This disk contains the distribution version of TheNet X-1J.

1. Hardware Requirements

The software runs in a Z80 based TNC2 or similar clone such as the BSX2. It is installed as described in the bankswitch mods file, but essentially all it needs is a single piece of wire from pin 8 of the modem disconnect header to pin 1 of the EPROM.

The EPROM needed is a 27512, rather than the 27256 of a normal TNC2. Pin 1 of the EPROM is bent out from the socket and connected as described above.

The TNC needs to be set to the higher clock speed of 4.9 MHz as a minimum. Whilst this version of TheNet is more efficient than others, it is not sensible to run at the slower speed.

The TNC needs at least 32K bytes of RAM.

The TNC needs to have DCDB from the SIO/0 connected to pin 23 of the RS232 connector. See the section on RS232 later in this note for more information.

2. Installing over TheNet X previous versions

If you are replacing a previous ROM with TheNet in it, be sure to do a coldstart (you may need to remove the battery link to force this).

3. Files

The files on this disk are :

```
readme.*        This file
thenet1.x1j    Part 1 of the code
thenet2.x1j    part 2 of the code
configur.*     Installation guide
userguid.*     A user's guide to the node
overview.*      The sysop's manual
patch.exe      A windowing driven patcher for thenet?.x1j
quickref.*     A handy quick reference guide
intel.exe      An Intel hex file dump utility
intel.c        The source of the above
motorola.exe   A Motorola S1 type file dumper
motorola.c     The source of the above
bankswit.*      Information on the hardware bankswitching
intro.*        The brief release note
devmeter.*     Details on the deviation meter
```

The files denoted '*' are stored in two formats

.TXT   ASCII versions of the files
.DOC   Word for Windows 2.0 format

The files contain the same except for the DEVMETER, as the ASCII version does not contain

the circuit diagrams.

4. Using it with a TCP/IP system

One of the reasons for the inclusion of the IP router was to help the development of IP networks. This is in two different ways :

- It allows a IP station that does not run 24 hours to run an IP router for the others in the area without leaving the PC running,

- It allows existing nodes to double as IP routers.

In scenario 1, where a station runs a TNC2 clone with a KISS ROM or similar, this software may be used instead of the KISS ROM. It should be configured to run KISS, Selective Copy on the RS232 port.

5. The other version

The version that includes the HIGH and LOW commands is not included here. It used a form of bankswitching that clashes with the deviation meter.

6. Problems

A long standing problem with the software was its tendency to crash on reset. I think I have now cured it. It was caused by an interaction between the bankswitching logic and the interrupt routines during reset. It should not happen now - tell me if it does - but please be certain that it was not caused by some other fault such as wiring errors or installing over a previous version without clearing the RAM first. You should still take care to use fast enough parts for the clock rate.

One common problem. If your node appears to 'lose' nodes, look very carefully at the rates of node broadcasts and the setting of the algorithm control. The RS232 rate should be faster than the radio rate or it should be set to zero, and the alternative algorithm should only be enabled on the RS232 port if at all. Try switching it off to see if that helps.

The patcher has been altered. The code now comes as two parts and the patcher patches both at the same time. It needs & expects to be able to access both parts.

7. RS232 connections

It is important that you understand the RS232 connections.

The RS232 port will operate in one of two basic modes, a dumb terminal mode and a protocol mode. Each of these modes has two basic types of operation. These are detailed further below.

The decision as to whether the node operates in dumb terminal or protocol mode depends on the setting of the DCDB input of the serial communications chip (the SIO/0). In TNC2 clones, this is the signal on pin 23 of the RS232 connector, but in most TNCs you will need to either insert a link or a piece of wire, as detailed in your TNC manual. After connecting the links if needed, then leaving pin 23 open circuit will cause the TNC to operate in dumb

terminal mode, and setting it to a negative voltage (ie connecting it to pin 10) will cause it to operate in protocol mode.

If you use a BSX2 TNC, then you should connect pin 23 to pin 7 rather than pin 10 for protocol mode. You will also need to insert a link into JMP14 & make sure there is no jumper in JMP9.

If you use one of the other common TNC2 clones such as the PK80, MFJ1270, TNC-200 etc, then I understand (but cannot confirm) that you will need to connect a wire from JMP9 pin 1,2 or 3 - they are all joined on the PCB - to RS232 pin 23.

Incidentally, don't forget to increase the watchdog timer capacitor to give a 1 minute timeout (C31 to 47uF in TNC2 clones).

Finally, the protocol modes are CROSSLINK or KISS, selected by the firmware, and the dumb terminal modes are STANDARD or MODEM, again set by firmware. In the MODEM mode, hardware handshaking is used for connect request / disconnect. This is NOT the usual method of operation. Unless you are certain you understand, DO NOT use this mode !.

8. Introduction to nodes

If you have not used a TNC based node before, the following notes on the operation of the 'dumb terminal' port may be of use.

When pin 23 on the RS232 interface is high, and with a terminal or terminal emulator on the RS232 port, the node will not appear to respond to anything. If you send an 'escape' character, the node should respond with a '* '. If it does not, look at the TNC status LED. It should be dimly lit with a little bit of a flicker. If not, the node is not operating. If it is, you have an RS232 problem. If you receive unsolicited garbage whenever the TNC receives data, you have pin 23 tied low and you are receiving crosslink or kiss frames.

If it does respond with a star and a space, you can now type one of 3 characters - C, D or P.

P will display or set the current password.
D will disconnect you from the node.
C will connect you to the node.

Try the C command. You should get a 'connected' message. Hit '?' followed by return and you will get a list of all commands.

Escape commands only work on the RS232 port when in dumb terminal mode. Don't forget to disconnect from the node before you disconnect the terminal.

9. 'User channel' nodes

To create a 'user channel' node (ie one that supports Net/Rom protocols on its RS232 port but not on its Radio port), do the following :

• Set the radio port default quality to one less than minqual
• Bar node broadcasts on the radio port by setting MODE parameter number four to 2

- Ensure that no manual routes exist in the route table for port 0.

10. EADG Nodes

If you put a node up in the UK that can be heard from East Anglia, may I encourage you to put the QRA locator in the Beacon text to enable the G1TLH Beacon analysis program to report accurately on propagation conditions.

73's

Dave G8KBB @ GB7MXM.#36.GBR.EU
[44.131.16.31] g8kbb@g8kbb.ampr.org

7, Rowanhayes Close
Ipswich
IP2 9SX
England

Tel   0473 682266
    +44 473 682266