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1. INTRODUCTION

The OPERA 6 is a polyphonic synthesizer with voice assignment. It actually contains 6 complete and individual synth modules (termed voices or channels); each voice contains 2 digitally controlled oscillators (to ensure the best pitch reliability on the whole extension of the Well Tempered scale) with linear waveforms.
It is fully programmable and able to store up to 95 programs in its computer memory.
It also comprises a 24 dB/octave low pass Voltage-Controlled filter and an envelope generator; this means that the OPERA 6 is provided with 12 oscillators, 6 filters, 6 envelope generators and 3 low frequency oscillators providing parallel modulations of parameters such as pitches, square waves P.W., filters.
All this is controlled by specific controls and memorized in the heart of the OPERA 6: the "PROGRAMMING UNIT".

2. POWER CONNECTION

Check that the line voltage is in accordance with local voltage. To switch on the OPERA 6 connect the power cable to the 3 contact fixture on the back panel and then connect the other end to a properly grounded outlet.
The ground cable is connected directly to the instrument's chassis.
Connect the 1/4" phone jack OUTPUT to the input of an amplifier or audio mixer. Now verify that only one of the two devices, either the OPERA 6 or the amplifier (better the amplifier) is grounded in order to avoid "ground-loops" which may cause low-level hum.
Reduce OPERA 6 and amplifier's master volume knobs to zero. Switch OPERA 6 on with its back-panel switch, which is at the right as you face the keyboard.
Switch power on to your amplifier and set the volume knobs of the devices to an acceptable level (usually the instrument's volume should be 3/4 of maximum level).

3. PROGRAMMING

3.1 PROGRAM SELECT

On power-up the OPERA 6 selects program 00 for itself (see display); this means that your instrument is ready to play the first program. The programs are numbered from 00 through 94; to change over to second program simply select the number desired on the switch-panel and then press the ENTER switch on the "PROGRAMMING UNIT".

The ENTER function must always follow the new program's data otherwise the display will show the newly recalled program while the instrument is still playing the former one. The ENTER function will be useful to load a program to be played later. The LED to the right of the ENTER switch blinks every time the instrument "waits" for the ENTER command (after recalling a new program to be entered later, or after modifying any timbre in one of the 95 memories).

The FREE function disables the display and sets the OPERA 6 to a "panel" position, ready to be programmed (all potentiometers with values corresponding to their real positions, all ON/OFF switches in off position).

3.2 PROGRAM EDIT

To modify or re-memorize a program is very easy.
If you wish to change any factory sound parameters, simply adjust the position of the various controls. As soon as you change any parameter or the position of the controls, the ENTER LED starts blinking and the decimal point near the program number lights.
To cancel changes, press ENTER. In this way you will recall the memorized sound and re-assign the values and on/off positions to the controls you had altered.

3.3 PROGRAM RECORD

I M P O R T A N T: at power on or after from/to tape recording the OPERA 6 is not enabled to record new programs. To modify programs or create new ones follow the instructions below:

There are several ways of recording a program:

A) Alter an already programmed sound and record it to its old memory location;
B) Alter an already programmed sound and record it to a new memory location;
C) Create a sound from the FREE position and record it to a memory location;
D) Transfer one or more sounds from one location to another.

A) Select MIDI INTERNAL function, recall number 95 on display and press ENTER (now the OPERA 6 is ready to record new programs).
Recall any program from 00 to 94, edit one or more features of the sound (ENTER LED blinks and decimal point lights). Press RECORD (display and ENTER LED blink). Now, pressing ENTER, you enable recording of the new program to the number of memory you see flashing on the display, cancelling the program that was previously memorized there.
If, for any reason, you wish to exit RECORD mode without completing the recording phase with the ENTER switch, simply switch RECORD again; in this way RECORD mode is disabled and the instrument plays the edited program. Switching ENTER the instrument will reset to its initial position without affecting the program memory.

B) Select MIDI INTERNAL function, recall number 95 on display and press ENTER (now the OPERA 6 is ready to record new programs).
Recall any program from 00 to 94, edit one or more sound parameters (ENTER LED blinks). Switch RECORD (display and ENTER LED blink). Now select the new location number; switch ENTER to enable recording of the new program to the number of memory you see flashing on the display, cancelling the program that was previously memorized there.

If, for any reason, you wish to exit RECORD mode without completing the recording phase with the ENTER switch, simply switch RECORD again; in this way RECORD mode is disabled and the instrument plays the edited program. Switching ENTER the instrument resets to its initial position without affecting the program memory.

C) Select MIDI INTERNAL function, recall number 95 on display and press ENTER (now the OPERA 6 is ready to record new programs).
Recall FREE (display and all ON/OFF's will be unlit). Create a sound, press RECORD (display and ENTER LED will blink when in 00 position) select the number of location in which you wish to memorize the sound; press ENTER to enable recording of the FREE position to the number of memory you see flashing on the display, cancelling the program that was previously memorized there.
If, for any reason, you wish to exit RECORD mode without completing the recording phase with the ENTER button, simply switch RECORD again; in this way RECORD mode is disabled and the instrument plays the edited program. Switching ENTER the instrument resets to its initial position without affecting the program memory.

D) Select MIDI INTERNAL function, recall number 95 on display and press ENTER (now the OPERA 6 is ready to record new programs).
Recall any program from 00 to 94, switch RECORD (display and ENTER LED blink); select the new number of location, press ENTER to enable recording of the new program to the number of memory you see flashing on the display, cancelling the program that was previously memorized there.
If, for any reason, you wish to exit RECORD mode without completing the recording phase with the ENETR switch, simply switch RECORD again; in this way RECORD mode is disabled and the instrument plays the edited program. Switching ENTER the instrument resets to its initial position without affecting the program memory.

3.3.1 PROTECTION OF PROGRAMS

Once the recording of new programs is over, follow the instructions hereunder:
A) Recall number 95 on display
B) Press ENTER
Now RECORD mode is disabled and the instrument is no more able to record new programs.

WARNING: before recording a program to any memory location, verify that the location is not occupied by a program you wish to keep memorized.

4. SOUND GENERATORS

This section will enable you to generate audio frequencies and/or noises. It contains two digital oscillators (DCO'A-DCO'B') which generate a square wave and/or saw-tooth wave at 16'-8'-4', and a pink-noise generator (NOISE).

4.1 NOISE

Knob which determines the volume of the "pink-noise" -(i.e. combination of all the frequencies having the same volume energy in every octave of the spectrum)-entering the VCF/VCA and then the audio output.

4.2 D.C.O. "A" (Digitally Controlled Oscillator)

It comprises : WAVES SELECTOR, FOOTAGE SELECTOR, and P.W. CONTROL.

4.2.1 WAVES SELECTOR

This selector enables:

A) the saw-tooth wave to enter the VCF/VCA section and the audio output. The saw-tooth wave contains all harmonics with an amplitude which is inversely proportional to the number of the harmonic itself;
B) the square-wave to enter the VCF/VCA section and the audio output. The harmonic content of this type of wave depends on the P.W. control position.
When both waveshapes are selected, their audio signals are summed and addressed to the VCF/VCA; as a result, the sound volume is higher and the harmonic content wider.
When neither waveform is selected, no signal is addressed to the VCF/VCA and audio output.

4.2.2 P.W. (Pulse Width)

The P.W. knob adjusts the harmonic content of the pulse wave by setting its duty cycle from approximately 1% to 99%. A 50% duty-cycle pulse (having only odd harmonics), also called a square wave, can be obtained by setting the knob approximately to the center, then carefully adjusting for the dropout of the second harmonic (the first octave overtone).
At the extreme knob settings (0 and 10) the pulses will "thin out" until they degenerate to dc, resulting in no audio output.

4.2.3 FOOTAGE 16' - 8' - 4'

Octave selector for transposition of oscillator A from a minimum of 32.7 Hz (first C - 16') to a maximum of 4186 Hz (last C - 4'). The correct pitch for A=440 Hz will be achieved with the MASTER TUNE knob (MASTERS section).

4.3 D.C.O. "B" (Digitally Controlled Oscillator)

It comprises : WAVES SELECTOR, FOOTAGE SELECTOR, and P.W. control.

4.3.1 WAVES SELECTOR

This selector enables:
A) the saw-tooth wave to enter the VCF/VCA section and the audio output. The saw-tooth wave contains all harmonics with an amplitude which is inversely proportional to the number of the harmonic itself;
B) the square-wave to enter the VCF/VCA section and the audio output. The harmonic content of this type of wave depends on the P.W. control position.
When both waveshapes are selected, their audio signals are summed and addressed to the VCF/VCA, as a result, the sound volume is higher and the harmonic content wider.
When neither waveform is selected, no signal is addressed to the VCF/VCA and audio output.

4.3.2 P.W. (Pulse Width)

The P.W. knob adjusts the harmonic content of the pulse wave by setting its duty cycle from approximately 1% to 99%. A 50% duty-cycle pulse (having only odd harmonics), also called a square wave, can be obtained by setting the knob approximately to the center, then carefully adjusting for the dropout of the second harmonic (the first octave overtone).
At the extreme knob settings (0 and 10) the pulses will "thin out" until they degenerate to dc, resulting in no audio output.

4.2.3 FOOTAGE 16' - 8' - 4'

Octave selector for transposition of oscillator B from a minimum of 32.7 Hz (first C - 16') to a maximum of 4186 Hz (last C - 4'). The correct pitch for A=440 Hz will be achieved with the MASTER TUNE knob (MASTERS section).

4.3.4. HALF

This switch selects the output level of oscillator B at approximately 6dB below the volume level of oscillator A.

4.3.5. COARSE DETUNE

Controls the pitch of the second oscillator with respect to the first one for a frequency interval of 8 semitones down.

4.3.6. FINE DETUNE

Controls the fine pitch of the second oscillator with respect to the first one for a frequency interval of about half semitone.

5. RELATION BETWEEN WAVE FORMS AND SOUNDS

The selection of sound waves provides set-up of the synth basic timbre for the creation of different groups of instruments. For example, the saw-tooth wave ( ) which contains odd and even harmonics will be useful to generate strings and brass instruments sonorities.
The square wave ( ) with a P.W. at about 50% will be useful to create timbres such as the clarinet; as soon as the square wave becomes asymmetric, operating the P.W. knob its content will change and become more complex; as a result you will obtain a "nasal" sound, suited to the imitation of reed instruments such as the oboe, the bassoon, etc. The audible differences from wave to wave depend on their different harmonic contents.
A complex sound (square wave, square wave with different P.W., saw-tooth wave, etc.) is the total of pure sounds (sine waves) in which the basic note (note which determines the pitch) has a single amplitude and all the others,called harmonic notes, have a different amplitude depending on the harmonic spectrum of the complex wave analysed.
The graphics hereunder show the harmonic spectrum of the OPERA 6 sound waves with respect to the 100 Hz basic frequency.

6. V.C.F. (Voltage Controlled Filter)

6.1 CUTOFF

This knob adjusts cutoff frequency of the 24dB octave (4 pole) Low-Pass filter. It is rather like a tone control. "Cutoff" is the frequency below which all elements of the mixer's output signal are let through. The higher-frequency components of the input signal (i.e. all those above the cutoff frequency) are suppressed. The higher the knob setting, the higher the knob frequencies are which pass through the filter. Thus, the higher the sound. The diagrams hereunder show the progressive suppression of the high frequencies of a saw-tooth wave according to the lower and lower filter cutoff.

A. Unfiltered saw-tooth wave

B. Frequency cutoff set-off

C. Cutoff frequency suppression

D. Formation of an almost sine wave with cutoff tuned on the same frequency as the basic note.

E. Frequency cutoff set to 0: no sound output

6.2 RESONANCE

The RESONANCE ("EMPHASIS", "REGENERATION", or "Q") knob adjusts the amount of filter resonance. If set from 0 to about 6 it raises the frequency region round the cutoff, thus increasing the harmonic content of that region. The filter control will be useful if you want to know the harmonic components of a timbre.
Selecting a waveform, with filter resonance knob to 6, and slowly reducing the CUTOFF setting from 8 to 0, you will hear the various components of the spectrum as in a descending scale.
Select another waveform and repeat the operation.

As the knob setting is increased beyond 6, the filter breaks into oscillation acting as a sine-wave oscillator whose pitch is determined by the cutoff frequency.

6.3 KEYBOARD TRACKING

When on, the keyboard voltage control applies to the filter frequency cutoff. This 'interaction' of the Well-Tempered scale on the filter makes it possible for you to obtain a consistency of timbre over the whole keyboard range.
If RESONANCE is set in self oscillation (generation of sine waves), the KEYBOARD TRACKING enables you to achieve sine waves on the Well-Tempered scale and to use them as normal audio-oscillators.

6.4 AMOUNT

This knob controls the A.D.S.R. (Attack, Decay, Sustain, Release) action on the filter. If set to 0, the envelope will have no effect on the filter.

7. DYNAMICS A.D.S.R. (Envelope Generators)

The envelope generator A.D.S.R. applies to the VCF and/or VCA sections through the ATTACK, DECAY, SUSTAIN and RELEASE knobs.
The envelope voltage generated by the four stages (A-D-S-R) may be used to change a timbre over time (operating VCF) or to modify an amplitude over time (operating VCA). The envelope function is initiated when a key is struck (each note has its individual envelope) and proceeds through its attack and decay periods at the rate determined by the setting of the SPEED knobs. The sustain level of each note is determined by the SUSTAIN knob; the note will remain at the level set by SUSTAIN until the key is released. When the key is released, the RELEASE function is activated and proceeds at a rate set by the RELEASE knob.

7.1 ATTACK

Adjusts the length of time for filter and/or amplifier to go from 0 level (when one or more keys are initially pressed) to maximum level.

7.2 DECAY

Adjusts the length of time for filter and/or amplifier to go back from maximum level (achieved after the attack stage) to sustain level.

If the SUSTAIN knob is set to 0, the decay will go from a maximum level to zero level. If the SUSTAIN knob is set to the maximum, decay will have no effect.

7.3 SUSTAIN

Adjusts the sustain level of filter and/or amplifier. This is a level control, not a time control. (Sustain time is the period between the end of the DECAY period and the beginning of the RELEASE period. This is determined by touch).

7.4 RELEASE

Adjusts the length of time for filter and/or amplifier to go from sustain level to zero after the key has been released.

If the key is released before the attack or decay periods have elapsed, the RELEASE knob controls the time taken for the filter and/or amplifier to drop to zero from their level when the key was released. If the SUSTAIN level is set to 0 and the attack and decay periods have elapsed, the RELEASE setting is irrelevant, because there is no level for the filter and/or amplifier to release from.

7.5 A.D.S.R. DESTINATIONS

A) When in VCF it assigns the ADSR functions of the envelope generator to the filter.

B) When in VCA it assigns the ADSR functions of the envelope generator to the amplifier. If OFF, the amplifier will be enabled by the the key gate (on when depressed, off when released). In this case, if the normal ADSR adjusts the filter with a long release period, the envelope will not be heard as the amplifier's gate goes off as soon as the key is released.

C) When in VCF+VCA it assigns the ADSR functions both to the filter and to the amplifier.

7.6 DYNAMICS DESTINATIONS

The keyboard is controlled by a microprocessor which constantly reveals the speed at which the keys are struck, which is directly proportional to the touch. This data is used to adjust the "feeling" of a performance, the filters and/or amplifier's amplitude and/or the attack speeds of the notes.

A) When in A.D.S.R. LEVEL, it applies the keyboard dynamic control to the maximum A.D.S.R. amplitude; if the A.D.S.R. is addressed to the VCF, you will obtain timbre variations determined by the touch; if A.D.S.R. is addressed to the VCA, you will obtain timbre variations determined by the touch; if the A.D.S.R. is addressed to both, you will obtain variations in timbre and volume depending on the touch.

B) When in **ATTACK TIME** it activates keyboard dynamic control on the attack time whose minimum levels are set by the ATTACK knob in the A.D.S.R. section. When the touch is "harder" the attack periods will correspond to those selected in the A.D.S.R. section; the "lighter" the touch the longer the attack periods. Also this control is polyphonic, thus you can play simultaneously notes with different attack times in accordance with the touch used in the performance.
C) When in **A.D.S.R. LEVEL+ATTACK TIME** it applies keyboard dynamic control to the maximum envelope amplitudes and attack periods.

7.7 ADJUSTABLE KEYBOARD TOUCH SENSITIVITY

The OPERA 6 features the control of the keyboard touch sensitivity for a better and more individual use of the dynamics. This control enables you to select 4 different levels of touch sensitivity:

a) 01 - for a higher dynamics response
b) 02 - for a medium dynamics response
c) 03 - for a medium dynamics response
d) 04 - for a lower dynamics response
To select the desired level proceed as follows:
1.Select number 98 and press ENTER.The display will show the level of sensitivity in use.
2.Select desired sensitivity level (from 01 to 04)
3.Press ENTER, the display will show again the musical program previous to operation.

8. L.F.O. (Low Frequency Oscillators)

This section makes it possible for you to obtain modulations of parameters such as the pitches of oscillators A and B, the P.W.M. of the V.C.F. square waves.

8.1. L.F.O. I/II

This section contains two sub-audio free-in-phase oscillators whose depth and rate are set by the same DEPTH and SPEED knobs. The destinations of these sine oscillators are respectively:LFO I for oscillator A, LFO II for oscillator B.
If you address the LFO I/II modulation source to one of the two audio-oscillators or to both, you will obtain a periodic pitch variation at a rate and depth set by the SPEED and DEPTH knobs; this modulation is known as VIBRATO.

8.1.1 DEPTH
The DEPTH knob adjusts modulation depth of LFO I and LFO II; it is possible to increase the depth, which can be stored, through the MODULATION section.

8.1.2 SPEED
The SPEED knob adjusts modulation rate of the LFO I and LFO II oscillators from 0.42 Hz to 40 Hz (rate will be indicated by the "RATE" LED).

8.1.3 PITCH

A) When in **DCO A** it assigns the sine modulation originating from LFO I to oscillator DCO A.
B) When in **DCO B** it assigns the sine modulation originating from LFO II to oscillator DCO B.
C) When in **DCO A + DCO B** it assigns the sine modulations originating from LFO I/II to both oscillators (DCO A – DCO B).

8.2 L F O III

This section contains a sub-audio oscillator with two wave shapes (triangle and square), whose depth and speed are adjusted by the relative knobs.
The oscillator has several destinations:
A) it is possible to modify the P.W. of oscillator A and/or B (set with the P.W. knob) and modulate them (P.W.M.);
B) it is possible to modify the cutoff of the 6 filters (set with the CUTOFF knob in the VCF section) and modulate it.

8.2.1 W A V E S

Switch control enabling you to select a triangle wave, a square wave, or both.
If you select the triangle wave, you will obtain a periodic linear modulation (first increasing then decreasing) with no discontinuity points.
If you select the square wave, you will obtain a periodic modulation with sharp changes from maximum to minimum values, thus with discontinuity points.
It is also possible to obtain modulations with the sum of the two wave shapes (triangle wave + square wave).

8.2.2 DEPTH

The DEPTH knob adjusts modulation depth of the LFO III oscillator; it is possible to increase the depth, which can be stored, through the MODULATION section.

8.2.3 SPEED

This knob adjusts modulation rate of the LFO III oscillator from 0.1 Hz to 10 Hz (rate will be indicated by the "RATE" LED).

8.2.4 P.W.M. (Pulse Width Modulation)

A) When in **DCO A** it assigns the modulation originating from LFO III to the P.W. of oscillator A ; as a result you will obtain an harmonic variation caused by the periodic variation of the square wave P.W.
If both the LFO III DEPTH and P.W. knobs are set to approximately the maximum, you will obtain a very deep modulation enabling you to hear the sound disappear and then appear again at the frequency rate set by the SPEED knob (LFO III).

B) When in **DCO B** it assigns the modulation originating from LFO III to the P.W. of oscillator B; as a result you will obtain an harmonic variation caused by the periodic variation of the square wave P.W.
If both the LFO III DEPTH and P.W. knobs are set to approximately the maximum, you will obtain a very deep modulation enabling you to hear the sound disappear and then appear again at the frequency rate set by the SPEED knob (LFO III).
C) When in **DCO A + DCO B** it assigns the modulation originating from LFO III to the P.W. of oscillators A and B.

8.2.5 V.C.F.

It assigns the modulation originating from LFO III to filter cutoff: as a result there will be a filter periodic variation with several combinations according to the settings of CUTOFF, RESONANCE, etc.

9. MODULATIONS

The OPERA 6 is provided with a wheel system for modulation enabling you to instantly change some of the already programmed controls. The destinations of the modulations are programmable; for example, it is possible to obtain momentary pitch-bend of one of the two oscillators or of both, or to increase one or more modulation depths.

9.1 PITCH

A) When in **DCO A** it assigns the first wheel control to the oscillator A pitch, making it possible for you to "bend" it up or down by about 3 semitones.
B) When in **DCO B** it assigns the first wheel control to the oscillator B pitch, making it possible for you to "bend" it up or down by about 3 semitones.
C) When in **DCO A + DCO B** it assigns the first wheel control to oscillator A and B pitches, making it possible for you to "bend" them up or down by about 3 semitones.

9.2 DEPTH

A) When in **LFO I/II** it assigns the second wheel control to the already memorized depth of LFO I/II, making it possible for you to increase it.
B) When in **LFO III** it assigns the second wheel control to the already memorized depth of LFO III, making it possible for you to increase it.
C) When in **LFO I/II+LFO III** it assigns the second wheel control to the already memorized depths of LFO I/II and LFO III, making it possible for you to increase them.

10. MASTERS

MASTERS Controls are not programmable.

10.1 VOLUME
Adjusts general volume.

10.2 TUNE
General pitch control (shifts keyboard up or down by about 1 semitone) to tune OPERA 6 to other instruments.

11. CASSETTE INTERFACE

The OPERA 6 microcomputer transforms the instrument's sonic identity into digital data. The cassette interface enables this sonic data to be transferred to and from common audio cassettes, enabling you to build up an unlimited stock of programs.
It will be possible for you to transfer all 95 programs to tape for tape storage,and also to load another group of programs to your OPERA 6 from tape.
For data transfer:
A) Use an AC-supply with portable recorders. Using (weak) batteries may cause tape speed variations outside the interface's range.
B) Possibly use stereo Hi - Fi tape-recorders featuring VU METER recording level indicator.
C) Use the same recorder both for recording and for data transfer from tape to OPERA 6 (to avoid errors in tape playback).

The OPERA 6 is provided with 95 Factory Programs which can be edited at will. They are also included on a cassette with each OPERA 6.

Connect "TO" (Opera 6 TAPE section) to your recorder's "IN" LEFT or RIGHT jack. (We suggest the "IN" RIGHT jack).

Connect "FROM" (Opera 6 TAPE section) to your recorder's "OUT" LEFT or RIGHT jack. (We suggest the "OUT" RIGHT jack).

WARNING: VERIFY YOU HAVE USED THE SAME LEFT OR RIGHT CHANNELS FOR THE RECORDER'S IN AND OUT JACKS.

BEFORE STARTING BOTH THE RECORD AND TRANSFER PHASES, CLEAN RECORDER'S MAGNETIC HEADS WITH A COTTON STICK AND WITH A SPECIFIC LIQUID DEOXIDIZER.

11.1 TO TAPE
(Data loading from instrument to tape)

1. Connect recorder to OPERA 6 as already explained.

2. Switch TAPE ON/OFF switch on rear panel ON. The instrument is now disabled by the other functions: ENTER LED blinks.

3. Select the desired function (MODE INTERFACES switch); in this case:TO TAPE.

4. Set your recorder in REC/PAUSE to adjust record level.

5. Switch ENTER (Opera 6) to enable data transfer.

6. Adjust record level; recorders with VU METERS should be at 0dB. When the TO TAPE function is completed, the ENTER LED blinks again and the TO TAPE LED goes out.

7. Select TO TAPE (MODE INTERFACES switch).

8. Disable pause on your recorder: wait a moment for the tape leader to pass, then set the recording speed indicator to 0.

9. Switch ENTER (Opera 6) to initiate data transfer.

10. When the transfer period is completed, the ENTER LED will blink again, while the TO TAPE LED will go out.

11. Rewind to start of tape.

To verify that all programs have been transferred without errors, simply compare all OPERA 6 memories to those you have memorized to tape.

11.2 VERIFY
(Verification of correct data memorization)

1. Keep TAPE switch ON (Opera 6).

2. Select the desired function (MODE INTERFACES switch); in this case: VERIFY.

3. Rewind to start of tape.

4. Set recorder to PLAY position. Wait for the recorder's first audio-signal.

5. Switch ENTER (Opera 6) to initiate recording verification.

6. With tape verification completed the VERIFY LEDS go out and the ENTER LED blinks; this means that the recording was correct and the instrument is able to re-memorize its programs from tape.

7. If after data transfer the two VERIFY LEDS stay lit, an error has occurred in recording and/or verification. Repeat VERIFY operation. If verification fails a second time repeat TO TAPE operation.
The errors which occur more frequently are: volume in record and/or play positions too low or too high; low-level hum in data recording.

TO AVOID ERRORS RECORD AND/OR LISTEN TO THE DATA USING DIFFERENT VOLUMES; IN CASE OF PROBLEMS DUE TO LOW-LEVEL HUM DISCONNECT AC GROUND OF EITHER THE INSTRUMENT OR THE RECORDER.

11.3 FROM TAPE
(Data loading from tape)

Selecting this function the OPERA 6 will be loaded with the 95 programs contained in the cassette, thus cancelling the ones previously memorized.

1. Connect recorder to OPERA 6 as already explained.

2. Switch TAPE ON/OFF switch ON.

3. Select the desired function (MODE INTERFACES switch).

4. Rewind to start of tape.

5. Use only tapes which have been already verified (with VERIFY).

6. Set your recorder to PLAY position.

7. Switch ENTER (Opera 6) to initiate memorization.

8. With memorization completed the FROM LED goes out, and the ENTER LED blinks, this means that the 95 cassette programs loading was correct.

9. If at data transfer completed the FROM LED stays lit, an error has occurred in the data transfer.
Repeat FROM operation after checking all connections, volumes,ground connections of the devices (synth and recorder).

12 M.I.D.I.
(Musical Instrument Digital Interface)

The OPERA 6 features a universal interface system used in several applications.
The instrument actually communicates with -and is prepared to receive data from- other M.I.D.I. equipped devices.
It is possible to make different instruments all play from one keyboard, or to connect your synth to a personal computer, to a poly sequencer, etc.
With the MODE switch you can select the INTERNAL, EXTERNAL, INTERNAL/EXTERNAL functions in order to communicate and/or receive possible program changes. If you want to play two synths through M.I.D.I. , connect the M.I.D.I. input (IN) of one synth to the output (OUT) of the other one, and vice-versa. Now the two instruments are interconnected, ready to communicate with each other and transmit the notes you will play on one of the two keyboards.
If you set the Opera 6 MODE switch to EXTERNAL, it will be possible for you to change the other synth's program; if you set it to INTERNAL, you will be able to change the OPERA 6 program from the other synth; setting it to INT/EXT you can change both instruments' programs simultaneously.

13. M.I.D.I. CONNECTIONS

The following diagrams show the most common basic connections:

MIDI SYNTH. + EXPANDER

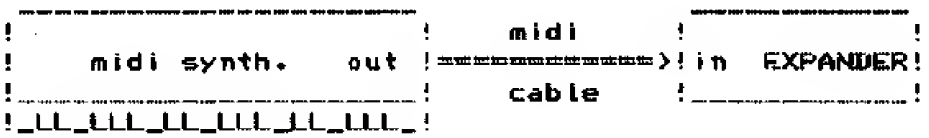


FIG.1

MIDI SYNTH. + 2 x EXPANDER

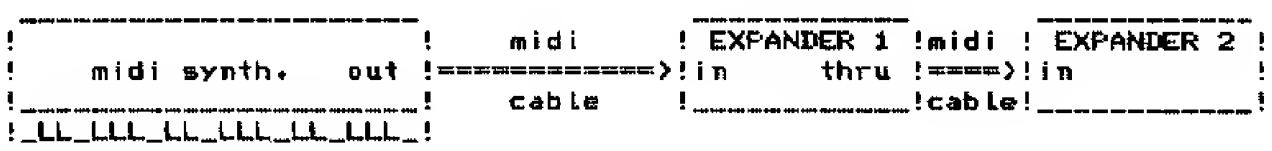


FIG.2

COMPUTER + MIDI COMPUTER INTERFACE + EXPANDER

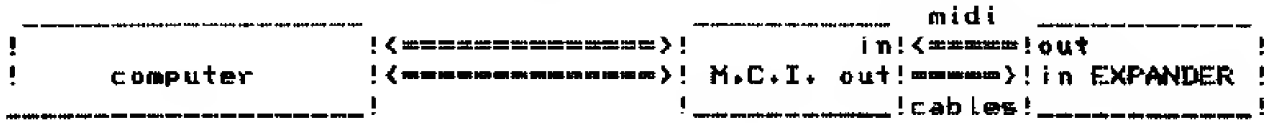


FIG.3

14. MIDI FUNCTIONS

A typical example of MIDI implementation is represented by the connection of the OPERA 6 to an Expander (or to another OPERA 6):

A) PROGRAM CHANGE

Enables selection of one of the Expander's programs direct from the OPERA 6 operating as follows:

1. Set OPERA 6 and Expander to "MIDI EXT" pressing MODE

2. Recall the desired program on the Expander(number+ENTER); the Expander's display will show the number of the desired program while the OPERA 6's will show the number of program selected before the operation.

B) PROGRAM DUMP

Enables transfer of one program's parameters from OPERA 6 to Expander operating as follows:

1. Introduce the RECORD function (95+ENTER) both on the OPERA 6 and on the Expander; verify that both are enabled to RECORD.

2. Set the OPERA 6 to "MIDI INT" with MODE selector.

3. Recall the program to be transferred (number+ENTER).

4. Set OPERA 6 and EXPANDER to "MIDI EXT" with MODE selector

5.Switch RECORD (OPERA 6). Now the display of the Expander should blink, if it doesn't repeat operations from point 1.

6.Select the Expander's number of program to which you wish to effect the transfer from OPERA 6.

7. Press ENTER (OPERA 6). The Expander's display will stop blinking and will show the number of program chosen for the transfer.

Note: These operations may be effected to load programs from Expander to OPERA 6.

C) PROGRAMMABLE SPLIT

Enables you to divide the OPERA 6 keyboard, at the desired point,to obtain two sections: left and right. The keys to the left will play the Expander's timbre, while the keys to the right will play the OPERA 6 timbre.
To obtain this function follow the instructions below:

1. Recall number 97 and press ENTER (OPERA 6) ; the display will show mode 00 corresponding to non-split keyboard mode.

2. Recall number 01 corresponding to split-keyboard mode.

3. Press shortly the note on the keyboard corresponding to the point at which you wish to divide it.

4. Press ENTER, the display will show again the musical program previous to the operation of Split keyboard.
Note: to start from power-up the OPERA 6 is in 00 mode (non-split keyboard); if you effect the programmable split operations omitting point 3., the keyboard will be automatically divided into two equal parts.
To go back to non-split:
A) recall number 97 and press ENTER: OPERA 6 display will show number 00.
B) press ENTER (in this case mode 00 (non-split keyboard) is selected).
C) press ENTER again to go back to the program previous to the Split function programming.

For a complete implementation of the OPERA 6 potential functions, we advise you to connect it to a 'SIEL' EXPANDER:

15. CONNECTION TO 'SIEL' EXPANDER

1. SIEL EXPANDER is the ideal completion of the OPERA 6.
The EXPANDER is a polyphonic synthesizer with voice assignment. It actually contains 6 complete and individual synth modules (termed voices or channels); each voice contains 2 digitally controlled oscillators (to ensure the best pitch reliability on the whole extension of the Well Tempered scale) with linear waveforms.
It is fully programmable and able to store up to 95 programs in its computer memory.
It also comprises a 24 dB/octave low pass Voltage-Controlled filter and an envelope generator, this means that the EXPANDER is provided with 12 oscillators, 6 filters, 6 envelope generators and 3 low frequency oscillators providing parallel modulations of parameters such as pitches, square waves P.W., filters.
All this is controlled by the 95 programs which can be recalled by the "PROGRAMMING UNIT" or by special MIDI functions.

2. The EXPANDER features a universal interface system used in several applications.
The instrument actually communicates with -and is prepared to receive data from- other M.I.D.I. equipped devices.
It is possible to make different instruments all play from one keyboard, or to connect your synth to a personal computer, to a poly sequencer, etc.
With the MODE switch you can select the INTERNAL, EXTERNAL, INTERNAL/EXTERNAL functions in order to communicate and/or receive control data.

3. MIDI CONNECTIONS

The following diagrams show the most common basic connections:

MIDI SYNTH. + EXPANDER



FIG.1

MIDI SYNTH. + 2 x EXPANDER

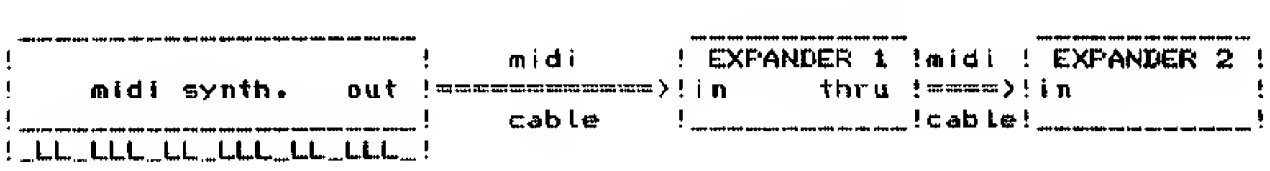


FIG.2

COMPUTER + MIDI COMPUTER INTERFACE + EXPANDER

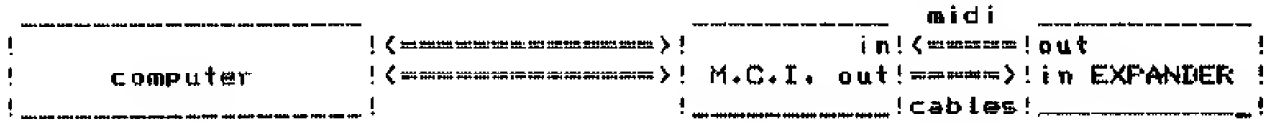


FIG.3

4. EXPANDER CODING

In case you use two or more expanders, it enables you to number each expander from 00 to 15 in order to be able to receive codified data with the same poly-mode code number. Poly-timbre sequencers, orchestral compositions through computers are the typical examples of implementation.

16. CONNECTION TO COMPUTERS

It is possible to connect the OPERA 6 to Computers based on CPU Z80, 6502, 6510 (SINCLAIR ZX SPECTRUM, SINCLAIR 81,VIC 20, CBM 64, APPLE II ...) through 'SIEL' MIDI COMPUTER INTERFACE. This makes it possible for you, through specific software, to obtain several musical applications by means of the Computer.

THE SIEL OPERA 6 NOTES FOR USE OF THE FACTORY PATCHES

The SIEL OPERA 6 contains many different types of sounds in its original set of factory patches. While these by no means represent the total of the OPERA 6's capabilities, they can be used as a starting point.

Each sound programmed into the OPERA 6 has a name which bears some descriptive relationship to the sound itself, wherever possible. Each name is then followed by letters or symbols which mean the following:

T	TOUCH SENSITIVITY CONTROLS ATTACK TIME.
L	TOUCH SENSITIVITY CONTROLS VOLUME LEVEL.
TL	TOUCH SENSITIVITY CONTROLS BOTH ATTACK TIME AND VOLUME LEVEL.
P	USE THE PITCH WHEEL TO MAKE SOUND MORE EFFECTIVE.
D	USE DEPTH (OR MODULATION) WHEEL TO ADD PROPER CHARACTER OR MAKE MORE EFFECTIVE.
O	NO TOUCH SENSITIVITY PROGRAMMED INTO THE SOUND!
f	CONTROLS VCF
a	CONTROLS VCA

For example:

OP after a voice name would mean that no touch sensitivity was programmed into the voice, but the pitch wheel should be used to make the sound more effective.

Several symbols may be used on a single voice name.

However, feel free to explore other sound possibilities of the OPERA 6 by adjusting any or all parameters to suit your taste as well as creating your own patches using the "FREE" mode!

17. FACTORY PROGRAMS (01.4/OP)

00	BRASS I	L	f				
01	STRINGS I	L	f	a			
02	ORGAN/LESLIE	O					
03	CLAV.	L	f				
04	DEEP SYNTH	L	f	a			
05	SYNTH BRASS	L	f				
06	SYNTH SWEEP	L	f	a			
07	PERCUSSION	L	f	a			
08	BELLS GONGS	L	a				
09	SYNTH BASS	L	f				
10	HI BRASS	L	f				
11	STRINGS/RELEASE	L	a				
12	ORGAN II	O					
13	CHORUS CLAV.	L	f				
14	FAT SYNTH	L	f				
15	LEAD SYNTH	O	D	P			
16	HI LEAD SYNTH	O	D	P			
17	EXPLOSION	O					
18	SYNDRUM	L	f	a			
19	TRICKLE SWEEP	O					
20	GROWL BRASS	O	D				
21	STRINGS II	L	f	a			
22	JAZZ ORGAN	O					
23	SLAP FUNK	L	f				
24	HARP	L	f	a			
25	HI LEAD II	O	D				
26	ETHERIAL	T	a				
27	HELICOPTER	O	D				
28	SUSTAIN HARPS	O					
29	PUNK ORGAN	O	D				
30	FANFARE BRASS	O	D				
31	LUSH STRINGS	O					
32	ORGAN CHORUS	O					
33	TCH. SYNTH	T	D				
34	CHORUS SYNTH HARPS	O					
35	SQUARE LEED	O	D	P			
36	FUNKY SWEEP	O	D				
37	WIND	O					
38	HONKY TONK	L	a				
39	LONG SWEEP	O	D				
40	WHIP BRASS	L	f				
41	SUBDUET STRINGS	O					
42	CHEAP ORGAN	O	D				
43	SYNTH ORGAN	TL	f	D			
44	CELESTE	L	a				
45	HARPS TCH.SENS.	L	f	a			
46	SPOOK	O					
47	REPEAT	O					
48	VARY ATTACK HARPS						
49	VARY ATTACK BRASS						
50	PUNCHY BRASS	L	f				
51	QUARTET STRINGS	L	a				
52	PIPE ORGAN I	O					
53	FUNKY VOLUME	L	f	a			
54	HARPS SIMPLE	O					
55	HARMONICA	L	f	a	D	P	
56	CLIMB SWEEP	O					
57	SUBMARINE	O					
58	ELECTRIC PIANO						
59	FUNKY CHORUS VOLUME						
60	FLUTE	L	a	D			
61	BASS CELLO	L	f	a			
62	PIPE ORGAN II	O					
63	SYNTH - CORD	L	f	a			
64	CLAVICORD	L	f	a			
65	SLAP BASS	L	a				
66	MALE CHOIR	O					
67	REVERSE SWEEP	O					
68	REPEAT SWEEP	L	f	a			
69	MELLOW BASS	O					
70	FLUTE CHORUS	L	f	a	D		
71	MUSETTE	L	a				
72	PIPE ORGAN III	L	f	a			
73	SYNTH PIANO	L	f	a			
74	NYLON GUITAR	L	f	a			
75	SYNTH CHOP	L	f	D			
76	FEMALE CHOIR	O					
77	SWEEP FILTER	O					
78	BELL PIANO	L	a				
79	PIN SWEEP	O					
80	MULTI LEAD	T	f				
81	SQUARE PIPE	L	a	D			
82	OCTAVE WOW	L	f	a			
83	LEAD SYNTH	L	f	a	D	P	
84	METAL GUITAR	L	f	a	D	P	
85	DRAMA	O					
86	FILTER MOD.	O					
87	WAVE ORG/LESLIE	O					
88	BELL LEAD	f	a				
89	FREE AREA						
90	SERVICE TEST						
91	"	"					
92	"	"					
93	"	"					
94	"	"					
95	RECORD ENABLE/DISABLE						
96	FUTURE USE						
97	SPLIT OPERATIONS						
98	ADJ. DYNAMICS OPERATION						
99	FUTURE USE						