low frequency sounds are removed and so the data will be lost. The same effect can be had with noise reduction techniques, as the hidden data will cause noise in the medium. These can be done accidentally by a person who is unknowingly transporting the cover-text, or maliciously, for example by the warden in the prisoner's problem.

There are reports of some people, such as sound engineers and musicians, who claim they can hear the "high-pitched whine" which comes with hiding high-frequency information encoded in messages [1].

2.1.5   Text Steganography

As previously mentioned there are three main forms of text steganography, these will be described in more detail here.

Structural

Structural based text steganography involves manipulating the structure of the text in order to hide data. The structure includes the line spacing, word spacing, font size and anything similar. For example, one could use double word spacing to hide a 1, single to hide a zero. At a first glance, this will not be noticeable to the human eye. Margaret Thatcher reportedly used this method to aid in the prevention of press leakages of government documents [21]. A certain number of white spaces were placed in documents, the number being related to the cabinet minster to receive the document, so she could identify the owner of any leaked documents.

Random and Statistical Generation

There are a number of different ways to generate a cover-text to hide data. This can either be done randomly, so the words chosen are purely based on the data to be hidden, or statistical, so the words are chosen to match some statistical criteria. Statistical methods generally produce much more meaningful text that random methods. An example of a random method is Stego! [37]. This algorithm encrypts the data to be hidden using the JavaScrypt encryption algorithm, and then uses the Base64 result to select words from a random dictionary of 65536 words, one word for every two bytes in the data. For example, the word "hello" (encrypted with the key "123456") gives the result:

"Grayest fagoting slurped basophil lowlives foliums quality casefy. Sheols agonised, petiolar reassure grant. Autacoid ipecacs, rabbi saltires recoded. Branders serene clucks bellboys depsides. Conge."

The punctuation is added randomly. Obviously, this makes no sense whatsoever and any more than a quick glance will arise anyone's suspicions.

An example of a statistical approach is spammimic [38].This algorithm uses a "spam" grammar and the author's mimic function for context-free grammars (which generates text according to some statistical criteria) to create spam-like text which can be sent via email to