

## USER GUIDE FOR TheNet X-1J release 4

This brief note is intended for users of TheNet X-1J, and explains the basic commands. Configuration and sysop features are not covered fully.

TheNet X-1J is an extension of TheNet 1, and provides a number of new features.

The switch provides the following user commands :

Connect  
Info  
Nodes  
Routes  
Users  
Talk  
CQ  
BBS  
Host  
MHeard  
Bye  
DXcluster  
IProute  
ARP  
QUIT  
ADC

Not all commands may be available on every node as certain commands might have been disabled. If a command has been enabled, it will be displayed when you type an invalid command such as '?'. In addition, there are some commands that are available but are not usually displayed. The main ones of interest are :

Links  
Mode  
Parms  
  
Stats  
  
IPAddress  
DXCAlias  
BBSAlias  
HostAlias  
MTU  
L3MHeard

The Sysop may have customised the command list according to local needs.

In general, commands take parameters, for example to connect to GB7MXM, the command to be entered is CONNECT GB7MXM followed by return. Usually, commands are not case sensitive, ( although node aliases may be ) and commands may be abbreviated.

#### Connect

If the connect command is given on its own, then assuming that the sysop has set it up correctly, you will get connected to the local BBS.

If you give another callsign, either of a local station or a node, the node will attempt to connect you

to that station either by a level 4 connection or by downlinking. If you are downlinking, you may also specify digipeaters.

In either case, you get either a connected message or a message telling you of the failure to connect. If you enter any other command at this stage, the connection attempt will be aborted.

If you attempt to downlink with digipeating, or attempt to downlink to an invalid callsign such as a node alias with an SSID, you may get an error message depending on how the Sysop has configured the node.

Finally, if you connect to the node, then connect to another station, and that station disconnects you ( e.g. connect to a BBS and use the 'Bye' command of the BBS ), you will either get reconnected to the node or disconnected completely depending on the configuration of the node.

If you enter a node alias and get an 'invalid call' message, it can either be because the node is not recognised or it can be because the Sysop has made node aliases case sensitive.

#### Info

This command gives information about the node as a combination of a message stored in the EPROM and a message entered by the Sysop.

#### Nodes

This command gives information about the distant nodes that this node thinks it can get to. With no parameter, it shows the alias and callsign of all the nodes except those starting with a '#' character. If a parameter of '\*' is given, those 'hidden' nodes will also be shown.

If a callsign or alias is given that the node does not know, it gives an error message. If the callsign or alias of a known node is given, the node gives details of the routes it knows about that lead to that destination. The display shows one option per line, each of which consists of the path quality, obsolescence count and port followed by the callsign of the neighbour. If any route is in use, a chevron is shown against the appropriate entry.

If so configured by the Sysop, 'Slime trails' i.e. nodes without aliases that have not been the subject of a valid node broadcast, may be omitted from the nodes list.

#### Routes

This command gives information about the neighbouring nodes that can be heard. For each neighbour, the display shows the port number, the callsign, the path quality and the number of nodes accessible through this neighbour. If a route has been 'locked' by the sysop, then a '!' character is shown after an entry. The sysop may have configured the node to display nodes as callsign or as alias:callsign. If so configured, then if a node is shown as a callsign alone it means that it is not currently reachable as its node broadcasts are not being received.

#### Users

This shows who is using the node. It does not show other nodes that are using the node as a level 3 relay, nor does it show those users who have connected to the node but otherwise have done nothing.

The display shows the through connections, followed by those users who are connected to the switch and 'idle'. It also shows those users who are connected to the conferencing facility. The latter stations are shown connected to a destination called 'Talk', whilst in the case of connections, the

two endpoints are shown. For connections, two symbols are used, '<-->' and '<.>'. The former is used for established connections whilst the latter is used for connections being established.

When a through connection is established, the "<-->" symbol may be modified if one or other circuit is choked. In this version, the '-' characters will be replaced by another character if one or other link is choked. The first '-' character is associated with the left hand connection ( circuit or uplink ). The second with the other circuit or downlink. A link is 'choked' if one end or the other has signalled that it cannot at the moment accept more data and wishes the sender to pause. It is designed to be used by the sysop in locating network congestion problems.

For a level 2 uplink or downlink, the "-" is replaced by 'C' if the connection is choked. For Level 4 connections, the "-" is replaced by one of 3 characters, "R" if it is choked from the other end, "L" if it is choked from this end or "C" if it is choked from both ends !.

## Talk

The Talk command allows a group of users to hold a conference call. It also allows a user to send a message to another user of the node provided that user is connected to the switch but is not patched through to another station and is not currently trying to connect to another station.

A user enters the conference by giving the command 'talk'. He/she gets a message informing them of this and reminding them that the command to escape from the talk command is '/exit'. Any other users currently in the conference get a message from the node telling them of the callsign of the user who has joined them. At this point, every line sent by a user in the conference is copied to all other users in the conference, preceded by their callsign.

To exit from the conference, the command '/exit' is used. This causes a response message to be sent to the user, and at the same time all of those left in the conference get a message from the node telling them of the station who has left the conference. If you force a disconnect, the other stations are not told of your departure.

A string of text may be entered on the same line as the talk command when the command is given. If this is done, before the user is connected to the conference, that string of text is sent to all the other users of the node who appear in the 'user' list but are not connected to anything else. For example if GxABC were to type :

**TALK GyXYZ, Hello fred can I have a chat - type TALK**

then other users of the node ( including presumably Fred, would get the message :

**GxABC>> GyXYZ. Hello fred can I have a chat - type TALK**

on their screens. The only exception to this is that sysops are not sent the message.

Note that the TALK command will pass 8 bit data if set to by the Sysop.

## CQ

This command is used to broadcast a CQ message. In addition, the fact that you are calling CQ is indicated in the USER list. The callsign will be your own with a different SSID, and anyone else can connect to you by connecting to the callsign with the appropriate SSID.

The CQ remains 'primed' for a while, and if any other command is given to the node the CQ will be

cancelled.

## BBS

When you issue the BBS command, assuming that the sysop has configured it, you will be connected to the local BBS.

If you enter the command 'BBS ?', then the current setting of the BBS will be displayed.

## Host

The HOST command operates just like the BBS command. It may have been disabled by the sysop, it may have been set to connect to the same station as the BBS, or it may have been set to connect to another host system.

If you enter the command 'HOST ?', then the current setting of the HOST will be displayed.

## MHeard

If enabled, the heard list shows the last few stations heard. The number of entries is limited and set by the sysop so any stations not heard for a while may get pushed out of the list by others heard. Assuming that a station is not pushed out in this manner, the display shows the number of packets heard from that station since it appeared in the list and the time since it was last heard. The time is hours, minutes and seconds. The list also shows the port on which the station was heard ( port 0 is the radio port ), and if it hears IP frames or Net/Rom frames, it adds a note to show that the station is a node and/or a TCP/IP station.

If the list is long enough so that a station is not heard for 12 hours, it will get deleted anyway.

The list may also show a column headed 'Dev.'. This will only be present where the sysop has added to the node a small hardware board that measures the received signal audio level. Specifically, it gives an indication of the peak audio level. By means of a software configuration control and prior calibration, this gets converted into an indication of the transmitting station's signal deviation. It does this by sampling the audio level after every valid packet.

Care must be taken over its interpretation. It does not measure independently the two tone levels - it is assumed that whatever local standards that relate to pre-emphasis ( i.e. use it or not ) have been implemented.

Often, packet stations are set up, and the audio level tweaked until it appears to work reasonably error free. The idea of this add-on is that, having done that, you then connect to the node and display the heard list to see an indication of your actual deviation. It may then be fine tuned to set it correctly. Local advice must be taken over the correct setting as it depends on the channel spacing being used ( e.g. 12.5, 25 or other KHz ).

The meter will give the wrong answer on the following conditions :

- A badly distorted audio signal
- Badly off frequency
- Incorrect adherence to local pre-emphasis standards
- A noisy signal

If you connect, then correct your deviation to the correct display then find performance has deteriorated, it indicates one of the above problems. It is not that the meter doesn't work, it is an indication of a fault elsewhere.

It is in your own interest for those around you to use the correct deviation. The list also allows you to see the deviation of others - so apply peer pressure if someone over or under deviates. Remember it is NOT a case of the higher or the lower the better - it is having the setting RIGHT.

The system may also be used to migrate users towards a lower deviation in advance of moving to narrower channel spacing.

The heard list may also show received signal strength. It shows how strong each station is at the receiver. The display will either be in dBm format or in the familiar 'S1 to S9' format ( or 'S9+' for big signals ). To understand this properly will need some guidance from the sysop. By looking at the METER parameters you can find the noise floor in dBm, and if the display is in dBm can subtract one from the other to find out how much stronger your signal is than it needs to be. How accurate this is depends on the radio and its calibration. It could be as close as +- 1 dB or it could be wildly wrong.

#### Links

The LINKS command shows the level 2 connections to the node. This is usually of academic interest, but I use it in testing. The display shows the links, one per line, with the two callsigns, the link state, the port number and the current number of retries.

#### Mode

The MODE command is a bit like the PARMs command. It shows a number of additional parameters. These are as follows as shown by example :

#### **MODE**

**THENET:G8KBB-5> 0 1800 6 3 2 20 0 600 2 900 1 31 0 1 1 0 0**

with the following meanings :

0	Host mode protocol ( 0 = standard, 1 = DCD mode )
1800	CWID period. Delay in seconds between CWID
6	CWID speed 10's of msec per dot. 6 equals 20 wpm
3	Enable / disable nodes broadcasts mask.
2	RS232 protocol, 0 = crosslink, 1,2 or 3 are KISS
20	TxDelay in 10's of milliseconds ( Centiseconds ?? )
0	Full duplex control. 0 equals simplex
600	RS232 port nodes broadcast interval in seconds
2	Nodes broadcast algorithm port mask
900	Beacon period in seconds
1	'connect' redirector. 0 is to HOST, 1 is to BBS, 2 is to DXCluster
31	Each bit controls one of the 'user' help messages, 8 bit TALK, case sensitivity & TexNet
i/f	
0	This byte controls the broadcasting of 'hash' nodes
1	This byte enables / disables the extra alias operation
1	If set to '1', a remote disconnect on a circuit will cause a node reconnection
0	The bits of this controls the operation of the node with regard to 'slime trails'
0	The bits of this control whether digi uplinks and downlinks are permitted

If you want additional details, ask the sysop for a copy of the overview guide.

#### Parms

This shows the node parameters as per TheNet 1.01 ( I am not going to list them again here. Sorry ).

#### Bye and Quit

These commands disconnects you from the node, closing the link. It says goodbye before disconnecting you if it has been so configured by the sysop. Quit does just the same as Bye does.

#### DXcluster

If there is a local DXcluster, this command may have been configured by the sysop to connect you to it. It therefore operates in a manner very similar to the BBS command.

#### Stats

The stats command gives lots of data about the node operation. A full description of the information is contained in the overview document.

#### IProute

This command is used by the sysop to configure the IP route table. It may also be used to display the router table.

#### Arp

This command is similar to the IProute command, but shows the Arp table. The Arp table provides a translation from IP address to callsign. The final column, if present, contains the ARP timer values for each entry. This is for entries made automatically from ARP protocol messages. The timer is in minutes and the entry will be deleted when it reaches zero. Note that the node does not queue frames for transmission whilst awaiting ARP resolution. If you PING the node and it generates an ARP request, you will get a response the NEXT time you PING the node as it will have deleted the first request.

#### IPaddress

This command is used to set or display the current node IP address.

#### BBSAlias

#### HostAlias

#### DXCAlias

These commands are used to set additional aliases for the node. It can be configured by the sysop to accept connect requests ( uplinks ) to the node callsign, the node alias, or the 3 aliases shown by these commands. When the node accepts a connection to one of these aliases, it will immediately invoke the BBS, DXC or HOST commands for you. The way this would normally be used is as follows. Suppose your local ( for example ) BBS was not accessible on the frequency that the node operates on. The BBS alias can be configured to provide easy access across other nodes to the BBS. Hence in the case of the Ipswich nodes, GB7MXM does not have a port on 144.650, but the node IPS2 on 144.650 can get to it by means of another node and a 9600 baud link. If IPS2 is set to

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accept the extra aliases, and if BBSAlias is set to MXMBBS, then anyone who tries to uplink to MXMBBS in the Ipswich area would be automatically connected to GB7MXM. It goes without saying that if GB7MXM had a port on 144.650 itself, then chaos would ensue.

#### MTU

This command allows configuration of the MTUs for IP users. The parameters have the following meanings :

Parameter	Default	Controls
1	256	The MTU for the radio port, AX.25 encapsulation
2	256	The MTU for the RS232 port, AX.25 encapsulation
3	236	The MTU for the Net/Rom encapsulation
4	257	The maximum number of data bytes in a received L2 frame
5	328	The maximum number of bytes in a received L2 frame

For more details on the IP router, consult the 'overview' document.

#### ADC

This command is used to read up to 4 channels of DC voltage. Whether they are enabled, and what they read is a local decision by the Sysop.

#### L3MHEARD

This is another heard list. It records the identities of nodes that gateway Net/Rom frames through this node, together with data such as the number of frames sent, port, time since last heard and last destination node.