Owner’s Manual

Warp 9

MAM
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Warp 9 Features

- **MIDI-controllable 12 dB resonant filter.**
- **Filter types include: lowpass, highpass, bandpass and notch (band-stop).**
- **Volume can be modulated via a voltage controlled amplifier (VCA).**
- **Filter modulation via a combination of LFO, envelope and MIDI.**
- **Knob positions can be sent and received via MIDI.**
- **32 program memories.**
- **External analog trigger input.**
- **Switchable distortion effect.**
- **Connections: Filter in/out, trigger in, MIDI IN/out/thru, external power adapter.**
- **Dimensions: standard 19-inch width, 1 rack-unit height**

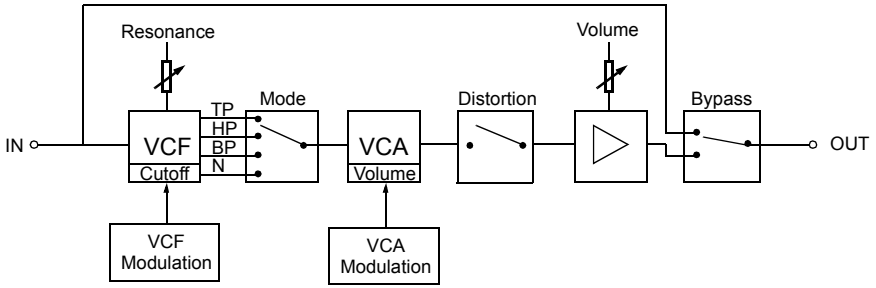
Contents

1 Introduction to the Warp 9

The Warp 9 is a versatile tool for shaping and manipulating audio material. Since this versatility is expressed through the vast number of operations and features that the unit offers, it may, at first seem daunting to a new owner.
The following sections in this first chapter are intended to give you a quick tour through some of the basic features and capabilities of the Warp 9.
In-depth treatments of all of the topics presented here will follow in the main chapters of the manual.

1.1 Warp 9 Concept

The schematic diagram below illustrates the signal flow of the Warp 9:



The audio input signal first passes through a 12 dB voltage-controlled filter (VCF) with variable cutoff frequency and resonance (set via the RESONANCE knob). The MODE function is used to the filter characteristic of the VCF, which can be chosen from the set lowpass (TP), bandpass (BP), highpass (HP) or notch (N).The output from the filter stage then passes through a voltage-controlled amplifier (VCA), which can alter the dynamics of the signal.
Finally, at the output stage, there is a volume control, a switchable distortion effect and a bypass switch.

1.2 Connections

Label	Description	Page
FILTER IN	Filter input	
FILTER OUT	Filter output	
TRIGGER IN	Input for external audio trigger; if this jack is empty, then the FILTER IN signal serves as the trigger	20
MIDI IN	Received MIDI data serve to trigger the envelope and VCA, control filter parameters and select internal programs.	26
MIDI THRU	Copy of data received at MIDI IN	
MIDI OUT	Sends real-time MIDI controller data of edited parameters	26
AC 12V	Input for included AC voltage adapter	

1.3 Controls

Label	Description	Page
A/B	Switches between program bank AS (1-16) and bank B (17-32)	21
PROG	Selects a program within a given bank	21
WRITE	Writes/copies a program	22
CHANNEL	Selects the global MIDI send/receive channel	23
MODE	Selects the filter characteristic TP, HP, BP or N	25
SELECT	Selects the active page within the MODULATION 1 section	28
TRIGGER SOURCE	Selects source (MIDI/analog) for envelope and VCA triggering	8
ENV MODE	Selects envelope mode	9-11
VCA MODE	Selects VCA modulation	12
LFO WAVE	Selects LFO waveform	14-15
LFO RESET	Selects LFO reset mode	16-19
ATTACK	Sets attack time of the envelope	7
DECAY	Sets decay time of the envelope	7
SUSTAIN	Sets sustain level of the envelope	7
RELEASE	Sets release time of the envelope	7
DELAY	Sets onset delay of the envelope	7
LFO RATE	Sets frequency of LFO	13
LFO DEPTH	Sets intensity of filter modulation (cutoff) via LFO	13
VELOCITY	Sets intensity of filter modulation (cutoff) via MIDI velocity	6
KEY FOLLOW	Sets intensity of filter modulation (cutoff) via MIDI note on/off	6
MODULATION	Sets intensity of filter modulation (cutoff) via MIDI mod. wheel	6
TRIGGER LEVEL	Sets volume threshold level for analog triggering	20
ENV MOD	Sets intensity of filter modulation (cutoff) via envelope	5
CUTOFF	Sets filter cutoff frequency	5
RESONANCE	Sets intensity of filter resonance	1
VOLUME	Sets the output volume	20
DISTORTION	Switches the Distortion effect on/off	20
BYPASS	Switches output between filtered and unaltered input signal	20

1.4 Getting Started

Setting up

1. Attach the included AC voltage adapter to the AC 12V jack on the back of the Warp 9 and turn the unit on. Each of the Warp 9's 32 programs has the following preset parameters:

   MIDI Channel: 1
   Filter Mode: TP (Lowpass)
   Trigger Source: AT (analog trigger)
   ENV MODE: N1 (envelope starts beginning of trigger impulse)
   VCA MODE: ON (VCA always on)
   LFO WAVE: Triangle
   LFO RESET: NORM (no reset)
   LFO DEPTH: 0
   MIDI Modulation: VELOCITY, KEY FOLLOW, MODULATION: all off

2. Connect an audio signal source to the Warp 9's FILTER IN jack and connect its FILTER OUT jack to an amplifier or a mixer.

3. Operation without MIDI

   Change the filter parameters RESONANCE and CUTOFF and the filter MODE. Trigger the envelope with the filter input audio signal. Adjust the TRIGGER LEVEL until the trigger LED begins to flicker.

   Modulate the cutoff frequency with the envelope ATTACK, DECAY, RELEASE, SUSTAIN and DELAY.

   To modulate the cutoff frequency with the LFO, adjust the parameters LFO RATE and LFO DEPTH (SELECT 3), and select an LFO waveform via the LFO WAVE knob (SELECT 1).

   The VCA MODE has two positions: In GATE mode, once triggered, the VCA outputs at a constant volume, while in ENV mode, the VCA volume is modulated by the envelope. Try them both.

4. Operation with MIDI

   Connect a MIDI source (for example, a MIDI keyboard) to the Warp 9's MIDI IN jack. Select the mode SINGLE as the trigger source (SELECT 1). Now, trigger the Warp 9's envelope by sending it a MIDI note ON/OFF message (for example press a key on the MIDI keyboard) on the default MIDI channel 1. The TRIGGER LED should blink on and off.

   Now try modulating the cutoff frequency of the VCF via MIDI velocity, key follow and modulation wheel messages on MIDI channel 1. Activate the controls VELOCITY, KEY FOLLOW and MODULATION via SELECT 3. In the center position, where the SELECT LED is blinking, the modulation is turned off.

5. Controlling the Filter via MIDI

   Connect the Warp 9's MIDI OUT to the MIDI input of a sequencer. Set the sequencer into record mode on MIDI channel 1, and turn, say, the CUTOFF knob on the Warp 9. The sequencer should now have recorded MIDI controller change messages which were sent by the Warp 9. Now, when these recorded data are played back to the Warp 9, the VCF cutoff frequency should change exactly as it did while the knob was being turned as the sequence was being recorded. Of course, it is also possible to edit the controller data in the sequencer before sending it back to the Warp 9, just as it is possible to simply generate or draw in the controller data with most modern MIDI sequencers.
   A table of all of the MIDI-controllable parameters supported by the Warp 9 and their corresponding controller numbers appears later in this manual.

6. Storing Programs

   To store the Warp 9's current settings, press the WRITE button. The WRITE LED will begin to blink. If you now press the PROG button, you will be able to select a program location number in which to store the settings. Each program number is reflected on the front panel by a different combination of the TP/HP/BP/N LEDs (the interpretation of the actual program location number is explained in the main manual). If you now press the WRITE button again, the current settings will be written into the Warp 9's memory (to cancel the pending write operation press a key other than WRITE, for example, the CHANNEL button).

7. Further Exploration

   You have now, in principle, acquainted yourself with all of the important basic features of the Warp 9. Many unusual effect can be achieved with the Warp 9's envelope modes (knob ENV MODE, SELECT 1), the LFO various waveforms (knob LFO WAVE, SELECT 1) and the LFO reset mode (knob LFO RESET, SELECT 1).

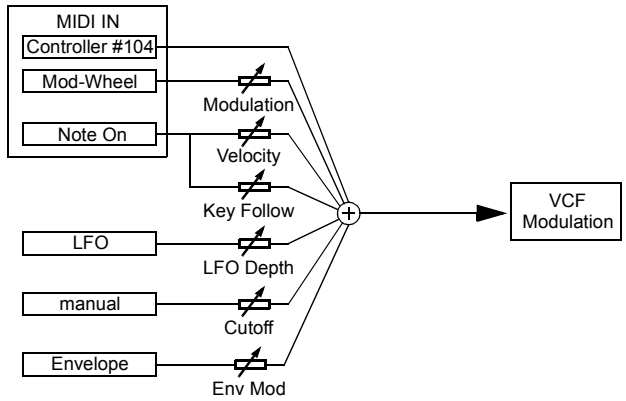
8. Go for It!

   Now, read the rest of the manual, and... have fun!

2 The Warp 9 Operator's manual

Each section of this chapter will detail a specific functionality of the Warp 9.

2.1 VCF Modulation



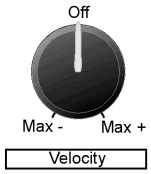
The WARP 9 offers a rich number of sources the modulation of the VCF. These sources can be combined in arbitrary ways for a multitude of effects.

The sources are

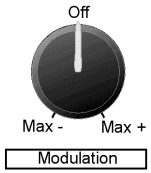
- **LFO**
  The intensity of the LFO modulation can be set via the LFO DEPTH knob.
- **manual**
  The VCF's cutoff frequency can be set manually via the CUTOFF knob.
- **Envelope**
  The VCF's cutoff frequency can be modulated via the Warp 9's envelope generator. The depth of the modulation is set via the ENV MOD knob.
- **MIDI**
  The VCF can also be modulated via MIDI through MIDI controller #104 messages and MIDI modulation wheel messages, as well as by the velocity and note values of MIDI note ON/OFF messages. The intensity of the effect of these data on the cutoff frequency of the VCF can be set via the Warp 9's VELOCITY, KEY FOLLOW and MODULATION controls, as follows:

OFF...MAX +:MIDI notes higher than C3 raise the cutoff frequency; notes lower than C3 lower the cutoff frequency.

Off:	MIDI note data ignored
Off...Max+:	MIDI notes higher than C3 raise the cutoff frequency; notes lower than C3 lower the cutoff frequency.
Max-...Off:	MIDI notes lower than C3 raise the cutoff frequency; notes higher than C3 lower the cutoff frequency.



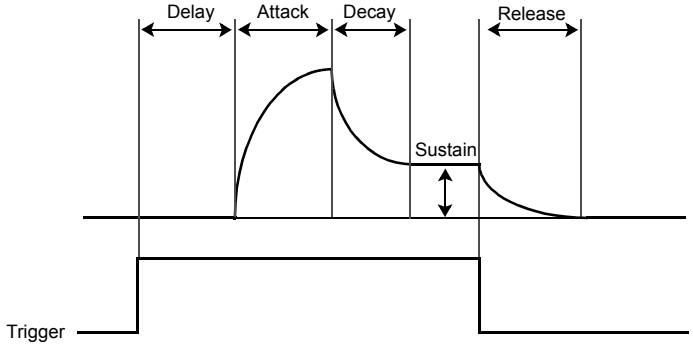
Off:	MIDI velocity data ignored
Off...Max+:	the cutoff frequency rises as MIDI velocity increases
Max-...Off:	the cutoff frequency decreases as MIDI velocity increases



Off:	MIDI modulation wheel data ignored
Off...Max+:	the cutoff frequency rises as MIDI modulation wheel values increase.
Max-...Off:	the cutoff frequency decreases as MIDI modulation wheel values increase.

2.2 Envelope

The Warp 9 has an ADSR-envelope with variable delay. The following diagram shows the change of a typical envelope curve over time:



The envelope parameters can bet set with the corresponding knobs on the Warp 9's front panel under MODULATION 1, SELECT 1.

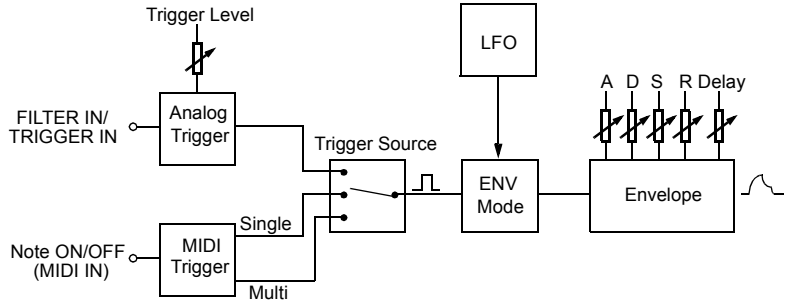
The ranges of the parameters are:

ParameterRange

- **Delay:** 0...1 second
- **Attack:** 1 millisecond... 10 seconds
- **Decay:** 1 millisecond... 10 seconds
- **Sustain:** 0% ... 100%
- **Release:** 1 millisecond... 10 seconds

2.3 Envelope Triggering (Trigger Source - ENV Mode)

The following diagram illustrates the basic principle of the Warp 9's envelope triggering:



The triggering of the envelope occurs either through the presence of an audio input signal on either the FILTER IN or TRIGGER IN jacks (see Section 2.6), or via MIDI note ON/OFF messages. Exactly one of these three trigger sources can be selected via the Warp 9's TRIGGER SOURCE parameter. The trigger signals do not, however, start the envelope directly, but rather are dependent on the setting of the ENV MODE parameter.

Example: the Warp 9 can be configures to ignore trigger signals when the LFO dips below a certain value, or the unit can be set to only accept every second trigger signal.

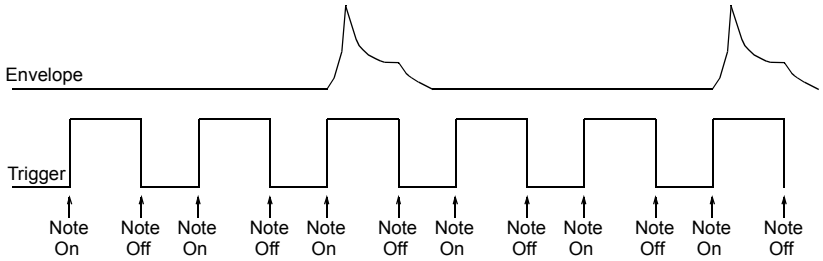
Trigger Source

- **MIDI Single**
  Every MIDI note ON message generates a trigger. The corresponding MIDI note OFF message ends the trigger impulse (that is, the envelope's release phase begins).
- **MIDI Multi**
  a MIDI note ON only generates a trigger when no other MIDI note is being received by the Warp 9 (i.e. every received note ON has been later followed by a corresponding MIDI note OFF; this is equivalent to a MIDI "all notes OFF" message). The trigger impulse ends when each of the received note ONs has had a corresponding note OFF (or, alternatively, an "all notes OFF" has been received).
- **AT - Audio Trigger**
  Triggers are generated by an input audio signal (see Section 2.6).

ENV Mode

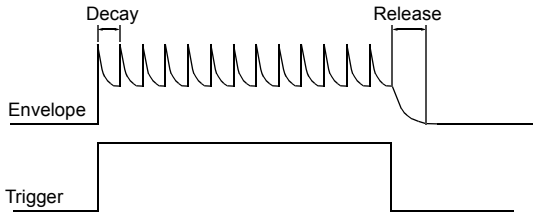
- **N1**
  in this envelope mode, each trigger signal causes the envelope to start.
- **N2,N3,N4,N5**
  in these envelope modes, only every second (N2), third (N3), fourth (N4) or fifth (N5) trigger signal starts the envelope. All other triggers are ignored.

  Example: TRIGGER SOURCE: Single, ENV Mode: N3



- **RPT (Autorepeat)**
  During an active trigger, the envelope automatically restarts when it reaches the sustain phase (i.e. after the decay phase). This retriggering occurs more often as the lengths of the envelope delay, attack and decay phases decrease. The release phase of the envelope will only be reached after the trigger impulse has ended.

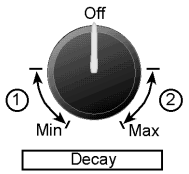
  Example: Delay, Attack min., Sustain 50 %



  Application: Very short delay, attack and decay times will produce a very high autorepeat rate, which will in turn produce a ring modulator-like effect (for example, delay, attack and decay set to minimum, sustain 50%)

- **DLM (Decay-LFO-Modulation)**
  In this mode, the envelope starts via a trigger signal as usual, but the envelope's decay time is dependent on the instantaneous value of the LFO. The intensity of the effect on the decay time depends on the setting of the DECAY know.

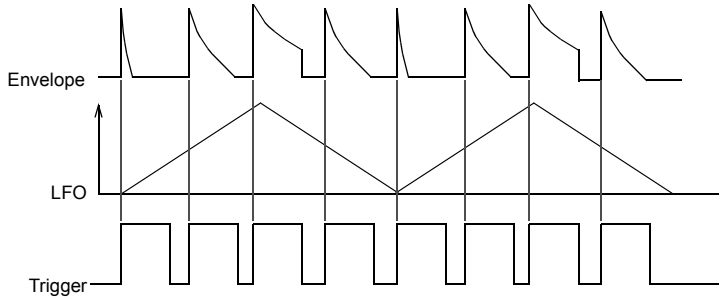
  DECAY settings near the minimum and maximum values are particularly effective.



  Range 1: The decay increases (decreases) as the LFO value increases (decreases). The nearer the knob is turned towards the MIN position, the short the overall decay time.

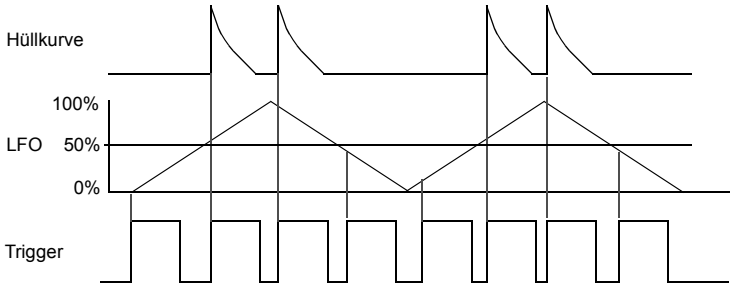
  Range 2: Dependent on the instantaneous value of the LFO, the decay time switches between its maximum (high LFO value) and its minimum (low LFO value) values. The closer the knob is turned towards the MAX position, the higher the proportion of minimal decay times.

  Example: Range1, Triangle LFO waveform, Delay, Attack, Sustain, Release minimum

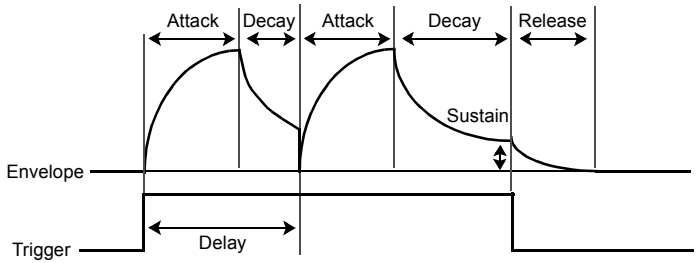


- **LT (LFO-Trigger)**
  A trigger signal only starts the envelope when the instantaneous value of the LFO is greater than 50%.

  Example: Triangle LFO waveform, delay, attack, sustain and release minimum.

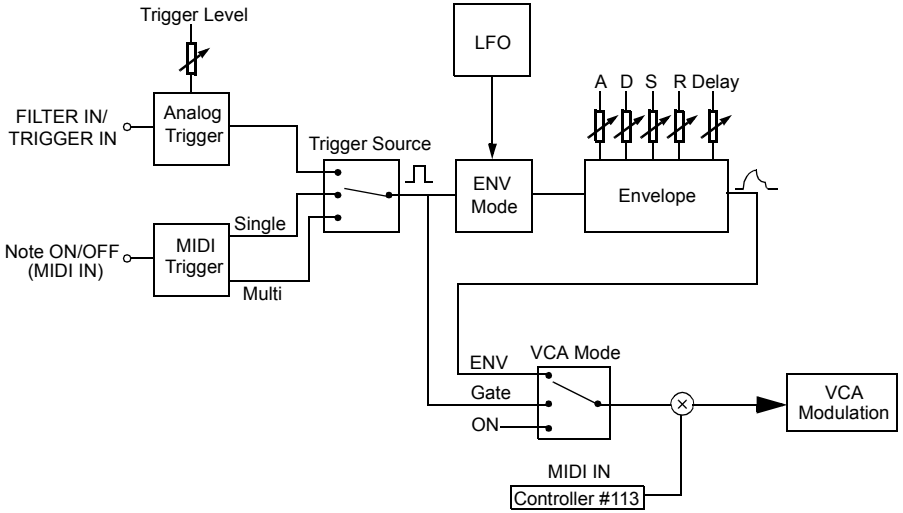


- **RD (Retrigger-Delay)**
  At the beginning of the trigger impulse, the envelope is started without a delay. After the delay period, as measured from the beginning of the trigger, has elapsed, the envelope is restarted (if the trigger signal is still present). Note that this differs from RPT mode in that the envelope is only restarted once. In fact, if the trigger duration is shorter than the decay time, then the envelope will only be started once.



2.4 VCA Modulation (VCA Mode)

The following diagram shows the possibilities for VCA modulation:



VCA Mode

- **ENV**
  The envelope amplitude controls the volume of the VCA. Note that the settings of the TRIGGER SOURCE and ENV MODE parameters must also be taken into account here.
- **Gate**
  An active trigger signal opens the VCA. The VCA is effectively muted in the absence of a trigger signal.
- **ON**
  ON - the VCA is permanently on.

Controller #113 (MIDI IN)

MIDI Controller #113 - The VCA control signals ENV/GATE/ON can also be influenced via MIDI controller #113 messages, which can be used to increase or decrease the output volume of the VCA. The allowed values for Controller #113 range from 0 (VCA is muted) to 127 (maximum VCA volume). Note here that the VCA is always muted in GATE or ENV mode when there is no trigger signal present, or the envelope has not been started. In other words, only an active gate signal or envelope can be influenced by MIDI controller #113 messages.

2.5 LFO (low frequency oscillator)

The LFO can be used to modulate the cutoff frequency of the VCF. Its parameters are LFO RATE, LFO DEPTH, LFO WAVE and LFO RESET, each of which has a corresponding knob in the MODULATION 1 section of the Warp 9.

A description of each parameter follows:

- **LFO Rate**
  The frequency of the LFO, variable between 0.01 Hz and 10 Hz.
- **LFO Depth**
  Intensity of the modulation of the VCF by the LFO, variable between 0 and 100%.
- **LFO WAVE**
  The LFO's waveform. In addition to the "classic" waveforms such as SQUARE, TRIANGLE, SAWTOOTH, INVERTED SAWTOOTH and RANDOM, the Warp 9 also offers LFO waveforms which are manipulated by trigger signals. This feature is particularly useful for creating rhythmic modulations (see Section 2.5.1).
- **LFO RESET**
  A particular strength of the Warp 9's LFO is the LFO RESET functionality. Here, RESET means that the LFO waveform is restarted at its lowest value (i.e. the beginning of the wave cycle) It is possible to cause an LFO reset via, for example, MIDI clock, MIDI note ON/OF or MIDI controller change messages.

The next two sections give detailed descriptions of the LFO WAVE and LFO RESET.

2.5.1 LFO Wave

This section describes the various LFO waveforms of the Warp 9 The descriptions are based on the assumption that no manipulation of the waveform, via LFO RESET is occurring (set the LFO RESET to NORM). The triggered LFO waveform processes the trigger signals selected via TRIGGER SOURCE.

- **For each of the following LFO waveforms, the actual shape of the waveform corresponds to its symbolic representation.**

  Triangle

  Sawthooth

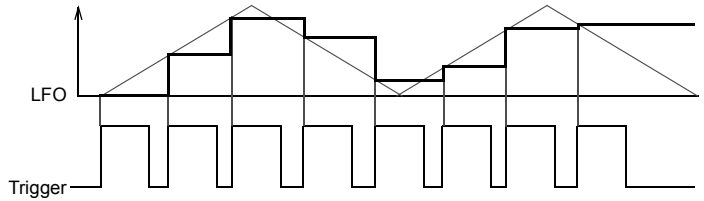
  Inverted Sawtooth

  Square

- **S/H (sample and hold)**
  Is a waveform where the LFO continually generates random values.

- T

  Creates a step-voltage in which an incoming MIDI note ON/OFF or analog trigger signal samples the triangular LFO waveform.
  At each incoming trigger, the LFO takes on the instantaneous value of a triangular LFO, and then retains this value until the arrival of the next trigger. The LFO waveform thus takes on an increasingly random character as the trigger impulses become more and more irregular and the LFO RATE is increased.
  .

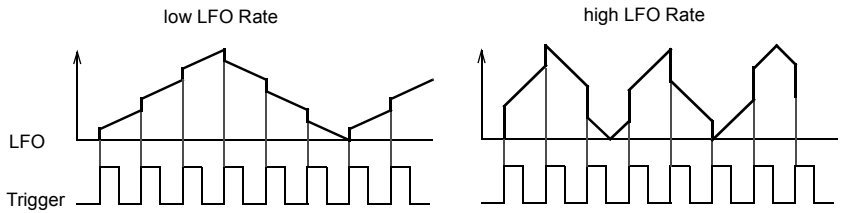


- C

  This waveform is a combination of the triangular LFO waveform and a step-voltage. In the absence of a trigger impulse, the LFO produces a normal triangular waveform. At each trigger impulse, the LFO value either jumps upward suddenly (when the triangle wave is sloping upwards) or drops downward (the triangle is

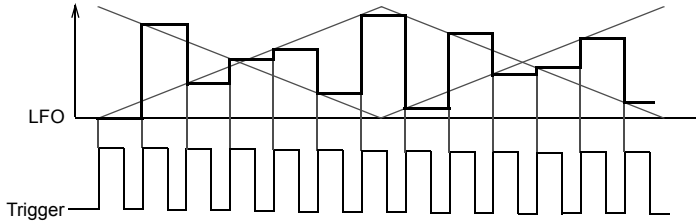
sloping downwards). The height/depth of the jump/drop increases in direct proportion to increases in the LFO RATE.

Example:

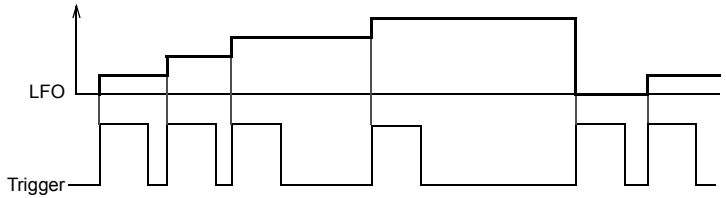


- ⊓⊔ T

This waveform is similar to the ⩘ **T** waveform with the difference that the samples are taken successively from the normal triangular wave and the inverted triangular wave.



- **AT**
  Here, the LFO outputs a constant value, which is incremented by a fixed amount at each trigger impulse. The size of the increment depends on the LFO RATE, with the effect that high rates will produce large jumps in the value. After reaching the maximum value, the LFO starts again at the minimum value.



2.5.2 LFO RESET

- **C2, C4, C8, C16, C32**

  Here, an external MIDI clock drives the LFO RESET after a pre-determined number of quarter notes has elapsed. The choices available for the number of quarter notes are 2 (C2), 4 (C4), 8 (C8), 16 (C16) and 32 (C32).

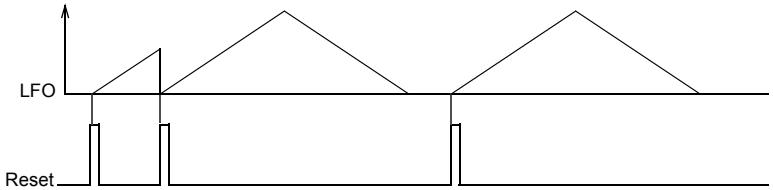
  A RESET affects the various LFO waveforms differently:

- ⩘◿⩙⊓⊔

  The LFO begins at the RESET and stops after one period. If a period has not ended when the reset occurs, then the reset also causes the LFO waveform to restart. The length of the period depends on the LFO RATE setting.

  So that a period lies exactly between two RESET signals, i.e. so that the LFO runs synchronized to MIDI clock, an appropriate LFO RATE must be set.

  Example: Triangle waveform



- **S/H**
  The LFO generates a random value after each RESET. The LFO knob has no effect.

- ⩘ T

  The step voltage from Section 2.5.1 is reset to its minimum value after each RESET. If a period of the triangular wave which generated the step-voltage has elapsed, then the LFO remains at the minimum value.

- ◿ T

  The LFO behaves as in the example above. Trigger signals are ignored.

- **⊓⊔T**

  The step voltage from Section 2.5.1 is reset to its minimum value after each RESET. If a period of the triangular wave which generated the step-voltage has elapsed, then the LFO remains at the minimum value.

- **AT**

  AT - The step-voltage in Section 2.5.1 is reset to its minimal value at each RESET.

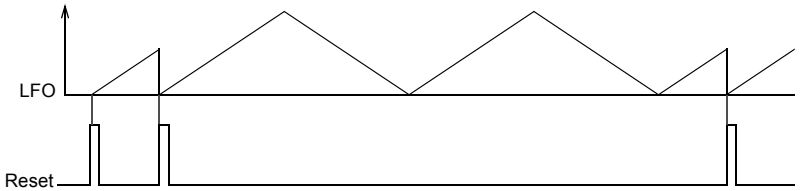
- **T**

  The LFO RESET is caused by a trigger signal (chosen via the TRIGGER SOURCE) setting. A RESET affects the various LFO waveforms differently:

- **/\ /| |\ ⊓⊔**

  The LFO runs permanently; the waveform restarts at the minimum value at the beginning of a RESET trigger.

  Example Triangle:



- **S/H**
  The LFO generates a random value at each RESET trigger. The LFO knob has no effect.

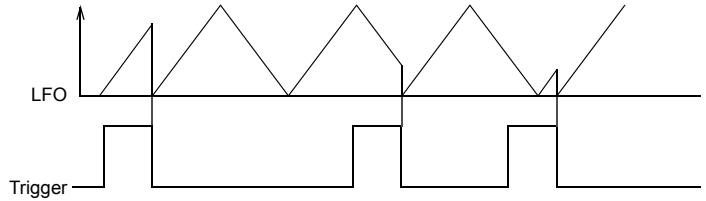
- **All other waveforms**
  The LFO has no effect.

- **TD**
  A RESET affects the various LFO waveforms differently:

- **/\ /| |\ ⊓⊔**

  The LFO runs permanently; the waveform restarts at the minimum value at the end of a trigger impulse.

  Example Triangle:

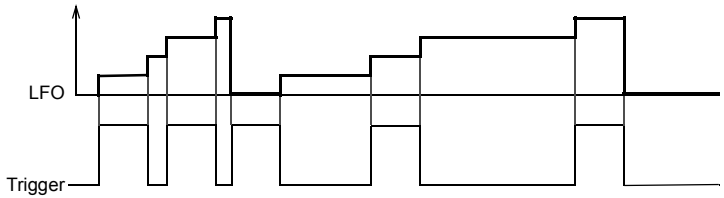


- **S/H**
  The LFO generates a random value at the beginning and end of each trigger impulse. The LFO knob has no effect.

- **/\ /| |\ ⊓⊔**

  A step-voltage is produced as in Section 2.5.1, but occurs at the end of the trigger impulse as well as at the beginning.

  Example AT:

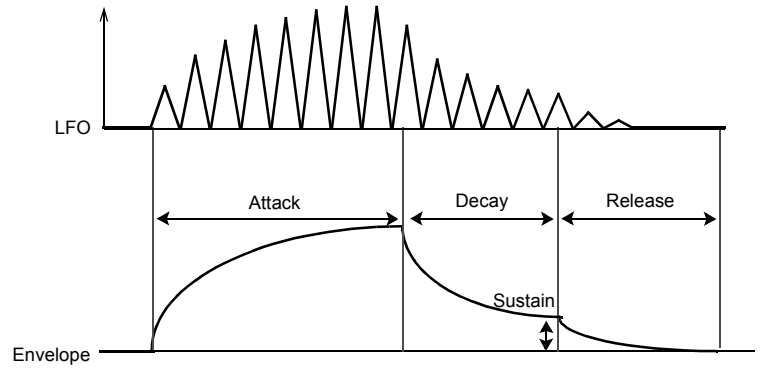


- **EM (envelope modulation)**
  The LFO waveforms are the same as those described in Section 2.5.1 (LFO RESET: NORM).

  No LFO RESET occurs, but the LFO intensity is not only affect by the LFO DEPTH setting, but is also modulated by the envelope.

  For example, the LFO intensity increases during the envelope's attack phase, and then sinks to the envelope's sustain level after the decay phase. The LFO intensity then drops to 0 when the envelope reaches the release phase.

  Example: triangular waveform



- **Norm**
  In NORM mode, the LFO waveforms are like those described in Section 2.5.1. No RESET takes place, and the LFO runs continuously.

MIDI Reset

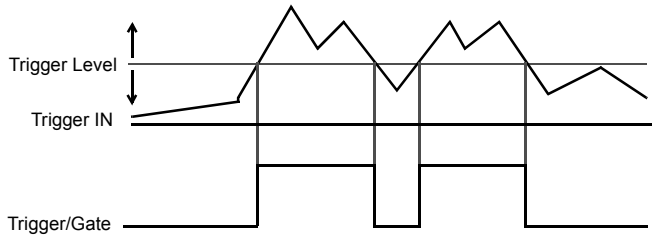
There is also a special MIDI-triggered "one shot" LFO RESET mode available when LFO RESET is set to NORM.

Here, a change in MIDI controller #114 with an arbitrary value will start the LFO as in the modes C2-C32. For example, the LFO waveforms triangle, sawtooth, inverse sawtooth and square. Are reset to the minimum value and then go through exactly one wave cycle. To return to the NORM mode after a "one shot," turn the LFO RESET knob to another mode, and then back to NORM.

2.6 ANALOG TRIGGER

Either an audio signal entering the Warp 9 via the TRIGGER IN jack on the back panel or, when the TRIGGER IN jack is empty, the signal on the FILTER IN jack, can be used as a trigger to generate a VCA voltage, start an envelope, etc. The TRIGGER LEVEL knob is used to set the minimum volume threshold that the input level must reach before a trigger is generated

.



2.7 Output Section

- **Volume**

  The VOLUME knob is used to set the Warp 9's output volume. An excessively high output volume or an input level with too much gain may cause distortion. The volume must be reduced in this case.

- **Distortion**

  If, however, distortion is *desired,* then the DISTORTION effect can be switched to on. The intensity of this effect depends on the unit's VOLUME setting.

- **Bypass**

  This BYPASS button switches the Warp 9's output between the filtered and unfiltered input signal.

2.8 Selecting Programs

The Warp 9 has 32 program memories, which are divided into two banks (A/B) of 16 programs each. Each program can contain the following data:

- **Filter Mode**
- **All Modulation1 parameter**
- **ENV MOD, Cutoff and Resonance**

The OUTPUT section settings (VOLUME, DISTORTION and BYPASS), as well as the TRIGGER LEVEL cannot be stored with a program.

The MIDI send and receive channel is global, that is, shared by all programs. The default MIDI channel can be stored with the so-called active program number, which is the default program automatically loaded by the Warp 9 when the unit is powered up.

Manual Program Selection:

1. Press the PROG button until the PROG LED begins blinking.
2. Now press the PROG button to step through the programs one after the other. This will be the programs 1-16 which are contained in bank A if the A/B LED is not lit, and programs 17-32 if bank B is selected (the A/B LED is lit). The four LEDs TP/HP/BP/N serve as the display of the program number of each of the 16 programs in a given bank.
3. To switch between the program banks A and B, press and hold the PROG button for longer than 1 second. The program bank will switch. The following diagram shows the correspondence of the TP/HP/BP/N LEDs to the program numbers.

A/B	TP	HP	BP	N	Prog
○	○	○	○	○	1
○	●	○	○	○	2
○	○	●	○	○	3
○	●	●	○	○	4
○	○	○	●	○	5
○	●	○	●	○	6
○	○	●	●	○	7
○	●	●	●	○	8
○	○	○	○	●	9
○	●	○	○	●	10
○	○	●	○	●	11
○	●	●	○	●	12
○	○	○	●	●	13
○	●	○	●	●	14
○	○	●	●	●	15
○	●	●	●	●	16

A/B	TP	HP	BP	N	Prog
●	○	○	○	○	17
●	●	○	○	○	18
●	○	●	○	○	19
●	●	●	○	○	20
●	○	○	●	○	21
●	●	○	●	○	22
●	○	●	●	○	23
●	●	●	●	○	24
●	○	○	○	●	25
●	●	○	○	●	26
●	○	●	○	●	27
●	●	●	○	●	28
●	○	○	●	●	29
●	●	○	●	●	30
●	○	●	●	●	31
●	●	●	●	●	32

MIDI Program Selection:

Changing programs via MIDI can be done via MIDI program change messages with the appropriate program number between 1 and 32, inclusive. Note that the Warp 9 only reacts to program changes on its global MIDI send and receive channel.

2.9 Storing and Copying Programs

If a program's parameters have been changed, then these changes will be lost if another program is selected or the Warp 9 is shut off. In order to retain the changes, it is necessary to store the program in the Warp 9's program memory.

Storing a Program

1. Press the WRITE button briefly until the WRITE LED beneath it begins to blink.
2. Press the WRITE button again. Now all of the parameters of the currently selected program will be stored. After completion of the storage operation, the Warp 9 will automatically revert to the program selection mode.

The write operation can be cancelled by pressing either the CHANNEL or MODE button before step 2 above.

Copying a Program

1. Press the PROG button briefly, and load the program, which is to be copied.
2. Press the WRITE button until the WRITE LED begins to blink.
3. Press the PROG button briefly (the WRITE LED will continue to blink) and select the destination the destination program location. Press the PROG button longer to switch between the A and B banks, if desired. The display of the destination program location number is as described in Section 2.8
4. Finally, press the WRITE button again to complete the copy operation.

The copy operation can be cancelled by pressing either the CHANNEL or MODE button before step 4 above.

2.10 MIDI SEND AND RECEIVE CHANNEL

The Warp 9 sends and receives the following channel-dependent MIDI data:

- **Program change (received)**
- **Note ON/OFF for envelope triggering (received)**
- **Control change messages for parameter editing (sent/received)**

A common MIDI receive/send channel can be set on the Warp 9 as follows:

Setting the Global MIDI Send/Receive Channel:

1. Press the CHANNEL button until the CHANNEL LED below it begins to blink.
2. Now, each press of the CHANNEL button increments the Warp 9's current MIDI channel by 1. The four TP/HP/BP/N LEDs display the current MIDI channel in the same fashion as was described in Section 2.8 for the program numbers.

TP	HP	BP	N	Channel
○	○	○	○	1
●	○	○	○	2
○	●	○	○	3
●	●	○	○	4
○	○	●	○	5
●	○	●	○	6
○	●	●	○	7
●	●	●	○	8
○	○	○	●	9
●	○	○	●	10
○	●	○	●	11
●	●	○	●	12
○	○	●	●	13
●	○	●	●	14
○	●	●	●	15
●	●	●	●	16

Storing the MIDI Channel:

To store the MIDI send/receive channel along with the default active program parameters so that they aren't "forgotten" when the unit is powered down, follow these steps.

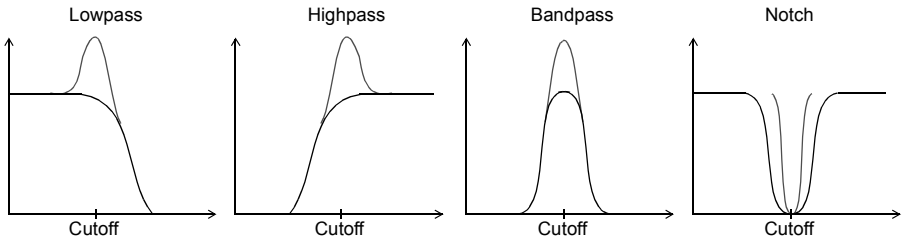
1. Press the WRITE button until the WRITE LED below it begins to blink. The operation is now complete.
2. Press the PROG, CHANNEL or MODE button to exit the function.

2.11 Filter Mode

The filter characteristic of the Warp 9's VCF can be selected as:

- **Lowpass (TP- from the German "*Tiefpass*")**
  The lowpass filter allows all signals below the cutoff frequency through and blocks all higher frequency signals
- **Highpass (HP)**
  The highpass filter allows all signals above the cutoff frequency through and blocks all lower frequency signals.
- **Bandpass (BP)**
  The bandpass filter allows only a certain frequency range around the cutoff frequency through.
- **Notch-Filter (N)**
  The notch filter cuts out signals within a range of frequencies around the cutoff frequency. This characteristic is also known as "bandstop".

The frequency characteristics near the cutoff frequency can be changed via the RESONANCE setting (the dotted line on the diagram is for a filter with a high RESONANCE setting).



Selecting the filter mode

3. Press the MODE button briefly until the MODE LED below it begin to blink.
4. Press the MODE button briefly to step through the filter types until the desired characteristic is selected.

TP	HP	BP	N	Mode
●	○	○	○	Lowpass
○	●	○	○	Highpass
○	○	●	○	Bandpass
○	○	○	●	Notch

3 MIDI Control

The Warp 9 sends or receives the following MIDI data:

- **Program changes (1-32, receive-only, on the Warp 9's global MIDI channel)**
- **MIDI clock (for LFO RESET)**
- **MIDI Note ON/OFF (for ENV/VCA trigger, receive-only, on the Warp 9's global MIDI channel)**
- **MIDI Controller changes (sent and received on the global MIDI channel)**

If a parameter is changed by adjusting a front-panel knob, then the Warp 9 sends MIDI controller change messages on its output MIDI channel.

A MIDI sequencer can be used to record these controller changes.

Playback of such a sequence of controller changes to the Warp 9 will cause the Warp 9's parameters to change in the same way that they did while the knobs were being moved.
The following table lists all of the MIIDI controller messages sent and received by the Warp 9, and their parameter ranges

Parameter	Controller Number	Controller Values
ENV MOD	103	0...127
CUTOFF	104	0...127
RESONANCE	105	0...127
ATTACK	106	0...127
DECAY	107	0...127
SUSTAIN	108	0...127
RELEASE	109	0...127
DELAY	110	0...127
LFO RATE	111	0...127
LFO DEPTH	112	0...127

Controller parameter 0 corresponds to knobs in the MINIMUM position,

Controller parameter 127 corresponds to knobs in the MAXIMUM position.

- The MIDI control messages in the following table can only be received by the Warp 9:

Parameter	Controller Number	Controller Values
VCA Control (see 2.4)	113	0...127
LFO RESET (see 2.5.2)	114	0...127
Filter MODE	102	1:TP 2:HP 4:BP 8:N
MOD WHEEL	1	0...127

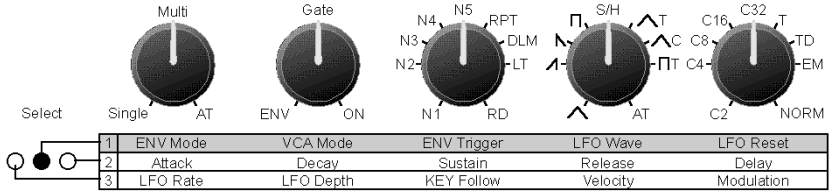
4 Modulation 1 Section

This section of the Warp 9 is sub-divided into the three groups SELECT 1, SELECT 2 and SELECT 3. The SELECT button is used to elect the currently active group. The five knobs in the MODULATION 1 section take on the functions written below them de-pendent on which of the three SELECT groups is active. The range of values that can be set by a given knob is dependent on which parameter the knob adjusts within the current SELECT group.

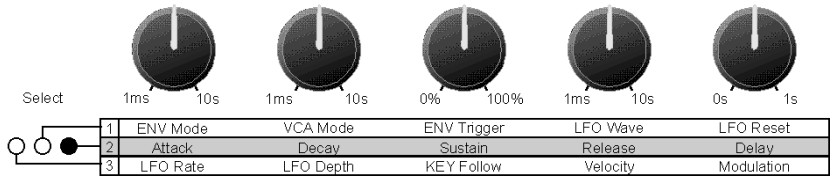
If the SELECT group is changed during an editing session, then the positions of the knob in the MODULATION 1 section will, in general, not reflect the current values of the different set of parameters to which they now correspond. However, as soon as you change the position of a knob, the value of the parameter will immediately jump to the value corresponding to the knob's position.
For example, suppose that you are in the SELECT 2 parameter group, and set the ATTACK knob to minimum. Then suppose that you change from SELECT 2 to SELECT 3, and set the LFO RATE to maximum, and then return to SELECT 2.
Now, although the ATTACK knob is set to maximum, the actual value of the ATTACK parameter is still minimum. Now, moving the ATTACK even slightly will cause the ATTACK value to change abruptly from the minimum to something near the maximum.

The knobs for each of the parameter groups SELECT 1, SELECT 2 and SELECT 3 have different types and ranges of values, which are summarized in the following diagrams:

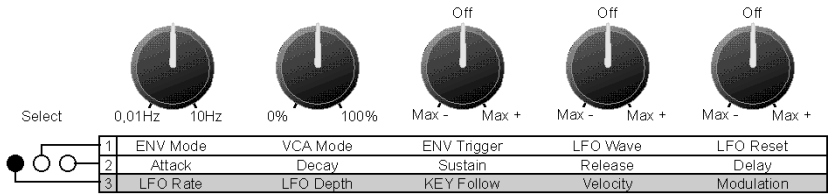
Select 1:



Select 2:



Select 3:



5 Appendix

Recalibrating the Warp 9's Knobs

If for some reason the markings or positions of the knobs on the Warp 9 no longer correspond to their valid parameters (for example, when a knob is replaced), it is possible to recalibrate the knob positions and store them permanently.

The procedure is as follows:

1. Turn the Warp 9 while pressing the WRITE and PROG keys simultaneously. The SELECT and TRIGGER LEDs should stay on continuously, and the TP, HP and BP LEDs should be off.

2. The calibration process involves setting each of the five knobs in the MODULATION 1 section simultaneously to a preset position. These seven positions are shown below using the LFO RESET knob as an example (it may help to think of these seven knob positions as "9 o'clock, 10 o'clock, 11 o'clock, 12 o'clock, 1 o'clock, 2 o'clock and 3 o'clock")

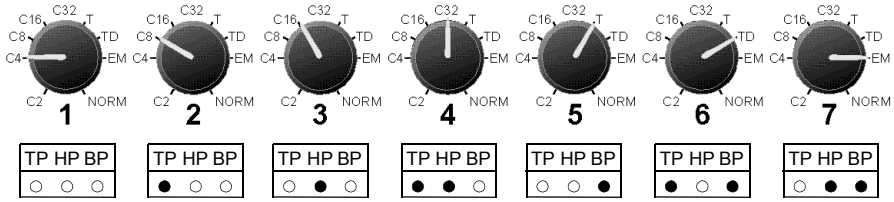
   Now turn <u>all</u> of the five knobs to position 1 (9 o'clock). Each knob should point to the second value on its scale (for example, LFO RESET should point to C4, LFO WAVE to SAWTOOTH, ENV MODE to N2, etc.) Note that although the TRIGGER SOURCE and VCA MODE knobs have no value under Position 1, they should still be set to the 9 o'clock position.

After all of the knobs are positioned properly, press the WRITE button to store the position information.

Now, press the PROG button briefly. The TP, HP and BP LEDs should now appear as shown in the diagram under calibration Position 2 (that is, only TP should be lit). Adjust each of the knobs to Position 2 (10 o'clock; for example LFO RESET to C8, LFO WAVE to INV SAWTOOTH, etc.).

Again, press the WRITE button to confirm and store the calibrated positions.

Repeat the above procedure for the Positions 3 through 7, using the LED combinations given.



3. After completing the entire procedure, press the CHANNEL button to exit the calibration mode.

4. You can check the accuracy of the calibration by selecting a page under MODULATION 1 and turning the knobs. As usual, the SELECT LED will light continuously when a knob is set to a valid parameter value, and blink otherwise.

Reinitialization the Warp 9's Program Memories

It is possible to completely reinitialize the Warp 9's program memories by holding the CHANNEL and MODE buttons down while turning the unit's power on. The program memory locations will be sequentially erased and reloaded with the following preset parameters:

MIDI Channel:	1
Filter Mode:	TP (Lowpass)
Trigger Source:	AT (analog Trigger)
ENV Mode:	N1 (envelope starts beginning of trigger impulse)
VCA Mode:	On (VCA always on)
LFO Wave:	Triangle
LFO Reset:	Norm (no reset)
LFO Depth:	0
MIDI Modulation:	VELOCITY, KEY FOLLOW, MODULATION: all off

The reinitialization procedure is completed when the PROG LED begins to blink. The Warp 9 then returns to its normal operating mode.

IMPORTANT SAFETY INSTRUCTIONS

Read all instructions before using the Warp 9

Do not use the Warp 9 near water - for example near a bathtub, washbowl, kitchen sink, in a wet basement, on a wet bar, or near or in a swimming pool.

The Warp 9 should be situated so that its location or position does not interfere with its proper ventilation.

The Warp 9 should be located away from heat sources such as radiators, heat registers, fireplaces, stoves, or ovens.

The Warp 9 should only be connected to a power supply of the type described in the operating instructions and as marked on the product.

The power supply of the Warp 9 should be unplugged from the outlet when left unused for a long period of time.

Care should be taken so that objects do not fall and liquids are not spilled into the enclosure of the Warp 9 through openings.

The product should be serviced by qualified service personnel when:

- the power supply cord has been damaged; or
- Objects have fallen, or liquid has been spilled into the product; or
- the product has been exposed to rain; or
- the product does not appear to operate normally or exhibits a marked
- change in performance; or
- the product has been dropped or the enclosure damaged.

All servicing should be referred to qualified service personnel.