

# ***TMS320C2xx Audio Loopback Using the AD55 Codec in C***

---

---

---

*APPLICATION REPORT: SPRA350*

*Jeff Axelrod*

*Digital Signal Processing Solutions  
March 1997*



## **IMPORTANT NOTICE**

Texas Instruments (TI) reserves the right to make changes to its products or to discontinue any semiconductor product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

TI warrants performance of its semiconductor products and related software to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are utilized to the extent TI deems necessary to support this warranty. Specific testing of all parameters of each device is not necessarily performed, except those mandated by government requirements.

Certain application using semiconductor products may involve potential risks of death, personal injury, or severe property or environmental damage ("Critical Applications").

TI SEMICONDUCTOR PRODUCTS ARE NOT DESIGNED, INTENDED, AUTHORIZED, OR WARRANTED TO BE SUITABLE FOR USE IN LIFE-SUPPORT APPLICATIONS, DEVICES OR SYSTEMS OR OTHER CRITICAL APPLICATIONS.

Inclusion of TI products in such applications is understood to be fully at the risk of the customer. Use of TI products in such applications requires the written approval of an appropriate TI officer. Questions concerning potential risk applications should be directed to TI through a local SC sales office.

In order to minimize risks associated with the customer's applications, adequate design and operating safeguards should be provided by the customer to minimize inherent or procedural hazards.

TI assumes no liability for applications assistance, customer product design, software performance, or infringement of patents or services described herein. Nor does TI warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right of TI covering or relating to any combination, machine, or process in which such semiconductor products or services might be or are used.

## **TRADEMARKS**

TI is a trademark of Texas Instruments Incorporated.

Other brands and names are the property of their respective owners.

### **CONTACT INFORMATION**

US TMS320 HOTLINE	(281) 274-2320
US TMS320 FAX	(281) 274-2324
US TMS320 BBS	(281) 274-2323
US TMS320 email	dsph@ti.com

## Contents

<b>Abstract .....</b>	<b>7</b>
<b>Product Support .....</b>	<b>8</b>
World Wide Web .....	8
<b>Introduction.....</b>	<b>9</b>
<b>Usage.....</b>	<b>10</b>
Modification.....	10
Troubleshooting .....	10

## Tables

<b>Table 1 List of Files.....</b>	<b>9</b>
-----------------------------------	----------

# TMS320C2xx Audio Loopback Using the AD55 Codec in C

---

---

---

## Abstract

This program demonstrates how to access the AD55 codec via the synchronous serial port using the Texas Instrument (TI™) C-compiler. The program is a C version of the `ad55.asm` file found in example C-14 of Appendix C in the TMS320C2xx User's Guide (SPRU127B).

The program receives input from the codec and outputs each sample as it is received.

It is intended for use with any of several third party evaluation boards that include the AD55 codec.



## Product Support

### World Wide Web

Our World Wide Web site at [www.ti.com](http://www.ti.com) contains the most up to date product information, revisions, and additions. Users registering with TI&ME can build custom information pages and receive new product updates automatically via email.



## Introduction

This program can be obtained via the Internet by typing the following location into your browser and executing the self-extracting archive after downloading it:

<ftp://ftp.ti.com/pub/tms320bbs/c2xxfiles/CODEC2XX.EXE>

This program demonstrates how to access the AD55 codec via the synchronous serial port using the Texas Instruments C compiler.

It is intended to be used with any of the several available third-party evaluation boards include an AD55 codec.

It is a C version of the ad55.asm file found in Example C-14 of Appendix C in the TMS320C2xx User's Guide (SPRU127B).

The program receives input from the codec and outputs each sample as it is received.

*Table 1 List of Files*

File	Description
main.c	Main C module, which initializes the serial port settings and contains the interrupt service routines.
register.h	Header file included by main.c that contains all memory-mapped registers that can be accessed in the C language.
c2vectors.asm	Assembly file which generates the C2xx vectors including the reset and synchronous serial receive interrupt vectors.
c203.cmd	Linker command file describing memory map and sections for the C203.
codec2xx.doc	This document (in Microsoft Word format).
codec2xx.htm	This document (in HTML format).
codec2xx.txt	This document (in plain text format).
codec2xx.out	Executable file for sample C program to be loaded by C2xx simulator or hardware.
build.bat	Batch file for building codec2xx.out using only the Texas Instruments toolset.
rts2xx.lib	Runtime support library.





## Usage

Just load `codec2xx.out` into the debugger and then run it.

Attach a line-level input source to the line-level input jack of your test board, and attach an amplified speaker to the line-level output jack. Your signal should be output.

## Modification

The sampling rate and AD55 MCLK rate may be changed in the `#define` statements of `main.c`. To build, just type `build.bat` from a DOS prompt.

If using the GODSP Code Composer development system, create a project with the following files: `rts2xx.lib`, `main.c`, `cvector.asm`, `c203.cmd`, and `registers.h`. Then build as usual.

## Troubleshooting

If you encounter problems,

- ☐ Make sure the jumpers are set properly on your evaluation board. See your board's documentation for details.
- ☐ Make sure MCLK is set correctly in `main.c`.
- ☐ Try switching your input and output cables.