



FIELD ENGINEERING BULLETIN #B16

March 3, 1993

8000A OPTIMOD-FM Audio Processor

Replacing Old Electrolytic Capacitors

With time, the electrolyte solution in older electrolytic capacitors may dry out, changing the capacitance. This results in a ripple greater than 2mV in the regulated 15-volt power supply. Since the 8000A's stereo generator uses the power supply as a reference, it needs a clean, ripple-free source. This ripple causes a high-pitched whistle or "birdies" in stereo operation. This problem is aggravated by the fact that most 8000A units are operated in transmitter shacks that are hot in summer and cooler in winter, which dries out the capacitors even faster.

The solution is to replace such aging electrolytic capacitors. Replacing these capacitors with the new ones enclosed with this bulletin will not affect the alignment of the 8000A.

Before proceeding, read through the instructions. Also read "Replacement of Components on Printed Circuit Boards" on page V-4 of the 8000A Operating Manual, which contains helpful suggestions for working on double-sided printed circuit boards that will save you time and improve soldering quality. Refer to the drawings in the 8000A Operating Manual for component locations.

Allow about 1 hour for this repair. The unit must be removed from its rack and placed on a workbench. It is best to replace the capacitors one at a time, removing the old capacitor and installing its replacement before continuing to the next. **NOTE:** Some capacitors in this update kit will be different than the capacitors originally in the 8000A. Refer to the list at the end of this Bulletin for the capacitors and their new values. Make sure you check the polarity of the leads before installation. You will need:

- 8000A Operating Manual
- 5/64-inch hex wrench
- 3/16-inch straight-blade screwdriver
- Low-wattage soldering iron
- Rosin-core solder
- Incidental tools (including solvent, cotton swabs, etc.)
- Capacitor replacement kit containing 14 capacitors (enclosed)

- 1) Remove the 8000A's top and bottom covers.
Each cover is attached with 26 screws.
- 2) Place the 8000A top side up on the workbench.
- 3) Replace the large aluminum electrolytic capacitors C801 and C802 on the Power Supply board.
The Power Supply board is mounted on the power transformer in the left rear corner of the unit.

4) Remove the six screws (three along the front of the board, and three along the back) that hold the Limiter circuit board in place, then tilt the board up and back.

Be careful to slide the board back slightly when tilting it, so the front panel controls don't catch on the chassis.

5) Replace capacitor C607 on the Limiter board *unless it already is a 470pF mica capacitor*. C607 is located on the *solder side* of the Limiter board between the base and collector of Q602. If C607 is a 47pF capacitor, remove it and install the 470pF mica capacitor. If no capacitor is present, install the 470pF capacitor.

6) Replace capacitor C259 on the Limiter board.

7) Replace small electrolytic capacitors C265, C269, C605, C606 on the Limiter Board.

NOTE: Because these capacitors are mounted next to transistor heat sinks, they are likely to dry out faster than normal. To avoid this and thus increase the life of the capacitors, mount them so they lean away from the heat sinks, as show in Fig. 1.

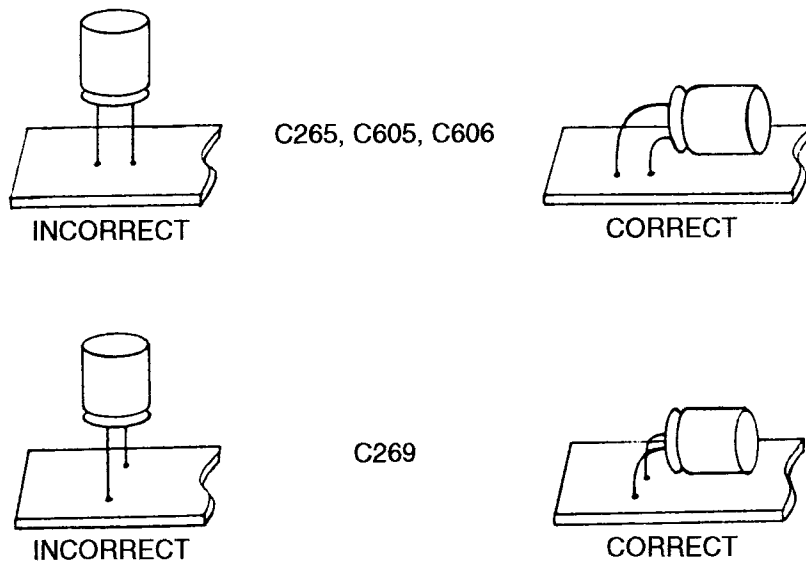


Fig. 1: Special Mounting for Capacitors C265, C269, C605, C606

8) Remove all residual flux with a cotton swab moistened with an appropriate solvent.

Suitable solvents include 1,1,1-trichlorethane (Sold as Energine® Fireproof Cleaning Fluid), naphtha (sold as Energine® Regular Cleaning Fluid), and 99% isopropyl alcohol.

Make sure that no solder splashes are left between the traces, and that the flux has actually been removed, and not just made less visible by smearing. While most rosin fluxes are not corrosive, they can slowly absorb moisture and become sufficiently conductive to degrade circuit performance.

11) Remove the six screws that hold the Stereo Generator circuit board in place, then tilt the board over and toward the back of the unit.

Be careful to slide the board back slightly when tilting it, so the front panel controls don't catch on the chassis.

12) Replace capacitors C409, C417, C419, C428, C434, and C436 on the Stereo Generator board.

13) Remove all residual flux with a cotton swab moistened with an appropriate solvent.

14) Tilt the Stereo Generator board back into position, and replace the six screws that hold it in place.

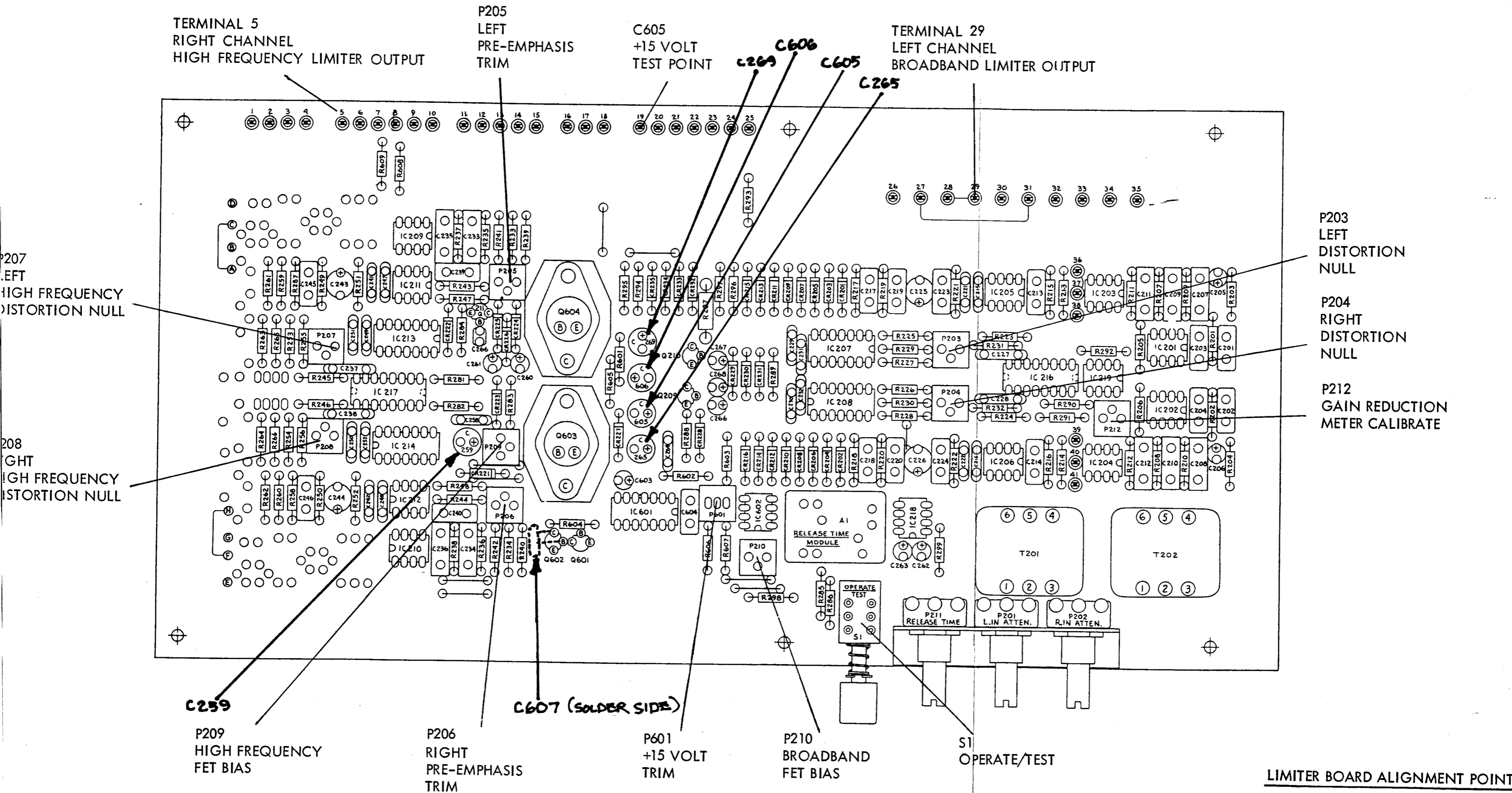
15) Replace the top and bottom covers.

Be sure to replace *all* of the 52 screws -- they are an integral part of the 8000A's RFI protection.

16) Note in your 8000A Operating Manual that these capacitors have been replaced (also note the date the capacitors were replaced):

C259 - 47 μ F/50V	C409 - 470 μ F/6.3V	C605 - 47 μ F/50V	C801 - 470 μ F/50V
C265 - 47 μ F/50V	C417 - 33 μ F/63V	C606 - 47 μ F/50V	C802 - 470 μ F/50V
C269 - 47 μ F/50V	C419 - 33 μ F/63V	C607 - 470pF mica	
	C428 - 47 μ F/50V		
	C434 - 33 μ F/63V		
	C436 - 33 μ F/63V		

It is probably a good idea to insert these instructions into your manual for future reference.



TERMINAL 5
RIGHT CHANNEL
HIGH FREQUENCY LIMITER OUTPUT

P205
LEFT
PRE-EMPHASIS
TRIM

C605
+15 VOLT
TEST POINT

TERMINAL 29
LEFT CHANNEL
BROADBAND LIMITER OUTPUT

P207
LEFT
HIGH FREQUENCY
DISTORTION NULL

P203
LEFT
DISTORTION
NULL

P204
RIGHT
DISTORTION
NULL

P208
RIGHT
HIGH FREQUENCY
DISTORTION NULL

P212
GAIN REDUCTION
METER CALIBRATE

C259
P209
HIGH FREQUENCY
FET BIAS

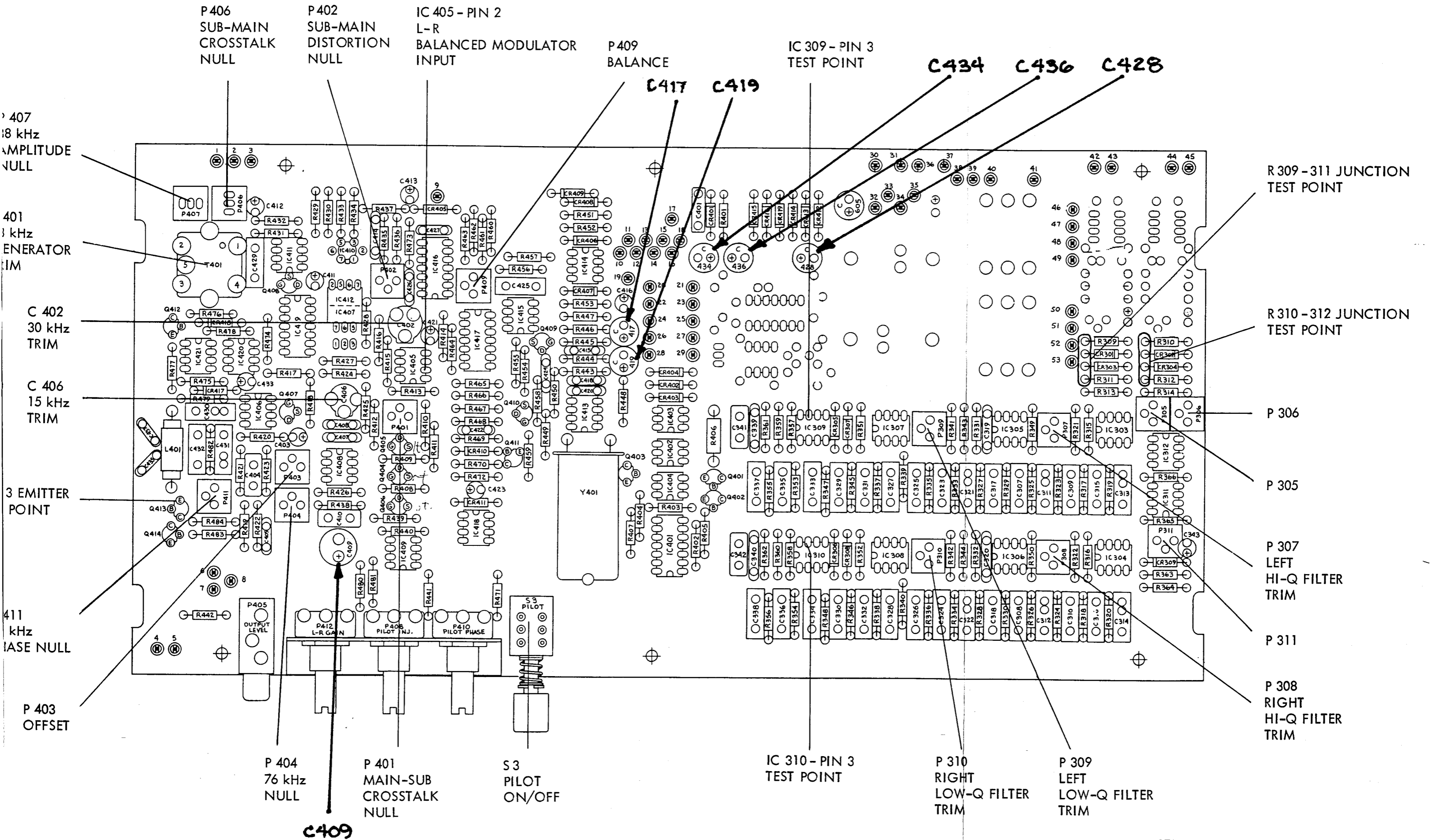
P206
RIGHT
PRE-EMPHASIS
TRIM

P601
+15 VOLT
TRIM

P210
BROADBAND
FET BIAS

S1
OPERATE/TEST

LIMITER BOARD ALIGNMENT POINT



STEREO GENERATOR BOARD ALIGNMENT