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Patching a Chico Crystal

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This note is intended for users of the Chico baseboard requiring a timebase unavailable via the onboard timers.

The Problem

The Chico baseboard timers are capable of generating only a restricted range of frequencies. Some Omnibus modules which can be used on the Chico baseboard, notably those employing sigma-delta converters, require very high-frequency timebases which cannot be readily synthesized using the onboard timers (See the App Note: *Chico Timer Granularity*).

While the Chico baseboard supports routing an external TTL input clock to the Omnibus module site DDS pin via the Chico baseboards EXT CLK input connector, this requires use of an external frequency generator. This is expensive and inconvenient.

ADDING A PATCH CRYSTAL

The Solution

It is possible to solder an inexpensive crystal oscillator, or *patch crystal*, onto the Chico baseboard which can drive the EXT CLK input instead of using an external frequency generator. For example, it is possible to add an 18.432 MHz patch crystal to allow SD16 Omnibus module users to sample at 48 kHz or to add a 24.576 MHz patch crystal to allow SD Omnibus module users to sample at 96 kHz. Follow the directions below to implement this patch.

Note: Performing this patch may invalidate your factory warranty. Be sure to perform all work at a static-controlled workstation. Have a qualified technician perform the patch.

The Solution

Locate surface-mount resistor R32, located on the component side of the baseboard, immediately above the XILINX logic device. Remove this resistor.

On the solder-tit side (back) of the Chico board, solder pins four and eight of the patch crystal oscillator to pins four and eight of U14, respectively. U14 is the standard Chico crystal oscillator, whose default frequency is 49.152 MHz. Bend out pins one and five of the patch crystal to avoid contact with corresponding pins on U14.

Pin one of U14 has a square (rather than round) solder pad on the baseboard. Pin one of the patch crystal is located immediately beneath the sharp corner (on metal-can crystals) or to the immediate left of the U-shaped notch with the notch opening oriented away from you while viewing the labelled-side of the device (on plastic-style crystals).

Solder a jumper wire (28g wire-wrap wire) to the patch crystal, pin five. Route the jumper wire through the hole in the middle of the Chico baseboard, adjacent to U14 through to the component side of the board. Solder the other end of the jumper wire to the pad on R32 *closest to the PCI connector*. R32 is the surface-mount resistor removed earlier. Tack the wire to the PCB using epoxy.

To select this crystal in application software, configure the baseboard ModuleDDSSource property to IICALI_MODULEDDS_EXTERNAL (DLL users) or msRawExternal (Armada users).