

YANKEE CLIPPER



CONTEST CLUB
1993 Contest Cookbook

SINGLE OPERATOR

Kurt Pauer, W1PH

As I write this on Oct 4, the solar flux is in the mid 120's and the bands are hot, except ten meters isn't. The big question mark for this year is ten meters. Generally, band conditions have a 27 day cycle and as we go into the winter season the bands get quieter and improve in quality. Even though ten meters isn't producing any great propagation, don't write it off yet.

This year I would like to give some tips and hints to the person who has a medium station and can operate 15 to 30 hours. (The people who have the big stations and/or will operate more than 30 hours already know these things!) The medium station is one with one radio, an amplifier, and a good tribander or 3 element monobanders at 60 feet or so. The 15 to 30 hour operating time allows for sleep and other family things that are politically necessary. It also allows you to enjoy the best hours of the contest.

Although the goal of the YCCC is to achieve a winning club score, the CQ WW Contests offer another group competition, that of Team Contesting. Essentially, five single operator entrants form a team and compete against other teams. The information is on page 88, Sep 93 CQ. Here is an opportunity for five club members to compete between themselves while achieving the highest aggregate score. It would be fun to get together with four other similarly equipped stations and create your own team. You don't have to be a super station to do this. And all your points still go to the YCCC.

Preparation is extremely important. Use the nice weather days to be sure your antennas are operating properly. Check that all the feedlines are in good shape. Check the alignment of your rotator. If it is possible to add a few antennas "Field Day style", put up an antenna at about 35 feet for Central America and the Caribbean. Don't wait until the day before the contest to fix your antennas.

Almost everyone is using computer logging these days. Be sure that your version is working properly by testing it out the week before the contest. If you need help during the contest, just call K1EA. NOT! Check your country file to make sure it is up to date as there have been a lot of country and prefix changes this past year. Practice with all the keys so that you are familiar with the ALT, CTRL, SHIFT, and F keys. If you are using a computer driven radio, be sure everything is working the way it should.

Set a goal for your score. See what you have done in previous years and adjust for a weaker ten meters. On the other hand, 15 meters should be a great band and may more than compensate for the loss on ten meters. Set a tentative operating schedule and band plan. "Tentative" is a key word as the actual operation may be much different

depending on conditions. But getting your brain psyched up for the contest is essential. Pick operating times to coincide with band openings to Europe. My experience has been that 80% of my contacts are with European stations. These are the most productive times and will be in the morning, late afternoon, and early evening.

CW memory keyers and voice keyers are also becoming standard operating equipment for contesters. These devices really help reduce fatigue and should be a high priority item if you don't have one. Make sure that they are operating properly. Some CW keyers do not key certain radios. Voice keyers can sometimes have bad characteristics such as hum or splatter if not operated properly. If you have not used a voice keyer, you won't believe how much it saves your voice. It also keeps a quieter shack.

During the week before the contest, check out the band conditions to see what the trend in propagation is. Watch the WWV numbers and look for a low K number. Based on the current numbers, the SSB weekend should be very good for CQWW. Also, study the N6BV signal charts found elsewhere in this cookbook. They give invaluable insight into the relative signal strengths on the different bands to the different areas of the world. For instance, a weak 10 meter European opening may occur between 13Z and 16Z with the peak about 14Z. However, the opening could be stronger or might not occur at all. On 15 meters, the band will be strong to Europe from 12Z to 19Z. The predicted signal strength is over S9 during this time period and reflects a strong likelihood of 15 meters being as good as 10 meters has been in the past few years. Fifteen meters should be a major part of your contest plan.

Grayline propagation is also possible twice a day at sunrise and sunset. During CQWW SSB, the sunrise grayline peaks at 1115Z on a 018/198 degree beam and the sunset grayline peaks at 2200Z on a 342/162 degree beam. During CQWW CW, the sunrise grayline peaks at 1150Z on a 028/208 degree beam and the sunset grayline peaks at 2125Z on a 332/152 degree beam. The opening is longest on 20 meters and shortest on 80 meters (maybe only 5 minutes on some paths). The grayline is most useful for the medium station on 40 and 20 meters. Also, check times when people are awake at the other end, typically local sunrise until a couple hours after dark. Except for the dihard contesters, there are not likely to be many people active in the middle of the night their local time.

And last but not least, take care of RFI problems. If you have TVI problems running a KW, but not at 100 watts, don't give up the contest. You can do very well with the lower power if your antennas are decent. Save the KW for late at night or early in the morning.

All of these preparations should be done before Friday. Use Friday as a mental preparation day getting psyched up and relaxing. Stock up on your favorite snacks. Let the

family know what the schedule is and what your plans are. Remember, a lot of people take off on fishing trips for an entire weekend. Contests give us the same opportunity to "de-stress" from our everyday activities and are as therapeutic as the fishing trip.

Once the contest starts, get on a band with Europeans if possible. For the medium station, this may not work if signals are weak or 40 is the only band to Europe. You should be content with your antenna pointed south and working South Americans on 20 and 15 meters. Friday night can be very slow as the sunspots decline, so don't be discouraged. Get a good nights sleep and get up for the European opening on 15 meters in the morning.

Many of these operating hints that were published before in my article in the NCJ (Vol 20, Nr 5) are worth repeating. The object of the contest is to accumulate the most points. For the medium contestant, one multiplier is worth about 3 QSOs. Before spending a lot of time in a pileup trying to work a single multiplier, evaluate if you could work three new QSOs in the same time. If it is a double multiplier (new zone and country), then it might be worthwhile to spend a couple minutes trying to snag him. Check your QSO rate to see how long you should stay. I usually try about 3 or 4 calls; if no luck, I mark the frequency in memory and try back every couple minutes. Most of the time, the highest scores also have the highest QSO totals. The multipliers seem to come with the QSOs.

When do you call CQ and when do you S&P? (S&P is search and pounce.) There is no easy answer. If CQing is productive, then by all means do it. When you CQ, act like a Big Gun. On CW, send at 30-35 WPM. On SSB, concentrate on sending your call. Any transmission should end with your call, not the word "CONTEST" or "TEST". Everyone knows it's a contest! Those who will answer your calls want your call sign to check for previous QSOs. If they hear the word "CONTEST" but not your call, they will yell back, "Whatchercall?" and you will waste a transmission. KIAR just gives his call with nothing else and gets lots of answers. (Writing a column in CQ and operating the most awesome station in the most awesome location doesn't hurt!) Unless you have that awesome super station, do your CQ's higher in the bands. On CW, stay above 035. On SSB, 50 khz or so up is a good place to look for a clear frequency. If you get an answer from a multiplier that you need on another band, aggressively ask him to listen for you on a specific frequency on another band. Be sure to load a couple memories with frequencies high in the band. But check that the frequency isn't on some net. There are more of them than you on that frequency and they all act like the DX police and every single one of them will tell you that the frequency's in use while you are trying to eek out that 5 second contact. When the high bands are open to Europe, the medium station should

be able to run at least 60 QSOs/hour for the first few hours on each band.

On the low bands, S&P is the most productive approach for the medium station. The one exception to this is when 40 meter CW is open to Europe. Otherwise, tune across the low bands and work the stations that are either loud or are new multipliers. During the first hour on a new band, it should be possible to work 30 to 40 stations with most of them being new multipliers. When you are tuning, start at one end of the band and tune toward the other end. When you get to that end, change to another band which is open. Think of the open bands as one continuous band and you should get good exposure to a lot of different multipliers as well as new QSOs. Don't pass up an easy QSO with a station you haven't worked even though he isn't a new multiplier. (He's as good as one-third of a multiplier toward your final score!) And especially don't pass up a VE in the CQWW. That two points is easier than any other two pointer. On the other hand, after you have worked a KL7 on a band and gotten your double multiplier, don't bother with another one. There will be too many others calling and that two pointer will be the hardest one you will ever work. When Europe isn't open on the high bands, S&P for Africans and South Americans. If you encounter a station that you need, but there is a pretty good size pileup, mark the frequency in memory and keep going.

One of the most frustrating things in contesting is the guy who never signs his call. There is no reason why the call can't be given at least once a minute or more often. I might yell out "Whatchercall?" or send "CL?" on CW after about 60 seconds. If he ignores it, I will call and work him and ask for his call "again slowly". If I have worked him before, I will tell him so. I refuse to hang around waiting for this clod to sign his call on his own. It seems to be more prevalent from the southerly beam direction. Another frustration is the warped guy who sends just two letters of his call. When you are calling someone, use your entire call and use accepted phonetics. Be prepared to have a lot of the IK3's call you with two letters, although I did have one use his complete call sign last year!

In the CQWW, don't miss zones 3, 4, and 5 on any band due to negligence. It is easy to miss a W multiplier on 40 SSB. If you haven't put up a decent 160 meter antenna, load up a piece of wire and work a VE3 and a W1 for 4 easy multipliers on 160. On the high bands, JA stations are not going to be as strong as in the past few years. Work the loudest ones. You might try a CQ, but I have never had a lot of luck getting JA's to answer. Besides, there is probably a band open to Europe which is a lot easier. Don't get in a pileup for a multiplier that you don't need. A contest is not the place for ego fulfillment. Work the easy stuff! If you're good at tailending, try it. On SSB, timing is everything. You want to be transmitting your call when the DX

station is listening and others aren't transmitting. That's how you get through.

About midday, when European rates start to fall off, turn your beam south and pick up the Caribbean and South American stuff while there are no U.S. pileups. You can identify the stations by their S9+ signals or a pileup dominated by Europeans. Check around 15Z on 20 meters to the north for the Southeast Asians and Indonesia. This is the easiest time to pick up zones 22, 24, 26, 27, 28 and 29. The northeast has a good path and the signals are easily identifiable with their characteristic polar flutter.

Read through the individual band strategies for more specific information. If you are planning a single band operation, work the other bands for multipliers and QSOs when your band is closed. You can still submit a single band entry for yourself and an all band entry for the YCCC. Clearly mark your summary sheet as such. Again, consider forming a team entry with some of your friends.

Here is my band plan for a 24 hour operation which maximizes your productivity:

00Z: South America on 15 meters and then 20 meters.

02Z: Europe on 40 meters.

03Z: Check 40, 80, and 160. (Tune across 20 m every hour!)

04-10Z: Sleep

10Z: Check 80 meters quickly for a couple mults. Go to 40 and pick up the Pacific, a JA for double mult, and the Caribbean.

11Z: By this time 20 meters should be open to Europe and you should be checking on 15 meters. As soon as there are several good signals from Europe, move up to that band.

12Z-14Z: Run Europe, run Europe, run Europe. This is when you really rack up the QSOs. You should make a couple hundred QSOs during this time period. Check on 10 meters; if it's open to southern Europe, work the I's and EA's that are there. There may not be any other Europeans.

15Z: Time to S&P. Check 20 meters with your beam north. Turn the beam south and QSY to 15/10 meters. Keep working Europeans and try running if you find a clear frequency.

16Z: Take a break. Spend some time doing the weekend things.

19Z: Back to 20 meters and Europe. Run if you can; otherwise work every signal you can copy. 15 meters will also yield a lot of western Europeans (G, DL, F, PA) if you call CQ.

Signal takeoff angles rise just before the band quits, the band is quiet, and it may be productive up to 22Z. The rate isn't great, but it is probably better than S&P at this time.

21Z: Tune across 10 meters for some Pacific stations. They will be weak and you have to be beaming toward them to hear them. Pick up the stuff to the south that you haven't worked. If a station is weak and isn't answering other W1's, you probably won't get through either. Ten meters is very fickle!

22Z: Check 40 meters. On CW, you should be running Europeans. On SSB, answer as many European CQ's as you can. After about 23Z on SSB, the band isn't as good, as it is opening to the midwest and broadcast stations are opening up. Check 15 meters to the north. JA's should be coming through. Work as many as you can. Try a CQ up higher in the band. On SSB, emphasize 15 meters more than 40 meters. On CW, stay on 40 meters. Your QSO rate will be higher. Check 20 meters to the south between now and 02Z. Pick up the multipliers that you didn't get last night. Change bands frequently during this time period.

00Z: Things are slowing down. Continue to S&P or knock off for the night.

0330Z: Check NBC-TV for Sat Night Live. (0430Z for CW.)

2nd day - Same plan. The bands could be better than Saturday, or they could be worse. The competition for multipliers should be less and you should be able to fill in a lot of blanks. Don't pass up a strong station that you haven't worked even if it isn't a multiplier (didn't I say this before?)

What score could you make? Without too much trouble, you should be able to score at least 500,000 points. This represents 600 QSOs and 300 multipliers at 2.8 points per QSO. Set a goal for yourself by checking previous scores. If you have put together a team, set a quota for each member. Fifty percent more QSOs and multipliers (900/450) will yield a score over 1 million. If you use the packet spotting system, you can really enhance your score, but you now become a single operator-assisted category. S/O Assisted is a lot of fun as well and should be considered unless you are trying for a special category award.

Remember, contesting is supposed to be fun and enjoyable. In this spirit, operate within the context of the rules. Pass on your scores to me (W1PH) via packet after the contest. Have a great time and good luck.

Multi-Single

Matt Strelow, KC1XX

Serious multi-single gets tougher every year, but it's still a great deal of fun for a modest station and a few friends. Knock off the mults and run your brains out at the same time!

PLANNING

The key to multi-single is PREPAREDNESS! Matt's rules number 1, 2, and 3 are prepare, prepare, prepare. Sometime in January sign up your ops, get together and work out a plan. Get everybody involved in preparing the station and antennas. Bring them over for a few small contests in the summer to become familiar with station operation.

THE COMPUTERS

You *must* use CT, networked computers, computer controlled radios and packet to be effective. This means at least a four port com board in one of the computers. If you can't do that, use two computers with two ports each. The run station should connect to packet and the other computer. The mult station should connect a computer controlled radio and the other computer. Use the ALT-J CT function. This displays the other station's VFO at all times. That way, the run station can give a pass frequency instantly.

THE BANDS

This is well covered by the other authors of this Cookbook.

THE ONE TRANSCEIVER MULTI-SINGLE

Don't! Use two radios for sure even if you must borrow from a non-contester. If you only have a tribander for the high bands, hang a dipole in the trees somewhere to work the loud mults (and some of the weak ones too).

RUNNING

First and foremost, never stop CQ'ing! This may be obvious, but W2PV always said you can't be the loudest guy on the band if you are not transmitting. As always, run the highest band open. Ten may only open for an hour or so...

Use your best op both mornings for the big European run.

FINDING MULTS

Packet is wonderful, but don't get lazy. It's amazing what you can find that hasn't been spotted. Treat all the bands as one big band and just keep tuning. For some reason a new op always seems to find a new mult on a band within seconds of sitting down - after you have tuned it dry for an hour.

BAND MAPS

CT doesn't have a band map feature yet. Torture K1EA, but in the meantime, make up paper band maps for the multiplier station.

THE HARD BANDS — WHAT TO DO ABOUT 160 AND 10

While running on say, 15, ask every loud European to try 10 for a new mult. Tell them to try again in an hour, if it doesn't work right now. The European multiops will be glad to try for you, and so will many of the single ops. Similarly, use 80 and 40 to recruit mults for 160.

PASSING

Matt's rules number 4, 5, 6 are PASS, PASS, PASS! Interview every station that has half a chance of working you for a new one on another band. Don't take no for an answer. Tell them to use the 80 meter dipole with the antenna tuner if they "have no antenna". Tell them you have a "very large antenna". Don't say "Can we work you on 15?", say "We are calling you on 21410 right now, can you hear us?".

Start passing real early. Sometimes that GJ is only on the first night. If the guy won't go, try to make a sked. Skeds have a much lower success rate, but what the heck, try it anyway.

The run operator must always have passing on his mind, even during the 200 hours! It only takes a second to scream "I think ten is open! I'll call you on 28800".

Multi-Multi

Larry Blouin K1MNS

Multi-multi contests require the greatest amount of logistics, can provide the maximum amount of satisfaction and opportunity to score points for the club. The problems multiply when you try to run 2 QTH's such as we do on Warner Hill in Derry NH. The computers of K1FWE and K1MNS are connected via modem via New England Telephone and we have operated under the calls of NB1H, K1ST, AD1C, K1RX and NX1H. The following thoughts reflect what should be done but not necessarily what we did.

Before the contest begins:

Draft operators early and renew their commitments several times during the interim period. You will need 10 to 12 operators in various stages of experience. Don't overlook new operators such as our youth. After all, today's youth have one heck of a lot more stamina than most of us older folks. Tomorrow's K1AR/K1DG type will come from the type of involvement.

Insure compatibility: non smokers are preferred as well as those without personal hygiene problems or abrasive personalities. If equipment is required get or bring documentation where available and necessary.

Recruit operators who have had previous contest experience and are most familiar with specific band conditions. I consider these to be the primary band managers. Technical people are always required so one or two minimum will be required. This stuff doesn't last forever under contest conditions and will make operating more enjoyable for those who prefer to only operate.

Do your engineering first. Engineering during the process of erecting the antennas will lead to confusion and frustration. Allow sufficient time for each step and include down time during construction for inclement weather. Schedule your work parties and follow up with volunteer commitments. Make sure tower climbers are available and qualified. Above all have your parts ready for the workers; don't start that morning shopping for stainless steel hardware.

Set up your transmitters, amplifiers and computers early (2 weeks is not too soon). Good grounds and filters are necessary for the successful operation with minimum interference. Place filters on everything: computer I/O lines on all ports, keyboard cables as well as power cords and voice keyers. I buy the Amidon split cores one hundred at a time and spread them around the shack. Your receivers should be free from any interference from any computers and transmitters. It helps to use FCC B type accepted computers. For the drivers I use the Industrial Communications Engineers (ICE) passband filters (lowcost) on drivers. In addition, I use the K2TR type traps, for second harmonics, on the output of every amplifier. This is the quarter wave type.

Make certain adequate outlets and electricity are available at each position. Be certain that adequate safety precautions have been taken for the 220 as well as the 110 volt circuits. It is great to have two radios running on each band but that is just frosting and do it only if you have the operators, room and equipment.

Use good feedlines. My preference is the CATV 3/4 inch jacketed or the one inch stuff available free of charge. You will just have to be a little creative when trying to develop these sources. Cut each line to multiples of one half wavelength so that transformers will be unnecessary when matching to fifty ohm circuits. Weatherproof all your connections. Use Silicon grease on the threads of the connectors. Then wrap several layers of a good electrical tape followed by one layer of roofing tape or Coax Seal followed by a coating (thick) of RTV adhesive.

Ground everything: computers, radios, amplifiers, keyers and antenna switches. I have a four by four foot copper

sheet buried under about a foot of dirt directly under the eaves of the roof where the rain running off the roof hits the ground.

Make arrangements for backup equipment that is compatible with station equipment. Have the operators bring them along; it sure beats having to run (drive) home in the middle of a run to fix an emergency.

If it is possible, it is more advantageous to use single band amplifiers. This will allow for maximum efficiency for the desired band. Use multi band amplifiers as backups. I always try to keep a few Heathkit SB220's around. Now is the time to check for co-station interference. Try several antenna headings and frequencies.

Make a list of equipment setting and document station wiring and cable connections. SWR readings for each frequency will tell the story in the middle of the contest when something appears erratic.

Provide a chart at each position of meter readings and dial settings on amplifiers for different frequencies and antenna selections. Don't forget notes or a chart on how to load the voice keyer.

Check for TVI, RFI and, telephone interference in your own home first. If you communicate with your neighbors, without harsh words, ask them if their cable system is working properly. I sometimes tell them of my plans and tell them I will be out of touch during this period. I usually tell them that my equipment exceeds government standards and I will not answer the telephone during the contest.

Plan on doing a quick refresher course on CT (our choice of logging programs). Show them how to grab and putout packet spots, how to use Pass, Sched and inter-station Talk functions as well as how to switch to the variety of available windows. Drill in passing of schedules. If possible, set up schedules with exotic places ahead of time.

Make sure the computers work in a standalone fashion. Does your 20MX packet crash when 10MX transmits? I/O cards should be tested. Download the latest version of CT but keep the previous version in a separate directory. If there is a bug in the new version you will be able to retreat to the previous version. Make sure all the computers are running the same version of CT. Create a batch file in the root directory to load all TSR as well as the latest version of CT along with the current log file for that band. Part of the batch should include unloading of the TSRs when you exit the program. We simply type in CT from anywhere and everything loads properly.

Visual aids such as keyboard cards showing what the F keys and other commands are most beneficial to the casual operator as well as the experienced operators. Other visual aids include the call sign to be used. Have band managers

or a knowledgeable person prepare a list of favorable directions for different propagation modes and time of day.

Make sure there are enough chairs/desks operating positions for the intended operations. Update your countries file with the latest list from AD1C.

Try to insulate each operating position from distractions and noise including adjacent operators. Keep a small refrigerator or two nearby to keep the operators well lubricated. Allow for adequate sleeping conditions for maximum benefit at a minimum of time. Work out an operating schedule that is practical. Try to minimize total exhaustion. Sleep in increments of 90 minutes, i.e. 1 1/2 hours, 3 hours etc.

Understand who the technical people will be and how they may be reached during the event. We use walkies on a simplex frequency to page the tech. This is usually the fun part as far as I am concerned. I hate to operate!

Set goals and circulate for each band based on previous contests, known conditions and equipment / operator improvements. Factor in what the competition has done.

During the contest:

At the start have someone follow up with each position to ensure operator is comfortable and there is a clear understanding of how the equipment operates. I sometimes offer pillows as additional back support or adjust the chair heights.

The tech should check all setting and instruct operators to leave settings alone unless approved. The greatest amount of TVI and co-station interference comes from mistuning our amplifiers.

Know each band's pass frequency. It helps if all the radios are connected to the computers. In that way, one simply looks at the screen to relay the pass frequency. Remember: Pass! Pass! Pass! If you work them on one band send them to the next band by saying "go to 21.xxx now, I will be waiting for you".

It is most important to run stations when the band is open. Talk over the other station if he is repeating information; otherwise you will lose your frequency.

Make sure that the auto backup feature is *not* turned on. Networked computers become painfully slow when the auto log feature has been turned on.

Visitors, word gets around, should not speak while the operator is calling or listening. Operators find this distraction most disruptive and easily lose their concentration.

After the contest:

Get on 3830 and pass in your score. Copy down what the competition has done. If you are on Internet send in your results to the Contest Reflector.

Enjoy a breakup lunch after the contest and compare the results. Exchange some humor and enjoy a pizza or two along with a few pops.

It will help to wait for another night to tear down the stations. Have a knowledgeable person, with a keen eye, examine the results and look for the typical typos. At the same time solicit feedback from the operating team of participants.

Send thank you notes or send QSL's to those DX stations that moved to several bands. Tell them what they did was a help. You would be surprised how many will look you up next time and help you with multipliers. By the same token, QSL all requests and return all QSL's sent to you. You will be heckled if you habitually avoid returning QSL's.

160 Meters

Jeff Briggs, K1ZM

With the solar flux now hovering between 80-90 each day, it is time to begin thinking seriously again about Top Band. This band, which was pioneered by the legendary Stew Perry, W1BB, will soon begin becoming important again. For the next four years or so, it won't be just a throw-away band anymore. There will be some *real* DX to be had on 160M but you will need good transmit and receive antennas to take full advantage of what will be available. Single-Ops can plan on making over 30 countries on 160M this year and Multis can make over 60 countries if the condx are favorable.

Okay fine - so what exactly does one need and how do you go about it? Since full-sized antennas for 160M generally require a lot of real estate Top Band can be a challenge but, fortunately, there are some very effective compromises that can be made - even on a 1/2 acre lot.

For Transmit

The whole secret on 160M is to put out a low angle signal. For this reason, dipoles and inverted vees are generally *poor* antennas. What is really required is something that produces vertical component in the radiated signal. This can be achieved quite easily and for very little investment. Try a 1/4 wave inverted "L" cut for 1830kHz, for example.

This antenna needs only around 134 feet of wire and requires a minimum vertical height of 40 feet (70-80 is better, but 40' will work). The remaining 94' of wire gets tied off to a tree or can even slope down to the ground and be tied off to 20' of Radio Shack mast with a back stay. Feed the "L" directly about eight inches off the ground and the coax shield goes to a radial system. The more radials the better but 18 - 24 will work and even these do *not* all have to be a 1/4 wave long - just some of them need to be to

achieve resonance - and even these can be bent to get around your house, swingset or whatever.

To facilitate tuning, cut the antenna *initially* for 140' and trim off a foot at a time for lowest SWR. If you want to be a purist, cut it for 134' and use an "L" network at the base instead of direct feed. I have done both and often the tuning network is not essential - you should be able to get down below 1.5:1 with careful pruning of the horizontal wire from the far end at the tie-off point.

I am often asked if it matters where the horizontal tie off point is aimed. W0ZV has done some extensive computer modeling of this point recently and contrary to conventional wisdom (also shared by myself until recently) it does indeed matter to a modest degree. If you can, Bill says to aim the horizontal part of the "L" *away* from your most favored direction (unlike a sloper). So apparently it does matter!

For Receive

Here beverages are best but not *essential* if your land does not allow it. The following are a few secrets from the K12M archives - give 'em a try and let me know how you fare with them this season.

Slinky Beverage

If you are land-poor, make up a slinky beverage using metal slinky toys instead of #14 wire. About 8 slinkies can be soldered together and stretched out together using a nylon line down the center as a means of support. Stretch them out as far as your land allows and follow all the familiar rules regarding beverages, eg: 9/1 matching transformer at the feedpoint and a 550 ohm terminating resistor to ground. You will find this to be a very *quiet* receiving antenna (almost incredible against static) and about 60-70% as effective as a 600' beverage.

RX Loop

This is also a favorite of mine. You need 20' of hardline split 1" at the 10' point on the *jacket only* (eg, you break the shield 1" but not the center conductor). Brace the point where you made the cut and then form a quad loop with 5' sides. The open ends come together into a box where you match the antenna and bring in the 50 ohm feedpoint. Put a 1000 pF ARCO trimmer (available from KMIH) across the two ends of the hardline from center to center in the box and attach the center conductor of your feedline to either side of the ARCO trimmer. Your three coax and hardline shields get tied together.

To tune, listen on your RX at 1832 kHz and peak the trimmer for maximum bandnoise/signal. Note: the loop is relatively Hi-Q and not terribly broadbanded, so peaking on 1832 is usually a good idea since that is where the DX is.

If All Else Fails

Use a low 160m dipole 8' above ground and bend the ends all around your property. Or, alternatively, listen on an 80M sloper if you happen to have one on your tower.

The whole secret on 160M is to have MULTIPLE receiving antennas all coming into a "beverage type" switchbox that you can rapidly switch between as you listen to your target signal. You will be amazed what differences there are from just these ideas suggested above - and it differs from a quiet band to a noisy one as to which one you will prefer. As has often been said about 160M, the whole secret is in HEARING the DX - and boy oh boy, is that ever the truth!

The 160 Gameplan

By now, most YCCers already know that 160M DX is concentrated from 1820 - 1850 kHz with the hottest spots around 1830-1840 kHz. Operating 160M will differ depending upon your entry class. Multis can afford to sit there and call CQ or tune the band all night long. Single ops should probably hit the band hourly starting about 03Z. Europe will peak around 0500-0700Z. After that, look hourly for the big Caribbean Multi-Multis who usually will be available on the hour from 0700 - 1100Z. Check out sunrise if you can afford to for a KH6, VK, or ZL but don't do like 2M does and waste too much time chasing static crashes while 20M is open to Europe. Multis and single-band entrants of course can follow the band right into daylight and this can be fun if your objective is merely to boost your 160M DXCC score.

Good hunting and please let me know how you make out with some of the antenna ideas.

80/75 METERS

John Kaufmann, W1FV

With the downward march in the sunspot count, 80/75 meters can be expected to play an increasingly important role over the next few contest seasons. However, the strategy for working the band can be distilled into one elementary rule: work Europe. The reasons are simple. That's where the QSO numbers and the bulk of the multipliers are. Furthermore, remember that those of us in W1/W2 land have a distinct propagation advantage across the pond over the rest of the U.S. What's more, in the process, you'll also snag the easy Caribbean, the occasional South American, and the odd African multipliers that usually mingle with Europeans. Most everything else is hard work.

When it comes to propagation on 80/75 meters, timing is the key to making your sessions here productive. Compared to the higher frequencies, the openings over a particular path tend to be shorter, more "peaky", and less

predictable. I have found that most of the QSOs in my many 80-meter single-band operations are compressed into just a few short spans of time. Single-ops should start tuning the band around 0200 to 0300 Z for Europeans. Of course, they are workable earlier, starting around local sunset, but the highest rates are usually generated around sunrise times in Europe. (In ARRL season, the propagation sometimes favors earlier openings, however, starting around 2200). The passing of each hour reveals a new layer of European signals peaking as they pass through their sunrise, starting with the UA boys around 0300 and concluding with EU/GM/Scandinavia at about 0800.

Be prepared both to search and to run. Avoid calling the weak guys unless they are new multipliers. The loudest Europeans are the ones who usually hear the best and are most likely to answer you, even though they attract the most attention. If a station doesn't come back after a couple calls, move on to another. If you can't easily raise even the strong Europeans, go back to 40 meters and try 80 again later. This is much more of a problem in CQWW than ARRL since the Europeans tend to be too preoccupied working each other early on to bother with North America. Remember that even the big guns stateside have trouble breaking the European logjam, especially the first night in CQWW. On the other hand, if you raise everything on first call through a good sized mob, then it's time to try CQing. Finding a clear frequency is critically important to the success of European runs on 80/75. Remember that the pip-squeak LZ making QRM near your run frequency is probably 20 over 9 in Europe. Unless you possess a potent signal, avoid trying to run on the bottom end of 80 cw or in the 3790-3800 slot on phone, and instead try CQing up the band a bit. Sometimes, it pays to QSY as high as 3540-3550 on cw. Most important, be flexible and take whatever the propagation gives you. If conditions seem exceptionally good, be prepared to spend extra time on 80/75. It is often the case that one of the two contest nighttime sessions is distinctly better propagation-wise than the other.

Once the band shuts down to Europe, after 0800 or so, the proceedings really bog down. Although the Pacific, deep South American, and Asian multipliers begin to show up, it can be really tough going in W1/W2 land since the propagation advantage now shifts to the rest of the country to almost everywhere the band is open. Tune the band for perhaps a few minutes each hour. Work a KH6, the easy Caribbean multipliers, and maybe a VK or ZL, but don't get bogged down in the big pileup for the KH2. Conditions peak at local sunrise, but by then, all except for the multi-ops should have moved on to the higher bands.

Below is a propagation summary for 80/75 meters:

UTC

- 0000-0200 Europe, Caribbean, Africa
- 0200-0300 Asia (UA9, UL, etc.-tough), Europe, Caribbean
- 0300-0400 Southern and Eastern Africa, Europe, Caribbean
- 0400-0800 European peak, Caribbean, South America
- 0800-0930 South America (LU, CX, etc.), KH6, Pacific, Caribbean
- 0930-1100 Occasional JA, VK, UA0, etc.(very slow, tough)
- 1100-1200 Peak time for JA, VK, ZL, KL7, Zone 40
- 2100-2200 First Europeans (spotty), long path Asia (tough) & VK6 (sometimes surprisingly easy)
- 2200-2400 Europe, Africa (better in ARRL than CQWW)

On phone, the activity is divided between transceive and split-frequency operation. Look for split-frequency Europeans between 3700 and 3750, and also around 3640-3650. Caribbean stations sometimes lurk between 3800-3810. For running Europeans, good clear transmit frequencies are usually found between 3815 and 3840. Before opening up with a CQ, however, listen a bit on the frequency. You might find that what appears to be a clear channel ends up being QRM'd by other stateside stations (who won't hear you) calling a European who also happens to be listening there.

The variability in propagation from year to year makes it difficult to establish hard and fast rules about QSO-total and multiplier benchmarks on 80/75 meters. However, in decent conditions, serious single-ops should be able to work 60+ countries and 20 or more zones in CQWW, while the top multi-ops may rack up 80 to 100 countries and 25-30 zones.

40 Meters

Greg Cronin W1KM

40 Meters—Phone

40M SSB has traditionally been like 160—good for multipliers only. But QSO totals have been creeping up over the last few years, so I suspect more Europeans are listening up for us 3 pointers. Conditions last year were extraordinary and the average top ten US single op had 180 Q's with 75 multipliers. Nearly all contacts on 40 will be worked split, with DX transmitting anywhere from 7035-7100 and listening above 7175. Unlike on CW, there's not much doing here before our sunset—outside of a few hyper-

powered Italians the Europeans just don't listen for us that early.

Try running Europe whenever their signals are loud. There are two tricks to running Europe on 40: transmitting on a frequency that's clear in Europe and being patient. (Note the problems here—contesters are, by definition, not patient! And even the Europeans don't know what frequencies are clear—that's why they constantly change their listening frequencies.) A good run on 40 means pushing the rate meter at about 50, so running is not usually a preferred option for anybody except MM's and singlebanders. (Unless conditions are like they were last year.) My best experiences running on 40 phone have been during the Western Europe sunrise opening—around 0630Z-0730Z.

Packet users have an enormous advantage in working 40 phone—they don't have to waste any time tuning through all the crud from 7040-7100, deciphering call signs and listening frequencies. All they have to do is get to the spots ASAP. (Of course, Real Ops don't rely solely on packet!) It's a good idea to get the easy to miss zones Friday night—especially zone 3!

40 Meters—CW

Those of us who've been spoiled by fantastic 40 M conditions and big QSO totals over the past few years may be in for a disappointment this year—40 could be a partial casualty of the declining sunspots. We may not be able to work many Europeans after 0130Z or 0200Z. This means we have to get there early. Poorer conditions on the higher bands will mean that when 40 is good to Europe there will be more contention for the limited space (the bottom 40 kHz—with occasional productive frequencies up to 7055). Stations to our south could enjoy an advantage in propagation to Europe, especially after 0100Z.

Even if conditions are subpar by recent standards, 40 will prove to be a key band and we should expect to spend lots of time there (at least 10-12 hours for a serious single-op). Forty is perhaps the most challenging band, where small differences in hardware, listening capabilities, and frequency selection can yield big differences in QSO totals.

40 meters is a good band to start the contest. Even if it's difficult to get a run going, the band will be loaded with easy to work DX and juicy multipliers. Whether running or S&P'ing, concentrate on rate at the beginning and the multipliers will pile up.

From YCCC land the best time to be on 40 (in fact, the best time to be anywhere) is before the rest of the USA gets there. Saturday and Sunday afternoon, as soon as 20 starts to slow down (1930Z to 2200Z) check to see if 40 is runnable. This is the best time for a modestly equipped station to run Europe, but a good receiving setup sure helps. The transition from a slow pace with weak signals to

a triple digit rate and booming signals can be very abrupt during the late afternoon/early evening.

The next best time for 40 is at European sunrise. Look for Eastern Europe around 0600Z and for Western Europe from 0730Z-0830Z. The last few years we've been able to work Western Europe until after 1000Z, but I'm not counting on that this year.

Regardless of what kind of Q totals are possible, there will be workable multipliers on 40 all weekend with new ones appearing all the time. At times the band seems to be open to everywhere at once. It is practically always open to South and Central America. Africa can be found from 2100Z until after their sunrise. Look for the Pacific after 0630Z and look for Japan and the far East any time after 0700Z with a peak towards our sunrise. Long path at our sunrise is great fun, but a luxury which single-ops should generally avoid when the object is maximizing score—it's too easy to get sidetracked and miss the all-important early runs on the high bands. (I speak from experience here!) It's a good idea to work some of the easy zones during the first night—for example, 1,3,30,31,32—as a hedge against the possibility of needing some sleep the second night.

Last year's average top ten single op had nearly 700 Q's on 40 and the top three multi-singles averaged an astounding 1055 Q's. While totals most likely won't be so high this year, look forward to some good European runs and a pile of multipliers.

20 METERS

Stu Santelmann, KC1F

With the sunspot cycle declining, and 10 meters likely to be marginal at best for Europe this year, 20 meters will for the next few years be the big band for YCCers. We also have a distinct geographical advantage over the rest of the USA on this band, as opposed to 15 and 10, where stations further south can sometimes get European openings that we don't get. YCCers should be able to administer a serious butt-kicking to the FRCers on 20, because we'll almost always have the edge up here on that band. For example, with my very modest station (KW + KT34A (16 foot boom tribander) at 57 feet) in the Assisted category last spring in the ARRL, I worked 890 QSOs on 20 SSB and 787 on 20 CW. These figures on 20 exceeded any other Assisted operator, and were higher than anyone among the single-op unassisted except for N6BV on phone, and KMIH and N2LT on CW.

It strikes me that the single most important thing for YCCers to remember about 20 is that good rates can be had on this band with a modest station, despite the usual appearance (especially on phone) that the band is quite full and has no clear frequencies. One very typical comment that I hear from newer contesters is that they spend prime

20 meter time looking for multipliers on 15 and 10, as there seemed to be no clear frequencies on 20. While we certainly don't want to cause intentional QRM, some level of assertiveness is called for (as it is in many aspects of life!) to establish a run frequency. If someone asks you to move within the first few minutes, do so without an argument, but if not, stay and be aggressive about establishing a frequency. If there are casual, non-contest QSOs adjacent to your frequency (and there often will be, especially above 14.250), when they end, new ones will not start so close to your frequency, and after 10-15 minutes or so you may find that you have a clearer frequency. Another technique that I use to keep the run going with QRM on the frequency is to simply call CQ again and hope that a louder guy calls you, even though you can hear fragments of calls through the QRM. You can often work a loud guy in a fraction of the time it would have taken to pull the weak guy through. I also feel that time spent listening and not transmitting is an invitation to have your frequency taken! My impression is that there are many medium-size YCCC stations who don't realize how loud they are on 20!

I've never felt that frequency selection for a run frequency is all that important on CW, and I think that medium-size stations could well find 14050-14070 to be profitable. On phone, the loud Europeans seem to avoid the bottom 30 KHz or so (probably because it is overrun by US east coast!), so if you can find a clear frequency there it might work well, but if it's not there, any frequency up to 14300 will do (except for mine, of course!). I usually try to avoid going above 14300, for several reasons: there are more nets, less DX activity (I think), and since 1986 there has been an IARU Region 1 prohibition against contesting above 14300 (we're not in Region 1, but Europe is!)

Also, before I forget, I think that answering your QSL cards could bring several dozen more QSOs during a weekend! There are plenty of casual operators who wouldn't call otherwise, but who might call to thank you for that snappy clipper ship card! I've been meaning to ask KIAR which YCCCer has ordered the most cards recently!

The solar flux for three of the 1992-93 CY contests was between 147 and 165 - the ARRL CW it was at 123. As I write this on October 11, it is at 107 and sure to go down, meaning that high band openings will be shorter. So when do you operate 20?

At the beginning of the contest, I think that the days of running Europe are over for a few years, except possibly for some extreme Northern Europe. You might try running JAs at the beginning of the contest, but I've never had any luck doing this from home. For the first five hours, there will be multipliers from every direction to call - Africa, Caribbean, South America, Pacific a bit later, and central Asia starting at about 02z. I think that after local midnight,

much of this may go away, and we'll be lucky to work Pacific from then on. The band might be totally dead from 07-10z.

For each of the four 92-93 CY contests, I started working Europe on 20 at around 10z, although with a lower antenna, it will be tough to work guys until around 11z, and this time might be better spent looking for multipliers on the low bands. Conversely, if 15 is slow to open, or if you have low antennas, you might need to stay on 20 until 13z or so. You single band guys I think will have stuff to work all morning, in contrast to past years - probably Europe, Russians, and Asians. It's easy looking for polar multipliers at this time (and from 00-04z) because of the distinctive warbly signals.

Early afternoon is YCCC time on 20, and this opening should not be missed on either day. Get some DXing done on 10 and 15 BEFORE this opening, not after it. Last year, on each of the eight afternoons I went to 20 anywhere from 18-1830z - I suspect this year some of us may be there by 17z. This is our best time into Europe, as we're the first US stations there, and you don't need the high antennas that you do in the morning opening. CT's "Control F9" dx told me I had close to a 200 hour during the CQWW phone in 1992 at around 19-20z. This opening will be pretty much done by 21z, when maybe you can work some JAs. On CW, you should go to 40 now, especially in the CQWW. On phone, you should go back to finding multipliers on 10 and 15. You could conceivably run JAs anytime from 21z to 05z, so it wouldn't hurt to try from time to time. Last ARRL CW I had a loud JA pileup from 23z to 0030z Saturday night.

Good luck, have fun, and keep your finger on "F1" !!

15 Meters

Luigi Giasi, AA1AA

Many have operated 15 meters as the leftovers band, grabbing a quick run of EU in the morning waiting for 10 to blossom, and hanging out in noontime/early afternoon waiting for 20 to juice up. Following the leftovers strategy, I have never had a 'ruling class' antenna on fifteen. I have oped with stacks of death on 10 and 20, but on fifteen it has never been a *need*. The band supported nice runs, stations calling were plenty loud, and mults have been plentiful. As the 93-94 contest season begins, the need for both effort and station on fifteen has come. The band could be a bust, barely providing the full line of European mults, or conditions could put 20 meters to shame. Serious antennas, serious attention, and serious planning are sure to make fifteen the money band (provided the A and K stay low). Stations lacking the antennas, towers, location and power, can outperform much of the pack with careful advance thought and preparation.

One plan that *must* be incorporated continuously throughout the contest is the "check the band and try calling a few CQs" strategy. Even if the F layer personally knocks on your shack door and commands that fifteen is closed you should not consider abandoning the "check the band and try calling a few CQs" strategy as you will most likely miss an opening or three. These small openings will be the time when a 5Z4, or C5 appears with little/no pileup, VQ9s will write those soapboxes saying "I called and called but nobody heard me!", and the retirees on V73 will be S3 and slow as molasses but workable. I cannot stress this enough, barring unforeseen proton events, coronal holes, or other solar oddities, every now and then, even in the depths of night, beam EU, call, repeat toward AF, the Caribbean, SA, VK/ZL and JA. If you have no plans to operate the contest at all, play DXer/propagation hunter a bit. Get on every few hours for a short stint and swing the beam around, even when 15 is supposedly dead. It won't take too much time and you will be surprised what comes up.

If 15 is hot, there will be an unending (especially on phone) supply of polite sharp ops whose calls begin with a J, running attic dipoles with 10 watts, workable with a small beam. Remember that we are 100-300 miles closer to Japan than the FRC, 300-500 miles closer than PVRG. There will be times when we have a bit of JA over the pole that our southern friends cannot copy. An S1 JA is our best friend, as he is a station that we can work and the rest of the east coast can't. It can mean not a few QSOs for the log.

When there is a lot of action on fifteen and you are on 20 with serious rate, bite the bullet and get to 15. The band may not be there tomorrow. If you are ten running like guns, especially in the morning to EU or the evening to JA, stay there and to hell with what I have to say!

The competitive single-op will be scanning the N6BV charts nestled in this cookbook. I hope that my pronouncements agree with Dean's charts, as I am a strong believer in statistics and merely a reluctant follower of anecdotal experience. (I have not seen the charts.) The single-bander and the 15m multi-multi operator have 48 hours to work, mostly as an unpredictable cat and mouse pounce game, not sprint-like running.

Starting off the contest and through the night (0000z-0400z), EU will be gone so concentrate on JA and deep Pacific (VK6, 9V, VS6) if they are there, as the polar shot is the most fickle. If the high-latitude path is missing, try some due west stuff into mid-Pacific islands and ZL/VK3, but it will most likely be a short foray as their numbers can't match the volumes of JA. Grab SA next, then as the band spurts and sputters, the Caribbean.

As the night wears on (0430z-0900z), the die hard will check those skew paths and make some noise into Africa, especially just before their sunrise as the equatorial advantage can bring workable signals from small stations. If you must, nap (in multiples of 45 minutes), and get up each time and check the band out. You may only make a handful of QSOs, but you will have eliminated the chance that some FRC guys worked a 110 degree path opening into the Indian Ocean at 0700z and grabbed the only 4S7, VU, A4, or AP of the weekend.

Before our sunrise (0930z), make that final nighttime effort towards Africa as an in-the-mud TY or XT could be logged now at S0 rather than when he is S6 at 1800z with the universe piling up on the frequency. Go looking south to see if the antarctic path opens to the Pacific, there will be some SA to grab. Finish up scanning the band again, as the EU opening will be slower than in past seasons. This slower opening will mean more time with marginal signals that can still translate into a significant rate. Having EU a bit weaker is good, as it makes every OH-SM-LA-ES-LY-YL-UN2 more likely to be in our log and not in W3,4,5!

As 1130z rolls around, **you need to be running Europe!** Central Asia, (UJ/UL/4J/9N) may be in and out around 1230z for about 2 hours. Camp out as high as 21.055 or 21.420, get a spot and call. Run like a banshee. You should give AF a look see around 1530z-1700z, but dollars-to-doughnuts the pileups will be extensive. You can keep at Europe as late as 2300z, but you will be better off working elsewhere after 1930z or so. After 1800z you have to judge how things are into EU. Consider swinging over for SA and the Pacific when EU begins to lighten up, especially if you are light on mults and the rate has dropped.

Toward 2230z, there is the chance of brief Central and Southeast Asia. You will have only about an hour. Try to get there Saturday, as those horrendous piles to the Pacific on Saturday are always worse on Sunday. This time Sunday most of us are trying to find that missing J6, YN, CX by now. On phone if you are quasi-fluent, move way up the band send a slow, ragchew style, Spanish CQ, and explain the whole thing to each guy, and be very polite, you will wake the dead. On CW, well you can call SA, but you will probably have better results working VE, KL7/KH6, VK/ZL and a final Caribbean sweep.

Barring serious aluminum appearing in the sky behind your home, planning for 21 Mhz is mandatory, but setting goals is very difficult. Fifteen is the band where the variations in strategy from similar stations can make huge differences in score. Continual evaluation and reevaluation during the contest should be the watch word. You must be cautious when considering fifteen meters, but do not shy away, as many five-(nine)-nines can come your way on this band.

10 Meters

John Dorr, K1AR

This year, 10 Meters is truly going to be the contest wild-card from a strategy perspective. This is so much the case, that I would have had to completely rewrite the article if it had been developed just 2 weeks ago!

As best as anyone can tell, it looks like we stand a good chance of getting one more 10M European opening in this year's contest season. However, fellow contesters--BEWARE--this is one band you're going to have to watch like a hawk!

When conditions deteriorate through a sunspot minimum, bands such as 10 Meters can vary like New England weather. A quick spin through the band at 1200Z may show little activity while 30 minutes later may yield vast openings to Europe and Africa. The main strategy for 10 Meters this year will be to check it often. If it sounds open at all, be sure to apply the old axiom that says: operate on the highest open band.

This past weekend (mid-October), 10 Meters sounded like the 10 Meters of old. There were fantastic openings to Northern Europe and even into Russia. The band displayed its normal characteristics of opening to Africa around 11Z and gradually expanding into Europe over the next hour or two. 10 Meters kept its resiliency by even supporting me making a contact with OX3KM at 1900Z!

Well, enough of the SWL reports and back to strategy. If 10 Meters turns out to be marginal, then it naturally becomes your "hunt & peck" band. Take 10 or 15 minutes every hour or so to tune for needed multipliers. Do this especially on Saturday if Europeans are coming through because you may not have the chance on Sunday.

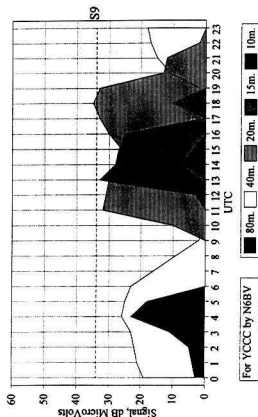
One of your most difficult decisions will be to decide whether or not to run on 10 or 15 Meters if conditions are slightly better. The best advice I can offer is to try it. Success on marginal bands is more a function of your station than anything else. K1EA's 4-stack will obviously perform better than KC1F's tribander in marginal conditions. An example of this occurred just the other day. While testing his station, Ken worked a 9H1 (and a few others) on 10 Meters while the majority of other locals could hear nothing but noise. Nevertheless, 10 Meters this season will be the band to seize when the going's good!

I think it's safe to predict this year that 10 Meters will at least be a good band for most other parts of the world (excluding Asia/Far Pacific Rim). You should have good success working African, South Americans, and even the Pacific. Having said that, 40 or 50 countries ought to be easy to work this year, with the push of Europe only adding to the fun.

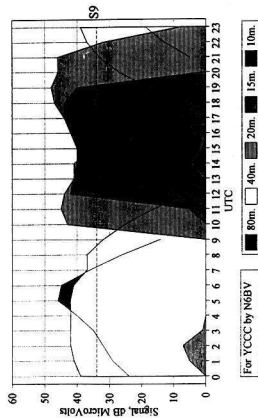
Let me conclude with the following thoughts. At a recent hamfest talk, I asked a serious contest audience how they felt about 10 Meters opening to Europe this year. As you might expect the ratio was almost 50-50. With that in mind, let me suggest some guidelines based on WWV numbers. Historically, 10 Meters always has come back to life in September. This year, for obvious reasons, it was later. Ironically, the September and October WWV numbers were almost identical. I believe that you will find 10 Meters to be relatively effective if the SFI is around 90 and the A/K indexes are low (A less than 5, K at 1 or 0). There seems to be more sensitivity with absorption than the solar flux activity as evidenced last week by a dead 10 Meter band even with a SFI of 110.

10 Meters will be the big operating variable this year. Be sure to check it early and often. See you in the pileups!

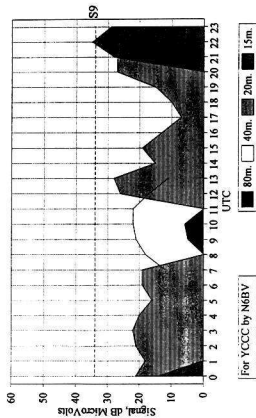
W1/W2 to Eastern Europe, Band Planning October 1993 CQWW SSB



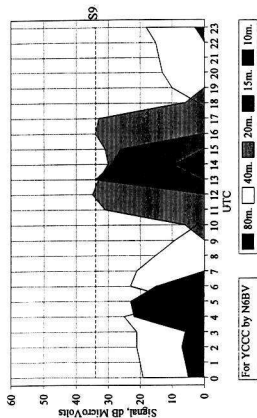
W1/W2 to Western Europe, Band Planning October 1993 CQWW SSB



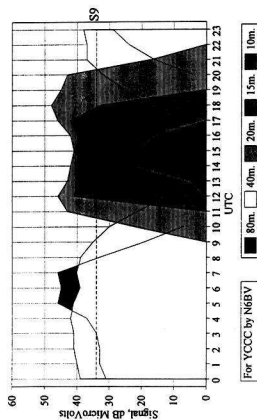
W1/W2 to Far East, Band Planning October 1993 CQWW SSB



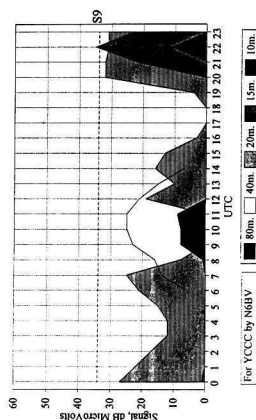
W1/W2 to Eastern Europe, Band Planning November 1993 CQWW CW



W1/W2 to Western Europe, Band Planning November 1993 CQWW CW



W1/W2 to Far East, Band Planning November 1993 CQWW CW



Yankee Clipper Contest Club

1993 Contest Cookbook

Yankee Clipper Contest Club
11 Michigan Drive
Hudson, MA 01749

First Class