PUBLISON KB 2000

PRELIMINARY NOTICE

SUMMARY

SUMMARY CONTINUATION

0 - CONNECTION

0-1) Between DHM 89 B2 and KB 2000

Connect together the remote control connectors of DHM 89 B2 and of KB 2000 by means of the remote control cable.

0-2) Inputs

0-2-1) Line inputs:

- Two separate line levels can be entered in the two inputs of the DHM 89 B2.
- The back panel switch of the KB 2000 must be set on the "LINE INPUT OF DHM" position.

0-2-2) Micro input:

- Connect an external microphone on the "MICRO INPUT" of KB 2000.
- The back panel switch of the KB 2000 must be set on the "MICRO OF KEYBOARD" position.

0-3) Outputs

0-3-1) Mode "TRUE STEREO": Each output can be used separately with two different functions between left and right channel.

0-3-2) Mode "QUASI STEREO": In most of the cases, the two outputs of DHM 89 B2 must be mixed together at the same level. Mainly when the KB 2000 is used in biphonic mode, a mismatch between left and right levels output mixing produces level changes from a note to the following.

1 - LEVEL ADJUSTMENT

1-1) When using the line inputs of the DHM, the "BALANCE" potentiometer of the KB 2000 must be completely set on "KEYBOARD".

1-2) When using the micro input of the KB 2000,
- Adjust the input gain with the "MICRO LEVEL" potentiometer.
- Adjust the balance between the direct sound (i.e. the signal from the microphone) and the signals delivered by the keyboard via the DHM by means of the "BALANCE" potentiometer.

1-3) Input gain of DHM: For optimum signal to noise ratio, the "INPUT GAIN" potentiometers of DHM must be set so that the "INPUT LEVEL" LED vu-meters indicate a 0 dBm level for mean levels of the input signal (green and yellow LED lighten up).

2 - BASIC SETTINGS

The following basic settings operate for any selected function . They must be checked over carefully before playing the keyboard, otherwise a wrong operation can occur.

2-1) "KEYBOARD GENERAL" switch:

- "OFF" position: All the functions of the keyboard are suppressed and the DHM operates as if it were alone

- "ON" position: The "DELAY", "PITCH RATIO", "CROSSPOINT 1", "CROSSPOINT 2" manual settings are suppressed and replaced by remote controls provided by the KB 2000. Two digitally controlled amplifiers within the KB 2000 are inserted in the outputs of the DHM to generate the envelopes of output signals.

- When going from "OFF" to "ON" position, the left and right pitch ratios are preset on the third DO key position (for semitone operation and trimmer on 0, the corresponding ratio is 1,00).

2-2)"SEMITONE-QUARTER-TONE" back panel switch:

- On "SEMITONE" position, the interval between two successive keys is one semitone. The keyboard covers the entire range of pitch-ratios of the DHM, from 0,25 to 2,00 (i.e. from -2 until +1 octave).

- On QUARTER-TONE A position, the interval between two successive keys is one quarter-tone. The lowest key remains unchanged, compared with the semitone position. The keyboard covers the range of pitch-ratios from 0,25 until 0,707.

- On QUARTER-TONE B position, the interval between two successive keys is one quarter-tone. The highest key remains unchanged, compared with the semitone position. The keyboard covers the range of pitch-ratios from 0,707 until 2,00.

2-3) MODE SWITCH

- On "LEFT CHANNEL" position, the keys drive only the left channel.

- On "RIGHT CHANNEL" position, the keys drive only the right channel.

- On "BIPHONIC MODE" position, the keys drive the both channels. A priority logic defines the channel of the DHM which is driven by a given key. The principal rules of this logic are:
  - If only one key is pressed, the selected channel is the one which was not selected by the previous pressed key. This rule allows each note to have the maximum possible sustaining time.
  - If a key remains pressed, the corresponding selected channel of the DHM remains latched on this note. Other notes are played only on the other channel.

2-4) "SUSTAIN-PUSH/PLAY" switch :

- On "SUSTAIN" position, the notes are sustained even if the corresponding keys are released. However they can be cancelled in two cases
  - If the envelope generator is into service, a note fades out when the "HOLD" and "RELEASE" times had passed.
  - If new keys are pressed, new notes can take place if the old key is released.

- On "PUSH-PLAY" position, a note can be heard only if the corresponding key remains pressed. However the sound can fade out, even if the corresponding key is pressed, when the envelope generator is into service and when the "HOLD" and "RELEASE" times had passed.

2-5) "TRIMMER":

- This potentiometer sets the general tuning of the keyboard. When it is on "0" and for "SEMITONE" position, the keyboard covers exactly the range of pitch-ratios: 0,25 to 2,00, and the third DO key gives the pitch-ratio 1,00.

- The pitch-ratios are digitally controlled by frequency synthesizers which are driven by the central microprocessor, so that the tuning cannot change in the time.

2-6) "SLOPE":

- The "SLOPE" potentiometer adjust for both channels the transition time of pitch-ratio from each note to the following. When it is not on "0", the resulting effect is a glissando. When it is on "0", the glissando time is null. When it is on "10", the glissando time is maximum (about 5 second).

3 - ENVELOPE

3-1) "OFF-REM-ON" switch:

- On "OFF" position, the notes are emitted at a constant level.

- On "ON" position, the levels of the notes are driven for each channel by an envelope generator which is triggere by the attacks of the notes. The form of the envelopes is set by the "ATTACK TIME", "HOLD TIME", "RELEASE TIME" settings.

- On "REM" position, the three envelope settings are controlled by the external monitor. When no monitor is connected, the manual settings remain active.

3-2) "ATTACK TIME":

- Once a note is made, the level of the note increases from zero to the maximum level during a time which is set by the "ATTACK TIME" potentiometer. This time is minimum on "0", maximum on "10".

3-3) "HOLD TIME":

- As soon as the attack time is finished, the level of the note remains at its maximum level during a time which is set by the "HOLD TIME" potentiometer. It is the shortest on "0", and infinite on "10".

3-4) "RELEASE TIME":

- As soon as the hold time is finished, the level of the note decreases according to a logarithmic curve. The decreasing time is set by the "RELEASE TIME" potentiometer. It is minimum on "0", maximum on "10".

4 - DIRECT MODE

4-1) Selection of the direct mode:

- Set the "MEMORY SYNCHRO" switch on "OFF".

- Set the "REVERSE SYNCHRO" switch on "OFF".

- If the DHM 89 B2 has the option "5000 mS", set the "SHORT/LONG" switch on "SHORT".

- In preference set the DHM in "QUASI-STEREO" mode, "20 kHz BANDWIDTH".

- Set the DHM 89 B2 in "PITCH-SHIFTING"

4-2) Delay adjustment:

- Set the display selection switches of DHM on "CROSSPOINT 1".

- Adjust the "ADDED DELAY" potentiometer so that the display of DHM shows 0,030 s (in direct mode, crosspoint 1 = added delay).

- The added delay cannot be lower than 0,030 s, otherwise "clics" or "glitches" can occur for pitch-ratios higher than 1,00.

- When the bandwidth selection is changed, the added delay is also changed; the added delay must be reset again.

- Higher added delays can be set without disadvantage.

- In direct mode, the value of added delay is also displayed for each channel by a 30 LED array which is called "INSTANTANEOUS DISPLAY OF MEMORY READING POSITION". The array is red for left channel yellow for right channel. The LED's are numbered from 1 to 30. The value given by each LED changes as a function of selected bandwidth, true-stereo or quasi-stereo mode, or DHM option. The following table gives for each case the maximum possible delay (which is shown by the LED N° 30) and the delay step from one LED to the following.

Table 1: Values of maximum delay and of LED arrays steps in ms

DHM OPTION	MODE	SELECTED BANDWIDTH	MAXIMUM DELAY		DELAY FOR EACH LED STEP	
1200 ms	QUASI-STEREO	5 kHz	1200		40	
		10 kHz	600		20	
		20 kHz	300		10	
	TRUE STEREO	5 kHz	600		20	
		10 kHz	300		10	
5000 ms			SHORT	LONG	SHORT	LONG
	QUASI-STEREO	5 kHz	480	4800	16	160
		10 kHz	240	2400	8	80
		20 kHz	120	1200	4	40
	TRUE STEREO	5 kHz	240	2400	8	80
		10 kHz	120	1200	4	40

5 - MEMORY SYNCHRO MODE

All the corresponding settings are within the "MEMORY SYNCHRO" frame of th front panel of the KB 2000.

5-1) Principle

When a sound is memorized inside the DHM, the memory synchro mode allow the synchronization of the reading of the memorized sound with the attacks of the notes. It is possible to set separately the beginning of the sound, the resonnant part and the speed of reading.

5-2) Selection of the memory-synchro mode:

- Preset the DHM in pitch-shifting mode, and quasi-stereo mode.

- If the 5000 ms DHM option is used, set the "SHORT/LONG" switch on "LONG".

- Set the"OFF/REM/ON" switch on "ON".

- Set the "LEFT CHANNEL" and/or "RIGHT CHANNEL" switches on "ON" according to the wanted choice for memory-synchro mode: left channel only, right channel only, or both channels.

5-3) Memorization of a sound:

- In manual mode:

  - Enter a sound in the DHM.

  - When the "MEMORY LATCH" button of the DHM is pressed, the piece of sound which was entered before the moment where the button was pressed remains latched in the memory. The length of memorized sound depends upon selected bandwidth and DHM option. It is equal to maximum delay of direct mode, and is given by table 1. (see section 4-2).

- With external monitor:

  The external monitor records a great number of various sounds with each their number. When a new sound is called by its number, the memorization of the new sound is automatically made.

5-4) Display

The LED arrays called "INSTANTANEOUS DISPLAY OF MEMORY READING POSITION" show at every moment the point of the memory which is read for each channel. The LED N° 1 shows the beginning of the sound, the LED N° 30 the end of the memorized sound.

5-5) "START-POINT":

When a key is pressed, the reading of the memory starts at a point which is adjusted by the "START-POINT" potentiometer.

5-6) "END POINT":

As soon as the note has started at the start-point, the reading of the memory continues up to the end point, which is set by the "END POINT" potentiometer.

- If the end point is higher than the start point, the sound is read in the original sense.

- If the end point is lower than the start point, the sound is read in the reverse sense, a little as a magnetic tape running reversed.

5-7) "RETURN POINT"

- As soon as the reading of the memorized sound has reached the end point, the reading goes from end point to return point, which is set by "RETURN POINT" potentiometer.

- When the reading has reached the return point, it goes again to the end point.

- To summer, the return point and the end point are the limits of the sustaining area of the memorized sound. This sustaining cycle continue until there is a new key pressed, which creates a new cycle beginning at the start point.

5-8) Two sustaining modes:

5-8-1) Serrated mode: When the end point is higher than the return point, the transition from the end point to the return point is immediate, and the transition from the return point to the end point is made with a speed which is set by the "SPEED" potentiometer (see section 5-9). The resulting curve, in terms of time, has a serrated form.

5-8-2) Triangle mode: When the end point is smaller than the return point, the transitions from the end point to the return point and from the return point to the end point are both made with a speed which is set by the "SPEED" potentiometer. The resulting curve, in terms of time, is triangular.

5-9) "SPEED":

5-9-1) Constant-speed mode: When the "SPEED" potentiometer is set equal or higher than "1", it adjusts the speed of the reading of the memory. The resulting speed does not depend on the selected key. For example if a rhythm is recorded in the memory, the speed sets the tempo of the rythm, which is not dependant on the pitch of the notes.

5-9-2) "FREE" mode: When the "SPEED" potentiometer is on the "FREE" position, the memory is read in a linear mode, without special computation. Contrary to the constant-speed mode, where the sound is submitted to a complex calculation to be forced to a given speed. The result is a more natural sound, but the speed depends on the pitch-ratio. For example the sound is read at its natural speed for pitch-ratio 1,00, and the speed is twice as fast for pitch-ratio 2,00.

5-9-3) Choice between constant-speed and free modes:

- The constant-speed mode is useful for sounds where the rhythm content has importance, for example a rhythm or a piece of speech. But for some sounds, the necessary computing can be audible.

- The free mode is useful for sounds where the rhythm content has no importance: for example single notes of brass, guitar, piano, gong, etc...

6 - REVERSE SYNCHRO MODE

All the corresponding settings are within the "REVERSE SYNCHRO" frame ot the front panel of the KB 2000.

6-1) Principle

When the DHM is set alone in the reverse mode, the tempo of the original sound is modified in a random way. The "REVERSE SYNCHRO" mode synchronizes the reversed sequences with the attacks of the sound,so that the tempo is preserved, with only a constant added delay.

6-2) Selection of the reverse-synchro mode:

- Preset the DHM in pitch-shifting mode

- If the 5000 ms DHM option is used, set the "SHORT/LONG" switch on "LONG".

- Set the "OFF/ON" switch on "ON".

- Set the "LEFT CHANNEL" and/or "RIGHT CHANNEL" switches on "ON" according to the wanted choice for reverse synchro mode: left channel only, right channel only, or both channels.

- If a channel is selected on memory synchro mode, this function has priority on reverse synchro mode. In that case the corresponding "OFF" green LED lightens.

6-3) "DELAY" setting:

- For reverse function the delay can never be null: It is necessary to wait until a piece of sound has entered the DHM, before reversing it.

- The "DELAY" potentiometer adjust this added delay, which is also the duration of the reversed sequence. If it is too short, the effect is not very sensitive. If it is too long, the shift between the direct and the reversed sound can be cumbersome.

- The value of the delay is displayed by the LED arrays "INSTANTANEOUS DISPLAY OF MEMORY READING POSITION". See table 1 for the corresponding value in ms.

- The maximum possible value of delay in reversed mode is reduced by half, compared with direct mode.

6-4) "THRESHOLD" setting:

- When the level of input signal becomes higher than the level which is set by the "THRESHOLD" potentiometer, a reverse cycle is triggered. The "THRESHOLD" must be set so that the reverse cycles are triggered by the main attacks of the sound, and not by the small levels.

- The triggering of a reverse cycle is shown by the displacement of the delay display on the LED arrays.

6-5) "NOISE GATE" switch:

- When the "NOISE GATE" switch is "OFF", at any time a reverse sequence is not active, the sound is transmitted in direct mode.

- When the "NOISE GATE" switch is "ON", only the reversed sequencies are transmitted.

7 - VIBRATO

All the corresponding settings are within the "VIBRATO" frame of the front panel of the KB 2000.

7-1) "OFF/REM/ON" switch:

- On "OFF" position, the vibrato does not operate.
- On "REM" position, (REM = remote), all the settings are driven by the external monitor.
- On "ON" position, the vibrato is sent on both channels. The result is a modulation of the pitch of the notes, which is adjusted by the settings described below.

7-2) Regular mode:

- In regular mode, the pitch of the notes is continuously modulated by a regular wave which is adjusted by the three basic settings: "FREQUENCY", "SHARPNESS", "DEPTH" (green knobs).
- To obtain regular mode, the three modulator settings (yellow knobs) must be set on "0", so that the green and red LED are swiched off.

7-3) Basic settings:

7-3-1) "FREQUENCY": The "FREQUENCY" knob sets the frequency, or speed of the vibrato

7-3-2) "SHARPNESS": The "SHARPNESS" knob sets the shape of the vibrato wave. On "0" it is a sine-wave. On "10" it is a square wave. Intermediate positions give a trapezoidal wave with various slopes.

7-3-3) "DEPTH": The "DEPTH" knob sets the amplitude of the modulating vibrato wave, i.e. the importance of the changes in pitch. It is null on "0". The peak change is ± 1 tone on "10".

7-4) Modulated mode:

- In modulated mode, the vibrato shape is not static and vary in terms of time.
- Each basic parameter can be modulated by an additive shape
- This shape is triggered by the attacks of the notes.
- It has an increasing part, which is set in duration by the "ATTACK TIME" knob, and a decreasing part which is set in duration by the "RELEASE TIME" knob. Then it is sent to modulate each basic parameter by means of the yellow control knobs.

7-5) Intensity and way of modulation

- The intensity and way of modulation are set for each basic parameter by a yellow knob.

- If a yellow knob is on "0", the corresponding parameter is not modulated.

- If a yellow knob is set on a positive value, the corresponding red LED lightens and the corresponding parameter is increased when the modulation shape occurs (after the attack of the note).

- If a yellow knob is set on a negative value, the corresponding green LED lightens and the corresponding parameter is decreased when the modulation shape occurs.

7-6) Examples:

- Vibrato null on attacks of the notes, incoming after about 2 second:

  - DEPTH = 2
  - DEPTH MODULATOR = -5
  - ATTACK = 0
  - RELEASE = 7
  - FREQUENCY = 8
  - FREQUENCY MODULATOR = 0
  - SHARPNESS = 0
  - SHARPNESS MODULATOR = 0

- Vibrato null in sustaining mode, incoming on attacks of the notes:

  - DEPTH = 0
  - DEPTH MODULATOR = +2
  - ATTACK = 0
  - RELEASE = 7
  - FREQUENCY = 8
  - FREQUENCY MODULATOR = 0
  - SHARPNESS = 0
  - SHARPNESS MODULATOR = 0

- Fast vibrato at beginning of the notes, slow during the sustain:

  - FREQUENCY = 3
  - FREQUENCY MODULATOR = +4
  - ATTACK = 0
  - RELEASE = 7
  - SHARPNESS = 0
  - SHARPNESS MODULATOR = 0
  - DEPTH = 2
  - DEPTH MODULATOR = 0

- By combination of different modulation settings, it is possible to obtain various effects, for example appoggiatura.

8 - CONNECTION TO EXTERNAL MONITOR

The rear panel connector called "TO CARTRIDGE MONITOR" allows the automatic loading fo DHM memory from any external tape machine . If such a tape recorder os provided with an automatic tape positions research control, it allows you to quickly memorize many different sounds on the DHM .

8 - 1) PINS DESCRIPTION :

The connection is a five pins XLR male connector ; pins are used as follows :

PIN 1 : Sets the DHM on "MEMORY LATCH" mode when connected to the ground .

PIN 2 : Sets the DHM on "PITCH SHIFTING " mode when connected to the ground.

PIN 3 : Ground .

PIN 4 : Connected to left input of the DHM .

PIN 5 : Connected to right input of the DHM .

8 - 2) OPERATION :

- If the DHM features the 5000ms option, set the "SHORT-LONG" switch on "LONG" position .

- Connect the two tape machine outputs either directly to the line inputs of the DHM , or to pins 4 and 5 of the "CARTRIDGE MONITOR" connector . In that case, do check up there is no other source connected to line inputs of the DHM, otherwise you could have a short-circuit on the tape recorder signals .

- Set the KB 2000 rear panel mic switch on "LINE INPUTS OF DHM" position.

- Set the KB 2000 onto " MEMORY SYNCHRO" mode .

- Connect pin 2 of "CARTRIDGE MONITOR" connector to the ground . Resulting effects are :
  - the DHM is preset on "PITCH SHIFTING" mode .
  - the yellow "REM" LED of memory synchro frame blinks, indicating that the KB 2000 is ready to start on with input sound .

- Remove pin 2 from the ground .

- Store the signal in : when the input sound starts, the KB 2000 computes a delay after which the memory of the DHM is automatically latched. While the sound is entering the memory, the "REM" LED illuminates all the time .

- As soon as memory is latched, the "ON" memory synchro frame LED lightens, indicating that the KB 2000 is now ready to be played on .

Note: The signal for pin 2 can be provided either by a manual push-button or by an interface circuitry, that will automatically send a zero pulse when the recorder is ready to produce sound .

9 - EXTERNAL TRIGGERING OF MEMORY SYNCHRO MODE

The rear panel connector called "PEDAL" allows an external triggering of memory synchro mode, either by a contact (Pedal), or by an external voltage .

9 - 1) PINS DESCRIPTION :

PIN 1 : Left channel triggering

PIN 2 : Right channel triggering

PIN 3 : Ground

PIN 4 : Internal + 5 volt

PIN 5 : Not connected

9 - 2) ELECTRICAL SPECIFICATIONS :

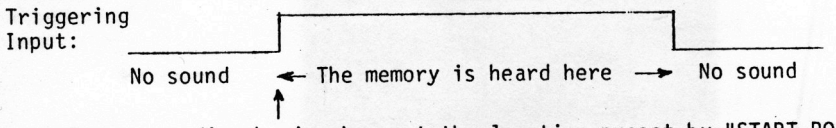
The operating levels of triggering inputs are :
- low level : from 0 to 1.5 Volt
- high level : from 3.5 to 15 Volt .

9 - 3) OPERATION :

For each channel :

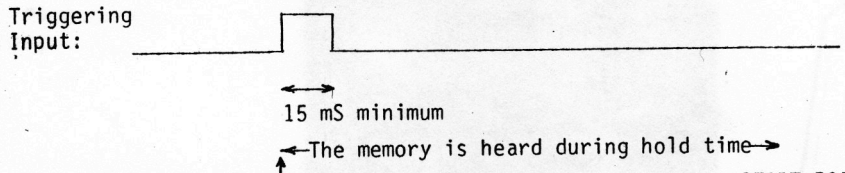
When entering a high level on the corresponding triggering input, the result is exactly the same as if a piano key of the KB 2000 was pressed, but without changing the pitch ratio .

Example 1 : KB 2000 is on " PUSH PLAY" mode .
Envelop is " OFF" .



Memory reading begins here at the location preset by "START POINT"

Example 2 : KB 2000 is on " sustain" mode
Envelop is " ON"
"ATTACK TIME" = 0
"HOLD TIME" = Wanted sequency time
"RELEASE TIME" = 0



Memory reading begins here at the location preset by "START POINT"