



Bulletin



August 2021

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This Month's Meeting

Date/Time: **Thursday @ 7:00 PM**

Location: **Zoom Teleconference**

Info: www.sedxc.org

Topic: Optimizing Your Signal

Speaker: Bob Heil, K9EID

From the Prez



Chuck Catledge, AE4CW

Wow! What an interesting list of things to talk about since our last Bulletin!!

It's Bouvet bingo as three teams shuffle their plans. Solar cycle 25 is coming on earlier and perhaps higher than predicted. The SEDXC groups.io was full of interesting questions, answers and ideas. And a club DX contest was proposed. A groups.io question posed by Scott, KB4KBS, challenged us to consider (paraphrased) "How many entities could a moderately aggressive, new ham with 100 watts and a multi-band wire antenna likely work over the next five years?" The responses from our club were amazing in quantity and depth; Scott's question was addressed by hams who literally wrote the book on what it takes to achieve DXCC and, then climb the ladder to higher scores.

If you missed these dialogs, I suggest you scroll through our [SEDXC.groups.io](https://sedxc.groups.io) list starting Saturday, July 24th. It's a great read.

Scott's question spawned an idea from Don, N4HH. "Isn't it time for SEDXC to sponsor the '100 Watts to a Wire' Contest again?" For those who may not recall, there was a 2007 contest designed to show that high power and expensive antennas weren't required to work DX. It was called "100 Watts and a Wire", and literally, that was all you needed to participate – A wire antenna and a transmitter capable of no more than 100 watts. That post resulted in another great set of responses suggesting various ways to do similar contests as soon as possible. So, with a current lack of new DX entities and/or DXpeditions, we have decided to reprise that 2007 contest during September 2021. Yes; less than one month away! Look a few pages further in the bulletin (or on the website) and you will find the Announcement for this contest with all the information on how it works. This link also shows the Announcement: <http://www.100w.sedxc.org>. We would like share a few highlights, including:

- It is very simple to understand, work and score.
- It lasts for one month, so there is plenty of time to participate.
- There is an opportunity for up to eleven winners.
- We are opening it up to non-SEDXC members anticipating, we will get some budding DXers to give it a try. So, please *invite* non-members to participate! Who do you know that might love DXing if only you invited them to join this contest?

Several ideas are in the hopper for follow-on contests; we would appreciate your participation in this one, and letting up know that you want more.

I am sure we have been watching the news of the Bouvet DXpedition with great interest. As I write this, the Intrepid-DX Group announced on August 3rd, that they have found a replacement vessel that can carry them to Bouvet. And then, on August 8th the 3YØJ team from Norway announced that they have a vessel under contract and are planning a November 2022 landing on Bouvet for a 20 day stay with 12 operators. Hearing that news, and knowing that the Rebel 3YØI group plans to depart for Bouvet as early as December 15th, 2021, the Intrepid-DX Group has now dropped their plan for Bouvet and is working to activate another Top Ten Sought After DX Location in January/February 2023. We have the funds originally committed for Bouvet back in hand ready to support one or more of these DXpeditions. Godspeed to all!

Meanwhile, let's hope and pray that Solar cycle 25 continues its rapid rise and presents us with a better-than-expected number of sunspots!

73, es gud DX!

Chuck, AE4CW

VP's Corner *(de Clark Macaulay, WUB4)*



Greetings, Southeastern DXers! This month we are honored to have Bob Heil, K9EID, as the featured speaker at the August meeting. Licensed as a ham since 1956, Bob has a multi-faceted career that includes products for amateur radio, commercial broadcasting, and systems for sound engineers.

In his biography on www.grz.com, Bob shows the diversity of rigs he still uses today that include “boat anchors” from Collins, Drake, and Heathkit. He also has several recent modern rigs he uses for design of audio products of ham ops such as the Parametric Receive Audio System.

On a personal note, I used a Heil headset with mic in my early SSB work to obtain my DXCC for phone. When I decided to focus my operations on CW, I sold the headset, but I still have a hand mic for those occasional forays into SSB-land. Bob has always produced “quality stuff”, in my view.

Looking at the upcoming months, we have a varied line-up of programs that should appeal to both the veteran DXer and the neophyte. If there is something you would like to share at a meeting, please email me.

73 es gud DX,

Clark, WU4B

Treasurer's Journal *(de Jeff Cantor, K1ZN)*



Hi, SEDXC Members! The Club checkbook balance as of August 1, 2021 was: \$18,573.93, an increase of over \$3,000 from my report in July.

Last month, we paid presented a DXpedition Grant to S9OK for \$254.99 (\$4.99 PayPal Fee included).

Gud DX, 73,

Jeff, K1ZN

Around the Shack *(de Hal Kennedy, N4GG)*



Dangerous Deeds

I've written many *Around the Shack* columns that required research on my part. I enjoyed those.

I enjoy learning. I enjoy teaching. I enjoy story telling.

As I began writing this month's column, I was badly pressed for time. I needed a subject I knew all about. Something that required minimal research, yet would be interesting and of value to readers. Finally, I found the perfect subject! A subject I can write about straight out of my head.

The title is: *Dangerous Deeds*, but it could just as well have been: *Stupid, dangerous and bonehead things I have done in 60 years of ham radio.*

Without exaggeration, I am lucky to be alive, have all my limbs, sight in both eyes and not be in jail. I have had a lot of dumb, high-risk ideas that I went ahead and put into practice. Some of them are embarrassing to commit to paper. I'm writing about them here, hoping I can help someone avoid my mistakes. If I do, I will have done a good deed.

What follows is a list of dangerous and dumb things I have done. It's in random order (just like these month-to-month columns are) except for the last item. Skip to and read the last one if you get bored.

Here are my dangerous and dumb ham adventures:

Climbing The sea belongs to fish. The air belongs to birds. Humans are land animals. When we scuba dive or climb to erect antennas we are leaving our domain and entering someone else's. People can't fly, but they sure can fall. As an early teenager I climbed trees. I fell out of a few too. By the time I was late into my teenage years I was climbing my own and others' towers – using nothing more than my pants belt as a safety belt. Wow was that dumb. Every year, without fail, I read of one or more tower related deaths within the ham community.

The answer to this is to do as the professionals do, although even they get into trouble, albeit less frequently than hams.

If you are tower climbing, have the correct gear and don't take a chance on anything less. You need a hard hat, gloves, steel-toed boots, a proper safety belt, a fall arrestor, a second safety line so that you are always

tied to the tower with at least one line, a deep tool pouch, a partner and some training. You probably know this but DO YOU DO IT?

The risks posed by towers and sloped roofs are at least recognized. A risk area we often minimize or fail to recognize is flat roofs. Erecting a VHF vertical on the flat roof of your EOC building seems safe enough until you fall off the edge.

Another climbing issue is the condition of towers or anything you might want to climb. Towers rust and become unsafe. Tree limbs rot. Walk away from anything that looks unsafe. Guy wires deteriorate and a surprising number of towers have not been properly installed to begin with. I have seen towers guyed with white cotton clothes line - no kidding.

An illuminating story: Some years ago I asked a friend who climbs ham towers for a living to share his worst "horror story." He was hired to take down 30 feet of Rohn 25 tower. That's an easy enough task. The tower had a concrete base and was up against a house. It had a house bracket helping secure the tower although the owner said that was overkill – the concrete base was a foot thick and more than sufficient, particularly since the antennas had been removed. The house bracket was removed to facilitate disassembly and the tower fell over with my friend at the top. The "one foot thick" concrete base was about one inch thick. The result was a few days in the hospital.

If hanging wires from trees is your thing, a "potato cannon" or "tennis ball cannon" is the tool of choice. Don't climb trees. Slingshots are an iffy choice. The risk to avoid in all cases is to pull a snagged line back toward yourself. You can load a lot of potential energy into fishing line. When the weight at the far end breaks free, the potential energy becomes kinetic energy heading straight for your head. I know a ham in the mid-Atlantic who lost an eye this way. I once broke a window (directly behind me) this way. Never pull a line back with more than the minimal force needed to nudge it over a small branch that's far away.

Exploding Capacitors Only the intervention of providence has kept me from serious injury from exploding capacitors. I've experienced two incidents, separated by 50 years. Both had potential catastrophic consequences. In 1962 I built a 150 watt linear amplifier as described in the April, 1961 QST. It was designed by Lew McCoy – a name familiar to old timers. I was a kid with no money at that time. My "parts supply room" was junk TV sets at the local landfill. In pre-politically correct days the landfill was called "the dump." My amplifier's power transformer and power supply filter capacitor were landfill parts. My DIY amplifier had about 550 volts on a 450 volt rated electrolytic filter capacitor.

It seemed to work fine and I spent a lot of time with my face inches above the parallel 807 tubes in that amp and, of course, directly above the filter capacitor. Through sheer luck, I was 20 feet away from that amp when the filter cap exploded. What I mean by exploded is EXPLODED. The outer aluminum can turned to shrapnel. The guts of the capacitor (hot tar and who-knows-what) shot around the room at high velocity. My new amp and the ceiling of my attic ham shack were covered with molten goop. Geez.

Using electrolytic capacitors above their rated voltage, or hooking them up in reverse, is reckless. Mayhem is sure to follow.

Also, electrolytic capacitors change with age. Sometimes gracefully and sometimes not. The changes can be subtle. The amount of capacitance usually drifts downward and out of spec. over time and that goes unnoticed. Eventually however, all the capacitance is gone and the capacitor behaves either as an open circuit or a resistor. Past the end of life, most vent. If not in use they may simply leak (goop, not current). If in use they may perform an instantaneous come-apart.

Whether in use or on the shelf, electrolytic capacitors more than 30 years old should be replaced. They should not be powered up. They should not be “aged” or “reformed” by bringing them up slowly on a Variac. Personally I find the notion of “reforming” old capacitors to be a fool’s errand. It rarely works, doesn’t last long if it does and results in a wholly unreliable component in use where a new one costing a few dollars could be in place. Just...replace...them! Some (but not all) can-style capacitors of a bygone era had pressure relief blow-out plugs in the base, to vent pressure before the can exploded. Why do you suppose they put those there? In my experience those blow-out plugs did not always work.

My second bad capacitor experience happened in 2010 while I was building my replica 1910 spark transmitter. Spark transmitters include a high voltage capacitor that must handle pulses of 1,000 amps or more. I found some 50 KV caps at a hamfest and used those during early bench testing while discovering the ancient arts. One of those capacitors let go just like the one had in 1962. High velocity hot goop shot across the garage and splashed against two walls. Once again I was 20 feet away and very lucky.

It’s rare that hams build spark transmitters anymore, but high capacitor current shows up in a variety of applications and, like excess voltage, excess current can destroy a capacitor and potentially imperil the owner. In-rush current at power-up is one example of this.

Many hams these days are into refurbishing “boat anchors.” Vacuum tube gear always has a high voltage power supply and electrolytic filter capacitor(s). These have the same potential to explode as mine did in 1962. In fact, some of the ones you will find in boat anchor gear were made around 1962. When firing up boat anchor gear for the first time in decades, it’s a good idea to do it from a distance, particularly if you are insistent on leaving the old capacitors in place. This is a good segue to the next section about my bad practices.

High Voltage A little knowledge can be a really bad thing and familiarity breeds contempt. I’ve repaired countless linear amps and home-brew-built several. I feel comfortable working around the 3 to 4 KV B+ supply in vacuum tube amps. I have troubleshot amps with the covers off and the interlocks jumped out since the 1960s.

I strongly recommend against doing this. I will probably keep doing it. My attorney has just advised me to explain that that last sentence was not a subtle wink to tell you that while it’s not according to Hoyle it’s probably an okay thing to do. It’s not. Somebody has to climb towers and somebody needs to repair amps, but if you have not acquired the full skill set and tools, DON’T DO IT.

The ARRL Handbook implores you to keep one hand in your pocket when working around high voltage. That’s valuable advice. Better yet is to have both hands in your pockets and be several feet away from anything you are about to power up with the covers off. I have been good about following that last piece of

advice, which is why I'm still here. I can't recall a single troubleshooting test I've run where I could not place the measurement leads (scope probe, voltmeter, etc) where they needed to go with the power off, step back 5 feet and turn the power on. It takes a little more time to do this the safe way. It's time well spent. The exception of course was my 1962 exploding capacitor DIY linear. It had no covers and no interlocks. All I can say is I was young and stupid.

It's rare anymore to find an amateur experimenting with high power amps using tubes that operate at *very high* plate voltage, but that was not always so. Tubes exist that are rated for, and perform best at high plate voltage. Also, there are a few of us who still might be inclined to work on such gear. It's a really bad idea to head north of about 4 KV. In addition to the chance of electrocution going up as voltage goes up, at 10 KV and higher some glass vacuum tubes emit X-Rays. High voltage systems also produce ozone, which is carcinogenic. High current arcs (intentional or unintentional) produce UV light at levels that can be unsafe to eyes. High voltage is not your friend.

Fortunately we are well into the low voltage solid state era.

Soldering This is mostly a good news story. I began soldering (and "artistic" wood burning) around age five. 68 years later I am still soldering. I'm guessing I've averaged well over 100 solder joints a year. That's 6,800 solder joints. Some years I built Heathkit, Eico and E.F. Johnson kits having 600 or more solder joints in a single kit. After all that soldering, I have no scars to show for it. I've burned myself countless times, but it always seems to heal up. The soldering pencil I currently use self-regulates at 480 degrees C (900 F). That's well above the threshold for third degree burns. I think the secret to avoiding permanent scars is to let go fast. Don't check me on this.

My concern about soldering has always been triggered by scraping solder splashes off my eyeglasses. All hams solder things. All hams do not use eye protection for this seemingly mundane task, but they should.

Setting fires N4GG is a "wires-in-the-woods" ham station. It's also a "full-legal-limit" ham station. I've worried about setting the woods on fire, which would be an event with horrific consequences. I came very close to doing it about a year ago.

One leg of my 80 meter inverted vee came into contact with the 300 ohm transmission line to my 20 meter dipole. I was head-down deep into a contest at the time and did not immediately notice the telltale SWR changes. When I did, I headed outside, in the dark, and saw the 300 ohm line on fire about 30 feet above the ground. The fire was slowly working its way up the line to the supporting trees. The word terror comes to mind.

I was able to extinguish the fire by vigorously shaking the line from the ground. It's easy to set fire to 300 and 450 ohm ladder line and fortunately, it's easy (sometimes) to put the fire out with the air current created by shaking.

Had I not gone outside when I did, I might be fighting lawsuits from my jail cell. The woods out back is part of Lake Allatoona's watershed, with countless subdivisions nestled in. Under drought conditions, I could have set a 10,000 acre blaze.

The polyethylene jacket covering 300 ohm and 450 ohm ladder line burns slowly. I have used that property to advantage. To make a connection, I've "stripped" the end of ladder line by setting it on fire. It burns about an inch every 30 seconds and you can easily blow it out. You can get a perfect result stripping balanced line this way if you pay attention to what you are doing (away from the woods!). This may or may not be in the bonehead category. My familiarity with extinguishing intentionally lit transmission line helped me put it out when it really counted. ADVICE: Stay completely away from all of this; it gives me the creeps just thinking about it.

The woods out back keep changing. Limbs fall. New ones sprout in unwanted places. Dry leaves fall onto wires in the fall. The wind breaks wires and insulators. The new procedure at N4GG is to never operate at KW level without first inspecting the antenna farm. Every time. Are all the wires away from trees and not about to touch each other? A prior *Around the Shack* column titled "*QRO Considerations*," listed the voltages and currents that can occur at 1,500 watt power operation. It's also covered in my book: [Ham Radio Tips and Tales](#). Those writings explain just how high the currents and voltages can be, but don't say much about the hazards posed and what to do about them. For starters, don't set the woods on fire.

Power Lines I've done a good job keeping masts and wire antennas away from power lines, but the same can't be said for some of my friends. I operated a station in the Caribbean that had an 80 meter dipole strung above and across a 14.4 KV high-voltage transmission line. Noticing it, I asked about it of course. The situation greatly reduced my desire to operate that station despite the long trip to get there. The owner assured me it was safe. The antenna was made of stainless steel wire and "would not break." I did wind up operating, with deep misgivings. I would not do that again. I have not been back.

Like tower accidents, I occasionally hear of electrocution due to masts touching power lines. I know I am preaching to the choir but I am mentioning it because it keeps happening.

A side story: Near my condo in Florida a boater was trailering his sailboat out of the parking lot of the local Ramada Inn. The sailboat mast touched power lines at the street. Two people died.

RF Safety Thresholds This is the must-read section. Paul Evens, VP9KF, has placed a valuable tool on the web. It calculates the RF field-strength for a given power level, given frequency and given antenna gain; at a given distance from the antenna. The FCC now requires amateurs to make this calculation and adhere to rules regulating maximum exposure levels. How many of us are doing this? It's easy to do with Paul's tool. Just fill in the blanks.

Here is the link to Paul's web tool: http://hintlink.com/power_density.htm

Here is a real-world case at N4GG:

Power: 1,100 watts

Antenna Gain: 4.5 dBi

Frequency: 50.313 MHz (The six meter FT8 frequency)

Distance from the antenna: 10 feet

Results:

RF power density: 7 mW/cm². FCC requirement: < 1 mW/cm² in a controlled environment and < 0.21 mW/cm² in an uncontrolled environment.

How far from the N4GG 6-meter Yagi would you need to be, to be compliant with the FCC specifications? It is 26 feet for the controlled environment case and 58 feet for the uncontrolled environment case.

The options should be obvious if you are non-compliant. Run less power, reduce your antenna gain or stay further away from the antenna. At N4GG I have been non-compliant on six meters by a wide margin. I'm in the process of fixing that and QRT until it's fixed.

I'll stop here, as the subject of RF exposure deserves an *Around the Shack* column of its own. Meanwhile, please take this subject seriously. RF is hazardous to your health and you cannot detect the deleterious effects as they are happening. The risks go up as frequency goes up.

In closing, it's embarrassing to note how many words it's taken to describe my dangerous deeds.

73,

Hal, N4GG

This Month's Meeting (de Clark Macaulay, WU4B)



Dr. Bob Heil, K9EID, is our guest speaker for the August 19th meeting of SEDXC. Bob founded Heil Sound in 1966, and since that time has been an innovator in the field of amateur radio, manufacturing microphones and satellite dishes for broadcasters and live sound engineers.

According to his bio on www.grz.com, Bob was first licensed in 1956 and, from that time, used Amateur Radio as the foundation for his many careers.

His shack includes rigs from Collins, Drake, and Heathkit—all rigs that he continues to use. In addition, he has several newer rigs that he uses to design his Parametric Receive Audio System (PRAS).

Bob is also a sound and radio engineer most well-known for creating the template for modern rock sound systems that included unique touring sound systems for bands such as The Grateful Dead and The Who. He has won multiple awards and honors, and in 2007 he became the first manufacturer to be invited to exhibit at the Rock and Roll Hall of Fame. In 2014, Bob Heil was awarded an honorary doctoral degree in Music and Technology from the University of Missouri.



SOUTHEASTERN DX CLUB

W4NT

*THE
SOUTH'S
PREMIER
DX CLUB*

August 1996

NEXT MEETING TIME & LOCATION

**Tuesday, August 20th, 7:30PM, Old Hickory House
in the Days Inn, Roswell Rd., just inside I-285.**

FROM THE VP

-Sonny Marsh, KE4LDJ, VP

When I saw the solar flux head into the 80's last week, I thought - here we go!! We didn't go far because now it's back in the low 70's.

The Second World Radiosport Team Championships are history now and our guys did great! John Laney, K4BAI, and Bill Fisher, KM9P, will be on hand at the next meeting to fill us in on their experiences. I'm looking forward to hearing all about this great event. I hope there will be a big turnout to welcome our guys back.

Hope to see you at the meeting.

-73, Sonny, KE4LDJ

SEDXC MEETING 7/16/96

-Dick Bentley, K2UFT

Meeting called to order at 7:45 by Sonny, KE4LDJ. He didn't realize until 2 minutes before that President Steve would not be with us. Sonny announced that the WRTC team we sent (K4BAI and KM9P) to the games had placed second among the 52 teams and the Wildcard team we endorsed (K4UEE and N6IG) placed fifth.

Kiyoshi, AE4EZ, picked up the Club Banner and Pins, both of which will be displayed at the Tokyo Hamfest in August. He introduced a new product his company is distributing, a Kent electronic key with touch sensitive no force paddles in a package about 1 3/4" wide, 2 1/2" long and 3/4" high.

Fritz, KJ4TE, spoke about some products Electronic Switch was working on.

Sonny had high praise for the technical coor-

dinators provided by ARRL, they seem to have declared his station clean but his PRO67 appears to be producing an offending oscillation that plays havoc with the neighborhoods electronic devices!

Dick Bentley announced that Larry, N4TMW was hosting a dinner for visitors HSØZAK and HSØZAL on July 23, location to be announced, a sign-up sheet was circulated. Dick also reported that his Russian house guests had decided to travel by car to see last month's featured speaker, KT5X and then fly to Boston where they will visit their Cambridge University counterparts, so they are no-shows for Atlanta.

After a ten minute break, the assembled multitude of 15 or so stalwarts watched the video on Easter Island provided by Bob, K4UFE.

-73 Dick, K2UFT, Secretary
Pro-(no one else would do it)

TREASURER'S REPORT

-Nancy Draheim, NK4U

I will not be able to give you a treasurer's report this month. My hours at the Main Press Center haven't allowed me an opportunity to get to the post office. Hopefully things will be better next month..but I'll be at the Paralympics then.

73, Nancy NK4U Treasurer

The SEDXC Newsletter is published monthly by the Southeastern DX Club. All opinions expressed by the contributors do not necessarily reflect those of the editor, officers, or club. We welcome your opinion.

BEEPS DE K2UFT

-Dick Bentley, K2UFT, Activities Director

We've certainly had a busy time of it since the last newsletter! The Olympics have come and gone with what turned out in retrospect to be minor personal annoyance versus the major catastrophe the experts were predicting. A otherwise successful event was unfortunately marred by some party(ies) on the wrong side of reality but in the true spirit of the phoenix we managed to rise above it. The USA athletes did us proud as did the USA volunteers, of which many in our own ranks can be counted.

At last report K4ØØPI was approaching 8,000 Qs, that's got to be something like KV4AA's effort to get in the Guinness Book of Records!

The Russians I had invited decided to go to Cambridge, Mass. after a two day stop at KT5X's New Mexico QTH. When last heard from they were oo-ing and ahh-ing at Niagara Falls!

For those of you who have the time and energy, the Paralympics were looking for additional volunteers - unlike their bigger brother, they actually have a job category on their volunteer application entitled "HAM." They were also kind enough to allow the use of their Blaze logo on QSL cards, sensing that in very few cases do any of us have a pecuniary interest at all.

We urge you all to come out and vote for the new slate of officers to guide us all through the coming year. Thanks to KR4DL for his time at the helm.

73 Dick, K2UFT Activities Manager

FROM THE INTERNET

DX Publications Sold

Chod Harris VP2ML/WB2CHO announces the sale of DX Publications to Paul AE4AP and Nancy KB4RGW Smith of Paducah, Kentucky, effective Aug. 12, 1996. DX Publications publishes three DX periodicals: The DX Bulletin, The DX Magazine, and The Long Island DX Bulletin. The Smiths will continue the publication of all three.

The DX Bulletin has been published since 1968, when it was called The West Coast DX Bulletin. The DX Magazine was founded by Chod Harris in 1989, and remains the only glossy-paper, English-

language magazine devoted entirely to DX. The Long Island DX Bulletin was purchased by DX Publications two years ago. It is the most economical DX newsletter in the US.

DXers may contact the Smiths at P. O. Box 2306, Paducah KY 42002-2306, phone 502-898-8863, fax 502-898-8865, e-mail: dxpub@midwest.net Chod Harris will continue editing the DX column for CQ Magazine.

This is an excerpt from the August 9, 1996 edition of the ARRL

NEW FCC RF SAFETY STANDARDS INCLUDE AMATEUR RADIO

New FCC RF safety standards that become effective January 1, 1997, could affect the way some hams operate. As a result of a Report and Order adopted by the FCC on August 1 (ET Docket No. 93-62, Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation), Part 97 will require hams running more than 50 W PEP to conduct routine RF radiation evaluations to determine if RF fields are sufficient to cause human exposure to RF radiation levels in excess of those specified. "Measurements made during a Commission/EPA study of several typical amateur stations in 1990 indicated that there may be some situations where excessive exposures could occur," the FCC said in ending the blanket exemption for Amateur Radio. Amateur operation at power levels of 50 W PEP or less is "categorically excluded" from the new requirement in most cases. Where routine evaluation indicates that the RF radiation could be in excess of the limits, "the licensee must take action to prevent such an occurrence," the Report and Order stated. The FCC said this could mean altering operating patterns, relocating the antenna, revising the station's technical parameters—such as frequency, power or emission type—or "combinations of these and other remedies." Although the new exposure criteria will apply to portable and mobile devices in general, at this time routine evaluation for compliance will not be required of devices such as "push-to-talk" portable radios and "push-to-talk" mobile radios used by Amateur Radio operators. These transmitting devices will be excluded from routine evaluation. (*read whole thing in QST -ed*)

WRTC-1996 Final Final Result

Call	Op#1	Op#2	Judge	Host	Score	QSOs	Mults	Uniq%
W6X	KROY	K1TO	UA6HZ	WA6AHF	761829	2457	183	1.7
K6T	K4BAI	KM9P	W6UM	NQ6X	678132	2511	162	1.2
W6R	K6LL	N2IC	WR3G	AF6S	655720	2424	169	1.1
K6P	VE3EJ	VE3IY	OH2KI	N6UUG	647112	2343	177	2.0
K6C	K4UEE	N6IG	BA1FP	WB6PCJ	644059	2355	169	0.9
W6T	K5ZD	WX3N	K6SSS	AB6CW	616308	2170	174	1.2
W6D	K1KI	K3UA	AA7FT	K6YT	606550	2145	175	1.6
W6Q	9A3A	S53R	W7NI	WA6GFY	598272	2233	164	2.1
W6V	KF3P	KR2J	N6RA	WB6YRN	577575	2352	151	1.6
W6P	K8CC	K5GO	K7LXC	WB6WSL	568435	2370	149	1.0
K6V	W2GD	W0UA	S59AA	KE6HUA	568378	2465	146	2.4
K6W	N6TV	K7SS	N6KT	AB6DI	556928	2261	152	1.5
W6I	K1AR	K1DG	S50R	KK6WP	547404	2204	156	1.3
W6Y	DL1IAO	DK3GI	NB6G	AD6E	545756	1993	167	1.7
K6D	DL5XX	DL1VJ	KJ4VH	NF6S	532728	2183	147	2.3
K6R	LZ1SA	LZ2PO	OK2FD	N6BT	531552	2256	147	2.1
K6G	NP4Z	WC4E	K5MM	K6MA	527592	2238	152	2.8
W6A	K3LR	WA8YVR	AB6NJ	KE6OT	523672	2478	134	2.2
K6X	UA3DPX	RZ9UA	AI7B	WB6UTY	518666	1960	163	1.7
K6Z	JH4NMT	JE3MAS	W0UN	W6YX	512535	2318	141	3.4
W6S	LY2IJ	LY1DS	S50A	AA6YQ	509392	1958	158	1.9
W6B	S59A	S56A	I2UIY	AE0M	507318	2257	141	1.7
K6Y	OK1CF	OK2PAY	W7RM	W6DU	499796	2143	148	2.3
W6H	RW1AC	RV1AW	PY5EG	AI6V	497965	1841	163	1.0
K6I	JH7PKU	JO1BMV	CT1BOH	KN6VO	488940	2296	145	2.1
K6S	ON4UN	ON9CIB	W3ZZ	N6WFK	480326	2120	154	2.4
W6U	EA1AK	EA4KR	N0AX	W6JD	470744	1918	152	1.7
W6G	JE1JKL	JH7WKQ	OH2MM	N6OM	470237	1984	139	2.0
K6U	SM3DMP	SM3CER	N7NG	AJ6V	465075	2165	135	1.1
W6O	ZS6EZ	ZS6NW	VE7SV	KV6S	461553	2093	137	1.7
K6O	WN4KKN	N6TR	WA7NIN	KW6C	454476	2331	121	0.6
W6E	EA7TL	EA9KB	N2AA	K6XV	445356	1871	139	1.6
K6N	YT1AD	YU1RL	K3ZO	WB6AFJ	440358	2228	140	3.7
W6W	LU6ETB	LU/OH0XX	I0JBL	W6OPO	437016	2319	131	3.3
K6J	N2NT	KZ2S	S57AL	KK6EK	426656	1902	134	1.1
W6K	F6FGZ	F5MUX	K5RC	W6VG	418375	2276	125	3.1
K6A	JH4RHF	JA8RWU	9A5W	K6SMH	412388	1981	131	2.7
K6H	DJ6QT	DJ2YA	RW9UP	N6DA	411376	2353	112	1.6
K6K	UT5UGR	UT4UZ	S59L	KG6FR	398399	1863	127	1.3
K6F	IT9BLB	IT9VDQ	UA9BA	KM6OH	385280	2000	128	3.1
K6B	9A9A	9A3GW	G3SXW	AB6YL	383166	1886	126	1.2
K6Q	VE7NTT	VE7CC	K0KR	WM6R	362440	1546	130	0.4
K6E	HA0MM	HA0DU	AA6XZ	KK6PH	357885	1759	135	4.0
K6M	G10NWG	G3OZF	K4XU	WB6JJJ	357094	1884	132	3.0
W6Z	VK5GN	VK2AYD	RU1AA	W6NA	343604	1822	124	2.2
W6J	SP6A2T	SP9FKQ	K6NA	K6LM	330876	2023	117	2.4
W6L	UN4L	UN2L	W7Yaq	KM6AV	309518	1796	121	4.9
K6L	SP9HWN	SP9IJU	JA7RHJ	W6ISO	298178	2149	97	3.7
W6N	I4UFH	I2VXJ	KC7V	KE6KXO	269028	1728	106	3.3
W6M	PY0FF	PY5CC	S56M	AB6CJ	231066	1580	99	2.6
W6C	IN3QBR	IT9TQH	K8AZ	AA6LY	185070	1615	93	5.0
* approximate score, damaged log file:								
W6F	OH2IW	OH1JT	KT3Y	AG6D	530000*	2100	155	1.2