SDR2GO Graphics Display Add On Builder's Notes   May 2012

Introduction

This document is prepared for the user who wishes to add the K5BCQ Graphics Interface V3 to their SDR2GO board.

Applicability

The Graphics Interface (GI) is an add on board which uses an SPI interface along with a MCP23S17, a 16 Bit I/O Expander chip, to allow the SDR2GO to drive a 128 X 64 Graphics LCD. This interface may be used with all versions of the SDR2GO board. This board does not require any programing, it is entirely configured and controlled by the SDR2GO dsPIC33JF128GP804I.

To use this board, the SDR2GO software must be upgraded to V1.9.0. All SDR2GO boards shipped after April 2012 will be programmed with V1.9.0. An SDR2GO running V1.9.0 will work just fine with or without the GI connected to the SPI connector, J12, on the SDR2GO board.

To use the GI with an SDR2GO shipped before May 2012, please download the V1.9.0 code hex file from the AQRP website and program your SDR2GO with the hex file. Please see the SDR2GO Builders Notes, Section **dsPIC33JF128GP804I/PT Programming Interface** for details on how to program your SDR2GO.

SDR2GO V1.9 Code Features

The V1.9 has two new features.

One is that addition of the SPI interface for Graphic Display of the received signal spectrum from - 6 kHz to + 6kHz of the SoftRock VFO frequency set by the SI570.

The other feature is the addition of both high pass and notch filters to the TI3204 codec. These filters provide significant rejection of low frequency components which are contained in the SoftRock receive I/Q output. The high pass filter is designed to pass signals greater than 200 Hz. The notch filters are designed to reject signals at 50 , 60 , 100, 120 and 180 Hz.

Graphics Interface Board

This board is designed to be a graphics interface development platform and thus has capabilities beyond those for a SDR2GO graphics display. These notes describe how the GI board should be populated and connected to the SDR2GO.

Assemble the GI per the instructions sent with the GI kit.

You will need to make an SPI interface cable and a 5 Volt power cable to connect the GI to the SDR2GO board. Please note that only the 5 volt SPI connections on J2 of the GI should be connected to the SDR2GO SPI connections on J12. And, the 5v power for the GI, connector J3b: pins 10 and 1 should be connected to the SDR2GO 5v power on connector J5. See the GI schematic below for polarity details.

The SPI interface address for this application is 00 hex. To set this address, install jumpers on J4 across pins 1, 2 &3.

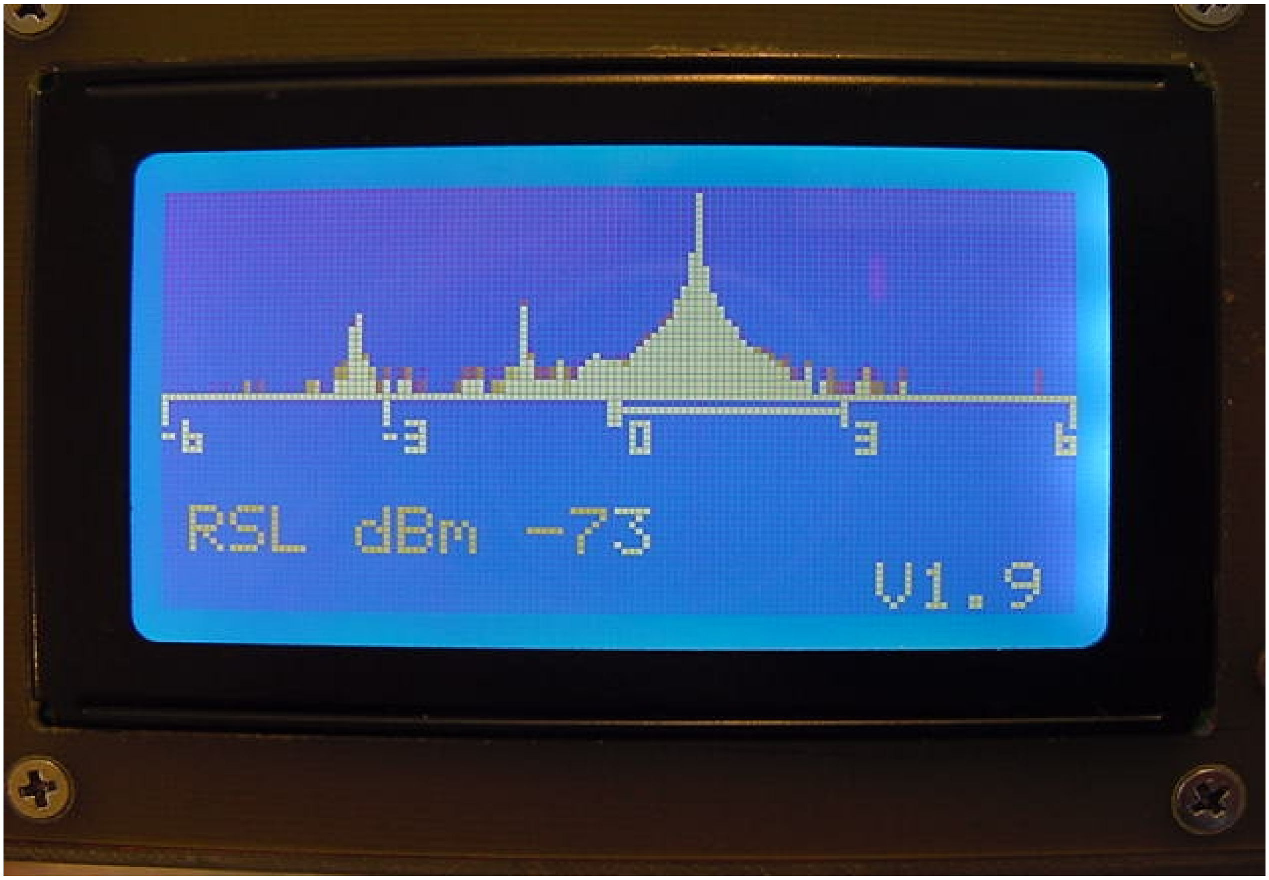
Please note that the four @ 3.3 volt to 5 volt signal convertors shown in the upper left hand corner of the GI schematic are **NOT** required for interface with the SDR2GO board! But, you may install them if you please.

Choice of LCD Graphics Displays

There are many 128 X 64 pixel graphics displays available. The GI board accommodates two popular types, the LUMEX/ Standard Chinese LCD and CRYSTALFONZ. Please review the schematic carefully and compare with the markings on the GI board to make sure you install your graphics display LCD module properly on the GI board. A suggested value for R5 which controls the Backlight Current is 27 ohms. This resistor may be adjusted to suit your display.

Turning it All On

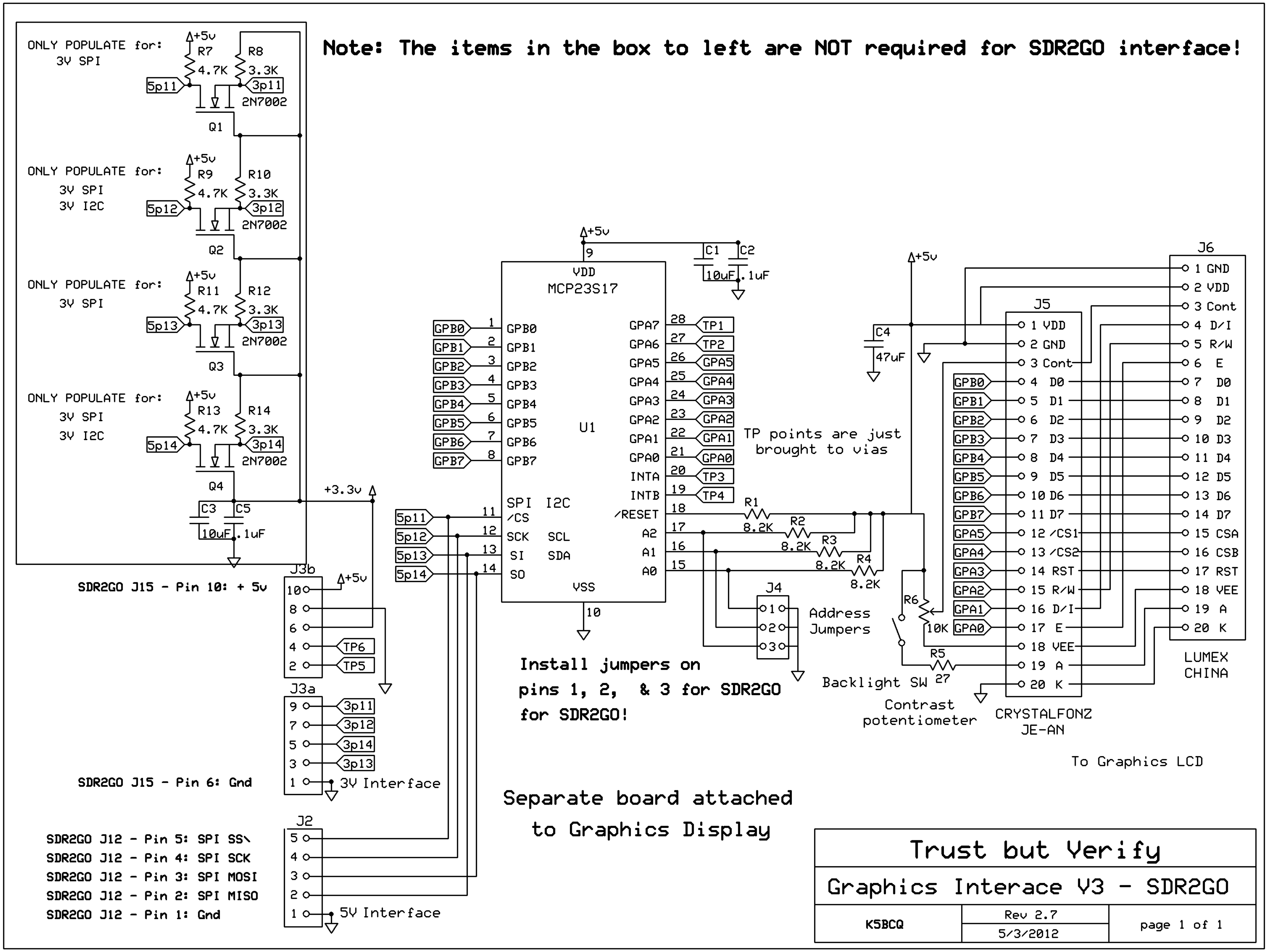
After you complete the GI board, install the signal and power cables between the SDR2GO and GI, and if necessary load SDR2GO V1.9.0, you are ready to power up the system. If all goes well you will see a display similar to the photo below:



This is a photo of the results of injecting a -73 dbm (S9) signal into a SoftRock connected to an SDR2GO with Graphics Interface / Display. The display covers frequencies from - 6 kHz to + 6 kHz of received frequency. Please note the bar from 0 to 3 kHZ, this indicates the receive pass band when the SDR2GO is in the SSB mode and Upper Side Band mode.

The RSL is a label meaning Received Signal Level. The RSL value displayed is in dBm.

Also, note that the revision level of the SDR2GO code is shown in the far lower, right hand corner.



Note: The items in the box to left are NOT required for SDR2GO interface!

Install jumpers on pins 1, 2, & 3 for SDR2GO for SDR2GO!

Separate board attached to Graphics Display

Trust but Verify		
Graphics Interace V3 - SDR2GO		
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