

MASSIVE ARRAY CELLULAR SYSTEM

(c) Copyright 1994-2003 and Patented by Victor Pierobon, Canada All Rights Reserved, (416) 221-2340 Toronto, Ontario Canada An entirely NEW no-service charge communication infrastructure that is automatically built by our patented MACS cellular transceivers/repeaters. Massive Array Cellular System is "disruptive technology" and killer application replacing cellular/cable/line/satellite communication service provider businesses.

The advantages:

1. Free local and long distance service for all who own our new MACS cellular phone! No central service provider exists.
2. The device utilizes short transmission distance hops of less than 1000 feet, therefore this allows us to utilize any frequency without utilizing any pre-approved government allocated frequencies.
3. Since the transmission hops are short, then the transmit power is low. This greatly reduces the health impact that present cellular phone have in regards to their high output power radiation.
4. The short distance allows us to utilize any frequency from very low (to limit distance) to very high to increase high-

density multi-media throughput (i.e. HDTV peer-to-peer).

5. The device may utilize the present public FRS (Family Radio Service) walkie talkie's bandwidth for long distance hops (greater than 1 mile per device hop).

Also, some existing wireless LAN Hubs 802.11 Chip sets (which may be already infringing on my patent) have simultaneous 50 channels and may be utilized in our device.

6. This protocol can be utilized for car-to-car communication for stop and speed safety co-ordination.

7. This wireless network automatically implements and expands itself (i.e. for military or small isolated communities' automatic communication infrastructure building).

8. Wireless Hot Spots based on 802.11 local wireless LAN cells are beginning to need our technology to allow them to repeat and navigate through other Wireless Hot Spots using our patented geo-physical co-ordinate location and device identity navigational protocol.

In a typically implementation of Massive Array Cellular System (M.A.C.S.) devices of, lets say, 1000 simultaneous channels. Each device is required to relay it's own signal and signals for other neighboring MACS in a crowded neighborhood of 300 feet average from one node to another. The transmission is very low power, low distance, but it has many channels/frequencies, preferably at extremely high frequencies for true multimedia communications. This short distance hop of less than 1000 feet allows us to utilize any frequency without obtaining a government allocated frequencies.

The long distance capability of the grid is a function of average relay hop times

number of channels/frequencies combination. For a 1000 channel, 1000 feet nodes the long distance capacity for 20% user use being on the system at the same time would provide 5,000,000 feet or 1,000 miles capacity.

Digital compression and other methods should increase this to 10,000 miles. In other words, it would meet all local and long distance requirements. Presently the hardware for such a device would probably cost \$5,000 Mass production should reduce this to \$500 or less. Since calls are usually within 100 miles, we could manufacture a cheaper 100 channel MACS device.

Companies and Standards Likely Infringing on Patent

Nokia 's Roof-Top Repeaters	Nokia Shouts from RoofTop - All Clear for Wireless Broadband 2nd Article www.wirelessnewsfactor.com/perl/story/12619.html www.bbwexchange.com/news/2002/apr/nokia042302.htm
Mesh Networks	Mesh Networks: Disruptive Technology www.80211-planet.com/columns/article.php/961951
Intel Wireless	Intel makes a mesh of wireless networks http://informationstate.com.com/2100-1103-985502.html
SIP	Session Initiation Protocol (SIP)
JXTA	Peer-to-Peer application (web services)

PATENT NUMBERS

The **Canadian Patent 2,132,180** has a priority date of 1994/09/15, granted in 2001, protection for 20 years from priority. PCT in Mexico, and in U.S. patent

MACS Patent Text

ABSTRACT

Devices and protocols and topologies for the implementation of a Massive Array Cellular System (henceforth referred as M.A.C.S.). The M.A.C.S. devices consist of electromagnetic transceivers capable of simultaneously sending and receiving electromagnetic signals of multiple frequencies.

The M.A.C.S. protocols allow these M.A.C.S. devices to communicate with each other, navigate signals through the devices and relay various forms of communication from M.A.C.S. device to M.A.C.S. device as well as link to non M.A.C.S. devices.

The mobile and stationary M.A.C.S. devices, protocols and topologies will freely provide a massive multimedia throughput, personal multimedia communication, mobile cellular service, as well as vehicular (i.e., automotive) safety control.

SPECIFICATION

This invention relates to the M.A.C.S. devices, protocols, and topologies.

This system is a cost effective alternative to current company provided communication services. Typically this system and devices allow both private households or companies having these M.A.C.S. devices to interlink for the purpose of relaying signals from other Massive Array Cellular System (M.A.C.S.) devices for the purpose of multimedia communications (i.e., voice and video, television, voice, data or any other form of digital or analog signals).

The M.A.C.S. protocols are used for the establishment of original two way connections to remote household/company M.A.C.S. devices, as well as to distribute signals to other M.A.C.S. devices. Each user of such M.A.C.S. devices would

be able to send and receive calls or multimedia communication relatively free of communication service charges.

A sub-set function of these M.A.C.S. devices and M.A.C.S. protocols is for the purpose of providing mobile connections to household/company M.A.C.S. devices, co-operating to connect to an existing communication service company. Another sub-set function of these M.A.C.S. devices and protocols is for the inter-communication system for traffic vehicles (land, air or water vehicles) for the purpose of accident prevention, and high speed navigation.

As a background note, the present telephone and cellular systems of communication available for the general public typically requires the purchase of a telephone or cellular phone, the account signing up and connection to the physical lines belonging to a telephone company, or connecting to a fee for service cellular system. These communication companies transmit such signals by various means (microwave, conductive or fibre lines), charging the user a fee. The proposed devices and system would eliminate the user need for such telephone companies, television broadcasters, as well as television cable companies.

The M.A.C.S. devices and protocols have the capacity of providing new videophone or other multimedia services.

These M.A.C.S. devices and protocols utilize many electromagnetic channels of relative small wattage. Because the specific electromagnetic wavelengths and maximum signal strengths will likely be government regulated, their specifications are hereby not being set. To compensate for limited frequency channels, the M.A.C.S. devices may utilize digital compression technology. For some multimedia communications, the M.A.C.S. may incorporate digital signal processing. Each channel may have varying strengths to optimize on long distance hops to other M.A.C.S. devices, thus minimizing the number of routing connections required to establish final destination M.A.C.S. device link.

These M.A.C.S. devices are connected to various input and output devices, such as one or more multimedia devices (ex:microphones, speakers, video cameras, computers, etc.).

Each M.A.C.S. device is able to simultaneously process multiple channels. Most of these channels would be used to relay the signals of other M.A.C.S. devices signals to their destination M.A.C.S. device. Each household/company having a M.A.C.S. device

would be able to originate a request to connect to a far distant M.A.C.S. device via other relaying M.A.C.S. devices.

The primary method of navigation is based on geo-physical locating coordinates (ex: longitude and latitude or UTM).

A M.A.C.S. device is addressed by a geo-physical co-ordinate location and device identity, such that the combination is unique. This address will henceforth be referred as LOC-Name.

For validation and security the M.A.C.S. device LOC-Name may also have a password unique to the LOC-Name.

The M.A.C.S. protocols are used to establish links between M.A.C.S. devices that may be separated and connected by other M.A.C.S. devices.

After the initial originating M.A.C.S. device to destination M.A.C.S. device link, subsequent connections of M.A.C.S. devices may be navigated by previous successful navigational links or by provided routing instructions sent by the originating M.A.C.S. device. The M.A.C.S. protocols also allows for navigation alternatives in case a intermediate M.A.C.S. device link fails or for lack of available channels on an intermediate M.A.C.S. device.

The M.A.C.S. devices and protocols allow the development of a network of millions of M.A.C.S. devices distributed across various countries. The M.A.C.S. devices would originate and relay among themselves data, videophone, television, and other multimedia broadcasts.

This M.A.C.S. devices, protocol and topology based network would have strategic communications defence advantages. A man made or natural destruction of a city (or cluster of M.A.C.S. devices) would not permanently interrupt communications to other surrounding and remaining M.A.C.S. devices. The communications between M.A.C.S. devices would be relayed around the destroyed city or the bordering M.A.C.S. devices by increasing the transmission reception radius to span the deactivated M.A.C.S. devices, or relay signals around the deactivated area via other M.A.C.S. devices.

These M.A.C.S. devices network would have a combined multimedia throughput far surpassing any and all present communication company services.

The M.A.C.S. protocols cover the basic methods for M.A.C.S. device initialization routines, relaying or repeating of communications between M.A.C.S.

devices, mobile M.A.C.S. devices communication links, and M.A.C.S. devices addressing. Various diagrams are attached to explain M.A.C.S. devices, protocols, and topologies.

M.A.C.S. Device Initialization:

On power up or first time activation the M.A.C.S. devices requires a LOC-Name. This Loc-Name may be a user entered set of geo-physical co-ordinates (ex: longitude, latitude or UTM), and a user or M.A.C.S. devices identity (ex: company name, personal name, Personal Identity Number, S.I.N., etc.). The user of the M.A.C.S. device may enter an access password for encryption, access authorization, and security.

The M.A.C.S. devices having the above manually entered or device calculated geo-location first broadcasts a Request for Neighbour-Hood-Nodes. The nearest M.A.C.S. devices will respond with their Loc-Names. The requesting M.A.C.S. device then stores these nearest and most immediate neighbouring M.A.C.S. devices' information for future routing strategies for the purpose of relaying or repeating communications from and to other M.A.C.S. devices.

Since many M.A.C.S. devices may be in one building, the M.A.C.S. devices begin first by using a signal transmission strength of a few meters radius in its broadcast for Requests for Neighbour- Hood-Nodes, waits for responses and slowly increments transmission wattage or signal strength until a sufficient number of surrounding M.A.C.S. devices respond, achieving maximum number of clear channels as well as directionally diverse neighbouring M.A.C.S. devices.

If a M.A.C.S. device LOC-Name geo-position does not fit within the signal radius of other M.A.C.S. devices LOC-Name geo-positions then the other M.A.C.S. devices will ignore all communications to the illicit device. This should prevent the unauthorized reception of signals.

M.A.C.S. device Request for Connection, and M.A.C.S. device Communication Relay/Repeat:

Having the LOC-Name of the M.A.C.S. device to connect to, a request for connection is transmitted to the neighbouring M.A.C.S. devices (determined by the above initialization routine) by sending the desired LOC-Name and it's own originating LOC-Name. The subsequent M.A.C.S. device will also pass the relaying station LOC- Name, since it is not the originator. For example, if the desired Loc-Name geo-position is north-west of the originating request,

the originating M.A.C.S. device would request the M.A.C.S. device closest to the north-west destination be the relaying M.A.C.S. device of its transmission. This relaying M.A.C.S. device would reply that it has a channel to relay its communication. The originating M.A.C.S. device confirms receipt of message, and stores the first level relay routing destination M.A.C.S. device LOC-Name. The relaying M.A.C.S. device, if not the final destination M.A.C.S. device, in turn would relay the original request with the desired destination M.A.C.S. device LOC-Name, the origin M.A.C.S. device LOC-Name, and the relaying M.A.C.S. device LOC-Name, to its neighbourhood M.A.C.S. devices. This process would repeat and continue until the final destination M.A.C.S. device is contacted. Once the final destination M.A.C.S. device responds then the relay of communication begins both ways from-to originating (origin) M.A.C.S. device and destination M.A.C.S. device via the interlinking and relaying M.A.C.S. devices. In cases where a M.A.C.S. device(s) connection fails, a back- tracking and re-routing via the Request for Connection as described above is done until a final destination M.A.C.S. device connection is again achieved.

For the purpose of speed, the successful route may be memorized by the origin M.A.C.S. device, for subsequent re-connections to the destination M.A.C.S. device. The relaying M.A.C.S. device may transmit back to the origin M.A.C.S. device through the paths taken by the relaying M.A.C.S. devices for the origin M.A.C.S.'s future use. Some channels may be reserved for the sole purpose of relaying one-way television or multimedia services to other M.A.C.S. devices in order to eliminate the need of cable service companies, television broadcasting, and satellite TV/multimedia transmission services.

Mobile M.A.C.S. device connection to stationary M.A.C.S. devices for relaying to existing telephone services:

A secondary function of such M.A.C.S. devices would be to relay a mobile M.A.C.S. device communication via stationary M.A.C.S. devices to a traditional telephone service company by allowing the mobile M.A.C.S. device to send its telephone service charge account number to the telephone company system for validation and have all such telephone charges charged to the user of the mobile M.A.C.S. device's telephone number. The stationary M.A.C.S. device would feed the mobile M.A.C.S. device's communication immediately into the existing Telephone Company services by hard wire or other traditional telephone systems.

Mobile M.A.C.S. devices communication to stationary M.A.C.S. devices:

In this situation the originating first level connection to a stationary M.A.C.S. device becomes the origin M.A.C.S. device's geo-location component of its LOC-Name for the returning communication from the desired destination M.A.C.S. device or relaying M.A.C.S. device, the first stationary M.A.C.S. device takes on the function of representing the mobile M.A.C.S. device's LOC-Name. When the mobile M.A.C.S. device begins to physically pass beyond the signal area of the first level connection stationary M.A.C.S. device, the mobile M.A.C.S. device requests another stationary M.A.C.S. device within its signal area to become the origin M.A.C.S. device LOC-Name and its first level connection to insure a reliable communication channel. The previous stationary M.A.C.S. device is informed of its desire to use another stationary M.A.C.S. devices to represent it as the origin M.A.C.S. device Loc- Name. The previous stationary M.A.C.S. device in turn informs the next level relaying M.A.C.S. device to communicate to the new origin M.A.C.S. device's LOC-Name.

If the any of the relaying M.A.C.S. devices becomes out of service, out of signal range, or out of free relaying channels then a re- routing backwards and forward to the new M.A.C.S. device (s) is performed. Password verification can be relayed to the users stationary M.A.C.S. device to authorize the mobile M.A.C.S. device's reception of signals that would normally be sent to the users stationary M.A.C.S. device .

Mobile M.A.C.S. can request a relay from one Mobile M.A.C.S. to another Mobile M.A.C.S. which in turn will relay to another Mobile M.A.C.S. using the geo-physical co-ordinates obtained by Geo-positioning satellites to determine their mobile geo-physical location for the purpose of navigating towards the direction of the destination LOC-Name. This allows the navigation of the relays to incorporate any mixture of Stationary and Mobile M.A.C.S. to achieve connection to the destination LOC-Name. Mobile M.A.C.S. devices communication for inter-vehicle navigational and safety and inter-vehicle user communications:

The mobile M.A.C.S. devices for such a function must have a means to re-calculate its geo-position or LOC-Name. With a geo- positioning resolution of better than few meters, vehicles can inter-communicate their speed, direction, vehicle conditions, braking conditions, passenger communication etc. to other signal area mobile M.A.C.S. devices. In cases where a vehicle, having a mobile M.A.C.S. device, is in front of another mobile M.A.C.S. device equipped vehicle, that may suddenly brake, then the following vehicle can take appropriate measures to prevent collision. In cases of

intersection crossing by such equipped M.A.C.S. device vehicles, the inter-communications of crossing vehicles can warn of an impending collision.

CLAIMS

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. The Massive Array Cellular System (M.A.C.S.) devices
2. The Massive Array Cellular System (M.A.C.S.) protocols.
3. The Massive Array Cellular System (M.A.C.S.) topologies.
4. The Massive Array Cellular System (M.A.C.S.) applications.

Drawings which illustrate embodiments of the invention, various types of communication topologies utilizing embodiments of the invention.

Figure 1: M.A.C.S. device Initialization.

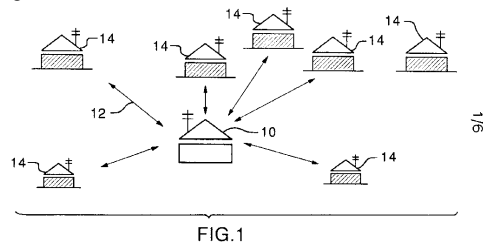


Figure 2: M.A.C.S. device Connection Request and Relay.

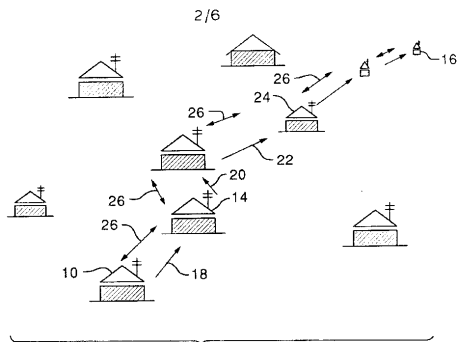


Figure 3: Mobile M.A.C.S. devices.

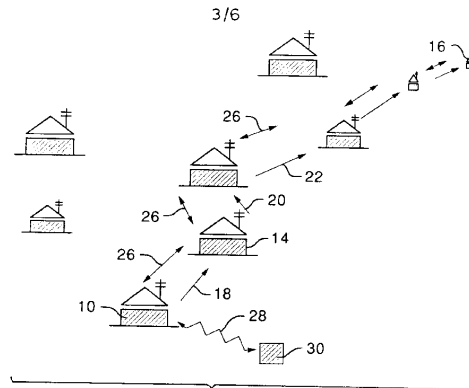


Figure 4: Mobile M.A.C.S. device connection to stationary M.A.C.S. device for relaying to existing telephone service companies' services.

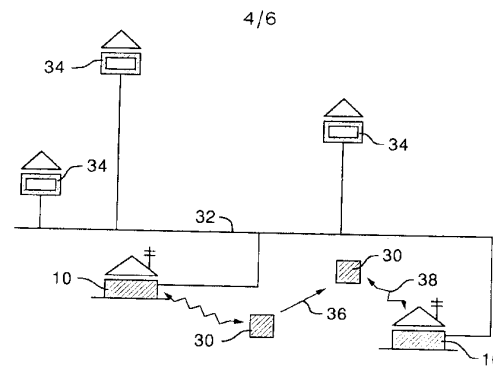


Figure 5: Mobile M.A.C.S. communicating with stationary M.A.C.S. device for the purpose of connecting to other M.A.C.S. devices.

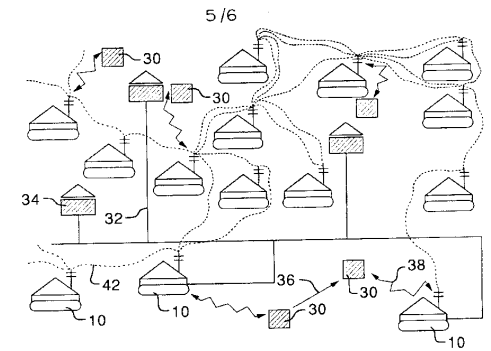
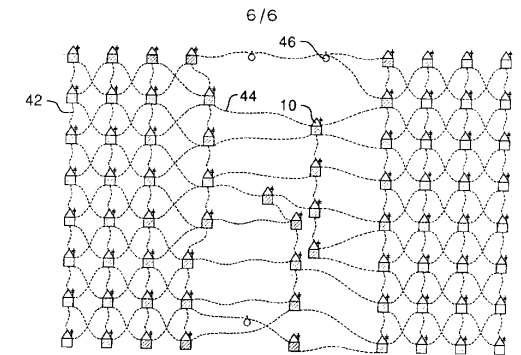


Figure 6: Typical topologies of M.A.C.S. devices with out of range repeaters.



Investor Inquiries:
Please contact Victor Pierobon.
Email: pierobon@sympatico.ca
Web: <http://massive-array-cellular-system.com>
Victor Pierobon Consultants Ltd. 174 Betty Ann Drive, Toronto Ontario Canada, M2N-1X6
Call (416) 221-2340