

transmissions in a large duty cycle; and is also efficient for missions using continuous operations of payload transmission.

In order to prevent the system from using 2 waveforms simultaneously all the control information may be mixed in the SCPC (Single channel per carrier) waveform, when payload transmissions are used.

Dynamic allocation of spectrum may be achieved by using ACM/VCM technology which allows spectrum minimization on demand. Spectrum allocation may be effected by a dynamic resource management system.

~~In accordance with an aspect of the presently disclosed subject matter, there is provided a communication system comprising a satellite communication apparatus providing communication services to at least a first set of communicants, the first set of communicants including a first plurality of communicants, wherein the communication services are provided to each of the communicants in accordance with a spectrum allocation corresponding thereto, thereby to define a first plurality of spectrum allocations apportioning a first predefined spectrum portion among the first set of communicants; and a Dynamic Spectrum Allocation apparatus operative to dynamically modify at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding the spectrum portion.~~ According to a first aspect, there is provided a communication system operative in conjunction with Satellite Communication apparatus providing communication services to at least a first set of communicants, said first set of communicants including a first plurality of communicants, wherein said communication services are provided to each of said communicants in accordance with a spectrum allocation corresponding thereto, thereby to define a first plurality of spectrum allocations apportioning a first predefined spectrum portion among the first set of communicants; the system comprising: Dynamic Spectrum Allocation apparatus operative to dynamically modify, once per time period, wherein at least one time period is within an order of magnitude of no more than one minute, at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion, wherein said first set of communicants includes communicants which want to share bandwidth such that different communicants can communicate high definition images at different times and wherein said Dynamic Spectrum Allocation apparatus is operative to dynamically modify at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion, so as to enable different communicants, from

among said first set, to communicate high definition images at different times, wherein plurality of communicants are all sent to a single high-bandwidth task, however, at any given time window, only a predetermined number of the communicants need actually to transmit high-bandwidth information, and wherein said Dynamic Spectrum Allocation apparatus provides each of said plurality of communicants with an indication of an anticipated time window in which wide band width applications are to be employed, thereby to reduce the required effective bandwidth by a factor of k, by separating command and control information, having a low data rate, from payload information having a high data rate by including all communicants as part of a command and control network and if there are requirements to use high data rate, assigning a new spectrum to a relevant communicant for transmission of payload data including provision of a video channel dynamically for a dynamic modification of the individual communicant's current spectrum allocation.

In accordance with an embodiment of the presently disclosed subject matter, there is provided a system wherein the first plurality of communicants comprises at least one mobile vehicle equipped with apparatus for mobile telephone via satellite.

In accordance with an embodiment of the presently disclosed subject matter, there is further provided a system wherein the communication services include provision of at least one narrow-band communication dedicated channel to at least one of the first plurality of communicants and wherein the Dynamic Spectrum Allocation apparatus is operative to dynamically provide use of the narrow-band communication dedicated channel to at least one of the first plurality of communicants.

In accordance with an embodiment of the presently disclosed subject matter, there is still further provided a system wherein the communication services include provision of at least one video channel to at least one of the first plurality of communicants and

wherein the Dynamic Spectrum Allocation apparatus is operative to dynamically provide use of the video channel to at least one of the first plurality of communicants.

In accordance with an embodiment of the presently disclosed subject matter, there is still further provided a system wherein the communication services include provision of a Dynamic Spectrum Allocation control channel to at least one of the first plurality of communicants and wherein said Dynamic Spectrum Allocation apparatus is operative to receive, over the control channel, and recognize, at least one request from at least one individual communicant from among the first plurality of communicants for a dynamic modification of the individual communicant's current spectrum allocation.

In accordance with an embodiment of the presently disclosed subject matter, there is still further provided a system wherein the Dynamic Spectrum Allocation control channel is a portion of an additional channel which is utilized in accordance with a protocol and the protocol supports recognition of the request for a dynamic modification of a current spectrum allocation.

In accordance with an embodiment of the presently disclosed subject matter, there is still further provided a system wherein the additional channel comprises at least one of: an audio channel, a video channel; and a control channel.

~~In accordance with an aspect of the presently disclosed subject matter, there is still further provided a method for providing communication comprising providing a satellite communication apparatus providing communication services to at least a first set of communicants, the first set of communicants including a first plurality of communicants, wherein the communication services are provided to each of the communicants in accordance with a spectrum allocation corresponding thereto, thereby to define a first plurality of spectrum allocations apportioning a first predefined spectrum portion among the first set of communicants; and providing a Dynamic Spectrum Allocation apparatus operative to dynamically modify at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding the spectrum portion.~~ According to a second aspect, there is provided a method for providing communication using Satellite Communication apparatus operative for providing communication services to at least a first set of communicants, said first set of communicants including a first plurality of communicants, the method comprising: providing communication services to each of said communicants in accordance with a spectrum allocation corresponding thereto, thereby to define a first plurality of spectrum allocations apportioning a first predefined spectrum

portion among the first set of communicants; and including providing Dynamic Spectrum Allocation apparatus operative to dynamically modify, once per time period, wherein at least one time period is within an order of magnitude of no more than one minute, at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion, wherein said first set of communicants includes communicants which want to share bandwidth such that different communicants can communicate high definition images at different times and wherein said Dynamic Spectrum Allocation apparatus is operative to dynamically modify at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion, so as to enable different communicants, from among said first set, to communicate high definition images at different times, wherein plurality of communicants are all sent to a single high-bandwidth task, however, at any given time window, only a predetermined number of the communicants need actually to transmit high-bandwidth information, and wherein said Providing Dynamic Spectrum Allocation apparatus includes provision by each of said plurality of communicants of an indication of an anticipated time window in which wide band width applications are to be employed, thereby to reduce the required effective bandwidth by a factor of k, by separating the command and control information, having a low data rate, from payload information having a high data rate by including all communicants as part of a command and control network and if there are requirements to use high data rate, assigning a new spectrum to a relevant communicant for transmission of payload data including provision of a video channel dynamically for a dynamic modification of the individual communicant's current spectrum allocation.

In accordance with an embodiment of the presently disclosed subject matter, there is still further provided a method wherein the communication services include provision of a Dynamic Spectrum Allocation control channel to at least one of the first plurality of

In accordance with an embodiment of the presently disclosed subject matter, there is still further provided a system wherein the at least one dynamic spectrum allocation channel is defined as at least one separate channel, allocation within which is independent of allocation within at least one additional channel.

In accordance with an embodiment of the presently disclosed subject matter, there is still further provided a system wherein the at least one dynamic spectrum allocation channel is defined as at least first and second separate channels, and wherein the Dynamic Spectrum Allocation apparatus is operative to receive, over the first separate channel, and to recognize at least one request from at least a first communicant from among the first plurality of communicants for a dynamic modification of the first communicant's current spectrum allocation; and to receive, over the second separate channel, and to recognize, at least one request from at least a second communicant from among the second plurality of communicants for a dynamic modification of the second communicant's current spectrum allocation.

In accordance with an embodiment of the presently disclosed subject matter, there is still further provided a system wherein different users operating simultaneously in a CDMA system are distinguished between using cross correlations mechanisms of signals coming into the system receiver.

In accordance with an embodiment of the presently disclosed subject matter, there is still further provided a system wherein a receiver cancels at least one strong well known signal, and subsequently, the remaining weak signals are decoded in parallel with the strong signal, thereby allowing a relatively large number of users to be supported.

~~In accordance with an aspect of the presently disclosed subject matter, there is still further provided a computer program product, comprising a computer usable medium having a computer readable program code embodied therein, the computer readable program code adapted to be executed to implement any of the methods shown and described herein.~~ According to a third aspect, there is provided a computer program product, comprising a non-transitory tangible computer readable medium having computer readable program code embodied therein, the computer readable program code adapted to be executed to implement a method for providing communication using Satellite Communication apparatus operative for providing communication services to at least a first set of communicants, said first set of communicants including a first plurality of communicants, the method comprising: providing communication services to each of said communicants in accordance with a spectrum

allocation corresponding thereto, thereby to define a first plurality of spectrum allocations apportioning a first predefined spectrum portion among the first set of communicants; and including providing Dynamic Spectrum Allocation apparatus operative to dynamically modify, once per time period, wherein at least one time period is within an order of magnitude of no more than one minute, at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion, wherein said first set of communicants includes communicants which want to share bandwidth such that different communicants can communicate high definition images at different times and wherein said Dynamic Spectrum Allocation apparatus is operative to dynamically modify at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion, so as to enable different communicants, from among said first set, to communicate high definition images at different times, wherein plurality of communicants are all sent to a single high-bandwidth task, however, at any given time window, only a predetermined number of the communicants need actually to transmit high-bandwidth information, and wherein said providing Dynamic Spectrum Allocation apparatus includes provision by each of said plurality of communicants of an indication of an anticipated time window in which wide band width applications are to be employed, thereby to reduce the required effective bandwidth by a factor of k, by separating the command and control information, having a low data rate, from payload information having a high data rate by including all communicants as part of a command and control network and if there are requirements to use high data rate, assigning a new spectrum to a relevant communicant for transmission of payload data including provision of a video channel dynamically for a dynamic modification of the individual communicant's current spectrum allocation.

According to certain embodiments, if n users are to be served e.g. by a hub, a strongest signal from among n signals generated by the n users respectively is identified, processed and then cancelled using a interference cancellation receiver; then a next strongest signal from among the n signals is identified, processed and cancelled using a

CLAIMS

1. A communication system comprising:

5 Satellite Communication apparatus providing communication services to at least a first set of communicants, said first set of communicants including a first plurality of communicants, wherein said communication services are provided to each of said communicants in accordance with a spectrum allocation corresponding thereto, thereby to define a first plurality of spectrum allocations apportioning a first predefined spectrum
10 portion among the first set of communicants; and

 Dynamic Spectrum Allocation apparatus operative to dynamically modify, once per time period, wherein each time period is within an order of magnitude of one minute, at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion.

15 2. A system according to claim 1 wherein said first plurality of communicants comprises at least one mobile vehicle equipped with apparatus for mobile telephone via satellite.

20 3. A system according to claim 1 wherein said communication services include provision of at least one narrow-band communication dedicated channel to at least one of the first plurality of communicants and wherein said Dynamic Spectrum Allocation apparatus is operative to dynamically provide use of said narrow-band communication dedicated channel to at least one of the first plurality of communicants.

25 4. A system according to claim 1 wherein said communication services include provision of at least one video channel to at least one of the first plurality of communicants and wherein said Dynamic Spectrum Allocation apparatus is operative to dynamically provide use of said video channel to at least one of the first plurality of
30 communicants.

5. A system according to claim 1 wherein said communication services include provision of a Dynamic Spectrum Allocation control channel to at least one of the first plurality of communicants and wherein said Dynamic Spectrum Allocation apparatus is operative to receive, over the control channel, and recognize, at least one request from at least one individual communicant from among the first plurality of communicants for a dynamic modification of the individual communicant's current spectrum allocation.

6. A system according to claim 5 wherein said Dynamic Spectrum Allocation control channel is a portion of an additional channel which is utilized in accordance with a protocol and said protocol supports recognition of said request for a dynamic modification of a current spectrum allocation.

7. A system according to claim 6 wherein said additional channel comprises at least one of: an audio channel, a video channel; and a control channel.

8. A method for providing communication comprising:
providing Satellite Communication apparatus providing communication services to at least a first set of communicants, said first set of communicants including a first plurality of communicants, wherein said communication services are provided to each of said communicants in accordance with a spectrum allocation corresponding thereto, thereby to define a first plurality of spectrum allocations apportioning a first predefined spectrum portion among the first set of communicants; and

Providing Dynamic Spectrum Allocation apparatus operative to dynamically modify, once per time period, wherein each time period is within an order of magnitude of one minute, at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion.

9. A method according to claim 8 wherein said communication services include provision of a Dynamic Spectrum Allocation control channel to at least one of the first plurality of communicants and wherein said Dynamic Spectrum Allocation apparatus is

operative to receive, over the control channel, and recognize, at least one request from at least one individual communicant from among the first plurality of communicants for a dynamic modification of the individual communicant's current spectrum allocation.

5 10. A method according to claim 9 wherein said Dynamic Spectrum Allocation control channel is a portion of an additional channel which is utilized in accordance with a protocol and said method includes modifying said protocol to support recognition of said request for a dynamic modification of a current spectrum allocation.

10 11. A system according to claim 1 wherein said Dynamic Spectrum Allocation apparatus comprises a dynamic resources management system.

12. A system according to claim 1 wherein ACM/VCM technology is used to provide spectrum minimization on demand.

15 13. A system according to claim 1 having an architecture which, relative to a star topology's architecture, supports more users working simultaneously, using SIC technology.

20 14. A system according to claim 1 wherein frequency cancellation technology is used to ensure that inbound and outbound bandwidths generally overlap thereby to decrease the frequency bandwidth used.

25 15. A system according to claim 1 wherein said Dynamic Spectrum Allocation apparatus dynamically modifies a spectrum allocation of an individual user and wherein said user is operative to switch at least one waveform accordingly, "on the fly".

30 16. A system according to claim 1 wherein at least one of the first plurality of communicants, rather than using PTP protocols hence consuming large portions of the spectrum, instead become part of a communication network by joining the network via at least one command and control channel.

17. A system according to claim 16 wherein at least one high data rate-requesting user uses an instantaneous SCPC waveform to transmit at least one payload.

5 18. A method according to claim 8 and also comprising using said Dynamic Spectrum Allocation apparatus and said Satellite Communication apparatus for a satellite telephone application.

10 19. A method according to claim 8 and also comprising using said Dynamic Spectrum Allocation apparatus and said Satellite Communication apparatus for a satellite television application.

15 20. A method according to claim 8 and also comprising using said Dynamic Spectrum Allocation apparatus and said Satellite Communication apparatus for a mobile satellite application.

20 21. A method according to claim 8 and also comprising using said Dynamic Spectrum Allocation apparatus and said Satellite Communication apparatus for a satellite radio application.

22. A method according to claim 8 and also comprising using said Dynamic Spectrum Allocation apparatus and said Satellite Communication apparatus for an amateur radio application.

25 23. A method according to claim 8 and also comprising using said Dynamic Spectrum Allocation apparatus and said Satellite Communication apparatus for a satellite Internet application.

30 24. A method according to claim 10 wherein said additional channel comprises at least one of: an audio channel, a video channel; and a control channel.

25. A system according to claim 1 wherein the at least first set of communicants includes at least first and second sets of communicants, said second set of communicants including a second plurality of communicants, wherein said communication services are provided to each of said second set of communicants in accordance with a spectrum allocation
5 corresponding thereto, thereby to define a second plurality of spectrum allocations apportioning a second predefined spectrum portion among the second set of communicants,

and wherein said dynamic spectrum allocation apparatus is also operative to dynamically modify at least one spectrum allocation corresponding to at least one of the
10 second plurality of communicants without exceeding said spectrum portion.

26. A system according to claim 5 wherein said dynamic spectrum allocation channel is defined as at least one separate channel, allocation within which is independent of allocation within at least one additional channel.

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27. A system according to claim 26 wherein said additional channel comprises at least one of: an audio channel, a video channel; and a control channel.

28. A system according to claim 3 wherein said narrow-band communication
20 dedicated channel comprises an audio channel.

29. A method according to claim 8 wherein said first set of communicants includes communicants which want to share bandwidth such that different communicants can communicate high definition images at different times and wherein said Dynamic
25 Spectrum Allocation apparatus is operative to dynamically modify at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion, so as to enable different communicants, from among said first set, to communicate high definition images at different times.

30. A system according to claim 25 wherein said communication services include
30 provision of at least one Dynamic Spectrum Allocation control channel to at least one of

the first and second pluralities of communicants and wherein said Dynamic Spectrum Allocation apparatus is operative to receive, over the control channel, and recognize, at least one request from at least one individual communicant from among the first and second pluralities of communicants for a dynamic modification of the individual communicant's current spectrum allocation.

31. A system according to claim 30 wherein said at least one dynamic spectrum allocation channel is defined as at least one separate channel, allocation within which is independent of allocation within at least one additional channel.

32. A system according to claim 31 wherein said at least one dynamic spectrum allocation channel is defined as at least first and second separate channels, and wherein said Dynamic Spectrum Allocation apparatus is operative:

to receive, over the first separate channel, and to recognize, at least one request from at least a first communicant from among the first plurality of communicants for a dynamic modification of the first communicant's current spectrum allocation; and

to receive, over the second separate channel, and to recognize, at least one request from at least a second communicant from among the second plurality of communicants for a dynamic modification of the second communicant's current spectrum allocation.

33. A system according to claim 13 wherein different users operating simultaneously in a CDMA system are distinguished between using cross correlations mechanisms of signals coming into the system receiver.

34. A system according to claim 13 wherein a receiver cancels at least one strong well known signal, and subsequently, the remaining weak signals are decoded in parallel with the strong signal, thereby allowing a relatively large number of users to be supported.

35. A system according to claim 13 wherein, if n users are to be served, a strongest signal from among n signals generated by the n users respectively is identified, processed

and then cancelled using a interference cancellation receiver; then a next strongest signal from among the n signals is identified, processed and cancelled using a interference cancellation receiver, and so on until all of the n signals have been processed.

5 36. A system according to claim 1 wherein the dynamic spectrum allocation apparatus obtains, from each individual user from among a plurality of users associated with a hub, high/low band scheduling information, typically including an indication of an anticipated time window in which wide band width applications are to be employed by the individual user, and wherein said dynamic spectrum allocation apparatus is operative to allocate
10 spectrum such that at least once, a wide band is allocated to a first user within a first time window which the first user has indicated to require a wide bandwidth application, and subsequently, within a second time window, said wide band is allocated to a second user which has indicated that said second time window requires a wide bandwidth application.

15 37. A system according to claim 12 wherein the size of spectrum assigned to an individual user is modified dynamically using adaptive coding modulation.

38. A system according to claim 14 wherein, given a transmitted signal having a first bandwidth, signal interference cancellation (SIC) technology is used to perform a
20 bandwidth conversion of each received signal so as to cause a bandwidth of the received signal to operate within the first bandwidth thereby to decrease total bandwidth employed.

39. A computer program product, comprising a computer usable medium having a
25 computer readable program code embodied therein, said computer readable program code adapted to be executed to implement any of the methods shown and described herein.

Claims:

1. A communication system operative in conjunction with Satellite Communication apparatus providing communication services to at least a first set of communicants, said first set of communicants including a first plurality of communicants, wherein said communication services are provided to each of said communicants in accordance with a spectrum allocation corresponding thereto, thereby to define a first plurality of spectrum allocations apportioning a first predefined spectrum portion among the first set of communicants;

the system comprising: Dynamic Spectrum Allocation apparatus operative to dynamically modify, once per time period, wherein at least one time period is within an order of magnitude of no more than one minute, at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion,

wherein said first set of communicants includes communicants which want to share bandwidth such that different communicants can communicate high definition images at different times and wherein said Dynamic Spectrum Allocation apparatus is operative to dynamically modify at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion, so as to enable different communicants, from among said first set, to communicate high definition images at different times,

wherein plurality of communicants are all sent to a single high-bandwidth task, however, at any given time window, only a predetermined number of the communicants need actually to transmit high-bandwidth information,

and wherein said Dynamic Spectrum Allocation apparatus provides each of said plurality of communicants with an indication of an anticipated time window in which wide band

width applications are to be employed, thereby to reduce the required effective bandwidth by a factor of k , by separating command and control information, having a low data rate, from payload information having a high data rate by including all communicants as part of a command and control network and if there are requirements to use high data rate, assigning a new spectrum to a relevant communicant for transmission of payload data including provision of a video channel dynamically for a dynamic modification of the individual communicant's current spectrum allocation.

2. A system according to claim 1 wherein said first plurality of communicants comprises at least one mobile vehicle equipped with apparatus for mobile telephone via satellite.

3. A system according to claim 1 wherein said communication services include provision of at least one narrow-band communication dedicated channel to at least one of the first plurality of communicants and wherein said Dynamic Spectrum Allocation apparatus is operative to dynamically provide use of said narrow-band communication dedicated channel to at least one of the first plurality of communicants.

4. A system according to claim 1 wherein said communication services include provision of at least one video channel to at least one of the first plurality of communicants and wherein said Dynamic Spectrum Allocation apparatus is operative to dynamically provide use of said video channel to at least one of the first plurality of communicants.

5. A system according to claim 1 wherein said communication services include provision of a Dynamic Spectrum Allocation control channel to at least one of the first plurality of communicants and wherein said Dynamic Spectrum Allocation apparatus is operative to receive, over the control channel, and recognize, at least one request from at least one individual

communicant from among the first plurality of communicants for a dynamic modification of the individual communicant's current spectrum allocation.

6. A system according to claim 5 wherein said Dynamic Spectrum Allocation control channel is a portion of an additional channel which is utilized in accordance with a protocol and said protocol supports recognition of said request for a dynamic modification of a current spectrum allocation.

7. A method for providing communication using Satellite Communication apparatus operative for providing communication services to at least a first set of communicants, said first set of communicants including a first plurality of communicants, the method comprising:

providing communication services to each of said communicants in accordance with a spectrum allocation corresponding thereto, thereby to define a first plurality of spectrum allocations apportioning a first predefined spectrum portion among the first set of communicants; and including

providing Dynamic Spectrum Allocation apparatus operative to dynamically modify, once per time period, wherein at least one time period is within an order of magnitude of no more than one minute, at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion,

wherein said first set of communicants includes communicants which want to share bandwidth such that different communicants can communicate high definition images at different times and wherein said Dynamic Spectrum Allocation apparatus is operative to dynamically modify at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion, so as to enable different

communicants, from among said first set, to communicate high definition images at different times,

wherein plurality of communicants are all sent to a single high-bandwidth task, however, at any given time window, only a predetermined number of the communicants need actually to transmit high-bandwidth information,

and wherein said Providing Dynamic Spectrum Allocation apparatus includes provision by each of said plurality of communicants of an indication of an anticipated time window in which wide band width applications are to be employed, thereby to reduce the required effective bandwidth by a factor of k , by separating the command and control information, having a low data rate, from payload information having a high data rate by including all communicants as part of a command and control network and if there are requirements to use high data rate, assigning a new spectrum to a relevant communicant for transmission of payload data including provision of a video channel dynamically for a dynamic modification of the individual communicant's current spectrum allocation.

8. A method according to claim 7 wherein said communication services include provision of a Dynamic Spectrum Allocation control channel to at least one of the first plurality of communicants and wherein said Dynamic Spectrum Allocation apparatus is operative to receive, over the control channel, and recognize, at least one request from at least one individual communicant from among the first plurality of communicants for a dynamic modification of the individual communicant's current spectrum allocation.

9. A method according to claim 8 wherein said Dynamic Spectrum Allocation control channel is a portion of an additional channel which is utilized in accordance with a

protocol and said method includes modifying said protocol to support recognition of said request for a dynamic modification of a current spectrum allocation.

10. A system according to claim 1 wherein said Dynamic Spectrum Allocation apparatus comprises a dynamic resources management system.

11. A system according to claim 1 wherein ACM/VCM technology is used to provide spectrum minimization on demand.

12. A system according to claim 1 having an architecture which, relative to a star topology's architecture, supports more users working simultaneously, using SIC technology.

13. A system according to claim 1 wherein frequency cancellation technology is used to ensure that inbound and outbound bandwidths generally overlap thereby to decrease the frequency bandwidth used.

14. A system according to claim 1 wherein said Dynamic Spectrum Allocation apparatus dynamically modifies a spectrum allocation of an individual user and wherein said user is operative to switch at least one waveform accordingly, "on the fly".

15. A system according to claim 1 wherein at least one of the first plurality of communicants, rather than using PTP protocols hence consuming large portions of the spectrum, instead become part of a communication network by joining the network via at least one command and control channel.

16. A system according to claim 15 wherein at least one high data rate-requesting user uses an instantaneous SCPC waveform to transmit at least one payload.

17. A method according to claim 7 and also comprising using said Dynamic Spectrum Allocation apparatus and said Satellite Communication apparatus for a satellite telephone application.

18. A method according to claim 7 and also comprising using said Dynamic Spectrum Allocation apparatus and said Satellite Communication apparatus for a mobile satellite application.

19. A method according to claim 7 and also comprising using said Dynamic Spectrum Allocation apparatus and said Satellite Communication apparatus for a satellite Internet application.

20. A system according to claim 1 wherein at least one Dynamic Spectrum Allocation control channel is provided to at least one of first and second pluralities of communicants and wherein said Dynamic Spectrum Allocation apparatus is operative to receive, over the control channel, and recognize, at least one request from at least one individual communicant from among the first and second pluralities of communicants for a dynamic modification of the individual communicant's current spectrum allocation.

21. A system according to claim 1 wherein the dynamic spectrum allocation apparatus obtains, from each individual user from among a plurality of users associated with a hub, high/low band scheduling information, including at least one of: an indication of an anticipated time window in which wide band width applications are to be employed by the individual user; and

an anticipated time window in which only narrow bandwidth applications are to be employed.

22. A method according to claim 7 wherein said indication of an anticipated time window comprises high/low band scheduling information, including a definition of the anticipated time window in which wide band width applications are to be employed, and/or an anticipated time window in which only narrow bandwidth applications are to be employed.

23. A method according to claim 7 wherein at any point during the task, only one communicant requires a high-bandwidth payload.

24. A system according to claim 1 wherein said dynamic spectrum allocation apparatus is operative to allocate spectrum such that at least once, a wide band is allocated to a first communicant from among said communicants within a first time window which the first communicant has indicated to require a wide bandwidth application, and subsequently, within a second time window, said wide band is allocated to a second communicant from among said communicants which has indicated that said second time window requires a wide bandwidth application.

25. A computer program product, comprising a non-transitory tangible computer readable medium having computer readable program code embodied therein, the computer readable program code adapted to be executed to implement a method for providing communication using Satellite Communication apparatus operative for providing communication services to at least a first set of communicants, said first set of communicants including a first plurality of communicants, the method comprising:

providing communication services to each of said communicants in accordance with a spectrum allocation corresponding thereto, thereby to define a first plurality of spectrum allocations apportioning a first predefined spectrum portion among the first set of communicants; and including

providing Dynamic Spectrum Allocation apparatus operative to dynamically modify, once per time period, wherein at least one time period is within an order of magnitude of no more than one minute, at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion,

wherein said first set of communicants includes communicants which want to share bandwidth such that different communicants can communicate high definition images at different times and wherein said Dynamic Spectrum Allocation apparatus is operative to dynamically modify at least one spectrum allocation corresponding to at least one of the first plurality of communicants without exceeding said spectrum portion, so as to enable different communicants, from among said first set, to communicate high definition images at different times,

wherein plurality of communicants are all sent to a single high-bandwidth task, however, at any given time window, only a predetermined number of the communicants need actually to transmit high-bandwidth information,

and wherein said providing Dynamic Spectrum Allocation apparatus includes provision by each of said plurality of communicants of an indication of an anticipated time window in which wide band width applications are to be employed, thereby to reduce the required effective bandwidth by a factor of k , by separating the command and control information, having a low data rate, from payload information having a high data rate by including all communicants as part of a command and control network and if there are requirements to use high data rate, assigning a new spectrum to a relevant communicant for transmission of payload data including provision of a video channel dynamically for a dynamic modification of the individual communicant's current spectrum allocation.