CHAPTER 5 - NET CONTROL

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5.1 NET CONTROL

The mechanics of controlling the net are presented, for the most part, in Chapter 4. The NCS should refer to the syntax and guidelines in that chapter as the primary reference for operation of the net. Obviously the NCS should be fluent in the use of those techniques to run a net most efficiently.

Some of the specific NCS tasks are expanded in this chapter to include operational guidelines and tips, net record keeping (net control sheets), net reporting, and examples of net operations at Area, Region, and Section level.

The guidelines in this chapter, although primarily for message traffic nets, may be applied to other nets where station's business is listed and commands issued to accomplish the net mission.

5.1.1 NET CONTROL STATION DUTIES

The NCS makes the net "happen", directing all activities and managing the sequence of traffic dispatching to achieve an efficient and orderly net to accomplish the mission (stated below and in the following section). The NCS is a manager, supervisor, tutor and mentor, and facilitator. The NCS, becomes the individual the net stations expect to take care of the business of controlling what they do... a task respected and understood.

The net control will arbitrate the net's adaptation to unusual circumstances which might arise due to missing personnel or outlets, liaison needs, and the need to use other bands and/or modes. The NCS will oversee emergencies of any sort, implementing the emergency plans of the NTS, and decide questions of routing, maintaining order and discipline, setting the example for the highest standards of operating practice, provide on the job training for stations, and the use of station's capabilities to the fullest extent possible.

NCS TASKS (From Chapter 4):

1) CALLING THE NET ON TIME: The NCS should call the net no later than 1 minute after the scheduled start time. If the assigned NCS is not present, the ANC (if any) or any other station on the net should assume net control and begin.
2) TRANSMITTING THE NET PREAMBLE (*)
3) CHECKING IN ANC AND SPECIFIC STATIONS (*)
4) CHECKING IN SINGLE LIAISON STATIONS FROM A NET
5) CHECKING IN MULTIPLE LIAISON STATIONS FROM A NET (*)
6) CHECKING IN STATIONS, OPEN AND SPECIFIC NET CALLS
7) LISTING TRAFFIC AND BUSINESS ON THE NET RECORD
8) ASSIGNING TRAFFIC
9) DISPATCHING FORMAL TRAFFIC AND OTHER BUSINESS
10) RECHECKING STATIONS AND ASKING FOR CHECK-INS OFTEN
11) MAINTAINING ORDER AND DIRECTING BUSINESS
12) HANDLING ADDITIONAL BUSINESS
13) ADJUSTING THE NET TO PREVAILING CONDITIONS
14) EXCUSING NET LIAISONS IN TIME TO MEET ASSIGNED NETS
15) EXCUSING NET STATIONS
16) CLOSING THE NET ON TIME
17) FILING NET REPORTS

(*) Only if required by the net format.

5.1.2 NCS MISSION, TRAFFIC NETS

On traffic nets, the NCS is 1) responsible for getting all net traffic cleared in the allotted time while maximizing efficiency to the greatest extent by moving the greatest amount of traffic possible per unit of time, and 2) assuring that all liaisons to subsequent NTS nets are assigned and released to check into their destination nets on time.

5.1.3 LEVEL OF TRAINING, NET STATIONS

Inexperienced net operators can dramatically slow down or confuse the net operation. We all, however, were beginners at some point. Hopefully new stations will always be welcomed warmly and have operations explained to them as needed. They should leave the net with a feeling of accomplishment and contribution, treated with respect and courtesy.

Newcomers can be helped along, and others can be taught new techniques as needed, preferably off net. The NCS is perhaps in the best position to provide feedback to the Net Manager concerning the need for training and tutoring. Such observations should be passed along, and the situation of a struggling net should be dealt with. Corrective action at this level is key to the success of the NTS in maintaining an efficient system to serve the public.

5.2 ALTERNATE NET CONTROL STATION (ANC)

The Alternate Net Control backs up the NCS in case the NCS is not able to make the session or leaves the net for any reason.

The Alternate Net Control function is optional, is used primarily on large Local or Section Nets, and is called for each session at the discretion of the NM. This station should monitor the net operation, record all the same information that the net control does, and be prepared to step in immediately and assume the net control duties should it become necessary for any reason.

If the net format does not call for an ANC, any station on the net should be ready to step in and perform the duties of NCS if that station leaves the air or fails to show up by one minute after scheduled net starting time.

The ANC should be called upon for relay help under difficult radio conditions. The NCS may ask additional stations to be assistant net controls for such purposes.

5.3 NET CONTROL TOPICS

5.3.1 USE OF FAST VOX, QSK

Use full break-in (QSK) on CW, and set the VOX on voice to drop out after every word, or syllable (minimum delay). You may have to modify SSB equipment to accomplish this.

Dispatch sequences are continuous phrases during which no interruptions are expected, except in the SPLIT DISPATCH. Other calls and commands are likewise brief succinct phrases. The QSK and fast VOX will be very helpful in responding to replies and avoiding talking over tail ending calls. They will also be helpful in detecting unexpected interference.

On voice you may have to obtain or modify linear amplifiers to permit fast VOX operation. Solid state switching will do the trick. Failing that, operate manually and release the PTT switch between words or phrases. Most radios return to full receive immediately upon the release.

QSK on CW is virtually a must. Fortunately most modern rigs offer the feature. The amplifier considerations apply, and some rigs may need an outboard transistor circuit to key amplifier relay circuits. The effort in arranging for relay free QSK will pay big dividends in speed, proper character weighting, and in reduced wear and tear on the equipment. Care should be taken when modifying amplifiers for QSK (or fast VOX) to assure that spurious generating instabilities and/or key clicks are not introduced by improper sequencing of switchover on make and break. The mere application of bias to class AB or B linear amplifiers can cause an output tank transient which rings the circuit and can cause spurious outputs through momentary oscillations. Modified amplifiers should be checked carefully for both near frequency unwanted outputs and spurious outputs anywhere in the spectrum which might be radiated by the antenna system. The sequence of the switching should not alter the keying waveshape of the exciter such that the rise and fall times are conducive to generating unwanted sidebands.

Stations will acknowledge your commands instantly. Listen in the gaps. You can catch the “E” QNI attempt on CW, or the “4 ALPHA” on voice, tail ending. You may not always be obligated to respond, but you will be better informed to make the choices for your next command. The advantage of hearing between groups for the NCS is as valuable as when sending traffic.

5.3.2 NEW STATIONS, VISITORS

Newcomers will very much appreciate a warm greeting, request for name and location, thanks for checking in when recognized and when excused, and perhaps even a few brief words on what is happening. This may be done after other pressing business is dispatched, often as the prelude to excusing that station. Mentors will often arrange with the NCS to have words with the newcomer off net or after the net is closed. What a missed opportunity it is to pass up that chance!

Keep the net roster close at hand. Stations always appreciate being addressed by name. The newcomer on Tuesday will be surprised to hear you use the correct name on Thursday when you are NCS. If the Net Manager does not maintain a specific roster, each NCS should. Newcomers may be listed as such in net reports so they might be put on the roster distributed by the NM.

Help the newcomer learn and understand the syntax and net format. Consider having a regular net member always at the ready to take a newcomer off net frequency and send a welcome message... get an email address... send some information... get particulars for the roster for the Net Manager. Remember what it was like just starting out?

As NCS you are the one responsible for doing these things. Others may not want to interrupt and make suggestions. The NM should have a policy for dealing with these matters.

5.3.3 CLEAR TCC STATIONS AND UNSCHEDULED REPS

Every effort should be made to clear TCC station’s traffic, even if it is stored for later.

Unlike other stations which are committed for the duration of the net, unscheduled arriving TCC stations may have to check into numerous nets, perhaps running concurrently. Getting their business handled promptly should be a high priority. Check them in, assign an outlet, and dispatch their traffic immediately if possible.

Unscheduled reps from higher nets should be treated in like fashion.

5.3.4 FIND VOLUNTEERS FOR MISSING LIAISONS OR OUTLETS

Fill empty jobs. Others will watch to see that such matters are taken care of. If you, the NCS, plan to cover for missing stations, so state.

Attempt to route traffic for which no assignment has been made. Ask advice, or have a station take the traffic to another net or take it to store and forward on a later net or session.

5.3.5 OPPORTUNITIES FOR STATIONS TO CHECK IN

Nothing pushes stations to become frustrated, or attempt to break the net, more than long periods of time without an opportunity to check in or return to net. Stations failing to make contact after being dispatched off frequency need to get back and get their problem solved or their time is being wasted. So, too, is the net's time.

The NCS should make frequent net calls, or at least leave pauses between transactions to offer tail ending opportunities. Avoid passing traffic or words on the net when there are stations expected back from off frequency. Fish the pond with OPEN or SPECIFIC calls until there are no more replies, even if a few commands are issued between calls. Simply continue the call afterwards. Taking one or two check-ins, leaving more waiting, and then engaging in a long series of commands or other net business can deter stations from ever wanting to check into the net again.

On Area and Region Nets, where most all of the stations are liaisons, there is a deeper level of patience among the stations waiting to check in. They know the NCS will get to all the TX reps and outlets eventually. They know the NCS knows all of the stations expected to be present. There the NCS has some latitude in the chosen sequence, hence some use the OPEN net call, others the SPECIFIC call for particular liaisons, to maintain control in their particular style. Leaving gaps, or calling for returning stations specifically on occasion, can expedite matters well to keep stations from having to wait.

5.3.6 USE CUSTOMARY PRACTICES

Experienced traffic handlers expect the NCS to adhere to the usual net format, use customary operating syntax, and to understand their needs while making the experience of net operating pleasurable and rewarding. The NCS job is a leadership role, and experienced traffic handlers will readily respond to good leadership and operate as a supportive team to accomplish the mission. Remember that the NCS is there at the pleasure of the stations to help them get their job done. Customary practices help the net to flow smoothly.

Properly done, this will make the NCS virtually "invisible" to stations who come to the net to get their traffic cleared in a prompt fashion.

Use the customary syntax for net calls, requests, dispatching and excusing... and the stations will respond. Imagine dispatching two stations off frequency by saying "W3RX WHY DON'T YOU GO UP 5 KILOHERTZ AND MAYBE CALL W3TX AND SEE IF YOU CAN TAKE THOSE TWO MESSAGES FOR PODUNK?". The reply might be "BECAUSE I JUST DON'T WANT TO!". The dispatch "W3RX W3TX UP 5 PODUNK 2" is a command, is expected and is shorter. RX and TX will acknowledge in order and be gone instantly.

Another way to look at this is that the NCS syntax is just so much "overhead" needed to get the business done. Minimize overhead! Participating in an efficient, snappy net is enjoyed by all.

5.3.7 AVOID EXTRANEOUS WORDS

Avoid a running stream of consciousness or thinking out loud as NCS. There is no need to use the awful "UHHH" to keep the VOX keyed, or to send a long series of double dits while thinking. Such commentary between expected NCS actions is considered irritating and a waste of net time by net participants, and it does suggest an NCS not in control. It will quickly destroy the confidence of net stations. Let go of the PTT switch or keep your fingers off the key when the temptation to make such idle chatter creeps upon you. Long periods of silence also make stations uncomfortable. If you need a moment to think, make an open net call, or call for returning stations. The listening pause is then expected, giving you time to plan the next move.

The NCS should not, however, dispense with friendly greetings, use of operator names, etc., which maintain a pleasant atmosphere on the net. Names are often omitted in this manual to simplify the material, but that is not a suggestion to behave that way on the air.

"Every single word not absolutely needed may be dispensed with profitably." (Operating an Amateur Radio Station; P. 17, CD-4, 1/83, ARRL, Newington, CT)

5.3.8 MAINTAIN CONTROL OF THE NET

Always try to use consistent and customary syntax for all calls, acknowledging, dispatching, and excusing, etc. The NCS asks questions in a different way than issuing commands. Deal with stations according to the type request or command issued. Stations will get the message that they are expected to operate with standard practices.

When the NCS asks questions of the net at large, it should call each responder in turn for the answer, unless there is an obviously sufficient single answer obtained. Stations naturally like their opinion to be heard. If serviced they are less likely to transmit without NCS permission.

Stations reply with their call suffix and wait for it to be repeated by the NCS before continuing. The NCS may ignore those who do not first seek such recognition.

In other words, there should be no question left in the minds of the operators about what the NCS expects them to do, or which station is expected to transmit.

Maintain control. If there is a flurry of calling activity repeating a suffix or single letter heard will often sort one out of the pile, or make a SPECIFIC or OPEN NET call to let the confusion dissolve. Stations will respond to the NCS calls. This will stop over eager callers and sort out pile-ups. Remember that not all stations can hear each other at all times.

Maintaining the appearance of calm control is very helpful to the net. It is contagious, and makes everyone feel comfortable. You may panic freely between transmissions, then take a deep breath and make a calm call or send a snappy command sequence. Everyone will marvel at what a crisp net you are running.

5.3.9 ASK QUESTIONS IF INFORMATION IS NEEDED

Stations are generally happy to answer questions, and will respect your desire to get information required for making good NCS decisions. Ask and ye shall receive... most of the time.

5.3.10 THINK AHEAD, KEEP THE NET TIGHT

Try to devise a few commands ahead. Issue one, make an OPEN CALL or call for returning stations (or clearly pause for tail ending), and then you are ready to issue the next without delay.

Few stations make note of the dispatching permutations. When you make an OPEN CALL no one knows you are just hard at work planning the next move. Vamp until ready. An OPEN call can buy a few seconds of thinking time and panic recovery. In a pinch a QNE, or NET PLEASE STAND BY, will suffice. Avoid idle chatter to fill the time. Few stations want to listen to NCS chatter on busy traffic nets.

Avoid erroneous dispatches or changing instructions if at all possible. It is too easy to lose stations off net frequency before a dispatch error may be withdrawn. Trying to interrupt acknowledgments is difficult, but might be done if uttered immediately after the command. Having stations chase others down to make corrections can be done as a last resort, but it is hardly efficient. You often will have to wait for stations to return and untangle the mess later.

Plan ahead and give clear and concise commands. If an error is made, let the stations return to net, issue a one word apology (optionally), and be ready to issue a dispatch that will work.

If traffic is passed to the wrong station, consider letting that station relay it on to the correct station to give sent points for its trouble, and to avoid having to give the “CANCEL” , or “QTA” order.

5.3.11 DEALING WITH IMPROPER CONDUCT OR TECHNIQUES

Ignore calls from those who interrupt transactions or violate SPECIFIC CALLS. Make note of the station, complete the business in progress, then call that station to service its request. If you make a specific net call expecting multiple responders, and the station does not leave a pause for legitimate replies, acknowledge it and repeat the net call. The station should get the message, hopefully.

Sometimes a comment such as “(call sign) STAND BY FOR (call sign) THANKS”, or on CW “(suffix) <AS> (new call sign) K” will do the trick. Remember that net stations do not always hear each other!

If a station persists in interrupting, service it, even if out of order, and put the matter to rest. A brief explanation at excusing time or after the net can turn a confrontation into a friendly bit of help gratefully received. The offender and other net stations will not appreciate a contest of wills on the net.

QNM (You are QRMing the net, Stand by.) can ultimately be drawn from your holster in difficult cases. It is virtually never used, however. Your best weapon is usually courtesy and efficiency. Everybody respects the NCS running a net in that fashion. It, in and of itself, discourages confrontations and rudeness.

As a last resort, any station may be excused from the net at any time. Technically, if you excuse an offending station from the net, and it persists in interrupting, it may be guilty of intentional interference. Most stations will get the message if excused and not cross that line.

Try to keep the matter from getting to this level. Throughout the years discipline on NTS nets has been taught by politely ignoring the undesired behavior and acknowledging the correct procedure. A “FB” or “WELL DONE” can reinforce the correctly learned method. A kind word of explanation will often settle things. Mentors and separate training off net or by landline or email is helpful.

As NCS you are the only station in the net directly communicating with each station with solicitations and commands and are, therefor, both the example and the tutor. The overwhelming majority of amateurs are eager to learn to do these things well. They learn from you both technique and demeanor. The more they learn, the more fun they have... and the greater the feeling of accomplishment.

5.3.12 TRAFFIC FOR ALL NET STATIONS, QNC

Formal traffic for all net stations is seldom if ever listed and passed on Area or Region nets. When such traffic is necessary on Local or Section nets the NCS must usually press for getting stations checked into the net and standby to copy the traffic. Such traffic might be formal radiograms to all stations, or informal words or announcements to all stations.

Net formats often stipulate if this type traffic is to be handled, and how. When done, it is often sent at the beginning of the net after all stations are checked in, before any other traffic is dispatched. Alternatives are to pass formal traffic to each station as opportunities present themselves in the sequence of dispatching.

Local/Section Nets may send informal announcements or bulletins at the start of the net prior to checking in stations. This is an open loop method. Stations who want to hear such transmissions must be present on time.

Open loop transmission of formal radiograms for all stations is not so easy. It is recommended that the NCS or the holder of the message check that each station is ready to copy, transmit the message, and then check that each station acknowledges the message. See chapter 4 regarding QNC traffic dispatching. If sent open loop, assuming all stations are on time, each station, upon checking in, might be asked by the NCS if they acknowledge the traffic. NCS can give fills or arrange re-transmission as required. The sender may note the recipients as they check in.

Once business for all stations is taken care of, the NCS should get all other traffic assigned and dispatched promptly.

5.3.13 INFORMAL WORDS

Words between stations are usually handled off net, generally after formal traffic, but also at times convenient to the net and stations involved. They are dispatched as in formal traffic commands using the term “WORDS” in place of the traffic (dest.-qty.). Stations with words are usually dispatched to stacks as the last stations to use the frequency. Brief words may be done on the net frequency... if they are really brief (Ask!), else done at QNF.

5.3.14 CONSIDER STATION LOCATIONS AND SIGNAL CONDITIONS

When preparing for dispatching, consider those stations which have difficulty copying the NCS or each other, and which stations might provide relays for those problems.

Issue “verify copy” commands to gain information for effective dispatching. The QNV dispatch command may be used without additional information to request two stations to verify copy before executing the exchange.

Call for relay stations able to assist, and have them check with target stations.

By the time the dispatch is made the NCS should be able to obtain the best probability for a successful exchange.

Consider the use of other bands to utilize propagation to advantage.

The NCS might use to great advantage multiple receivers to monitor other frequencies and bands to manage and monitor dispatching effectively. Using a transceiver for other bands permits commanding on another band while continuing the net on the primary.

5.3.15 GET TRAFFIC MOVING PROMPTLY

High level NTS nets usually begin dispatching as soon as the first traffic is listed. This is customary since the inbound and outbound liaisons are usually separate and known in advance. Assignment of traffic is by default.

On Local/Section Nets the NCS may need to ask for outlets or information to find paths. The NCS may sometimes ask for liaisons to check in first and list traffic in order to get a clear picture of the outlets needed and the loading volume. Outlets may then be assigned wisely and traffic dispatched in an efficient order thereafter. Even in this case, however, most stations will know in advance which station can handle their traffic. Getting traffic listed and sorted is still overhead. The business of the net has begun when traffic is being exchanged.

For example, two stations checking in with traffic for the same town, one holding other traffic as well, can be handled efficiently if two separate outlets from that town are dispatched in parallel to separate stacks, followed immediately by servicing the other traffic.

Use Immediate or Split dispatching when possible, if the net stations are so experienced.

5.3.16 FINDING OUTLETS, THE TRAFFIC AUCTION

On Local/Section Nets the inbound traffic may be for any part of the covered area, and outlets for each area may or may not be present on a given session. At this level the delivery of traffic is often determined by the toll free calling range of individual stations. These nets often find it helpful to have traffic listed with additional information to help in this regard (See chapter 4, TRAFFIC LIST, ASSIGNING, etc.); phone prefixes and zip codes or county are helpful.

Once inbound traffic is listed the NCS should be familiar with the area and outlets to the greatest extent possible. This permits a directed assignment of traffic to specific stations to expedite matters as much as possible.

For any traffic where that is not so clear, the traffic auction may begin, i.e., the NCS may have to call for volunteers to take the traffic.

This may be done at least two ways: 1) Ask a particular net station if it can take specified traffic; or 2) Ask the net for volunteers for the traffic; listing one, several, or all of the unassigned messages in the call. (The specific calls for outlets and calling the net's unassigned traffic list are shown in chapter 4.) Relays, two meter outlets, store and forward to local nets, etc., should be considered. Once assignment is accomplished the dispatch may be issued promptly.

5.3.17 HANDLING PRECEDENCES (From Chapter 4)

Traffic is handled in order of precedences as much as possible with the means at hand to do so. Emergency traffic is handled immediately, and it is important to use any means available to get Emergency traffic delivered promptly, including telephone, public safety services, etc. Death and serious injury or illness messages are often best delivered by public safety or private relief agencies such as the American Red Cross.

It is a myth, however, that all Priority traffic must be handled before any Welfare or Routine traffic. The P, W and R traffic is handled in order, but it is often misunderstood that it is the option of the NCS to dispatch lower level traffic while there is higher precedence traffic pending when the NCS needs to wait for an available outlet to be free.

It is equally important for the NCS to consider the overall net workload, time available, and situation. Nets operating during disasters may dispense with handling Routine traffic, and perhaps even Welfare traffic, for extended periods until the higher priority traffic is cleared. Multiple nets may be needed.

5.3.18 EMERGENCIES

Should new or net stations declare an Emergency, they will check in with the word EMERGENCY, or use the international call MAYDAY. The NCS should stop all net activity and process the declaration by whatever means are possible to get the situation resolved. The response should use the fastest communications means possible and not be limited to amateur radio circuits.

The NCS may have to employ ingenious methods to expedite resolution. Net stations may be assigned to directly assisting the caller and handling the case on another frequency, for example. Calls to public safety or private relief organizations should be made promptly when necessary. Net stations should stand by to assist as information develops. Regular traffic handling may be suspended, or continued if the emergency is handled off frequency. Liaisons to other nets should still be excused for their assigned nets, or substitutes assigned.

The Net Manager should be contacted to assist when local disaster issues are involved and the net's emergency response plan must be evoked. Section officials should be notified if the emergency is likely to trigger a disaster response locally. The NCS should extend net operations as warranted or ordered.

Death and serious injury or illness messages are often best delivered by public safety or private relief agencies such as the American Red Cross.

5.3.19 DISASTER AND WELFARE TRAFFIC, MULTIPLE NETS

During disasters large volumes of welfare traffic may be encountered along with inquiries from large numbers of stations checking into the net from outside the affected area. The Net Manager should have a policy for dealing with this situation. The NCS must adjust how traffic is handled, and there are several points of interest.

The ARRL PSCM and the NTS Terms of Reference provide for operation of the NTS during emergencies. Net controls and TCC stations should be familiar with the changes that might affect nets at Area, Region and Section levels, changes in liaisons and scheduling, etc..

In addition, at Section level, the Section's emergency plans should include NTS support, and net controls should be familiar with how the Section's activities are organized, and what changes might be needed on their nets. Extra liaisons with other Section nets are likely, and routing of traffic to and from served agencies must be clearly established.

Served agency traffic is essential to recovery in disaster areas and, if not sent with Emergency or Priority precedences, should still be given the highest level of attention.

Public outbound welfare traffic from the affected area is given high priority over incoming welfare traffic. The latter may not be able to be delivered or serviced for days until relief agencies and government officials have organized shelters and collected victim lists. Local amateur resources may be tied up with more pressing business. Telephones may be out or restricted, and transportation limited. Therefor, it is often necessary to establish a means of archiving incoming traffic for review by local ARES/RACES operators when time permits. A special net provision may be made to do this, perhaps with a number of packet liaisons to a BBS system, etc.

Inquiries from concerned stations from outside the affected area can become an overwhelming burden on traffic nets, preventing normal traffic business. Section and Local nets often establish "lightning rod" nets to service this problem with a number of stations present that can answer the most frequently asked questions and give general status reports. The regular published net frequencies are often used for this purpose and traffic essential to recovery operations is handled on separate frequencies or nets. More shifts of net controls and liaisons are needed. Net controls need to be practiced in this exercise.

The NCS, on its own, may have to organize the opening of multiple nets for handling these situations. The Net Manager should be notified to organize the required shifts of operators, and to pass the word to the Section management.

5.3.20 NET CONTROL SHEETS ARE IMPORTANT

It is crucial that the NCS keep a record of all listed business and stations in the net, and be able to update the record as traffic is dispatched, stations leave and return to the net, and business is cleared and stations are excused.

Notes should also be made regarding which stations can hear each other when propagation is poor. Prudent use of relays by the NCS can expedite what otherwise might be ineffectiveness. This can be a daunting task on large traffic nets when conditions are poor, but can facilitate getting the traffic moved..

The NCS should at all times know where every station is, what business is handled and still pending, stations excused, etc. Unless the NCS has an extraordinary memory this usually requires some form of net control sheet or computer program. Some examples are given in the specific net sections of this manual.

5.3.21 NET REPORTS REQUIRED

The net control station reports on each net session to the Net Manager including information on which stations were present, liaison assignments, traffic handled, session time, newcomers, and other information required by the Net Manager.

Net reports are filed promptly within a few days in order to keep current the information on net operations. The Net Manager must report net statistics with a deadline, usually early in the month, and should not be forced to receive a large number of reports immediately after the end of the month or chase after stations for reports as the deadline approaches. Forty eight hours works!

A generic report format for Area, Region, and Section nets is shown in the respective net sections later in this Chapter. Consult with the Net Manager for the exact format desired.

Net reports are transmitted by radio by NTS convention, or as amended by the Area Staffs. Such administrative reporting by email has been approved in some cases.

*** BOOKING:**
Note that net reports are sent by radio as individual messages and are not transmitted in booked form. This is a traditional convention.

5.4 TRAFFIC SEQUENCING, CONTROL STRATEGY

Keep in mind that the NCS is (a) responsible for getting all net traffic cleared in the allotted time while maximizing efficiency to the greatest extent by moving the greatest amount of traffic possible per unit of time, and (b) assuring that all liaisons to subsequent NTS nets are assigned and released to check into their destination nets on time.

The simplified basic NCS task list (see chapter 4, NCS Tasks):
1) Open the net;
2) call for stations to check in and list traffic;
3) assign outlets;
4) dispatch traffic;
5) loop until all business is listed and cleared;
6) excuse stations with no further pending business;
7) close the net.

The Net Manager sets the format for the net, and nothing in this manual is intended to interfere with that discretion. Here we are concerned with the tools for accomplishing the net mission and NCS tasks as set forth in the format. Information about the role each type net plays in the overall NTS may be found in the ARRL Public Service Communications Manual, ARRL, Newington, CT, 06111, FSD-235 as amended.

The NCS task of accomplishing the part (a) responsibility is dependent upon how the tasks of checking in stations, assigning outlets and dispatching are accomplished. The strategies for

expediting these tasks vary somewhat as a function of whether the NCS is running an Area, Region, Section, Local, ARES/RACES, or special disaster traffic net.

In any of the cases the general approach is to check in liaisons and begin to assign and dispatch traffic as quickly as possible. Following that opening, individual non-liaison stations are usually checked in with OPEN net calls, and their traffic is assigned and dispatched. The sequence of dispatching is tailored to assure that outbound liaisons are loaded as fully as possible and excused in time for their next assignment without fail. Auxiliary helpers may be assigned to assist outbound reps to help assure that all traffic is cleared. Such stations must also be excused in time for their net assignment. The NTS system relies upon prompt scheduled liaison representation.

On Region and Area nets the primary stations checking in are liaisons, therefor the task of assigning outlets is predetermined by default. As soon as traffic is listed by a new liaison station the NCS may dispatch that station with an outlet and get things moving. Pending traffic is dispatched as soon as the target liaison outlet is free. Thus the assigning process is totally dispensed with unless a volunteer is needed to perform missing liaison duties or help is needed to carry excess loading.

On Section and lower nets traffic sources and outlets are not limited to scheduled liaisons. Any station checking in may bring traffic or volunteer to receive traffic for its area. The NCS should be familiar with which stations can handle traffic to specific areas, assign traffic to those stations, and save time by avoiding fishing for outlets. Specific stations should be asked to accept listed traffic. Alternate paths should be called for. The pending unassigned net traffic list should be transmitted to solicit recipients. Additional information provided at the time of traffic listing (or asked for), such as phone prefixes or zip codes, can be helpful in executing the assignments or traffic auction. Stations should be asked to store and forward traffic from unscheduled TCC stations or liaisons from higher nets if immediate outlets are not available..

With station’s checking in, and some assigning completed, the NCS attacks the dispatching sequence problem. This can present many permutations of easy station pairing, or complex problems with many stations holding much traffic for each other.

*** SEQUENCING, AREA AND REGION LEVELS:**
All stations expect to be present for the normal scheduled net duration, thus giving the NCS the flexibility to dispatch traffic to them in the order which optimizes the net throughput. The process of checking in stations, listing traffic, and assigning outlets can be thought of as an overhead activity for the convenience of the NCS, albeit an essential one. Getting traffic passed is the work of the net. The sequence of dispatching traffic then becomes the primary task which determines the net throughput per unit of time and total net time to clear all station’s hooks.

It is usually the case that the order of checking in stations becomes an essential tool to increase dispatching efficiency. That is evident in the time saved by checking in liaisons, calling immediately for an outlet station, then promptly dispatching the two stations for a particular part of the listed traffic. The NCS may use Immediate and Split dispatching to save time by avoiding extraneous transmissions and wasted exercises of having stations checked in, waiting unnecessarily, and later dispatched with the full syntax (see Chapter 4, Dispatching). The NCS reviews all listed traffic, calls for specific liaison or station outlets in preparation for dispatching

traffic, and continuously adjusts throughout the net to keep stations busy... in parallel to the greatest extent possible. This permits getting all stations cleared in minimal time---if the puzzle fits together well.

On an area net, for example, if there are 6 TX and 6 RX reps free, and each TX rep has one message for a different RX rep, then all six messages may be passed more or less in parallel. If the NCS can dispatch all the pairs of stations to separate stacks in quick succession, the total task may take one message transmission interval plus the dispatching sequence time to the off-net stack and the station's return time. Each pair of stations would be slightly behind the pair dispatched before them by the time it takes the NCS to order the exchange. The NCS can anticipate each station returning to net after a little more than one exchange interval, thus making them all available for additional work at an expected time. It is obvious that the parallel dispatching of such pairs of stations is a far better strategy then having each of them transmit their messages one after the other on one stack or on the net frequency (as might happen with a totally inexperienced NCS).

There is a price to pay for such parallel dispatching, however. Twelve stations will be returning to re-check in quick succession, thus making the NCS busy when other tasks might be at hand... a small price, but worth considering.

This example, then, may be likened to 6 separate and independent blocks of message exchange---one message long in this case. These blocks may be moved about and dispatched at any time during the net, and even used to fill time and keep stations busy between other longer exchange sequences.

On the other hand, if each of the 6 TX reps had one message for just one of the RX reps, the 6 messages would have to be passed in series to the RX rep, no matter when done, thus taking a net time of 6 exchange intervals plus dispatching and moving overhead time. The RX station in this case can be said to have "multiple tasks", i.e., the station has pending business with more than one station, and in other examples may have multiple message exchanges with each. This example, then, may be likened to 6 distinct message exchange blocks all linked to the availability of the RX rep. In this example, it is not mandatory for all six exchanges to run contiguously, however, but they must be run separately in terms of net time.

The NCS may dispatch the station pairs at various times to permit making certain a particular station will be available for other tasks. This makes the 6 sequence exchange with RX much like a sub-task that runs and continues in the background, possibly interrupted from time to time. This might be done, for example, if the RX rep was needed to clear a station just released from a large traffic exchange on another stack, and such station was subsequently needed for other work. The NCS also has the flexibility to dispatch the 6 TX stations in a large variety of different orders, thus timing the deployment of each station so that it may be assigned to different jobs when other stations are free. If another TX rep had 6 or 7 messages for a TCC rep, those might be passed during the same interval required for a contiguous exchange of the 6 messages in series in this example. It makes sense to arrange such parallel moves on the net as one of the tools available to the NCS.

The NCS has at least two types of blocks to deal with so far---the single independent blocks, and the multiple task blocks linked to the availability of a particular station. In addition, the size of

each of these block types may be of variable length, i.e., where each station has a different number of messages to exchange. The net may also have a huge variety of mixes of independent and linked pairings listed.

The imperative for efficient dispatching is clear when considering the difference in time required to complete 6 exchanges in series on one stack, one right after the other with the RX rep remaining in control of the stack, as opposed to dispatching the one RX rep and the TX reps 6 separate times. Even though experienced stations may be dispatched, make contact, and return to the net with only ten or twenty seconds of overhead, this time adds up. It is therefor often an efficient strategy to execute the series transaction contiguously on one stack when possible, but the savings are not absolute. Significant other benefits to solving the net's traffic puzzle may be enabled by interrupting the series, in addition to picking the optimum order for the exchanges.

The two previous examples are fairly easy to visualize. In the first case there are 6 independent unit blocks of station pairing, and, in the second example, 6 pairings tied to one station potentially consuming 6 times as much net time. It begins to become clear that getting parallel dispatches done for independent pairings may lead to a good solution to the net puzzle. If each pairing of stations had been different quantities of messages, then the NCS can visualize them as blocks of a size directly proportional to the number of messages in each, and they may be dispatched to fill available slots in the sequence of the net accordingly... keeping in mind that the series linked cases can become the bottlenecks in the flow.

In a third example situation there might be a TX station holding a large block of messages for a single RX station with no multiple tasks, or for an RX station with many multiple tasks. In the first case the strategy for handling the block depends on whether the TX station has other business pending. If it does, the NCS may need to take care of the other TX pairings first. Conversely, if the TX is free, the NCS may need to take care of the multiple RX tasks first in the second case. Often the status of both the TX and RX stations is not either extreme. The NCS may hold the large block until both stations are down to their last assignment, then dispatch them off net excused in advance.

In some cases, a benefit to the net during the early phase can be realized by reducing the number of returning station net transactions and re-dispatching by handling a few larger blocks early. This, however, is a gamble on some occasions.

A situation may become clear after numerous stations check in that a bottleneck station situation is developing involving a station off with a large assignment. The NCS, therefor, may choose to treat large blocks conservatively, waiting to be certain it is safe to dispatch them based on the overall net workload.

The NCS is usually not limited by the number of simultaneous stacks available. Frequencies may be used which do not interfere with other nets so that as many parallel exchanges as possible may be dispatched.

Nearing the end of work, when there are only two choices and there are no other assignments pending for the stations, there is no net traffic throughput difference in one pair of stations passing ten while another waits with one, or vice versa. It makes a big difference, however, to the station holding the single in terms of waiting time. Therefor, the NCS must give consideration to

the factor of waiting times for stations if only to make the net experience a pleasant one. Earlier in the net, getting the single passed for a station with other pending business is an imperative.

On most traffic nets, stations may be excused as soon as they have no further pending business, or excused in advance when sent to a stack for their last assignment. To some extent, the NCS must balance the throughput objective with a reasonable and courteous treatment of those stations who are volunteering their time to participate in the net. In that respect, dispatching stations with smaller amounts of traffic before those with larger amounts is often considerate, releasing the more lightly loaded stations sooner. Being considerate may also be efficient. Waiting stations are not doing productive work, but understanding and experienced operators appreciate that there are going to be situations where waiting is required.

An ideal situation would be for all stations to be checked in with their traffic listed (or telepathed to the NCS before net) so the NCS could work out the optimum strategy. All the easy pairings, large blocks, and bottlenecks would be seen ahead of time and dealt with using one fixed plan. The time expended in doing this, however, often reduces the net throughput per unit of time by putting a big block of overhead up front. Things usually do not work out that way. The reality is that the net stations are occupied elsewhere before net. The NCS is faced with checking them in using open calls or specific liaison calls and building the plan “on the fly” so to speak. Added to this reality is the possibility of difficult propagation, failed exchanges, multiple relays, etc., which can totally alter the plan of attack.

The process, put so well by Gary, W2CS, devolves into an “opening game”, a “middle game”, and an “end game”.

1) The opening involves checking in as many stations as possible, dispatching them to stacks to get as much traffic moving as possible, and using a sequence to pre-determine the return of those stations in a manner permitting an efficient subsequent middle game.

2) The middle game involves planning the dispatching choices to maximize the amount of traffic being passed per unit of time, avoiding bottlenecks where stations with heavy loads could keep others waiting, and balancing the residue for the final dispatches. Here the NCS attempts to whittle down the listed traffic to permit the clean execution of the end game.

3) The end game involves dispatching last assignments for the remaining stations such that they can all be sent to stacks, with the minimum number of stations waiting in line, all stations excused in advance, clearing the last business of the net. At this point the NCS can close the net, job accomplished. It may monitor the stacks and the net frequency to accommodate problems and assure the validity of the net’s traffic count.

*** SEQUENCING, SECTION AND LOCAL:**

The net puzzle at Section/Local level is different than on the Area/Region nets where all stations are liaisons accepting assignments by default. At this level, the assignment of traffic becomes a significant part of the NCS workload. The only stations expected to check in with certainty are the liaisons from source nets and to destination nets. On early sessions, traffic bound for the Region nets may come from source liaisons or from any number of local stations checking in with traffic for the system, or traffic for swapping within the Section. The Section nets are often like bulletin boards for distribution of traffic beyond the range of Local VHF/UHF nets (if any).

On late sessions the inbound liaisons from Region may bring most of the traffic for local delivery.

The NCS expects traffic to be listed for any number of local area destinations with no certain outlets guaranteed. The tools available to the experienced NCS are its knowledge of what traffic may be handled by known stations who frequent the net, the ability to ask for relays, the ability to arrange storing and forwarding, and the ability to route traffic to other non-NTS nets in the Section or other outlets.

Every net session presents a new combination of problems---new permutations of traffic distribution. All the liaisons show up with one message for one other separate net station, or QRU, at one end of the yardstick, or they all show up with numerous messages for every other station on the net with some books of 20 for multiple stations thrown in for good measure at the other end of the yardstick. The challenge for the NCS is to provide the most efficient throughput however the loading is presented, accommodate missing liaisons, fix failed dispatches, solicit auxiliary help, and, solicit outlets. The solicitation of outlets may be aided by extra listing information, such as zip codes, phone numbers, or county, or such information may be requested by the NCS for the benefit of listening net stations.

Unfortunately, the NCS must often resort to conducting an “auction” to find outlets for traffic for some areas of the Section. The net must constantly encourage newcomers and Section ARES/RACES groups to provide regular stations to check into the net to make outlets available. This investment in effort pays big dividends for Section emergency operations when required. The Section and Local nets are also where newcomers get their first experience with the NTS and are trained to move up to NCS and liaison roles moving up in the system.

In other respects, the role of the NCS is much like that on the Area/Region nets described above. The opening game, middle game, and end game are executed in a similar fashion, optimizing the net’s throughput and efficiency. Blocks are dispatched to stations with multiple tasks while parallel time is filled with dispatches of independent blocks to keep the traffic moving.

If station A has traffic for B and C, B has traffic for A and C, and C has traffic for A and B, the classic simple series game begins assuming those stations have no other pressing business. A and B go to a stack and swap. C waits then swaps with A while B returns to net. B is re-dispatched to the stack and swaps with C, perhaps both excused in advance. The NCS may have several of these games ongoing while simultaneously working numerous single block exchanges in parallel with those. Often the larger blocks are saved for the late middle or the end games. Stations are excused when they have no further business, preferably in last pairings at a stack and excused in advance.

Although work still continues on the ideal mathematical algorithm to permit computer control of the sequencing choices for maximum efficiency (not simply record keeping), these guidelines in the hands of a good NCS will satisfy the net’s requirements quite well if practiced with courtesy and wisdom. It is an art form, however, and every NCS will use his or her own style and methods for handling the unusual or difficult situations. The NCS should feel free to dispense with canned syntax and revert to plain English when absolutely necessary. All resources at its disposal should be considered and used. When information or help is needed, ask and ye shall receive.

The stations coming to the net have one purpose---to clear their hooks. The NCS is there at the pleasure of those stations to help make that happen efficiently, and to assure the net fulfills its obligations to the system. Any qualified station can perform the duties of NCS, and should prepare for that eventuality.

A key to the NCS management of the net puzzle is some form of record keeping to aid in visualizing the traffic loading, pending business, and the whereabouts of all stations. Net control sheets of various forms are devised for this purpose based on the type of net. Some examples are shown in later sections.

Chapter 4 presents the NCS with a number of tools and strategies for executing these tasks no matter what comes along. The guidelines in earlier sections of this Chapter should be part of the tool kit as well. The NCS is left with using the tools naturally while concentrating on the strategy for getting to the end game---the most efficient net. Stations and net controls alike find such nets a most enjoyable and rewarding experience... and the NTS lives up to its reputation as an efficient traffic handling system.

This all must all be done while appearing invisible to the stations, remaining calm and in control, willing to accept the curve ball without being abrupt, working through poor propagation and the need for assigning relays, coaching new inexperienced stations, and putting up with the QRN and QRM.

Learn the tools well, then try being net control. The experienced operators will be happy to help with suggestions and explanations... even during the net if required. There is considerable personal reward in having stations responding to standard syntax in expected fashion and getting the job done. The NCS is the orchestra leader, the stations the players.

And remember, if you have never made a mistake, you have never been net control.

5.5 OPENINGS AND CLOSINGS, TYPICAL NETS, GENERIC

Net opening and closing statements vary widely throughout the system in terms of comments added relative to schedule, affiliations, etc. They are determined by the Net Managers as part of the net format discretionary choices beyond the typical barest essentials shown in case 1 below. Basic opening and closing syntax is also shown in Chapter 4, Net Operations.

Items in parentheses ( ) are filled in by the NCS, items in brackets [ ] are optional.

VOICE:

*** OPENINGS:**

1) CALLING THE (net name) THIS IS A DIRECTED NET THIS IS (call sign); or
2) CALLING THE (net name) AFFILIATED WITH THE ARRL NATIONAL TRAFFIC SYSTEM [CYCLE (#)] MEETING HERE DAILY AT (time) THIS IS A DIRECTED NET THIS IS (call sign)

*** CLOSINGS**

1) (net name) IS CLOSED 73 THIS IS (call sign)

CW:

*** OPENINGS:**

1) CQ (net name) (net name) (net name) DE (call sign) QND [PSE] QNZ

*** CLOSINGS**

1) [QNC] (net name) [QRU] QNF 73 DE (call sign) [<SK>]

The prosign <SK> evolved from the old Morse 30, (...-. = 3, long dash = 0; together in current Morse = <SK>), indicating “Out; clear (end of communications, no reply expected.)”, the end of the telegrapher’s shift. Some operators prefer no ending prosign, others <AR> or CL.

5.6 AREA NETS

The Eastern, Central, and Pacific Area nets meet to exchange traffic from their constituent Regions, with TCC liaisons carrying traffic to the subsequent Area net to the west, and to bring traffic east. Schedules shown for 2001 local times. Consult the ARRL Net Directory for changes.

EAN: Regions 1, 2, 3, 4, 8, ECN (11), ARN (13), CAN, PAN, TCC

CYCLE 2	M-F	7243	2:30 PM (Eastern time)
	S-SUN	7050	2:30 PM (Eastern time)
CYCLE 3	Dly	3670 / 7050	5:30 PM (Eastern time)
CYCLE 4	Dly	3670	8:30 PM (Eastern time)

CAN: Regions RN5 (5), 9, TEN (10), PAN, TCC

CYCLE 2	Dly	14345	2:30 PM (Central time)
CYCLE 4	Dly	3670 / 7062	8:30 PM (Central time)

PAN: Regions 6, 7, TWN (12), TCC

CYCLE 2	Dly	14345	2:30 PM (Pacific time)
CYCLE 4	Dly	3652/7052	8:30 PM (Pacific time)

See the ARRL PSCM for the full NTS cycle structure and times, and the TCC schedules. Consult Area staff for the latest schedule of net operations.

Each Region has a TX rep, voiced as FIRST REGION TRANSMIT, or ONE R N TRANSMIT, on voice, 1RN TX on CW; and an RX rep voiced/sent in similar fashion. ECN is the Eastern Canada Net, ARN is the Atlantic Region Net. EAN, CAN, and PAN are the Eastern, Central and Pacific Area Nets. TCC the Transcontinental Corps.

EAN cycle two voice frequencies of 14317, 7260, 7250, 7238, 7233, 7228 and 7210 are often used for stacks. EAN cycle 4 stacks are usually at -30, -25, -20, -15, -10, -5, +5, +10 KHz. from the net. These will change from time to time to adapt to changing band use and conditions.

5.6.1 AREA TYPICAL FORMATS

Voice and CW Area nets are run in a similar fashion. Cycle 2 weekday EAN voice contends with daytime propagation on 40 meters and may have 4RN liaison on 20 meters. It may use 80 meters for some dispatches. Daily EAN Cycle 4 nets meet on 80 meters, using 40, 160, or even 20 meters for some dispatches when skip or QRN demands. CAN and PAN will often switch to 40 meters in summer, 80 in winter.

Two styles of calling Area nets are in general use. In the first the NCS calls TX reps by region, lists their traffic, calls RX reps as needed to begin dispatching, and loops until all TX reps are accounted for and traffic cleared. The second style opens the net with an Open net call, taking stations as they QNI, dispatching and looping until all reps and traffic are cleared. In this later case the TX reps may check in first, the RX reps dragging their feet to give way unless called.

The occasional non-liaison station will be serviced after the regular stations, time permitting.

5.6.2 AREA CW TRANSCRIPT

Example EAN CW transcript (with references to the example NCS sheet).

	NCS	QRL? (NO RESPONSE)
1	**NCS**	CQ EAN EAN EAN DE W2XXX QND QNZ DE W2XXX EAN K
	STN	U
	NCS	U
	STN	KW1U 1RN TX QTC 3RN 4 8RN 2 PAN 1 <AR> (T in 1RN col.)
	NCS	3RN RX?
	STN	W3IPX 3RN RX QRU (W3IPX in 3RN R row)
	NCS	W3IPX KW1U DWN 5 3RN (moves markers -5, slashes 1U's 3RN 4)
	IPX	T (ack)
	1U	T (ack)
	STN	F (QNI tail end call)
	NCS	F
	STN	WB4FDT 3RN TX QTC 1RN 1 2RN 2 CAN 2 FR 1 <AR> (T 3RN)
10	**NCS**	W2FR?
	STN	W2FR CAN QRU (W2FR in CAN R row)
	NCS	W2FR WB4FDT DWN 10 CAN 2 FR 1 (markers -10, slash CAN & FR)
	FR	T (ack)
	FDT	T (ack)
	STN	N (QNI tail end call)
	NCS	N
	STN	KJ4N 4RN TX QTC 3RN 3 <AR> (T in 4RN col.)
	NCS	KJ4N QNQ DWN 5 W3IPX 3RN (adds 4N -5, slashes 4N's 3RN)
	4N	T (ack)
	STN	A (QNI tail end call)
	NCS	A
	STN	VE3AWE ECN BOTH QTC ARN 2 <AR>
20	**NCS**	ARN?
	STN	WA3YLO ARN QRU
	NCS	WA3YLO VE3AWE +5 ARN 2
	YLO	T
	AWE	T
	NCS	EAN DE W2XXX QNI
	STN	W
	NCS	W
	STN	GE W2TX 2RN TX QRU
	NCS	W2TX GE <AS>
	STN	T
30	**NCS**	T
	STN	GE W8TX 8RN TX QRU
	NCS	W8TX TU <AS> 2RN RX?
	STN	W2RX 2RN RX QRU
	NCS	W2RX QNQ DWN 10 WB4FDT 2RN 2
	2RX	T
	NCS	W2TX 73 QNX
	2TX	73 W2TX
	STN	R
	NCS	R
40	STN	W1RX 1RN RX QRU
	NCS	W1RX TU <AS> (FDT has 1 pending.)
	STN	X
	NCS	X
	STN	W4RX 4RN RX QRU
	NCS	W4RX GE QRU 73 QNX
	STN	W4RX E E
	NCS	E E DE W2XXX EAN K
	STN	I
	NCS	I
50	STN	W8RX 8RN RX QRU
	NCS	W8RX GE <AS>
	STN	73 W8RX

	STN	FR
	NCS	W2FR TU HWI 73 QNX
	2FR	73 W2FR
	NCS	W1RX QNQ DWN 10 WB4FDT 1RN 1 BOTH QNX
	1RX	TU 73 W1RX G
	NCS	W8TX 73 QNX
	8TX	73 W8TX
60	STN	1U
	NCS	W8RX KW1U DWN 15 8RN 2 W8RX QNX GE
	8RX	73 W8RX G
	1U	T
	STN	C
	NCS	C
	STN	W2CS PAN QRU
	NCS	GE W2CS QNQ DWN 15 KW1U PAN 1 BOTH QNX 73
	2CS	TU 73 W2CS
	STN	YLO
70	**NCS**	WA3YLO TU TONY 73 QNX
	STN	73 WA3YLO
	STN	AWE
	NCS	VE3AWE TU 73 QNX
	AWE	73 VE3AWE
	STN	IPX
	NCS	IPX
	STN	4N
	NCS	KJ4N TU QRU 73 QNX
	4N	73 KJ4N
80	**NCS**	W3IPX TU JN 73 QNX
	STN	W3IPX GE
	2RX	2RX
	NCS	W2RX QRU 73 QNX
	STN	72 W2RX
85	**NCS**	QNC EAN QNF 73 DE W2XXX

5.6.3 AREA CW NET CONTROL SHEETS

EAN NCS SHEET EXAMPLE (The K2KIR method.)

1) From beginning of net to LINE 50 of transcript.

-30	-25	-20	-15	-10	-5	+5	+10	Station	1RN	2RN	3RN	4RN	8RN	ECN	ARN	CAN	PAN	FR
								O W1RX	R									
				O				2RX		R								
					O			W3IPX			R							
								O W4RX				R						
								O W8RX					R					
						O		VE3AWE						R/B	2/			
						O		WA3YLO							R/B			
				O				W2FR								R		
								O W2CS									R	
					O			KW1U	T		4/		2				1	
				O				WB4FDT	1	2/	T					2/		1/
					O			KJ4N			3/	T						
								W2TX /		T								
								O W8TX					T					
								O										

In the stack down 10, FDT and FR will finish first; FDT has 2RN 2 pending for W2RX. In the stack down 5, KW1U will clear first and return with 8RN 2 and PAN 1 pending. NCS may selectively call RX reps to prepare, or continue open calls.

2) At QNF, two stacks still working, all 5 stations excused in advance.

-30	-25	-20	-15	-10	-5	+5	+10	Station	1RN	2RN	3RN	4RN	8RN	ECN	ARN	CAN	PAN	FR
				O				W1RX /	R									
								W2RX /		R								
								W3IPX /			R							
								W4RX /				R						
			O					W8RX /					R					
								VE3AWE/						R/B	(2)			
								WA3YLO/							R/B			
								W2FR /								R		
			O					W2CS /									R	
			O					KW1U /	T		(4)		2/				1/	
				O				WB4FDT/	1/	(2)	T					(2)		(1)
								KJ4N /			(3)	T						
								W2TX /		T								
								W8TX /					T					
								O										

KW1U will clear 8RN then PAN, all excused. FDT will clear the 1RN, both excused.
A QNI representing BOTH Region TX and RX is entered in the appropriate upper row and the "R" is overwritten to "B". The "T" TX rep column entry is optional, alternatively noted after the station's call sign in the station column, or the TX reps may be entered in numerical order on subsequent rows. Station's markers are moved to the stack when dispatched, and the traffic is single slashed. When a station returns, its marker is moved back to the station column and the slashed traffic crossed off the row. If a dispatch fails, NO JOY, marker is returned, and that traffic is circled to re-list it. Some NCS stations may prefer to organize the sheet such that both the RX and TX reps for each Region are entered on subsequent rows (see last section for blank sheet.). Markers could be hex nuts, or small magnets with the sheet clipped on a steel surface, etc.

5.6.4 AREA NET REPORTS

Area net reports are sent to the Area Net Manager for the respective cycle.
Example Area net report (courtesy W2CS):

NR 67 R W2CS 28 APEX NC JUL 1
K2KIR <BT>

EAN/C4	JUNE	28	UTC	BOTH
KK3F	W8UQ	VE3AWE	RX	KB1AJ
KA2GJV	WA4DOX	W2MTA	W2FR	W2FR/VOLPAN
TX	W1UD	NO	2RN	AA4YW
TFC	22/22	IN	18	CONDX
FAIR	X	73		

<BT> GARY W2CS <AR> N

The stations are listed if the following order: (1, 2, 3, 4, 8, 11, 13, CAN, PAN)

(RGN)	3	8	11			
BOTH:	KK3F	W8UQ	VE3AWE			
(RGN)	1	2	4	13	CAN	PAN
RX:	KB1AJ	KA2GJV	WA4DOX	W2MTA	W2FR	W2FR/VOLPAN
(RGN)	1	2	4			
TX:	TX	W1UD	NO	2RN	AA4YW	

This cycle 4 report shows the reps in BOTH, RX and TX categories, volunteers noted with "/", missing reps as "NO 2RN", a station having more than one assignment listed twice (W2FR case), station leaving without QNX shown as "/DISAPPEARED" (none here), traffic 22/22 indicating all cleared---otherwise "IN 22 OUT 21" when not. Some managers may also request a tally of fully relayed messages by a third station (as opposed to a relay helping with fills only) as in "4 RELAYED".

For the transcript example net. The stations are listed in the following order in each category: 1, 2, 3, 4, 8, 11, 13, CAN, PAN.

NR 44 R W2XXX 29 PODUNK NY JUL 1
K2KIR <BT>

EAN/C4	JUL	1	UTC	BOTH
VE3AWE	RX	W1RX	W2RX	W3IPX
W4RX	W8RX	WA3YLO	W2FR	W2CS
TX	KW1U	W2TX	WB4FDT	KJ4N
W8TX	TFC	18/18	IN	20
CONDX	GOOD	X	73	

<BT> W2XXX <AR> N

Using the classical appended assignment method (note the extra length):

NR 44 R W2XXX 24 PODUNK NY JUL 1
K2KIR <BT>

W2XXX/NCS	EAN/C4	JUL	1	W1RX/1RNRX
W2RX/2RNRX	W3IPX/3RNRX	W4RX/4RNRX	W8RX/8RNRX	VE3AWE/ECNBOTH
WA3YLO/ARN	W2FR/CAN	W2CS/PAN	KW1U/1RNTX	W2TX/2RNTX
WB4FDT/3RNTX	KJ4N/4RNTX	W8TX/8RNTX	QTC/18/18	QNF/0150Z
CONDX	GOOD	X	73	<BT>

W2XXX <AR> N

5.7 REGION NETS

Regions 1, 2, 3, 4, 8, ECN (11), ARN (13), RN5 (5), 9, TEN (10), 6, 7, TWN (12), meet in the respective cycles, early and late sessions if in a complete cycle, to swap traffic among the Section reps and send traffic up to area (early session), and distribute incoming area traffic (late).

Consult the ARRL Net Directory for the schedule of these nets.

5.7.1 REGION TYPICAL FORMATS

At least two styles of calling Region nets are in general use. In the first the NCS calls reps by Area and Section, lists their traffic, calls specific reps as needed to begin dispatching, and loops until all reps are accounted for and traffic cleared. The second style opens the net with an Open net call and takes stations as they QNI.

As in Area nets, all the liaison assignments are known in advance. On the early session the NCS makes certain that TX and RX reps (or at least one station to cover both) are assigned to the Area net. Often the early session NCS is the Area RX rep, another station being assigned as TX. The TX rep will often return to the late session as the NCS with the RX rep bringing down the area traffic for the net. Any of the net stations could perform the duties of Area RX or TX in addition to their other assignments, except that the early NCS should avoid the Area TX job, and the late NCS should avoid the Area RX job, in both cases to avoid making the NCS a primary traffic exchanger..

The NCS will solicit volunteers for missing Area net liaisons. The Section nets are responsible for providing their own liaisons, but the NCS may ask for help to relay traffic to Sections missing a rep..

Although these nets are generally for liaisons from Area and each Section, the occasional non-liaison station will be serviced after the regular stations, time permitting. Such stations check in as “(call sign) NIL” followed with the traffic list.

TCC representatives and AUX reps (auxiliary assistant liaisons) are always serviced.

5.7.2 REGION CW NET TRANSCRIPT

The voice net is run in a similar fashion using the voice techniques in Chapter 4.

The 3RN net has reps from EPA, WPA and MDD, to EAN RX and EAN TX. The other Regions vary depending on the served Sections.

3RN EARLY SESSION EXAMPLE:

1	NCS	QRL?
		(NO RESPONSE)
	NCS	3RN 3RN 3RN DE K3GHH QND PSE QNZ QNA EAN TX
	STN	W3KOD EAN TX QRU
	NCS	W3KOD TU <AS> EPA
	STN	N3DRM EPA QTC WPA 2 GHH 1 <AR>
	NCS	N3DRM TU <AS> WPA
	STN	W3NGO WPA QTC EAN 1 <AR>
	NCS	W3NGO TU <AS> MDD
10	STN	N3DE MDD QTC WPA 3 EAN 1 <AR>
	NCS	N3DE <AS>
	NCS	W3KOD W3NGO UP 4 EAN 1
	KOD	T
	NGO	T
	NCS	N3DE QNQ UP 4 W3KOD EAN 1
	DE	T
	NCS	3RN DE K3GHH QNI
		(NO RESPONSE)
	NCS	N3DRM QRV
20	DRM	(Sends GHH 1.)
	NCS	QSL DE K3GHH
	DRM	N3DRM
	NCS	3RN QNI
	STN	NGO (Returning.)
	NCS	W3NGO N3DRM DWN 5 WPA 2 N3DRM QNX
	NGO	T
	DRM	73 N3DRM G (Signs out excused in advance.)
	STN	DE (Tail ends transaction, returning.)
	NCS	N3DE QNQ DWN 5 W3NGO WPA 3 BOTH QNX 73
30	DE	73 N3DE G
	STN	KOD
	NCS	W3KOD EAN 1 QRV?
	KOD	QRV
	NCS	(Sends EAN 1 to KOD.)
	KOD	QSL W3KOD
	NCS	W3KOD TU 73 QNX
	KOD	73 W3KOD
38	**NCS**	QNC 3RN QNF 73 K3GHH <SK>

5.7.3 REGION NET CONTROL SHEETS

Net control sheets for early 3RN transcript, two stages, marker method:

(At line 18)

3RN 142345ZMAR	EAN	EPA	WPA	MDD	NCS	+4	-5	
NCS K3GHH	1							
EANTX W3KOD	-					O		
EPA N3DRM O		-	2		1/			
WPA W3NGO	1/		-			O		
MDD N3DE	1/		3	-		O		
QTC/ QNF/								

(At QNF)

3RN 142345ZMAR	EAN	EPA	WPA	MDD	NCS	+4	-5	.
NCS K3GHH	(1)							
EANTX W3KOD X	-							
EPA N3DRM X		-	(2)		(1)		O	
WPA W3NGO X	(1)		-				O	
MDD N3DE X	(1)		(3)	-			O	
QTC/9 QNF/2356Z								.

Traffic figures or “W” for Words listed under Section column. Each Section station is both TX and RX. Dispatches to stacks +4 or -5 marked with hex nuts or magnets on sheet clamped to metal plate. Traffic quantity digits are slashed upon dispatch, crossed off when cleared (shown here in parentheses), struck through if canceled. Area type net control sheets may be used for larger nets. The NCS column is for “other” traffic, marked here for NCS when the N3DRM traffic for K3GHH was listed.

A simpler “traffic list” method may be used. This method is a minimal record keeping technique but is often used on Section or Local nets due to the large number of traffic listing permutations precluding the use of specific outlet columns.

3RN 142345ZMAR	STN	QTC	QTY	QSP	NET	+4	-5	.
NCSRX K3GHH	GHH	EAN	(1)	KOD	6/			
EANTX W3KOD X	DRM	WPA	(2)	NGO			4/	
EPA N3DRM X		GHH	(1)	GHH	3/			
WPA W3NGO X	NGO	EAN	(1)	KOD		1/		
MDD N3DE X	3DE	EAN	(1)	KOD		2/		
		WPA	(3)	NGO			5/	
QTC/9 QNF/2356Z								.

In this example the QNI’s are listed after their pre-written liaison positions on the left, the NCS assumed to be EAN RX rep, else the RX is listed separately. Each is marked with an “X” when excused in advance or from the net. Each station suffix holding traffic is entered in the STN column, destination in QTC column, quantity in QTY column, assigned recipient in QSP column (defaults on this Region net). The STN and QSP stations assigned to stacks are noted with the sequence number in the frequency columns and the QTC column marked. When either station returns the traffic QTY is marked off (shown in parentheses here) and the sequence number is slashed. Marker hex nuts or magnets may be used instead, moving the QSP station marker to the frequency column in the traffic row, the STN marker over the STN suffix, until those stations return.

5.7.4 REGION NET REPORTS

Example Region net report for the transcript net. Check with the Net Manager for the format desired for each specific net.

33 R K3GHH 15 BALTO MD MAR 14
WB4FDT <BT>

3RN	MAR	14	2345Z	QNS
K3GHH/NCS/EANRX	W3KOD/EANTX	N3DRM/EPA	W3NGO/WPA	N3DE/MDD
QTC	NINE	QNF	2356Z	73

<BT> K3GHH <AR> N

5.8 SECTION AND LOCAL NETS

Section nets throughout the US vary in coverage area and format to accommodate Section needs. Consult the ARRL Net directory for specific schedules.

Some of these “Section” nets actually cover two or more ARRL Sections combined. In some cases a Section may have more than one net covering the area or parts thereof.

Some Sections are also serviced by nets covering multiple Sections which do not regularly send liaisons to the Region net serving the area. This is done to expedite traffic flow within states containing more than one ARRL Section, for example.

Local nets such as VHF/UHF repeater traffic nets generally receive and send traffic to Section nets for relay up to Region level.

5.8.1 SECTION TYPICAL FORMATS

Section and Local nets use a wide variety of formats depending upon the net purposes and coverage areas. Some NTS affiliated nets also serve as emergency nets and/or social nets for the covered area. Many training nets at Section and local levels are also NTS affiliated. The general rules for assigning all liaisons and releasing them to higher nets on time applies to all NTS affiliated nets. The integrity of the entire system depends upon reliable net liaison.

The Section and Local nets of the NTS are the roots of the system. Originated traffic is inserted in these nets, and outlets check into these nets to provide toll free calling range delivery for any traffic addressed to destinations in their coverage area. All amateur stations are welcome and encouraged to participate in these nets. The ARRL appointment of Official Relay Station (ORS) is available for those stations wishing to become regular participants living up to the standards and traditions of the NTS. Net Managers provide “Net Certificates” to participants with endorsements for NCS and liaison duties.

The Net Manager is responsible for establishing the net format to suit the needs of the net mission and to maintain the standards of the NTS when affiliated. This manual, therefor, does not stipulate net formats. The typical NTS operating protocols used on NTS nets are, or should be, relatively uniform everywhere, however. Operators who learn these basic protocols should be able to function well on any of these Section or Local nets.

Some net formats are observed to include some of the following activities:
1) Calling for stations with emergency or priority traffic at the opening;

2) Calling for an Alternate Net Control station;
3) Transmitting an opening explanatory preamble;
4) Calling for stations with announcements or bulletins, and transmitting same;
5) Calling for “new” stations desiring to enroll or request information about the net;
6) Calling for liaisons for Local or other concurrent nets meeting in the area;
7) Calling for liaisons from preceding, subsequent, or next higher level nets;
8) Calling for stations holding only formal traffic;
9) Calling for stations holding informal traffic or other business;
10) Excusing stations early which have no traffic or can not take listed traffic;
11) Conducting 1 minute comments round-table fashion, exchanging social comments, or servicing questions after formal traffic is handled; etc., etc.

Throughout these special functions the standard NTS listing, assignment, and dispatching of traffic is accomplished with standard protocols, often before social activities begin.

Section nets described in the following sections are, therefor, examples only.

5.8.2 SECTION VOICE NET TRANSCRIPTION

MEPN is a Section net of the NTS, MDC, with early excusing, a social net with station comments, and a Section-wide emergency net..

1	**NCS**	THIS IS K3XXX IS THE FREQUENCY IN USE?
		(NO RESPONSE)
	NCS	CALLING THE MEPN THIS IS THE MARYLAND EMERGENCY PHONE NET K3XXX
		NET CONTROL STATIONS WITH EMERGENCY OR PRIORITY TRAFFIC?
		(NO RESPONSE)
	NCS	ALTERNATE NET CONTROL PLEASE?
	STN	THIS IS WA3WRT ALTERNATE NET CONTROL NO TRAFFIC OVER
	NCS	WA3WRT ROGER THANK YOU PLEASE STANDBY
		HIS IS K3XXX CALLING THE MARYLAND EMERGENCY PHONE NET A DIRECTED
10		NET AFFILIATED WITH THE ARRL NATIONAL TRAFFIC SYSTEM. (PREAMBLE)
		THIS IS K3XXX THE NAME IS JOHN
	NCS	ARE THERE ANY ANNOUNCEMENTS FOR THE NET PLEASE?
		(NO RESPONSE)
	NCS	STATIONS HOLDING TRAFFIC FOR WEST VIRGINIA OR DELAWARE PLEASE?
		(NO RESPONSE)
	NCS	WEST VIRGINIA REP (THIS IS AN ARES LIAISON ONLY.)
	STN	W3FZT WILL GO TO WEST VIRGINIA NO TRAFFIC
	NCS	W3FZT ROGER NO TRAFFIC EXCUSED TO WEST VIRGINIA
	STN	FZT GOING
20	**NCS**	DELAWARE REP?
	STN	W3PVO DELAWARE NO TRAFFIC (CYCLE 2 DE IS SEPARATE FROM MDC.)
	NCS	W3PVO GE GEORGE NO TRAFFIC DELAWARE COMMENTS? 73 YOU ARE EXCUSED
	PVO	(COMMENTS AND SIGNS OUT)
	NCS	3RN REPS PLEASE (MULTIPLE LIAISONS POSSIBLE FROM CYCLE 2 3RN.)
	STN	N3KGM 3RN WITH TRAFFIC; KB3AMO 3RN NO TRAFFIC
	NCS	KB3AMO THANK YOU STAND BY N3KGM GOOD EVENING PLEASE LIST
	KGM	THIS IS N3KGM FROM 3RN TRAFFIC BOWIE ONE HAGERSTOWN TWO OVER
	NCS	N3KGM ROGER THANK YOU STANDBY ANY OTHER 3RN REPS?
		(NO RESPONSE)
30	**NCS**	MDD REP PLEASE (MDD IS COMBINED DE/MDC CYCLE 4 NET.)
	STN	HELLO THIS IS WA3YLO TO MDD NO TRAFFIC
	NCS	GOOD EVENING TONY WA3YLO N3KGM 3905 BOWIE (IMMEDIATE DISPATCH.)
	STN	YLO GOING; KGM GOING
	NCS	HAGERSTOWN PLEASE?
	STN	KD3JK EMERGENCY POWER NO TRAFFIC WILL TAKE HAGERSTOWN
	NCS	GOOD EVENING BOB KD3JK 3905 N3KGM AFTER WA3YLO HAGERSTOWN TWO
	JK	JK GOING (ADDED TO THE STACK AT 3905.)
	NCS	BTN REP PLEASE (LOCAL VHF REPEATER NET IN BALT. METRO AREA.)
	STN	WA1QAA TO BTN NO TRAFFIC
40	**NCS**	WA1QAA THANK YOU PLEASE WAIT
	NCS	PACKET REPS PLEASE (MULTIPLE LIAISONS EXPECTED.)
	STN	N3WKE PACKET NTSD NO TRAFFIC
	NCS	N3WKE THANKS STAND BY OTHER PACKET REPS?
		(NO RESPONSE... PAUSE FOR ADDITIONAL PKT REPS.)
	STN	FZT BACK NO TRAFFIC (TAIL ENDS AFTER PAUSE.)
	NCS	FZT (ACKNOWLEDGES FZT)
	NCS	THIS IS K3XXX ANY STATIONS WITH FORMAL TRAFFIC FOR THE MEPN?
	STN	W3DFW WITH TRAFFIC
	NCS	W3DFW PLEASE LIST OVER
50	DFW	W3DFW TRAFFIC MDD ONE OVER
	NCS	W3DFW ROGER PLEASE STAND BY (MDD REP IS BUSY WITH ONE WAITING.)
	NCS	ANY OTHER STATIONS WITH FORMAL TRAFFIC? (SPECIFIC CALL.)
		(NO RESPONSE)
	NCS	ANY FORMAL OR INFORMAL TRAFFIC FOR THE NET PLEASE? (SPECIFIC CALL.)
	STN	AMO
	NCS	AMO
	STN	KB3AMO PLEASE ADD TRAFFIC WORDS WITH N3WKE OVER
	NCS	SHORT?
	AMO	NO

60 **NCS** N3WKE KB3AMO 3900 WORDS
STNS WKE GOING; AMO GOING
NCS ADDITIONAL STATIONS WITH FORMAL OR INFORMAL TRAFFIC?
(NO RESPONSE)
NCS STATIONS WHO WOULD LIKE TO CHECK IN AND LEAVE AT THIS TIME ALPHA THROUGH MIKE PLEASE (SPECIFIC LIMITED CALL, USED ON THIS NET.)
STNS W3ABC..WB3BFZ..W3BOB.....
NCS W3ABC WB3BFZ W3BOB THANKS FOR JOINING US TONIGHT 73
NCS OTHERS WISHING TO LEAVE AT THIS TIME ANYWHERE IN THE ALPHABET?
STNS K3USO..K3ORW.....
70 **NCS** K3USO K3ORW THANK YOU 73 HAVE A GOOD EVENING OTHERS?
(NO RESPONSE)
NCS MEPN THIS IS K3XXX STATIONS WITH OR WITHOUT TRAFFIC PLEASE?
(OPEN NET CALL.)
STN YLO BACK (AFTER PAUSING FOR OTHERS)
NCS WA3YLO W3DFW 3892 MDD ONE (IMMEDIATE DISPATCH.)
STNS YLO GOING; DFW GOING
NCS K3XXX MEPN STATIONS WITH OR WITHOUT TRAFFIC?
STN WA4GGH NO TRAFFIC.. WA3UVQ NO TRAFFIC.. W3SOG NO TRAFFIC
NCS WA4GGH HELLO HAROLD.. WA3UVQ GOOD EVENING ARTHUR
80 W3SOG HELLO CHUCK
PLEASE STAND BY ADDITIONAL STATIONS?
STN KGM BACK
NCS KGM
STN KD3JK BACK REQUEST TO BE EXCUSED.
NCS THANK YOU BOB KD3JK 73 YOU ARE EXCUSED
STN 73 KD3JK
STNS YLO BACK DFW BACK
NCS YLO DFW ADDITIONAL STATIONS?
STN AMO BACK...
90 **NCS** AMO
STN WKE BACK
NCS WKE ADDITIONAL STATIONS?
(NO RESPONSE)
NCS WA1QAA COMMENTS AND THEN 73 EXCUSED
QAA (COMMENTS EARLY TO LEAVE FOR BTN AT ‘30) WA1QAA
* (REMAINING STATIONS IN THE NET ARE CALLED FOR 1 MINUTE COMMENTS OPEN NET CALLS AFTER EACH STATION. THIS IS A SOCIAL FUNCTION FORMAT.)
NCS MEPN K3XXX STATIONS WITH OR WITHOUT TRAFFIC?
(NO RESPONSE)
100 **NCS** WA3YLO COMMENTS TONY?
* (STATIONS CALLED FOR COMMENTS UNTIL NO FURTHER BUSINESS.)
NCS LAST CALL FOR ADDITIONAL BUSINESS OR COMMENTS FOR THE NET?
(NO RESPONSE) THIS HAS BEEN A REGULAR SESSION OF THE MARYLAND EMERGENCY PHONE NET MEETING HERE DAILY AT 1800 LOCAL THANKS TO THE STATIONS WHO JOINED US 73 TO ALL THE NET IS NOW CLOSED
GOOD EVENING THIS IS K3XXX
107 * (ALL STATIONS REMAINING IN THE NET ARE EXCUSED EN-MASS.)

* (Notice that "Q" signals are not used in voice net operations.)

5.8.3 SECTION VOICE NCS SHEET (Traffic list method.)

NCS SHEET * (shown at line 100 status in the transcript.)

MEPN*	D/T					.
LIAISONS	OTHERS	STN	TRAFFIC	QTY	QSP - FREQ #	E/O stns
NCS K3XXX		KGM	BOWIE	(1)	YLO 3905-1	W3ABC
ANC WA3WRT	KD3JK/EP		HAGERSTOWN	(2)	JK 3905-2	WB3BFZ
3RN N3KGM	W3DFW	DFW	MDD	(1)	YLO 3892-1	W3BOB
... KB3AMO		AMO		(W)	WKE 3900-1	K3USO
WVA W3FZT	WA4GGH					K3ORW
DTN W3PVO	WA3UVQ					
MDD WA3YLO c	W3SOG					
BTN WA1QAA c o						
PKT N3WKE/NTSD						
.						.
QNI/ 19	QNF/			QTC/ 4		.

Liaisons in left column, early excused stations in right column. Traffic listed in traffic list using suffix of holder under STN, traffic with tel nrs, quantity as digits only or “W” for words, assigned RX station under QSP, stack freq. and order under FREQ #. Traffic assigned when QSP indicated, dispatched when FREQ # indicated. Traffic circled when stations return, or left digit(s) if no joy, struck through if canceled. Stations commented appended with “c”, excused with “o”, early outs on left side appended with “e”. This is a manually marked sheet only.

5.8.4 SECTION VOICE NCS SHEET (Marker method.)

NCS SHEET (shown at line 100 status in the transcript.)

MEPN	TRAFFIC	QTY	QSP	3905	3900	3892
NCS K3XXX						
ANC WA3WRT						
3RN N3KGM	BOWIE	(1)	YLO	1/		
	HAGERSTOWN	(2)	JK	2/		
KB3AMO	WKE	(W)	WKE		1/	
WVA W3FZT						
DTN W3PVO						
MDD WA3YLO c				1/		1/
BTN WA1QAA co						
PKT N3WKE/NTSD					1/	
KD3JK/EP				2/		
W3DFW	MDD	(1)	YLO			1/
W3ABC e						
WB3BFZ e						
W3BOB e						
K3USO e						
K3ORW e						
WA4GGH						
WA3UVQ						
W3SOG						
QNI/19 QNF/		QTC/ 4				.

One line per station. Liaison assignments are written in as stations QNI. Traffic listed under TRAFFIC, QTY digits or “W” for Words, and QSP as assigned to RX. When dispatched the freq. column is marked with the order number at the stack, crossed off when stations return, or may be marked by moving magnets or hex nuts as in Area/Region sheets. QTY digits circled when traffic passed and stations return, left unchanged if no joy, struck through if canceled. Early outs marked with “e”, comments “c”, excused “o”.

5.8.5 SECTION VOICE NET REPORT

Example Section voice net report. Consult the Net Manager for the desired format for the specific net.

45 R K3XXX 29 DAYTON MD MAR 14
KE3OX <BT>

MEPN	TUE	MAR	14	2300Z
QNS	NNI/NCS	WRT/ANC	KGM/3RN	AMO/3RN
FZT/WVA	PVO/DTN	YLO/MDD	QAA/BTN	WKE/PKT/NTSD
JK/EP	DFW	GGH	UVQ	SOG
ABC	BFZ	BOB	USO	ORW
QNI/19QTC/4	QNF/2325Z73			

<BT> K3XXX <AR> N

Note that suffixes were optionally used for regular stations known to the NM. Stations with similar suffixes would be shown with additional characters or with the full call sign. Newcomers would be shown with full call sign appended with name and QTH.

5.8.6 SECTION CW NET TRANSCRIPTION

(MDD is a Section net of the NTS, MDC, cycle 4.)

	NCS	QRL? --- (NO RESPONSE)
1	**NCS**	CQ MDD MDD MDD DE K3GHH QND PSE QNZ QNA 3RN3 (BEGINS QNA SERIES.)
	STN	GE N3DE 3RN3 QRU
	NCS	N3DE GE HARRY TU PSE <AS> 3RN4 (QNA NOT REPEATED TO CALL 3RN4.)
	STN	GE NR3Q 3RN4 QRU
	NCS	NR3Q GE TU RAY PSE <AS> DTN (ACK 3Q, <AS> ENDS ACK, CALLS DTN.)
	STN	GE WA3WIY DTN QRU
	NCS	WA3WIY GE HAL PSE <AS> MSN
	STN	GE MR JN KC3Y MSN QTC 3RN 2 BALTO 1 <AR>
	NCS	GE BUCK NR3Q KC3Y UP 6 3RN 2 (IMMEDIATE DISPATCH 3Q, 3Y.)
10	STNS	(NR3Q) T, (KC3Y) T (STNS ACK IN ORDER OF DISPATCH.)
	NCS	BTN (AGAIN QNA OMITTED IN SERIES OF CALLS.)
	STN	GE DE AA3LN BTN QRU
	NCS	AA3LN GE LEE PSE <AS> PKT
	STN	GE K3NNI PKT QRU
	NCS	K3NNI GE JB PSE <AS>
	NCS	MDD DE K3GHH QNI (FIRST OPEN NET CALL FOR NON-LIAISONS.)
	STN	W (SINGLE LETTER QNI METHOD STANDARD FOR MULTIPLE RESPONDERS.)
	NCS	W
	STN	W3ZNW GE JN QRU
20	**NCS**	W3ZNW GE WOODY PSE <AS>
	STN	Y (TAIL ENDING THE <AS>.)
	NCS	Y
	STN	GE JN W3YVQ QRU
	NCS	W3YVQ QNQ UP 6 KC3Y BALTO 1 (SINGLE ADDITION TO STACK.)
	YVQ	T
	NCS	MDD DE K3GHH QNI
	STN	V R
	NCS	V (SELECTS V, REMEMBERS R.)
	STN	HI JN W3FZV QTC WDS NR3Q <AR>
30	**NCS**	W3FZV GE PHIL PSE <AS> R (HEARD IN EARLIER ATTEMPT.)
	STN	GE AA3SB QRU
	NCS	AA3SB GE RBN <AS>
		(NO TAIL END CALLS.)
	NCS	MDD K
		(NO RESPONSES)
	NCS	N3DE TNX HRY 73 QNX
	DE	TU JN 73 N3DE GE
	NCS	GE AA3SB QRU RBN TU 88 QNX
	DE	88 AA3SB E E
40	**NCS**	E E MDD K
	STN	3Q (3Q RETURNS, JOB COMPLETED.)
	NCS	NR3Q W3FZV DN 10 WDS W3FZV QNX 73 K
		(IMMEDIATE DISPATCH AND EXCUSE.)
	3Q	T (NORMAL ACK, NOT EXCUSED.)
	FZV	R TU 73 W3FZV G (FZV SIGNS OUT SINCE EXCUSED.)
	NCS	GE MDD K
		(NO RESPONSES)
	NCS	WA3WIY TNX HAL QRU 73 QNX
	WIY	73 JN WA3WIY GN
	NCS	GN MDD K
50	STN	YVQ
	NCS	YVQ
	STN	3Y
	NCS	KC3Y TNX MSN QRU 73 QNX (IMMEDIATE ACK AND EXCUSE.)
	STN	73 KC3Y E E
	NCS	E E DE K3GHH MDD K
		(NO RESPONSES)
	NCS	AA3LN TU BTN QRU 73 QNX
	LN	R 73 JN CU AA3LN E E

	NCS	E E MDD K
60		(NO RESPONSES)
	NCS	K3NNI TU PKT QRU 73 GE QNX
	NNI	73 K3NNI E E
	NCS	E E W3YVQ QRU 73 QNX
	YVQ	73 W3YVQ GE
	NCS	W3ZNW TNX WDY 73 QRU QNX
	ZNW	73 JOHN W3ZNW E E
	NCS	E E MDD K
	STN	3Q
	NCS	NR3Q TNX RAY QRU 73 QNX
70	3Q	R 73 CU NR3Q GE
	NCS	GE MDD K
		(NO RESPONSES)
	NCS	MDD QNF 73 DE K3GHH <SK>

5.8.7 SECTION CW NCS SHEETS (Traffic list method.)

NCS SHEET (shown at line 71 just before QNF in transcript)

MDD* 142300ZMAR	STN	TRAFFIC	QTY	QSP FREQ
NCS K3GHH	3Y	3RN	(2)	NR3Q +6 1
3RN3 N3DE o		BALTO	(1)	YVQ +6 2
3RN4 NR3Q o	FZV	NR3Q	(W)	NR3Q -10 1
DTN WA3WIY o				
MSN KC3Y o				
BTN AA3LN o				
PKT K3NNI o				
W3ZNW o				
W3YVQ o				
W3FZV o				
AA3SB o				
QNI/11 QTC/3	QNF/			

Liaisons pre-listed on left and called in order, additional QNI below. Stations with QTC shown under STN, QTC under TRAFFIC, Qty. in digits or W for Words, assigned to QSP station, dispatched up 6 or down 10 in order shown. QTY circled when QSP returns, left unchanged if NO JOY, crossed out if canceled. Excused stations appended with “o”.

5.8.8 SECTION CW NCS SHEETS (Marker method.)

NCS SHEET (shown at 71 just before QNF in transcript)

MDD* 142300ZMAR	TRAFFIC	QTY	QSP	+6	-10	.
NCS K3GHH						
3RN3 N3DE o						
3RN4 NR3Q o						
DTN WA3WIY o						
MSN KC3Y o	3RN	2	3Q	1/		
	BALTO	1	YVQ	2/		
BTN AA3LN o						
PKT K3NNI o						
W3ZNW o						
W3YVQ o						
W3FZV o	NR3Q	W	3Q		1/	
AA3SB o						
QNI/11 QTC/3	QNF/2313Z					.

One line per station. Liaison assignments are written in as stations QNI. Traffic listed under TRAFFIC, QTY digits or “W” for Words, and QSP as assigned to RX. When dispatched the freq. column is marked with the order number at the stack, crossed off when stations return, or may be marked by moving magnets or hex nuts as in Area/Region sheets. QTY digits circled when traffic passed and stations return, left unchanged if no joy, struck through if canceled. Excused stations marked as “o”. FZV was excused in advance down 10, marked “o” as dispatched..

5.8.9 SECTION CW NET REPORT

Example Section CW net report.. Consult with the Net Manager for the desired format for the specific net.

23 R K3GHH 24 BALTO MD MAR 14
WJ3K <BT>

MDD	TUE	MAR	14	2300Z
QTC	THREE	IN	13	MINS
QNS	K3GHH/NCS	N3DE/3RN3	NR3Q/3RN4	WA3WIY/DTN
KC3Y/MSN	AA3LN/BTN	K3NNI/PKT	W3ZNW	W3YVQ
W3FZV	AA3SB	X	73	

<BT> K3GHH <AR> N

Some nets report only suffixes except for newcomers which would be shown full call sign with name and QTH appended as in N3XYZ/BOB/SPARKS. Other nets may report statistics as mixed groups QNS/11 QTC/3 QNF/2313Z, and perhaps the duration rather than end time as QND/13.

5.9 NEW TRAFFIC HANDLERS

As NCS you may wish to share with new stations the training material in this manual, and perhaps the following tips regarding moving up in the NTS system.

As a new station participating in traffic handling it will seem at first like there is a great deal to learn. One of the easiest ways to get your feet wet is to join a training net in your area. Some nets like the Maryland Slow Net welcome trainees from anywhere in range (80 meters, 3717 kHz, 19:30 daily local time. They will assign you to go off the net frequency with a personal trainer who will help you with your sending, basic traffic handling and net operating skills, send you training radiograms, and help you become proficient and comfortable in short order.

You may also learn a great deal about traffic handling and net operating by simply listening to the nets in your area. The ARRL Net Directory lists all registered nets in your Section as well as the NTS nets covering your area. Local traffic handlers and members of ARES/RACES, and the Section Traffic Manager or Section Emergency Coordinator, can help you with training literature.

Remember to ask your home net NM to provide you with a “Net Certificate” to recognize your traffic net participation once you get involved.

You may also apply for the ARRL appointment of “Official Relay Station”, or ORS, to recognize your interest in the NTS and willingness to adhere to good operating practices and handle radiograms faithfully. Contact your Section Traffic Manager for details and assistance.

If you find the NTS a rewarding experience, you will be joining a long tradition of devoted traffic handlers practicing an art since 1914 in service to the public.

Good luck and have fun!

5.10 NEW LIAISONS

Liaison stations carry traffic between NTS nets. They are the links that make the NTS system work. If you have learned how to handle traffic, receive and send single and multiple messages and books, you should be able to take a liaison job. Check with the NCS or Net Manager regarding the particular requirements for the liaison job of interest. Section liaisons to Region nets, for example, are expected to attend both Region sessions in a given NTS cycle. Check also that your equipment and antennas are suitable for operating on the target net.

Liaisons from Region nets to Area nets are either transmit reps (TX) or receive reps (RX). Although there are various arrangements made, it is often customary for the RX rep to be NCS on an early Region net, the TX rep being busy accepting traffic to carry to the Area net. The RX rep then goes to the Area net to accept traffic for the later Region session. The TX rep returns to that later Region session to be NCS, relieving the RX rep to pass traffic. Sometimes the TX and/or RX reps do not run the Region nets. You may volunteer to be a liaison to Area without being obligated to be Region NCS.

Learn how "through" traffic is listed on your Region net. It is usually directed to one of the three Area nets, EAN, CAN, or PAN. Traffic for other Sections in your Region net are identified and listed for the Section name (or sometimes the Section net name if different). These Section liaison names can be learned by listening to the Region net a few times. See chapter 4, for details on liaison assignments and listing traffic.

As a liaison from your Section net to the Region net, listen for the opening of the Region net and see if the NCS is calling for liaisons by net name, as in "EPA" on CW, or "Eastern Pennsylvania Please" on voice, or if the NCS is calling for stations to check in with an open call, as in "3RN QNI" or "Third Region Net... stations with or without traffic please".

If the call is by net name, you simply check in when your net is called. Assume for the examples you are from the EPA Section net, as in:
NCS: QNA EPA
YOU: W3XX EPA QRU; if you have no traffic; or
YOU: W3XX EPA QTC EAN 2 WPA 1 <AR>; listing your traffic.
NCS: W3XX GE TU PSE <AS>; acknowledging you

If the NCS makes an open net call, use the single letter method for checking in:
NCS: 3RN QNI
YOU: X
NCS: X
YOU: W3XX EPA QRU; if you have no traffic; or
YOU:W3XX EPA QTC EAN 2 WPA 1 <AR>; listing your traffic.
NCS: W3XX GE TU PSE <AS>; acknowledging you

If you are new to the net, the NCS may ask you your name and QTH for his roster, and welcome you to the net.

Listen carefully and wait for the NCS to issue you a dispatch command to pass some of your traffic. You may be ordered to pass your traffic on the net frequency or move off the net.
NCS: W3NGO W3XX UP 4 WPA 1
NGO: T; the first station addressed acknowledges first;
YOU: T; you acknowledge and follow.
(The receiving station would call you first UP 4.)

If you are ordered to pass the message on the net, the "UP 4" would be replaced with "HR", or "HERE" on voice, or might even be omitted, implying the net frequency.
NCS: W3NGO W3XX HR WPA 1 (W3NGO would ask if you are ready to copy.)

NGO: QRV?
YOU: QRV (and W3NGO would send you the message(s)).

Remember the receiving station initiates the call off frequency. On net, the first station addressed in the dispatch makes the first call. See chapter 2 or 3, Station Operations, for the details on how to move off the net, make contact, and exchange your traffic at either location.

You may always ask a sending station to QRS if you would like a slower sending speed on CW.

Return to net, make sure there are no other business transactions in progress, then check back in by sending your suffix if your job is completed.
YOU: XX
NCS: XX; (this exchange tells the NCS you have completed your assignment); or;

If you were not able to exchange your traffic, return as above except use your full call sign (or suffix if the net prefers) followed by "NO JOY". The NCS will help you resolve the problem.
YOU: W3XX NO JOY; or W3XX NO NGO; (making it clear the job was not completed))
NCS: XX R <AS> (The NCS will wait for NGO and help solve the problem.)
The NCS may also dispatch you for other business and later make arrangements for the NGO traffic.

When all your traffic is passed, the NCS will excuse you... and you're done.

If you have sharpened you skills and are assigned as liaison to an Area net, the process is virtually the same. The NCS may use open calls or call for Region reps by name. In this case the rep name is compound, i.e., 3RN TX, or 3RN RX; "Third Region Transmit", or "Third Region Receive". Check in the same way as shown above. Full call signs will be used in the dispatches, and most traffic is dispatched off the net frequency.

You can listen to both the Region nets and Area nets to see if you can handle the pace of business and sending speeds, etc. Area nets may also need you to be ready to switch to other bands to adjust for propagation. If you are dispatched to another band and can not operate there, simply inform the NCS "Unable 20 meters.", if so dispatched, or whatever is appropriate. The NCS help will work out a solution.

Remember to ask your home net NM to endorse your net certificate for liaison duty when you have accomplished this level.

5.11 NEW NET CONTROLS
If you are participating in a Local or Section NTS net and would like to try your hand at being the NCS a few tips might be helpful.

1) Listen to the experienced net control and make note of how the net opening call is made. Note the sequence of liaisons checked into the net, and how other stations are checked in. The NCS will then assign and dispatch traffic during the net, making frequent pauses or calls to check in additional stations. Stations will be excused as soon as their business is concluded. This sequence

is the format of the net. The language used for commands and responses is the standard syntax covered in this manual.

2) The Net Manager can provide a summary of the net format for you to use, and suggest means or forms to use to keep the net records as the net is run (net control sheets).

3) Listen to the syntax used by the NCS to make the net calls, ask for liaisons or outlets for traffic, and then dispatch stations to pass traffic on the net or off net on stack frequencies. Note the language used for sending two stations off net, and that used for adding an additional station to such a stack. Listen to the language used to excuse stations. This syntax used by the NCS and net stations is based upon the standard net operating protocols used throughout the NTS. The Net Manager can provide training literature to help you understand what the syntax means and how it is used.

4) Listen to the nets from which liaisons are sent to your net, and those nets to which liaisons are sent from your net. Learn the times and frequencies of those nets from another NCS station, net stations, the Net Manager, or the ARRL Net Directory.

5) Obtain (from the NM), or make, a roster of stations who frequent your net, noting the names of the operators, their locations, areas for which they can handle traffic, and the call signs of operators who perform liaison duties. This will be a great help when you become the NCS. Use names and friendly greetings or farewells to keep a friendly net atmosphere. Try to place those words ahead of line-ending command syntax as much as possible so the net stations will know when to respond without you using “K” or “OVER”.

6) The Net Manager can provide you with specific requirements for the required net report message. Listen to and copy some net reports sent by net controls to the Net Manager reporting the details of net sessions. Reporting on each net will be part of your job as a net control. These reports should be sent to the NM as soon as possible, certainly within two days.

7) Practice keeping the record of transactions during the nets. This will help you develop your own shorthand methods for noting the listed traffic, the stations to receive it, where the traffic is dispatched, and which stations are cleared and excused. The alternate net control keeps the same records as the NCS to be ready to step in and take over the net if required. Volunteer to be an alternate net control. If your net does not use an alternate net control, you may still practice this function by simply listening and tracking the net business. Ask the Net Manager about trying your hand at the job when you feel ready. Most NCS stations will be glad to stand aside and help you take a turn at the helm.

Remember to ask your home net NM to endorse your net certificate for NCS duty when you have accomplished this level.

5.12 EAN NET CONTROL SHEET EXAMPLE

-30	-25	-20	-15	-10	-5	+5	+10	Station	1RN	2RN	3RN	4RN	8RN	ECN	CAN	PAN	ARN	---
									R									
										R								
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