

# CONSUMER MICROCIRCUITS LIMITED PRODUCT INFORMATION

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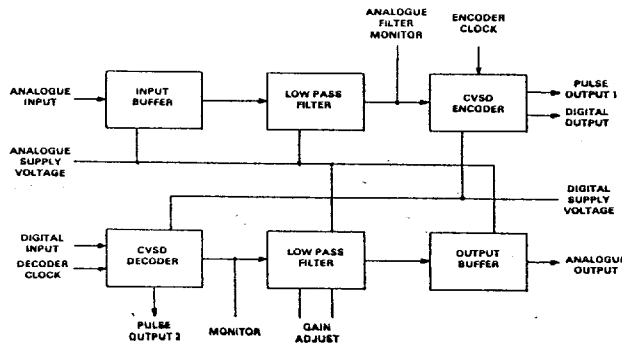
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ADVANCE INFORMATION D/159/1/020

T-75-11-05



## FX3090 DELTA CODEC HYBRID

### FEATURES

\*MEETS EUROCOM D1-IA8 SPECIFICATION

\*VERY FLEXIBLE POWER SUPPLY

\*PERFECT IDLE PATTERN

\*GAIN ADJUSTMENT FACILITY

\*LOW CURRENT CONSUMPTION

\*INPUT & OUTPUT FILTERS INCLUDED

### DESCRIPTION

The FX3090 is a delta-codec specifically designed to meet the Eurocom D1-IA8 specification. A block diagram of its functions are shown in Fig.1.

The FX3090 consists of an input analogue low pass filter with an input impedance of greater than 6Kohm, which then feeds the delta-modulator Encoder, giving a digital output compatible with C.M.O.S. or T.T.L. logic. Also a delta-modulator decoder, compatible with C.M.O.S. or T.T.L. outputs, feeding an output analogue low pass filter (similar to the input filter) with an output impedance less the 600ohms.

The Encoder and Decoder have separate clock inputs and also various monitoring points as specified by the Eurocom D1-IA8 specification. Both input and output filters can have their gains increased by up to 10dB each, in order to match the device to other than Eurocom levels.

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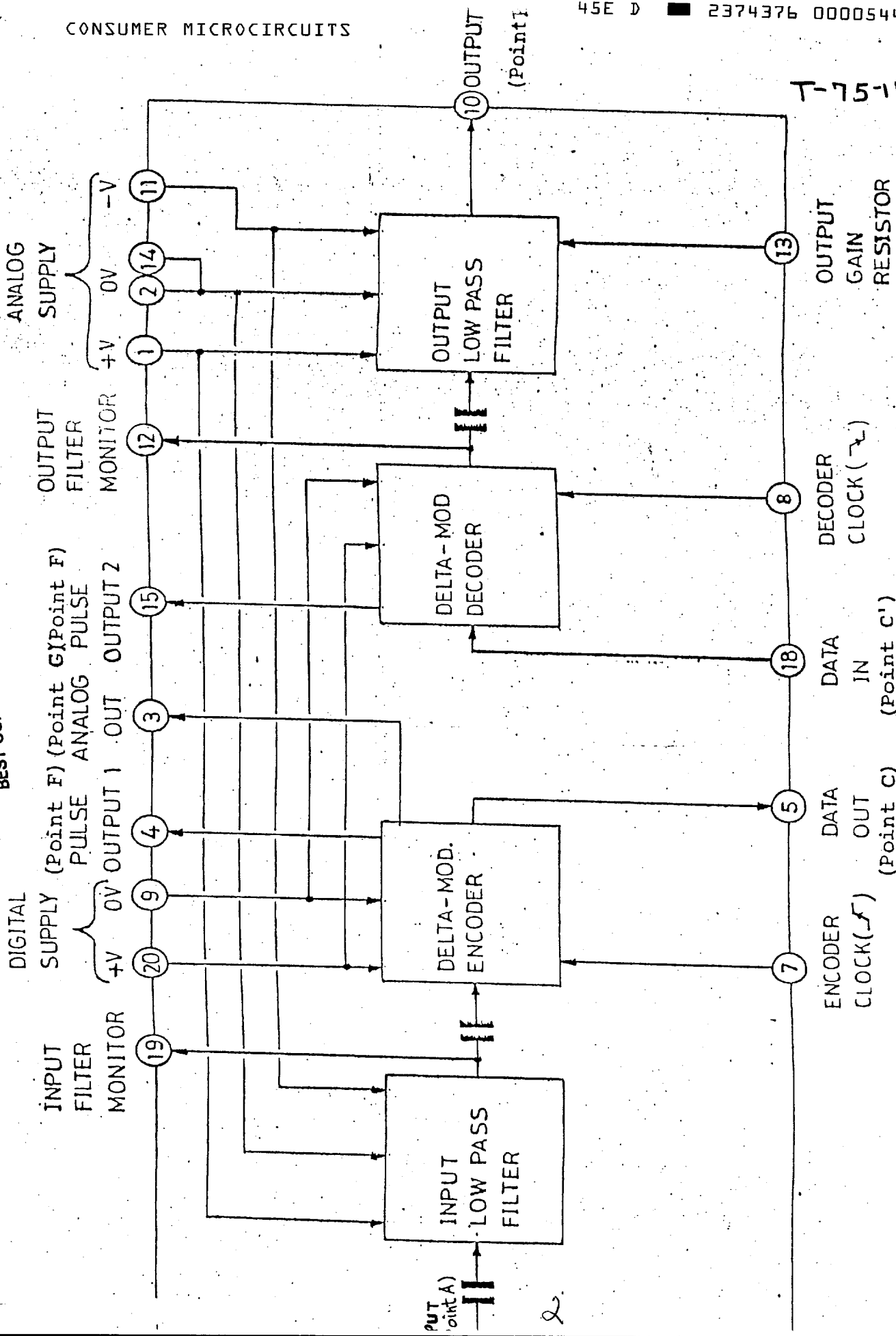


FIG. 1  
DELTA-CODEC HYBRID  
BLOCK SCHEMATIC



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4. Electrical Specifications

Digital supply:

Absolute maximum working voltage: +8V

Normal supply voltage: +4.5V to +7.5V

Dynamic range specified at +5V

Analog supply:

Absolute maximum working voltage: 30V (ie ±15)

Minimum supply voltage: 4.5V

Dynamic range specified at 5V

Clockwidth: 1  $\mu$ s to 40  $\mu$ s positive pulse

Maximum set-up time from data, to clock: 450 ns \*(Typically 400ns)

Maximum set-up time, clock to data out: 750 ns \*(Typically 450ns)

\* Vcc = +4.5 to +7.5V

Nominal test level analogue input: -4dBm  
(with two external resistors programming the gain)

Max. output impedance analog output: 600 ohm @ 5V supply

Test level: Ref. to table 1, IA8-5, in  
Eurocom specifications.  
Multiply tolerances with a factor  
of 2 for coder-decoder looptest.Total current consumption: Less than 3mA at 5V  
(Typically 0.7 mA)

Supply ripple: Less than 6mV peak to peak

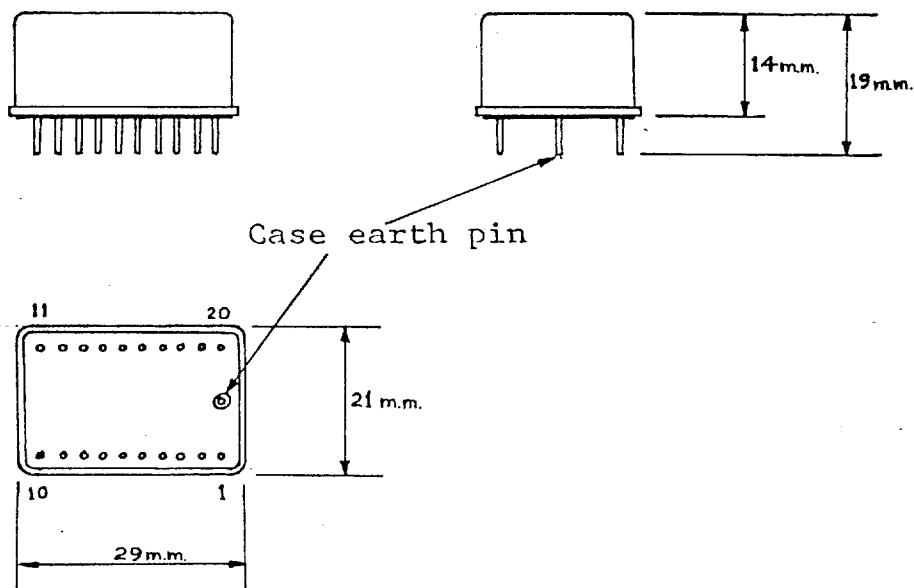
Max. voltage on any pin: VDD + 0.3 volts

Min. Voltage on any pin: VSS - 0.3 volts

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Pin functions

- |                   |                           |
|-------------------|---------------------------|
| 1. +V Analog      | 11. -V Analog             |
| 2. OV Analog      | 12. Output filter monitor |
| 3. Analog out     | 13. Output gain resistor  |
| 4. Pulse output 1 | 14. OV Analog             |
| 5. Data out       | 15. Pulse output 2        |
| 6. N/C            | 16. Input                 |
| 7. Encoder clock  | 17. Internally connected  |
| 8. Decoder clock  | 18. Data in               |
| 9. OV Digital     | 19. Input filter monitor  |
| 10. Output        | 20. +V digital            |

Package dimensions (actual size)

Practical usePower supply

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The hybrid contains two 10K ohm resistors acting as a potential divider between the +V Analog and -V Analog supplies, to establish a 0V Analog. This means that with the addition of two 47 $\mu$ f supply decoupling capacitors, the filters can operate from a single power supply.

Also, because the Encoder and Decoder are A.C. coupled to the filters, the same single power supply can be used for both digital and analog supplies. Thus, there are four basic supply configurations that can be considered for this device as in Figs. 2 to 5. It must be remembered however, that in order to comply to the Eurocom D1-IA8 specifications, the digital supply must always ideally be 5V.

Gain adjustment

As it stands the output gain of the FX-3090 conforms to the Eurocom levels but the input gain is 9dB  $\pm$  1dB greater. In order to reduce the gain of the input to Eurocom levels (i.e. to conform to the Eurocom D1-IA8 specifications) the input signal is attenuated by 10dB using two resistors as shown in Fig. 6. Any value of gain from 0dB to 10dB greater than Eurocom levels can be programmed by varying these two resistors or eliminating them altogether (for 10dB extra gain). But in order to maintain correct operation at low input signal levels the impedance from the input pin to ground must always be lower than 10k ohms. The output filter has similar adjustments but the gain is increased from that of the Eurocom levels to 10dB greater by putting a resistor of value 1.1K $\Omega$  from pin 13 (output gain resistor) to 0V Analog supply. Again, any intermediate value of gain can be obtained by varying the resistor from 1.1K $\Omega$  to infinity.

Although it is possible to vary the gains of these two filters beyond the 10dB limits specified, correct operation is not guaranteed. Also, when operating outside the Eurocom specifications (i.e. increase in gains) combined with a low voltage analog supply, clipping may occur to the input or output signal.

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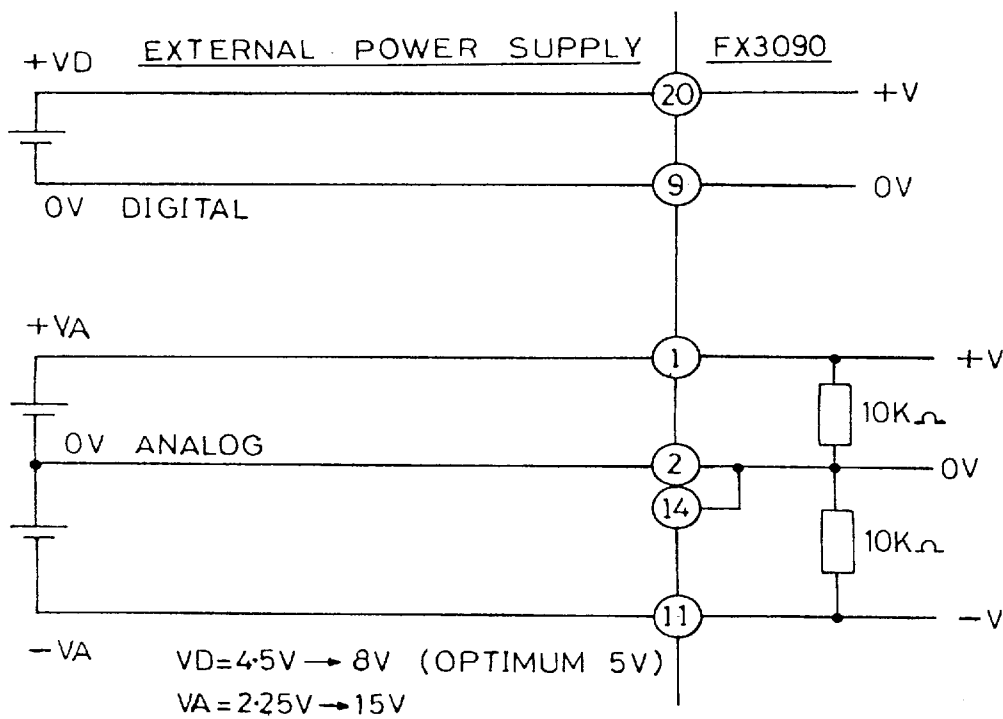


FIG. 2

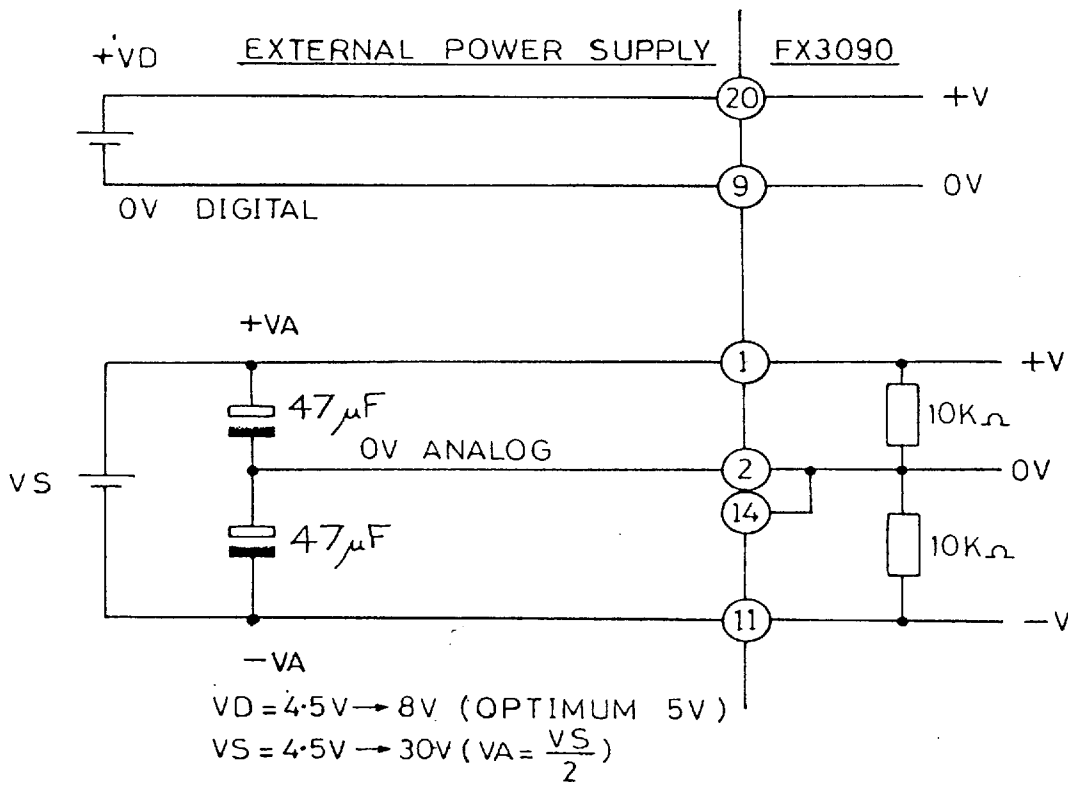


FIG. 3

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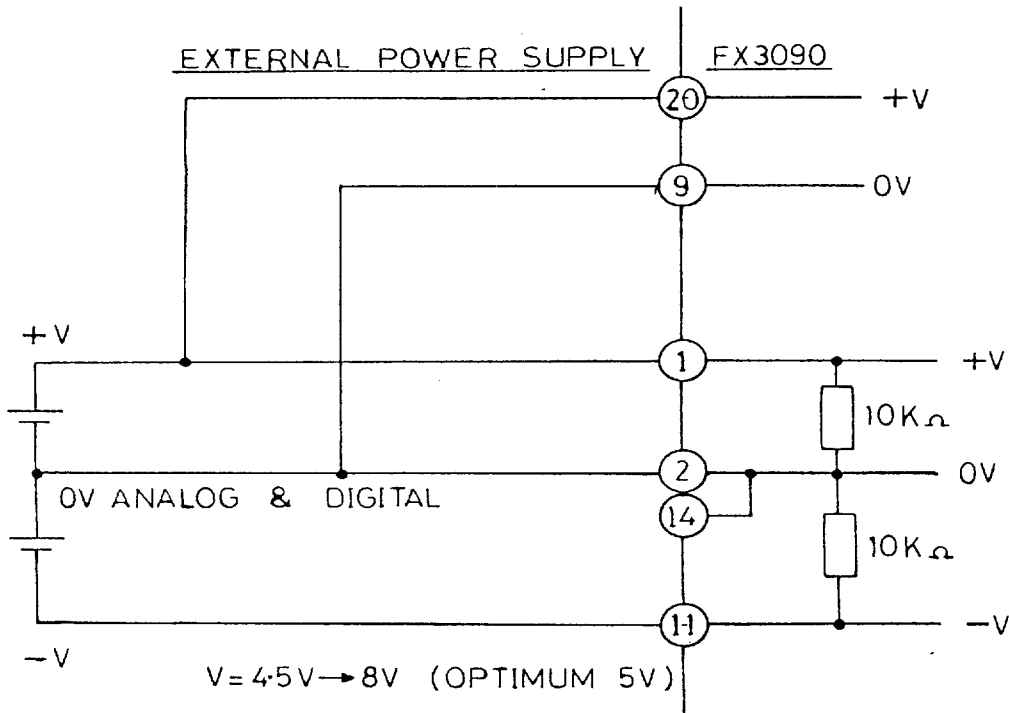


FIG. 4

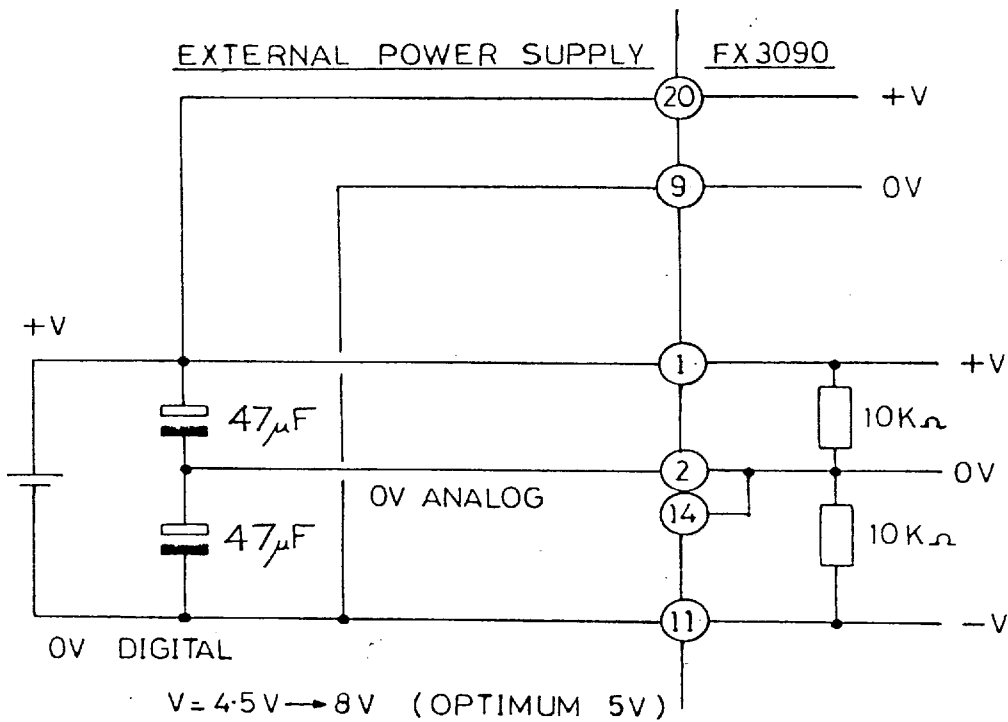
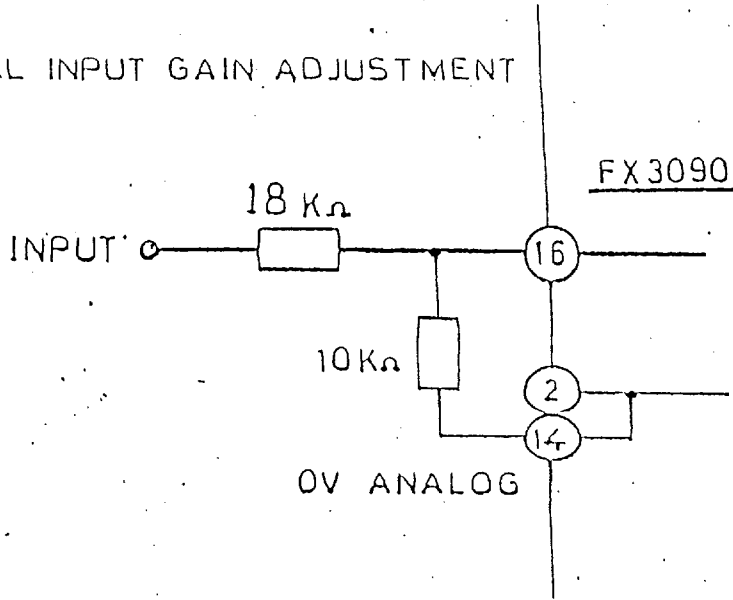


FIG. 5



EXTERNAL INPUT GAIN ADJUSTMENT



Note: If a single analog supply is used, the 10k resistor should be taken to pin 11 not pins 14 or 2.

FIG. 6