

**CHAPTER 6 - NTSD - NTS DIGITAL**

Table of contents (Double click RTF, click PDF page number to section; Ctrl-Home TOC.):

6.1 NATIONAL TRAFFIC SYSTEM - DIGITAL .....	2
6.2 PROTOCOL FOR NTS DIGITAL STATION OPERATIONS .....	3
6.2.1 ARRL STANDARD MESSAGE UPLOADING.....	3
6.2.2 ONE SINGLE MESSAGE PER UPLOAD .....	5
6.2.3 VHF CONNECTIONS.....	5
6.2.4 CHECKING FOR NTS TRAFFIC ON VHF PACKET .....	5
6.2.5 EXAMPLE, LISTING TRAFFIC VIA VHF PACKET.....	6
6.2.6 EXAMPLE, SENDING NTS TRAFFIC ON VHF PACKET .....	8
6.2.7 HF DIRECT DOWNLOADING AND UPLOADING COMMANDS.....	10
6.2.8 UPLOADING FILES OF MULTIPLE MESSAGES, SMF COMMAND .....	10
6.2.8.1 SMF EXAMPLE.....	11
6.3 INTERFACING WITH SECTION NTS SSB AND CW NETS .....	12
6.4 WHY DIGITAL? N4SS .....	13
6.5 EQUIPMENT AND SOFTWARE REFERENCES.....	14
6.6 NTSD FREQUENCY LIST (MAY 2002) .....	14
6.7 NTS DIGITAL GUIDELINES, NTSDGD4.....	15

Extensive contributions from N3QA and N4SS are appreciated.

CHAPTER 6 - NTSD - NTS DIGITAL

**6.1 NATIONAL TRAFFIC SYSTEM - DIGITAL**

NTS Digital (NTSD) is currently configured as a parallel system to the manually operated NTS nets, providing 24 hour continuous service as links between Regions through manned BBS stations operating on multiple HF bands. Hubs in each of the three U.S. NTS Areas, Eastern, Central and Pacific, are key stations in the Area interconnects.

The Regional NTSD stations have access to and from Section level liaison packet operators by way of VHF/UHF packet interfaces. These packet liaisons carry traffic to and from the Local and Section NTS manual nets, thus providing the links to origination and delivery.

Area and Region digital coordinators are assigned to manage the system throughout the NTS.

Since they are manned stations, traffic routed via the NTSD is monitored to assure that traffic is kept moving, and any path loss is circumvented by manual intervention... the traffic being diverted to the manual nets as necessary.

These stations often operate with scanning radios capable of being accessed on the optimal band for the path desired. Although there is a variety of software available for such BBS operation, numerous stations are using WinLink as a platform and Pactor as the HF mode. VHF/UHF links are often via normal ground packet direct, or via a large variety of packet node station interconnections.

NTSD handles only ARRL formatted formal radiograms.

The following overview of NTSD operation is provided by the former Third Region Digital Coordinator, N3QA, and the Eastern Area Digital Coordinator, N4SS, for which we are very grateful.

**All call signs used in this manual are intended to be generic for tutorial purposes and not related to the holders of those call signs in any way.**

## 6.2 PROTOCOL FOR NTS DIGITAL STATION OPERATIONS

### 6.2.1 ARRL STANDARD MESSAGE UPLOADING

Sample ARRL Formatted Message for Digital Systems. Note that the entire message, including preamble, address, text and signature, is uploaded in the TEXT upload to the digital system. The "TO" and "SUBJ" fields are used for routing purposes.

(BBS prompt: Enter "To" line.)

ST 99999@NTSCA <enter>

Subj.

QTC SOMETOWN / 555 555 <enter>

Msg.

NR 1 R HXG N3QA ARL 5 CHESTERTOWN MD JAN 1 Preamble..

GUY ANYONE

123 MAIN STREET

SOMETOWN CA 99999

555 555 5555

ARL FIFTY SEE YOU SOON

JOHN Q PUBLIC

/EX <enter>

(Text example with OP NOTEs shown.)

NR 1 R HXG N3QA ARL 5 CHESTERTOWN MD JAN 1 Preamble

GUY ANYONE

123 MAIN STREET

SOMETOWN CA 99999

555 555 5555

OP NOTE DELIVER ON WEEK DAYS

ARL FIFTY SEE YOU SOON (text)

JOHN Q PUBLIC

OP NOTE REPLY VIA N3QA 3RD REGION NTSD

/EX <enter>

(Notes.)

**TO:** upload line.

**SUBJECT:** upload line.

**MSG.:** field lines:

Address

< blank line or BT, text start

Text

< blank line or BT, text end

Signature

< blank line for clarity

**UPLOAD**, message end.

(Text field)

Preamble

Address

Address OP NOTE

< blank line or BT, text start

< blank line or BT, text end

Signature

Signature OP NOTE

< blank line, no characters

**UPLOAD** message, end.

Once the BBS sees the /EX at the start of a new line, your message will be acknowledged and stored on the BBS for forwarding. You may then enter another message by using the "ST ....." command again or end the connection by using the "B" for Bye command.

NOTES:

ST

(S)end (T)raffic - "To" line introducer, used to indicate an NTS message, followed by a space.

**W3YVQ.v6.04-5/02 PSCM APP. B, NTS MPG - NTS DIGITAL P 6-4**

ST 99999@NTSCA	To: Destination Zip Code and the letters NTS followed by the STATE (not ARRL Section) abbreviation of the destination. There may be spaces between the parts, i.e., 99999 @ NTSCA.
QTC	QTC (message): Subject line introducer, followed by a space.
QTC SOMETOWN / 555 555	Subject line. Town of the destination and the area code and prefix of the phone, or "NO PHONE", and/or call sign of an amateur addressee; 30 characters max., including the QTC.
NR (#)	NR, space, (#): Serial number of your message. Usually starts with "1" at the beginning of a year or month. Preamble starts at this point.
R (Precedence)	<u>R</u> outine precedence. The standard precedence level for normal message traffic. Others: <u>P</u> riority, <u>W</u> elfare, <u>E</u> MERGENCY. The word <u>T</u> EST precedes the precedence for exercise messages.
HXG (Handling- Instructions)	Delivery by mail or toll call not required. If expense involved, cancel message and send a service message to the originating station.
N3QA (Stn-of-Orig)	Call sign of the station originating the message.
ARL 5 (Check)	Check (word count) of the text portion of the message. In this case the ARL indicates that the message contains an ARRL Numbered Radiogram text. There are many ARL numbered messages to make the message transmission shorter. See Ch. 1.
CHESTERTOWN MD	Place-of-Origin. Place where the message originated (the location of the person for whom the message is originated).
(Opt. Time-Filed)	Not shown. 24 hour UTC unless marked EST, etc. (1830EDT), placed just before a space before the month.
JAN 1	Month and day the message originated, UTC unless Time-Filed is not Z, then time and date must agree. Preamble ends at this point following the day figure(s).
ADDRESS:	The name, address, and telephone number of the addressee follow the preamble. Address begins on a new line.
Address OP NOTE	Follows the end of the address if needed (re delivery). New line.
(Blank line or BT)	Blank line marks the start of the text. A "BT" may optionally be used on a line of its own as a break between the address and the text (for those who use software with BT's to generate their messages). The "BT" is consistent with the <BT> and "BREAK".
TEXT:	Next comes the text of the message. (Note that exercise message texts contain the words "test message", or "exercise" as the first and last groups of the text.
(Blank line or BT)	Blank line marks the end of the text. A "BT" may optionally be used as a break between the text and signature (as above).
SIGNATURE:	Name of the person(s) sending the message.

Signature OP NOTE (/EX spacing)	Follows the signature if needed (re reply). New line. Blank line precedes the following "/EX" for clarity (no characters.).
/EX	The characters which tell the BBS that the message is ended. The "/EX" or "/ex" must be the only characters at the beginning of a new line. Commands may be in upper or lower case.

\* Message formatting on the digital modes is best done with a simple, but precise, method. In the above example note that there is no line space between the preamble section and the address section. There is a blank line (or "BT") between the address and the text section and a second blank line (or "BT" ) between the text section and the signature section of the message. Keep the message text to five (5) words per line. That makes confirming the word count, or check, simple for the receiving operator.

### 6.2.2 ONE SINGLE MESSAGE PER UPLOAD

Booking is considered poor practice on digital systems and is difficult to process at the delivery points.

### 6.2.3 VHF CONNECTIONS

This exact protocol is specific to NTS Digital station N3QA. The procedure is the same for any WinLink station. N3QA operated on 145.650 MHz packet radio from Chestertown, Maryland, on the Eastern Shore. VHF packet stations that could not connect on a direct path could access N3QA through the NEBALT node (KE3GP-8) port 1, which was also on 145.650 MHz, or via any other node with a good path to the NEBALT node. Many VHF SYSOPS have nodes on multiple frequencies: Thus the need to indicate the port on the node stack corresponding to the frequency desired for the connection, e.g., C 1 N3QA in the sample text. The number "1" in the command indicates to the system that one needed to put out the call to N3QA on 145.650 (port 1 on NEBALT). If the system operates on only one VHF frequency, it may be that only a sequence like C N3QA is required.

The above connect sequence will be similar on any VHF packet system. In general, for a single frequency system:

C (CALL SIGN)

On a multiple frequency system:

C (PORT #) (CALL SIGN).

### 6.2.4 CHECKING FOR NTS TRAFFIC ON VHF PACKET

Note that on WinLink stations there is a special command for listing NTS traffic that is still pending. The command is not found on most packet BBS software. It is: "NTS".

The LT command to List Traffic is also available. The LT command lists all NTS traffic including those messages which have already been forwarded but have not been archived.

NOTES: On WinLink a keyboard operator would see a total of six (possibly eight if bulletins are allowed) status code two-letter combinations. The first letter is either P or T or B: P for Personal messages, and T for Traffic (NTS) messages, or B for bulletins.

The second letters are: N for Not forwarded to a distant station nor accepted by a local station; Y for Yes forwarded or accepted; and K which means the message is in the process of being forwarded at that very moment on another port (HF or VHF).

Most of the NTSD stations do not allow bulletins. On those which may, the Y/N/K have the same meaning.

On different BBS stations there are other status letters in use. Most frequently: Y on WinLink equates to F for Forwarded on the most popular FBB type packet BBS. P/T/B are the same as is N.

### 6.2.5 EXAMPLE, LISTING TRAFFIC VIA VHF PACKET

Simulating N3DE as “you”, N3QA as the NTSD station:

\* YOU (N3DE as EXAMPLE):

C NEBALT

{Connected to NEBALT....

C 1 N3QA

\* BBS Response (blank lines not shown):

[WinLink-2.9-BFHIMR2T\$]

3RN NTS DIGITAL - NTS ONLY

Accepting NTS messages for destinations outside of 3RN.

Use command NTS to list NTS messages awaiting action.

New HF pactor scan freqs effective 10 March 2000.

Info on the web at: [www.qsl.net/n3qa](http://www.qsl.net/n3qa)

(Use lower case letters)

You have 360.0 of 360 daily BBS usage minutes left.

N3DE de N3QA>

\* YOU:

nts

NOTE: The listing for “LT” looks the same as the example below, however it includes traffic that has already been accepted or forwarded. The “NTS” command is a major step toward avoiding dupes. It is unfortunate that none of the BBS system except WinLink contain such a command. Many local ops on a packet BBS will read an NTS message and act on it, but not kill it at the BBS. Any operator following would see that the message had been read, but would have no idea as to whether or not it was accepted for delivery or forwarding.

Most VHF BBS use the “TF” to indicate that a message has been forwarded to another BBS. One should NOT download for action any message that has been forwarded. On WinLink the equivalent is “TY” to indicate an NTS message which has been forwarded.

If one uses the command “NTS” rather than “LT” one will never be shown messages that have been forwarded or accepted for delivery. On WinLink there are four traffic status indicators. Note the following:

1) TN for Traffic NOT previously accepted by a station checking nor forwarded to another BBS.

**W3YVQ.v6.04-5/02 PSCM APP. B, NTS MPG - NTS DIGITAL P 6-7**

2) TY for Traffic YES it has been forwarded. Do not download TY marked traffic for delivery or forwarding.

3) TK is traffic that is in the process of being sent on another port, e.g., on an HF port if one is checking in on the VHF port.

Persons using the NTS command will never see any of these except TN which represent available traffic.

\* BBS Response to the "nts" request:

NR	TS	SIZE	TO	FROM	AT	FILED(Z)	SUBJECT
21305	TN	512	NTSMD	WX4H	NTSMD	0314/1822	WALDORF 301 555
21304	TN	973	NTSMD	WX4H	NTSMD	0314/1822	BOOK OF THREE MD
21303	TN	269	34467	WX4H	NTSNH	0314/1821	MORLAND 603 399
21302	TN	371	01436	WX4H	NTSMA	0314/1821	BALDWINVILLE 978 939

N3DE de N3QA>

\* You (seeing one for MD):

R 21305

\* BBS Response:

Nr: 21305 To: NTSMD From: WX4H Filed: 03/14 18:22 UTC  
WALDORF 301 555

NR 1400 R HXG AD4IH 15 SAN MARCOS CA MAR 14  
ROBERT L SOMEONE  
5105 SOME ST  
WALDORF MD 20601  
301 555 5555

MAKE USNCVA REUNION 2000 THE  
BEST EVER X SEE YOU  
IN SAN DIEGO IN SEPTEMBER

SCOTTY DAVIS REUNION HOST  
SVC TO AD4IH LAKELAND FLORIDA

Accept NTS Message (YES, NO, CANCEL)?

NOTE: Unless "YES" is the response when an operator is asked if he accepts the traffic, then it remains available for a different operator to receive. There is no need to relist unless one mistakenly responds "YES" rather than "NO".

"CANCEL" is only available to the operator to whom the message is addressed or to the operator who put the message onto the system. It allows for "cancellation" of the message if there is an error. Other operators who attempt to "CANCEL" receive an error message.

\* You (Note you must use YES or NO. Y or N will not be accepted):

YES

## W3YVQ.v6.04-5/02 PSCM APP. B, NTS MPG - NTS DIGITAL P 6-8

NOTE: Entering "YES" converts the listing of the message status to "TY". On WinLink one should never read a message with "TY" status to deliver or forward on a local net. The exception to that is if the operator who originally accepted the message lost it and wanted to re-read the message again. He could then issue the "LT" command and get the listing of all traffic (forwarded and not forwarded) remaining on the system. Messages are not "Killed," but remain on the system for a certain period of time. Again, the use of the "NTS" command prevents a lot of problems concerning dupes.

\* BBS Response:

NTS Message Accepted

N3DE de N3QA>

\* YOU (If there are more messages you can handle then issue another R # command. Otherwise use the B for Bye command):

b

NOTE: In the listing of traffic available above there is a message listing "booked" traffic. Unfortunately the only way an operator can see where the traffic is actually destined is to read the message using the "R #" command. The operator should NOT accept the traffic if he cannot handle it.

This situation should be avoided by the practice of putting each message in as a separate piece of traffic. Booked traffic works well on CW and Voice nets, but it does not on digital. The exception is that a packet representative from a section net could accept booked traffic and disseminate it at the section level.

### 6.2.6 EXAMPLE, SENDING NTS TRAFFIC ON VHF PACKET

Simulating N3DE as "YOU", and N3QA as the NTSD station.

\* YOU (N3DE as EXAMPLE):

C NEBALT

{Connected to NEBALT....

C 1 N3QA

\* BBS Response (blank lines omitted):

[WinLink-2.9-BFHIMR2T\$]

3RN NTS DIGITAL - NTS ONLY

Accepting NTS messages for destinations outside of 3RN.

Use command NTS to list NTS messages awaiting action.

New HF pactor scan freqs effective 10 March 2000.

Info on the web at: [www.qsl.net/n3qa](http://www.qsl.net/n3qa)

(use lower case letters)

You have 359.5 of 360 daily BBS usage minutes left.

N3DE de N3QA>

\* YOU:

ST 99999 @ NTSCA



**W3YVQ.v6.04-5/02 PSCM APP. B, NTS MPG - NTS DIGITAL P 6-9**

NOTE: The spaces between the 99999 and the NTSCA are optional. Personally, I like to put them in simply because it is easier to read for the person typing them into the system.

\* BBS response:

Subj:

\* You:

QTC SAN SOMEWHERE / 415 555

NOTE: For an NTS message the subject is formally supposed to begin with "QTC" followed by the city of destination. The phone area code and exchange should be given in the listing if they are available. If there is no phone number it is best to include that information as "NO PHONE". Messages should have a phone number for the addressee if it is at all possible. If there is an amateur call for the addressee that should be listed. Note that on most BBS systems there is a limit of about 30 characters in the "subject" line. More will be truncated.

\* BBS Response:

Msg:

\* You:

NR 1 R HXG N3DE 15 BALTIMORE MD MAR 13  
DAN ANYONE  
123 SOME STREET  
SAN SOMEWHERE CA 99999  
415 555 5555

ARL FIFTY ALL IS WELL  
HERE X WE HOPE THE  
SAME WITH YOU X LOVE

MOM AND DAD

/EX

NOTE: The BBS only stops accepting text when the /EX is received at the beginning of a new line. Otherwise, the actual NTS message preamble, address groups, body, and signature are all "text" to any BBS. A blank line before the "/EX" line helps to make the end of the signature section easier to read for the receiving operator. It is good form.

\* BBS Response:

Message Filed  
N3DE de N3QA>

\*You:

B

(BYE, disconnect command)

NOTE: Letter case does not matter on the commands. In practice many hams use upper case all of the time to avoid the need to capitalize words. If you wish to post an additional message simply issue an additional "ST" command.

### **6.2.7 HF DIRECT DOWNLOADING AND UPLOADING COMMANDS**

When connecting directly to the NTSD station the commands for listing traffic, downloading traffic, and uploading messages are the same as above without the need to establish connections through other packet BBS links.

Remember, when on HF pactor or amtor, unlike a packet BBS, there is only ONE QSO permitted at a time. Multiple connects are not permitted. Listen before transmitting, and also remember that such fixed NTSD stations do not "own" their frequency. Give the right of way to any QSO's in operation on or near the desired calling frequency.

Note that on NTSD there are HUB stations in the Eastern, Central and Pacific Areas. They are N4SS in the East, W5SEG in the Central, and K6YR in the Pacific areas. Most traffic for out of area flows through the hub stations, but at times any of the NTSD stations acts as a mini-TCC and goes direct to another area's hub. See the latest frequency list.

### **6.2.8 UPLOADING FILES OF MULTIPLE MESSAGES, SMF COMMAND**

This command is for keyboarders only. It allows a keyboarder to prepare a file of messages to be uploaded to a WinLink MBO. This file must contain all the required commands normally used to send files: each message must begin with a Sx command, followed by the title of the message, the message itself and the terminating /EX line.

The /EX line may then directly be followed by the next Sx command. Make sure there are no extra blank lines in-between.

The message file is terminated by the /EOF line, that is a line with the characters /EOF beginning in position 1 of the line. The /EOF follows directly on the next line after the /EX of the last message. (See the example in the next section.)

After WinLink receives the /EOF it will acknowledge the transmission.

#### **\* CAUTION:**

Any addressing errors detected by WinLink will terminate the link immediately along with an appropriate explanation. The user should then correct the message file accordingly and remove all preceding messages from that file as they have already been received by WinLink. Failure to remove those messages will result in duplicate messages sent.

-----

Keyboarders will find that this means of "uploading" traffic is significantly faster than the traditional means of typing commands and text. Not only does it speed up the typing part, it also eliminates all the link change-overs associated with interactive operations.

MBOs and BBSs should not use this command to move messages due to the lack of BID/MID control on the receiving end.

6.2.8.1 SMF EXAMPLE

ST N3QA	(UPLOAD ADDRESS)
QTC N3QA	
	(BLANK LINE)
NR 2403 R KJ3E 18 CALIFORNIA MD AUG 24	(MSG 1)
CAL N3QA	
	(BLANK LINE)
HAL HF MODEM ARRIVED THIS	
AFTERNOON X LOOKS NEAT X	
TAKING MY TIME SETTING IT	
UP X 73	
	(BLANK LINE)
AL KJ3E	
	(BLANK LINE)
/EX	
ST L8L6L6@NTSON	(MSG 2)
QTC HAMILTON / VE3ABC	
	(BLANK LINE)
NR 2402 R HXG KJ3E 16 MONETA VA AUG 24	
RICHARD APPLE VE3ABC	
800 KENWOOD AVE	
HAMILTON ON L8L 6L6	
	(BLANK LINE)
PLEASE SEND A SASE TO	
FISTS QSL BUREAU TO RECEIVE	
SIX QSL CARDS THERE FOR	
YOU	
	(BLANK LINE)
STAN K4UK	
MGR FISTS QSL BUREAU	
	(BLANK LINE)
/EX	
ST L4R2H1@NTSON	(MSG 3)
QTC MIDLAND / VA3XYZ	
	(BLANK LINE)
NR 2401 R HXG KJ3E 16 MONETA VA AUG 24	
KENNETH SMITH VA3XYZ	
20 ALLEN ST	
MIDLAND ON L4R 2H1	
	(BLANK LINE)
PLEASE SEND A SASE TO	
FISTS QSL BUREAU TO RECEIVE	
SIX QSL CARDS THERE FOR	
YOU	
	(BLANK LINE)
STAN K4UK	
MGR FISTS QSL BUREAU	
	(BLANK LINE)
/EX	
/EOF	(UPLOAD)

### **6.3 INTERFACING WITH SECTION NTS SSB AND CW NETS**

The NTSD operates in parallel with the manual NTS system of nets. Once inbound traffic arrives at a Region NTSD station, however, the systems merge.

Operators from the Local and Section manual nets need to access the NTSD, offload the inbound traffic, and see that it is passed to the outlet stations on those nets. The majority of amateurs available to deliver traffic to the public and served agencies check into those nets.

Often the inbound traffic from NTSD Region stations is forwarded to a controlled VHF/UHF packet BBS or node station where it can be picked up by local packet operators for delivery, or forwarding to the manual nets. It is important that this packet server be monitored and controlled to assure that all NTS traffic is handled in a timely fashion, or serviced as required. An open loop packet system without such safeguards endangers the integrity of the NTS system.

Additional stations are needed, and encouraged, to establish regular contact from the Local/Section manual nets to the NTSD Region servers to receive and distribute messages. Developing equally reliable NTSD WinLink servers for each Section over the long term will enhance our capabilities. All of these stations can likewise handle outbound traffic routed via the NTSD.

In this later case, the routing of outbound traffic via the manual pathways to Region Nets, or alternatively, via NTSD, is a matter of concern. A balance must be struck between loading on the respective paths so as not to “starve” one or the other. Consult with the Section Traffic Manager in your Section for guidance on loading ratios, preferences of the leadership, etc.

Manual operators are more easily starved of motivation than automated digital equipment---an obvious concern here. The manual NTS operators, the backbone of the NTS since its inception, are a valuable national resource to be preserved. When all the advanced equipment fails, the mics and keys at individual station locations will enable us to sustain the overall system.

On the other hand, the NTS system will benefit from a smoothly operating reliable digital forwarding system, manned by live operators to assure functioning and delivery, and increased volume of error free throughput during the heaviest workloads. This will be especially evident in disaster services when the traffic loads become very high in both volume and criticality.

In mid 2000 there is a notable shortage of stations devoted to providing the link between the NTSD system and the Local and Section connections. Some traffic must be pulled from NTSD servers and forwarded to manual Region nets to get it into the target Sections. Plenty of jobs available! The NTSD folks have put the effort into building the system---give them a hand.

Hopefully, in the near term, these two systems will work together hand in glove to improve NTS service overall.

## 6.4 WHY DIGITAL? N4SS

### THOUGHTS ABOUT "WHY DIGITAL."

by Nick Zorn  
Eastern Area ADC

1. Digital is approximately equal to CW in weak signal ability to successfully pass messages. There are instances when each is superior to the other. Both CW and digital are superior to 'fone in weak signal conditions.

2. Digital is superior to both CW and 'fone in accuracy. Further, messages handled via digital circuits present themselves in printed form which eliminates the problems most of us have, even with our own handwriting. Mine is seriously deficient. Also, digital always sends things perfectly, which is something I can't say for my own CW sending. Also, digital receives perfectly or not at all. Current software allows for compression which reduces the size of a given message to be transmitted and also adds more error checking functions.

If errors occur it merely aborts and breaks the link. So digital promotes accuracy. Please note that none of this contemplates the use of Baudot or plain ASCII.

3. Since most mbos operate continuously (except during threats of lightning damage) they offer more opportunities to transmit traffic and thus better speed than the cyclic nets. The software in use allows for scheduled fully automatic forwarding throughout the day.

4. Usually, and especially under good signal conditions over longer paths, digital can pass messages faster than they can be read by human operators. For these reasons digital is a better choice for Area and probably Region operations. It must be stressed that digital can only augment and never replace local and section nets because of the origination and delivery functions.

5. Contrary to present practice, digital is more suited than 'fone for non-tactical emergency communications. In situations where accuracy is critical digital is the only choice. Appropriate equipment and support (and access) will have to be provided for digital to provide the support that it is capable of to served agencies.

## 6.5 EQUIPMENT AND SOFTWARE REFERENCES

Information about mbo and keyboarder software may be found at [www.winlink.org](http://www.winlink.org) on the Internet. Be sure and read the guidelines presented there concerning versions available and how stable they are. The Airmail software is recommended for beginners and those who intend to keyboard only.

AirMail is not only for beginners. It is great software to connect with the WinLink BBS systems. (In fact, it is required to connect with any of the WinLink 2000 BBS systems around the world which forward not only radio messages but also email. At this time none of the NTSD sysops use WinLink 2000. They probably will not do so for some time.)

Once a connecting station using AirMail is recognized as a regular user, the WinLink sysop can assign traffic destined for that station to be automatically downloaded to the station. The AirMail software will automatically accept it and put it into the Inbox - just like an email system. This works not only with personal messages, but also with NTS messages, either by call sign, Zip Code, State, etc.

At this time (mid 2000) AirMail is compatible with SCS, AEA, KAM, and MFJ data controllers. It is not yet compatible with the HAL P-38 or DXP-38 controllers.

For hardware questions refer to the manuals for your TNC and the Winlink Help files. For more involved questions contact the Area Digital Coordinator or an experienced Winlink mbo Sysop.

## 6.6 NTSD FREQUENCY LIST (MAY 2002)

Consult NTSD station lists provided on NTSD server resources for station frequencies, schedules, modes and links.

All FSK frequencies are mark. Use LSB. Stations using AFSK will have to tune approximately 2100 hertz above the desired mark frequency. Clover frequencies are LSB dial on all bands.

### **NTSD FREQUENCIES 2002 (All "mark" frequencies), kHz**

(Table frequencies are for pactor unless marked clover.)

3621	7066 Clover	10128	14067 Clover	21076
3622	7067 Clover	10129	14073.5	21093.5
3628 Clover	7071	10141	14096	21096 Clover
	7072.5	10143 Clover	14098	
	7100.5		14112.5	
	7104.5 Clover		14114 Clover	

## 6.7 NTS DIGITAL GUIDELINES, NTSDGD4

National Traffic System (NTS)

### NTS DIGITAL SYSTEM GUIDANCE

#### I. SCOPE AND PURPOSE

The NTS Digital System (NTSD) is a continuous system of computer-assisted, automatic digital stations, serving as Mailbox Operations (MBOs), each under the control of a system operator (sysop). Forwarding operations occur on both a fully automated basis and manually depending upon prevailing circumstances, routing plans and sysop preferences. MBOs access other system MBOs automatically or manually, and “keyboard” operators access MBOs manually.

This Guidance supplements NTS Area Terms of Reference, and should be interpreted consistent with the *Public Service Communications Manual (PSCM)*, Section II, published by the ARRL. It describes routing approaches, sets NTSD station roles and coordination standards, and outlines generally accepted principles and practices within the NTSD.

#### II. NTSD ROUTING APPROACHES

Area Digital Coordinators (ADCs) have the flexibility to implement a variety of routing plans consistent with NTS principles and other requirements. One approach uses Area Digital Hubs -- MBO stations designated in the three geographical areas, Eastern, Central and Pacific by the respective ADCs, providing scheduled inter-area forwarding and coordination. This approach permits ADCs the flexibility to establish one or more such MBOs to achieve a systematic and scaled digital-routing plan under this Guidance. The area hub approach has access and capacity limitations. Another approach is an “open system” in which any digital station may forward to an MBO within an area at any time. This approach increases flexibility, but, to some extent, requires more effort by keyboarding operators to locate and poll traffic coming into a region or area.

#### III. COORDINATION AND ROLES

ADCs exchange information with respect to status and operation of MBOs and disseminate received information to the NTS levels within the area. ADC-designated digital station operators making changes will consult with and issue information through the ADC.

##### A. AREA DIGITAL COORDINATORS

1. Qualifications – ADCs must presently serve as an NTSD MBO sysop or have past MBO sysop experience and have the capability to promptly activate such an operation.

2. Duties – The ADC duties include the following:
  - a) Designate digital stations at the region and area levels;
  - b) Assign digital stations to a MBO polling schedule;
  - c) Issue standard operating procedures;
  - d) Issue certificates in recognition of participation;
  - e) Coordinate the standard frequency plan; and
  - f) Collect digital statistics and report activity.

**B. STATION OPERATIONS.** Digital station operators perform functions consistent with Area, Region and Section responsibilities as prescribed for the NTS in accordance with the PSCM. Digital station operations at the NTS section and local level are the responsibility of the Section Traffic Manager (STM). To the extent feasible, ADCs should coordinate digital operations with the STMs.

1. AREA/REGION HUB MBOs -- One or more stations are designated by the ADC as a Hub or as Hub backups and perform forwarding tasks according to the digital routing plan.

These stations:

- a) Operate fully automatically under computer control;
- b) Scan multiple bands according to prescribed plan;
- c) Auto-forward according to prescribed schedules; and
- d) Submit reports and station information to the ADC.

2. DIGITAL RELAY STATIONS (DRS) -- Perform functions of relay involving posting of message files and removing traffic from NTSD MBOs for appropriate nets or TCC functions in support of NTS objectives observing NTSD principles and practices. DRSs are designated by the ADC and:

- a) Perform assigned relay duties to clear area MBOs
- b) Route incoming traffic via area/region nets
- c) Handle assigned TCC schedules and traffic
- d) Submit periodic reports as required.

#### **IV. DIGITAL STATION OPERATING PRINCIPLES AND PRACTICES**

**A.** NTSD operates in parallel with the other NTS nets and circuits but on a continuous basis and at all levels. Access is available to all, both "keyboarders" and sysops consistent with proscribed NTSD station roles and this Guidance. Roaming in other areas is discouraged except as necessary to accomplish manual forwarding due to system failures. Stations may be excluded for causing interference or unauthorized removal of traffic.

**B.** NTSD has established a core of common frequencies covering all bands that provide suitable propagation. Area and Regional MBOs may add additional frequencies for their own forwarding use but are not required to publish the additional frequencies. This core list may change from time to time but provisions must be coordinated through the ADC with the NTSD sysops within the area. All NTSD MBOs are expected to scan the core list frequencies.



## **W3YVQ.v6.04-5/02 PSCM APP. B, NTS MPG - NTS DIGITAL P 6-17**

C. MBO sysops are encouraged to provide multiple modes, with an emphasis on the faster ones. Every effort should be made to avoid using AmTOR for MBO forwarding. Ideally an NTSD MBO should be available on PacTOR, and Clover or PacTOR II. VHF packet should be used to provide higher speed access for local "keyboarders".

The use of VHF packet should be limited to those BBSs KNOWN to be reliable for NTS use. General packet circuits should never be used to route NTS traffic. In general, a single relay by packet represents a reliable disposition of NTS formatted traffic. HF packet should NEVER be used to forward NTS traffic.

D. NTS traffic received into NTS digital circuits will be routed via NTS circuits and/or nets except in rare emergency cases when no NTS outlet is then available or some other more expeditious and reliable route is available. Such exceptions should not become the basis for establishing a routine circuit for such traffic.

E. NTSD sysops should handle their traffic giving due regard to message precedence, just as is done in the cyclic nets.

F. TCC stations may use NTSD circuits to forward traffic routed through schedules. Such traffic may be placed on the selected MBO by the sending TCC station and removed by the receiving TCC station. Use of the "P" type may be necessary to ensure that ONLY the receiving TCC station gets the traffic. Standard reports to the appropriate TCC Director are required, and traffic sent or received using type "P" should be counted as though it had been "T".

G. Counts of traffic received and traffic forwarded should be reported by the individual MBO sysop to the ADC. Originations and deliveries are not included in these reports but should be reported to the STM as part of the Station Activity Report (SAR).

H. NTS digital stations are expected to forward or ensure delivery of all traffic on hand in a timely manner. If a station experiences a system failure it is the sysop's responsibility to find a way to clear the traffic on hand. If it is not possible to extract all messages on hand from the failed disk drive, then that sysop must notify at least one of the other NTSD sysops (preferably the ADC) and ask that a notice be passed throughout the system advising of the failure. Any sysop who has recently passed traffic to the failed MBO should then review the situation and reinstate any messages so forwarded. The sysop of the failed MBO should, after recovery, try to establish which messages were on hand, pass a list of them to all other NTSD sysops for further follow up and place all of them on hold. When sufficient time has passed that no further demand is expected to be made regarding these messages the failed MBO sysop may delete them.

J. MBO sysops should participate at least occasionally in their local and section nets to maintain cyclic net proficiency.

K. Since the NTS Digital System operates on a continuous basis, traffic should never be removed from an NTS MBO and taken to a cyclic net for later transmission unless it has reached the (digitally serviced) point nearest its destination. There is one exception to this: if an opportunity exists to DIRECTLY DELIVER a message to a station for delivery through the net, then it is proper to remove the traffic from the MBO. Removing traffic from an MBO to increase the traffic count of a cyclic net only delays traffic and is not an acceptable practice.

L. Keyboarder stations are responsible for ensuring that messages they remove from a BBS or MBO are marked as forwarded (that is their status is changed to "TY" or "TF". Failing to do so will lead to duplicated attempts to relay and deliver such messages. Likewise, Keyboarders should NEVER download messages marked as already forwarded.

**V. AREA DIGITAL STANDARD OPERATING PROCEDURES**

ADCs are authorized to develop and implement Area Standard Operating Procedures (SOPs) for the designated NTSD stations within the area. Such SOPs shall be consistent with this Guidance and shall be filed with the Area Staff Chair and League headquarters.

NTSDGD4 - N4SS - EAS/CAS/PAS - 6/01

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