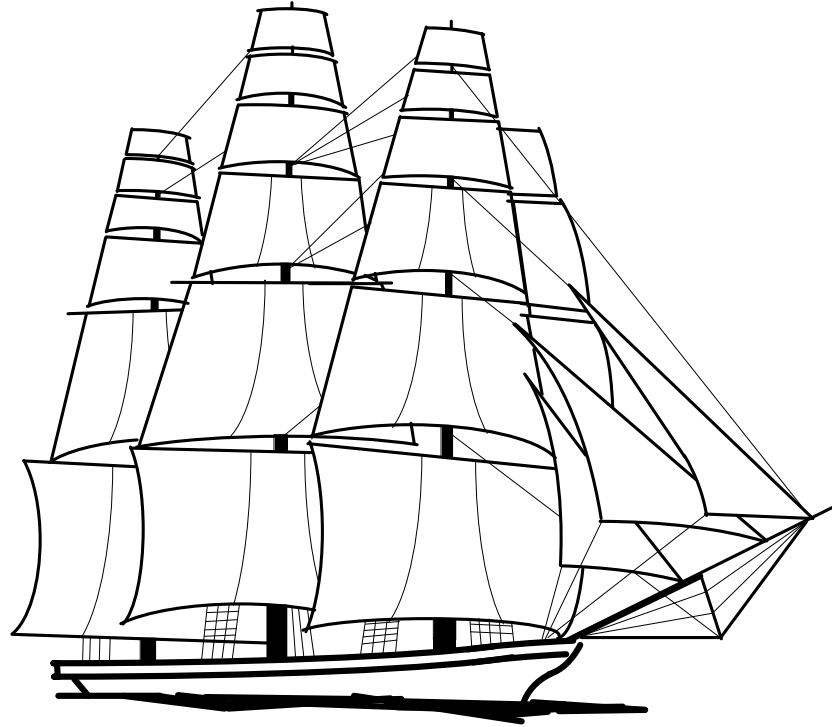


Yankee Clipper Contest Club



1995 Contest Cookbook

Introduction

Leonard Kay, KB2R

There it was, in black and white, in the 1995 ARRL DX writeup on page 116 of October QST:

Frankford Radio Club	145,472,466	161
Yankee Clipper Contest Club	137,622,645	151

We weren't off by much. If you do the math, you see that our *average* entry was higher: 911k vs. 904k. Only 9 more entries and we would have won. Not shabby at all, considering how late in the season we rallied to do this! Hats off to the ARRL DX awards team, and to everyone who operated!

Now it's the beginning of the 1995-96 season, and we have *two* shots at a win. I think the message this year should be: *get the numbers up*. I mailed out almost 300 Scuttlebutts to dues-paying members last week - imagine our club score if only 2/3 of our members get QRV! And we're going to need it, if the DXpedition club entry rule for ARRL DX passes the Awards Committee.....

It's with that idea in mind that I assembled this year's cookbook (combined with the fact that we're at a sunspot minimum....). The focus is toward the basics, and towards single-op setups. The big multis already know how to play the game, and we need single op scores - especially from all our newer shipmates. KY1H has written a wonderful article on the basics of computers and contesting, N6BV has once again provided his IONCAP propagation charts (printed front-to-back to so you can yank them out and put them in clear plastic sheet holders), we have the usual band articles, and a very interesting special interest article from K1VR rounds it all out.

Remember that getting on the air and making Qs is *the* most important thing you can do to help the club score. The second most important thing is remembering to submit your log on time! And keep in mind - while you're winning, of course - that this is a *hobby*. Have *fun*!

Beat FRC (and don't let 'em see this book!)!! ☐

Computers and Contests

Dave Robbins, KY1H

Ah, computer logging, propagation predictions, packet networks, radio and rotor control, automatic CQing on CW or voice, automatic report sending, all that great stuff that computers do for you in a contest. How much nicer it has made operating since the days of paper logs, dupe sheets, tape loops and voice repeater DX spotting. That is until you start calling CQ and the computer won't stop. Or you go to type a call and the computer won't take it. Or you hit a button to grab a DX spot and your run frequency ends up on a WARC band. Using a computer can make contests so much more fun, or so much more of a headache, depending on how careful, or lucky, you are. I am going to try to give some hints to make you one of the careful ones who enjoys using a computer during a contest. It's not that hard if you take your time and check it all out ahead of time.

As some background, I started out contesting using paper and pencil with no outside spotting help. Since then I have used just about every computer that has come along for duping, logging, packet, and propagation tracking. This has included everything from a homebrew 8080 to a Pentium. Right now during contests I run a network of 9 PC clones plus the AA1AS PacketCluster node alongside 7 transmitters, so I have seen my share of RFI problems.

Regularly scheduled contests like the CQ World Wide, or ARRL DX contests are not Field Day. You are allowed to prepare for them early. I know many of you spend hours and hours studying propagation, following expedition plans, and spend all summer working on antennas. Yet the Friday before a major contest you are trying to learn how to use the latest CT changes and hooking your computer to your radio. Except for some multi-op set ups that are put together Friday night, most of us have the radio and computer we will use for the contest in place long before the contest starts. Yet I regularly get phone calls the Thursday or Friday before major contests asking about how to set up serial ports, or how to make CT talk to packet. Remember this when you are stuck inside on a rainy weekend, take a little time and play with CT, or run a bit in one of the state QSO parties, or just make up your own contest and play a bit before you have to do it for real.

In this article, I will try not to comment on operating practices related to particular entry classes or contests. I will leave all that to the experts on operating. I *will* talk about hardware set-up and testing, first about keeping your RF out of the computer and accessories, then about keeping the accessories out of your receiver. I will also give some tips about setting up your logging program, using and sending DX spots on the PacketCluster. I will also point out solutions to some problems with 'Contest Mode' on the network. Finally, I will touch briefly on the use of propagation prediction programs.

Hardware - Transmitting

When I am getting ready for a contest, especially the first one of the fall season after a summer full of antenna work, I try to test out everything that will be running during a contest. This means that I fire up all the radios, amps, computers, and accessories. Then I try each band at full power on each of its antennas and make sure everything keeps running. When I do this I try to use all the interfaces to the computer that will be used during a contest. Some problems only show up if you are typing when you transmit, or if you are sending or receiving packet data while you are transmitting. So I make sure I exercise all those interfaces while transmitting. Also, I run CT during this test. Since programs like CT use some functions that most other PC programs don't, they may react differently to RF. Some odd effects I have seen include the clock running fast or slow, keyboard response slowing to a crawl, loss of radio control, or garbage in or out of packet interface.

Now: how do you fix a problem if you find one? First try disconnecting all external cables from the computer except power, keyboard, and monitor and see if you still have problems. If that cures it then reconnect one cable at a time until the problem returns, when it does put ferrites on the offending cable. You may also have to filter power to the device that caused the problem. If disconnecting cables doesn't solve the problem

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check to be sure your computer case is grounded and all the covers are on tight. If the case is OK try adding ferrites on the keyboard, video, and power lines (most likely in that order).

One thing I did when I decided to go to computer logging was to buy good cables. In my case I needed several long cables with specific connector combinations to work with an 8 port COM card and dumb terminals. It may have cost a bit more, but I called up 'Black Box' and had them made to order from their best shielded cable. I have never had a problem related to leaky COM port cables. I have heard of other stations going to fiber optic serial links to solve RF problems.

If you are getting jumps or wiggles on your monitor from power transformers you have three basic options. First, you can invest several hundred dollars in a magnetic shield for your monitor. Or you can move the monitor and offending power supply farther apart. And if that doesn't work you can try entering QRP classes. My solution is to move them apart; usually just a few extra inches is all that is needed.

VHF radios: This final link in the cluster connection can also be susceptible to RFI from other bands. These problems may not be obvious at first, since most of the time the radio continues to operate and when you stop transmitting the TNC will catch up on missed packets. A quick way to test this is to see if the Cluster response to commands is slower while you call a long CQ. Even though this may not be a big problem to you the extra transmissions needed by the node you are connected to may cause the user channel to slow down for everyone else. A 1/4 wave (about 12" for 2m) shorted stub works very well to stop input overload. Hook it up with a T connector close to the radio. But beware of dual banders: 1/4 wave on 2m is close enough to a full wave on 440 MHz to look like a short circuit. Also check the VHF radio ground and shielding of the audio lines to and from the TNC.

The cable ground connection in PL-259s is a common source of RF leakage. If you do not get good solder connections to the braid it can break loose when cables are flexed or twisted. A bad coax ground connection can put enough RF onto cables in the shack to totally undo any other shielding you try to do.

Hardware - Receiving

On the other side of the coin you should check that none of your accessories is creating RF that is going to disrupt your reception. I try to tune through the bands during a quiet time so that birdies stand out better. After all, an S-3 birdie will be buried in the noise during the daytime European opening on 20m, but will totally obscure that weak long path multiplier at 3am. Remember to check the whole range of frequencies you might use, some birdies only show up at multiples of 100 kHz or farther apart. And when you check, use the widest filter to make them more obvious. If you find a birdie the next step is to figure out what it is coming from.

I usually start with turning off computer monitors and TVs, both of these are great generators of RF across the whole HF spectrum. If that doesn't work then I start turning off accessories like TNC's and printers, and finally the computer itself. If turning off the computer makes it go away then disconnect all the cables except power and restart the computer (yes, it will fail booting because there is no keyboard, but that is ok for now). If the bare computer is causing the problem start by

ferrites on the power cord, then try the 'sniffer' described below. Otherwise start reconnecting cables one at a time until the birdie returns, then treat the cables and cases of that accessory.

One other thing to consider is that birdies can change depending on the software you are running. If you find one of these the most common sources are either the monitor or the keyboard. Keyboard birdies normally pulse or change tone when you press keys. They can also completely disappear when some programs are running. Monitor birdies may change tone when the display changes modes or even with what is being displayed. Try bringing up a different window (in CT, try ALT-H to bring up the help window or ALT-Comma to bring up band map) to see if the noise changes. They can also disappear, move, or change signal strength with changes in video modes. This is another reason to run these tests with just what you are planning to use during a contest, including the software package.

A handy tool for finding sources of computer birdies is an 'RF sniffer probe'. To make one simply take a hunk of coax long enough to reach what you suspect is the source, plug it into the radio, and on the other end just wind a couple turn coil an inch or so in diameter and connect between the center conductor and braid. For a quicky just use a 6" clip lead wound in a small coil and clipped from the center pin to the shell on a PL-259. For a more permanent probe solder a small coil to an SO-239. Some people have luck by just trimming the braid back a couple inches, but I like the small loop better. Use the probe to poke around the cables, cases, keyboards, monitors, etc until you find the source of the birdie.

To fix birdie problems from a computer start with checking for good metal to metal connections at case joints and screws, on the grill over the cooling fan, and on covers over unused add on board slots. Computers with all plastic cases may have to be wrapped in foil, just be sure to leave air vents open. Add ferrites to the power cord if the case is OK. Some power strips provide some filtering also, others seem to radiate it more, so try with and without your power strip or filter.

Keyboards and other accessory noise can often be cured with simple clip-on ferrites on both ends of the cable. Another option is a ferrite rod inside the coiled keyboard cord. Stubborn cases may need to have the cable wrapped in foil. Remember to check the cases, and power supplies, of the accessories and ground them well also.

Monitors can be tough. There are two major sources from monitors, first is the video source signal. This is usually the case if the tone of the birdie changes drastically when the display content changes, and may completely disappear when you clear the screen or change video modes. Video birdies can often be fixed by adding ferrites to the video cable from the computer and in stubborn cases by wrapping the cable in foil. The other source is the horizontal sweep generator. These birdies are usually raspy and broad, and repeat at 15-30kHz intervals, but do not change noticeably when something is written to the display. Sweep birdies can be very hard to get rid of since they are fairly high power. These may be reduced by ferrites or shielding on the power line and video cable, but often they are radiating right through the case. I have one color monitor that is very bad and had to be wrapped in foil (with air vents cut in top and a fan added to help cool it), have ferrites on both ca-

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bles, and have the cables wrapped in foil to quiet it down... But I have another one (a newer 'low radiation' type) that I can't hear at all even without any shielding.

Logging Software

Just pop in a floppy, run an install program, and away you go, ready to run 200/hr while grabbing DX spots and never touching the radio. Right! And if you believe that I have a bridge or two I can let you have cheap. There are three major variables to consider when talking about software and how to use it.

First is the hardware, different hardware configurations can affect how you have to set up the software. The installed hardware determines what drivers need to be installed, how much memory it has available, conflicts with other devices, etc, etc, ad nauseum. Which IRQ do you use for COM3, COM4, your sound card, the DVP card, a mouse? All those fun things that are documented in great detail in your hardware manuals that came with all those things... They are documented aren't they??? You did write down which jumpers you changed on that multi-IO controller when you plugged it in, didn't you? Which IRQ does that new CD player use? Oops, I need another COM port for a rotor controller, what IRQ is available and can you get a new card to use it? Oh no, I don't see any input from packet until I move the mouse! Lots of fun, isn't it? This is why we got all these nice computers, so we can spend time pulling out cards and resetting jumpers.

Second, the software itself. Programs like CT or NA have many options and features that react differently based on the selected contest. Some features change based on entry class, type of hardware connected, and even band or mode selected. It is impossible to test these programs in all the possible configurations before they are distributed. So it is important that you test your specific configuration and make sure everything you need works ok. Also, software evolves. New features are added, old bugs are fixed, new bugs are added, old features change or go away to make room for improved ones, etc. So don't assume that just because CT 9.10 works, that when you download 9.23 that it will work the same way.

And finally the biggest variable is the user. I was writing a derivative of CT for multi-multi operation with only one computer. I thought I had all the bugs out and had tested all the possible commands from the different terminals, but the first time I had someone else sit down at it, he crashed it within a minute. And no matter how much you may like to think that you can sit down at any software and know how to use it immediately it is just plain impossible with most logging programs today. And even if they are intuitively obvious how to use, getting used to all the keystrokes so you can do them quickly without thinking about them takes some time.

Some of the more problem-causing features in CT seem to be:

1. *Grabbing DX spots.* There have been many problems with this in the past. You should carefully try out this feature with your radio and be sure that you know how to do it, and how to get back to your run frequency afterwards. Try it with and without the RIT/XIT turned on, with various splits (for 40/80m SSB mostly), and across band or mode changes. This is one area where you can really get yourself messed up and loose a

run frequency or even damage equipment by ending up on the wrong frequency or band.

2. *Correcting log entries.* This may seem simple, but if you are not familiar with it you can really get mixed up. With CT its a good idea to use CTRL-G to get back to the bottom of the log after scrolling back to fix a call, this gaurantees that you are at the bottom even in multi-op settings where someone can log while you are correcting.

3. *Setting time.* How many times have you heard someone ask how to change the time or date for the whole log because the clock was on the wrong time zone or the wrong year. I set the clock in all my PC's to GMT anyway so there is no question, but if you have to share your machine with other family members be sure you check it before starting the contest. Its not a bad idea to keep an eye on it during the test also, some pc clocks are affected by RF or hardware/software conflicts. Finding that you are 5 minutes off after the first 12 hours is better than being 20 minutes off after 48.

4. *Autosave of log to floppy.* If you are running just one PC, I highly recommend enableing this feature in CT. This will copy your log to the floppy every hour 'just in case'. However I do recommend a couple things if you plan on using this. First, have two or three formatted floppies handy and change them every couple hours 'just in case'. Second, if you get big logs and the time it takes to copy the log to the floppy is too long for you to wait you may want to consider setting up a write cache for the floppy. I used to use Norton's NCache program to cache the floppy writes and return immediately. If you think you want to try this I highly recommend copying the biggest log you have and testing it for a while to be sure it works ok on your equipment and with your software.

5. *Sending serial numbers.* This is one of the cases where the feature changes depending on entry class. Check the rules and be sure the serial numbers are sent properly for your entry class. Also check what happens if you try to send a fill after entering the call, does it still send the right number automatically, or do you have to fill by hand. If you are using two computers for single op, or multi-op, be sure you know that the serial number you see is the one you should send, and what happens when you change bands.

Propagation Prediction Software

Another popular type of software is for propagation prediction. My only recommendation on using this stuff is to study it real hard before the contest, but once the contest starts forget the details. None of the programs out there can predict exactly what will happen with propagation, even given the latest WWV numbers, so except for general planning don't depend on them to find all the openings. The best bet for planning your operating time is to get expert opinions from your general geographic area.

PacketCluster DX Spots

There are of course two things to think about on the subject of PacketCluster DX Spots. First is grabbing them, the other is sending them. I'm not going to try to comment on the pros and cons of either one when it comes to your bottom line or club total score, just some of the mechanics that affect your use of them and how useful yours are to others.

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First, on grabbing spots. Like I said before, this is one of the big problem areas for many users of CT. Figure out how to do this and practice it regularly, especially when you get a new version of CT or a new radio... They don't all work the same! Now, lets say you have figured out the keystrokes to get the spot you want, what else could go wrong? Well, the most common problem is that the call in the spot is wrong. In about an hour once I saw IK4GRO, IK4GNO, and IK4ZRO all spotted on the same frequency on SSB. Then GW4HNO and GW3HNO were spotted on the same CW frequency.

Remember it is up to you to verify the accuracy of your log, you should always copy the call of the station you log... trusting that you are hearing the same station that someone else spots and that they got the call right just isn't safe. Even if the spotter got it right that station may have QSYed and another taken its place by the time you get there. And on some bands you may be hearing a different station than the spotter heard.

About sending spots. Please, for all of us that use the network, be careful sending spots. While we are all going to verify that we have copied the right station it is much nicer to just have to confirm the call instead of having to correct it. I recommend that if you are using CT for logging you don't send a spot unless you are sure enough of it to either log it yourself or you are dumping it because its a dupe. In either case you have typed the call and checked it so just hit ALT-F3 to send it. This procedure can prevent most of the errors caused by retyping. If you don't have a computer controlled radio please be careful when you type in the frequency. And if you have a radio like a TS-830 that doesn't show you the real carrier frequency make sure you know what frequency to spot on CW.

One of the most frequently discussed topics on the PacketCluster is what to spot. Everyone has their own opinions on this but in general I think if you use common sense in deciding what you should spot it works out ok. Just remember that most ops are using packet to find new multipliers first, then new QSO's later. Following this thought "Rare" DX can always be spotted, just remember that for a contest 'rare' has a different definition than for day to day DXing. An HB0 isn't normally considered 'rare DX' but if there is only one on for the contest then it is as rare as an HS0 and probably more useful since it can be worked more quickly. Since most G, I, DL, EA, F, etc stations call us when we are CQing there is usually no need to spot them on most bands, but please consider spotting them on the fringe bands. 10m (maybe even 15m this year) will suffer from a distinct lack of DX with the low Solar Flux we can expect this year so spotting any DX on them could be useful.

Another hot topic is the 'called me' spot. These can be an alert that a very rare country is searching and pouncing on a given band. If you are not calling CQ you won't work them, so if you are S&Pping and see a 'called me' spot for a rare country you know that its a good idea to find a CQ frequency quickly. This can also be a big help in sorting out a strange caller. How many times have you been running Europe and heard just part of a weak caller, then found out later that it was probably some rare Asian that was answering CQ's? If someone had spotted it you might have had a clue that it was an HL instead of a DL. Just beware though, if you spot something like that with your own CQ frequency you may find a packet pileup on you. Remember, the CT spot window doesn't show the comment part of

the spot. Spotting the bottom of the band is usually a good way to flag it as a 'called me' spot.

PacketCluster 'Contest Mode'

On major contest weekends many of the YCCC PacketCluster nodes go into what has been dubbed "Contest Mode". This is controlled by the Sysop of your node and they can answer specific questions about what that means for your node. But in general things like mail, databases, bulletin files, and some other features are turned off, nodes outside the club area may be cut off, and talk may not work as expected. Also, some Sysops have been known to get upset at non-contest DX spots and announcements and cut off offending users for the duration.

One particular problem is the failure of 'talk' to function as you normally expect. This is because steps are taken in contest mode to limit backbone traffic. Its not that talk is disabled, its just that your node doesn't know where to find other users like it normally does. You can get around this by adding route instructions to your talk messages. i.e. You see a DX spot from W1WEF but you can't talk to him. Do "show/station w1wef" and the cluster will reply with Jack's information including his home node. You can then route talk to W1RM for Jack with the command "t w1wef> w1rm Hi jack....". Note the space before and after the ">" are required, don't run it all together. Using DX spots or ANNOUNCE/FULL to talk to someone is a quick way to get dumped during a contest.

Summary

Finally, remember contests are not Field Day, you can set up early and check things out. And before the contest starts is the time to find incompatibility problems, RF leaks, and learn to use the contest software. It is also much easier to ask for help well in advance, trying to call someone and get an answer the Friday of CQWW is almost impossible. And the answers you get you may not have time to impliment in time before the contest.

So get out there, prepare early, and have fun operating, not troubleshooting, during the contests. ☐

Single Op Assisted - Medium to Little Pistol Category

Tony Brock-Fisher, K1KP

No matter what your station set up may be, the most important piece of gear is between your ears! That's right - all other things being equal, operator skill can make a 200% difference in your score. Perhaps a major factor in operator difference comes in the form of attitude. In the weeks before the contest, you should be practicing some 'sports psychology' on yourself. Remember - think loud, be loud! Plan your activities before the contest to tune up the critical station component - you! Here are some things you should be doing before the contest to get yourself in fighting shape!

1. Make sure you operate a lot before the contest. Get on Saturday and Sunday mornings and 'run the boys'. Make lots of DX friends, and ask them all to look for you in the contest. It really works - you remind them that the contest is coming up. And when you do work one of your DX friends in the test, it gives you a real lift when they say hi and call you by name!

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2. As far as operating before the contest, make sure you get on 28 days before and 7 days before the contest. Operating 28 days before the contest will give you a forecast of what solar conditions will be like, as solar conditions tend to repeat every 28 days. Operating 7 days before the contest will help you find likely long-path and grey line openings, even though solar conditions may be different from the test weekend.

3. Practice on PED before CW contests. Have you ever noticed how much your CW speed increases during the 48 hours of the contest? Doing some time on PED can help you get your speed in shape for the opening gun.

4. Get in physical shape. This means regular exercise, which will put your body in good condition for enduring the effects of sleep deprivation. Start a routine of walking or other exercise several weeks before the test.

5. Visualize yourself in a positive way. Place thought patterns in your mind of such events as running the Europeans at a sustained high rate; working rare mults on one call; or making your target number of Q's by Saturday night! Expect to have a great contest! Remember, most of last season's contests were very badly affected by disturbed geomagnetic conditions. This year, I think the contests will miss the monthly visit by the coronal hole. This means this year's contests are going to be much more fun than last year!

6. Prepare yourself mentally for any downers as well. See yourself continuing on in spite of anything that might go wrong. With the poor conditions last year, I got bummed out and slept 7 hours on Saturday night. Turns out that nap probably cost me some wallpaper, as little did I know that my major competition was having their own brand of difficulties, and only beat me by about 100K points. NEVER GIVE UP!

7. Study your results from previous years. Try to prepare some goals based on last year's score, in points/Q's/mults. Look at the rates from previous years, adjusting for propagation differences, to get an idea of what a good rate for you would be. This will help you when you are wondering if you should be running or search and pouncing.

8. Premodify your sleep habits. There are many different approaches to this - try to find one that works well for you. Some folks try to rotate their sleep hours to fit with European sunrise. Others deprive themselves of sleep in mid week, so they can take a nap on Friday. Whatever works for you - do it!

9. Clear the decks of obligations. Let others know how important contest weekend is for you. Make an extra effort to spend time with the family before the contest, so they'll give you a break during. Try to arrange some fun activities for your significant others before the test. My favorite plan is to give 'em a new credit card and send 'em to an outlet mall. Sure it's expensive, but it works!

Operating Techniques: ...in no particular order..

1. If you are less than lightning fast on CW, run more and S&P less. This sounds strange, but it works. Here's why. When you S&P, you have to adjust your sending speed to that of the calling station, often above your comfortable range. But if you're calling CQ, everyone else will be adjusting to you. As a result,

you can work people at your maximum comfortable rate - and your accuracy will be at peak.

2. On SSB, use a DVK. You can now build a DVK for less than \$20, so there's no excuse for not having one. It doesn't have to have 4 memories or be controlled from CT. What you'll find is that you will call CQ more. And that's the key to a bigger score.

3. If you must sleep each night, don't sleep at the same time both nights, as that will be a piece of the propagation-go-round you'll miss.

4. Don't waste time going for easy mults, like the big Caribbean MM's, early on. They'll be begging on Sunday afternoon. DO work rare Africans when they show up, as they may not hang around Sunday. Try to get the JA mults on Friday night; remember Saturday night for us is Sunday morning for them, and they're sleeping in consideration of work Monday morning.

5. QSO's are KING! Mults happen. Whenever, wherever you can, run, run, run! Running should always be your highest priority, as you will accumulate mults even while running. If you are operating in the little- to medium- pistol category, you may have to try various techniques to get a run going - such as getting on a different band from the big guns, or looking in strange places for run frequencies. Either high in the band, 3 kHz up from a net, or often somewhere between the US big guns at the bottom of the band and the EU big guns 20 KHz higher, running frequencies can be found. Remember - the best indicator of whether you have chosen a good running frequency is the rate. Even if the QRM is S9, if you're working folks a good clip, hang in there. On the other hand, if the frequency is dead quiet but the rate is also dead, you better go find a better spot.

6. As Kenny Rogers sings, "You gotta know when to hold 'em, know when to fold 'em". One of the hardest things to learn in contesting is when to stay with a run frequency that is not really productive, versus going off for S&P. In the medium to little pistol category, I would suggest you use a rate of 60-90 as the break point. If your rate is 60 or better, you should probably stay where you are. A rate of 60 per hour is one QSO per minute. That seems pretty slow, as you will probably call CQ four times for every answer. But a rate of 60/hr for 24 of the 48 hours is over 1400 QSO's - a very respectable total! I have looked the statistics of rate, based on minutes per QSO. 95% of QSO's will be made between .5 and 1.5 times the basic rate. This means that you should be able to tell what your rate will be after just a few QSO's. So don't waste more than about 5-10 minutes trying to establish a run. If after 5 minutes you haven't worked at least 3 stations, try a new frequency or a new band. Run frequencies are not really that hard to find.

7. Try all combinations of phonetics for the call you are using. You should be able to discover which phonetics result in the fewest request for fills. Ask the owner of the call if you are not using your own.

8. Tune quickly. When you first S&P a band, you should be able to get a rate of 90/hr or better. If you are constantly getting beat by the same stateside station as you move up the band, you are losing time by waiting for the other guy at each Q. Try leapfrogging the other stateside station so you won't have to wait.

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9. Remember the law of averages. If you have one hour of 300/hr, that's cool, but it won't win the contest by itself. In order to get the numbers up, you need to work on average rate. That means saving a few seconds on each Q adds up to a higher average rate - and a much higher score. Keep this in mind as you make your exchanges and operate your station. Saying '73 and thanks' is polite, but not fast. Keep your words and operating techniques snappy.

10. Packet Tips: Check a spot when it comes in - if you're fast, you may be able to get in and out. Don't call twice though - if you don't get through before the packet pileup, let it wait. Don't let packet mesmerize you - use it more as a guide to who's on, what band is open. If you try to work every packet spot, you're guaranteed to have a lower score than if you just ran G's and DL's all weekend and never got the VK6 mult.

Station Design:

By the time you read this, it will probably be too late and too cold to do much in the way of antenna work, but I can't resist throwing out a few considerations:

Antennas are really simple to understand. When designing antennas, remember the three most important factors:

1. Height.
2. Height.
3. (You guessed it) Height.

Another important point is that any time you have more than one antenna for a certain band, one of them will be better than the rest. What this means is that you should put up some extra antennas for the contest. It doesn't matter how big - just different. If you main antenna is a tribander, you'll be amazed at how well a 20 meter dipole works for the Caribbean when the tribander is pointed at Europe. The antenna switch is always faster than the rotator! □

Single Op CQ WW

Jack Schuster, W1WEF

It's hard to come up with anything new in the way of guidelines toward winning scores that hasn't been already written. Perhaps I'll be able to give you a reminder of what you already knew. What's difficult is to do what you know you have to do to meet your personal goal, like staying awake!

I've never used Packet in any contest. For some it leads to bigger scores; for other's it's been referred to as single op distracted. Perhaps if I ever take the time to clean up the RFI from my packet setup, I'll find that I really enjoy operating assisted. Meanwhile, I won't be able to give any tips on using packet.

Although Len asked me to write about WW, most of what I have to say applies to any contest.

Pre-contest check list

1. Give the family advance notice of your planned contest activity. In my case, it's a great time for my wife to visit her mother, especially during the phone contest.
2. Start checking out the station with plenty of time to spare. Are the antennas still working on bands you haven't used late-

ly? Did that new antenna you put up interact with another (as did my low TH6 with my 160 shunt feed)? Are the rotors pointing where you think they are, or did the mast slip in the wind?

3. Walk the beverage. If you don't have a beverage, walk the dog. If you don't have a dog, walk anyway! Get in as good physical shape as you can.

4. Check out the backup gear. Twelve hours into the recent IARU test, my amp failed, so I switched to my backup amp that had been waiting about three years for just such an occasion. You got it! It smoked as soon as I turned it on! Two hours later I was back having fun again, after fixing the first amplifier.

5. If you haven't been keeping up with the DX scene, start reading DX Bulletins on packet or whatever you can get your hands on. Learn what DXpeditions have been announced, and what weird calls they might be using. See where Dick Norton (N6AA) is going, and of course where Paul and Charlotte are off to!

6. Start getting familiar with the bands again the week before the Contest. Study propagation by listening and reviewing packet spots.

7. Refresh your memory where CQ Zones are...dig out that map that CQ used to give out. (We're in 5, NOT 8, for this one!)

8. Review your old logs and results from last year's contest and the year before that. Reading the "USA and DX QRM" comments help get you enthused for this year. Set a personal goal for yourself, but don't get hung up on it. Conditions might be better than you expected, and you might be able to far exceed it. The opposite can also happen.

9. Check out the computer with the version of the logging program you're planning to use. Practice logging at least a couple dozen calls, and operate your station just as you will in the Contest (eg amplifier on). Be sure your DVP or CW interface works with the new computer you got since last year, and that no new RFI problems have developed.

10. Reset the computer clock to WWV.

11. Refresh your memory with your logging program features, or learn new features in the new rev. level you got since last year. Get a new countries list update and load it, and be ready for the unexpected like "YU50 NOT IN EU", during the recent WAE. All you have to do (with CT) is type YU50=YU in the call field and it's in the countries list.

12. Label the keyboard so when you're half asleep you don't have to rely on your memory.

13. Read the Contest Rules...there are new CQ Countries this year! (African Italy, IG9, IH9)

14. Plan your menu, set up the cooler chest and coffee pot in the shack and go shopping. I usually go out for a good Chinese lunch on Friday, then try to sleep a few hours Friday afternoon (an advantage of being retired...how quickly I forgot I couldn't always do this!) I also try to get extra sleep Thurs night, but it never seems to happen.

15. See N6BV's Propagation forecast elsewhere in the Cookbook. Make an hour by hour listing to tell you when to look for propagation, based upon Dean's forecast and recent packet spots. Better yet, use the SCHEDULE feature in CT (I'm not

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familiar with the others) to pop up the reminders on your monitor at the right times.

16. Don't hit the F5 key before the contest starts! (It bombed out CT the last time I did it, just as the contest started, and I didn't know what I had done!)

17. Look at WWV 27 days before the contest if you want to get an idea whether we have any chance of decent condx. Do this on Packet Cluster by doing sh/wwv/216 (not available on all nodes). Then look for the correct date because all possible 8 updates a day are not entered.

18. One hour before the Contest, start checking bands, think about where to start. As it gets closer to zero zulu, start writing calls and freqs of the good mults you heard, or the big sigs who might not be signing calls often so you recognize who's there and don't waste time. If you have band mapping capability, you can start putting calls in the map.

Get ready, get set, go for it!

1. If you haven't got a big station, you might find it most productive to start by combing the bands from one end to the other, answering CQs. It might pay to stay in the high end of the bands near the start, where pileups will be smaller. On the first sweep, every station is a new one for you, so drop your call as soon as he signs, even if you didn't catch his. Copy his call after he comes back to you. Don't waste time waiting to get his call first! If necessary, ask his call when he comes back.

2. In the case of the station who doesn't bother to sign his call but once every ten Q's or more, I use the same strategy. I haven't got time to wait around for him, so I work him, and if he's a dupe so be it!

3. If you feel LOUD, you can start by holding that frequency you warmed up by running stations. I load my memory keyer and the F1 key with different length CQs. Don't waste time with extraneous characters like "de". CQ W1WEF W1WEF TEST is usually sufficient. Use 5NN5 rather than 59905.

4. Take advantage of high band openings. In the recent IARU contest, I started on ten, and worked multipliers that I never heard again. By the end of the first hour, I was on three bands. Don't be afraid to move...never wait until you round out a number of Qs if your rate isn't up to what you think it should be.

5. Watch your rate statistics, and establish a goal for yourself as to when you should change your modus operandi. Note how many Qs a multiplier is worth, and use that to help you decide when to S&P. Search & Pounce you MUST, no matter how great a run you're having! I tend to stick to CQing too much, but almost every time I S&P, I find a new multiplier.

6. Check often for band openings on the higher bands. If you use two radios (I don't), you can check without losing your run frequency. If using one radio, you can have the other bands in memory and make a fast check occasionally.

7. Turn your antenna often. While you may be working OH's, you might not be hearing the A22 calling you.

8. While operating, stand up and stretch frequently. Don't become glued to your chair!

9. Don't be afraid to ask stations to move - in fact, don't ask, tell them: "now 21085". Have a frequency like that stored in memory, high in the band so you can move hopefully in less QRM and can go there fast. More rare DX will move than you think. If you make a sked for a later time, not only can the other station forget it, YOU might forget it. He might decide to watch TV or hunt water buffalo instead of hanging around for your sked!

10. On phone, USE STANDARD PHONETICS. Sign your WHOLE CALL!!!

11. If you only catch a piece of a call coming back to you, go back to "the station with ALPHA RADIO, 5905". When he comes back with his exchange, hopefully the pileup will have stood by, and you can fill in the rest of his call. Be a snappy operator, talk fast, and the pileup will stick around. If you take too long to make a contact, be assured they will not wait.

12. Enunciate clearly, even to the point of exaggerating your normal speech at times.

13. Use VOX and a headset with a Heil HC4 DX element.

14. While running, sign your call at least every couple of Qs. This will lessen dupes and QRM from stations who already worked you.

15. This may seem obvious, but know how to tune your radio so that you are zero beat (this means so that you are on the guy's frequency you are calling!). I'll leave it up to you to figure out, but so many people call off your frequency on CW, that you must continually tune your RIT.

16. Send the other station's call. It's easy to time it just right so you "have no doubt" you're working who you think you are, but there might be a station zero beat with you who you can't hear, working guys who you think YOU are working!

17. Look high in the bands for stations who are NOT in the contest. You will often find good mults who will give you a Q if you politely say "excuse me, ..." Good Luck!

18. Get used to the "type ahead" feature in CT (I don't know if the other logging programs do this). HS0ZAR comes back and you have only typed HS0Z when he stands by. You hit the Insert key and your W1WEF CW Interface starts sending his call. While it is sending, you type the rest of his call, and the program picks it up in time to send his whole call and the exchange. I think this feature is terrific being the one finger typist I am!

19. On the hour, starting at about 0200, check 160. If you hear a station like J77J, work it now. You never know if they'll lose power later!

20. Later in the contest, your goal should be to work EVERY new call you hear.

21. To rack up a big score, you have to be awake and always doing something toward making a contact. Never in my life have I operated for 48 hours straight, but I once blew a shot at #1 World when I took ten hours OFF time while I was awake in PJ2! No matter how slow the rate, it's better to make a few Q's than none.

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22. Don't ask your buddies how they're doing during the Contest. It can be depressing, or it can give you a false sense of security!

Remember, above all, we do this crazy thing because it's FUN. Get your log in by the deadline, and remember to give credit to YCCC. GOOD LUCK! ☐

160 Meters

Carl Huether, KM1H

For all practical purposes we are at the bottom of the sunspot cycle and the only MF ham band will become more important than ever to a competitive contest score.

The following will be written for the new or casual contesteer. The big boys already know all the answers!??

There are 3 antennas to use in a DX contest, vertical, vertical and vertical. All others will lead to frustration and cause me unnecessary QRM. High angle radiators such as dipoles and inverted vees will work to a degree for DX but are usually preferred for QSO party style contests such as the ARRL 160M contests. In the CQ 160M contests it is highly advantageous to have both vertical (low angle) and horizontal (high angle) polarization available. There are always exceptions to the rules however so don't sue me if you encounter unusual conditions. For that very reason I have both phased verticals and an inverted vee available at the flick of a switch.

Verticals or low angle radiators can take several forms. Naturally the choice will be dictated by your specific circumstances but there are many very successful 160M ops on lots well under an acre. An inverted L is an ideal choice since it can be easily installed. Get at least 60' vertical, with the remainder horizontal or bent however to fit the property. Space at least 10' from tower or metal objects or hang from a rope between trees, etc. A ground system of at least 32 radials with 60+ preferred is required for efficient performance *if* it is ground mounted. By starting the antenna 15' or so *above* ground and using 4 to 6 elevated 1/4 wave radials efficiency can be well over 90%. A 60+ foot tower with one or more HF yagis can be shunt fed. The same ground system caveats apply. The elevated radials can be bent, linear loaded, etc. to fit and can easily and quickly be deployed just for the contest or even after dark to keep wife and neighbors under control. A 100+ foot tower can be used as the basis of an array (or just a single element) by hanging the verticals from the top set of guy wires. Linear or coil load as necessary to get the elements at least 50' apart at the top and 130' at 15' above ground. Add some elevated radials, a 78 degree phasing line per ON4UN's book and two 10Amp DPDT relays and you will have a real pileup buster at almost no cost. The same idea holds true with phased inverted L's. Quarter wave slopers are reputed to be effective performers by some but can be a chore to get functioning properly. Consider one if other options are not feasible.

A low noise receiving antenna is a must and can also take many forms. I use "classical" beverages of 500' or more, a Slinky Toy beverage and a full wave loop 10' above ground. The Slinky is my best beverage ever and is my European and African choice due to lot size restrictions in those directions. I've used this antenna since 1986. Call me for detailed info. The

EWE and other receive only antennas have been described recently in the magazines and have many fans. A low noise tunable preamp such as the old Ameco series can be quite advantageous. I use the Ameco PLF modified for variable gain; the stock 25dB gain is too much for my antennas; 5-10dB is ideal.

One oft repeated fallacy is that you must operate on 160 only on the hour for 10 minutes or so. This was a fairly accurate statement in the past but no longer. With the proliferation of contest software, rate meters and accurate Sun times even the casual DX station is showing up when *he feels it is necessary*. KM1H is usually at the top of the 160M multipliers and the contest op, KQ2M, abandoned the hourly thing years ago. On the hour checks are still done but only as a part of his strategy. It is almost mandatory to be constantly switching bands particularly as AS/EU/AF sunrise approaches and/or the rates slow on 40/80. If possible have a separate receiver or backup xcvr available for rapid band checks of 160 and 80M while concentrating on other bands. A simple 3dB resistive pad can be used to split the Rx antenna between two radios; just remember not to transmit into it!

Read the DX bulletins before the contest. Make notes of all announced DX activity *and* sunup/sunset times. During the contest is not the right time to be doing a sh/sun on packet; it slows the network down for everybody. Buy and keep a manual DX edge available at all times.

During the various CQ contests it is usually hard to work EU the first night, even for the well-equipped stations, as the DX is all working each other. Concentrate on other areas and just try EU in small spurts as their sunup approaches. Above all, experiment since 160M propagation is highly variable and erratic.

Use packet spots intelligently, let the big guys get thru first and fast. After a while you will get a feel for your station's capability and maximize your effort instead of just causing QRM. Listening and learning the band and its operators is probably the best advice I can give.

East coast sunrise is usually not a good time to be on 160 for the serious contesteer. This is an excellent time to pick up some good Pacific DX. Dxing or Contesting?.....it's sometimes a hard decision.

Check WWV for changing conditions. Low A/K indices plus no local storm activity could

signify wild 160M condx; I emphasize the word could.

Check contest results for the past 2 years to get an idea of your potential. This year the band *should* be at its best.

Pay particular attention to the band in the closing hours of the contest, KM1H has picked up as many as 6 multipliers in the last 45 minutes. If conditions warrant it don't be afraid to move a new multiplier from another band. Only dedicated EU contesters are still awake at the end and are usually very receptive to a plea. Get a copy of past Contest Cookbooks. There is lots of good info and no one can cover all the bases. I've deliberately not mentioned what hours to work the band. Some say start at 0300Z. I suggest periodic checks from your sunset on until activity shows; the band is too independent to fit into a must do formula.

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I'm always open to phone calls or packet chats if I can help; enjoy the contest season. ☐

80 Meters

Dennis Egan, NB1B

The keys to 80M operation are simple- work Europe, work Europe, work Europe. From 0200 to 0600 especially, work any European you can find. As the sun rises across Eastern Europe, signals peak in both directions- from the UAs at 0400 to the HG/SPs at 0500 to the DLs at 0600 to the Gs at 0700, work Europe, work Europe, work Europe. Towards those ends, I like to offer several suggestions as to how you can work more Europe.

1. Be aware of the split frequency operations, particularly on SSB. The band breaks down as follows:

Russians	3600-3650
Other Euros(split)	3700-3750
Other Euros	3750-3790 (the going can be tough)
Other Euros	3790-3800 (the going can be <i>very</i> tough)
Caribbeans	3800-3810

As you can imagine, the band between 3750-3800 can be bedlam in Europe. Watch your CQ frequency- what sounds like a clear frequency to you can be covered in Europe by a QRP YU that you can't even hear. Many US stations have more luck calling CQ above 3800 and listening down just to be heard in Europe.

2. If you're in Search & Pounce mode, spot everything you hear. Fill up the band maps for the other stations.
3. Use the bandmap on CT9. When the going gets tough, and no one is answering your CQ, it can produce several contacts.
4. Spot stations on Packetcluster correctly. Computer controlled radios can zero in on both listening and transmitting frequencies if they are spotted correctly.

What can be worked on 80M? On SSB, a medium-sized station can work 30-40 multipliers in several hours. A large Multi Unlimited can work 120 multipliers. 0200-0700 produces Europe; 0500-0800 is the best time for the Caribbean, and 0900-1100 is best for SE Asia, New Zealand/So Pacific, and Australia. There may be other openings to the Far East and Australia Long Path at 2200-2300, but unless you're a big station it's probably not worth the bother. Don't forget to work IG9T in the new CQ contest country of African Italy, TO5M from St Pierre (easy from here), ZC4, LX, V4, P4, and, for those with big antennas, HS, 9K, and XX9. Good hunting, and keep a bottle of NoDoz handy! ☐

40 Meters

Randall A. Thompson, K5ZD

Forty meters is probably my favorite contesting band. It offers worldwide propagation throughout the sunspot cycle. Openings are every bit as good as 20m, although often not as long. And when one end of the path is at sunrise or sunset, anything is possible!

There's just one little problem... the rest of the world also uses the band for commercial broadcasting. Throw in a mismatch between our allocations on Phone and it also becomes one of the most challenging bands. Unfortunately, many people hurt their contest scores by letting the band intimidate them. Since Phone and CW have completely different "personalities", I will discuss them separately.

In a CW DX contest, 40 meters is a 'volume' band. At this point in the sunspot cycle, it offers two opportunities each day for rich European runs. For a single-op, or multi-single, 40m is the band to start the contest. With some luck, we will have excellent propagation for the first hour or more. After this, the MUF to Europe will probably drop below 7 MHz and it is time to start searching for multipliers in the rest of the world.

The band recovers as the sun moves across Europe. The band really quiets down and some good runs can be expected from around 0600z to 0930z. It is amazing how late the UK stations will come in after their sunrise. After this time, it's back to multiplier hunting.

At our sunrise, the band offers a short opening to JA. Sometimes direct path, but more often via skew path beaming west. After sunrise, long path possibilities exist to VS6, YB0, DU, and the rest of Southeast Asia. The multi-multi's and multi-single's will love it, but the competitive single op should keep an eye on 20m for more productive action.

The real advantage for New Englanders occurs in the afternoon well before sunset. European QSOs are possible as early as 1900z, but the real action gets underway during the 21z hour. This is still well before our sunset, but the band has lengthened out in Europe so that all they can hear is loud W1's calling CQ. We have an "exclusive" into Europe for awhile and this is the time to secure a good run frequency.

Don't forget to check for long path openings at our sunset. The CQWW CW often has workable JA's and other Asians mixed in among the loud Europeans and W's calling CQ. This is also the place to find those zone 24, 26 and 29 multipliers.

During the last few DX contests, 40m has been bothered during the evenings by a loud rushing noise across the band. The noise appears to follow the transmitting schedule of the Radio Vatican in Rome. It doesn't trouble the Europeans too much since the band is so long, but it does make it difficult for us to copy the weaker signals. There is nothing you can do except work through it and know that it is bothering the guys south and west of us even more!

The big guns always seem to work their way into the bottom 10 kHz of the band. But don't forget about the upper ranges. It's a lot easier to hear, and be heard, if you pick a CQing frequency up above 7030. Plus, when tuning for multipliers, check all the way up to 7070. I found a number of juicy multipliers last year above 7050 (that's the only place the low power DXpeditions can get a spot).

For Phone, the propagation is the same, but the broadcast QRM and need for split frequency completely change the game. Forty becomes a band that is more important for multipliers than QSO volume. It tests your ability to tune and react rather than just sit and call CQ. Here are a few tips that will help your Phone score:

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- Get a computer controlled radio! Working split is easy when you just have to type in the frequency the DX is saying and then call.
- Make it easy for the DX station to recognize you. I always say the call of the DX station when I am calling. With many stations listening on the same frequency, this will help them lock in on you.
- Tune slowly and listen carefully. With so little room, there are often stations stacked 2 or 3 deep. Since QSOs often take longer in all the QRM, you are more likely to tune across a needed multiplier while he is listening. Or while covered up by a loud Italian!
- Don't be afraid to call CQ. Pay attention to the frequencies the Europeans are listening on. If you hear one of them clear, try a few CQs listening down. It's tempting to listen down very low in the band to find a clear spot. But many Europeans respect the IARU recommended phone allocation and will not call you below 7040. I have had my best luck CQing early (2200-0000z) and late (after 0700z). CQing is often the only way to get some of the "second tier" multipliers which don't ever call CQ themselves.
- Finally, don't forget to listen up above 7150. A quick scan of the band will sometimes uncover a South American or VK station working transceive. And if all of the bands fold during a solar storm, try 40 meters transceive and beg for VE QSOs (in CQ WW they are worth 2 points each!).

Good luck in your 40 meter contesting efforts this season. Anyone with a 2-element Yagi should be able to take full advantage of the above tips. With less antenna, plan on working a little harder, but with an equally positive impact on your score. □

20 Meters

Greg Cronin, WIKM

20 meters may well be the only productive "high-band" this year. And while 20 CW promises to be tough, 20 phone during a sunspot minimum poses one of DX contesting's greatest challenges. Nevertheless, top YCCC scorers will rack up huge Q totals, and even a modest YCCC station (60 foot high rotary) should have a shot at several good hours of runs into Europe. The key to good runs and high Q totals is a clear frequency--easier said than done, especially on phone.

Establishing and keeping a clear running frequency are functions of signal strength and operator savvy. There's an enormous rate difference between a clear frequency where copy involves no repeats and the splatter-laden frequency where every Q is a struggle. A clear frequency should be guarded as you would guard your first-born. It's well worth sacrificing a Q or two to ward off would-be intruders. When somebody moves in make it immediately clear that you hear them, you know who they are and you are telling them (politely) to move. It's a good idea to frequently tune up and down 1 Khz. to be familiar with who's nearby and how close they are. Despite our best efforts, there will be times when a run frequency deteriorates. If the rate falls below a pre-determined figure take the opportunity to look for mults and check the higher

bands before searching for a new run frequency. It's usually not a good idea to stubbornly fight for a lost frequency just because it was productive 30 minutes ago. (Though we may feel justified in trying to punish the thief who rudely "stole" our frequency!) But never give up on running EU because that's the name of the game from YCCC-land--running the inexhaustible supply of weak Europeans.

Perseverance pays. Top scorers will be glued to their operating positions and F1 keys no matter how bad the QRM. Bear in mind that this is a hobby and we are really having a good time no matter how miserable the insufferable QRM makes us.

Just how good a time we have will be determined in large part by what happens on 15. With any kind of 15 opening to Europe we will have a much-needed respite from 20; then when 15 shuts down we can attack 20 with renewed vigor. But if 15 doesn't open we (and everybody else in NA and EU) will be forced to stay on 20 all day and we will have more trouble convincing ourselves we are having fun. I think this is the most difficult aspect of contesting during a sunspot minimum--keeping focussed and hanging in there on 20 when the rate dips, the QRM is horrendous, and there's nowhere else to go.

There probably won't be any lengthy JA openings on 20--if we're lucky around 2200Z Saturday we should have a shot at them. This opening offers a good chance to pick up other East Asian multipliers. (On CW this is prime time for 40, so unless 20 is really hot consider spending more time on 40.)

20 is a multiplier gold mine--check out K1AR's SSB total from last year. It's very possible to work 100+ countries on CW, 120+ on phone. There are always new multipliers to be worked--right up to the last hour-- and any mults worked on the other bands should be workable on 20. I always have difficulty with zones 21 and 31 on CW. Don't miss an early chance to work elusive zones. Packet users should really make out on 20, catching all the quirky openings. The rest of us have to check for multipliers constantly, giving our rotors a constant workout.

There probably won't be too much activity on 20 during the nighttime this year. On SSB there are lots of Caribbeans and Latin Americans and these multipliers alone make it worthwhile starting the contest here. With any favorable propagation we'll also be able to work some juicy DX over the pole at the start of the contest. Later on in the night and on Saturday night if things get slow a few Say-Koo's may raise some Spanish "collegas" and an occasional multiplier. All that's needed are some Spanish phonetics, "cinco-nueve-zero-cinco" and "adios." Unfortunately there's much less activity from the South during CW. Some Africans may pop through around 0400Z and look for the Pacific throughout the night. During last year's CQWW CW there was a good opening to EU from 0900-1100Z (long before our sunrise). The EU big guns make this kind of opening easy to spot.

Our sunrise opening to Europe is crucial for serious competitors. This opening could be our only high band sunrise opening--be there early because it opens for us first and the QRM will only get worse later. We also enjoy a clear propagation advantage over the rest of the country during the noon to early afternoon European opening (EU sunset)--that's the best time for the smaller stations to run if they can dig a hole in the QRM. 20 M will be S9+ from edge to edge during most daylight hours--look for spots on any frequency up to about 14075 on CW and 14310 on phone.

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20 will be the most important band during this year's contests-- with our advantage to Europe and lots of tenacity we should be able to kick butt--and maybe even persuade ourselves we're having a great time while doing it. ☐

15 Meters

Doug Grant, K1DG

[Ed. Note: Being short on authors (and at a sunspot minimum), I decided to cover these two bands by reprinting the 15 and 10 meter articles (with a little bit of editing) from the 1985 cookbook, written by two guys with 1x2 calls... they must be old-timers or something.....Anyway, it's interesting how nicely the articles fit 10 years later - '2R]

This is painful to write, being that I love this band so much, but I don't think the 1995 CQWW will be won by pushing hard on 15. It looks like a 20-meter weekend. Here's how to make the most out of 15:

Listen on 15 an hour before the contest starts. You probably won't hear anything, so you can forget about 15 until morning. If you *do* hear something, mark the frequency and go back every 15 minutes or so and work the guy at the beginning of the contest. Then forget about 15 until morning.

In the morning, 15 will either open or not. If it opens, it may not be for long, so don't miss it. There are three ways to see if 15 is open:

1. Big guns are there working people.
2. If they're not, try listening south for Caribbean guys working Europe, since the band *will* open for them. Figure out if you can hear the Europeans somehow (remember to beam "skew path"; anything from 45° to 180° is fair game).
3. If you can't find hams, listen for broadcasters above 21.400.

Tune the band a couple times, call loud guys, try a couple CQs. Then go back to 20. Do this at least once an hour.

If the band doesn't really 'open', you should concentrate on getting as many African, Caribbean, and South American multipliers you can. Try to get an I/YU/9A/S5 and an EA/CT for Europe. Then turn south again. Here's a 15-meter 'dead-band' list of 18 CQ zones you should be able to work: 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 33, 35, 36, 37, 38. If there's any luck out West maybe 31 and 32 also. *Remember to pass goodies from 20 to 15 if there is any chance at all.*

Bear in mind that 15 could be a lot better than this, or a lot worse. The idea is to keep checking. ☐

10 Meters

Tom Frenaye, K1KI

[See my note above at 15 Meters - '2R]

This may be the year that 10 meters essentially vanishes from most logs. If you do nothing else on 10 meters, make sure you work one USA station and ask a loud VE1 or VE2 to QSY to 10 for a sked. Even the opening to South America and the Car-

ibbean may be weak, but be sure to check occasionally from 1600 to 2200Z; check N6BV's charts later in the cookbook.

Remember that the top ten W/VEs in 1995 ARRL DX averaged only 100 Q's / 50 mults on 10, and it will likely be worse this year. Again, like with 15, the idea is to keep checking, every hour or so. Ask multipliers to QSY from 15 if you've heard *any* signals at all from their part of the world. ☐

Chairs

Fred Hopengarten, K1VR

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[A little background: Shortly after 1995 ARRL DX, Fred made the post which appears below to the Internet Contest reflector. The subject proved quite popular, and in June I asked Fred to write a cookbook article on it. He decided that it read the best in its original form. I agree. - '2R]

To: cq-contest@tgv.com
From: Fred Hopengarten, K1VR
Date: sometime early March 1995

This plea may not be worthy of the engineering and other talents of this august body, but . . . ;-)

I've just spent a weekend sitting in a chair. 2400 QSO's later, I'm giving serious thought as to a better pair of chairs (one for the RUN station, and one for the MULT station). Has anyone got any good ideas on chair brands and models at reasonable prices? Hell, we fuss over band pass filters which cost \$30, why not fuss a bit over the subject of good operating chairs? All thoughts welcome.

.....

To: cq-contest@tgv.com
From: Fred Hopengarten, K1VR
Date: March 24, 1995

Well, the subject proved popular, as you will see below. Thanks to all who contributed. As contributions have now trailed off, and I've edited the replies, I offer:

Chairs -- The Summary

The various chairs in the Herman Miller office chair product line are fantastic. I think mine is the "Ergon" model, but can't remember. The chair is so good that I bought one here in the USA and then airfreighted it for a couple hundred more bucks back to Japan where I used it in my hamshack at home. I've NEVER regretted the money I've spent on it. I've now shipped it more than 11,000 miles .. and it (like my FT-1000D) will go where I go. ;-)

Sandy WA6BXH/7J1ABV slay@netcom.com

Since the subject was raised, and there appears to be some interest, thought I would pass along some ergonomic guidelines that Texas Instruments (my day job) uses for workstation design. As it is intended for people who sit in front of a computer all day, it seems like it should apply pretty well to testers!

Step 1: Adjusting your chair:

Yankee Clipper Contest Club

1. Height: thighs should be parallel with floor and heels resting comfortably on floor. Knees 90-110 degree angle.
2. Adjust the chair back (if possible) so the contour fits the contour of your back. (If not possible, try the lumbar support pillow).
3. Arm rests should not be too high (they shouldn't cause you to "hunch" your shoulders).

Step 2. Finding the right workstation height:

1. With your arms in a comfortable typing position (relaxed shoulders, arms hanging loosely at sides, elbows at 90 degree angle, wrists straight or neutral position), your hands should now be on the keyboard. (See note on footrests later.) Remember, as someone else noted, sliding keyboard trays are available which attach to the underside of your desktop; very handy if your desk is too high and/or not enough room on a short desktop and it slides out of way when needed.)

Step 3. Correct monitor height:

1. Screen should be 16" to 22" from your eyes.
2. Adjust so the top of the screen is at eye level. Bifocal users may need to lower it to a comfortable level.
3. Tilt or use a glare filter to reduce glare from overhead lighting.
4. Adjust brightness & contrast controls to ease eyestrain.
5. Green-yellow colors are easiest on the eye.
6. Clean your screen and glare filter regularly.
7. Take down decorations, notes, and other distractions around your screen; your eye muscles are straining to focus on these as well. (Hmm, what about schedule and band opening reminders and inspirational signs like "Think Loud!")

Other areas:

1. Wrist rests: help support the wrist but shouldn't immobilize them (don't become too dependent and lazy).
2. Footrests: help support the feet and provide better blood flow through the legs. Thighs should be parallel to the floor when the feet are supported. Anything will work: use an old telephone book, two 3-ring binders taped together, etc. NOTE: Thighs should be parallel to floor whether using a footrest or not. This is basically to adapt for other things you can't adjust. For instance, you may not be able to adjust your workstation height and chair height to match the previously listed parameters.
3. Area layout: this should all be obvious, with things you need to look at or reach for closer than things you don't need access to as often.
4. "Document Holder" - we don't use these, but the ideas should be the same for other thing(s) besides the screen that you look at often (like a radio): First find your "dominant" eye. Your dominant eye is the one you focus with first when you look at something. The document holder (or rig) should then be on the same side of the screen as your dominant eye, and it should be the same distance from your eyes as the screen so you don't have to refocus to a different distance. Now, this isn't always the best setup for radios, if you have to keep reaching up to tune it or adjust stuff. Might work if you have one of those cool remote tuning controls, or if you can remotely tune from the keyboard (a hint for software writers).

Lots of folks seem to like the rig directly below the monitor, or slightly to one side so they can rest the elbow on the table while tuning. Sometimes the keyboard gets in the way of this, but smaller keyboards are available (as are new keyboards with the keys angled to fit hands better).

That's about it. Others are sure to have little hints, such as standing up every so often and stretching and moving around. You really should do this at least every 30 minutes. The more often you do it the better you will feel (and more alert). No need to stop operating as you do it.

Yeah, I know that Trey, WN4KKN, likes to slouch in his chair with the keyboard in his lap as he breaks records, and some people like to put their feet up on the table (and WB5VZL likes to sleep on the floor under the operating desks during multi's -- go figure). Whatever feels good. But while slouching feels really good at first, it isn't good to stay that way too long (unless of course your chair and station are designed to operate that way - who needs Herman Miller chairs, get a Lazy-boy!).

Dave "Quasimodo" Harper, WD5N wd5n@msg.ti.com

P.S. Regarding chairs: until you spend the bux for a good one, spruce up your fave chair by buying an inexpensive lumbar support pillow. You can also fold up a towel or such in a pinch (like on expeditions) for lumbar support, but it tends to fall out of place when you get up or move around.

It is most certainly a worthy subject, and a good deal of contemporary engineering and design is being expended on this and related subjects.

A few notable principles applicable to the subject of seating:

Holding the same seated position for long periods causes fatigue. The angles of the body should be at approximately 90 degrees, especially the head. An adjustable chair and adjustable work surfaces are *required*. Your head and especially your neck should be vertically over your spine while seated, looking at the monitor, and your forearms should be resting on a chair arm with the keyboard at just the right height and angle. You may have to make some adjustments to the operating position, but this is supposed to be FUN! remember, if it hurts, you're doing it wrong!!!

Lack of movement also causes pooling of the blood in the lower extremities, leading to increased risk of circulation problems and clotting of the blood. TAKE BREAKS! Get up and walk around.

Many books on the subject have been published. No, it is not a new age. Everyone is a victim. It is a politically correct, liberal-approved field filled with flaks and fakirs. Real medical facts only.

AE0M, Tony Becker becker@shell.portal.com

I got mine at Building 19 [a retailer which buys insurance company damaged goods and manufacturer overstocks] in Woburn [MA]. A \$350 dollar chair for \$110. I don't know if it even has a brand name. It has low arms that fit under the operating table, and a high back. With a foot rest, it's a dream.

Tony, K1KP, fisher@hp-and.an.hp.com

Yankee Clipper Contest Club

I use an expensive chair. It is a top grade secretarial chair with the following attributes...

1. No arm rests (they get in the way of tables, constrain arm movements). Also, with no arm rests, one can turn the chair around backwards and sit on it, leaning one's chest against the backrest. The change in position is a relief.
2. A "5-star" base: better than 4 casters; won't tilt over.
3. Adjustable height: the pneumatic kind that can be changed quickly with a lever is the best.
4. Adjustable height of back rest.
5. Tilting back that can be locked into any position with a quick-change lever.
6. Tilting seat cushioning that can also be locked into any position, including one which is slightly forward.

This kind of chair works fine for 48 hours. Most others cause troubles. I also find that I will take breaks and operate standing up for 10 minutes or so ... or sometimes kneel on a pillow for a while. Usually I do this when I am getting sleepy.

Eric, K3NA k3na@aol.com

I'm in the antique business here in Seattle and just purchased a lot of Herman Miller Charles Eames chairs. They have the molded seat and back, and the legs are chrome. Same design they have sold since the 1950s.

Don't think it would be a 48 hour ideal chair, better for conference rooms, etc. Herman Miller makes great stuff, and has a large line from which to pick. Nice to see some great products available for years on end.

Danny Eskenazi, K7SS 0005720561@mcimail.com

In a world of \$6,000 transceivers and \$5,600 amplifiers, I can't pretend to know what 'reasonable' means, but I've been thinking along similar lines...

There was a review of a chair made by Lux Steel in the July, 1992 issue of PC Computing. Since sitting in front of a PC is exactly like playing on the radio, I sent away for information.

Lux makes over a dozen models: high back, fancy executive type, secretary-type, and everything in between. You have a choice of three grades of fabrics, and many patterns and colors in each grade.

"Suggested Retail Prices" are in the \$600 - \$1,300 range. I have no idea what the street prices would be. Lux's number is 800.334.7426. Let me know what you decide. There is a new chair in my future, someday.

73, Steve KC2X ssacco@mcimail.com

Thought I would add my two cents' worth, since finding something which will keep my 320 pound frame from getting too sore in a particular 48 hour period and still survive the punishment I am giving it has been a subject of great interest to me.

I found that what made me more uncomfortable than anything else was a chair that was too short to give support to my legs all the way out to the knee joint. So I went to an office supply store and sat in all the desk chairs they had and bought the one that had the longest rear-of-ass to knee-joint distance. That one

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gave out after five years of yeoman duty and, after being repaired, was retired to service at my upstairs office desk, where it still provides me admirable comfort without having to provide service for such long hours as it previously did.

My current operating chair was selected the same way, though of vastly different appearance. It has come close to breaking down a couple of times but N6CZG, Chief Engineer of Radio Station K3ZO, has always managed to bring it back to life with appropriate repairs.

I do agree with one of your correspondents that (relatively) frequent breaks are advisable, especially for someone like myself within hailing distance of 60, so before changing bands I generally go upstairs, take a pee and grab another bottle of grapefruit juice before returning to the fray.

Fred Laun, K3ZO

I discovered a trick which really seemed to work for me at TIIC in 1993.

After 24 hours in one chair, I changed chairs to a different one. It was amazing how good it felt to have the pressure points somewhere else! Probably neither chair was that good to start with, but when you are visiting a station in a different country, you won't have many choices.

Tree N6TR tree@cmicro.com

PS: It is also neat to be able to operate standing up. I try to do this for several periods during the contest.

Before I came to the League, and lived closer to New York City, there was a company in Stamford, CT that specialized in re-selling used office furniture from offices that had closed for one reason or another.

I used to get the 100% leather high backed executive type office chairs there (you know, the ones that go for \$2,000- 3,000 or more) for about \$250 to \$300. There might be a place like that in [your] area if you look.

Warren, NF1J wstankiewi@arrl.org

Get a footstool under your operating desk (if the amount of wires and stuff permit...) and get the feet up about 6-8 inches. It takes the pressure off the back of your thighs where they go over the edge of the chair. [K1VR note: I've done this, and it is a wonderful addition to a contest station.]

H. Ward Silver, N0AX hwardsil@seattleu.edu

For years I had back problems, especially after long stints in a chair. That problem is gone now, but it wasn't cheap. Call your Steelcase dealer. They make an office chair called a Sensor. Make sure you get the right one for you, and make sure it has a high back. It will set you back \$800 or so, but you will agree it was money well spent. If you can't find a dealer, Steelcase is in Grand Rapids, MI, and their phone number is 616 247-2710.

Jay, W6GO w6go@netcom.com

P.S. This is not an advertisement for Steelcase, and I am in no way associated with Steelcase (except as a happy customer).

As you know, I'm in the seating biz and have been for 15 years.

Yankee Clipper Contest Club

There are really two kinds of ergonomic seating being marketed today: fully adjustable and passively ergonomic. The fully adjustable chair can be configured to fit just about anyone (with SOME exceptions always!) but there is a learning curve involved in the use of the product. The passively ergo chair fits about 85% of the populace and requires little adjustment. This chair generally has only two or three adjustments...pneumatic or manual height adjustment, tension adjustment and maybe forward (what we call "negative") seat tilt adjustment.

I am using "the most popular office chair in America" - the Steelcase Sensor chair. It comes in three basic sizes, manual or pneumatic, with or w/o arms, etc., etc. It is NOT inexpensive! It ****IS**** the best chair I have ever owned I think and built to last - legendary Steelcase quality. Prices run anywhere from \$575 to \$1200 (leather!) at LIST price. Net price runs about 35% less.

I have thought about writing an article for NCJ on something relative to Amateur station ergonomics issues but as always, time is at a premium. All kinds of issues come into play and good seating is only one piece of the puzzle. I'm convinced that a well engineered contest station could increase the rate by 10%-15% with the "right" ergonomic design. Good luck working with your contest "cell" or (soon to be I hope) "ergonomic envelope"!

73, Bruce Marshall, WA1G bruce@shore.net

I went down to the "Staples" office supply store and sat in all the chairs they have. I went in with no price limit, only to find the most comfortable chair to operate in (I also program all day, so sitting is REAL important!)... I ended up buying a \$200 chair with adjustable everything. It has excellent back support. I just slide my butt/back in and its comfy.

The chair was mfd by "Global" in Ontario. I just looked underneath and there is no model number to speak of...

Ray Ortgiesen, WF1B Wyvern Technology, Inc.

In the business section of the Dallas Morning News for Saturday, February 18 [1995], there is a special report on the Aeron chair, by Herman Miller, Inc. I don't want to go into all the details, but it comes in three sizes. Has multi-position everything, and adjustable lumbar. Arms, recline, pitch, tilt, tension, etc. It has no foam or fabric. "It uses transparent Pellicle" technology, whatever the hell that is (which) "permits flow of air and conforms to the individual worker's shape."

It has attracted acclaim in the Wall Street Journal, and Fortune magazine. How much? \$765 to \$1,190, depending on options.

Jay, WX0B

Chairs are a favorite subject for me, as a proper chair is not an extravagance, but a necessity!

About 10 years ago, the friendly commercial air carrier, now known as US Air, abruptly rearranged my neck by shattering two vertebrae and doing significant spinal cord injury. One of the things that I found to be simply indispensable was to acquire a good, no, excellent, chair for all tasks that require sitting. Before I was forced to retire, the insurance company that underwrote my ADD policy sent an ergonomic expert to my office and he re-arranged my work space and showed me the

many options that were available to me for chairs. In my case, it is imperative to have my cervical and lumbar spines supported at all times, or I suffer excruciating pain. I found a company that provided the perfect solution, and, of course, when I ended my career, the chair followed me home. I am sitting in it while composing this tome.

Look for a company that specializes in office ergonomics or contact your insurance company as they have voluminous lists of those companies. I ended up with a moderately priced (\$1200) chair that is built like a battle ship and looks great. That seems like a lot of money, but in the general scheme of contesting, it is money well spent.

Go try many chairs and get the advice of an expert. You will be amazed at the comfort that is available with a properly designed chair. It is less money than a new Alpha, and the results to the bottom line will be remarkable.

Natan W6XR/2

Being one of advancing age and expanding posterior, I made a startling discovery. I can contest longer in a good chair. My wife and I maintain a home office and we bought chairs from Office Max. Spent about \$150. I liked mine so much, I bought one for the shack. Go to Office Max (or some other joint) and sit in them and find one that 'fits'. There is a great variability in size. I got one that comes all the way up to my mid shoulder area so I can stretch back without falling over. It also has a good support for the small back area and a really neat pneumatic piston for raising and lowering to change during the test. I also have tried two different chairs and switched off - it helps the fatigue factor. Alas, I fear we all will be making similar adjustments as we 'grey'.

Dan W8CAR pems_st_dk@noeca.ohio.gov

My posture changes during the contest, no question. It will go from bad to worse! Without question, having a second chair (Single Op Multi Chair) is a delicious relief. Occasional periods of standing up, too, are great. I recommend a trip into the newspaper classifieds to find used office furniture places (there is usually a category for this stuff). My favorite chair was bought for less than my cheapy secretary chair was. I bought the secretarial chair at Office Depot (or one of them places), it pales compared to my "used" chair - the upholstery is a much better grade fabric and it is so much more "comfy" thanks to better padding.

RE Standing: A carton the size of a rural mailbox (I had one which housed a mailbox that replaced a 'box a Budweiser fueled baseball bat had graced) is the perfect size to place under your keyboard. If you elevate the keyboard you don't have to bend over during typing. This is appropriate when running in the AM, after a night of low band sitting and pouncing. You might have to hit the RIT once in a while, but otherwise it is a time when you just have to listen and keyboard rapidly. The rush of the run is also enjoyable when coupled with an occasional tip toe stretch.....yawn YES, an HB0!

Once upon a time about 30 years ago, my Dad as W1WPO [now W1CW] did an ironman effort in the Sweepstakes. At 0300 Sunday, Mom (W1YYM) [now W1YL] and I applauded him on the effort. He then proceeded to walk away from the rig in a seated position. I wasn't a ham yet, but today I understand.

Yankee Clipper Contest Club

Then about 10 years old, I sure didn't understand contesting or masochism, but after what I saw, I think I had learned the essence of the later!

Jim, K1ZX k1zx@mcimail.com ☐

1995-96

Contest Propagation Predictions

Dean Straw, N6BV

We are presently at, or very near, the minimum level of solar activity for Cycle 22. The good news is that some believe that Cycle 23 has started and that the solar flux should start rising within a year or so. The bad news is that solar activity will still be low for the CQWW and the ARRL DX contests this fall and winter. I am using an optimistic value of Smoothed Sunspot Number = 15 for this season's propagation tables.

There is a new format for this year's tables, listing predicted signal strengths by S-units instead of dB μ V. I think it is far more intuitive this way for hams. I have divided the world up into seven geographic areas, as follows:

EU = Europe; zones 14, 15, 16, 20 and 40

FE = Far East; zones 19, 24, 25, 26 and 28

SA = Central/South America/Caribbean; zones 7, 8, 9, 10, 11, 12 and 13

AF = Africa; zones 33, 34, 35, 36, 37, 38 and 39

AS = Central and South Asia; zones 17, 18, 21, 22 and 23

OC = Oceania; zones 27, 29, 30, 31 and 32

NA = North America; zones 1, 2, 3, 4, 5 and 6.

As usual, the predictions were done using *IONCAP*, and they assume undisturbed geomagnetic conditions. The antennas used at each end of all circuits represent typical good-sized contest stations: 100-foot high dipoles on 80 and 40 meters, a 3-element Yagi at 100 feet on 20 meters, and 4-element Yagis at 60 feet for 15 and 10 meters. Scale the results accordingly for different types of antennas. For example, if a DX station transmits with a dipole on the higher bands instead of with a Yagi, subtract 2 S-units from the values in the table. I have assumed that a typical receiver's S-Meter is generous, with 4 dB per S-unit.

Observations:

Conditions on 10 meters will not be a lot of fun. No surprise there, but do watch out for those weak-signal openings into Oceania late in the afternoon. There will be some nice multipliers there, but the pileups will probably be horrendous, just as they will be for the Africans coming through about 18 UTC.

15 meters will be very important for multipliers. The European runs will not be as hot and heavy as they have been in the last few years, nor will they last as long. If you are running Europeans, you should occasionally ask them to stand by for any Asian stations that might be in the pileup.

20 meters will be the workhorse band, as it has for the last couple of years. Look for Far East stations also during the

morning European runs, and in the afternoon. Signal levels will be moderate (a peak of S7 predicted), but there should be lots of JAs available. In the middle of your 40-meter CW runs, don't forget to catch the 20-meter Southeast Asia opening about 22-23 UTC.

40 meters should be a lot of fun at this point in the solar cycle. *IONCAP* predicts that signals, albeit very weak, will be available 24 hours a day on 40 meters. Work your brains out into Europe! Turn your beam to catch long-path Southeast Asians just about sunset too.

80 meters will be 80 meters. Work all the Europeans you can to get lots of multipliers. The signals from the western Africans will be S9 for much of the evening, while the deep south Africans will only be about S4, about 01-03 UTC. If you're going to get a JA, it will be about 09-10 UTC, but they'll be weak as usual.

Note that the column "NA" (North America) includes all zones in North America. This means that the signals will be very loud on the lower bands, dominated in these computations by signals from Zone 5, of course. On 80 meters you may be able to snag a zone 1 KL7 around 10 UTC, and zone 3 will peak about 09 UTC. ☐

CQWW Phone Predictions, Oct. 1995, for SSN = 15, Sigs in S-Units. By N6BV, ARRL

UTC	80 Meters							40 Meters							20 Meters							15 Meters							10 Meters							UTC
	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	
0	6	-	9	9	3	-	9	9	1	9	9	7	-	9	5	6	9	7	7	7	9	-	-	1	-	1	4	1	-	-	-	-	-	2	0	
1	8	-	9	9	3	-	9	9	-	9	9	7	1	9	1	4	9	4	6	6	9	-	-	-	-	-	-	2	-	-	-	-	-	2	1	
2	8	-	9	9	4	-	9	9	-	9	9	7	3	9	-	2	8	6	4	4	9	-	-	-	-	-	1	-	-	-	-	-	2	2		
3	8	-	9	9	-	-	9	9	-	9	9	6	5	9	-	-	7	7	2	-	9	-	-	-	-	-	1	-	-	-	-	-	2	3		
4	9	-	9	9	-	1	9	9	-	9	9	5	5	9	-	-	8	6	2	-	9	-	-	-	-	-	-	-	-	-	-	-	2	4		
5	9	-	9	9	-	2	9	9	-	9	9	4	7	9	-	-	9	7	-	-	9	-	-	-	-	-	-	-	-	-	-	-	2	5		
6	9	-	9	9	-	4	9	7	2	9	9	-	8	9	-	-	9	2	-	1	9	-	-	-	-	-	-	-	-	-	-	-	2	6		
7	9	-	9	9	-	5	9	8	5	9	9	-	8	9	-	-	9	-	-	2	9	-	-	-	-	-	-	-	-	-	-	-	2	7		
8	8	-	9	8	-	5	9	8	6	9	9	5	8	9	-	-	7	-	-	2	9	-	-	-	-	-	-	-	-	-	-	-	2	8		
9	4	2	9	4	-	5	9	8	6	9	8	4	8	9	-	-	4	4	-	-	9	-	-	-	-	-	-	-	-	-	-	-	2	9		
10	1	2	9	-	-	4	9	7	7	9	6	4	8	9	6	-	8	9	1	-	9	-	-	-	1	-	-	-	-	-	-	-	2	10		
11	-	2	9	-	-	5	9	5	6	9	2	6	7	9	9	2	9	9	6	-	8	-	-	-	7	1	-	1	-	-	-	-	2	11		
12	-	-	5	-	-	2	9	4	5	9	1	2	7	9	9	7	9	9	7	6	8	4	-	9	8	6	-	1	-	-	-	1	-	2	12	
13	-	-	-	-	-	-	9	2	3	8	-	2	5	9	9	7	9	8	7	8	9	5	1	9	8	8	1	8	-	-	5	2	-	-	1	13
14	-	-	-	-	-	-	9	1	-	4	-	-	2	9	8	6	9	8	7	7	9	5	3	9	8	8	2	6	-	-	7	1	-	-	1	14
15	-	-	-	-	-	-	9	1	-	2	-	-	-	9	8	5	9	8	6	6	9	6	2	9	8	8	1	8	-	-	7	1	-	-	1	15
16	-	-	-	-	-	-	9	1	-	1	-	-	-	9	8	5	9	9	7	7	9	7	2	9	9	6	1	8	-	-	7	1	-	-	1	16
17	-	-	-	-	-	-	9	2	-	2	1	-	-	9	9	5	9	9	8	6	9	6	3	9	9	-	6	8	-	-	8	4	-	-	6	17
18	-	-	-	-	-	-	9	4	-	4	5	1	-	9	9	6	9	9	7	6	9	4	4	9	9	-	8	8	-	-	9	6	-	-	7	18
19	-	-	-	-	-	-	9	6	-	5	5	1	-	9	9	5	9	9	6	7	9	-	4	9	9	-	8	9	-	-	9	5	-	-	8	19
20	1	-	2	2	-	-	9	7	-	9	8	4	-	9	9	7	9	9	6	5	9	-	-	9	9	-	8	9	-	-	9	1	-	1	8	20
21	2	-	6	4	-	-	9	8	2	9	9	5	1	9	9	7	9	9	7	7	9	-	1	9	8	-	7	9	-	-	9	-	-	-	8	21
22	4	-	9	7	2	-	9	8	2	9	9	6	-	9	7	7	9	9	8	7	9	-	2	9	6	-	7	8	-	-	3	-	-	-	2	22
23	5	-	9	8	3	-	9	8	1	9	9	6	-	9	6	7	9	9	7	6	9	-	2	8	-	-	6	1	-	-	-	-	-	-	2	23

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CQWW CW Predictions, Nov. 1995, for SSN = 15, Sigs in S-Units. By N6BV, ARRL

UTC	80 Meters							40 Meters							20 Meters							15 Meters							10 Meters							UTC
	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	
0	8	-	9	9	4	-	9	8	1	9	9	7	-	9	-	5	9	2	5	6	9	-	-	-	-	-	1	1	-	-	-	-	-	-	2	0
1	8	-	9	9	4	-	9	8	-	9	9	8	1	9	-	2	8	1	2	4	9	-	-	-	-	-	-	1	-	-	-	-	-	-	2	1
2	8	-	9	9	4	-	9	8	-	9	9	8	3	9	-	-	8	-	1	3	9	-	-	-	-	-	-	-	-	-	-	-	-	2	2	
3	8	-	9	9	3	1	9	8	-	9	9	7	5	9	-	-	7	4	1	-	9	-	-	-	-	-	-	-	-	-	-	-	-	2	3	
4	9	-	9	9	-	2	9	9	-	9	9	6	6	9	-	-	8	6	1	-	9	-	-	-	-	-	-	-	-	-	-	-	-	2	4	
5	9	-	9	9	-	2	9	8	-	9	9	5	6	9	-	-	9	5	-	-	9	-	-	-	-	-	-	-	-	-	-	-	-	2	5	
6	9	-	9	9	-	4	9	6	3	9	9	1	7	9	-	1	9	3	-	1	9	-	-	-	-	-	-	1	-	-	-	-	-	2	6	
7	9	-	9	9	-	4	9	9	5	9	9	4	8	9	-	-	9	-	-	4	9	-	-	-	-	-	-	1	-	-	-	-	-	2	7	
8	9	2	9	8	-	5	9	9	5	9	9	5	8	9	-	-	9	-	-	6	9	-	-	-	-	-	-	-	-	-	-	-	-	2	8	
9	6	3	9	5	-	5	9	8	7	9	8	6	8	9	-	-	7	3	-	4	8	-	-	-	-	-	-	-	-	-	-	-	-	2	9	
10	2	4	9	1	-	4	9	7	8	9	7	6	8	9	2	-	8	8	1	1	8	-	-	-	-	-	-	1	-	-	-	-	-	-	2	10
11	1	3	9	-	1	5	9	6	7	9	4	5	8	9	9	-	9	9	7	-	8	-	-	-	4	-	-	1	-	-	-	-	-	-	2	11
12	-	-	7	-	-	4	9	4	6	9	1	5	8	9	9	7	9	9	8	2	6	2	-	9	8	4	-	1	-	-	-	1	-	-	2	12
13	-	-	-	-	-	1	9	3	5	8	-	5	6	9	9	7	9	9	8	9	9	6	2	9	8	8	1	1	-	-	8	3	-	-	1	13
14	-	-	-	-	-	-	9	2	3	5	-	5	5	9	9	5	9	8	7	8	9	7	2	9	9	8	6	8	-	-	9	3	-	-	1	14
15	-	-	-	-	-	-	9	1	-	3	-	-	1	9	9	5	9	9	7	6	9	6	4	9	9	1	4	9	-	-	9	2	-	-	1	15
16	-	-	-	-	-	-	9	2	-	2	1	-	-	9	9	5	9	9	7	7	9	5	5	9	9	-	4	9	-	1	8	2	-	-	8	16
17	-	-	-	-	-	-	9	3	-	2	2	-	-	9	9	5	9	9	2	7	9	-	3	9	9	-	4	9	-	-	8	2	-	-	9	17
18	-	-	-	-	-	-	9	5	-	5	5	1	-	9	9	5	9	9	3	6	9	-	2	9	9	-	8	9	-	-	8	1	-	2	1	18
19	1	-	-	1	-	-	9	7	-	7	7	4	-	9	9	6	9	9	2	6	9	-	-	9	9	-	8	9	-	-	7	-	-	4	1	19
20	2	-	3	3	-	-	9	8	1	9	8	5	-	9	8	5	9	9	5	7	9	-	-	9	7	-	8	9	-	-	6	-	-	4	1	20
21	5	-	8	6	-	-	9	8	2	9	9	6	1	9	7	8	9	9	7	7	9	-	-	9	3	-	8	9	-	-	2	-	-	2	1	21
22	7	-	9	8	3	-	9	8	3	9	9	6	1	9	5	8	9	9	6	7	9	-	2	9	-	-	7	7	-	-	-	-	-	-	1	22
23	8	-	9	9	3	-	9	8	1	9	9	7	-	9	2	8	9	8	2	6	9	-	1	1	-	-	5	1	-	-	-	-	-	-	2	23

EU FE SA AF AS OC NA EU FE SA AF AS OC NA EU FE SA AF AS OC NA EU FE SA AF AS OC NA EU FE SA AF AS OC NA

ARRL DX CW Predictions, Feb. 1996, for SSN = 15, Sigs in S-Units. By N6BV, ARRL

UTC	80 Meters							40 Meters							20 Meters							15 Meters							10 Meters							UTC
	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	
0	9	-	9	9	4	-	9	9	1	9	9	8	-	9	-	7	9	7	6	7	9	-	-	3	-	-	4	1	-	-	-	-	-	2	0	
1	9	-	9	9	4	-	9	8	-	9	9	8	1	9	-	3	9	2	1	6	9	-	-	-	-	-	-	1	-	-	-	-	-	2	1	
2	8	-	9	9	4	-	9	8	-	9	9	8	2	9	-	1	7	3	1	5	9	-	-	-	-	-	-	1	-	-	-	-	-	2	2	
3	8	-	9	9	4	-	9	8	-	9	9	7	5	9	-	-	7	2	-	-	9	-	-	-	-	-	-	-	-	-	-	-	2	3		
4	9	-	9	9	-	1	9	9	-	9	9	6	6	9	-	-	8	4	-	-	9	-	-	-	-	-	-	-	-	-	-	-	2	4		
5	9	-	9	9	-	2	9	8	-	9	9	5	7	9	-	-	9	3	-	-	9	-	-	-	-	-	-	-	-	-	-	-	2	5		
6	9	-	9	9	-	3	9	6	2	9	9	1	7	9	-	-	9	5	-	-	9	-	-	-	-	-	1	-	-	-	-	-	2	6		
7	9	-	9	9	-	4	9	7	4	9	9	1	8	9	-	-	9	-	-	1	9	-	-	-	-	-	1	-	-	-	-	-	2	7		
8	8	-	9	8	-	4	9	8	5	9	8	4	8	9	-	-	9	-	-	4	9	-	-	-	-	-	1	-	-	-	-	-	2	8		
9	6	2	9	5	-	4	9	8	6	9	8	5	8	9	-	-	9	1	-	4	9	-	-	-	-	-	-	-	-	-	-	2	9			
10	2	3	9	1	-	4	9	8	7	9	7	6	8	9	-	-	9	9	-	1	8	-	-	-	-	-	1	-	-	-	-	-	2	10		
11	1	4	9	-	1	5	9	6	8	9	4	6	7	9	5	-	9	9	5	-	6	-	-	-	1	-	-	1	-	-	-	-	2	11		
12	-	-	7	-	-	5	9	5	6	9	1	4	8	9	9	1	9	9	6	-	8	-	-	7	7	-	-	1	-	-	-	-	2	12		
13	-	-	-	-	-	1	9	3	4	8	-	4	5	9	9	7	9	8	8	8	9	3	-	9	8	5	-	1	-	-	1	-	-	1	13	
14	-	-	-	-	-	-	9	2	2	5	-	-	4	9	9	6	9	8	7	7	9	4	-	9	8	8	2	8	-	-	5	-	-	-	1	14
15	-	-	-	-	-	-	9	1	-	2	-	-	1	9	9	6	9	8	6	6	9	5	-	9	9	8	1	5	-	-	5	-	-	-	1	15
16	-	-	-	-	-	-	9	1	-	1	-	-	-	9	9	5	9	9	7	6	9	5	-	9	9	-	-	7	-	-	5	-	-	-	1	16
17	-	-	-	-	-	-	9	2	-	1	1	-	-	9	9	5	9	9	7	7	9	1	4	9	9	-	1	8	-	-	6	-	-	-	1	17
18	-	-	-	-	-	-	9	4	-	3	2	-	-	9	9	5	9	9	5	6	9	-	2	9	9	-	8	8	-	-	7	-	-	-	3	18
19	1	-	-	-	-	-	9	6	-	5	6	1	-	9	9	6	9	9	4	6	9	-	1	9	9	-	8	8	-	-	6	-	-	-	3	19
20	2	-	-	2	-	-	9	8	-	9	8	5	-	9	6	5	9	9	5	5	9	-	-	9	8	-	8	9	-	-	5	-	-	-	4	20
21	4	-	6	5	-	-	9	8	2	9	9	6	-	9	1	8	9	9	6	7	9	-	-	9	3	-	8	8	-	-	5	-	-	-	4	21
22	6	-	9	7	-	-	9	9	2	9	9	6	1	9	1	8	9	9	5	6	9	-	1	9	4	-	8	5	-	-	1	-	-	-	2	22
23	8	-	9	9	3	-	9	8	2	9	9	7	-	9	-	8	9	9	5	7	9	-	1	9	-	-	6	1	-	-	1	-	-	-	2	23

EU FE SA AF AS OC NA EU FE SA AF AS OC NA EU FE SA AF AS OC NA EU FE SA AF AS OC NA EU FE SA AF AS OC NA

ARRL DX Phone Predictions, Mar. 1996, for SSN = 15, Sigs in S-Units. By N6BV, ARRL

UTC	80 Meters							40 Meters							20 Meters							15 Meters							10 Meters							UTC
	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	EU	FE	SA	AF	AS	OC	NA	
0	8	-	9	9	3	-	9	9	1	9	9	6	-	9	2	5	9	9	7	6	9	-	-	9	-	-	5	5	-	-	-	-	-	2	0	
1	9	-	9	9	3	-	9	9	-	9	9	7	-	9	-	3	9	8	5	7	9	-	-	3	-	-	3	5	-	-	-	-	-	2	1	
2	9	-	9	9	4	-	9	9	-	9	9	7	2	9	-	2	9	6	2	6	9	-	-	-	-	-	-	-	-	-	-	-	2	2		
3	9	-	9	9	-	-	9	9	-	9	9	7	4	9	-	1	9	6	1	2	9	-	-	-	-	-	-	-	-	-	-	-	2	3		
4	9	-	9	9	-	1	9	9	-	9	9	6	6	9	-	1	9	7	-	-	9	-	-	-	-	-	-	-	-	-	-	-	2	4		
5	9	-	9	9	-	2	9	8	-	9	9	4	7	9	-	-	9	7	-	-	9	-	-	-	-	-	-	-	-	-	-	-	2	5		
6	9	-	9	9	-	4	9	7	-	9	9	-	8	9	-	-	9	1	-	-	9	-	-	-	-	-	-	-	-	-	-	-	2	6		
7	9	-	9	9	-	5	9	8	4	9	9	1	8	9	-	-	9	-	-	1	9	-	-	-	-	-	-	-	-	-	-	-	2	7		
8	8	-	9	8	-	5	9	8	5	9	9	1	8	9	-	-	8	-	-	1	8	-	-	-	-	-	-	-	-	-	-	-	2	8		
9	4	2	9	4	-	5	9	8	6	9	8	4	8	9	-	-	4	2	-	-	7	-	-	-	-	-	-	-	-	-	-	-	2	9		
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11	-	2	9	-	-	6	9	5	6	9	3	3	7	9	9	1	9	9	5	-	5	-	-	-	4	-	-	1	-	-	-	-	-	2	11	
12	-	-	6	-	-	2	9	3	5	9	1	2	7	9	9	5	9	8	7	4	9	-	-	8	6	1	-	1	-	-	-	-	-	2	12	
13	-	-	-	-	-	-	9	2	3	8	-	2	5	9	7	6	9	8	8	9	9	1	-	9	8	4	-	4	-	-	1	-	-	-	2	13
14	-	-	-	-	-	-	9	1	-	4	-	-	2	9	7	7	9	8	6	8	9	2	-	9	7	5	2	9	-	-	3	-	-	-	1	14
15	-	-	-	-	-	-	9	1	-	1	-	-	-	9	7	5	9	8	6	5	9	2	1	9	8	5	-	4	-	-	2	-	-	-	2	15
16	-	-	-	-	-	-	9	-	-	1	-	-	-	9	8	5	9	9	6	5	9	2	1	9	8	4	-	5	-	-	4	-	-	-	1	16
17	-	-	-	-	-	-	9	1	-	1	-	-	-	9	9	4	9	9	7	5	9	3	-	9	8	1	1	7	-	-	6	1	-	-	2	17
18	-	-	-	-	-	-	9	2	-	2	2	-	-	9	9	6	9	9	8	7	9	3	-	9	9	1	6	8	-	-	7	2	-	-	4	18
19	-	-	-	-	-	-	9	5	-	3	6	1	-	9	9	6	9	9	5	6	9	1	-	9	9	-	6	8	-	-	8	1	-	-	5	19
20	1	-	-	1	-	-	9	6	-	8	7	3	-	9	9	6	9	9	5	6	9	-	-	9	9	-	8	4	-	-	8	-	-	-	5	20
21	2	-	4	3	-	-	9	8	-	9	8	4	-	9	8	7	9	9	6	8	9	-	-	9	8	-	6	4	-	-	6	-	-	-	5	21
22	4	-	8	6	-	-	9	8	1	9	9	5	-	9	5	7	9	9	7	8	9	-	-	9	7	-	6	6	-	-	4	-	-	-	4	22
23	6	-	9	8	2	-	9	8	1	9	9	6	-	9	4	6	9	9	8	7	9	-	1	9	5	-	6	2	-	-	5	-	-	-	2	23

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1995 Contest Cookbook Log	Ship's
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Introduction Leonard Kay, KB2R.....	1
Computers and Contests Dave Robbins, KY1H.....	1
Single Op Assisted - Medium to Little Pistol Category Tony Brock-Fisher, K1KP	5
Single Op CQWW Jack Schuster, W1WEF.....	7
160 Meters Carl Huebner,	8
80 Meters Dennis Egan,	9
40 Meters Randall Thompson, K5ZD.....	10
20 Meters Greg Cronin, W1KM.....	10
15 Meters Doug Grant,	11
10 Meters Tom Frenaye, K1KI.....	11
Chairs Fred Hopengarten, K1VR.....	12
1995-96 Contest Propagation Predictions (with charts) Dean Straw, N6BV	15

The YCCC Scuttlebutt
6R Johnson St.
Woburn, MA 01801