EXPERIMENTAL ACTIVITY IN THE FIELD OF DIGITAL MOBILE RADIO CARRIED OUT IN ITALY BY CSELT AND SIP

The activity plan in the field of digital mobile radio can be subdivided into four reseach programs : propagation, modulation, speech coding and system simulation and optimization

The main aim of this activity is to examine and compare possible solutions relating to the most relevant parameters of a frequency division multiple access (FDMA) architecture by computer simulations, laboratory tests and field trials. However the results on speech coding will be applicable to any digital architecture and those on modulation methods will also be valid for any narrow band solution (narrowband TDM and slow frequency hopping). An indication of the activities already defined for the four programs are given below :

A. Propagation

A propagation model for the 900 MHz band to be utilized in the calculation of the coverage area and of the interference levels, which includes slow and fast fading. This model will be validated through an appropriate field measurement campaign.

B. Modulation

Two families of modulation methods, continuous phase and frequency modulation are under investigation. Hardware modulators-demodulators, capable of handling different modulation methods (e.g. GTFM and CCPSK) and a range of bit rates, will be produced for laboratory and field test; they will be available during the first quarter of 1986. Appropriate channel coding will also be investigated.

C. Speech coding

Three families of speech coders (SBC, APC and multipulse) are under investigation ; hardware prototypes for one or two algorithms will be implemented taking into account simulation results.

D. System simulation and optimization

System simulation with various coverage plans (omnidirectional and sectorial antennae) will be carried out in order to optimize the system parameters. Field tests of a digital mobile radio connection will be carried out in order to get practical results especially concerning quality.

In addition to the above mentioned programs an activity on network configuration and signalling is envisaged.