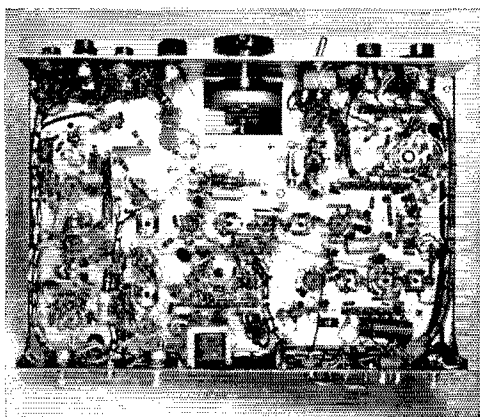




Bottom of the Clegg Venus. Despite complex circuitry, the layout has been kept open, with all parts accessible. A factor in this is inclusion of the power supply components in the speaker enclosure, a separate unit.

ing the key and turning the speech gain control to its off position. The switch on this control is used as the send-receive switch in c.w. work. The carrier level control may be used to set the power output at any convenient level for tuning or antenna adjustment purposes.

For a.m. service the carrier level is set so that the amplifier cathode current is approximately 60 ma., and the speech gain so that both meters show only very slight upward movement on voice peaks. Reception of a.m. involves merely placing the mode switch in the proper position. It should be noted that the Venus is designed for sideband and c.w. service. The receiver selectivity (2.7 kc. at 6 db. and less than 6 kc. at 50 db.) is such that the deficiencies of many a.m. signals currently heard on 50 Mc. show up very markedly. A stable well-modulated a.m. signal is quite readable, even at low signal levels, but the wobbly v.f.o. and the fuzzy modulation that so often characterize 50-Mc. a.m. operation fare very poorly indeed.

Venus 50-Mc. S.S.B. Transceiver

	R. F. Unit	Power Supply & Speaker
Height:	8 inches	8 inches
Width:	15 inches	7½ inches
Depth:	11 inches	11 inches
Weight:	18 pounds	21 pounds
Price Class:	\$195	\$110
Manufacturer: Squires-Sanders, Inc., Watchung, New Jersey.		

Options

The power supply, which also contains the speaker, is normally supplied for a.c. operation, but a 12-volt version is available. The a.c. supply is an all-solid-state chokeless design which is compact and relatively light in weight. Being separate from the r.f. unit, it can be placed away from the operating position to conserve table space, if desired.

The Venus was designed with many contingencies in mind. It is a complete 50-Mc. station in its own right, with enough power to perform well, but it may be used effectively in conjunction with other gear. Provision is included for operation with a high-powered linear amplifier. The 14-Mc. output from the first mixer in the receiver, F_2 , may be taken off and fed to a communications receiver, thus using the receiving front end as a converter and providing wider tuning range than the Venus tuning system affords. This also frees the operator for transmitting and receiving in widely separated frequencies, where this is desirable.

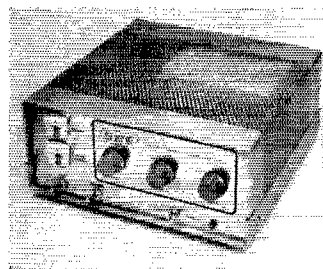
Though the prospect is not discussed in the instruction book, it takes no great amount of imagination to visualize the Venus as a frequency-control system for any and all higher bands, both transmitting and receiving. Some fairly simple transverter equipment for each additional band is all that would be required.

—E. P. T.

SBE Linear Amplifier SB1-LA

THIS is truly the age of miniaturization. SBE has managed to pack neatly an s.s.b. kilowatt linear amplifier, including power supply, into a 1½-cubic foot package. Although the amplifier is designed to go with the SB-33¹ transceiver, it is compatible with other excitors that can furnish about 65 watts of drive. Since the SB-33 covers the 80-, 40-, 20-, and 15-meter bands, the SB1-LA also operates in the amateur bands between 3.8 and 21.5 Mc. The amplifier is rated at 1000 watts p.e.p. input on s.s.b. (750 watts on 15 meters), 400 watts on c.w., f.m., and f.s.k., and 300 watts on a.m.

¹ Recent Equipment, *QST*, Apr. 1964.



One secret that could account for the small size of the amplifier is the use of several relatively small tubes instead of one large kilowatt tube. SBE incorporates six 6JE6 TV sweep tubes in a grounded cathode circuit. With all of these high-perveance tubes in the circuit, it doesn't take a

super-high voltage to power the amplifier, and it's quite impressive when the plate meter swings up to 1.5 amperes!

Since the amplifier is operated Class AB₁, no power is required for driving the grids, so a bank of swamping resistors is connected across the input to the amplifier. The input impedance is about 75 ohms resistive. Fixed operating bias is fed in shunt to the 6JE6 grids from a voltage-doubler power supply. This bias can be adjusted, if necessary, by a potentiometer located at the rear of the cabinet.

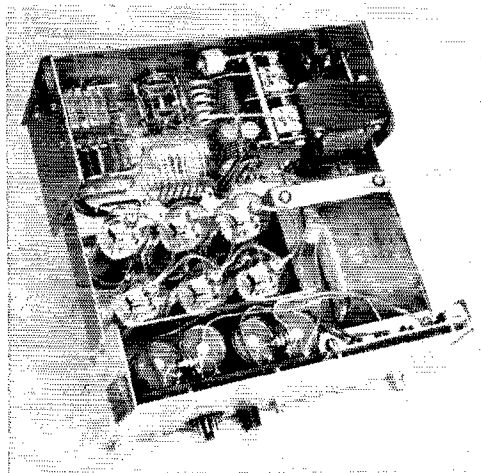
A pi-network output circuit is used in the amplifier plate and, because of the unusually low plate load impedance of the six parallel-connected 6JE6's, the pi-network input capacitor (TUNE) is rather large in value while the inductance required is small. In fact, the coil on 80 meters has only 7 turns. The BANDSWITCH automatically selects the proper inductance tap and, on 80 and 40 meters, switches in fixed capacitors across the load capacitor. Additional capacitance is also connected in shunt with the TUNE capacitor on 80 meters. The amplifier output circuit is designed to work into a 50-ohm load that does not exceed an s.w.r. of 2 to 1.

If you inspect the SB1-LA amplifier closely and look over its circuit diagram, you'll find no obvious parasitic or neutralization precautions except for 27-ohm resistors in each of the 6JE6 grid leads. Undoubtedly, SBE has found the secret to stable amplifier operation because it is stable and there were no indications of parasitics in the unit inspected here at the ARRL lab. Perhaps it is a combination of the grid loading, plate lead dressing and effective screen grid bypassing.

The power-supply section should be of special interest to those who normally think of having the power supply located beneath the operating table in a table-top amplifier. As mentioned earlier, the SB1-LA power supply is included in the cabinet with the amplifier. A single transformer with three secondary windings supplies the high voltage and bias for the amplifier. Two of the windings are for a pair of semiconductor voltage doublers connected in series. This allows the use of relatively low-voltage (and small-size) electrolytic capacitors in the filter. Output from the high-voltage supply is about 800 volts with a nominal load of 1.2 amperes. The third transformer winding provides bias voltage which is also rectified by semiconductor diodes. Screen voltage is taken from one half of the voltage doublers.

Two miniature meters are mounted on the front panel of the amplifier. One indicates the PLATE AMPERES (actually measures plate and screen current) on a 0 to 1.5 ampere scale. The other meter is an OUTPUT indicator, 0 to 5 scale, and measures the relative r.f. volts at the output of the amplifier.

Some thought has been given, in the design of the SB1-LA, to antenna switching and use of the amplifier with its companion driver. Panel toggle switches and internal relays allow for "barefoot" or amplifier-in operation. The three toggle



All of the components for the kilowatt linear, including the power supply, are neatly packed into the SB1-LA cabinet. Here, with the cabinet top removed, most of the major amplifier and power supply components are visible. The six 6JE6 amplifier tubes are just to the left of the plate transformer. Filter capacitors and semiconductor diodes (diodes not visible here) are placed along the rear wall of the cabinet at the bottom of the photograph. At the upper right hand corner is the filament transformer and to its left are the r.f. amplifier tank circuit components. Rear-apron connectors and controls are, from left to right: Antenna connector (SO-239), driver connector (phono plug), power plug, bias adjust potentiometer, and ground stud.

switches are FIL (on-off), POWER (hi-low), and TUNE-OPERATE. The POWER switch gives the straight-through or amplifier action, while the TUNE-OPERATE switch lowers the screen voltage on the amplifiers so that the operator can roughly tune the amplifier tank to resonance before turning on the full power. During standby, the amplifier tubes are biased off completely to prevent tube noise.

Mobile operation is possible with the SB1-LA and the manufacturer can supply a matching inverter (model SB3-DCP DC/AC) to power it from the car's power supply. The instruction manual furnished with the amplifier has recommendations and suggestions for going mobile.

The SB1-LA has the same general color scheme as the SB-33 — gray cabinet with a satin chrome panel and light blue knobs and trim. — E. L. C.

SBE Linear Amplifier SB1-LA

Height: 5¾ inches

Width: 12 inches

Depth: 12½ inches

Weight: 40 pounds

Power Requirements: 117 v.a.c., 50-60 cycles, 1400 watts peak.

Price Class: \$280

Manufacturer: Sideband Engineers, 317 Roebling Rd., South San Francisco, California.