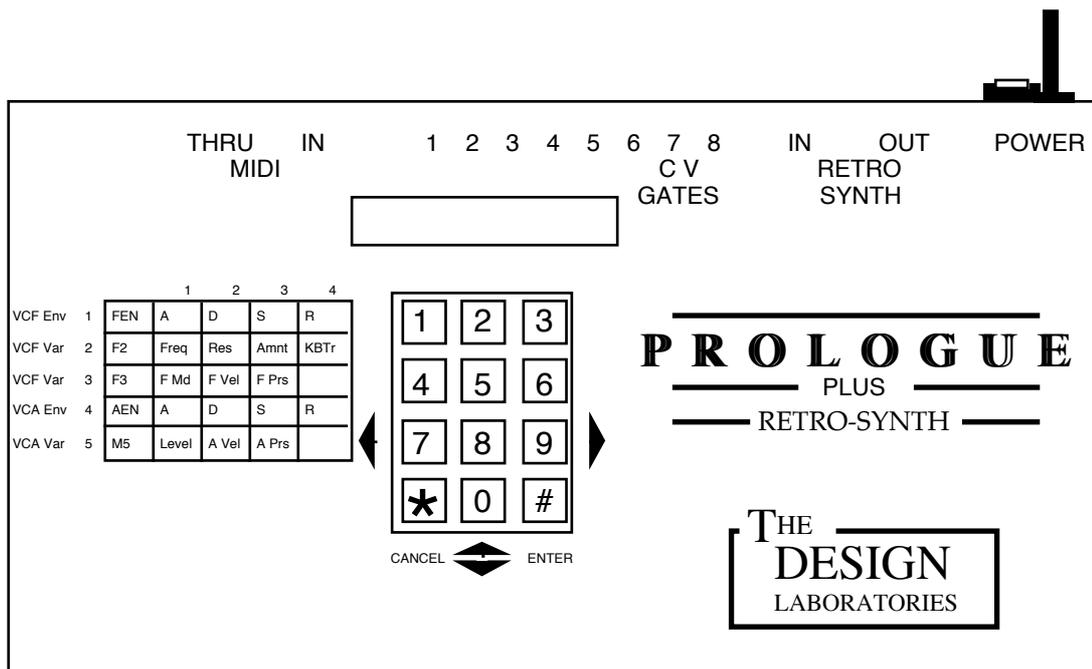


# Design Laboratories

## Prologue & Prologue Plus MIDI to CV & Gate Converters



### OWNER'S MANUAL

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**CHAPTER 1**

**GENERAL  
INSTRUCTIONS**

**and**

**OVERVIEW**

# INTRODUCTION

Even in this MIDI-dominated world you can't dismiss analogue synthesisers. Second-hand units from Moog and ARP, on the surface far more limited than modern instruments, sell for hundreds or even thousands of pounds. Players are prepared to pay huge sums to own and play synthesisers that have characters and offer sounds that they believe can not be emulated on more modern instruments.

This resurgence of interest in vintage synthesisers extends to keyboards designed and sold before MIDI descended upon the keyboard world. Indeed, the most revered of instruments are those such as the Minimoog (1970) and ARP Odyssey (1970), both of which significantly pre-date the introduction in 1983 of the now ubiquitous 5-pin DIN plugs labelled IN, OUT and THRU.

However, even early synthesisers can be controlled electronically. Control voltages and trigger (or gate) pulses allow analogue sequencers to determine the pitch, time and duration of a sound produced by such a synth. But nowadays few players and composers create music exclusively using analogue electronics. The MIDI sequencer and the keyboard workstation are the tools of the '90s, and these offer power and facilities almost undreamed of when Moog and ARP were still in business. Consequently, musicians need a device that connects vintage synths to more modern equipment - a MIDI to CV converter - that translates MIDI information into the control voltages, gates and trigger pulses understood by suitably equipped analogue synthesisers.

The Design Laboratories' Prologue and Prologue Plus MIDI to CV converters (which will, henceforth, both be referred to as the "Prologue") are powerful and comprehensively featured units that can connect up to eight synthesisers to a single MIDI input. With a wide range of control options, programmable polyphony, and (in the case of the 'Plus') powerful synthesis capabilities, they offer an unrivalled combination of facilities and performance.

## **Their features include the following:**

- Sixteen re-mappable CVs and Gates
- V/Oct or V/Hz scales
- Conventional trigger outputs, plus S-Triggers for use with Moog™ synthesisers
- 24 volt CV range (approx).
- LFO
- Polyphony
- Multiple simultaneous clock rates
- Slew generator for polyphonic portamento and other effects
- DIN Sync-24 compatible with equipment from Roland Corporation
- Wasp interface for EDP synthesisers
- MIDI re-channeliser to filter and re-transmit MIDI data on the channel of your choice
- Re-synthesis using "Retro-Synth"
- Clarity, simplicity and speed of use

## SAFETY INSTRUCTIONS

1. **Read all of these instructions**  
All safety and operating instructions should be read before the Prologue is operated.
2. **Save these instructions for future reference.**
3. **Follow all warnings and instructions.**
4. **Water and Moisture**  
The Prologue should not be used near water, and must not be exposed to rain or moisture. If the Prologue is brought directly from a cold environment into a warm one, moisture may condense inside the unit. This may cause hazardous electrical shorting to occur, severely damaging the unit, and even causing danger to life. ALWAYS allow time for the Prologue to naturally reach ambient temperatures before connecting the mains power.
5. **Mounting**  
The Prologue should be placed on a flat, stable surface. Do not position it in a place subject to strong sunlight, excessive dust, mechanical vibration or periodic shocks.
6. **Ventilation**  
It should not be necessary to provide special ventilation because air-flow across the case should be sufficient to ensure adequate heat dissipation. Nevertheless, the Prologue should not be placed where it impedes the flow of air through the vents of other equipment.
7. **External Heat Sources**  
The Prologue should be installed away from significant heat sources such as radiators, and (if possible) away from audio devices such as amplifiers that produce large amounts of heat.
8. **Power Source (UK version)**  
The Prologue features a power supply which will work safely on mains supplies in the range 220v to 240v, 50Hz or 60Hz AC only.  
  
**You should never attempt to modify or adjust the internal power supply in any way. It contains no user serviceable parts.**
9. **Grounding or Polarisation**  
The Prologue should always be grounded (or 'earthed').
10. **Power Cord Protection**  
Power connectors should be routed so that they will not be walked on or pinched.
11. **Extended Periods of Non-Use**  
The Prologue is not disconnected from the mains power as long as it is connected to the wall outlet, even if the unit itself has been switched off. Therefore, if the Prologue is not to be used for an extended period of time, unplug the unit from the wall. Pull the connector out by the plug, never by the cord itself.
12. **Cleaning**  
Clean only with a dry cloth. NEVER use liquid cleaners such as alcohol or benzene on the Prologue. NEVER use abrasive pads.
13. **Damage Requiring Service**  
The Prologue should be returned to qualified service personnel when:
  - foreign objects have entered the unit
  - liquid has been spilled into the unit
  - the unit has been exposed to rain
  - the unit fails to function or operates abnormally
  - the unit has been dropped, or the case damaged.
14. **Servicing**  
The user should not attempt to service the Prologue. All servicing should be referred to qualified service personnel.

## SET UP

Be careful not to damage the Prologue during unpacking. Save the carton and all packing materials since you may need them to transport the Prologue in the future.

The Prologue may be used in most areas, but to maintain reliability and prolong operating life observe the following environmental considerations:

- Nominal temperature should be maintained between 5° and 35° Centigrade (41° and 95° Fahrenheit).
- Relative humidity should be in the range 30% to 60% non-condensing.
- Strong magnetic fields or other sources of electrical interference should not exist nearby.

The Prologue has not been designed for rack mounting and should be used as a free-standing unit.

## CONNECTIONS

The Prologue may be connected to MIDI equipped sequencers and synthesizers, and to any analogue synthesiser or related audio unit which features voltage control interfaces operating in the range  $\pm 15\text{v}$ .

CV and gate outputs are made via standard 3.5mm jack plugs, while the audio input and output for Retro-Synth are via a pair of 1/4" jack sockets. The Prologue also features standard 5-pin MIDI IN and MIDI THRU sockets, plus a dual-purpose 5-pin socket capable of transmitting both MIDI OUT and Roland DIN-Sync24 data. The final connector is a 7-pin DIN socket which allows users who have purchased the optional "Wasp Buzz" interface to control an EDP Wasp synthesiser.

Full descriptions of each connector and interface will be found later in this section.

### 1. BEFORE CONNECTION

- Be sure to insert plugs firmly into sockets. Loose connections may cause hum and noise in addition to causing intermittent operation.
- When unplugging any lead, do so by grasping the plug, not the lead.
- With the exception of mains power, it is not necessary to turn off the power to equipment before making connections.

### 2. POWER CONNECTIONS

- Ensure that the Prologue is switched OFF before inserting the mains lead.
- Ensure that the Prologue's voltage requirements match the supply before inserting the mains lead.

*Note: Users with 2-pin mains supplies:*

*When the Prologue is connected to other audio components, the AC hum of the unit may be increased or decreased by reversing the direction of the power connector in the socket. Check that the cord is in the favourable position ('in-phase') with respect to other audio devices in the chain. For further information on grounding and polarity consult a person familiar with studio grounding techniques.*

### 3. AUDIO AND DATA CONNECTIONS

The Prologue offers a total of 19 sockets, of which 8 are Control Voltage outputs, 8 are gates, and 3 are MIDI (IN, OUT and THRU). The Prologue Plus offers 21 sockets, the additional two being the audio input and output for Retro Synth.

With the exception of the standard 5-pin DIN MIDI sockets and the 1/4" Retro-Synth input and output, all other sockets are standard 3.5mm jack-plugs.

If the "Wasp Buzz" option is installed, this uses a 22nd (7-pin DIN) socket found on the side of the Prologue.

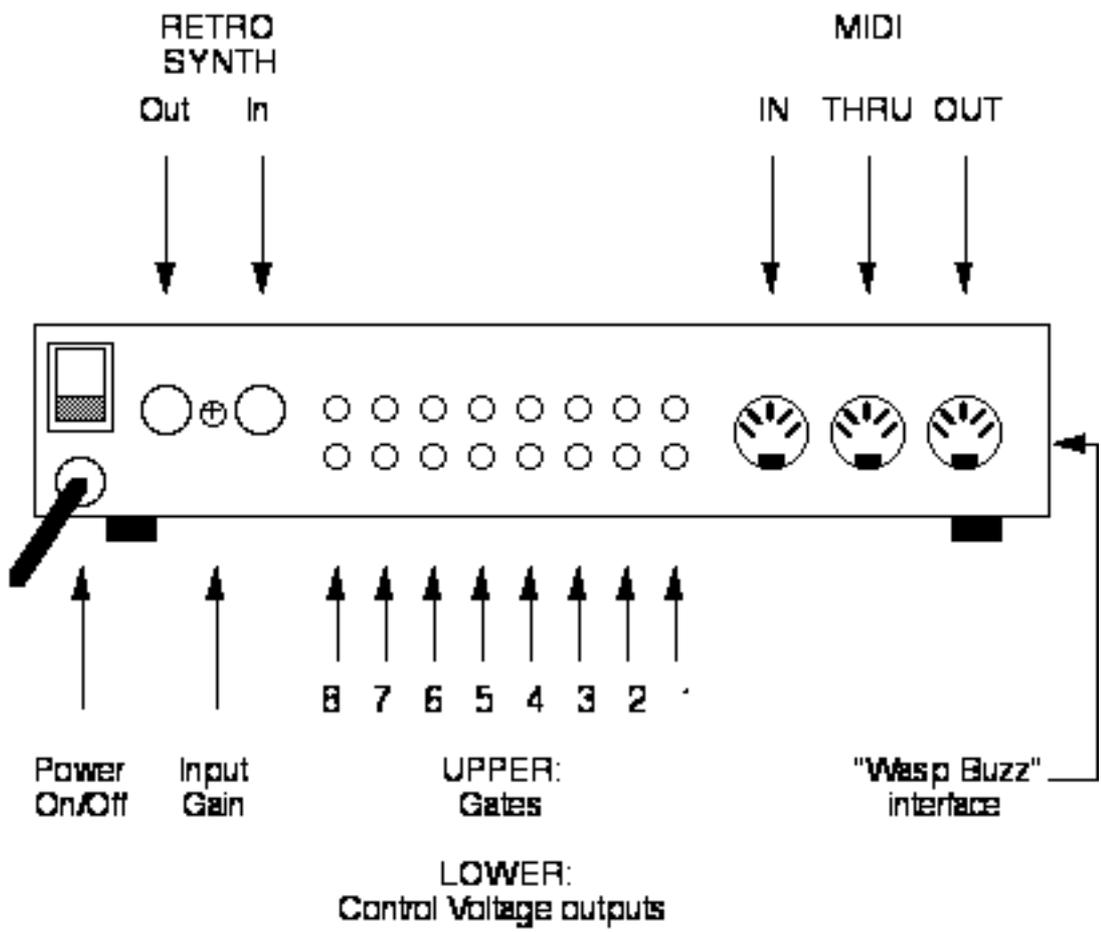


Figure 1 - The Prologue rear panel inputs & outputs

### **CV and Gate Outputs**

- CV1, CV2, CV3... etc.

Output the Control Voltages (CVs) in the range  $\pm 10\text{v}$ .

- Gate 1, Gate 2, Gate 3... etc.

The electrical characteristic of the gate pulse is +5 volt to ground. The Gates are intended for signals which require only two states: ON (nominally +5v) and OFF (nominally 0v).

*Note: If 'Gate' type signals with different state voltages are required you should use a CV output with the range and scale set appropriately.*

### **MIDI Connections**

Control voltages and gate pulses will be derived from information contained within the MIDI signal presented to the MIDI IN.

All MIDI data will be echoed at the MIDI THRU which may be used to 'daisy-chain' further pieces of MIDI equipment.

### **DIN-Sync24**

The MIDI OUT specification requires only that pins 4 and 5 are used for data transmission, while pin 2 is connected to ground. Pins 1 and 3 are, therefore, redundant. The Prologue makes use of these pins for its DIN-Sync24 output.

The socket labelled MIDI OUT *or* SYNC performs two functions:

- (i) It may be used as a standard MIDI OUT
- (ii) It may be used as DIN-Sync24 to drive sequencers and drum machines that require this type of interface.

### **Retro-Synth Connections**

These are designed for line-level audio signals. Connect the signal to be treated to the IN socket. The treated signal will be output from the OUT socket.

### **The [Optional] "Wasp Buzz" Interface**

The Wasp Buzz interface is an optional addition available for both the Prologue and Prologue Plus. It offers connection to the EDP Wasp synthesiser via the Wasp's non-standard 7-pin digital interface.

The output derived from Register 1 of Processor 1 is always available at the Wasp Buzz output, and no more set-up is required than to plug a suitable cable between the Prologue and the EDP synth.

*Note: The NOTE information used to drive the Wasp Buzz may simultaneously be directed to the conventional CV & GATE outputs. Consequently, you can "stack" a conventional synth with an EDP, for "fat" or layered sounds.*

## CONTROLS AND INDICATORS

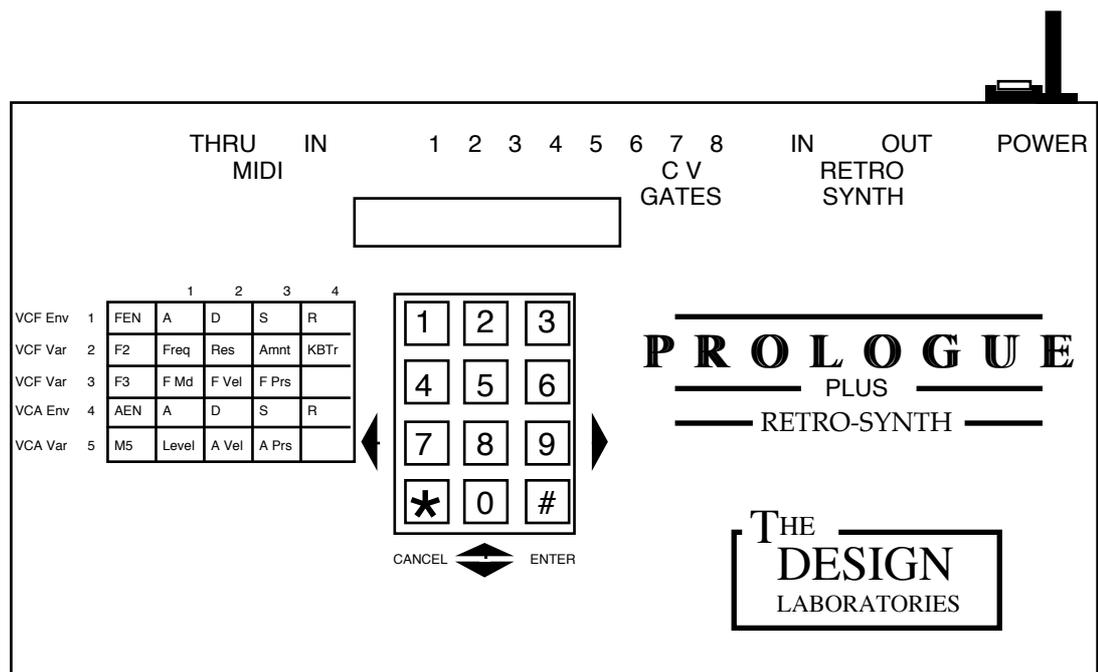


Figure 2 - The Prologue top panel

All Prologue controls and indicators, with the exception of the mains on/off switch, are to be found on the top panel of the unit.

There are only two of these, the "keypad" and the "display", and these are described below:

## 1. THE KEYPAD

The Prologue offers a comprehensive set of menus and options. These are navigated and manipulated using the keypad, which fulfils the functions of a full set of CURSOR, ENTER and CANCEL keys. The assignments are:

Key	Primary function	Secondary function/name
Key 7	CURSOR LEFT	
Key 8	CURSOR UP	Increment
Key 9	CURSOR RIGHT	
Key 0	CURSOR DOWN	Decrement
Key *	CANCEL operation	EXIT
Key #	PERFORM operation	ENTER

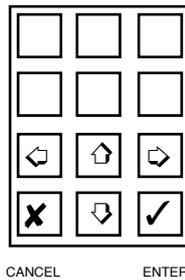


Figure 3 - The Keypad's alternative functions

### Fast Increment & Fast Decrement:

A 'fast' method has been included to move quickly through options with a wide range of possible values.

- To move quickly press the required CURSOR, followed by the opposite CURSOR.
- To stop, release both CURSORS together.

*Example:*

*To increase a parameter value quickly, first press key 8 - CURSOR UP.  
Then, without releasing key 8, also press key 0.*

## 2. THE DISPLAY

The Prologue is fitted with a 15 character LED display. This provides information about the unit's status, and also allows the user to control all aspects of its performance.

The display uses 7-segment technology which, unlike LCD screens, is unable to produce all the alphanumeric characters. A character table is provided in appendix 1.

## PROCESSOR OVERVIEW

The Prologue is an advanced MIDI to CV interface. It features four independent MIDI to CV converters making it possible to translate signals on four MIDI channels and assign these to any of the eight CV or GATE outputs.

Each of the four processors constantly monitors its assigned MIDI channel, and updates its internal registers with values corresponding to the following MIDI data:

- key pitch
- pitch-bend amount
- channel pressure amount (after-touch)
- any other controller
- clock sync
- stop / start
- gates
- internal ADSR1 envelope generator
- internal ADSR2 envelope generator
- internal LFO

The assignment of the 16 CV & GATE outputs is preset at the factory, but may be re-mapped by the user.

### Output Description

Each of the output sockets is labelled as either a CV or a GATE. However, these terms are only used to distinguish between the types of output, and should not be taken literally:

- A CV output is described more correctly as a *continuous* source of control voltage, offering any value between its maximum and minimum.  
  
It is appropriate to map pitch information and any continuous MIDI controllers to these outputs.
- A GATE is described more correctly as a *switch* or *ON/OFF* voltage, offering only its extremes of 0V and +5V (approx).  
  
It is appropriate to map clock signals and MIDI 'state' data to the GATES.

## QUICK TOUR

If you are impatient to hear some immediate results using your Prologue the following instructions should have you up and running within a few minutes. However, these brief instructions will NOT work with Moog or other S-TRIG synthesisers for which additional setting-up is required.

1. **READ THE SAFETY INSTRUCTIONS.**
2. Connect the Prologue to the mains supply.
3. Connect the MIDI OUT from your keyboard or sequencer to the MIDI IN of the Prologue.
4. Connect CV1 to your analogue synthesiser's CV IN socket.
5. Connect GATE1 to your analogue synthesiser's GATE IN socket.
6. Set your MIDI synthesiser or sequencer to transmit on MIDI Channel 2.
7. Play and have fun!



# **CHAPTER 2**

## **MIDI to CV**

# THE MIDI to CV MENUS

All aspects of the Prologue's operation are controlled via five master menus. Four of these offer extensive sub-menus, so the full set of controls may be considered as a two-dimensional array.

When first powering-up the Prologue the screen will show:

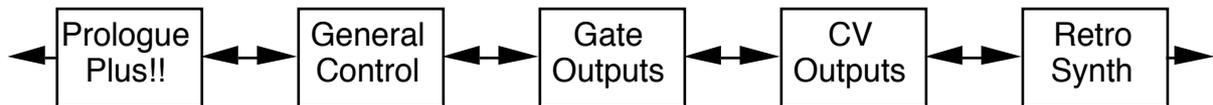
## PrOLOGUE or PrOLOGUE PLUS!!

Pressing CURSOR LEFT (Key 7) or CURSOR RIGHT (Key 9) will access the other four Master Menu headings.

*Note: This manual describes the full set of commands available to owners of the Prologue Plus, so its menu names will be used.*

## MASTER MENUS

There are five master menu headings. Movement between them is accomplished using CURSOR LEFT (Key 7) and CURSOR RIGHT (Key 9).



The sub-menu options contained within each master menu are described in the following pages.

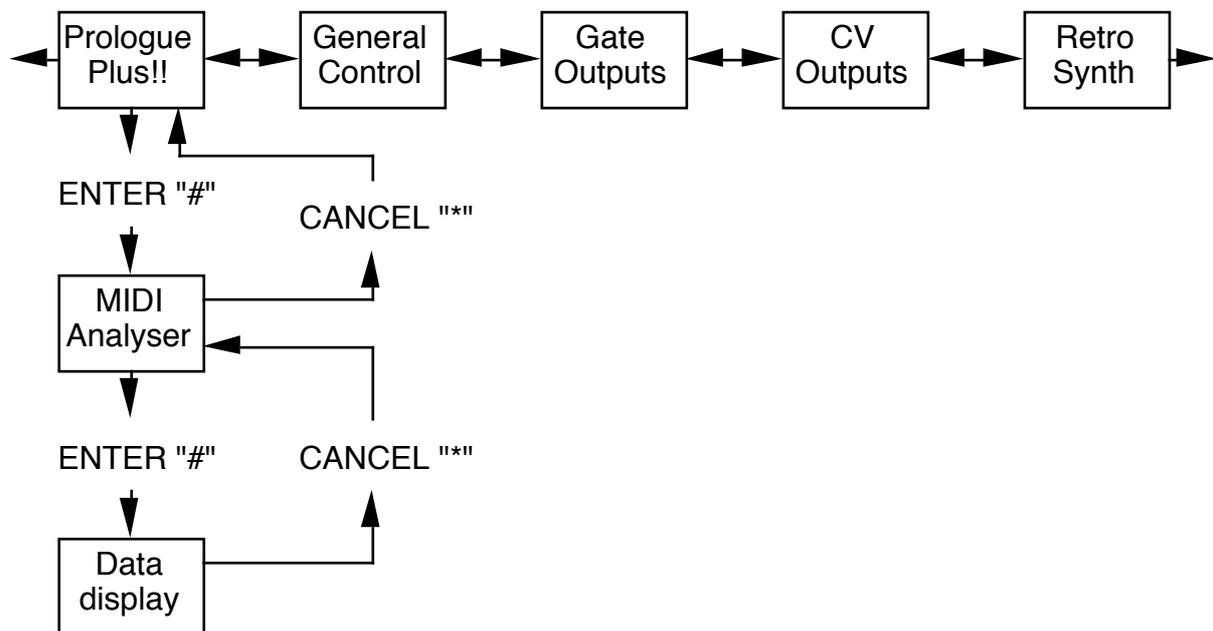
## PARAMETER MEMORY

You will sometimes notice a delay when leaving a Prologue menu. This occurs because the unit always stores new settings within its internal memory. This removes the time-consuming need to re-program the Prologue every time you wish to use it.

To re-initialise with the factory settings, press CANCEL “\*” when you next switch the unit on.

## PROLOGUE PLUS!! MENUS

### MIDI ANALYSER

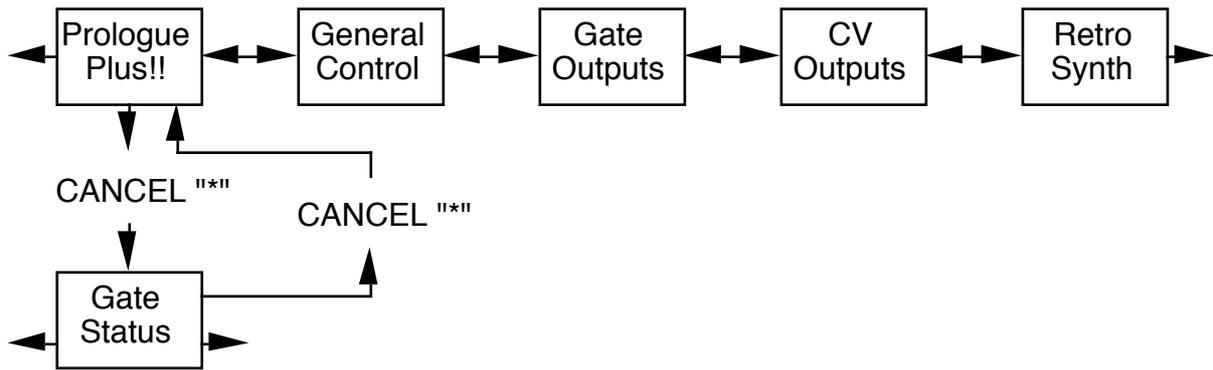


The MIDI Analyser offers a line of 14 hex characters.

- The first two (left-most) characters indicate the current status byte.  
The status indicator will flash if a status byte is not present in the MIDI data stream.
- The following 12 characters display the latest six MIDI words, each of two hexadecimal characters. To assist legibility the first character of each word will have a dot within it.  
The most recent (current) status byte will be flashing.

*Note: Running status is employed by many MIDI transmitters. If the Prologue is connected to such a device the current status byte will not be visible. In this case the left-most word will flash.*

## GATE STATUS



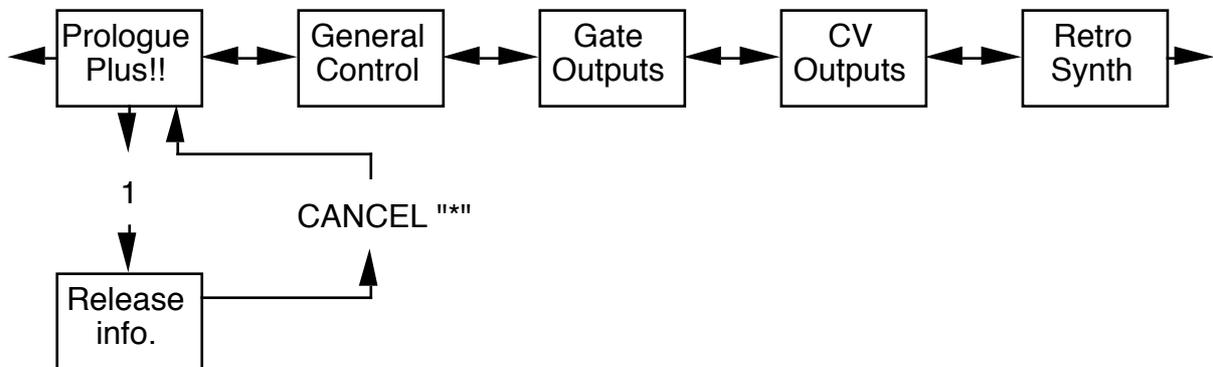
Gate status is shown by the dots in the last eight characters of the LED display.

- Active (NOTE ON) gates are shown by dots ON.
- Passive (NOTE OFF) gates are shown by dots OFF.

In the case of inverse gate outputs this convention is reversed.

*Note: The Gates Display menu is logically equivalent to the "Prologue Plus!!" menu header within the overall menu structure, and it is possible to access other menu items as if you were showing "Prologue Plus!!" in the LED screen.*

## RELEASE INFORMATION



- The software version of your unit will be displayed as:
- The software date will be displayed as:

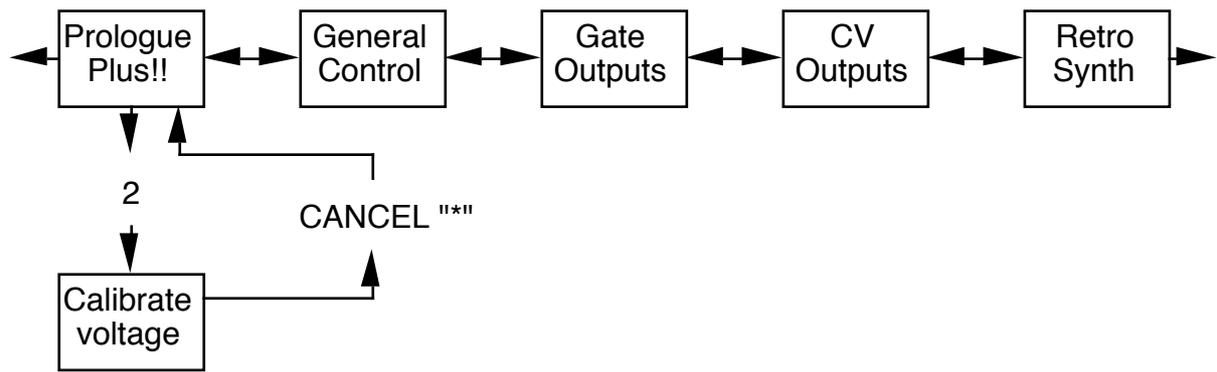
where

**rel. x.xx**

**YYMMDD**

YY = the year  
MM = the month  
DD = the day

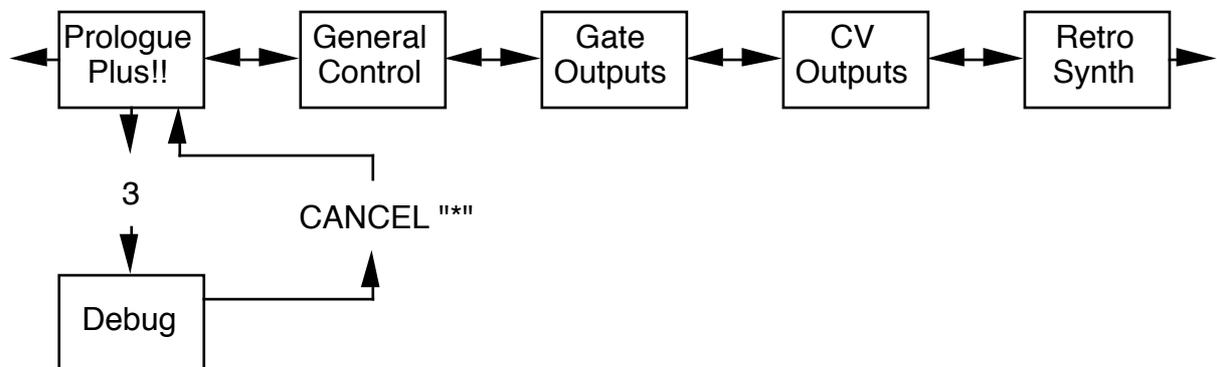
## CALIBRATE VOLTAGE



The CV and GATE voltages of your Prologue have been factory-calibrated for optimum performance. This menu item will allow qualified service engineers to re-calibrate the unit should this ever be required.

Although this option is not disabled, please do not attempt to adjust your Prologue.

## DEBUG

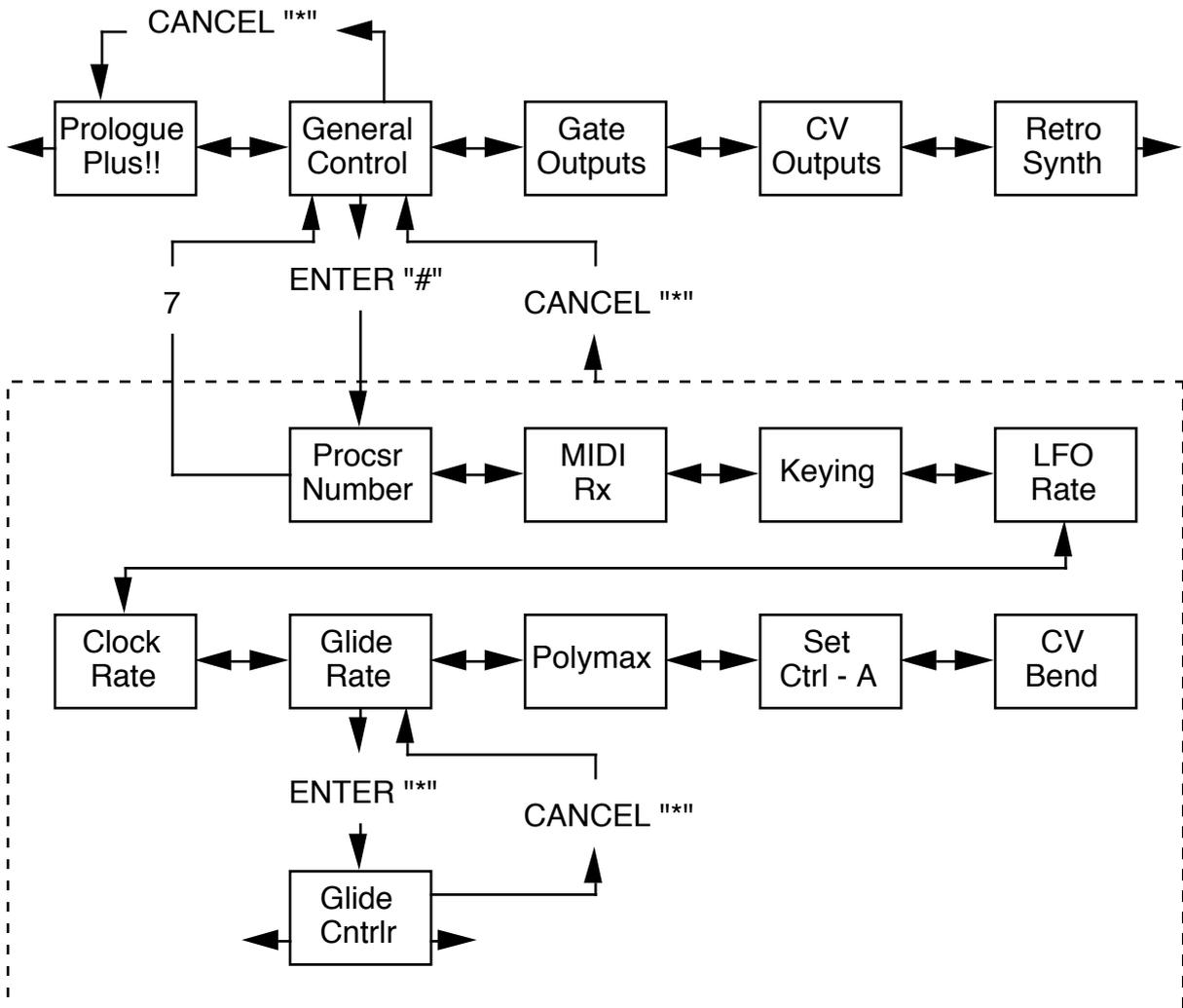


The Prologue has a "debug" mode used for factory calibration and error detection. This mode is disabled on your unit.

## GENERAL CONTROL

There are nine sub-menus and one sub-sub-menu within the General Control menu. These are accessed by pressing ENTER "#" and then scrolling left and right using the CURSOR LEFT "7" and CURSOR RIGHT "9" keys. You may exit to the master menu at any time by pressing CANCEL "\*".

Parameter values are increased and decreased by pressing the CURSOR UP "8" and CURSOR DOWN "0" keys respectively.



## Processor Number

Range = 01 to 06

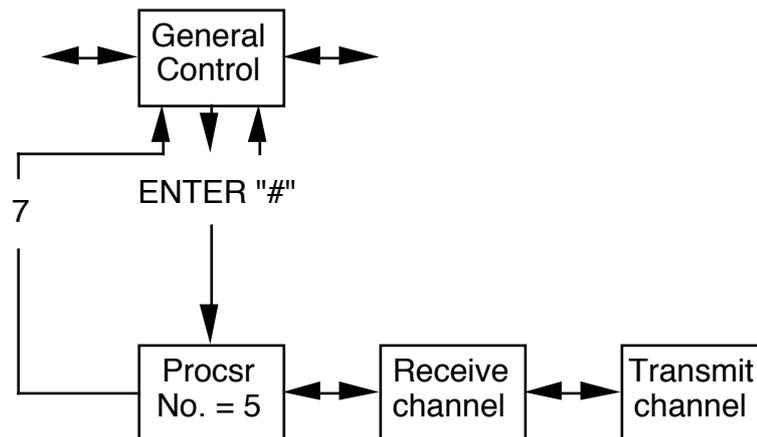
This selects the processor which will be affected by all subsequent operations within the General Commands menu.

- Processor = 1, 2, 3 or 4

These values select the processor to which subsequent changes will be applied.

- Processor = 5

This is the MIDI "Channeliser" and enables you to re-transmit on the channel of your choice (channel 'm') any MIDI received on a single given channel (channel 'n').



Receive channel = n  
Transmit channel = m

This option removes all MIDI information received on any channels other than the selected channel 'n'. This is particularly useful when used in conjunction with early MIDI synths that lacked OMNI OFF. Examples of these are the Roland JX-3P and the Sequential Circuits Prophet 600.

- Processor = 6

This value is disabled and has no effect.

Power-up default = 1.

## Receive (MIDI Receive)

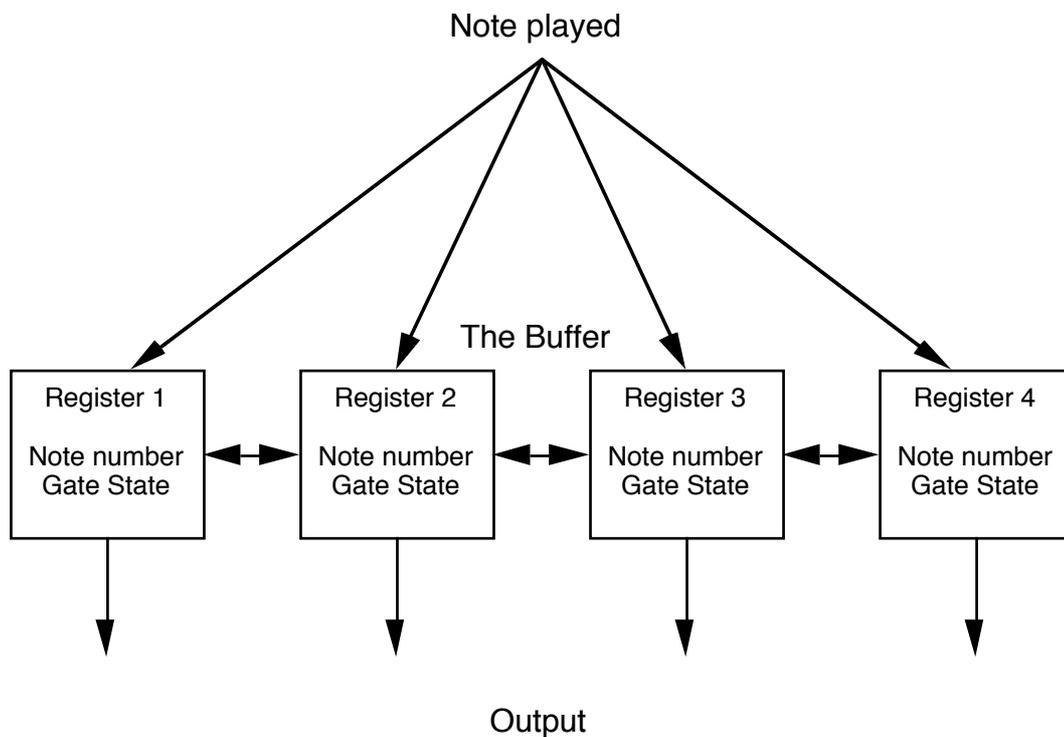
Range = 01 to 16, OMNI

This selects the MIDI channel to which the selected processor will respond.

Power-up default = 1.

## Keying

The Prologue has four MIDI/CV processors. Each recognises up to four notes, and stores the note information in the four registers which make up its buffer. This information takes the form of which notes are being played, and the state of each note's gate. The 'keying' option determines the note priorities and the allocation of notes within the buffer.



There are five Keying modes and these are applied globally to all processors:

- **Lo Priority**                      The lowest note played has priority over all others.

The buffer is filled with registers 1 to 4 arranged LOW to HIGH.

If fewer than four notes are played any remaining registers are filled with the highest note played but with the gate set OFF.
- **Hi Priority**                      The highest note played has priority over all others.

The buffer is filled with registers 1 to 4 arranged HIGH to LOW.

If fewer than four notes are played any remaining registers are filled with the lowest note played but with the gate set OFF.

*Note: This mode is recommended for use with monophonic synthesisers, although it may also be used for multi-oscillator synths to replicate the pseudo-polyphonic style of instruments such as the ARP Odyssey.*
- **Last rotate**                      The most recent note played has priority over all others.

Each NOTE ON will be allocated sequentially to the next register whether that register is empty or not.
- **Last static**                      The most recent note played has priority over all others.

As each NOTE ON is received it is allocated to the register which has been most recently vacated. When all four registers are full the next NOTE ON will cause the oldest to be overwritten.

Pressing one key repeatedly will cause the same register to be allocated.

- **First static**                      The first note played has priority over all others.

As each NOTE ON is received it is allocated to the lowest register available, so the buffer is filled from register 1 to register 4 as each note is played. When a NOTE OFF is received the GATE will be turned OFF, but the CV is retained.

*Note: This mode is also suitable for use with monophonic synthesizers.*

Power-up default = Hi Priority.

### LFO Rate

**Range = 0000 to 3000 (hex)**

This selects the oscillator rate of the Prologue's internal LFO.

- A rate of 0000 (hex) represents 0Hz.
- A rate of 3000 (hex) represents approximately 30Hz.

Power-up default = 0030 (hex).

### Clock Rate

**Range = 01 to 04 (processor number)  
1 to 96 ppqn (value)**

- Processor

The Prologue derives four clocks from an incoming MIDI signal. The clocks (termed 1, 2, 3 & 4) are directly associated with processors 1, 2, 3 & 4 and may be mapped to any of the outputs.

To set a clock rate for a processor first select that processor by pressing 1, 2, 3 or 4 on the keypad.

- Clock

Each clock may take one of nine values, described as xx ppqn (pulses per quarter note). Permitted values are:

1, 2, 3, 4, 6, 8, 12, 16, 24, 32, 48, 96 ppqn

Power-up default = 01, 96ppqn

### Glide Rate

**Range = Clock, OFF, 01 to 199**

This selects the glide rate for all the notes derived by a given processor.

The glide is implemented as a semi-tonal glissando which, at high rates, is indistinguishable from an unquantised portamento.

- Clock:                      The glissando is stepped at the rate derived by Clock 1.
- OFF                         There is no glide effect
- Rate = 01                 10mS.
- Rate = 199                10S.

Power-up default = OFF.

### Glide Controller

**Range = OFF, 00 to 127**

Glide ON/OFF may be derived from any MIDI controller (0 to 127).

If the value of the selected controller is less than 64, Glide is OFF.

If the value of the selected controller is equal to or greater than 64, Glide is ON.

Power-up default controller = 00.

**Polymax****Range = 4, 8, 16**

The value of POLYMAX determines the number of voices handled by a given processor.

- 4 The unit acts as four 4-voice MIDI/CV converters with each group of registers operating independently.
- 8 Provided that processors 1 and 2 are set to the same MIDI channel, and processors 3 and 4 are likewise set to the same channel (but different to that chosen for 1 & 2) the note-buffer registers of processors 1 and 2 are concatenated, as are those of processors 3 and 4. In this case the unit acts as two 8-voice MIDI/CV converters.
- 16 All four note-buffers are concatenated to form a single 16-note register bank, and the Prologue acts as a single 16-voice MIDI/CV converter.  
  
This mode may be used at any time, although it will be necessary to link two Prologues via MIDI THRU and MIDI IN if all 16 CVs are required simultaneously.

Power-up default = 04.

**Set Controller****Controller = A, B, C, D**  
**Range = OFF, 00 to 127**

Select controller A to D by pressing numbers 1 to 4 respectively. Then use CURSOR UP and/or CURSOR DOWN to allocate a MIDI controller number to the selected controller.

Power-up default = 00.

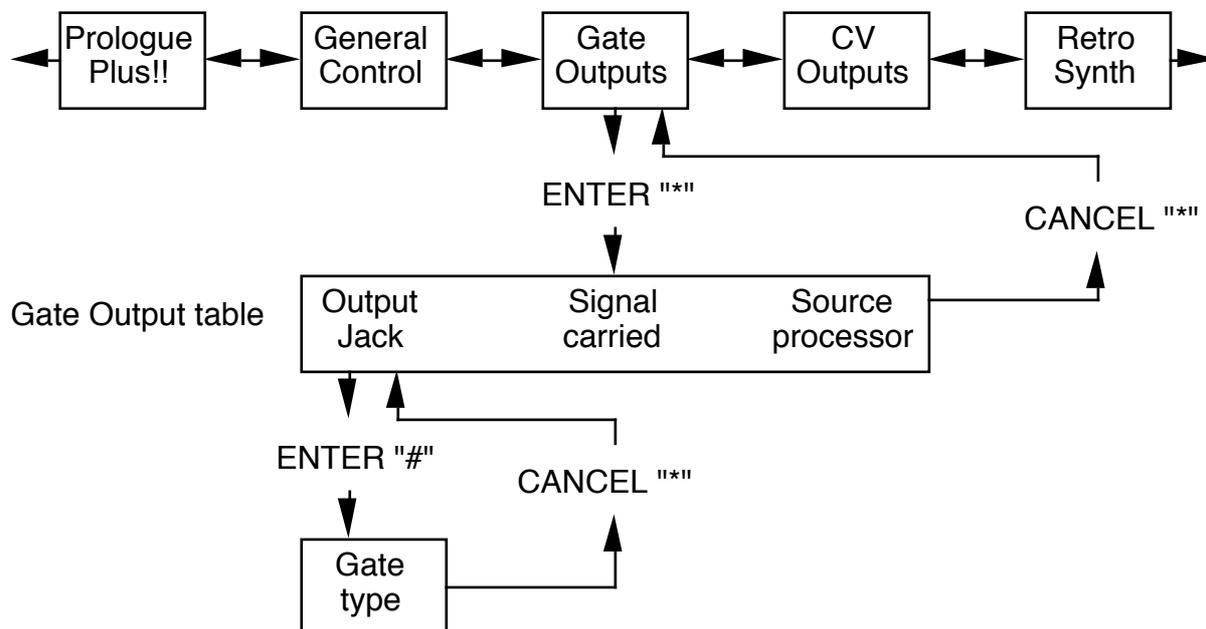
**CV Bend****Range = 00 to 12**

This parameter sets the Bend range from 'zero' to one octave in semitone increments.

Power-up default = 12.

## GATE OUTPUTS

There are two tables within the GATE OUTPUTS menu, the GATE OUTPUT TABLE and the GATE TYPE TABLE. These are accessed by pressing ENTER "#".



### Gate Output Table

There are three columns in the Gate Output table, and these may be accessed by scrolling left and right using the CURSOR LEFT "7" and CURSOR RIGHT "9" keys. You may exit to the master menu at any time by pressing CANCEL "\*"".

Parameter values are increased and decreased by pressing the CURSOR UP "8" and CURSOR DOWN "0" keys respectively. At any given time, the flashing parameter is the one that will be altered.

### Gate Type Table

Press ENTER "#" to select the GATE TYPE menu. There are four options available for each output GATE:

- GATE                      A standard +5V gate is output  
NOTE OFF/ON = LOW/HIGH
- INVERSE GATE            The polarity is inverted for use with S-TRIG devices  
NOTE OFF/ON = HIGH/LOW
- PULSE                     A +5V TRIGGER is output  
NOTE ON transition = output pulse HIGH
- INVERSE PULSE          The polarity is inverted for use with S-TRIG devices  
NOTE ON transition = output pulse LOW

*Note: A GATE remains open from the reception of an appropriate MIDI NOTE ON message until a MIDI NOTE OFF or MIDI NOTE ON (VEL = 00) message is received. A TRIGGER is a brief pulse which is output at the instant of the NOTE ON but not sustained.*

The Gate Output Table options are:

Output GATE Jack (Destination)	Signal Carried	Processor
1	GATE1	01
2	GATE2	02
3	GATE3	03
4	GATE4	04
5	MULTI-TRIGGER	
6	Clock (Proc1)	
7	Clock (Proc2)	
8	Clock (Proc3)	
	Clock (Proc4)	
	Run-Stop	
	MIDI Controller A	
	MIDI Controller B	
	MIDI Controller C	
	MIDI Controller D	

With the exception of the Clocks, any option in each of the three columns may be used with any of the options in the other two columns.

## DIN-SYNC24

The MIDI OUT may be used to provide DIN-Sync24. (Refer to the diagram in the appendices.) The internal connections are "hard-wired" as follows:

PIN1:	Always carries the same signal as the Gate7 output
PIN3:	Always carries the same signal as the Gate6 output

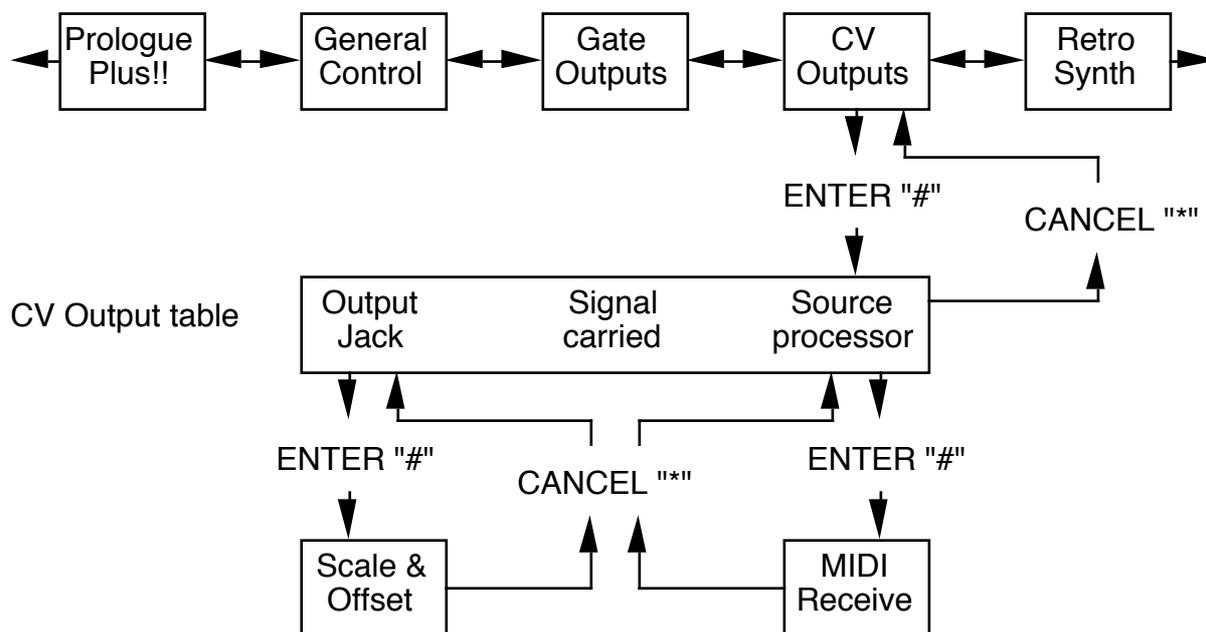
Gates 6&7 can, of course, be freely re-mapped, but the default settings are:

Gate7 / PIN1:	Stop/Start
Gate6 / PIN3:	Clock

Because the data pins are completely independent, DIN-Sync24 and MIDI OUT will operate simultaneously. However, it will be necessary to make a "splitter cable" to direct the signals to their appropriate destinations.

## CV OUTPUTS

There are three tables within the CV OUTPUTS menu. These are accessed by pressing ENTER "#".



### Control Voltage Output Table

There are three columns in the main CV Output table, and these may be accessed by scrolling left and right using the CURSOR LEFT "7" and CURSOR RIGHT "9" keys. You may exit to the master menu at any time by pressing CANCEL "\*".

Parameter values are increased and decreased by pressing the CURSOR UP "8" and CURSOR DOWN "0" keys respectively. At any given time, the flashing parameter is the one that will be altered.

### Linear/Log Control Voltages

The CVs may be set to obey either a "Volt per Octave" (Linear) or "Volt per Hertz" (Logarithmic) relationship, thus making the Prologue suited for connection to all makes of synthesiser.

### Scale and Offset

When the "Output jack" (Destination) option is flashing, you may press ENTER "#" to select the Scale & Offset sub-menu. There are two options available:

- LOG OFFSET                      If the output is set to carry a logarithmic control voltage, an offset may be introduced in order to accommodate the slight discrepancies between synthesisers.
- SCALE OFFSET                    If the output is set to carry a linear control voltage, an offset of  $\pm 12$  Volts may be introduced by pressing CURSOR UP "8" and/or CURSOR DOWN "0".

The output may also be scaled by pressing CURSOR RIGHT "9" (stretch scale) and/or CURSOR LEFT "7" (compress scale).

*Note: There is no indication in the Scale and Offset windows that any action has been performed. All such adjustments must be made by monitoring the response from the synthesiser connected to the appropriate CV output..*

**MIDI Receive****Range = OMNI, 01 to 16**

When "Processor" option is flashing, you may press ENTER "#" to select the MIDI Receive menu.  
 This menu duplicates the action of the MIDI Receive menu found in the General Controls.

**The CV Output Table options are:**

	<b>Output Jack (Destination)</b>	<b>Signal Carried</b>	<b>Processor</b>
	01	Linear CV1	01
02	Linear CV2	02	
	03	Linear CV3	03
	04	Linear CV4	04
	05	Log CV1	
	06	Log CV2	
	07	Log CV3	
	08	Log CV4	
		Bend	
		Modulation	
		After-touch	
		Velocity	
		LFO	
		Envelope1 (Processors 1&3 only)	
		Envelope2 (Processors 2&4 only)	
		MIDI Controller A	
		MIDI Controller B	
		MIDI Controller C	
		MIDI Controller D	
		GATE1	
		GATE2	
		GATE3	
		GATE4	
		Clock (Proc1)	
		Clock (Proc2)	
		Clock (Proc3)	
		Clock (Proc4)	
		Run-Stop	

With the exception of the Clocks and Envelopes, any option in each of the three columns may be used with any of the options in the other two columns.

## INSTALLATION IDEAS

There's no room to do more than scratch the surface in this manual (any more than a synthesiser manual can describe all the possible combinations of the sound creation parameters it offers), but here are some basic ideas of what is possible using the Prologue in conjunction with a single source of MIDI and one or more analogue synthesisers such as an ARP2600. Remember... an open mind and some free experimentation can yield startling results.

### 1. SIMPLE CONNECTION TO AN ANALOGUE SYNTHESISER

In this example a digital synthesiser is used to control an analogue monosynth equipped with CV & Gate interfaces. The pitch of the mono-synth, and the duration of note produced by it, is controlled directly by your playing on the digital synth.

This is the set-up described in the QUICK TOUR.

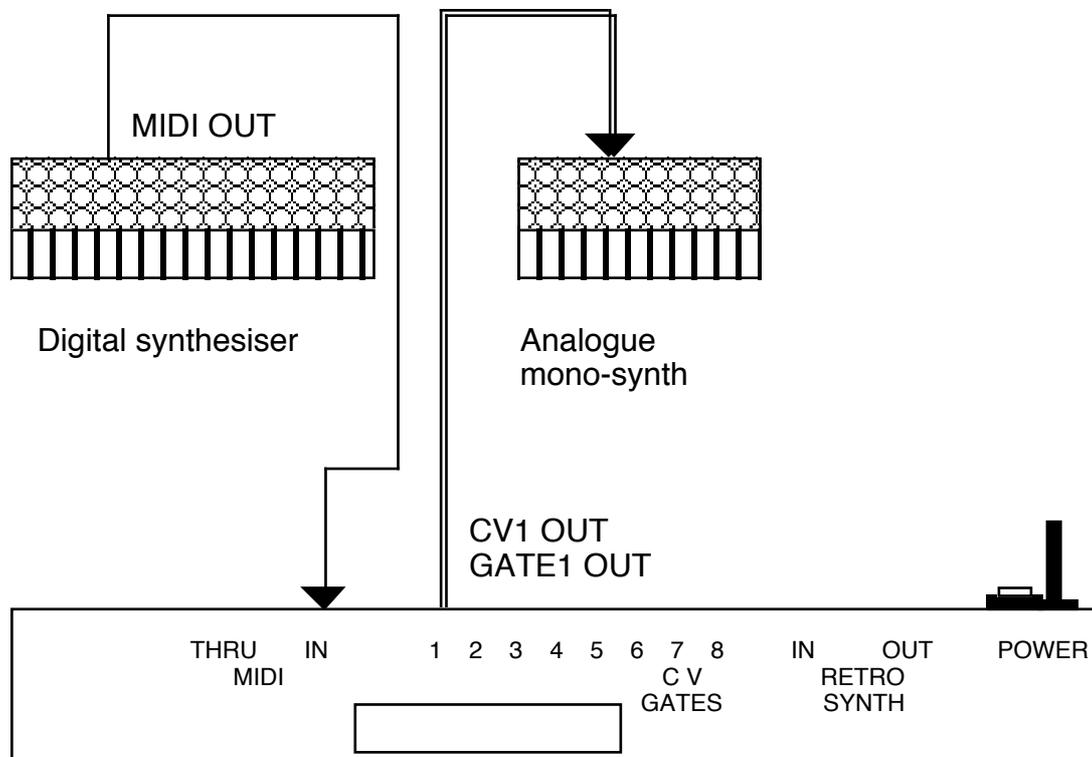


Figure 4 - Controlling a single analogue mono-synth with the Prologue

Connect the MIDI OUT of the digital synthesiser to the MIDI IN of the Prologue.  
Connect the CV1 of Prologue to the CV IN of the mono-synth.  
Connect the GATE1 of Prologue to the GATE IN of the mono-synth.

## 2. CONNECTION TO A MODULAR OR POLYPHONIC ANALOGUE SYSTEM

This example works perfectly with an ARP2600, but will work equally well with any modular or polyphonic synth having multiple independent oscillators and multiple CV inputs.

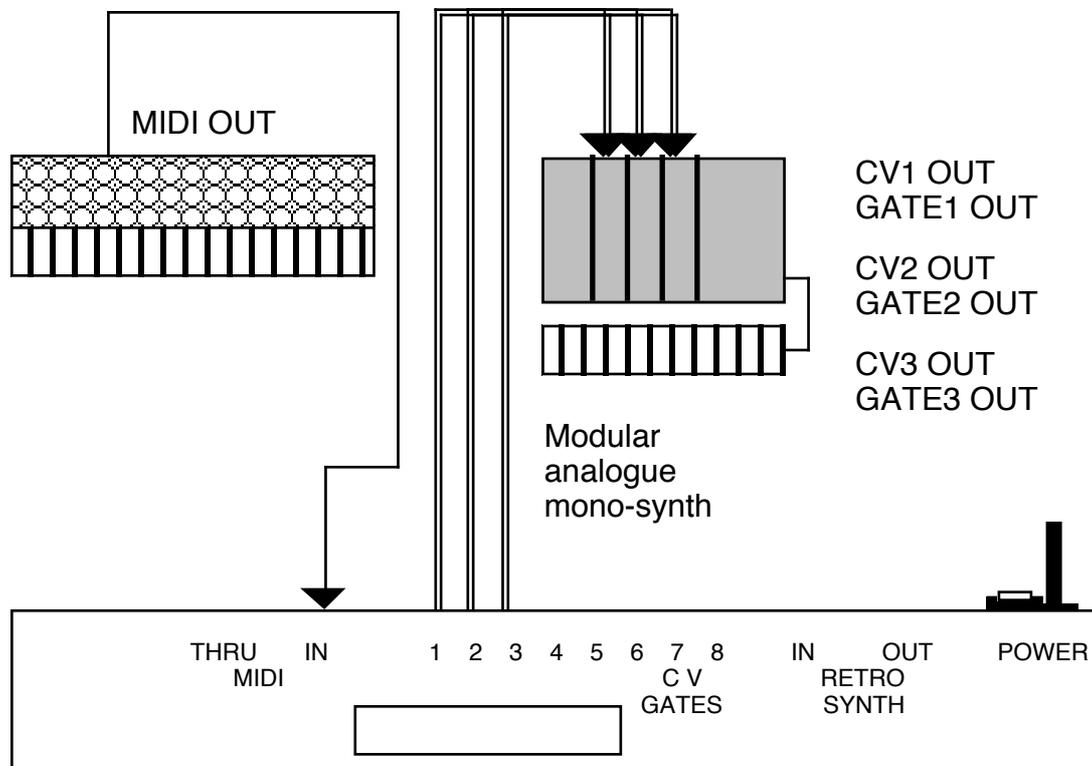


Figure 5 - The Prologue connected to a modular analogue synthesiser

Connect the MIDI OUT of the digital synth to the MIDI IN of the Prologue.  
Connect the Prologue's CV1 output to the CV input for oscillator 1  
Connect the Prologue's CV2 output to the CV input for oscillator 2  
Connect the Prologue's CV3 output to the CV input for oscillator 3  
Connect the Prologue's GATE1 output to the GATE input on the synth

*And, if independent gates are available for each oscillator...*

Connect the Prologue's GATE2 output to the GATE2 input on the synth  
Connect the Prologue's GATE3 output to the GATE3 input on the synth

With appropriate MIDI assignments defined within the Prologue, it will now be possible to play the analogue synthesiser polyphonically. The Prologue will also allow you to route MIDI controllers to additional CV outputs so that, for example, after-touch can be routed to the analogue synth's LFOs for vibrato or other effects.

Don't forget... CVs and Gates can control many aspects of a modular analogue synthesiser's operation, including but not limited to: pitch control, filter frequency modulation, and envelope modulation.

### 3. CONNECTION TO MULTIPLE ANALOGUE MONO-SYNTHS

This example works shows how multiple synthesisers can be linked to a MIDI sequencer for complex multi-track sequencing.

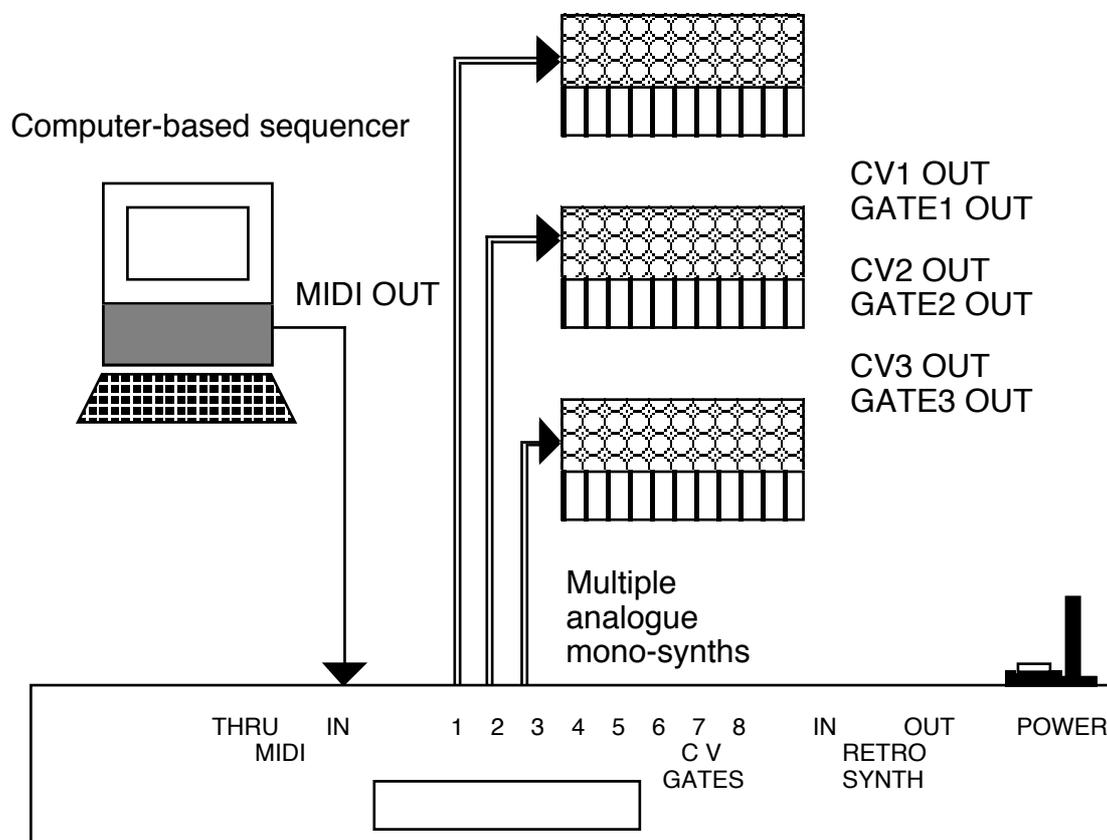


Figure 6 - The Prologue connected to a number of analogue synthesisers

- Connect the MIDI OUT of the sequencer to the MIDI IN of the Prologue.
- Connect the Prologue's CV1 output to the CV input for synthesiser 1
- Connect the Prologue's GATE1 output to the GATE input on synthesiser 1
- Connect the Prologue's CV2 output to the CV input for synthesiser 2
- Connect the Prologue's GATE2 output to the GATE input on synthesiser 2
- Connect the Prologue's CV3 output to the CV input for synthesiser 3
- Connect the Prologue's GATE3 output to the GATE input on synthesiser 3

With appropriate MIDI assignments defined within the Prologue, it will now be possible to sequence each analogue synthesiser independently. As before, the Prologue will also allow you to route MIDI controllers to additional CV outputs so that, for example, after-touch can be routed to each analogue synth's LFOs for vibrato or other effects.



# **CHAPTER 3**

## **RETRO-SYNTH**

**(Prologue Plus only)**

## RETRO-SYNTH

The Prologue Plus was designed not only as a MIDI to CV converter, but as a means to inject the life and vibrancy of analogue synthesisers into any audio signal passed through the unit.

Retro-Synth, which is in essence a monophonic synthesiser without an oscillator, fulfils this aim by passing audio through a 24dB/Oct analogue filter. However, unlike a 'filter-bank', Retro-Synth is resonant, responds to velocity and after-touch, and provides two ADSR envelopes triggered by MIDI. Envelope 1 is a dedicated 4-stage ADSR filter envelope, while Envelope 2 is a dedicated 4-stage ADSR amplitude envelope.

You supply the sound - say, from a somewhat dry or 'soulless' digital synth - and Retro Synth will do the rest. The result is just like having a Moog- or ARP-style filter within your digital synthesiser.

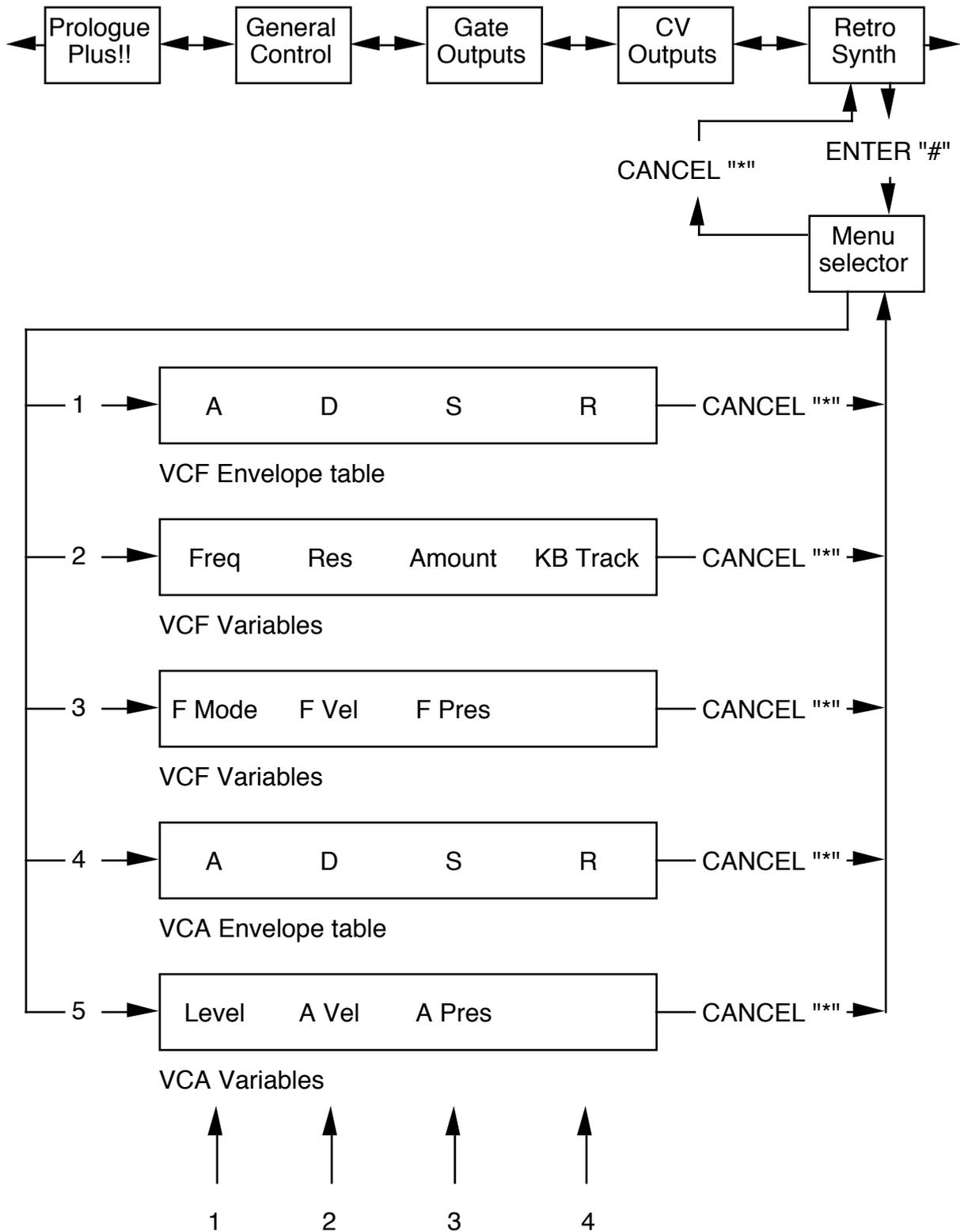
These features are accessed using the fifth of the Prologue Plus's master menus: Retro-Synth.

- With master menu item "Retro-Synth" selected, press ENTER "#" to access the sub-menu selector.
- To select the desired sub-menu press one of the numeric keys 1 to 5.
- To select a parameter within a sub-menu press one of the numeric keys 1 to 4.
- To increase or decrease a parameter's value press CURSOR UP "8" or CURSOR DOWN "0" respectively.

## CONTROLLING RETRO-SYNTH VIA MIDI

Once a parameter is selected, the MIDI controller routed to CONTROLLER-A may be used to change its value. However, to protect against 'noisy' controllers, the controller value must pass the existing parameter value before editing will occur.

Editing by MIDI controller is often quicker than using the CURSOR buttons to scroll through values.



## FILTER ENVELOPE (MENU 1):

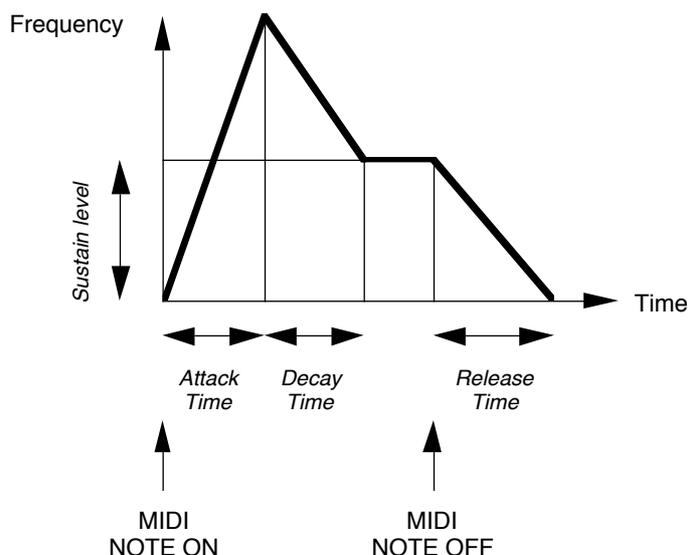


Figure 7 - The ADSR Filter Envelope

### **A**      **Attack Time**      **Range = 00 to 199**

The filter envelope enters the attack phase at the moment that a MIDI NOTE ON is received by Retro-Synth.

- Attack = 0                      10mS
- Attack = 199                    10S

### **D**      **Decay Time**      **Range = 00 to 199**

The filter envelope enters the decay phase once the attack phase is completed.

- Decay = 0                        10mS
- Decay = 199                    10S

### **S**      **Sustain Level**      **Range = 00 to 199**

The filter envelope reaches the sustain level once the decay phase is completed. This level is maintained until a MIDI NOTE OFF or MIDI NOTE ON (VEL = 00) is received by Retro-Synth.

- Sustain = 0                      The filter is closed\* (lowest freq)
- Decay = 199                    The filter is fully opened\* (highest freq)

*Note:*    The filter frequency is determined by a combination of the envelope settings, the amount, and the velocity and after-touch settings.

### **R**      **Release Time**      **Range = 00 to 199**

The filter envelope enters the release phase immediately a MIDI NOTE OFF or MIDI NOTE ON (VEL = 00) is received.

- Release = 0                      10mS
- Release = 199                    10S

## FILTER VARIABLES (MENU 2):

### **Freq**      **Filter Cut-off Frequency**      **Range = 00 to 199**

The initial cut-off frequency is determined by FREQ. However, the actual value of the cut-off frequency will be modified by combinations of AMOUNT, the filter envelope, filter velocity sensitivity and filter pressure sensitivity.

- Freq = 0                      The initial cut-off frequency = 0Hz
- Freq = 199                    The initial cut-off frequency = 15 kHz

**Res                      Filter Resonance                      Range = 00 to 199**

The Prologue filter is fully resonant.

- Res = 0                      No filter resonance
- Res = 199                    The filter self-oscillates\*

*Note:    Depending upon the "MODE" the filter self-oscillates from approximately 170 upwards.*

**Amount                      Envelope Amount                      Range = 00 to 199**

The amount of filter envelope applied to the initial filter frequency may be varied.

- Amount = 0                    The envelope is not applied
- Amount = 199                The envelope is fully applied to the filter

**KBTrack                      Filter Keyboard Tracking                      Range = 00 to 01**

The filter frequency may be independent of, or track the keyboard pitch. The tracking relationship is approximately 1:1.

- KBTrack = 0                    The filter frequency is independent of pitch
- KBTrack = 1                    The filter frequency tracks the pitch

## FILTER VARIABLES (MENU 3):

**F Mode**                      **Filter Mode**    **Range = 00 to 13**

There are 14 filter modes, each with its own character and sonic identity. The descriptions below are approximate, and subject to change. However, the essential character of each mode will be retained.

- **Mode = 00**                      **BP1**    **Band-pass filter 1**  
The 'Q' of the filter is defined such that a wide range of frequencies is passed.
- **Mode = 01**                      **BP2**    **Band-pass filter 2**  
The 'Q' of the filter is defined such that a medium range of frequencies is passed.
- **Mode = 02**                      **BP3**    **Band-pass filter 3**  
The 'Q' of the filter is defined such that a narrow range of frequencies is passed.
- **Mode = 03**                      **HP+L 1**    **High-pass filter 1 with low emphasis**  
This is a resonant 12dB/octave high-pass filter with a low-frequency EQ boost.
- **Mode = 04**                      **HP+L 2**    **High-pass filter 2 with low emphasis**  
This is a resonant 18dB/octave high-pass filter with a low-frequency EQ boost.
- **Mode = 05**                      **HP+L 3**    **High-pass filter 3 with low emphasis**  
This is a resonant 24dB/octave high-pass filter with a low-frequency EQ boost.
- **Mode = 06**                      **LP1**    **Low-pass filter 1 with no emphasis**  
This is a 12dB/octave low-pass filter with no EQ applied.
- **Mode = 07**                      **LP2**    **Low-pass filter 2 with no emphasis**  
This is a 24dB/octave low-pass filter with no EQ applied.
- **Mode = 08**                      **LP-L 1**    **Low-pass filter 1 with low roll-off**  
This is a 12dB/octave low-pass filter with a low-frequency roll-off.
- **Mode = 09**                      **LP-L 2**    **Low-pass filter 2 with low roll-off**  
This is a 24dB/octave low-pass filter with a low-frequency roll-off.
- **Mode = 10**                      **LP+L 1**    **Low-pass filter 1 with low emphasis**  
This is a resonant 12dB/octave low-pass filter with a low-frequency EQ boost.
- **Mode = 11**                      **LP+L 2**    **Low-pass filter 2 with low emphasis**  
This is a resonant 24dB/octave low-pass filter with a low-frequency EQ boost.
- **Mode = 12**                      **NOTCH-LP 1**    **Notch filter 1 with low roll-off**  
The 'Q' of the filter is defined such that a medium range of frequencies is rejected. There is a low-frequency roll-off.
- **Mode = 13**                      **NOTCH-LP 2**    **Notch filter 2 with low roll-off**  
The 'Q' of the filter is defined such that a narrow range of frequencies is rejected. There is a low-frequency roll-off.

**F Vel**                      **Filter Velocity Sensitivity**    **Range = 00 to 199**

The Prologue filter may respond to the velocity information carried within a MIDI signal. The degree to which it responds is determined by the F Vel value.

- F Vel = 0 No response to keyboard velocity
- F Vel = 199 Increasing and decreasing the keyboard velocity dramatically increases and decreases the filter frequency\*

**F Pres      Filter Pressure Sensitivity      Range = 00 to 199**

The Prologue filter may respond to the channel pressure (after-touch) information carried within a MIDI signal. The degree to which it responds is determined by the F Pres value.

- F Pres = 0 No response to channel pressure
- F Vel = 199 Increasing and decreasing the channel pressure dramatically increases and decreases the initial filter frequency\*

*Note: The filter frequency is determined by a combination of the envelope settings, the amount, and the velocity and after-touch settings.*





## INSTALLATION IDEAS

Retro-Synth is a close relative of the voltage control synthesisers of the '70s, and emulates many of the facilities and sounds of instruments such as the Roland SH-101, ARP Odyssey, and Minimoog.

The following figure gives an example of the most common way in which the Prologue can be used to modify and improve the sounds of an otherwise lacklustre synthesiser.

### BASIC RETRO-SYNTH INSTALLATION TREATING A DIGITAL SYNTHESISER

- Connect the AUDIO OUT of a digital MIDI synthesiser to the RETRO IN of your Prologue Plus.
- Connect the RETRO OUT of the Prologue Plus to the signal input of your amplifier (or to a mixing desk, effects unit, etc.)
- Connect the MIDI OUT of the synthesiser to the MIDI IN of the Prologue Plus.
- Set the parameters of Retro-Synth for the desired filter and amplitude effects.
- Play.

How it works:

The MIDI IN will trigger the Retro-Synth envelopes whenever a NOTE ON message is received, and any velocity and aftertouch information will also be interpreted and directed to the appropriate parameters. Simultaneously, the audio signal output by the synthesiser will pass through Retro-Synth and be treated by the filter and envelopes.

If the audio source is played monophonically, Retro-Synth performs all the filtering and enveloping functions of a traditional '70s mono-synth. If the audio source is played polyphonically, Retro-Synth treats the composite signal. This is equivalent to many early polyphonic synthesisers which offered multiple voices (polyphony) but only a single filter. Examples of such instruments are the Polymoog, Korg Poly800 and ARP Quadra.

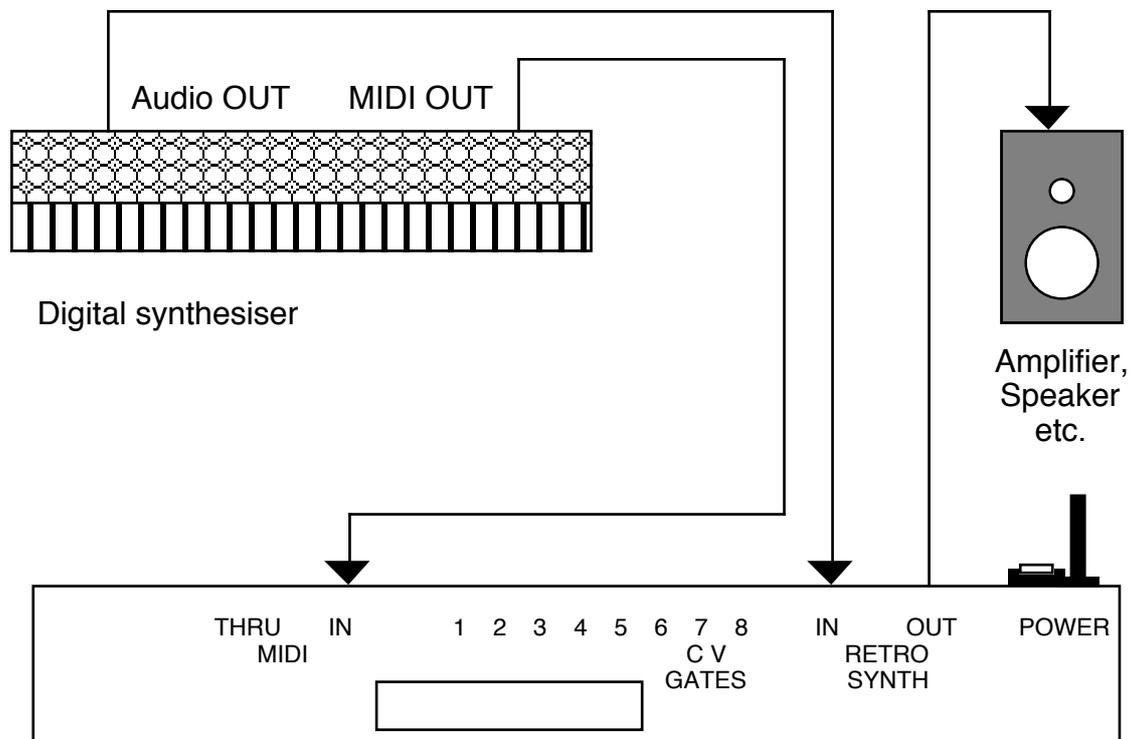


Figure 9 - The Prologue Plus used for revitalising digital sounds

# APPENDIX 1 CHARACTER LOOK-UP TABLE

Lowercase a b c d e  
Uppercase C E F  
a b c d e f

g h i k l m n o  
g h i k l m n o

p r s t u v x y  
p r s t u v x y

0 1 2 3 4 5 6 7  
0 1 2 3 4 5 6 7

8 9 !  
8 9 !

## APPENDIX 2 FACTORY DEFAULT TABLE

The Prologue is supplied with its outputs set to the following default values:

<u>Output</u>	<u>Function</u>	<u>MIDI Channel</u>
CV1	Keyboard CV	2
CV2	Keyboard CV	3
CV3	Keyboard CV	4
CV4	Keyboard CV	5
CV5	Bend	2
CV6	Modulation	2
CV7	Velocity Sensitivity	2
CV8	Internal LFO	---

<u>Output</u>	<u>Function</u>	<u>MIDI Channel</u>
GATE1	Keyboard Gate	2
GATE2	Keyboard Gate	3
GATE3	Keyboard Gate	4
GATE4	Keyboard Gate	5
GATE5	---	---
GATE6	Clock	---
GATE7	Run / Stop	---
GATE8	Keyboard Gate	2

### Notes:

- The Control Voltage outputs are trimmed to 1Volt/Oct.
- Gates will drive (nominally) 0V - 5V inputs.

# APPENDIX 3 MIDI PROTOCOL

In these tables the following conventions apply:

c	=	Channel Number	0	to	15
hh	=	High byte	0	to	127
kk	=	Key number	0	to	127
ll	=	Low byte	0	to	127
nn	=	Controller number	0	to	127
pp	=	Program number	0	to	127
vv	=	Value	0	to	127

## MIDI PROTOCOL

Note OFF	8c-kk-vv
Note ON	9c-kk-vv
Poly Pressure	Ac-kk-vv
Controller	Bc-kk-vv
Program Change	Cc-pp
Channel Pressure	Dc-vv
Pitch Bend	Ec-ll-hh
System	F?-??-??

## SYSTEM EXCLUSIVE

F0 \_ \_ \_ \_ \_

## SYSTEM COMMON

F1 _	MTC 1/4 frame
F2	Song position pointer
F3 _ _	Song select
F4 _	<i>Undefined</i>
F5	<i>Undefined</i>
F6	Tune Request
F7	EOX

## SYSTEM REAL-TIME

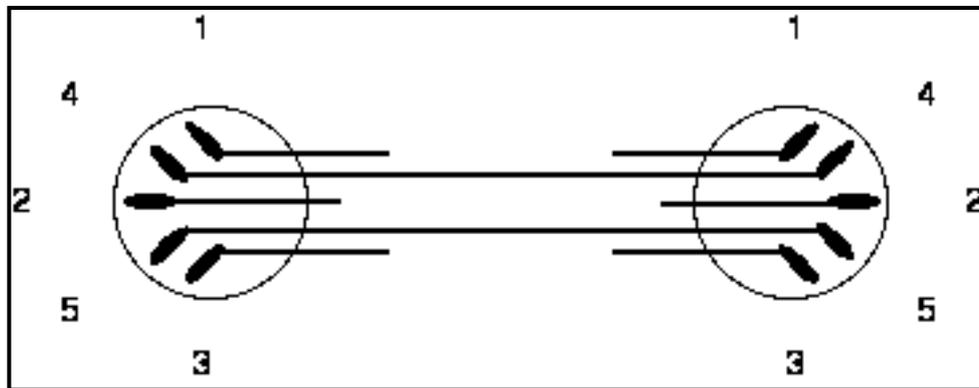
F8	Clock
F9	<i>Undefined</i>
FA	Start
FB	Continue
FC	Stop
FD	<i>Undefined</i>
FE	Active sensing
FF	System reset

## CONTROLLER NUMBERS

Hex	Controller
00	<i>Undefined</i>
01	Modulation wheel
02	Breath Controller
03	<i>Undefined</i>
04	Foot Controller
05	Portamento time
06	Data entry - MSB
07	Main volume
08	Balance
09	<i>Undefined</i>
0A	Pan
0B	Expression
0C to 0F	<i>Undefined</i>
10 to 13	General purpose 1 to 4
14 to 1F	<i>Undefined</i>
20 to 3F	LSB for 0 to 31
40	Damper pedal
41	Portamento
42	Sostenuto
43	'Soft' pedal
44	<i>Undefined</i>
45	Hold 2
46 to 4F	<i>Undefined</i>
50 to 53	General purpose 5 to 8
54 to 5A	<i>Undefined</i>
5B	External effects depth
5C	Tremolo depth
5D	Chorus depth
5E	Celeste detune
5F	Phaser depth
60	Chorus depth
61	Data increment
62	Non-registered parameter number - LSB
63	Non-registered parameter number - MSB
64	Registered parameter number - LSB
65	Registered parameter number - MSB
66 to 78	<i>Undefined</i>
79 to 7F	Reserved for channel mode messages

# APPENDIX 4 MIDI CONNECTIONS

- Standard MIDI --> MIDI Connection



- Roland DIN-Sync24 Connections

