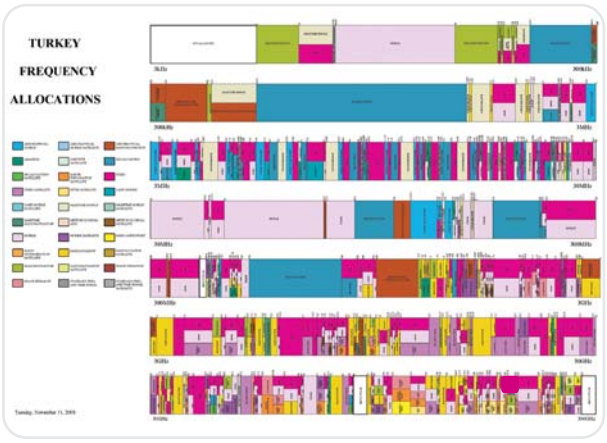
frequency assignment & planning module

SES – Frequency Assignment and Planning Module is a special module designed to fulfill your demands for frequency assignment in different services and for a successful planning of frequency spectrum. Frequency spectrum is a valuable but limited natural resource. With the development of new technologies and services, efficient assignment of frequencies and planning of the frequency spectrum has become the most important issue in favorable and effective use of this resource. Just as in other SES products, this module provides comfort during your frequency assignment and planning studies in conjunction with other modules, besides achieving cost reductions and success in resource allocation.



▶ *The graphical display of a frequency allocation table*

SES – Frequency Assignment and Planning Module has the following features and capabilities:

- Frequency Allocation Tables
- Frequency assignment and planning for Land Mobile Service
- Frequency assignment and planning for Analog Broadcasting Services
- Frequency assignment and planning for Aeronautical Services
- Frequency assignment and planning for Microwave Links
- Frequency assignment and planning in HF band.

FREQUENCY ALLOCATION TABLES

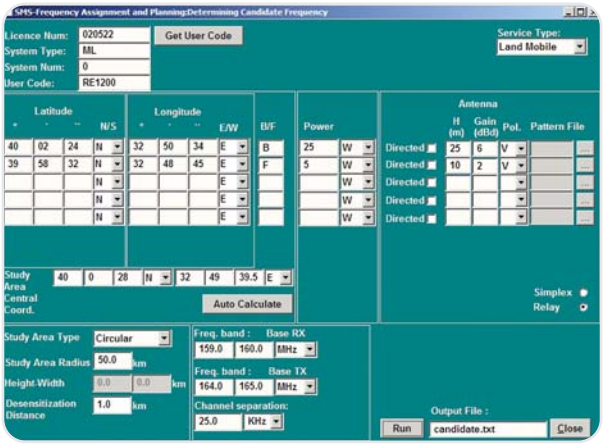
The frequency spectrum is allocated to different radiocommunication services according to the rules and regulations defined by the international, regional, and national telecommunication authorities. The frequency allocation tables of SES – Frequency Assignment and Planning Module are designed for you to view and search for the allocations, services, and footnotes based on the usage of frequency bands by ITU (International Telecommunication Union), CEPT (European Conference of Postal and Telecommunications Administrations) and national telecommunication authorities.

You can either select a frequency band to find the corresponding allocations or select an allocation to find the corresponding frequency bands. You are also able to view the description of footnote references which may apply to one or more of the allocated services in a table. The facilities are

provided for making various queries on the tables as well as updating the allocations when a change has been made by the authorities.

FREQUENCY ASSIGNMENT

SES – Frequency Assignment and Planning Module helps you to produce all necessary technical information about your new and existing stations in the study area for Land Mobile Service and Analog Broadcasting Services in order to determine candidate frequencies. For this purpose, a database search is carried out to find the existing stations which may potentially affect the new stations. The Module prepares a list including the new stations defined by the user and all other stations obtained from the database considering the study area. You can make propagation analysis for all of the stations in this list using SES – Basic Module, without any need for an external tool. After the interference analysis has been performed, the generation and selection of candidate frequencies with SES is an easy and time saving task.

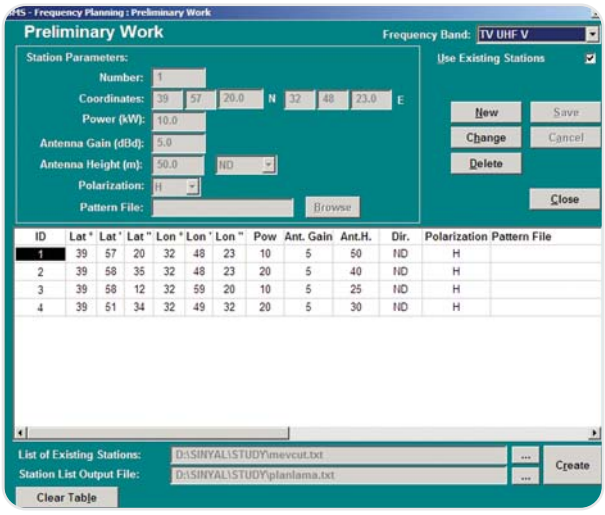


▶ *The frequency assignment and planning process in land mobile service*

With SES – Frequency Assignment and Planning Module, you are able to define your service type, study area, frequency band and station parameters such as geographical coordinates, power, and antenna characteristics. For Microwave Links and Aeronautical Services the module performs the interference and compatibility calculations by itself and generates the list of interference-free frequencies considering all other stations in your study area. In this module, both existing and proposed new stations are analyzed as potential interferers and victims.

FREQUENCY SELECTION

Frequency Selection program of SES – Frequency Assignment and Planning Module provides the user with a list of proposed interference-free channels for a new radio station in the frequency band studied. Either the user can select one of these candidate frequencies or the program can automatically select an appropriate frequency from the list. Frequency selection is the last step of the technical analysis functions in a frequency assignment process.



▶ *Preliminary work for frequency planning to define the stations included in the plan*

FREQUENCY PLANNING

The Frequency Planning program in SES – Frequency Assignment and Planning Module has two separate parts: one for defining the parameters of new stations in the plan and the second for distributing the frequency channels to individual stations. The program has the ability to include existing stations in the planning process. First part of the program does a preliminary work and produces the files that contain technical parameters of the new and

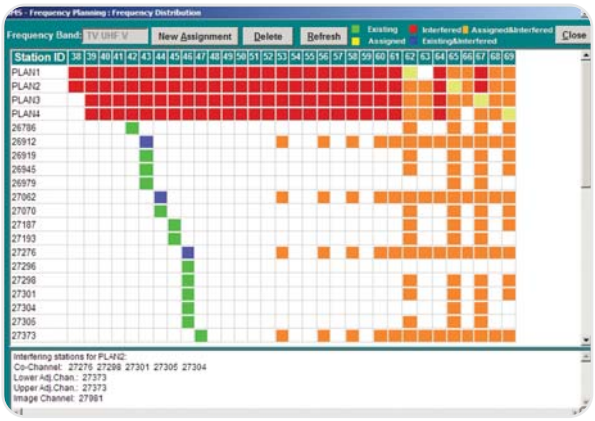
existing stations included in the plan. Parameters of the new stations are defined by the user and the technical information about the existing stations is obtained from the frequency assignment database. These files are used by the other modules of SES to perform propagation analysis and interference analysis. The second part of the Frequency Planning program takes the outputs of the interference analysis as its inputs and displays graphically the interference relationship among the stations in the plan. It also allows the user to make trials for frequency distribution to stations. During the frequency distribution, interference graph is dynamically evaluated and redisplayed each time a frequency is assigned to any station.

HF FREQUENCY ASSIGNMENT AND PLANNING

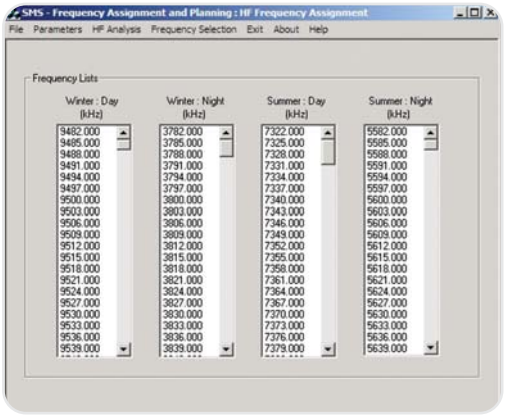
HF frequency band is generally used for radio transmissions over long distances. The transmission of waves at these frequencies are enabled by the reflection from the ionosphere. Daily, monthly and seasonal changes in the ionosphere affects the quality of transmission and therefore the appropriate frequencies for a good transmission in HF band vary depending on the time of the day and month of the year. HF Frequency Assignment and Planning program in this module considers this phenomenon and provides the user with four different frequency groups each of which is determined to be appropriate for a good reception during the day and the night and also in the summer and the winter.

With HF Frequency Assignment and Planning program, you can define transmitter and receiver parameters, antenna characteristics, atmospheric conditions, geographic coordinates, time of the day, month of the year and the sunspot number. Based on these inputs, the propagation model computes the propagation loss between the transmitter and receiver sites and the field strength at the receiver. The propagation model decsribed in the following ITU Recommendation is used for the purpose of HF frequency assignment and planning in this module:
Rec.ITU-R P.533

HF Frequency Assignment and Planning program is designed to generate a list of candidate frequencies that can be assigned to your stations under study. You can use either the Maximum Usable Frequency (MUF) and Lowest Usable Frequency (LUF) values or Frequency of Optimum Transmission (FOT) value during the generation of candidate HF frequencies for your new stations.



▶ *Illustration of the interference between proposed and existing stations of a frequency plan in TV Broadcasting service*



▶ *The list of candidate frequencies for a new radio station in HF band*