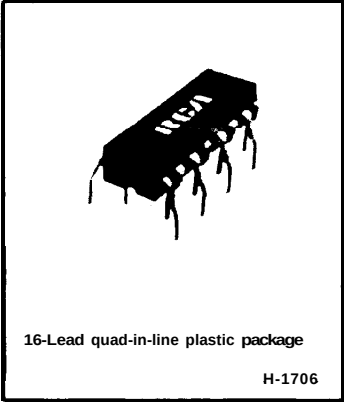


CA3090AQ



Stereo Multiplex Decoder

For FM Stereo Multiplex Systems

FEATURES:

- Requires the use of only one low-inductance tuning coil
- Automatic stereo switching
- Directly drives a stereo indicator lamp up to 100 mA
- Includes driver for stereo-lamp indicator
- Operates from a wide range of power supplies: 10 to 16 volts
- Requires only one adjustment for alignment
- Switching from monaural to stereo and stereo to monaural produces no audible thumps

RCA-CA3090AQ*, a monolithic silicon integrated circuit, is a stereo multiplex decoder intended for FM multiplex systems.

The CA3090AQ is the successor to the CA3090Q; it offers three major advantages over the CA3090Q as follows:

1. Can directly drive a stereo indicator lamp with a current drain of up to 100 mA.
2. Stereo Defeat/Enable control-voltage specifications.
3. Capable of operation with lower distortion.

This stereo multiplex decoder requires only one low-inductance tuning coil (requires only one adjustment for complete alignment), provides automatic stereo switching, energizes a stereo indicator lamp, and operates from a wide range of voltage supplies.

Figure 1 shows the block diagram for the CA3090AQ. The input signal from the detector is amplified by a low-distortion preamplifier and simultaneously applied to both the 19-kHz and 38-kHz synchronous detectors. A 76-kHz signal, generated by a local voltage-controlled oscillator (VCO), is counted down by two frequency dividers to a 38-kHz signal and to two 19-kHz signals in phase quadrature. The 19-kHz pilot-tone supplied by the FM detector is compared to the locally generated 19-kHz signal in a synchronous detector. The resultant signal controls the voltage controlled oscillator (VCO) so that it produces an output signal to phase-lock the stereo decoder with the pilot tone. A second synchronous detector compares the locally generated 19-kHz signal with the 19-kHz pilot tone. If the pilot tone exceeds an externally adjustable threshold voltage, a Schmitt trigger circuit is energized. The signal from the Schmitt trigger lights the stereo indicator, enables the 38-kHz synchronous detector, and automatically switches the CA3090AQ from monaural to stereo operation. The output signal from the 38-kHz detector and the composite signal from the preamplifier are applied to a

- Low distortion: under 0.5%
- Separate dc input permits stereo defeat or enable
- High signal output: directly drives audio amplifiers
- Excellent SCA (storecast) rejection: 55 dB typ.
- High audio channel separation: 40 dB typ.

matrixing circuit from which emerge the resultant left and right channel audio signals. These signals are applied to their respective left and right post amplifiers for amplification to a level sufficient to drive most audio amplifiers.

The CA3090AQ may be used without the stereo defeat/enable function (see Fig. 6) if a control voltage for this function is not readily available. In this case, Terminal 4 should be grounded.

The CA3090AQ utilizes the 16-lead quad-in-line plastic package and operates over the ambient temperature range of -40° c to +85° c.

*Formerly Developmental Type No. TA6262G.

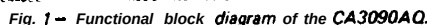
MAXIMUM RATINGS, Absolute-Maximum Values at T_A = 25° C:

DC Supply Voltage	*.....	16 V
Current at Term. 12		100 mA
Input Signal Voltage (Composite)		400 mV
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 s max.		
		+265° C

- For stereo operation, a minimum input signal voltage (composite) of 40 mV is required.

C A3090AQ

NOTE: For improved pilot sensitivity and overload characteristic replace the $0.039 \mu\text{F}$ capacitor between Terminals 7 and 8 with a Series L-C Network ($L = 4.7 \text{ mH}$, $C = 0.015 \mu\text{F}$). Under these conditions, Indicator Lamp Sensitivity: 'ON' = 3.3 mV , 'OFF' = 2.0 mV .



CA3090AQ

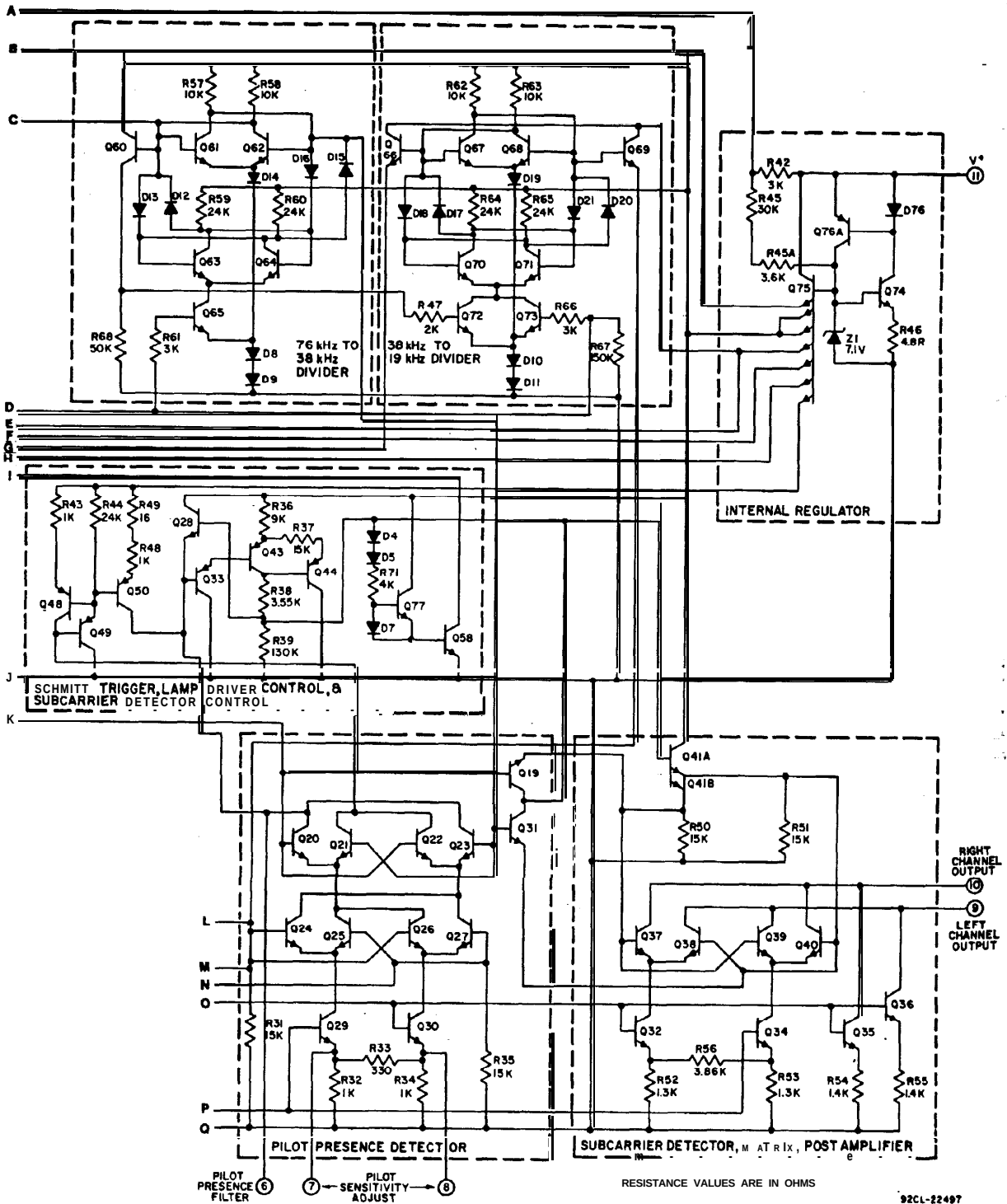


Fig. 2 - Schematic diagram of the CA3090AQ (cont'd from previous page).

CA3090AQ

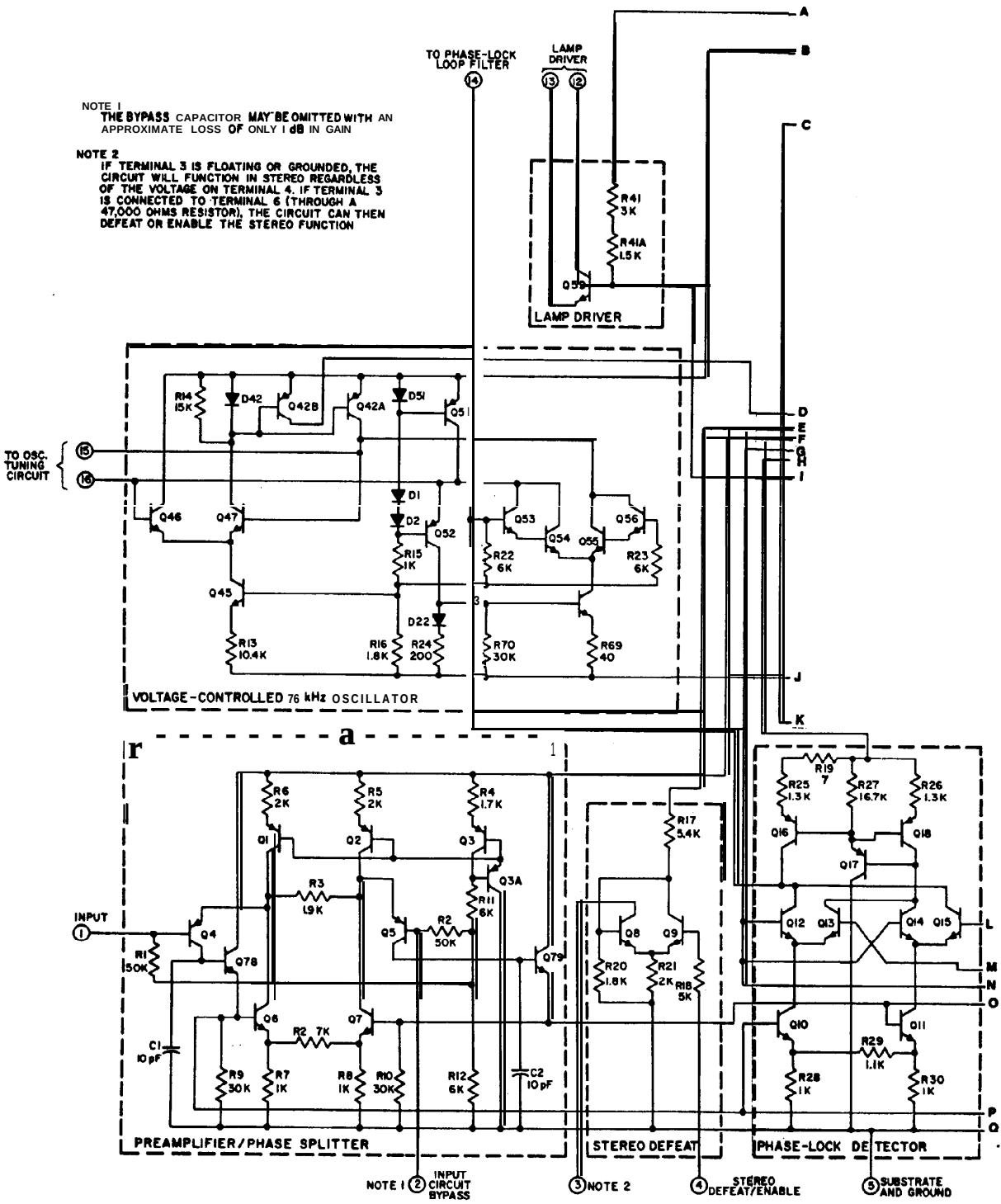


Fig. 2 - Schematic diagram of the CA3090AQ (cont'd on next page).

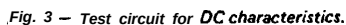


Fig. 5 — Test circuit for *us?* with stereo *defeat/enable*.

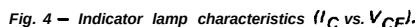


Fig. 6 — Test circuit for use without stereo defeat/enable.



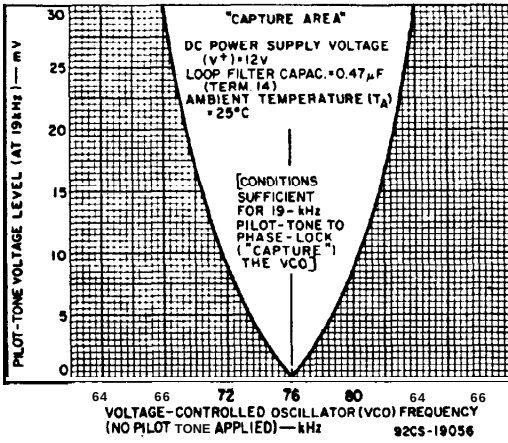


Fig. 8 — Pilot-tone **voltage level** vs. VCO frequency with no pilot-tone applied.

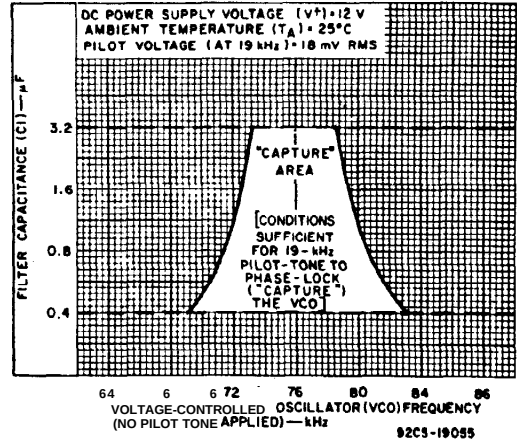
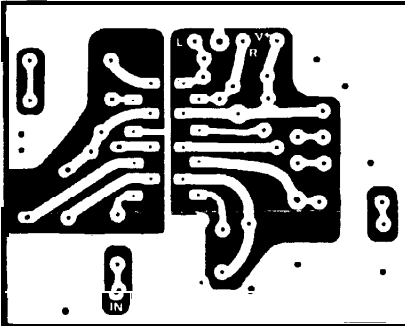
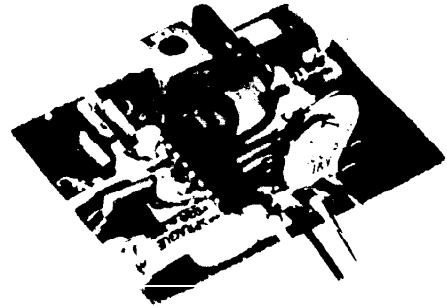


Fig. 9 — Filter capacitance vs. VCO frequency with no pilot-tone applied



A- Foil side.



B-Component side.

Fig 10 — photographs of the CA3090AQ and outboard components mounted on a 2 X 2½-inch printed-circuit board to constitute a complete stereo multiplex decoder.