Working principle for 75MHZ pistol radio (FM-34)

1. Oscillation of fundamental frequency

Fundamental frequency is made up of some components, such as Q1…etc. For applying to FM technology, so adopt the oscillated circuit, supposed RF as fo , then the frequency of oscillation (fa) ,is as follows: fa=fo/5,that is to say,RF frequency is fivefold bigger than the fundamental frequency.

And the fundamental frequency is decided by the total
Amount of contacted capacitance ,including CR1,C_J(D1,reverse capacity),C2//C_{ID}(Q1,import capacity) and C3. So long as $\dfrac{1}{C_J} + \dfrac{1}{C2+C_{ID}} + \dfrac{1}{C3} = CL.$ Then fa can be stay at the appoint by CR1 stablely. As above-mentioned

$CL,$ is the loaded capacitance for CR1 crystal。If fa does not conform to the standard, we can amend it by changing C2. For C3≥C2+ C_{ID}, the input capacitance of Q2 does not influence too much towards the oscillated frequency. Other wise, for Q1,choose a work place which is near to saturated area, to disturb the waveform of oscillation, so that can assure that circuit can not stop even if in the status of lower voltage.

2. Modulation

We usually finish off modulation as following steps.
Firstly change the reverse voltage of diode (D1), so that the capacitance of D1 can be changeable. Finally achieve to changing the frequency of Oscillation.

At this point, we must make sure that the modulation range or scope must be smaller than the breadth of frequency band. According to the formula,R2/(R1+R2)=1/5, choose suitable R1,then can limit the frequency breath at the suitable scope.

3. Restrain

If we tune the loop (which is made up of T1,T2,L3, L4 and other related appliances) at the frequency of RF strictly. We can control it well .

4. The dc voltages applied to and dc currents into the several elements of the final radio frequency amplifying device for normal operation over the power range is 8-12v, not over200mA.