

General Class Review

G6 Circuit Components

Michael Carroll

KM6OTE

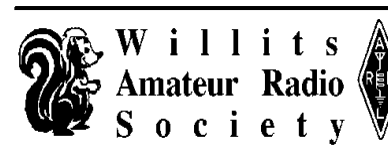
Amateur Radio General License Training

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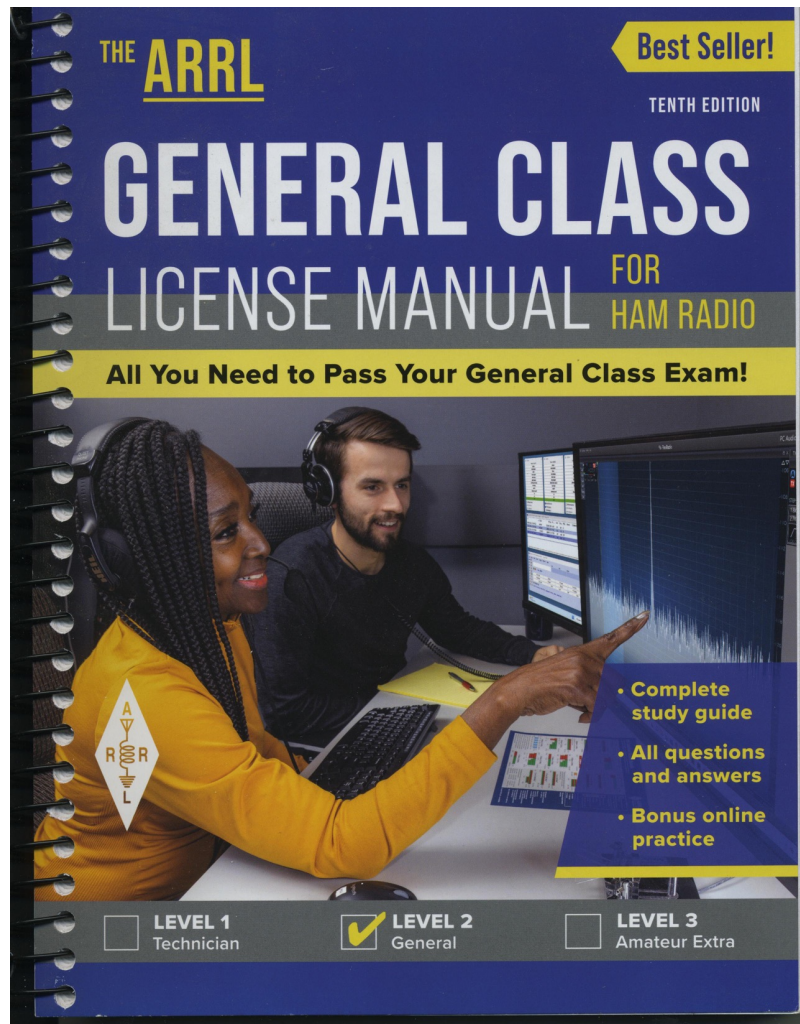
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Topics on Exam

Section	Contents	Questions on Exam	Questions in Pool	Covered in Session
G1	FCC Rules and Regulations	5	57	Session 5
G2	Operating Procedures	5	50	Session 4
G3	Radio Wave Propagation	3	37	Session 2
G4	Amateur Radio Practices	5	60	Session 3
G5	Electrical Principles	3	40	Session 1
G6	Electronic Components	2	24	Session 1
G7	Practical Circuits	3	38	Session 1
G8	Signals and Emissions	3	43	Session 3
G9	Antennas and Feedlines	4	46	Session 2
G0	Safety	2	25	Session 4



Review Manual
ARRL, 10th edition, Question pool
for 2023 - 2027

Review Software
hamstudy.org

<http://www.arrl.org/question-pools>

Wikipedia

Circuit Components

G6A01

What is the minimum allowable discharge voltage for maximum life of a standard 12-volt lead-acid battery?

- A. 6 volts
- B. 8.5 volts
- C. 10.5 volts
- D. 12 volts

Circuit Components

G6A01 (C)

What is the minimum allowable discharge voltage for maximum life of a standard 12-volt lead-acid battery?

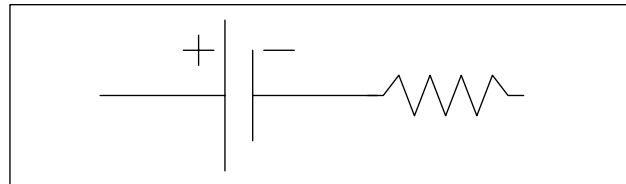
- A. 6 volts
- B. 8.5 volts
- **C. 10.5 volts**
- D. 12 volts

Circuit Components

- G6A02
- What is an advantage of batteries with low internal resistance?
 - A. Long life
 - B. High discharge current
 - C. High voltage
 - D. Rapid recharge

Circuit Components

- G6A02 (B)
- What is an advantage of batteries with low internal resistance?
- A. Long life
- **B. High discharge current**
- C. High voltage
- D. Rapid recharge



battery

Circuit Components

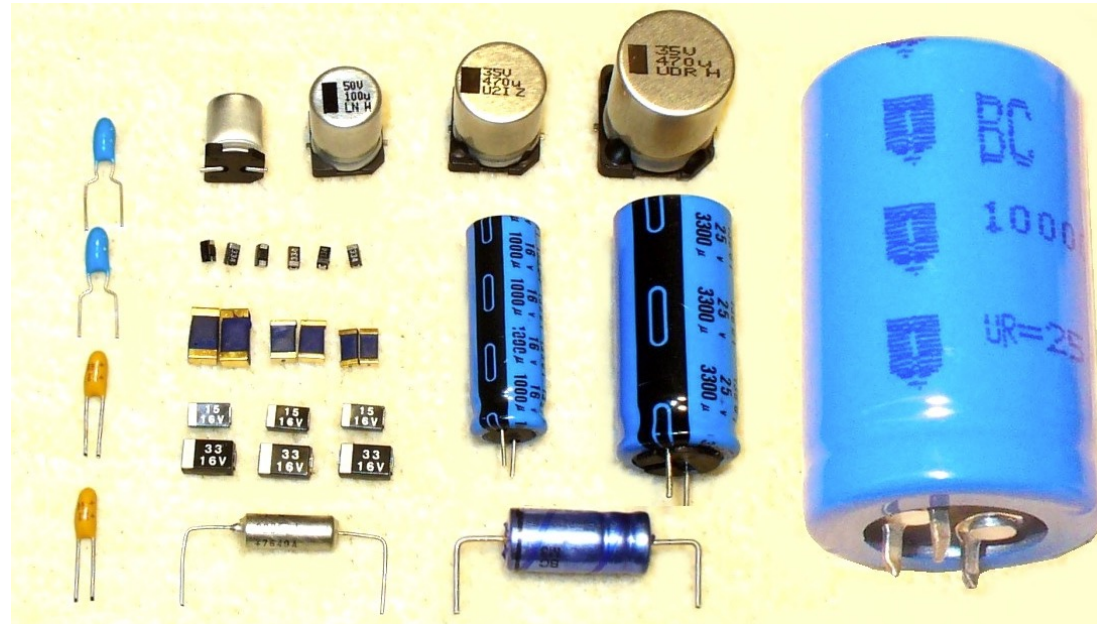
- G6A03
- What is the approximate forward threshold voltage of a germanium diode?
- A. 0.1 volt
- B. 0.3 volts
- C. 0.7 volts
- D. 1.0 volts

Circuit Components

- G6A03 (B)
- What is the approximate forward threshold voltage of a germanium diode?
- A. 0.1 volt
- **B. 0.3 volts**
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- D. 1.0 volts

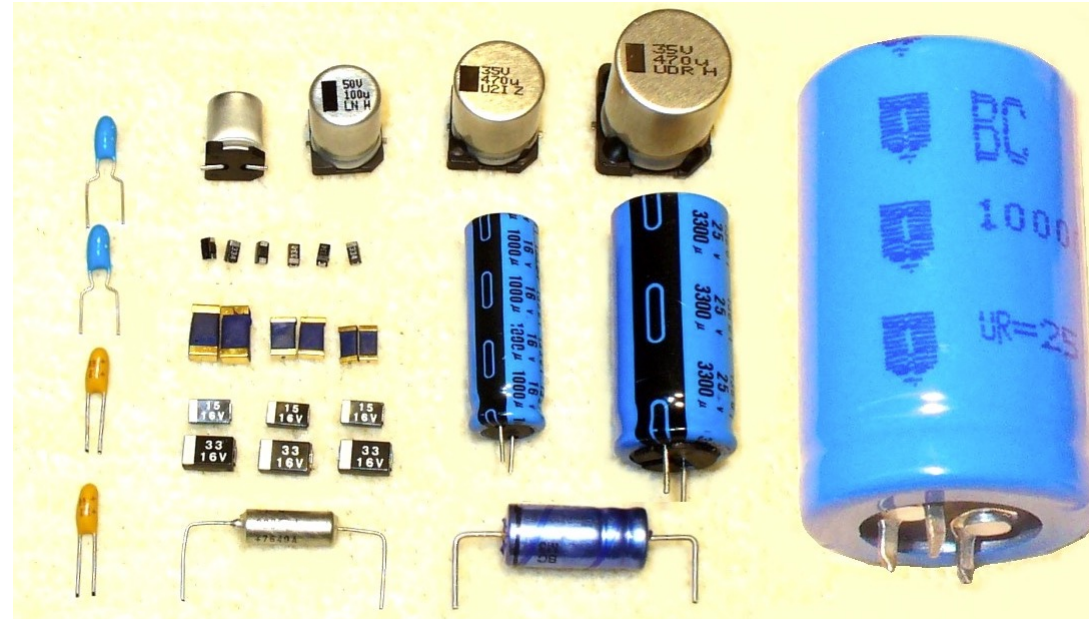
Circuit Components

- G6A04
- Which of the following is characteristic of an electrolytic capacitor?
- A. Tight tolerance
- B. Much less leakage than any other type
- C. High capacitance for a given volume
- D. Inexpensive RF capacitor



Circuit Components

- G6A04 (C)
- Which of the following is characteristic of an electrolytic capacitor?
- A. Tight tolerance
- B. Much less leakage than any other type
- C. **High capacitance for a given volume**
- D. Inexpensive RF capacitor



Circuit Components

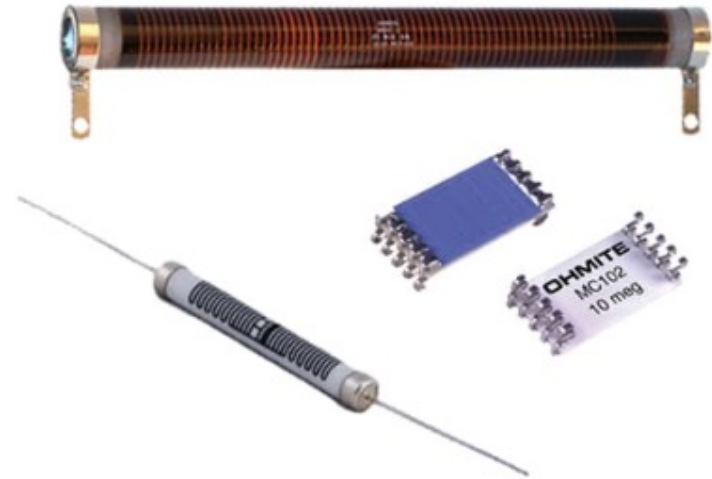
- G6A05
- What is the approximate forward threshold voltage of a silicon junction diode?
- A. 0.1 volt
- B. 0.3 volts
- C. 0.7 volts
- D. 1.0 volts

Circuit Components

- G6A05 (C)
- What is the approximate forward threshold voltage of a silicon junction diode?
- A. 0.1 volt
- B. 0.3 volts
- **C. 0.7 volts**
- D. 1.0 volts

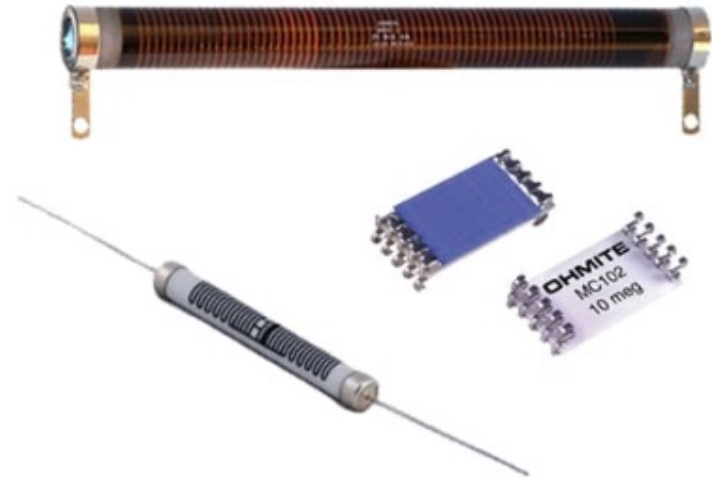
Circuit Components - Resistor

- G6A06
- Why should wire-wound resistors not be used in RF circuits?
- A. The resistor's tolerance value would not be adequate
- B. The resistor's inductance could make circuit performance unpredictable
- C. The resistor could overheat
- D. The resistor's internal capacitance would detune the circuit



Circuit Components - Resistor

- G6A06 (B)
- Why should wire-wound resistors not be used in RF circuits?
- A. The resistor's tolerance value would not be adequate
- B. **The resistor's inductance could make circuit performance unpredictable**
- C. The resistor could overheat
- D. The resistor's internal capacitance would detune the circuit



Circuit Components

- G6A07
- What are the operating points for a bipolar transistor used as a switch?
- A. Saturation and cutoff
- B. The active region (between cutoff and saturation)
- C. Peak and valley current points
- D. Enhancement and depletion modes

Circuit Components

- G6A07 (A)
- What are the operating points for a bipolar transistor used as a switch?
- A. **Saturation and cutoff**
- B. The active region (between cutoff and saturation)
- C. Peak and valley current points
- D. Enhancement and depletion modes

Circuit Components

- G6A08
- Which of the following is characteristic of low voltage ceramic capacitors?
- A. Tight tolerance
- B. High stability
- C. High capacitance for given volume
- D. Comparatively low cost



Circuit Components

- G6A08 (D)
- Which of the following is characteristic of low voltage ceramic capacitors?
- A. Tight tolerance
- B. High stability
- C. High capacitance for given volume
- D. **Comparatively low cost**

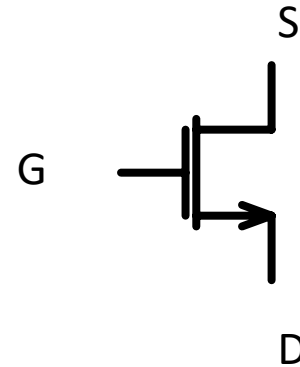


Circuit Components

- G6A09
- Which of the following describes MOSFET construction?
- A. The gate is formed by a back-biased junction
- B. The gate is separated from the channel by a thin insulating layer
- C. The source is separated from the drain by a thin insulating layer
- D. The source is formed by depositing metal on silicon

Circuit Components

- G6A09 (B)
- Which of the following describes MOSFET construction?
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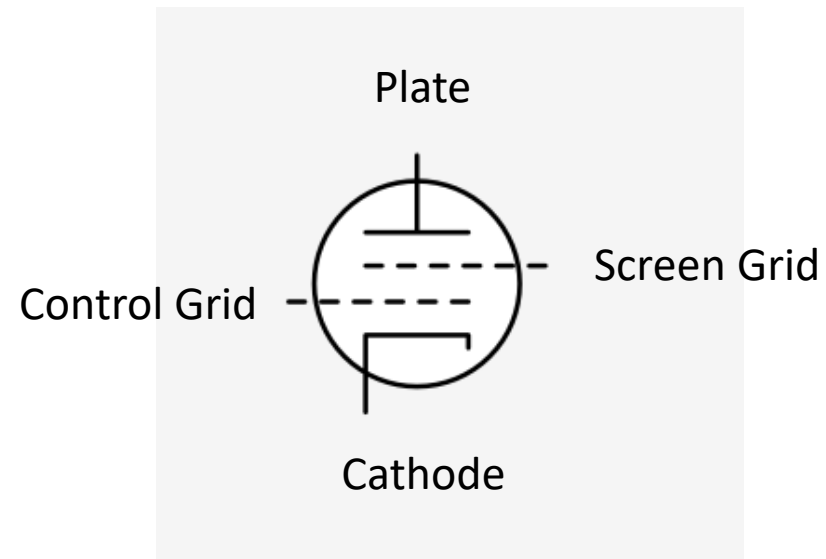


Circuit Components

- G6A10
- Which element of a vacuum tube regulates the flow of electrons between cathode and plate?
- A. Control grid
- B. Suppressor grid
- C. Screen grid
- D. Trigger electrode

Circuit Components

- G6A10 (A)
- Which element of a vacuum tube regulates the flow of electrons between cathode and plate?
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Circuit Components

- G6A11
- What happens when an inductor is operated above its self-resonant frequency?
- A. Its reactance increases
- B. Harmonics are generated
- C. It becomes capacitive
- D. Catastrophic failure is likely

Circuit Components

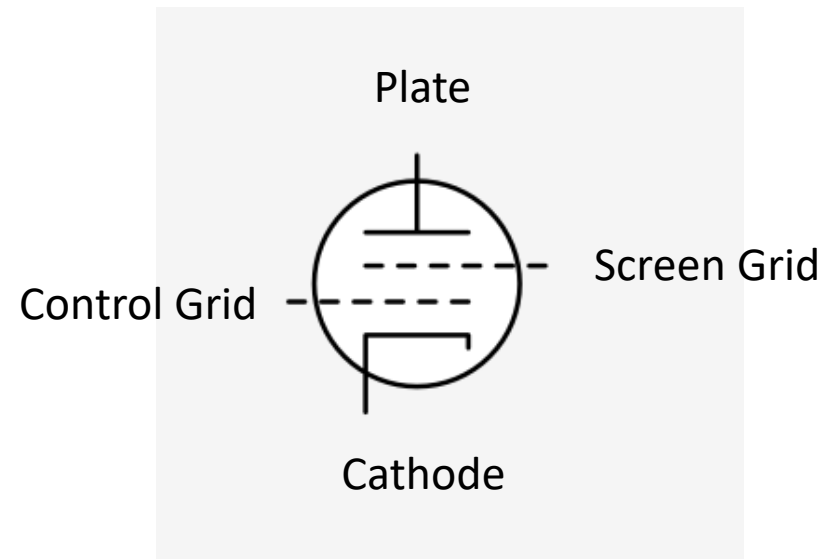
- G6A11 (C)
- What happens when an inductor is operated above its self-resonant frequency?
- A. Its reactance increases
- B. Harmonics are generated
- **C. It becomes capacitive**
- D. Catastrophic failure is likely

Circuit Components

- G6A12
- What is the primary purpose of a screen grid in a vacuum tube?
 - A. To reduce grid-to-plate capacitance
 - B. To increase efficiency
 - C. To increase the control grid resistance
 - D. To decrease plate resistance

Circuit Components

- G6A12 (A)
- What is the primary purpose of a screen grid in a vacuum tube?
- **A. To reduce grid-to-plate capacitance**
- B. To increase efficiency
- C. To increase the control grid resistance
- D. To decrease plate resistance



Circuit Components

- G6B01
- What determines the performance of a ferrite core at different frequencies?
- A. Its conductivity
- B. Its thickness
- C. The composition, or “mix,” of materials used
- D. The ratio of outer diameter to inner diameter

Circuit Components

- G6B01 (C)
- What determines the performance of a ferrite core at different frequencies?
- A. Its conductivity
- B. Its thickness
- **C. The composition, or “mix,” of materials used**
- D. The ratio of outer diameter to inner diameter

Circuit Components

- G6B02
- What is meant by the term MMIC?
- A. Multi-Mode Integrated Circuit
- B. Monolithic Microwave Integrated Circuit
- C. Metal Monolayer Integrated Circuit
- D. Mode Modulated Integrated Circuit

Circuit Components

- G6B02 (B)
- What is meant by the term MMIC?
- A. Multi-Mode Integrated Circuit
- **B. Monolithic Microwave Integrated Circuit**
- C. Metal Monolayer Integrated Circuit
- D. Mode Modulated Integrated Circuit

Circuit Components

- G6B03
- Which of the following is an advantage of CMOS integrated circuits compared to TTL integrated circuits?
- A. Low power consumption
- B. High power handling capability
- C. Better suited for RF amplification
- D. Better suited for power supply regulation

Circuit Components

- G6B03 (A)
- Which of the following is an advantage of CMOS integrated circuits compared to TTL integrated circuits?
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Circuit Components

- G6B04
- What is a typical upper frequency limit for low SWR operation of 50-ohm BNC connectors?
- A. 50 MHz
- B. 500 MHz
- C. 4 GHz
- D. 40 GHz

Circuit Components

- G6B04 (C)
- What is a typical upper frequency limit for low SWR operation of 50-ohm BNC connectors?
- A. 50 MHz
- B. 500 MHz
- **C. 4 GHz**
- D. 40 GHz



Circuit Components

- G6B05
- What is an advantage of using a ferrite core toroidal inductor?
- A. Large values of inductance may be obtained
- B. The magnetic properties of the core may be optimized for a specific range of frequencies
- C. Most of the magnetic field is contained in the core
- D. All these choices are correct

Circuit Components

- G6B05 (D)
- What is an advantage of using a ferrite core toroidal inductor?
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- B. The magnetic properties of the core may be optimized for a specific range of frequencies
- C. Most of the magnetic field is contained in the core
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Circuit Components

- G6B06
- What kind of device is an integrated circuit operational amplifier?
- A. Digital
- B. MMIC
- C. Programmable Logic
- D. Analog

Circuit Components

- G6B06 (D)
- What kind of device is an integrated circuit operational amplifier?
- A. Digital
- B. MMIC
- C. Programmable Logic
- **D. Analog**

Circuit Components

- G6B07
- Which of the following describes a type N connector?
- A. A moisture-resistant RF connector useful to 10 GHz
- B. A small bayonet connector used for data circuits
- C. A low noise figure VHF connector
- D. A nickel plated version of the PL-259

Circuit Components

- G6B07 (A)
- Which of the following describes a type N connector?
- **A. A moisture-resistant RF connector useful to 10 GHz**
- B. A small bayonet connector used for data circuits
- C. A low noise figure VHF connector
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Circuit Components

- G6B08
- How is an LED biased when emitting light?
- A. In the tunnel-effect region
- B. At the Zener voltage
- C. Reverse biased
- D. Forward biased

Circuit Components

- G6B08 (D)
- How is an LED biased when emitting light?
- A. In the tunnel-effect region
- B. At the Zener voltage
- C. Reverse biased
- **D. Forward biased**

Circuit Components

- G6B10
- How does a ferrite bead or core reduce common-mode RF current on the shield of a coaxial cable?
 - A. By creating an impedance in the current's path
 - B. It converts common-mode current to differential mode current
 - C. By creating an out-of-phase current to cancel the common-mode current
- D. Ferrites expel magnetic fields

Circuit Components

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Circuit Components

- G6B11
- What is an SMA connector?
 - A. A type-S to type-M adaptor
 - B. A small threaded connector suitable for signals up to several GHz
 - C. A connector designed for serial multiple access signals
 - D. A type of push-on connector intended for high-voltage applications

Circuit Components

- G6B11 (B)
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Circuit Components

- G6B12
- Which of these connector types is commonly used for low frequency or dc signal connections to a transceiver?
 - A. PL-259
 - B. BNC
 - C. RCA Phono
 - D. Type N

Circuit Components

- G6B12 (C)
- Which of these connector types is commonly used for low frequency or dc signal connections to a transceiver?
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- **C. RCA Phono**
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