For the TIA test method, both the adjacent and alternate channels are held at the same power level. However in the field, users frequently have to deal with IMR where the frequency relationships aren't that close and are unequal in power. In these cases the equivalent power to use for *Ci* would be to consider only the specific case which would be where the two signals have different average powers and the effect of the actual mixing process where one frequency is doubled and the other not, so the resultant power falls into the victim’s bandwidth. The example is for third order intermodulation. It is also assumed that the mixer remains constant and that no additional selectivity is available. In this case:

  11\\* MERGEFORMAT ()

Where *Pa* is the power in absolute dB of the signal whose frequency is doubled and *Pb* is the power in absolute dB of the signal whose frequency is not doubled.

An application with specific frequencies, calculates the interfering carrier levels and the intermodulation power that results for a specific design or problem evaluation. At the input of an amplifier:

 *Relative IM* = 2 (*IIP*3 - *Ci*) 22\\* MERGEFORMAT ()

Where *Ci* = Equivalent interferer.

 *Absolute IM Level* = *Ci* - *Relative IM* 33\\* MERGEFORMAT ()

Combining equations 3 and 2 plus accounting for the Gains and Losses the result is:

 44\\* MERGEFORMAT ()

Where *Ci* and *IIP3* are in dBm and Gains (*G*) and Losses (*L*) are in dB.

In most cases system designers are interested in the level of the IM and can then follow it through the chain of amplifiers and loss elements until it arrives at the input of the last amplifier stage. At the final stage, the individual carriers also will be present and can once again produce IM. The total noise would then be the sum of the individual noise sources and the individual IM products,

*C/ (N +IM*). Continuing with the example, consider the following case.