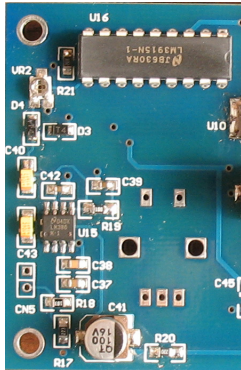# DDS Unit Construction Guide of TJ6A pro

The main board, PA and the DDS function of TJ6A pro is the same with TJ6A. The different part is the DDS unit in which the S meter unit (SM unit) is add (see picture below).
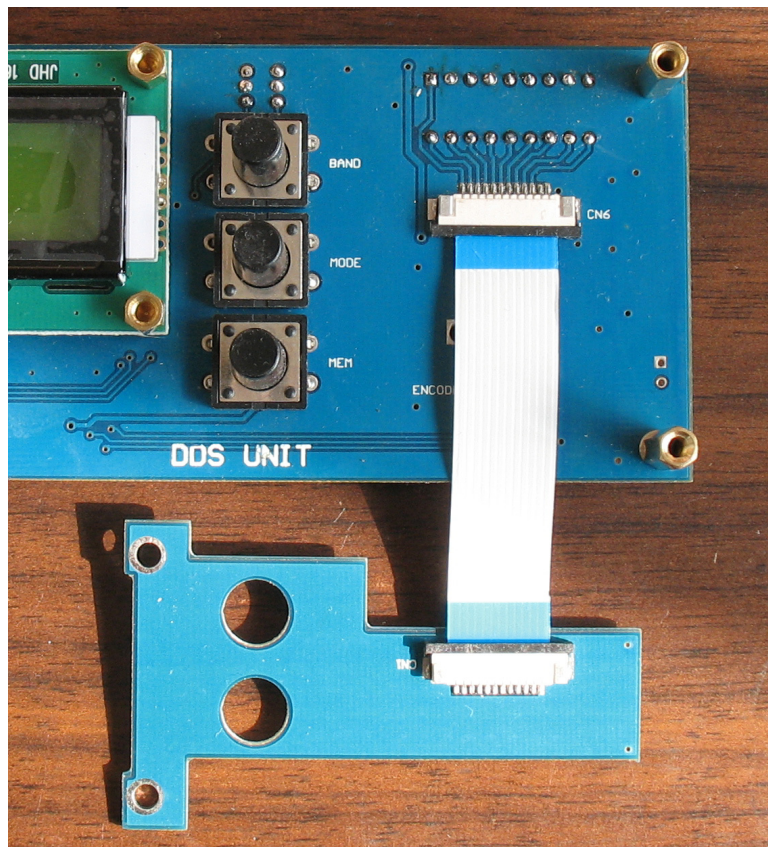

The DDS output filter circuitry is modified in the "pro" version to remove "birdies" caused by DDS unit.

Besides, the phone connector is added on the front panel. This guide only discusses the construction of the "pro" DDS unit and calibration of the S meter.
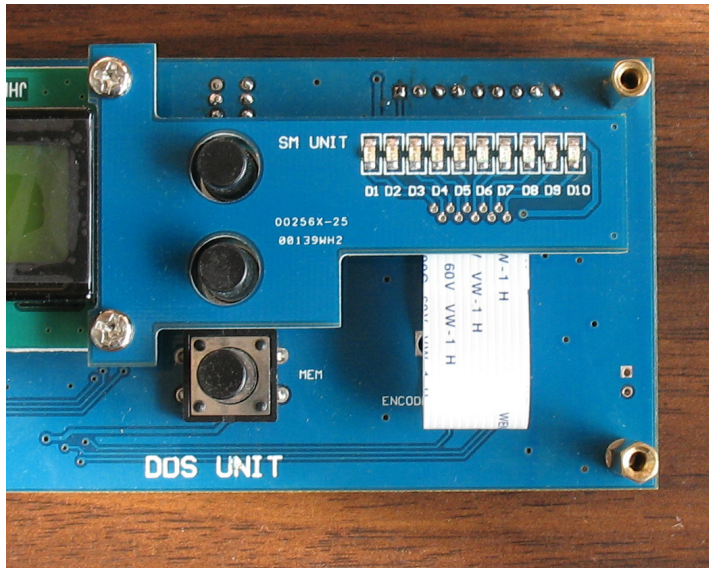
Assembling and Wiring

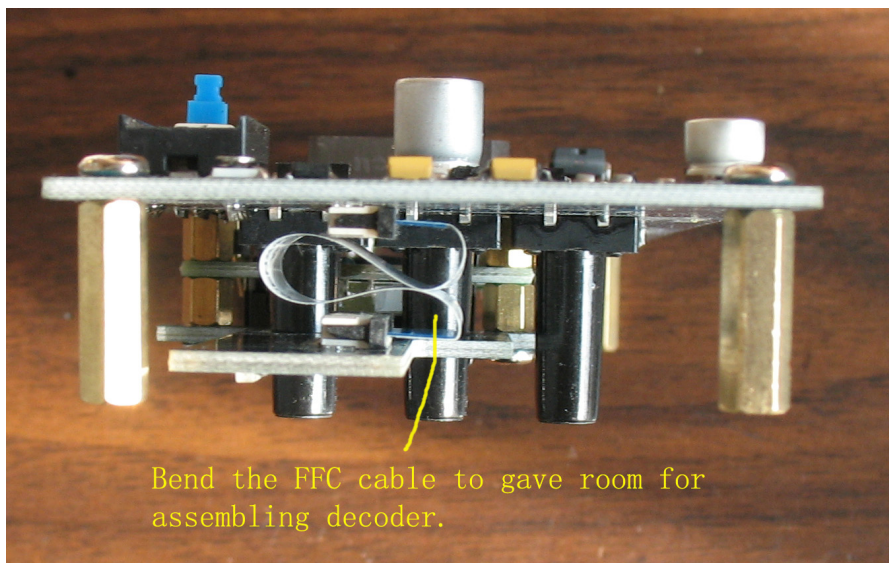The assembling of the LED SM is illustrated in the following pictures.

1. Insert the FFC cable, with blue plastic part up.

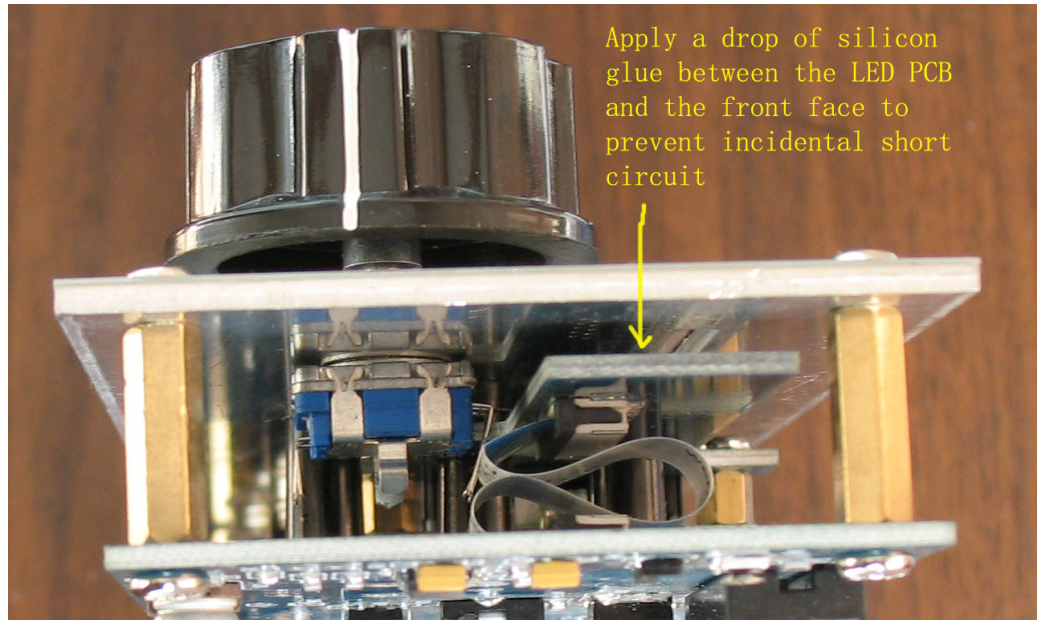2. Position the LED unit and fasten with 2 screws. **Be sure to tighten the 2 screws.**

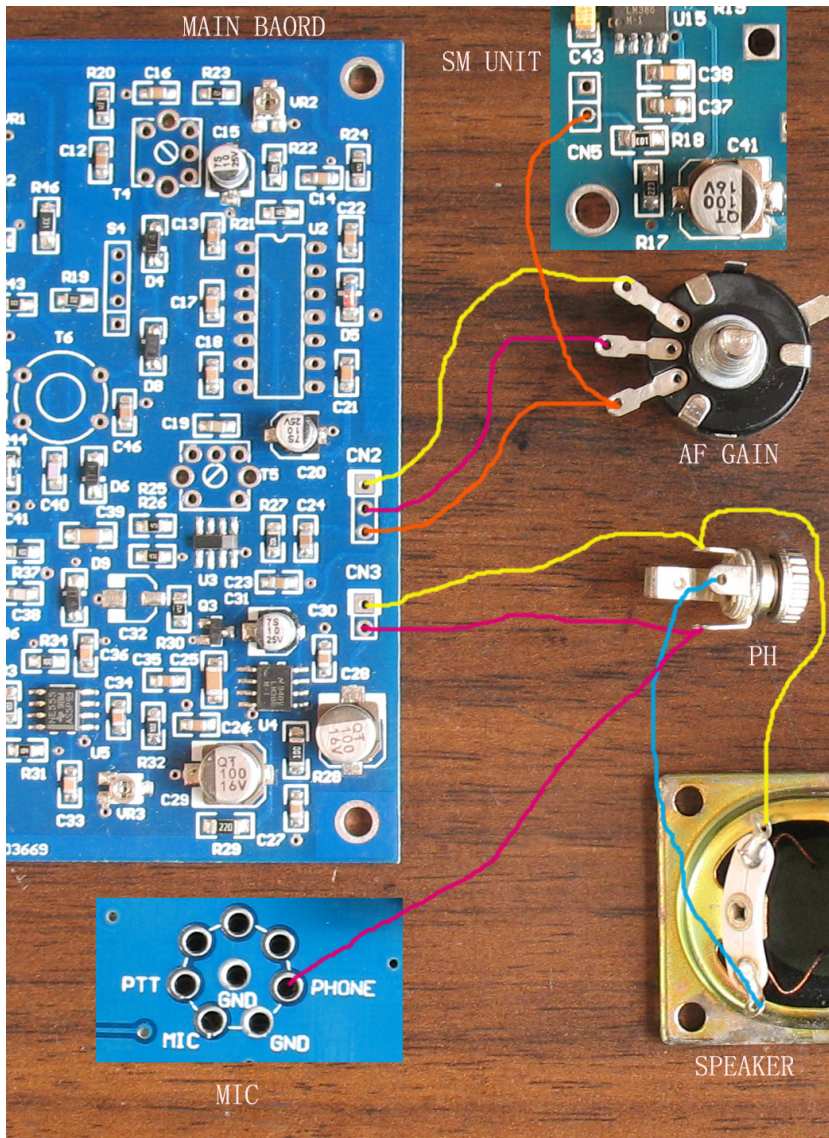3. Bend the FFC cable, so that it does not block the connecting pads of the decoder.

Bend the FFC cable to gave room for assembling decoder.

Mount the decoder on the front panel. Extend the decoder leads and solder them to the PCB pads respectively.

4. When the whole DDS assembly has been finished, it is suggested to apply a drop of silicon glue between the LED PCB edge and the front face to prevent incidental short circuit. The clearance between the LED and the front face is wide enough, but if the 2 screws become loose, the LED's metallic part might contact the front which is connected to GND, damaging the LED's and the FFC cable.

Apply a drop of silicon glue between the LED PCB and the front face to prevent incidental short circuit

The wiring of the Pro DDS board to the main board is illustrated as the following picture.

After the AF GAIN control, and PH, KEY, and MIC connectors are mounted on the front panel, wire them as shown.

Connect speaker's "+" lead to output lead of the PH connector (red line); connect speaker's "-" pin to the GND lead of the PH connector (yellow line).
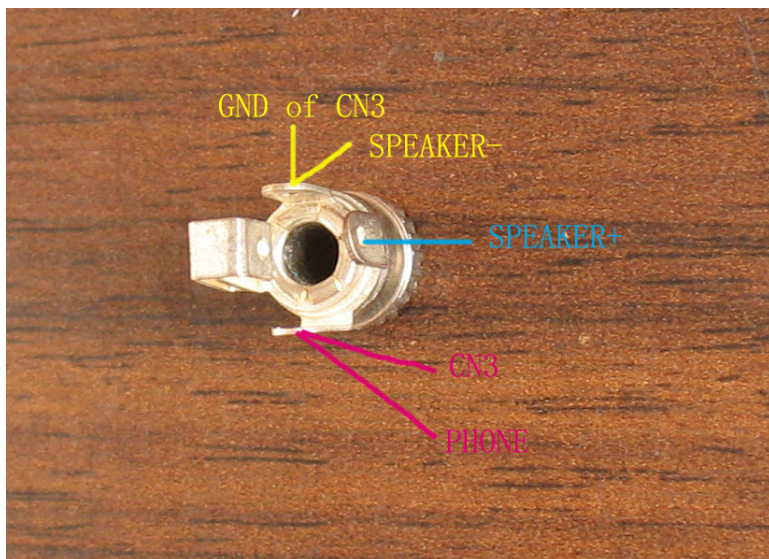
The speaker is disconnected when the earphone is plugged in.

From the wiring you can see that "PHONE" of MIC connector is directly connected to audio output of CN3. "PHONE" signal is not disconnected when the earphone is plugged in. "PHONE" of the MIC connector can be used as DATA OUT for PSK31 service.
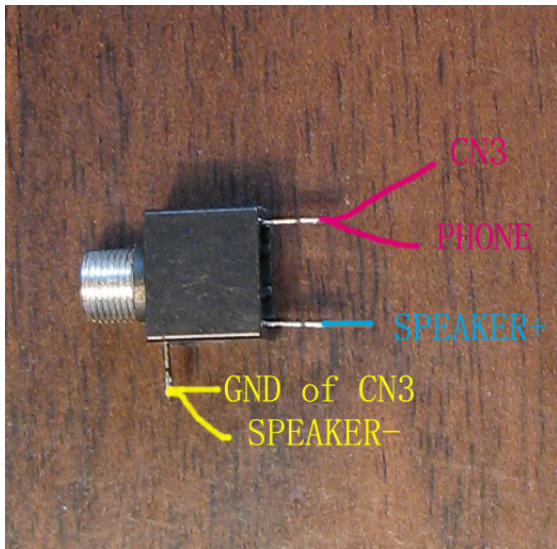

Connect AF GAIN control to CN2 of the main board as shown above.

The S meter picks up signal from CN2. Connect CN5 of DDS Board to the signal arm of AF GAIN control (see above picture).
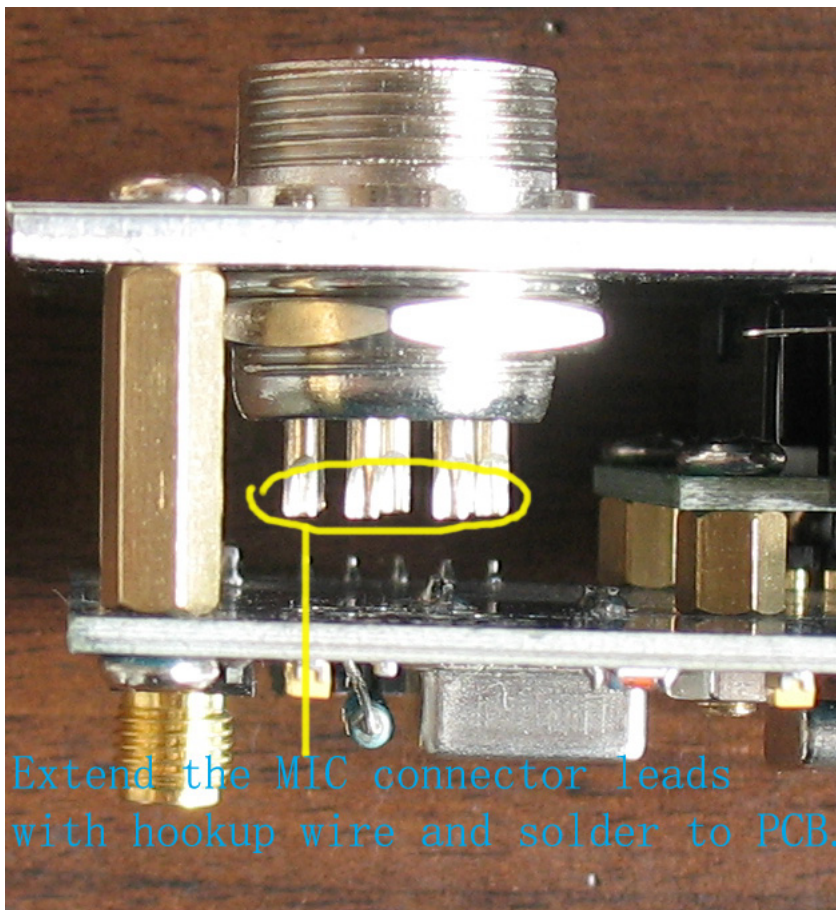
If the black plastic PH connector is supplied in the kit, please connect as shown below.

Solder all the connections.

The connection of the MIC connector is illustrated below.

Extend the MIC connector leads with hookup wire and solder to PCB.

The definition of the MIC connecting pads on PCB is shown below (Viewed from front of radio). Unlabeled pads have no connections. Extend the connector leads to the PCB pads respectively.
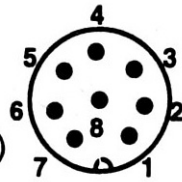
After the MIC connector leads are connected to the respective PCB pads, connect "MIC" pad and adjacent "GND" pad to CN5 of the main board. Connect "PHONE" pad to PH connector as

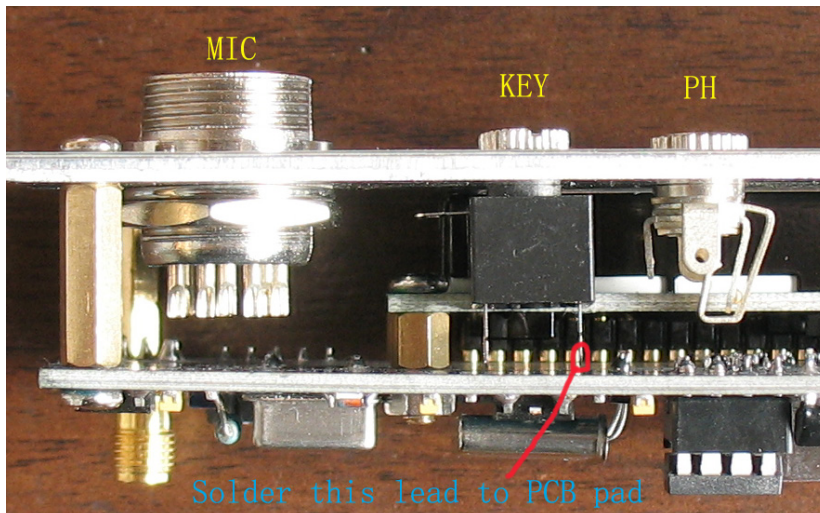shown in the previous picture. "MIC" of the MIC connector can also be used as DATA IN for PSK31 service.

However, you may wish to define the connector wiring as that of SG-2020 so as to suit the NUE-PSK Digital Modem connector. Then wire the 8-pin connector leads to the PCB pads according to the connector wiring as shown below.

1 MIC AUDIO
2 PTT
3 OPT 1
4 OPT 2
5 N/C
6 PHONE (RX AUDIO)
7 MIC GND
8 GND

VIEWED FROM FRONT OF RADIO

The connection of the KEY connector is illustrated as the following picture. Solder the indicated lead (the tip lead) to the KEY pad on PCB. Since the front face is GND, it is not necessary to solder the GND lead of the KEY connector to the PCB.

Phone Connector

PH connector is the mono phone connector. When the earphone is connected, the louder speaker is disconnected.

IF SET Button

The "IF SET" feature has been discussed in the Instruction Guide of TJ6A. TJ6A pro has a button to access IF SET mode. Press IF SET button of the DDS unit, the DDS unit enters IF set up mode. Press MEM to exit this mode.

Calibration of S meter

The S meter circuit is used with LM3915 which drives 10 LEDs, providing a logarithmic 3dB/step analog display. Each 2 LEDS stands for an S. For example, LEDs 1 – 2 stands for S6 (6.3uV), LEDs 3 – 4 for S7 (13uV), LEDs 5 – 6 for S8 (25uV), LEDs 7 – 8 for S9 (50uV), LEDs 9 – 10 for 59+.

TJ6A pro uses the dot display mode to save power. The S meter displays the signal peak. For bar display mode, connect Pin 3 to Pin 9 of U16 (LM3925) with a hookup wire or a resistor between 10 – 100ohms.

After checking, apply power. Try to find a strong signal (S9+) of either SSB or CW to calibrate the S meter. Trim VR2 of the DDS board (VR2 is beside U16) until all the LED's are lit. If you have a standard signal generator, input a 50uV signal into ANT of TJ6A pro. Trim VR2 until the 8th LED is lit, which stands for S9.

Louder Speaker Liner

To prevent the friction occurs between the speaker cone and the casing, it is suggested to insert a hard paper liner (around 1 mm thick) between the speaker frame and the casing. The speaker cone friction causes hoarse or distorted sound when the strong signal presents. Alternatively, 4 spacers can be used to raise the speaker frame a little from the casing. However, the liner offers better sound. Draw the shape of the speaker on a piece of hard paper (or other materials), and then cut a opening the size of the speaker cone. Position the liner on the speaker mounting, and then put the speaker on the liner. Insert the screws and tighten them. Do not use too much force to tighten the screws. Too much force might distort the speaker metal frame, resulting in permanent damage to the speaker (unclear and distorted sound). The liner can be made larger, because the paper liner breaks easily if the flange is too narrow.