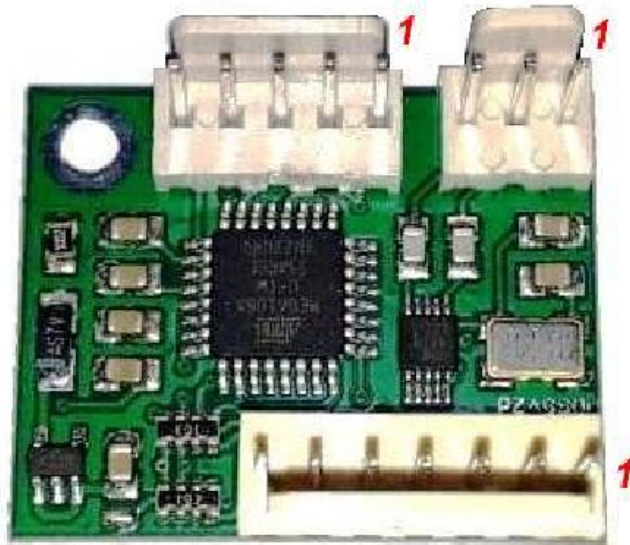


## ***DDS-Module for Jackson1 and Superstar 3900***



### **1. General:**

This doc describes how to install the DDS-module into a President Jackson1 or Superstar 3900. Both these radios are different, therefore the modules are assembled and programmed in a different way, please consider about this when ordering.

This module removes the problem of the frequency drift, which is terrible in these (otherwise quite good) radios and make the usage of SSB difficult. It also can shift the total frequency range of the radio (after a new alignment!) by 1 band down or up to 3 bands up (10m).

The unstable internal reference oscillator of the radio will therefore be disabled and replaced a highly stable frequency produced by the DDS-module. The Jackson1 uses a mixing frequency of 14.550, the Superstar 3900 uses 14.010.

Furthermore, the module also generates the offsets of  $\pm 2.5\text{kHz}$ , which simplifies the alignment, and also takes care of clarifier- und coarse-function in a digital way, after modification the coarse control will adjust the frequency by exactly  $\pm 5\text{kHz}$  and has a centre position stabilisation, meaning that about 1mm left/right from the middle position of the control the frequency will stay absolutely in the middle.

Both radios have different voltages on the clarifier-control, therefore the modules are differently.

## **2. Controls**

Attention: The numbers on the plugs are sometimes different from the mentioned pin-numbers in this doc, see symbol pic !

### **2.1. Connection assignments 7-pin plug:**

Pin 1: Ground (GND)  
Pin 2: +3.3V out for coarse  
Pin 3: Input for coarse, 0-3.3V  
Pin 4: Input for clarifer, 0-6V (Jackson), 0-8V (Superstar 3900)  
Pin 5: Input for +8V USB  
Pin 6: Input for +8V LSB  
Pin 7: Voltage supply +5..9V

### **2.2. Connection assignments 5-pin plug:**

Attention: These pins must be connected to GND only !

Pin 1: Ground (GND)  
Pin 2: +900 kHz (2 bands up)  
Pin 3: +450 kHz (1 band up)  
Pin 4: - 450 kHz (1 band down)  
Pin 5: +10kHz

### **2. 3. Connection assignments 3-pin plug:**

Pin 1: Ground (GND)  
Pin 2: Frequency output  
Pin 3: BFO (optional)

## **3. Prepare/modify of the radio:**

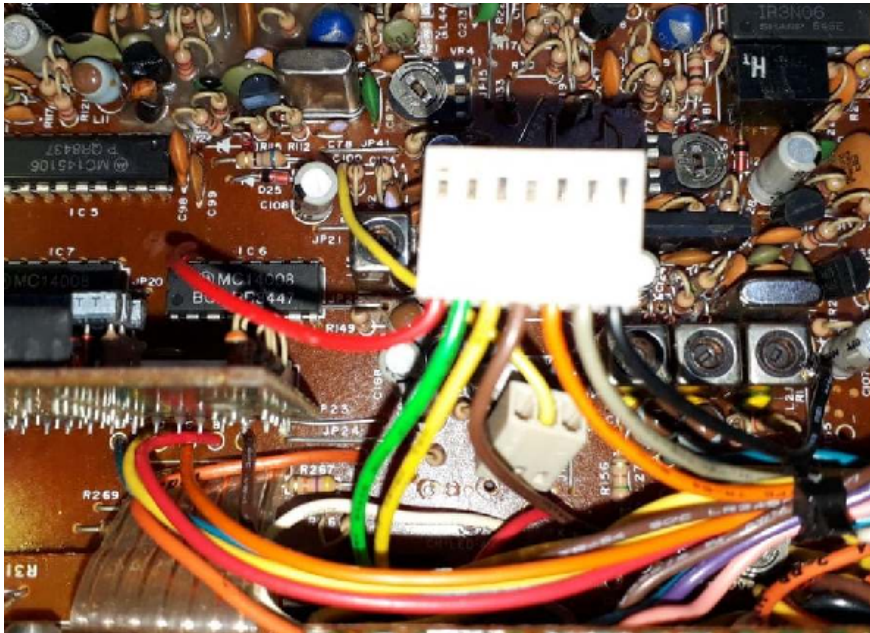
### **3.1. President Jackson1:**

The lower ends of both coarse- and clarifier-controls must be connected directly to ground. This will best be done by shorting the resistors R601 and R602, see pic3. These will be found on the right side of the small board with the switches. Also ground the left end of the tx-frequency-control by shorting R189, see pic2.

The black wire (pin1) goes to ground, e.g. to a filter case. The red wire (pin7) goes to +8V, you can find this e.g. at pin16 of IC6.

The gray wire coming from the upper end of the coarse-control will be disconnected from the mainboard (remember the position!), attached to a pin header and connected to pin2 of the plug.

This point of the coarse control must not be connected to anything else, otherwise the module can be destroyed !



*Pic1: Connecting the wires, President Jackson1*

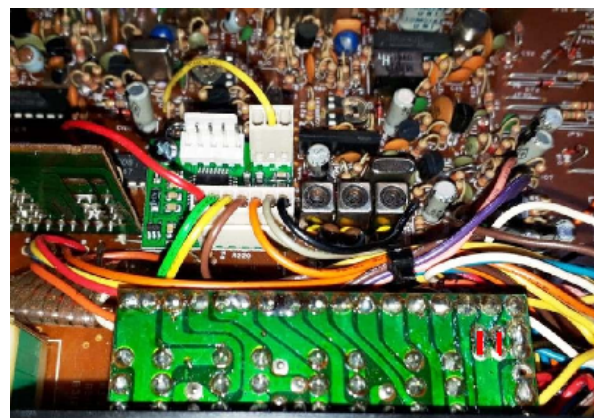
The orange wire coming from the middle pin of the coarse-control will be disconnected from the mainboard, attached to a pin header and connected to pin3 of the plug.

Pin4 of the plug (brown wire of the module) goes to the point, where we disconnected the gray wire (we remember).

The yellow wire of the module, pin5, goes to +8V USB, the green wire, pin6, to +8V LSB, this can easily be done on the bottom side of the mainboard, see pic2.



*Pic2: R189, +8V USB, +8V LSB*



*Pic3: shorting R601, R602*

Now remove the crystal 14.550 and C100 (15pF) and solder the yellow wire of the 3-pin header, pin2, to the left pin of the removed C100 ( the closer one to the PLL-IC).

Replace C56 (2pF) to 15pF to bring the old 10.240 crystal again to the frequency it should be.

### **3.2. Superstar 3900:**

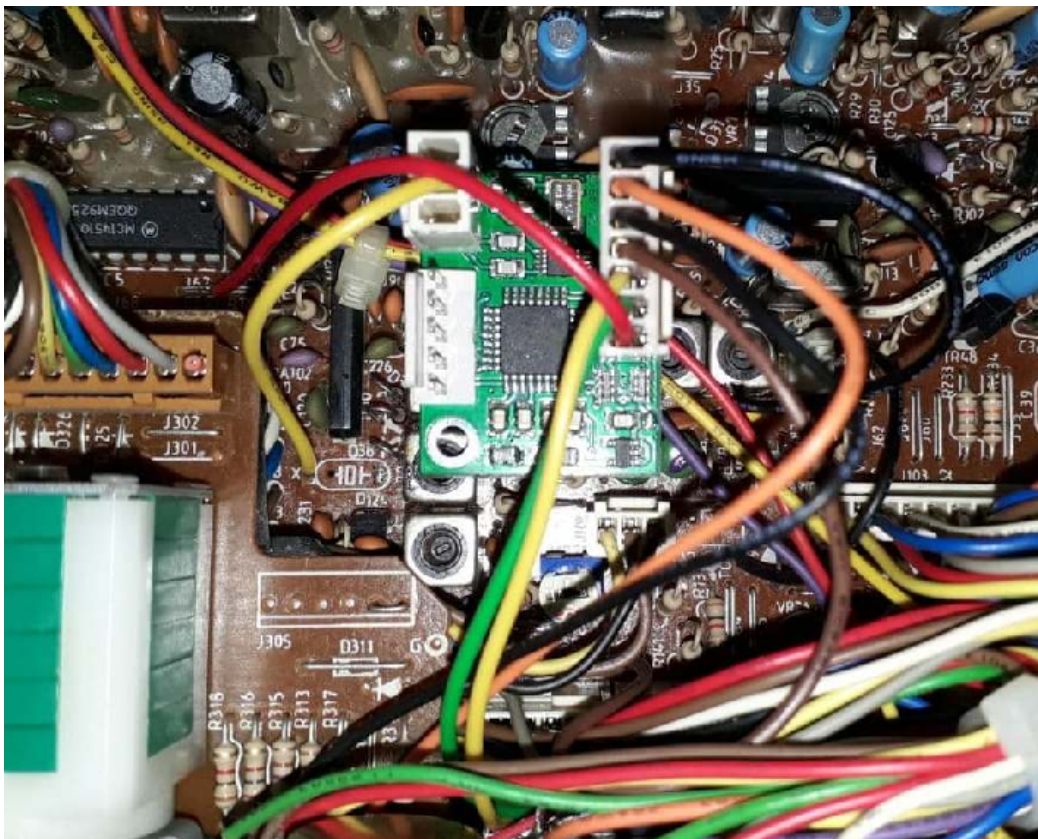
The lower ends of both coarse- and clarifier-controls (usually green and brown) will be connected directly to ground. This will best be done by shorting the resistors R137 and R138. Also ground the left end of the tx-frequency-control by shorting R136, see pic2.

The black wire (pin1) goes to ground, e.g. to a filter case. The red wire (pin7) goes to +8V, you can find e.g. at J67 (wire-bridge) near the PLL IC.

The orange wire coming from the upper end of the coarse-control will be disconnected from the mainboard (remember the position!), attached to a pin header and connected to pin2 of the plug.

**This point of the coarse control must not be connected to anything else, otherwise the module can be destroyed !**

The black wire coming from the middle pin of the coarse-control will be disconnected from the mainboard, attached to a pin header and connected to pin3 of the plug.



*Pic1: Connecting the wires, Superstar 3900*

Pin4 of the plug (brown wire of the module) goes to the point, where we disconnected the gray wire (we remember). It is the same as the cathodes of D38 und D39.

The yellow wire of the module, pin5, goes to +8V USB, the green wire, pin6, to +8V LSB, this can easily be done on the bottom side of the mainboard, see pic2.



*Pic2: R136, R137, R138, +8V USB, +8V LSB*

Now remove the crystal 14.010 and solder the yellow wire of the 3-pin header, pin2, to the left pin of the removed crystal (the closer one to the PLL-IC).

#### **4. Alignment**

Just measure the frequency on pin2 (yellow wire removed) of the 3-pin header, so that the frequency is the nominal crystal oscillator frequency with the clarifier (and coarse) control centered.

Adjust the tx-frequency control in the radio for exact frequency when transmitting.

After this do an alignment of the BFO.