KIT ASSEMBLY

&

Operating Instructions

# *EDM-TX-LCD*

series + RDS

# ***ASSEMBLY INSTRUCTIONS:***

**All components were tested before shipping for proper performance and quality.**

- **Inspect your shipment** for any damage. **Notify** us **if** anything looks **abnormal**.
- Contents: 1 X PCB + LCD display
  1 X Microprocessor
  1 X Power Jack
  1 X Universal 12VDC regulated power adaptor
  1 X Manual
  1 X Wire Test Antenna
  1 X Enclosure (optional) with screws (4 x M3, 4 X countersunk)
- **Choose** a **safe work area free of potential static electricity**. Avoid carpets and wearing woolen garments that can generate high levels of static. **Touch** a large **metal** object that is **connected to earth** to **discharge any stored static electricity on your body**, such as **a stove, fridge, cold water pipe** etc. before the next step.
- Undo the 4 screws on the bottom of the enclosure to free the PCB. Gently lift out the PCB + LCD assembly.
- Remove the 4 nuts and insulating washers from the LCD corners. Gently lift off LCD display and lay it flat on the side of the main PCB. Do not pull on the ribbon cable connecting the LCD display to the control PCB.
- Next **remove** the pre-programmed **microprocessor from** its protective **foil**.
- **Carefully plug** it, (after making sure the ident notch is aligned **in the correct direction** and all pins aligned with the holes in the socket) **into the IC socket** as indicated on the assembly drawing. Make sure it is properly **seated by** applying **gentle pressure** to the top of the part. Avoid excessive pressure. Refit the LCD after completion of inserting the micro-controller chip. See picture on last page.
- Remember to insert the plastic insulating washers between LCD's pcb and nuts. Do not over tighten.
- Using a low **wattage soldering iron** (under 100W) and **acid-free electronic-grade solder** (obtainable from your local electronic parts store), continue to **solder** the power jack into the PCB. Make sure it is filmy seated and flush against PCB (see photo's). Apply solder **iron tip** so to make **contact** with **BOTH** the **terminal and PCB** for about 3 **seconds** before applying your **solder** wire to **this** area, **WHILE** holding the solder **tip in** the same **position**. Apply **just enough solder** to flow freely into this joint making a **good, solid** and shining **connection**. Quickly remove iron tip and solder wire and **allow** solder joint **to cool down** for about 5 seconds **WITHOUT moving** the **part** during the cool down process. Moving the part during this cool down period may result in a intermittent or "dry-joint". Repeat for all terminals.
- Basic **assembly is now finished** and you may **continue with** powering, setting up, adjusting and using your unit by following the instructions in the next section. (**Operating Instructions**)

# ***OPERATING INSTRUCTIONS:***

(Please **read completely** before operating the unit)

**Remember all the responsibility is with you to operate your completed unit with courtesy to others and within the local laws and regulations of the country you are in.**

**Your EDM TX-LCD kit version's RF output is factory set in the 10mW position for safety reasons. We recommend this setting for most countries. Operating in the 100mW position is NOT recommended for North America and Canada under "Part 15" regulations where legal range is limited to between 200-400'**

**Slide switch to Red for 100mW and to Black for 10mW**

- **First monitor the frequency you intend to transmit on with a good quality receiver to find a clear channel, and if possible open channels on either side. Make sure this channel is clear for at least ½ mile radius from the point where your transmitter will be located. Car radios make good monitoring receivers because of their better sensitivity**
- **Apply** the **audio source** material. This should be line-level audio from a CD player, DVD etc.
- **Apply** the **regulated 12VDC** from the switching adaptor. **(It is OK to power up without antenna for short periods while setting your transmit frequency for the first time)**
- The unit should power up in the **default mode of 87.7MHz** after displaying "Resetting" as indicated on the LCD
- **Tune** a suitable **radio** capable of receiving Stereo transmissions **to** the same **frequency**, or **another frequency** of your choice **previously selected**, by using the **UP** or **DOWN** preset **buttons**
  **Now apply** a suitable **antenna** load 50Ohm, or the wire test antenna supplied to your unit.
- The source **material** should now be **received in** full **stereo**. The **stereo indicator** should also be **lit** on the receiver. **If** you hear **distortion,** turn the two **input** level **adjustments counter-clockwise** (by equal amounts) **until no** more **distortion** can be detected. About 50% setting is suitable for standard line-levels of 200mV rms
- This unit uses a PLL with **fairly long locking times** to achieve **good** low **frequency** audio **response**. This will be more **noticeable when** tuning **rolls over** at the ends of the band.
- Unit will **remember** (8 seconds after no button press, last frequency setting is stored in memory) the last frequency **setting** before power-down and **will reset** to that value **on** a **power-up**. Display will show a "*" to indicate that the current frequency is stored in memory.
- Unit will **reduce** (mute) the **RF** signal by about 25-30dB **while tuning** with the PLL in the un-lock state. During this time the **display** will **show "Tuning<-"** when **tuning is from high to low** or **"Tuning->" when tuning** is **from low to high.** The **display and RF** level will return to **normal** once the **desired frequency** is **reached. Best range** will be achieved making sure the wire **antenna** is positioned **vertical** and **away from** any **metal** surfaces. Increased range with the RF switch in the 100mW position, only where permitted.
- Any **other** transmit **frequency** 87.7-107.9 may be selected by **pushing** the **UP or DOWN** button.
- If you operate the **unit near a TV** set, you **may hear** sound like a **high pitch whistle** on your signal and is **due to** the **15 kHz** used to generate the high voltages **for the picture tube.** This **15 kHz** will **beat with** the **19 kHz** stereo **pilot** tone **and produce** a **difference signal. This** is the **4~5 KHz** high pitch whistle often **heard.** Use longer audio leads to **operate** the unit some distance **away from TV.**
- **Do not allow static electricity to discharge into the antenna**. Keep away from TV and PC CRT screens that will have high static voltage levels.
- **Lastly, be responsible in operating your unit. If you receive any complaints, terminate your transmissions immediately and investigate. You may need to change to another frequency. Remember all the responsibility is with you to operate your unit with courtesy to others and within your local laws and regulations. Licensed radio stations always have priority getting their signal to their listeners.**

**If you have a problem and need to return your shipment for service etc. DO NOT ship it back to the dispatch location where your order shipped from. Email us first and we will provide a return address if your problem can't be solved via email!**

**Tampering or removing parts or any signs of removal will void your warranty.**

**Please note that in the 100mW position you may experience "hum" on your signal from RF energy getting into your audio cables or audio equipment feeding the unit. If the hum is not there in the 10mW mode, but only when switched to 100mW, you are experiencing RF feedback problems. Use good quality, well screened cables and/or reposition the test antenna to eliminate this. Using an external antenna where allowed will eliminate this from happening in most cases.**

**Adjustments:**

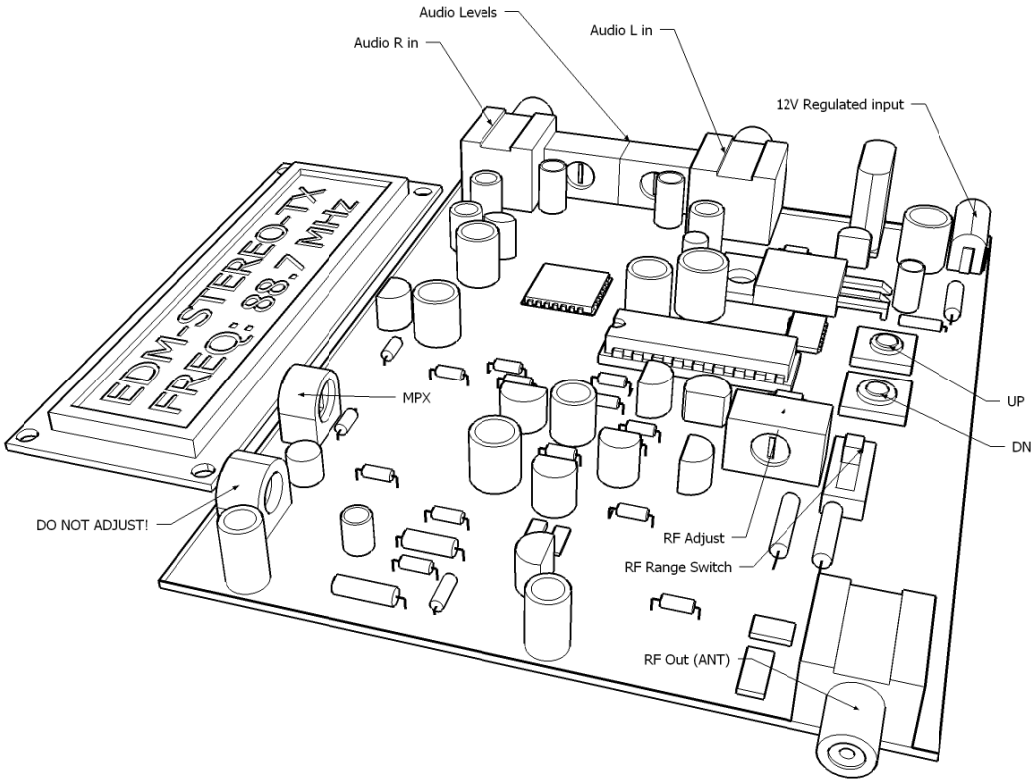
**Audio L & R**
**(Use 50% setting for 75kHz deviation with 200mV rms audio line-level input)**
**Too high setting will cause distortion on your signal. Feeding a MP3 player into the unit's audio inputs through the player's earphone connection will overdrive the EDM's audio inputs causing distortion. You need an MP3 to RCA line-level attenuator (contact us for details)**

**MPX**
**(75% factory set for 75kHz deviation with above input level)**
**Under normal conditions MPX level should not need any adjustment.**
**Turning MPX clockwise (see note on last page) will increase deviation. Too low setting will remove stereo signal on your receiver. Too high setting will cause distortion on your signal. This adjustment is also accessible through a hole in the bottom case assembly. When accessed from outside the casing, modulation level will increase in a CCW direction.**

**It is normal that your on-air volume will sound a little softer than commercial stations. This is because commercial stations use sound compressors to maintain a high average audio modulation signal without exceeding the maximum deviation limits. Increasing your MPX level to match will result in over modulation on peaks and possible interference to other adjacent frequencies.**

**Power level can be set in the range 1-10mW or 10-100mW using the slide switch to set range and the power pot to vary the RF level.**

**DO NOT ADJUST P2!**




**This setting affects the deviation linearity and distortion across the band. This is factory preset for optimal performance. Adjusting this may also prevent the VCO from locking at the top end of the broadcast band.**

**Note: PCB layout may differ slightly between P and EP models.**

**NOTES FOR SETTING RF LEVEL**

**USE A SMALL FLAT BLADE SCREWDRIVER FOR ADJUSTMENT.**
**ADJUST GENTLY (DO NOT FORCE PAST END-STOP's)**
**FORCING WILL CAUSE INTERNAL DAMAGE TO THIS CONTROL**

Slide switch is shown in 10 mW position in above diagram:
RF will increase with "RF Adjust" in a CW direction. Ranges 1-10mW
With slide switch in 100mW position: RF will increase with "RF Adjust" in a CW direction. Ranges 2-100mW

MPX, Audio L& R will increase in a CCW direction when accessed from outside the casing through the adjustment holes and CW when accessed from inside the casing

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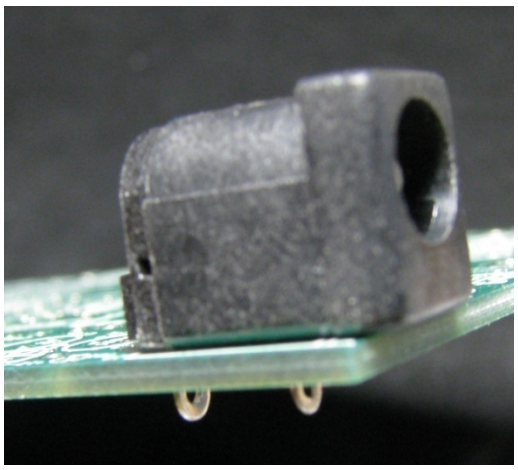
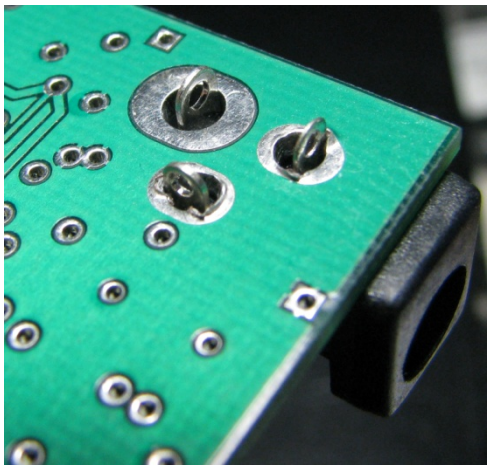
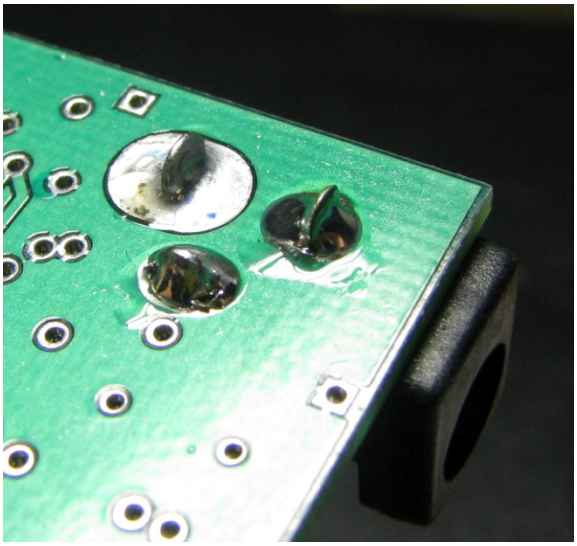
**Soldering of Power Connector**

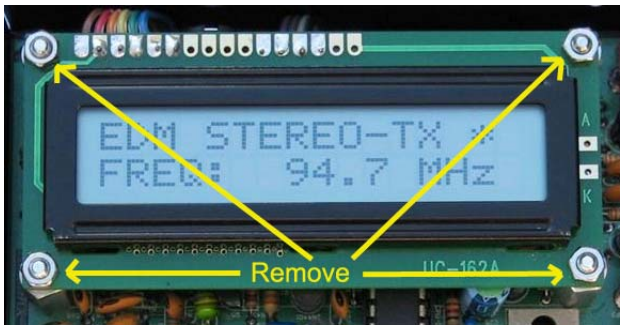




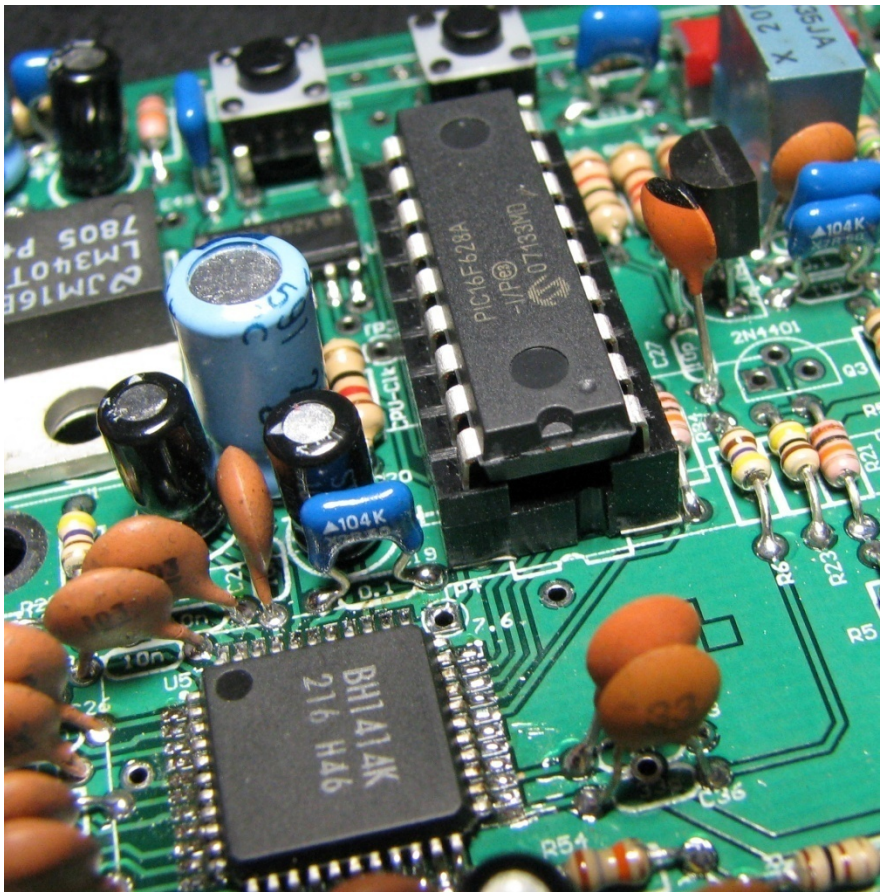


Make sure you apply enough solder & heat to fill in the holes completely as shown. First apply soldering iron tip for 3 seconds to heat up the solder pad and component pin. Then apply the solder at a point between the iron tip and pin. Keep feeding solder until the hole is filled evenly with solder.

**Remove nuts and washers to gain access to microprocessor socket**




**Correct way to insert the Microprocessor**




**Any other questions just send an email to EDM_sales@edmdesign.com**

**You may also want to join our Yahoo user's group**

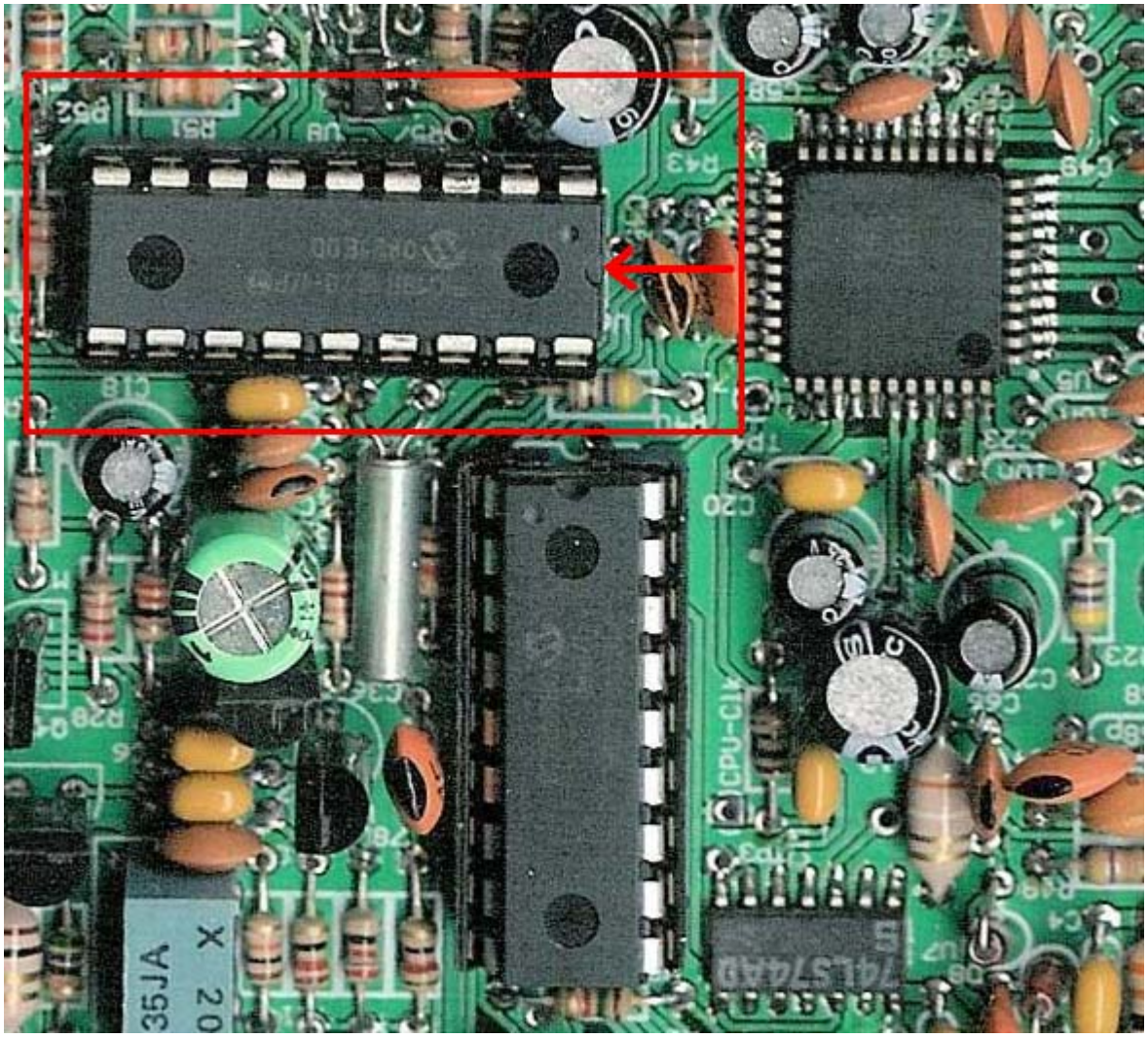
http://groups.yahoo.com/group/edmdesign/

# Supplementary for RDS Option

Make sure that your EDM unit is functioning and transmitting normal before activating the RDS function. Power off the unit and perform the following steps.

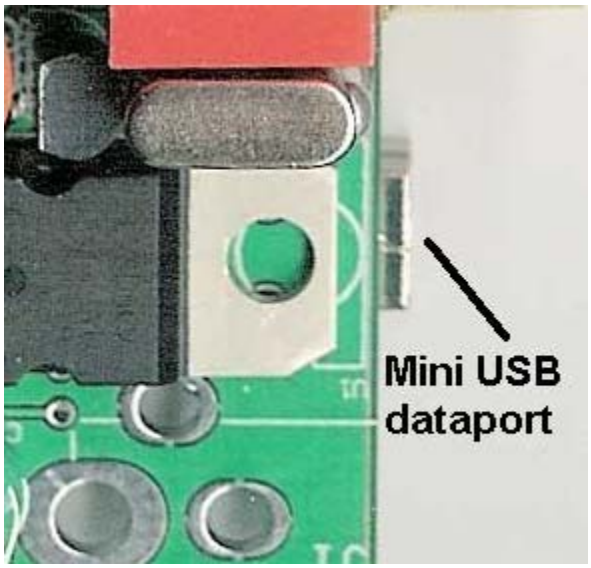
**1)**

Insert the RDS chip into the socket location marked “RDS encoder” on the PCB. Make sure the orientation is as shown



**2)**

Insert the Mini USB end of the supplied data cable into the data port on the EDM unit.




**3)**

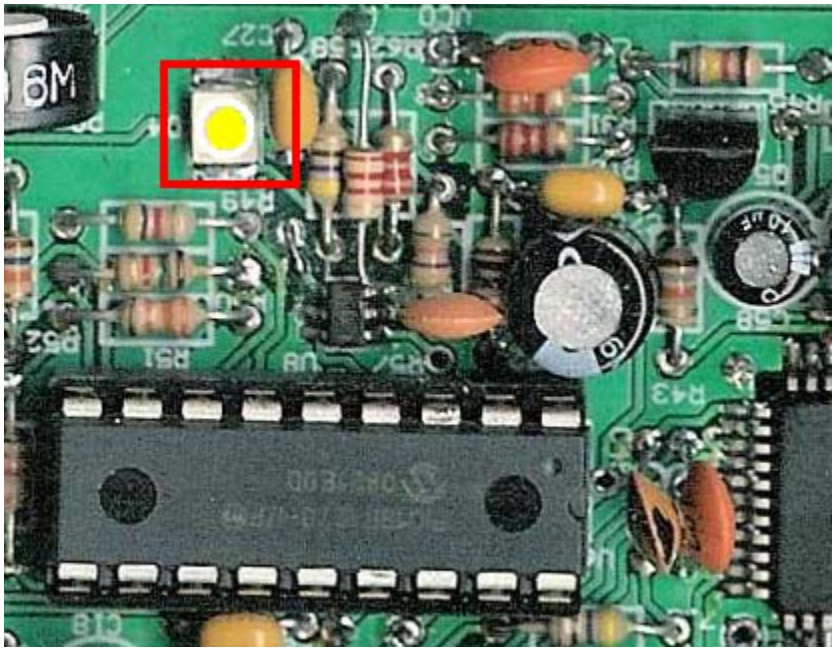
Insert the DB9 plug into a **true serial port** on your PC or laptop.


NOTE: (Most USB to serial port convertors do not support bi-directional data)

**This may cause problems sending and receiving data from the EDM-RDS**
**Read under notes section: http://pira.cz/rds/show.asp?art=minirds_encoder**

**4)**

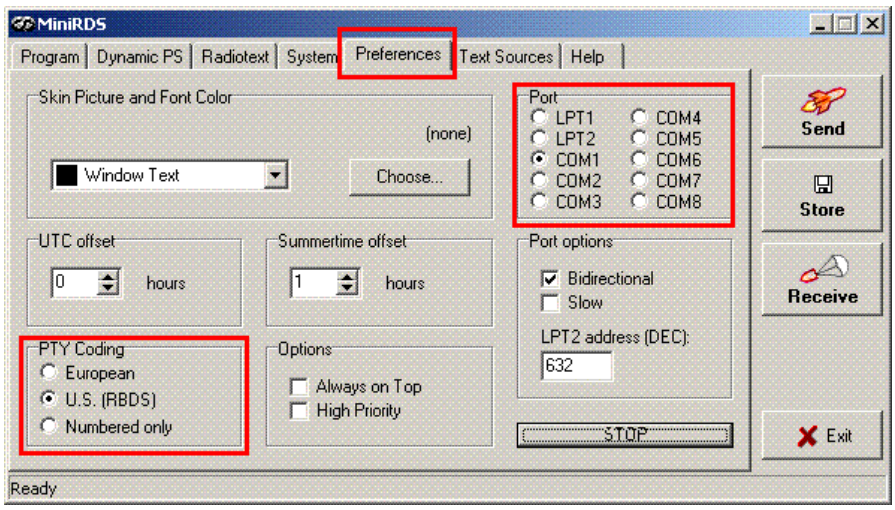
Now apply power again to the EDM unit. If all is well the yellow RDS status LED should flash on the EDM unit.



**5)**

Next start your miniRDS software that you have downloaded and unzipped.
http://www.pira.cz/rds/show.asp?art=minirds_encoder

**6)** Go to **Preferences**




Set the following:

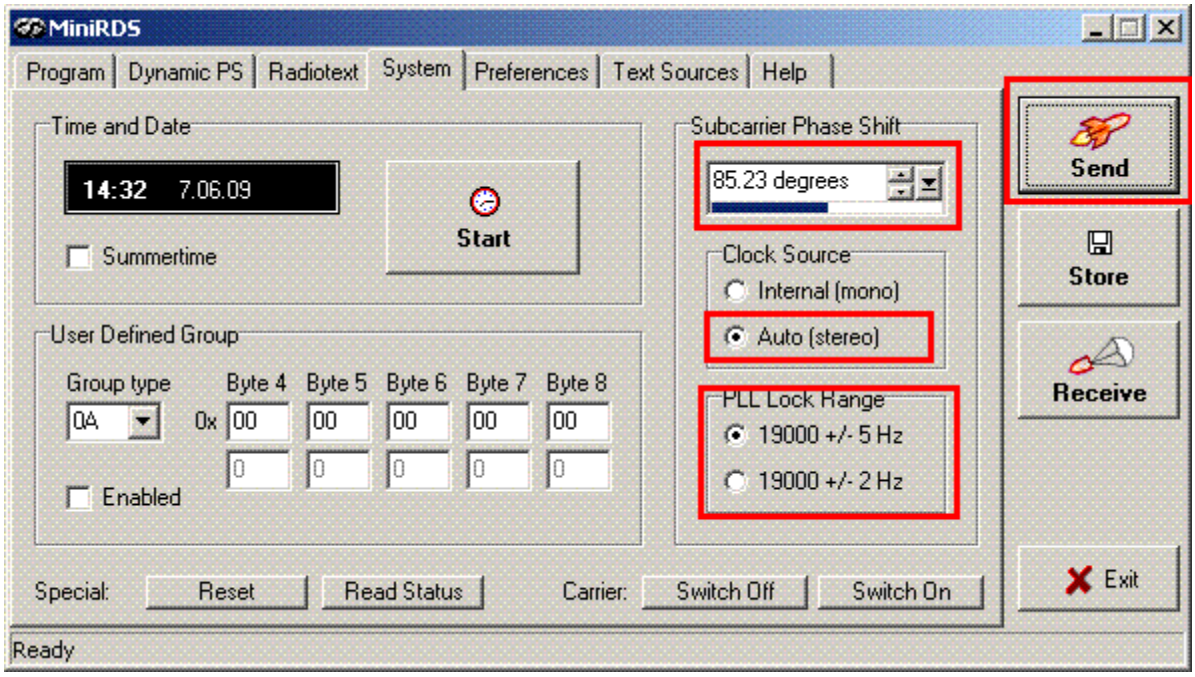
a) Coding (US or European)
b) Your serial COM port on your PC or laptop

**7)**

Go to **System**

Set:

a) Subcarrier Phase shift to **85.23 degrees** and Clock source to **Auto.**
b) Set PLL lock range to **± 5Hz.**
c) Click **Send**
(You should see the yellow RDS status indicator lit for a few seconds as data are being received. After this it will flash at 1pulse per second again)




You may set the time, summertime etc.

Refer to the **Help** tab for more information.

**8)**

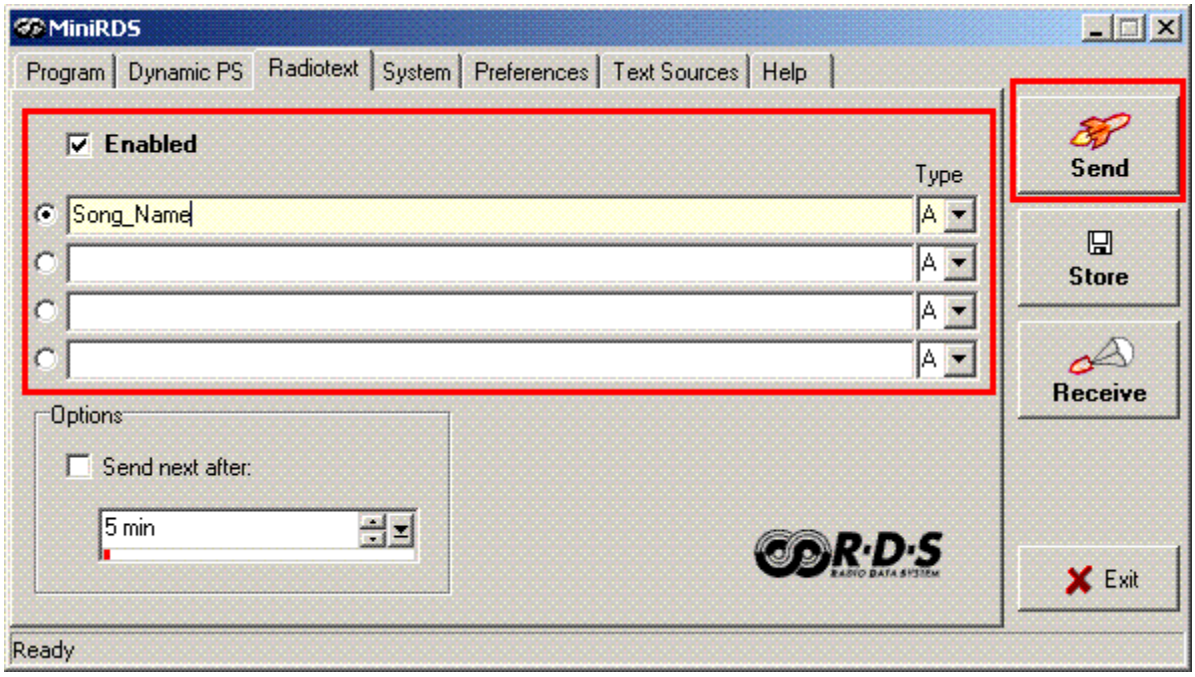
Go to **Program** tab where you can enter the **Default PS.**

This is the station ID that will be displayed on RDS capable radios.

Read help section for more information.

**9)**

Go to **Radiotext** where you can enter more text information like station type.

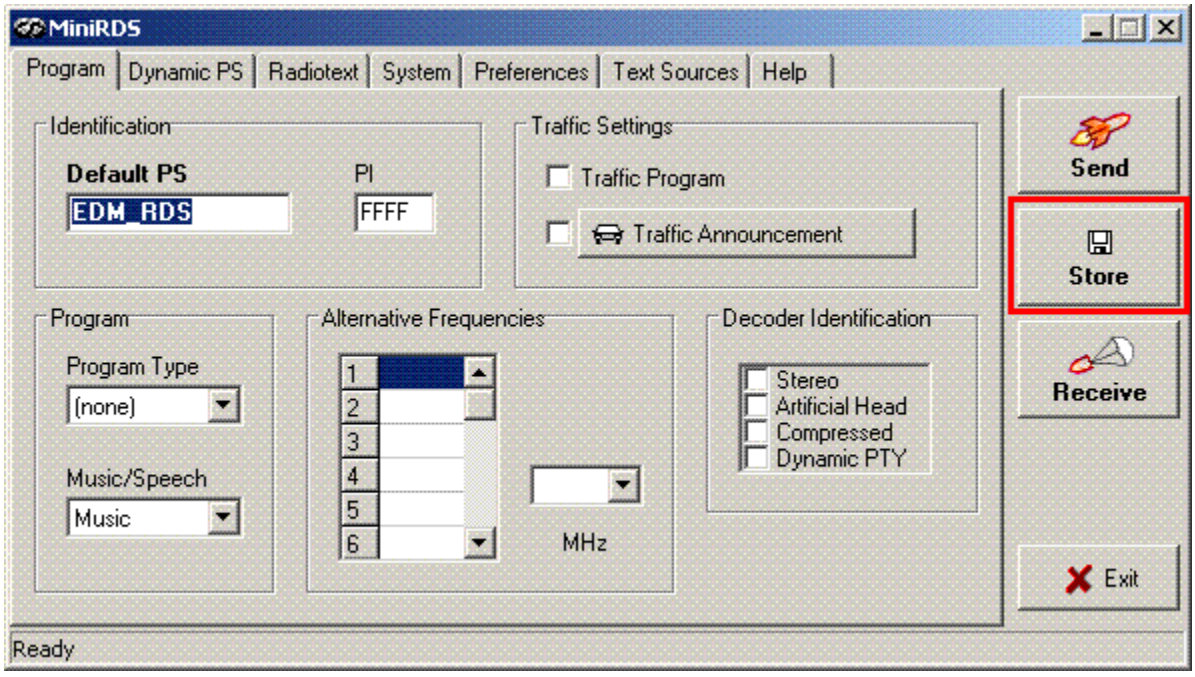



Read Help for more information

**10)**

Click **Send** to update this information to the RDS encoder chip on the EDM unit

Finally click **Store** to store the updated information to the EDM unit.



**11)**

To find out how to use the additional features like **Text Sources** and other, read the Help section. Additional information on how to use this program can be found here: http://www.pira.cz/rds/show.asp?art=rds_encoder_support

http://www.pira.cz/forum/diskuze.asp?cislo=3#vlozit

or

http://www.pira.cz/forum/index.asp

**12)**

Once data is stored on the EDM unit you may remove the cable if you don't need to update any new data.

**END**