

The HOWES CBA2 is a buffer amplifier kit designed for use with HF equipment, in particular as a buffer to fit between a direct conversion receiver's variable frequency oscillator (VFO) and a digital frequency counter.

The CBA2 can also be used as an input stage for a "stand alone" frequency counter, and as a buffer/amplifier for many applications requiring a high standard of output/input isolation at frequencies up to 30MHz. The module can give either gain or loss to suit the particular application by selecting the relevant component values.

PLEASE READ all the paperwork through BEFORE starting work

BRIEF SPECIFICATION

Frequency range: 500kHz to 30MHz (approx 4dB down at 30MHz)

Gain: Approx. 10dB NOTE Either gain or loss is selected by fitting
Loss: Approx. 20dB the relevant components.

Output/Input isolation: >70dB over entire frequency range ("loss" IP)

I/P Signal handling:	2nd Harmonic reaches	-20dB at -10dBm with "gain"
"	"	-20dB at +20dBm with "loss"

Power: +12 to 14V DC at approx. 20mA.

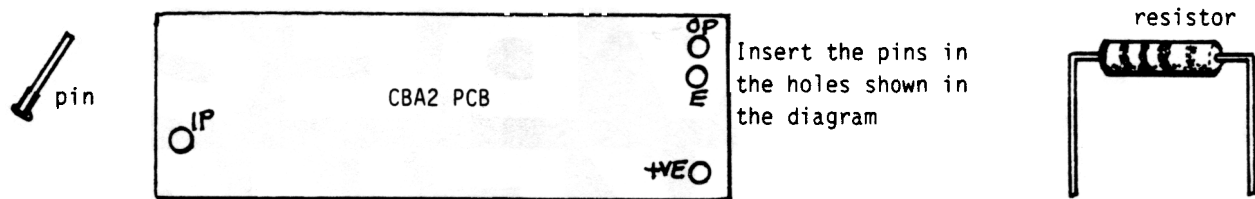
TOOLS REQUIRED

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Fine tipped soldering iron of about 25 to 30W (or if thermostatic, 50 or 60W). Long nosed pliers. Small side cutters. 30AWG wire strippers would be useful if you have any.

BUILDING THE KIT

Ensure you have all the correct parts and tools to hand BEFORE you start. Check the User Information sheet to see if you need to build the version with loss or gain. Make sure you fit the correct optional parts for your application.

Start by fitting the terminal pins. These are fitted to the holes as shown below. Insert these from the wiring (foil) side of the board so that they project from the component side. Rest the board over the edge of the bench and push them home fully with a hot iron and a little solder. BE CAREFUL not to slip with the hot iron. Next fit the optional resistor. Select the correct component from the parts list, bend its leads as shown in the diagram, and insert it into the holes marked for it on the PCB.



Make sure the body of the resistor is flat against the board, then bend the leads out just enough to hold it in place. Turn the board over and solder the leads to the PCB tracks. Once the joints have been soldered, cut off the excess lead length as close to the joints as possible. Fit the optional capacitor next. Now work your way through the rest of the resistors in the parts list, and then the capacitors, installing them in the PCB with their leads as short as possible. Save an off-cut capacitor lead and use it to make the link "LK1" on the board.

Next fit the transistors, making sure you install them the right way round. Keep the transistors leads short.

Lastly, wind the transformer as detailed in the parts list, and fit it to the PCB with the coloured leads going to the holes as marked on the board. Check your handiwork carefully before going on to install your module.

HOWES

OPTIONAL PARTS - fit these first. Choose which version you need to build from the User Information sheet.

"Loss" Version

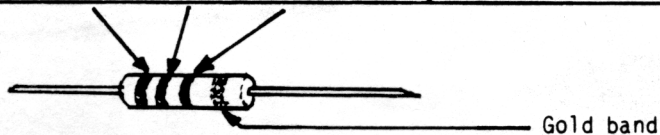
Resistor R2 is 1M5 colour coded Brown Green Green Gold
Capacitor C1 is 3p3 marked 3p3.

"Gain" Version

Resistor R2 is 100R colour coded Brown Black Brown Gold
Capacitor C1 is 1nF marked 102.

PARTS FOR BOT VERSIONSRESISTORS

Value	Colour Code	Part Numbers
100R	Brown Black Brown	R1 R7 R10
680R	Blue Grey Brown	R8 R11
10k	Brown Black Orange	R4 R6 R9
47k	Yellow Violet Orange	R5
1M5	Brown Green Green	R3

CAPACITORS

C2 and C4 are 1nF marked 102.



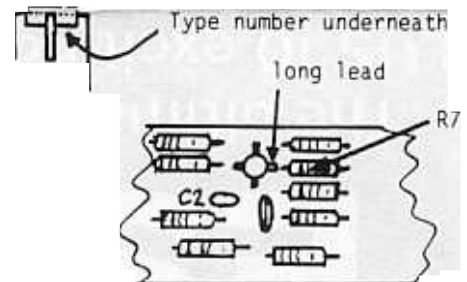
C3, C5 & C6 are .01uF marked 103



TRANSISTORS - fit these the right way round

TR1 - BF960

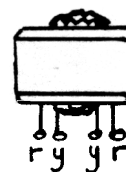
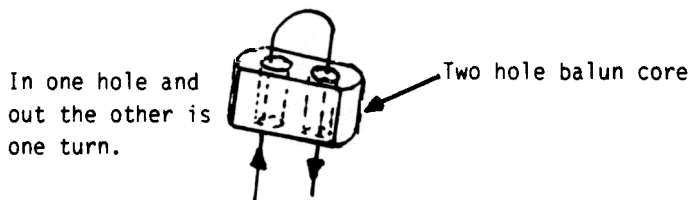
Bend the leads down, so that the type number is underneath. The long lead goes to the hole nearest to R7.

TR2 - BSX20

Fit this as the printed outline on the board indicates. Keep the leads quite short without forcing it down into the board.

Transformer, L1

Twist the red and yellow insulated wires together and then wind three turns on the two hole balun core. Going in one hole and out the other is counted as one turn. Wind the three turns neatly side by side.



Transformer mounted on PCB.

The red leads go to the holes marked "r", the yellow ones to the holes marked "y". Strip the insulation from the ends of the wire before inserting them into the board. Be careful not to nick the conductor or it may break.

CHOOSING "Gain" or "Loss" VERSION

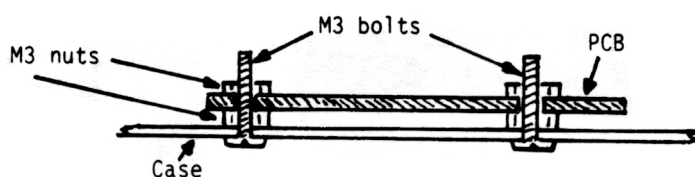
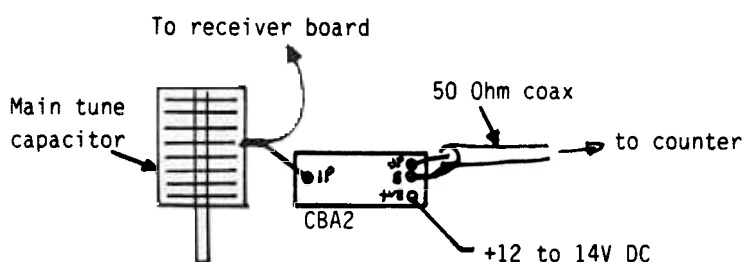
If you are using the CBA2 with a high amplitude signal such as provided by a HOWES direct conversion receiver's VFO tuned circuit (DcRx, MBRX, DXR10 etc) Then the CBA2 should be built to have loss, or otherwise it will be overdriven.

If you are going to use the CBA2 as the input stage of a general purpose frequency counter to give a high input impedance facility with enhanced sensitivity, then build the CBA2 to have gain.

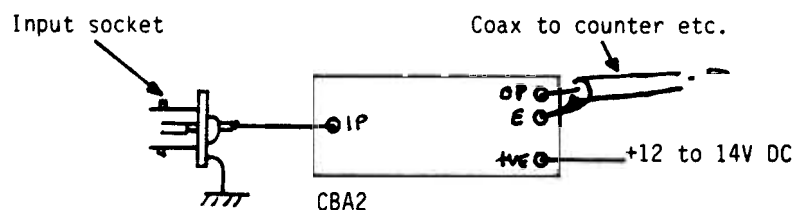
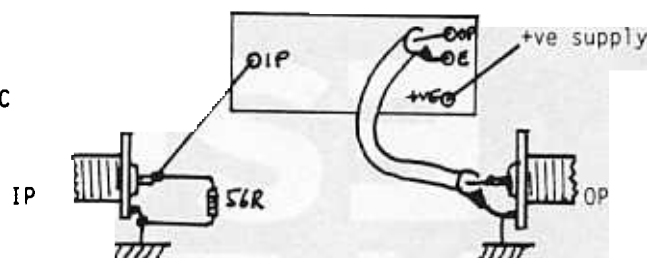
The CBA2 can also be used as a broad band preamp covering the 0.5 to 30MHz range by building the gain version and adding a 56R resistor from the IP terminal to earth to give a nominal 50R input impedance.

MODULE INSTALLATION AND WIRING

If used as a buffer with a receiver, the DFD5 must be located as close to the receivers tuning capacitor as possible. Make sure the +ve input track on the PCB does not short to ground via the rear mounting spacer.

USE WITH DIRECT CONVERSION RECEIVER:MOUNTING THE CBA2 MODULE

SEE NOTE above regarding the avoidance of a short to chassis.

GENERAL PURPOSE USE:HIGH IMPEDANCE INPUT50R INPUT.CIRCUIT DIAGRAM