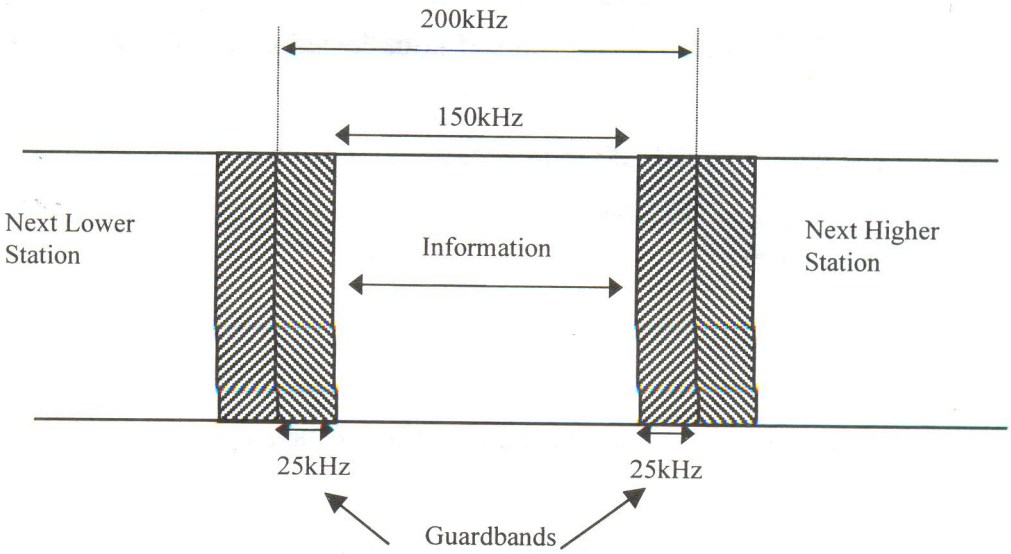

Figure 2.14 FM frequency allocation by FCC

2.4.2. Analysis of FM

Let the instantaneous wave equation for ,

Carrier signal is , $\upsilon_c(t) = V_c \cos \omega_c(t)$ (2.12)

and ,

Information signal $\upsilon_m(t) = V_m \cos \omega_m(t)$ (2.13)

where $\omega_c >> \omega_m$

In FM, frequency changes with the change of the amplitude of the information signal. So the instantaneous frequency of the FM wave is ;

$\omega = \omega_c + k\upsilon_m(t)$; k is constant of proportionality

$\omega = \omega_c + k V_m \cos \omega_m(t)$ (2.14)

or

$f = f_c + k V_m / 2\pi \cos \omega_m t$; f_c = carrier frequency

$= f_c + \Delta f \cos \omega_m t$