



SIX LINEAR IC APPLICATIONS

BY DON LANCASTER

Integrated circuits are basically tiny "active" packages of various combinations of transistors, diodes, and resistors, requiring only connection to external elements to produce complete operating systems similar in most respects to discrete component transistorized systems familiar to most electronics experimenters. Here are six, readily available, low-cost linear IC's and circuits that lend themselves to a number of projects.

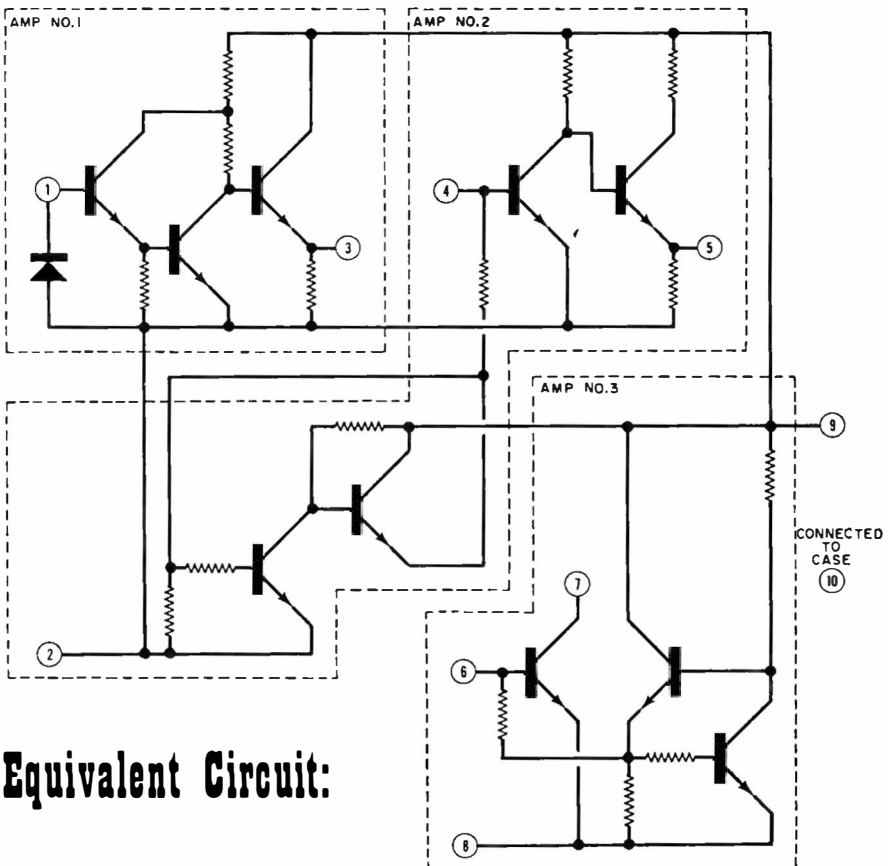


1 CA3035 REMOTE CONTROL AMPLIFIER



What It Is:

Three separate voltage amplifiers (each X100) in a single package, two having a d.c. to 2-MHz frequency response and one having a d.c. to 500-kHz frequency response and high input impedance. One amplifier will directly drive a headphone.

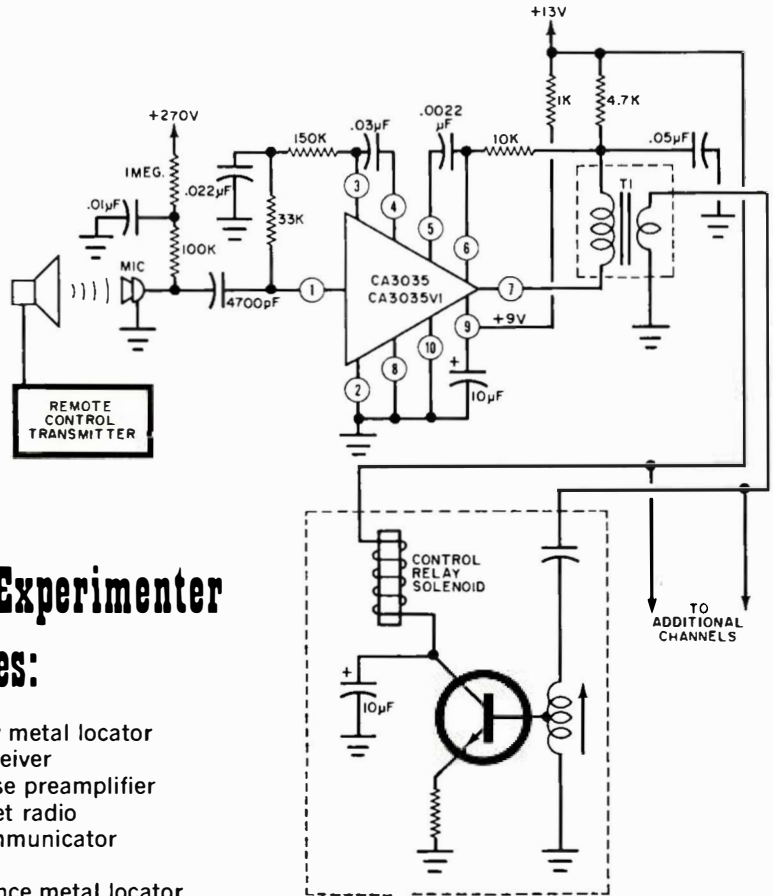


Equivalent Circuit:



Quickie Project:

ULTRASONIC REMOTE CONTROL activates a control relay if a 40 kHz audio transmitter or tuning fork is activated anywhere within operational range.



Other Experimenter

Uses:

- Beat-frequency metal locator
- Light-beam receiver
- General-purpose preamplifier
- TRF or superhet radio
- Ultrasonic communicator
- Burglar alarm
- Induction-balance metal locator

IC Data Sheets Available From:

Radio Corporation of America
Electronic Components and Devices
Harrison, New Jersey

Stocking Distributor:

Allied Radio Corporation
100 N. Western Avenue
Chicago, Illinois 60680
Part Number: 50-E-1-CA3035

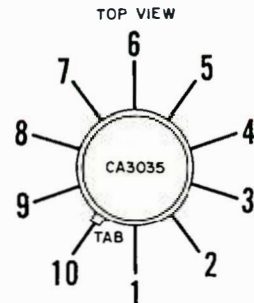
Price Each: \$2.40

Supply Voltage:

+9 V d.c. at 5 mA, + to lead 9
ground leads 2, 8, and 10

Package:

10-pin TO-5 metal can

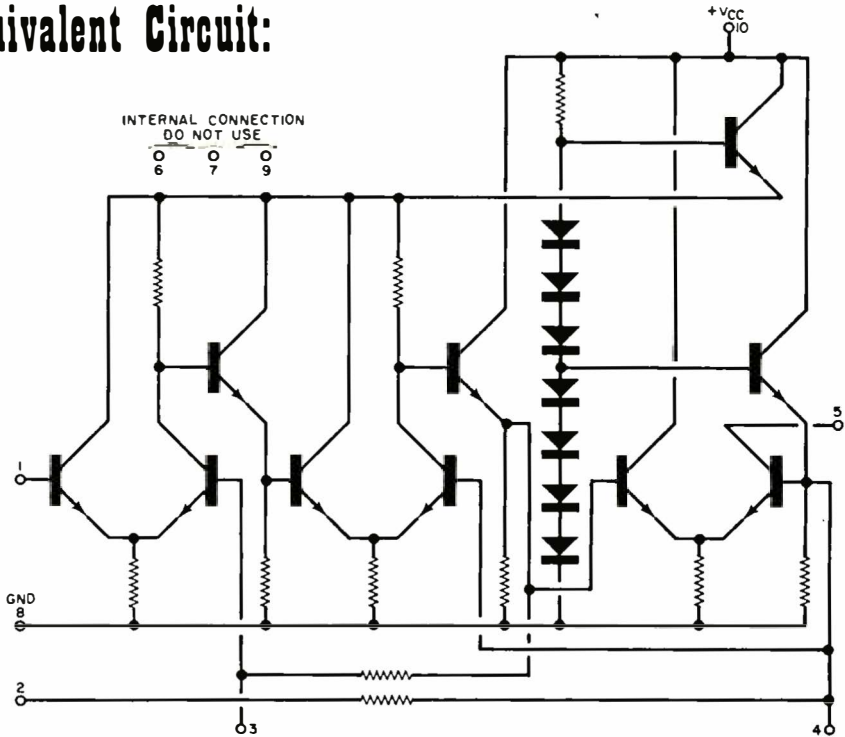


2 CA3011 WIDE-BAND AMPLIFIER & LIMITER

What It Is:

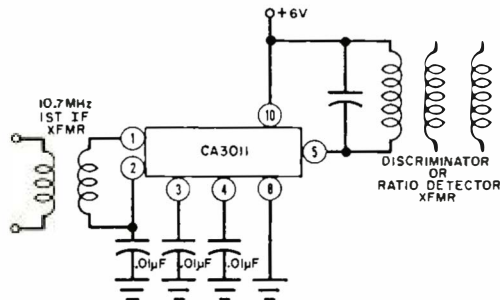
A three-stage, self-limiting r.f. amplifier with a gain of 3000, and an internal regulated power supply. Useful from d.c. to 10 MHz, it limits with 100 microvolts input. Limiting action is symmetrical and of high quality.

Equivalent Circuit:



Quickie Project:

10.7 MHz I.F. STRIP FOR FM RECEIVER replaces conventional FM i.f. from the first i.f. transformer to the discriminator. Unit has an excellent capture ratio.



Other Experimenter Uses:

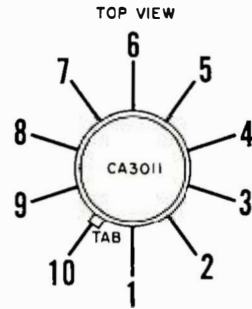
- Phase meter
- Audio clipper/limiter
- TV sound i.f. strip
- Receiver for FM carrier communicator
- Square-wave generator
- Low-level r.f. amplifier

Data Sheets From:
 Radio Corporation of America
 Electronic Components and Devices
 Harrison, New Jersey

Stocking Distributor:
 Allied Radio Corporation
 100 N. Western Avenue
 Chicago, Illinois 60680
 Part Number: 50-E-1-CA3011

Price Each: \$2.00
Supply Voltages:
 +6 volts at 18 mA,
 + to pin 10, ground pin 9

Package:
 10-lead TO-5

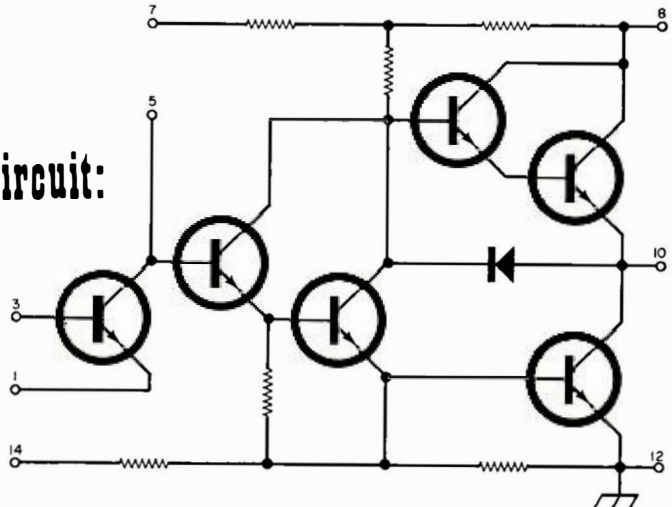


3 PA222 ONE-WATT AUDIO AMPLIFIER

What It Is:

This IC uses a quasi-complementary six-transistor circuit to directly drive a speaker. If it is properly heat-sunk, one watt of audio over a 55- to 15,000-hertz frequency range can be obtained. The typical power gain is over ten million.

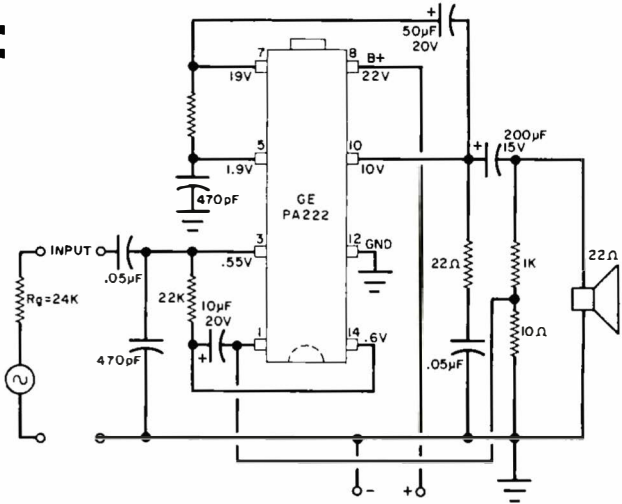
Equivalent Circuit:



Quickie Project:

GENERAL-PURPOSE ONE-WATT AMPLIFIER

circuit directly drives a 22-ohm speaker without a transformer. Input impedance is 40,000 ohms. Resistor between pins 7 and 5 equals value marked on the IC. The IC must be heat-sunk. Circuit is susceptible to r.f. oscillations unless all leads are short.



Other Experimenter

Uses:

Intercom
Radio or phonograph output stage
Walkie-talkie output stage
Monitor amplifier
Electronic crossover network

Data Sheets From:

General Electric Semiconductor Products
Electronics Park
Syracuse 1, New York

Stocking Distributor:

Allied Radio Corporation
100 N. Western Avenue
Chicago, Illinois 60680
Part Number: 50-E-3-PA222

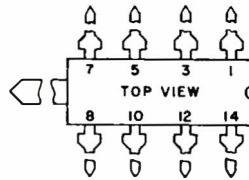
Price: \$3.70

Supply Voltage:

+22 V at 22 mA, + to pin 8, ground
pin 12

Package:

8-lead, dual in-line package with special
heat-sink tab

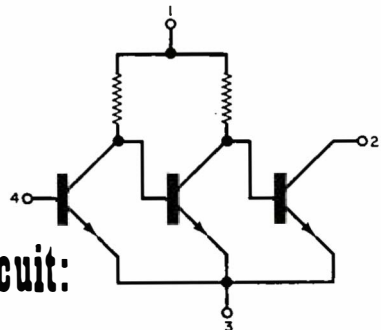


4 TAA103 SUBMINIATURE AUDIO AMPLIFIER

What It Is:

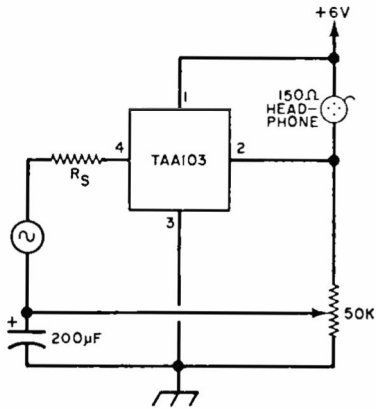
An 0.1"-square by 0.04"-high amplifier that can deliver 10 milliwatts to a headphone; requires 1 nanowatt of input for full output.

Equivalent Circuit:





Quickie Project:



TINY, HIGH-GAIN HEADPHONE AMPLIFIER provides 70 dB of gain from d.c. to 600 kHz. Volume is controlled by 50,000-ohm potentiometer. R_s should be 1000 ohms or less. A transformer can be added to drive high-impedance phones.



Other Experimenter Uses:

Hearing aid	Stethoscope
Signal tracer	Vibration monitor
Electronic "bugs"	Miniature radio

IC Data Sheets From:

Amperex Electronic Corporation
Slatersville, Rhode Island 02876

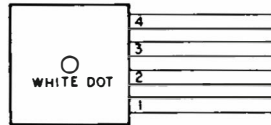
Price Each: \$2.55

Supply Voltage:

+6 volts at 15 mA, + to lead 1, ground lead 3

Package:

Special subminiature four lead

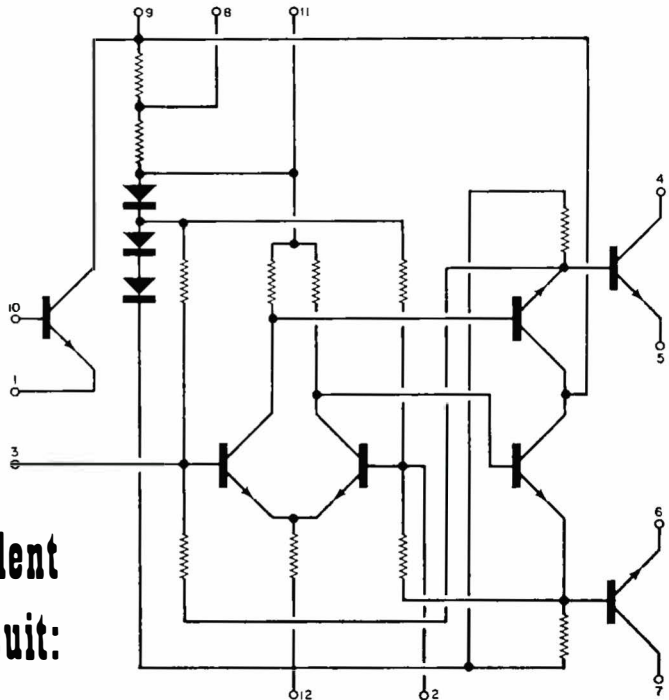


5 CA3020 HALF-WATT AUDIO AMPLIFIER



What It Is:

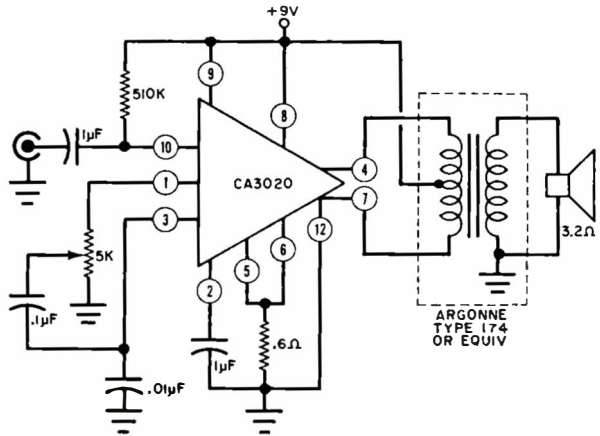
A tiny one-half watt audio amplifier that needs no heat sink and will directly drive a speaker; has high gain and reasonable distortion figures. It consists of a Class B amplifier, a Class A preamplifier and a regulated power supply.



Equivalent Circuit:

Quickie Project:

HALF-WATT GENERAL-PURPOSE AMPLIFIER requires 45 millivolts of input signal for full output. Distortion is 3%; input impedance, 50,000 ohms.



Other Experimenter Uses:

Portable phonograph amplifier
Driver for higher-power amplifiers
Signal tracer

Tape recorder monitor
Power supply regulator
Radio output stage

Data Sheets From:

Radio Corporation of America
Electronic Components and Devices
Harrison, New Jersey

Stocking Distributor:

Allied Radio Corporation
100 N. Western Avenue
Chicago, Illinois 60680
Part Number: 50-E-1-CA3020

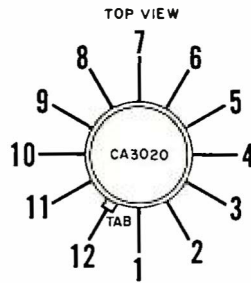
Price Each: \$2.80

Supply Voltage:

+ 9 volts at 22 mA standby, 145 mA at full output, + to pin 8 and 9, ground 12

Package:

12-pin TO-5 metal can

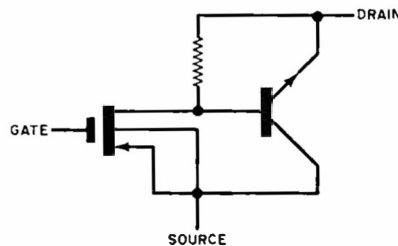


6 TAA-320 BIFET AMPLIFIER

What It Is:

An integrated amplifier having a MOSFET input stage and a conventional transistor emitter-follower output stage. It has an extremely high input impedance and a low output impedance. The only low-cost IC with an input impedance comparable to that of a vacuum tube.

Equivalent Circuit:



(Continued on page 118)

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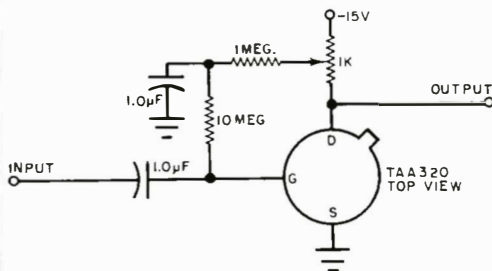
LINEAR IC APPLICATIONS

(Continued from page 56)

QUICKIE PROJECT:

AUDIO PREAMPLIFIER

Has voltage gain of 10. Input impedance is 10 megohms; output impedance less than 100 ohms. Adjust potentiometer for best combination of gain and linearity.



OTHER EXPERIMENTER USES:

- Phase-shift audio oscillator
- Photo timer
- Time-delay relay
- Proximity alarm
- Impedance-matching device
- Microphone line driver
- Sawtooth ramp generator

Data Sheets From:

Amperex Electronics Corporation
 Slatersville, Rhode Island 02876

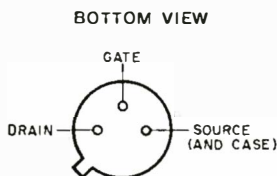
Price Each: \$2.25

Supply Voltage:

— 15 volts at 10 mA, — to drain
 through 1000 ohms, + to source

Package:

TO-18 metal can



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