super Rectangular,
                         Cylindrical Face.

   Deflection Angle ------ 90° diagonal, by Magnetic Deflection
                        with "Scan-magnification" effect

   Color Screen --------- Vertically Striped Tri-color Phosphors,
                        Aluminized.

   Color Selection ------- Post-Deflection Focusing Method
                        with Color-selecting Grid.

   Color Convergence ----- Not necessary, because of 1-gun Type

   Electron Gun --------- Single, Electrostatic Focusing Type

   Electron Beam Efficiency 80% or over.

2. Color Displaying System

   Color Circuitry ------- "New RE-ENCODING" System based
                         on Dot-Sequential System

   Color-switching Frequency --- 3.58 MC dot-interleaved.

3. Received TV-Signal Standard

   Color Signal --------- "NTSC" System

   Signal -------------- Ordinary
4. Picture Brightness

Luminance Output --- Approx. 90 ft-L on white-peak point

H. V. Supply Voltage -- 22KV

5. Picture Resolution

Vertical Resolution -- Approx. 400 lines

Horizontal Resolution-- Approx. 300 lines

Tri-color Phosphor Stripes --- 400 Trios over

Equivalent Picture Elements -- Red: 400,000 elements over
                            Green: 200,000 elements over
                            Blue: 200,000 elements over

6. Picture Contrast-ratio

In Quite Dark Room ---- Approx. 30 times (Approx. 30dB)

In Well-lighted Room---- 10 to 20 times (20 to 26dB)

7. Sound System

Sound Circuitry -------- 4.5 MC Intercarrier System

Speaker System ------- 3 speakers

Sound Output --------- 4.5 Watts

8. Automatic Control Functions

Fine Tuning --------- Automatic Pre-setting Type for
each channel

Gain Control -------- Keyed AGC System

Horizontal Synchronization --- Balanced Detection Type

AFC System
Color Synchronization ---- Crystal-controlled APC System
Coloring Control ------- Automatic Coloring Control &
                       Automatic Color-killer
Sharpness Control ------ Automatic Picture-sharpness
                       Compensator
Color-Convergence Alignment --- Not necessary
Color-Purity Alignment --- Automatic Twist-magnetic Field
                         Equalizer
White-Balance Alignment -- Simplified Automatic White-balance
                         Compensator

9. Tubes ---------------------- 27 tubes, except CRT

10. Power Supply ----------------- 290 Watts

11. Set-Dimensions

                  Cabinet only / Full size
Width -------------- 32" / same to right
Height -------------- 16" / 33"(Legs included)
Depth -------------- 16" / 20"(with Rear-side Protector)

12. Weight --------------------- 104 lbs.

Disclosed by Sony Corp. Tokyo, Japan

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