

Notes on using Analog Devices' DSP, audio, & video components from the Computer Products Division
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What Can I Do When My ADSP-21xxx EZ-ICE Gives Me The Error Message:

"Failure in GUI_COFF_LOAD_FILE"

Last Modified: 6/13/96

Introduction

When using the JTAG-based EZ-ICE (and release 3.x of the ADSP-21000 family development software) with ADSP-2106x or ADSP-21020 DSPs, it is convenient to be able to download executables through the EZ-ICE and run them on your target DSP. The success of process, however, depends on the following features of your debugging setup:

- You reset the DSP before downloading a file
- Format of the download file is for the PC platform
- External memory (if used) is correctly configured and operational
- JTAG EZ-ICE hardware and ribbon cable support communications
- DSP is operational, and board is laid out appropriately

If any of these features of your debugging setup are failing, you could be seeing the "Failure in GUI_COFF_LOAD_FILE" error message as a result. This note describes some steps for debugging the cause of this error message.

Debugging The Error, Set Up

Before getting started with debugging, check whether this situation applies (You are ...):

1. Using the ADSP-2106x SHARC or ADSP-21020 EZ-ICE, which is attached to a PC
2. Trying to download an executable file to the target (after resetting the DSP)

3. Running WICE060.EXE and loading the architecture file successfully
4. Trying to download the .EXE file with the EZ-ICE and seeing the emulator fail to load the program, responding with the error message "Failure in GUI_COFF_LOAD_FILE"

Debugging -- Step 1: Format

First, verify that the code was compiled with the PC version (*not with the SUN version*) of the development tools. Because executable files created with the SUN (UNIX) tools have a different format from those created with the PC (DOS) tools, this file format difference could be the cause of the error. If the file is in SUN (UNIX) format, you must use the CSWAP utility to convert the file to PC (DOS) format. This tool comes with the floating point development tools software and can be found in the \21K\BIN\ subdirectory. The CSWAP utility is a COFF File conversion program to convert executables between platforms. You can convert files with the following command (in DOS):

```
C:> CSWAP sun.exe [-o] dos.exe
```

If the code was compiled on the PC, then no conversion is necessary, and format is not the cause of the error.

Debugging -- Step 2: JTAG Loop

If the file format is correct, the next step is to verify the JTAG loop, connecting the EZ-ICE and your target DSP. To set up the loop test, change the SCOPE_LOOP option to YES in the EZ-ICE initialization file (WICE060.INI or WICE020.INI) and save your changes.

The test is part of the Debug Monitor utility, DBWIN.EXE, which is located in the C:\WINDOWS directory. The DBWIN utility lets you get more detailed information on what the EZ-ICE is doing by displaying messages from the emulator. Setting SCOPE_LOOP to YES in the initialization file directs the EZ-ICE to send a serial bit stream to the JTAG port and loop the stream back. The results of this scan test are

displayed by DBWIN. An example initialization file, which has been modified for testing, appears in Listing 1.

Listing 1 Example EZ-ICE Initialization File (WICE060.INI)

```
; wice060.ini file
; A Windows based, ADSP-21060 Emulator
; initialization file which is sought
; in the host's Windows directory.

[startup_sect]
ach_file=
exe_file=

[user_sect]
base_address=0x340
do_reset=yes

; "memory_verify=[yes|no]" controls
; whether target memory writes are
; verified. Default is "no". Change to
; yes for memory test.
memory_verify=no
command_timeout=0
font_size=10

[system_sect]
verbose=yes
; "scope_loop=[yes|no]" controls
; self-test sequence at startup time.
; Default is "no". Change to yes for
; scan test & opcode test
scope_loop=yes
status_timeout=250
initial_focus=0
node_ir_widths=5
dma_stop=no
```

Use the following steps to run the test:

1. start the DBWIN.EXE program
2. start the WICE060.EXE program

The emulator responds with the message:

```
"Running Raw JTAG Scan Test,
hit a key to end . . ."
```

As it runs, the DBWIN screen provides information on the number of packets sent and the number of valid packets correctly returned. If the number of valid packets returned is not 100 %, there may be a problem with the JTAG/EZ-ICE hardware or the problem can be caused by a defective ribbon cable.

After you end the test, the DBWIN program's updated screen should resemble the following:

```
VALDLL: hModule 0x0002
VALDLL: not loaded
1 JTAG device(s) detected on JTAG chain
Entered RAW JTAG scope loop test
- press any key to exit
51642 valid packets out of 51642
total packets, 100.0 % valid
```

Debugging -- Step 3: DSP & Board

After you stop the JTAG raw scan test (described in Step 2: JTAG Loop), the DBWIN utility performs an Opcode Test on the target DSP. This test verifies that the target DSP is correctly functioning by sending a single instruction stream for execution on the DSP. The emulator displays the following message:

```
"Running Opcode Scan Test,
hit a key to end . . ."
```

If this test fails, either your DSP is defective or your system may be displaying trouble with potential high speed design issues. These issues include things like decoupling capacitor usage, ground plane geometry, and clock distribution. After terminating the Opcode Test, the DBWIN utility displays an updated screen, resembling the following:

```
"Entered Opcode Scan scope loop test
- press any key to exit
222300 valid packets out of 222300 total
packets, 100.0 % valid"
```

If the JTAG Scan Test and Opcode Test pass without any problem, you can assume that the

EZ-ICE is operating correctly and the DSP is not defective.

Debugging -- Step 4: Memory

If the file format, the JTAG loop, and the DSP all check out as okay, you should verify that the EZ-ICE can access the target DSP's external memory. The "Failure in GUI_COFF_LOAD_FILE" error message result if the EZ-ICE is unable to write to the target DSP's external memory. This type of problem can occur if the DSP's external memory is incorrectly configured (or defective), if the EZ-ICE cannot access the DSP's external memory, or if the target system is not functioning properly.

If the target is the Analog Devices SHARC EZ-LAB, use the diagnostic utility called DIAG21K.EXE, which comes with the EZ-LAB software, to test memory accesses. This utility lets you to test the target DSP's external memory.

Try loading and dumping memory to see if the EZ-ICE is able to write something to target board's external memory. Set the MEMORY VERIFY option to equal YES in the EZ-ICE initialization file (WICE060.INI or WICE020.INI), which is located in the C:\WINDOWS directory. To see an example initialization file (which has been modified for testing), see Listing 1.

After you modify the file for testing, make sure that you save your changes. The EZ-ICE may run a little slower because of memory verification, but tests memory, issuing an error message that informs you when the EZ-ICE cannot accurately write to memory. If this test fails, the target DSP's memory system is either not configured correctly or is defective. You may see an error message like "Failed to get WIN_MEM_GET" when there is a memory problem. Check to see if the memory system is configured correctly. Note that you must set the WAIT register (ADSP-2106x) or PMWAIT and DMWAIT registers (ADSP-21020) with the proper wait mode and wait states for any external DSP memory on the target.

Conclusion

The following are the most common causes of the error message:

"Failure in GUI_COFF_LOAD_FILE"

1. Incompatible executable file format (use the CSWAP utility to convert an executable file from SUN (UNIX) format to PC (DOS) format)
2. Communications failure in JTAG loop (use DBWIN to test for a defective JTAG-to-EZ-ICE ribbon cable or other faulty hardware by performing a JTAG scan test)
3. Operations failure from a defective DSP or improper board layout (use the DBWIN utility to test DSP execution, by performing an opcode test)
4. Communications failure between the EZ-ICE and the DSP's external memory (test for incorrectly configured or defective memory)