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ALTEC
LANSING

436C
AMPLIFIER



SPECIFICATIONS

Type:	Compressor Amplifier	Attack Time:	50 milliseconds
Gain:	56 db from 15,000 ohm source 40 db bridging 600 ohm line	Release Time:	Adjustable: .3 seconds to 1.3 seconds (63% recovery)
Frequency Response:	± 1.5 db, 30-15,000 cycles	Threshold:	Adjustable: 0 dbm to +16 dbm output
Power Output:	+24 dbm (as straight amplifier)	Compression Ratio:	2:1 at 0 dbm threshold; 4:1 at +16 dbm threshold
Harmonic Distortion:	At 25 db of compression: Less than 1.5%, 35-15,000 cycles; At 30 db of compression: Less than 2.5%, 25-10,000 cycles. (0 db threshold setting)	Controls:	Input gain control Threshold control Release time control AC power switch
Noise Level:	74 db below rated output (-111 dbm equivalent input noise)	Power Supply:	117 volts, 60 cycles, 20 watts
Input Impedance:	15,000 ohms bridging transformer (ungrounded)	Tubes:	6BC8, 6CG7, 6AL5
Source Impedance:	Any up to 15,000 ohms	Dimensions:	19" long; 3 1/2" high; 6" deep
Load Impedance:	150/600 ohms	Color:	Dark green
Maximum Compression:	30 db	Weight:	8 1/2 lbs.
		Special Features:	Compression meter; shaft locks for threshold and recovery time controls

DESCRIPTION

The 436C Compressor Amplifier is designed for use in professional recording, PA, and sound reinforcement systems wherein varying amounts of compression, threshold, and release time are required. The unit operates from a 115-volt, 60 cycle AC source and occupies 3 1/2 inches of rack mounting space. The input source (to the bridging transformer) may have an impedance from 600 to 15,000 ohms; output loads of 150 to 600 ohms may be accommodated. All indicators and controls are mounted on a hinged front panel.

APPLICATIONS

The 436C may be employed wherever it is desired to maintain a relatively uniform level of reproduced sound, regardless of the differences in the audio input signal level. Such variations are caused, in part, by varying distances of performers from a single microphone, together with extreme changes in the level of the sound source itself.

NEW RELEASE

OPERATING
INSTRUCTIONS

REPRINT RELEASE
WITH NO CHANGES

REPRINT RELEASE
WITH CHANGES

The 436C also finds use in those applications (primarily the recording of sound) wherein optimum dynamic range must be preserved, while maintaining a higher average recording level without causing overmodulation of the recording medium. Because of the unusually wide latitude afforded by the variable compression ratio, threshold, input gain, and release time controls, the 436C may be adjusted for optimum performance in virtually any application. The compressor-amplifier may also be used to advantage in instances requiring automatic fading of background music for voice announcements.

The unit may be employed as a 'straight' line amplifier, with a power output of +24 dbm, simply by removing the 6AL5 tube from its socket.

Specifications and components subject to change without notice. Overall performance will be maintained or improved.



INSTALLATION

The design of the 436C compressor amplifier provides considerable versatility of connection when used with other components of the 1500 series. The bridging input has sufficiently high impedance that it may be directly connected to the output of the Altec 1566A, 1567A, or 1563A line amplifiers without the use of line transformers in these units. When the transformers are desired to provide balance and isolation from ground, a 560 ohm resistor is used across the 436C input terminals to provide proper termination for the line transformer.

The output transformer of the 436C provides load impedances of 150 and 600 ohms and is well balanced. Because of the transformer configuration and amplifier power capability, it is suitable for directly feeding transmission lines or combinations of one or more power amplifiers.

OPERATION AND USE OF CONTROLS

The 436C compressor amplifier has four controls, all mounted on the front panel:

- 1: Input gain control
- 2: Threshold control
- 3: Release time control
- 4: AC power switch

1: Input Gain Control:

This control is used to adjust the input level to provide the desired average compression as indicated on the compression meter.

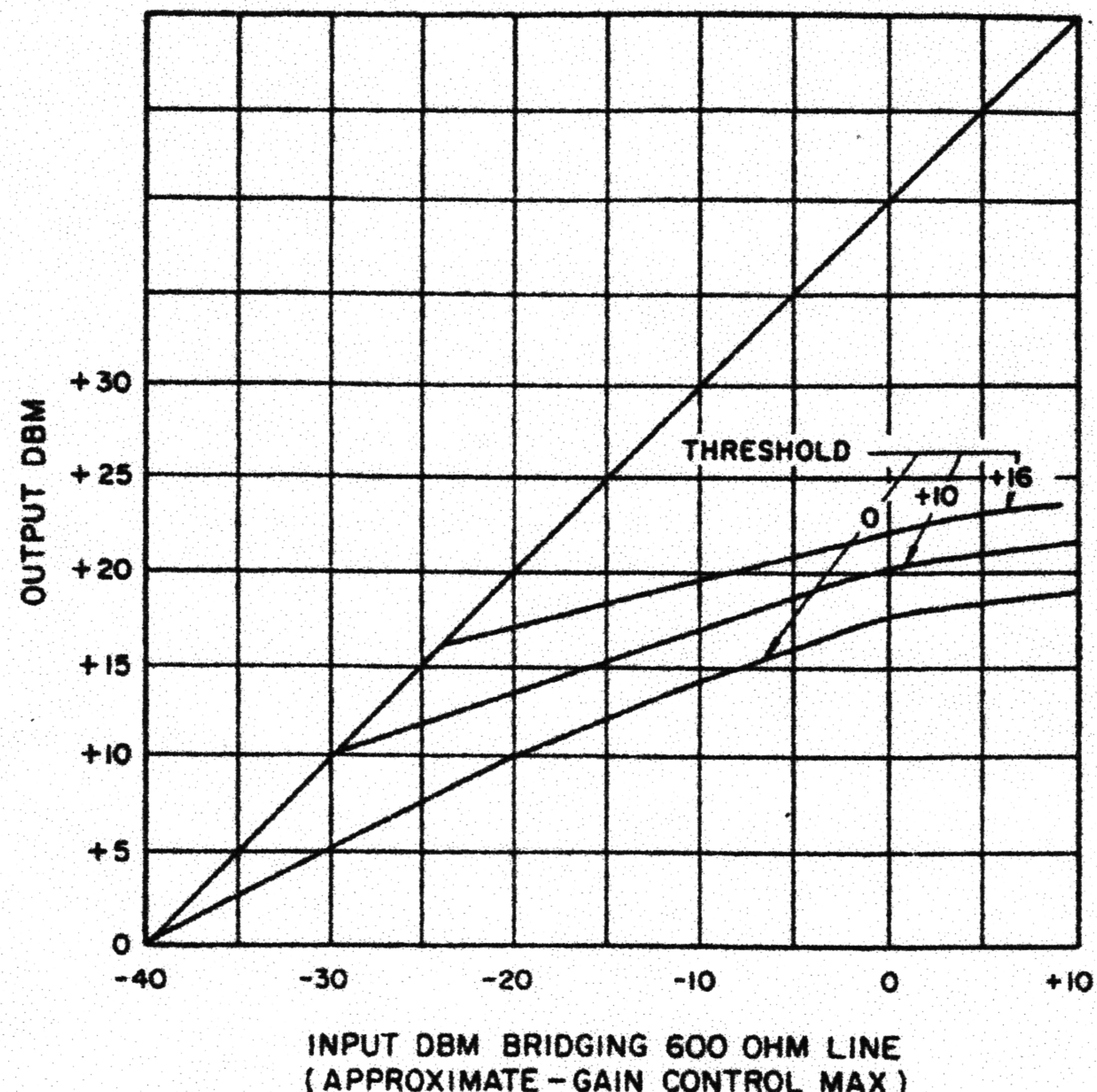
2: Threshold Control:

The output level at which compression commences, together with the compression ratio, is adjustable by means of this control. In the maximum counter-clockwise position, compression begins when the output is approximately zero level. An increase in input level of 20 db at this point results in an output level increase of 10 db, giving a compression ratio of 2:1. At maximum clockwise rotation, compression starts when the output is approximately +16 dbm; an increase in input level of 20 db at this point, results in an output level increase of 5 db, giving a compression ratio of 4:1 (Maximum compression before distortion is 22 db at this setting). The higher threshold and flatter output characteristics may be more desirable in applications, such as the recording of sound, where the adjustment can be such that the majority of the material operates the amplifier in the linear transfer region and the occasional peak is compressed sufficiently (by the higher compression ratio) to prevent overmodulation of the recording mechanism.

For background music control, on the other hand, where the compressor function is to equalize differences in recording level and program dynamics, the zero level threshold and 2:1 ratio are more desirable. In this application, "average" level material is used to set the compressor for 10 to 15 db of compression, and expansion or compression results for material of lower or higher level than the standard "average." Input-output characteristics are shown in more detail on the accompanying "transfer graph" for three settings of the threshold control.

3: Release Time Control

The time interval required to restore full gain following a condition of compression is adjustable in the range of .3



seconds to 1.3 seconds by means of this control. In applications such as sound recording, where only an occasional peak actuates the compressor, the faster release times will be found desirable.

For public-address usage, where the compressor is utilized as an averaging device to compensate for variances in microphone and speech levels, the longer release time will be found desirable.

4: AC Power Switch:

This control operates the power switch (Altec 12180-1), turning the compressor amplifier on and off, as indicated by the front panel pilot light.

CONTROL LOCKS

Both the threshold and release time controls are of the screwdriver adjustment type and are mounted flush with the front panel. A 1/2" open end wrench is required for loosening and tightening the shaft locks before and after adjustment. (The front panel must be dropped to gain access to the locks.)

COMPRESSION METER

It is usually desirable to have the compression meter visible from the operating position. When conditions dictate a remote location for the compressor amplifier, an Altec 6049 meter is connected in parallel with the front panel by means of a pair of wires extended to the console location.

SERVICING

All circuit components are easily reached by opening the hinged front panel of the unit. Normal servicing may be done with a voltmeter; all pertinent information is shown on the accompanying schematic.

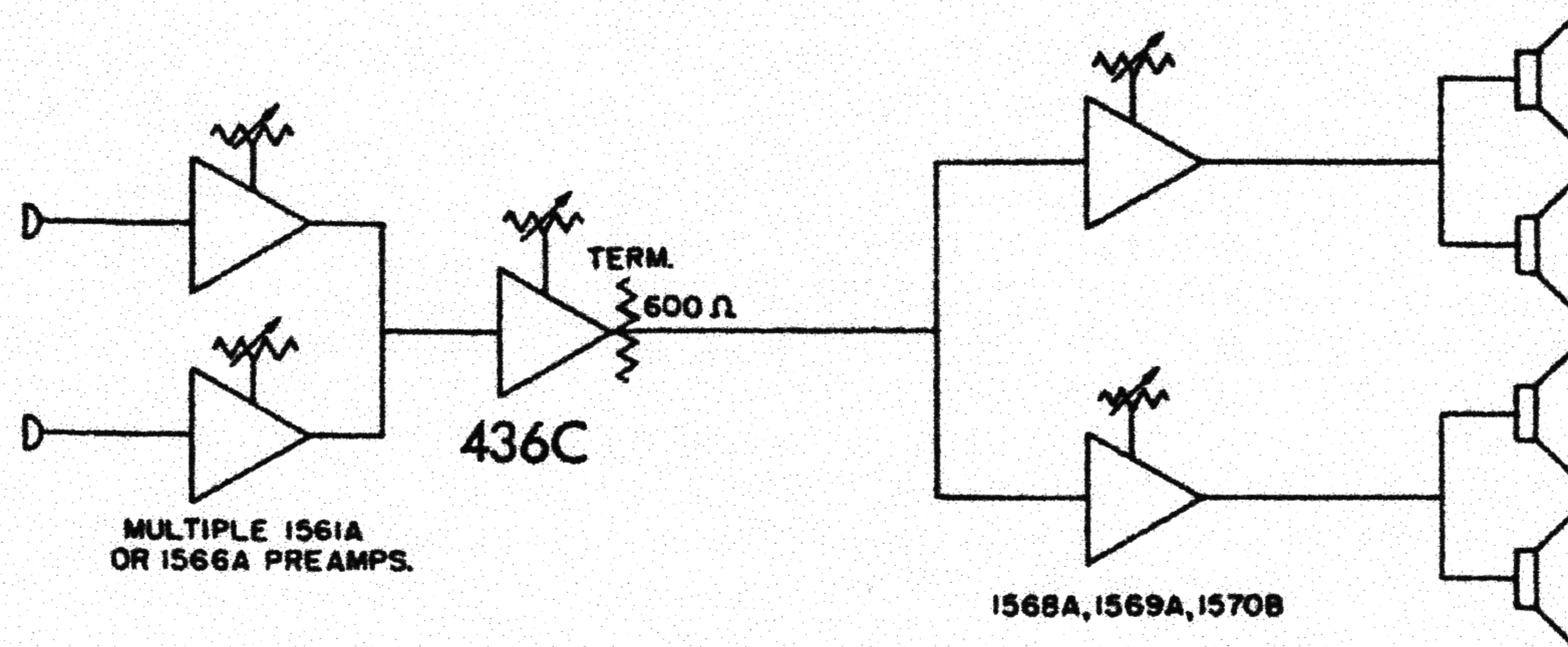


Figure 2

The 436C Compressor Amplifier connected to the high impedance input of the Altec 1568A, 1569A, or 1570B: Terminate 436C with 600 ohms. Line to power amplifiers may be 1,000 feet of 30 mmf/ft cable for 1 db loss at 10 kc.

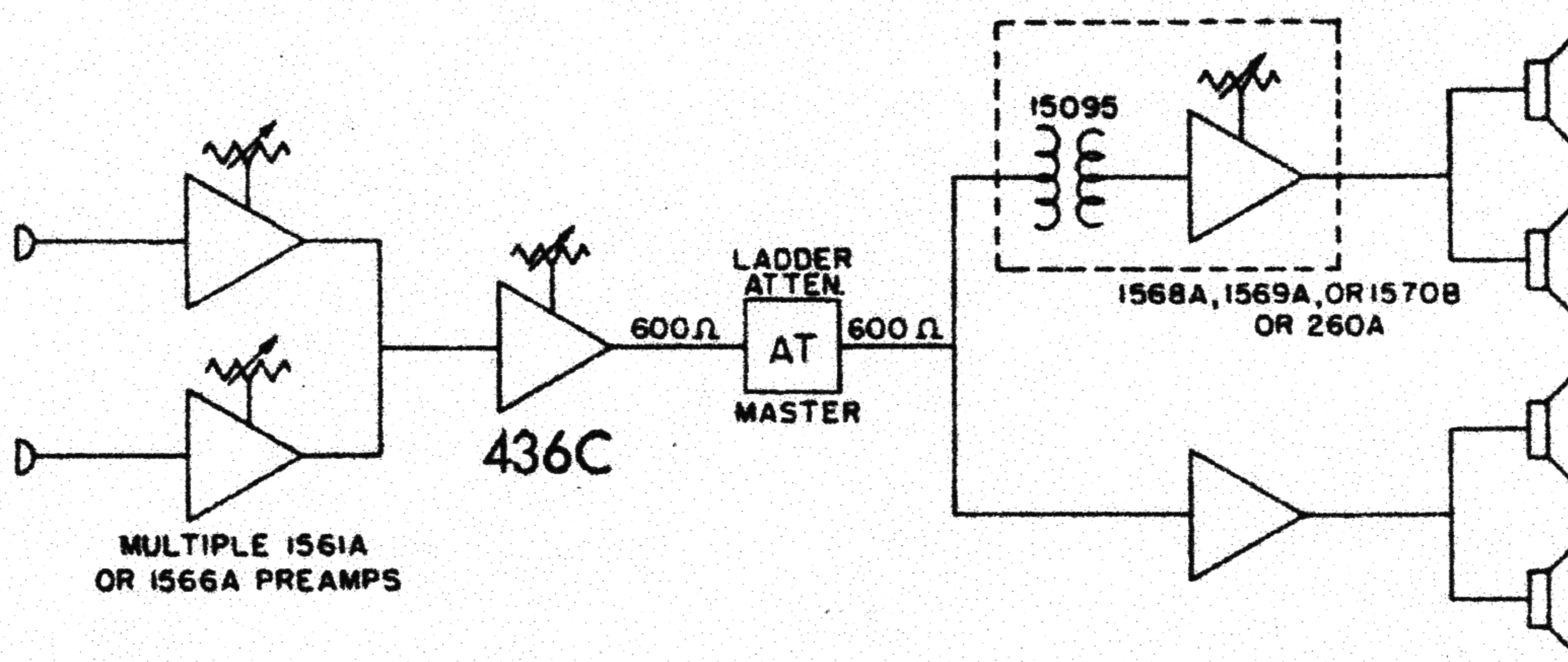



Figure 3

Illustrating the use of a master in compressor output of 436C for control of volume. Added control is essential when Altec 260A amplifier is used.

PARTS LIST

Reference Designator	Name and Description	Reference Designator	Name and Description
C2,3,5,6	Capacitor, 0.022 mfd $\pm 10\%$, 600V CD PKM6522	R9,15	Resistor, 270K $\Omega \pm 10\%$, 1/2W
C4	Capacitor, 1 mfd, 200V (Hopkins 15-390-3)	R10,11	Resistor, 220K $\Omega \pm 10\%$, 1/2W
C7	Capacitor, 80 mfd, 350V (Mallory F P 138A or Sprague TVL-1630)	R12	Resistor, 33K $\Omega \pm 10\%$, 1/2W
C8	Capacitor, 80/200, 40/450, 10/450 (Mallory FP 370 or Sprague TVL-3761)	R13	Resistor, 10K $\Omega \pm 10\%$, 1W
F1	Fuse, 1/2 Amp, 3AG	R14	Resistor, 7K Ω , 5W, axial leads
M1	Meter (Altec 6049)	S1	Switch, power (Altec 12180-1)
P1A,1B	Volume control (Altec 13021-1)	T1	Transformer, input (Altec 4651A)
P2	Potentiometer, 1 M Ω (Altec 14289-1)	T2	Transformer, output (Altec 16402)
P3	Potentiometer, 25,000 Ω (Altec 14288-1)	T3	Transformer, power (Altec 6216)
PL1	Pilot lamp (Mazda 44)	TS1	Terminal strip (Jones Barrier Strip 353-18-03-001)
R3,4	Resistor, 47K $\Omega \pm 1\%$, 1/2W	TS2	Terminal strip (Jones Barrier Strip 353-18-05-001)
R6,6	Resistor, 1 M $\Omega \pm 10\%$, 1/2W	V1	Vacuum tube, 6BC8
R7	Resistor, 220 $\Omega \pm 10\%$, 1/2W	V2	Vacuum tube, 6CG7
R8	Resistor, 34 $\Omega \pm 1\%$, 1/2W	V3	Vacuum tube, 6AL5
			Rectifier (Sarkes #58-D)



ALTEC LANSING 436C COMPRESSOR AMPLIFIER

**FIRST MADE FOR
TOLERANCES EXCEPT AS NOTED. PRACT. 0.1 MM. BORE. A 10MM HOLE DRILLED TO 1MM & 4000 GRS. OVER LIP. 0.005 ANNUAL. 0.1MM**

July 16, 1991

Here's the mod info for your Altec compressor. I had a bunch of gear come in for service from UK sevral years back. There was an Altec compressor in the lot that had been repainted and had a bunch of extra controls on it. I fixed it up and got it working and was surprised at how well it performed. I never really cared much for these Altecs and always thought of them as PA gear, but this one was pretty good. So I decided to make notes about the circuit changes and drew a schematic for it. It wasn't until a few years later that I saw a picture of some Altecs at a Beatles session and realized the one I worked on was probably one of those or another modified by EMI techs.

These updates are pretty simple and easy to install. If you don't want to drill holes in yours you could mount controls inside of it. There's a lot of space in there. You can't use a multiturn pot for the balance control unless you mount it on the face but a good quality 2 watt linear pot should work fine. You may want to get some pin jacks to connect to the plate resistor connections for balance voltage measurements. The pad can be mounted outside on the terminal strip or connected inside.

I forgot if you said yours was a 436B or 436C? If it is a B then you will have to look at the original Altec schematic for the threshold and release control circuits. Let the amp warm up for sevral hours before setting the balance. The input pot may seem a bit scratchy and this is because of increased DC across it. If it annoys you replace it with a dual 50K 2W conductive plastic type. The Altec I took these notes from had an output L-pad control mounted in the hole where the fuse holder goes and the holder was mounted on the back. It was a British make that I'm not familiar with. I don't realy think it's needed and it also unbalances the line. Good luck with it and call me if you have any trouble.

Parts Required for Altec Compressor Amp as per EMI Mod

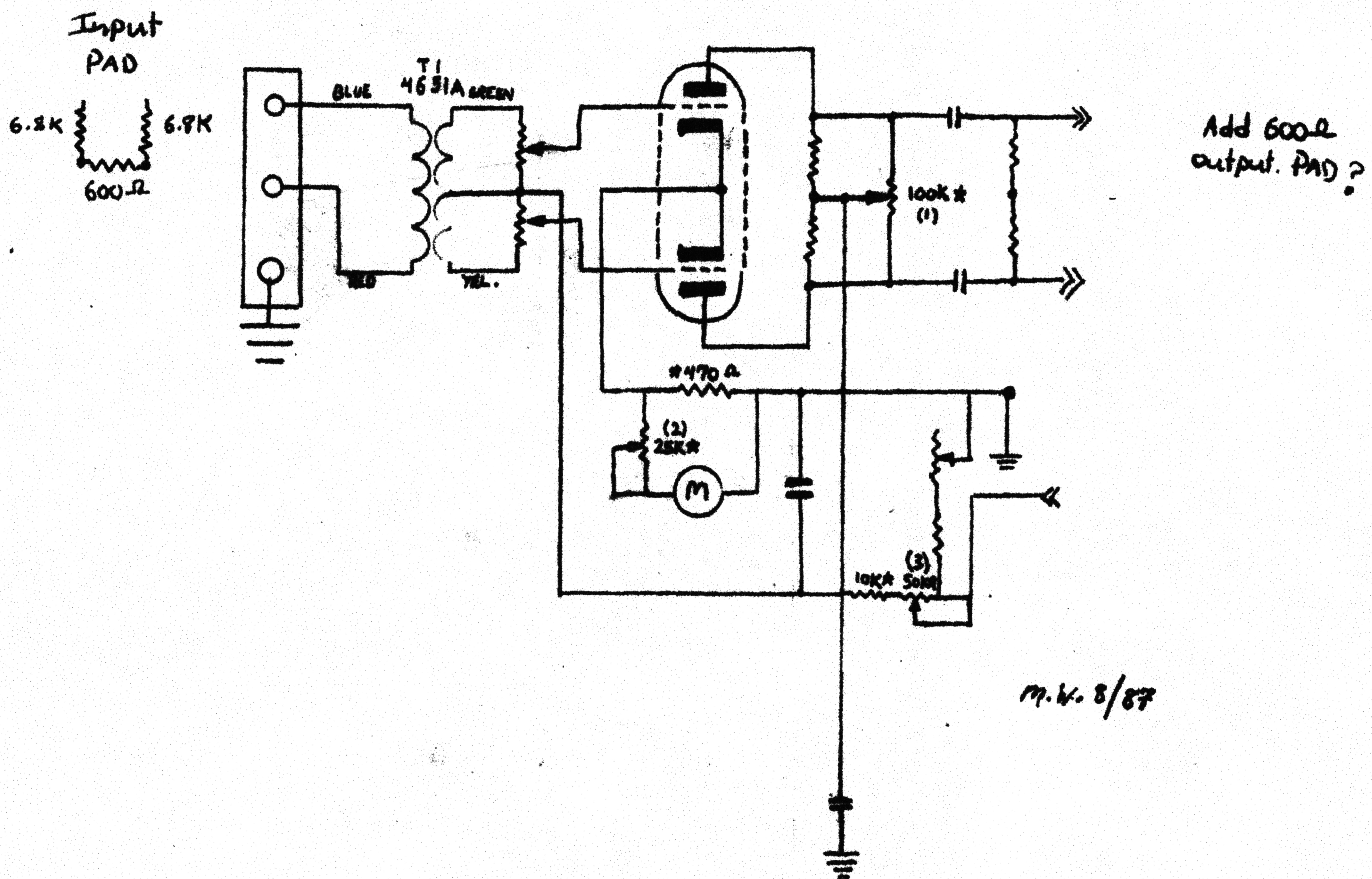
- (2) High quality .022 mfd. 600V polystyrene capacitors such as MIT, Relcap or Solen. These are for the first stage coupling and are critical for good bass. The coupling caps in the unit I worked on were German Siemens caps. They are very good but probably hard to find now.
- (1) 1 mfd. 200V or better polypropylene capacitor. This is to replace the old leaky release time cap. Poly caps drift the least over time and are a good choice.
- (2) Good quality mylar or poly .022 600V caps for drive coupling. You don't really need to spend the big bucks for these. They are not as critical as the audio path caps.
- (1) 4700 mfd. 16V or better electrolytic cap. For DC filament supply.
- (1) 100K 2 watt linear potentiometer. A multiturn type would work best for critical balancing but since they are pretty big will only work if you plan on drilling holes into your faceplate. The unit I worked on had a large multiturn helipot mounted to the face.
- (1) 50K 1 watt linear pot. Attack time control.
- (1) 25K 1 watt linear pot. For meter zero control.
- (1) 470 ohm 1/2 watt 1% resistor. Meter level.
- (1) 10K 1/2 watt 5% resistor. Attack time circuit.
- (2) 50K 1 watt 1% precision resistor (Hand match). Replace worn out of tolerance plate resistors.
- (2) 6.8K 1/4 watt 5% resistor. Input pad legs.
- (1) 620 ohm 1/4w 5% resistor. Input load.
- (1) 1N5400 high current diode. For DC filament supply.
- (2) 1N4007 diodes. Replace worn selenium rectifier.
- (1) 600 ohm L pad. For output level control.

Modification Install Instructions for Altec Compressor

1. Desolder and remove C1 and C2 .022 mfd. caps. and replace with MIT, REL or Solen polystyrene types.
2. Desolder and remove C5 and C6 .022 mfd. caps and replace with mylar caps.
3. Replace R3 and R4 plate resistors with hand matched 50K ohm 1 percent 1 watt precision types.
4. Install 100K pot onto faceplate or metal bracket. Solder leads from the outer legs of the pot, 1 and 3 to the solder post eyelets that feed C1 and C2.
5. Connect lead from wiper on 100K pot to center connection of plate resistors. (4th eyelet down on 2nd terminal post from the left).
6. Replace R8 (34 ohm) with 470 ohm 1% resistor.
7. Install 25K pot onto face of bracket and connect legs 1 and 3 across meter positive in series with existing wiring. Jumper the wiper to leg 3 (see schematic).
8. Remove R12 (33K ohm) and replace with 10K 5% resistor and legs 1 and 3 of 50K pot connected in series. Jumper the wiper to the side of pot connected to R9.
9. Remove blue selenium HV rectifier and replace with 2 1N4007 diodes connected in series. Carefully follow the original schematic connecting ground at low side of first diode and power transformer output to center connection. Solder plate feed wire that goes to positive of C8 to diode array output (2nd diode).
10. Desolder the heavy gauge green wire from pins 4 of the 6AL5 diode tube. Connect a 1N5400 diode in series with the green wire to pin 4 and solder a 4700 mfd 16V cap across pins 4 and 5 of the tube.
11. Connect 2 6.8K and 1 620 ohm resistors as shown in schematic. The pad may be installed into the amp on the terminal strip with the red and blue wires soldered to the 620 ohm resistor.

Balance Setup for modified Altec Compressor

1. Before powering up double check all wiring and component changes.
2. Set the 100K Balance control to its approximate mid position, or half way up.
3. Set 25K Meter level control full counter clockwise or all the way down.
4. Make sure all of the tubes are well socketed.
5. Plug in the compressor and turn it on.
6. Let it warm up for a minute or so and then slowly turn up the meter control until the meter reads zero gain reduction.
7. Allow it to warm up for an hour before setting the Balance. This is vital for good balance.
8. After warm up carefully connect a multimeter to junctions of R3-C2 and R4-C3. If you used pin jacks connect tester to them.
9. Adjust the Balance control for as close to 0mv DC as possible. If you used multiturn pot for balance it may take a few turns to find the null spot. The voltage will drift a bit but should stay close to zero.
10. Check the voltages of each plate to ground. They should be very close to the same.
11. Send a +4 dBm signal into the input terminals or pad and set input and output controls for +4dBm output.
12. Adjust Threshold control until Gain Reduction begins on the meter.
13. If you have access to a distortion analyzer, THD should read about .2 to .3 percent. A big improvement.
14. I would recheck Balance before each session. A pain but worth it.



ALTEC LANSING
436C COMPRESSOR AMPLIFIER
(BALANCE MODIFICATION)

Notes:

- ★ New or updated component
- (1) Adjust for minimum mV across plates
- (2) Meter zero adjustment
- (3) Attack Time Control