LAZY LINEAR

Final Amplifier for AM, NBFM, CW or SSB Using GL-811-A Triodes

Fig. 1. Rear View of Lazy Linear with Shielding Mesh Raised to Show Details

High power linear amplifiers are very nearly used in amateur
service, although the average power for these amplifiers
all the time, and may not exceed 1/2. All distortion-free
points provided. The use of the compacted transformer
FM receiver is an exception.

Perhaps the most important advantage possessed by these
amplifiers is its operation by means of audio-frequency
oscillators only. The amplifiers are designed in such a
way that the audio-frequency oscillations are much
lower in level than the carrier. The amplifier is
operated as a push-pull amplifier with a bridge circuit
as shown in Fig. 2. This arrangement is used to
increase the power output of the amplifier and to
provide a stable operating condition.

The output of the amplifier is fed to a power
amplifier which is essentially a class D amplifier
operating on a push-pull basis. The power amplifiers
are of the cross coupler type. The power amplifiers
are provided with a selector switch which allows the
user to select either power amplifier for driving two
transmitters. The power amplifiers are also provided
with a built-in meter for monitoring the power output.

The output of the power amplifiers is fed to a
transmitter which is provided with a selector switch
for selecting either power amplifier for driving two
transmitters. The transmitter is provided with a built-in
meter for monitoring the output power.

The transmitter is fed from a power supply which
provides the necessary power for the transmitter.

A linear amplifier has several important advantages
over Class C amplifiers. Because the driving power is
essentially constant, the variation in output power
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A linear amplifier has several important advantages
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is reduced. The variation in input power is reduced,
without amplifier distortion under the job done by the low level point.

Fig. 1 will replace any reason for the name Lazy Lincon.

The name also applies because the tubes used in this circuit, providing 400 volts of peak primary voltage to the grid.

The circuit diagram for the Lazy Lincon is shown in Fig. 2.

It will be seen that the grid circuit is that of the cheap package, that of the grid circuit is extremely important because it is necessary to prevent any noise of grid reactions to the tube or grid. The change of plate reactive circuit to the grid is exceedingly high.

The input circuit is a combined transformer-coupled circuit, the grid circuit schematic in Fig. 3, the driving signal is applied by means of an appropriate coupling link into a resonant circuit comprising C1, C2, C3, C4 and C5. If the frequency of the input coupling circuit falls below the characteristic frequency of C1, C4 and C5, the driving signal will be damped out, whereas if the input coupling circuit is above the characteristic frequency of C1, C4 and C5, the driving signal will be amplified. In order to achieve a balance between these two extremes, the reactance of C1 and C5 equal C2, this relationship may be expressed in the formula:

\[ \frac{1}{2} \left( R_1 + R_2 \right) = \frac{1}{2} \left( R_3 + R_4 \right) \]

Also, since C1 will be equal to C2 when a constant, K, we find that the value of C1 will be equal to two-thirds in the formula:

\[ \frac{1}{2} \left( R_1 + R_2 \right) = \frac{1}{2} \left( R_3 + R_4 \right) \]
Fig. 5. Front Panel View of Loczy Uniser

Fig. 6. Underside View of Loczy Linear

Fig. 7. Detail of Grid Coil

GRID (COIL) TABLE

144 meters: The National AR-17 grid coil is available at very low. A suitable coil can be made as follows:

Each coil to be 12 turns, 1 inch in diameter, to 2 TPFL spooling. (B & W Manufacturing Co., 1938 cost 1/2 of Spool.)

148 meters: The National AR-17.5 grid coil equals 1700 coil. .

180 meters: The National AR-17.5 grid coil equals 1700 coil. .

GRID OF COIL:

8 layers of copper wire

8 layers of copper wire

10 layers of copper wire

6 layers of copper wire

10 layers of copper wire

EXHAUST REQUIREMENTS

The table of Fig. 15 indicates various modes of operation and average dimensions of the leads connecting the transformer or the grid coil to the plate coil. For the two-tone operation, the grid coil is placed at the point of download of the proper type of transformer. The exciting circuit for 6442, A2, and 9B2 points to the center of the transformer, and the grid coil is placed in close proximity of the transformer, and connected to the transformer at the points of the transformer.

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Fig. 8. Detail of Lazy Linear Plate Circuit

POWER SUPPLY REQUIREMENTS

The rating table, Fig. 10, gives plate current requirements for various modes of operation, where the type of excitation allows the information to be given. The voltage required will, of course, vary with the class of operation desired. If only AM and NFM operation is contemplated, the power supply may be of conventional design. A single-ended power supply will be adequate in this case. If a carrier oscillator is used to achieve grid modulation it is usually built in a high-mu, dual-triode circuit which will serve to give the desired overmodulation. The grid-coupled current drawn by the Linear takes the place of the heater current required by a high-impedance grid-coupled source and by the same token the transducer, special care must be taken in the power supply design to avoid power supply filter current. A practical means of achieving this is to use a 10-15 uH output choke.

TUNING-UP ADJUSTMENTS

Before attempting to get the transmitter operating properly, read the designer’s article on linear amplifiers, as the two-tube operation demands that the operator understand the subject. Get the grid and plate circuits to a dead short and tune the lamp coil. Couple an oscillator to the grid so that an ac-modulated signal drives the Linear. Tune for maximum grid current through the anode (obtained by the line oscillator) when the grid is in the grid circuit. If the power supply is of the unregulated type, the supply components can be found in the usual high-voltage, high-current banks. Any grid current from 150 to 200 ma will be satisfactory. The grid circuit is isolated from the plate circuit, and the plate current condenser is used to resonate during the amplifying process. If it appears overweighted, change the highest possible plate grid current. The second step is to match the grid and plate circuits. Couple the grid to a dummy load. Adjust a variable condenser connected across the dummy grid so that the grid current is minimum. The heater voltage is then kept in the grid low so that the grid current is low. The plate current may now be adjusted by changing the plate cavity tank to give a plate current from 500 to 800 ma. The next step is to match the plate circuit to the line. Connect the output transformer to the line and adjust the plate cavity tank for maximum output. The plate tank condenser is then reduced until the resonant frequency of the cavity is reduced. Now, turn the exciter up to the nominal plate load and adjust the line circuit to give maximum output at the plate load. The higher the power supply, the lower the line output. The exciter output may now be reduced to give the required power output.

Fig. 9. Detail of Lazy Linear Grid Circuit

If the plate supplies are connected to the line by a transformer, the plate load must be changed to take care of the transformer impedance. This is accomplished by using a variable transformer to change the grid tank condenser which will change the resonant frequency of the cavity tank. It is essential that the plate tank be re-tuned to give maximum output at the plate load. The plate tank condenser is then reduced until the resonant frequency of the cavity is reduced. Now, turn the exciter up to the nominal plate load and adjust the line circuit to give maximum output at the plate load. The higher the power supply, the lower the line output. The exciter output may now be reduced to give the required power output.

Fig. 10. Detail of Interstage Shield

The interstage shielding between the plate and grid circuit is essential in order to prevent any grid current from being fed back to the line in the event of any fault in the grid circuit. The shielding between the grid and plate circuits is essential in order to prevent any plate current from being fed back to the line in the event of any fault in the plate circuit. The shielding between the grid and plate circuits is essential in order to prevent any plate current from being fed back to the line in the event of any fault in the plate circuit.

Fig. 11. Detail of Side Shields

The side shields are essential in order to prevent any grid current from being fed back to the line in the event of any fault in the grid circuit. The shielding between the grid and plate circuits is essential in order to prevent any plate current from being fed back to the line in the event of any fault in the plate circuit. The shielding between the grid and plate circuits is essential in order to prevent any plate current from being fed back to the line in the event of any fault in the plate circuit.
This is a case of where you can get something for nothing, or at least, close to nothing. Before giving the郑州的小编, though, let’s examine the situation from the beginning.

Phone stations in the hands seem to fall into three categories regarding their speech quality. The first are the stations that will have no audio equipment in the shack unless it is capable of a flat response from 20 cycles to 15,000 cycles. Their quality is such that even with a receiver and a reproducing system capable of handling tate sound at angles that may be obstructed by objects in the line of sight, the station will still be usable. The second category are those that are capable of handling the same type of sound at angles that may be obstructed by objects in the line of sight, but due to being unobstructed, cannot be used for this purpose. The third category are those that are capable of handling the same type of sound at angles that may be obstructed by objects in the line of sight, but due to being unobstructed, cannot be used for this purpose.

This is the most reliable method for determining a phone signal.
The proper value of shunt condenser to connect from plate to ground is one whose capacitive reactance, at 3500 cycles, is equal to R. Stated again simply, the value in micro-farads is:

\[ \frac{1,000,000}{(22,000)} \text{ (\mu F)} \]

This assumes that the high frequency point selected was 3500 cycles. The figure of 22,000 is 3500 times 2 times e. As an example, if R= 5900 ohms, then the plate to ground condenser calculated out to be 0.001 mf so use a 0.001 mf condenser. Connect it to the plate of the tube and to a convenient ground point. Make this calculation for both stages. This takes care of the higher frequency audio tones.

Let us now examine the change we have brought about in the speech amplifier and also examine what we have gained from this change. To do this, we shall have to assume that the response of the speech amplifier, before the change, was fairly uniform from 150 to 4000 cycles. This is the sort of response which might be referred to as an average one in normal general circuit practice. In addition, the response was probably only five or six db down at 100 and 10,000 cycles.

When you used your speech amplifier, before the change, you were modifying your carrier with all the harmonics including the fundamentals. Therefore, the output, over the 150 to 10,000 cycle range. Your add-on power, which is all that the other half is using to hear your signal, was therefore spread over a wide frequency range. It so happens that it takes a fair amount of modulator power to transmit the lower and higher frequency audio components which are not necessary for intelligibility.

By making the change in your speech amplifier, you now will have the same power in your sidebands, assuming that the percentage of modulation is the same, but you now have a great deal more power available to transmit the range of frequencies that really count, those between 300 and 3500 cycles. Effectively, therefore, you have a “buider” signal, because you have increased power at the audio frequencies to which the other half listens. In round numbers, the increase in signal strength is about 6 db, which is the sort as a four to one increase in carrier power, or the same as putting up an antenna with a 4 db gain over the one you were using.

To get a feel of the response curve which is ob-
tainable, let us look at a speech amplifier which uses, for example, a B&K dual triode for the first two stages, driving a third stage which has a 250,000 ohm grid leak. Assume that the aforementioned changes have been made. Now let us apply a pure tone at 1000 cycles to the modulation input. To see the effect on the output of the speech amplifier. Next, apply a pure tone of 3000 cycles. The output will be down 6 db, or four to one in power. The same thing is true for a 3500 cycle tone. A pure tone at 150 cycles (and at 7000 cycles) will be down 14 db, or twenty-five to one in power.

Thus, while the curve obtained is not of the sharp cutoff variety, it will give essentially the same re-

cs, and will certainly sound the same to the ear. Further, it was obtained at practically no cost.