Chapter 20

Translan Bridges

This article is by Barry Lowry.

It is not intended to replace the Translan bridge training courses. It should help you get started when faced with a Translan bridge problem, and hopefully help you fix it.

20.1 Common General Description

The Translan bridges are made by a company called Vitalink.

Unlike a DEBET which has two ports, both connected to different ethernet cables, the Translan bridge has one ethernet port and up to eight synchronous ports. It allows ethernets to be connected using synchronous links. This means that sections of ethernet can be miles apart, with a Translan bridge at the end of each synchronous link. The Translan bridge is functionally similar to the DEBET except that several connections are allowed on the synchronous side. The software is loaded from a local floppy when the bridge is powered up, after a short rom based self test. After the software is loaded, the floppy is not usually used.

There are two types of Translan bridge which DEC currently maintain. One type is the Translan II which is the older product. The other type is the Translan 3A. The Translan 4 is a cheaper version of the 3A with only one synchronous port.

20.1.1 Translan II General Description

The Translan 2 is a box 9.5 inches high, 17 inches wide and 21 inches deep. Each Translan II Bridge will support up to 8 V.35, RS232-C or RS422 ports. On the front of the box there is a floppy drive, a reset button and six led indicators. (see figure)

Figure 20–1: Translan II front panel

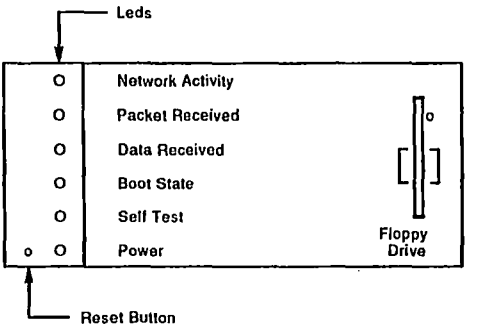


Table 20–1: Translan II Front panel Indicator meanings

Led	Function
Ethernet Activity	Indicates any ethernet activity. This is used to verify that the ethernet cable is attached
Packet Received	Flashes when an ethernet packet address matches the Translan II address
Data Received	Flashes when any data arrives on a synchronous port
Boot State	Comes on when software is being loaded from floppy into memory
Self Test	Comes on for 10 seconds during power up self test. Stays on if self test fails. Flashes if no boot floppy present.
Power	Indicates +5v present.
Disk Activity	Indicates diskette is being accessed. Do not remove diskette or reset box if this indicator is on.

The reset button causes a power up self test followed by a software boot.

20.1.1.1 Translan II Module Layout

To get to the inside of the box, lift off the top cover. There are no screws. There is an eight sl... backplane containing an ethernet controller, a mcpu module, and up to four synchronous I/O (SIO) modules.

Figure 20–2: Translan II module layout

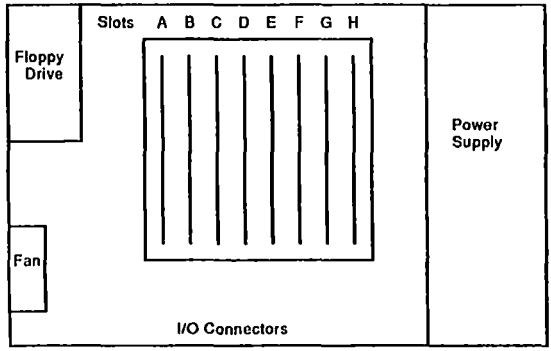


Table 20–2: Translan II module layout

Backplane Slot	Module Type
A	EC/2
B	EMPTY
C	MCPU
D	FDC
E	SIO4
F	SIO3
G	SIO2
H	SIO1

The ethernet controller is usually one module although there may be some old two board versions in the field.

The mcpu is the main cpu of the Translan.

There is a floppy disk controller piggy back module connected to the mcpu module.

There can be up to four SIO modules in a Translan II and each of these can be one of the following three basic types:

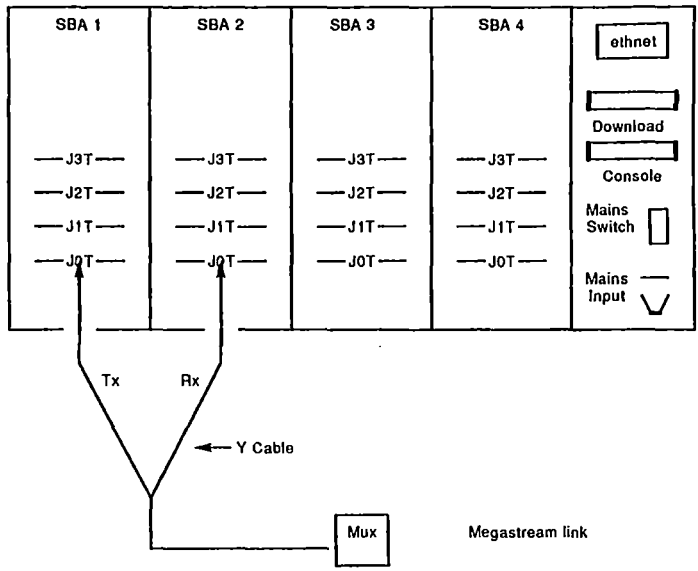
1. A two port V.35 interface. The Vitalink name is SIO V35.
2. A two port RS232 interface. The maximum speed is 19.2k. It can act as a DCE or DTE depending on software setups and I/O panel jumpers. The Vitalink name is SIO SM or SIO ST.
3. A two port RS422 interface. This can use two types of I/O connector, either an X.21 (15-pin connector) or an RS449 (37-pin connector). It supports two ports at up to 64k, or a single port at up to 224k. If high speed roms are fitted then it can support one port at any speed between 64k and 448k. The Vitalink name is SIO 422, 422S or 422SMH, depending on the roms used.

If the link speed is greater than 64k then two line cards are used to create the link. One card is used for transmit and the other for receive. A Y-cable is used to connect the two I/O connectors to a multiplexer, which is then connected to the comms. link. (see figure)

20.1.1.2 Translan II Rear Connectors

The back of the box has up to eight synchronous I/O connectors, one ethernet connector and one console port. (see figure)

Figure 20–3: Translan II rear panel



The I/O connectors at the back of the bridge connect to the SIO modules via internal cables plugged into the backplane . The I/O connectors are called SBA's. There are four basic types:

1. SBA SM/ST used for RS232 when the bridge is the DCE/DTE.
2. SBA V35 used for V.35
3. SBA 422S which has a 37-pin RS422 connector.
4. SBA HS422 which has a 15 pin X.21 connector.

Each SBA has up to four connectors but only two are used by the Translan II. Each SBA port is labelled J0T, J1T, J2T or J3T. There are four SBA's used on a Translan II. To identify a port the SBA position and port number are combined to produce a number like B1J0T which means port 0 on Board 1 (ie SBA position 1).

20.1.2 Translan 3A/4 General Description

The Translan 3A and 4 boxes are 5.5 inches high, 17 inches deep and 21 inches wide. A Translan 3A will support four synchronous ports, either V.35 or RS232, as standard, but can be ordered with eight ports. A Translan 4 has only one V.35 port. It is possible to have one port at 2.048 Megabits or several ports with an aggregate speed of 1.024 Megabits/sec.

Figure 20–4: Translan 3A/4 Front Panel

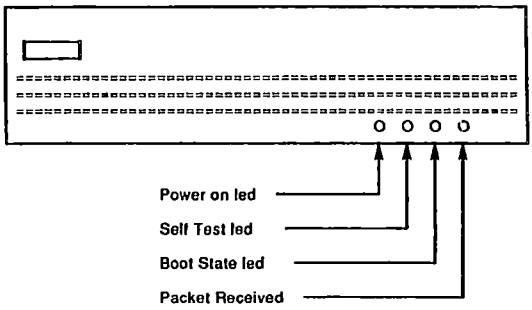


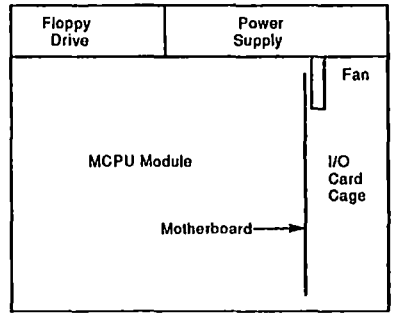
Table 20–3: Translan 3A Front panel indicator meanings

Led	Function
Packet Received	Flashes when any frame is received
Boot State	Comes on when software is being loaded from floppy into memory
Self Test	Comes on for 45-60 seconds during power up self test. Stays on if self test fails. Flashes if no boot floppy present.
Power	Indicates +5v present.

20.1.2.1 Translan 3A module layout

To get to the modules remove the top of the box. The motherboard is vertically mounted inside the box. The MCPU module plugs into the front of the motherboard and the I/O modules plug into the back of the motherboard.

Figure 20–5: Translan 3A/4 Module Layout



Remove three screws to change the MCPU. The cables for the floppy drives are underneath the MCPU. Do not change I/O modules without removing the top of the box. The I/O modules have straps to set them up as DTE or DCE. Only one DCE is allowed per box. Be careful that you do not trap the fan cable when changing I/O modules.

The power supply can be 110v or 240v. A power supply must have W101 removed to be used at 240 volts. W101 is located next to C115.

20.1.2.2 Translan 3A/4 Rear Connectors

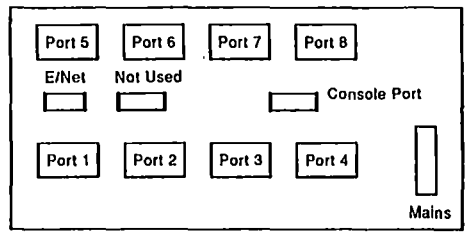
The back of the box has up to eight synchronous I/O connectors, one ethernet connector and one console port. There is also an unused auxiliary port. The I/O connectors are built in to the I/O modules, and there can be two or three I/O modules depending on the number of ports.

The synchronous port I/O modules are known as CIC (Customer Interface Cards). There are three types:

1. CIC RS232 4 Ports. Used in Translan 3A only
2. CIC V.35 4 Ports. Used in Translan 3A only
3. CIC V.35 1 Port. Used in Translan 4 only

The other type of I/O module is the console/ethernet interface which is always present.

Figure 20–6: Translan 3A/4 Rear Connector Layout



20.2 Components List For Translan II

Table 20–4: Translan II Components List

Dec Part Number	Description	Vitalink Part Number
29-81723	MCPU Board	007801
29-81724	EC/2 Ethernet Board	007800
29-81725	Floppy Drive	008380
29-81726	Floppy Controller	008381
29-81727	Power Supply	008382
29-81728	Front Panel	008384
29-81729	SIO board V.35 2 ports	2320II
29-81730	SIO board RS-232-C 2 ports	2310II
29-81731	SIO board RS422 2 ports	2311II

20.3 Jumpers and Roms for Translan II

When the modules are changed, the roms from the original modules must be fitted into the new modules. The roms in the ethernet controller are labelled ETNT. The roms in the MCPU module are labelled MCPU. The SIO roms are labelled HDLC for speeds up to 224k and HDLC-FAST for speeds over 224k.

The MCPU module has a row of jumpers located near the top of the board. Jumper A is nearest to the front of the module. Jumper K is nearest the centre of the module. Jumper G is the only one that should be in, the rest should be out.

The SIO boards have jumpers to select SIO board number and synchronous clock source.

The SBA SM panels have jumpers to select RX EXT and TX EXT which means that the clock comes from the modem or TX INT and RX INT which means the clock is derived from the bridge. If a modem is used then the board should be set up for external transmit and receive clocks. If a direct connection is used then internal clocks should be selected for transmit, and external for receive.

Table 20–5: Translan II SIO Board Numbers

Board No.	Slot	Jumper E22A	Jumper E22A	Jumper E59
SIO 1	H	OUT	OUT	10-11
SIO 2	G	IN	OUT	7-8
SIO 3	F	OUT	IN	4-5
SIO 4	E	IN	IN	1-2

Table 20–6: Translan II SIO Clock Jumpers

Port No.	Clock Source	E49 pins connected	E70 pins connected
0	TX EXT	1-2	2-3
0	TX INT	2-3	1-2
0	RX EXT	4-5	N/A
1	TX EXT	7-8	5-6
1	TX INT	9-10	4-5
1	RX EXT	11-12	N/A

The RS232 SBA has jumpers to select the transmit clock. Pins 1 and 2 are linked for external clock. Pins 2 and 3 are linked for internal clock.

20.4 Translan 3A/4 Components List

Table 20–7: Translan 3A/4 Components List

Dec Part Number	Description	Vitalink Part Number
29-81947	MCPU Board	2650
29-81940	Ethernet Board	2660
29-81941	Floppy Drive	2670
29-81942	Power Supply	2675
29-81943	CIC RS232 4 Port	2610
29-81945	CIC V.35 4 Port	2620
29-81946	CIC V.35 1 Port	2621

20.5 Common Troubleshooting Guide

The maintenance philosophy for both types of bridge is to find the failing module and change it. The roms must be removed from a faulty Translan II module and fitted into the new module. There are jumpers on some of the Translan II modules.

The maintenance aids are:

1. The power on self tests. There is an led indicator on the front of both types of bridge, which comes on when the bridge is powered up and goes out if the test passes. Each Translan II module has a led which stays on if the module fails its rom based power-up self test.
2. The console messages. If a console is plugged into the port at the back of the bridge then messages appear to indicate the result of the test of each module and boot status etc.
3. The software allows a user on the console to monitor statistics and change parameters. (see software section)

20.5.1 What to do first to determine problem area

This section will help to identify the problem area. The first things to look at are the leds on the front of the box. If they are normal then connect a terminal to the console port and type DIM. This gives last eight messages, most of which are self-explanatory. The customer should have a software manual, which explains the meanings of all messages.

Here are some suggestions for each of the following suspected problems:

- POWER. Is the power led on? Only change the power supply after checking the fuse at the back of the box. The fuse is sometimes hard to find on a Translan 3A/4. It is under a co just above the mains switch. Check jumper W101 if you change the Translan 3A/4 po supply.
- ETHERNET. Type DSDL and look for ethernet errors in the status display. If ethernet errors are shown then check connections. Check if other ethernet options are working ok. Power up the system and check the ethernet board test result on the console.
- SYNC PORT. Type DBD. This should give a list of other bridges that your bridge can communicate with. If you cannot "see" a remote bridge then put the modem into loopback mode and type DBD again. You should now be able to "see" yourself as a remote bridge. By doing this you can identify the problem as your end or the far end. Type DSDL to check for intermittent errors on the sync ports. On a Translan 3A/4 use the LOOP tests to verify the comms. link.
- NO BOOT. Check for self test leds staying on. The MCPU module may still be faulty even if led is off. Check console for messages. Try another floppy if available.

- SUSPECT SOFTWARE PROBLEM. Use the customer's backup floppy and see if it makes any difference. Use the Configuration file to see if the customer has made some silly changes. (see software section). Get the customer to ring his software support group.

20.6 Software

The software can be used to display and change parameters and display statistics. The software is supplied by Vitalink and is not supported by DEC. We are responsible for problems with the hardware only. Customers should be advised to make their own backups using the monitor commands described below. The console port for the Translan 3A/4 defaults to 19.2k, 8 bits, no parity, full duplex. The console port for the Translan II defaults to 9600, 8 bits, no parity, full duplex.

The console user can use the software in four main modes: monitor, vms, view and reconfiguration.

The software refers to the ethernet and synchronous ports as Networks.

Table 20–8: Ports and Networks

Translan II Port	Translan 3A/4 Port	Network
Ethernet	Ethernet	1
B1J0T	Port 1	2
B1J1T	Port 2	3
B2J0T	Port 3	4
B2J1T	Port 4	5
B3J0T	Port 5	6
B3J1T	Port 6	7
B4J0T	Port 7	8
B4J1T	Port 8	9

20.6.1 Power on messages

The translan bridge will output messages to the console during its power up test. The messages will indicate the result of each power up self test, give some information about booting, give some information about the configuration and then go to vms mode with a <V0000> prompt.

20.6.2 Monitor mode commands

When in monitor mode the prompt is >. To get to this mode, power on with no floppy inserted, or use the VMSE command in vms mode.

Table 20–9: Monitor Mode Commands

Command	Meaning
BT	Boot system from Floppy disk
CO (n)	Copy system disk (n = number of copies.) The floppy is then read into memory, the user is prompted to insert another floppy and the new floppy is written.
	This could be a DISASTER if the system floppy gets written to! It must only be used if monitor mode was entered by booting the system without a floppy inserted. If monitor was entered by using the vms command VMSE, then use of the CO command will destroy the customers software.
FO (den)	Format disk. density = optional on a Translan II only. Floppy should always be formatted for 8 sectors/track, so use FO 8 on a Translan II and FO on a Translan 3A/4
VMS	Enter Vitalink Management Service mode.
SP	Set port speed. eg SP A 9600 sets console speed to 9600. (Translan 3A/4 only)

20.6.3 VMS Mode Commands

Vitalink Management Services is known as VMS. In VMS mode the prompt is <Vxxx> where xxx is a number that increments every time a command is issued. It allows the user to monitor traffic, show status, connect to and manage other bridges in the network, show and reset statistics, change passwords and enter reconfigure or view mode. On a Translan 3A/4 VMS can also be used to perform loopback tests.

Table 20–10: VMS Mode Commands

Command	Meaning
	STATUS COMMANDS
DBD	This command gives a display showing all the other bridges that your bridge can communicate with. It is useful to prove that the sync. link is running. If the local modem is put into loopback, then a DBD command should show your own bridge as a remote bridge.
DFDSE	This command shows the list of ethernet addresses known to the bridge and the port on which the address was last seen.
DSDL	This command shows status and error counts all the ports, including the ethernet port. To get more information about errors the view mode is used.
DSTD	Shows status of other bridges in the network, their names, ethernet addresses and software versions.
DSTLAN	Shows more detailed port status, including reasons for ports not working and amount of filtering being done. There should be discarded frames, which are the ones that did not need to be forwarded because the destination address was on the same port as the source address.
DTI	Shows topology information ie; which ports are working or in the backup state.
	MONITOR COMMANDS
MMT	Shows all multicast traffic on all links for a time period.
MTT	Shows all traffic on all ports and some error information. If late discards occur on transmit networks then it means congestion. Errors shown are frames received with errors.
SMMT	Stops MMT.
SMTT	Stops MTT.
	MANAGEMENT COMMANDS
C	This command allows you to connect to another Translan Bridge and execute commands on it. The command requires a destination. Use DBD command to find names of other bridges in the system.
DC	This command disconnects you from any connection made using a C command.
SW	This command allows you to switch from a link set up using a C command back to the local bridge without breaking the link. You can then set up several connections, switch between them all and thoroughly enjoy yourself!
	TEST COMMANDS
LOOP <port>	This command puts the port into loopback mode so that a test can be run from the far end. It stays in this state for two minutes. The port information is the number of the transmit network.(see earlier tables)
TEST <port>	This command runs a loopback test on the specified port. The port at the far end needs to be set into loopback mode, or you can put the modem into loopback mode, or use a loopback connector. Produces a status report at the end of the test.
SLOOP	Resets a port to normal if its been put into loopback mode.
STEST	Stops a test.

Table 20–10 (Cont.): VMS Mode Commands

Command	Meaning
	OTHER COMMANDS
DIM	This command causes the last eight messages to be repeated. Use the customers software manual to interpret them.
RS	This command resets the counters.
VIEW	This command allows you to enter a tree like structured menu driven database of reconfiguration screens. You can then examine configuration details and some error counters.
REC	This command allows you to enter the same structure as above and change things. Remember that DEC are not responsible for the software or its configuration so be careful if you use this command.
VMSE	This command allows you to exit from VMS mode into monitor mode.
SP	Set console port speed (Translan 3 only)
HELP	Gives info. on all the commands plus any optional parameters
REBT	Reboot the box.
ST std or dec	Changes console terminal type. For a DEC terminal use ST DEC.

20.6.4 VIEW Mode and REC mode

The REC (Reconfiguration) utility allows the customer to examine and change the software parameters. The REC mode allows access to a tree-like menu driven screen utility, somewhat like a VTX system or PRESTEL. Each screen gives a selection of further screens which may be selected for more detailed information. To go back up to the previous screen use the ESC key. The VIEW utility uses the same menu driven screen structure but does not allow you to change anything.

It is possible to get more information about errors by using these screens. The different versions of software have slightly different menus so the following list are a general guide rather than a specific guide.

From the VMS prompt, <Vxxx>, type VIEW then:

- To get to the ethernet errors screen select a menu path something like:

  Top screen.
  View/Alter Category Variables
  Data Link Variables
  Ethernet/802.3 Variables
  Error Statistics.

  If you see missed packet errors, overflow errors or receive buffer errors then the Translan bridge is dropping packets due to internal software set up problems or the bridge is overloaded.

- To get to the synchronous port errors screen select a menu path something like:

  Top screen.
  View/Alter Category Variables
  Data Link Variables
  Serial Port Variables
  I/O Card #1 Port 1
  Use the information from this screen, and the Configurable Variables and Trunk Circuit Variables screens.

  Abort errors are usually caused by clocking problems. CRC errors are usually caused by transmission errors. CTS/DCD errors could be a connection problem or either end not asserting RTS. If Frames/Bytes Received = 0 then check the connections.

- The configuration file shows all the differences between a standard software console floppy and the customers floppy. To get to it select a menu path something like:

  Top screen.
  Configuration and Transformation files
  View/Edit Configuration File.

  This file allows a new version of software to be installed and then reconfigured quickly. It also shows anything that may have been set up by the customer, possibly incorrectly.