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## RCA to Breadboard Adapter (#28050)

The Parallax RCA to Breadboard Adapter makes it convenient to connect an RCA jack to breadboards, protoboards and perfboards with 1/10-inch hole spacing. Designed with the Propeller Education Kit in mind, this adapter simplifies connecting the PE Platform's Propeller Microcontroller to Audio/Video inputs on televisions and other devices.

Our "...to Breadboard" adapters make connectors breadboard-friendly for prototyping. These adaptors tend not to feature built-in circuits, just the connector mounted on a PCB and routed to pins. This makes each adapter more flexible for different applications. Hand wiring the interface circuit also gives students the opportunity to become more familiar with the relationships between circuits, theory of operation, and coding principles.



### Features

- RCA Jack
- 4 dual-pin DIP board improves mechanical stability for plugging and unplugging the peripheral's cable.
- Compact board can be oriented across a breadboard trench lengthwise or crosswise for flexibility in parts placement.
- 1/10" pin spacing for common breadboard placement

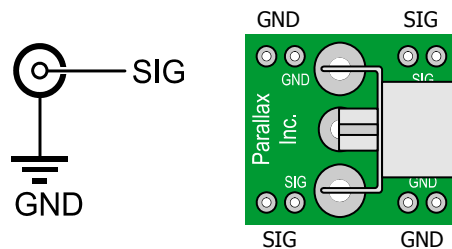
### Key Specifications

- Supply voltage: N/A
- Supply current: N/A
- Communication: Depends on peripheral. Examples include NTSC, PAL, and PWM.
- Package: 4 dual-pin DIP, 0.1" spacing
- Operating temperature: 0 – 70° C.
- Size: (0.87 in H x 0.65 in W x 0.75 in D)  
22 mm x 16 mm x 19 mm
- Weight: 0.12 oz (3.5 g)

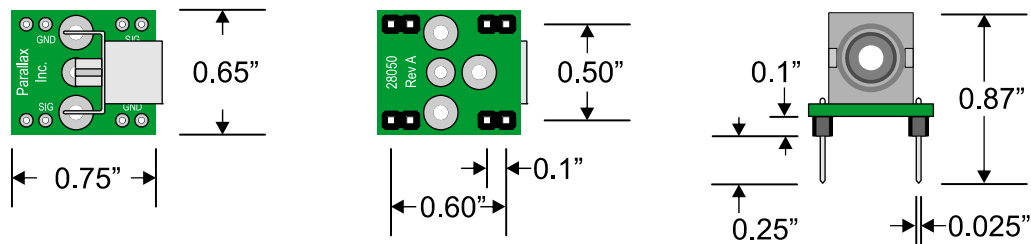
### Pin Definitions

SIG	RCA center connection (tip)
GND	RCA outer sleeve (ring)

The two pins in each pin-pair are electrically connected to each other; either pin by a given pin label can be used to make the electrical connection.



## Dimensions



Dimensions are approximate and subject to minor changes based on component availability.

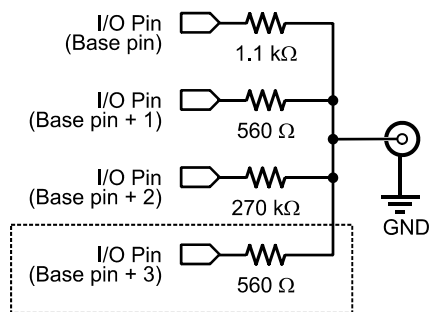
## Test Applications

The next two test applications use the Propeller microcontroller to test baseband video and audio transmission to a TV set's video and audio inputs. The Resources and Downloads section has pointers to lots more audio/video example applications.

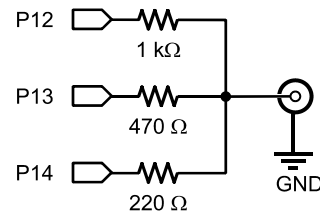
### Propeller Microcontroller – TV Display with Baseband Video

The RCA to Breadboard Adapter can be used to build the Propeller Demo Board's 1 V, 75  $\Omega$ , 3-bit DAC on a breadboard. The Propeller Demo Board uses it to generate either broadcast or baseband video. Most Propeller video objects are written so that the base pin in the schematic gets connected to an I/O pin that's a multiple of 4. In the case of the Propeller Demo Board, the base pin is P12, and the successive DAC bits are P13, P14, and optionally P15.

Propeller Education Kit resistor values of 220  $\Omega$ , 470  $\Omega$ , and 1 k $\Omega$  can be used in place of the slightly larger values shown in the schematic with no discernible change in video quality. Also, for baseband transmission with Test TV Text.spin, the aural subcarrier DAC bit is not required.



Base pin + 3 is only used for Aural Subcarrier in broadcast mode  
Propeller Demo Board Circuit



PE Kit Circuit for Test TV Text.spin

- ✓ Build the PE Kit Circuit for Test TV Text.spin.
- ✓ Connect a TV's video input to the RCA adapter.
- ✓ Run Test TV Text.spin. This file is included in Test-TV-Text-and-Notes.zip, which is available for download from the RCA to Breadboard Adapter (#28050) page at [www.parallax.com](http://www.parallax.com)

```

''File: Test TV Text.spin
''Tests baseband video connection by displaying text message on TV.

CON

    _clkmode = xtal1 + pll16x                ' System clock settings
    _xinfreq = 5_000_000
    
```

```

BASE_PIN = 12                                     ' DAC base pin is P12

OBJ

tv      : "tv_terminal"                          ' Declare tv_terminal object

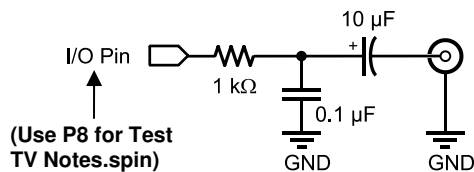
PUB start | i

tv.start(BASE_PIN)                              ' DAC base pin is P12
tv.str(string("This is a test message..."))      ' Display message

```

## Propeller Microcontroller – TV Audio Tone

The adapter can also be used to build the Hydra Game System's audio circuit on a breadboard, providing audio options for the Propeller microcontroller on a breadboard. The Test TV Notes.spin application uses duty modulation and the Propeller chip's ROM sine lookup table to synthesize musical notes.



Audio Circuit

- ✓ Build the audio circuit and use I/O pin P8.
- ✓ Connect a TV's audio input to the RCA adapter.
- ✓ If you have not already done so, download Test-TV-Text-and-Notes.zip from the RCA to Breadboard Adapter (#28050) page at [www.parallax.com](http://www.parallax.com).
- ✓ Unzip Test-TV-Text-and-Notes.zip, and then open and run Test TV Notes.spin.

```

''File: Test TV Notes.spin
''Plays audio notes for TV speakers.

CON

_xinfreq = 5_000_000                             ' System clock settings
_clkmode = xtall + pll16x

C6 = 1047, D6 = 1175, E6 = 1319, F6 = 1397        ' Do, Re, Mi, Fa, Sol, La, Ti, Do
G6 = 1568, A6 = 1760, B6 = 1976, C7 = 2093

OBJ

sine : "Sine"                                     ' Declare Sine Driver object

PUB solfege | i, note

repeat i from 0 to 7                             ' Loop to play the notes
  note := lookupz(i:C6,D6,E6,F6,G6,A6,B6,C7)     ' Use index to look up notes
  sine.freqout(8, 250, note)                     ' P8 transmits for 250 ms at f = note
  waitcnt(clkfreq/4 + cnt)                       ' Rest 1/4 s

```

## Resources and Downloads

To get to the resources listed in this section, go to [www.parallax.com](http://www.parallax.com), enter the part number into the Search field, and click the Go button.

The Propeller Education Kit 40-pin DIP and PropStick USB versions are both compatible with these adapters. The Propeller Education Kit also features tutorials for getting started with the Propeller Microcontroller.

- Propeller Education Kit – 40 Pin DIP version (#32305)
- Propeller Education Kit – PropStick USB version (#32306)

There are more audio and video examples in the Propeller Library – Demos folder. These examples utilize a television display with RCA video and audio inputs, and have been tested on the Parallax Mini LCD A/V Color Display. This display is also included in the Propeller Accessories Kit along with a Parallax PS/2 Optical mouse and Mini Keyboard. You can connect a PS/2 mouse and keyboard to your PE Platform or other breadboard with the PS/2 to Breadboard Adapter.

- Propeller Accessories Kit (#32311)
- PS/2 to Breadboard Adapter (#28060)

The display and PS/2 optical mouse and keyboard are also sold separately.

- Mini LCD A/V Color Display (#603-3200)
- Parallax PS/2 Optical Mouse (#32350)
- Parallax PS/2 Mini Keyboard (#32351)