160SL CALIBRATION AND PROOF OF PERFORMANCE 1—16-06 (v1.10)

This procedure is intended for calibrating and verifying the performance of the 160SL.

Several assumptions are made at this time:

1. That the unit is fully functional, and is not in need of repair.

2. The person performing the calibrations and tests has more than a casual knowledge of audio in general, and is familiar with audio testing and audio specifications.

3. You have adequate test equipment.

4. The unit has been allowed to warm up sufficiently.

Well… Allow yourself enough time. The 160SL has many trims, and has various operating modes. Calibration (and proof of performance) may appear to be a daunting task. But really, think about it, the unit's function is fairly simple, a 2 channel compressor with peak limiting.

The calibration should be done in the order outlined. If you become very familiar with the unit, some of the calibrations can be done on an as needed basis. But beware. As far as proof of performance, it is not imperative to follow the outline precisely, and if there is confidence in the unit's performance, this section can be omitted. But as always, use sound judgement.

For those of you with access to an Audio Precision test set, a set of individual test panels are provided in the System One DOS format. These tests can be translated to various other Audio Precision formats. Go to www.audioprecision.com and download the needed translation software. Note that the Audio Precision test panel file names are in parentheses, usually at the end of the test steps indicating generator setup (1. Set the generator for 1kHz @ 5.00dBu. (**IO2**)). In general, these test panels were taken from what is used at the factory, but some are different, as the factory procedure uses more automation via software and proprietary equipment. Be assured that this manual calibration is in every way as thorough.

However, calibration and proof of performance do not require an Audio Precision test set. If the test equipment is equivalent, this is, of course, best. Even with less than the requirements, most of the calibration and proof of performance can be done. But keep in mind the limitations of your test equipment.

This procedure is in a format that should be applicable to any audio test set. You may notice redundancy, moving from Channel 1 to Channel 2 and back, etc. This was done for (supposed) clarity. Some steps require more than one action on one channel, these should be done as written. Nothing precludes editing this procedure for a more reasonable length, or even changing the individual tests somewhat. For instance, in many cases it's perfectly acceptable to drive both channels simultaneously and proceed accordingly.

Having thoroughly bored you by now, you can contact the author with suggestions, corrections, questions and other issues at mhills@dbxpro.com.

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HMG

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You will need the following equipment:

1. General purpose dual trace, oscilloscope.

2. DVM with an accuracy of 0.10% VDC.

3. Audio waveform generator with:

   Balanced output.
   Residual sine wave distortion below 0.001%.
   Output capability of at least +30dBu into 50 ohms.
   Frequency response of at least 10Hz-200kHz.

4. Audio distortion analyzer with:

   Balanced input.
   Ability to read residual distortion to 0.001%.
   Input capability of at least +30dBu.
   Frequency response of at least 10Hz-200kHz.

5. Audio voltmeter with:

   Balanced output.
   Ability to read levels of -100dBu.
   Output capability of at least +30dBu.
   Frequency response of at least 10Hz-200kHz.

6. 22Hz highpass filter with an 18dB/octave slope.

7. 22kHz lowpass filter with an 18dB/octave slope.

8. 80kHz lowpass filter with an 18dB/octave slope.

9. A 1/2W 600 ohm load.

NOTE: An Audio Precision DCX-127 will satisfy 2.
An Audio Precision System One or System Two (and newer) will satisfy 3-9.

NOTE: All amplitude measurements are in dBu unless otherwise noted.

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POWER SUPPLY RESISTANCE TESTS

NOTE: At this time, the unit must be disconnected from the audio test set for proper results.

1. Set the POWER switch to the OFF position.

2. Connect the DVM between the AC receptacle ground terminal and the CHASSIS GROUND terminal. (OHM1)

3. Verify a reading of < 1.0 ohms.

4. Connect the DVM in turn, between the AC receptacle high then low terminals and the chassis. (OHM1)

5. Verify a reading of infinite resistance in each case.

6. Connect the DVM between the AC receptacle high and low terminals. (OHM1)

7. Verify an infinite resistance.

8. Set the POWER switch to the ON position.

9. Connect the DVM between the AC receptacle high and low terminals. (OHM1)

10. Verify a reading of 10.0 ohms (+/-20%) for the 115V version, and 35.0 ohms (+/-20%) for the 230V version. (OHM1)

GROUND LIFT TESTS

1. Set the POWER switch to the OFF position.

Ch1

2. Connect the DVM between PIN 1 of the Ch1 INPUT and the CHASSIS GROUND terminal. (OHM1)

3. Verify a reading of < 1.0 ohms.

4. Set the Ch1 PIN 1 LIFT switch to the IN position.

5. Verify an infinite resistance.

Ch2

1. Connect the DVM between PIN 1 of the Ch2 INPUT and the CHASSIS GROUND terminal. (OHM1)

2. Verify a reading of < 1.0 ohms.

3. Set the Ch2 PIN 1 LIFT switch to the IN position.

4. Verify an infinite resistance.

5. Set the Ch1 and Ch2 PIN 1 LIFT switches to the OUT position.

GROUND LINK TESTS

1. Remove the rear panel GROUND LINK.

2. Connect the DVM between the CIRCUIT GROUND and CHASSIS GROUND terminals. (OHM1)

3. Verify a reading of approximately 100k OHMS.

4. Connect the DVM between the CHASSIS GROUND terminal and the chassis itself.

5. Verify a reading of < 1.0 ohms.

6. Replace the ground link.

UNBAL AND GROUND TESTS

1. Power the unit up.

2. Verify that the POWER LED is LIT and that it is BLUE.

3. Verify that the Ch1 and Ch2 METERS are LIT.

Ch1

1. Connect the DVM between the CIRCUIT GROUND terminal and PIN 3 of the Ch1 OUTPUT. (OHM1)

2. Set the Ch1 UNBAL and GROUND switches to the IN position.

3. Verify a reading of < 6.0 ohms.

Ch2

1. Connect the DVM between the CIRCUIT GROUND terminal and PIN 3 of the Ch2 OUTPUT. (OHM1)

2. Set the Ch1 UNBAL and GROUND switches to the IN position.

3. Verify a reading of < 6.0 ohms.

4. Set the Ch1 and Ch2 UNBAL and GROUND switches to the OUT position.

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POWER SUPPLY VOLTAGE TESTS

1. Connect the DVM ground to the CIRCUIT GROUND terminal. (DC1)

2. Verify within +/-5%:

+24.00VDC at PIN 1 of header H17.
-24.00VDC at PIN 2 of header H17.
+15.00VDC at PIN 5 of header H17.
-15.00VDC at PIN 6 of header H17.
+5.00VDC at PIN 7 of header H17.
+5.00VDC at PIN 8 of header H17.

+48.00VDC at PIN 9 of header H17.

3. Monitor in turn, pins 1-9 of H17 with the oscilloscope.

4. Verify that the noise and ripple is < 10MV peak.

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NOTE: At this point, an assumption is made that the unit is not grossly out of calibration. If you suspect that the unit is indeed, grossly out of calibration, you may want to move on to the calibration portion of the procedure, then return here.

The function of some of the LEDs is dependent on where thresholds are calibrated, and on COMPRESSOR THRESHOLD and STOP LEVEL control positions (as well as the amplitude and frequency of the applied signal). When the unit is properly (or nearly so) calibrated, the SIGNAL PASSAGE and LED TESTS can serve as a (very) quick check on the unit's functionality, by noting at what level(s)the various threshold LEDs turn on and off, by noting readings on the meters, readings at the outputs of the unit, and by comparing results between the two channels.

However, for best performance, there is no substitute for a complete calibration.

Unless otherwise noted, connect between the unit and the test setup using balanced connections.

SETUP

1. CONTROL SETTINGS (Ch1 and Ch2):

THRESHOLD	FULL CW
COMPRESSION	FULL CCW
ATTACK	12 O'CLOCK
RELEASE	12 O'CLOCK
OUTPUT GAIN	12 O'CLOCK
STOP LEVEL	FULL CW

2. SWITCH SETTINGS (Ch1 and Ch2):

OVEREASY		OUT
SIDECHAIN		OUT
AUTO		OUT
PeakStopPlus		OUT
BYPASS		OUT
STEREO COUPLE		OUT
INPUT		OUT
OUTPUT		OUT
G.R.		IN
POWER	(rear panel)	ON
PIN 1 LIFT	(rear panel)	OUT
UNBAL	(rear panel)	OUT
GROUND	(rear panel)	OUT
GROUND LINK	(rear panel)	CONNECTED
AVD	(internal)	OUT

SIGNAL PASSAGE TESTS

Ch1

1. Set the generator for 1kHz @ 0.00dBu. (IO1A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Verify that the Ch1 METER indicates 0dB (lower scale) of GAIN REDUCTION.

4. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

5. Verify a reading of 0.00dBu (+/-1.00dBu)

Ch2

1. Set the generator for 1kHz @ 0.00dBu. (IO1B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

4. Verify a reading of 0.00dBu (+/-1.00dBu)

COMPRESSOR AND PEAKSTOP THRESHOLD LED TESTS

Ch1

1. Set the generator for 1kHz @ 5.00dBu. (IO2A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Verify that the Ch1 BELOW LED is LIT and that it is GREEN.

4. Set the Ch1 OVEREASY switch to the IN position.

5. Slowly rotate the Ch1 COMPRESSOR THRESHOLD control full CCW.

6. As the Ch1 COMPRESSOR THRESHOLD control is rotated CCW, verify that:

   The Ch1 BELOW LED extinguishes, the Ch1 OVEREASY LED lights, and that is is GREEN/YELLOW.

   The Ch1 OVEREASY LED extinguishes, Ch1 ABOVE LED lights, and that is RED.

7. Set the Ch1 COMPRESSOR THRESHOLD control to 0dBu.

8. Set the Ch1 OVEREASY switch to the OUT position.

9. Set the Ch1 PeakStopPlus switch to the IN position.

10. Verify that the Ch1 PeakStopPlus LED is LIT and that it is GREEN.

11. Rotate the Ch1 STOP LEVEL control full CCW.

12. Verify that the Ch1 PeakStopPlus LED turns from GREEN to RED.

13. Set the Ch1 STOP LEVEL control full CW.

Ch2

1. Set the generator for 1kHz @ 5.00dBu. (IO2B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Verify that the Ch2 BELOW LED is LIT and that it is GREEN.

4. Set the Ch2 OVEREASY switch to the IN position.

5. Slowly rotate the Ch2 COMPRESSOR THRESHOLD control full CCW.

6. As the Ch2 COMPRESSOR THRESHOLD control is rotated CCW, verify that:

   The Ch2 BELOW LED extinguishes, the Ch2 OVEREASY LED lights, and that is is GREEN/YELLOW.

   The Ch2 OVEREASY LED extinguishes, Ch2 ABOVE LED lights, and that is RED.

7. Set the Ch2 COMPRESSOR THRESHOLD control to 0dBu.

8. Set the Ch2 OVEREASY switch to the OUT position.

9. Set the Ch2 PeakStopPlus switch to the IN position.

10. Verify that the Ch2 PeakStopPlus LED is LIT and that it is GREEN.

11. Rotate the Ch2 STOP LEVEL control full CCW.

12. Verify that the Ch2 PeakStopPlus LED turns from GREEN to RED.

13. Set the Ch2 STOP LEVEL control full CW.

MORE LED TESTS

1. Mute the generator signal.

2. Exercise ALL of the Ch1 and Ch2 front panel switches, excepting the OVEREASY switch.

NOTE: The OVEREASY, and ABOVE, and PEAK LEDs will NOT LIGHT at this time. Test the STEREO COUPLE switch last. Exercising the STEREO COUPLE switch will cause the Ch2 BELOW, AUTO, and PeakStopPlus LEDS to turn ON or OFF, if the related Ch2 switches are set to the IN position.

3. Verify that the related LEDs turn ON and OFF as the relevant switches are exercised.

4. Verify that the LEDs noted below are the correct color:

BELOW	GREEN
SIDECHAIN	RED
AUTO	GREEN
PeakStopPlus	GREEN
BYPASS	RED
INPUT	GREEN
OUTPUT	GREEN/YELLOW
G.R.	RED
STEREO COUPLE	GREEN

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CALIBRATION

SETUP

1. CONTROL SETTINGS (Ch1 and Ch2):

THRESHOLD	FULL CW
COMPRESSION	FULL CCW
ATTACK	12 O'CLOCK
RELEASE	12 O'CLOCK
OUTPUT GAIN	12 O'CLOCK
STOP LEVEL	FULL CW

2. SWITCH SETTINGS (Ch1 and Ch2):

OVEREASY		OUT
SIDECHAIN		OUT
AUTO		IN
PeakStopPlus		OUT
BYPASS		OUT
STEREO COUPLE		OUT
INPUT		OUT
OUTPUT		OUT
G.R.		IN
POWER	(rear panel)	ON
PIN 1 LIFT	(rear panel)	OUT
UNBAL	(rear panel)	OUT
GROUND	(rear panel)	OUT
GROUND LINK	(rear panel)	CONNECTED
AVD	(internal)	OUT

NOTE: When the following calibrations require a test probe, be sure to use the balanced input of the AC voltmeter. Ground the test probe ground lead at TP4 for Ch1 and TP7 for Ch2.

COMMON MODE REJECTION RATIO

NOTE: Using the Audio Precision test set...

Ch1

1. Set the generator for 60Hz @4.50dBu. (CMRR1)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Connect the test probe (no attenuation) to the CHANNEL A INPUT.

4. Monitor TP3 with the test probe.

5. Adjust the Ch1 CMRR ADJ (P8) for minimum reading (typically < -80dBu).

Ch2

1. Set the generator for 60Hz @4.50dBu. (CMRR1)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Connect the test probe (no attenuation) to the CHANNEL A INPUT.

4. Monitor TP6 with the test probe.

5. Adjust the Ch2 CMRR ADJ (P21) for minimum reading (typically < -80dBu).

6. Remove the test probe.

NOTE: Using a test set with no common mode measurement system...

Ch1

1. Set the generator for 60Hz @4.50dBu.

2. Short PINS 2 and 3 of the Ch1 INPUT of the unit together.

3. Apply the signal to either PIN 2 or 3 of the Ch1 INPUT of the unit, with signal ground connected to PIN 1 of the Ch1 INPUT.

4. Monitor TP3 with the AC voltmeter.

5. Adjust the Ch1 CMRR ADJ (P8) for minimum reading.

6. Remove the test probe.

7. Disconnect the short between XLR PINS 2 and 3 of the Ch2 INPUT.

Ch2

1. Set the generator for 60Hz @4.50dBu.

2. Short PINS 2 and 3 of the Ch2 INPUT of the unit together.

3. Apply the signal to the Ch2 INPUT of the unit with signal ground connected to PIN 1 of the Ch2 INPUT.

4. Monitor TP6 with the AC voltmeter.

5. Adjust the Ch2 CMRR ADJ (P21) for minimum reading.

6. Remove the test probe.

7. Disconnect the short between XLR PINS 2 and 3 of the Ch1 INPUT.

AMPLITUDE TRIM

NOTE: It is important to be accurate (within reason) when trimming for unity gain. Since many of the calibration and proof of performance steps rely on reading levels at the output of the unit, gain errors can occur because of inaccuracies that develop because of improper trimming, and/or because the OUTPUT GAIN controls have been inadvertently moved. It may be necessary to revisit the AMPLITUDE TRIM step from time to time to maintain accurate (unity) gain through the unit as calibration and performance evaluation is done. If the amplitude trims are good, usually trimming with the OUTPUT GAIN controls is all that is needed.

Many voltmeters have a "referencing" function, that is readings can be set relative to a chosen level. Example: If the absolute reading of the meter is 0.17dBu, and a reference of 0dBr is chosen, it then becomes less difficult to note changes in level. If the equipment used does not have a referencing function, then resetting the OUTPUT GAIN controls to correct an error of a few tenths of a dB will work. In any case, be aware that gain deviation beyond a few tenths of a dB should be looked into more closely.

Ch1

1. Set the generator for 1kHz @ 0.00dBu. (ATRIM1)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Verify that the Ch1 OUTPUT GAIN control is set to exactly 12 O'CLOCK.

5. Adjust the Ch1 OUTPUT GAIN TRIM (P6) for a reading of 0dBu.

Ch2

1. Set the generator for 1kHz @ 0.00dBu. (ATRIM2)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

4. Verify that the Ch2 OUTPUT GAIN control is set to exactly 12 O'CLOCK.

5. Adjust the Ch2 OUTPUT GAIN TRIM (P19) for a reading of 0dBu.

RMS SYMMETRY TRIM

NOTE: If oscillation occurs, connect a 600 ohm resistor in series with the test probe.

NOTE: Using the Audio Precision test set...

Ch1

1. Set the generator for 20Hz @ 0.00dBu. (STRIM1)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Set the Ch1 AUTO switch to the IN position.

4. Connect the test probe (no attenuation) to the CHANNEL A INPUT.

5. Monitor TP2 with the test probe.

6. Adjust the Ch1 RMS SYM TRIM (P10) for a minimum reading (typically < 10.0% THD+N)

7. Remove the test probe.

Ch2

1. Set the generator for 20Hz @ 0.00dBu. (STRIM2)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Set the Ch2 AUTO switch to the IN position.

4. Connect the test probe (no attenuation) to the CHANNEL A INPUT.

5. Monitor TP5 with the test probe.

6. Adjust the Ch2 RMS SYM TRIM (P22) for a minimum reading (typically < 10.0% THD+N)

7. Remove the test probe.

METER RMS SYMMETRY TRIM

1. Set the generator for 20Hz @ 0.00dBu. (STRIM5)

2. Apply the signal to the Ch2 INPUT.

3. Set the Ch2 AUTO switch to the IN position.

4. Connect the test probe (no attenuation) to the CHANNEL A INPUT.

5. Monitor TP9 with the test probe.

6. Adjust the Ch2 RMS SYM TRIM (P31) for a minimum reading (typically < 10.0% THD+N)

7. Remove the test probe.

RMS SYMMETRY TRIM

NOTE: Using an oscilloscope.

Ch1

1. Set the generator for 100Hz @ 0.00dBu.

2. Apply the signal to the Ch1 INPUT of the unit.

3. Set the Ch1 AUTO switch to the OUT position.

4. Monitor TP2 with a oscilloscope.

5. Set the oscilloscope resolution for 20mV vertical and 2.5ms horizontal.

6. Adjust the Ch1 RMS SYM TRIM (P10) so that the positive peaks of the waveform are equal in amplitude, and the negative peaks of the waveform are equal in amplitude.

7. Set the Ch1 AUTO switch to the IN position.

8. Remove the test probe.

Ch2

1. Set the generator for 100Hz @ 0.00dBu.

2. Apply the signal to the Ch2 INPUT of the unit.

3. Set the Ch2 AUTO switch to the OUT position.

4. Monitor TP5 with an oscilloscope.

5. Set the oscilloscope resolution for 20mV vertical and 2.5ms horizontal.

6. Adjust the Ch2 RMS SYM TRIM (P22) so that the positive peaks of the waveform are equal in amplitude, and the negative peaks of the waveform are equal in amplitude.

7. Set the Ch2 AUTO switch to the IN position.

8. Remove the test probe.

METER RMS SYMMETRY TRIM

1. Set the generator for 100Hz @ 0.00dBu.

2. Apply the signal to the Ch2 INPUT of the unit.

3. Set the Ch2 AUTO switch to the OUT position.

4. Monitor TP9 with an oscilloscope.

5. Set the oscilloscope resolution for 20mV vertical and 2.5ms horizontal.

6. Adjust the Ch2 RMS SYM TRIM (P31) so that the positive peaks of the waveform are equal in amplitude, and the negative peaks of the waveform are equal in amplitude.

7. Set the Ch2 AUTO switch to the IN position.

8. Remove the test probe.

PEAKSTOP RMS SYMMETRY TRIM

NOTE: Using the Audio Precision test set...

Ch1

1. Set the generator for 200Hz @ 0.00dBu. (STRIM3)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Connect the test probe (no attenuation) to the CHANNEL A INPUT.

4. Monitor TP1 with the test probe.

6. Adjust the Ch1 RMS SYM TRIM (P9) for a minimum reading (typically < 50.0% THD+N).

6. Remove the test probe.

Ch2

1. Set the generator for 200Hz @ 0.00dBu. (STRIM4)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Connect the test probe (no attenuation) to the CHANNEL A INPUT.

4. Monitor TP8 with the test probe.

5. Adjust the Ch2 RMS SYM TRIM (P18) for a minimum reading (typically < 50.0% THD+N)

6. Remove the test probe.

NOTE: Using an oscilloscope.

Ch1

1. Set the generator for 200Hz @ 0.00dBu.

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor TP1 with an oscilloscope.

4. Set the oscilloscope resolution for 100mV vertical and 2.5ms horizontal.

5. Adjust the Ch1 RMS SYM TRIM (P9) so that the positive peaks of the waveform are equal in amplitude, and the negative peaks of the waveform are equal in amplitude.

6. Remove the test probe.

Ch2

1. Set the generator for 200Hz @ 0.00dBu.

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor TP8 with an oscilloscope.

4. Set the oscilloscope resolution for 100mV vertical and 2.5ms horizontal.

5. Adjust the Ch2 RMS SYM TRIM (P18) so that the positive peaks of the waveform are equal in amplitude, and the negative peaks of the waveform are equal in amplitude.

6. Remove all test probes.

VCA DISTORTION TRIM

Ch1

1. Set the generator for 1kHz @ 0.00dBu. (DTRIM1)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the distortion analyzer.

4. Use the 22Hz highpass and 22kHz lowpass filters.

5. Adjust the Ch1 VCA SYM TRIM (P13) for a minimum reading (typically <0.010% THD+N).

Ch2

1. Set the generator for 1kHz @ 0.00dBu. (DTRIM2)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the distortion analyzer.

4. Use the 22Hz highpass and 22kHz lowpass filters.

5. Adjust the Ch2 VCA SYM TRIM (P26) for a minimum reading (typically <0.010% THD+N).

AMPLITUDE RETRIM (Usually not necessary)

Ch1

1. Set the generator for 1kHz @ 0.00dBu. (ATRIM1)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Verify that the Ch1 OUTPUT GAIN control is set to exactly 12 O'CLOCK.

5. Adjust the Ch1 OUTPUT GAIN TRIM (P6) for a reading of 0dBu.

Ch2

1. Set the generator for 1kHz @ 0.00dBu. (ATRIM2)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

4. Verify that the Ch2 OUTPUT GAIN control is set to exactly 12 O'CLOCK.

5. Adjust the Ch2 OUTPUT GAIN TRIM (P19) for a reading of 0dBu.

PEAKSTOP CALIBRATION (Temperature sensitive and tweaky)

Ch1

1. Set the generator for 1kHz @4.00dBu. (PEAK1)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the distortion analyzer.

4. Set the Ch1 PLUS TRIM (P3) full CCW.

5. Set the Ch1 STOP LEVEL control full CCW.

6. Adjust the Ch1 LIMIT THRES CAL (P11) for a reading of 0.35% THD+N.

7. Verify that the Ch1 PEAKSTOP LED is LIT and that it is RED. Can be iffy.

8. Rotate Ch1 STOP LEVEL CW until the PEAKSTOP LED goes OUT.

9. Note that the PEAKSTOP LED goes out immediately.

10. Set the Ch1 STOP LEVEL full CCW.

1. Set the generator for 1kHz @ 25.00dBu. (PEAK3)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Set the Ch1 PeakStopPlus switch to the IN position.

5. Verify that the Ch1 PEAKSTOP LED changes from RED to GREEN.

6. Set the Ch1 STOP LEVEL control to +25 (on the front panel).

7. Reference the AC voltmeter reading to 0dBr. (For Audio Precision, press the F4 key.)

8. Adjust the Ch1 PLUS TRIM (P3) for a reading of -1.50dBr (+/- 0.10dBr) on the AC voltmeter.

9. Verify that the Ch1 PEAKSTOP LED changes from GREEN to RED.

10. Rotate Ch1 STOP LEVEL control full CW.

11. As the Ch1 STOP LEVEL control is rotated, note that the PEAKSTOP LED immediately turns GREEN.

Ch2

1. Set the generator for 1kHz @4.00dBu. (PEAK2)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the distortion analyzer.

4. Set the Ch2 PLUS TRIM (P24) full CCW.

5. Set the Ch2 STOP LEVEL control full CCW.

6. Adjust the Ch2 LIMIT THRES CAL (P27) for a reading of 0.35% THD+N.

7. Verify that the Ch2 PEAKSTOP LED is LIT and that it is RED. Can be iffy.

8. Rotate Ch2 STOP LEVEL CW until the PEAKSTOP LED goes OUT.

9. Note that the PEAKSTOP LED goes out immediately.

10. Set the Ch2 STOP LEVEL full CCW.

1. Set the generator for 1kHz @ 25.00dBu. (PEAK4)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

4. Set the Ch2 PeakStopPlus switch to the IN position.

5. Verify that the Ch2 PEAKSTOP LED changes from RED to GREEN.

6. Set the Ch2 STOP LEVEL control to 25dB (on the front panel).

7. Reference the AC voltmeter reading to 0dBr. (For Audio Precision, press the F4 key.)

8. Adjust the Ch2 PLUS TRIM (P24) for a reading of -1.50dBr (+/- 0.10dBr) on the AC voltmeter.

9. Verify that the Ch1 PEAKSTOP LED changes from GREEN to RED.

10. Rotate Ch2 STOP LEVEL control full CW.

11. As the Ch2 STOP LEVEL control is rotated, note that the PEAKSTOP LED immediately turns GREEN.

12. Set the Ch1 and Ch2 PeakStopPlus switches to the OUT position.

20Hz THD+N TRIM

Ch1

1. Set the generator for 10Hz @ 23.50dBu. (ADJ20A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the distortion analyzer.

4. Adjust the Ch1 THD TRIM (P4) for a minimum reading (typically < 0.045% THD+N).

Ch2

1. Set the generator for 10Hz @ 23.50dBu. (ADJ20B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the distortion analyzer.

4. Adjust the Ch2 THD TRIM (P16) for a minimum reading (typically < 0.045% THD+N).

COMPRESSION THRESHOLD CALIBRATION

Ch1

1. Set the generator for 1kHz @ 0.00dBu. (CT1)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Set the Ch1 COMPRESSION control full CW.

5. Set the Ch1 THRESHOLD control to 0dBu on the FRONT PANEL.

6. Set THRESHOLD CAL (P34) full CCW.

7. Reference the AC voltmeter reading to 0dBr. (For Audio Precision, press the F4 key.)

8. Adjust the Ch1 THRESHOLD CAL TRIM (P34) CW for a reading of -0.10dBr on the AC voltmeter.

9. Verify operation of the Ch1 THRESHOLD LEDs (BELOW GREEN, OVER RED) by rotating the Ch1 THRESHOLD control slightly CCW, then CW.

10. Readjust the Ch1 THRESHOLD control as needed for a reading of -0.10dBr on the AC voltmeter.

11. Set the Ch1 OVEREASY switch to the IN position.

12. Verify that the Ch1 OVEREASY LED is LIT and that it is GREEN/YELLOW.

13. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

14. Verify a reading of -6.00dBr. (+/-1.00dBr)

Ch2

1. Set the Ch2 COMPRESSION control full CW.

2. Set the Ch2 THRESHOLD control to 0dBu on the FRONT PANEL.

3. Set THRESHOLD CAL (P35) full CCW.

4. Set the generator for 1kHz @ 0.00dBu. (CT2)

5. Apply the signal to the Ch2 INPUT of the unit.

6. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

7. Reference the AC voltmeter reading to 0dBr. (For Audio Precision, press the F4 key.)

8. Adjust the Ch2 THRESHOLD CAL TRIM (P35) CW for a reading of -0.10dBr on the AC voltmeter.

9. Verify operation of the Ch2 THRESHOLD LEDs (BELOW GREEN, OVER RED) by rotating the Ch2 THRESHOLD control slightly CCW, then CW.

10. Readjust the Ch2 THRESHOLD control as needed for a reading of -0.10dBr on the AC voltmeter.

11. Set the Ch2 OVEREASY switch to the IN position.

12. Verify that the Ch2 OVEREASY LED is LIT and that it is YELLOW.

13. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

14. Verify a reading of -6.00dBr. (+/-1.00dBr) on the AC voltmeter.

4:1 CALIBRATION

Ch1

1. Set the Ch1 OVEREASY switch to the OUT position.

2. Set the Ch1 COMPRESSION control full CCW.

3. Set the generator for 1kHz @ 0.00dBu. (FOUR1A)

4. Apply the signal to the Ch1 INPUT of the unit.

5. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

6. Reference the AC voltmeter reading to 0dBr. (For Audio Precision, press the F4 key.)

7. Set the generator for 1kHz @ 20.00dBu.

8. Set the Ch1 COMPRESSION control to 12 O'CLOCK (4:1).

9. Adjust the Ch1 4:1 CAL (P1) for a reading of 5.50dBr.

10. Set the Ch1 COMPRESSION control full CCW.

Ch2

1. Set the Ch2 OVEREASY switch to the OUT position.

2. Set the Ch2 COMPRESSION control full CCW.

3. Set the generator for 1kHz @ 0.00dBu. (FOUR1B)

4. Apply the signal to the Ch2 INPUT of the unit.

5. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

6. Reference the AC voltmeter reading to 0dBr. (For Audio Precision, press the F4 key.)

7. Set the generator for 1kHz @ 20.00dBu.

8. Set the Ch2 COMPRESSION control to 12 O'CLOCK (4:1).

9. Adjust the Ch1 4:1 CAL (P20) for a reading of 5.50dBr.

10. Set the Ch2 COMPRESSION control full CCW.

METER CALIBRATION

Ch1

1. Set the generator for 1kHz @4.00dBu. (MET1A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Set the Ch1 SIDECHAIN switch to the IN position.

4. Set the Ch1 METER SELECTION INPUT switch to the IN position.

5. Adjust the Ch1 METER REF trimmer (P15) for a reading of 0dB (upper scale) on the Ch1 meter.

6. Set the Ch1 METER SELECTION OUTPUT switch to the IN position.

7. Verify a reading of 0dB (+/- 1.00dB, upper scale) on the Ch1 meter.

Ch2

1. Set the generator for 1kHz @4.00dBu. (MET1B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Set the Ch2 SIDECHAIN switch to the IN position.

4. Set the Ch2 METER SELECTION INPUT switch to the IN position.

5. Adjust the Ch2 METER REF trimmer (P30) for reading of 0dB (upper scale) on the Ch2 meter.

6. Set the Ch2 METER SELECTION OUTPUT switch to the IN position.

7. Verify a reading of 0dB (+/- 1.00dB, upper scale) on the Ch2 meter.

PEAK LED TEST

Ch1

1. Set the generator for 1kHz @ 27.50dBu. (MET2A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Set the Ch1 METER SELECTION OUTPUT switch to the IN position.

5. Verify that the Ch1 PEAK LED is LIT and that it is RED.

6. Lower the AMPLITUDE of the generator in 0.10dB increments.

7. Verify that the Ch1 PEAK LED goes out when the AC voltmeter reads 27.00dBu (+/-0.25dBu).

NOTE: With Audio Precision you can press the (+) and DELETE keys to change the amplitude of the generator.

Ch2

1. Set the Ch2 METER SELECTION OUTPUT switch to the IN position.

2. Set the generator for 1kHz @ 27.50dBu. (MET2B)

3. Apply the signal to the Ch2 INPUT of the unit.

4. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

5. Verify that the Ch2 PEAK LED is LIT and that it is RED.

6. Lower the AMPLITUDE of the generator in 0.10dB increments.

7. Verify that the Ch2 PEAK LED goes out when the AC voltmeter reads 27.00Bu (+/-0.25dBu).

NOTE: With Audio Precision you can press the (+) and DELETE keys to change the amplitude of the generator.

METER LINEARITY CALIBRATION

Ch1

1. Set the generator for 1kHz @ 0.00dBu. (LIN1A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Set the Ch1 METER SELECTION G.R. switch to the IN position.

5. Adjust the Ch1 GR0 trimmer (P17) for a reading of 0dB (lower scale) on the Ch1 meter.

6. Set the Ch1 SIDECHAIN switch to the OUT position.

7. Set the Ch1 COMPRESSION control full CW.

8. Adjust the Ch1 THRESHOLD control for a reading of -25.00dBu on the AC voltmeter.

9. Adjust the Ch1 METER GR TRIM (P14) for a reading of -25dB (lower scale) on the Ch1 meter.

Ch2

1. Set the generator for 1kHz @ 0.00dBu. (LIN1B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

4. Set the Ch2 METER SELECTION G.R. switch to the IN position.

5. Adjust the Ch2 GR0 trimmer (P32) for a reading of 0dB (lower scale) on the Ch2 meter.

6. Set the Ch2 SIDECHAIN switch to the OUT position.

7. Set the Ch2 COMPRESSION control full CW.

8. Adjust the Ch2 THRESHOLD control for a reading of -25.00dBu on the AC voltmeter.

9. Adjust the Ch2 METER GR TRIM (P29) for a reading of -25dB (lower scale) on the Ch2 meter.

SLOW RELEASE CALIBRATION

Note: This calibration is very tweaky. The unit must be warmed up completely. And... adjusting the calibration for too slow a release time will result in the unit "freezing" when in gain reduction, or releasing very slowly.

Ch1

1. Set the generator for 1kHz @ 0.00dBu. (SREL1A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Set the Ch1 ATTACK control full CCW.

5. Set the Ch1 RELEASE control full CW.

6. Set the Ch1 AUTO switch to the OUT position.

7. Set the Ch1 OVEREASY switch to the IN position.

8. Adjust the Ch1 THRESHOLD control for a reading of -20.00dBu on the AC voltmeter.

9. Mute the generator repeatedly. Or... If the generator has tone burst capabilities, set the tone burst on time for approximately 600mS, and the tone burst off interval for 2S.

Note: For Audio Precision, set the generator waveform to BURST.

10. Adjust Ch1 SLW RLS TRIM (P2) for 2 sec of meter decay (the time interval for the meter (lower scale) to change from -20dB to 0dB gain reduction when the signal is muted).

Ch2

1. Set the generator for 1kHz @ 0.00dBu. (SREL1B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

4. Set the Ch2 ATTACK control full CCW.

5. Set the Ch2 RELEASE control full CW.

6. Set the Ch2 AUTO switch to the OUT position.

7. Set the Ch2 OVEREASY switch to the IN position.

8. Adjust the Ch2 THRESHOLD control for a reading of -20.00dBu on the AC voltmeter.

9. Mute the generator repeatedly. Or... If the generator has tone burst capabilities, set the tone burst on time for approximately 600mS, and the tone burst off interval for 2S.

Note: For Audio Precision, set the generator waveform to BURST.

10. Adjust Ch2 SLW RLS TRIM (P23) for 2 sec of meter decay (the time interval for the meter (lower scale) to change from -20dB to 0dB gain reduction when the signal is muted).

SLOW RELEASE METER TEST

1. Set the generator for 1kHz @ 20.00dBu. (MET3)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Mute the generator repeatedly.

4. Set the STEREO COUPLE switch to the IN position.

5. Set the Ch1 AUTO switch to the IN position.

6. Verify close tracking between the Ch1 and Ch2 meters.

7. Set the Ch1 AUTO switch to the OUT position.

8. Set the STEREO COUPLE switch to the OUT position.

THE UNIT IS CALIBRATED

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PROOF OF PERFORMANCE

SETUP

1. CONTROL SETTINGS (Ch1 and Ch2):

THRESHOLD	FULL CW
COMPRESSION	FULL CCW
ATTACK	12 O'CLOCK
RELEASE	12 O'CLOCK
OUTPUT GAIN	12 O'CLOCK
STOP LEVEL	FULL CW

2. SWITCH SETTINGS (Ch1 and Ch2):

OVEREASY	OUT
SIDECHAIN	OUT
AUTO	OUT
PeakStopPlus	OUT
BYPASS	OUT
STEREO COUPLE	OUT
INPUT	OUT
OUTPUT	OUT
G.R.	IN
POWER (rear panel)	OFF
PIN 1 LIFT (rear panel)	OUT

UNBAL	(rear panel)	OUT
GROUND	(rear panel)	OUT
GROUND LINK	(rear panel)	CONNECTED
AVD	(internal)	OUT

AMPLITUDE TRIM (Once again!)

NOTE: It is important to be accurate (within reason) when trimming for unity gain. Since many of the calibration and performance steps rely on reading levels at the output of the unit, gain errors can occur because of inaccuracies that develop because of improper trimming, and/or the because of the OUTPUT GAIN controls been inadvertently moved. It may necessary to revisit the AMPLITUDE TRIM step from time to time to maintain accurate (unity) gain through the unit as calibration and performance evaluation is done. If the trims are good, usually trimming with the OUTPUT GAIN controls is all that is needed.

Many voltmeters have a "referencing" function, that is readings can be set relative to a chosen level. Example: If the absolute reading of the meter is 0.17dBu, and a reference of 0dBr is chosen, it then becomes less difficult to note changes in level. If the equipment used does not have a referencing function, then resetting the OUTPUT GAIN controls to correct an error of a few tenths of a dB will work. In any case, be aware that gain deviation beyond a few tenths of a dB should be looked into more closely.

Ch1

1. Set the generator for 1kHz @ 0.00dBu. (ATRIM1)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Verify that the Ch1 OUTPUT GAIN control is set to exactly 12 O'CLOCK.

5. Adjust the Ch1 OUTPUT GAIN TRIM (P6) for a reading of 0dBu.

Ch2

1. Set the generator for 1kHz @ 0.00dBu. (ATRIM2)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

4. Verify that the Ch2 OUTPUT GAIN control is set to exactly 12 O'CLOCK.

5. Adjust the Ch2 OUTPUT GAIN TRIM (P19) for a reading of 0dBu.

FREQUENCY RESPONSE

Ch1

1. Set the generator for 1kHz @ 0.00dBu. (FREQ1A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Reference the AC voltmeter reading to 0dBr. (For Audio Precision, press the F4 key.)

5. Verify that the Ch1 frequency response is within:

0.10dBr, -1.35dBr @ 200kHz.
0.10dBr, -0.10dBr @ 20kHz.
0.10dBr, -0.10dBr @ 2kHz.
0.10dBr, -0.10dBr @ 200Hz.
0.20dBr, -0.10dBr @ 20Hz.

Ch2

1. Set the generator for 1kHz @ 0.00dBu. (FREQ1B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

4. Reference the AC voltmeter reading to 0dBr. (For Audio Precision, press the F4 key.)

5. Verify that the Ch2 frequency response is within:

0.10dBr, -1.35dBr @ 200kHz.
0.10dBr, -0.10dBr @ 20kHz.
0.10dBr, -0.10dBr @ 2kHz.
0.10dBr, -0.10dBr @ 200Hz.
0.20dBr, -0.10dBr @ 20Hz.

THD+N

Ch1

1. Set the generator for 2kHz @ 0.00dBu. (THD0A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the distortion analyzer.

4. Use the 22Hz highpass and 80kHz lowpass filters.

5. Verify that the Ch1 THD+N is less than:

0.075% @ 20kHz.
0.055% @ 2kHz.
0.055% @ 200Hz.
0.055% @ 20Hz.

Ch2

1. Set the generator for 2kHz @ 0.00dBu. (THD0B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the distortion analyzer.

4. Use the 22Hz highpass and 80kHz lowpass filters.

5. Verify that the Ch2 THD+N is less than:

0.075% @ 20kHz.
0.055% @ 2kHz.
0.055% @ 200Hz.
0.055% @ 20Hz.

NOISE LEVEL

Ch1

1. Set the generator for 1kHz @ 0.00dBu. (N1A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Reference the AC voltmeter reading to 0dBr. (For Audio Precision, press the F4 key.)

5. Use the 22Hz highpass and 22kHz lowpass filters.

6. Mute the generator.

7. Verify a reading of < -92.00dBr.

Ch2

1. Set the generator for 1kHz @ 0.00dBu. (N1B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

4. Use the 22Hz highpass and 82kHz lowpass filters.

5. Reference the AC voltmeter reading to 0dBr. (For Audio Precision, press the F4 key.)

6. Mute the generator.

7. Verify a reading of < -92.00dBr.

HEADROOM and OUTPUT STAGE

Ch1

1. Set the generator for 1kHz @ 29.40dBu. (OLVTH1)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Monitor the Ch1 OUTPUT of the unit with the distortion analyzer.

5. Use the 22Hz highpass and 22kHz lowpass filters.

6. Connect the 600 ohm load to the Ch1 output.

NOTE: For Audio Precision using the OLVTH1 test the 600 ohm load is connected.

7. Adjust the Ch1 OUTPUT GAIN control for a reading of 29.40dBu at the OUTPUT of Ch1.

8. Verify a reading of < 0.40% THD+N.

9. Set the Ch1 UNBAL switch to the IN position.

10. Verify a reading of < 0.40% THD+N.

11. Verify a reading of 23.50dBu (+/-0.50dBu).

12. Set the Ch1 GROUND switch to the IN position.

13. Verify a reading of < 0.40% THD+N.

14. Verify a reading of 23.50dBu (+/-0.50dBu).

15. Set the Ch1 UNBALANCED switch to the OUT position.

16. Set the Ch1 GROUND switch to the OUT position.

17. Ground PIN 3 of the Ch1 OUTPUT XLR.

18. Verify a reading of < 0.40% THD+N.

19. Verify a reading of 29.40dBu (+/-0.50dBu).

21. Remove the ground from PIN 3 of the Ch1 OUTPUT XLR.

22. Ground PIN 2 of the Ch1 OUTPUT XLR.

23. Verify a reading of < 0.40% THD+N.

24. Verify a reading of 29.40dBu (+/-0.50dBu).

25. Remove the ground from PIN 2 of the Ch1 OUTPUT XLR.

Ch2

1. Set the generator for 1kHz @ 29.40dBu. (OLVTH1B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

4. Monitor the Ch2 OUTPUT of the unit with the distortion analyzer.

5. Use the 22Hz highpass and 22kHz lowpass filters.

6. Connect the 600 ohm load to the Ch2 output.

NOTE: For Audio Precision using the OLVTH1 test the 600 ohm load is connected.

7. Adjust the Ch2 OUTPUT GAIN control for a reading of 29.40dBu at the OUTPUT of Ch2.

8. Verify a reading of < 0.40% THD+N.

9. Set the Ch2 UNBAL switch to the IN position.

10. Verify a reading of < 0.40% THD+N.

11. Verify a reading of 23.50dBu (+/-0.50dBu).

12. Set the Ch2 GROUND switch to the IN position.

13. Verify a reading of < 0.40% THD+N.

14. Verify a reading of 23.50dBu (+/-0.50dBu).

15. Set the Ch2 UNBALANCED switch to the OUT position.

16. Set the Ch2 GROUND switch to the OUT position.

17. Ground PIN 3 of the Ch2 OUTPUT XLR.

18. Verify a reading of < 0.40% THD+N.

19. Verify a reading of 29.40dBu (+/-0.50dBu).

21. Remove the ground from PIN 3 of the Ch2 OUTPUT XLR.

22 Ground PIN 2 of the Ch2 OUTPUT XLR.

23. Verify a reading of < 0.40% THD+N.

24. Verify a reading of 29.40dBu (+/-0.50dBu).

20. Remove the ground from PIN 2 of the Ch2 OUTPUT XLR.

OUTPUT GAIN RANGE

Ch1

1. Set the generator for 1kHz @ 0.00dBu. (OUT1A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Adjust the Ch1 OUTPUT control full CW then full CCW.

5. Verify +/-25dB gain (+/-1.0dB).

6. Readjust the Ch1 OUTPUT GAIN control for a 0dBu (+/-0.05dBu) reading.

Ch2

1. Set the generator for 1kHz @ 0.00dBu. (OUT1B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

4. Adjust the Ch2 OUTPUT control full CW then full CCW.

5. Verify +/-25dB gain (+/-1.0dB).

6. Readjust the Ch2 OUTPUT GAIN control for a 0dBu (+/-0.05dBu) reading.

PEAKSTOP

Ch1

1. Set the generator for 2kHz @ 28.00dBu. (PFREQ1A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Set the Ch1 STOP LEVEL control full CCW.

5. Set the Ch1 PeakStop Plus switch to the IN position.

6. Verify a reading of approximately -24dB G.R.(lower scale) on the Ch1 meter.

7. Verify that the Ch1 frequency response is within:

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5.00dBu,  3.00dBu @ 20kHz.
4.60dBu,  2.60dBu @  2kHz.
2.00dBu,  0.00dBu @ 200Hz.
4.75dBu,  2.75dBu @  20Hz.
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Ch2

1. Set the generator for 2kHz @ 28.00dBu. (PFREQ1B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Set the Ch2 STOP LEVEL control full CCW.

5. Set the Ch2 PeakStop Plus switch to the IN position.

6. Verify a reading of approximately -24dB G.R. (lower scale) on the Ch1 meter.

7. Verify that the Ch2 frequency response is within:

      5.00dBu, 3.00dBu @ 20kHz.
      4.60dBu, 2.60dBu @ 2kHz.
      2.00dBu, 0.00dBu @ 200Hz.
      4.75dBu, 2.75dBu @ 20Hz.

PEAKSTOP THD+N

Ch1

1. Set the generator for 2kHz @ 28.00dBu. (PTHD1A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the distortion analyzer.

4. Use the 22Hz highpass and 80kHz lowpass filters.

5. Verify Ch1 THD+N less than:

      0.75% @ 20kHz.
      0.25% @ 2kHz.
      0.45% @ 200Hz.
      2.00% @ 20Hz.

Ch2

1. Set the generator for 2kHz @ 28.00dBu. (PTHD1B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the distortion analyzer.

4. Use the 22Hz highpass and 80kHz lowpass filters.

5. Verify Ch2 THD+N less than:

      0.75% @ 20kHz.
      0.25% @ 2kHz.
      0.45% @ 200Hz.
      2.00% @ 20Hz.

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GAIN REDUCTION

SETUP

1. CONTROL SETTINGS (Ch1 and Ch2):

THRESHOLD	FULL CW
COMPRESSION	FULL CW
ATTACK	12 O'CLOCK
RELEASE	12 O'CLOCK
OUTPUT GAIN	12 O'CLOCK

STOP LEVEL		FULL CW

2. SWITCH SETTINGS (Ch1 and Ch2):

OVEREASY		OUT
SIDECHAIN		OUT
AUTO		IN
PeakStopPlus		OUT
BYPASS		OUT
STEREO COUPLE		OUT
INPUT		OUT
OUTPUT		OUT
G.R.		IN
POWER	(rear panel)	OFF
PIN 1 LIFT	(rear panel)	OUT
UNBAL	(rear panel)	OUT
GROUND	(rear panel)	OUT
GROUND LINK	(rear panel)	CONNECTED
AVD	(internal)	OUT

GAIN REDUCTION FREQUENCY RESPONSE

Ch1

1. Set the generator for 2kHz @ 0.00dBu. (FRGR1A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Adjust the Ch1 THRESHOLD control for a reading of -20dBu.

5. Verify that the Ch1 frequency response is within:

-19.00dBu, -21.00dBu @ 20kHz.
-19.00dBu, -21.00dBu @ 2kHz.
-19.00dBu, -21.00dBu @ 200Hz.
-17.00dBu, -19.00dBu @ 20Hz.

Ch2

1. Set the generator for 2kHz @ 0.00dBu. (FRGR1B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

4. Adjust the Ch2 THRESHOLD control for a reading of -20dBu.

5. Verify that the Ch2 frequency response is within:

-19.00dBu, -21.00dBu @ 20kHz.
-19.00dBu, -21.00dBu @ 2kHz.
-19.00dBu, -21.00dBu @ 200Hz.
-17.00dBu, -19.00dBu @ 20Hz.

ATTACK AND RELEASE (THD+N)

1. Set the generator for 550Hz @ 0.00dBu. (ATCK1A)
2. Apply the signal to the Ch1 INPUT of the unit.
3. Monitor the Ch1 OUTPUT of the unit with the distortion analyzer.
4. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.
5. Use the 22Hz highpass and 22kHz lowpass filters.
6. Set the Ch1 ATTACK control full CW.
7. Set the Ch1 RELEASE control full CCW.
8. Adjust the Ch1 THRESHOLD control for a reading of -20dBu.
9. Verify approximately 0.13% THD+N.
10. Set the AUTO switch to the OUT position.
11. Verify approximately 1.00% THD+N.
12. Set the ATTACK control full CCW.
13. Verify approximately 6.20% THD+N.
14. Set the AVD switch to the IN position.
15. Verify approximately 0.23% THD+N.
16. Set the RELEASE control full CW.
17. Verify approximately 0.03% THD+N.

Ch2

1. Set the Ch2 ATTACK control full CW.
2. Set the Ch2 RELEASE control full CCW.
3. Set the generator for 550Hz @ 0.00dBu. (ATCK1B)
4. Apply the signal to the Ch2 INPUT of the unit.
5. Monitor the Ch2 OUTPUT of the unit with the distortion analyzer.
6. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.
7. Use the 22Hz highpass and 22kHz lowpass filters.
8. Adjust the Ch2 THRESHOLD control for a reading of -20dBu.
9. Verify approximately 0.13% THD+N.
10. Set the AUTO switch to the OUT position.

11. Monitor the Ch2 OUTPUT of the unit with the distortion analyzer.

12. Verify approximately 1.00% THD+N.

13. Set the ATTACK control full CCW.

14. Verify approximately 6.20% THD+N.

15. Set the AVD switch to the IN position.

16. Verify approximately 0.23% THD+N.

17. Set the RELEASE control full CW.

18. Verify approximately 0.03% THD+N.

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SIDECHAIN TESTS

SETUP

1. CONTROL SETTINGS (Ch1 and Ch2):

THRESHOLD	-20dBu
COMPRESSION	FULL CW
ATTACK	12 O'CLOCK
RELEASE	12 O'CLOCK
OUTPUT GAIN	12 O'CLOCK
STOP LEVEL	FULL CW

2. SWITCH SETTINGS (Ch1 and Ch2):

OVEREASY		OUT
SIDECHAIN		OUT
AUTO		OUT
PeakStopPlus		OUT
BYPASS		OUT
STEREO COUPLE		OUT
INPUT		OUT
OUTPUT		OUT
G.R.		IN
POWER	(rear panel)	OFF
PIN 1 LIFT	(rear panel)	OUT
UNBAL	(rear panel)	OUT
GROUND	(rear panel)	OUT
GROUND LINK	(rear panel)	CONNECTED
AVD	(internal)	OUT

SIDECHAIN SIGNAL PASSAGE

Ch1

1. Set the generator for 1kHz @ 0.00Bu. (SC1A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 SIDECHAIN SEND of the unit with the AC voltmeter.

4. Verify a reading of 0.00dBu (+/-0.10dBu).

5. Apply the signal to the Ch1 SIDECHAIN RETURN of the unit.

6. Set the Ch1 SIDECHAIN switch to the IN position.

7. Verify a reading of -20dB (lower scale) on the Ch1 meter.

Ch2

1. Set the generator for 1kHz @ 0.00dBu. (SC1B)

2. Apply the signal to the Ch2 INPUT of the unit of the unit.

3. Monitor the Ch2 SIDECHAIN SEND of the unit with the AC voltmeter.

4. Verify a reading of 0.00dBu (+/-0.10dBu).

5. Apply the signal to the Ch2 SIDECHAIN RETURN of the unit.

6. Set the Ch2 SIDECHAIN switch to the IN position.

7. Verify a reading of -20dB (lower scale) on the Ch2 meter.

NOTE: When the following tests require a test probe, be sure to use the balanced input of the AC voltmeter. Ground the test probe ground lead at TP4 for Ch1 and TP7 for Ch2.

SIDECHAIN FREQUENCY RESPONSE

Ch1

1. Set the generator for 2kHz @ 6.10dBu. (SFREQ1A)

2. Apply the signal to the Ch1 SIDECHAIN RETURN of the unit.

3. Connect the test probe (no attenuation) to the BALANCED INPUT of the AC voltmeter.

4. Monitor TP10 on with the AC voltmeter.

5. Verify that the Ch1 frequency response is within:

0.10dBu, -3.50dBu @ 200kHz.
0.10dBu, -0.20dBu @ 20kHz.
0.10dBu, -0.20dBu @ 2kHz.
0.10dBu, -0.20dBu @ 200Hz.
0.10dBu, -0.20dBu @ 20Hz.

Ch2

1. Set the generator for 2kHz @ 6.10dBu. (SFREQ1A)

2. Apply the signal to the Ch2 SIDECHAIN RETURN of the unit.

3. Monitor TP11 on with the AC voltmeter.

4. Verify that the Ch2 frequency response is within:

0.10dBu, -3.50dBu @ 200kHz.
0.10dBu, -0.20dBu @ 20kHz.
0.10dBu, -0.20dBu @ 2kHz.
0.10dBu, -0.20dBu @ 200Hz.
0.10dBu, -0.20dBu @ 20Hz.

SIDECHAIN CMRR

Ch1

1. Set the generator for 60Hz @6.10dBu (SCMRR1A).

2. Apply the signal to the Ch1 SIDECHAIN RETURN of the unit.

3. Monitor TP10 with the AC voltmeter.

4. Verify a reading of < -40.00dBu.

Ch2

1. Set the generator for 60Hz @6.10dBu (SCMRR1B).

2. Apply the signal to the Ch2 SIDECHAIN RETURN of the unit.

3. Monitor TP11 with the AC voltmeter.

4. Verify a reading of < -40.00dBu.

NOTE: Using a test set with no common mode measurement system...

Ch1

1. Set the generator for 60Hz @6.10dBu.

2. Short PIN 2 and 3 of the Ch1 SIDECHAIN RETURN of the unit together.

3. Apply the signal to either PIN 2 or 3 of the Ch1 SIDECHAIN RETURN of the unit, with signal ground connected to PIN 1 of the Ch1 SIDECHAIN RETURN.

4. Monitor TP10 with the AC voltmeter

5. Verify a reading of < -40.00dBu.

6. Disconnect the short between XLR PINS 2 and 3 of the Ch1 INPUT.

Ch2

1. Set the generator for 60Hz @6.10dBu.

2. Short PIN 2 and 3 of the Ch2 SIDECHAIN RETURN of the unit together.

3. Apply the signal to either PIN 2 or 3 of the Ch2 SIDECHAIN RETURN of the unit, with signal ground connected to PIN 1 of the Ch2 SIDECHAIN RETURN.

4. Monitor TP11 with the AC voltmeter

5. Verify a reading of < -40.00dBu.

6. Disconnect the short between XLR PINS 2 and 3 of the Ch2 INPUT.

SIDECHAIN NOISE LEVEL

Ch1

1. Set the generator for 1kHz @ 6.10dBu. (SN1A)

2. Apply the signal to the SIDECHAIN RETURN of the unit.

3. Monitor TP10 with the AC voltmeter

4. Use the 22Hz highpass and 22kHz lowpass filters.

5. Mute the generator.

6. Verify a reading of < -100.00dBu.

Ch2

1. Set the generator for 1kHz @ 6.10dBu. (SN1B)

2. Apply the signal to the SIDECHAIN RETURN of the unit.

3. Monitor TP11 with the AC voltmeter

4. Use the 22Hz highpass and 22kHz lowpass filters.

5. Mute the generator.

6. Verify a reading of < -100.00dBu.

SIDECHAIN THD+N

Ch1

1. Set the generator for 2kHz @6.10dBu. (STHD0A)

2. Apply the signal to the Ch1 SIDECHAIN RETURN of the unit.

3. Monitor TP10 with the distortion analyzer.

4. Use the 22Hz highpass and 80kHz lowpass filters.

5. Verify THD+N less than 0.01% 20Hz - 20kHz.

Ch2

1. Set the generator for 2kHz @6.10dBu. (STHD0B)

2. Apply the signal to the Ch2 SIDECHAIN RETURN of the unit.

3. Monitor TP10 with the distortion analyzer.

4. Use the 22Hz highpass and 80kHz lowpass filters.

5. Verify THD+N less than 0.01% 20Hz - 20kHz.

SIDECHAIN HEADROOM

Ch1

1. Set the generator for 2kHz @ 29.50dBu. (SHR1A)

2. Apply the signal to the Ch1 SIDECHAIN RETURN of the unit.

3. Monitor TP10 with the distortion analyzer.

4. Use the 22Hz highpass and 80kHz lowpass filters.

5. Verify THD+N less than 0.005% 20Hz - 20kHz.

Ch2

1. Set the generator for 2kHz @ 29.50dBu. (SHR1B)

2. Apply the signal to the Ch2 SIDECHAIN RETURN of the unit.

3. Monitor TP10 with the distortion analyzer.

4. Use the 22Hz highpass and 80kHz lowpass filters.

5. Verify THD+N less than 0.005% 20Hz - 20kHz.

6. Remove the test probes.

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STEREO COUPLE

NOTE: Channel 1 and channel 2 interact. For Audio Precision – the panels are set for 2 channel readings.

SETUP

1. CONTROL SETTINGS (Ch1 and Ch2):

THRESHOLD	FULL CW
COMPRESSION	FULL CCW
ATTACK	12 O'CLOCK
RELEASE	12 O'CLOCK

OUTPUT GAIN		12 O'CLOCK
STOP LEVEL		FULL CW

2. SWITCH SETTINGS (Ch1 and Ch2):

OVEREASY		OUT
SIDECHAIN		OUT
AUTO		IN
PeakStopPlus		OUT
BYPASS		OUT
STEREO COUPLE		IN
INPUT		OUT
OUTPUT		OUT
G.R.		IN
POWER	(rear panel)	OFF
PIN 1 LIFT	(rear panel)	OUT
UNBAL	(rear panel)	OUT
GROUND	(rear panel)	OUT
GROUND LINK	(rear panel)	CONNECTED
AVD	(internal)	OUT

1. Set the generator for 1kHz @ 0.00Bu. (STO7A)

2. Apply the signal to the Ch1 and Ch2 INPUTS of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Verify a reading of 0.00dBu (+/-0.10dBu). Use the Ch1 OUTPUT GAIN control to trim as needed.

5. Verify that all Ch2 LEDs (except METER SELECTION G.R.) are NOT LIT.

6. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

7. Verify a reading of 0.00dBu (+/-0.50dBu).

8. Set the Ch1 COMPRESSION control full CW.

9. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

10. Adjust the Ch1 THRESHOLD control for a reading of -10.00dBu.

11. Set all Ch2 controls full CCW except for the STOP LEVEL control.

12. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

13. Verify a reading of -10.00dBu (+/-1.00dBu).

14. Set the Ch1 OVEREASY switch to the IN position.

15. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

16. Verify a reading of -13.00dBu (+/-1.00dBu).

17. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

18. Verify a reading of -13.00dBu (+/-1.00dBu).

19. Set the Ch1 AUTO switch to the OUT position.

20. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

21. Verify a reading of -14.00dBu (+/-1.00dBu).

22. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

23. Verify a reading of -14.00dBu (+/-1.00dBu).

24. Set the Ch1 OVEREASY switch to the OUT position.

25. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

26. Verify a reading of -11.00dBu (+/-1.00dBu).

27. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

28. Verify a reading of -11.00dBu (+/-1.00dBu).

STOP LEVEL

1. Set the generator for 1kHz @ 10.50Bu. (STO8A)

2. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

3. Set the Ch1 STOP LEVEL control full CCW.

4. Set the Ch1 COMPRESSION control full CCW.

5. Verify a reading of 7.00dBu (+/-1.00dBu).

6. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

7. Verify a reading of 7.00dBu (+/-1.00dBu).

8. Set the Ch1 PeakStopPlus switch to the IN position.

9. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

10. Verify a reading of 3.20dBu (+/-1.00dBu).

11. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

12. Verify a reading of 3.20dBu (+/-1.00dBu).

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BYPASS

SETUP

1. CONTROL SETTINGS (Ch1 and Ch2):

THRESHOLD		FULL CCW
COMPRESSION		FULL CW
ATTACK		12 O'CLOCK
RELEASE		12 O'CLOCK
OUTPUT GAIN		12 O'CLOCK
STOP LEVEL		FULL CW

2. SWITCH SETTINGS (Ch1 and Ch2):

OVEREASY		OUT
SIDECHAIN		OUT
AUTO		OUT
PeakStopPlus		OUT
BYPASS		OUT
STEREO COUPLE		OUT
INPUT		OUT
OUTPUT		OUT
G.R.		IN
POWER	(rear panel)	ON
PIN 1 LIFT	(rear panel)	OUT
UNBAL	(rear panel)	OUT
GROUND	(rear panel)	OUT
GROUND LINK	(rear panel)	CONNECTED
AVD	(internal)	OUT

Ch1

1. Set the generator for 1kHz @ 0.00Bu. (BYP1A)

2. Apply the signal to the Ch1 INPUT of the unit.

3. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

4. Set the Ch1 BYPASS switch to the IN position.

5. Verify a reading of 0.00dBu (+/-0.10dBu).

Ch2

1. Set the Ch2 BYPASS switch to the IN position.

2. Verify that the Ch2 BYPASS LEDs are LIT.

3. Set the generator for 1kHz @ 0.00dBu. (BYP1B)

4. Apply the signal to the Ch2 INPUT of the unit.

5. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

6. Verify a reading of 0.00dBu (+/-0.10dBu).

Ch1

1. Set the POWER switch to the OFF position.

2. Set the generator for 1kHz @ 0.00Bu. (BYP1A)

3. Apply the signal to the Ch1 INPUT of the unit.

4. Monitor the Ch1 OUTPUT of the unit with the AC voltmeter.

5. Verify a reading of 0.00dBu (+/-0.10dBu).

Ch2

1. Set the generator for 1kHz @ 0.00Bu. (BYP1B)

2. Apply the signal to the Ch2 INPUT of the unit.

3. Monitor the Ch2 OUTPUT of the unit with the AC voltmeter.

4. Verify a reading of 0.00dBu (+/-0.10dBu).

This completes proof of performance.