

CLAIMS

1 – A method for transmitting data in a communication system operating in the HF band comprising a link layer and a physical layer, said system comprising a transmitter and a receiver, said transmitter comprising at least one scheduler,
 5 wherein the method is characterized in that it comprises:

- ~~a step of segmenting at least one first data stream F_1 , and one second data stream F_2 , each of the streams having a service constraint, each being segmented into a plurality of data sub-blocks $F_i B_i$,~~
- 10 ~~a step in which the data sub-blocks are transformed into a first frame TF_1 and a second frame TF_2 , then a step of coding and interleaving the first frame TF_1 and of the second frame TF_2 , producing sub-frames STF_{16} , STF_{26} by executing the following steps:~~
 - ~~• segmenting (311) the first stream F_1 into a plurality of blocks $F_1 B_i$,~~
 - 15 ~~• preparing (312) a first frame TF_1 by adding information required for the format used for the transmission,~~
 - ~~• performing a coding and an interleaving (313) of the data frame, TF_{16} , the parameters of which are adapted to the formatting of the frame, producing sub-frames STF_{16}~~
 - 20 ~~• segmenting (321) the second data stream F_2 into a plurality of blocks $F_2 B_i$,~~
 - ~~• preparing (322) a first frame TF_2 by adding information required for the format used for the transmission,~~
 - ~~• performing a coding and an interleaving (323) of the data frame, TF_{26} , the parameters of which are adapted to the formatting of the frame, producing~~
 - 25 ~~(324) sub-frames STF_{26} then~~
 - ~~a step of generation of a frame to be transmitted by executing the following steps:~~
 - ~~• preparing the data of the physical frame PHY to be transmitted,~~
 - 30 ~~according to instructions set by a scheduler (315, 325) by mixing sub-frames STF_{16} of the data stream F_1 with m sub-frames STF_{26} of the data stream F_2 producing a frame F_3 comprising sub-frames STF_{16} and sub-frames STF_{26} ,~~

~~transmitting (330) the duly prepared coded T_3 and interleaved T_{3ee} frames, by alternating the frame transmission (331), TX/RX half-duplex switchover (332), the frame reception (333).~~

5 ~~2—The method as claimed in claim 1, characterized in that the step of coding and interleaving of the data frames is performed at the level of the physical layer of the transmission system.~~

10 ~~3—The method as claimed in claim 1, characterized in that it comprises an error correcting coding step (316, 326), generating coded sub-frames F_{3c} prior to the interleaving step.~~

15 ~~4—The method as claimed in claim 1, characterized in that the data streams are made up of non-time-constrained data stream G_1 and time-constrained data stream G_2 and wherein that it comprises at least the following steps:
at the level of the link layer~~

20 ~~• segmenting the data streams having compatible non-time-constrained characteristics G_1 (410411) into a plurality of blocks $G_{1A}Bi$, $G_{1B}Bi$, $G_{1C}Bi$, (411), a sub-block corresponding to a unit cell for an ARQ retransmission process,~~

~~• preparing (412₁) one or more data frames TG_1 , by adding headers required for transmission format $T'G_1$,~~

25 ~~• performing (413) a coding and an interleaving for eachthe data frame TG_{1c} , and coding and interleaving the data frame $T'G_{1c}$ separately, according to the quality of service requirements of the service concerned for a given application and for a data stream, giving sub-frames STG_{1Ac} , STG_{1Bc} , STG_{1Cc}~~

~~• segmenting each of the coded and interleaved data frames TG_{1c} , $T'G_{1c}$~~

30 ~~• segmenting the data streams having compatible time-constrained characteristics G_2 (420, 421) into a plurality of blocks $G_{2A}Bi$, $G_{2B}Bi$,~~

~~• preparing (422₁) by adding a header one or more corresponding data frames TG_2 , $T'G_2$~~

- 5 • executing (423) a coding and interleaving step for each the data frame TG_{2Ac} , TG_{2Bc} , and coding and interleaving the data frame $T'G_2$ separately,

• segmenting (424) each of the coded and interleaved data frames TG_{2c} , $T'G_{2c}$,
 - preparing (425) from the sub-frames resulting from the segmentation steps, the data of the frame PHY to be transmitted,

• preparing (426) a plurality of frames T_3G by mixing the sub-frames obtained from the stream G_1 and from the stream G_2 , namely the sub-

10 frames STG_{1Ac} , STG_{1Bc} , STG_{1Cc} , STG_{2Ac} , STG_{2Bc} ,

at the level of physical layer

 - ~~interleaving each frame T_3G ,~~
 - transmitting the frames T_3G .
- 15 2 – The method as claimed in claim 1, wherein it comprises an error correcting coding step (416, 426), generating coded sub-frames T_3G_c at the level of the physical layer before step of transmission.
- 20 35 – The method as claimed in claim 14, ~~wherein~~ characterized in that the step of transmission of the frames T_3G comprises a step of ~~is executed by~~ transmitting a first frame, followed by an RX/TX half-duplex switchover step, followed by a frame receiving step in a reception time slot, followed, by the transmission of a second frame T_3G .
- 25 ~~6 – The method as claimed in one of claims 4 or 5, characterized in that it comprises an error correcting coding step prior to the step of interleaving of the frames T_3G .~~
- 30 47 – The method as claimed in claim 14, ~~wherein~~ characterized in that the step of transmission of the frames T_3G comprises a frame transmission step, followed by a guard time, followed by a transmission of a second frame, followed by a guard time.

58 – The method as claimed in claim 14, ~~wherein~~ characterized in that it comprises a step of monitoring or listening to the data received during a time corresponding to the half-duplex switchover method and of taking into account
 5 the time-constrained data of the time-constrained service such as speech G_2 by processing them with the non-constrained stream data.

69 – The method as claimed in claim 1, implemented in a data communication system, ~~wherein~~ characterized in that the first stream is a non-constrained
 10 stream H_1 , H_2 and the second stream is a constrained stream and in that only the non-constrained stream is coded and interleaved (513) at the level of the physical link layer of a data transmission system.

740 – A system for transmitting a plurality of multiservice streams in the HF
 15 band comprising at least the following elements: a transmitter (1) comprising at least one scheduler (10) adapted for executing the steps of the method as claimed in one of claims 1 to 69, for preparing the data frames of the multiservice streams prior to transmission over an HF channel and a receiver (15).