|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Attack | Flute.wav | | Speech.wav | | Newsound.wav | |
| NC | BER | NC | BER | NC | BER |
| Noise addition  AWGN 20 dB |  |  |  |  |  |  |
| Re sampling  44.1-22.05-44.1 KHz |  |  |  |  |  |  |
| LPF  Cut off frequency 11.025 KHz |  |  |  |  |  |  |
| Re quantization  16-8-16 bits/sample |  |  |  |  |  |  |
| Echo  Delay 0.5s |  |  |  |  |  |  |
| Reverse |  |  |  |  |  |  |
| Mp3 compression  32 kbps |  |  |  |  |  |  |
| Mp3 compression  64 kbps |  |  |  |  |  |  |
| Mp3 compression  128 kbps |  |  |  |  |  |  |

Table: An Efficient and Robust Zero-Watermarking  
Scheme for Audio Based on DWT and DCT (IEEE)