CHAPTER - V

CONCLUSIONS

An extra operational amplifier permits the integrator's time constant to be scaled by resistors $R_a$ and $R_b$ (fig 2.2) so that an exceptionally long timing period can be obtained. The desired initial conditions for the capacitance is established by simply closing the switch which can go to ground (for zero initial charge) or to some d.c. voltage. The performance of the integrator of fig 2.4 was experimentally verified with a sinusoidal input for $m = 0.1, 1, \text{ and } 10$ the phase shift was found to be $90^\circ$ over a wide range of input frequencies.

The circuits described in chapter - II have desirable features for active filter design and IC implementation owing to the use of grounded capacitor.

The section 3.2 presents a quadrature oscillator with extended time constants. The frequency of oscillation can be controlled easily by a single resistance or voltage variable resistance (fig 3.7). In addition if the circuit is fabricated using hybrid IC technology, the frequency of oscillation can be made stable over a wide temperature range. The basic circuit is modified for amplitude stabilization. The modified circuit incorporates AGC unit. The circuit is found to be suitable where good amplitude stability is required.

The oscillator of fig 3.16 can be implemented conveniently using a Raytheon 4136 quad, op. amp which has 3 MHz band width.
The Motorola 3403 and National 348, both are 1 MHz devices, provide ultralow distortion performance at frequencies up to 2 KHz. The main asset of the quad device for this circuit is its cost-effectiveness. The use of grounded capacitors makes it suitable for IC-implementation. It can be made into a voltage controlled oscillator by replacing controlling resistor Rp by FET. The AGC circuit minimizes the distortion and stabilizes the output amplitude.

The oscillator circuit described in section 3.4 involves four-quadrant analog multipliers as the basic elements for obtaining sustained oscillations and tuning the frequency of oscillation. Low distortion operation requires careful adjustment of the gain of the positive feedback path. The gain adjustment is achieved by use of some type of automatic gain control, in this case the mechanism is an analog multiplier (AM) where gain is adjusted by a control voltage Vx. The AGC loop tracks the reference voltage VR to maintain the output voltage at about constant level.

The design of parasitic insensitive MOS switched capacitor filters is presented. Second order low-pass, high pass and notch filters have been proposed. The filters have been realized using MOS quad switches (14016) and op. amp. The filters presented can be used in cascade to realize higher order filters. Second order filters have been realized using unity gain amplifiers. The circuits have small sensitivities good dynamic range and a reasonable spread of capacitor values. The filters can be used for high Q realization.