

Including Ham Radio Fun!

FEBRUARY 1997

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# 73<sup>®</sup> Amateur Radio Today

*International Edition*

**Software Home-brewing** see page 10...



Photo by W0LMD

## To Build:

- Beam-aimer
- Turbo Digi-sniffer
- Gel Cell Charger
- 160m Antenna Tuner
- Stealth Antennas

## Reviews:

- Ten-Tec 6m Transverter
- Hamtronics RWX



the power supplies is not usually important.

Place attenuators directly at the input and output of the amplifier. This removes the effect of poor cable, source and power detector matching. Always remove power when making connections and soldering tuning stubs. Make sure the amplifier output is terminated before applying power.

ohm line. Be careful not to cut the thin brass lines. If you are unsure of possible damage to the bias lines, carefully check continuity or use a magnifier to do visual inspection before applying power. In some cases it pays to go through the agony of removing the stub completely as the correct new stub placement may overlap and cause problems.

verify that the output is as high or higher than obtained with the wand. Move the tuning stub if required to obtain results equal to or better than those of the wand.

Slide the wand over the previously attached new stub and if improvement can be made, attach another square. Continue this for the entire length of the main 50 ohm line until no further improvement is found. Increase the input power if working with a power amplifier and retune the output stage for maximum power. Be careful here not to mismatch the output so badly with the wand as to damage the FET.

The process can be very slow, with some stubs only gaining a fraction of a dB. In most cases it will take all of those small increases to get good results so don't expect to see major improvement with a few stubs. It may take four stubs per stage sometimes to get the maximum output.

#### Additional notes

Direct grounding of a microwave power device emitter/source is essential for proper operation. Any form of insulating grease can prevent full gain/power output from being obtained.

When mounting boards into enclosures, take care to ensure that the entire perimeter of the board is connected to the enclosure to prevent oscillation. 73

## “Several types of 14-14.5 GHz power amplifiers are readily retunable for use on the 10 GHz amateur band.”

### Tuning procedure

Prepare the tuning wand and tuning stub material. Cut about 1" or 2" strips .080" wide (not critical) of about the same width as the main 50 ohm microstrip lines in the amplifier from thin copper or brass stock (.003" to .010"). Tin both sides of the strips and flick off excess solder. Make several tuning wands by cutting one end of a wooden toothpick square at the largest diameter. Using SuperGlue™, attach a square (.080" x .080") of the prepared tinned copper or brass to the curved end of the toothpick. Wipe off excess glue from the exposed side of the square and let dry.

Remove existing tuning stubs. Using an X-Acto™ knife, make a deep enough cut to disconnect tuning stubs from the main 50

Connect the amplifier to the signal source, attenuators, power detector and power supplies. Turn on the power and adjust input attenuation for as low an input as can be readily detected on the output. Start at the output and slide the tuning wand along (in contact with) the main 50 ohm line, watching for an increase in output. Note the maximum output reading obtained with the wand. Remove power and solder a square of the prepared material in the same position as noted by the wand.

Do not add solder. The tinning is normally sufficient to allow the new tuning stub to be held in place with the pointed end of a toothpick and then just touched with the soldering iron to reflow the solder. Turn on the power and

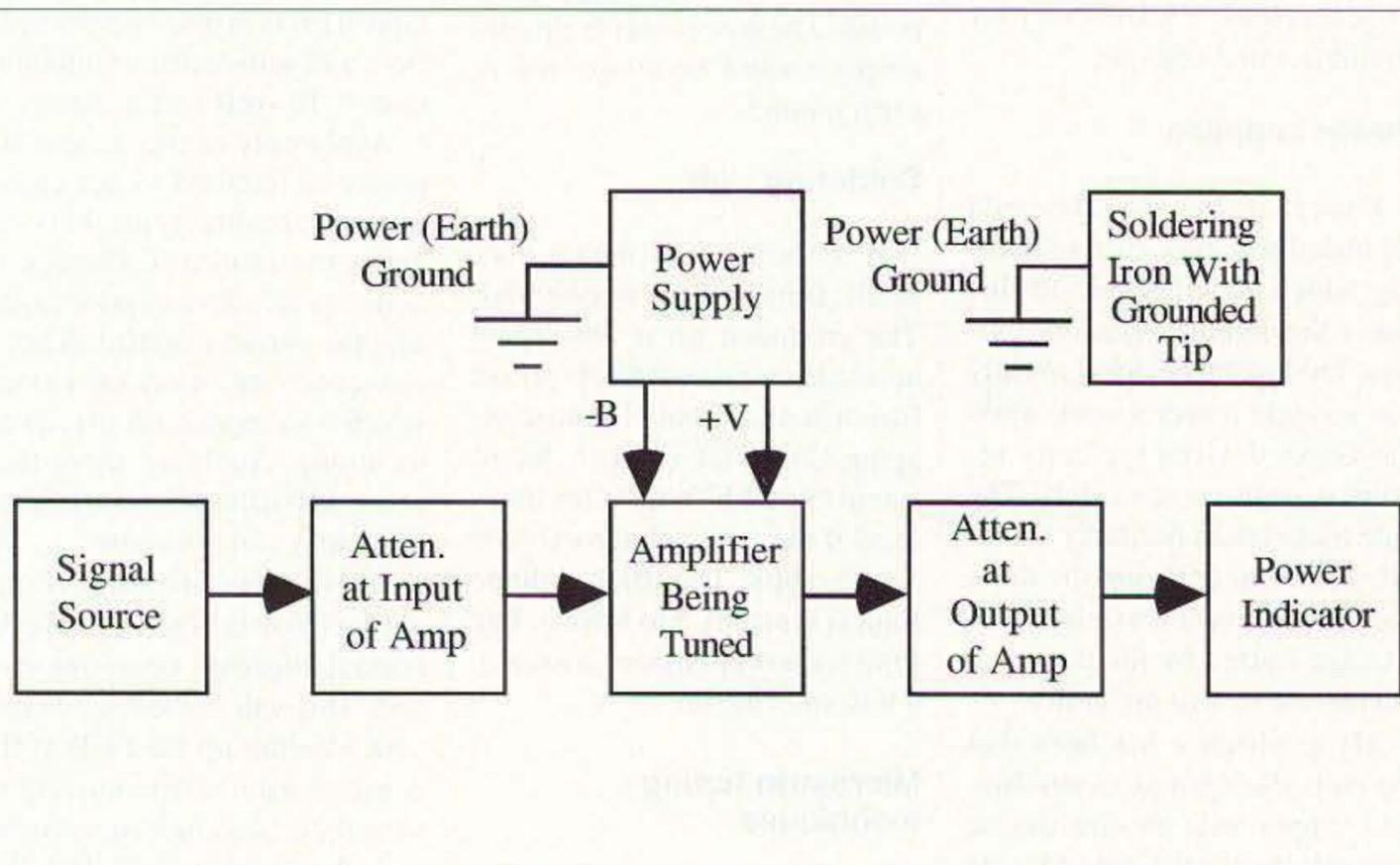


Fig. 2. Equipment configuration for retuning microstrip amplifiers.

### LETTERS

Continued from page 7

truly are the unsung heroes of amateur radio—I thank you all, and please do keep up the great work! There are people out there who really do appreciate it.

Aw, shucks... Wayne.

**Roger Wendell WBØJNR.**

Wayne, in "Never Say Die" you asked if we'd like to hear you talk about something besides ham radio. You bet! How about the beauty of 3.5 billion years of organic evolution and what hams can do to save it? We don't need any more money schemes, dirty religions, or mindless hobbies—we need more of nature—the real world.

Roger, I've flown over the Pacific Northwest, so I've seen the ugliness of clearcutting our forests. I've seen the horrendous scars of strip mining. I'm also seeing the pollution of the radio frequencies, with around 30,000 rock music radio stations crowding my AM and FM dial, and 200 or so TV channels of mind-rotting crud. Our school system is crumbling. Our health care system is just as bad as our school system. Crime, drugs, welfare, and so on. Yes, we've made a real mess of our states, country and planet and we're trying to figure out how to go out and spread it to other planets. So what do we do, knuckle under and try to cut as big a piece of the pie as we can for ourselves, and to hell with the mess we make doing it? Or do we fight? But how can you fight City Hall? I've already proposed a way we can secretly infiltrate the "system" and start changing it, working from the inside. Roger, we hams are 700,000 strong, but only if we're working together. As individuals we're of no significance. Yes, as small a group as we are—we have the potential to change our cities, our states, our country, and then the world. Our foes are entrenched interests, apathy, and indifference. Our strength is a never-say-die attitude. Motivation. Determination. Perseverance. Roger, 700,000 people can be an army... Wayne.

**Cliff Gieseke W4ZFL.** UFOs are a topic I've been fascinated with since the early '50s, when I was first

Continued on page 62

## SPECIAL EVENTS

Listings are free of charge as space permits. Please send us your Special Event two months in advance of the issue you want it to appear in. For example, if you want it to appear in the June issue, we should receive it by March 31. Provide a clear, concise summary of the essential details about your Special Event.

### FEB 8

**CHARLESTON, SC** The 24th annual Charleston Hamfest and Computer Show will be held at Stall H.S. near I-26 and Ashley Phosphate Rd., in North Charleston. Tailgating allowed. Talk-in on the WA4USN Linked Rptr. Sys. 146.79(-) Rptr. aboard the *USS Yorktown* and the 145.25(-) Rptr. near Summerville. Tickets will be sold Sat. morning at the door; \$5 for adults. Children under 12 admitted free. Pre-reg. tables are \$8 per 8 ft, \$10 at the door as long as they last. Make check payable to C.A.R.S. Hamfest Committee, and send with an SASE, to Jenny Myers WA4NGV. Table reservations must be received before Jan. 24th. VE Exams on site starting at 12 Noon. Walk-ins. Bring original and copy of your license, any CSCEs you have, and two IDs, one with a photo. For exam info, call Ed Frank KC4OOZ, 610 Longstreet Cir., Summerville SC 29483. Tel. (803) 871-4368; or Doc W4MUR, (803) 884-5614 or E-mail: efrank@charleston.net. The Hamfest contact is Jenny Myers WA4NGV, 2630 Dellwood Ave., Charleston SC 29405-6814. Tel. (803) 747-2324, or E-mail: brycemyers@aol.com. VE Exams are also given monthly on each 3rd Saturday, at Trident Tech College, Rivers Ave., North Charleston, Bldg. 630 at 9 AM. Contact Ed Frank KC4OOZ, (803) 871-4368.

**DEARBORN, MI** The Michigan Antique Radio Club will host its Swap Meet at the Armenian Hall on Ford Rd. Open to the public 8 AM-Noon. Adm. \$2 per person. A Silent Auction, Equip. Contest, and a Donation Auction will be featured. Contact Jim Clark at (517) 349-7187.

### FEB 9

**MANSFIELD, OH** The Mansfield Mid\*Winter Hamfest/Computer show will be held by the InterCity ARC, Inc., at the Richland County Fairgrounds in Mansfield. Doors open at 7 AM. Tickets \$4 in advance, \$5 at the door. Tables \$9 in advance, \$12 at the door, if available. Advance orders must be received and paid by Jan. 13th. Send requests, payments, and SASE to Pat Ackerman N8YOB, 63 N. Illinois Ave., Mansfield OH 44905; or phone (419) 589-7133 after 1 PM EST. Talk-in on 146.34/.94 W8WE.

### FEB 13 and 27

**FORT WORTH, TX** The Lockheed ARC and the Kilocycle Club of Ft. Worth will sponsor VE Exams for all classes at the Lockheed Rec. Area Facility located at 2400 Bryant Irvin Rd. Exams start at 7 PM. G.R.D.L. testing done by appointment only. Call Ted Richard AB5QU at (817) 293-6745.

### FEB 14-16

**ORLANDO, FL** The OARC of Orlando will host the Orlando HamCation and Computer Show, and ARRL North Florida Convention at Central Florida Fairgrounds. Set up Fri. 9 AM-5 PM; open to the public Fri. 5 PM-9 PM, swap tables only. Sat. 9 AM-5 PM and Sun. 9 AM-4 PM. 150 commercial exhibits. Largest tailgate area in FL. RV overnite parking \$16. Adm. \$6 advance, \$9 gate. Free parking. Swap tables \$25/Tailgate \$15 all 3 days. For advance tickets and info, contact Orlando HamCation, P.O.

over-driving the amplifier. This is a very common problem, especially with home-brewed equipment. Let the gain of the amplifier do its job—you don't need to apply 200 mW of drive! Design your audio preamplifier so it provides the proper level for the LM386.

Another problem with some LM386 designs is a tendency to oscillate, or "motorboat." With rare exceptions, this can be cured by increasing the value of the decoupling capacitor on the VCC line of the LM386. It's also good practice to have this capacitor mounted as close as possible to the chip. Many designs show the value of this decoupling capacitor at about 220  $\mu$ F. Increasing the value to 470 or 1,000  $\mu$ F will usually do the job.

In really stubborn cases, a small value resistor, usually 10 or 22 ohms, may be inserted in series with the VCC line feeding the LM386. A 1/2 watt resistor should be used instead of the junk box 1/4 watt device.

An all-too-often overlooked item when fixing a wimpy LM386 is a poorly regulated power source. If your rig is running from a battery, and there is an internal 7812 regulator feeding the LM386, the regulator won't have enough overhead to regulate. This will cause the voltage supplying the LM386 to wander about. You can prevent this several ways.

First, you can run the LM386 from the input side of the regulator, assuming the input (supply) voltage is between 12 and 14 volts DC.

If this is not possible, you can use a voltage regulator with a

lower voltage rating. A 7810 will have the necessary overhead when using a 12 volt supply, but just barely! A 7808 would be ideal, provided your circuit will operate at 8 volts. There is a 7809, but it's hard to come by.

If you need to increase the voltage of a 7808 regulator, there are two fixes. First, you can put a diode in series with the ground pin. For each diode, you will raise the output by .7 volts. Or, you can use a resistor connected to the ground pin. In both cases, you raise the ground pin slightly above ground, which causes the output voltage to increase. I should mention that neither way is the preferred method to increase the voltage of a three-terminal regulator. It's always best to specify the correct voltage regulator for the circuit under design.

### Last month's schematics

Some of the schematics were missing from last month's column. Moving into a micro apartment has really put the screws to me. As things begin to settle down, I'll be able to get back into my routine. If you are interested in some of the missing schematics, drop me a line. Do be sure to send letters to my new address, P. O. Box 508, Massillon, Ohio 44648.

Out of all this madness, a 100 percent solar home will be constructed. A 4 kW peak solar array is planned. Also planned is a 65-foot free-standing tower, complete with some real antennas! The best part of it all is that by the time I'm done, the sunspot cycle should be taking off. Talk about good timing!

73

## LETTERS

Continued from page 60

licensed as WN4ZFL and W4ZFL in Pensacola, FL, as a teenager. I teach foreign military personnel at the Defense Language Institute English Language Center at Lackland AF Base and last week I was introduced to a Turkish AF officer there who had an encounter with a UFO. About five years ago, he told me, he was in the front seat of an F-104 when his instructor in the back seat called his attention to

an approaching disc-shaped bright light. It continued to approach them, and when it was quite close his instructor decided to initiate the ejection sequence. Before he was ejected, after being told to prepare for ejection in 10 seconds, he saw the UFO veer away from them, but too late to save the aircraft. The approach of the UFO to their aircraft was, fortunately for the pilots involved, witnessed by personnel in a control tower close to the runway.

Other DLIELC students have told me of UFO encounters over the years. While teaching all the military officers attached directly to the Colombian president (his personal pilot, security chief, protocol officer, a Navy liaison officer, and the colonel in charge of "La Casa Militar") a number of years ago at the Presidential Palace in Bogota, Colombia, I asked these officers one day when we were all together

if they thought the most likely explanation for the more reliable, more substantial, credible reports was that we are being visited by extraterrestrials. Going around the conference table with this question I was fascinated when each officer responded with a "Yes." That's the only military group I've taught over the past 30 years that was so unanimous when asked such a question.

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## Some highlights

I can recall one winter snowstorm when all travel came to a halt. I heard some QRN on the 15 meter band that sounded like noise being generated from some type of an electrical appliance. I left the door of the radio shack open,

caused that interference; the signals weren't that strong and besides, I couldn't find anyone else who could hear it to confirm its presence.

I remember, with delight, many evening ground-wave QSOs with New York City/Long Island hams which put my antenna in the direction of South

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**"I could put up anything I wanted—life was good!"**

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stepped out into the snowbound road and looked down into the valley where I could see a section of Route 23 in Stockholm, New Jersey, which was approximately three miles away. I heard the noise in the receiver and simultaneously spotted a puff of smoke coming from a snowplow. This was repeated several times until I realized that the snowplow was the source of the noise and since it was diesel-operated, what I was hearing was not ignition noise, it was alternator noise—three miles away. Early morning differences in noise background could be detected depending upon the pointing of the antenna with respect to the sun. I can recall observing some weird noise which sounded like a mishmash of several signals when the antenna was pointed in a certain direction, which happened to be towards the abandoned Edison mines, about eight miles away. I never did find out what

Africa. The band was dead with respect to skip, but on many occasions ZSs would break in just to let me know that I was the only stateside station being heard. I guess having a Henry 2K4 and six elements on 15 didn't hurt. On many occasions I would work 15 meter ground-wave stations at a distance of approximately 200 miles and the ham on the other end would excuse himself so that he could work "other short skip stations."

So why did I give up this ham paradise? It was just time to do something else. I sold all my possessions, bought a sailboat and lived aboard while spending the next 15 years in the sunny Caribbean between Puerto Rico and the Virgin Islands.

Within the past year I had occasion to be within five miles of my old QTH and couldn't resist visiting. My old ham shack was now in use as a garage—to coin a cliché, you can't go home again. 73

## NEVER SAY DIE

*Continued from page 79*

Step one is to design the transmitting and receiving units. Keep 'em simple. Sure, I'll be glad to publish your solution, if it looks promising. And yes, any manufacturers who decide to use it should pony up a 2% on gross sales royalty to you too.

Once something like this starts to catch on, every restaurant will have to invest in a system.

My preference would be to use infrared—like your TV remote control units. With a little power a table unit can cover a large area. A booster can be installed if needed to cover the kitchen.

## LETTERS

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While waiting for one of their security people to drive me back to my apartment, the Colombian Navy captain and I were alone and he told me about an encounter one of their frigates had with a UFO one night while on patrol along the Colombian coast. Recently I

Hey, do Sherry and I get some free meals out of this?

### Selling Music

For that matter, you should be able to make a nice living selling audio systems to restaurants, complete with CD players and a set of appropriate ethnic music CDs. Mexican music for Mexican restaurants; Italian, Chinese, and so on. The sales and service in providing good music for a few hundred restaurants should keep you out of trouble. The next thing you know you'll be on your way to Mexico, portable digital recorder in hand. Or Greece. Or Japan. Oh, and don't forget that 2% for Wayne. On gross sales. 73

had a Colombian AF colonel in one of my classes at DLIELC, so I asked him if he had ever been given a briefing in which he was told that we have been having extraterrestrial visitors. Looking at me directly, he responded, "Yes." Most Colombian AF officers apparently have not had such a briefing, only those working at the highest levels.

*Continued on page 82*

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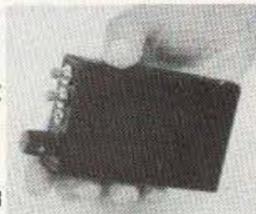
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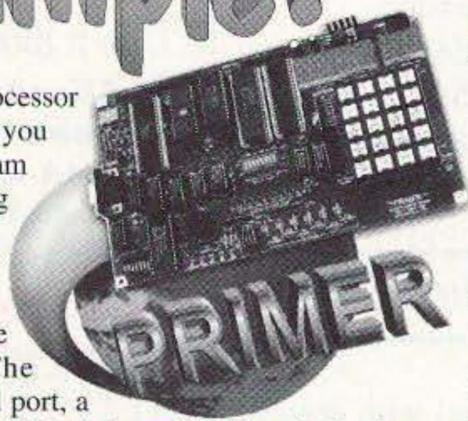
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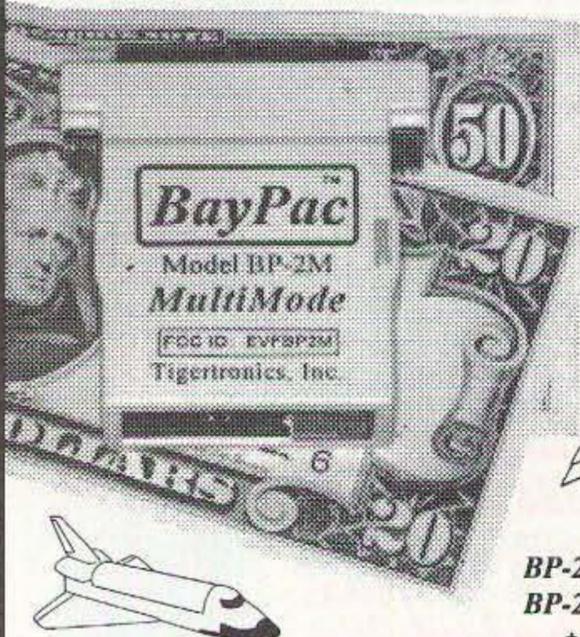
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## LETTERS

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A couple of years ago I participated in a MUFON investigation of a family's encounter with a UFO that had hovered over their farmhouse near San Antonio, frightening them badly. There were three witnesses: a mother and two of her children. The 13-year-old daughter stayed outside looking at the craft the longest and experienced some physical symptoms (sunburn, fever, etc.). All felt heat and came down with colds shortly afterwards. The younger son will not go outside the house alone anymore and the daughter couldn't sleep at night for long afterwards. Other strange things occurred that evening and there is some suspicion that one or more family members were abducted. The UFO phenomenon is quite bizarre and I'm also puzzled, amused and frustrated by the strange human response. Why aren't more people eager to find answers to the questions being raised?

*That's simple, Cliff: We believe what the government tells us. The government wouldn't lie to us. But then there are a few troublemakers like you and me. I personally know the government is still lying about Amelia Earhart, even after 60 years.*

*A few years ago I was called by a farmer to look at some crop circles in Frankestown, NH. I talked with the woman who lived next to the farm and she told about a UFO that had hovered over her house for several minutes a few nights previously, scaring the heck out of her and her children. When her husband got back he ridiculed her and the kids. The next day he apologized when he reported that the staff at the Crotched Mountain Children's Rehabilitation Center a few miles away reported the same silent bright light hovering over their buildings that same evening, and then zooming away at an incredible clip.*

*Then there's a chap with the highest security clearance who is a consultant to President Clinton who called me a few days ago. He's had several contactee experiences himself and his son, in Annapolis, reports that they are teaching the upper class students*

*that the ETs are already here. I do wish someone would teach these critters to talk instead of always using telepathy, and lend them some HTs so we could let them hear what a pileup sounds like... Wayne.*

**John Peters K1ER/KH6.** You asked for a report on Dayton. Well, in brief, it stank. The WX used to be wet and cold, which was easy to handle with a waterproof jacket. This year the stupidity of the shift to May was demonstrated by pouring rain for several days before the HamVention, making it possible for the humidity to be unbearable on Friday and Saturday when the temperature was unbearably hot. The flea market seemed to be about 50% full, with many of the spaces purchased by people looking for a close-in parking space. Nothing in the flea market space but a parked vehicle. The flea market was *not* taken over by computers, it was taken over by completely useless junk—old lab equipment (junked by hospitals), old telephone equipment junked by some telephone company. Much less ham gear or computers than before. The tent area, normally known for the two or three inches of water running over your feet, was hot and humid, and contained basically the stuff that didn't sell at the local Radio Shack. The flea market was a bust. The inside displays were the same gang as usual. It would be hard to tell one year from another, except that it was hot.

You should have had your own forum in competition with those scheduled. Best example was the DX forum. Scheduled to start first thing in the morning with a set schedule of topics. So far so good. The first event was Bill K from the DXCC desk who was scheduled to talk for 30 minutes or so. He took five to say the card checking backlog is gone and all's well with the world. The DXAC chair then announced that there was really nothing controversial going on with the DXAC (probably the most blatant statement before the presidential lies started) and sat down. With no questions or arguments, and since the forum was then approximately 50 minutes ahead of schedule (the later speakers had not arrived), they