Bulletin boards (BBSs) have become almost ubiquitous in our packet system. In this chapter, we will look at the basic method in which these operate.   We will concentrate on the "store-and-forward" BBS; TNC "mailboxes", automatic mail programs such as LanLink, and DX spotting systems are discussed elsewhere.

While bulletin boards have become widespread, not all packeteers are enthusiastic about them; in some cases, the feelings are very negative. The cause and effect of this situation will also be considered in this chapter.

At the present time, all bulletin boards are full computers. Because of economic considerations, it does not seem practical to build a special purpose "bulletin board machine". Also, due to the human supervision generally required, it does not appear practical at the present time to locate a BBS on a remote hilltop.

Where BBS commands are discussed, there are often two forms, a short and long form. Usually, the short form is made up of the first few characters of the long form. If the long form is used, it must be entered exactly, in full. These commands will be shown as *XX[yyy]* where *XX* is the short form and *yyy* are the optional additional characters to make the long form. Thus, the command *L[ist]* could be entered either as *LIST* or *L* . Usually upper-case and lower-case characters are interchangable.

6.A HOW A BULLETIN BOARD WORKS

The primary use of bulletin boards is the receipt, movement, and delivery of messages and bulletins. We will use the term message to indicate something addressed to a specific individual; bulletin refers to something which can be read by anyone. Some other services may be provided but these represent the core function of a BBS.

Every message deposited at a BBS with a *S[end]* or *SP* (Send Personal) is given a reference number. You specify to whom the message is to be sent by callsign. The BBS uses your callsign to indicate who sent the

message. The BBS also attaches its call (and other information) to show where the message originated.

Every time you log onto a BBS, the program reads through all of the messages. If it finds any addressed to you which have not been previously read, it notifies you. If there is no notification, then there are no unread messages.

When a message is addressed to a user of the same BBS, the message remains for a time set by the BBS operator (SYSOP). If the message has not been read by that time, it may be erased.

6.A.1 HIERARCHICAL ADDRESSING: When a message is addressed to somebody at another BBS, part of the addressing includes both the BBS callsign and its hierarchical address. The address includes the state, the country, and the continent. In this form, one of the Portland, Oregon-area BBSs might be specified as KB7DBD.OR.USA.NA.

The first part of the address is the two character abbreviation for state or province. In the US, the two letter postal state abbreviation is used. There is a separator (a period), followed by the country designator. The most common designators for those of us in North America are CAN (Canada), MEX (Mexico), and USA (United States). There is one more period separator followed by the continent designator. This is needed because there are duplicate country abbreviations on several continents (such as AUS for Austria and Australia).

Some large states or states with many bulletin boards use additional address elements. For example, with California BBSs, there are addresses such as "N6AA.#NOCAL.CA.USA.NA". The letters preceded by the pound-sign (#) are commonly used as a regional designator with a state; sometimes it designates the nearest network node.

6.A.2 LOCAL MESSAGE FORWARDING: Once a message has an address, how does it move? Bulletin boards automatically connect to each other through the packet network. If the destination is a BBS which is normally in direct contact with the one where it was sent, your BBS simply says to the other one (in effect) "I have a message for you. Can you accept it?" If the answer is "yes", it is transferred. The only difference between this message and one which stayed at the BBS is a forwarding record which shows where the message went.

6.A.3 DISTANT FORWARDING: But what if the message is for a BBS

which is not in direct contact with the one where the message originated? The SYSOP must create a forwarding file which tells which of its neighbors are sent messages for various destinations. For example, on the West Coast, a neighbor which does HF forwarding might be sent all messages for states east of the Mississippi River. The BBS simply scans its forwarding file and, (usually) based on the state designator in the hierarchical address, hands the message off to the appropriate neighbor. Thus, a BBS in Washington need not know the precise location of a BBS in North Carolina; it simply sends the message in the (hopefully appropriate) direction until it is close enough to be delivered.

Each BBS though which the message passes adds its signature to the forwarding record attached to the message. This record tells where the message went and when.

6.B MESSAGES

As previously indicated, a message is something addressed to a specific individual. Lets look at the basics of message handling in somewhat more detail than in Chapter 5.

6.B.1 LOG-ON NOTIFICATION: Every time you log onto a BBS, the program compares your call with the address of messages it holds. If there are any which you have not yet read, it notifies you. In general this notification looks something like this:

```
SALEM:AF7S-1}  Connected to SRABBS:N7IFJ
[MSYS-1.12-H$]
Hello Jim, Welcome to N7IFJ's MSYS BBS in Salem, OR

You have unread mail, please kill when read:
MSG # TR  SIZE TO     FROM    @BBS    DATE    TITLE
 8559 PN   380 KA7EHK KB7IVK   ---  930225 RE: Guide
Enter command: A,B,C,D,G,H,I,J,K,L,M,N,P,R,S,T,U,V,W,X,?,*
>
```

Observe the elements of this notification. The first item is the message number. Next comes message type; in this case PN means that it is a personal message which has not yet been read. The type becomes PY after being read. The next item is size in characters. Then comes the callsign of the person to whom the message is addressed. Following that is the callsign of the person who sent the message. Depending on

the BBS style, the @BBS item may or may not show something here; in this case, there is an entry only if the message has not yet arrived at its destination. The date may be either the date it arrived at the destination or the date it was mailed. The final item is the subject as provided by the person who wrote the message. The format of this information may differ among BBS styles but, in general, all contain about the same information.

6.B.2 READING MESSAGES: With almost all BBSs, *R[ead] ####* (where #### is a number) will provide you with the text of the message of the number you specified. You will not be able to read messages addressed to others. Most BBSs allow you to read several messages in one "batch". The usual format is *R[ead] ###1 ###2 ###3* (where ###1 is the number of the first message, etc.) I usually limit such batches to 4 messages or so if they are not too large (say 1000 characters or fewer).

Many BBSs accept the command *RM[ine]* (ReadMine). This command usually gives you the text of all unread messages addressed to you.

6.B.3 LISTING MESSAGES: Almost all BBSs recognize *LM [ine]* (ListMine) as the command to list all messages addressed to you, whether you have read them or not. In some cases, this list also includes messages you have sent. This list does not give you message text, only the basic information about the message.

6.B.4 KILLING MESSAGES: Again, with almost all BBSs, *K[ill] ####* will kill (erase) message number ####. You cannot kill a message which you did not send or was not addressed to you. Unless there is a definite reason not to do so, please kill messages after you read them. They occupy disk space on the BBS computer and will stay there until the SYSOP's time limit runs out.

6.B.5 VERBOSE READ: If you are interested in how a message arrived at your BBS, try a verbose read. In some programs, the command is *RH ####* (ReadHeaders) and in others, *V ####* (Verbose) This gives you the message with the forwarding log. Here is an example:

```
rh 8629
MSG # TR  SIZE TO      FROM   @BBS    DATE     TITLE
 8629 PN  1125 KA7EHK N7HYD  ---     930227 CALLBOOK
R:930227/0636z @:N7IFJ.#SALEM.OR.USA.NA Salem, OR
R:930227/0339 3903@W0RLI.OR.USA.NA
```

```
R:930228/0306 3289@N7CHR.#VANC.WA.USA.NA
R:930223/0447 0@N7UVH.#INW.ID.USA.NA
R:930222/0637 8218@N7KQB.#INW.ID.USA.NA
```

This message originated at the N7KQB BBS in Idaho & was handed off the next day to the N7UVH BBS in Idaho. Three days later, it was handed to the N7CHR BBS in Vancouver, WA. From there, it went to the W0RLI BBS in Oregon and from there to the N7IFJ (destination) BBS in Salem, Oregon.

6.B.6 AUTOMATIC REPLY: A recent addition to many BBS programs is the automatic reply feature. It copies the sender information from the message you specify. The program addresses a message from you back to that sender. In this way, you avoid errors in copying this information. The command varies with BBS. With some it is _REPL ####_ to send a reply to message ####; with others it is _SR ####_ (SendReply).

6.B.7 HELP: All BBSs that I am aware of have some kind of help method. Almost universally, the _?_ tells you how to get help; _H_ also usually works. In some cases _H xxx_ (where xxx is the command you want to find out about) will tell you about that command. In other cases, it is _?xxx_. The prompt line usually gives you a list of all of the basic commands which the program accepts.

6.C BULLETINS

Bulletins were previously defined as a message which can be read by any user of a BBS.

6.C.1 LISTING BULLETINS: In general, the _L[ist]_ command will list all of the bulletins which you have not read. Here is a common example of such a listing:

```
L
MSG # TR  SIZE TO      FROM    @BBS    DATE     TITLE
 9412 B$   871 SALE    KD7H    PNW     930303 TEN TEC SALE
 9411 B$   630 ALL     KB7PLE  PNW     930303 SALE, ALINCO  DJ160
 9407 B$  1422 ALL     EB5BUF  WW      930303 IMFORMATION...?
 9404 B$  4329 AMSAT   GM4IHJ  WW      930303 Satgen205 SUN AND RADIO
COMMS
 9403 B$  2767 SALE    AA6ED   PNW     930303 SALE: Sanyo 555 Computer
 9402 B$  1436 QST     KT7H    ARRL    930303 ARLB022 FCC call sign
update
 9401 B$   605 WANT    KB6YZD ALLUSA 930303 Want Collins 75A4
```

```
 9400 B$    883 SALE    N6WMK   ALLUSA 930303 KENWOOD 440SAT, PS-50,
SP-430
 9399 B$    672 WANT    KA9UMJ ALLUSA 930303 Heath HW24 mobile mods
wanted
 9398 B$    650 SALE    KV6I    ALLUSA 930303 ARGO 509+PWR SUPPLY+CW
FILTER
 9397 B$    555 WANT    KV6I    ALLUSA 930303 BOONTON 260A Q METER
 9396 B$   1068 HELP    N9MXT   ALLUSA 930303 Info On 10meter Mobile
Help
 9395 B$    800 ALL     KF9AQ   ALLUSA 930303 Need schem Motorola G41LLB
 9394 B$    748 WANT    WE6A    ALLUSA 930303 INFO & N.B. FOR ALDA 103
 9393 B$   1274 BINARY  WD6EHR ALLUSA 930303 Binary files for ALL p1/4
```

The listing shown here is but a small fraction of the actual list which
was obtained. If it several days has passed since the last listing, it may
be very long!

Note that the information in this listing is very much like that contained
in the message notification (see 6.B.1). There are two distinct
differences. The first is under the type; here you see B$ which indicates
that it is a bulletin.   The second is in the TO column. This item is used
to very roughly categorize the bulletin. The third is in the @BBS column.
For bulletins, this item is used to specify distribution. This item is
specified by the person who sent the bulletin. You should note that these
vary from PNW to ALLUSA to WW (World Wide!).

6.C.2 READING BULLETINS: The method is exactly like reading
messages except that _RM_ does not apply here.

6.C.3 REPLYING TO BULLETINS: You may use the same automatic
reply method which is used for personal messages. See section 6.B.6
for more information.

6.C.4 SENDING BULLETINS: Bulletins are sent just like messages
except that you generally use _SB_ to denote a bulletin. Instead of the
callsign address for personal messages, pick a 6 character category it
might fall in. Read bulletin lists to observe what sort of categories are
being used. Instead of the destination BBS call, the entry should be a
distribution category; if you don't put anything here, it will stay on the
BBS where it is sent.

PLEASE! Use the smallest distribution which makes sense for your
message. Please read section 6.F.1, below, about bulletin addressing!

For subject, try to choose a concise entry of about 35 or fewer
characters including spaces. People decide whether or not to read a

bulletin largely based on this. If it makes no sense, it won't be read!

Keep the text of your bulletins concise. If you can keep it fewer than 1000 characters (12 lines, 80 characters long), you will get more readers and fewer objections to its presence.

6.D NTS TRAFFIC

NTS refers to the National Traffic System, a arm of the American Radio Relay League (ARRL). One of the major NTS activities is the movement of third-party traffic. While much of this is done by CW and voice, digital modes including packet serve well.

Because of the relative slowness of BBS forwarding, (when compared to some of the other traffic methods), packet is generally not used for relatively urgent messages. But packet does particularly well with lists which might be confusing in some other modes.

You do not need to be an NTS person to originate or deliver NTS messages. Lets look at delivery first, then origination.

6.D.1 DELIVERING NTS PACKET MESSAGES: These messages are not listed among bulletins. You must ask for a list. On most BBSs, _LT_ lists traffic.   The result (which should not be a surprise) looks a lot like lists of personal messages and bulletins:

```
MSG # TR SIZE TO      FROM   @BBS    DATE     TITLE
 9412 PT 871 97389 KD7H    NTSOR 930303 503-928-TANGENT
 9411 PT 630 97301 KB7PLE NTSOR 930303 503-233-SALEM
```


While the form should look familiar, what's in it is quite different. The entry under TO is the postal ZIP code of the addressee. The entry under @BBS is the NTS state designation; the two letter postal state abbreviation attached to NTS is used. The last part under title gives the telephone area code and telephone prefix. The latter is not required and not all messages will have it but it does make it easier to tell if the number is one you can call without a toll charge.

If you decide that it is one which you want to try to deliver, try _R ####;_ if the BBS won't do it, try _RT ####_ (ReadTraffic message number) to read it. The message should follow the NTS message format which you

will find in Chapter 23, (Volume 2). Try to deliver it quickly. When you are successful, go back to the BBS and _KT ####_ (KillTraffic message number) to erase it. If you don't, somebody else may try to deliver the same message.

6.D.2 ORIGINATING NTS PACKET MESSAGES: Originating a third-party message is just the reverse of delivering one. Use:

ST ZZZZ @NTSxx

where: ZZZZ is the postal ZIP code and xx is the two letter state abbreviation.

When subject is requested, try to include the telephone & town information as shown in the previous section.

For the text of the message, follow the standard NTS message format which is shown in Chapter 23, (Volume 2).

6.E WHITEPAGES

The WhitePages are an attempt to automatically route messages to individuals. When you log-on to a BBS for the first time (see Section 5.B.3), the information which you enter may be sent to a regional WhitePages server. This server attempts to keep a listing (much like the telephone directory white pages). The results are distributed regularly to other BBSs in the area covered by this server.

In general, the WhitePages process works well. There is, however, a rather drastic flaw in it. Suppose that you travel and take your packet equipment with you (yes, there are folks who do!) Suppose that your home BBS is in Seattle and you are in Chicago. You send a message to a friend back home. The person who receives the message attempts to answer you. But where does the message go? It goes where the WhitePages listing says you are supposed to be, not where you are.

At present, there appears that little can be done about this in areas where this system is used other than to notify the normal home-BBS sysop of the new (temporary) location. Just don't be surprised if it happens to you or a friend.

6.F COMMON CUSTOMS

Most of the customs issues on bulletin boards concern bulletins. But whether message or bulletin, both are forms of amateur radio communication and fall within the regulatory limits set by the FCC.

6.F.1 BULLETIN ADDRESSING: One of the most misused activities on BBSs is the ALL@USA or SALE@USA bulletins. Please think before you address a bulletin. Is it really important that it be distributed all over the country? There certainly some issues and items which warrant such addressing, but most do not! It may take several days or more for a bulletin to travel from one coast to another; most FOR SALE items are probably sold by the time the notice reaches the opposite coast. The resulting bulletins are just so much "trash" on the BBS!

6.F.2 LIMITED BULLETIN ADDRESSES: There are bulletin addresses which are far more limited in scope that "@USA". You can use "@USW" for the Western U.S. You can use "@PNW" for the Pacific Northwest. You can use "@ALLOR" for the state of Oregon (and there are similar designators for other states). There are even more localized addresses like "@PDX" (for Portland-area); again, there are probably similar designators in other metropolitan areas. Check with the SYSOP for these designators if you have any questions.

6.F.3. OTHER CONSIDERATIONS: Some BBSs do not welcome for sale items. Please observe or ask if you have any questions.

There are often other local "customary practices". Talk to others. If there is a problem with the customary practice, find out what is common with other BBSs in your area. If you don't like it, use another BBS. If you feel strongly about it, prepare a well-thought and persuasive argument... and use the bulletin process to present it to other users in your immediate area (but not to ALL@USA !!).

6.G THE BBS & THE PACKET NETWORK

After getting past the issue of ALL@USA and SALE@USA bulletins, the next most commonly voiced complaint is "how BBSs hurt our network!" Let's look at this concern and see how valid it is.

It is not uncommon for a BBS with reasonable access to other BBSs

which move regional bulletins to handle in excess of 100 bulletins per day. One observation suggests that bulletin sizes of about 1000 characters may be about average. Depending on the local node parameters, such a bulletin would take 8 packets of 125 message characters (and another 50 header characters per packet). At 1200 baud, each packet occupies the network for 0.5 seconds or more, again depending on node parameters. In addition, there is transmitter key-up time ahead of the packet. With modern transceivers, this might be 0.3seconds; with older, 0.5 seconds (see sections 3.F.3 and 4.G.1 for about DWait). Lets be charitable, then, and say that a packet takes about 0.8 seconds, recognizing that it may be considerably longer. A short packet is required to ACK (acknowledge) each packet and make take another 0.05 to 0.1 seconds (plus DWAIT of 0.3 to 0.5 seconds). With zero retries, the 8 packets would thus occupy one link of the network for about 8.8 seconds. Packets, of course, are not sent without wait time between them so the actual time is again a little longer. Thus, our hypothetical 100 bulletins will take up 880 seconds or 14.7 minutes for each section of the network through which they pass. If the BBS forwards every bulletin received, that BBS is occupying the local network for about 30 minutes per day with bulletins.

Now, if a BBS did not have to share the network with other users, 30 minutes per day of "network loading" per day on account of bulletins is pretty small. But this is actually an unrealistically small value.

Suppose that the local network is congested. Suppose that there are hidden transmitter nodes in portions of this network (See Chapters 8 & 9 for discussions about networking). Then the retry rate goes up. It may go way up. If the network is congested and packets takes an average of 4 tries to get through, 30 minutes becomes 2 hours. If the number of bulletins is larger, the loading time goes up also. And this still does not include message forwarding.

If a BBS forwards during "prime time" (about 5PM local to about 8PM local), the impact is quite obvious. As a result, most BBSs schedule forwarding for off-peak times (especially Midnight to 6AM, local).

This discussion, as sketchy as it is, should show the source of the conflict. Users get disconnected when a BBS hogs an inadequate network. There are at least three commonly used solutions to this problem.

One solution is to fix the network. The view of some (including the

author) is that if the network cannot support BBS forwarding, it is ill equipped to support other operations which also stress the network (such as emergencies). In this view, networks should be restructured so that there are only a few nodes on each frequency. The commonly stated guideline to maximize the capability of such networks is: no packet should leave a node on the same frequency as it came in on. This way, the retry rate is drastically reduced, the throughput goes up, and everybody is happier.

Another solution is to increase the network baud rate. This solution also increases the throughput but only so long as links are good, the retry rate is relatively low to begin with, and appropriate equipment is used.

Another solution is to have BBSs exchange packets on different frequencies than the regular network. The extreme version of this is to disallow BBS operation on segments of the network. This is the position taken by some node operators in scattered areas of the country; while the author may disagree with the philosophy behind viewpoint, I respect it. Node users should also. When the node information says no BBS use, please respect that request.