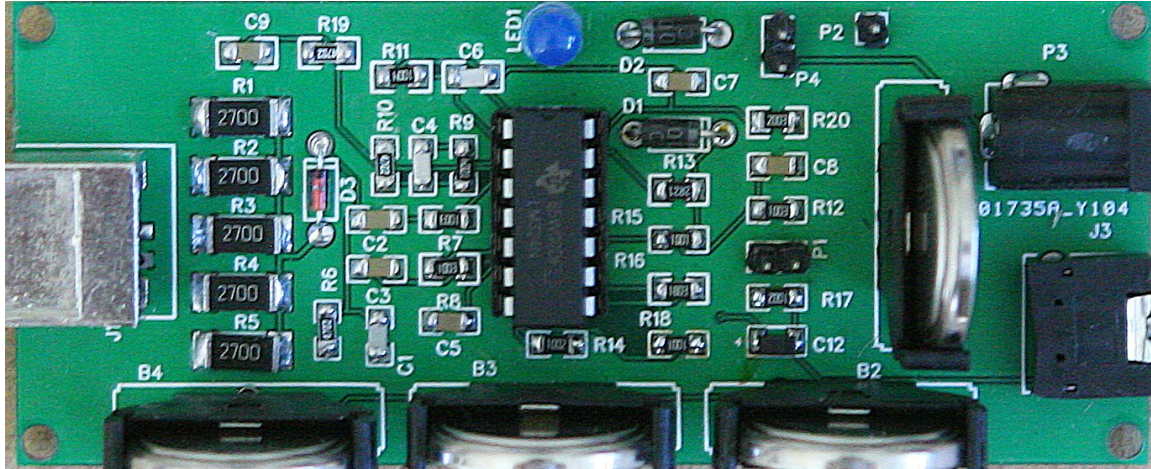


IQBD(IQ BALANCE DETECTOR)

Overview:



The IQBD (IQ Balance Detector) is a device to aid in determining the correct balance of the IQ audio signal sent to a SDR transceiver. Multus SDR, LLC transceivers use Tayloe balanced mixers to produce the signal to be amplified by the final amplifier. Audio I and Q signals feed the mixer along with a local oscillator signal. The I and Q audio signals need to be very close in amplitude, otherwise image signals may be produced in the output signal. MSCC configures a default set of I/Q values for each transceiver version. The default values set the I/Q balance well with the limits for spurious radiation. However due to variations in assembly of the transceiver, the I/Q balance may not optimal. With I/Q calibration, the I/Q image(s) can be reduced to well below 60 db below carrier. Determining the strength of the image signal is often performed by listening to the transmitted signal on a second receiver or transceiver. The IQBD eliminates the need for a second transceiver. The IQBD will function properly with an input signal of 1W to 5W. The IQBD may also serve as general purpose 50Ω dummy load and accommodates a power input of up to 10W.



IQBD(IQ BALANCE DETECTOR)

Features:

- 1) Highly sensitive to IQ out of balance conditions.
- 2) LED IQ balance visual indicator.
- 3) Audio IQ balance output indicator.
- 4) 10W maximum input power.

Table of Contents

Overview:.....	1
Assembly:.....	4
<input type="checkbox"/> 1. Install SMD components.....	4
<input type="checkbox"/> 2. Install through hole components.....	5
<input type="checkbox"/> 3. Power Up and Operation.....	7
Using the IQBD:.....	7
<input type="checkbox"/> 4. Notes on Operation.....	8

Please check the parts inventory against the bill of materials. Contact Multus SDR regarding missing parts.

All support for the IQBD is located at our support forum: [Support](#) Please join the group.

Also, please read the ECN and Errata documents in the files section before starting assembly for important information that may supersede the contents of this assembly document.

DO NOT ATTEMPT TO REMOVE INTEGRATED CIRCUITS EXCEPT WITH A HOT AIR TOOL. YOU WILL DAMAGE BOTH THE IC AND CIRCUIT BOARD.



IQBD(IQ BALANCE DETECTOR)

What you will need:

Tools:

Illuminated magnification

Soldering iron with 1/32" tip

Flux core solder, 0.020" or 0.015"

Solder flux, pen or syringe

Electronic multi meter

SMT tweezers

X-ACTO Knife or other very sharp cutting instrument

IQBD(IQ BALANCE DETECTOR)

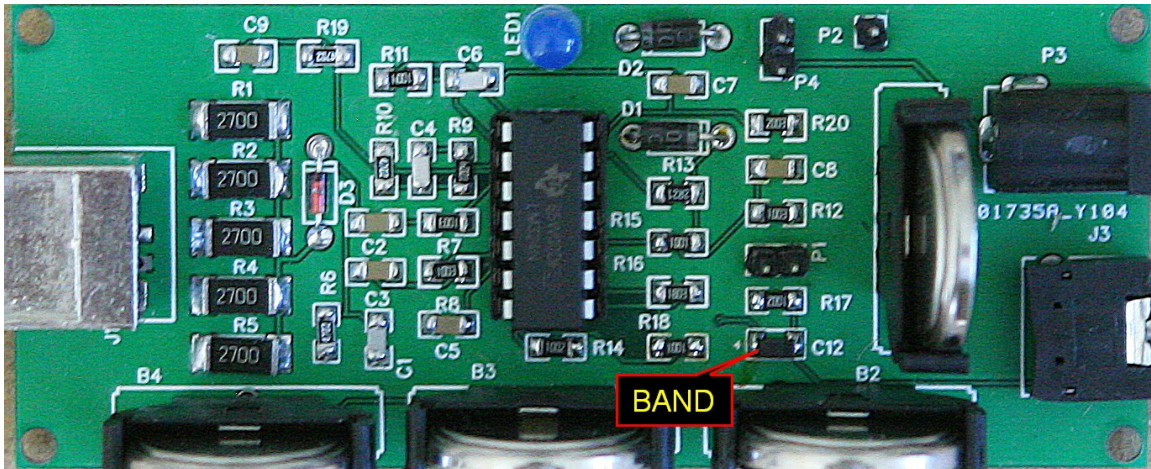
Assembly:

The IQBD is an easy to build kit and for an experienced builder will take about two hours to complete.

NOTE: Use only an X-ACTO knife or other very sharp pointed instrument to remove the components from the component sheet. There is a good chance the component will stick to the tape that secures it to the paper sheet. Simply grasp the component with tweezers and gently pull it off the tape.

□ 1. Install SMD components

All SMD components are clearly marked on the silk screen on the PCB. Installing the SMD components first allows for easier construction as the PCB will lay completely flat. Remove the components from the component sheet one component at a time and install in the appropriate place on the PCB.



Notes:

- A) Capacitor C12 is polarized tantalum capacitor. A 10x loop may be required to view the band indicating the positive end. Install as indicated in the above illustration.

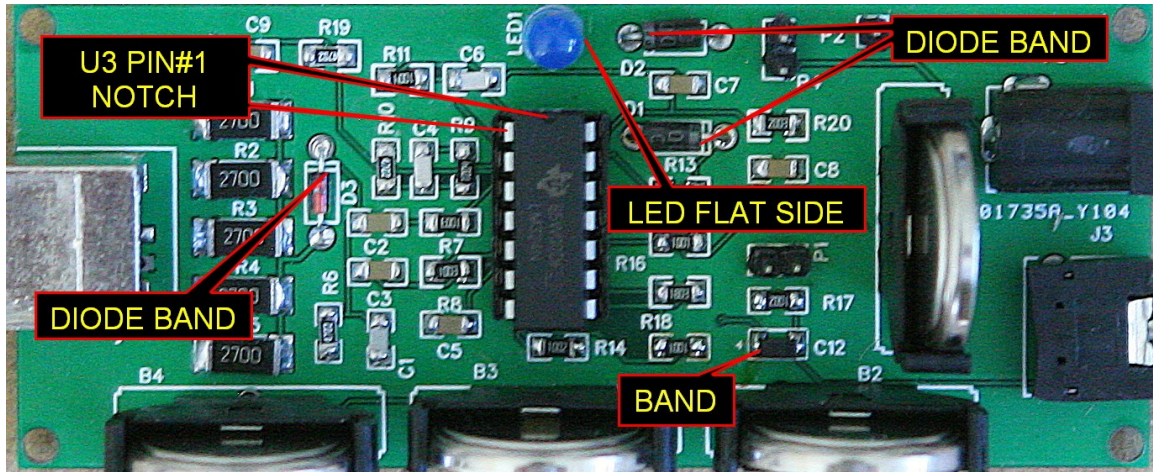


IQBD(IQ BALANCE DETECTOR)

2. Install through hole components.

Now install the through hole components.

IQBD(IQ BALANCE DETECTOR)



1. The LED has a flattened surface on one side. This denotes the cathode of the LED. The cathode is also the shorter of the two leads. Install the LED with the flattened surface towards the bottom of the PCB as presented in the illustration above.
2. Install the pin headers and remaining connectors as shown in the illustration above.
3. The P1 and P2 (ground test point) pin headers are optional. P1 is for attaching a 13.8V supply. **Never** place a jumper on P1. Placing a jumper on P1 will cause a short circuit across P3 or the battery supply.

The assembly of the IQBD is now complete.



IQBD(IQ BALANCE DETECTOR)

□ 3. Power Up and Operation

Attach a 13.8V power source to the power jack (P3) or install the four CR2032 button cells and place a jumper on P4. The LED may flash once when power is applied. Instructions for calibrating the transmit I/Q balance are found in the MSCC Operators Guide.

Using the IQBD:

- A) Attach the IQBD directly to antenna connector of the transceiver.
- B) Start MSCC and follow the I/Q Transmit balance procedure found in the MSCC Operators Guide.

Enjoy your new IQ Balance Detector.



IQBD(IQ BALANCE DETECTOR)

□ 4. Notes on Operation

1. The IQBD is more sensitive on the higher frequency bands of operation. A reduction of power may be required on higher frequencies (15M through 10M). Reduce the transceiver output power if the LED will not reduce to an OFF condition or a faint flicker when adjusting the IQ balance on these higher bands.