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CA3209

FM-IF System

For Search and Scan

Features:

- *Exceptional limiting sensitivity: 12 μV typ. at -3 dB point*
- *Exceptional temperature stability of tuning and stop-pulse window*
- *Single-coil tuning capability*
- *Externally programmable stop-pulse window width*
- *Programmable level for AGC action*
- *Forward AGC for pin-diode or bipolar rf amplifier*
- *Required input level to generate a stop-pulse is programmable*

The RCA CA3209E• is a monolithic integrated circuit that provides all the functions of a comprehensive FM-IF system. It is intended for use in FM—IF amplifier applications in high-fidelity, automotive, and communications receivers where the synthesizer counter can be controlled by a stop-pulse for scan and search operation.

•Formerly Developmental Type No. TA10493B

Fig. 1 shows the CA3209E features, which include a three-stage FM-IF amplifier/limiter configuration with level detectors for each stage, a doubly-balanced quadrature FM detector and an audio amplifier.

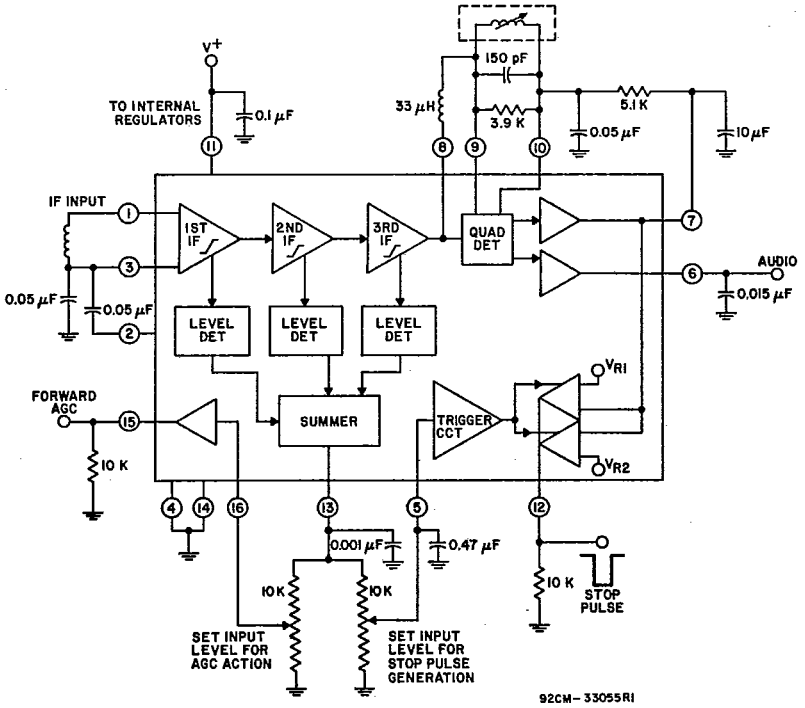

Fig. 1 - Block diagram of CA3209E.

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The advanced circuit design of the if system includes desirable deluxe features such as delayed AGC for the rf tuner, and an output signal to drive a tuning meter and/or provide stereo switching logic control of stop pulse and AGC thyristors. In addition, internal power supply regulators maintain a nearly constant current drain over the voltage supply range of +8.5 to +16 volts.

The CA3209E is ideal for high-fidelity operation. Distortion in a CA3209E FM-IF System is primarily a function of the phase linearity characteristic of the outboard detector coil.

The CA3209E utilizes the 16-lead dual-in-line plastic package and can operate over the ambient temperature range of -40° C to +85° C.

MAXIMUM RATINGS, *Absolute-Maximum Values:*

DC SUPPLY VOLTAGE:
- Between terminals 11 and 4 ..... 16 V
- Between terminals 11 and 14 ..... 16 V

DC CURRENT (Out of Terminal 15) ..... 2 mA

DEVICE DISSIPATION:
- Up to T_A = 85° C ..... 735 mW
- Above T_A = 85° C ..... Derate linearly 11.4 mW/° C

AMBIENT TEMPERATURE RANGE:
- Operating ..... -40 to +85° C
- Storage ..... -65 to +150° C

LEAD TEMPERATURE (During Soldering):
- At distance not less than 1/32" (0.79 mm) from case for 10 seconds max. ..... +265° C

ELECTRICAL CHARACTERISTICS at T_A = 25° C, V+ = 12 Volts
(See Fig. 3 for Test Circuit)

CHARACTERISTIC	TEST CONDITIONS	LIMITS			UNITS
		MIN.	TYP.	MAX.	
Static (DC) Characteristics					
Quiescent Circuit Current		20	31	44	mA
DC Voltages:					
V_1, V_2, V_3		1.2	1.9	2.4	V
V_{10}		4.9	5.6	6.1	V
V_{15}	V_{16} = 0 V	—	0.005	0.4	V
V_{15}	V_{16} = 1.4 V	4.1	5.1	5.6	V
V_{16}	V_{15} = 1-2 V	—	1.22	—	V
V_{12}	$V_5 \leq$ 0.24 V	4.3	5.7	6.6	V
V_{12}	$V_5 \geq$ 0.53 V	—	0.06	0.4	V
V_5 to cause transition of trigger (V_{12}) high to low		—	0.45	—	V
V_5 to cause transition of trigger (V_{12}) low to high		—	0.40	—	V
Dynamic Characteristics					
Input Limiting Voltage (-3 dB point)		—	12	25	μV
Recovered Audio Voltage	400 Hz Input ≧ 1 mV ±75 kHz Deviation	350	520	700	mV
Frequency Window of Stop Pulse	V_5 = 0.6 V, Input = 100 μV; R_7 -10 = 5.1 K	70	120	200	kHz
	R_7 -10 = 8.2 K	45	75	125	
Total Harmonic Distortion, THD: *			0.50	1.0	%
AM Rejection	30% AM 100 mV Input	50	65	—	dB
	100 μV Input	35	42	—	
S/N Ratio **	100 mV Input	70	80	—	dB
	100 μV Input	55	65	—	
V_{13}	No Signal	0	0.2	0.8	V
	100 μV Input	1.4	2.2	3.2	
	100 mV Input	4.9	6.5	8.5	

* THD characteristics are essentially a function of the phase characteristics of the network connected between terminals 8, 9, and 10.

** Measured with a 30-kHz low-pass filter (-3 dB at 30 kHz, 18 dB/octave).

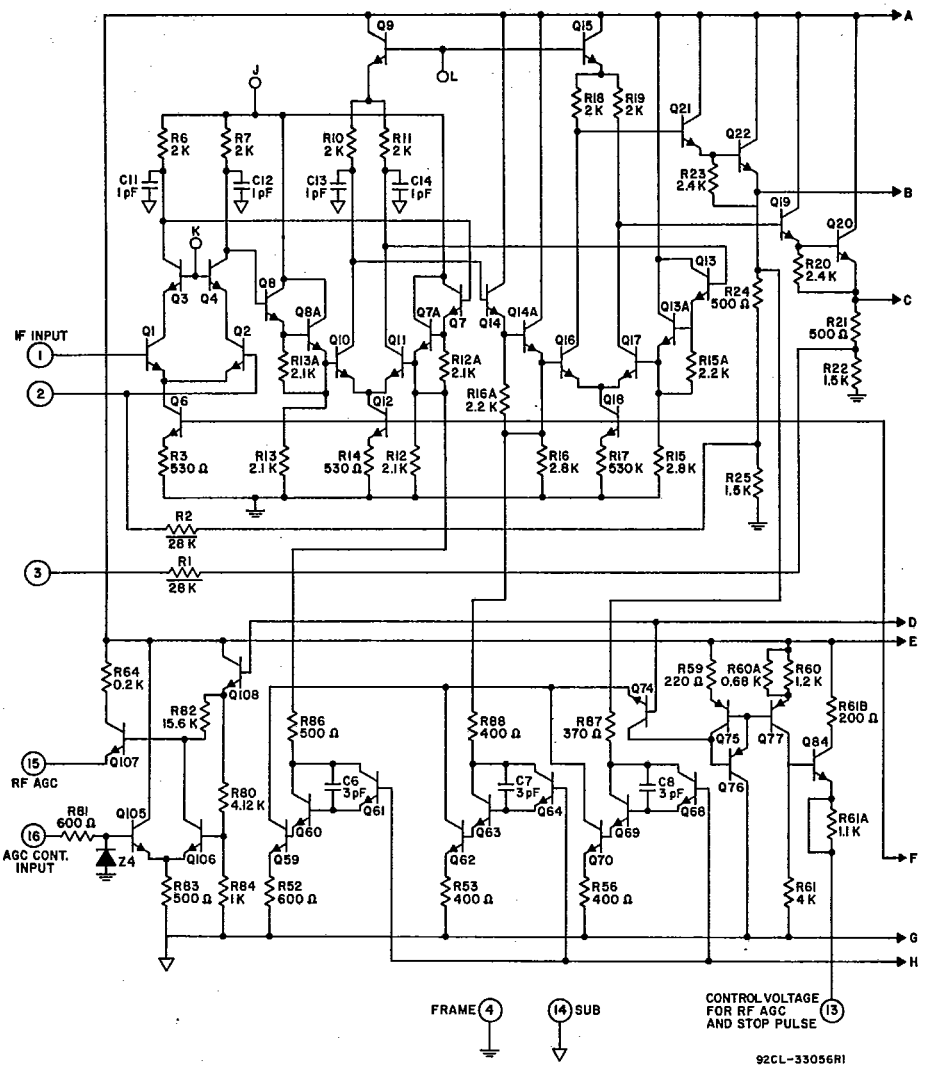

Fig. 2 - Schematic diagram of CA3209E
(continued on next page).

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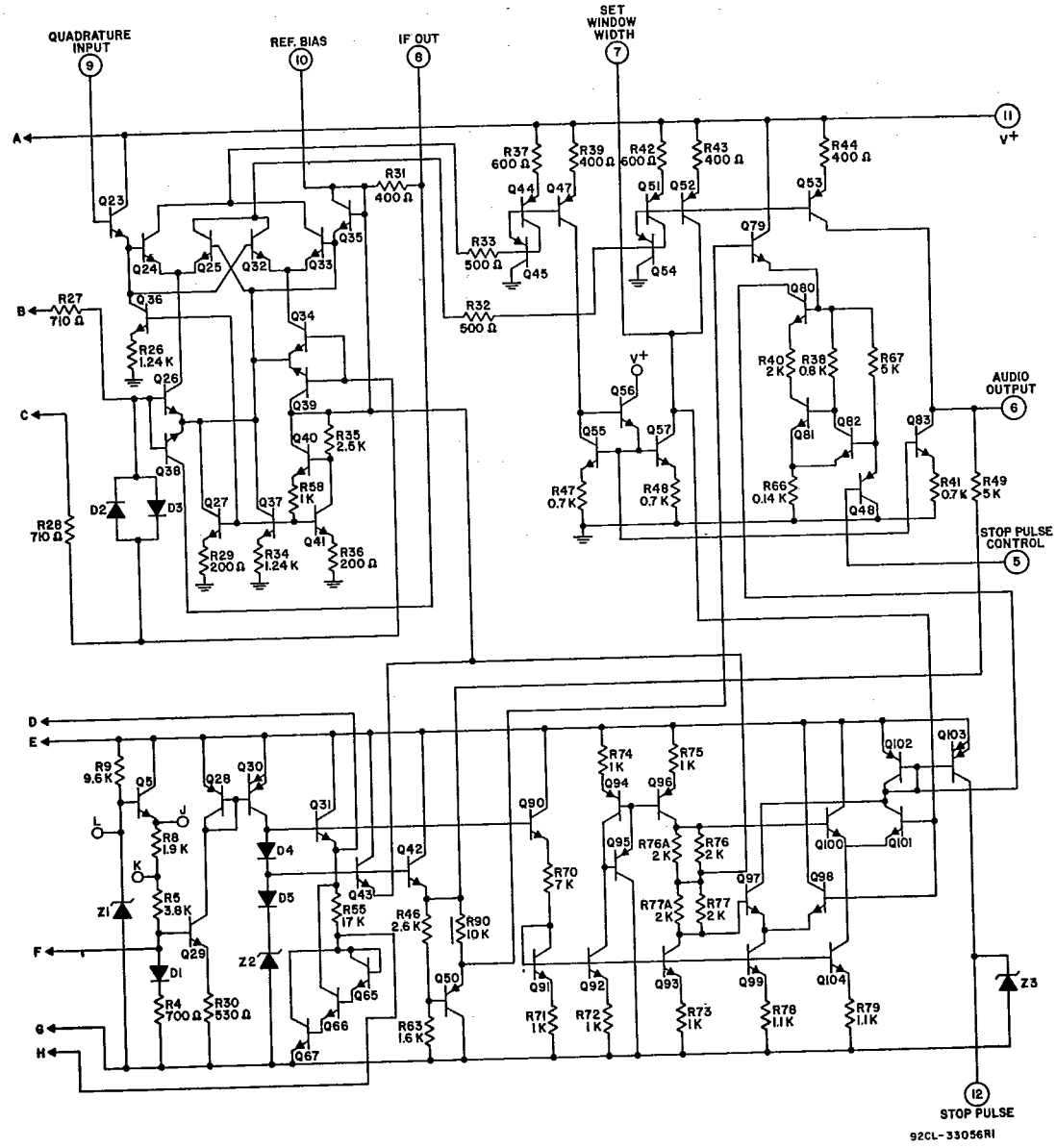

Fig. 2 - Schematic diagram of CA3209E (continued from previous page).

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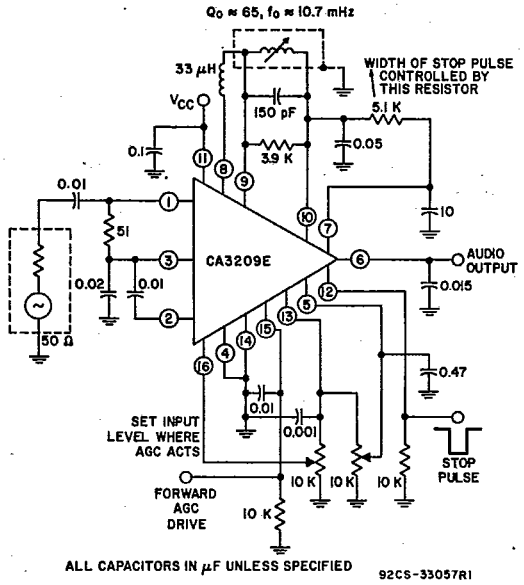

Fig. 3 - Test circuit.