

Timing Resolver Test Procedure

Required Equipment

- 1) Timing Resolver Test Fixture. See **Figure 1**.
- 2) **Altera Max + Plus II Programming Software**. Currently available at <https://www.altera.com/support/software/download/programming/asap2/dnl-asap2.jsp>
- 3) **Altera ByteBlaster MV Programming Cable**.
- 4) 25 Pin one to one parallel port cable.
- 5) Test program files. Currently available on the CEPS web site at http://www.c-ad.bnl.gov/ceps/internal/timing_resolver_test.sof
http://www.c-ad.bnl.gov/ceps/internal/timing_resolver_test.pof

Software Test Setup

- 1) The Altera Programming software must be installed on a Windows computer. The software may require a driver installation under the sound, video and games area in order to work. See the contact list in **Table 1** for names of experts on this subject..
- 2) Connect the one to one 25 pin parallel port cable to the computer and connect the other end to the **Altera ByteBlaster MV Adapter cable**.
- 3) Download the two programming files noted above from the CEPS web site to the local computer. (See **note 2** below in the Final Notes section for further information about this test software.)
- 4) Start the **Altera Max + Plus II Programming Software**. If it starts correctly, a screen as shown in **Figure 2** should be displayed. If it does not, an expert from **Table 1** should be contacted.
- 5) Select menu item **Max + Plus II** then **programmer**. A **programmer** window should pop up.
- 6) Select menu item **JTAG** then **Multi-Device JTAG Chain Setup**. A window as in **Figure 3** should pop up.
- 7) If any files are visible in the **programming file names** box they should be removed with the **delete all** button unless they are known to be the correct files.
- 8) Click the **Select Programming File** button and use the **Drives** and **Directories** selectors to find the test programming file downloaded from the CEPS web site with the “**sof**” extension. Choose this file and click the **OK** button. Next click the **Add** button to place the file on the list. It should show up as an **EP1K100 Device Name**.
- 9) Repeat the steps above for the programming file with the “**pof**” extension. This time the file should show up as an **EPC2 Device Name**. The files must be in the order shown for the next step to work.
- 10) Click on the **Detect JTAG Chain Info** button. Then click **OK** in the dialog box that pops up. When complete, the window should appear as in **Figure 3**.
- 11) The software has now been set up to program the Timing Resolver.

Hardware Test Setup

- 1) Plug in the test fixture and set the switch to the **1 Hz** position.
- 2) Place the Timing Resolver on top of the test fixture and plug it in.
- 3) Observe the LED's on the Timing Resolver. The **+5V**, **+3.3V** and **+2.5V** LED's should all be lit.
- 4) Operate the four switches labeled **S0** through **S3**. The corresponding LED should light for each switch. Leave all the switches in the down position.
- 5) All other LED's on the chassis should be off except the **Modbus** board LED's behind the Plexiglass window. The status of these LED's will be tested later.
- 6) Connect all of the cables from the back of the fixture to the appropriate connectors on the back of the Timing Resolver.

- 7) The lower row (input side) of LED's on the Timing Resolver should start flashing in sequence at this point except for the 1A LED. No upper row LED's should be on.

Programming the Timing Resolver

- 1) Remove the cover from the J15 Timing Resolver connector and connect the Programming cable from the computer to this connector.
- 2) Click the **Program** button in the **Programmer** window on the computer. It takes about one minute for the programming process to complete.
- 3) Programming of the Timing Resolver chassis does not take effect until it is powered down and back up again. Do that now.
- 4) When the Timing Resolver is powered back up, the red LED in the top right corner of the Modbus board (behind the Plexiglass window) will flash momentarily. After that, the green LED in the lower right corner will start flashing and the green LED in the lower left corner will come on continuously.
- 5) If this sequence does not happen, momentarily disconnect power to the Timing Resolver and try again.

Timing Resolver Test

- 1) When the Modbus LED's act as noted above, observe the display on the Timing Resolver. The display contrast can be adjusted with a small screwdriver inserted into the hole next to the S3 LED if necessary. The display should show "**Test.. Program...**" on the first line.
- 1) The second and third lines of the display should show all "**D**'s" except for one "**F**" that is sequentially moving across the display.
- 2) The fourth line of the display shows a binary count of the time
- 3) Flip switch S0 up. This is the follow mode where the output (top row of LED's) follows the input (bottom row of LED's).
- 4) All upper LED's should follow the action of the lower LED's. Channel 1A is always on in this mode. Wait for all LED's to sequence. Each pair should turn off in sequence. Any deviation from this action is cause for failure.
- 5) Place switch S0 in the down position.
- 6) Momentarily place S3 in the up position then back down. This action places the Timing Resolver into a mode where all the outputs (upper row of LED's) flash simultaneously at about a 1 Hz rate initially but as the channels are scanned by the test fixture, each output channel LED will go out in turn until they are all off. If any output channel remains lit after a complete scan it is cause for failure of the test.
- 7) Throw switch S1 up. This displays the currently active channels. There should be 14 LED's lit. Which ones are lit is not important but 14 of them is.
- 8) The switch on the test fixture can be changed to the 8 Hz rate if desired. It only serves to speed up the processes described above.
- 9) Remove the Programming cable from the Timing Resolver and reconnect the cover over the J15 connector.
- 10) Remove all connectors from the back of the Timing Resolver.

Final Notes

- 1) The Timing Resolver can be left in this state for storage as a spare, however if it is to be deployed into the field, it needs to be re-programmed for it's intended location. It is anticipated that all the programming files for the various locations will eventually be located on the CEPS web site. In order to re-program the Timing Resolver, obtain the appropriate programming files for the intended location and repeat the programming steps above.

- 2) The test programming software just installed is basically the same software as the version 3 code used in the B1 chassis in the service buildings with only the display information changed. The chassis could actually be used in one of these locations at this point but should not. Other features of the Timing Resolver as installed in the field can be tested using this software since it is the same code.

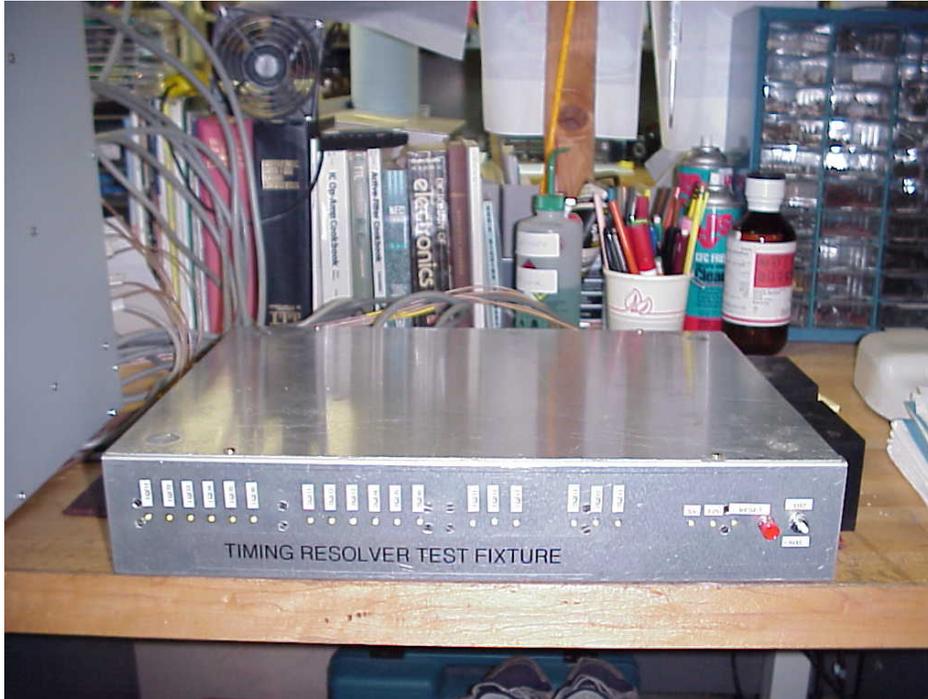


Figure 1

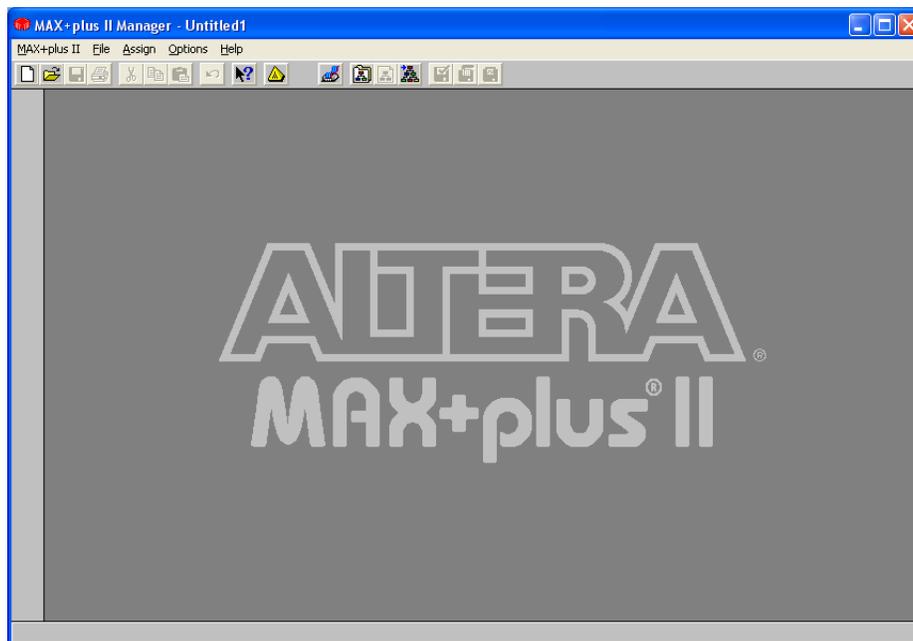


Figure 2

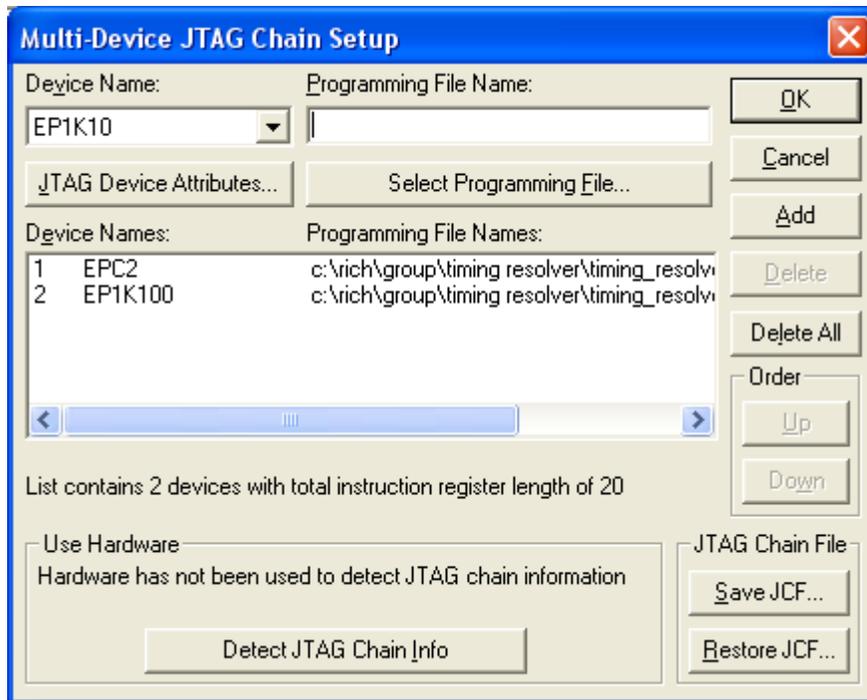


Figure 3

Contact	Phone	Beeper
Yuke Tian	2872	
Wing Louie	5732	4151
Gregory P. Heppner	5740	7162
Rich Conte	5741	4406

Table 1