KENTON

Pro-2000mkII

MULTI-CHANNEL
MIDI TO CV CONVERTER

KENTON
www.kenton.co.uk
PRO - 2000 MkII
high specification multi channel
midi to cv converter

MIDI ○   PARA ○   DEC   INC   POWER   0
CH A ○
CH B ○   VAL ○   SEL   ENT   1

Operating manual

INTRODUCTION

The Kenton Electronics Pro-2000 mkII multi channel MIDI to CV converter, has been designed to give you maximum flexibility, whilst maintaining ease of use.

The converter has 10 completely independent sections - called channels A, B, C & D plus Aux's 1 to 6. Each can be assigned its own MIDI channel, and controlled independently from the others.

The Pro-2000 mkII has two independent, MIDI programmable LFOs that can modulate both the CV outputs, and the auxiliaries. Each of the CV channels A & B has a portamento function.

There are also many other features designed to make the Pro-2000 mkII as flexible as possible to allow as much control as possible over your analogue synthesizers.

Please take some time out to read all through this manual which will, hopefully explain everything you need to know.

The Pro-2000 mkII has a thorough MIDI system exclusive specification for those who wish to perform data dumps or real-time editing from their computer sequencer or generic patch editor. See the SysEx section at the back of the manual.

The Pro-2000 mkII auxiliary outputs have the following additional functionality, the first two of which allow the Pro-2000 mkII to control a further 3 CV/Gate synths if required (making a total of 5) :
 V/Oct from Notes - Gate from Notes - Trig Pulse (for synths requiring a trig as well as a gate i.e. ARP2600)

The Pro-2000 mkII has intelligent MIDI sync. This means that if MIDI sync is selected and is in operation, the 2000 will automatically recalculate the LFO speed in order to fit a whole LFO waveform between MIDI clocks (or multiples of clocks depending on the setting of sync divide)

A full 128 note range is now implemented on all outputs giving CV out.
Auto portamento feature added to enable playing style to dictate when portamento is to be used.
The non-volatile memory has been increased from 7 to 24, so even more setups can be stored.
Jan 2008 update –
Polyphonic Capability added
Fixed time portamento added for Channels A + B in addition to existing fixed rate
Sustain now available for Aux outputs when in Volt/Octave mode

THE Pro-2000 mkII CHANNELS

CHANNELS A & B

These are for controlling analogue synths such as the SCI PRO-1, Roland SH-101, MS-20, CS-5 or indeed almost any other synths with CV and Gate or Hz/V and Trig inputs.

Note, the CV output for controlling the pitch uses one of two (selectable) scaling methods: the Volts per octave (V/oct) pitch scaling system, which is the most common system used in analogue synths, as used by Roland, SCI, Oberheim and Moog synths. The other system is called Hertz per volt and is used by synths such as Korg & Yamaha, (MS20, MS10, CS5). The Pro-2000 has been designed to handle these synths as well, it is simply a case of switching between the two systems from the front panel. (See CV/Hz Select - later)

Some synths do not have CV, Gate or Filter inputs, such as the TB-303. We can fit or supply socket kits for most monosynths that do not have inputs. See our website for details (www.kenton.co.uk)

CHANNEL C, MIDI channel filter

This is used to rechannelize or filter MIDI data.

Connect the synth to the Pro-2000 mkII MIDI out socket, and set the MIDI filter receive channel to the MIDI channel data you want your old synth to respond to. Only data received on that channel will be sent out of the Pro-2000 mkII MIDI out, and any other channels will be filtered out. These data can be sent out on a different channel if required (see rechannellizing above). An example of rechannelizing might be to change the transmit channel of early DX7s, for instance, that can only transmit on MIDI channel 1, to another MIDI channel, say 2. An example of filtering might be on an early MIDI synth that can only receive in Omni mode (receive on all MIDI channels at the same time), the Jupiter 6, for instance.

CHANNEL D, the Optional Expansion Port

This channel is a digital output for controlling a range of other synthesizers, which do not use CV and gate as their method of control. It can be fitted with a DCB port or a KADI/WASP port (but not both at the same time) If it is fitted with the KADI/WASP port, it can be programmed for either KADI or WASP. can be done either by us, or by you, call us for details and pricing.

WASP -
Note, the Wasp responds to three octaves of notes only - on a DX7 or other 61 note keyboard, this corresponds to bottom C#, to C, three octaves above. The Wasp does not respond to pitchbend - or indeed any other controls except sustain pedal, which will hold the current note, this is a design limitation of the Wasp itself.

KADI -
The KADI (Kenton Auxiliary Digital Interface) is a digital port. This can be used to play the TR606 or TR808 drum sounds over MIDI, although a small modification will have to be made to the drum machine.
It is also there for any other possible future expansion.

DCB -
DCB (digital communications bus) is an early digital interface which Roland fitted on their Juno 60 & some Jupiter 8 synths. This is a polyphonic interface which sends note & program change information, however Juno synths only respond to notes whereas Jupiter 8s also respond to program changes.

Note, special cables are needed to use the Wasp, DCB & KADI ports. These are available direct from Kenton.

SYNC 24 & Clock Pulse

The Pro-2000 mkII has a Roland SYNC 24 clock output. Instruments having a SYNC 24 input, such as the TB-303, TR-808, TR-606, MC-202, can be connected to the Pro-2000 mkII. If the Pro-2000 mkII is receiving MIDI clock, these instruments will play their internal patterns in time to MIDI clock.

The Pro-2000 mkII also has a clock pulse (arpeggio output). This can be used to synchronize drum machines, analogue sequencers, and arpeggios to MIDI clock.

FRONT PANEL

Each channel, A and B, has LED indicators to indicate when that channel`s Gate is on.

There are three more LED status indicators;
One is marked DATA. This illuminates when the Pro-2000 mkII is receiving MIDI data.
The other two are marked PARAMETER and VALUE. These indicate which mode the Pro-2000 mkII is in, and are toggled by the SELECT button.

Four buttons; SELECT, ENTER and INC and DEC. - These are for editing the Pro-2000 mkII.

* INC and DEC - scroll through parameters or values, depending on which mode the unit is in.
* SELECT - (1) toggles between Parameter and Value for editing. (2) If you hold in the SEL button for a couple of seconds it will take you directly to the STORE or LOAD page. If something has been edited it will take you straight to STORE otherwise it take you to LOAD. It just takes you to the page - you still need to select the correct memory location and press Enter to perform the operation.
*ENTER - this button has 3 functions - (1) It displays the memory number from which the setup has been loaded, and whether or not it has been edited. (2) When in system settings mode (LOAD from or STORE to) this button will save the settings which you have entered. (3) If you hold the button in for about 6 seconds it will perform a global all notes off and display a message to that effect on the display. (NB this turns off all notes on the Pro-2000 mkII, it does not send any MIDI messages out of the MIDI out port.

* 2 x 16 backlit LCD, and power switch.

BACK PANEL

From left to right, there is the:
> IEC power socket (power lead supplied).
> MIDI In, Out, and Thru DIN type sockets.
> Sync24 DIN socket.
> Clock pulse 3.5mm minijack output.
> Channel A and B CV and Gate 3.5mm minijack outputs.
> The six auxiliary 3.5mm minijack outputs.

> Above these is space for the optional expansion port, which (if fitted) is either a WASP/KADI port or a DCB port .

SETTING UP YOUR Pro-2000 mkII

MIDI CONNECTIONS

MIDI IN
- connect this to the MIDI Out of your MIDI synth or MIDI sequencer using standard MIDI cables.

MIDI OUT
- connect this to the MIDI In of your MIDI sequencer or old synthesizer. This is only needed if you will be editing the Pro-2000 mkII using SYSEX or doing MIDI data dumps, or if you are using the MIDI channel filter.

MIDI THRU
- this provides a copy of the information coming into the MIDI In socket so that you can "daisy-chain" several MIDI devices. It should be connected only to a MIDI In socket if needed.

ANALOGUE CONNECTIONS

CV A & B(-3 volts to +8 volts)
- the control voltage output to control the pitch of most synths, such as Roland, SCI, and Moog, Korg and Yamaha. When using this make sure that the correct scaling is selected ie volt per octave or Hz/v. Connect this output to the input marked CV, oscillator, KBD IN, VCO CV in, VCO, KEY Volt in, etc., of your synth.

GATE A & B (0 to +5volts or +15 volts)
- the gate voltage output that provides the note on/off information for synths. This is used for most synths, such as Roland, ARP, Oberheim, Moog etc.
Connect this output to the input marked Gate in, TRIG in, etc., of your synth.

This socket has several modes, which are selectable in software, you may have to adjust this to receive optimum performance from your synth, as some synths require S-Trig - S-Trig is used to control Moogs, Korgs etc.

The tip of the jack is the trigger signal - if your synth has the CINCH/JONES connector with two flat pins, the narrower pin is the trigger signal and the wider one is ground.

AUXILIARIES 1 to 6 (-12.6 to +12.6 volts)

- a voltage output for connecting to an auxiliary input on a synth such as filter control or VCA volume.

Connect this output to the input marked VCF in, VCF fcM, Filter, etc, on your synth to control the filter cut-off, or the input marked VCA, Volume, loudness, etc., to control volume. You could also connect this to inputs such as portamento, pulse width, high pass filter cut-off, etc.

Cable Connections

All minijack outputs on the Pro-2000 mkII need standard 3.5mm mono minijack plug. The connection at the synth end of course depends on what synth you are using. Kenton are able to sell you cables for connecting to just about any synth, just visit our website.

THE ARP CLOCK & SYNC 24 OUTPUTS

CLOCK PULSE - (arpeggio clock)

- this output provides a +5 volt clock pulse related to the incoming MIDI clock. The ratio of MIDI clocks to arpeggio pulses can be adjusted - (see CLOCK PULSE DIVIDE).

A +5 volt level will be output on the first MIDI clock after a MIDI start (or continue if selected) is received, and thereafter dependent upon the CLOCK PULSE DIVIDE ratio.

You may for example connect this to an input marked Ext. Clock In on an analogue drum machine or sequencer. It could also be used to gate/trigger envelopes or Sample and Hold circuits in time with MIDI clock.

SYNC 24 - (DIN 24 sync, used on SOME ROLAND equipment)

- this output provides clock and stop/start signals. See later in the manual for pinout information.

Cable Connections

MIDI leads may not be suitable for connecting to the SYNC 24 socket as they require different pins connected. Use a 5 pin DIN to 5 pin DIN audio lead available from Kenton (or a HI-FI shop).

Connect this output to the SYNC 24 input on a TR606/808, MC202, or TB303 to synchronize these instruments' sequencers to MIDI clock.

<u>EDITING THE Pro-2000 mkII</u>

The Pro-2000 mkII is very easy to use. It uses a standard system of editing. It has a clear and informative 2x16 LCD with backlight, INCREMENT, DECREMENT, SELECT and ENTER buttons.

To select the parameter you wish to edit, the parameter LED (the red light emitting diode), must be lit. If it is not, press the SELECT button. You can now scroll through the parameters using the INC and DEC buttons.

To edit a value, press the SELECT button again. The value LED will light up. Now by pressing the INC and DEC buttons, the value can be edited.

To speed up editing - if you are holding the INC button and want to go faster, press the DEC button too, this will step about twice as fast, similarly if you are holding the DEC button you can press INC to go faster.

When you have edited parameters to your own specification, go to the "STORE to Mem#x" menu option, where, by selecting which of seven locations you wish to use and pressing ENTER you can save your set-up. The most recently LOADed or STOREd setup will be loaded next time you power-up. You can get to the LOAD / STORE location quickl;y by holding the SEL button in for a couple of seconds.

PARAMETERS

THE FOLLOWING PARAMETERS ARE THE SAME FOR BOTH OF THE CV CHANNELS, A, B (where x is the channel)

CV x SYNTH CHANNEL x (1 to 16, defaults: A=1 B=2)

- sets the MIDI receive channel for Pro-2000 mkII analogue channel.

CV x NOTE PRIORITY (low/high/newest, default: newest)

- sets the note priority.
If set to "Lowest" then the new note played takes precedence if it is lower than the preceding note.
If set to "Highest" then the new note played takes precedence if it is higher than the preceding note.
If set to "Newest" then the newest played note played takes precedence regardless.

CV x TRIGGER MODE (Single/Multiple, default: Multiple)

- sets the whether the envelope on your synth will be retriggered when a new, overlapping note is played. If set to "Single," then the Gate output will stay on, or the trigger (if selected) will not re-trigger when a new note is played, if you are playing in a legato fashion, with notes overlapping.
If set to "Multiple," then the Gate (or S-Trig) output will re-Gate each time a new note is played, re-triggering your synth`s envelope generators, regardless of your playing style.

CV x TRANSPOSE (-24 to +24 semitones, default: 0)

- allows you to Transpose the incoming MIDI notes in semitone steps. You can adjust this in real-time, allowing you to hear the changes you make to Transpose, without having to re-play a key.

CV x PITCHBEND (0 to 24 semitones, default: 2)

- sets the maximum range the pitchbend will bend the CV output.

CV x PORTAMENTO TYPE (fixed rate or fixed time, default: fixed rate)

- sets how the next parameter affects the portamento.
Fixed rate: the time taken to glide between notes depends on the amount of notes in the glide range. The glide time between semitones is constant.

Fixed time: the time taken to glide between notes is the same no matter how far apart the notes are.

CV x PORTAMENTO RATE (or TIME) (0 to 127, default: 98)

- sets the speed at which portamento glides between notes. Note that 0 is fastest rate but does not mean portamento off, use portamento controller (below) for that! This value can also be varied in real time using MIDI controller number 5 (portamento time). If this parameter is in view on the display, its new value will not be displayed when varied using controller 5. However If varied via SYSEX, the new value will be displayed.

CV x PORTAMENTO CONTROLLER (Auto ,ON, OFF, 0-119, default: 65)

- sets the controller responsible for enabling-disabling the portamento control. If on or off are selected these force on or off. If Auto is selected, then portamento is obtained only when you play in a legato manner (i.e. playing the new note before releasing the old one), thus you can turn portamento on or off, depending on how you play the notes.

CV x LFO DEPTH CONTROL (pb, vel, aft, controllers 0-119, default: #1 mod wheel).

- assigns which MIDI controller will control the LFO depth of modulation of the CV output.

CV x LFO DEPTH AMOUNT (for controller maximum 0-127, default:65).

- allows you to set the maximum LFO depth for the CV out

CV x LFO ASSIGN Use LFO number (1 to 2, default: A=1, B=2)

- lets you assign which of the two inbuilt LFOs will modulate the CV outputs.

CV x Gate Select (default: 5v pull-up)

- you can select the following type outputs for the Gate output;

        S-trig no pull-up
This would probably be used for Moogs & Korgs.

        S-trig 5v pull-up
        S-trig 15v pull-up
This would probably be used on the Yamaha CS range of synths instead of the Gate output.

        Gate V-Trig 5v pull-up
        Gate V-Trig 15v pull-up
These are the standard gates and should be used to run most synths including Roland,Arp, SCI.

CV x Fine Tune (-127 to +127 default 0)

- Fine tunes the mono-synth.

CV x Scale (-127 to +127 default 0)

- This is used to tune in the octave scaling of your analogue synth. Will only need adjusting if your synth sounds out of tune as you play further up the keyboard (see `Tuning in Your Analogue Synth`). - Check whether CV select has been set correctly (see below).

CV x CV/HZ Select (Volt/Oct or Hz/V or 1.2V/Oct – default: Volt/Oct scaling)

- This is used to select the scaling system. Most synths will use Volt/Octave scaling, although most Korg and Yamaha synths will require the Hz/V selection (note that the Korg Monopoly is Volt/Octave). For the very few synths that employ 1.2V/Octave scaling (one tenth of a volt per semitone) the 1.2V/Octave mode should be selected.

DIGITAL OUTPUT PARAMETERS

ChC DATA FILTER MIDI Receive Channel (1 to 16, default: 3)

- sets the MIDI receive channel for the MIDI channel filter.
Only MIDI data on this channel will be retransmitted to the Pro-2000 mkII MIDI out.
It can be retransmitted on a different channel if necessary; see below.

ChC DATA FILTER MIDI Transmit Channel (1 to 16, default: 1)

- sets the channel that the MIDI data from the MIDI channel filter is retransmitted on.
This might be used to change the transmit channel of early DX7s, for instance, that can only transmit on MIDI channel 1.

ChD EXPANSION PORT MIDI Receive Channel (1 to 16, default: 4)

- sets the MIDI receive channel for the expansion port (either DCB or WASP/KADI)

ChD EXPANSION PORT status

- tells you which port, if any, is fitted & allows you to change between KADI & WASP modes. A standard unit will read NO PORT FITTED, however if a DCB port is present it will say DCB PORT FITTED or if the KADI/WASP port is present it will say KADI selected or WASP selected, you can change between the two modes using the inc & dec buttons.

Using the KADI port with your modified TR606/808

Connect the special 15 way cable supplied to the TR606 or TR808 and to the Pro-2000 mkII KADI port. The TR606/808 can now be played from your master keyboard/sequencer. The sounds will play with or without Accent. A velocity level of over 85 will cause the sound to be accented, subject to the level of Accent selected on the TR606/808. KADI kits for other drum machines are now available, (including CR8000 and CR78) contact us for details and voice mapping.

Below is the MIDI drum map for the TR-606

NOTE	MIDI NOTE #	TR-606 SOUND
C	36	BASS DRUM
C#1	37	SNARE DRUM
D1	38	LOW TOM
D#1	39	HIGH TOM
E1	40	CYMBAL
F1	41	OPEN HIHAT
G1	42	CLOSED HIHAT

Below is the MIDI drum map for the TR-808

NOTE	MIDI NOTE #	TR-808 SOUND
C	36	BASS DRUM
C#1	37	SNARE DRUM
D1	38	LOW TOM/CONGA
D#1	39	MID TOM/CONGA
E1	40	HI TOM/CONGA
F1	41	RIMSHOT/CLAVES
F#1	42	CLAP/MARACAS
G1	43	COWBELL
G#1	44	CLOSED HIHAT
A1	45	OPEN HIHAT
A#1	46	CYMBAL

AUXILIARY OUTPUTS

THE FOLLOWING PARAMETERS ARE THE SAME FOR EACH AUXILIARY 1 TO 6
(where x is the auxiliary number)

AUX   x AUX OUTPUT x Receive channel(1to16, default: 1 to 6 set to 1 to 6 respectively)
- assigns the auxialiary to which ever MIDI channel you wish to set it to, i.e. to get the auxiliary to respond the synth on CV channel A, set it to the same receive channel as that synth.

AUX x CONTROLLER (pb, vel, aft, controllers 1-119, V/Oct form Notes, Gate from Notes, Trig pulse A/B - default: #16 general purpose controller)
- sets the MIDI controller source to control the analogue auxiliary output level, to control VCF, VCA etc.
see below for details of the new modes V/Oct, Gate & Trig A/B.

AUX x OUTPUT LEVEL For cntrl Min (-64 to +64, default: 0)
- sets the auxiliary output level for when the MIDI Controller Source is at its minimum.

AUX x OUTPUT LEVEL For cntrl Max (-64 to +64, default: 64)
- sets the auxiliary output level for when the MIDI Controller Source is at its maximum.

AUX x OUTPUT LEVEL Reset Level (-64 to +64, default: 0)
- sets the level that the auxiliary will reset to when a MIDI reset command is received.

AUX x LFO DEPTH CONTROLLER (pb, vel, aft, controllers 1-119, default: #17)
- sets the MIDI controller source to control the LFO depth that will modulate the auxiliary output.

AUX x LFO DEPTH AMOUNT For cntrl Max (0-127 default: 63)
- sets the depth of the LFO at the controller maximum.

AUX x LFO ASSIGN Use LFO number (1 to 2, default: 1-3=1, 4-6=2.)
                    - lets you assign which of the two inbuilt LFOs will modulate the auxiliary

NEW MODES FOR AUX CHANNELS 1-6

V/Oct from Notes
- this allows the selected auxiliary output to give a CV voltage to control the CV input of a synth. Set the MIDI receive channel of the selected auxiliary and use in conjunction with another Aux set to the same channel but configured as a gate (see below). The MIDI channel can be any channel you want, for any aux, it is independent of Channels A/B.

You can modulate the output using an LFO but the range default is set to be appropriate for its use as an Aux out - we suggest you set the LFO Depth Amount to 10 or so (and probably set the controller for it   to #1 (Mod Wheel))

When using this mode, the Min value becomes the Fine-tune value, the Max value becomes Scale and you should ensure the reset value is 0. When you want to tune the converter to your synth, first play C note #36 (usually the bottom note on a 61 note keyboard) and use fine tune to get that right, then play C a couple of octaves up and get that in tune using the scale adjustment. Restrictions - The Aux outputs cannot be set to Hz/V mode, there is no portamento, sustain pedal or transpose facility, note memory is for 2 notes only, note priority is for most recent note in multiple trigger mode. Pitchbend range is set globally for all any auxes in CV mode using the Ax1-6 Pitchbend Range parameter.

Gate from Notes

- this allows the selected auxiliary output to give a voltage output in response to notes on any MIDI channel you select - the off and on levels can be changed by using the Min & Max (and Reset) level controls - Min sets the voltage when the gate is off and Max sets the level when the gate is on. For example if you set min to zero and Max to 25 you will have a 5v gate signal or if you set Min to 25 and Max to zero you will have an S-trig with +5v pullup.

Trig Pulse A / B   (mainly used for ARP-2600 & early Odysseys)

 - this allows the selected auxiliary to give a trigger pulse for synths requiring this extra signal in addition to the normal gate signal. To use this mode, select Trig Pulse A / B on any Aux and set the MIDI receive channel of that aux to be the same as the MIDI receive channel of the Synth Channel (A or B) you want it to work with - set min and max to be the off an on output voltages you want to use - see below for an   example of connecting to an ARP-2600. NOTE the Trig Pulse A/B mode only works in conjunction with Channels A/B.

Example of using `Trig Pulse A / B' mode of the Pro-2000 mkII with an ARP-2600 synth from CHANNEL A for CV & Gate and Aux 1 for Trigger. The following example applies to the `Trig Pulse A / B' mode only, it DOES NOT apply to the "V/Oct from notes" or "Gate from notes" modes.

1)   Connect CV CHANNEL A of Pro-2000 mkII to all 3 KBD CV inputs of the ARP-2600. You may need to use the MULTIPLE 4 way socket connection to the bottom left of the ARP to do this. If the ARP keyboard is not attached you may be able to connect using just one lead into the KBD CV Output on the ARP (it can be used as an input if the 2600 Keyboard is not connected).
2)   Ensure CvA CV/HZ Select is set to Volt/oct scaling
3)   Connect GATE CHANNEL A of the Pro-2000 mkII to the GATE input of the 2600 (located above the right speaker volume control)
4)   Set CvA Gate Select to "Gate 15v pullup"
5)   Connect that AUX 1 to the TRIG input of the 2600 (located next to the gate input - see above)
6)   Set parameter Ax1 Main Cntrllr to "Trig Pulse A / B"
7)   Set AUX 1 to the same MIDI channel as Channel A
8)   Ensure that Ax1 output level for cntl Min = 0
9)   Ensure that Ax1 output level for cntl Max = +63
10) Store the settings (long press on SEL will take you to store page)
11) Everything should now be ready but note the following points:-

The above can similarly apply to CHANNEL B and any of the AUXes 1-6 outputs if that Aux Main Controller is set to "Trig Pulse A / B". The selected AUX output will only give a trigger signal in the `Trig Pulse A / B' mode when it is set to the same MIDI channel as either CHANNEL A or CHANNEL B.

Ensure that any aux output which is no longer required as a trigger output, is reset to another controller or "ignore controllers" as operation of gate A or B outputs on the same MIDI channel are affected when `Trig Pulse A / B" is in operation.

LOW FREQUENCY OSCILLATORS

THERE ARE TWO INDEPENDENT LFOs, 1 & 2 (where x is the LFO number)

LFO x SPEED = (0 to 127, default: 80)
- sets the speed of the LFO

LFO x WAVESHAPE # (1 to 9 as below, default: triangle[1])

- sets the wave shape for the LFO

1, Triangle	◠	2, Sawtooth up	
3, Sawtooth down		4, Square	
5, PulseWidth 10%		6, PulseWidth 20%	
7,1 PulseWidth 30%		8, PulseWidth 40%	
9, Sample + Hold (random depth)			

LFO x MIDI SYNC (off, 1 to 96, default: off)

- allows the LFO waveform to be synchronised to MIDI clock, with a variable divide ratio. If MIDI sync is selected and is in operation, the 2000 will automatically recalcul;ate the LFO speed in order to fit a whole LFO waveform between MIDI clocks (or multiples of clocks depending on the setting of sync divide. (See below for divide ratios).

If set to 1, there will be 1 cycle of the LFO for every 1 MIDI clock. (i.e. 24 cycles per quarter note)
If set to 24, there will be 1 cycle of the LFO for every 24 MIDI clocks. (i.e. 1 cycle of the LFO per quarter note)

Note; MIDI sends 24 clocks per quarter note.

Below is a table of values you can set the divide ratio to to obtain LFO cycles of various musical lengths:

| Note type;	Divide ratio;
Semibreve	96
Minim	48
Crotchets	24
Crotchet triplets	16
Quavers	12
Quaver triplets	8
Semiquavers	6
Semiquaver triplets	4
Demisemiquavers	3
Demisemiquaver triplets	2

SYNC and CLOCK SETTINGS

SYNC Clock Divide (1/2 &1 to 24, default: 2)

- sets the ratio of MIDI clocks to output pulses from the clock pulse output.
Note that cpqn = clocks per quarter note and that the MIDI clock rate is always 24 cpqn

If set to ½ = 48 cpqn - there will be 2 pulses from the clock pulse output for every 1 MIDI clock
If set to 1 - there will be 1 pulse from the clock pulse output for every 1 MIDI clock (24 cpqn)
If set to 24 - there will be 1 pulse from the clock pulse output for every 24 MIDI clocks (1 cpqn)

Below is a table of values you can set the divide ratio to to obtain a clock pulse at various musical time intervals:

Note type;	Divide ratio;	CPQN
Crotchets	24	1
Crotchet triplets	16	
Quavers	12	2
Quaver triplets	8	3
Semiquavers	6	4
Semiquaver triplets	4	6
Demisemiquavers	3	8
Demisemiquaver triplets	2	12

SYNC CLOCK Polarity: +ve/-ve clock pulse (default: +ve)

- sets the type of clock pulse sent from the clock pulse output.
Most synths, sequencers & drum machines require this to be set to +ve, but there may be a few that require it to be set to Inverted (including the KORG MONOPOLY)

SYNC MIDI CLOCK Continue is ignored/= start (default: ignored)

- If set to 'ignored', MIDI continue messages are ignored unless immediately preceded by a 'song position pointer' zero message – in which case they are automatically treated as a 'start'. If set to Continue=start, MIDI continue messages are always treated as if they were MIDI 'start' messages.

PROBLEMS YOU MAY ENCOUNTER WHEN USING MIDI CLOCK

When using the MIDI clock in conjunction with the Pro-2000 mkII please note the following. The Kenton add-on cannot sync the arpeggio if it is not actually receiving the MIDI clock. This is not as silly as it sounds, there are a few points to watch for:-

Some MIDI mergers & patch bays actually remove MIDI clock information from the MIDI data stream or you may have to enable it for the port you are using.
Users of CUBASE note that the default for MIDI clock is for it NOT to be sent, you will have to go into MIDI Synchronization page and select MIDI Clock to transmit.
Users of UNITOR/EXPORT on an Atari note that the MIDI clock will only come out of port A, (that is the Atari's own MIDI port), unless you can re-assign it.

SYSTEM SETTINGS

SYSEX DEVICE NUMBER (1 to 16, default: 1)

- sets a device number for the unit in case you have more than one pro-2000 and want to control each independantly

POLY CHAN ACTIVE (None, A+B, +Aux12,+Aux34,+Aux56, default: None)

- This setting lets you decide which synth channels are assigned for use in poly mode.
Options are:

None - All Mono (default)
A+B only   (2 voice)
A+B+Aux12   (3 voice)
A+B+Aux12+34   (4 voice)
A+B+Aux12+34+56 (5 voice)

Polyphonic mode is active when this parameter is set to anything other than "None - All Mono"
If you are using more than just channels A+B, then the Aux outputs must be used in pairs:
Aux 1 with Aux 2, Aux 3 with Aux 4, Aux 5 with Aux 6. Auxes not being polyphonically
controlled will continue to be independent. Remember to set the Auxes to CVs or Gates.

POLY NOTE ASSIGN (Regular Cyclic, Memory Cyclic, Reset, default: Regular Cyclic)

- This parameter sets how incoming MIDI notes are assigned to voices. This setting only has any effect if polyphonic mode is active. Options are:

Regular Cyclic Mode (default)
Memory Cyclic
Reset Mode

Regular Cyclic Mode:
Incoming MIDI notes are assigned the next free voice. (Even if it is the same note played repeatedly).
If, for instance you have channels A+B+Aux12+34 set to poly, each time you play a note it will step through and assign channels A then B then Aux12 then Aux34 then back to A again as you play.
If you hold a note, new notes will be assigned to the next voice in that order that is free.
If all voices are already assigned to held notes, the next note will use the lowest voice held.

Memory Cyclic:
This mode is similar to the regular cyclic mode described above. However, a new note will be assigned to the same voice as before if that voice is not currently playing and has not been re-assigned. For example if you play notes C D D C then they will be played by channels A B B A, rather than A B Aux12 Ax34 as they would in Regular Cyclic Mode. If all voices are already assigned to held notes, the next note will use the lowest voice held.

Reset Mode:
As you play, the lowest free voice (channel A being the lowest) is assigned to the new note.
If all voices are already assigned to held notes, the next note will use the lowest voice held.

More information about using Polyphonic Mode:

Note that if you assign any of the Auxes to be polyphonically controlled, then you will have to configure them as either CV or Gate outputs. It is recommended that you use the odd numbered Auxes for CV and the even numbered ones for Gate to preserve the pattern of CV followed by gate across the back panel, however this is not essential.

In order for the Auxes to perform in a similar way to channels A and B, you will also have to change the following parameters on the auxes which are acting as CVs (the odd numbered ones).

Ax1 LFO Dpth Ctl - set to: 1   Mod Wheel
Ax1 LFO Dpth Amt - set to: at Cntl Max   9

The same changes for auxes 3 & 5 (Ax3 & Ax5) if they are also to be polyphonically controlled.
This is so that use of the mod wheel will be the same as for channels A and B.

Change the following parameters on the auxes acting as Gates (the even numbered ones).

Ax2 LFO Dpth Ctl - set to: Ignore Cntrllers

The same changes for auxes 4 & 6 (Ax4 & Ax6) if they are also to be polyphonically controlled.
This is so that the gate outputs will not be modulated too.

When a channel (or pair of Aux outputs) is assigned as polyphonic, it becomes a slave to Channel A and takes its MIDI channel from Channel A.

In Polyphonic Mode - Note priority for any active polyphonic channels is always set by the "Poly Note Assign" parameter. Individual channel note assignments are overridden.

You may also need to set the Gate Voltage (and/or gate polarity) of any auxes used in poly mode

STORE TO MEMORY (Memory #1 to 24, default: 1)

- having changed all the parameters to suit your setup, you can use this option to save these settings to one of 24 memories, for use within different configurations.

LOAD FROM MEMORY (Memory #1 to 24, default: 1)

- allows you to load from one of the 24 memories into the unit.

With both of the above two parameters, you need to select Value edit and use the INC & DEC buttons to select the memory you want to load from or store to.

When you have loaded from or stored to a memory location, the Pro-2000 mkII will treat that as the current location and load from it on power up. If you hold in the SEL button for a couple of seconds it will take you straight to the STORE or LOAD page depending on whether anything has been edited.

MIDI DIAGNOSTICS MODE

The Pro-2000 mkII has a built-in MIDI analyser function. This feature allows you to see what types of MIDI messages are being transmitted by your master keyboard/sequencer, making the *PRO 2000* a useful diagnostic tool, which can help you when you have a problem with your MIDI set-up.

To enter analyser mode, you must power on the *PRO 2000* whilst holding the **SELECT** button. The display will then show 'CHANnel', 'NOTE#' and 'VELOCity', and will display the relevant data, below the heading. Using the **INC**, **DEC**, **SELECT** and **ENTER** buttons, different types of MIDI messages received may be displayed as follows:-

SELECT	Short press	CLock,STATUS and SYSEX data received for checking MIDI clock.
DEC	Short press	CHANnel,NOTE# and VELOCity as above, note information.
INC	Short press	CHANnel,CONTroller# and VALUE displays controller information.
	Long press	CONTROLLER IDENTity - displays the name of the rec'd controller.
ENTER	Short press	CHANnel,PROG# and BANK# - displays program change as rec'd.

Although pitchbend and after-touch are not strictly controllers, they will be identified and treated as if they are controllers for the purposes of the analyser mode.

Pro-2000 mkII SYSEX INFORMATION

The first five bytes of sysex for the Pro-2000 mkII are always the same for all data types

[1]   0F0h   - Sysex command
[2]   00h   - Company ident first byte
[3]   20h   - Company ident second byte
[4]   13h   - Company ident third byte
[5]   02h   - Product code (pro-2000)

[6]   0ddd0000   - where ddd is data type
                if ddd = 100 = memory dump   (40h)
                if ddd = 010 = data change   (20h)
                if ddd = 001 = dump request   (10h)

----
ddd = 001 = dump request

[7]   000bbbbb   - where bbbb = block requested - valid are 0 - 24
[8]   0F7h   - end of exclusive

The Pro-2000 mkII responds with a memory dump of the block requested
n.b. block 0 is the current setup, blocks 1 – 24 are the stored memory locations
Example of dump request for memory #7:   F0 00 20 13 02 10 07 F7

----
ddd = 010 = data change

[7]   0000uuuu   - where uuuu = low 4 bits of parameter address
[8]   0000hhhh   - where hhhh = high 4 bits of parameter address
[9]   0000uuuu   - where uuuu = low 4 bits of data
[10]   0000hhhh   - where hhhh = high 4 bits of data
[11]   0F7h   - end of exclusive

The Pro-2000 mkII responds by changing the specified data and updating the
display if necessary. - See below for parameter addresses. Examples given after parameter list.

----
ddd = 100 = memory dump

[7] 000bbbbb   - where bbbb = block requested - valid are 0 – 24 (*see below)
[8] 0nnnnnnn   - where nnnnnnn = number of bytes in dump

[9]   0000uuuu   - where uuuu = low 4 bits of data
[10] 0000hhhh   - where hhhh = high 4 bits of data

Bytes 9 & 10 are repeated the number of times specified in 8

[11]   0F7h   - end of exclusive

The Pro-2000 mkII will send the above data when requested by the sysex
dump request listed above.

When memory dump data are sent to the 2000 the following will happen:-

* If the dump specifies block 0 (current setup) the data will be immed-
iately utilised and the display will be updated. If the dump specifies
any other block (a stored memory location) the dump will be sent to the

specified memory location and also to the edit buffer (current setup)
the data will be immediately utilised and the display will be updated.

You may change the block number of a memory dump without causing any
problem. For example, data that came from memory 6 could be returned to
the current setup by merely changing the 06 in byte [7] to a 00.
Parameter data are stored in the following addresses.

Address	Function	Range	Notes (see end)
00h	A Receive chan	0 - 15	{ 1 }
01h	A note priority	0 - 2	
02h	A trig / retrig	0 - 1	
03h	A transpose	232 > 0 > 24	{ 2 }
04h	A pitchbend range	0 - 24	
05h	A portamento speed	0 - 255	
06h	A portamento cont #	252 - 0 - 119	{ 3 }
07h	A lfo depth controller #	252 - 0 - 119	{ 4 }
08h	A lfo max val	0 - 127	
09h	A lfo assign	0 - 1	
0Ah	A gate select	0 - 7	5 modes used
0Bh	A fine tune val	129 > 0 > 127	129>0 = -ve
0Ch	A scale val	129 > 0 > 127	129>0 = -ve
0Dh	A v/o – hzv – 1.2v select	0 - 2	
0Eh	B Receive chan	0 - 15	{ 1 }
0Fh	B note priority	0 - 2	
10h	B trig / retrig	0 - 1	
11h	B transpose	232 > 0 > 24	{ 2 }
12h	B pitchbend range	0 - 24	
13h	B portamento speed	0 - 255	
14h	B portamento cont #	252 - 0 - 119	{ 3 }
15h	B lfo depth controller #	252 - 0 - 119	{ 4 }
16h	B lfo max val	0 - 127	
17h	B lfo assign	0 - 1	
18h	B gate select	0 - 7	5 modes used
19h	B fine tune val	129 > 0 > 127	129>0 = -ve
1Ah	B scale val	129 > 0 > 127	129>0 = -ve
1Bh	B v/o – hzv – 1.2v select	0 - 2	
1Ch	C Receive chan	0 - 15	{ 1 }
1Dh	C Transmit chan	0 - 15	{ 1 }
1Eh	D Receive chan	0 - 15	{ 1 }
1Fh	D kadi / wasp select	0 - 1	
20h	Ax1 Receive chan	0 - 15	{ 1 }
21h	Ax1 Cont #	239 > 0 > 119	{ 6 }
22h	Ax1 min val / fine tune	0 > 64 > 127	{ 5 }
23h	Ax1 max val / scale	0 > 64 > 127	{ 5 }
24h	Ax1 reset val	0 > 64 > 127	{ 5 }
25h	Ax1 lfo cont #	252 - 0 - 119	{ 4 }
26h	Ax1 lfo max val	0 - 127	
27h	Ax1 lfo assign	0 - 1	
28h	Ax2 Receive chan	0 - 15	{ 1 }
29h	Ax2 Cont #	239 > 0 > 119	{ 6 }
2Ah	Ax2 min val / fine tune	0 > 64 > 127	{ 5 }

|			
2Bh	Ax2 max val / scale	0 > 64 > 127	{ 5 }
2Ch	Ax2 reset val	0 > 64 > 127	{ 5 }
2Dh	Ax2 lfo cont #	252 - 0 - 119	{ 4 }
2Eh	Ax2 lfo max val	0 - 127	
2Fh	Ax2 lfo assign	0 - 1	
30h	Ax3 Receive chan	0 - 15	{ 1 }
31h	Ax3 Cont #	239 > 0 > 119	{ 6 }
32h	Ax3 min val / fine tune	0 > 64 > 127	{ 5 }
33h	Ax3 max val / scale	0 > 64 > 127	{ 5 }
34h	Ax3 reset val	0 > 64 > 127	{ 5 }
35h	Ax3 lfo cont #	252 - 0 - 119	{ 4 }
36h	Ax3 lfo max val	0 - 127	
37h	Ax3 lfo assign	0 - 1	
38h	Ax4 Receive chan	0 - 15	{ 1 }
39h	Ax4 Cont #	239 > 0 > 119	{ 6 }
3Ah	Ax4 min val / fine tune	0 > 64 > 127	{ 5 }
3Bh	Ax4 max val / scale	0 > 64 > 127	{ 5 }
3Ch	Ax4 reset val	0 > 64 > 127	{ 5 }
3Dh	Ax4 lfo cont #	252 - 0 - 119	{ 4 }
3Eh	Ax4 lfo max val	0 - 127	
3Fh	Ax4 lfo assign	0 - 1	
40h	Ax5 Receive chan	0 - 15	{ 1 }
41h	Ax5 Cont #	239 > 0 > 119	{ 6 }
42h	Ax5 min val / fine tune	0 > 64 > 127	{ 5 }
43h	Ax5 max val / scale	0 > 64 > 127	{ 5 }
44h	Ax5 reset val	0 > 64 > 127	{ 5 }
45h	Ax5 lfo cont #	252 - 0 - 119	{ 4 }
46h	Ax5 lfo max val	0 - 127	
47h	Ax5 lfo assign	0 - 1	
48h	Ax6 Receive chan	0 - 15	{ 1 }
49h	Ax6 Cont #	239 > 0 > 119	{ 6 }
4Ah	Ax6 min val / fine tune	0 > 64 > 127	{ 5 }
4Bh	Ax6 max val / scale	0 > 64 > 127	{ 5 }
4Ch	Ax6 reset val	0 > 64 > 127	{ 5 }
4Dh	Ax6 lfo cont #	252 - 0 - 119	{ 4 }
4Eh	Ax6 lfo max val	0 - 127	
4Fh	Ax6 lfo assign	0 - 1	
50h	Ax1-6 pb range	0 - 24	
51h	Lfo1 speed	0 - 127	
52h	Lfo1 waveshape	0 - 8	{ 7 }
53h	Lfo1 sync	0 - 96	{ 8 }
54h	Lfo2 speed	0 - 127	
55h	Lfo2 waveshape	0 - 8	{ 7 }
56h	Lfo2 sync	0 -96	{ 8 }
57h	arp clk div	0 - 23	{ 9 }
58h	arp clk polarity	0 - 1	{ 10 }
59h	cont = start	0 - 1	{ 11 }
5Ah	Poly Chan Active	0 - 4	0=mono, 1=2chans, 4=5chans
5Bh	Poly Note Assign	0 / 10h / 20h	{ 12 }
5Ch	A portamento type	0 - 1	0=rate, 1=time
5Dh	B portamento type	0 - 1	0=rate, 1=time

{ NOTES }

{ 1 } Data 0 - 15 corresponds to MIDI channels 1 - 16
{ 2 } 232 = -24 semitones 0 = no transpose 24 = + 24 semitones - 25 to 231 are invalid
{ 3 } 252=auto pmt 253=pmt off 254=pmt on 255=prg chng & 0 - 119
{ 4 } 252=ignore 253=pitchbend 254=velocity 255=aftertouch & 0 - 119
{ 5 } 0= -64 64=0 127=+63
{ 6 } 249=gate 250=v/oct 251=trig a/b 252=ignore 253=p.bend 254=vel 255=aft & 0 - 119
{ 7 } 0= triangle 1= saw up 2= saw down 3= 10% pulse etc. as display
{ 8 } 1 - 96 corresponds to sync divide 1 to 96 and 0 = off
{ 9 } 0 - 23 corresponds to arpeggio divide 1 to 24
{ 10 } 0=positive 1=negative
{ 11 } 0 = continue ignored   1 = continue=start
{ 12 } 0 = Regular Cyclic, 10h = Memory Cyclic, 20h = Reset Mode

All sysex addresses and data are range checked and out-of-range values
will either be ignored or adjusted to give a valid response.

Example SysEx string to change channel A to Hz/V scaling: F0 00 20 13 02 20 0D 00 01 00 F7
Example SysEx string to change channel D to MIDI channel 16:   F0 00 20 13 02 20 0E 01 0F 00 F7

PIN OUTS FOR DCB/WASP Pro-2000 mkII CABLES

Juno 60 (and some Jupiter 8s) connector
14 way IEEE plug (viewed from terminals).
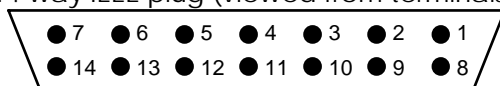
PIN 1 - Busy   PIN 2 - Data
PIN 3 - Clock   PIN 4 - Ground
No other pins connected. Insulate the screen at this end.

Other Jupiter 8s connectors
20 pin bump polarised socket (viewed from terminals).
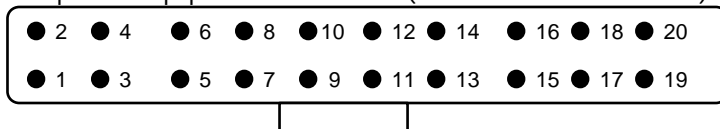
PIN 7   - Clock   PIN 9   - Data
PIN 10 - Ground   PIN 11 - Busy
As this header is an IDC type you will need to put a 6 inch length of 16 way IDC
ribbon cable in the header, then join the cables.

Wasp connector (Wasp end of cable)
7 pin DIN plug (viewed from terminals).
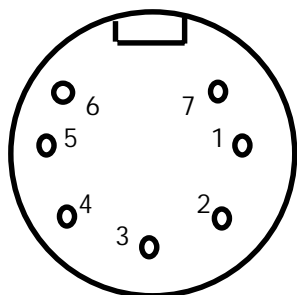
1   Keyboard Data (least significant bit) (0)
2   Keyboard Data (Next significant bit) (1)
3   Keyboard Data (Next significant bit) (2)
4   Keyboard Data (Next significant bit) (3)
5   Keyboard Data (Next significant bit) (4)
6   Keyboard Data (Most significant bit) (5)
7   Note on trigger

Pro-2000 mkII KADI/Wasp Connector; (Pro-2000 mkII end of cable)
15 way high density D plug (viewed from terminals).

```
●5  ●4  ●3  ●2  ●1
 ●10  ●9  ●8  ●7  ●6
●15  ●14  ●13  ●12  ●11
```
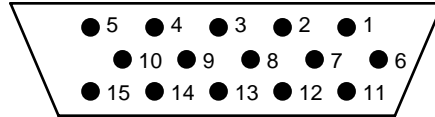
Wasp wiring;

1	Kybd Data (least significant bit) (0)	5	Kybd Data (Next significant bit) (4)
2	Kybd Data (Next significant bit) (1)	6	Kybd Data (Most significant bit) (5)
3	Kybd Data (Next significant bit) (2)	7	NC (No Connection)
4	Kybd Data (Next significant bit) (3)	8	Note-On Trigger

screen all remaining wires, (insulate screen).

Pro-2000 mkII DIN sync port connections:
 5 pin 180 degree DIN connector
 Pin 1 - Stop = 0 volts Start = +5 volts (or continue if selected)
 Pin 3 - 5 volt pulses; 24 clocks (pulses) per quarter note, the same as MIDI
 Pin 2 - Ground (zero volts)
 Pins 4 & 5 are not used.

CONNECTING YOUR MODIFIED TB303 (5 SOCKET RETRO) TO THE Pro-2000 mkII

Pro-2000 mkII	*to*	*TB303*
CV CHANNEL A	>	CV IN
GATE CHANNEL A	>	GATE IN
AUX1	>	FILTER
AUX2	>	SLIDE
AUX3	>	ACCENT

Set the AUX sources to which ever MIDI controller you wish to control the Filter, Accent or Slide, and link them all to CV channel A (or which ever you are using).

Using Slide;
The AUX2 controller range should be set to 0 minimum, and 50 maximum. Reset value should be 0. To turn the SLIDE on/off, the MIDI controller must be set to 65 for on, and 0 for off. When the slide is on, all following notes will glide into each other. It is best to play legato style for good results.

Using Accent;
The AUX3 controller range should be set to 0 minimum, and 50 maximum. Reset value should be 0. To turn the ACCENT on/off, the MIDI controller must be set to 65 for on, and 0 for off.

MIDI Controller Numbers (for reference)

Controller Number   **Control Function**

Decimal	Hex	
0	00H	Bank switch MSB
1	01H	Modulation wheel/lever
2	02H	Breath controller
3	03H	Undefined
4	04H	Foot controller
5	05H	Portamento time
6	06H	Data entry MSB
7	07H	Main volume
8	08H	Balance
9	09H	Undefined
10	0AH	Pan
11	0BH	Expression controller
12-15	0C-0FH	Undefined
16-19	10-13H	General purpose controllers (1-4)
20-31	14-1FH	Undefined
32-63	20-3FH	LSB for values 0-31
64	40H	Damper pedal (sustain)
65	41H	Portamento
66	42H	Sostenuto
67	43H	Soft pedal
68	44H	Undefined
69	45H	Hold 2
70-79	46-4FH	Undefined
80-83	50-53H	General purpose controllers (5-8)
84-90	54-5AH	Undefined
91	5BH	External effects depth
92	5CH	Tremolo depth
93	5DH	Chorus depth
94	5EH	Celeste (detune) depth
95	5FH	Phaser depth
96	60H	Data increment
97	61H	Data decrement
98	62H	Non-registered parameter number LSB
99	63H	Non-registered parameter number MSB
100	64H	Registered parameter number LSB
101	65H	Registered parameter number MSB
102-119	66-77H	Undefined
120-127	78-7FH	Reserved for channel mode messages

SPECIFICATIONS

Power;   230v AC 50Hz (170v - 260v) or 115v AC 50/60Hz (85v - 130v) - See note below.
                        6 Watts

Dimensions;   280mm x 132mm x 42mm

Weight;   2.5Kg

CONNECTIONS

Inputs;   Power Socket   (3 pin IEC)
                        MIDI In   (5 pin 180 degree DIN type)
                        4 push buttons

Outputs;   MIDI Out, Thru   (5 pin 180 degree DIN type)
                        Sync24   (5 pin 180 degree DIN type)
                        Clock Pulse   (3.5mm mono minijack)
                        6 Auxiliaries   (3.5mm mono minijack)
                        2 Control Voltage outputs   (3.5mm mono minijack)
                        2 Gate outputs   (3.5mm mono minijack)
                        Expansion port - optional   (15 pin High Density D or 8 pin Mini Din)
                        LCD 2x16 backlit
                        5 LED indicators

Accessories;   Operating Manual, Power cable

Optional Accessories;   DCB port with cable (either 14 pin IEEE or 20 pin bump polarised)
                        KADI/WASP port with cable (either KADI or WASP cable)
                        Pair of ears for rack mounting

Note

The Kenton Electronics Pro-2000 mkII MIDI-CV converter has a built in mains transformer factory set to 230 volts AC 50Hz unless otherwise marked. There is an internal switch to select 115 volts AC if required. Ensure that this adjustment is made by competent service personnel only.

Warranty

The Pro-2000 mkII comes with a 12 month (from purchase date) back-to-base warranty, (i.e. customer must arrange and pay for carriage to and from Kenton Electronics).

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