VORTIS™
TECHNOLOGY CONSORTIUM

Mitigates Energy Waste for Safer RF Levels to Head & Body;
Increases Speed, Clarity, Gain, Coverage and Battery Life;
Green Technology for the next seven generations;

Next generation antenna architecture

Interferometric array antenna structures for optimizing power and minimizing interference

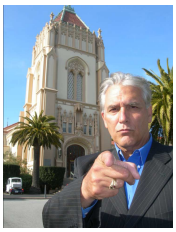
Vortis Announces Earth's First Green Phone; SF Symposium!

James R. Johnson, founder, inventor and Chairman of Vortis Technology Consortium joined California State Senators Mark Leno and Leland Yee along with the Environmental Health Trust Symposium at San Francisco State University's Lone Mountain Room as they lead the "CHARGE FOR CHANGE" toward new regulations and antenna technology. "San Francisco has taken a historical stance against industry with this shot heard around the world" says Johnson; "and we intend on supporting this fully!"

"It's about the antenna" says Johnson, a Silicon Valley inventor, technologist, change agent, Socialpreneur and former director of Quality Assurance who believes the CTIA may be negligent in supporting his and other technologies supporting customer care in this matter!

"Teaching Corporate Responsibility and prosecuting variations in management standards since the late 70's, I find I am at variance with what is happening today" Says Johnson; "It's just stupid to lose half the energy to the customer's head while compromising battery, clarity and performance to save a buck. Johnson's prior leadership in 2003's helped unclog an FCC question of whether the poor and hard of hearing could be helped technically. The CTIA claimed ignorance on the subjection while Johnson brought forth solutions. The FCC sided with those in favor of better antennas and even endorsed the concept in a Report and Order placing his company on the map as he worked with the hard of hearing experts. It's Occam's razor; the most obvious answer is to just focus on the source of energy; the antenna technology; and it's done! Move On!

"These guys are moving in the wrong direction" explained Johnson as he pointed out industry's antenna costs over the last 10 years dropped from $1.50 and lowest radiated signal to the head to today's cost of $0.05 spewing out the highest radiated signal loss to the head like a leaky facet from today's antennas which are just a simple piece of tape.



The solution stares us in the face and thanks to Steve Jobs, it now touches our face with Apple's iPhone band antenna. Sir Richard Branson, founder of Virgin Mobile Sprint claimed on 20/20 News, It'll fry your brain." These are leaders and we rely on their care!

The CTIA sued our city by the bay and we built this city on Rock and Roll so it's time to Rock and Roll with the worlds first interferometric array antenna; a game changer!

Cell Phone Antennas made it to top management's attention when Steve Jobs' world was upset by Apple's iPhone antenna debacle. Jobs stated "I'm not going to tell my customers how to hold the phone." According to the Symposium sponsored by the Environmental Health Trust sponsored, this is exactly what Steve needs to be doing--right now! Apple is an innovator and a leader. There are little babes hugging these two way radios as if they are grandma while they emit EM. "Teach Your Children Well!"

This whole thing is out of control and as Director of Quality Assurance for the process, I'm going to be asking directors around the country to request ISO 9000 compliance. Anyone looking back with headlight eyes should have resume viewed and possibly held to personal negligence for not know ISO; a Constitution derivative.

In Quality Assurance, International Standards Organization (ISO) has taken America's finest US standards to build the most successful deployment of globalization ever experienced by humanity. It's too bad these standards have been lost to these new young executives Maureen Dowd calls extortionists! allow us to measure compliance and variation from the top down; then prosecute where needed!

"The beauty of the constitution is that it calls for the protection of one over the many" says Mr. Johnson. ISO does the same thing looking at one single defect as a window of opportunity for continuous improvement.

"Disney executives have told us they would support such technology and introduction to Motorola by Ed Zander, former Chairman of Motorola shows intent by some to do the right thing.

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We intend on presenting this amicus brief to help federal courts view this matter and navigate smoke, mirrors and now clouds of service we have seen centralized industry. When industry claims "if we educate people, they'll be confused," I've got to draw the line. This is insanity and enough is enough; it's time to **Wake Up America** and let our leaders know we have a **"Right To Know"**

Please step up to the plate and end this debate!

The message of the Symposium is "we are seeing truth and it isn't being shared!"

We are here to help Ellie and others in the "Right To Know" ordinance and we say America grew to dominate the world because we have a can do attitude! We can pursue our dreams free of constraints and safely at the same time. It's time to find out what happened to the $2 billion in cost savings from cheaper antennas? This sounds like a typical Tyco Debacle. The FCC is we the people, and the CTIA declares they are self policed!.

If so, their ISO records will reflect Best Practice FMEA records on what they did to close this question in the context of the agreements we have in place today.

The obvious elephant in the room is the 30 million customers complaining along with epidemiological evidence showing serious problems. This is a customer complaint?

This statement points to non conformance to ISO standards; enough to decertify the industry while causing serious market share drop from lost opportunities due to mishandling customer complaints. This is enough to drop market share 1%.

Johnson shared his wins against the CTIA when the FCC supported the hard of hearing in 2003 as they ordered this industry to come up with new antenna technology for reducing signal strength to the head by reshaping it. "Industry has been confused ever since. The historical order is a calibration point to the level of Management Variation I have seen from the CTIA's confusion" cites Johnson.

Environmental Health Trust

The Symposium at the University of San Francisco was sponsored by Debra Davis, an epidemiologist who studied the records and later founded the Environmental Health trust to create change. Her work as an advisor in Washington led to her receiving a Nobel Laureate with Al Gore on Global Climate Change as she recently brought forth epidemiological data concerning the matter in an article published by Green America. The general message of the Symposium was that the preponderance of evidence seems pretty clear with all the epidemiological studies reflecting higher rates of nearly every type of cancer when studied over 10 years.

"The real hero's though were those who organized the event and brought all of us together" says Mr. Johnson.

Mr. Zack Marks, student and son of Alan Marks did this in honor of his father, who contracted brain cancer accredited to his use of the cell phone.

Zack's mother, Ellie Marks is the good wife who worked directly with Mayor Newsome to write the legislation. Ellie has been known nationally and notoriously as the leader of this no nonsense movement toward warnings and legislation. Ellie and friends have been leading ideas in the halls of Congress, Washington, Sacramento and San Francisco where she originated the powerful legislation that put the CTIA and my city by the bay in dissonance when my city by the bay ordered that industry start educating the customer on safety.

"I am honored," said Mr. Johnson, "to have been invited as a commercial entity with a larger more important stake at hand." "We want to launch a product showing people are interested and could

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care less about dollars if it helps. We want to show that Alan Marks and family are not victims; they are casualties and wounded soldiers against a war raged against humanity by CTIA obstructionism.

Mr. Johnson was awarded "Innovator Visa" by the UK Government based on his award winning technology brought to the UK. He has worked with top management in Silicon Valley implementing standards for over 30 years and has spoken about it on live TV, Washington D.C., and several talks around the world where his insights into humanistics, process and requirements are unmatched.

"It works when it's worked" says Johnson and he's now solving one humanities most prolific question:

Can you hear me now?

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The success of his last efforts was a collaborative undertaking as he worked with the ANSI Chair for Standards for Cell Phones, top management of two major telecoms and the Hard of Hearing leadership.

The New York Times
Tuesday, June 17, 2008

Technology

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NEWS WATCH: COMMUNICATION; Hearing Aid and Cellphone Call a Truce

By MARC WEINGARTEN
Published: November 27, 2003, Thursday

PRINT
SAVE

Wireless technology has not been kind to most people who wear hearing aids: because the older models lack internal shields to segregate digital frequencies, the devices are vulnerable to interference from cellphones. As a result, some 12 million people around the world are said to hear a buzz or static during cellphone conversations.

Myers Johnson, a San Francisco company focusing on products that give the hearing-impaired better access to telecommunications, has developed an antenna to banish the annoying garble. The Vortis antenna clips onto the phone and reduces the amount of energy the phone emits laterally toward the user's head, reducing interference and improving clarity. The antenna also increases the phone's signal strength by redirecting the energy toward the front and rear of the user, the company says.

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The antenna, which is expected to reach stores by the end of the year at a suggested price of $79.95, will work with a variety of Nokia phones, and Myers Johnson says it is working with other cellphone manufacturers on potential compatibility. More information on the antenna is available at www.thevortis.com. Myers Johnson says it is preparing a special service package that will include a free phone. For more details, send a message to info@thevortis.com. Marc Weingarten

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Lord Kelvin said, "when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science, whatever the matter may be."

Jim Johnson says, "when you show management measures from a dashboard in the vehicle, change comes automatically since no one wishes to be perceived as an obstructionist or with harmful intent.

Array Technology: Next Generation Antennas for Cellular Technology.

Enables Hearing Aids, Enhances Performance, Reduces SAR, Mitigates Energy Loss to Head

Prepared by James R. Johnson, President/CEO Vortis Technologies Ltd. 650 595 8888. Additional information may be obtained on the web at www.jamesrjohnson.net.

Abstract (delivered to FCC, 2003 that supported change)

James R. Johnson provides this paper to present arguments in favor of the use of an Interferometric Array Antenna commercialized under the name Vortis for the improvement of compatibility between hearing aids and cellular telephones (HAC) as required by Section 68.4(a) of the Federal Communications Commission's rules governing hearing aid-compatible telephones.

The Vortis is an advanced antenna concept for cell phones that improve performance when compared to omni-directional or semi-directional antennas. When integrated under a set of reasonable design rules, the Vortis enhances far field gains, reduce near field interaction with the head and hearing aid and provide other improvements of a handset or other wireless devices. The Vortis is a passive, dual element, 180 degree phased end-fire array antenna operating at frequencies tested from 800 MHz to 1950 MHz with positive results that show enhanced mobile handset performance by improving the distribution of radiated energy.

The Vortis can be applied to most handsets to create a unique propagation pattern that reduce RF energy in the lateral near fields toward the head and hearing aid and enhances the RF energy in the far fields longitudinal to the elements. The unique figure 8 patterns of the Vortis results in reduced multipath interference, increased gain in the primary lobes and provides an ideal means for achieving hearing aid compatibility that can improve access to digital cellular phones for hearing aid users. The performance improvements offer a unique competitive advantage for handset makers and service providers (carriers) that do not require significant modifications or changes to pre-existing designs.

The Vortis also offers a quasi diversity configuration that can ultimately be integrated with RF MEMs as part of a front end MIMO structure as a means to advance 3G, 4G and 5G technologies.

The Vortis is currently produced as a printed element on a PCB and can be produced as a stamped part or a metallized plating process over plastic causing no significant real-estate requirements within the handset. The Vortis is a readily achievable solution available today that may be implemented to address several issues confronting handset makers and carriers. The Vortis may be retrofitted and at similar economies of scale, would cost around the same as existing handset antennas. VTL's third party testing of the Vortis reveals unique and attractive qualities that offer competitive advantages when evaluated with other means or methods having similar goals.

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NOTE: It was discovered during testing that the unique propagation patterns of the Vortis actually provide greater azimuthal coverage when used next to the head. This unique new discovery (see comparative wave propagation patterns below) could have significant safety impact for all users of cellular phones since it offers the lowest SAR solution while providing maximum performance ratings. The Vortis exceeds U4 ratings [best hearing rating] while increasing gain and efficiency.

Introduction

Hearing Aid and Digital Cellular Phones continue to have radio frequency (RF) interference and electromagnetic (EM) interference and no means to interface with T-Coil pick ups in hearing aids. Technical consortiums, carriers, OEM's and other entities have been studying this issue in order to meet compliance mandates of this multivariate problem. This is the basis for the hearing aid compatibility controversy that has endured for years. There are three primary concerns: (1) radio frequency interference (RFI) noise based on the normal use of a hearing aid with the handset's antenna next to the head within the antenna's near field range; (2) electromagnetic interference (EMI) noise caused from backlighting, liquid crystal displays, power surges within the circuitry or EMI leakage and (3) lack of a telecoil compatible signal generated from the cellular handset. This paper addresses the RFI component of these three critical issues.

VTL is commercializing the Vortis as a means to offer a controlled, localized field strength reduction for the purpose of minimizing radiated field interactions with hearing aids and user's head and hand during normal use of a handset. In contrast to other widely utilized methods, the Vortis does not rely on delicate parasitic coupling of radiating elements for the control of RF energy (directors, reflectors, shields, etc.). The Vortis achieves its benefits by exploitation of active, destructive interference capable of nulls as much as 20 to 40 dBi (1/100 to 1/10,000 reduction in intensity) depending on the host circuit design and surrounding structures and use. Typically 15 to 25 is expected in most handset form factors. Loading and surrounding environment does cause variation while internal testing shows these effects can be tuned to meet average goals based on average use. In its current embodiment, two elements may be incorporated on the circuit board, embedded in the handset casing or attached to a handset. These two elements emit two opposite polarity fields so that they annihilate each other in defined regions. Elsewhere, these fields contribute constructively to increase antenna performance.

On July 10, 2003, the Federal Communications Commission (the commission) adopted a Report and Order asking the hearing aid and carrier industry to address this issue partially within 18 months of the order. This order requires a reduction in RF signal toward the hearing aid. VTL's studies were presented to the commission and a petition was filed with the commission for a rule change/clarification contained in Part 24.232, 47CFR24.232, in order to allow innovative use of directional antennas with cellular phone handsets in support of HAC. The petition for rule change may be found in the commission's WT Docket No. 01-309, NPRM related to reexamination of exemption granted to personal communications services devices from the Hearing Aid Compatibility Act of 1988. The commission responded citing no changes were necessary to bring new highly directional antenna technology to fruition.

Advantages of the Vortis:

1. Passive handset solution to HAC with minimal plastics or mechanical changes that can be retrofitted without changes to the manufacturing line and scaleable to the potential user base.
2. Reviewed and generally accepted as an accessory by HAC and access groups around the world.
3. Offers greater azimuthal coverage, gain and efficiency over conventional embedded antennas.
4. Reduces SAR to lowest possible standards if incorporated as a full solution for HAC and SAR.

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New Look for Cell Phones Create Competitive Advantages

Creating competitive drive by consumers frequently comes from visible technology enhancements. This was apparent in the early 90's with Motorola's new StarTec (the first flip phone). In the late 90's Nokia introduced the first embedded antennas and a surge of new sales was recently experienced with color screens and cameras. Increased market share was a result of visible and practical enhancement technologies. As disruptive technologies, these freshly-conceived products or services threaten the entrenched positions of established market share. With feature rich handsets being released regularly and a diverse, competitive environment becoming more and more fierce, VTL has created the Vortis to reshape energy around a handset and reduce the radiated signal toward the hearing aid and head while improving signal strength, efficiency and performance of a handset by as much as 30%.

This new handset style will generate excitement with new users and cause on-lookers to take a second look. Early adopter service providers could build a sustainable competitive position on performance, esthetics and compliance.

Sales success for handsets has always depended on the right combination of features, fashion and design esthetics. Battery life, processing power, size and cost are also key drivers that provide differentiation. For new breakout technologies to come to fruition, the design process often takes enormous capital investments and usually requires several years to roll out.

What is the Problem?

The proximity of a handset to a user's head will not likely change for several years. Because of this, the hearing aid and head are found within the near field of the mobile handset's antenna (embedded, whip or helical stubby). This proximity and near field range causes three problems:

1. Antenna coupling with head and hand reduces RF signal performance due to RF energy absorption.
2. Demodulation of the radio frequency (RF) pulses for digital cell phones causes interference sounds in the audio mode of most hearing aids, rendering them useless.
3. Coupling with the head and hand loses energy, heats up the head and requires specific absorption rate (SAR) regulatory limits.

Because of this there are severe efficiency losses that cause reduced performance.

1. Signal strength (Gain) is reduced by as much as –1 to -3 dB or more.
2. Efficiency in power usage is reduced by 25% or more.
3. Pattern coverage around the user is reduced by as much as 20% or more.
4. Bandwidth changes due to parasitic coupling with the head cause de-tuning.
5. Range and clarity are reduced proportionately.

Given the rich scattering propagation environments of today's link budgets, these reduced properties and increased directionality are rarely noticed. However, in environments where optimum performance is an advantage or when compared to less capable equipment, performance is noticed.

The Vortis antenna has the ability to reduce near field emissions by as much as 15 to 25 dBi in an idealized form factor with general expected reductions of around 20 dBil toward the head and hearing

aid. In addition, the Vortis can provide far field gains of 1 to 2 dB with greater azimuthal coverage for improved uplinks.

Because the antenna reduces RF energy to the user's head using near field nulls, it drastically reduces head and hand interaction making it ideal for HAC and SAR compliance.

Antenna & Vortis Technology

Antenna selection and combining methods have advanced rapidly over the last five years as suppliers and handset makers strive to improve antenna capability, performance, cost, style, and configurations to meet regulatory requirements. Public consortiums and private enterprises have been focusing on new materials, improved modeling techniques, multi-segmented antenna systems and test processes that support the introduction of new technologies. As the industry progresses to 2.5G, 3G and 4G technologies, diversity antennas (spatial, polarization, angular, time, phasing, frequency, etc.) will be utilized more often and across more platforms in order to mitigate signal losses from fading or provide secondary signal pathways that can be combined to increase the paths of RF signal and thus improve data transfer capacity and reliability.

Simple diversity arrays have always been used in base stations in order to mitigate fading as mobiles move about. Intelligent antenna phased arrays are new to the infrastructure and are being tested and implemented. Some handset makers have active antennas operational and ready for launch in specialized niche environments. These IA's will be utilized for beam steering to/from a mobile unit and follow the strongest signal in order to improve the uplink and reduce interference with other mobiles.

Although small mobile arrays have the potential to improve handset performance, these smaller arrays have not been readily achievable relative to costs and spacing constraints. Spacing between elements is limited to the width of handsets, which is generally less than 15% of the wavelengths. Phased arrays operating within these near field constraints usually result in the system becoming strongly coupled due to mutual interaction. If the mutual coupling between elements can be resolved, phased array antennas for handsets could offer several advantages as described herein.

Two antennas, separated by a fraction of a wavelength, can provide sufficient diversity to combat multipath fading. Diversity antennas for handsets may prove particularly valuable for operation inside buildings, where smaller differences in signal-path length are encountered routinely. Based on what's been learned about signal propagation in urban settings, it is believed that equipping handsets with array antennas will provide performance improvements. Technology roadmaps, research and patents of most firms have been focused on array technology as a means to improve reliability in downlinks (base station signals) and uplinks (handset signals). The results of these improvements can produce:

1. Faster data transfer resulting from stronger signal,
2. Signal to Noise ratio increase produces higher quality hearing and clarity,
3. Longer battery life for more efficient energy use qualifying the technology as "Green,"
4. Harmonizing regulatory compliance for hearing aid compatibility and SAR,
5. Lowest SAR and thus the safest technology for kids use of cell phones,
6. Improved signal strength and multipath interference from less scattered signal,
7. greater coverage as it reduces signal loss to the head and spreads outward signal better.

As array technology focuses primarily on interactive systems using algorithms, DSPs and new chipsets, there is an opportunity to introduce a passive array technology today that will allow the

adopter a means to immediately jump ahead of competition while moving closer to the long term goals of array technology.

Business, Design & Technology Environment

In the arcane world of antennas, innovative engineering companies have created claims about new-patented technologies on all fronts. Greater range, higher reliability, more consistent performance, more reliable uplinks, higher efficiencies (95%), smaller sizes, less ground plane requirements, increased bandwidth (greater than 10%) tailorable-to-application, tailorable directionality, highly localized, smaller near fields (immunity to proximity de-tuning), good impedance matching, relatively good VSWR and of course, reduced costs. Actually meeting all of these requirements simultaneously would, of course, be counter to the nature of electromagnetic physics. Most RF Engineers appreciate this.

Antenna designers ultimately end up compromising a balance between performance, configuration, capabilities, size, cost and regulatory aspects as best as possible. As opposing forces, these aspects are inexorably tied to the design and geometry of the specific handset. When traditional handset designs utilize an interactive approach to antenna designs, a more effective overall program is developed and many claims are realized. However, under certain of today's constraints, many of these claims cannot occupy the same product at the same time nor are they readily achievable in the business environments needed by handset makers and carriers. In addition, claims and specifications are usually frequency-specific that vary with operating ranges.

It is likely that there are nearly 2 million users in the U.S. who will want or require a HAC handset. This could amount to over 6 million globally. Compared to the total user base and over 700 million new handsets sold annually, the HAC number is relatively small compared to other business requirements. However, the impact to HAC users is of far greater value and therefore very much worth the effort given a proper implementation. If a solution for HAC can be combined with a performance enhancement antenna, then the overall value of a HAC solution is substantial to the carrier and handset maker.

New concerns regarding performance and operation of antennas today are focused on measurements against the user's head and hand. This is a new testing protocol. Measurements are executed in a free space environment and most antennas operate under the following general performance requirements:

1. Total Radiated Power Gain is at around -1 plus or minus 1 dB.
2. Efficiency (EIRP) is around 30% to 50% more or less.
3. Pattern coverage averages out to 320 degrees while normal handsets are around 300 degrees.
4. Transmit and receive bandwidths for cellular frequencies: around 70 Mhz (824-849 xmt, 869-894 rec) and for PCS frequencies: around 140 megahertz (1850-1910 xmt, 1930-1990 rec). Added bandwidth is needed to accommodate world phones operating in Asia or Europe.
5. Return losses for these operating bands are at around 2.5:1 and 3:1 in the receive frequencies giving the transmit bands more efficiency than the receiving.

Full testing includes both free space measurements and measurements using a phantom head and hand. Comparisons with before and after can be performed to show variations in performance at different configurations. 3D testing in anechoic chambers provide recorded power over all the angles to come up with a total effective radiated power (ERP) metric. Drive tests are performed to determine frame error rates and battery usage.

Next generation antenna architecture

Interferometric array antenna structures for optimizing power and minimizing interference

Given the relatively small economies of scale for meeting the HAC requirements, VTL has prepared a plan to retrofit the Vortis into selected handsets under the sanction of the handset maker and carrier. This retrofit program will be executed by a pre-approved ISO 9000 certified supplier for OEMs in order to minimize the supplier management overhead. In addition, VTL has working relations with hearing organizations around the world who can provide distribution within the hearing channels. It is possible that a handset maker and carrier can have a HAC certified handset available before the end of 2004 with virtually little cost invested.

Antenna Operating Environment

A 1996 IEEE study pointed out that because portable handsets operate in close proximity to a human being, an important consideration involves the interaction of the radiated electromagnetic fields with the nearby biological tissue. This also holds true with the hearing aid. The computations revealed the human operator influence on antenna performance. The simulations presented for representative handset/tissue geometries revealed that the tissue exercises a noticeable effect on the antenna input impedance, radiation patterns, and gain for both external and internal configurations. The numerical simulations reveal that the “tissues absorb between 35% and 68% of the power delivered to the antenna for a head/handset separation of 2 cm."

This loss of signal has caused omni antennas to become directional antennas during operation. The far field propagation patterns when used next to the head are significantly distorted in gain and coverage. Considering these factors, antenna performance changes when tested in the intended operating environment.

1. Gain is reduced by as much as –1 to -3dB or more.
2. Efficiency is reduced to 25% or more.
3. Pattern coverage is reduced by as much as 20% or more.
4. Bandwidth changes due to parasitic coupling.

Given the rich scattering propagation environments of today’s link budgets, these reduced properties and increased directionality are rarely noticed. However, in environments where optimum performance is an advantage or when comparing to less capable equipment, performance is a strong competitive edge.

The Vortis, with it’s broad beam, high gain forward and rearward and deep nulls actually reduce head and hand coupling.

Hearing Aid Compatibility

Linked to one aspect of the HAC resolution is the need to produce a field strength reduction in the near fields substantially to reduce the hearing aid interference. In the FCC’s Report and Order for HAC, they wrote: (2) require certain digital wireless phone models to provide reduced radio frequency (RF) interference (i.e., meet a “U3” rating under the ANSI standard). [ANSI C63.19 Technical Standard]

The U3 code requires less than 36 - 41 dB(V/m) representing an approximate 10 dB reduction in signal strength. Most handsets operate at around 75 to 150 dB (V/m) at the location of the ear. The highest rating of the standard (U4) calls for a 15dB reduction in energy or much less than the 36 dB(V/m).

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NOTE: It is ironic that the FDA recommends one discard their broken microwave oven if leakage exceeds 15 V/m while cell phones recommend up to 150 V/m next to the head; same frequency.

The Vortis can provide as much as 20 to 30dB reduction when integrated well. It has been measured to 8 V/m in the peak null for HAC under an ANSI C63.19 test standard and has the potential for greater reductions when tuned effectively. The average reduction is generally sufficient to pass maximum requirements.

Regulatory Perspective:

Antenna technology and basic requirements have been developed under a basic isotropicity rule Part 24.232, 47CFR24.232 based on the assumption that a minimum isotropic standard was required to maintain adequate carrier connection.

On November 14, 2001 the commission was "Seeking Comments on whether public mobile service telephones should be required to be hearing aid compatible (HAC) in a NPRM pursuant to direction of the HAC Act. The Commission reexamined their exemption of public mobile service phones from the hearing aid compatibility requirements of that Act. Comments were due January 11, 2002, and replies were schedule for February 11, 2002. This was subsequently extended to July 10, 2003 when the Commission presented its report and order.

In developing the Vortis, VTL discovered concerns with CTIA and some carriers as to whether FCC regulations would allow for directional antennas since the effective isotropic radiated power (EIRP) call out in the regulations related to a spherical radiated pattern verses effective radiated power (ERP). Part 24.232(b) called for: (b) Mobile/portable stations are limited to 2 watts e.i.r.p. peak power (tolerance of +/- 2 dB) and the equipment must employ means to limit the power to the minimum necessary for successful communications. Since the isotropic call out seemed contrary to directional antennas, VTL sought a waiver to the isotropicity requirement found in regulations. This is further outlined in VTL's Position Paper dated 11/14/02 as presented to the FCC and explained further in VTL's response to Docket No. 01-309 comments NPRMWT filed on 5/15/02.

The FCC's public response was made in the NPRM on August 10th 2003 stating: (#47) "A directional antenna manufacturer, Myers Johnson, Inc. (VTL), has filed a petition for revision of this rule. VTL believes that the rule, as it is written, prohibits the use of directional antennas." The FCC says that "the EIRP requirement does not in any way prohibit employing wireless phone directional antennas." The FCC went on to state: (#46) "Because such antennas have the potential to significantly reduce the RF interference to hearing aids, as well as provide efficiency benefits both to the wireless network and to battery life, there are several benefits that could be gained from their increased use in handsets."

The FCC further stated within the order that "contrary to assertions [that directional antennas could cause systemic problems], directional antennas have the potential to help mitigate the effects of multipath, improve frequency bandwidth performance, achieve higher gain, and provide better directional control over emissions."

With reference to Hearing Aid Compatibility, there are three primary documents:

1. Hearing Aid Compatibility Act of 1988;
2. Section 68. 4(a) of the Commission's Rules Governing Hearing Aid-Compatible Telephones
3. WT (Wireless Bureau) Docket No. 01-309, RM 8658 Notice of Proposed Rule Making

These three are cited as, HAC Act, FCC Part 68 and the NPRM. Additional regulatory issues are:

1. ANSI C63.19 Hearing Aid Compatibility standard for testing to the regulations.

2. 47CFR Part #24 Section, #232 Power and Antenna Height Limits, controlling antenna regulations.

3. CTIA's ERP Adhoc Test Plan and Handset Certification Program for testing to antenna requirements.

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VORTIS™ TECHNOLOGY CONSORTIUM

Mitigates Energy Waste for Safer RF Levels to Head & Body;
Increases Speed, Clarity, Gain, Coverage and Battery Life;
Green Technology for the next seven generations;

Next generation antenna architecture

Interferometric array antenna structures for optimizing power and minimizing interference

On November 13, 2002 VTL met with the Commission's Wireless Telecommunications Bureau's Senior Engineer Policy Division, Senior Economist, Policy Division and several other agents working on this matter.

VTL submitted three papers surrounding these issues designed to convince the Commission that the technology was readily achievable and should be used in support of meeting requirements. These papers can be viewed on VTL's web page.

The Commission's reexamination of the exemption granted Personal Communications Services (PCS) devices from certain provisions of the HAC Act as announced in the NPRM, WT Docket 01-309 in July 10, 2003, was published in August 2003. The NPRM (2) require certain digital wireless phone models to provide reduced radio frequency (RF) interference (i.e., meet a "U3" rating under the ANSI standard). [ANSI C63.19 Technical Standard].

The petition submitted to the commission by VTL was not granted but the commission did clarify that the Vortis technology was not against regulations; which was a major win against industry claims to the contrary.

Studies on Health Effects

It is not the science that is in it's infancy, it is the leadership presenting the science.

Federal Courts and senserly interested people are seeking truth but that presentation of truth seems skewed and biased thus making quantification nearly impossible.

Pioneers such as Mead Killian, Etomotic Research [circa 1999], led the way toward quantifying the variables for the hard of hearing while Stephen Berger, Chairman of the American National Standards Institute refined the C63.19 Standard for hearing aid compatibility and provided training to those seeking to align with solutions.

The CTIA understands these methods and are suggesting the issues are too complex to understand; while not having adopted a policy of pro-activeness. This is only CTIA management creating obstructions.

Variables such as 37.5 dBV/m of interference were the equivalence of 75 V/m antenna radiation for general use with digital cell phones 20 dBV/m (10 V/m) for immunity to "bystander" problems.

Note: Combined with cell phone ratings, a sum of ratings of 5 or better should allow normal hearing aid use with that cell phone.

In practice, most cell phones fall in the U2 category producing around 41 dBV/m.

We urge all parties and stake holders to adopt the following:

1. ANSI C-63 U4 rating for all cell phones.
2. Adopt new antenna technology and start treating RF signal radiation to the head as a negative factor
3. Train your users on proper handling techniques.

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