SERIAL PROTOCOL TRANSLATOR

AND

VIRTUAL CROSSPOINT INTERFACE

This manual provides a comprehensive user reference to the use and configuration of the Pro-Bel serial protocol translator and virtual crosspoint interface.

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CONTENTS - APPENDICES

OTHER RELEVANT DOCUMENTATION

REFERENCE NO	DESCRIPTION
1. SW-P-08	General Remote Control Communication Protocol. Issue 8, 28/08/92.
2. SW-P-02	General Switcher Communication Protocol. Issue 8, 20/09/93.

1 GENERAL INTRODUCTION

Welcome to the Pro-Bel Protocol Translator package.

This manual explains how to use the Protocol Translator and the Protocol Translator Editor software. Figure 1 presents an overview of how the Protocol Translator is connected in a routing system.

The Pro-Bel Protocol Translator extends the standard Pro-Bel System 2 or System 3 and Procion controller to facilitate the use of virtual crosspoints along with interfacing to Other Equipment Manufacturers (OEM) routing Systems. Where permissible the Protocol Translator provides virtual crosspoints with protocol translation.

The Editors are used to create and edit a database that provides the Protocol Translator with the basic information necessary for it to provide virtual sources and destinations on a router and protocol translation between different OEM Routing Systems. The database comprises of a source and destination mapping table, which is held and edited on the Editors PC. The database is downloaded to the Protocol Translator where it is stored in non-volatile memory.

The Pro-Bel Protocol Translator package provides a user interface that is easy and consistent in operation with the System 3 Editors.

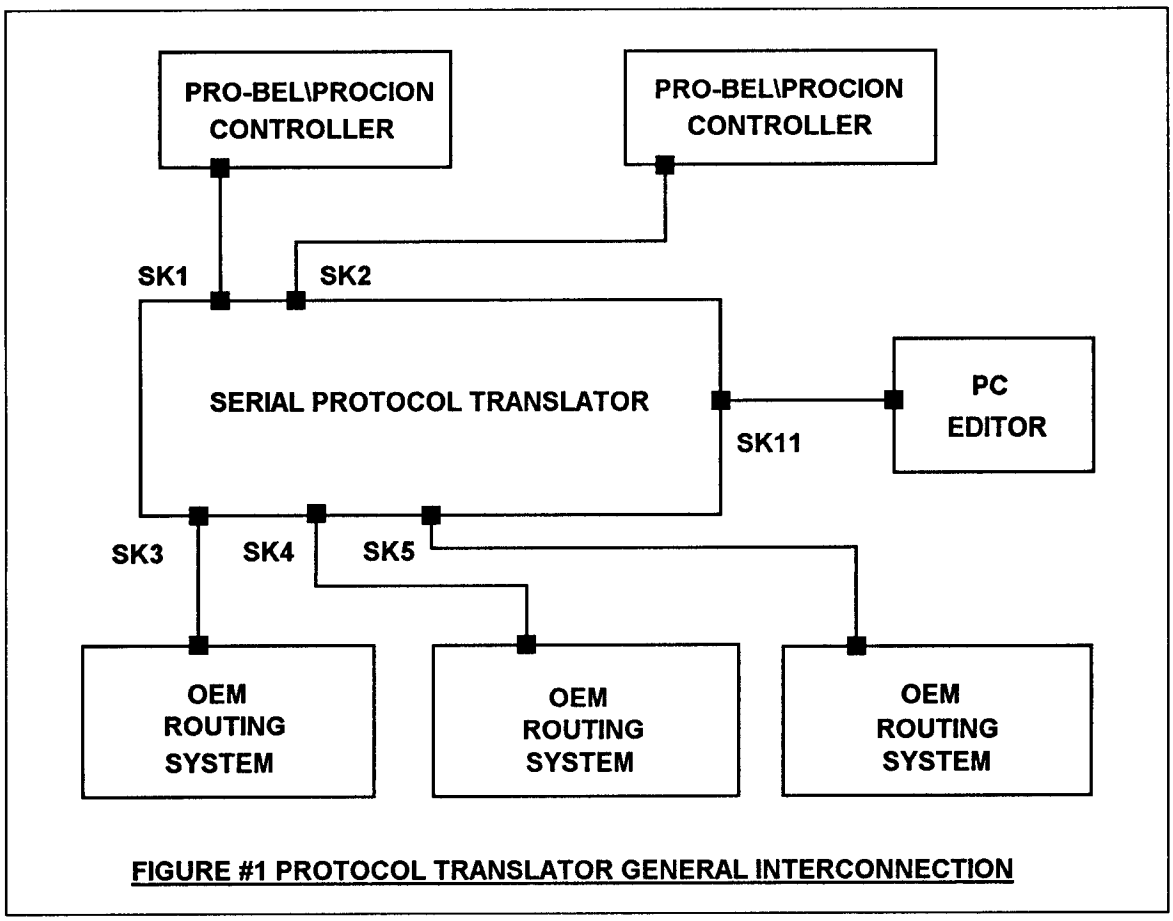


FIGURE #1 PROTOCOL TRANSLATOR GENERAL INTERCONNECTION

2 USING THIS MANUAL

This manual is a complete reference for the Pro-Bel Protocol Translator package. The package consists of a Protocol Translating unit and PC based configuration Editor software. The manual is logically split into two distinct sections and each section is further sub-divided into numbered sections.

2.1 Protocol Translation Package Components

The package contains the following items:

- ***Protocol Translator***
  The Protocol Translator unit is a 2411 6U control card situated either within a 6170 1U control frame or a HD Video Router. This manual covers both hardware types.
- ***Protocol Translator Editors Disk***
  The Protocol Translator Editors are provided upon a single floppy disk (diskette).

2.2 Terminology

Due to the confusion that arises in the use of the various terminology this section defines the meanings of various terms used within this document.

- *Router*
  This is a generic term used to describe a switching unit.
- *Level*
  This is used to describe a type of router, e.g. video level.
- *Matrix*
  This term is used to describe a group of associated levels.
- *Source*
  This term is used to describe an input of a router.
- *Destination*
  This term is used to describe an output of a router.
- *Virtual Source*
  Describes a source which can be routed, but does not physically exist as an input of a router.
- *Virtual Destination*
  Describes a destination which can be routed to, but does not physically exist as an output of a router.
- *OEM*
  Describes non Pro-Bel equipment.

2.3 Associated Publications

The following is a list of the Pro-Bel publications associated with the Pro-Bel Protocol Translator package, including the Pro-Bel document reference. These documents are available upon request.

- General Switcher Communication Protocol, reference 2.
- General Remote Control Protocol, reference 1.

3 SYSTEM DESCRIPTION

This section provides an overview into the facilities provided by Pro-Bel's Protocol Translator package. Diagram SK2592 provides a pictorial overview of the how the Protocol Translator fits into the facilities provided by Pro-Bel's System 3.

3.1 Protocol Translator Controller Hardware Overview

The Protocol Translator controller, type 2411, is a versatile Motorola 68000 microprocessor based 6U module. It can be mounted within a 1U rack mounting frame, type 6170, or where space dictates within a HD Video router. The capabilities of the module in either frame are:

- Eight RS-422 ports and two ports which are jumper selectable to either RS-422 or RS-232. One of the jumper selectable ports is used as the PC Editor Port.
- Twenty-four jumpers providing configuration and diagnostic features, which can be user selected.
- Sixteen LEDs which provide system status along with a mono or RGB status display output in either 525 or 625 line mode.

3.2 Protocol Translator Operational Overview

The software within the controller is capable of supporting systems with 1024 unique destinations. These destinations may be split across any number of matrices or levels. It utilises the LEDs on the 2411 to provide confirmation of uP execution and an indication of the activity of the router ports. The jumpers on the 2411 select various diagnostic features, one of which provides constant diagnostic information on a status display.

- **Fan-In**
  A minimum of two, to a maximum of eight controllers can be jumper selected as controlling the same OEM routing system.
- **Fan-Out**
  A minimum of one, to a maximum of seven OEM routing systems can be controlled by a single/multiple controller as any specified combination of matrix and level. The OEM routing systems must all be of the same type.
- **Virtual Routing**
  A Matrix Level can be specified as having a number of virtual sources and destinations thus giving the controller a virtually sized router. The same number of virtual sources and destinations must be specified. The destinations are taken as values from the maximum destination size of 1024.
- **Protocol Translation**
  A Pro-Bel routing system can transparently control OEM routing systems as if it were a Pro-Bel routing system connected directly to the control system. Protocol Translation is available for some OEM routing systems with the other features mentioned above.

4 HARDWARE DESCRIPTION

4.1 General Configuration For The 2411

The following table specifies the settings for the non-user jumpers on the 2411.

JUMPER	FUNCTION	REQUIRED SETTING
PL4	Processor Clock	16MHz
PL5	EPROM size select	27256
PL6	EPROM size select	27512
PL36	Watchdog NORM/TEST	NORM
PL37	EPROM/EEPROM	EPROM

The Protocol Translator software is installed within the 2411 as shown within the following table. *Anti-static precautions must be taken when handling EPROMS.*

THE EPROMS ARE TO BE SITUATED TO THE REAR OF THE SOCKETS AS INDICATED BY THE SILK SCREEN ON THE PCB.

EPROM NUMBER	2411 LOCATION
SP81/?	IC 6
SP80/?	IC 7
SP83/?	IC 8
SP82/?	IC 9

Where /? is the version number, e.g. /1 indicates issue 1.

4.2 Socket Pin-Outs

Situated on the rear of the frame in which the 2411 is situated are twelve 9-Way Female 'D' Type sockets, labelled SK1 to SK12. These are connected as shown within the following table. Refer to sections 4.3 and 4.4 of this document to determine which of the sockets can be selected as RS-232 instead of RS-422. SK12 PSU monitoring is only available on the 6170.

PIN	RS-422 CONNECTION	RS-232 CONNECTION	SK12 CONNECTION
1	Chassis	No Connection	PSU1 Fail
2	RX-	TX	PSU1 Common
3	TX+	RX	PSU2 Fail
4	Signal Ground	DSR	PSU2 Common
5	No Connection	Signal Ground	No Connection
6	Signal Ground	DTR	No Connection
7	RX+	CTS	No Connection
8	TX-	RTS	Signal Ground
9	Chassis	No Connection	Chassis

4.3 Configuration For The 2411 Within The 6170 1U Frame

Situated on the rear of the control frame are twelve 9-Way Female 'D' Type sockets, labelled SK1 to SK12. Two PSU are provided which are selectable between 110V and 240V. Mono or RGB monitor output is also provided via BNC connectors. Socket SK12 provides monitoring for the two PSUs.

SK PORT	PORT MEDIUM	SYSTEM USAGE
SK1	RS-422	Pro-Bel Controller
SK2	RS-422	Pro-Bel Controller
SK3	RS-422	Selected via Editor/PL User Jumpers
SK4	RS-422	Selected via Editor/PL User Jumpers
SK5	RS-422	Selected via Editor/PL User Jumpers
SK6	RS-422	Selected via Editor/PL User Jumpers
SK7	RS-422	Selected via Editor/PL User Jumpers
SK8	RS-422	Selected via Editor/PL User Jumpers
SK9/10	RS-422/232	Selected via Editor/PL User Jumpers
SK11	RS-422/232	Fixed Editor Port
SK12	---------	Fixed Power Supply Monitor

Sockets SK1 to SK8 are RS-422 communication links.

Sockets SK9 and SK10 act as a single socket to provide (via jumpers) either an RS-422 or an RS-232 communication link. The jumper PL8 on the 2411 determines what communication standard is adopted. If RS-232 is linked then socket SK10, must be used, socket SK9 will not be enabled. The opposite being true if RS-422 is linked.

Socket SK11 can also be either RS-422 or RS-232 through two sets of jumpers. The jumper PL7 on the 2411 has to be set to either RS-232 or RS-422 along with the seven jumpers PL26 to PL32 on the 6170 control frame.

Link **all** the jumpers high to select RS-422 or link **all** the jumpers low to select RS-232.

	PL26	PL27	PL28	PL29	PL30	PL31	PL32
RS-422	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐
RS-232	☐	☐	☐	☐	☐	☐	☐

4.4 Configuration For The 2411 Within A HD Video Router

Situated on the rear of the router are twelve 9-Way Female 'D' Type sockets, labelled SK1 to SK12. Mono or RGB monitor output is also provided via BNC connectors. The 2411 uses the same PSUs as the router so no extra monitoring is provided apart from the routers.

SK PORT	PORT MEDIUM	SYSTEM USAGE
SK1	RS-422	Pro-Bel Controller
SK2	RS-422	Pro-Bel Controller
SK3	RS-422	Selected via Editor/PL User Jumpers
SK4	RS-422	Selected via Editor/PL User Jumpers
SK5	RS-422	Selected via Editor/PL User Jumpers
SK6	RS-422	Selected via Editor/PL User Jumpers
SK7	RS-422	Selected via Editor/PL User Jumpers
SK8	RS-422	Selected via Editor/PL User Jumpers
SK9/11	RS-422/232	Selected via Editor/PL User Jumpers
SK10/12	RS-422/232	Fixed Editor Ports

Sockets SK1 to SK8 are RS-485 communication links.

Sockets SK9 and SK11 act as a single socket to provide (via jumpers) either an RS-422 or an RS-232 communication link. The jumper PL8 on the 2411 determines what communication standard is adopted. If RS-232 is linked then socket SK11, must be used, socket SK9 will not be enabled. The opposite being true if RS-442 is linked.

The same relationship exists for Sockets SK10 and SK12, with the jumper used to select the communication standard being jumper PL7.

5 DIAGNOSTICS

5.1 LED Diagnostics

The LEDs on the front of the 2411 provides the system status information as shown in the table below.

LED Number	Diagnostic
D1 1	SK1 Received data.
D1 2	SK2 Received data.
D1 3	SK3 Received data.
D1 4	SK4 Received data.
D2 5	SK5 Received data.
D2 6	SK6 Received data.
D2 7	SK7 Received data.
D2 8	SK8 Received data.
D3 9	SK9/SK10 Received data.
D3 10	SK9/SK10 Received data.
D3 11	SK11 Received data.
D3 12	Valid Virtual Command Received.
D4 13	Received Pro-Bel Command Database search failure.
D4 14	Received OEM response Database search failure.
D4 15	General Fault.
D4 16	Microprocessor (uP) activity.

The activity of the serial ports is indicated by the flashing of the LEDs 1 to 11. Ports SK9 and SK10 operate mutual exclusively, this operation is mirrored with LEDs 9 and 10.

Any fault or error which occurs will cause LED 15 to flash. LEDs 13 and 14 are flashed along with LED 15 to indicate that the source and destination numbers in the commands and responses are not found within the database.

Virtual commands activity is indicated by LED 12 flashing each time a valid virtual command has been received and acted upon by the system.

The activity of the uP is indicated by the flashing of LED 16.

5.2 Jumper Diagnostics

The twenty-four jumpers which are available for use by the software are configured as outlined below.

PL16	PL09	PL21	PL17	PL29	PL25
□	□	□	■	■	■
□	□	□	■	■	■
□	□	□	■	■	■
□	□	□	■	■	■
PL13	PL12	PL24	PL20	PL32	PL28

□ = System (used) jumpers.

■ = Spare (unused) jumpers.

PLxx	PLxx
[■ ■] ■	■ [■ ■]
Linked High	Linked Low

Recommended Default Jumper Settings

The following recommendation assumes basic Protocol Translator operation. The jumpers may require adjustment depending on the operational functionality that is required.

- PL13 I/O Setup Status Display **LOW**
- PL14 Status Display Operation **LOW**
- PL15 Status Display Data Format **HIGH**
- PL16 Status Display Information **LOW**
- PL12 Router Simulation **LOW**
- PL11 Status Display Lines **LOW**
- PL10 <INTERROGATE> Responses **HIGH**
- PL9 Controller Protocol Select **LOW**
- PL21, PL22 and PL23 Controller Input Select **ALL LOW**
- PL24 Protocol Dependent, refer to the relevant appendix.

PL13 I/O Setup Status Display.

If jumper PL13 is linked high then the 2411 displays are current I/O operating characteristics for all the SK I/O ports. The screen is shown for ten seconds at which point the communications monitor screen is then displayed. While the I/O display screen is being displayed the communications monitor screen is updated in the 'background'.

PL14 Status display operation.

If jumper PL14 is linked high the 2411 writes diagnostic data to the status display. The jumper should be linked low for normal system use. When linked low jumpers : PL13, PL15 and PL16 are ignored.

PL15 Status Display Data Format

If jumper PL15 is linked high the 2411 displays all valid data onto the status display in a 'transcoded' format. For example the Pro-Bel Interrogate command for destination one is displayed as <INTER 1>. If the jumper is linked low then the actual hexadecimal numbers received are displayed.

PL16 Status Display Information

When jumper PL16 is linked high the 2411 only displays the Connect commands and Connected responses on the status display. When it is linked low all commands and responses are placed onto the status display screen. In both cases error messages are still displayed.

PL12 Router Simulation

When jumper PL12 is linked high the Protocol Translator acts as a router simulator. The text <ROUTER SIMULATION> is displayed to the right of the other manufacturers name on the status display to indicate this mode of operation. The operation of the Protocol Translator is identical to normal operation, except that the commands are not translated and false responses are always given. This jumper is provided to help during system installation.

PL11 Status Display Lines

Jumping PL11 high selects 525 lines for the status display, whilst jumpering low selects 625 lines for the status display. The setting of this jumper is only applicable to hardware as the software within the Protocol Translator does not use the extra display lines when in 625 mode.

PL10 <INTERROGATE> Responses

When jumpered high the system returns the value 1023 as the source number in a <TALLY> response if there is no communication with the OEM routing equipment. If it is linked low then the Protocol Translator mimics the operation of a router and does not respond if there is no communication with the router.

PL9 Controller Protocol Select

If jumpered high the Protocol Translator uses Pro-Bel General Remote Control Communication Protocol (SW-P-08) as the controller protocol. Whist jumpered low selects the Pro-Bel General Switcher Communication Protocol (SW-P-02).

PL21, PL22 and PL23 Controller Input Select

These jumpers select the number of sockets which are assigned as extra controller input ports. A maximum of six sockets can be assigned as controller ports, specific ports cannot be assigned as the ports are block allocated. Refer to the table below for the jumper settings and the sockets which are subsequently allocated.

EXTRA PORTS	PL23	PL22	PL21	SOCKETS ALLOCATED
0	LOW	LOW	LOW	NONE
1	LOW	LOW	HIGH	SK3
2	LOW	HIGH	LOW	SK3, SK4
3	LOW	HIGH	HIGH	SK3, SK4, SK5
4	HIGH	LOW	LOW	SK3, SK4, SK5, SK6
5	HIGH	LOW	HIGH	SK3, SK4, SK5, SK6, SK7
6	HIGH	HIGH	LOW	SK3, SK4, SK5, SK6, SK7, SK8

PL24 Protocol Dependent

This jumper is used within certain protocols to select between various commands and modes of operation. Refer to the relevant appendix to determine the setting of this jumper.

6 INSTALLING THE EDITORS

6.1 Installation Requirements

The Protocol Translator Editors software is supplied on a single 3.5" 1.44MB IBM PC format floppy disk (diskette).

- Microsoft MS-DOS version V3.3 or later.
- OS/2 version V2.0 or later.
- Microsoft MS-Windows version V3.1 or later.
- OS/2 for Windows has not been tested with this product.

This and subsequent versions should run on any IBM compatible PC (desktop or notebook), Pro-Bel does not endorse particular manufacturers or models and does not accept responsibility for software performance under these circumstances.

For an up-to-date specification of an appropriate PC please request this from Pro-Bel, Pro-Bel Inc Sales Department or its overseas agents.

The requirements at the time of writing are for running the Editor, not third party operating systems are:

- Any IBM compatible 80*86, Pentium or Emulated PC.
- 640K RAM minimum.
- Hard disc drive installation requires a maximum of 200K of free space to hold the Editor and a database.
- Mono display adequate, colour VGA display preferred.
- Keyboard with all function keys F1 to F12 on individual keys, no mouse operation is supported.
- 3.5" 1.44MB floppy disc (diskette) drive for installation of software.
- Either an RS-232 or an RS-442 serial communication port configured as either COM1 or COM2, capable of 19200 baud, 8 data, No parity and 1 stop bit.

6.2 Installing The Protocol Translator Editor Program

The Protocol Translator Editor works under OS/2, MS-Windows or MS-DOS and can be run from the delivered floppy or hard disc.

Files On The Installation Disc

- PTC.EXE the editor program.
- INSTALL.BAT the installation program.
- README.TXT a release note.
- EXAMPLE.TCD a sample database
- CURR_SYS.TCD the database for your system.

Installing for the First Time

The installation program is MS-DOS based and must be run at either:

- A normal MS-DOS command prompt.
- An 'OS/2 DOS BOX' command prompt session. This is achieved by double-clicking the icon within the 'Command Prompt' folder to start the command prompt session.
- An MS-DOS window by double-clicking the icon within Windows.

To install into a new directory proceed as follows :

- Ensure that the installation Disc is write-protected.
- Make a backup copy of the installation disc, write-protect it and keep it in a safe place. For a PC with a single 3.5" drive A enter the following command and follow the prompts:

  diskcopy a: a:

- Put the Pro-Bel Protocol Translator Editor Installation disc into drive A:
- Type **install** to install to the default directory of **c:\ptc**, otherwise specify the full MS-DOS drive and path to the directory where you want the software to install after the install command, e.g *install m:\probel\editors*.

Installing Over A Previous Version

To reinstall the Editors software to a directory where the program has already been installed proceed as above, but note that the installation program overwrites the program files and any database files with the same name.

For information on compatibility between the version of the editor supplied on the disk and older databases see the 'readme.txt' file on the installation disc.

6.3 Starting The Editors

Caution ! Pro-Bel recommends that before any major editing session you make a backup copy of the file edited. Use the 'COPY' or 'REPLACE' command to copy them to another directory on your hard disc or to a diskette.

Upon successfully starting the Editor the software version number is displayed on a banner page, refer to section 8 of this document.

Starting Editor from the Command Line

- Change to the Drive and Path where the Editor is installed.
- Type **PTC** *<Enter>*

Starting Editor from an OS/2 Program Object

Double-click the Program Object using the mouse, or use cursor keys to move the highlight to it, then press *<Enter>*.

Starting Editor from an MS-WINDOWS Icon

Double-click the Icon using the mouse, or use cursor keys to move the highlight to it, then press *<Enter>*.

7 EDITOR MENU TREE

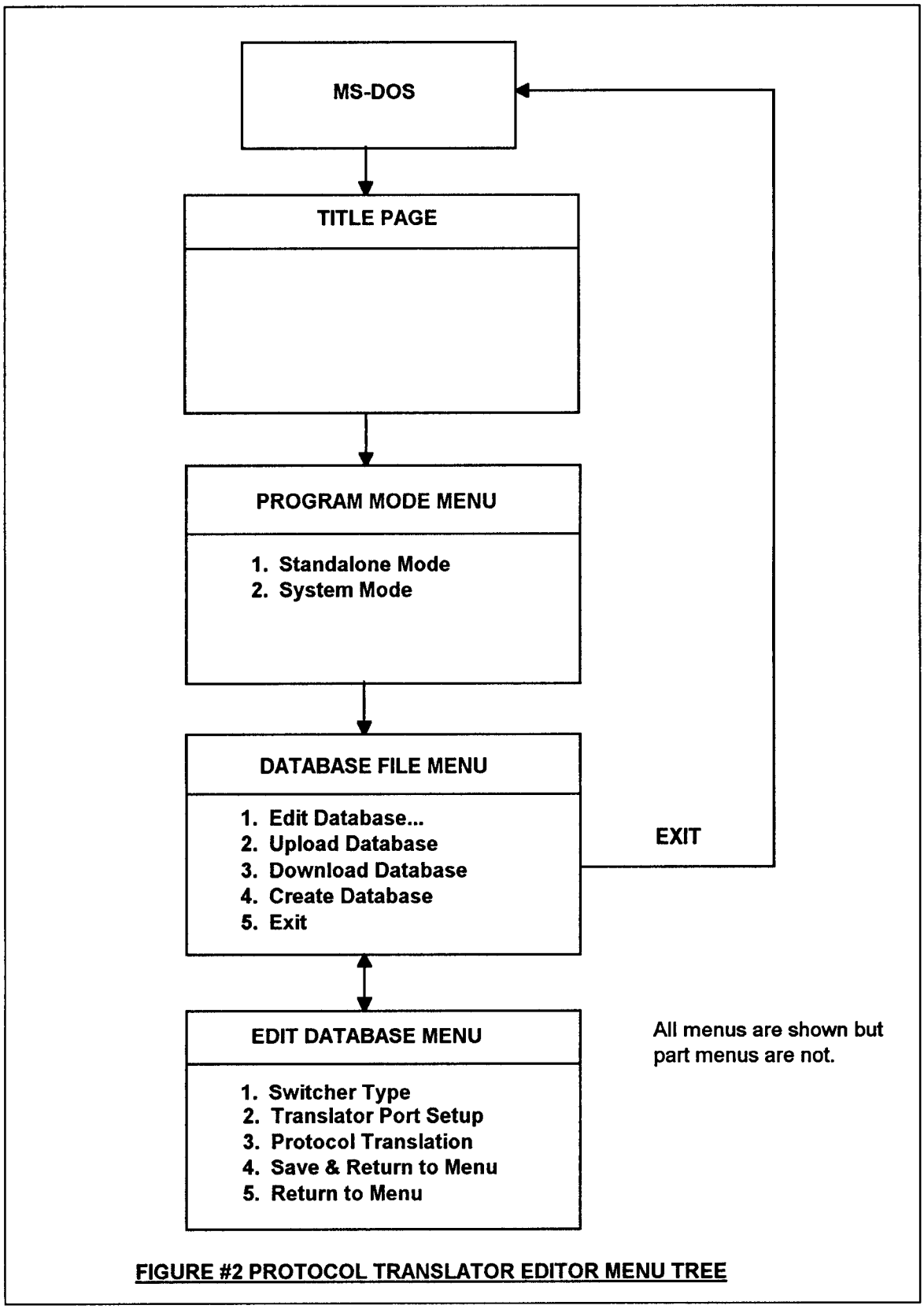
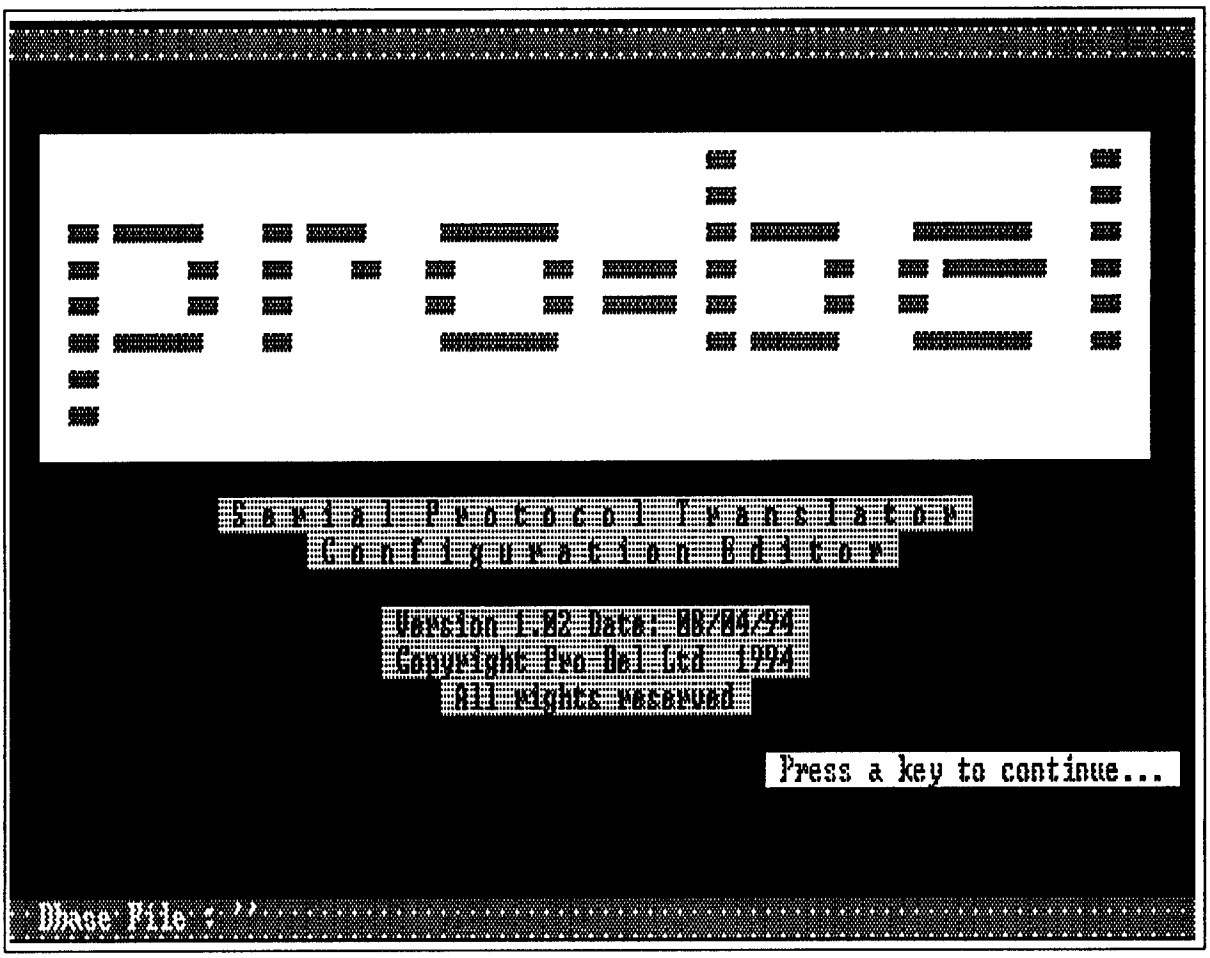


FIGURE #2 PROTOCOL TRANSLATOR EDITOR MENU TREE

8 THE TITLE PAGE

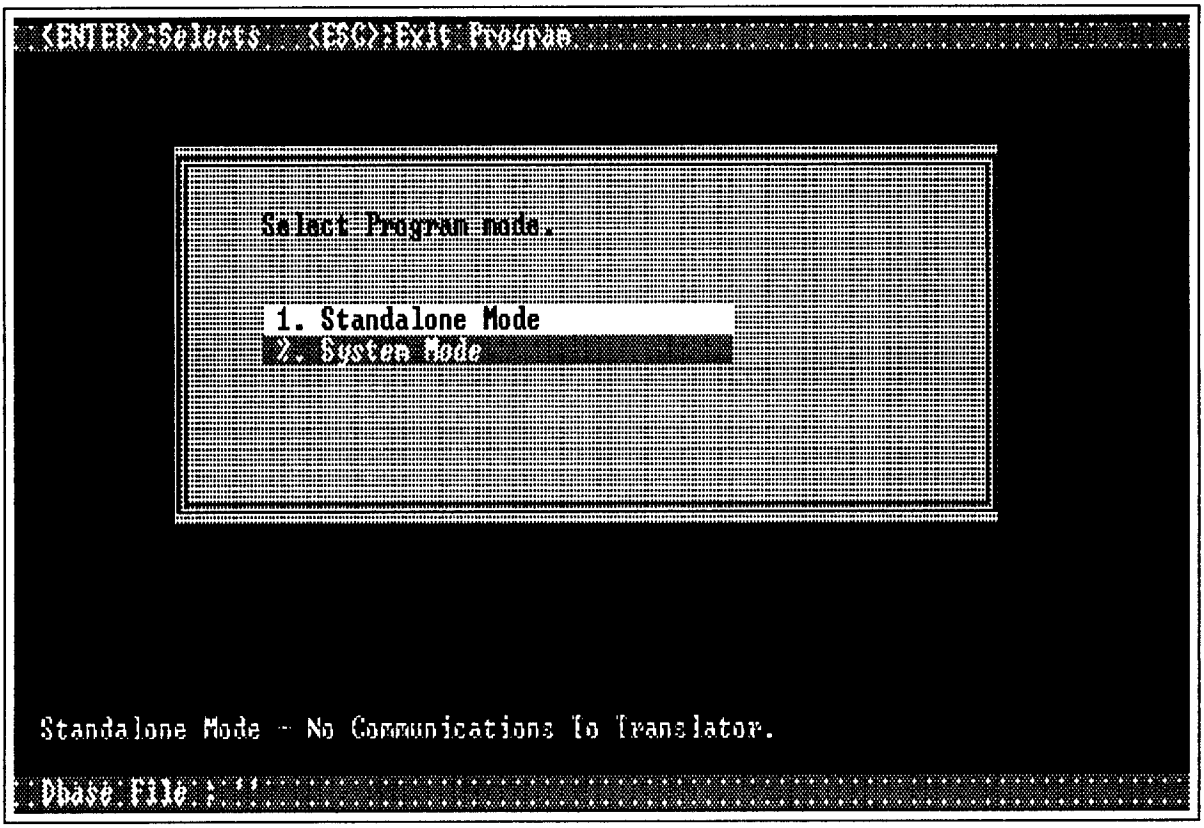
The title page provides the version number of the Editor you are running. Pressing any key on the keyboard displays the 'Program Mode' Menu.



9 THE "PROGRAM MODE" MENU

9.1 About This Menu

This menu allows you to select an Operational Mode or leave the program. The Mode you select remains in effect for the duration of time you are within the Editor. The selected mode is displayed on the information line at the bottom of the screen.



9.2 How To Use This Menu

Move up or down the list using the cursor keys and select an item with *<Enter>*. Alternatively, simply press the number key corresponding to the item number and the selection is made immediately. The system does not remember the last selection made therefore 'Standalone Mode' is shown as the default.

9.3 Menu Choices

Standalone Mode

You may operate in 'Standalone Mode' at any time. This ignores any serial link to the Protocol Translator. Select 'Standalone Mode' when you want to modify an existing database off-line. The current database can be edited in this mode.

System Mode

You may operate in 'System Mode' only when the serial link to the Protocol Translator is connected and the Protocol Translator is switched on. Any database may be edited in this mode, but none of the changes are echoed simultaneously within the Protocol Translator Database. Once edited the Database has to be selected and downloaded from the 'Database File' Menu.

When this mode is selected a 'Communication Port' Sub-Menu is displayed and the PC communication port which you wish to use has to be selected. This is selected in the same way as specified in section 9.2 of this document. The available options are PC ports COM1 and COM2.

After a selection is made the Editor attempts to communicate with the Protocol Translator on the specified PC communication port. On the information line the following message is displayed.

COM1...Checking Link..

If the attempt is successful then the 'Database File' Menu is displayed, otherwise four more communication attempts are made before the Editor gives up and requests that the PC communication port be re-selected. Failed attempts are indicated by colons on the information line as shown below. The Editor will perform all the attempts to establish communications and it cannot be stopped via key sequences. An indication that the Editor has given up is displayed as the word 'Failed' on the information line.

COM1...Checking Link..::::..Failed

10 THE "DATABASE FILE" MENU

10.1 About This Menu

This allows for database file management. Certain options are not selectable depending on the 'Program Mode' selected.

10.2 How To Use This Menu

Move up or down the list using the cursor keys and select an item with *<Enter>*. Alternatively, simply press the number key corresponding to the item number and the selection is made immediately. The system remembers the last item you selected so this is shown as the default.

10.3 Menu Choices

Edit Database...

Select this to make changes to the Current Database. The 'Edit Database' menu is displayed.

Upload Database

This menu item is only accessible if the Editor is in System Mode. A pop-up form appears requesting the filename of a file to upload the protocol translator database to. The Editor creates the file if it does not already exist. After successful upload the program returns to the *<Database File>* Menu.

Download Database

This menu item is only accessible if the Editor is in System Mode. A pop-up form appears requesting the filename of the database to download to the protocol translator. On selecting a file the Editor downloads the database to the Protocol Translator **OVERWRITING** the database currently held within the Protocol Translator. After successful download the program returns to the *<Database File>* Menu.

Create Database

A pop-up form appears prompting for the database filename. There is no default so a filename must be entered into the *<Create File>* field. The filename can be any mixture of alphanumeric characters, no extension for the file name is necessary as the Editor automatically provides it.

The *<Translator Type>* field requires the type of database file to be created. Select the default type *<Serial>*.

After creating the new database file the program returns to the *<Database File>* Menu.

Exit

This quits the Editor. Any changes made that were saved are preserved by the Editors.

11 THE "EDIT DATABASE" MENU

11.1 About This Menu

This allows the editors which operate on the data for the configuration of the Protocol Translation to be selected. The editors available from this menu can be selectable in any required order. Changes made in one editor do not reflect in the other editors.

11.2 How To Use This Menu

Move up or down the list using the cursor keys and select an item with *<Enter>*. Alternatively, simply press the number key corresponding to the item number and the selection is made immediately. The system remembers the last item you selected so this is shown as the default.

11.3 Menu Choices

Switcher Type

A pop-up form appears requiring the OEM protocol which the Pro-Bel protocol is to be translated into and any required 'XON/XOFF' software handshaking. Exiting the pop-up returns back to the *<Edit Database>* menu.

Translator Port Setup

A pop-up form appears requiring the transmit and receive serial I/O ports operating parameters to be setup for the Protocol Translator output sockets: SK3, SK4, SK5, SK6, SK7, SK8 and SK9/SK10. Exiting the pop-up returns back to the *<Edit Database>* menu.

Protocol Translation

A pop-up form appears requiring the mapping of the incoming matrix, level, source and destination ranges to the matrix, level, source and destination ranges on selectable output sockets of the Protocol Translator. Exiting the pop-up returns back to the *<Edit Database>* menu.

Save & Return To Menu

Select this to save any changes made to the selected Database and return to the *<Database File>* Menu. No message box is displayed to confirm the save operation.

Return To Menu

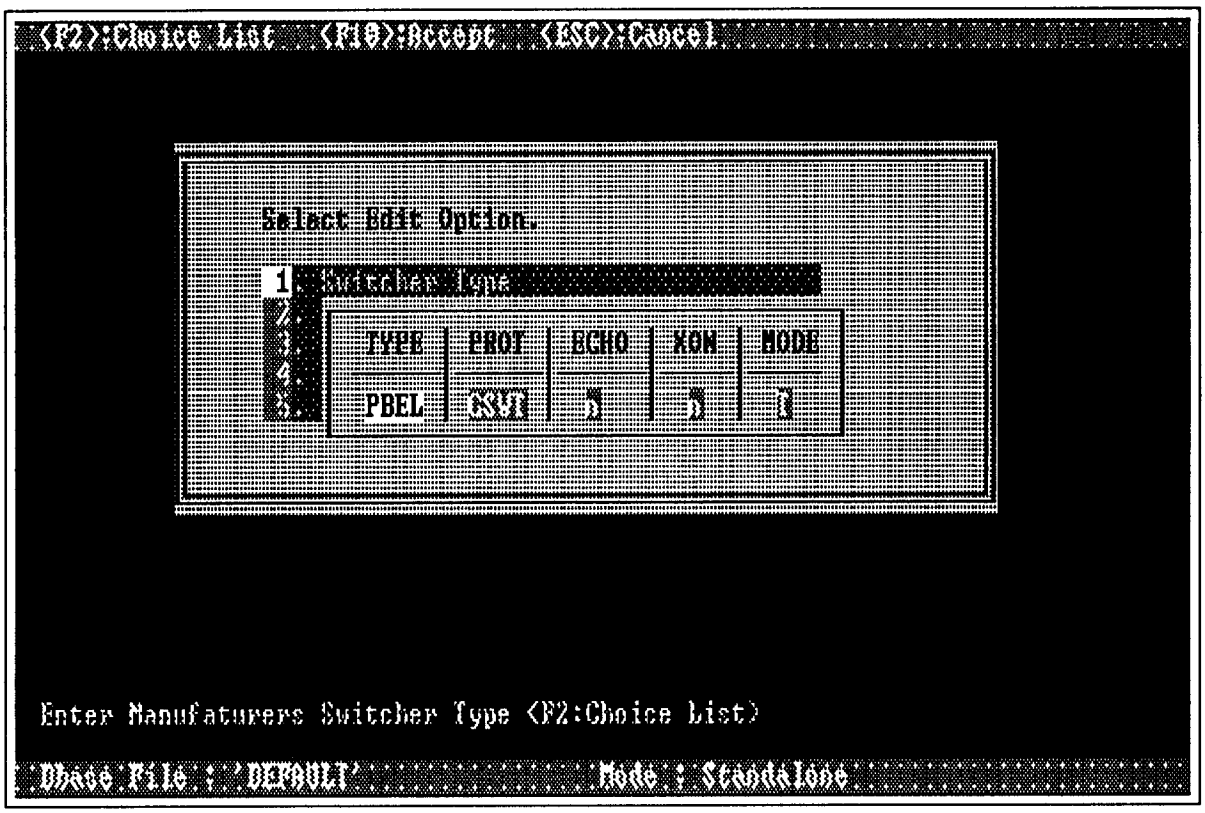
Select this to return to the *<Database File>* Menu without saving changes to the selected Database. Before returning a message box is displayed to verify that the changes are to be made. The default setting is 'Yes' so press *<Enter>* to save the changes or press *<n>* followed by *<Enter>* to return without saving changes.

12 "SWITCHER TYPE"

12.1 About This Editor

This editor allows you to set or change the OEM equipment type and protocol which the Protocol Translator is to interface to.

This editor is a simple data-entry form using Choice Lists for some fields.



12.2 Field Description

TYPE

This specifies the OEM router or controller that is to be interfaced to. The type can only be set by selecting from a choice list. To access the choice list press *<F2>*, move up and down the list using the cursor keys and select one of the items with *<Enter>*. The default type is *<PBEL>*, which selects a Pro-Bel router.

PROT

This is the OEM protocol which is to be used to talk to the OEM router or controller. The protocol can only be set by selecting from a choice list. To access the choice list press *<F2>*, move up and down the list using the cursor keys and select one of the items with *<Enter>*. The default protocol is *<GSWT>*, which select the Pro-Bel General Switcher Communication Protocol (SW-P-02).

Echo

This flag controls indicates if the OEM controller is to perform echoes of commands back to the Protocol Translator. This field is wholly protocol specific and further reference should be made to the appropriate protocol appendix.

Xon

This flag controls the use of the 'XON/XOFF' software handshaking protocol, to provide data flow control between the Protocol Translator and the OEM router or controller. The flag should only be enabled if the OEM router or controller is also enabled to use the 'XON/XOFF' software handshaking protocol.

This is turned off by default, and can be set by pressing <*y*> and unset by pressing <*n*>.

MODE

This flag controls the use of False Responses by the Protocol Translator. Some OEM routers or controllers only operate at slow baud rates or do not provide crosspoint set confirmation. This flag allows the Pro-Bel controller to be updated with the expected response to a command ***BEFORE*** the command is actually carried out by the OEM router or controller. The Protocol Translator updates the Pro-Bel controller later in time if the crosspoint did not get set.

This is turned off by default, and can be set by pressing <*y*> and unset by pressing <*n*>.

12.3 Validation And Acceptance

The system does not check that the OEM router or controller characteristics supplied are within the capabilities of the OEM router or controller that may be selected within the <*Switcher Type*> editor.

It does check that the appropriate OEM protocol has been selected for the equipment manufacturer.

It checks the number of Echo, Xon and Mode flags have valid settings. To save the setup press <*F10*>. This stores the data and exits the editor.

12.4 Special Function Keys

Press <*Tab*> and <*BackTab*> to move between fields.

Press <*F2*> to change the choice list fields.

Press <*F10*> to save changes and leave the editor.

Press the up and down cursor to move within a column.

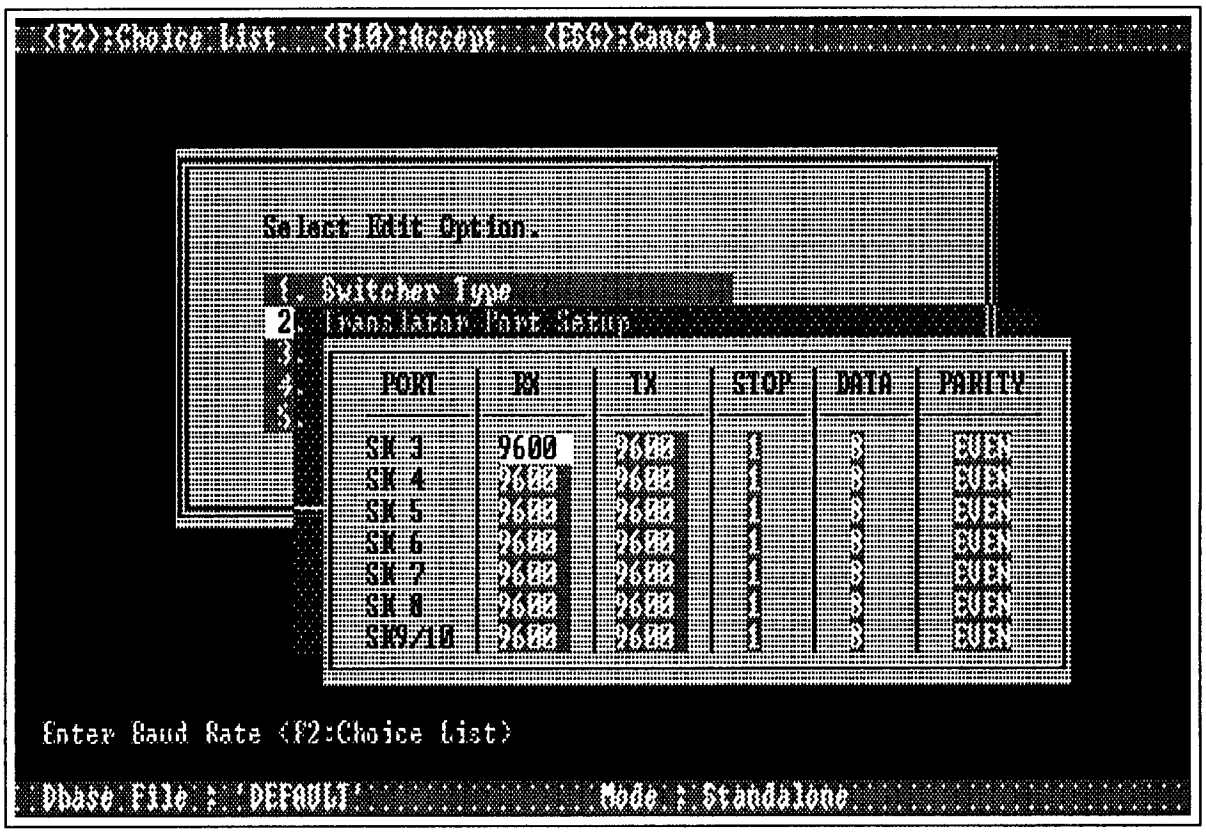
Press <*Esc*> to be prompted before leaving the editor, without saving any changes.

13 "TRANSLATOR PORT SETUP"

13.1 About This Editor

This editor allows you to set or change the serial I/O operational characteristics of the Protocol Translator to match those of the OEM equipment that is being interface to.

This editor is a simple data-entry form using Choice Lists for some fields.



13.2 Field Description

RX

This is the receive baud rate which will be used on the serial link between the Protocol Translator and the OEM router or controller to receive data packets on the specified Protocol Translator output socket. The baud rate specified has also to be selectable and supportable as the transmission rate within the OEM router or controller.

The baud rate can only be set by selecting from a choice list. To access the choice list press <F2>, move up and down the list using the cursor keys and select one of the items with <Enter>. The default baud rate is "38400", which selects a receive rate of 38400 bits per second on the serial link.

TX

This is the transmission baud rate which will be used on the serial link between the Protocol Translator and the OEM router or controller to transmit data packets on the specified Protocol Translator output socket. The baud rate specified has also to be selectable and supportable as the receive rate within the OEM router or controller.

The baud rate can only be set by selecting from a choice list. To access the choice list press <F2>, move up and down the list using the cursor keys and select one of the items with <Enter>. The default baud rate is "38400", which selects a transmission rate of 38400 bits per second on the serial link.

STOP

Enter the number of Stop Bits for each data packet which are sent on the serial link. This may be either 1 or 2 according to the serial device capabilities of the OEM router or controller.

By default the number of stop bits is "1".

DATA

Enter the number of Data Bits for each data packet which are sent on the serial link. This may be either 7 or 8 according to the serial device capabilities of the OEM router or controller.

By default the number of data bits within a data packet is "8".

PARITY

Enter the Parity type for the data packets which are sent on the serial link. This may be either 'EVEN', 'ODD' or 'NONE' according to the serial device capabilities of the OEM router or controller.

By default the Parity type for a data packet is "EVEN".

13.3 Validation And Acceptance

The system does not check that the serial I/O operational setup supplied is within the capabilities of the OEM router or controller that may be selected within the 'Switcher Type' editor. It checks the number of Stop Bits, Data Bits and Parity Type for the data packets. To save the setup press <F10>. This stores the data and exits the editor.

13.4 Special Function Keys

Press <Tab> and <BackTab> to move between fields.

Press <F2> to change the choice list fields.

Press <F10> to save changes and leave the editor.

Press the up and down cursor to move within a column.

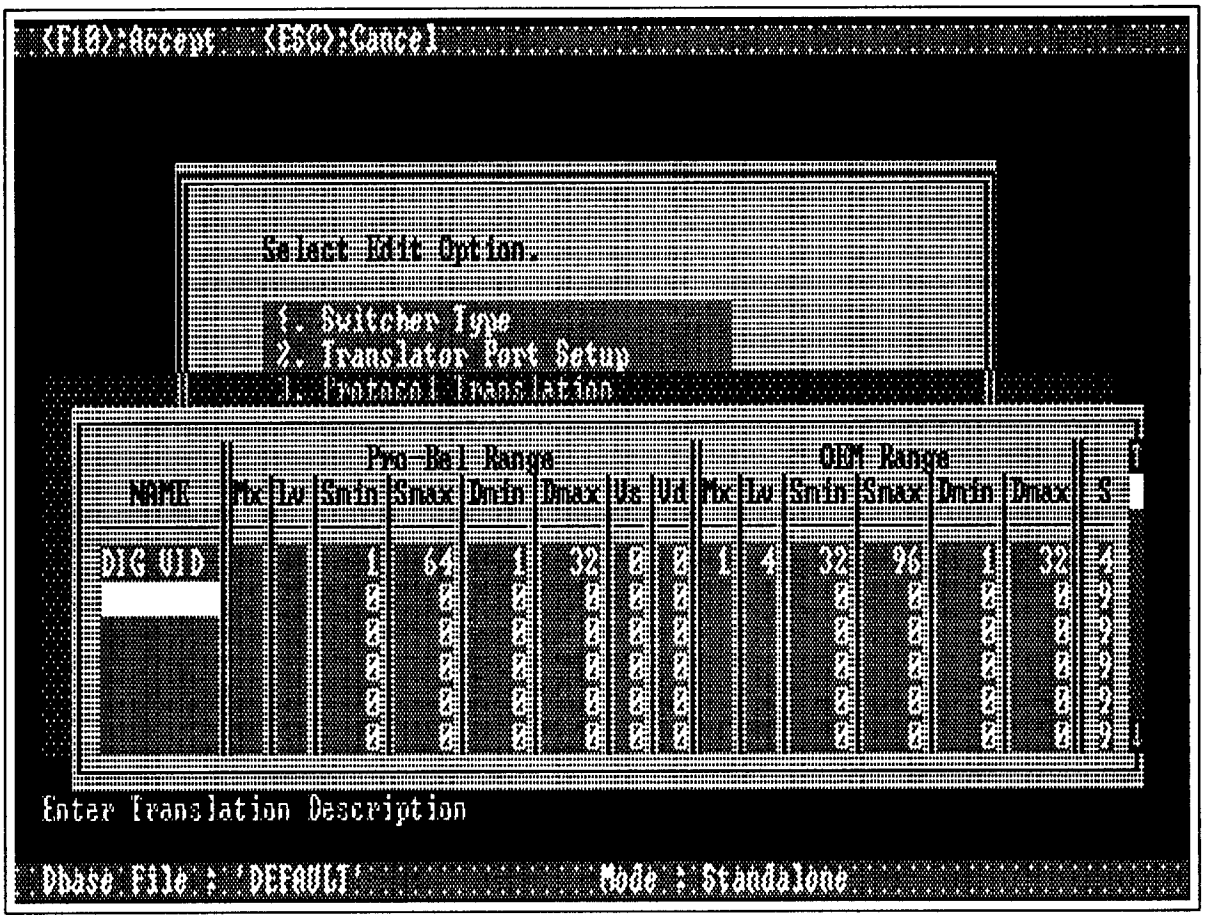
Press <Esc> to be prompted before leaving the editor, without saving any changes.

14 "PROTOCOL TRANSLATION"

14.1 About this Editor

This editor allows you to set or change how the Pro-Bel matrix, level, source and destination ranges are mapped onto the OEM matrix, level, source and destination ranges. The editor allows 128 separate translations to be specified.

This editor is a simple data-entry form, with blanks as default unless otherwise specified.



14.2 Field Description

NAME

An eight character name to describe the OEM Matrix Level which is being mapped onto. Make it descriptive, e.g DIG VIDEO or ALOG AUD.

Pro-Bel Range Mx

A two digit number to specify the incoming Pro-Bel Matrix number. This should only be entered if the selected input protocol is Pro-Bel General Remote Control Communication Protocol (SW-P-08).

Pro-Bel Range Lv

A two digit number to specify the incoming Pro-Bel Level number for the matrix defined within the Pro-Bel Range Mx field. This should only be entered if the selected input protocol is Pro-Bel General Remote Control Communication Protocol.

Pro-Bel Range Smin

A four digit number to specify the incoming minimum Pro-Bel source range number for the Pro-Bel Matrix and Level specified within the Mx and Lv fields. This must be entered in all circumstances. This may be a number between 1 and 1023.

The default is zero.

Pro-Bel Range Smax

A four digit number to specify the incoming maximum Pro-Bel source range number for the Pro-Bel Matrix and Level specified within the Mx and Lv fields. This must be entered in all circumstances. This may be a number between 1 and 1023.

The default is zero.

Pro-Bel Range Dmin

A four digit number to specify the incoming minimum Pro-Bel destination range number for the Pro-Bel Matrix and Level specified within the Mx and Lv fields. This must be entered in all circumstances. This may be a number between 1 and 1023.

The default is zero.

Pro-Bel Range Dmax

A four digit number to specify the incoming maximum Pro-Bel destination range number for the Pro-Bel Matrix and Level specified within the Mx and Lv fields. This must be entered in all circumstances. This may be a number between 1 and 1023.

The default is zero.

Pro-Bel Range Vs

A two digit number to specify the maximum number of Pro-Bel virtual sources for the Pro-Bel Matrix and Level specified within the Mx and Lv fields. If this is entered it must be the same as the Pro-Bel Range Vd field. This may be a number between 0 and 99.

Pro-Bel Range Vd

A two digit number to specify the maximum number of Pro-Bel virtual destinations for the Pro-Bel Matrix and Level specified within the Mx and Lv fields. If this is entered it must be the same as the Pro-Bel Range Vs field. This may be a number between 0 and 99.

OEM Range Mx

A two character alpha-numeric string to specify the OEM router or controller Matrix which the .

OEM Range Lv

A two character alpha-numeric string to specify the OEM router or controller Level which the .

OEM Range Smin

A four digit number to specify the minimum OEM source range number for the OEM Matrix and Level specified within the Mx and Lv fields. This must be entered in all circumstances. The value entered is the equivalent Pro-Bel source value entered within the Pro-Bel Range Smin field. This may be a number between 1 and 1023.

The default is zero.

OEM Range Smax

A four digit number to specify the maximum OEM source range number for the OEM Matrix and Level specified within the Mx and Lv fields. This must be entered in all circumstances. The value entered is the equivalent Pro-Bel source value entered within the Pro-Bel Range Smax field. This may be a number between 1 and 1023.

The default is zero.

OEM Range Dmin

A four character number to specify the maximum OEM destination range number for the OEM Matrix and Level specified within the Mx and Lv fields. This must be entered in all circumstances. The value entered is the equivalent Pro-Bel destination value entered within the Pro-Bel Range Dmin field. This may be a number between 1 and 1023.

The default is zero.

OEM Range Dmax

A four character number to specify the maximum OEM destination range number for the OEM Matrix and Level specified within the Mx and Lv fields. This must be entered in all circumstances. The value entered is the equivalent Pro-Bel destination value entered within the Pro-Bel Range Dmax field. This may be a number between 1 and 1023.

The default is zero.

S

A single number to identify the Protocol Translator output socket on which the OEM router for the specified OEM Ranges Matrix and Level value is to be connected. This may be a number between 3 and 9 according to the OEM requirement for RS-422 or RS-232 communication ports.

The default is nine which selects output socket SK9/SK10.

14.3 Validation And Acceptance

The system does not check that the serial I/O operational setup supplied is within the capabilities of the OEM router or controller that may be selected within the 'Switcher Type' editor. It checks the number of Stop Bits, Data Bits and Parity Type for the data packets. To save the setup press <F10>. This stores the data and exits the editor.

The OEM destination range must contain the same number of destinations as specified by the formula:

OEM Dmax - OEM Dmin = (PBel Dmax - PBel Dmin) - Vd

The OEM source range must contain the same number of sources as specified by the formula:

(OEM Smax - OEM Smin) = ((PBel Smax - PBel Smin) - Vs)

14.4 Special Function Keys

Press <Tab> and <BackTab> to move between fields.

Press <F2> to change the choice list fields.

Press <F10> to save changes and leave the editor.

Press the up and down cursor to move within a column.

Press <Esc> to be prompted before leaving the editor, without saving any changes.

15 SYSTEM ERROR MESSAGES

15.1 Serial I/O Diagnostic Messages

These diagnostic messages are displayed when there is a discrepancy in the operating parameters within the two ends of the data link. These diagnostic messages can occasionally be generated when the equipment is turned on/off or reset. In these circumstances the error messages can be ignored.

DIAGNOSTIC	DESCRIPTION
<BREAK ERR>	Break error.
<BRK\FRM ERR>	Break and Framing error.
<BK\FR\OV ER>	Break, Framing and Overrun error.
<BK\FR\PR ER>	Break, Framing and Parity error.
<B\F\P\O ERR>	Break, Framing, Parity and Overrun error.
<BRK\OVR ER>	Break and Overrun error.
<BRK\PAR ERR>	Break and Parity error.
<BK\PR\OV ER>	Break, Parity and Overrun error.
<FRAME ERR>	Framing error.
<FRM\OVR ERR>	Framing and Overrun error.
<FRM\PAR ERR>	Framing and Parity error.
<FM\PR\OV ER>	Framing, Parity and Overrun error.
<OVERRUN ERR>	Overrun error.
<OVR\PAR ERR>	Overrun and Parity error.
<PARITY ERR>	Parity error.

15.2 Trouble Shooting

These diagnostic messages are likely to occur during the initial system setup or reconfiguration. Once the system is running these diagnostic messages should not occur.

DIAGNOSTIC	DESCRIPTION\SOLUTION
<ASSIGN ERR>	Data is being received on a OEM routing system socket which is unassigned within the system database. Check that the cables are connected to the right sockets and that the Protocol Translator database is correct.
<NO COMMS>	No communication to the connected device, check power and cabling.
<CMD ERR>	Unrecognised command, check that the Controller cables are connected to the correct sockets.
<RESP ERR>	Unrecognised response error to a command error, check OEM routing system cable connections to the sockets.
<DB SRCH ERR>	Command data is not within the ranges specified within the Protocol Translator database. Check the databases within the Protocol Translator, Controllers and OEM routing system (if a database exists).
<VIRT DB ERR>	Virtual command data is not within the ranges specified within the Protocol Translator database. Check the databases within the Protocol Translator and Controllers.
<VIRT CMD ER>	Illegal virtual command received, check the databases within the Protocol Translator and Controllers.
<LEVEL ID ERR>	Received an invalid level identifier within a command or response. Check the databases within the Protocol Translator, Controllers and OEM routing system (if a database exists).
<MTRIX ID ER>	Received an invalid matrix identifier within a command or response. Check the databases within the Protocol Translator, Controllers and OEM routing system (if a database exists).
<CMD CSUM ER>	The checksum for the command or response was invalid. Check Serial I/O Operating parameters and cabling.
<INV DEST ERR>	Received an invalid destination within the command or response. Check the databases within the Protocol Translator, Controllers and OEM routing system (if a database exists).
<INV SRC ERR>	Received an invalid source within the command or response. Check the databases within the Protocol Translator, Controllers and OEM routing system (if a database exists).
<X-FLOW ERR>	Received X-FLOW software handshaking characters on the OEM routing system socket connection. The option not being specified within the Protocol Translator database. Check cabling and the Protocol Translator database.

15.3 System Diagnostic Messages

These messages indicate the current operation of the system in response to events which are occurring.

DIAGNOSTIC	DESCRIPTION
<UNIM CMD ER>	Received an unimplemented command from the Pro-Bel or Procion Control System which is ignored.
<NO TRANSLAT>	The command has no OEM protocol translatable equivalent and is ignored.
<ER DEST PRO>	The destination is currently protected by the OEM Routing System.
<15? OR 31?>	The UTAH input has never been switched.

15.4 System Errors Messages

If any of these error messages occur then contact Product Manager at Pro-Bel, detailing the setup of the system.

ERROR MESSAGE	DESCRIPTION
<*CASE ERR*>	CASE Statement failure.
<CIF Q ERROR>	CIF I/O queue full.
<LIST GET ERR>	Internal Linked List of commands fault.
<LIST PUT ERR>	Internal Linked List of commands full.

16 FACILITIES

16.1 System Configuration Limits

This section defines the absolute maximum limits of the basic configuration parameters.

- Number of Matrices = 16
- Number of Levels per Matrix = 16
- Number of Destinations for all Levels = 1024
- Number of Source for all Levels = 1023
- Number of Virtual Destinations per Level = 99
- Number of Virtual Sources per Level = 99
- Number of Controller Ports = 8
  Assuming only one Matrix\Level Control ports.
- Number of Matrix\Level Control Ports = 7
  Assuming only two Controller Ports.
- Number of Translation Entries = 128
  There are 128 entries in the Protocol Translation Table.

16.2 Fan-Out

The fan-out facility allows from one to seven physically different OEM routing systems (of the same type) to be controlled from the Protocol Translator. In most instances a single System Controller provides control over the system. This facility is provided by the normal operation of the system.

The Protocol Translator allows seven OEM Routing Systems to be connected by default.

The connections from the Protocol Translator are selected within the PC Editor in the *Protocol Translation* menu option.

16.3 Fan-In

The fan-in facility of the Protocol Translator allows different Pro-Bel System Controllers to provide control over the same OEM routing systems.

The system by default allows two controllers to be connected to the Protocol Translator. This allows for a main control system connection along with an Emergency Panel. A maximum of six other system controllers may be jumper selected, via jumpers PL21, PL22 and PL23, providing eight controllers total. Refer to the *Jumper Diagnostic* section of this document.

If extra system controllers are jumper selected then the number of OEM routing system connections is decreased by the same amount.

16.4 Protocol Translation

A Pro-Bel or Procion Controller can transparently control OEM routing systems as if it were Pro-Bel routing systems connected directly to the control system. The operation of the Protocol Translator is best described as an example.

Example System

In this example the Protocol Translator is to interface to an OEM routing system which is controlling two routers:

- 32 x 32 Video router which is a single level.
- 32 x 32 Audio router which has two levels and is logically two audio routers. The two audio routers are each 16 x 16.

The OEM protocol dictates that the video matrix is identified by a '0', and the first level by a '0'. The audio matrix is identified by a '1', and the first level by '0' and the second level by '1'.

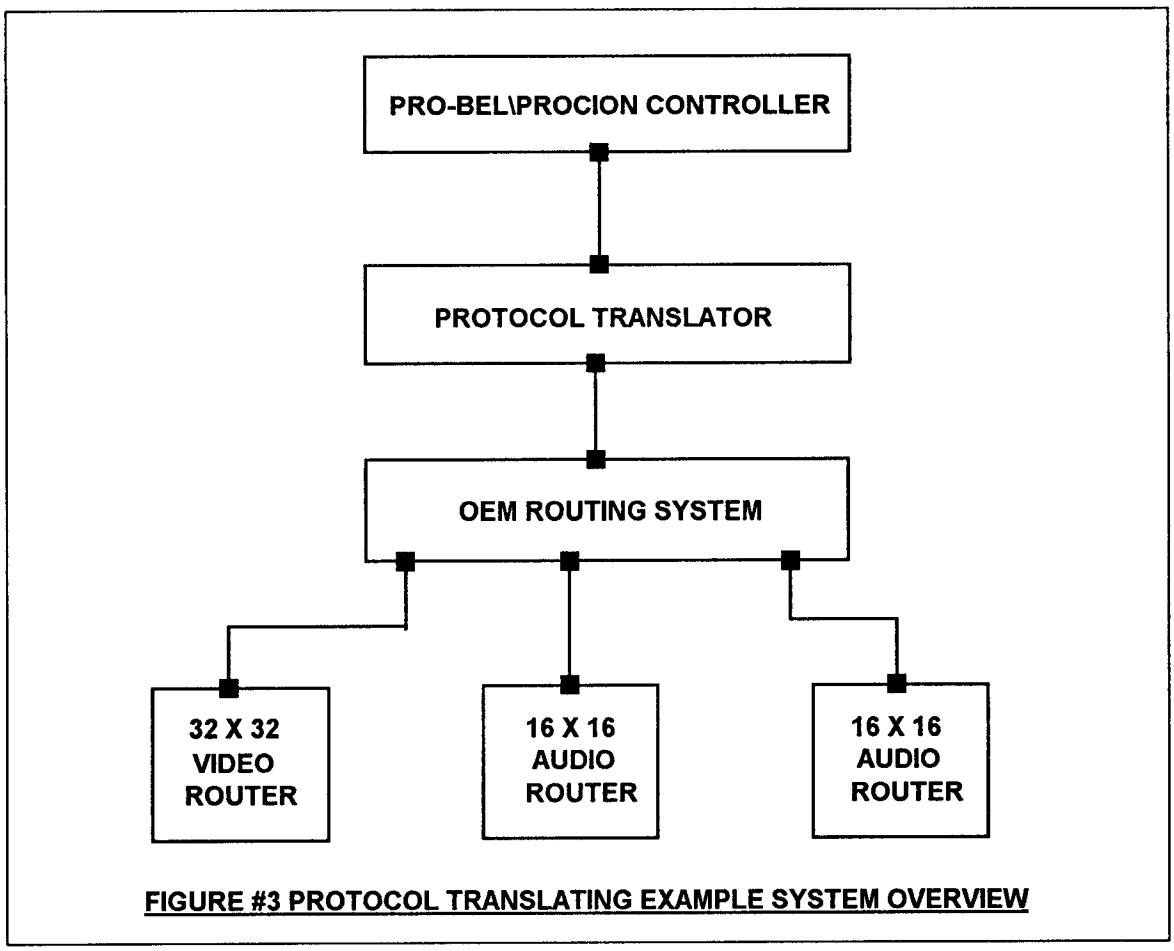


FIGURE #3 PROTOCOL TRANSLATING EXAMPLE SYSTEM OVERVIEW

Pro-Bel System 2 Controller System

The Pro-Bel System 2 control system can control the OEM routing system in a number of different ways. System 2 allows a single matrix to be specified with up to four independent levels within the matrix. Each level has a maximum of 128 destinations.

Pro-Bel System 3\Procion Controller System

Pro-Bel System3\Procion can control the OEM Routing System in a number of different ways. Some of these include:

- A single matrix with three levels on a single System 3 matrix port.
- Two routers the video with one level and the audio with two levels on two System 3 matrix ports.
- Three routers each with a single level on three System 3 matrix ports.

In this example they are treated as a single matrix with three levels on a single matrix port.

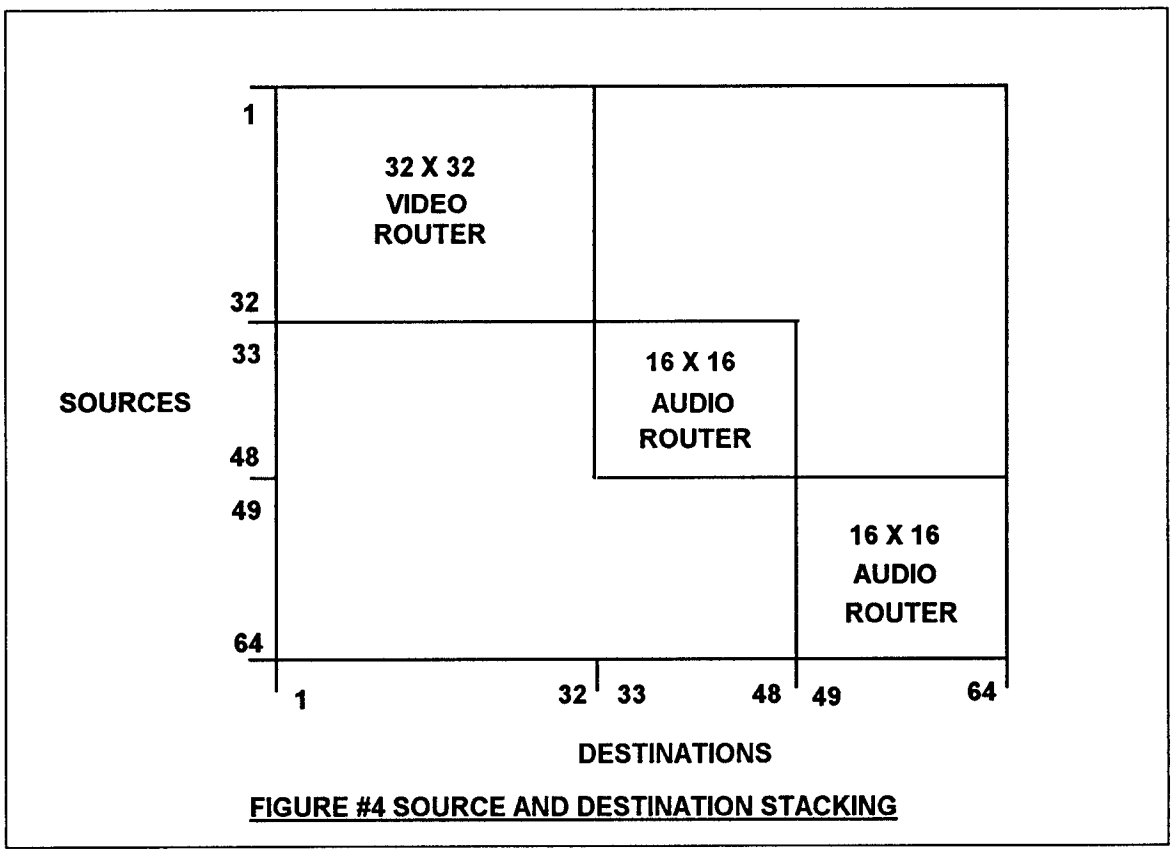
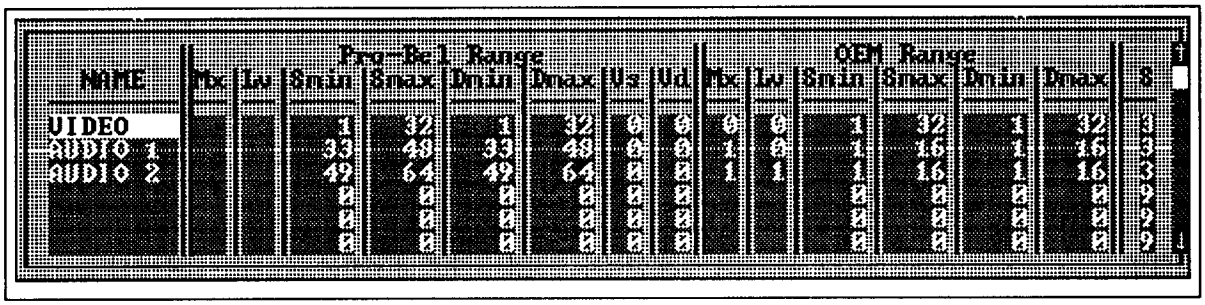


FIGURE #4 SOURCE AND DESTINATION STACKING

Protocol Translating Table Configuration

The Protocol Translator Editor is used to create a database which maps the Control Systems Matrix and Level source and destinations architecture onto the OEM Routing Systems Matrix and Levels source and destination architecture.

With reference to the table screen-shot below the three OEM routers have been mapped to the control system.



16.9 Virtual Routing

Any level can be specified as having a number of virtual sources and destinations thus giving the controller a virtually sized router. The same number of virtual sources and destinations must be specified. The destinations are taken as values from the maximum destination limit of 1024.

Allocation

The same number of virtual sources and destinations has to be specified.

Assignment

The virtual sources and destinations are defined as a block of sources and destinations and cannot be scattered through the real matrix level. This block is always taken by the Protocol Translator to be defined after the real sources and destinations for the matrix level.

Connections

All virtual sources and destinations are 'connected' through on a constant '1-to-1' basis. That is virtual source 1 is always associated to virtual destination 1, with virtual source 1 always following the real source routed to virtual destination 1.

Routing

When routing virtual sources and virtual destinations it is the virtual source and destination numbers which are returned to the Pro-Bel controller not the real source and destination numbers routed.

Operation

The logical image of the crosspoints are preserved through system power-down within non-volatile RAM. On power-up the Protocol Translator validates the virtual routes stored. Any discrepancies that exist between the virtual routes and the real crosspoints within the routers are dealt with by the real crosspoint sets prevailing.

Example System

This example is an extension of the example provided within section 16.4 Protocol Translation. The 32 x 32 Video matrix is to be extended to include eight virtual sources and eight virtual destinations, effectively having a virtual 40 x 40 Video matrix.

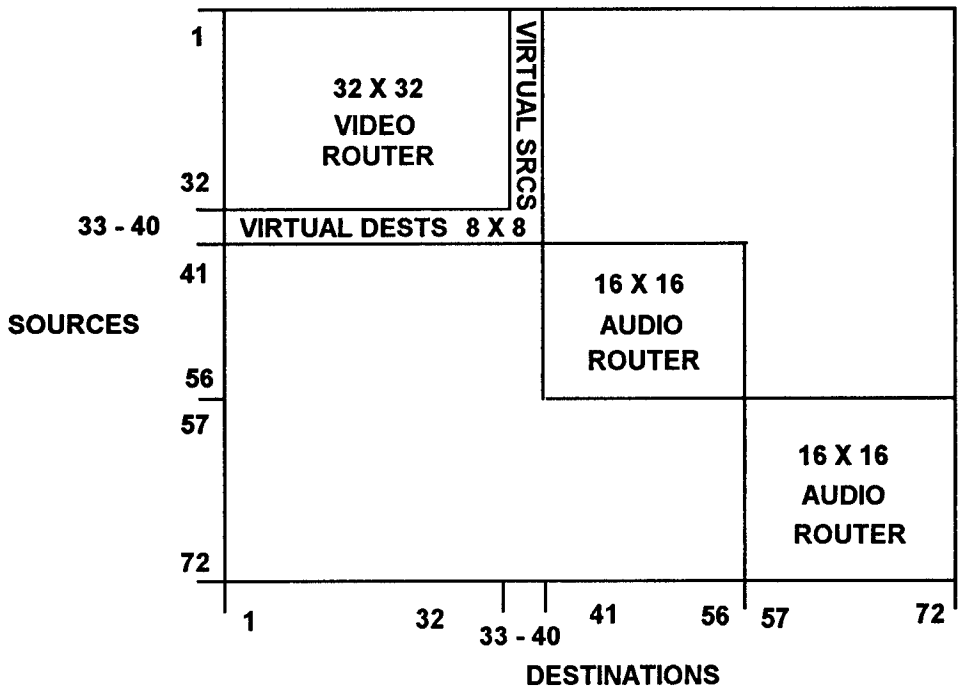


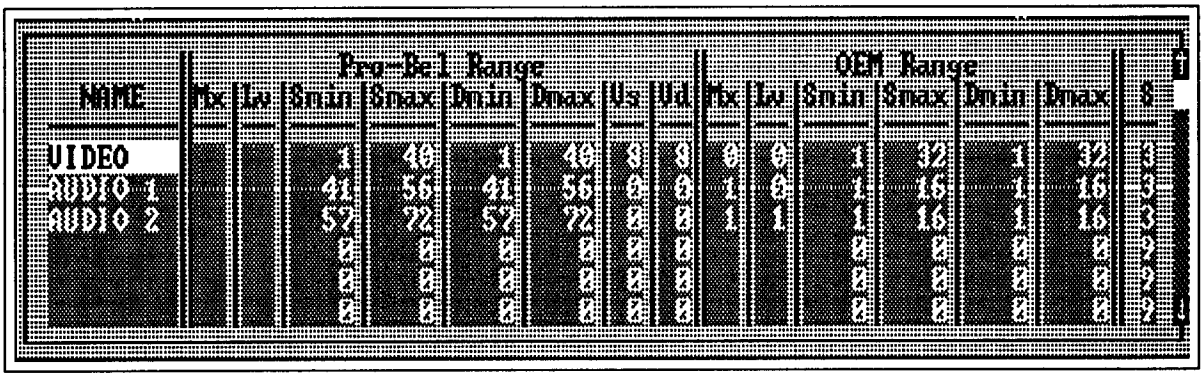
FIGURE #5 VIRTUAL SOURCES AND DESTINATIONS

Protocol Translating Table Configuration

The Protocol Translator Editor is used to create a database which maps the Control System matrix, level, source and destinations architecture onto the OEM Routing Systems matrix, level, source and destination architecture.

With reference to the table screen-shot the three OEM routers have been mapped to the Control System. The extra virtual sources and destinations have been added to the Video row of the table.

The column entries <Vs> and <Vd> now specify that the video Level has eight virtual sources and eight virtual destinations. The physical size of the OEM systems Video Level **STILL** remains as a 32 x 32 level, logical size is now 40 x 40.



NAME	Pro-Bel Range								OEM Range							
	Mx	Lv	Smin	Smax	Dmin	Dmax	Vs	Vd	Mx	Lv	Smin	Smax	Dmin	Dmax	S	
VIDEO			1	40	1	40	8	8	0	0	1	32	1	32	3	
AUDIO 1			41	56	41	56	0	0	1	0	1	16	1	16	3	
AUDIO 2			57	72	57	72	0	0	1	1	1	16	1	16	3	
			0	0	0	0	0	0			0	0	0	0	2	
			0	0	0	0	0	0			0	0	0	0	2	
			0	0	0	0	0	0			0	0	0	0	2	

17 STATUS DISPLAY DIAGNOSTIC SCREENS

17.1 Status Displays Overview

The 2411 Controller has a status display output (MONO or RGB) which is used for diagnostic information. The status display is 40 x 25 characters in size.

The system only generates two status display screens. One of which is jumper selectable with it displaying the current I/O settings of the serial SK ports for the first ten seconds after power-up. The second screen acts as a communications monitor and replaces the first after ten seconds (if the jumper option was selected), or is displayed initially otherwise.

The status display can be turned on and off and its displayed output affected by setting various jumper options.

17.2 Serial I/O Setup Display

Serial I/O Setup Overview

This display page lists the serial I/O operational characteristics of SK ports SK3 to SK9/SK10. The receive, transmit, parity, number of stop bits and the number of data bits are displayed, along with an indication if that port has been assigned within the Editor. This page is only displayed for ten seconds before it is swapped for the communications monitor page.

Manufacturer Line

The first line of the display identifies the OEM manufacturers name as selected on the "SWITCHER TYPE" editor (refer to section 12 of this document).

To the right of the OEM manufacturers name an asterix '*' may appear. This indicates that the internal tally table has been cleared (effectively wiping all virtual crosspoint routes). The clearing of the tally table is ONLY performed when a system database is downloaded and NOT on system power-up.

An indication of the operational mode the Protocol Translator is currently in is displayed on the right-hand-side of the line.

OPERATION MODE	MEANING
<ROUTER SIMULATION>	Protocol Translator is router simulating.
<WRONG DATABASE TYP>	Database is of type 'Kadenza' instead of 'Serial'.
<NO VALID DATABASE>	Database is invalid.
<INVALID NEW DATABASE>	The default empty database has been downloaded.
<INV ALID INP PLJUMP>	Seven Fan-In input ports have been assigned.
<INP ASSIGNED SK ER>	Fan-In port is assigned as an output port.
<VIRT PR'COL TRANSL>	Virtual Protocol Translating has been selected.
<PR'COL TRANSLATING>	Normal Protocol Translating has been selected.

Protocol Line

The second line of the display identifies the OEM protocol being translated into, as selected on the "SWITCHER TYPE" editor (refer to section 12 of this document).

To the right of the OEM protocol the message **<X-FLW>** will be present if the XON/XOFF software handshaking protocol option was selected within the "SWITCHER TYPE" editor (refer to section 12 of this document).

An indication of the mode flags that are currently set within the Protocol Translator from the "SWITCHER TYPE" editor (refer to section 12 of this document) is displayed on the right-hand-side of the line.

- <TRUE RESP> Indicates true response mode.
- <FALSE RESP> Indicates false response mode.

17.3 Communications Monitor Display

Monitor Overview

This display page provides a communications monitor screen. All commands received and transmitted by the Protocol Translator are displayed in either a transcoded format or in Hexadecimal.

Manufacturer Line

This display information is identical to the information displayed as specified within section 17.1 Serial I/O Setup Display.

Protocol Line

This display information is identical to the information displayed as specified within section 17.1 Serial I/O Setup Display.

Communication Monitor

The remaining display indicates the commands received and responses transmitted on all the SK ports.

The columns with the <ER> heading is an indication of the number of errors which have occurred on that socket for the receiving and transmitting of data. The error count is displayed in green for error counts between zero and ninety-nine. Once ninety-nine is passed the error count cycles back to zero and is then displayed in red to indicate that more than one hundred errors have occurred on that socket. The error counts continues to cycle.

The <RECEIVED> and <TRANSMITTED> columns indicate the actual commands processed by the Protocol Translator. These columns are also used to display diagnostic error messages to indicate any faults which may occur.

The system expects a continuous command stream from the connected Pro-Bel Controllers. If it does not received any data every five minutes the error count for that port is increased and the message **<NO COMMS>** is displayed.

Display Data Flow

The way the data is displayed on the status display is described with the aid of an example.

SK1	**CNT 001 0023**	0	< >	0
SK2	< >	0	< >	0
SK3	< >	0	< >	0

The system receives a 'Connect source twenty-three to destination one' command from the Pro-Bel Controller on port SK1.

SK1	CNT 001 0023	0	< >	0
SK2	< >	0	< >	0
SK3	< >	0	**CNT 0064 0086**	0

It checks the values within the received command and performs the translation into the corresponding command in the OEM protocol. In this example it is being converted into the same Pro-Bel protocol but all destinations and sources are offset by 63. The command is then sent to the router on the SK port specified within the database.

SK1	CNT 001 0023	0	< >	0
SK2	< >	0	< >	0
SK3	**CTD 0064 0086**	0	CNT 0064 0086	0

When a 'CONNECTED' response is received on port SK3 indicating that source eighty-six is routed to destination sixty-four. The system validates the values returned by the router...

SK1	CNT 001 0023	0	**CTD 0001 0023**	0
SK2	< >	0	**CTD 0001 0023**	0
SK3	CTD 0064 0086	0	CNT 0064 0086	0

...and performs a backwards conversion into the Pro-Bel Controller Protocol and issues the response back to the Pro-Bel Controller which originally issued the command. The 'CONNECTED' response is also echoed out of all the other assigned Pro-Bel Controller ports.

APPENDIX A - PROCION CONTROL SYSTEM

CONTENTS

OTHER RELEVANT DOCUMENTATION

REFERENCE NO	DESCRIPTION
1. SW-P-08	General Remote Control Communication Protocol. Issue 8, 28/08/92.
2. SW-P-02	General Switcher Communication Protocol. Issue 8, 20/09/93.
3. H052	Serial Protocol Translator User Guide. Issue 1, July 95.

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1 OVERVIEW

This appendix describes the installation requirements and operational features available when using the Procion Control System to control an OEM routing system using the Pro-Bel Protocol Translator to provide the protocol translation. It is split into distinct sections which cover : installation, configuration, operation and trouble shooting.

The Procion Control System interfaces to the Pro-Bel Protocol Translator as shown in Figure A1 'Procion Control System Interconnection'.

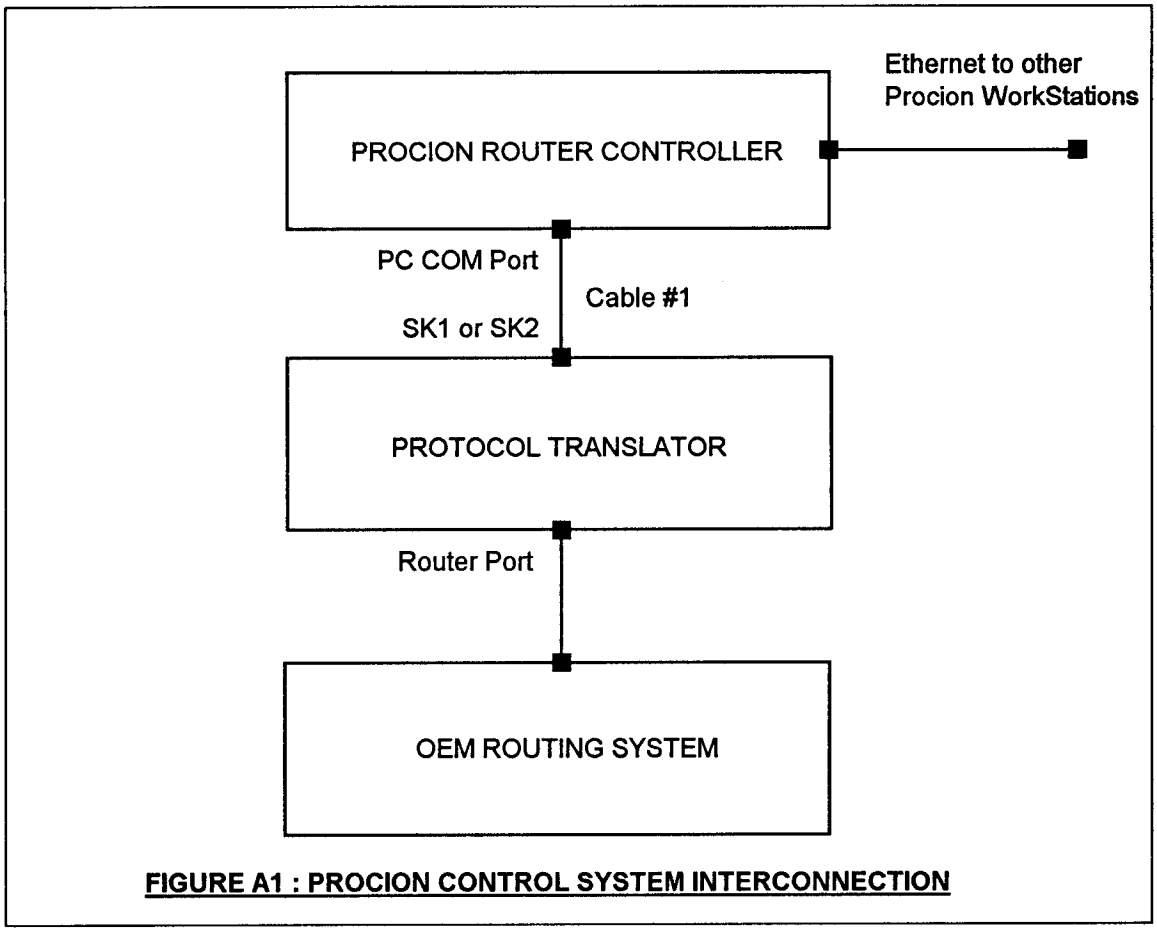

FIGURE A1 : PROCION CONTROL SYSTEM INTERCONNECTION

2 INSTALLATION

2.1 Installation Requirements

A suitable PC with a serial I/O port is required to run the Protocol Translator Editor software. Refer to the 'Installing the Editor' section of the Protocol Translator User Guide (reference 3). The Procion PC may be used.

2.2 Cabling (Cable #1)

The Procion PC is connected to the Protocol Translator using an RS-422 serial link, therefore the PC must be fitted with an RS-422 serial I/O card.

The interconnection cable requires a male 9-way 'D' Type connector on the Protocol Translator end. Refer to the PC RS-422 card's manufacturers handbook for the connector and the pin-out requirement for the PC end of the cable.

In all instances the cable signals must be connected as shown within the following table.

Procion Controller	Protocol Translator SK1/SK2
Chassis	1 Chassis
RX-	8 TX-
TX+	7 RX+
Signal Ground	4 Signal Ground
No Connection	5 No Connection
Signal Ground	6 Signal Ground
RX+	3 TX+
TX-	2 RX-
Chassis	9 Chassis

3 CONFIGURATION

3.1 General Configuration For The Pro-Bel Protocol Translator

- Set the appropriate jumper PL9 on the Protocol Translator to select the desired Controller protocol. Refer to the 'Jumper Diagnostics' section of the Protocol Translator handbook (reference 3). Link *low* for AV0201-002, or *high* for AV0201-001.

3.2 General Configuration For The Procion Router Controller

- If the Pro-Bel Protocol Translator is to accept General Remote Protocol (reference 1) from the Procion Router Controller then the Procion software **AV0201-001** must be used.
- If the Pro-Bel Protocol Translator is to accept General Switcher Protocol (reference 2) from the Procion Router Controller then the Procion software **AV0201-002** must be used.

Check the Procion Router Controller setup by highlighting (single mouse click) either the *Pro-Bel GEN-SWI Interface (AV0201-002)* or *Pro-Bel GEN-REM Interface (AV0201-001)* icon in the *Procion program group.*

Then using the *File* menu on *Program Manager*, select the menu option *Properties*. A dialog box should appear check that the *Command Line* box has the following settings.

- **c:\procion\genswi.exe 2,8600,0,2** for AV0201-002
- **c:\procion\genrem.exe 2,8600,0,2** for AV0201-001

The MS-DOS path to the program is dependent on where the Procion software was installed. The value *8600* is the default *ES address of the router interface*, and in most cases this value will be correct. The final value *2* specifies the PC COM port number which is connected to the protocol translator, this may change dependent on the system setup.

For the General Switcher driver (AV0201-002) the initial value 2 defines the communication baud rate.

- **1** for 9600
- **2** for 38400

For the General Remote driver (AV0201-001) the initial value 2 defines the Pro-Bel Control System being communicated with. The Protocol Translator provides a System 2 or System 3 interface, refer to the main handbook (reference 3) for further details.

- **2** for System2
- **3** for System3

4 OPERATION

4.1 Available Facilities

- Virtual Crosspoints may be used in **TRUE** translation mode.
- Either *TRUE* or *FALSE* response mode may be used.
- Software flow control using **XON** and **XOFF** cannot be used.
- A minimum of one and a maximum of seven Pro-Bel Routers can be connected to a single Protocol Translator.
- A minimum of two and a maximum of eight Procion Router Controllers can be connected to a single Protocol Translator.

4.2 Implemented Commands

The following commands are implemented within the Protocol Translator for Interfacing with a Procion Controller using AV0201-001 or AV0201-002 Router Driver software (reference 1 and reference 2).

- **INTERROGATE** command with **TALLY** response.
- **CONNECT** command with **CONNECTED** response.
- **STATUS REQUEST** with **STATUS** response.

The STATUS RESPONSE command cannot be directed to a specific router therefore the Protocol Translator returns the STATUS of each OEM router in turn, if possible.

5 TROUBLE SHOOTING

This section is not an exhaustive guide but presents the most salient problems which could arise during installation and running.

- Check the connecting between the Procion Router Controller and the Protocol Translator. Check the Protocol Translator and Procion Router Controller have power.
- A response on the Protocol Translator display of the form ***<NO COMMS>*** on the sockets designated as Controller inputs (SK1 and SK2 by default, refer to section 4.1) indicates that there is no communication between the Procion Router Controller and the Pro-Bel Protocol Translator.
- Check the Procion Router Controller is running by selecting the Windows task list and ensuring there is an entry Gen Switcher Driver for product AV0201-002 or Gen Remote Driver for product AV0201-001.
- Check the Procion Router Controller setup as specified within section 3.2 of this appendix.

APPENDIX B - PRO-BEL ROUTING SYSTEM

CONTENTS

OTHER RELEVANT DOCUMENTATION

REFERENCE NO	DESCRIPTION
1. SW-P-08	General Remote Control Communication Protocol. Issue 8, 28/08/92.
2. SW-P-02	General Switcher Communication Protocol. Issue 8, 20/09/93.
3. H052	Serial Protocol Translator User Guide. Issue 1, July 95.

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1 OVERVIEW

This appendix describes the installation requirements and operational features available when using the Protocol Translator with a Pro-Bel routing system. It is split into distinct sections which cover : installation, configuration, operation and trouble shooting.

The Pro-Bel Protocol Translator can control a Pro-Bel Routing System by directly interfacing to Pro-Bel Routers or through a Pro-Bel System Controller by connecting to the *'EXT CONT'* port, refer to Figure B1 'Pro-Bel Routing System Interconnection'.

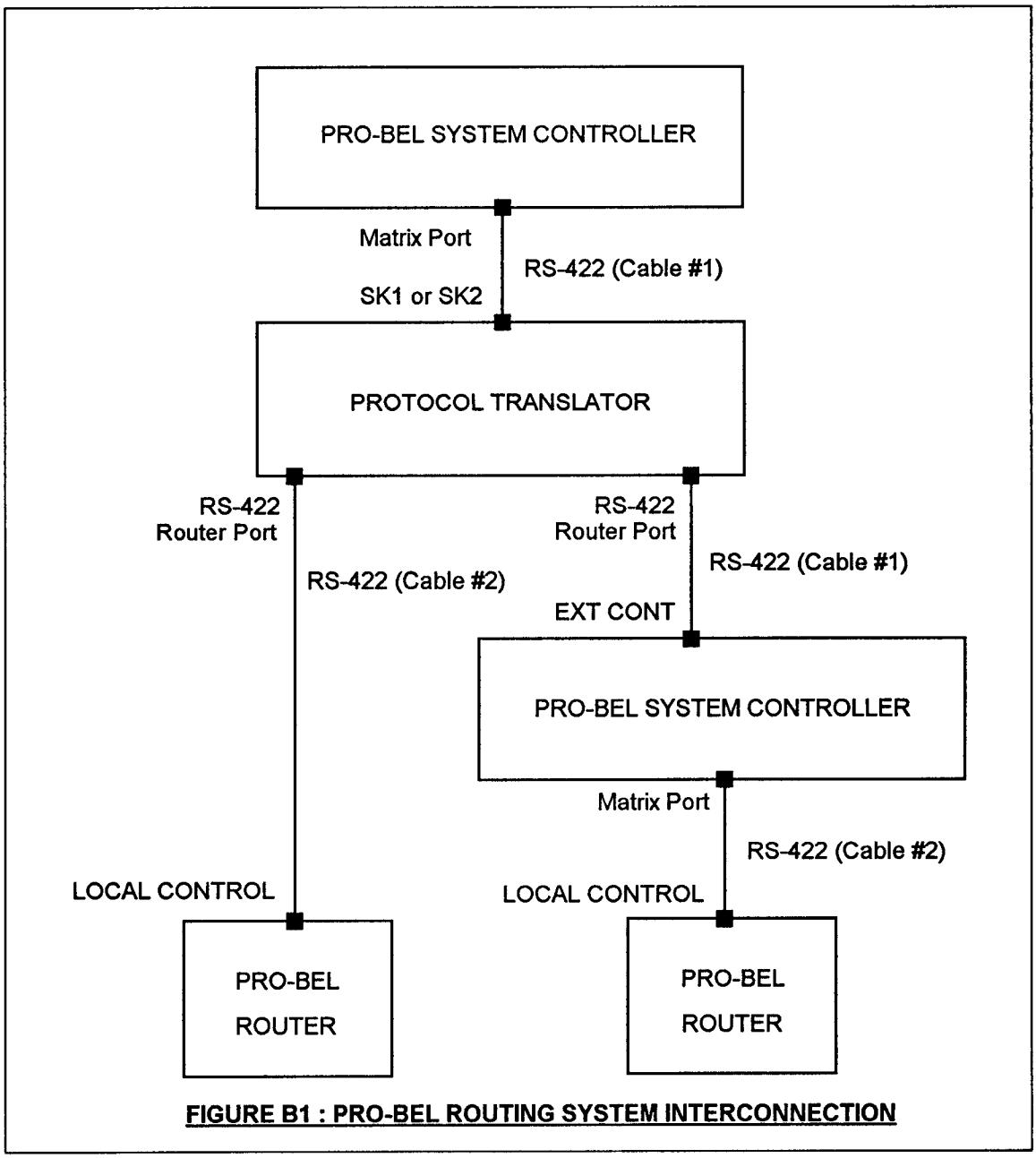

FIGURE B1 : PRO-BEL ROUTING SYSTEM INTERCONNECTION

2 INSTALLATION

2.1 Installation Requirements

A suitable PC with a serial I/O port is required to run the Protocol Translator Editor software. Refer to the 'Installing the Editor' section of the Protocol Translator User Guide (ref 3). A Procion PC may be used.

2.2 Cabling (Cable #1)

2.2.1 Cable #1 Pro-Bel Controller to Protocol Translator

For connection to a **PROCION** Router Controller refer to *Appendix A.* The pin-out for the cable which connects the Pro-Bel Controller to the Protocol Translator is given below. The cable requires male 9-way 'D' Type connectors on either end.

Pro-Bel Controller	Protocol Translator SK1/SK2
1 Chassis	1 Chassis
2 RX-	8 TX-
3 TX+	7 RX+
4 Signal Ground	4 Signal Ground
5 No Connection	5 No Connection
6 Signal Ground	6 Signal Ground
7 RX+	3 TX+
8 TX-	2 RX-
9 Chassis	9 Chassis

2.2.2 Cable #2 Pro-Bel Protocol Translator\Pro-Bel System Controller to Pro-Bel Router

The pin-out for the cable which connects the Protocol Translator to a Pro-Bel Router is given below. The cable requires male 9-way 'D' Type connectors on either end.

Protocol Translator SK3..SK9/10	LOCAL CONTROL
1 Chassis	1 Chassis
2 RX-	2 TX-
3 TX+	3 RX+
4 Signal Ground	4 Signal Ground
5 No Connection	5 No Connection
6 Signal Ground	6 Signal Ground
7 RX+	7 TX+
8 TX-	8 RX-
9 Chassis	9 Chassis

3 CONFIGURATION

3.1 General Configuration For The Pro-Bel Protocol Translator

Set the appropriate jumper PL9 on the Protocol Translator to select the desired Controller protocol. Refer to the 'Jumper Diagnostics' section of the Protocol Translator handbook HB027 (reference 3).

Controlling A Pro-Bel System Controller

The OEM protocol *<GREM>* must be selected if connecting to the *EXT CONT* port of a Pro-Bel System Controller. The different operating characteristics of the interfaces are defined as follows with the bold baud rate being the default.

- Type 8n00 SYSTEM3 frames have a fixed serial I/O operating characteristcs of **19200**, 8, 1, NONE.
- Type 6000 SYSTEM3 frames have selectable baud rates of 38400, **19200**, 9600 and 2400 all with 8, 1, NONE.
- Type 241 SYSTEM2 cards have selectable baud rates of 38400, **9600**, 4800 and 2400 all with 8, 1, NONE.

When controlling a Pro-Bel System Controller 896 destinations can be stacked down a single control port, this is due to destinations 897 to 1024 being treated as monitor rows by the Pro-Bel System Controller.

Controlling A Pro-Bel Router

The OEM protocol *<GSWT>* must be selected if connecting to a Pro-Bel Router. With Serial I/O operating parameters of 38400, 8, 1, EVEN.

The full destination range may be stacked down a single control port.

3.2 General Configuration For The Pro-Bel Controller

If the Protocol Translator is controlling a Pro-Bel System Controller then the following points are to be noted.

- Logging *must be turned off* within the Pro-Bel Controller.
- No source or destination associations are available as the interface operates at a lower level than the control panels and bypasses the association tables.
- The interface returns true tallies which indicates absolute crosspoints.

4 OPERATION

4.1 Pro-Bel System Controller Matrix Mapping

When connecting to the *EXT CONT* port of a Pro-Bel System Controller, Matrix identifiers have to be specified within the commands sent to it by the Protocol Translator. These have to be entered within the OEM *<Mx>* field of the Protocol Translation Table within the Editors.

The Matrix identifiers which have to be entered to select the Pro-Bel Controller Matrices are shown in the table below. The Matrix identifier does not need to be specified if connected directly to a Pro-Bel Router.

Pro-Bel Matrix	SYSTEM3 OEM <Mx> Field Character	SYSTEM2 OEM <Mx> Field Character
1	0	1
2	1	N/A
3	2	N/A
4	3	N/A
5	4	N/A
6	5	N/A
7	6	N/A
8	7	N/A
9	8	N/A
10	9	N/A
11	10	N/A
12	11	N/A
13	12	N/A
14	13	N/A
15	14	N/A
16	15	N/A

4.2 Pro-Bel System Controller Level Mapping

When connecting to the *EXT CONT* port of a Pro-Bel System Controller Level identifiers have to be specified within the commands sent to it by the Protocol Translator. These have to be entered within the OEM *<Lv>* field of the Protocol Translation Table within the Editor.

The Level identifiers which have to be entered to select the Pro-Bel Controller Matrix levels are shown in the table below. The Matrix Level identifier does not need to be specified if connected directly to a Pro-Bel Router.

Pro-Bel Matrix Level	SYSTEM3 OEM <Lv> Field Character	SYSTEM2 OEM <Lv> Field Character
1	0	1
2	1	2
3	2	3
4	3	4
5	4	N/A
6	5	N/A
7	6	N/A
8	7	N/A
9	8	N/A
10	9	N/A
11	10	N/A
12	11	N/A
13	12	N/A
14	13	N/A
15	14	N/A
16	15	N/A

4.3 Implemented Commands

The following commands are implemented within the Protocol Translator for Interfacing with a Pro-Bel Router or Pro-Bel System Controller (ref 1 and ref 2).

- **INTERROGATE** command with **TALLY** response.
- **CONNECT** command with **CONNECTED** response.
- **STATUS REQUEST** with **STATUS** response.

The STATUS RESPONSE command cannot be directed to a specific router therefore the Protocol Translator returns the STATUS of each OEM router in turn, if possible.

4.4 Available Facilities

- **Protect** is available from Pro-Bel control panels, but it is only local to the control system which instigated it.
- **Line-up** (*CHOP*) is available from Pro-Bel control panels but is only local to the control panel which instigated it. However the constant alternation of the sources routed to a destination will indicate that line-up is in operation.
- Virtual Crosspoints may be used in **TRUE** translation mode.
- Either *TRUE* or *FALSE* response mode may be used.
- Software flow control using **XON** and **XOFF** cannot be used.
- A minimum of one and a maximum of seven Pro-Bel Routers or Pro-Bel Control Systems can be connected to a single Protocol Translator.
- A minimum of two and a maximum of eight Pro-Bel System Controllers can be connected to a single Protocol Translator.

5 TROUBLE SHOOTING

This section is not an exhaustive guide but presents the most salient problems which could arise during installation and running.

- Check the connecting between the Pro-Bel Controller and the Protocol Translator. Check the Protocol Translator and Pro-Bel Controller have power.
- A response on the Protocol Translator display of the form ***<NO COMMS>*** on the sockets designated as Controller inputs (SK1 and SK2 by default, refer to section 4.1) indicates that there is no communication between the Pro-Bel Controller and the Pro-Bel Protocol Translator.
- A response on the Protocol Translator display of the form ***<NO COMMS>*** on the sockets designated as OEM Routing System outputs (SK3 to SK9/10 by default, refer to section 4.1) indicates that there is no communication between the Protocol Translator and the OEM Routing System.
- Connection to a Pro-Bel Controller through the *EXT CONT* port by-passes any source and destination association tables within the Pro-Bel Controller's Database.

APPENDIX C - GRASSVALLEY HORIZON ROUTING SYSTEM

CONTENTS

OTHER RELEVANT DOCUMENTATION

REFERENCE NO	DESCRIPTION
1. CPG11	Horizon General Purpose Interface Manual. Manual Number TP3005-0. Issue A1.
2. H052	Serial Protocol Translator User Guide. Issue 1, July 95.

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1 OVERVIEW

This appendix describes the installation requirements and operational features available when using the Protocol Translator with the Grass Valley HORIZON routing system. It is split into distinct sections which cover : installation, configuration, operation and trouble shooting.

The Pro-Bel Protocol Translator interfaces to a GrassValley HORIZON routing system via the GrassValley HX-GPI (General Purpose Interface) unit refer to Figure C1 'HORIZON Routing System Interconnection'.

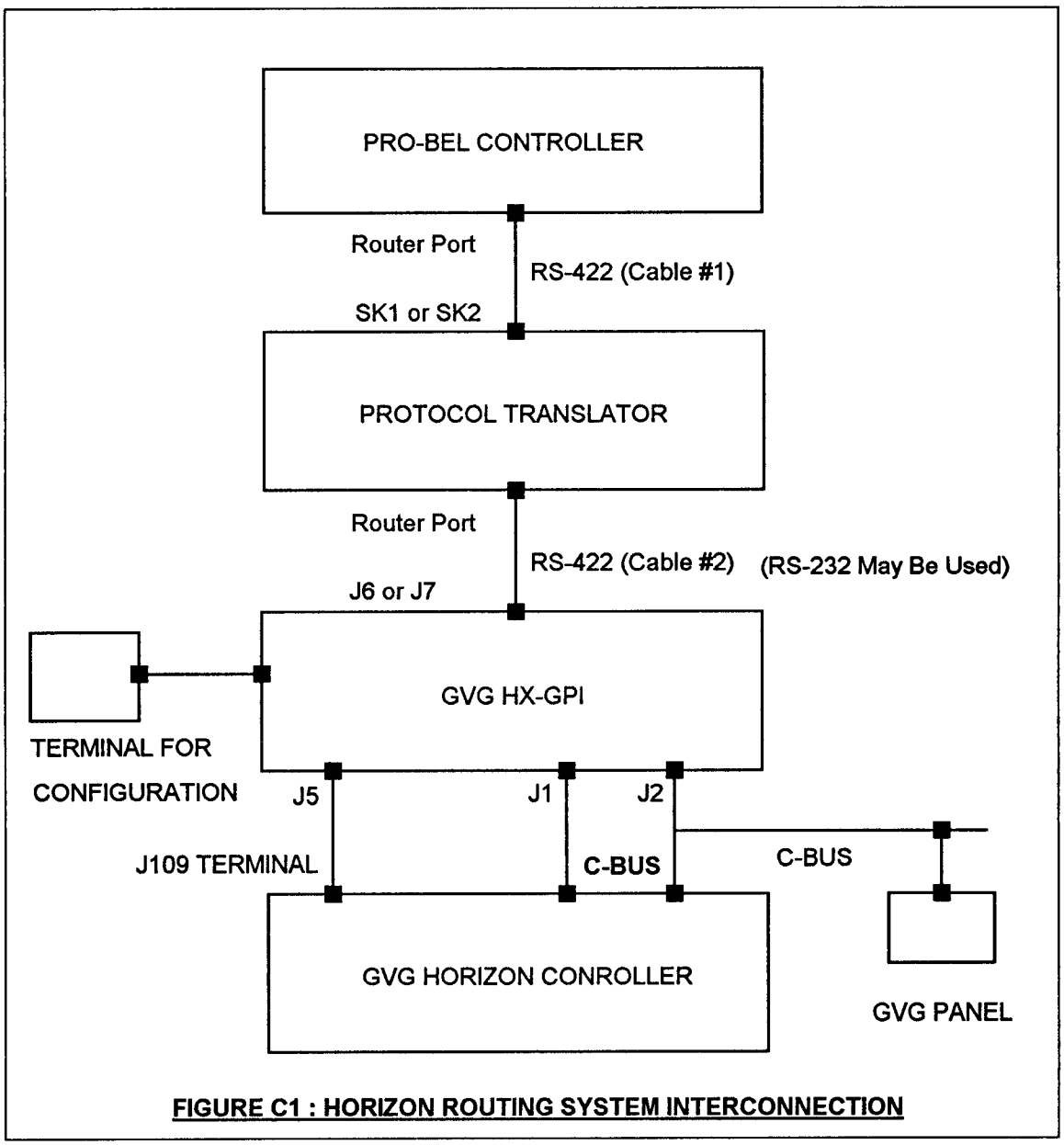


FIGURE C1 : HORIZON ROUTING SYSTEM INTERCONNECTION

2 INSTALLATION

2.1 Installation Requirements

A suitable PC with a serial I/O port is required to run the Protocol Translator Editor software. Refer to the 'Installing the Editor' section of the Protocol Translator User Guide (reference 3). A Procion PC may be used.

2.2 Cabling

2.2.1 Cable #1 Pro-Bel Controller to Protocol Translator

For connection to a **PROCION** Router Controller refer to *Appendix A.* The pin-out for the cable which connects the Pro-Bel Controller to the Protocol Translator is given below. The cable requires male 9-way 'D' Type connectors on either end.

Pro-Bel Controller	Protocol Translator SK1/SK2
1 Chassis	1 Chassis
2 RX-	8 TX-
3 TX+	7 RX+
4 Signal Ground	4 Signal Ground
5 No Connection	5 No Connection
6 Signal Ground	6 Signal Ground
7 RX+	3 TX+
8 TX-	2 RX-
9 Chassis	9 Chassis

2.2.2 Cable #2 Pro-Bel Protocol Translator to GrassValley HORIZON HX-GPI

If the connection is to be RS-422 use Protocol Translator port SK3 along with the following cable details. The cable requires male 9-way 'D' Type connectors on either end.

Protocol Translator SK3..SK9/10	GVG HX-GPI J6 or J7 RS-422
1 Chassis	4 No Connection
2 RX-	7 TX-
3 TX+	8 RX+
4 Signal Ground	1 Signal Ground
5 No Connection	5 No Connection
6 Signal Ground	9 Signal Ground
7 RX+	2 TX+
8 TX-	3 RX-
9 Chassis	6 No Connection

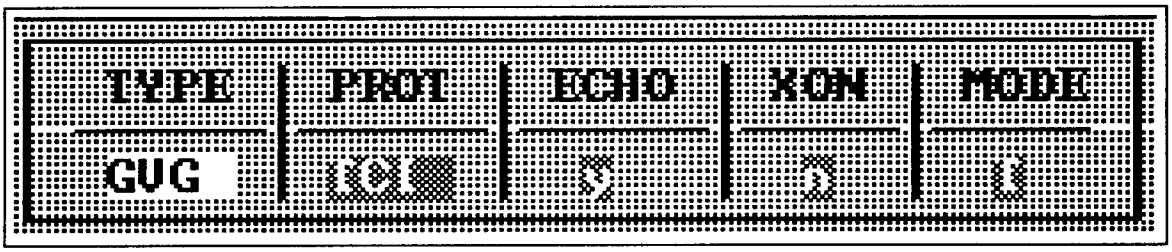
If the connection is to be RS-232 use Protocol Translator port SK10 along with the following cable details. The cable requires a male 9-way 'D' Type connector on the Pro-Bel end and a male 25-way 'D' Type connector on the HX-GPI end.

Protocol Translator SK10	GVG HX-GPI J8 or J9 RS-232
1 No Connection	
2 TX	3 RX
3 RX	2 TX
4 DSR	20 DTR
5 Signal Ground	
6 DTR	
7 CTS	
8 RTS	5 CTS
9 No Connection	

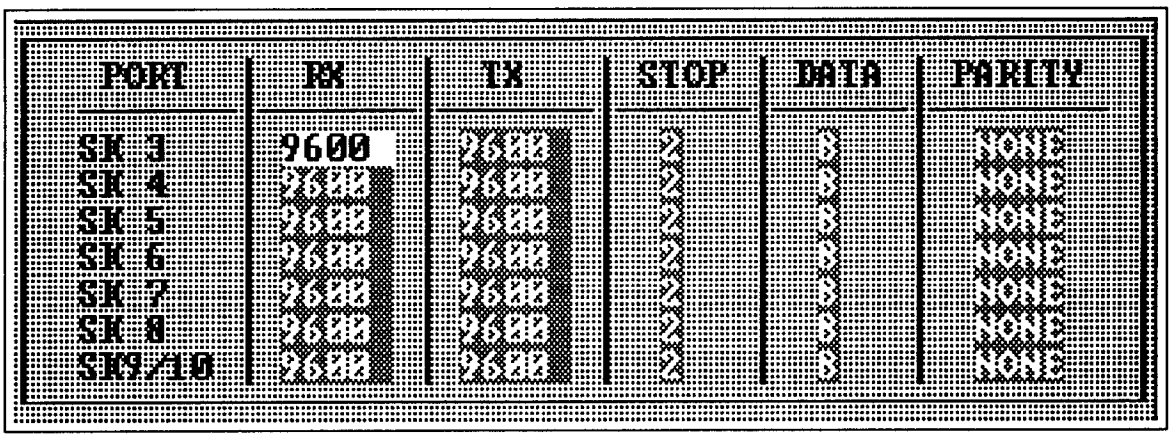
3 CONFIGURATION

3.1 General Configuration For The Protocol Translator

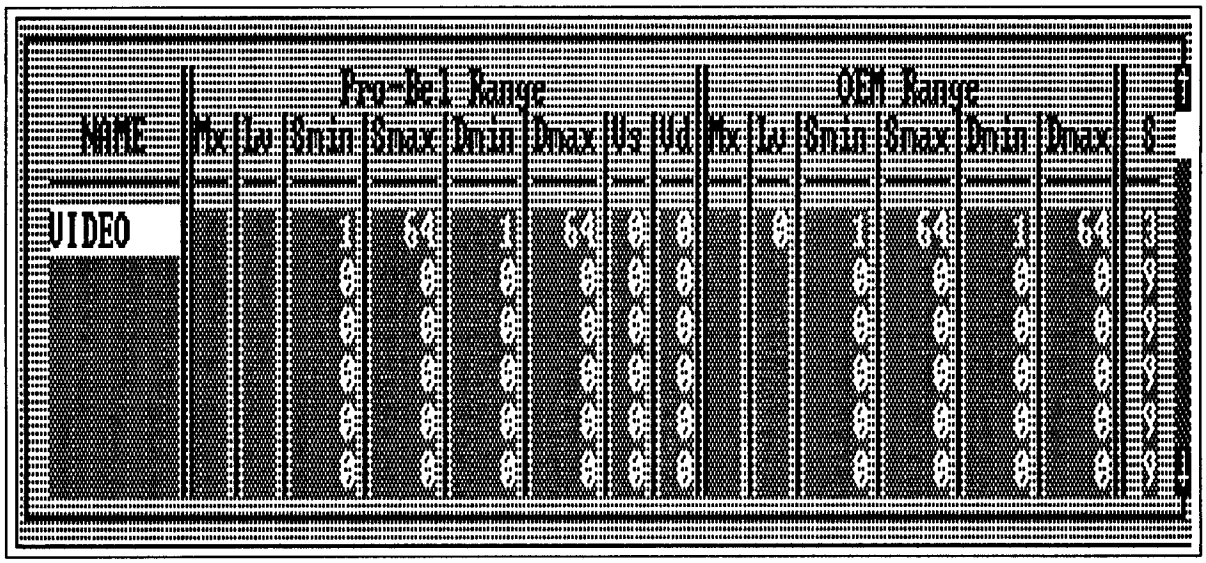
- Select the <*Switcher Type*> as shown below. Set <*TYPE*> as <*GVG*> , <*PROT*> as <*TCI*> and <ECHO> as <Y>.



Specify the <*Translator Port Setup*> as shown below. Other serial I/O characteristics can be selected but they must match those specified within the HX-GPI interface, refer to sections 3.2 and 4.3 of this appendix. *Two Stop bits are used to provide a delay between data bytes arriving at the HX-GPI which is configured to have only one stop bit.*



- Specify the *<Protocol Translation>* as shown below, with the HORIZON level identifiers being specified as described within section 4.1 of this appendix. The values shown are for example purposes only.



3.2 General Configuration For The GrassValley HX-GPI

- Connect a suitable terminal to the HX-GPI RS-232 configuration connector **J4**.
- Interconnect the HX-GPI to the HORIZON Controller by connecting **J5** on the HX-GPI to the HORIZON Controller's **J109 TERMINAL** connector.
- Ensure that the dip switches on the HX-GPI PCB and the HORIZON Change Over PCB (*062615*) have the same operating parameters.
- Establish communications with the HX-GPI by typing **^G** (Hold down the *<CTRL>* key whilst pressing the *<G>* key).
- With reference to the HORIZON General Purpose Interface Manual (reference 1) configure the Serial Control I/O ports J7/9 and J6/8 of the HX-GPI to be either **RS-232/RS-422, 9600, 8, 1, None**. Baud rates of *38400* and *19200* **are not recommended.**
- Ensure that the *<Controllable Output List>* within the HX-GPI does not exclude any of the destinations which are to be controlled by the Protocol Translator.

4 OPERATION

4.1 Horizon Level Mapping

The Horizon HX-GPI requires level identifiers to be specified within the commands sent to it by the Protocol Translator. These have to be entered within the OEM <*Lv*> field of the Protocol Translation Table within the Editors. The Level identifiers which have to be entered to select the HORIZON Controller levels are shown in the table below.

HORIZON Level	OEM <*Lv*> Field Character
V	0
A1	1
A2	2
A3	3

4.2 Implemented Commands

The following HX-GPI commands are implemented within the Protocol Translator for controlling the HX-GPI interface, refer to reference 1 for further details.

- **COS** *Clear Operational Switch*
- **DIN** *Display Inputs In Use*
- **SOS** *Set Operational Switch*
- **TIN** *Take Input To In Use*

Operational Switch 0 (zero) is cleared to allow commands to specify the HORIZON inputs and control levels by their absolute number rather than by their transcoded name.

Operational Switch 1 (one) is set to allow error responses to be specified as <*!E*> or <*!W*> followed by a two digit (ASCII decimal) error number.

4.3 Available Facilities

- **Protect** is available from both the Pro-Bel or HORIZON control panels, but it is only local to the control system which instigated it.
- **Line-up** (*CHOP*) is available from both Pro-Bel control panels and the HORIZON control panels, but is only local to the control panel which instigated it. However the constant alternation of the source routed to a destination is shown by both control systems and will therefore indicate that line-up is in operation.
- Virtual Crosspoints may be used in **TRUE** translation mode.
- Either *TRUE* or *FALSE* response mode may be used.
- Software flow control using **XON** and **XOFF** can be used.
- A minimum of one and a maximum of seven HX-GPI interface units can be connected to a single Protocol Translator.
- A minimum of two and a maximum of eight system controllers can be connected to a single Protocol Translator.

5 TROUBLE SHOOTING

This section is not an exhaustive guide but presents the most salient problems which could arise during installation.

- Check the C-Bus is connected between the HX-GPI and the HORIZON Controller. Check the Protocol Translator, HX-GPI and HORIZON Controller have power.
- A response on the Protocol Translator display of the form ***<000: --->*** on sockets SK3 to SK9/10 indicates that there is communication between the Protocol Translator and the HX-GPI. However there is a communication problem the HX-GPI and the HORIZON Controller.
- A response on the Protocol Translator display of the form ***<NO COMMS>*** on sockets SK3 to SK9/10 indicates that there is no communication between the Protocol Translator and the HX-GPI.
- Responses on the Protocol Translator of the form ***<!E>*** or ***<!W>*** followed by two ASCII decimal numerical digits are *error codes* returned from the HORIZON Controller. Refer to the HORIZON Controller Manual (reference 1) for the solution to the problem.

- On increasing the size of the HORIZON matrices the source names have to be added within the HORIZON Controller's *<Input Transcode Table>* before control via the Protocol Translator. If they are not then the crosspoint will be routed and will then be routed back by the HORIZON Controller after approximately six to seven seconds.
- If communication problems exist then connect the HORIZON configuration terminal to one of the RS-232 ports, set the correct Serial I/O setup and send commands from the protocol (refer to reference 1) through the terminal. Once communication with the terminal is established connect the Protocol Translator.

APPENDIX D - UTAH PL-160/PL-320 ROUTING SYSTEM

CONTENTS

OTHER RELEVANT DOCUMENTATION

REFERENCE NO	DESCRIPTION
1. CPU1	PL-160 Reprogramming and System Terminal Operation.
2. CPU1	PL-320 Reprogramming and System Terminal Operation, TM# 00101-0009.
3. H052	Serial Protocol Translator User Guide. Issue 1, July 95.

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1 OVERVIEW

This appendix describes the installation requirements and operational features available when using the Protocol Translator with either the UTAH PL-160/PL-320 microprocessor card to control a AVS-1B routing system. It is split into distinct sections which cover : installation, configuration, operation and trouble shooting.

The Pro-Bel Protocol Translator interfaces to the UTAH routing system via the PL-160 or PL-320 control and memory card mounted within the switcher chassis or a separate chassis such as the RF-2 rack frame, refer to Figure D1 'UTAH Routing System Interconnection'.

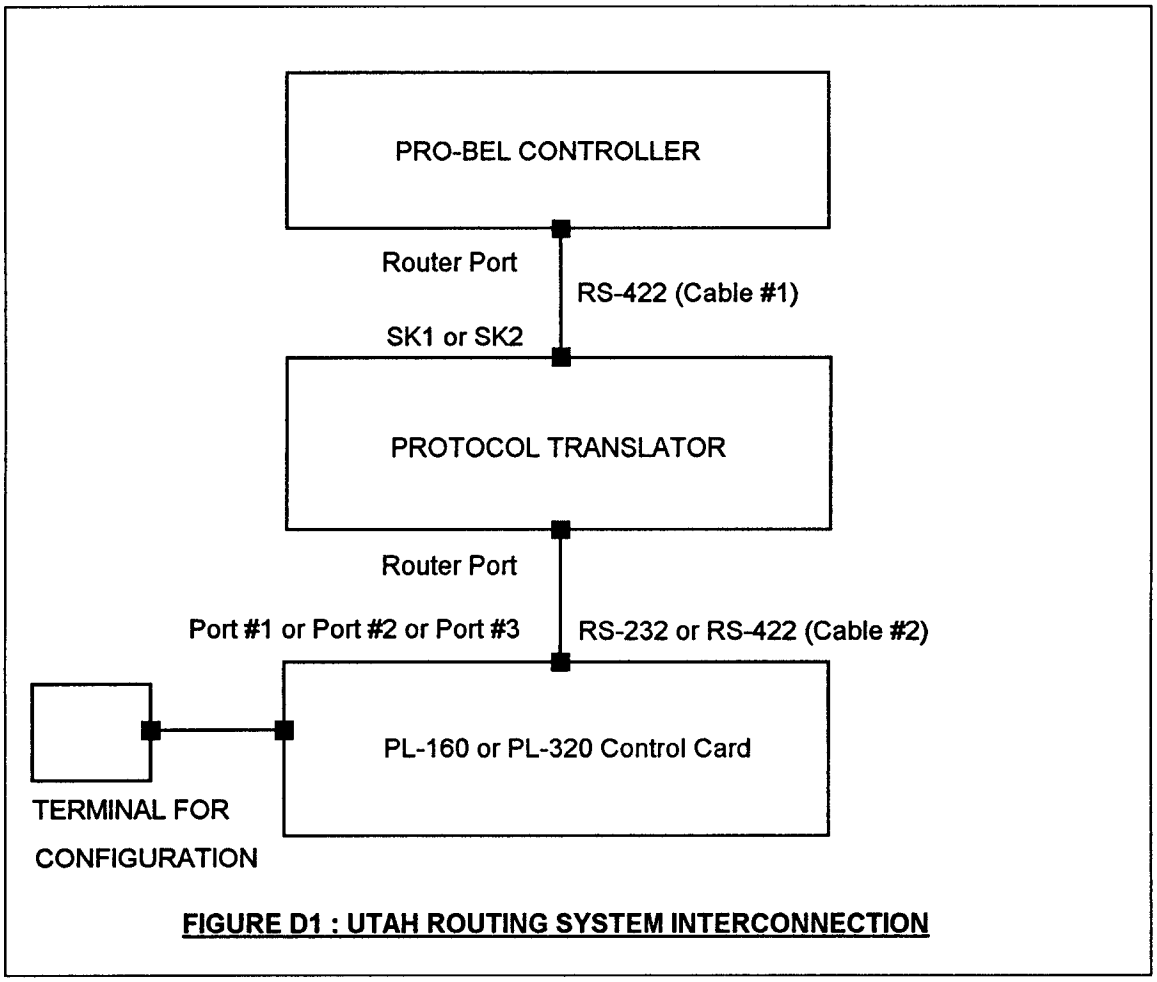


FIGURE D1 : UTAH ROUTING SYSTEM INTERCONNECTION

2 INSTALLATION

2.1 Installation Requirements

A suitable PC with a serial I/O port is required to run the Protocol Translator Editor software. Refer to the 'Installing the Editor' section of the Protocol Translator User Guide (ref 2). A Procion PC may be used.

2.2 Cabling

2.2.1 Cable #1 Pro-Bel Controller to Protocol Translator

For connection to a **PROCION** Router Controller refer to *Appendix A.* The pin-out for the cable which connects the Pro-Bel Controller to the Protocol Translator is given below. The cable requires male 9-way 'D' Type connectors on either end.

Pro-Bel Controller	Protocol Translator SK1/SK2
1 Chassis	1 Chassis
2 RX-	8 TX-
3 TX+	7 RX+
4 Signal Ground	4 Signal Ground
5 No Connection	5 No Connection
6 Signal Ground	6 Signal Ground
7 RX+	3 TX+
8 TX-	2 RX-
9 Chassis	9 Chassis

2.2.2 Cable #2 Pro-Bel Protocol Translator to UTAH PL-160 Controller Card.

For connections to a PL-320 Controller Card refer to section 2.2.3 of this appendix, this section is for connections to a PL-160 Controller Card.

The UTAH system can be connected to on three different serial I/O ports.

- Port #1 is RS-232 only, with Party Line Priority 5.
- Port #2 is RS-422 only, with Party Line Priority 6.
- Port #3 is RS-232/RS-422, with Party Line Priority 7. It **MUST** be strapped for either RS-232 or RS-422 operation. Refer to section *'6.1 COMPUTER CONNECTION'* of the UTAH manual (reference 1).

The recommended connection to the UTAH system is an RS-422 link on either port #2 or port #3. Port #2 is recommended over Port #3 as it has the higher Party Line Priority.

The pin-out for the RS-422 cable which connects the Protocol Translator to Port #2 or Port #3 is given below. The cable requires male 9-way 'D' Type connectors on either end.

Protocol Translator SK3..SK9	UTAH RS-422
1 Chassis	4 No Connection
2 RX-	7 TX-
3 TX+	8 RX+
4 Signal Ground	1 Signal Ground
5 No Connection	5 No Connection
6 Signal Ground	9 No Connection
7 RX+	2 TX+
8 TX-	3 RX-
9 Chassis	6 No Connection

The RS-232 connection to the UTAH system is either port #1 or port #3. Port #1 is recommended over Port #3 as it has the higher Party Line Priority and it does not require '*strapping*'.

The pin-out for the RS-232 cable which connects the Protocol Translator to Port #1 or Port #3 is given below. The cable requires a male 9-way 'D' Type connector on the Pro-Bel end and a male 25-way 'D' Type connector on the UTAH side.

Protocol Translator SK10	UTAH RS-232
1 No Connection	No Connection
2 TX	3 RX
3 RX	2 TX
4 DSR	20 DTR
5 Signal Ground	7 Signal Ground
6 DTR	6 DSR
7 CTS	4 RTS
8 RTS	5 CTS
9 No Connection	No Connection

2.2.3 Cable #2 Pro-Bel Protocol Translator to UTAH PL-320 Controller Card.

For connections to a PL-160 Controller Card refer to section 2.2.2 of this appendix, this section is for connections to a PL-320 Controller Card.

The UTAH system can be connected to on three different serial I/O ports.

- Port #1 is RS-232 only.
- Port #2 is RS-232/RS-422. It **MUST** be strapped for either RS-232 or RS-422 operation. Refer to section *'6.1 COMPUTER CONNECTION'* of the UTAH manual (reference 1).
- Port #3 is RS-422 only.

The recommended connection to the UTAH system is an RS-422 link on either port #2 or port #3. Port #2 is recommended over Port #3 as it has the higher servicing Priority.

The pin-out for the RS-422 cable which connects the Protocol Translator to Port #2 or Port #3 is exactly the same as the RS-422 cable specified within section 2.2.2 of the appendix.

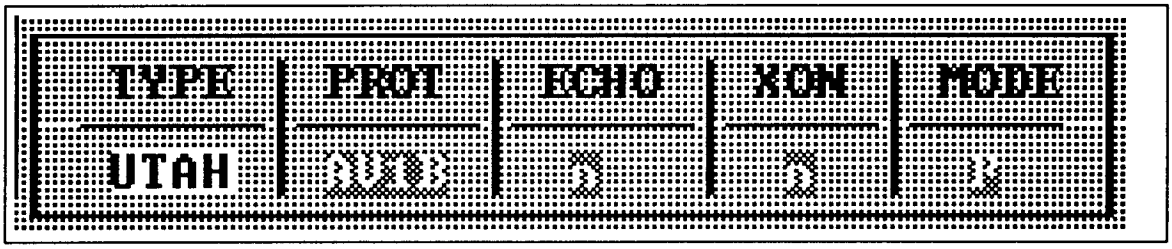
The RS-232 connection to the UTAH system is either port #1 or port #2. Port #1 is recommended over Port #2 as it has the higher servicing Priority.

The pin-out for the RS-232 cable which connects the Protocol Translator to Port #1 or Port #2 is exactly the same as the RS-232 cable specified within section 2.2.2 of the appendix.

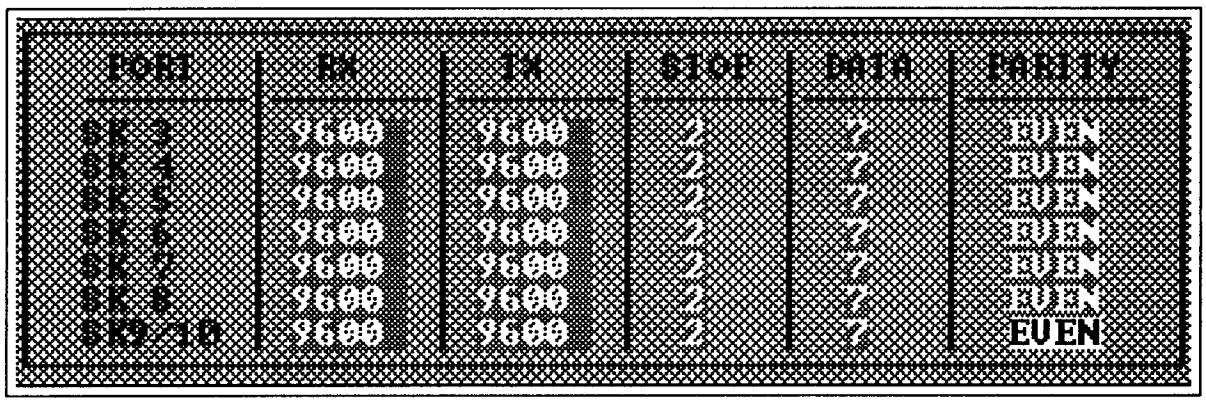
3 CONFIGURATION

3.1 General Configuration For The Protocol Translator

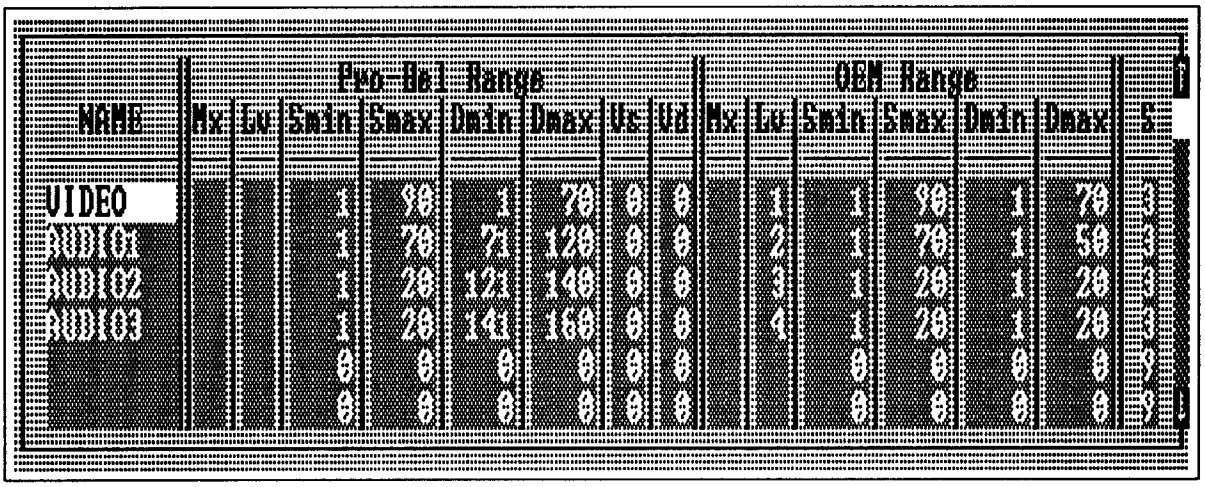
- Select the *<Switcher Type>* as shown below.
- Set *<TYPE>* as *<UTAH>* , *<PROT>* as *either <AV1B>* or <AV2B> and <MODE> as <F>.



- Specify the *<Translator Port Setup>* as shown below. Other serial I/O characteristics can be selected but they must match those specified within the UTAH System Terminal to sections 3.2 and 4.3 of this appendix. *Two Stop bits are used to provide a delay between data bytes arriving at the UTAH Controller which is configured to have only one stop bit.*



- Specify the *<Protocol Translation>* as shown below, with the UTAH level identifiers being specified as described within section 4.1 of this appendix. The values shown are for example purposes only.



NAME	Pro-Bel Range								OEM Range							
	Mx	Lv	Smin	Smax	Dmin	Dmax	Vs	Vd	Mx	Lv	Smin	Smax	Dmin	Dmax	S	
VIDEO			1	90	1	70	0	0		1	1	90	1	70	3	
AUDIO1			1	70	71	120	0	0		2	1	70	1	50	3	
AUDIO2			1	20	121	140	0	0		3	1	20	1	20	3	
AUDIO3			1	20	141	160	0	0		4	1	20	1	20	3	
			0	0	0	0	0	0			0	0	0	0	3	
			0	0	0	0	0	0			0	0	0	0	3	

3.2 General Configuration For The UTAH PL-160/PL-320

- Connect a suitable terminal to the UTAH Controller RS-232 configuration connector **SYS TERMINAL**.
- Establish communications with the UTAH by typing **ESC.**
- With reference to the appropriate UTAH Manual (either reference 1 or reference 2) configure the required External Computer Port to be **9600, 7, 2, EVEN**.
- Ensure that the dip switches on the PL-160/PL-320 PCB and have the correct baud rate setting for the required External Computer Port (reference 1 and reference 2). Baud rates of 9600 or less are recommended, 38400 is **not recommended**.

4 OPERATION

4.1 Horizon Level Mapping

The UTAH PL-160 and PL-320 requires level identifiers to be specified within the commands sent to it by the Protocol Translator. These have to be entered within the OEM *<Lv>* field of the Protocol Translation Table within the Editors. The Level identifiers which have to be entered to select the UTAH Controller levels are shown in the table below. Only the first four levels are available with the UTAH PL-160.

UTAH Level	OEM *<Lv>* Field Character
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8

4.2 Implemented Commands

The following UTAH commands are implemented within the Protocol Translator for controlling the PL-160 and PL-320, refer to reference 1 and reference 2 for further details.

- **ESC S** and **ESC T** *Controlling XON/XOFF*
- **SOH** *Matrix Take and Status*

4.3 Available Facilities

- **Protect** is available from both the Pro-Bel or UTAH control panels, but it is only local to the control system which instigated it.
- **Line-up** (*CHOP*) is available from both Pro-Bel control panels and the UTAH control panels, but is only local to the control panel which instigated it. However the constant alternation of the source routed to a destination is shown by both control systems and will therefore indicate that line-up is in operation.
- Virtual Crosspoints cannot be used.
- *TRUE* response mode cannot be used.
- Software flow control using **XON** and **XOFF** can be used.

- A minimum of one and a maximum of seven UTAH Controller Cards can be connected to a single Protocol Translator.
- A minimum of two and a maximum of eight system controllers can be connected to a single Protocol Translator.

5 TROUBLE SHOOTING

This section is not an exhaustive guide but presents the most salient problems which could arise during installation.

- Check the Protocol Translator and the UTAH Controller have power and are connected.
- Check 'strapping' for PL-160 serial I/O Port #3 or PL-320 serial I/O Port #2.
- Check the baud rate dip switches on the PL-160/PL-320 PCB are correct (reference 1 and reference 2).
- A response on the Protocol Translator display of the form ***<SOH@@xxxyyyCr>*** on sockets SK3 to SK9/10 indicates that there is communication between the Protocol Translator and the UTAH. Where *xxx* and *yyy* are three digit ASCII numeric character strings.
- A response on the Protocol Translator display of the form ***<NO COMMS>*** on sockets SK3 to SK9/10 indicates that there is no communication between the Protocol Translator and the UTAH Controller.
- A response on the Protocol Translator display of the form <NO ***COMMS***> on sockets SK1 or SK2 indicates that there is no communication between the Protocol Translator and the Pro-Bel Controller.
- The PL-320 system may generate a response on the Protocol Translator of the form ***<15? OR 31?>.*** This is a UTAH error message indicating that the requested inputs have never been switched, refer to the UTAH Manual (reference 2).
- If other equipment is connected to the computer control ports of the UTAH system then the Protocol Translator should be connected on the Port which has the higher Party Line or servicing priority. This is due to a transfer of several consecutive commands on a higher priority port could keep lower priority port commands from being acted upon. Eventually causing an OVERRUN resulting in commands being lost.

APPENDIX E - SONY ROUTING SYSTEM

CONTENTS

OTHER RELEVANT DOCUMENTATION

REFERENCE NO	DESCRIPTION
1. CPS1	SONY Switcher Protocol for DVS-V1616, DVS-V3232 and DVS-A3232.
2. H052	Serial Protocol Translator User Guide. Issue 1, July 95.

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1 OVERVIEW

This appendix describes the installation requirements and operational features available when using the Protocol Translator with a SONY routing system.

Even though the SONY Protocol can be selected within the Editor it is not currently implemented within the Protocol Translator.

This option must not be selected.

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APPENDIX F - PRO-BEL T.D.M 4-WIRE ROUTING SYSTEM

CONTENTS

OTHER RELEVANT DOCUMENTATION

REFERENCE NO	DESCRIPTION
1. SW-P-02	General Switcher Communication Protocol. Issue 8, 20/09/93.
2. H052	Serial Protocol Translator User Guide. Issue 1, July 95.

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1 OVERVIEW

This appendix describes the installation requirements and operational features available when using the Protocol Translator with a Pro-Bel T.D.M 4-Wire routing system.

Even though the Pro-Bel T.D.M 4-Wire Protocol can be selected within the Editor it is not currently implemented within the Protocol Translator.

This option must not be selected.

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APPENDIX G - DYNAIR DYNASTY/SYSTEM 21 ROUTING SYSTEM

CONTENTS

OTHER RELEVANT DOCUMENTATION

REFERENCE NO	DESCRIPTION
1. CPD1	Technical Reference External Control Port Dynasty and System 21 Routing Switchers. 900-21016-01, August 02 1989.
2. H052	Serial Protocol Translator User Guide. Issue 1, July 95.

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1 OVERVIEW

This appendix describes the installation requirements and operational features available when using the Protocol Translator with the DYNAIR Dynasty or System21 routing system. It is split into distinct sections which cover : installation, configuration, operation and trouble shooting.

The Pro-Bel Protocol Translator interfaces to a DYNAIR Dynasty or System 21 routing system via the External Computer Port, refer to Figure G1 'DYNAIR Routing System Interconnection'.

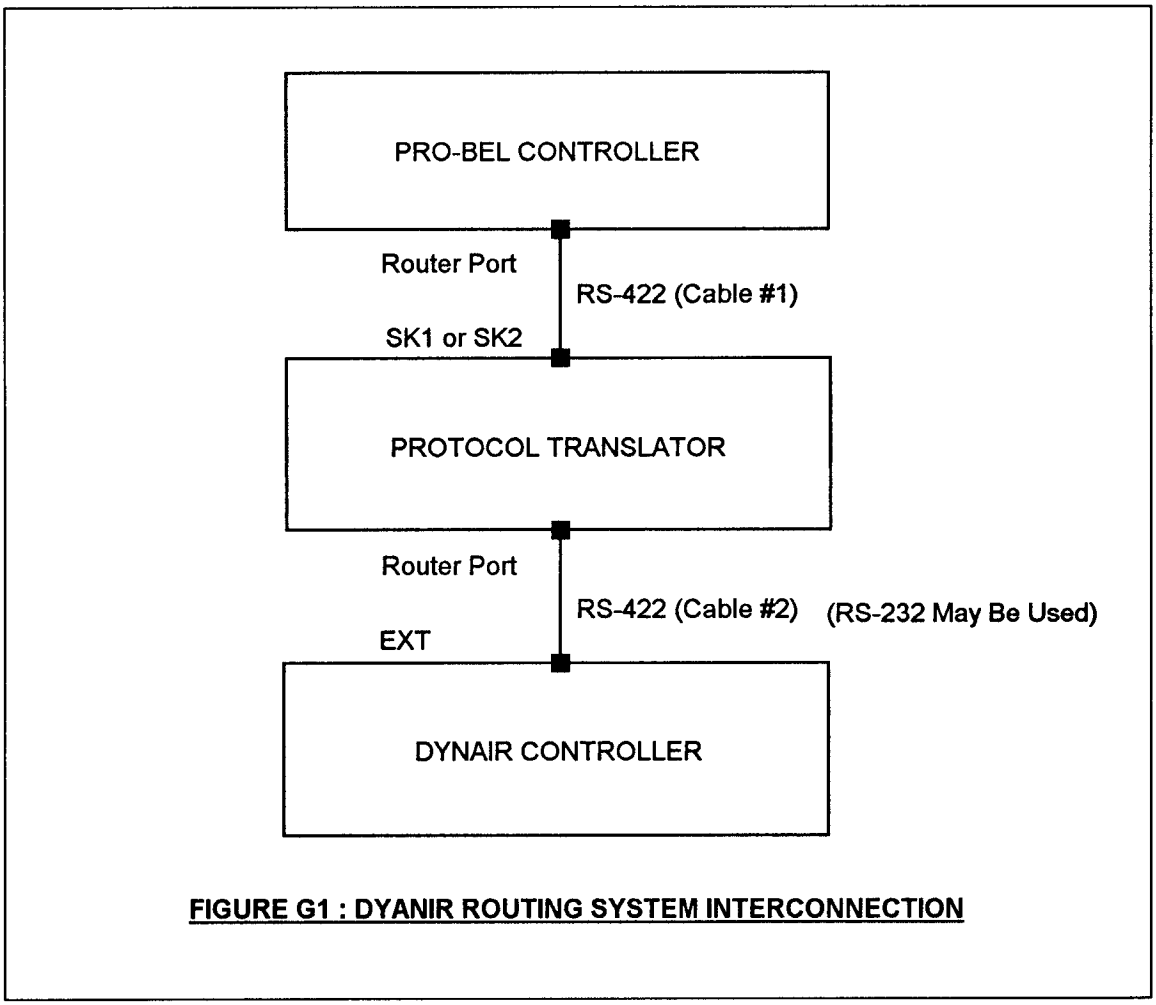


FIGURE G1 : DYANIR ROUTING SYSTEM INTERCONNECTION

2 INSTALLATION

2.1 Installation Requirements

A suitable PC with a serial I/O port is required to run the Protocol Translator Editor software. Refer to the 'Installing the Editor' section of the Protocol Translator User Guide (reference 2). A Procion PC may be used.

2.2 Cabling

2.2.1 Cable #1 Pro-Bel Controller to Protocol Translator

For connection to a **PROCION** Router Controller refer to *Appendix A.* The pin-out for the cable which connects the Pro-Bel Controller to the Protocol Translator is given below. The cable requires male 9-way 'D' Type connectors on either end.

Pro-Bel Controller	Protocol Translator SK1/SK2
1 Chassis	1 Chassis
2 RX-	8 TX-
3 TX+	7 RX+
4 Signal Ground	4 Signal Ground
5 No Connection	5 No Connection
6 Signal Ground	6 Signal Ground
7 RX+	3 TX+
8 TX-	2 RX-
9 Chassis	9 Chassis

2.2.2 Cable #2 Pro-Bel Protocol Translator to Dynair Dynasty or System 21

For connections to a System 21 frame the single port has to be assigned to be external computer control or a VDT. To select the external computer control port set DIP switch S1-8 OPEN to the off position for the 'computer connected to port labelled RS-232'.

Both ports can be selected for System 21 frames with a special 'kit' from DYNAIR, refer to the control router handbook for further information. When using two ports on a System 21 frame or using a DYNASTY frame DIP switch S1-8 is used as a port swap. Set DIP switch S1-8 CLOSED to the on position for the 'EXT port computer and AUX port for VDT'.

If the connection is to be RS-422 use Protocol Translator port SK3 along with the following cable details. The cable requires male 9-way 'D' Type connectors on either end. Jumper W2 and W3 to set the port to be RS-422.

Protocol Translator SK3..SK9/10	DYNAIR EXT RS-422
1 Chassis	
2 RX-	2 TX A
3 TX+	3 RX B
4 Signal Ground	9 RCV COM
5 No Connection	
6 Signal Ground	4 XMT COM
7 RX+	7 TX B
8 TX-	8 RX A
9 Chassis	

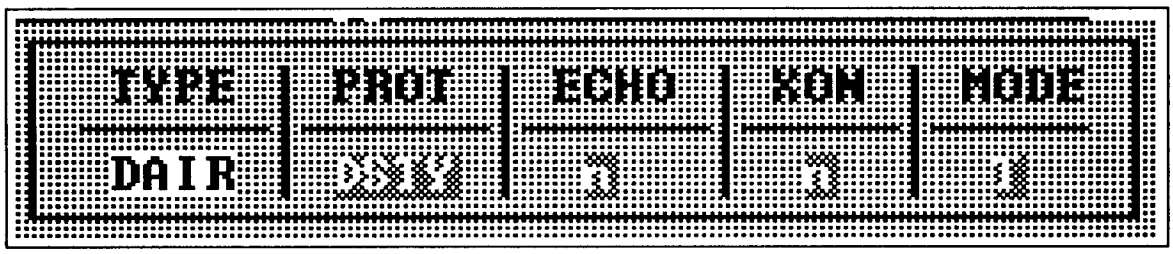
If the connection is to be RS-232 use Protocol Translator port Sk10 along with the following cable details. The cable requires a male 9-way 'D' Type connectors on either end. Jumper W2 and W3 to set the port to be RS-232.

Protocol Translator SK10	DYNAIR EXT RS-232
1 No Connection	
2 TX	8 RX
3 RX	2 TX
4 DSR	
5 Signal Ground	6 Signal Ground
6 DTR	
7 CTS	
8 RTS	
9 No Connection	

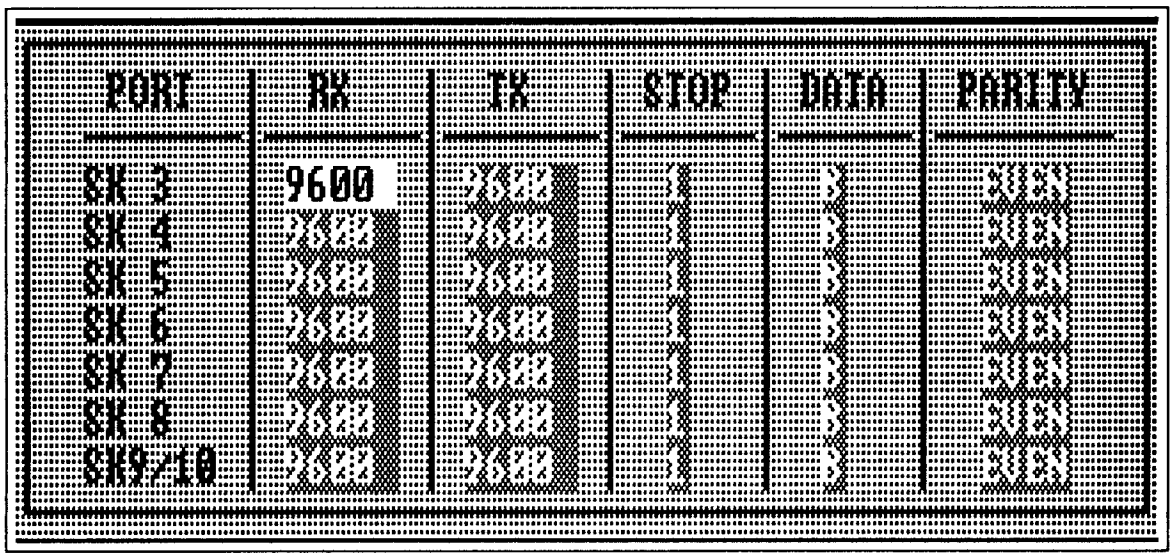
3 CONFIGURATION

3.1 General Configuration For The Protocol Translator

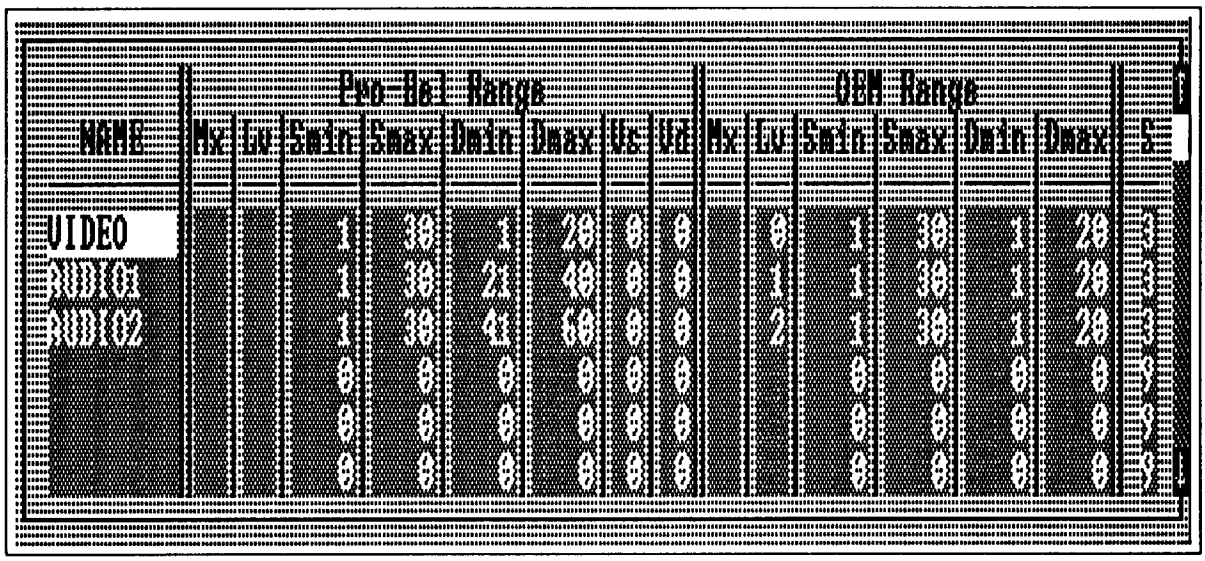
- Select the *<Switcher Type>* as shown below. Set *<TYPE>* as *<DAIR>* and *<PROT>* as *<DSTY>*.



Specify the *<Translator Port Setup>* as shown below. Other serial I/O characteristics can be selected but they must match those specified on the DYNAIR control card, refer to sections 3.2 and 4.3 of this appendix. *Only the baud rate is selectable for the EXT port, the other parameters are fixed at 8,1,E.*



- Specify the *<Protocol Translation>* as shown below, with the DYNAIR level identifiers being specified as described within section 4.1 of this appendix. The values shown are for example purposes only.



3.2 General Configuration For The DYNAIR

Set the DIP switches on the DYNAIR control card PCB as shown below. The serial I/O port is to be configured 9600,8,E,1, with a timeout of 200 milliseconds.

SWITCH	POSITION
1 Baud	Open
2 Baud	Closed
3 Baud	Open
4 TimeOut	Open
5 TimeOut	Closed
6	Refer to Manual
7 VDT Type	Refer to Manual
8 VDT Logging	Refer to Manual

4 OPERATION

4.1 DYNAIR Level Mapping

The DYNAIR requires level identifiers to be specified within the commands sent to it by the Protocol Translator. These have to be entered within the OEM *<Lv>* field of the Protocol Translation Table within the Editor.

DYNAIR Level	OEM *<Lv>* Field Character
0	0
1	1
2	2
3	3

4.2 Implemented Commands

The following DYNAIR commands are implemented within the Protocol Translator, refer to reference 1 for further details.

- **AB** *Status Request Reply*
- **AC** *Reset*
- **AD** *AutoStatus Report*
- **DA** *Status Request*
- **C0-C3** *Level0 -Level3 Switch*
- **F0** *Tilt*
- **FA** *Negative Acknowledge*
- **FB** *Acknowledge*

4.3 Available Facilities

- **Protect** is available from both the Pro-Bel or DYNAIR control panels, but it is only local to the control system which instigated it.
- **Line-up** (*CHOP*) is available from both Pro-Bel control panels and the DYNAIR control panels, but is only local to the control panel which instigated it. However the constant alternation of the source routed to a destination is shown by both control systems and will therefore indicate that line-up is in operation.
- Virtual Crosspoints may be used in **TRUE** translation mode.
- Either *TRUE* or *FALSE* response mode may be used.
- Software flow control using **XON** and **XOFF** cannot be used.
- A minimum of one and a maximum of seven DYNAIR Controllers can be connected to a single Protocol Translator.
- A minimum of two and a maximum of eight system controllers can be connected to a single Protocol Translator.

5 TROUBLE SHOOTING

This section is not an exhaustive guide but presents the most salient problems which could arise during installation.

- Check the Protocol Translator and the DYNAIR Controller have power.
- A response on the Protocol Translator display of the form ***<NO COMMS>*** on sockets SK3 to SK9/10 indicates that there is no communication between the Protocol Translator and the DYNAIR Controller.
- If DYNAIR levels 0 and 1 can be switched but levels 2 and 3 cannot then check that levels controlled DIL switches (S1-1 and S1-2) are correctly set.

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APPENDIX H - DI-TECH 9002 ROUTING SYSTEM

CONTENTS

OTHER RELEVANT DOCUMENTATION

REFERENCE NO	DESCRIPTION
1. CPD2	Model 9002 Virtual Matrix System Controller, Serial System Protocol, External Computer Interface.
2. H052	Serial Protocol Translator User Guide. Issue 1, July 95.

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1 OVERVIEW

This appendix describes the installation requirements and operational features available when using the Protocol Translator with a DI-TECH 9002 routing system. It is split into distinct sections which cover : installation, configuration, operation and trouble shooting.

The Pro-Bel Protocol Translator interfaces to a DI-TECH 9002 routing system via the Virtual Matrix Controller Model 9002 refer to Figure H1 'DI-TECH Routing System Interconnection'.

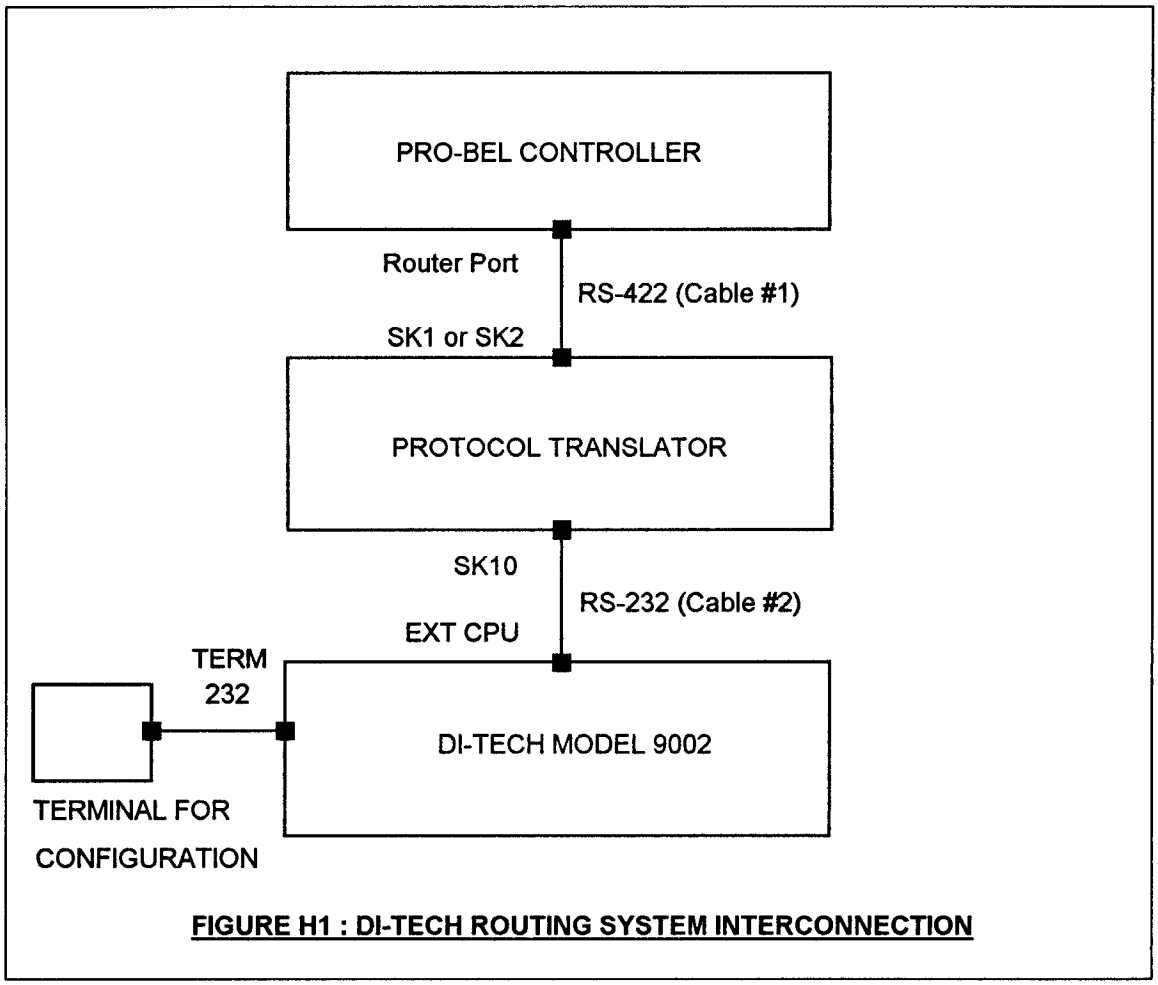


FIGURE H1 : DI-TECH ROUTING SYSTEM INTERCONNECTION

2 INSTALLATION

2.1 Installation Requirements

A suitable PC with a serial I/O port is required to run the Protocol Translator Editor software. Refer to the 'Installing the Editor' section of the Protocol Translator User Guide (reference 2). A Procion PC may be used.

2.2 Cabling

2.2.1 Cable #1 Pro-Bel Controller to Protocol Translator

For connection to a **PROCION** Router Controller refer to *Appendix A.* The pin-out for the cable which connects the Pro-Bel Controller to the Protocol Translator is given below. The cable requires male 9-way 'D' Type connectors on either end.

Pro-Bel Controller	Protocol Translator SK1/SK2
1 Chassis	1 Chassis
2 RX-	8 TX-
3 TX+	7 RX+
4 Signal Ground	4 Signal Ground
5 No Connection	5 No Connection
6 Signal Ground	6 Signal Ground
7 RX+	3 TX+
8 TX-	2 RX-
9 Chassis	9 Chassis

2.2.2 Cable #2 Pro-Bel Protocol Translator to DI-TECH 9002 Controller

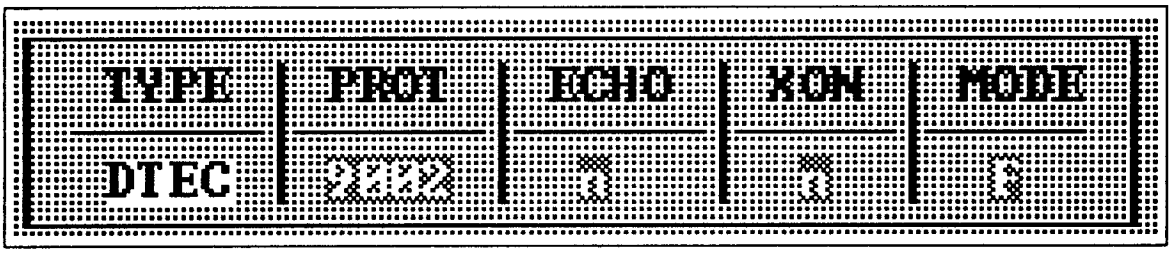
The pin-out for the cable which connects the Protocol Translator to the DI-TECH 9002 is given below. The cable requires a male 9-way 'D' Type connector on Protocol Translator end, and a male 25-way 'D' Type connector on the DI-TECH 9002 end.

Protocol Translator SK10	DI-TECH EXT CPU
1 No Connection	No Connection
2 TX	2 RX
3 RX	3 TX
4 DSR	No Connection
5 Signal Ground	1 and 9 Signal Ground
6 DTR	No Connection
7 CTS	No Connection
8 RTS	No Connection
9 No Connection	No Connection

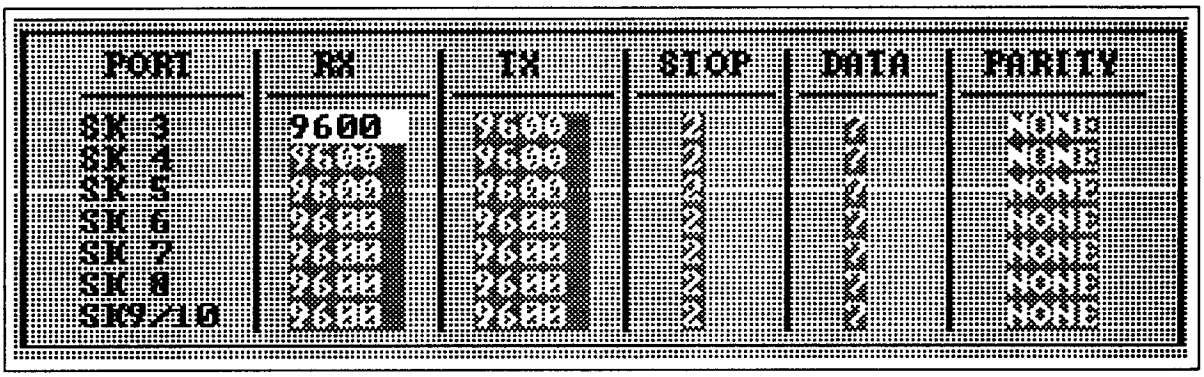
3 CONFIGURATION

3.1 General Configuration For The Protocol Translator

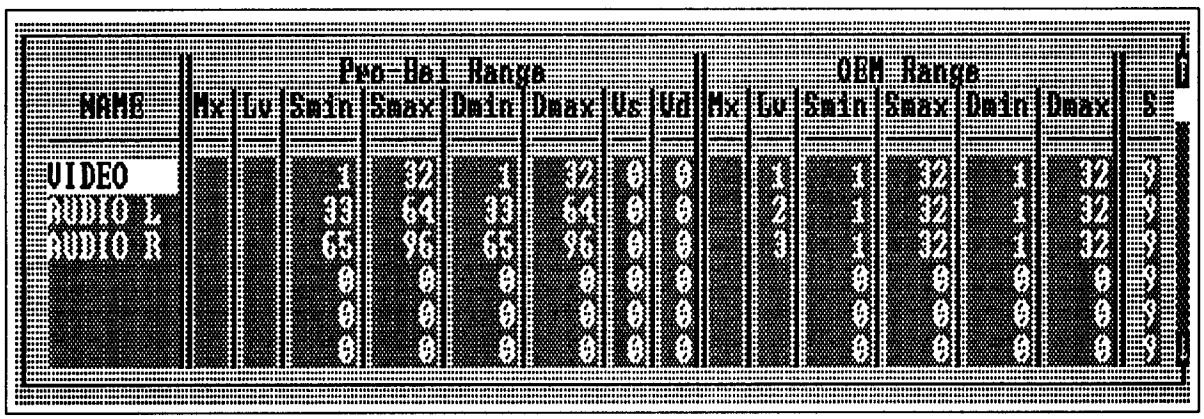
- Select the *<Switcher Type>* as shown below.
- Set *<TYPE>* as *<DTEC>* and *<PROT>* as *<9002>*.



- Specify the *<Translator Port Setup>* as shown below. Other serial I/O characteristics can be selected but they must match those specified within the DI-TECH Controller, refer to sections 3.2 of this appendix. *Two Stop bits are used to provide a delay between data bytes arriving at the DI-TECH Controller which is configured to have only one stop bit.*



- Specify the *<Protocol Translation>* as shown below, with the DI-TECH level identifiers being specified as described within section 4.1 of this appendix. The values shown are for example purposes only.



3.2 General Configuration For The DI-TECH 9002

With reference to the DI-TECH Serial System Protocol Manual (reference 1) configure the *EXT CPU* Serial I/O port of the DI-TECH Controller to be **9600, 7, 2, None**. This is performed through two switches on the DI-TECH Virtual matrix Controller Model 9002 PCB. Baud rates of 38400 and 19200 **are not recommended.**

The 76800 Baud must not be selected.

Switch S1 (External CPU UART)

Select the following recommended switch positions.

SWITCH	POSITION
8	OFF
7 232	ON
6 422	OFF
5 SBS	ON
4 EP	ON
3 CS 2	OFF
2 CS 1	ON
1 PE	OFF

Switch S6 (External CPU Baud Rate)

Select the following recommended switch positions.

SWITCH	POSITION
8 300	OFF
7 1200	OFF
6 2400	OFF
5 4800	OFF
4 9600	ON
3 19.2 K	OFF
2 38.4 K	OFF
1 76.8 K	OFF

4 OPERATION

4.1 DI-TECH 9002 Level Mapping

The DI-TECH 9002 requires level identifiers to be specified within the commands sent to it by the Protocol Translator. These have to be entered within the OEM <*Lv*> field of the Protocol Translation Table within the Editor.

DI-TECH Level	OEM <*Lv*> Field Character
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8

4.2 Implemented Commands

The following DI-TECH 9002 commands and responses are implemented within the Protocol Translator (refer reference 1).

- **S** *Switch Command*
- **T** *Tally Command*
- **E** *Unrecognised Command Response*
- **X** *Data Out of Range Response*
- **V** *Valid Command Received Response*
- **P** *Output Protected Response*
- **C** *Tally Response*

4.3 Available Facilities

- **Protect** is available from both the Pro-Bel or DI-TECH control panels, but it is only local to the control system which instigated it.
- **Line-up** (*CHOP*) is available from both Pro-Bel control panels and the DI-TECH control panels, but is only local to the control panel which instigated it. However the constant alternation of the source routed to a destination is shown by both control systems and will therefore indicate that line-up is in operation.
- Virtual Crosspoints cannot be used.
- *TRUE* response mode cannot be used.
- Software flow control using **XON** and **XOFF** cannot be used.
- Only one DI-TECH Virtual Matrix Controller Model 9002 can be connected to a single Protocol Translator. Up to seven may be connected with the extra six requiring external RS-422 to RS-232 converters.
- A minimum of two and a maximum of eight system controllers can be connected to a single Protocol Translator.

5 TROUBLE SHOOTING

This section is not an exhaustive guide but presents the most salient problems which could arise during installation and running.

- A response on the Protocol Translator display of the form ***<VCr>*** or ***<CxxxxxxxxCr>***, where ***xxxxxxxx*** are twenty-seven ASCII numerical digits, on sockets SK3 to SK9/10 indicates that there is communication between the Protocol Translator and the DI-TECH.
- A received response on the Protocol Translator display of the form ***<NO COMMS>*** on sockets SK3 to SK9/10 indicates that there is no communication between the Protocol Translator and the DI-TECH Controller.
- A transmitted response on the Protocol Translator display of the form ***<NO COMMS>*** on the System Controller sockets (SK1/SK2) indicates that there has no communication between the System Controllers and the Protocol Translator for at least five minutes.
- Received responses on the Protocol Translator of the form ***<ECr>*** or ***<XCr>*** are *error messages* from the DI-TECH Controller, indicating serial I/O and database setup problems.
- Received responses on the Protocol Translator of the form ***<PxxxCr>***, where ***xxx*** are three ASCII numerical digits, is a *diagnostic message* returned from the DI-TECH Controller. It is indicating that the last switch was not made as that destination is currently being protected by a panel.

APPENDIX I - VISTEK 'S' SERIES ROUTING SYSTEM

CONTENTS

OTHER RELEVANT DOCUMENTATION

REFERENCE NO	DESCRIPTION
1. CPV1	External Remote Control For 'S' Series and Array Routing Switchers Protocol Specification Issue 2.1.
2. H052	Serial Protocol Translator User Guide. Issue 1, July 95.

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1 OVERVIEW

This appendix describes the installation requirements and operational features available when using the Protocol Translator with the VISTEK 'S' series routing system. It is split into distinct sections which cover : installation, configuration, operation and trouble shooting.

The Pro-Bel Protocol Translator interfaces to the VISTEK 'S' series routing system via the External Remote Serial Interface refer to Figure I1 'VISTEK 'S' Series Routing System Interconnection'.

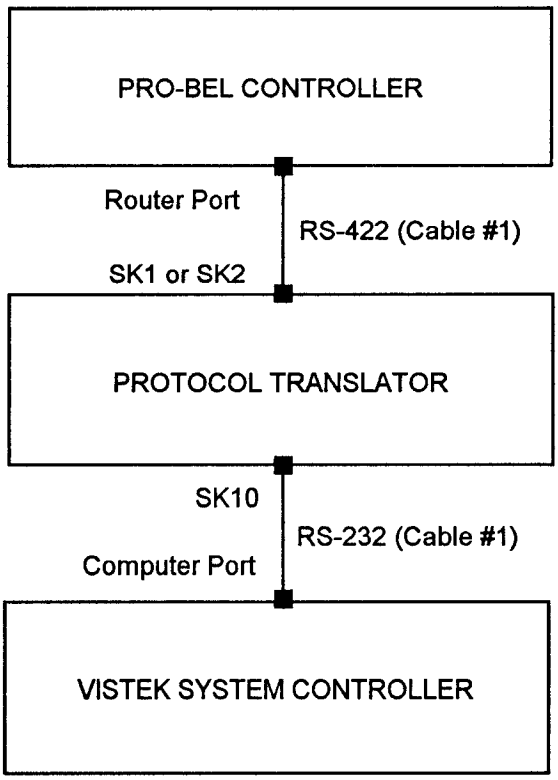


FIGURE I1 : VISTEK 'S' SERIES ROUTING SYSTEM INTERCONNECTION

2 INSTALLATION

2.1 Installation Requirements

A suitable PC with a serial I/O port is required to run the Protocol Translator Editor software. Refer to the 'Installing the Editor' section of the Protocol Translator User Guide (reference 2). A Procion PC may be used.

2.2 Cabling

2.2.1 Cable #1 Pro-Bel Controller to Protocol Translator

For connection to a **PROCION** Router Controller refer to *Appendix A.* The pin-out for the cable which connects the Pro-Bel Controller to the Protocol Translator is given below. The cable requires male 9-way 'D' Type connectors on either end.

Pro-Bel Controller	Protocol Translator SK1/SK2
1 Chassis	1 Chassis
2 RX-	8 TX-
3 TX+	7 RX+
4 Signal Ground	4 Signal Ground
5 No Connection	5 No Connection
6 Signal Ground	6 Signal Ground
7 RX+	3 TX+
8 TX-	2 RX-
9 Chassis	9 Chassis

2.2.2 Cable #2 Pro-Bel Protocol Translator to VISTEK System Controller

If the connection is to be RS-232 use Protocol Translator port SK10 along with the following cable details. The cable requires a male 9-way 'D' Type connector on the Pro-Bel end and a female 25-way 'D' Type connector on the VISTEK end.

Protocol Translator SK10	VISTEK Serial Interface RS-232
1 No Connection	
2 TX	3 RX
3 RX	2 TX
4 DSR	
5 Signal Ground	1 Ground
6 DTR	
7 CTS	
8 RTS	
9 No Connection	

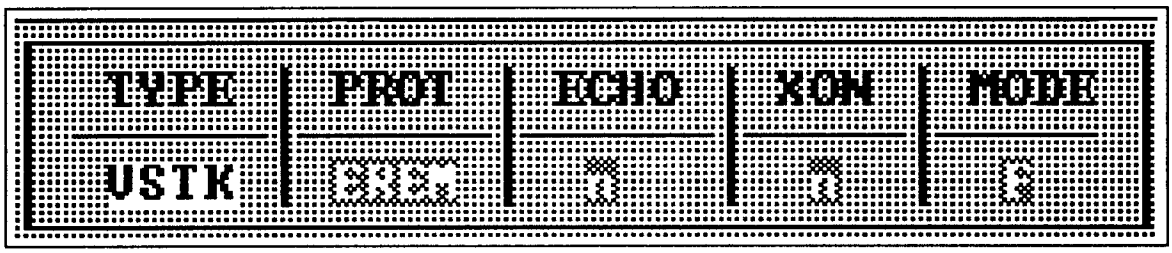
If the connection is to be RS-422 use the Protocol Translator ports SK3 to SK9 with the following cable details. The cable requires a male 9-way 'D' Type connectors on both ends of the cable.

Protocol Translator SK3..SK9/10	VISTEK Serial Interface RS-422
1 Chassis	1 Chassis
2 RX-	2 TX-
3 TX+	3 RX+
4 Signal Ground	7 Signal Ground
5 No Connection	
6 Signal Ground	
7 RX+	7 TX+
8 TX-	8 RX-
9 Chassis	

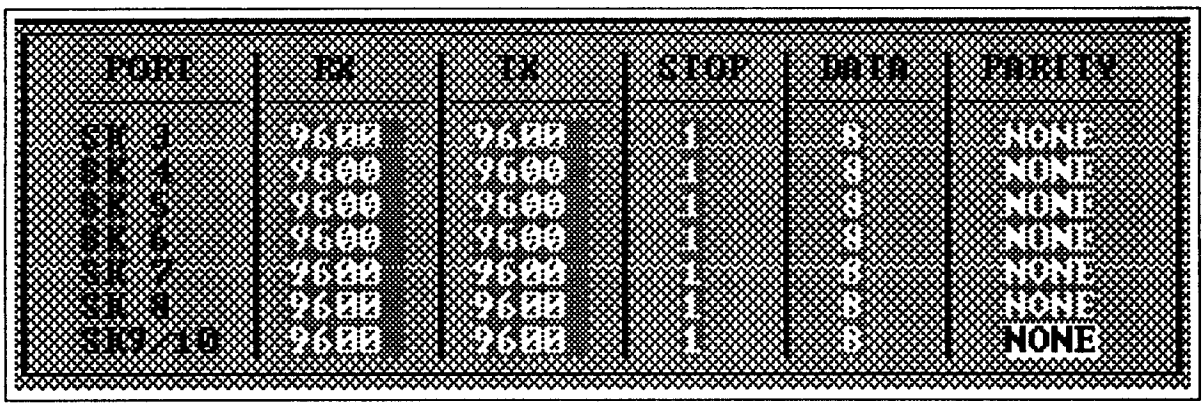
3 CONFIGURATION

3.1 General Configuration For The Protocol Translator

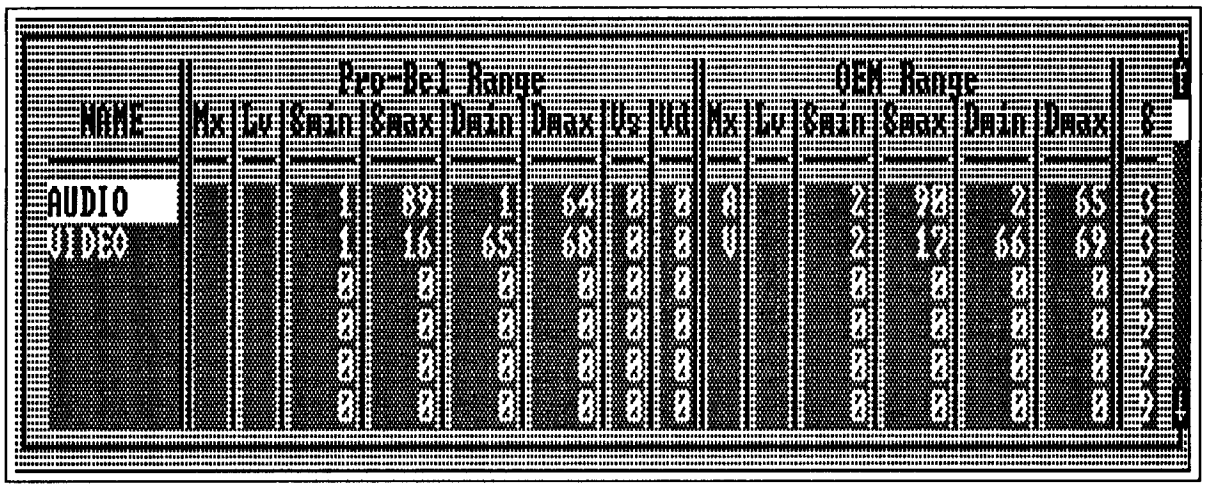
- Select the *<Switcher Type>* as shown below.
- Set *<TYPE>* as *<VSTK>*, *<PROT>* as *<EREM>* and <MODE> as <F>.



- Specify the *<Translator Port Setup>* as shown below. Only this serial I/O characteristic (**9600, 8, 1, N**) can be selected, refer to sections 3.2 and 4.3 of this appendix.



- Specify the *<Protocol Translation>* as shown below, with the VISTEK matrix identifiers being specified as described within section 4.1 of this appendix. The values shown are for example purposes only.



3.2 General Configuration For The VISTEK System Controller

- Connect other VISTEK routers to the main control frame housing the VISTEK system controller using the Fast Transfer Bus.
- With reference to the VISTEK 'S' External Remote Protocol (reference 1) the External Remote Serial Port is fixed to **9600, 8, 1, None**.

4 OPERATION

4.1 VISTEK Matrix Mapping

The VISTEK System Controller requires matrix identifiers to be specified within the commands sent to it by the Protocol Translator. These have to be entered within the OEM *<Mx>* field of the Protocol Translation Table within the Editors. The Matrix identifiers are to be entered as specified by the ID letters of the matrices used within the system.

4.2 Implemented Commands

The following VISTEK commands are implemented within the Protocol Translator for controlling the matrices, refer to reference 1 for further details.

- **.I** *Interrogate Command*
- **.S** *Set Command*
- **.A** *Acknowledge Response*
- **.N** *Invalid Data Response*
- **.P** *Power-Up Response*
- **.E** *Syntax Or Transmission Error Response*

4.3 Available Facilities

- **Protect** is available from Pro-Bel control panels, but it is only local to the control system which instigated it.
- **Line-up** (*CHOP*) is available from Pro-Bel control panels but is only local to the control panel which instigated it. However the constant alternation of the sources routed to a destination will indicate that line-up is in operation.
- Virtual Crosspoints cannot be used.
- Only *FALSE* response mode can be used.
- Software flow control using **XON** and **XOFF** cannot be used.
- A minimum of one and a maximum of seven VISTEK system controllers can be connected to a single Protocol Translator, dependent on the communications medium chosen.
- A minimum of two and a maximum of eight system controllers can be connected to a single Protocol Translator.

5 TROUBLE SHOOTING

This section is not an exhaustive guide but presents the most salient problems which could arise during installation.

- Check the Protocol Translator and the VISTEK Matrix Controller have power.
- A response on the Protocol Translator display of the form ***<NO COMMS>*** on sockets SK3 to SK9/10 indicates that there is no communication between the Protocol Translator and the VISTEK.

APPENDIX J - PRO-BEL BTS 2000 ROUTING SYSTEM

CONTENTS

OTHER RELEVANT DOCUMENTATION

REFERENCE NO	DESCRIPTION
1. CPB2	BTS 2000 Protocol for CE-2200 and CI-2000 control systems.
2. H052	Serial Protocol Translator User Guide. Issue 1, July 95.

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1 OVERVIEW

This appendix describes the installation requirements and operational features available when using the Protocol Translator with a Pro-Bel BTS 2000 routing system.

Even though the BTS 2000 and 2200 Protocols can be selected within the Editor they are not currently implemented within the Protocol Translator.

This option must not be selected.

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APPENDIX K - NTP 512 ROUTING SYSTEM

CONTENTS

OTHER RELEVANT DOCUMENTATION

REFERENCE NO	DESCRIPTION
1. CPN1	Matrix Controller The "Dot" Protocol 512-8013D, latest issue.
2. H052	Serial Protocol Translator User Guide. Issue 1, July 95.

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1 OVERVIEW

This appendix describes the installation requirements and operational features available when using the Protocol Translator with the NTP 512 routing system. It is split into distinct sections which cover : installation, configuration, operation and trouble shooting.

The Pro-Bel Protocol Translator interfaces to the NTP 512 routing system via Serial Interface 1 or Serial Interface 2 refer to Figure K1 'NTP 512 Routing System Interconnection'.

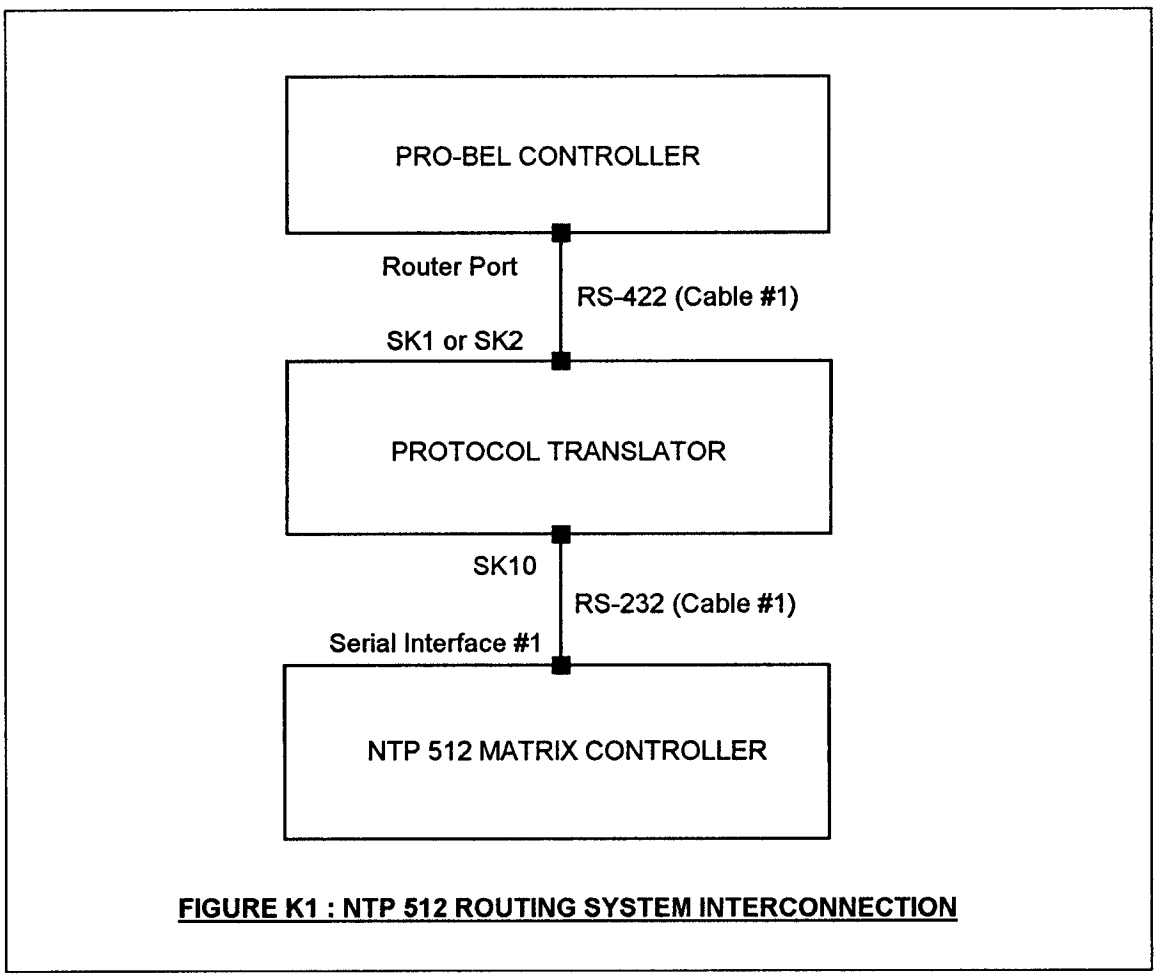


FIGURE K1 : NTP 512 ROUTING SYSTEM INTERCONNECTION

2 INSTALLATION

2.1 Installation Requirements

A suitable PC with a serial I/O port is required to run the Protocol Translator Editor software. Refer to the 'Installing the Editor' section of the Protocol Translator User Guide (reference 2). A Procion PC may be used.

2.2 Cabling

2.2.1 Cable #1 Pro-Bel Controller to Protocol Translator

For connection to a **PROCION** Router Controller refer to *Appendix A.* The pin-out for the cable which connects the Pro-Bel Controller to the Protocol Translator is given below. The cable requires male 9-way 'D' Type connectors on either end.

Pro-Bel Controller	Protocol Translator SK1/SK2
1 Chassis	1 Chassis
2 RX-	8 TX-
3 TX+	7 RX+
4 Signal Ground	4 Signal Ground
5 No Connection	5 No Connection
6 Signal Ground	6 Signal Ground
7 RX+	3 TX+
8 TX-	2 RX-
9 Chassis	9 Chassis

2.2.2 Cable #2 Pro-Bel Protocol Translator to NTP 512 Matrix Controller

The pin-out for the cable which connects the Protocol Translator to the NTP 512 is given below. The cable requires a male 9-way 'D' Type connector on the Pro-Bel end and a female 25-way 'D' Type connector on the NTP 512 end.

If the connection is to be RS-232 use Protocol Translator port SK10 along with the following cable details.

Protocol Translator SK10	NTP 512 Serial Interface #1 RS-232
1 No Connection	
2 TX	3 RX
3 RX	2 TX
4 DSR	20 DTR
5 Signal Ground	7 Ground
6 DTR	6 DSR
7 CTS	4 RTS
8 RTS	5 CTS
9 No Connection	

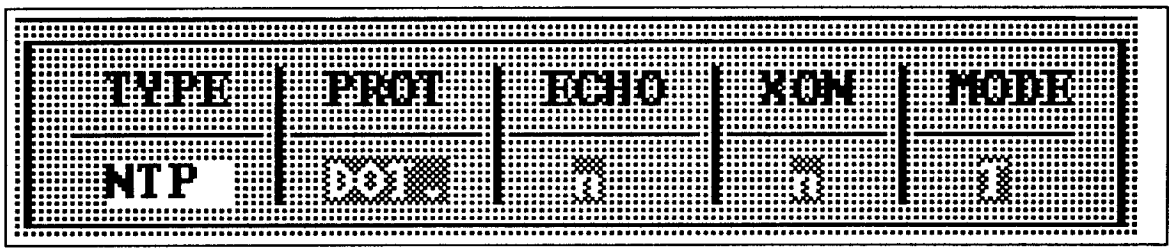
If the connection is to be RS-422 use the Protocol Translator ports SK3 to SK9 with the following cable details.

Protocol Translator SK3..SK9/10	NTP 512 Serial Interface RS-422
1 Chassis	1 Chassis
2 RX-	14 TX-
3 TX+	3 RX+
4 Signal Ground	7 Signal Ground
5 No Connection	
6 Signal Ground	
7 RX+	2 TX+
8 TX-	15 RX-
9 Chassis	

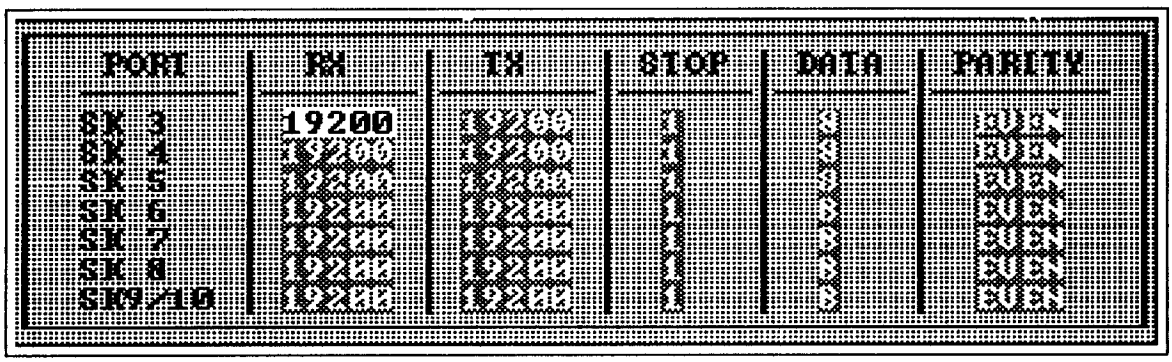
3 CONFIGURATION

3.1 General Configuration For The Protocol Translator

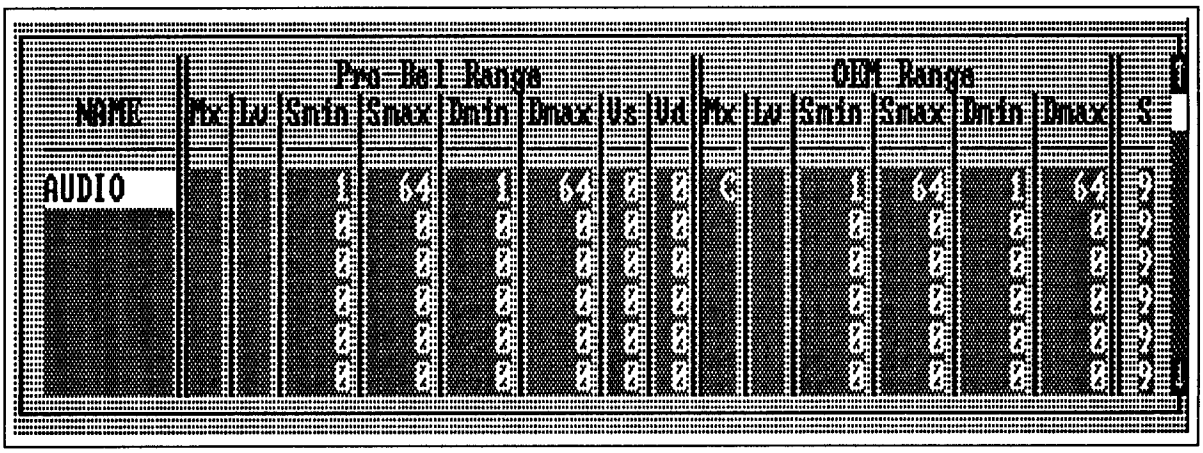
- Select the *<Switcher Type>* as shown below.
- Set *<TYPE>* as *<NTP>* and *<PROT>* as *<.DOT>*.



- Specify the *<Translator Port Setup>* as shown below. Other serial I/O characteristics can be selected but they must match those specified within the NTP 512, refer to sections 3.2 and 4.3 of this appendix.



- Specify the *<Protocol Translation>* as shown below, with the NTP matrix identifiers being specified as described within section 4.1 of this appendix. The values shown are for example purposes only.



3.2 General Configuration For The NTP 512

Ensure that the dip switches on the NTP 512 Matrix Controller 1 PCB and the NTP Controller 2 PCB for the serial port to be used have the same operating parameters. The table specifies the serial ports to be configured to 19200, 8, 1, Even.

SWITCH	POSITION
1 Handshake	OFF
2 Parity Type	ON
3 Parity State	OFF
4 Auto Line Feed	OFF
5 Number of Data Bits	ON
6 Baud Rate	ON
7 Baud Rate	ON
8 Baud Rate	ON

4 OPERATION

4.1 NTP 512 Matrix Mapping

The NTP 512 requires matrix identifiers to be specified within the commands sent to it by the Protocol Translator. These have to be entered within the OEM *<Mx>* field of the Protocol Translation Table within the Editors. The Matrix identifiers are to be entered as specified by the ID letters of the matrices used within the system.

4.2 Implemented Commands

The following NTP 512 commands are implemented within the Protocol Translator for controlling the matrices, refer to reference 1 for further details.

- **.C** *Connect Command*
- **.I** *Interrogate Command*
- **.L** *List Command*
- **.A** *Acknowledge Response*
- **.N** *Invalid Data Response*
- **.F** *Fault Response*
- **.E** *Syntax Error Response*
- **.B** *Blocked Route/Crosspoint Response*
- **.e** *Not Implemented Response*

The jumper PL24 is used within this interface to select between the Interrogate (.I) and List (.L) command for interrogation of the routers.

When jumper PL24 is linked high the Protocol Translator uses the List Command to obtain router crosspoint status. When jumped low the Interrogate Command is used.

4.3 Available Facilities

- **Protect** is available from Pro-Bel control panels, but it is only local to the control system which instigated it.
- **Line-up** (*CHOP*) is available from Pro-Bel control panels but is only local to the control panel which instigated it. However the constant alternation of the sources routed to a destination will indicate that line-up is in operation.
- Virtual Crosspoints cannot be used.
- Either *TRUE* or *FALSE* response mode may be used.
- Software flow control using **XON** and **XOFF** can be used.
- A minimum of one and a maximum of seven NTP 512 matrix controllers can be connected to a single Protocol Translator, dependent on the communications medium chosen.
- A minimum of two and a maximum of eight system controllers can be connected to a single Protocol Translator.

5 TROUBLE SHOOTING

This section is not an exhaustive guide but presents the most salient problems which could arise during installation.

- Check the Protocol Translator and the NTP 512 Matrix Controller have power.
- A response on the Protocol Translator display of the form *<.Fxx,xxCr>* on sockets SK3 to SK9/10 indicates that there is communication between the Protocol Translator and the NTP 512. However the NTP 512 Matrix Controller could not execute the command.
- A response on the Protocol Translator display of the form ***<NO COMMS>*** on sockets SK3 to SK9/10 indicates that there is no communication between the Protocol Translator and the NTP 512.

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