Solid
State
Logic

Service Calibration Procedure

611 I/O Module Calibration

18 September 1996

Issue 1.01

SL 611 Input/Output Module
Daughter Card Alignment

The following alignment instructions are applicable to all SL4000 and SL6000 Input/Output modules. Alignment may be carried out either with the module connected via a SL612 or SL613 Test Jig. Note however that VCA alignment for the 82E13 and 82E10 Cards should be carried out with the module fitted in the console, as adjustments are temperature dependent.

Input Card 82E291

Set the console to MIX status and inject 1kHz at +4dB into the channel Line Input. Set the Line Gain to its indent position (0dB).

Measure at the Insert Send, and adjust VR2 on the 82E291 PCB for 0dB.

The preset control marked VR1 is for adjusting the Mic Input low frequency CMRR. This is factory set and should not require further adjustment.

Dynamics Card 82E10

Inject 1KHz into the channel Line Input and increase the input level to +14dB so as to obtain +10dB at the Insert Send.

Set the Compressor controls as follows:

THRESHOLD	+10dB
ATTACK	Fast (pull Release knob up)
RELEASE	Fast (fully ACW)
RATIO	Infinity

Press the Dynamics to Channel Input button (CH IN) and check that the output level at the Insert Send drops by 4dB. This can be adjusted with the preset marked '0dBm'. Confirm that, when the Attack switch (on the Release pot) is pushed back in, the output level increases by 1.5dB approx (no adjustment available).
Decrease the input level to approximately -20dB, and with the Threshold pot set to -20dB, increase the input signal level so that the compressor starts to limit. Check that once limiting is achieved, the output level remains reasonably constant (within $\pm$1dB). If not, use the 'Gain' preset to correct. Now set the compressor Ratio pot to its minimum setting (1:1).

Set the Expander controls as follows:

THRESHOLD	10dB
ATTACK	Fast (pull Release knob up)
RELEASE	Fast (fully ACW)
RANGE	40dB
GATE SWITCH	In

Increase the input level to +14dB and adjust VR3 so that the channel just begins to pass audio (all the Green LEDs should extinguish). The gating level can then be confirmed either by adjusting the Line Trim around its indent position or by increasing and decreasing the oscillator input.

Set the Expander Range control to the minimum setting and adjust the 'Symmetry' preset for minimum distortion measured at the Insert Send. Release the Gate Switch. Set all other expander controls ACW.

VCA Card 82E13 (Non-Ultimation only)

Set the console to Record status and press the channel FLIP and DIRECT buttons. With +14dB applied to the Line Input, measure at the Group Output and adjust VR3 for +14dB output with the large (VCA) fader set at 0dB. Measure this output again for fader settings of +10, -10, and -20dB. Adjust VR2 (dB/V adjustment) to correct or evenly distribute any measured error.

Set the fader to 0dB and, using a distortion meter, adjust the Symmetry present VR1 for minimum distortion.

82E354 Card Calibration (Ultimation only)

On the computer enable the Analogue Input test by typing:
!TES at the command prompt and selecting the Analogue Input test.
When a screen full of 4-digit codes is displayed type:
T1 to set the input hysteresis (sensitivity) to 1.
Use VR4 to set the top of the fader travel so it just reads 0000 at the top of the fader travel and VR5 to set the bottom of the fader travel to just read 1023. Then run the fader calibrate routine on the computer by ENDing out of the test and pressing SETUP, M, C, O, SETUP from the command prompt.

With motors on (use the MO <EX> command to toggle Motor status), measure the dB level with the fader at +10, then turn motors off and use VR3 on the fader to set the VCA level to be exactly the same.
Do the same with the fader at -5, using VR1 to set the VCA knee-point,

then check the difference between the paths with the fader at 0. Use VR1 again to halve the error between the -5 and 0 points. The difference between the paths at these points should be no worse than 0.5dB.

Measure the fader path level with the fader at -30 and use VR2 to match the VCA level, then check the levels at -10 and -20 on the fader are no worse than 1dB.

Group Output Amplifier

With the console in Record status, deselect the DIRECT button and route the channel signal to its Group Output by pressing the appropriate routing button. Set the Group Trim to its 0dB (detent) position and with the fader set at 0dB, adjust the Group Output preset (located on the 611 Motherboard, next to Ready Group/Ready Tape switches) for +14dB or the level of the current Line Input signal.

Set the Oscillator output of the SL651 to its 'Cal' position and confirm that this is +4dB measured at the patch (unbalanced). Select the Oscillator GROUPS button and confirm that +4dB is present on the Group Output of the channel being aligned.

If required, the Output Balance for the Group Output may be trimmed using RV1 ('Balance') on the 82E294 card (82E11 for E Series). Output Balance is determined by measuring between 2 x 10k matched resisters in series across the output and 0 volts. RV1 ('Balance') is adjusted for minimum output.

Equaliser 82E02

Set the Oscillator frequency to 3kHz, switch the EQ section in with full HMF boost, and narrow 'Q'. All other gain controls should be set to their detent positions (flat). Adjust the frequency control until the output level peaks. At this frequency and 'Q' setting the Boost/Cut control should give ±15dB of gain. This should be set with the preset control marked 'HMF Q'.

Repeat the above at 1kHz for the LMF section using 'LMF Q'.

There is no adjustment for the HF or LF sections.

Equaliser 82E242

Set all Boost and Cut controls, including the HP and LP filters to their detent positions and then turn the High Pass filter control clockwise so that it is just 'on'. Adjust RV5 for unity gain with the Equaliser switched in.

Set up one band at a time as above for the 82E02 Equaliser. However, on the 82E242 there are also presets to adjust the HF and LF sections. These adjustments are made as above but with BELL selected.

Appropriate frequencies for the four bands are 100Hz for the LF, 1kHz for the LMF, 3kHz for the HMF and 10kHz for the HF band. Adjust the frequency control to peak the output of each band and set the gain for ±18dB using the appropriate preset.

Once the ±18dB levels have been checked, recheck for unity gain with the EQ controls to their detent positions, adjusting RV5 as necessary.

The LF Corner preset control has been factory set and will not normally require further adjustment.

Equaliser 82E292

Set the Oscillator to 3kHz at -10dB and feed the Line Input with the channel set for unity gain. Select EQ to Channel, HMF boost to max, Q to narrow. All other gain controls should be set flat.

Adjust the HMF frequency control until the output level peaks. At this frequency and Q setting, the Boost/Cut control should give ±22dB gain. This is adjusted with the 'HMF Q' preset control.

Repeat the above for the LMF section, injecting 1kHz at -10dB and using the 'LMF Q' preset control.

There are no adjustments for the HF or LF sections.

SL611 Motherboard (SL4000)

There are four presets located adjacent to the Quad Pan control which are used to set the channel output level to the main mix busses. With the F/B and L/R Pan controls set to Centre and the F/B Pan switched in, adjust for an 8.5dB drop in level when the signal is panned from that bus to centre. Please note that these adjustments are interactive and should be repeated and checked for the final result.

SL611 Motherboard (SL6000)

There are presets located adjacent to the Stereo Pan control which are used to set the channel output level to the main mix busses when panned to centre. These are normally set to give a 4.5dB drop in level on any main mix bus when the signal is panned from that bus to centre, but can, if required, be used to set pan centre levels between -2 and -6dB. Please note that these adjustments are interactive and should be repeated and checked

for the final result.

SL611 Motherboard (SL8000 and SL4000 consoles fitted with Film Panning)

There are no adjustments for the pan controls on consoles with Film Panning.