BITSTREAM PRO
ROM UPGRADE INSTALLATION INSTRUCTIONS

1. SHOULD YOU ATTEMPT TO DO THIS?

Before deciding to take the plunge and upgrade the ROM chip yourself, read this document fully and decide if you feel comfortable that you will be able to follow the steps. If you have never worked inside a computer or other electronic device, it might be better to let Wave Idea do the upgrade for you so that you can be confident of nothing getting broken!

To put it another way - if you don't know what I mean by "take anti-static precautions", stop right now and go find out, or let Wave Idea do the upgrade for you.

Wave Idea have told me that performing this upgrade yourself will **not void your warranty** … but please, be honest with yourself about whether you're confident doing this upgrade or not!

2. WHAT YOU WILL NEED

- A socket set containing either a 5.5mm or 7/32" socket with a screwdriver handle. Don't be tempted to use pliers, as that's asking for trouble!
- A pair of pliers with cushioning applied to the jaws
- A small, flat-bladed screwdriver
- A blanket or other soft surface
- A piece of wood or hardcover book approximately 8" x 11" or A4 size.
- Two containers for holding all the knobs, nuts and so on
- Patience ☺

3. GETTING STARTED

You will need a soft surface to work on, as you're going to be laying the Bitstream Pro (BSP) face-down to work. A blanket folded over several times is quite sufficient.

Disconnect all cables from the BSP and place it *face up* on your work surface. You now need to remove all of the knobs and slider caps from the unit. This means the 32 knobs and 8 slider caps on the left and the three LFO knobs on the right. The covers of the switches and buttons do *not* need to be removed.

This is not an easy job, as the knobs are made of a semi-hard rubber and are quite difficult to remove by hand. Although many of the knobs will come off by hand alone (with some force), you may find there are some that refuse to budge.

In this case, you might find it necessary to use a pair of pliers. Since the knobs are rubber, you don't want to grab them directly with the pliers as the pliers will damage the knobs … so wrap the jaws of the pliers in something soft. I used a strip of paper towel wrapped around the jaws about 15 times and held in place with sticking tape (see figure 1). The more padding you can apply to the jaws, the better.

In either case, the best way to remove the knobs is *straight up.* Avoid wiggling them side-to-side if at all possible as this may damage the potentiometers.

Above all, be patient! I say it again – this is not an easy job and can very quickly become frustrating, especially with 43 knobs and sliders to remove, so if you get frustrated, better to take a break than break the BSP!

One last word of advice – as you remove them, put the knobs and slider caps into a container so that you do not lose them!

Figure 1 – my pliers, with the jaws covered in many layers of paper towel so they won't damage the knobs if I need to use the pliers to remove them.
(In the end, four knobs had to be removed this way)

4. REMOVING THE BOTTOM COVER

Once the knobs and slider caps are removed and safely stored, you can turn the BSP over. Make sure the top of the unit (where the power switch and MIDI sockets are) is furthest away from you, as in figure 2.

Figure 2 – the underside of the Bitstream Pro prior to removal

There are six bolts holding the underside to the faceplate; three on each side. To remove the nuts from these you will need a 5.5mm or 7/32" socket with a screwdriver handle (as there is no room for a ratchet).

You might be tempted to use pliers to undo these nuts. *Don't*. Apart from the fact that you can easily burr the bolts, you will have more to undo later where using pliers will not be an option.

If you don't have the right-size socket for this job, go out and buy one. It will only cost you a very small amount. Think of it as cheap insurance against damaging your BSP.

Under each nut is a small serrated metal washer. These are not easy to remove yet, so leave them in place for now. As you remove the nuts, make sure you put them somewhere safe, such as a plastic container or saucer.

Once you have removed all six nuts, *carefully* lift the bottom cover up and away from you as if you were opening a briefcase. There are wires from the internal circuitry connected to this bottom section, so don't handle it too roughly or try to move it too far or you will break these wires!

As you open the cover, the metal washers will slide off. To make sure you don't lose them, put them with the nuts you just removed.

Once fully open, you should now see something like figure 3.

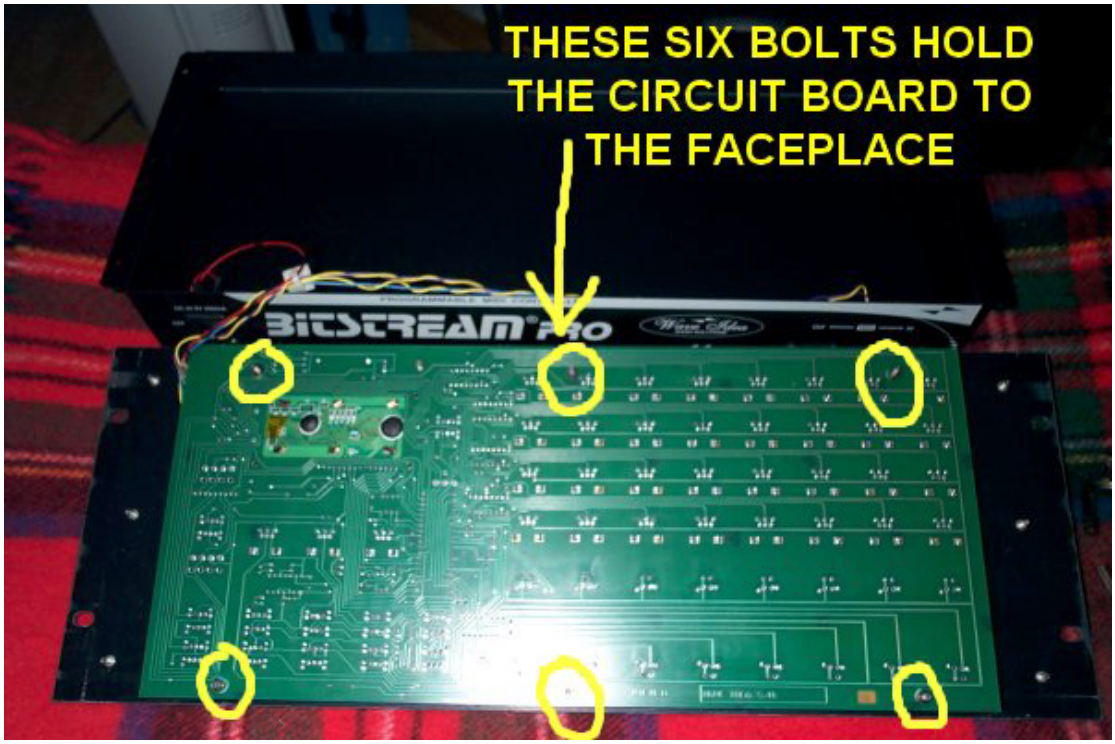

Figure 3 – the BSP after carefully opening the bottom cover

5. REMOVING THE MAIN CIRCUIT BOARD

As you can see from figure 3, there are now six more nuts undo. These hold the circuit board to the faceplate.

Hopefully you can now see why I insisted on you having the appropriate socket to undo the nuts. Using pliers on an external case is one thing, but using pliers directly against a circuit board is something else again. If you ignored my advice before and used pliers anyway, please go out and buy a 5.5mm or 7/32" socket now, OK?

Undo and remove the six nuts, and remember to store them safely. There are no washers this time.

Now, carefully lift the circuit board *straight up*. It should simply slide right off the faceplate. Turn it over by rotating it away from you and place it inside the back cover, as shown in figure 4. You can move the faceplace out of the way for now if you wish.

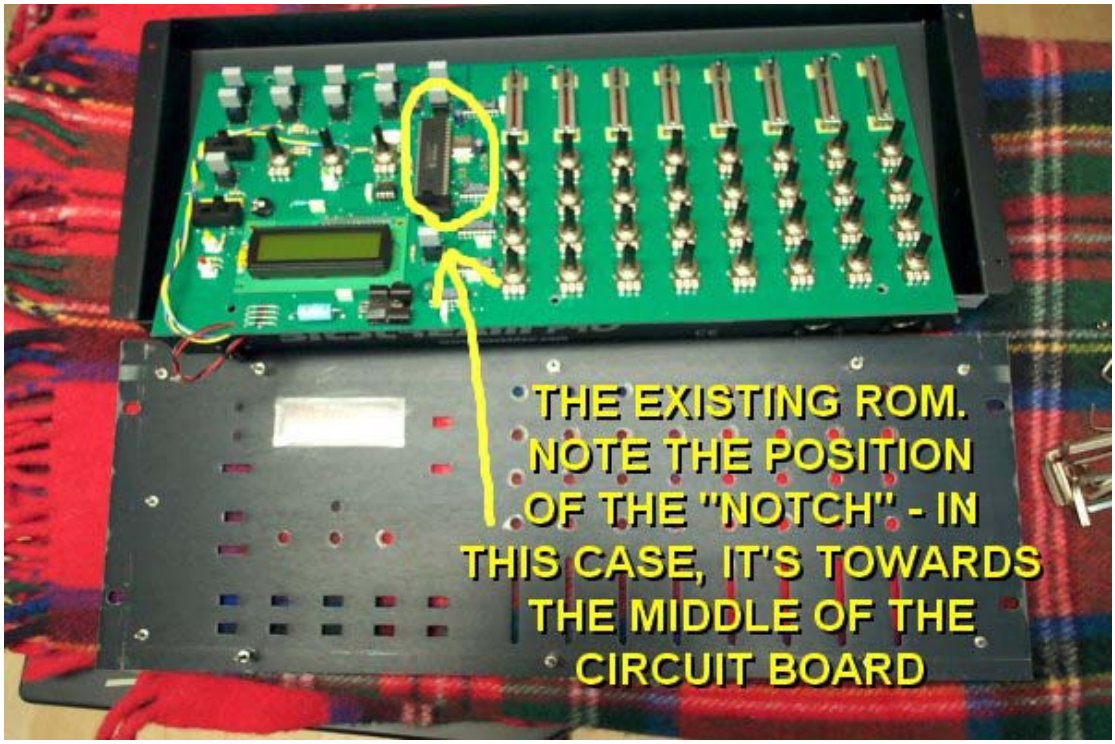

Figure 4 – the circuit board has been removed from the faceplate and turned right-way up inside the back cover.

There is only one large chip in the BSP, as you can see in figure 4. Before you proceed, take a good look at the top of the chip. You will see that at one end, there's a semi-circular notch. This notch tells you the orientation of the chip. It's vitally important that you remember which way that notch is pointing – if you put the replacement chip in the wrong way around, the results are unlikely to be good!

In this case, the notch is facing towards us, or if you prefer, towards the middle of the circuit board, or towards the LCD display. It doesn't matter *how* you remember the orientation of the chip, just that you do!

6. PREPARING TO REPLACE THE ROM CHIP

The first thing we need to do is place the circuit board on something more solid than the back cover, because when we insert the new chip we're going to press down on it, and we don't want the circuit board to bend.

A large hardcover book (protected by a thick cloth) is a good choice. In my case I had a book inside a cardboard box which I had just received which made the perfect surface. Do NOT use anything metal, for obvious reasons.

(It's not possible to just place the circuit board directly onto your soft surface because the wires connecting it to the back cover are not long enough).

Carefully lift the BSP circuit board and place your chosen hard surface underneath on the back cover, then put the circuit board on top of that. See figure 5.

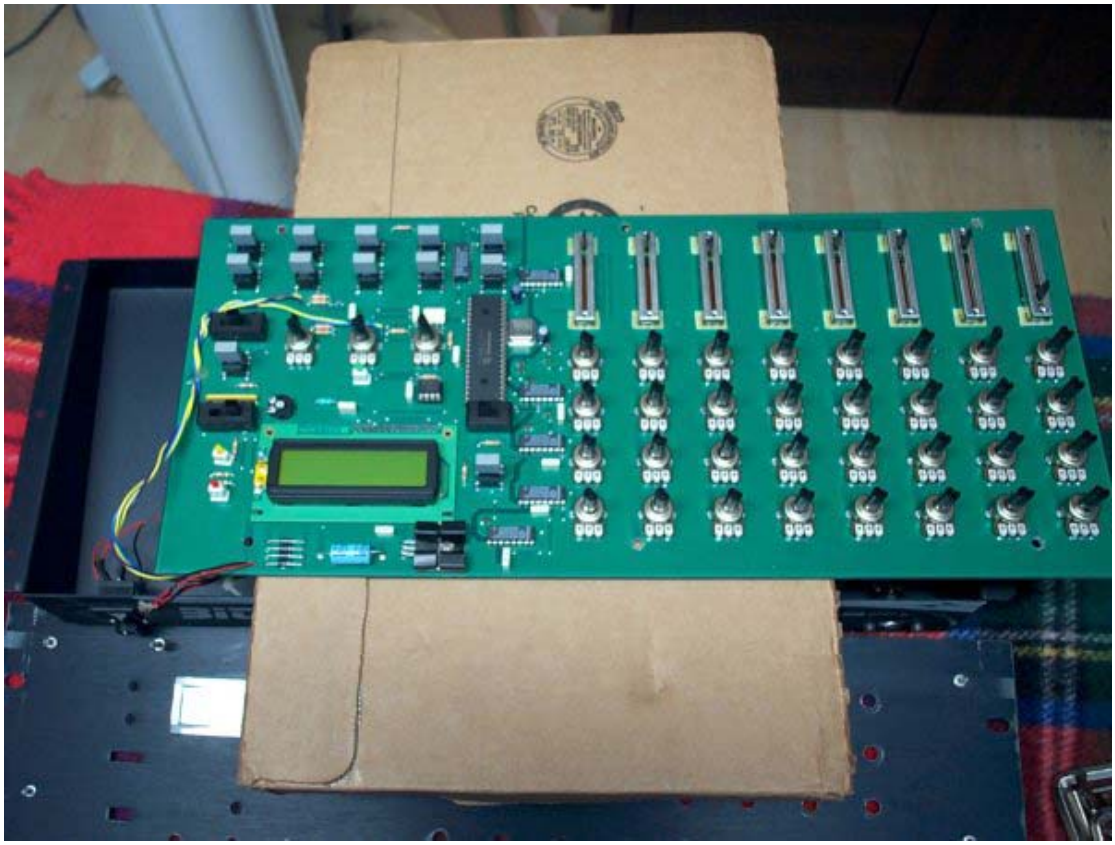

Figure 5 – the BSP circuit board resting on a hard surface, which in turn is resting on the back cover. The wires are not long enough to do it any other way.

The first thing we need to do is get the existing ROM chip out. This is not easy, as the User/CC switch is directly next to one end, so close that I could not even get a proper IC (chip) removing tool into the gap. Therefore, we must resort to careful use of a flat-bladed screwdriver.

What we must do is lever the chip out of its socket, without touching the pins directly if at all possible, and without bending them. To do this, insert your small flat-bladed screwdriver under the end of the chip and *gently* twist it to lever the chip up. Do not lever it too far or the pins will start to bend.

It's impossible to get the screwdriver into the other end of the chip due to the placement of the User/CC switch, so improvise as best as you can, but remember, at all times be gentle and try to avoid touching the pins if you can. It might take a little while, but the chip will eventually come loose.

Again, when you remove it, do not touch the pins!

7. PREPARING THE NEW ROM CHIP

Up until now, you should not have removed the new ROM chip from its protective packaging. Remove it, again being careful not to touch or bend any of the pins.

Remember the notch? This chip has one too! Do I need to explain why? Good.

Carefully put the chip onto the socket, remembering to get it the right way around. *Do not put any pressure on it yet, or try to insert it into the socket – just sit it on top!*

At this point, if you look carefully, you will probably find that the pins do not match up directly with the holes in the socket, but splay outwards (away from the socket, not towards each other).

If your chip does not have this problem, lucky you - you can skip to section 8.

What we have to do, then, is bend the pins inwards so that they line up with the socket holes. There are probably many methods of dealing with this situation. I'm going to show you mine, but there may be other better ways to do it.

Holding the chip by the ends, place the chip edge-down (ie, on the pins) on a flat hard surface. *Gently* press down and forward so that the pins are bent inwards. I can't stress this enough – be *gentle*! The pins are only small and do bend fairly easily, so there's no need to be too enthusiastic. See figure 6.

Figure 6 – using a desk and gentle pressure to bend the pins inwards

Only bend the pins a very small amount. It's much easier to repeat this process several times than it is to bend the pins back out again if you go too far!

Now, place the chip on the socket again. Do the pins line up with the holes now? If not, repeat the above process, but this time, bend the pins on the other side.

Keep repeating this process until the pins sit neatly into their corresponding holes.

8. INSERTING THE NEW CHIP

Check that the chip is aligned correctly by making sure that the notch is facing the right way!

This is your last chance to make sure the pins align to the socket correctly, so check again. There's a lot of pins there (40, to be exact), and it's easy not to notice that a single one of them is bent inwards or sideways or not aligned correctly. So check again.

Are all the pins aligned? Are you sure? OK, yes, I'm nagging you, but these pins break off really easily and can't be reattached. Don't say I didn't warn you!

Using both thumbs and a slow, even force, push the chip straight down into the socket. If you aligned the pins correctly, the chip should slide into place with only a small effort required. To put it in quantitative terms, you should not need to use any more force than it takes to operate the BSP's On/Off switch.

If it feels really stiff, STOP! Check to make sure that you haven't got a pin which has missed the socket hole and is bending. Failing that, you might need to realign the pins as in section 7. If you do happen to bend a pin, *carefully* straighten it using a pair of needle-nose pliers. Again, use too much force and you risk bending or breaking the pin altogether, so be gentle!

9. TESTING THE NEW CHIP

Do *not* put the BSP back together yet! Plug the power in and turn the BSP on. If everything has gone according to plan, you should see the Bitstream Logo on the LCD screen and the unit should initialise as normal. Try turning a few of the controls and you should see the values change on the screen, as you're used to.

Turn the BSP off again and disconnect the power.

Did it work? Congratulations! Go to step 10.

If not, check the following in this order:

1. Are you sure the power supply was actually on?
2. Carefully check each and every pin on the chip. Does each pin go into a socket hole? If not, remove the chip and make the necessary adjustments.
3. Is the chip oriented the right way? (check the notch, remember?)

If the answer to all of these questions is "yes", then there are two possibilities. One is that the replacement chip is faulty, and the other is that somewhere along the way you have damaged it. Remember what I said about anti-static precautions, and not handling the pins?

To double-check, remove the chip as in section 6 and reinsert the original chip as in sections 7, 8 and 9. Does the BSP work now?

- *Yes* … your replacement chip is faulty and must be replaced.
- *No* … you've got a serious problem. Time to contact Wave Idea.

10. PUTTING THE BSP BACK TOGETHER AGAIN

To put the BSP back together again, you just need to repeat how you took in apart, but in reverse order!

To wit;

- Flip the circuit board over, carefully insert it over the six pins and screw the six nuts back into place. They only need to be finger-tight, so don't over-tighten them.
- Replace the bottom cover as you would close a briefcase, by folding it over and back towards yourself. As you do so, make sure you don't get any wires caught between the cover and the faceplate.
- Slide the six metal rings over the six bolts, then screw the six nuts back into place. Again, finger-tight only.

Replacing the knobs and slider caps is simply a matter of pushing them straight down onto the shafts. Here's a handy hint: before replacing the knob, turn the control all the way anti-clockwise. It's then a simple matter to put the knob on with the indicator (the white or black line) in the right place (ie, with the line pointing to about 7 o'clock).

(In fact, the BSP knobs can only go on one way anyway, but this does save you from pushing on a knob and wondering why it won't slide down as it should.)

Also, on my BSP at least, the control knobs having white lines and the LFO knobs have black lines – if yours does too, remember to use the right knobs in the right places.

Finally, plug the power in and turn the BSP on again. If it doesn't work now, you've probably got one of the wires caught in the case. Go back and check!

11. FINAL NOTES

If you've made it this far and your BSP is still working, congratulations! ☺

You should never need to this again, because from the version 1.3 ROM, you'll be able to upgrade your BSP ROM using software! So plug the midi and power cables back in, and get twiddling! Remember to check Wave Idea's site for information on what else is new in the v1.3 ROM and for information on how the software upgrading works.

12. ABOUT THIS DOCUMENT

This document was written by Gwydion Elderwyn in December 2001. As they are in France and I'm in Australia, I couldn't bear to be without my BSP for the time it would take to ship it to them to be upgraded (not to mention the expense!) so I had them ship me the ROM chip instead.

If this document helps you, that's great, but please remember – *I don't work for Wave Idea* – so if you have any problems, questions, or need technical help, please contact them via their website at http://www.waveidea.com