amateur service newsletter
W6SAI

# A HIGH POWER LINEAR AMPLIFIER USING THE NEW EIMAC 3-1000Z

The Eimac 3-1000Z is a compact power triode designed for zero bias, class B r.f. and audio application. Grounded-grid operation is attractive as a power gain as high as twenty can be obtained in a cathode driven circuit. At a plate potential of 2500 volts, two kilowatts PEP input may be run, with intermodulation distortion products -35 decibels or more below maximum PEP level.

Shown in the drawing is the schematic of an all-band (3.5 - 29.7 Mc) amplifier designed around the 3-1000Z. A tuned cathode circuit is employed to achieve minimum distortion and ease of drive (1), and the popular bandswitching pi-network output circuit is used to match coaxial antenna feed systems.

The amplifier may be driven by any sideband exciter having a power output of approximately 65 watts. Drive is monitored by a grid current meter placed across a low impedance r.f. shunt located between grid and ground at the tube socket. The plate current meter is placed in the B-minus lead to the power supply. A simple diode voltmeter is used to indicate relative r.f. output, and is used for tuning purposes. During standby periods, the 3-1000Z is biased close to cutoff by the 50K resistor in the filament return circuit. The resistor is shorted out by the external VOX relay, grounding the center-tap of the filament transformer.

The new Eimac SK-510 Air-System Socket and SK-516 Chimney are recommended for use with the 3-1000Z. The older SK-500 socket may be used, provided care is taken to see that the contact pins move freely about, and do not place lateral strain on the tube pins. Flexible leads should be used with either socket to allow free pin movement.

At a plate potential of 2500 volts, peak plate meter current will be about 400 ma. under voice conditions, and grid current will approximate 125 ma. With carrier injection, the amplifier should be loaded to the single-tone operating conditions shown in the data sheet.

The amplifier may be constructed on a 14" x 17" x 4" aluminum chassis. The tuned input circuit and filament components are mounted below deck, and the plate circuit components atop the chassis. The chassis is pressurized by the addition of a bottom plate, and air forced into the chassis by a "squirrel cage" blower is exhausted through the air socket. The plate circuit components and tube are enclosed in a TVI-proof screen made of perforated aluminum sheet. Overall height of the amplifier is 14½".

(1) "The Grounded Grid Linear Amplifier", QST, August 1961, page 16.

# 3-1000Z LINEAR AMPLIFIER--PARTS LIST

C1--Three gang b.c. capacitor with sections in parallel. J. W. Miller #2113.

C2--500 μμfd., 10 KV. Jennings Radio Co. #UCSL-500 variable vacuum capacitor.

C3--1500 μμfd., 0.03" spacing. Barker & Williamson #51241.

L1--(See drawing) Mounted beneath chassis in close proximity to tube socket.

L2--Filament choke. Barker & Williamson FC-30. Windings connected in parallel.

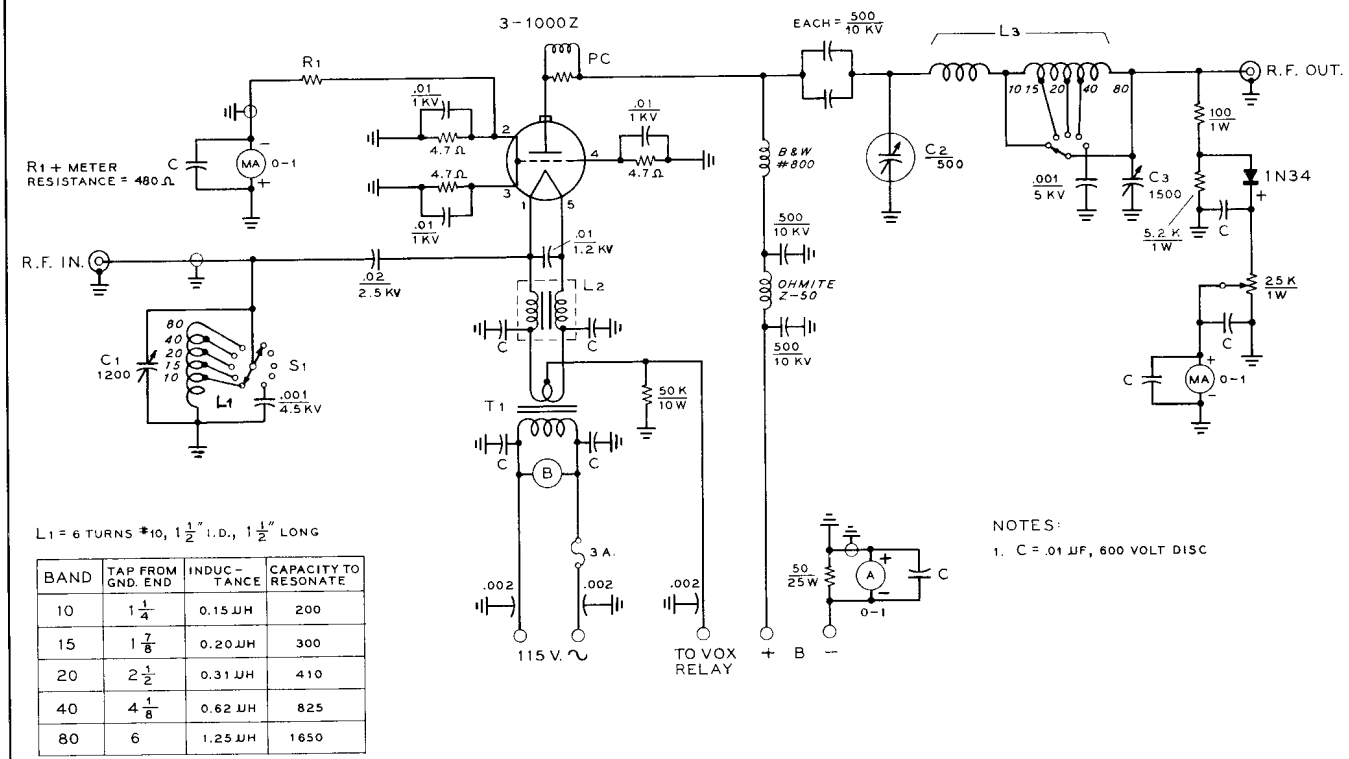
L3--Barker & Williamson #852 all-band coil assembly.

PC--Three 150 ohm, 2 watt composition resistors in parallel, shunted by three turns #12, 3/4" long.

T1--7.5 volts at 22 amperes. Stancor P-6457.

Blower: 20 cubic feet per minute, or greater. Dayton #1C-180, or Ripley #81.

Grid Meter: 0-1 d.c. milliammeter (55 ohms internal resistance), with multiplier. Full scale reading is 300 ma.




L1 = 6 TURNS #10, 1½" I.D., 1½" LONG

| BAND | TAP FROM GND. END | INDUCTANCE | CAPACITY TO RESONATE |
|---|---|---|---|
| 10 | 1¼ | 0.15 μH | 200 |
| 15 | 1⅞ | 0.20 μH | 300 |
| 20 | 2½ | 0.31 μH | 410 |
| 40 | 4⅛ | 0.62 μH | 825 |
| 80 | 6 | 1.25 μH | 1650 |

NOTES:

1. C = .01 μF, 600 VOLT DISC