

The invention relates to a method according to the preamble to the Claim.

Within the framework of the prior art radio data system (RDS) as is described, for example, in the technical document No. 3244 of the European Broadcast Union, it is inter alia possible to transfer a list of alternative frequencies (AF) as the contents of a data signal modulated onto a 57 kHz auxiliary carrier. This information is intended, in particular, for mobile reception and states on which frequencies a specific programme is radiated by the same transmitter chain (e.g. BR 3). It is thus possible for suitably constructed receivers with a memory to store this list and so to reduce the time for tuning the receiver to the respective optimum frequency of this list (e.g. according to optimum reception conditions). By agreement, the list is limited to a maximum of 25 frequencies or channel numbers. In the case of transmitter networks having more than 25 transmitters, as with the Bavaria 3 network of transmitters, for example, it is not possible to emit one list which is common to all the transmitters in the network; instead, each transmitter or each group of spatially adjacent transmitters must send out its own list which may not contain more than 25 frequencies. The difficulty with this is that, by reason of the multiplicity of demodulator paths in the transmitter network structure within the radio companies formed under public law within the Federal Republic of Germany, the list issued by the master transmitter may not be appropriate to the daughter transmitter; it has to be filtered out according to the demodulator receiver and replaced by a list which is appropriate to the particular daughter transmitter. This filtering-out and re-feeding increases costs. In addition, filtering-out also impairs the quality of the programme signal. In the case of transmitter chains with fewer than 25 transmitters, it would be possible to incorporate all the transmitter frequencies in one joint list, but if there are

very many transmitter frequencies, this would lead to correspondingly long receiver tuning times.

In contrast, the object of the invention is to indicate a method of the type mentioned at the outset in which filtering and re-feeding of the list of alternative frequencies can be avoided and, as a rule, a relatively short tuning time of the receivers can be guaranteed.

According to the invention, this object is achieved by the characterising features of the Claim.

In the method according to the invention, each transmitter radiates not only its own list but sequentially also the lists of all the other stations in the same chain, the operating frequencies of the individual transmitters being in each case at the start of the individual lists. Therefore after reception of all the lists, the receiver can, on the basis of its tuning frequency at the given time, select the list belonging to the transmitter adjusted at the time by comparing the tuning frequency with the first frequency of each list within the sequence of lists. With demodulator reception, therefore, filtering and re-feeding become superfluous. Furthermore, the receiver also recognises the alternative frequencies on which, when leaving the area of supply of the transmitter adjusted at the time, it can continue to receive the same programme without having to check the alternative frequencies of the other lists. Switchover to a different transmitter in the same chain can generally be carried out very rapidly in this way.

The invention will be explained in greater detail with reference to the drawing which shows a diagrammatic view of the sequence of lists of alternative frequencies emitted by each transmitter in a chain of transmitters. The example in question is based on a radio signal into which an auxiliary

carrier of 57 kHz is incorporated. The auxiliary carrier may contain amplitude modulation, the content of which is recognition of a traffic signal. As modulation or as further modulation, there is imprinted on the auxiliary carrier a data signal which is coded in a specific manner which is not of greater interest here. This data signal is transferred concurrently by all the transmitters in a chain of transmitters, for example by all 29 transmitters of the "Bavaria 3" chain in the area of supply within the Bavarian Radio system. The concurrently transferred data signal contains a sequence of lists of alternative frequencies for all the transmitters in the chain; in the example shown this is the list of transmitter No. 1, the list of transmitter No. 2, the list of transmitter No. 3 up to the list of transmitter No. 29 in the case of a chain consisting of 29 transmitters. Each list is specifically tailored to the particular transmitter and, by agreement within the European Broadcast Union, contains a maximum of 25 frequencies although the number will generally be considerably fewer. According to the invention, each list starts with the operating frequency of the associated transmitter, i.e. in the case of the list for transmitter No. 1, there is at the beginning the operating frequency of transmitter No. 1, e.g. 98.5 MHz. As mentioned, the illustrated sequence of 29 lists of each transmitter in the chain of transmitters is transferred as a data signal.

The receiver receives and decodes the transferred data signal, i.e. the sequence of lists of alternative frequencies. In order to select, from the sequence of lists received, the list valid for the particular station which is tuned at the time, the receiver only has to compare the first frequency on each list with the particular tuning frequency at the time and, even with 29 lists, this can be carried out in an extremely short time. This selection can take place either in on-line operation or in off-line operation, i.e.

with or without the intermediate storage of the received sequence of lists. In each case, the selected list is stored. During the processing of the received and possibly intermediately stored sequence of lists, the receiver selects that list of which the first frequency (equal to the working frequency of the associated transmitter) coincides with the particular tuning frequency at the time. If the first frequency on several lists coincides with the adjusted operating frequency, then all these lists must be selected. Only the selected list(s) is (are) used for the subsequent optimising of tuning. This tuning process takes place either by a corresponding command of the listener or automatically if, for instance, the station being received at the time is no longer worthy of reception. During the tuning process, the receiver automatically tunes into the alternative frequencies mentioned in the selected list(s) and selects that alternative frequency which offers the best possible reception.

By means of the data signal transferred according to the invention, it is possible, even with transmitter chains of more than the established maximum number of alternative frequencies, to carry out rapid optimisation of the tuning of mobile receivers without any need to filter out and re-feed frequency lists at the location of daughter transmitters.

Claim

A method of transferring digital information within a radio signal for optimum tuning of mobile receivers, wherein the digital information indicates, with respect to the radio transmitter emitting the radio signal, the operating frequencies of alternative radio transmitters which can be received with the same programme content, in the form of a "list of alternative frequencies" (frequency list), characterised in that, in each frequency list, the operating frequency of the respective radio transmitter is put in front of the alternative frequencies so that, for a mobile receiver, a clear allocation of the operating frequencies of received transmitters to associated alternative frequencies can be established and in that all frequency lists which are optimized in this way for the individual radio transmitters with identical programme content are emitted by each of these transmitters as a sequence of lists.