**Frequency Hopping**

Frequency hopping is the technique of improving the signal to noise ratio in a link by adding frequency diversity. The base station commands the mobile station to activate frequency hopping as the mobile station moves toward the edge of a cell or into an area of high interference. When frequency hopping is activated in the mobile station, the base station assigns the mobile station a set of RF channels, rather than a single RF channel. A frequency hopping algorithm is also assigned to the mobile and is used to inform the mobile of the pattern of the available frequencies it is to use. In a GSM/GPRS/EGPRS network, frequency hopping is specified in individual cells based on the number of frequencies offered by a specific cell. The advantages that frequency hopping offers are:

* Improved voice quality and prevention of dropped calls in GSM
* Improved data throughput in GPRS and EGPRS

**Overview**

The test set offers two basic forms of frequency hopping algorithms: cyclic and pseudo random. When set to the cyclic form, the test set and the mobile station are cycled through a fixed repeated pattern of frequencies. There are a total of 64 different frequency patterns that the test set can generate and use. The hopping sequence the mobile station uses depends on the Hopping Sequence Number (HSN) specified in the test set. An HSN of zero corresponds to the cyclic hopping sequence, and values 1 through 63 correspond to the pseudo random patterns. The ARFCNs used in the hopping sequence pattern are determined by the contents of the test set's Mobile Allocation (MA) Table. The entry of the MA Table at which the hopping sequence begins is called the Mobile Allocation Index Offset (MAIO). Note that an MAIO of zero corresponds to the first entry of the MA Table.

An MA Table is a list of the ARFCNs present in the [Cell Allocation (CA) Table](http://wireless.agilent.com/rfcomms/refdocs/gsmgprs/gen_bse_ca_table.php#CACBAFHJ) that share the same frequency band. There is a separate MA Table for each frequency band. The ARFCNs in the MA Table must be chosen from the test set's Cell Allocation (CA) Table because the CA Table contains all the ARFCNs available for use in the cell. If a handoff to another band occurs, the test set uses the MA Table for the band that it was instructed to handoff to.