

# SUPPLEMENT #1 TO MODEL L-1000-A LINEAR AMPLIFIER

## INSTRUCTION MANUAL

### LINEAR AM OPERATION

August 28, 1956

The Model L-1000-A Grounded Grid Linear Amplifier has been designed expressly for operation in single sideband and CW applications. While AM has not been specifically recommended, it is not to be assumed such is the result of limitations in design or constructional features. Rather it is due to the power supply duty cycle. The integral power supply was selected for 1-KW peak envelope power on SSB, but not designed for use under constant carrier conditions.

Linear AM operation is feasible with the equipment to the extent of the integral power supply limit or to a limit of 625 watts input when powered with an external supply capable of delivering a constant DC potential of 2500 volts at 250 MA. Limitation of plate input power with integral power supply is 375 watts (150 MA. at 2500 V.)

Under Linear AM operating conditions, the Model L-1000-A requires a driving power of approximately 20 watts. This can be supplied by any exciter-driver unit capable of delivering this or a higher level of power output. A typical exciter-driver unit for the L-1000-A is the B&W 5100 - 5100-B Series Transmitters, combined with the 51SB - 51SB-B Series Single Sideband Generators or Collins 32V Series Transmitters combined with 51SB Generator - Viking I and II Series Transmitters combined with 51SB Generators and other equivalents of these combination transmitters with SSB provisions.

Two methods of AM Linear operation are possible. These are, namely: Single Sideband with Carrier or Amplitude Modulation (Carrier with Double Sideband).

Listed below are step by step instructions for operating the L-1000-A as a Linear AM Amplifier with its integral power supply to include single sideband with carrier and carrier with double sideband. For the purpose of clarifying these two methods of operation, we will choose the combination of a B&W Model 5100-B/51SB-B. However, other combination equipments as given above may also be used, so long as equivalent step by step instructions are followed.

#### Paragraph I - Single Sideband with Carrier

- A) Having interconnected the 5100-B/51SB-B output to L-1000-A input, along with antenna and VOR connections as given in the manuals, turn filament switches on both equipments to the "On" position.
- B) Turn Power Switch to "Operate" position and adjust Bias Control on L-1000-A so that meter reads 40 mils when meter switch is in "Plate" position. Return Power Switch to "Fils" position.
- C) Turn Meter Switch on L-1000-A to "Grid" position, then proceed to tune and load the 5100-B/51SB-B with Balance-Unbalance Switch in the "Unbalanced" position, so as to feed carrier to the L-1000-A. Adjust loading and tuning controls on 5100-B/51SB-B for a "Grid Current" value of 90-100 MA. as read on meter of L-1000-A.
- D) Turn Meter Switch on L-1000-A to "Plate" position. Turn Power Switch on L-1000-A to "Tune" position. Adjust Amp. Loading and

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Tuning Controls on L-1000-A for a plate current value of 150 MA. Make sure to adjust Tuning Control for minimum dip each time Loading Control is adjusted.

- E) Place Power Switch on L-1000-A to "Operate" position and readjust Amp. and Tuning Controls for a plate current value of 300 MA. with tuning control indicating minimum dip.
- F) Next, throw Balance-Unbalance switch on 51SB-B to "Balanced" position and proceed to balance out carrier in a normal manner with both balance pots.
- G) Adjust one of the two balance pots on 51SB-B so as to again feed carrier to the L-1000-A to a plate current value of 150 MA. This is exactly one half the value under section (E) above.
- H) Speaking into the microphone, adjust the Audio Gain Control Knob on the 51SB-B until the plate current on L-1000-A barely moves in a positive direction. Overmodulation with distortion will result if plate current kicks up in excess of 5%. Either upper or lower sideband with carrier may be selected by means of the sideband selector switch on 51SB-B.

Paragraph II - Amplitude Modulation - Carrier with Double Sidebands

- A) Repeat steps b, c, d, e, and f under Paragraph I above.
- B) Remove the balanced modulator tube, V101, in the 51SB-B from its socket, then repeat step "G" under Paragraph I above, except that in this case, the left hand balancing pot is adjusted.
- C) Repeat step "H" under Paragraph I above. The equipment is now adjusted for emitting an amplitude modulated signal.

Paragraph III -

Any straight AM Transmitter may also be used to drive the L-1000-A as a linear amplifier provided it has a maximum power output of 80 watts which may be reduced to approximately 20 watts for linear operating conditions.

Tuning procedure is as follows -

- A) Turn Power Switch to "Operate" position and adjust Bias Control on L-1000-A so that meter reads 40 mils. when meter switch is in "Plate" position. Return Power Switch to "Fils." position.
- B) Turn Meter Switch on L-1000-A to "Grid" position, then proceed to tune and load the AM Transmitter, so as to feed carrier to the L-1000-A. Adjust loading and tuning of AM transmitter for a "Grid Current" value of 90-100 mils. as read on Meter of L-1000-A.
- C) Turn Meter Switch on L-1000-A to "Plate" position. Turn Power Switch on L-1000-A to "Tune" position. Adjust Amp. Loading and

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Tuning Controls on L-1000-A for a plate current value of 150 mils. Make sure to adjust Tuning Control for minimum dip each time Loading Control is adjusted.

- E) Place Power Switch on L-1000-A to "Operate" position and readjust Amp. and Tuning Controls for a plate current value of 300 mils., with tuning control indicating minimum dip.
- F) Next, reduce the power output of the AM driving Transmitter in a normal manner, until the Plate Current on L-1000-A reads 150 mils. This is exactly half the value of plate current given under sub-paragraph (E) above. Resistive swamping may be required to sufficiently reduce driving power.
- H) Speaking into the microphone connected to AM transmitter, adjust the Audio Gain Control Knob to a point where the plate current on L-1000-A barely moves in a positive direction. Overmodulation with distortion will result if plate current kicks up in excess of 5%.

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