

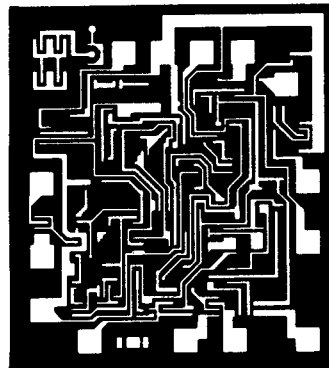
**ULN-2219A/TBA396  
LUMA/CHROMA CONTROL COMBINATION**

**FEATURES**

- D-C Controls
- Luma/Chroma Tracking with Contrast Control
- Stable Black Level Clamp
- Simple Alignment Procedure
- Beam Current Limiting
- Used in PAL or NTSC Receivers
- 14-Pin Dual In-Line Plastic Package

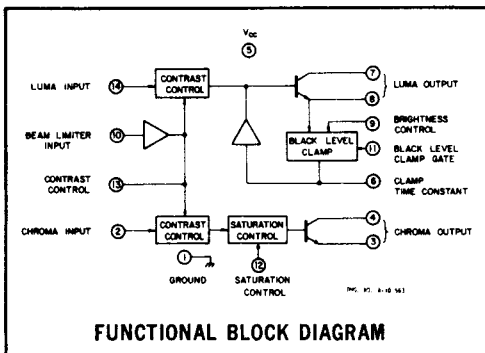
**I**NTENDED for use primarily in TV receivers utilizing the PAL color system, the ULN-2219A luma/chroma control combination integrated circuit features improved luma/chroma tracking with changes in the contrast level. When used in conjunction with the ULN-2217A chroma demodulator and the ULN-2220A chroma processor, these three devices constitute a complete PAL color system. The ULN-2219A can also be used with the ULN-2224A demodulator and ULN-2298A processor for a complete three-chip NTSC color system.

The ULN-2219A control combination provides d-c controls for the standard TV functions of contrast,



saturation, and brightness. These are d-c operated for ease of system design and lowest receiver cost.

These monolithic integrated circuits will be marked with the standard Sprague part number (ULN-2219A) rather than the Pro-Electron part number, unless otherwise specified.

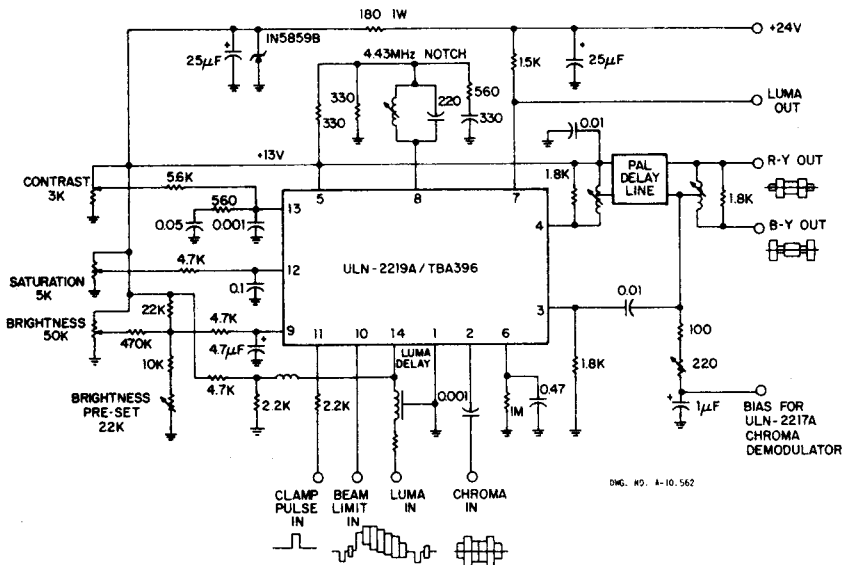


**ABSOLUTE MAXIMUM RATINGS**

Supply Voltage, VCC	20 V
Luma Output Collector Voltage, V7	30 V
Luma Output Emitter Current, I8	7.0 mA
Chroma Output Emitter Current, I3	5.0 mA
Operating Temperature Range, TA	-40°C to +85°C
Storage Temperature Range, TS	-65°C to +150°C

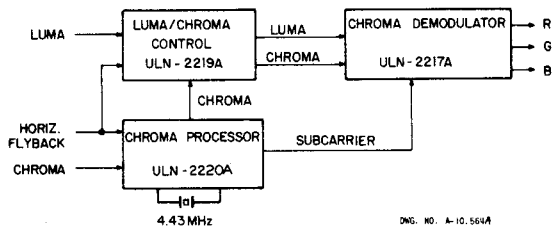
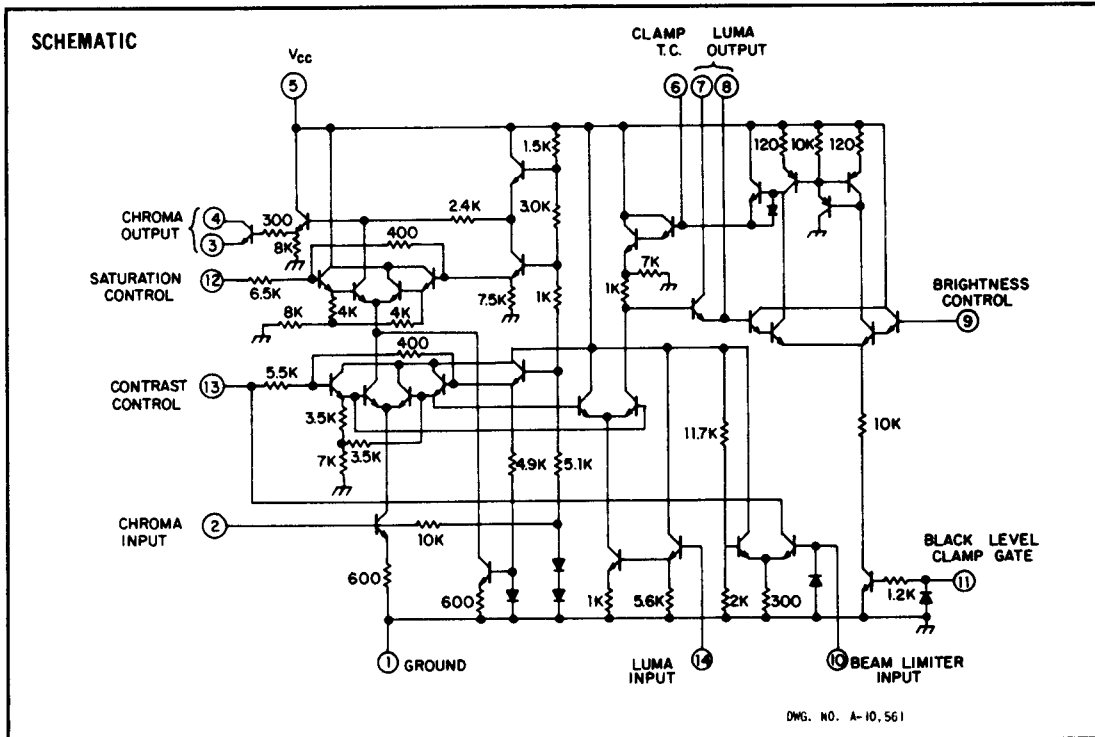
**ELECTRICAL CHARACTERISTICS at  $T_A = 25^\circ\text{C}$**

Characteristic	Test Pins	Test Conditions	Limits			Units
			Min.	Typ.	Max.	
Luma Bandwidth	14-8	-3 dB, resistive load	—	7.5	—	MHz
Luma Voltage Gain	14-8		0.6	1.0	1.2	—
Luma Input Resistance	14		100	—	—	k $\Omega$
Video Input Aperture	14		1.4	—	3.4	Vpp
Chroma Voltage Gain	2-3	resistive load	2.5	3.8	5.0	—
Chroma Input Resistance	2		5.0	—	—	k $\Omega$
Contrast Control Range			35	—	—	dB
Saturation Control Range			35	—	—	dB
Chroma Phase Shift		over contrast control range	—	—	$\pm 3$	%
		over saturation control range	—	—	$\pm 3$	%
Chroma/Luma Tracking Error		over contrast control range	—	—	$\pm 2$	dB
Black Level Clamp Gating Pulse	11		50	—	1000	$\mu\text{A}$
Black Level Shift		with contrast and signal changes (black to white 4 $\mu\text{s}$ gating)	—	—	$\pm 3$	%
Beam Limiter Threshold	10		1.8	2.0	2.2	V

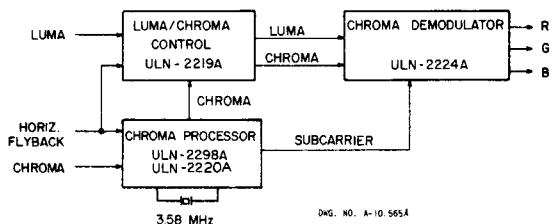


**TYPICAL APPLICATION**

# ULN-2219A/TBA396 LUMA/CHROMA CONTROL COMBINATION



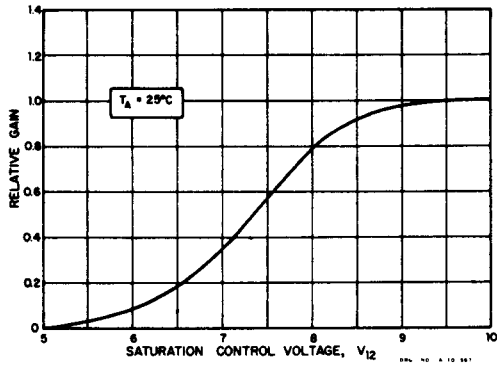
**TYPICAL PAL COLOR SYSTEM**



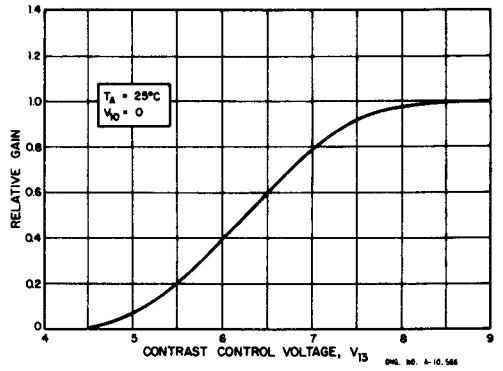
**TYPICAL NTSC COLOR SYSTEM**

## GENERAL DESIGN NOTES

1. The d-c controls are relatively insensitive to interference if the associated decoupling is close to the device pins.
2. Good decoupling is required close to the supply side of the PAL delay line to prevent subcarrier components from reaching the device supply line.
3. The brightness pre-set control should be adjusted for 16.5 volts at pin 7 with the brightness control set at mid-point. If the ULN-2217A chroma demodulator is used to complete the color system, a voltage of 7.5 V at the chroma outputs can be set using the same procedure.



TYPICAL CHROMA SATURATION



TYPICAL LUMA CONTRAST