

Explanatory notes for Combo 'P1" version, 31st Dec 2012

The 'Porta' Combo PIC-a-STAR¹ boards are a series of two PCB panels containing all of the PCB's to build a version of the G3XJ P PICaSTAR transceiver. This version combines the original individual module designs by G3XJP into two main boards, to greatly reduce the amount of inter-wiring required in integration of the transceiver. This version follows on from the previous "COMBO" versions and while using all of the same module layouts, has been combined in a different layout to the previous Combo versions. Please note there are some variations incorporated into these Combo versions, from the original G3XJP schematics, which are detailed here <http://www.m0rjd.co.uk/LO.html>

The intent of this version was to reduce the overall footprint of the PCB's in order to reduce the potential size of the finished transceiver. Of course, this will entirely depend on the builders choice of case, either home built from aluminium, PCB sheet material or an adapted ex-commercial case found in disposals etc. Just how this is done, is up to the builder of these boards. **This is not a 'kit'**, so there are no step by step instructions on how to build a PICaSTAR! But, usually, help is at hand on one of the Groups.

There are a high number of SMD parts used in this design but with just a little practice, most builders should have no trouble assembling the PCB's. The builder will also need to be PC savvy or at least willing to have a go. There is lot's of help available from the PICaSTAR community on the Yahoo groups.

The PCB's have been designed to allow substitution of a number of parts, with dual footprints for many parts or alternate circuitry in some cases to allow an equivalent section to be built with more common parts. E.g. in some areas, the voltage regulator can be the original G3XJP specified part, or an alternate topology. Keep this in mind when ordering parts, by checking the Schematics carefully and the BOM.

¹ PICaSTAR was designed by G3XJP. Originally in a number of separate modules.

There are a number of optional parts also that can be fitted. E.g. in the TrxAVRB controller area, if you don't plan to use the LCD type displays, some of the components that 'drive' those displays can be deleted.

There is provision for a real time clock (RTC) display also. This is optional and also allows several different types of IC to be used, depending on availability from your supplier. There is also provision in the RTC area to fit a back up battery, either an on board CR2032 type or an external (to the PCB) re-chargeable battery pack. The latter is recommended. Ni-MH type packs used on portable phones for example are cheap on Ebay and elsewhere. E.g. a 400mAh 3.6v pack with leads will work great!

Some parts may be shown on the BOM as "NF". This means Not Fitted.

In some PCB sections and BOM you will see two values with "/" between them. This means that two components are fitted in parallel. This is easily done using SMD technology, by fitting one part over the other on the PCB pads.

There are several SMD IC's on this board with fine pitch leads. It is suggested that you practice soldering on an old PC card that has similar parts on it, before attempting to solder these PCB's. Ideally, you will need SoderWick™ to remove excess solder and solder flux paste is an excellent help to this work. A soldering iron with about a 1-2mm tip is ideal. The usual hand tools, cutters, pliers, and a pair of tweezers to hold the SMD parts while soldering will be needed. Some method to store the SMD parts is also a good idea. A suggestion is to obtain some small plastic containers that have compartments in them, to hold the various component values.

It's also a good idea to buy extra parts when you order them. Don't buy the exact number of any value! For certain, you will lose a few parts on the floor of your shack and never find them again! Having to re-order one or two resistors would be expensive. Buying a few extra costs next to nothing.

Where to buy components?

Start with Ebay. There are a number of resistor and capacitor 'kit's available quite cheaply. Keep in mind though the quantity you will need. Some values in

this project are used in large numbers. Of course, you can use your favorite supplier in your own country, or mail order etc.

Some, if not all of the IC's crop up on Ebay™ also, from time to time. A quick check on 3rd Jan, 2013 found all of the AD parts on eBay and many of the other semis.

One place for the parts you may not find, is www.utsource.com e.g. the Analog Devices parts are usually found here. Be certain that you buy the correct part!

The crystal filter specified is the 10M4D. This may still be available as a spare part for Galaxy™ brand CB radio in the USA.

http://www.rfparts.com/serviceparts_galaxy.html

<http://www.ricom.com/radioparts/Ranger%20Price%20List%202.htm>

www.pacific.us.fm/pacific2005/store/index.html

GERMANY

<http://www.helpert.de/Ubersicht/Quarzfilter/Quarzfilter2/quarzfilter2.html> **NO LONGER AVAILABLE, see below:**

- > The source for x-tal filters in Germany (helpert) does not exist anymore
- > as the owner of the shop died last year.
- >
- > Another source may be:
- >
- > http://www.box73.de/index.php?cPath=82_100_164
- >
- > They have a 9 MHz and recently also a 10.7 MHz x-tal filter 2.4 kHz
- > wide...
- >
- > 73
- >
- > Henning

Other CB's to use this same filter are some of the Uniden™ versions (e.g. PC-122) which may also be sold under the Radioshack brand too. Before buying an old CB though, ask the vendor to take the lids off to make sure the filter is the right one!

There is also an ITT™ filter, which will fit the PCB. It's a 10.7MHz +- 3.75KHz type and mostly seen on Ebay from time to time. Usually fairly cheap. Ask also on the Yahoo group as there may be some for sale there. >> There are also filters made by, say, HY-Q™ part number QMF10726, which will fit the PCB but their impedance is about 3kR so the matching network will need to be altered.

The filter does not have to be 10.695 or 10.70MHz. Other frequencies are perfectly usable also. Refer to G3XJP information (Yahoo Picaproject) for details please.

The associated 2nd LO conversion crystal depends on your IF frequency. If you use the 10M4D filter you need a 10.710MHz crystal. For the ITT filter, use 10.715MHz. Unfortunately, this is a custom made crystal and Quartslab™ in the UK do it at a reasonable price. One of the Chinese builders on the Yahoo Homebrew group had some made in a group buy and may also have some spares. Ask on the group.

The SD1487 transistors on the 140W PA, are no longer available. They used to be found in the UK at a disposals store, but sadly they are all gone. There are other transistors that will work just as well though.

See http://carnut.info/singleboard/Ver_B/singlestar_B.htm for some alternates.