

# 3.5 mm Headset: Accessory Specification

This article specifies requirements for 3.5 mm plug headsets to function uniformly across the Android ecosystem.

Device manufacturers should consult the [3.5 mm jack specification](#) and the [Android Compatibility Definition Document](#) (CDD) for additional requirements.

## Functions

Function	Accessory Support
Stereo Audio Out	Required
Audio in (Mic)	Required
Ground	Required

## Control-function mapping

Control Function	Accessory Support	Description
Function A	Required	Play/pause/hook (Short Press), Trigger Assist (Long Press), Next (Double Press)
Function B	Optional	Vol+
Function C	Optional	Vol-
Function D	Optional	Reserved (Pixel devices use this to launch voice commands)

Assign functions to buttons as follows:

- All one-button headsets must implement Function A.
- Headsets with multiple buttons must implement functions according to the following pattern:
  - 2 functions: A and D
  - 3 functions: A, B, C
  - 4 functions: A, B, C, D

## Mechanical

Function	Accessory Support	Notes
4 conductor 3.5 mm plug	Required	Ref: EIAJ-RC5325A standard
CTIA pinout order (LRGM)	Required	Except in regions with legal requirements for OMTP pinout
OMTP pinout order (LRMG)	Optional	
Microphone	Required	Must not be obstructed when operating headset controls

# Electrical

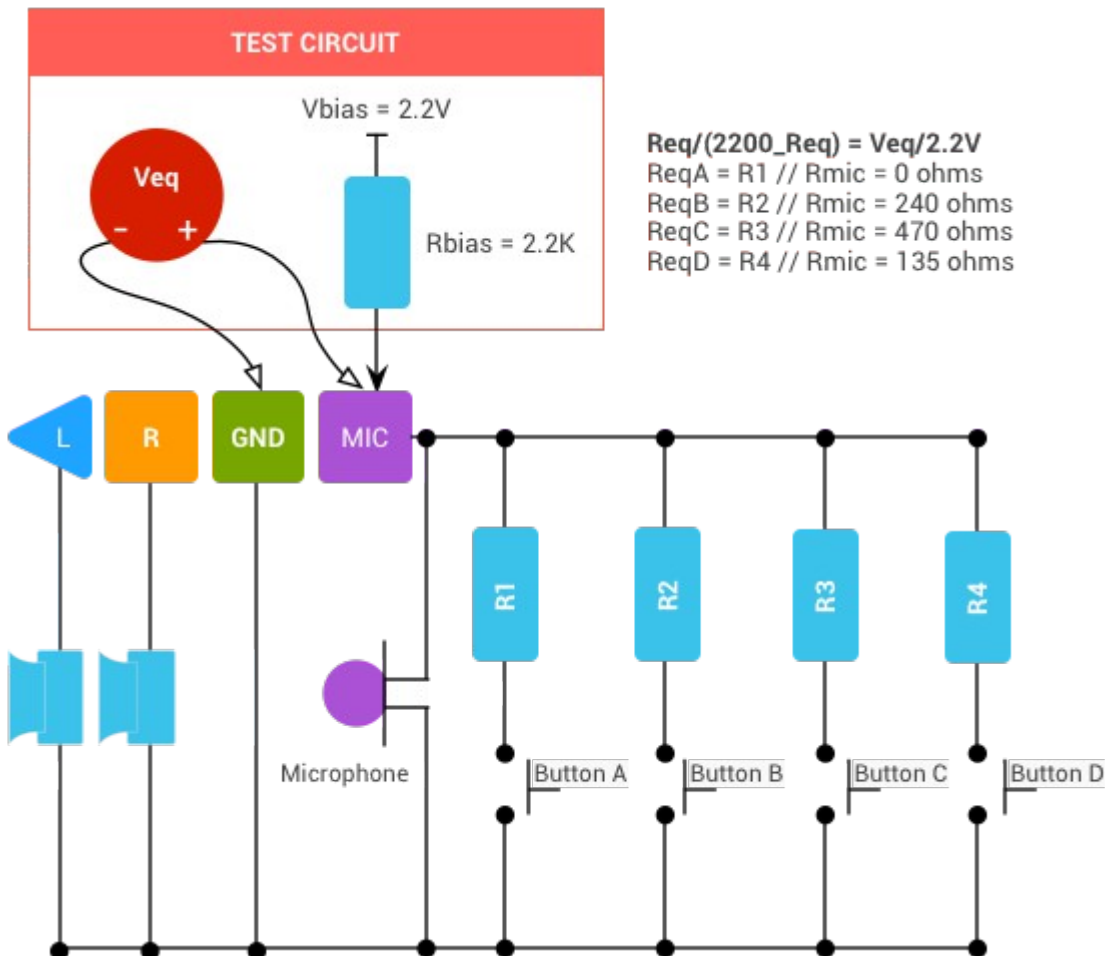
Function	Accessory Support	Description
Ear speaker impedance	16 ohms or higher	Recommend 32 - 300 ohms
Mic DC resistance	1000 ohms or higher	Mic characteristics must be compliant with section 5.4 <i>Audio Recording</i> of the current <a href="#">Android CDD</a>
Control Function Equivalent impedance*	0 ohm	[Function A] Play/Pause/Hook
	240 ohm +/- 1% resistance	[Function B]
	470 ohm +/- 1% resistance	[Function C]
	135 ohm +/- 1% resistance	[Function D]

\*Total impedance from positive mic terminal to GND when button is pressed with 2.2 V mic bias applied through 2.2 kOhm resistor

In the following diagrams, Button A maps to Function A, Button B to Function B, and so on.

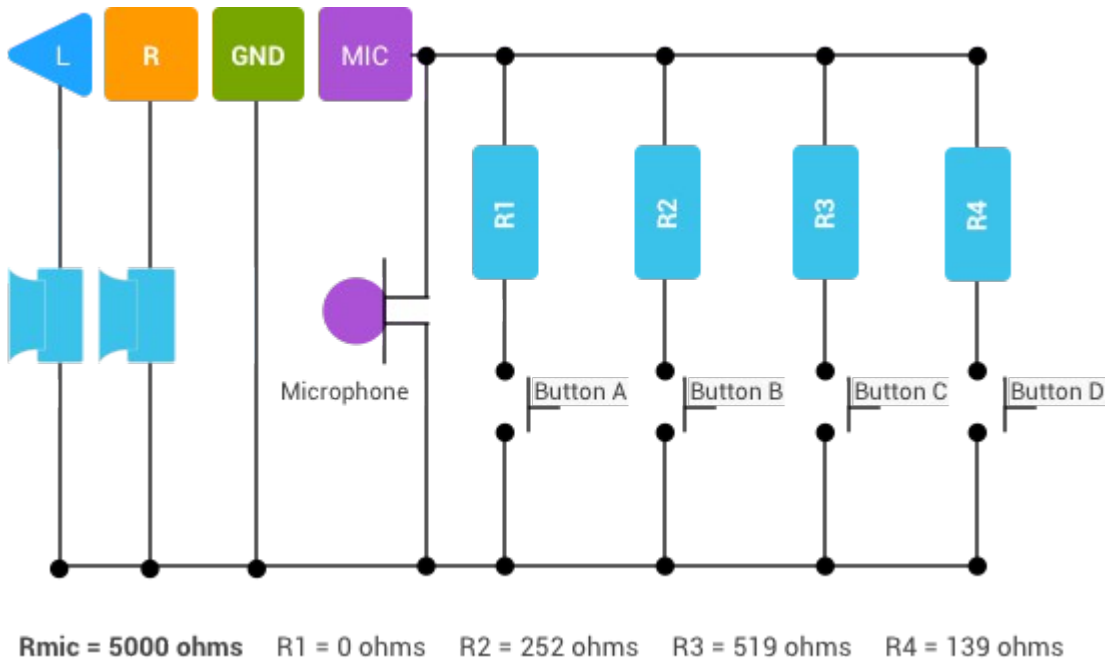
## Reference headset test circuits

The following diagram for Reference Headset Test Circuit 1 shows the CTIA pinout for a 4-segment plug. For the OMTP pinout, switch the positions of the MIC and GND segments.



**Figure 1.** Reference headset test circuit 1

The following diagram for Reference Headset Test Circuit 2 shows how the actual resistor values (R1 - R4) are altered to meet this specification.



**Figure 2.** Reference headset test circuit 2

The actual resistance of the buttons parallel with the microphone (R1-R4) is based on the microphone capsule resistance ( $R_{mic}$ ) and the equivalent impedance values ( $ReqA-ReqD$ ). Use the following formula:

$$Req_N = (R_{mic} * R_n) / (R_{mic} + R_n)$$

Where  $R_n$  is the actual resistance of a button,  $ReqN$  is the equivalent impedance value of that button (provided), and  $R_{mic}$  is the microphone impedance value.

The example above assumes a 5 kohm microphone impedance ( $R_{mic}$ ); to achieve an equivalent  $R4$  impedance of 135 ohm ( $ReqD$ ), the actual resistor value ( $R4$ ) must be 139 ohms.