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Claims

1. A process for determining frequency allocations for efficient spectrum management and reuse, in communication between multiple users of moving platforms and ground stations using directional antennas, comprising:
 - (a) generating a preferential ranking list; and
 - (b) repeatedly recalculating desirable frequency allocations for communication between platforms and stations according to said preferential ranking list and user-to-user interference data.
2. A process according to claim 1, wherein the user-to-user interference data is a matrix that updates in real-time.
3. A process according to claim 1, wherein the input to the process comprises one or more of:
 - 1) Available spectral bandwidths;
 - 2) The desired order of utilization of frequencies and bandwidths;
 - 3) Platform priority ranking;
 - 4) Geographic locations of ground stations;
 - 5) Platforms to ground-stations assignments;
 - 6) Location of moving platforms and their velocity;
 - 7) Spatial gains of directional antennas used;
 - 8) Possible bandwidth occupancies of the modems used; and
 - 9) Information regarding unused spectrum from external neighboring.
4. A process according to claim 1, wherein the output of the process comprises one or more of:
 - a) Frequency allocation for each link; and
 - b) Bandwidth allocation for each link.
5. A process according to claim 1, wherein the ground stations and platforms communicate via up-link and down-link channels, and wherein the two links share at least some of the same frequency spectra.

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6. A process according to claim 1, wherein the ground stations and platforms communicate via up-link and down-link channels, and wherein the two links do not share the same frequency spectra.

7. A process according to claim 6, wherein the links operate independently and the process is carried out for the up-link allocations and for the down-link allocations independently.

8. A process according to claim 1, wherein the frequency allocations size is selected from a group of pre-defined sizes, and wherein said group enables selections such that no gaps are left between the members of the group after assignment or release of an allocation.

9. A process according to claim 8, wherein said group of pre-defined sizes consists of sizes that are multiples of a base size.

10. A process according to claim 1, wherein ground stations and moving platforms are paired according to predefined criteria.

11. A process according to claim 1, wherein ground stations and moving platforms are randomly paired.

12. A process according to claim 1, further comprising, for each platform and ground station, generating a table of 'platform viewed angle' and 'platform viewed RSSI' (Received Signal Strength Indication) based on the locations and direction of the antenna patterns.

13. A process according to claim 12, further comprising computing the signal-to-interference ratio between ground stations and moving platforms.

14. A process according to claim 13, wherein the interference ratio is obtained by subtracting the Viewed RSSI of the disturber from the Viewed allocated platform RSSI.

15. A process according to claim 13, further comprising generating an interference Boolean matrix including information regarding which platforms would interfere with each other, if using the same frequency channel.