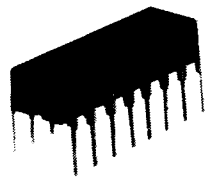

16-Lead Dual-In-Line Plastic Package "E"-Suffix Type H-1622

TV Chroma System

FEATURES:
- *Voltage-controlled oscillator*
- *Keyed APC and ACC detectors*
- *DC hue control*
- *Operates from +12 V*

The RCA-CA3158E* is a monolithic silicon integrated circuit that performs the functions of subcarrier regeneration, ACC and APC detection, and tint control in color television receivers. It is designed to function compatibly with the CA3145E TV Chroma Amplifier/Demodulator in a 2-package chroma system.

The CA3158E is a TV Chroma System equivalent to the CA3170E except that the typical supply voltage is +12 volts and no internal shunt regulator is incorporated.

The CA3158E is supplied in the 16-lead dual-in-line plastic package.

*Formerly Developmental Type No. TA6895G.

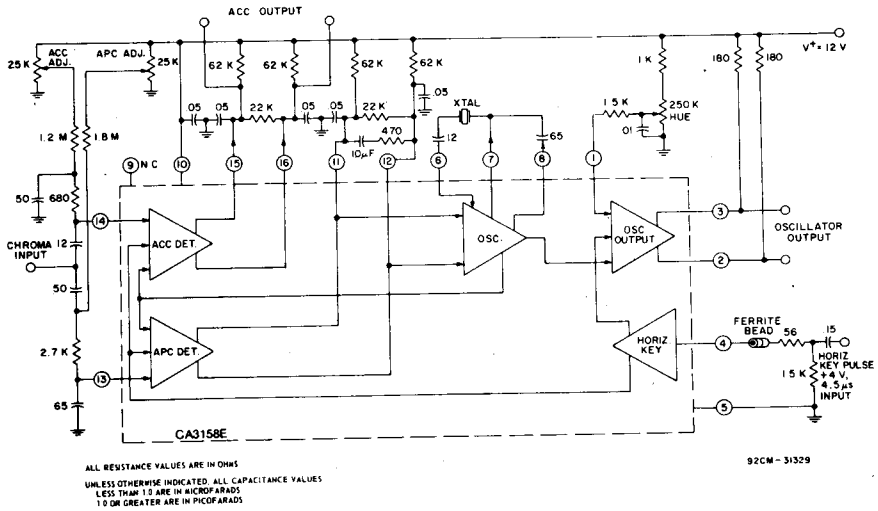

Fig. 1 — Functional block diagram of CA3158E.

MAXIMUM RATINGS, *Absolute-Maximum:*

DC SUPPLY VOLTAGE . . . . . 15 V
DEVICE DISSIPATION:
Up to T_A = 55°C . . . . . 630 mW
Above T_A = 55°C . . . . . derate linearly 6.6 mW/°C
AMBIENT-TEMPERATURE RANGE:
Operating . . . . . −40 to +85°C
Storage . . . . . −65 to +150°C
LEAD TEMPERATURE (During soldering):
At distance 1/16 ± 1/32 inch (1.59 ± 0.79 mm) from case for 10 s max. . . . . +265°C

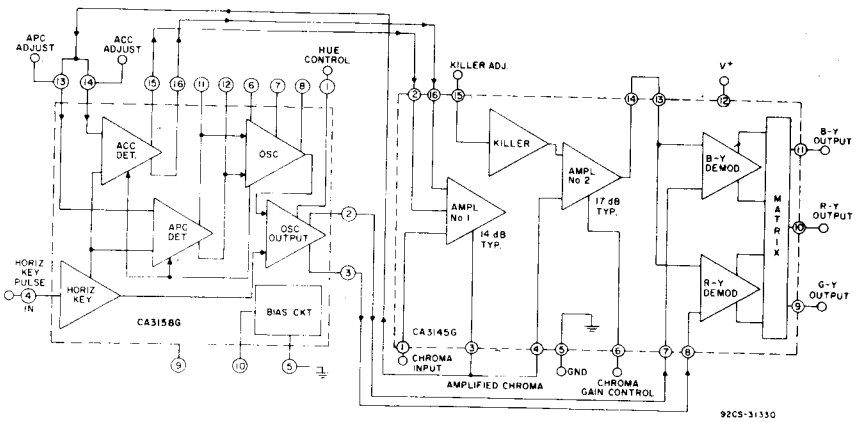

Fig. 2 — Simplified functional diagram of a two-package TV chroma system utilizing the CA3158E and CA3145E.

CIRCUIT DESCRIPTION

The CA3158E is a complete subcarrier regeneration system with automatic phase control applied to the oscillator. An amplified chroma signal from the CA3145E is applied to terminals No. 13 and No. 14, which are the automatic phase control (APC) and the automatic chroma control (ACC) inputs. APC and ACC detection is keyed by the horizontal pulse which also inhibits the oscillator output amplifier during the burst interval. The ACC system uses a synchronous detector to develop a correction voltage at the differential output terminal Nos. 15 and 16. This control signal is applied to the input terminal Nos. 2 and 16 of the CA3145E. The APC system also uses a synchronous detector. The APC error voltage is internally coupled to the 3.58 MHz oscillator at balance; the phase of the signal at terminal No. 13 is in quadrature with the oscillator. To accomplish phasing requirements, an RC phase shift network is used between the chroma input and terminal Nos. 13 and 14. The feedback loop of the oscillator is from terminal Nos. 7 and 8 back to No. 6. The same oscillator signal is available at terminal Nos. 7 and 8, but the dc output of the APC detector controls the relative signal levels at terminal Nos. 7 or 8. Because the output at terminal No. 8 is shifted in phase compared to the output at terminal No. 7, which is applied directly to the crystal circuit, control of the relative amplitudes at terminal Nos. 7 and 8 alters the phase in the feedback loop, thereby changing the frequency of the crystal oscillator. Balance adjustments of dc offsets are provided to establish an initial no-signal offset control in the ACC output, and a no-signal, on-frequency adjustment through the APC detector-amplifier circuit which controls the oscillator frequency. The oscillator output stage is differentially controlled at terminal Nos. 2 and 3 by the hue control input to terminal No. 1. The hue phase shift is accomplished by the external R, L, and C components that couple the oscillator output to the demodulator input terminals. The CA3158E operates from a 12-volt dc supply.

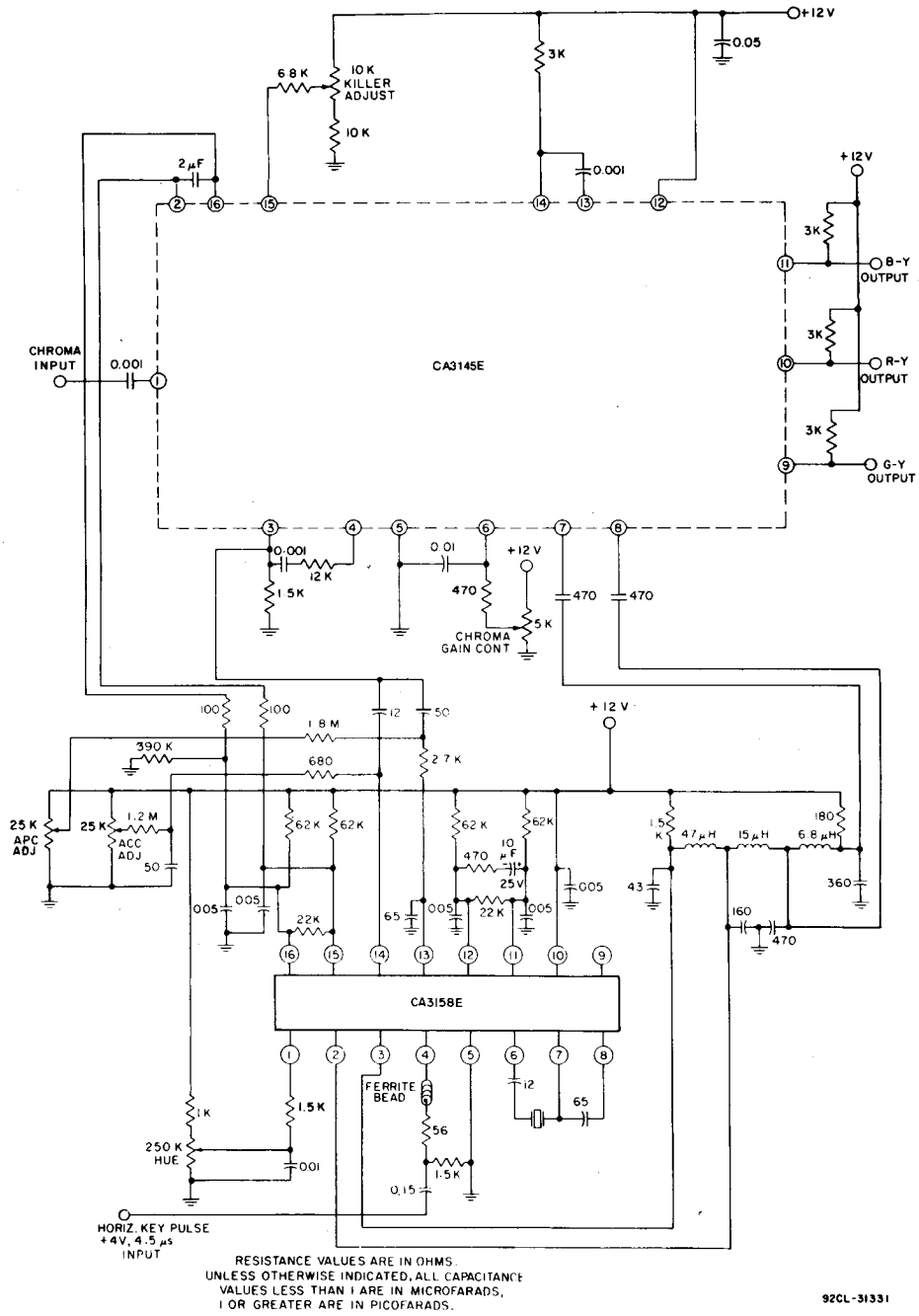

Fig. 3 — Outboard circuitry of a typical two-package chroma system for color-TV receivers utilizing the CA3145E and CA3158E.

ELECTRICAL CHARACTERISTICS At T_A = 25°C, V^+ = 12 V unless otherwise specified

CHARACTERISTIC	SWITCH NUMBERS S1	S2	S3	SPECIAL TEST CONDITIONS	LIMITS Min.	Max.	UNITS
	SWITCH POSITIONS						
STATIC (See Fig. 6)							
Supply Current, I^+	1	1	1		12	24	mA
Oscillator Current, I_2	1	2	1		4.25	8.55	
ACC Output Balance	2	2	1	Measure Term. 15 to 16	−330	300	mV
APC Output Balance	2	2	1	Measure Term. 11 to 12	−450	450	
Oscillator Balance	2	3	2	Measure Term. 7 to 8	−330	330	
DYNAMIC (See Fig. 8); e_{IN} = 0.4 V p-p sine wave							
Oscillator Center Frequency, f_O	1	2	1	Set R for f_O = 3579545 ± 5 Hz	–	–	Hz
Oscillator Frequency Deviation, f_O1	1	1	1		−400	400	
Oscillator Frequency Deviation, $\lvert\Delta f_O\rvert$	1	2	1	V^+ = 12 V ± 1 V	–	175	
Oscillator Pull-In Range:	1	2	2	Osc. must pull-in and lock to e_{IN} at:			
High Frequency Side				f_{IN} = 3.579745 MHz	200	–	
Low Frequency Side				f_{IN} = 3.579345 MHz	−200	–	
Dynamic ACC	2	2	1	Measure Term. 15 to 16 Record value (V1)	−75	75	mV
ACC Control	2	2	2	Measure Term. 15 to 16, f_{IN} = 3.579545 MHz	Record Value (V2)		
Δ ACC Control	–	–	–	Limits for Δ ACC Control = V2 − V1	120	250	
Dynamic APC	1	2	1	Tap of R to ground	1	12	V

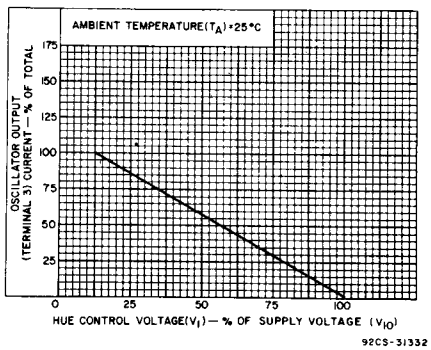

Fig. 4 — Typical hue control characteristic.

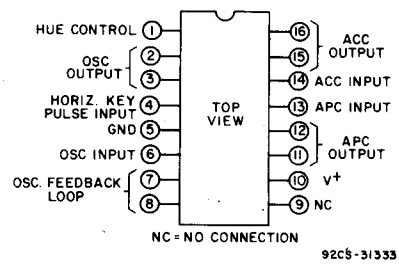

Fig. 5 — Terminal diagram of the CA3158E.

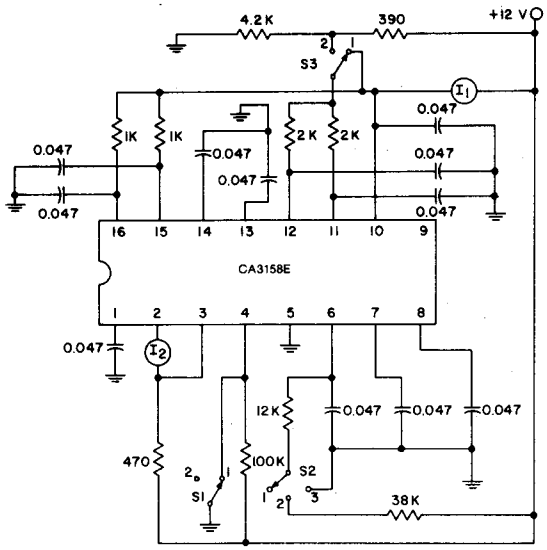

Fig. 6 – Static characteristics test circuit.

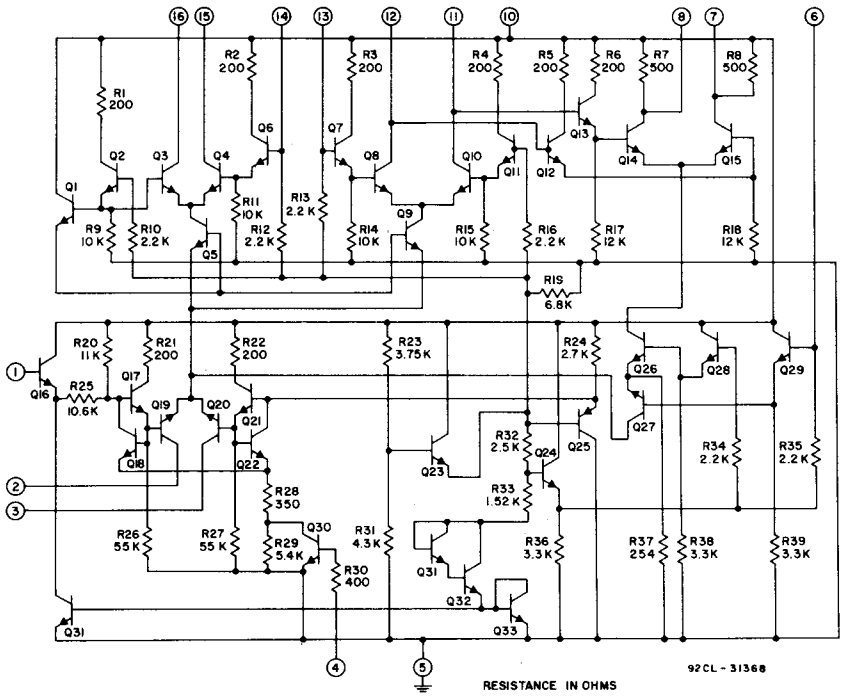

Fig. 7 – Schematic diagram.

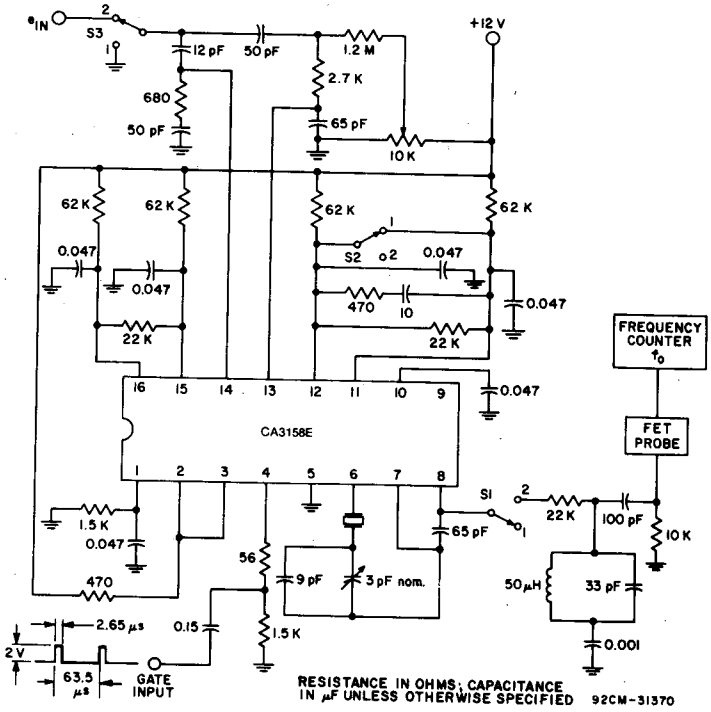

Fig. 8 – Dynamic characteristics test circuit.