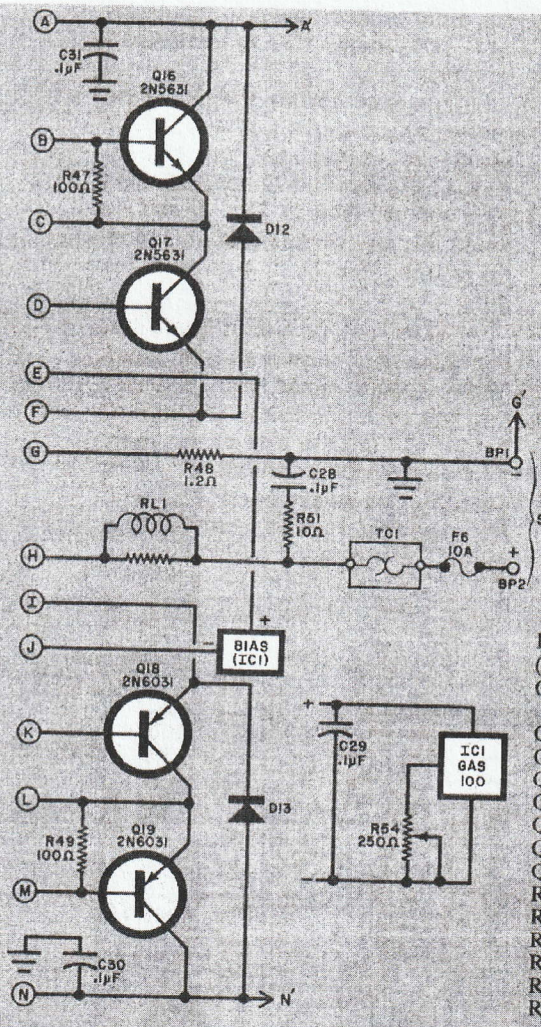
unit's design is fully pushpull from input to output, modulation noise is totally absent at low frequencies. Overall noise, too, is diminished since there is no ground loop. Measurements made with an r-f filter to eliminate r-f contamination yield a noise figure of −112 dB.

About the Circuit. Since most amplifiers employ a single differential input circuit, they are essentially single-ended designs. Virtually all power amplifiers can accurately reproduce sine waves fed into their inputs. However, it is not necessarily true that all amplifiers will accurately reproduce music and voice signals that are generally nonsinusoidal and rarely have positive and negative peaks that are equal in amplitude. The obvious solution to accurately amplifying music and voice signals, of course, is to use separate amplifiers for the positive and the negative half cycles. If the amplifiers are identical, it is then possible to obtain a virtually "perfect" amplifier.

Due to its unique mirror-image design, Ampzilla is an almost perfect amplifier. The positive and negative half-cycle amplifiers in Ampzilla share a common feedback loop, an advantage for any source that must drive the amplifier.

The biasing system in Ampzilla employs a unique integrated circuit (*IC1* in Fig. 2) that contains five operational amplifiers. The op amps in this IC track the quiescent output current in such a way as to make thermal runaway impossible.

The output stage of Ampzilla operates in a quasi-class-A mode, while the driver and slave output stages are driven class A for the full cycle. Only the driven output transistors, *Q17* and *Q18*, are operated class B. However, *Q17* and *Q18* do not switch from positive to negative. Rather, they traverse back through the class-A region at



PARTS LIST

(For power supply and **one channel**)

BP1, BP2—Five-way binding post (one red, one black)
C1—200-pF, 100-volt ceramic capacitor
C2, C3, C10, C11, C20, C21—100μF, 10-volt electrolytic capacitor
C4, C24, C29—0.1-μF, 16-volt ceramic capacitor
C5-C8—330-μF, 10-volt electrolytic capacitor
C9—100-μF, 50-volt electrolytic capacitor
C12, C14—22-pF, 500-volt, 10% ceramic capacitor
C13, C15—47-pF, 500-volt, 10% ceramic capacitor
C16-C19, C28, C30, C31—0.1-μF, 100-volt ceramic capacitor
C22, C26, C27—0.001-μF, 500-volt, 10% ceramic capacitor
C23, C25—220-μF, 16-volt electrolytic capacitor
C32, C33—16,800-μF, 75-volt com- puter-grade electrolytic capacitor
D1-D4, D15, D16—1N4148 diode
D5—1N5878C 51-volt, 5% zener diode
D6-D9—1N4938 diode
D10, D11—1N5823 diode (do not substitute)
D12, D13—1N4004 diode
D14—MV5022 (Monsanto) diode
F1-F4—AGC 6-ampere fuse
F5—MDL 10-ampere slow-blow fuse
F6—AGC 10-ampere fuse
IC1—GAS100 op amp integrated circuit
J1—Phono jack
L1, L2—1-mH r.f.c. (12-ohm dc resistance)
(*Do not substitute for following transistors.*)
Q1, Q2, Q5, Q8—MPSU06 transistor (Motorola)
Q3, Q4, Q6—MPSU56 transistor (Motorola)
Q7, Q11—MJ3584 transistor (Motorola)
Q9, Q10—2N3584 transistor
Q12, Q13—2N6316 transistor
Q14, Q15—2N6318 transistor
Q16, Q17—2N5631 transistor
Q18, Q19—2N6031 transistor
R1—2.2-ohm
R2—1-megohm
R3—1000-ohm
R4, R6, R16, R17—7500-ohm
R7, R8, R23, R24—150,000-ohm
R9-R12, R31, R33, R35, R36, R47, R49—100-ohm
R14, R15—1800-ohm
R18, R22, R25—620-ohm
R21, R26, R46—62-ohm
R29, R30—36,000-ohm
R32—390-ohm
R34—470-ohm
R48—1.2-ohm
R52, R53—10-ohm

All resistors ½ watt, 5%

R5—1000-ohm, linear-taper trimmer potentiometer
R13—200-ohm, ½-watt, 1% resistor
R19, R20, R28—3900-ohm, 1-watt, 10% resistor
R27—4990-ohm, ½-watt, 1% resistor
R43, R44—0.39-ohm, 5-watt, 10% resistor
R55—2000-ohm, 5-watt, 10% resistor
R50—2.2-ohm, 2-watt, 5% resistor
R51—10-ohm, 2-watt, 5% resistor
R45—0.125-ohm, 10-watt, 3% resistor
R39, R40—300-ohm, 1-watt, 2% resistor
R37, R42—1000-ohm, 2-watt, 2% resistor
R38, R41—750-ohm, 2-watt, 2% resistor
R54—250-ohm, linear-taper trimmer potentiometer
RECT1—200-PIV, 25-ampere bridge rectifier
RL1—32 turns *u*16 enameled wire wound on R50
S1—Dpdt 15-ampere switch (Cutler-Hammer No. 7241K2 or similar)
T1—106-volt center-tapped, 12-ampere transformer (1500 volt/amperes)
TC1 — 70° C thermal cutout (Elmwood Sensors)
Misc. — Suitable heavy-duty alum. chassis; mounting bracket for RECT1 and fuse block; 1000-sq-in. finned heat sink; fuse block for four fuses; fuse holder for F5; fuse holder for F6; "Boxer" fan (IMC Magnetics Corp.); 3½-in. long L bracket with 1½-in. and 1-in. legs for small heat sink; silicone paste; insulators for transistors; insulating fish paper (goes between large pc board and chimney); shielded cable; No. 16 or No. 14 stranded and solid hook-up wire; heavy-duty ½-in. (minimum) tall hard plastic feet; No. 6 solder lugs (3); No. 6 crimp ring-type solderless lugs; small rubber grommet; heavy-duty three-conductor line cord; shoulder fiber washers (2) for J1; machine hardware; rubber washers (4) for mounting power transformer; solder; etc.

Note: The following items are available from the Great American Sound Co., Inc., 8780 Shoreham Dr., West Hollywood, CA 90069: Complete stereo amplifier kit, including assembly manual for $340, plus shipping for 65 lbs. (specify fan speed: slow, medium of fast.); factory-wired for $475; with wattmeters for $525 (plus shipping); Set of four etched, drilled, screened, and staked pc boards for $20; Special power transformer for $100, plus shipping for 45 pounds; Chimney and L brackets, $50; Special GAS100 operational amplifier IC for $1.50. A power-reading wattmeter system with 2 meters and with a range selector switch is also available for $35 in kit form or $50 factory wired and tested.