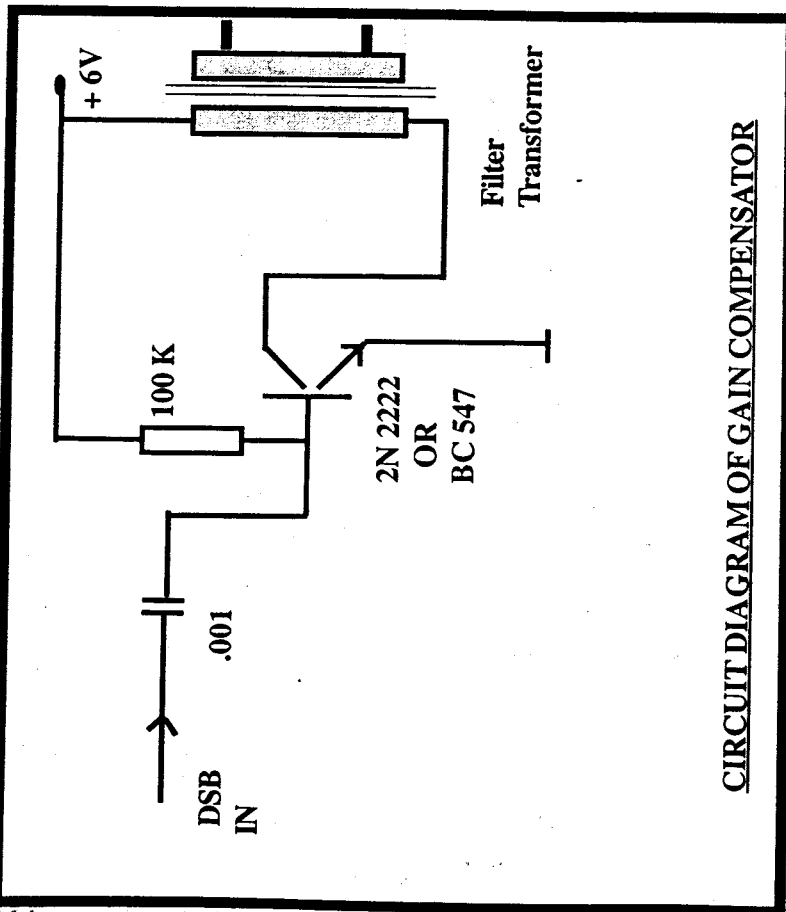


**APPENDIX**  
**GAIN COMPENSATOR FOR X'tal FILTER**  
**WITH HIGH ESR**

If your X'tals are having high ESR , then the output will be less . In that case , you can use a transistor as amplifier at the input of the SSB filter as shown below . .



**APPENDIX**

**PCB CONSTRUCTION METHODS**

PCB's role in the construction of an electronic project is very important . But the problem with most of the ham radio projects is the unavailability of PCB ,s in the market .

PCB's can be constructed by yourself using the method discussed below . The materials required are the copper clad sheet , marking ink and ferric chloride solution . Ferric chloride is available from chemical stores . You can also use nail polish as marking ink .

**P.C.B. Making Steps**

1. Cut copper clad epoxy sheet to the required size.
2. Draw the print side layout of components on a sheet of paper.
3. Place this drawing on copper clad sheet and drill holes at the required points.
4. Polish P.C.B. using nice sand paper.
5. Draw the print on the copper side of the copper clad using Luxor permanent marker pen or enamel point.
6. Immerse it in a strong solution of Ferric Chloride for about 45 minutes.
7. Observe for the completion of etching. When the process of etching is completed take the P.C.B. out and clean in water several times.
8. Remove the ink and clean the P.C.B.