

Oberheim

Xpander

6-Voice MIDI Synthesizer Expander

**SOFTWARE REVISION 1.4
Operations Guide**

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Oberheim

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**XPANDER Software Revision 1.4 - Operations Guide
Part No. 950048**

Printed in the United States of America

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SOFTWARE REVISION 1.4 – OPERATIONS GUIDE

The Oberheim XPANDER, being a software-based instrument, is capable of being continually updated with additional features and improvements by simply changing a few I.C.'s (integrated circuits) inside the chassis.

Since there are actually two separate microprocessors inside the XPANDER, two separate sets of software are inside as well. The Main Processor software determines all of the operating functions of the instrument such as what the displays will read, what functions are programmable and all MIDI functions, etc. The Voice Processor software actually generates all of the controlling waveforms for the Voices such as the Envelope generators, the LFO's, RAMPs and TRACKing Generators, etc. It also tunes all of the Voices.

To determine which Software Version is in an XPANDER, press MASTER PAGE, then PAGE 2, and then the button below the display that reads **VERSION**. The Main Processor and Voice Processor version numbers will appear in the display, along with the Cassette version.

The Main Processor will show either version 1.0 or 1.2 (Revision 1.1 for the Main Processor was not released). If the display shows version 1.0, this XPANDER has the initial software release version, and it may be desirable to update it to 1.2 at your nearest ECC/Oberheim Authorized Service Center. If the Main Processor version reads 1.2, the XPANDER already contains the most recent Main Processor version. The Voice Processor version will be displayed as 1.0, 1.1, 1.2, or 1.4. Again, if the version displayed is below 1.4, the software should be updated.

The original Owner's Manual for the Oberheim XPANDER covers all of the functions of the XPANDER for Main Processor version 1.0, and Voice Processor versions 1.0 through 1.3. This document details all of the changes of operation and new features that exist in the new software.

NEW FEATURES

1. The "+" and "-" buttons in the Programmer section are used to select the next Patch number up or down. They now can also be used to **scan** forwards or backwards through the Patches by holding them down. This makes it easier to scan through the Patch names in order to find a desired Patch.
2. The MIDI **SEND** Page is used for sending the current SINGLE Patch to another XPANDER or a computer via MIDI. The new software now allows for **all** of the SINGLE and MULTI patches to be sent via MIDI, as well as being able to send SINGLE Patches one at a time.

When in the MIDI **SEND** Page, if the destination Patch number is set below 00 (by turning Knob #4 counter-clockwise), the display will read:

SEND ALL PATCHES TO MIDI

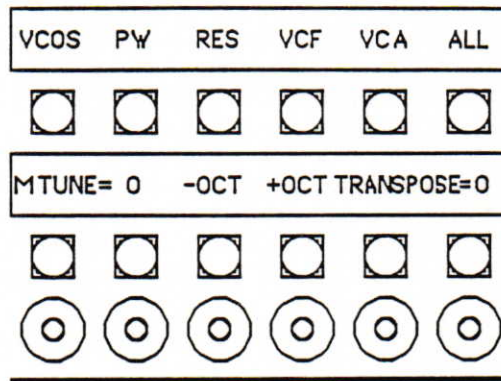
DESTINATION PATCH = ALL START

If the button below the display reading **START** is pressed, **all** of the Patches (both SINGLE and MULTI) will be sent out MIDI. This function will take about 17 seconds to complete and the display will read:

SEND ALL PATCHES TO MIDI

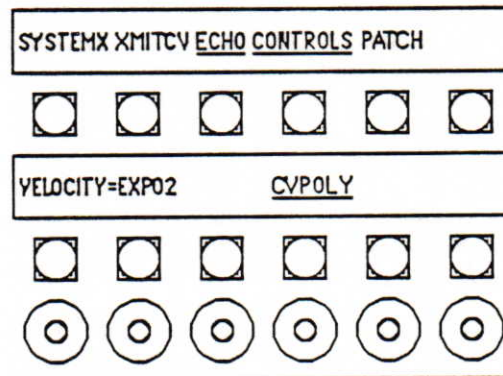
DESTINATION PATCH = ALL SENDING

3. The TUNE PAGE functions have been changed slightly in the new version. The displays will now read:



The upper display shows which parameters can be tuned. A fifth tuning has been added – displayed as **VCA** – to allow matching of the final VCA levels of each Voice. The lower display now has two extra functions. The buttons below the **-OCT** and **+OCT** displays can be used to shift the pitch down or up in octave increments.

4. The MIDI **ENABLES** Page has been changed slightly and is now displayed as:



The displayed functions are the same as described in the XPANDER Owner's Manual. The exception is that the lower right display used to say **DEFAULTS ON** or **NO DEFAULTS**. This feature was used to choose whether or not the XPANDER should remember the MIDI settings when power is turned off. This function has now been eliminated so that the XPANDER will always remember the current MIDI settings.

5. "Quantized Lag" is now possible on both of the oscillators and the filter by selecting **KEYBD** and **LAG** (**both underlined**) on PAGE 2 of VCO1, VCO2, or VCF/VCA. This feature is useful for *glissando* type effects, characterized by the gliding between notes on the Keyboard as semi-tone increments rather than being a smooth *portamento*.
6. The **SPEED** and **AMP** modulation amounts on PAGE 2 of VIB can now be set from -63 to +63. This allows for the Speed and Amplitude of the vibrato to be modulated negatively, if desired.
7. The Cassette Interface is now capable of loading in MATRIX-12 cassettes. All of the SINGLE Patches from a MATRIX-12 cassette will be loaded intact. The MULTI Patch and Global data will be ignored, since they have different formats.

CHANGES OF OPERATION

FOR XPANDER MAIN PROCESSOR VERSION 1.2 AND VOICE VERSION 1.4

The updates described in this document can be added to any Oberheim XPANDER by replacing the four 2764 EPROMs on the Main Processor board with revision 1.2 software, and the two 2764 EPROMs on the Voice board with revision 1.4 software.

It is possible to use an XPANDER with new Processor software and old Voice software (and vice versa), but many of the features described would not be possible, since they are accomplished by an interaction between the new Main Processor software and the new Voice software. Therefore, it is recommended that the software of the Voice and the Main Processor be updated simultaneously.

NOTE: Voice board revisions D and up must use revision 1.4 Voice software, and Voice boards using Curtis 3372 rev. C filters must use revision 1.4 Voice software and 1.2 Main Processor software.

The following list includes all of the new software features and improvements that have been implemented in this software update.

1. The "+" and "-" keys in the Programmer section now repeat when they are held, allowing for quick scanning through patches. When **CHAIN** Mode is on, this feature can be used to scan through the patch Chain list as well.
2. The new software now allows for all SINGLE and MULTI Patch data to be transmitted via MIDI to another XPANDER, a MATRIX-12, or a computer. Refer to item #2 in the previous section **NEW FEATURES** for the complete details of this feature's operation.
3. The TUNE page has been modified to allow for quick octave changes in the transposition by pressing the **+OCT** or the **-OCT** buttons. These functions add or subtract 12 from the **TRANSPOSE** value shown on the display.
4. The new Voice software improves the tuning accuracy of the Pulse Widths (**PW**) and the filters (**VCF FREQ**).
5. The MIDI **ECHO** feature has been improved to include the echoing of System Exclusive and System Common commands that are received via MIDI IN. This means that System Common commands (such as Song Start, MIDI Clock, etc.) that are received will be sent out the MIDI OUT if the MIDI **ECHO** parameter is on, allowing for drum machine or sequencer timing information to be passed through to additional synthesizers or drum machines. XPANDER System Exclusive Page change commands will also be echoed.
6. Many of the default settings in the XPANDER have been modified so as to reflect the most common uses of specific functions:
 - The VIB Page 1 default now sets the **SPEED** to 56 and the **AMP** to 0.
 - VIB Page 2 sets the **AMP** modulation source to LEV 2 and the **AMP** modulation amount to 63.
 - The MIDI **ENABLES** Page now defaults to **CONTROL** and **PATCH** changes ON (underlined), all others OFF.
 - The MIDI **CTRLS** Page now defaults PEDAL 2 to controller number 64, so that sustain pedals transmitted via MIDI (like those in the OB-8 or DX-7) can be used without having to select the proper controller number beforehand.

7. The **NO DEFAULTS** parameter on the MIDI **ENABLES** Page has been eliminated. This switch was used to select whether or not the XPANDER would retain the MIDI settings when the power was turned off. Now, the XPANDER will retain all MIDI settings at all times.
8. "Quantized Lag" is now possible on both the oscillators and the filter. This is used for *glissando* effects where the slide is quantized to half steps (semi-tone increments). If both **KEYBD** and **LAG** are selected (underlined) at the same time on Page 2 of either VCO or the VCF, the **LAG** will be quantized to half steps.
9. The modulation amounts set on page 2 of the **VIB** page can now be set positive or negative (-63 to +63). Previously, these could only be set positive.
10. On the TUNE PAGE, it is now possible to tune the final VCA's of each Voice. This is done by pressing the **VCA** button. This adjusts the control voltage offsets of each voice so that the envelope's release time will be smooth and even from Voice to Voice.
11. The MIDI **RESET** function now resets all three ZONE **INPUT** parameters to **OMNI** in SINGLE PATCH Mode. This is useful when using the XPANDER with another MIDI synthesizer and they do not appear to be working together. The previous version left the ZONE **INPUT** parameters alone.
12. The Cassette routine in the old version did not load in the Global settings (such as SINGLE Patch **ZONE** settings, MIDI, etc.). This problem has been fixed in the new version.

This fix also adds two possible problems when loading an older cassette. First, the Global settings cannot be loaded from an older cassette (since the data was not valid anyway), which causes the display to read...

ERROR IN GLOBAL DATA

...when an older version cassette is loaded in. If this message is received, the Global data will have been ignored from the tape and will remain set the way they were before loading the cassette. All of the SINGLE and MULTI Patch data will be loaded incorrectly.

Second, it will not be possible to load in only one MULTI Patch at a time from an older cassette. If the entire cassette is loaded, and a new cassette is made, individual MULTI Patches can again be loaded in.

13. If an individual SINGLE or MULTI Patch is loaded from cassette, the new version will exit the Cassette Mode as soon as the Patch is loaded, making individual Patch loading much faster. The old software would always wait until the end of the cassette before stopping.
14. With the new software, MATRIX-12 cassettes can be loaded into the XPANDER. All of the SINGLE Patches will be loaded intact, but the Global and MULTI Patch data will be ignored, since it is a different format. The display should read...

DATA COMPLETE

PRESS PAGE 2

...after loading in a MATRIX-12 cassette.

15. The new software version has an improved Display Test routine. In the old version, the Display Test would cycle through the 16 segments on each of the 40 digit displays. In the new software, the first two encoders (knobs) can be used to select which segment of which digit is to be lit. When the **DISP** Page is first entered, all digits are lit so that burned out segment drivers can be easily identified.
16. The new software scans the Programmer switches more often, allowing for faster program changes.

17. The initial pitch of the oscillators on power up before notes are played has now been set to 440 Hz in Voice version 1.4. This function exists only for testing purposes.
18. The Cassette routine now displays the type of error that was first received, rather than the last error received. Since the Cassette Mode always loads data in the same order (SINGLE, then MULTI, then CHAIN, then GLOBAL), data loaded before the error occurred can be assumed valid. If the display reads...

ERROR IN MULTI PATCH DATA

...all of the SINGLE Patches have been loaded correctly. In the previous software version, it could only be assumed that the Chain and Global data was valid.

IMPROVEMENTS

The following list describes all of the software changes that have been made to correct operational irregularities, otherwise known as "bugs".

1. Previously, MIDI "All Notes Off" commands were received on the MIDI Basic Channel only, causing all Voices on all Channels to be turned off when the command was received, instead of only turning off the Voices assigned to the Channel the command was received on. Since very few products use the All Notes Off command, this is an infrequent problem.

The Roland MSQ-700 does use this command, which could cause Voices to seem "chopped" off at times. The current revision properly recognizes the All Notes Off command and will only turn off the Voices assigned to the MIDI Channel in which the All Notes Off command was received.

2. Previously, when using a synthesizer with Channel Pressure (the new DX-7 software for example), the Pressure would be ignored if the ZONE *INPUT* was set to OMNI. To use the Pressure with the old software, *INPUT* had to be set to Channel 1. This problem has been corrected in version 1.2.
3. When comparing a Patch (the Patch number flashing), it was possible to edit Modulation Pages even though you are not supposed to be able to. Any changes made while comparing a Patch would be deleted when you stopped comparing. This problem has been corrected in the 1.2 version.
4. MULTI Patch transpositions below -32 were previously stored incorrectly as positive transpositions. This problem has been fixed in the new software.
5. Pressing the "+" key in X SELECT while the *STEP* or *PATCH* number in the CHAIN Page was underlined used to cause the number displayed to change to a random number. Fixed in version 1.2.
6. In the previous version, Patch changes on the XPANDER were **always** transmitted via MIDI OUT. The setting of the MIDI *PATCH* enable switch would affect **incoming** Patch changes only. In revision 1.2, the MIDI *PATCH* enable switch enables and disables incoming **and** outgoing patch changes via MIDI.
7. If a Voice fails any of the tunings, it is automatically disabled. If the disabled Voice is manually re-enabled (in the *VOICES ON/OFF* Page), it can then be played again. However, if the Voice is now tuned on something other than what it failed on (e.g. tune VCO after failing PW), the Voice will be disabled again until the failed tuning parameter is reselected and the Voice passes. Since failed tunings are very rare, this bug is seldom seen, but has been corrected in the new software version.
8. The VCO 1 page LED used to light when in *VIB* PAGE 2. Fixed with software version 1.2.
9. The LED's were slow to respond when TUNE PAGE was entered. Fixed in version 1.2.
10. When the memory in the Voice circuitry is tested on the *SERVICE* Page, the display used to read: "*CA MEM OK*". The new software reads: "*V MEM OK*".

11. If SINGLE PATCH Mode is selected from MULTI PATCH Mode, and MULTI PATCH Mode was selected while in a SINGLE MASTER PAGE, the LED's would be incorrectly displayed. Fixed in version 1.2.
12. In previous software, if **CHAIN** Mode was on and a SINGLE Patch was being edited (underlined) while in MULTI PATCH Mode, the "+" and "-" keys would advance to the next step of the Chain, causing the edit to be lost. The new software renders the "+" and "-" keys inoperative while editing a SINGLE Patch in MULTI PATCH Mode and Chain is on.
13. Previously, if a Patch number was entered into the Chain Page using the VALUE X buttons while in MULTI PATCH Mode, the result would be 0. This has been fixed in version 1.2.
14. On occasion in the old software, if ZONE 3 was used, random notes might appear when the Patch was recalled. This has been fixed in version 1.2.
15. The PAGE 2 LED would not light on MASTER PAGE 2 and **VIB** PAGE 2. Fixed in version 1.2.
16. In the previous software version, if a MIDI Channel was used in MONO Mode, and multiple Note Off commands were given (a feature used in guitar synthesizers), and MULTI trigger was turned on for an Envelope, the Envelope would not retrigger. This has been fixed in the version 1.4 Voice software.
17. In previous software, if PAGE 2 was pressed in the TUNE PAGE, and a parameter was tuned and failed, the display would jump into PAGE 2 instead of displaying the **FAIL** message. Fixed in version 1.2.
18. In previous software, if a knob was turned while in TUNE PAGE, the STORE button would not work until a new Page was entered. This has been fixed in version 1.2.
19. If MULTI PATCH Mode was selected while in a SINGLE Patch modulation page, and SINGLE PATCH was re-selected, the MULTI PAGE dot in the CURRENT PAGE display would stay illuminated, and the LEDs would still be displaying the MULTI PATCH Page. This has been corrected in version 1.2.
20. In the previous software, if a SINGLE Patch was edited and Stored in SINGLE PATCH Mode, and that same Patch was used in the currently selected MULTI Patch, the Patches with that number would not have an edit dot next to them, even though they will not sound the same as the stored Patch. In the new software, the Patches in the MULTI Patch (as well as the MULTI Patch itself) will have an edit dot if the stored Patch is changed.
21. In the previous software version, the All Notes Off command cleared all of the Controller settings in the XPANDER. For example, if a sustain pedal was used with a Roland keyboard (which sends All Notes Off any time no keys are held), the sustain pedal would not work, since it was cleared when the keys are released. In version 1.2, the Controllers are **not** cleared unless a new Controller Number or a new MULTI PATCH is selected.
22. In the previous software version, if an All Notes Off command was sent immediately following a Note On command (less than 10 msec.), the note might stick on. The new revision solves this problem.
23. In Voice software 1.2 and earlier, if a Square wave LFO was routed to the **FREQ** of a VCO with 0 amount, a slight bit of the LFO modulation could be heard. Voice revision 1.4 solves this problem.
24. In the previous software version, the LEDs would sometimes "glitch" when a tuning was finished in the TUNE PAGE. This is fixed in version 1.2.
25. In the previous software version, if STORE was pressed and held while in SINGLE PATCH Mode, and MULTI PATCH was pressed, MULTI PATCH Mode would be selected even though the Store function was still in operation. The new software does not allow switching between SINGLE and MULTI PATCH Modes while STORE is being held down.
26. The amount of time the PROGRAMMER Keypad waits for the second digit to be entered has been sped up in the new software.

27. While in the TUNE PAGE, comparing Patches would sometimes not recall the stored Patch, even though the Patch number would be flashing. This problem has been solved in the new version.
28. In the old software, the displays would sometimes "ghost" (be dimly illuminated) while performing one of the Cassette functions. This has been fixed in the new software version.
29. The PAGE 2 LED will begin flashing sooner upon completion of the Cassette routines in version 1.2.
30. MIDI System Common commands F2H (Select Song) and F3H (Song Position Pointer) were misinterpreted in the previous software version and could cause operational errors, even though they have no function in the XPANDER. This has been fixed in the new version.
31. In the old software, if there was both **SPEED** and **AMP** modulation selected in VIB, and an external trigger occurred, the display would read...

VOICE PROCESSOR MALFUNCTION

...and the Voices would not operate until the XPANDER was turned off and then on again. This problem has been solved in the new software.

32. The new Voice software (1.4) can recognize the difference between a "B" revision Voice board and a "D" revision Voice PCB (the sample-and-holds are in a different order). This means that version 1.4 can be used in **all** revision Voice boards, but versions below 1.3 cannot be used in "D" Voice PCBs.
33. In previous software versions, if the **VERSION** Page was entered while in MULTI PATCH Mode, and then SINGLE Patch VCO 1 Page 2 is selected, and MULTI PATCH Mode is reselected, the underlines that were on VCO 1 Page 2 will remain displayed when the **VERSION** Page reappears.

In the new software, the **VERSION** Page as well as the **SERVICE** Page do not change to different Pages when switching from MULTI to SINGLE. This keeps these two Pages consistent with the other MASTER Pages.

34. In the previous software, selecting any Page 2 while in MULTI PATCH Mode (e.g., VIB Page 2 or **VERSION** Page 2), then selecting SINGLE PATCH Mode, then pressing STORE + CLEAR, and finally reselecting MULTI PATCH Mode would leave the XPANDER in MULTI PATCH Mode, but in the VCO1 Page. The new software solves this problem.
35. In the previous software, if a VALUE X display number was underlined and part of the number was entered using the X SELECT buttons and a new Page is selected without completing the number, the VALUE X LED would continue flashing. The new software fixes this problem.
36. In previous software versions, if a MULTI Patch was used in which Voice 1's Patch had VCO 1's waveforms turned off, VCO 1 on Voices 2 through 6 would not sound, even though the displays show that the waveforms are on for voices 2 through 6. The same is true for VCO 2. Fixed in version 1.4
37. In the previous software version, the **RANDOM** waveforms of the LFO's and VIB would have a small glitch in them half way through each cycle, sounding as if they were outputting the same value twice. This has been fixed in the new Voice software.
38. In the revision "B" Voice boards and earlier, there was a small glitch in the loading of the final VCA sample-and-hold of each Voice which would be interpreted as distortion at very low volumes. In the revision "D" Voice boards with the 1.3 software, this glitch appeared on the VCO1 Pulse Width. Revision 1.4 Voice software solves these problems for both revision Voice boards.
39. In the previous software version, a MIDI Note Off had to be at least 3 milliseconds after a MIDI Note On or the note may not sound. In the new software, a Note Off command can immediately follow a Note On command and the Voice will play.