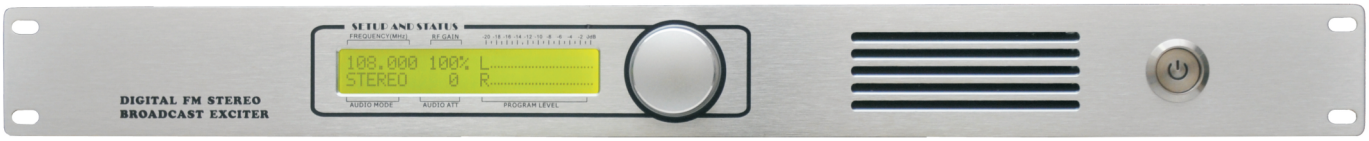
DDone-10 DIGITAL

Digital FM stereo broadcast exciter

OPERATING MANUAL



Based on DSP and DDS technology

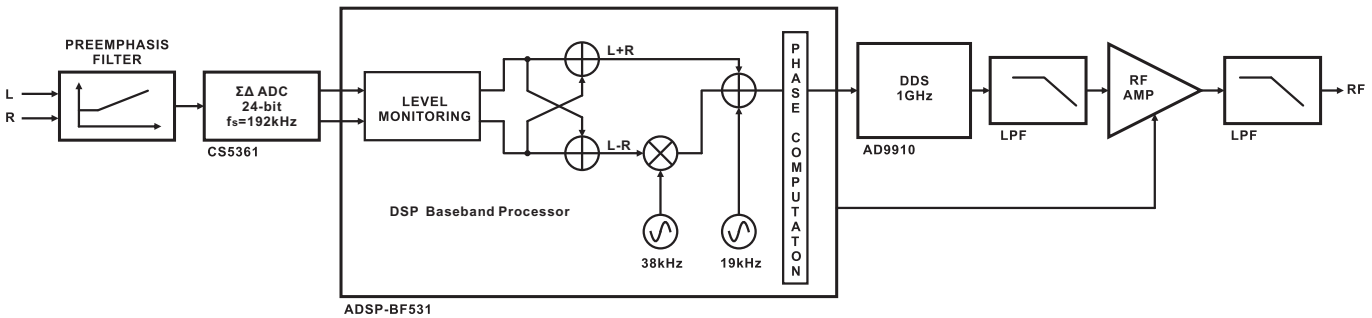
For Production or FM-Airchain Use

MAIN FEATURES

Digital Signal Processing technology
Advanced Direct Digital Synthesizer (1 GSPS, 14-bit DAC)
24-bit A/D, 114 dB Dynamic Range, Sampling Rates up to 192 kHz
Complete digital solution in a compact 1U/19 Inch housing

AUDIO SECTION	
Audio connector	XLR Female
L/R input level	±1.2Vp-p for 75 KHz deviation (1KHz)
Pre-emphasis	Flat / 25 / 50 / 75μsec.
Channel separation	60 dB min., (65 dB typ.), 20Hz to 15kHz,
S/N Ratio	80dB with CCIR unweighted
Frequency response	±0.5dB @ 30Hz - 15kHz
Encode mode	MONO-L, MONO-R, LR-MIX, STEREO
Spurious and harmonic suppressione	< 75dBc (Typical 80 dBc)
RF SECTION	
Output power	< 10W, adjustable
Output impedance	50Ω
Output connector	N,Female
Frequency range	87.5 to 108MHz
Frequency step	10KHz
RF Spurious	> -80 dBc @ ± 1MHz min.
RF Harmonics	> -45 dBc
Modulation capability	WFM (F3)
Frequency deviation	± 75 KHz
GENERAL SECTION	
Remote Control	RS232, Connector DB9 female
AC power	110V or 240V selectable,50/60Hz
Power consumption (typical)	25 W
Ambient temperature	-5° to +40°C
External dimensions (W x D x H)	483mm(19") x 200mm x 44mm(1U)
Weight	2.5kg

BLOCK DIAGRAM



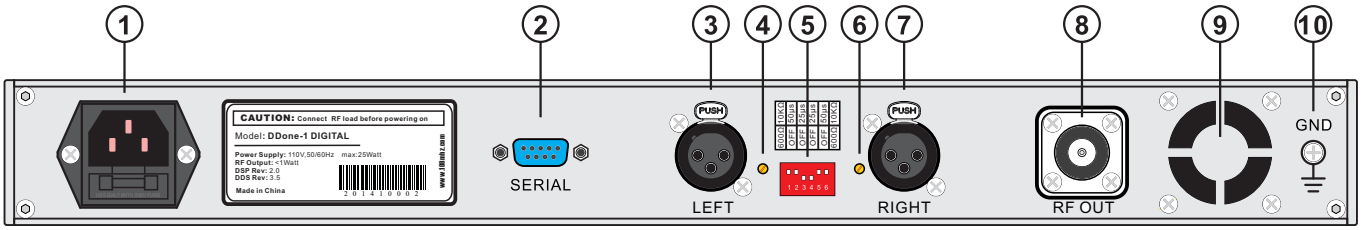
INSTALLATION AND OPERATION

Unpacking and inspection

As soon as the equipment is received, inspect carefully for any shipping damage. If damage is suspected, notify the carrier at once, and then contact supplier.

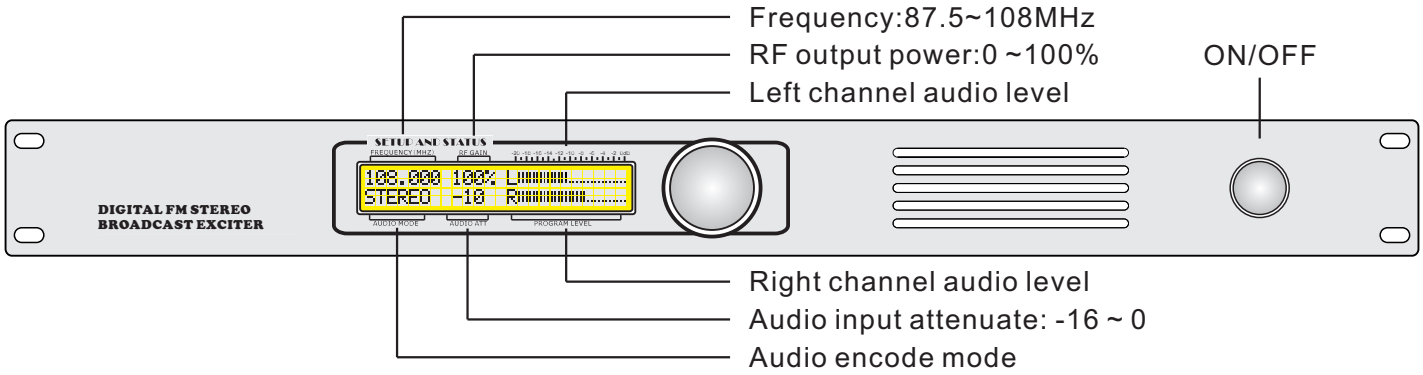
We recommend that you retain the original shipping carton and packing materials, just in case return or reshipment becomes necessary.In the event of return for Warranty repair, shipping damage sustained as a result of improper packing for return may invalidate the Warranty!

Rear panel diagram



[1]	MAINS	Standard IEC connector for mains supply 110 or 230 V, +10/-15%
[2]	REMOTE	Db9 connector to telemetry the equipment.
[3]	LEFT	XLR connector, for balanced LEFT channel input.
[4]	LEFT ADJ	Adjustment trimmer for the LEFT channel input.
[5]	TOGGLE SWITCH	Audio input impedance select and pre-emphasis setting.
[6]	RIGHT	XLR connector, for balanced RIGHT channel input.
[7]	RIGHT ADJ	Adjustment trimmer for the RIGHT channel input.
[8]	RF. OUT	RF output connector, N-type.
[9]	AIR FLOW	Grid for the passage of the air flow of the forced ventilation.
[10]	GND	GND

Front panel diagram



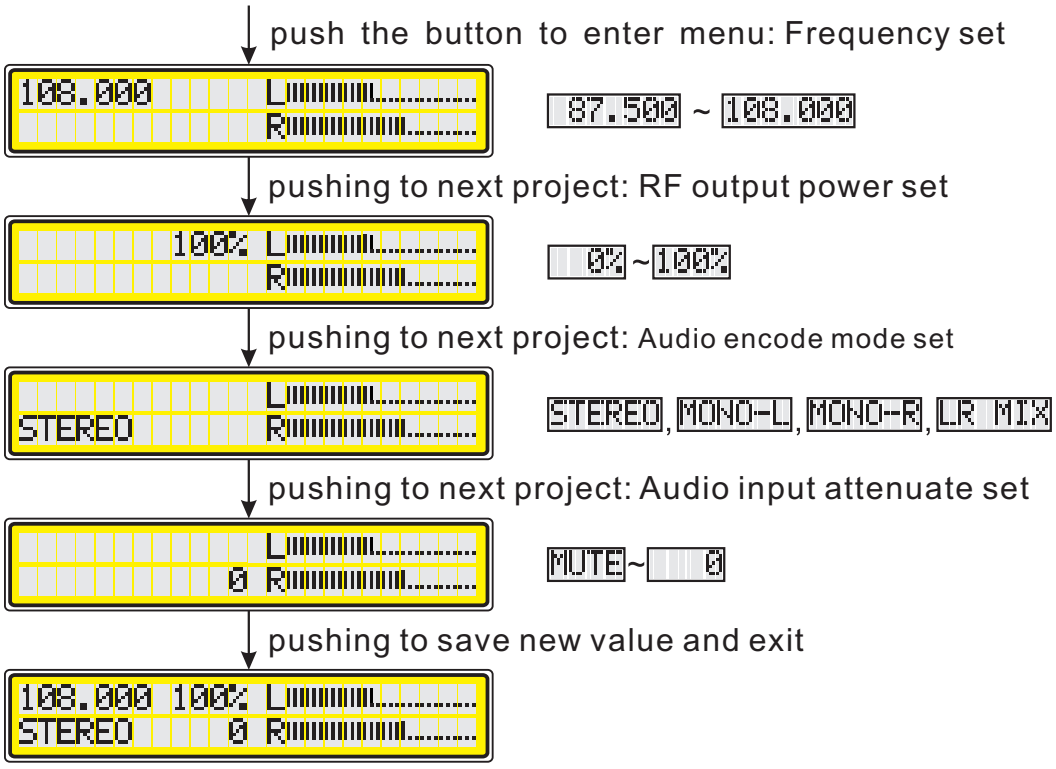
The exciter is able to work in all range frequency without calibration and setting operations.

The DSP system includes an LCD display and push-button panel for interaction with the user, and implements the following functions:

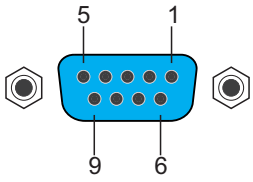
. Setting of working frequency.
. Setting of RFoutput power.
. Setting of Mono or Stereo operation.
. Setting of audio level atten...
. Measurement and display of the program level.

The operations that you can perform on the encoder are:

. **rotation**: modify the paramete,quickly rotation will ...
. **pushing**: push the button to enter menu or modify project, after the modification of parameter, push the button to save the new value.



Remote description



2 TX_D
3 RX_D
5 GND

Remote port is a RS–232C compatible serial interface. The baud is 9600 Bps.
Comunication protocol:
Evey framing have 16 bytes., The message structure is show below.
When the command has been active, it return 'OK', otherwise return 'ERROR'.

Byte	Description	Length	Example	Comment
1	Head	1 byte	$	Fixed
2-6	Frequency	5 byte	087510	Unit: KHz
7	Encode mode	1 byte	0	0: STEREO 1: MONO-L 2: MONO-R 3: LR-MIX
8	Audio source *	1 byte	0	0: Analog input 1: Digtal input
9	Pre-emphasis *	1 byte	0	0: OFF(Flat) 1: 50μs 2: 75μs
10-11	Audio attenuate	2 byte	00	00~16
12-14	RF power	3 byte	080	000 ~ 100 (0 ~ 100%)
15-16	End	2 byte	<CR>	0DH 0AH

* No effects in this version

Audio connectors

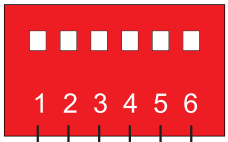
1 GND
2 Positive
3 Negative

Attach audio inputs to the Left and Right XLR connectors on the rear panel. (The Left channel audio is used on Mono.) Pin 1 of the XLR connector goes to chassis ground. Pins 2 and 3 represent a balanced differential input. They may be connected to balanced or unbalanced left and right program sources.

By bringing the audio return line back to the program source, the balanced differential input of the transmitter is used to best advantage to minimize noise. This practice is especially helpful if the program lines are fairly long, but is a good practice for any distance.

The input impedance can be set at 600Ω or 10KΩ by the toggle switch of real panel.

Toggle switch Set



The toggle switch is use for set audio input impedance and pre-emphasis.
Audio input impedance can set at 10KΩ or 600Ω.
Pre-emphasis can be set at 25μs,50μs,75μs or OFF(flat).
25μs and 50μs can be combine to 75μs.

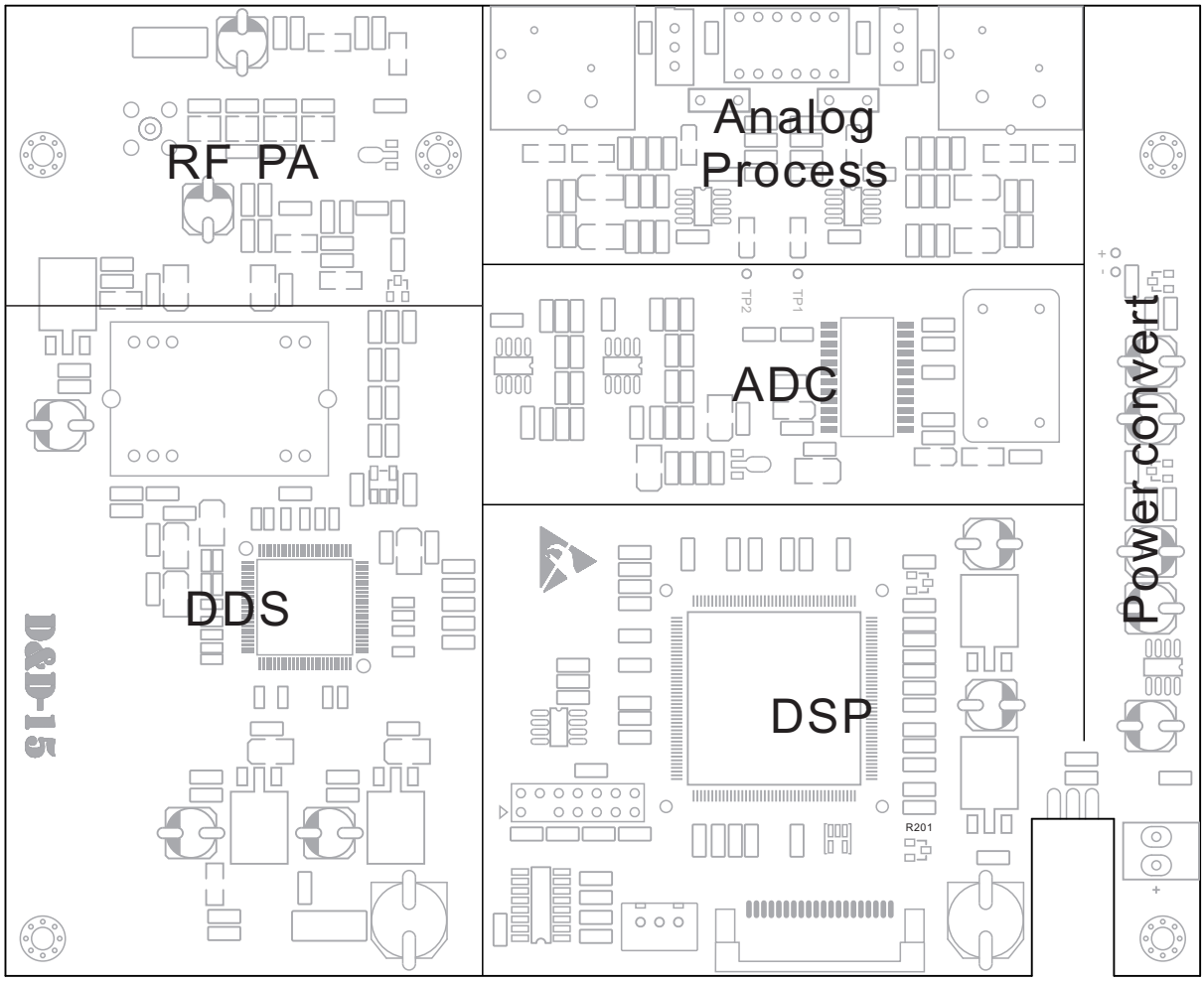
	Up	Down
Right chanel input impedance	10KΩ	600Ω
Right chanel pre-emphasis	50μs	OFF
Right chanel pre-emphasis	25μs	OFF
Left chanel pre-emphasis	25μs	OFF
Left chanel pre-emphasis	50μs	OFF
Left chanel input impedance	10KΩ	600Ω

MODULE DESCRIPTION

There are senven section in the main board:

(1) Power :convert positive voltage to negative voltage.
(2) Analog process: Audio input,pre-emphasis process,buffer amplifier.
(3) ADC : Analog to digital convert.
(4) DSP : Digital signal processing. baseband processing, user interface ,drive DDS
(5) DDS : Direct Digital Synthesizer,FM RF generator.
(6) RF PA : RF amplifier with low pass filter.

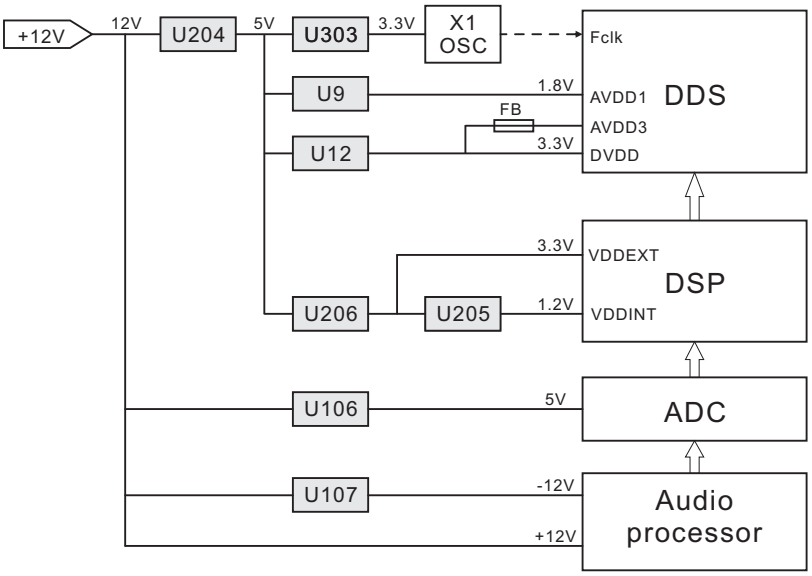
The user interface board include LCD and rotary encoder .



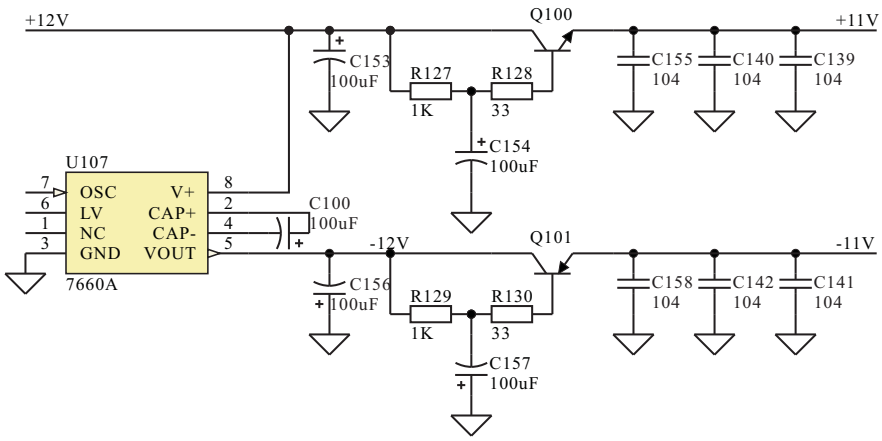
DC power supply

DC power schematic :

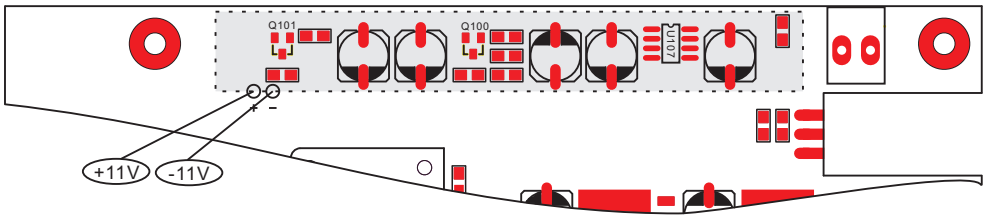
Main supply is a 12V DC,supply by a switch power supply. typ. current is about 0.8A(100% RF output).It used seven regulators to product several voltage use for evey module.



U107 performs supply voltage conversions from +12V to -12V,after these voltage are supply to operational amplifier via the filter. final voltage is about ± 11V.



±11V voltage have two test point in the main board. show as below.



Audio input and pre-emphasis

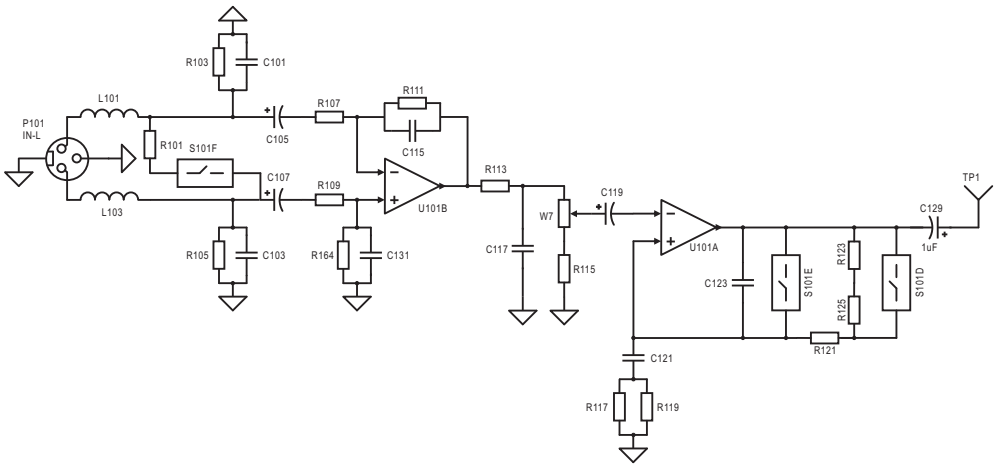
Attach audio inputs to the Left and Right XLR connectors on the rear panel. Pin 1 of the XLR connector goes to chassis ground. Pins 2 and 3 represent a balanced differential input. They may be connected to balanced or unbalanced left and right program sources.

The audio input cables should be shielded pairs, whether the source is balanced or unbalanced. For an unbalanced program source, one line (preferably the one connecting to pin 3) should be grounded to the shield at the source. Audio will then connect to the line going to pin 2.

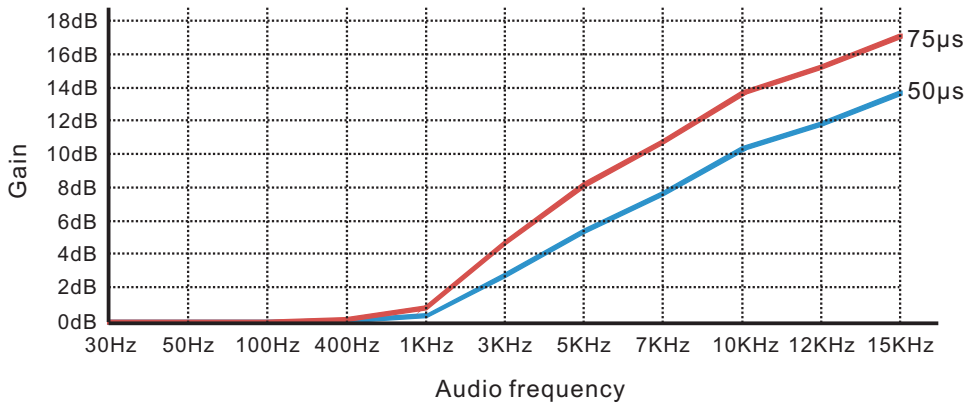
By bringing the audio return line back to the program source, the balanced differential input of the transmitter is used to best advantage to minimize noise.This practice is especially helpful if the program lines are fairly long, but is a good practice for any distance.

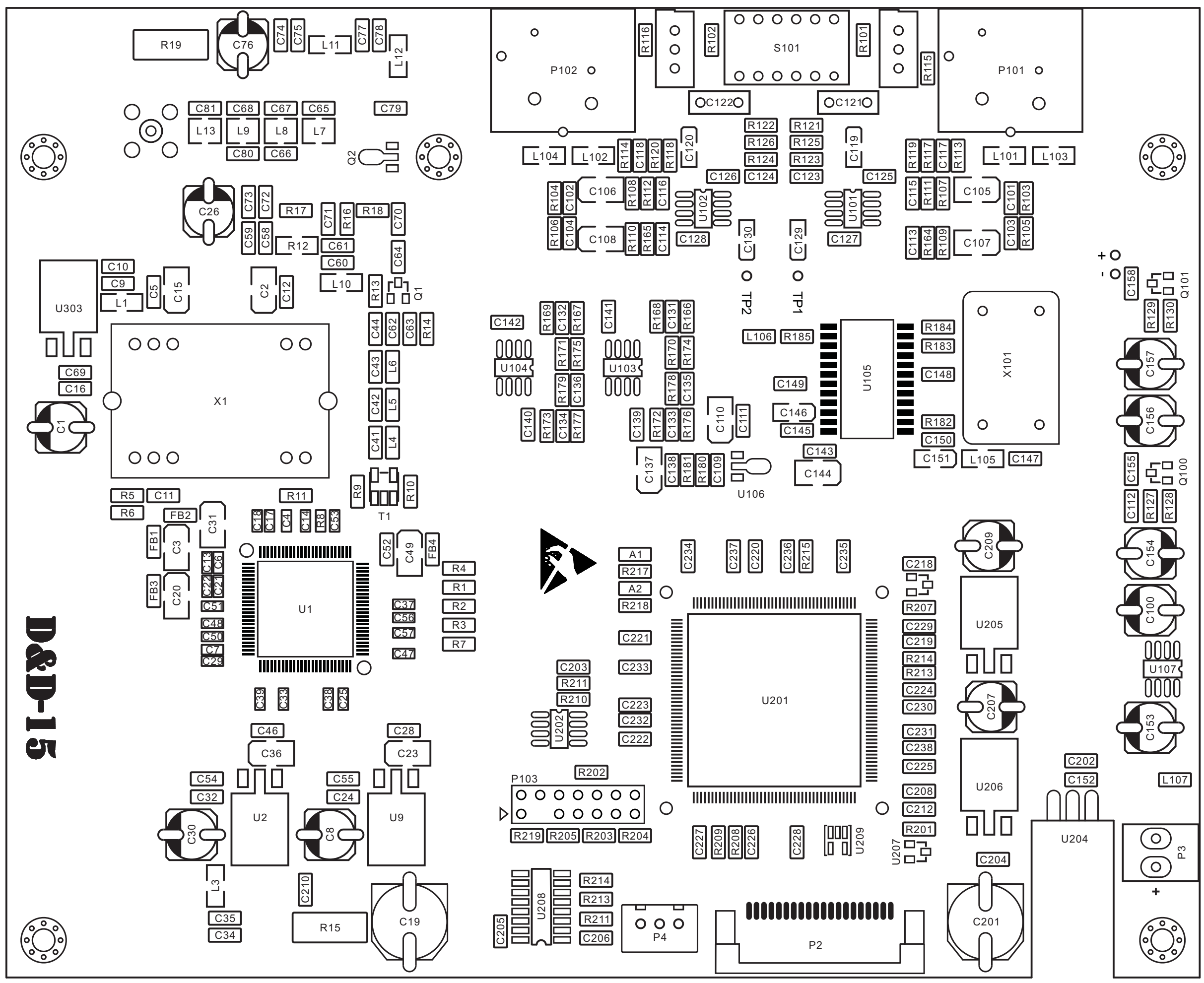
Below circuit show the left channel of audio process. audio is fed in via P101. the impedance is 10KΩ when S101F is close and 600Ω when S101F is open.

S101D and S101E concern the pre-emphasis.these two switch can assemble to provider four pre-emphasis value: 0,25μs,50μs,75μs.



pre-emphasis is a typ




D&D-15
U1
U2
U9
U201
U202
U204
U205
U206
U303
X1
X101
S101
P101
P102
P103
P2
P3
P4
TP1
TP2