ADX-MINI Tuner Build Manual

for tuner board version 1.0

March 19, 2023

Intro

This tuner was inspired by this YouTube video
https://www.youtube.com/watch?v=JwVuvu-C30c

I modified the design by adding a second variable cap to make a Pi-network rather than the simpler L-network.

Table of Contents

Step 1: Inspect the board 3
Step 2: Install SMT cap C1 4
Step 3: Install the Switches Caps and Connectors 5
Step 4: Install D2 (LED) 6
Step 5: Install R4 and D1 7
Step 6: Wind T1 8
Step 7: Install T1 9
Step 8: Install R1,R2, and R3 10
Step 9: Wind and Install L1, L2, L3, and L4 10
Step 10: Put the main board in the case 11
Step 11: Install the Top Plate and Tuning Knobs 12
Schematic 13
BOM 14

Step 1: Inspect the board

Here’s what it looks like when it arrives from JLCPCB

Step 2: Install SMT cap C1

C1 is the only SMT part on this board. It's in an 0805 package, so soldering with a fine-tipped soldering iron is no problem. Put a little solder on one pad first and use tweezers to hold the cap in place while soldering the first pad.

Step 3: Install the Switches Caps and Connectors

a) Use four m2.5x6mm screw to secure the variable caps C2 and C3
b) Solder C2 and C3
c) Hold P1 and P2 BNC in place while soldering them
d) Solder the five switches. It is helpful to use the tuner case top plate to keep things aligned.

Step 4: Install D2 (LED)

In order to align with the tuner case top plate, the LED height needs to be approximately 19.5mm as shown here:

Step 5: Install R4 and D1

R4 and D1 are installed as shown. Mind the polarity of D1.

Step 6: Wind T1

T1 is a transformer with 2 turns on the primary and 5 turns on the secondary. 1.5 inches of 24 AWG wire is needed for the primary and 3 inches of 24 AWG wire is needed for the secondary

Step 7: Install T1

The primary windings are inserted in the inner pair of through holes and the secondary windings are inserted in the outer pair of through holes as shown.

Step 8: Install R1,R2, and R3

Step 9: Wind and Install L1, L2, L3, and L4

Use 24 AWG enameled copper wire for winding these tuning toroids. The approximate wire lengths are:

L4 11T = 8"
L3 16T = 11"
L2 22T = 14"
L1 32T = 21"

Step 10: Put the main board in the case

Use four m3x6mm screws to install the board in the case.
The .stl files for printing this 3D printed case are on the GitHub page.

Step 11: Install the Top Plate and Tuning Knobs

Use four m3x10mm screws to install the top plate. And use two m2.5x6mm screws to install the tuning knobs. Here's a picture of the completed tuner:

Schematic

S1
S2
S3
S4
L1
4uH
L2
2uH
L3
1uH
L4
.5uH
T50-6 32T
T50-6 22T
T50-6 16T
T50-6 11T
C2
220pF
C3
220pF
To Antenna
ANT
P2
From PA
P1
RFIN
SWR Meter
Bypass Switch
S5
R1
50
R2
50
T1 FT37-43
2T
5T
R3
50
C1
.1uF
D1
1N4148
D2
R4
470
Tune for minimum
LED brightness

BOM

Comment	Designator	Quan	Supplier	Part Number
.1uF	C1	1	LCSC	C1711
1N4148	D1	1	LCSC	C14516
LED	D2	1	LCSC	C99771
50	R1, R2, R3	3	LCSC	C348878
470	R4	1	LCSC	C119317
Switch SPST	S1, S2, S3, S4	4	Amazon	NA
Switch DPDT	S5	1	Amazon	NA
Cap Var	C2, C3	2	Amazon	PolyVaricon
Toroid	T1	1	Amazon	T37-43
Toroid	L1, L2, L3, L4	4	Amazon	T50-6
BNC	P1, P2	2	Amphenol	031-5431-10RFX