

CIRCUIT DESCRIPTION

FREQUENCY CONFIGURATION

The frequency configuration is shown in Figure 1

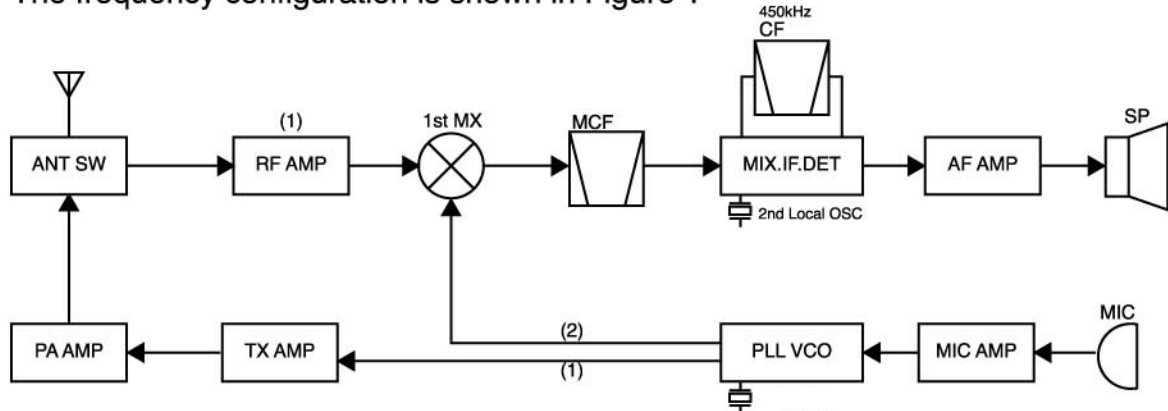


Fig.1

RECEIVER SYSTEM

RF amplifier

The signal from the antenna is passed through a low-pass filter and the transmission/reception selector circuit D211,D212 input to the RF amplifier. The input signal is amplified by T231. The unwanted frequency band of the signal is then eliminated by a band-pass filter.

First-stage mixer

The input signal is mixed with the first local oscillator signal from the PLL circuit by the first-stage mixer T251, producing a first IF signal. The unwanted frequency band of the first IF signal is eliminated by a crystal filters.

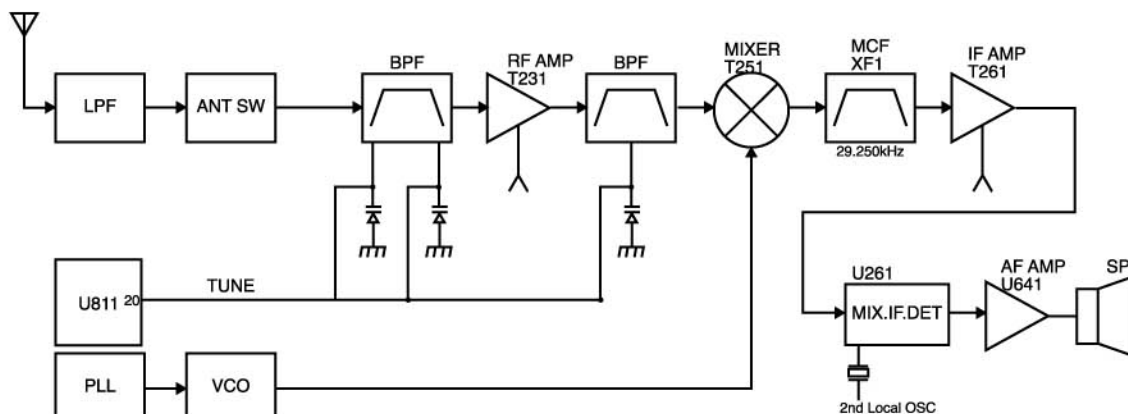


Fig.2

IF amplifier

The first IF signal is amplified by T261 and enters U261(FM signal processing IC), where it is mixed with the second local oscillator signal and so converted into the second IF signal. The unwanted frequency band of the second IF signal is eliminated by ceramic filter FL261. The resulting signal is then amplified and detected.

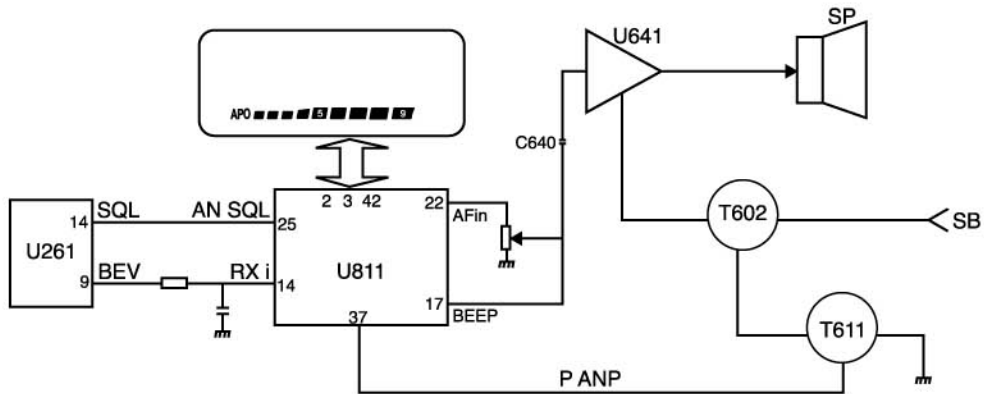


Fig.3

AF amplifier

The audio signal output by the FM detector are corrected by the high-pass filter and de-emphasize circuit. The audio signal is then passed through an AF variable resistor and amplified by power amplifier U641 to obtain the desired output.

Squelch and mute circuits

The output detected by U261 is input to MCU(pin 25), the voltage input to the microprocessor is digitized, and the microprocessor controls the MUTE.,RXI, RXO, thus controlling the audio signal. The microprocessor control this system from level 1-9, it can be programmable by software or keypad.

S meter

The S-meter signal is output from U261 as a direct voltage corresponding to the input signal, converted to a voltage by R278, then input to the microprocessor. The DC voltage is digitized to control the LCD S-meter display.

TRANSMITTING SYSTEM

Microphone amplifier

The audio band of the signal from the microphone is corrected by preemphasis circuit. The signal is amplified and limited by U411B(1/2). Distortion components exceeding the audio band of the resulting signal are then eliminated by a splatter filter consisting of U411A(2/2). Then input to Pin 15 of the microprocessor, VOX input to Pin 22 of the microprocessor.

Modulation circuit

The signal from the microphone amplifier passes through the modulation adjustment variable resistor VR378, is applied to VCO varicap diode D333, and modulated by variable reactance.

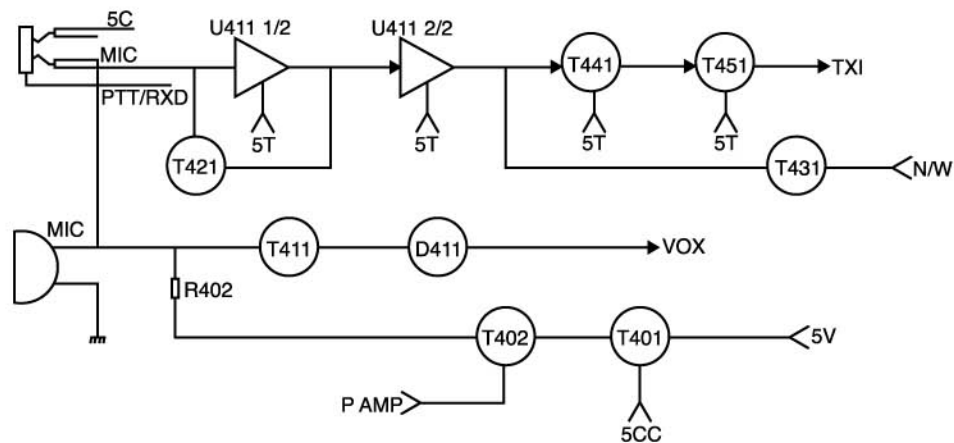


Fig.4

Drive and Final Circuit

The desired signal is produced by the VCO, and amplified by T111. It is then amplified by T121. The amplified signal is input to a two-stage FET amplifier, and increases the power to about 5W/4W.

Transmission/reception selector circuit

The transmission output is passed through the transmission/reception selector circuit and low-pass filter to the antenna. The transmission/reception selector circuit, which consists of D156, D211 and D212, is turned on during transmission and off during reception to switch the signal.

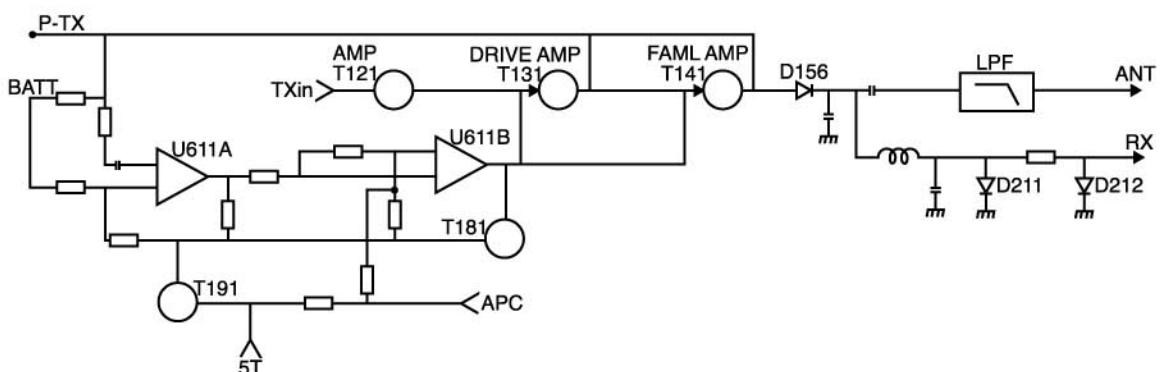


Fig.5

APC and transmission output selector circuits

The automatic power control (APC) circuit is used to obtain a stable transmission current. This circuit detects the drain current in the final stage of the power module and controls the transmission output. For U161, two voltages are applied: one is the reference voltage for transmission output adjustment, another is the detection voltage generated across R171, R173 in proportion to the drain voltage in the final stage. The voltage, proportional to the difference between the reference voltage and the detection voltage, is obtained at the output of U161. This voltage is reversed by T181 to provide the APC voltage. This APC voltage controls the power control pin of the power module and stabilizes the transmission output.

PLL CIRCUIT

PLL

The output from the 14.4MHz reference oscillator is divided by U377 to produce a 5 kHz or 6.25Khz reference frequency. The comparison frequency is obtained by amplifying the VCO output by T331 and dividing it by the U311. 5, 10, 12.5, 20, and 25Khz PLL synthesizer is implemented by phase-comparing the reference frequency and comparison frequency obtained when CR311 is divided. The pulse output from Pin 5 of U311 according to the difference between the reference frequency and the comparison frequency is passed through the charge pump. And is removed the ripple by a low-pass filter to produce the lock voltage.

VCO

The desired frequency is directly produced by the Colpitts oscillator configured around FET, T331, and 351. The lock voltage is applied to D331, D332, D351 and D352 to change the oscillator frequency.

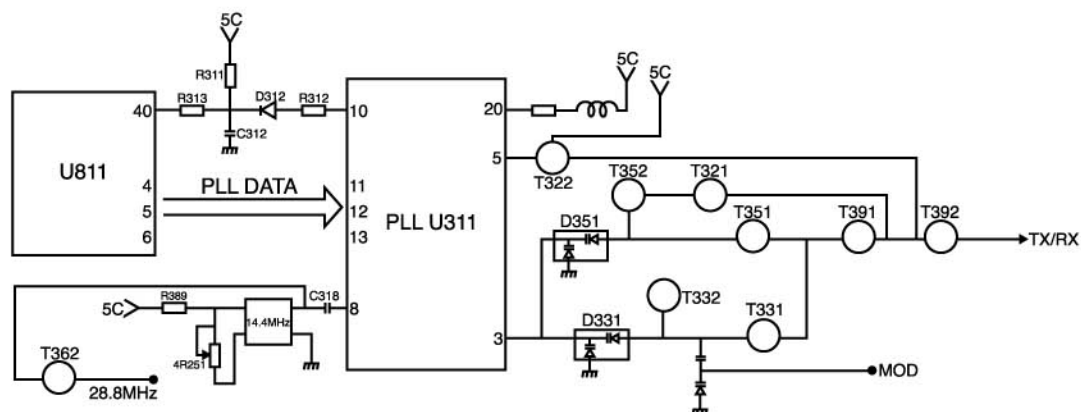


Fig.6

Unlock detection circuit

When the PLL is in the unlock state, the pulse that is output to the LD pin (pin 10) of PLL is waveform shaped by R312,D312,C312 and R313. The LD pin is then made high. The voltage at the LD pin is monitored by the microprocessor to control the transmission or reception selection timing.

DIGITAL CONTROL CIRCUIT

Keys and rotary encoder circuit

The signal from keys and rotary encoder input to microprocessor directly

Reset and backup circuits

When the SB is turned on, a high-level pulse is output from the reset circuit consisting of T881,C883, and R883 to reset microprocessor U881(Pin 32). If SB is turned off, U517 detects a 5V voltage drop, and outputs a low signal. When the microprocessor port goes low, it outputs data to U821 and enters backup mode.

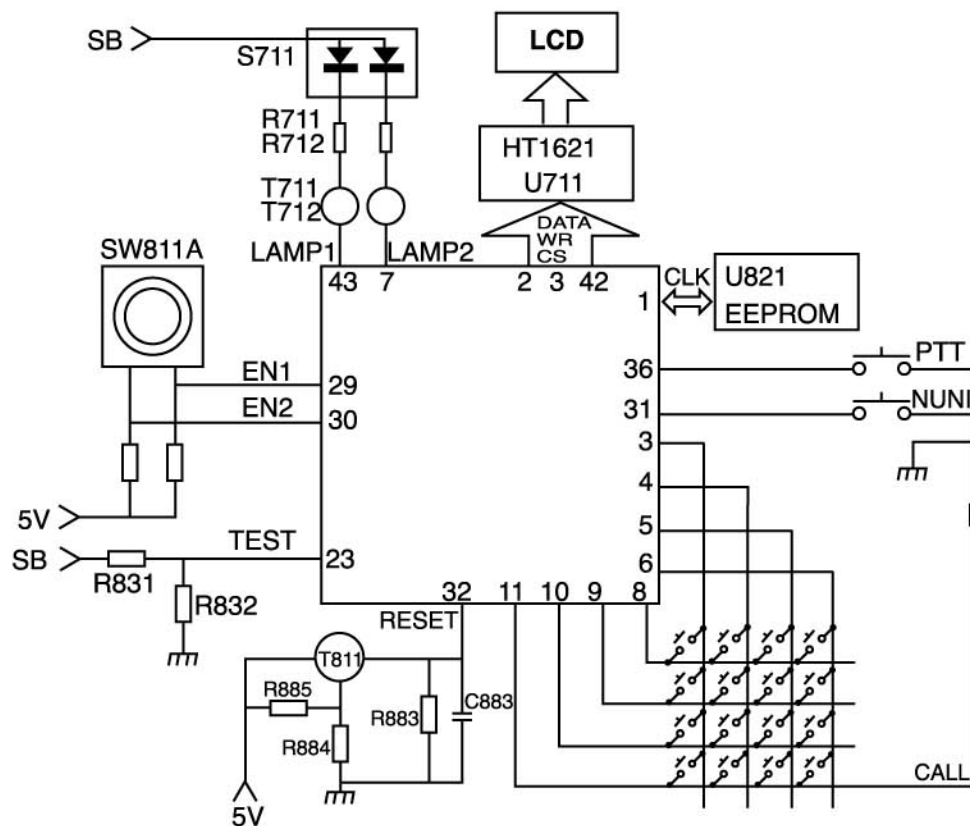


Fig.7

Battery voltage detector circuit

The supply voltage(SB) is divided and input to the analog port(Pin23) of the microprocessor. The voltage input to the microprocessor during transmission is digitized to drive the LCD battery display.

Lamp&LCD circuit

The LCD is turned on or off by directly flowing current to the microprocessor ports.

Battery save circuit

The squelch is switched in during receive. The power circuit enters battery save mode if no key has been pressed for five seconds. This circuit is controlled by microprocessor.

CTCSS/DCS circuit

The sub-tone signal is produced by the serial data from Pin17(CTCSS) or Pin44(DCS) of microprocessor. When the sub-tone is transmitted, the CTCSS /DCS is output from the microprocessor and modulated, after through LPF. The audio signal detected output to the decoder of microprocessor. The DEV pin is made low when the tone frequency coincides. The microprocessor determines the DEV pin state.

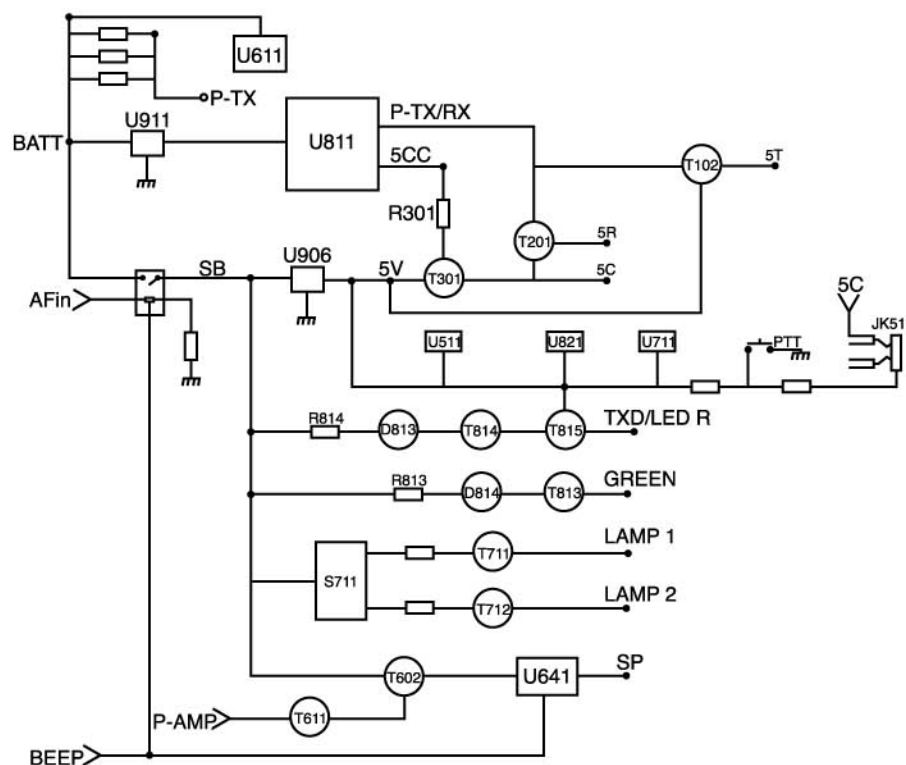
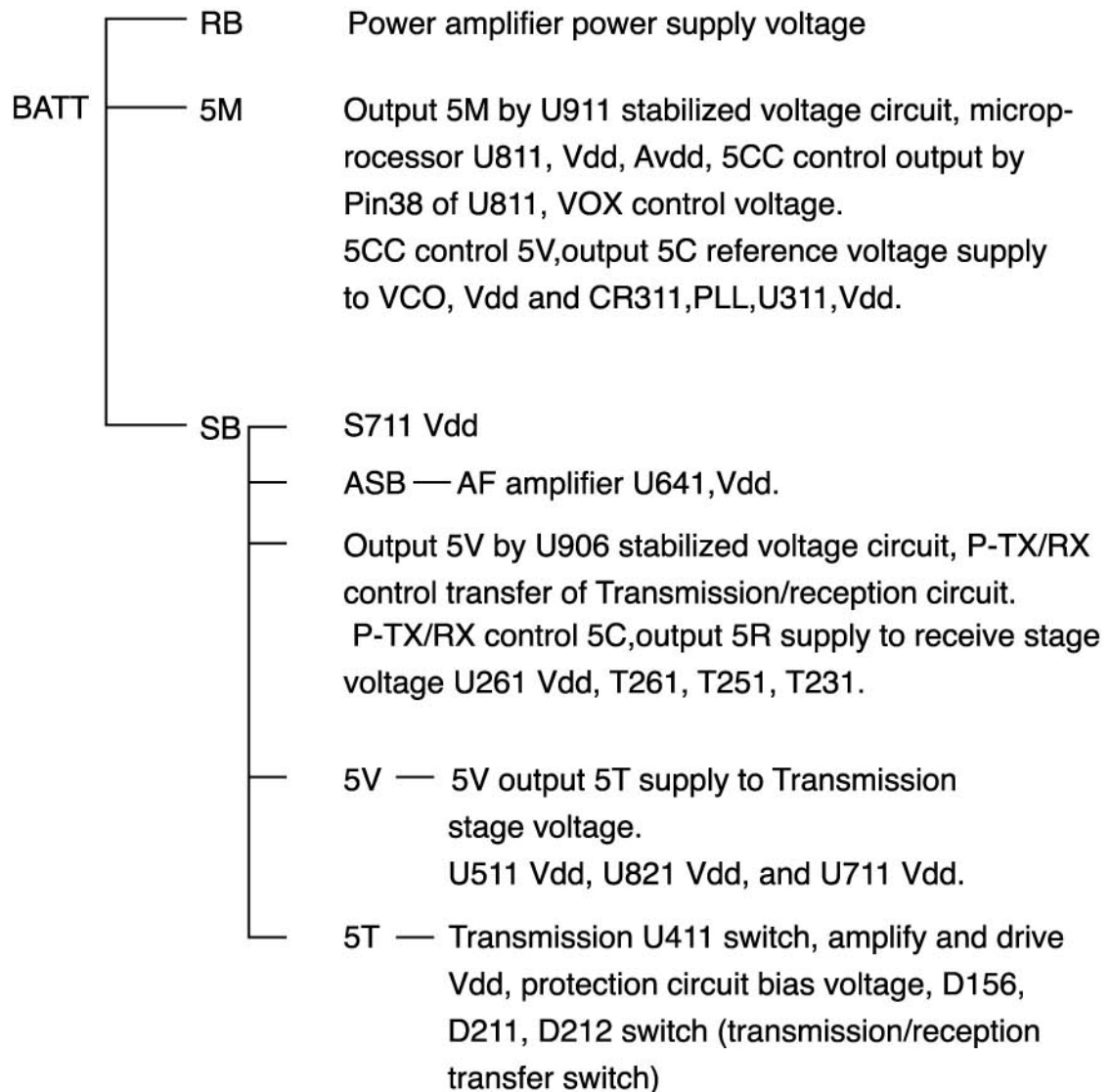


Fig.8

POWER SELECTOR CIRCUIT

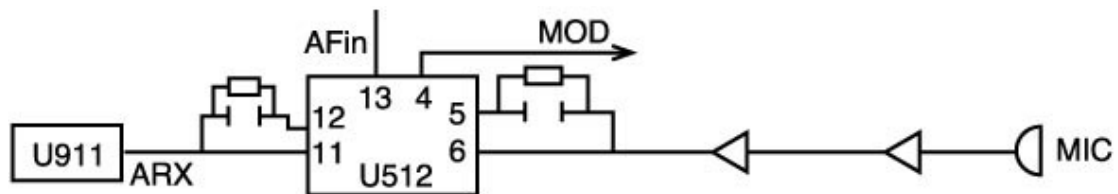
The power circuit configuration is shown in Figure 8. The power circuit branches are as follows:

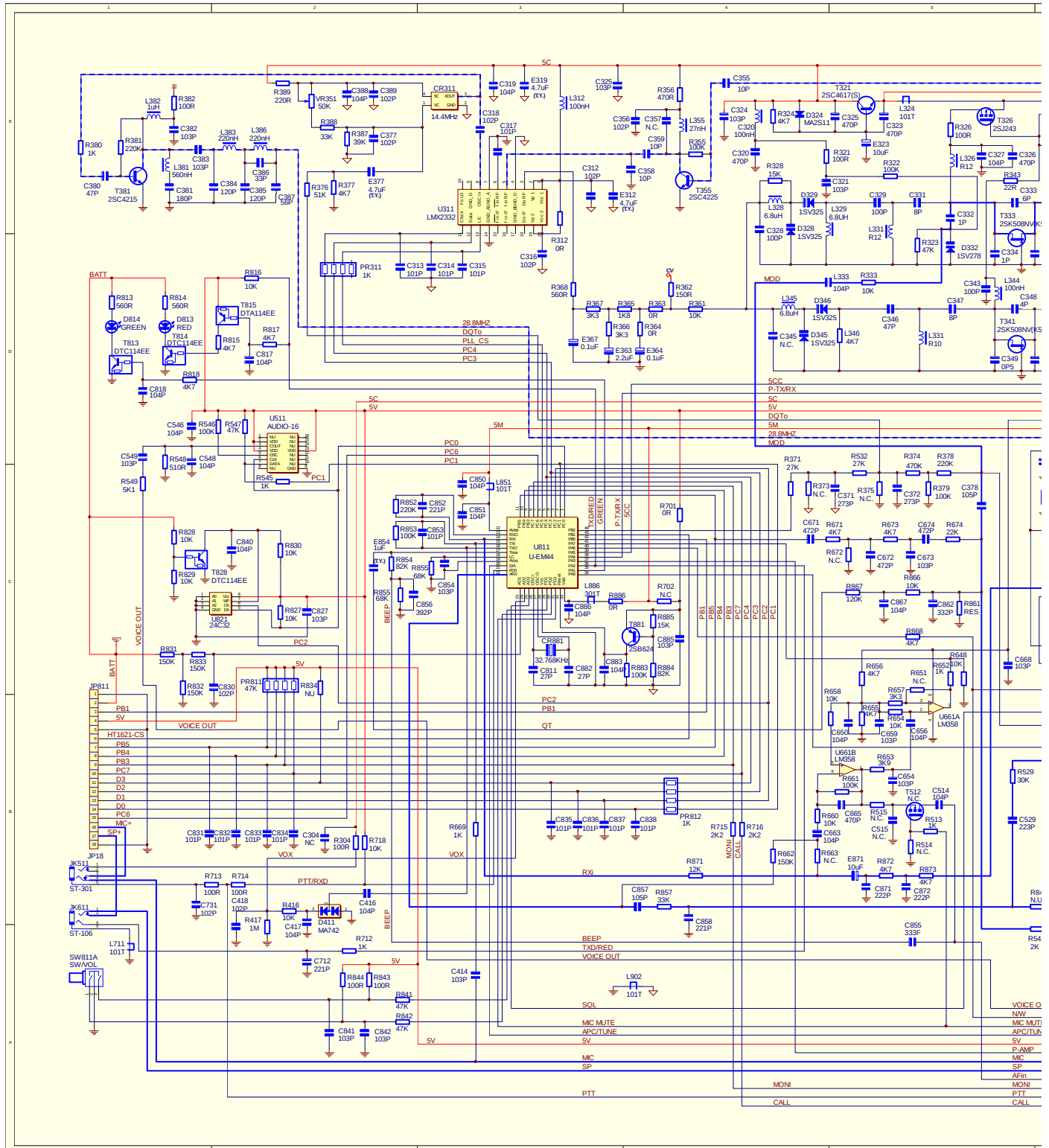


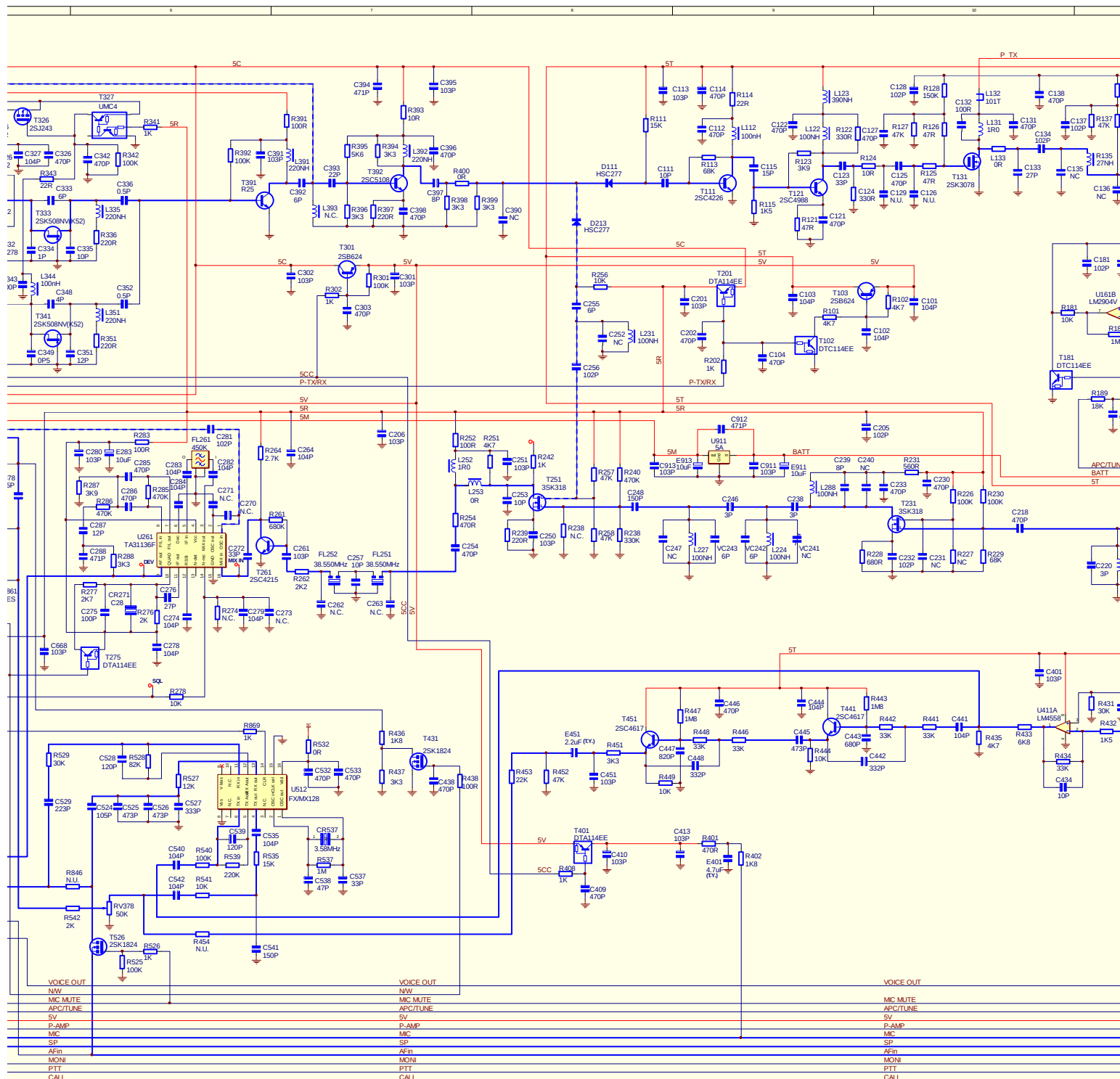
SCRAMBLER

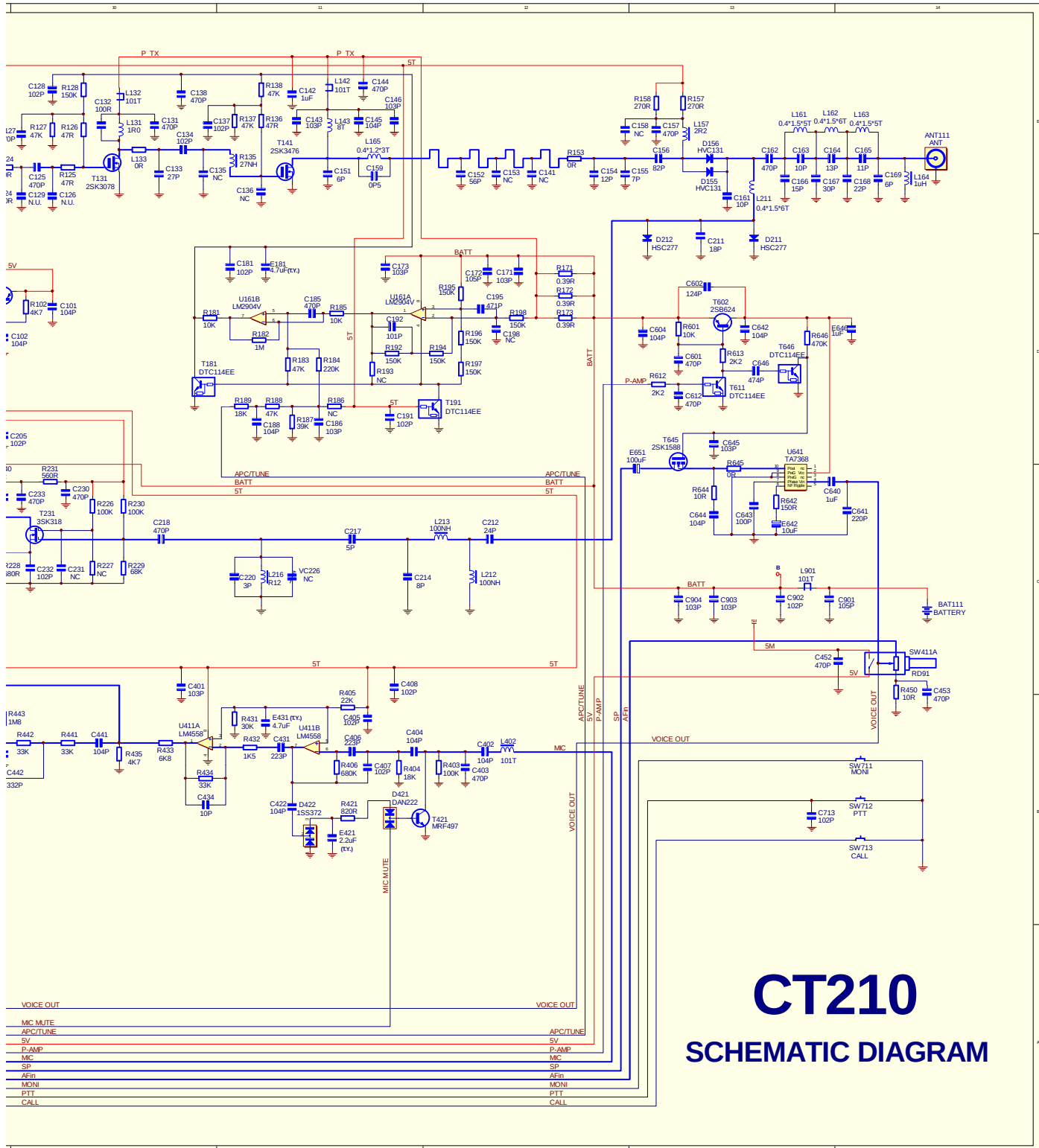
Audio signal is amplified and enters U512(Pin 6), there is a audio signal in Pin 5, IC 128 disturb this audio signal and output from Pin 4 to MOD.

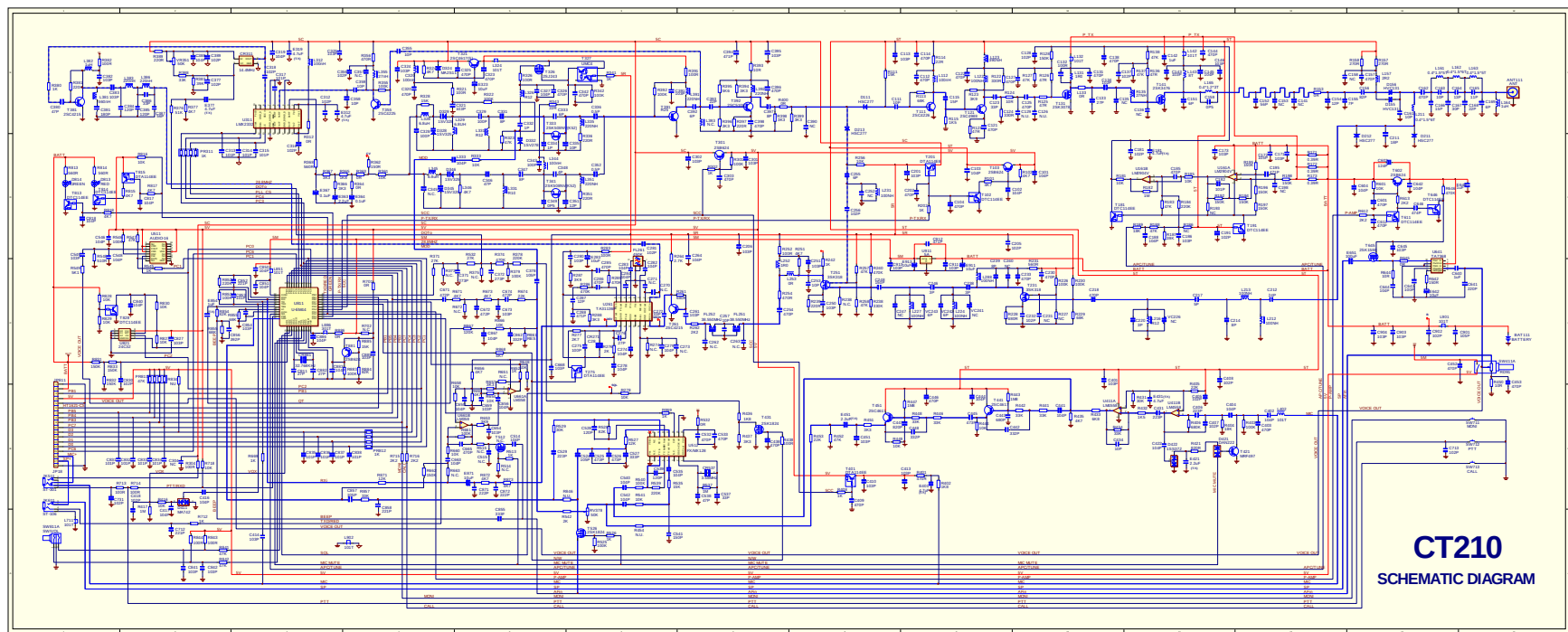
When receiver obtained the signal and output from U911(Pin 22) to open the audio switch of U512(Pin12), the disturb audio signal which input to Pin 11 was corrected by IC 128 to a normal audio signal.



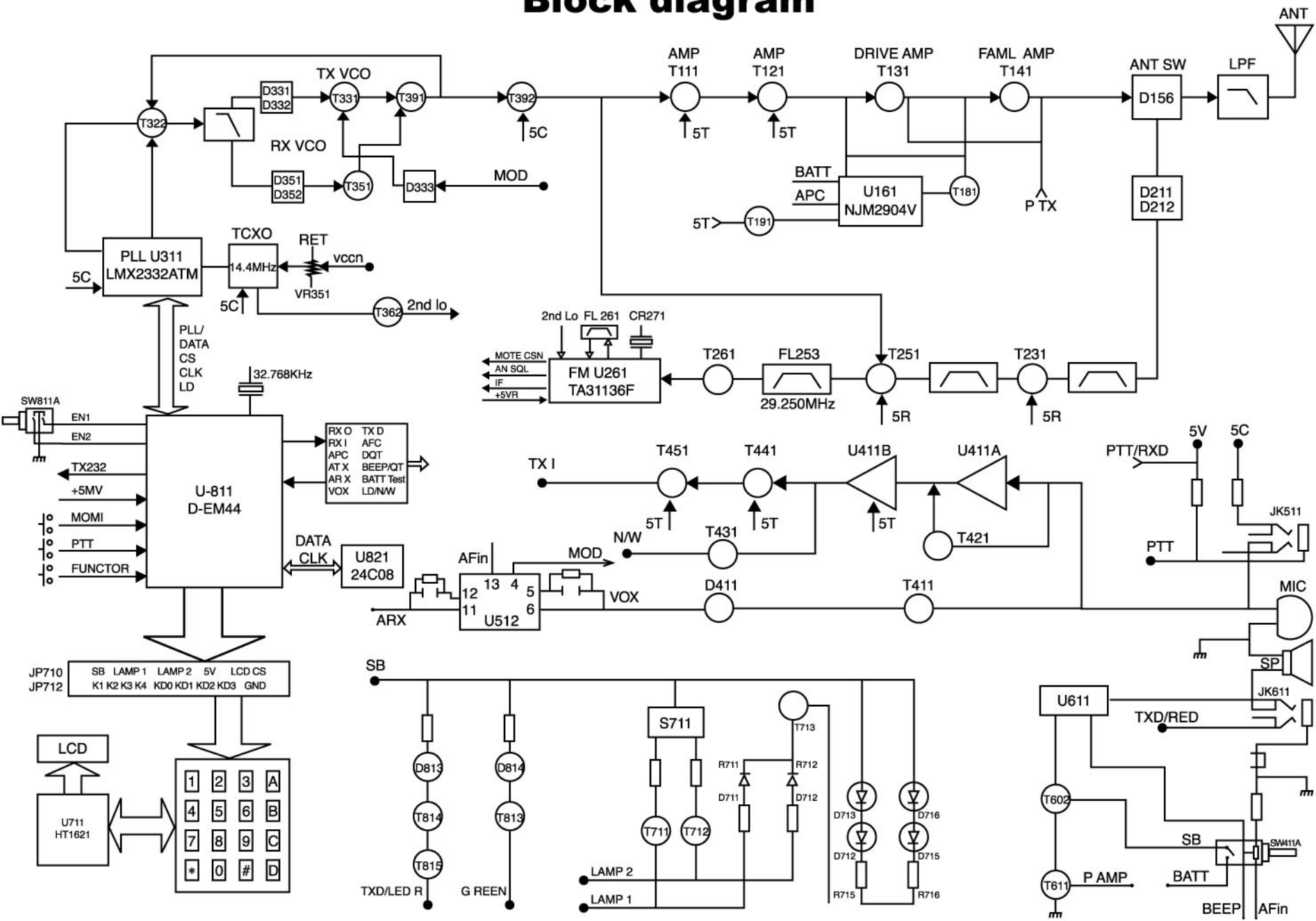


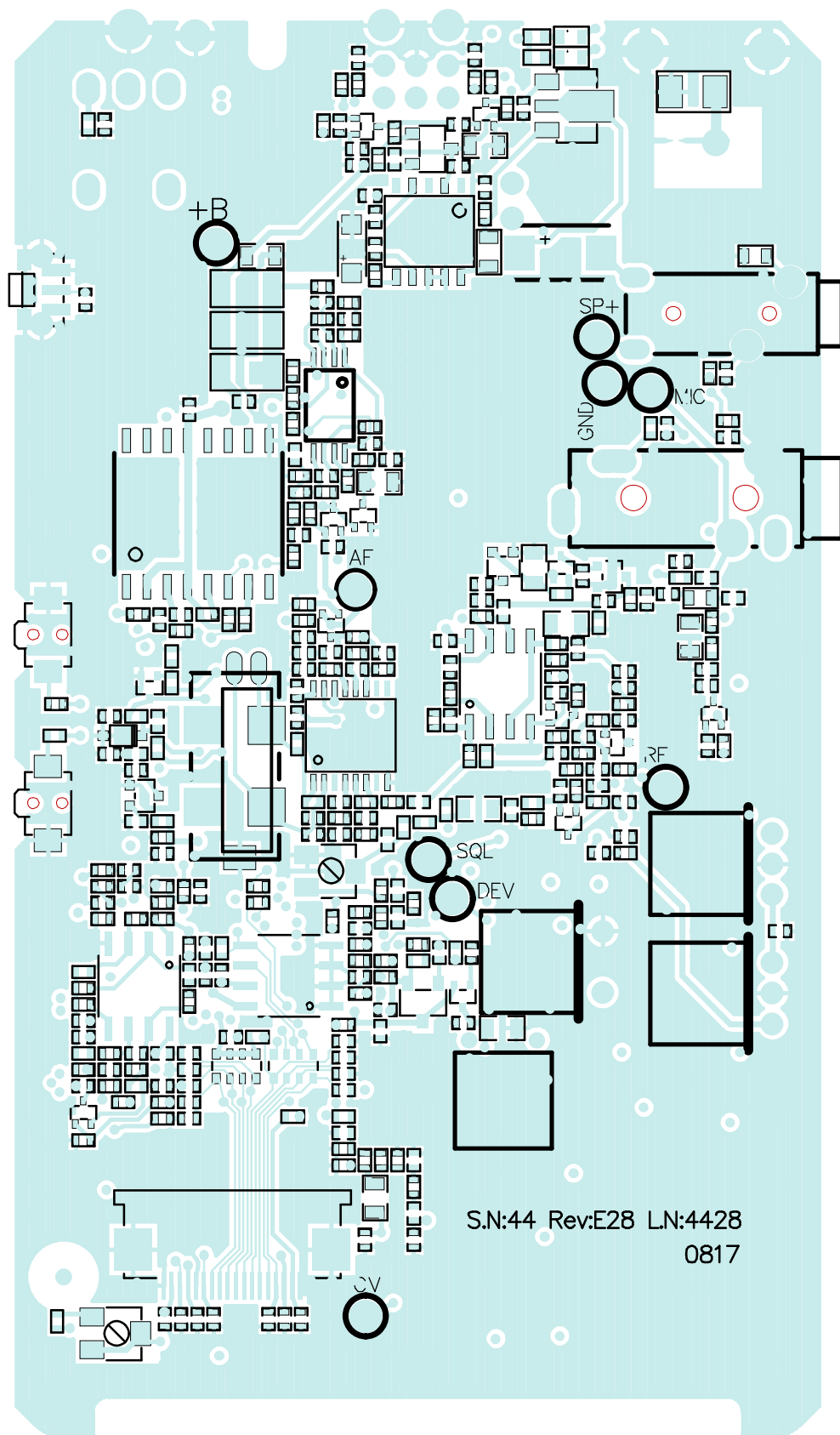




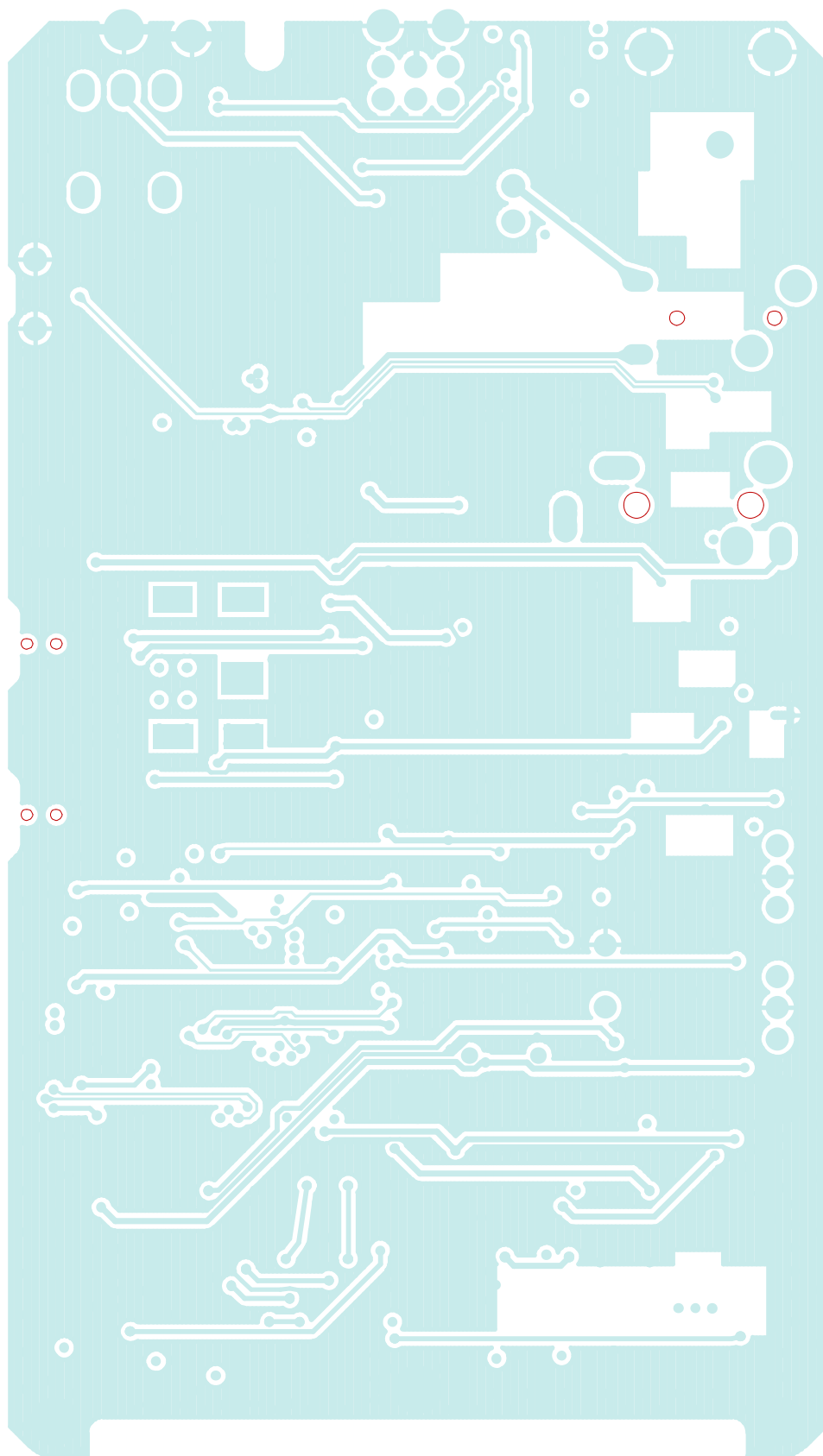


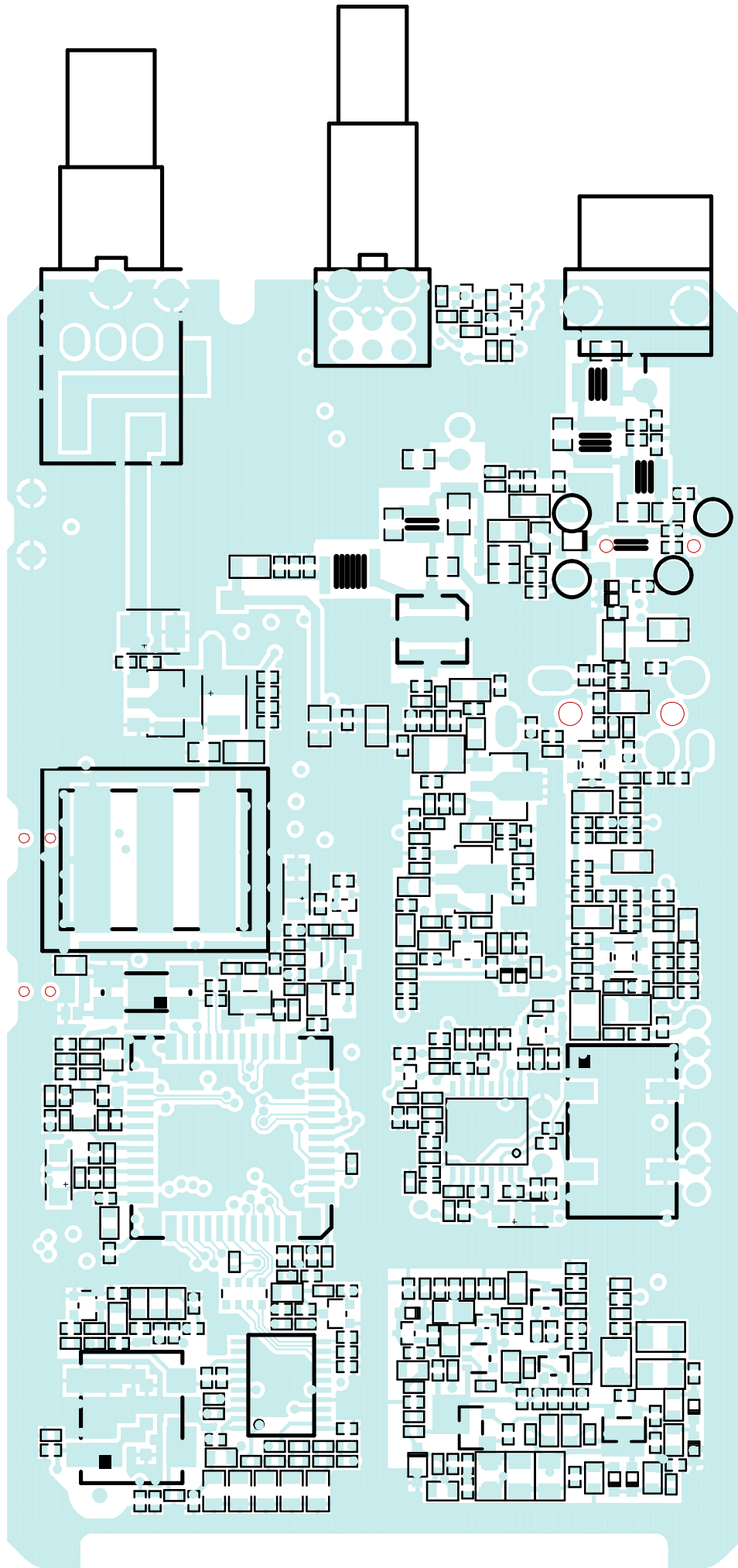
Block diagram

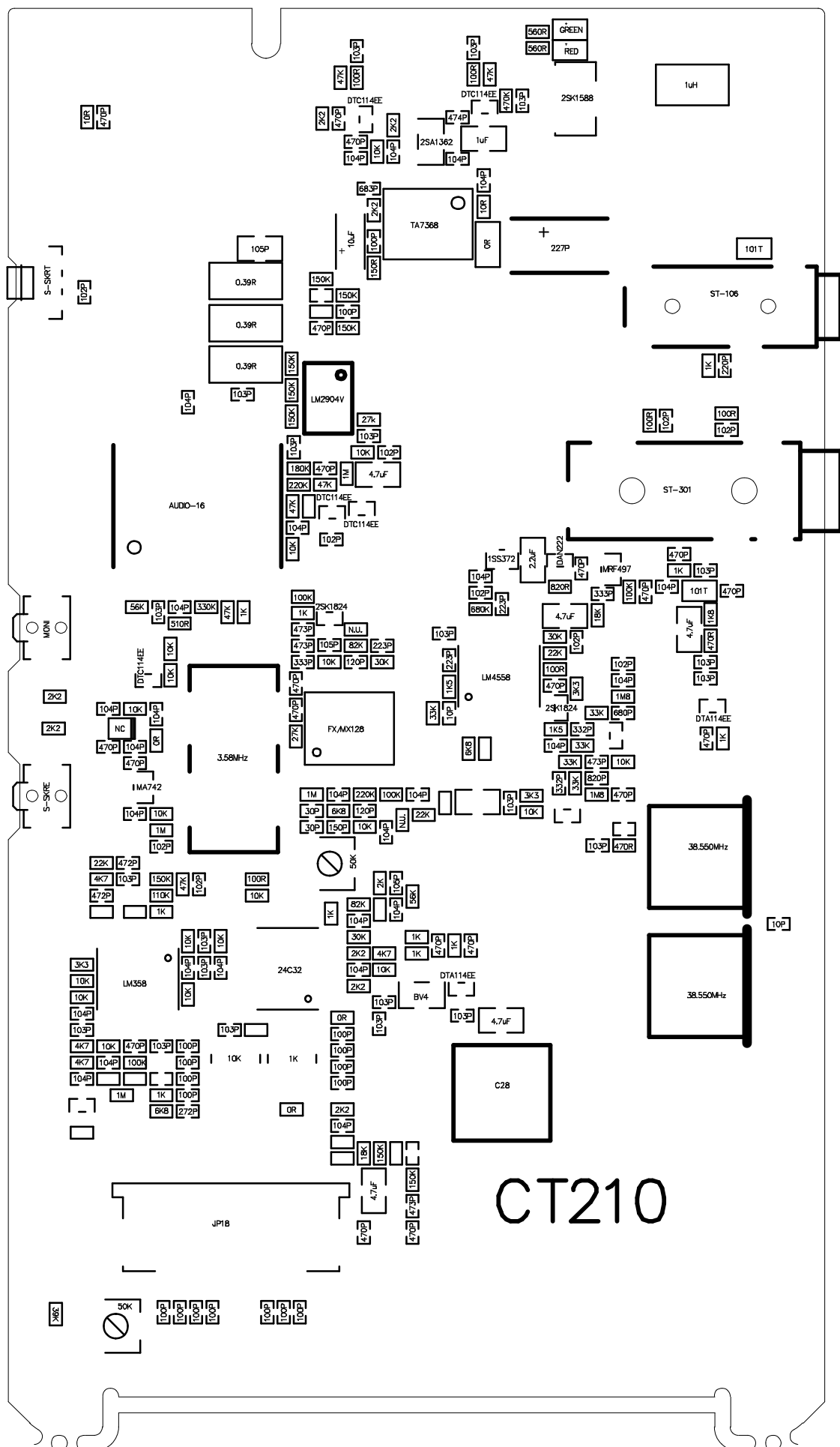


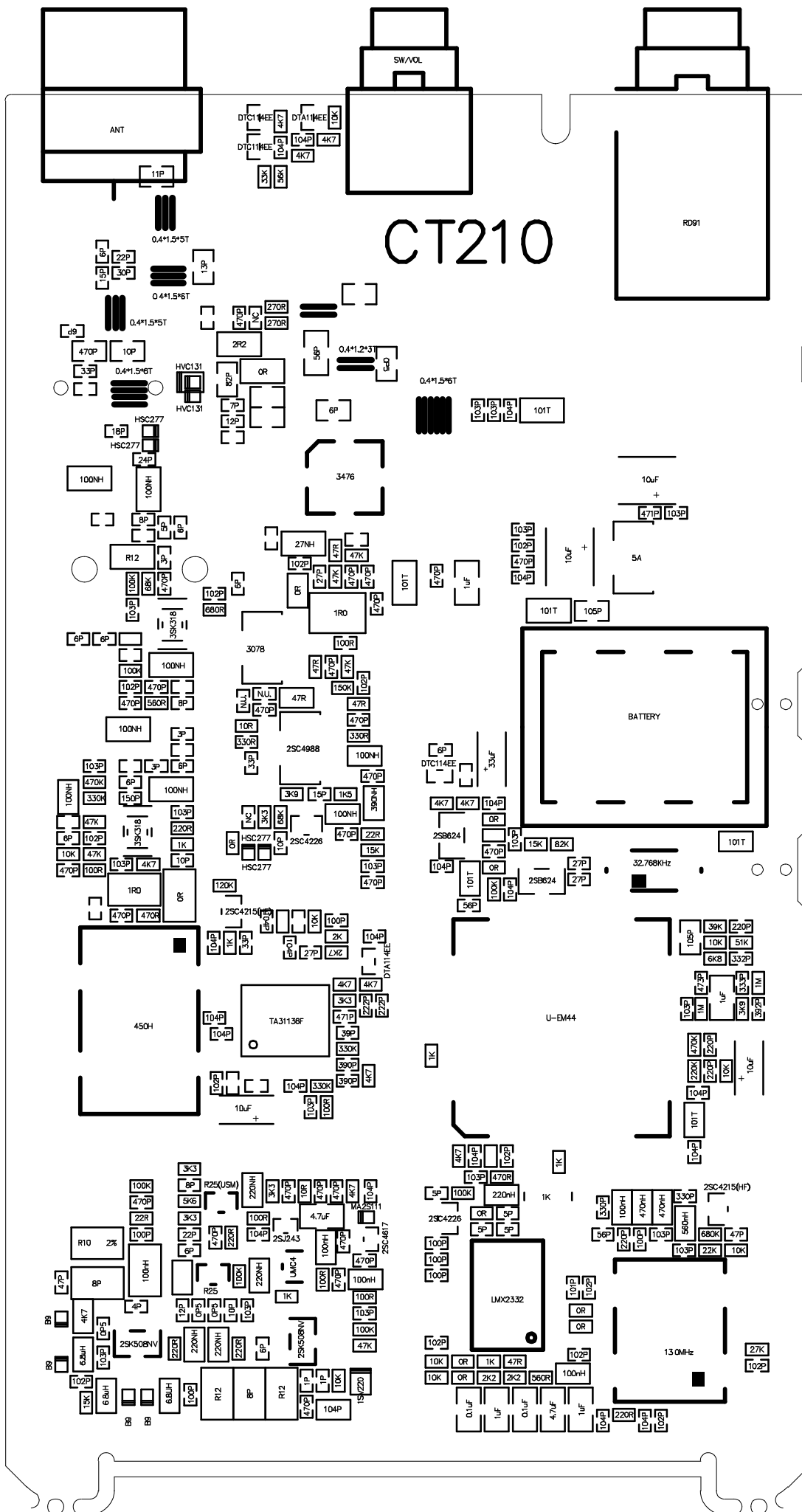


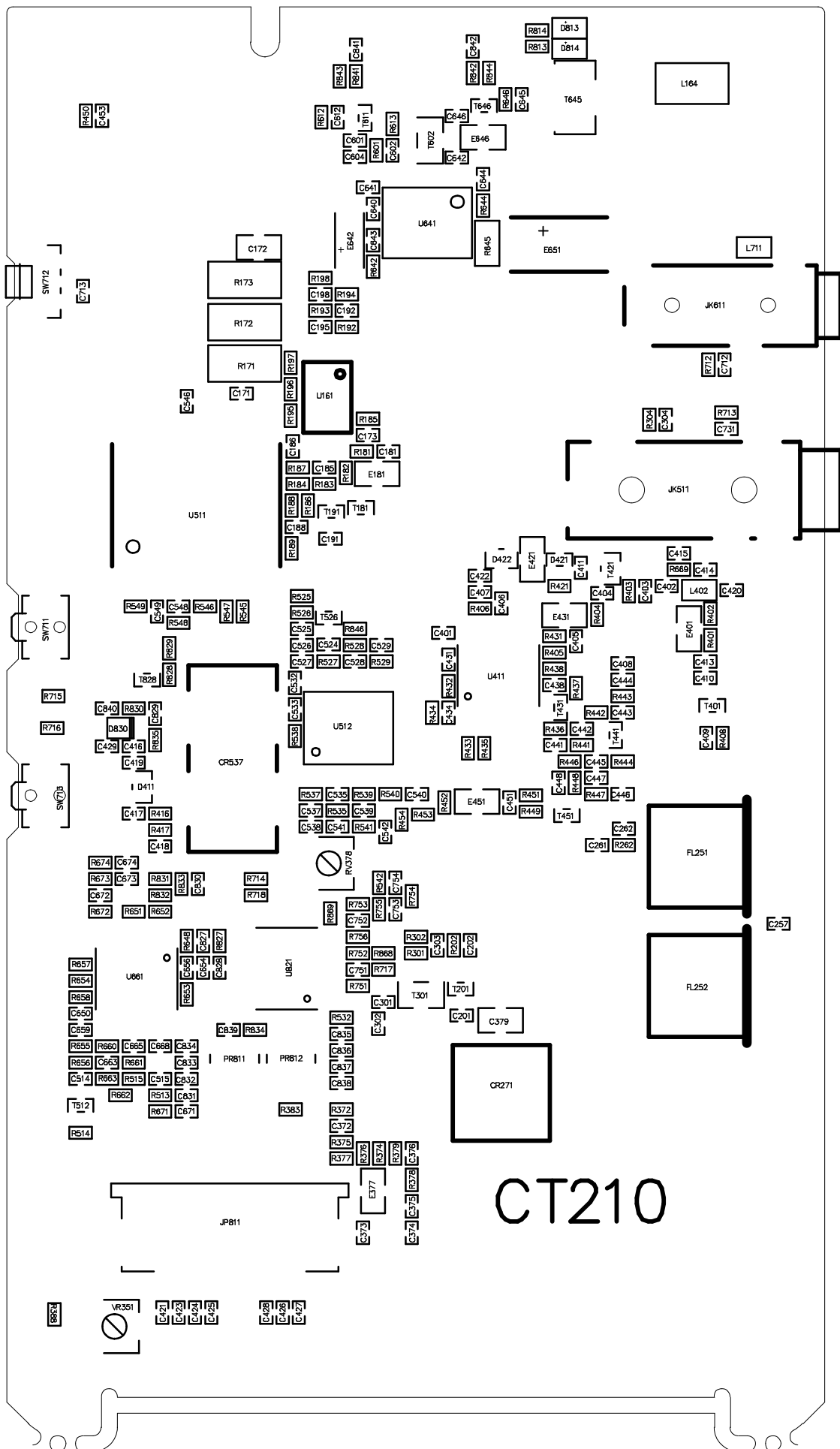
S.N:44 Rev:E28 LN:4428
0817

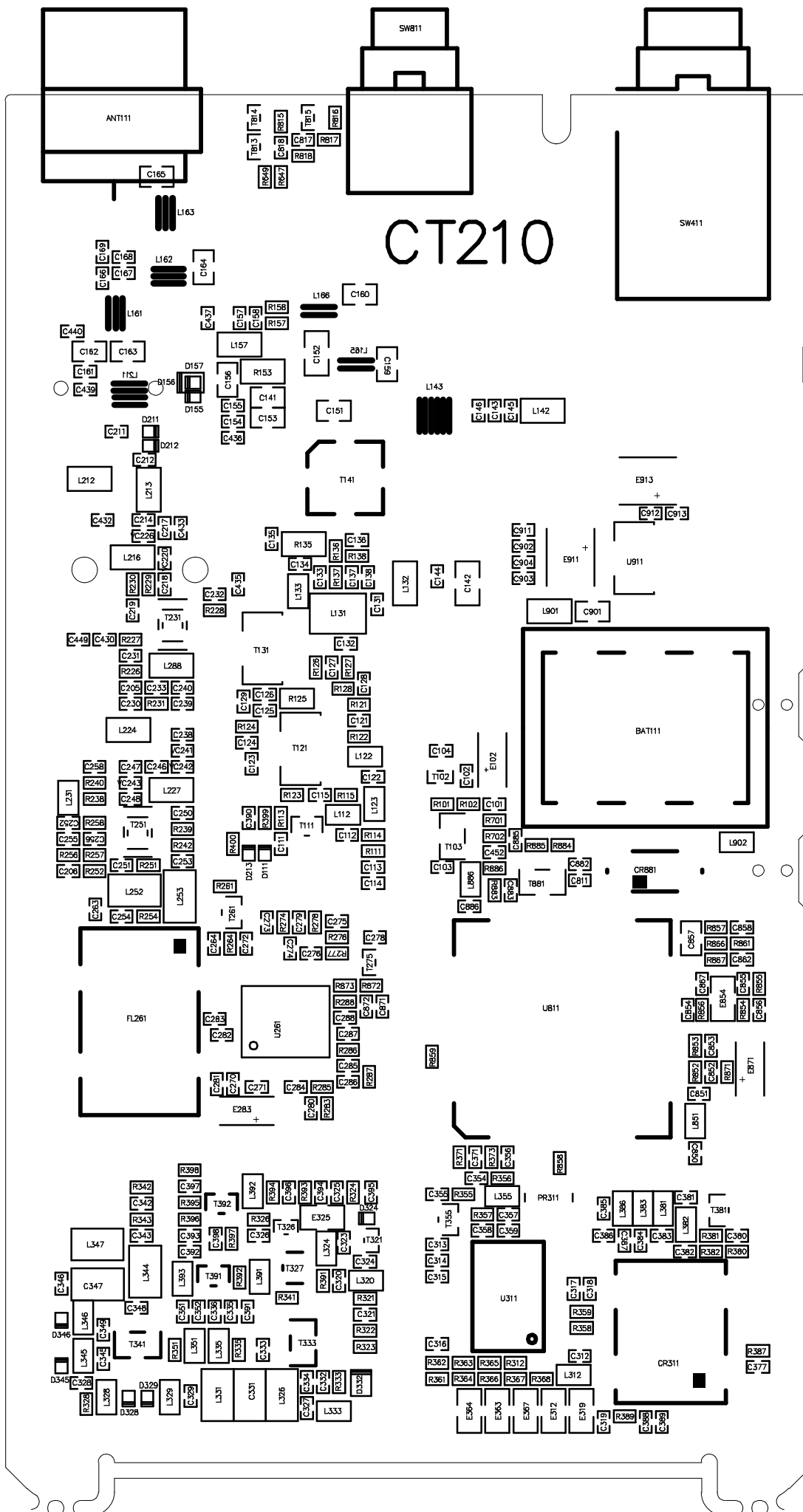


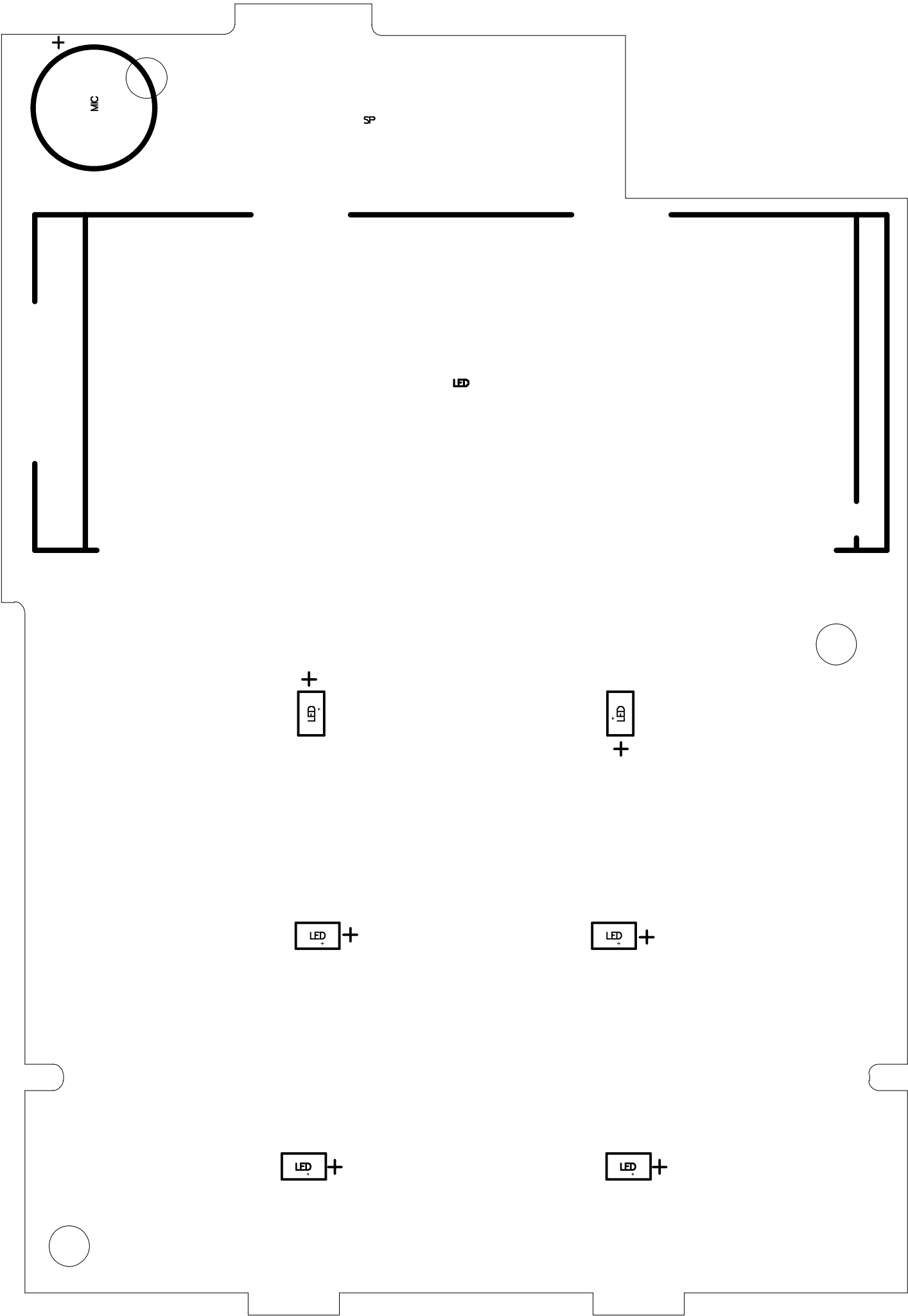


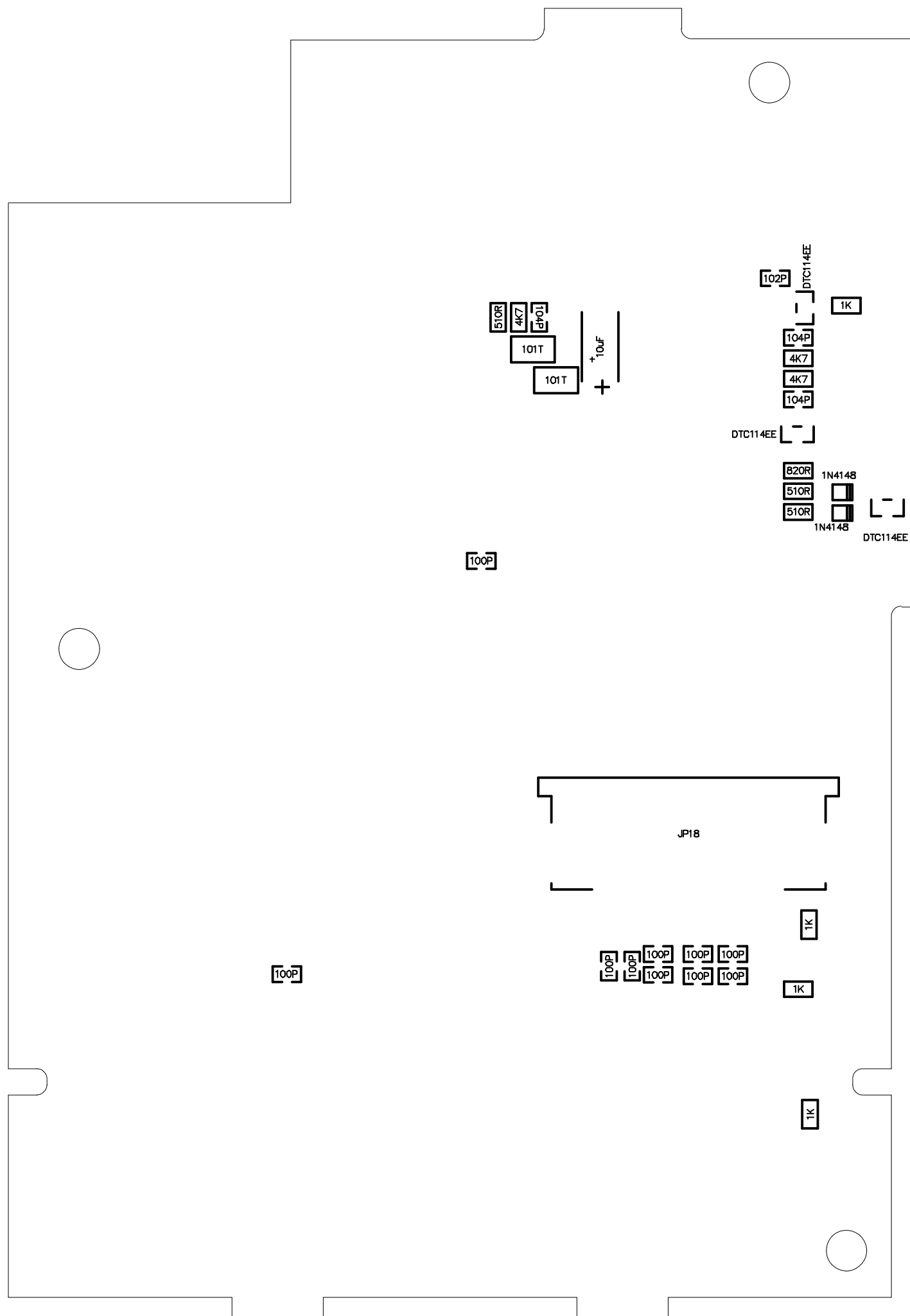


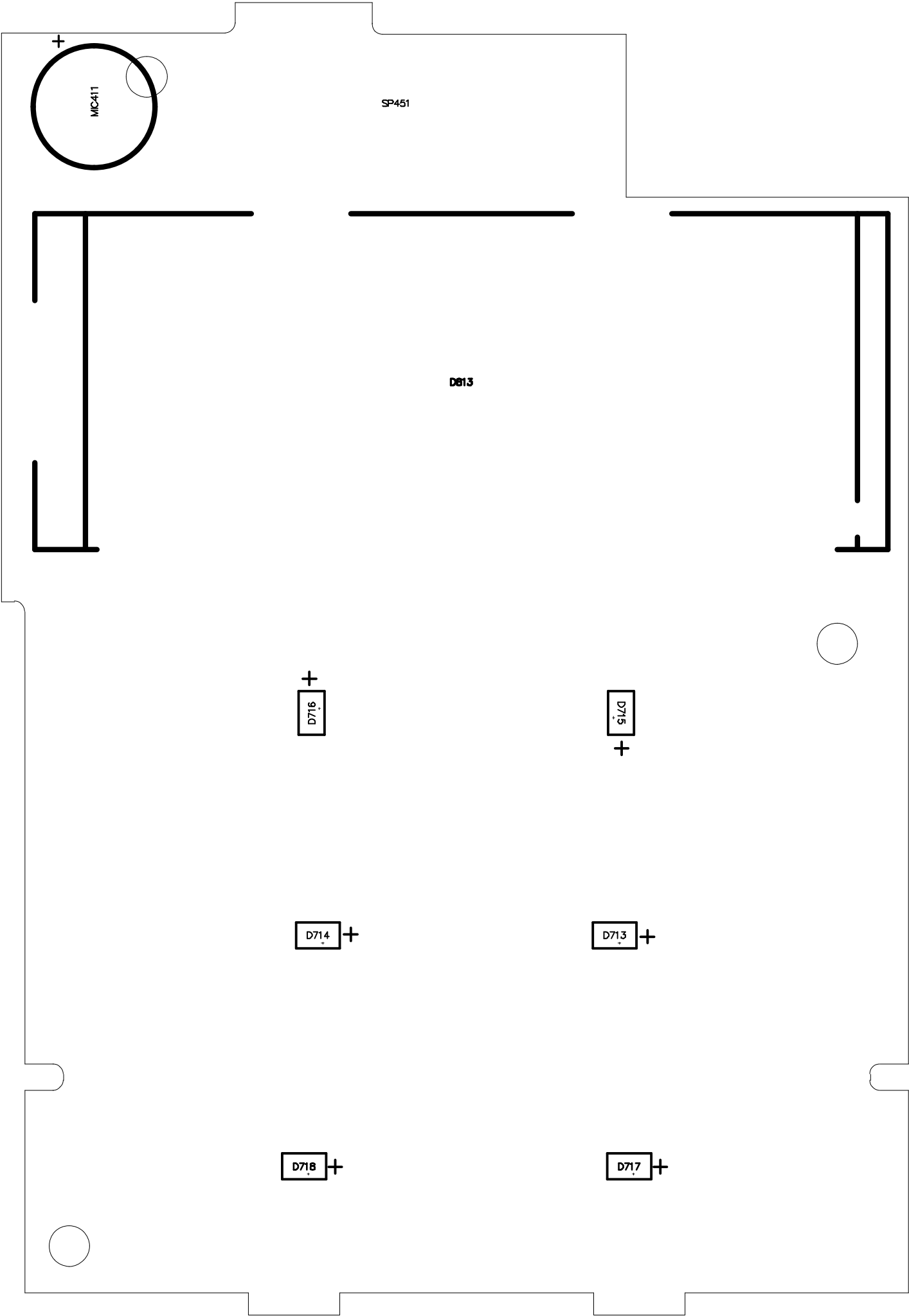


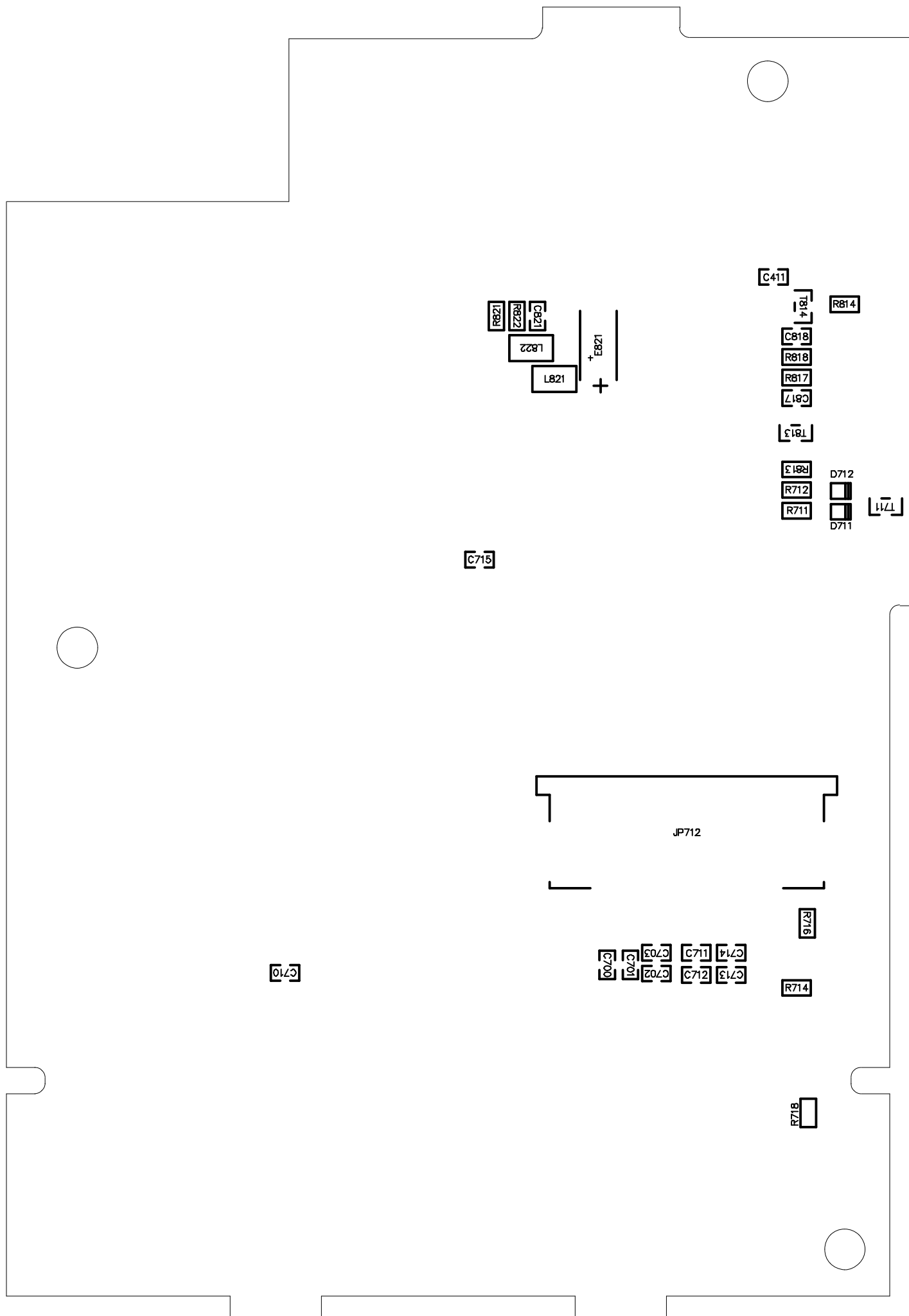


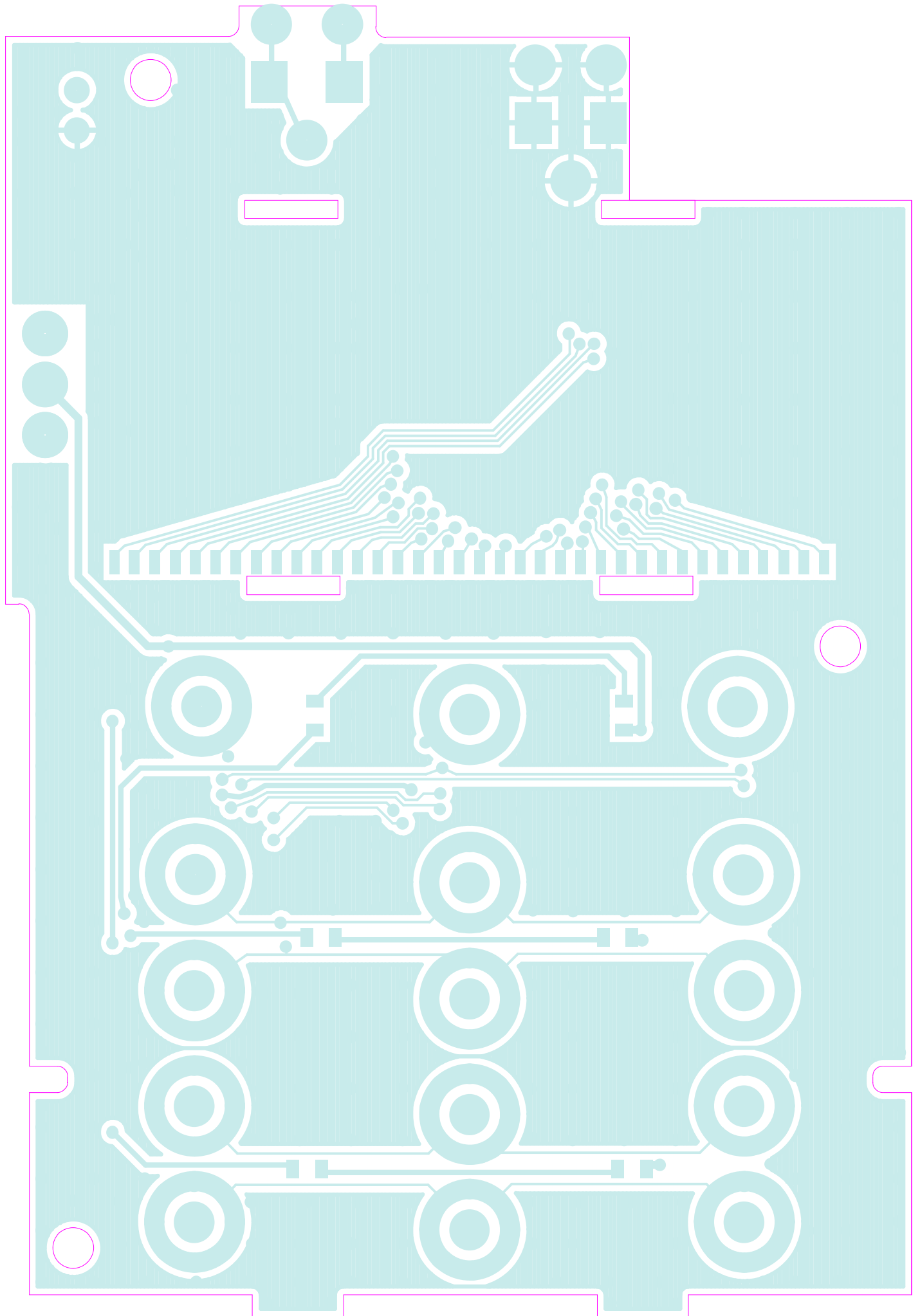


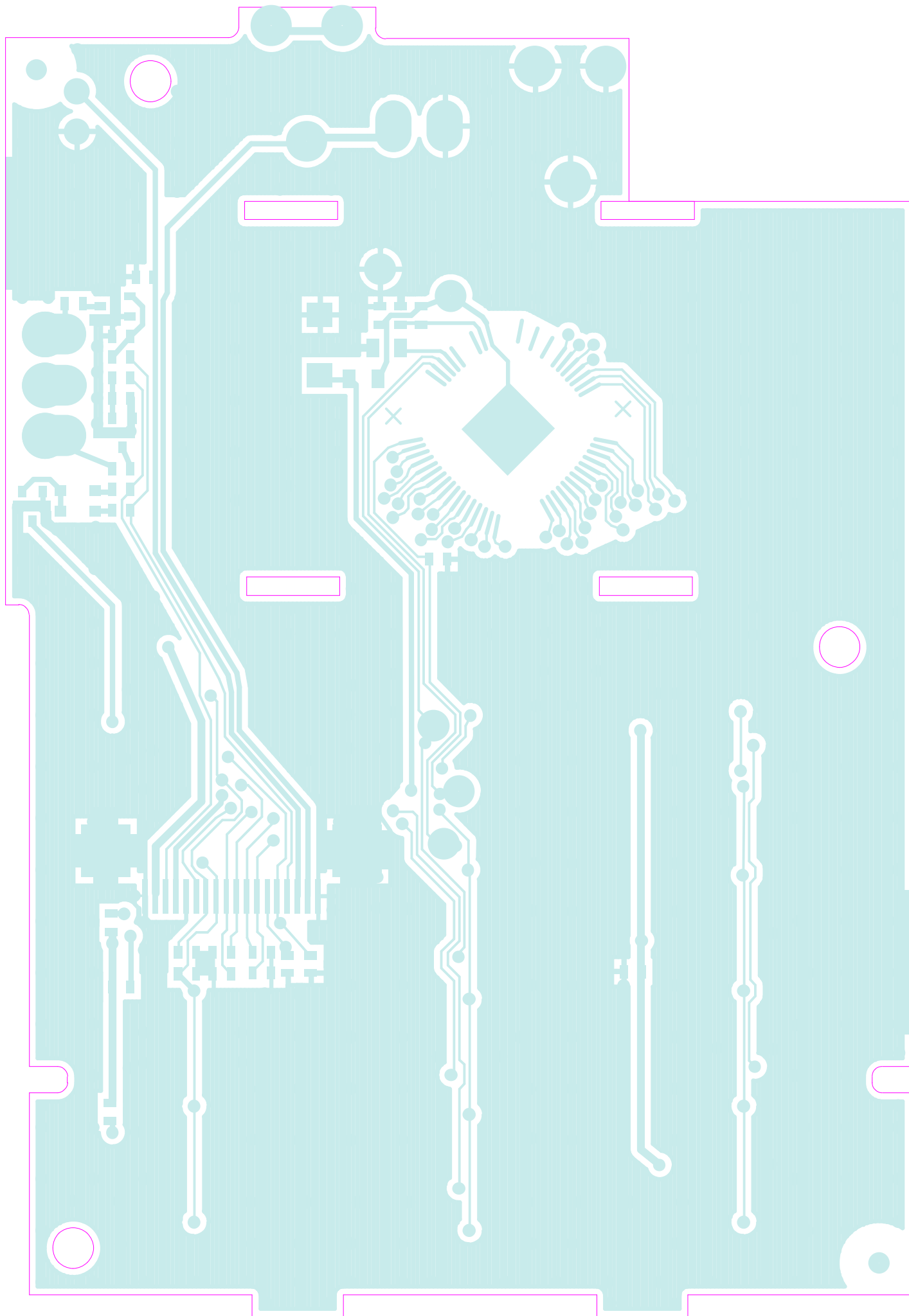












厦门市普星电子科技有限公司

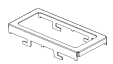
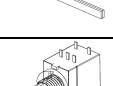
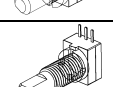
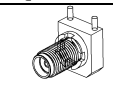
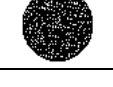
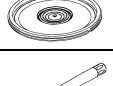
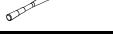
CT210

						VERSION	V1.00	2008.12.03
NO.	items	part No.	Description	Description	Qty	material	TECHNICS	
塑胶件								
1		PXCT210MK01	面壳housing	housing	1	ABS+PC	MOLD	
2		PXCT210CDZHK01	充电座后壳	charger's black case	1	ABS+PC	MOLD	
3		PXCT210XYM101	旋扭帽-1knob1	knob1	1		MOLD	
4		PXCT210XYM201	旋扭帽-2knob2	knob2	1		MOLD	
5		PXCT210DCCPJ01	电池触片架	battery case1	1	ABS+PC	MOLD	
6		PXCT210CPJ01	触片架	battery case2	1	ABS+PC	MOLD	
7		PXCT210MP01	铭牌	Name brand	1		MOLD	
8		PXCT210JP01	镜片	Len	1			
9		PXCT210PTTGDJ01	PTT固定架	PTT frame	1	ABS+PC	MOLD	
10		PXCT210DCXG01	电池下盖	Battery case(front)	1	ABS+PC	MOLD	
11		PXCT210GB01	背光板	Backlight board	1	PC	MOLD	
12		PXCT210DCG01	电池盖	Battery case(back)	1	ABS+PC	MOLD	
13		PXCT210DCK01	电池扣	battery lock	2	ABS+PC	MOLD	
14		PXCT210ZCQK01	座充前壳	charger's front case	1	ABS+PC	MOLD	
硅胶件								
15		PXCT210ES01	耳塞	Jack cover	1	silica gel	oil pressure	
16		PXCT210PTTJ01	PTT键	PTT key	1	silica gel	oil pressure	
17		PXCT210SZJ01	数字键	keypad	1	silica gel	pressure, Carve	
18		PXCT210ZFJFSQ01	正负极防水圈		1	silica gel	oil pressure	
19		PXCT210LBHD01	喇叭红点		1	silica gel	oil pressure	
20		PXCT210DP201	垫片-1	cushion	1	PVC	punch	
21		PXCT210LBD01	喇叭垫	speaker cushion	1	silica gel	oil pressure	
22		PXCT210FSQ01	防水圈	waterproof circle	1	silica gel	oil pressure	
五金件								
23		PXCT210JCP01	接触片	speaker connector	2	Phosphor copper +Gild	punch	
24		PXCT210LBGDJ01	喇叭固定架	Speaker fixing	1	stainless steel	punch	

确认:

审核:

制表:

25		PXCT210DCTP01	电池弹片	battery metal lock	1	spring steel+nickel	punch	
26		PXCT210DCLJP01	电池连接片	battery connector	3	Phosphor copper +Gild	punch	
27		PXCT210MLP01	唛拉片		1	stainless steel	punch	
28		PXCT210LK01	铝壳	Chassis	1	aluminium	压铸	
29		PXCT210ZFJJCP01	正负极接触片	battery connector on radio	3	Phosphor copper +nickel	punch	
30		PXCT210CDZJCP01	充电座接触片	charger pin	4	Phosphor copper +nickel	punch	
31		PXCT210ZFJCD01	正负极接触点	battey pin	4	Phosphor copper +Gild	punch	
32		PXCT210YJK01	液晶框	LCD frame	1		punch	
33		PXCT210LS101	螺丝-1 M2. 3*10	screw1	4	nigrescence		
34		PXCT210LS201	螺丝-2 M2. 0*3	screw2	10	nickel		
35		PXCT210LS301	螺丝-3 M1. 8*4	screw3	2	nickel		
电子件								
36		PXCT210YJ01	液晶	LCD	1			
37		PXCT210BMT01	斑马条	Zebra	1			
		PXCT210DYKG01	电源开关	Power switch	1			
		PXCT210DWQ01	定位器	Channel switch	1			
		PXCT210TXT01	天线头	Antenna connector	1			
38		PXCT210LBP01	喇叭布	Speaker cloth	1			
39		PXCT210LB01	喇叭	Speaker	1			
40		PXC210TX01	天线	Antenna	1			

确认:

审核:

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确认：

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确认：

审核：

制表：

CT210 BOM								DATE	
								12/08/2008	
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温补/中频	13.0/38.550								
MODEL	SPEC.	QTY	POSITION NO.						REMARK
CAPACITOR									
0P5	C0402	3	C336	C352	C349				
1P	C0402	2	C334	C332					
3P	C0402	3	C238	C246	VC220				
4P	C0402	1	C348						
5P	C0402	5		C217	C359	C358	C357	C355	
6P	C0402	12	C392	C169	C104	C449	C440	C435	
			C433	C430	VC242	VC243	C255	C333	
7P	C0402	1	C155						
8P	C0402	3	C214		C397	C239			
10P	C0402	5	C257	C434		C335	C111		
			C253						
12P	C0402	2	C154	C351					
15P	C0402	2	C115	C166					
18P	C0402	1	C211						
22P	C0402	2		C393	C168				
24P	C0402	1	C212						
27P	C0402	4	C811	C882	C133	C276			
30P	C0402	3	C167	C538	C537				

33P	C0402	3	C161	C123		C272			
39P	C0402	1	C287						
56P	C0402	2	C886	C386					
47P	C0402	2			C380	C346			
100P	C0402	25	C421	C423	C424	C425	C426	C427	
			C317	C428	C192	C831	C832	C833	
			C834	C835	C836	C837	C838	C643	
			C343	C275	C313	C314	C315	C384	C329
102P	C0402	24	C418	C830	C304	C181	C191	C713	
			C731	C405	C407	C408	C256	C205	
			C232	C328	C318	C312	C356	C377	
			C389	C128	C134	C281	C316	C902	
103P	C0402	40	C201	C301	C171	C173	C186	C451	
			C413	C549	C401	C410	C414	C302	
			C645	C654	C659	C668	C673	C839	
			C258	C250	C251	C219	C321	C345	
			C391	C885	C854	C383	C113	C143	
			C146	C280	C382	C911	C913	C354	
			C261	C827	C841	C842			
104P	C0402	48	C753	C751	C752	C188	C441	C444	
			C535	C540	C542	C602	C604	C642	
			C644	C372	C546	C548	C416	C402	
			C417	C422	C514	C650	C656	C663	
			C840	C828	C829	C326	C395	C371	
			C817	C818	C851	C883	C388	C101	
			C103	C145	C264	C282	C283	C284	

			C273	C274	C278	C319	C903	C850	
105P	C0402	2	C754	C524					
120P	C0402	2	C528	C539					
150P	C0402	2	C541	C248					
220P	C0402	5	C712	C858	C852	C853	C387		
222P	C0402	2	C871	C872					
223P	C0402	3	C529	C406	C431				
272P	C0402	1	C671						
330P	C0402	2	C381	C385					
332P	C0402	3	C442	C448	C862				
333P	C0402	3	C527	C404	C855				
390P	C0402	2	C285	C286					
392P	C0402	1	C856						
470P	C0402	50	C411	C420	C419	C374	C453	C202	
			C288	C912	C303	C185	C195	C446	
			C601	C612	C403	C409	C665	C373	
			C429	C415	C218	C206	C230	C233	
			C254	C320	C327	C342	C396	C398	
			C323	C324	C325	C394		C112	
			C114	C121	C122	C125	C127	C131	
			C137	C138	C144	C157	C904	C452	
			C438	C532	C533				
472P	C0402	2	C674	C672					
473P	C0402	5	C375	C445	C525	C526	C867		
474P	C0402	1	C646						
680P	C0402	1	C443						

683P	C0402	1	C641						
820P	C0402	1	C447						
0.5P	C0402	1	C159						
6P	C0603	1	C151						
10P	C0603	1	C163						
11P	c0603	1	C165						
13P	C0603	1	C164						
82P	C0603	1	C156						
104P	C0603	1	L333						
105P	C0603	2	C901	C857					
470P	C0603	1	C162						
15P	C0805								
8P	C0805	2	C347	C331					
56P	C0805	1	C152						
105P	C0805	1	C172						
0.1uF	C0805	2	E364	E367					
1uF	C0805	5	E646	E854	C142	E319	E363		
2.2uF	C0805	1	E421						
4.7uF	C0805	7	C379	E181	E401	E377	E431	E325	
			E312						
10uF	EIA3216	3	E642	E871	E283				
33uF	EIA3216	1	E102						
10uF	EIA3528	2	E911	E913					
227P	EIA6032	1	E651						
RESISTOR									
0R	R0402	11	R383	R532	R835	R359	R358	R701	

			R886	R357	R363	R364	R400		
1K	R0402	17	R869	R301	R669	R202	R302	R712	
			R545	R408	R526	R513	R652	R242	
			R858	R341	R365	R264	R859		
1K5	R0402	3	R436	R432	R115				
1K8	R0402	1	R402						
2K	R0402	2	R542	R276					
2K2	R0402	10	R715	R716	R751	R752	R612	R613	
			C640	R372	R366	R367			
2K7	R0402	1	R277						
3K3	R0402	8	R437	R451	R657	R394	R398	R396	
			R288	R399					
3K9	R0402	2	R854	R123					
4K7	R0402	15	R868	R655	R656	R673	R251	R324	
			R371	R815	R817	R818	R872	R873	
			R101	R102	R287				
5K6	R0402	1	R395						
6K8	R0402	4	R535	R433	R671	R867			
10K	R0402	28	R181	R189	R444	R449	R717	R527	
			R541	R601	R827	R416	R648	R654	
			R658	R653	R660	R718	R828	R829	
			R830	R256	R333	R816	R866	R871	
			R361	R362	R380	R278			
10R	R0402	4	R450	R644	R393	R124			
15K	R0402	3	R328	R885	R111				
18K	R0402	2	R376	R404					

22K	R0402	4		R453	R405	R674	R382		
22R	R0402	2	R343	R114					
27K	R0402	3	R387	R185	R538				
30K	R0402	3	R529	R431	R756				
33K	R0402	6	R441	R442	R446	R448	R434	R649	
39K	R0402	2	R388	R857					
47K	R0402	12	R833	R183	R188	R843	R844	R547	
			R258	R257	R323	R127	R137	R138	
47R	R0402	4	R121	R126	R136	R312			
51K	R0402	1	R861						
56K	R0402	3	R754	R549	R647				
68K	R0402	2	R229	R113					
82K	R0402	3	R753	R528	R884				
100K	R0402	11	R540	R403	R525	R661	R230	R226	
			R322	R342	R392	R883	R355		
100R	R0402	12	R304	R438	R713	R714	R841	R842	
			R252	c132	R326	R391	R321	R283	
110K	R0402	1	R832						
120K	R0402	1	R261						
150K	R0402	10	R378	R831	R198	R192	R194	R195	
			R196	R197	R374	R128			
150R	R0402	1	R642						
180K	R0402	1	R187						
220K	R0402	3	R184	R539	R852				
220R	R0402	5	R239	R335	R351	R389	R397		
270R	R0402	2	R157	R158					

330K	R0402	4	R546	R238	R285	R286			
330R	R0402	2	R122	C124					
470K	R0402	3	R646	R240	R853				
470R	R0402	4	R401	R262	R254	R356			
510R	R0402	1	R548						
560R	R0402	4	R813	R814	R231	R368			
680K	R0402	2	R406	R381					
680R	R0402	1	R228						
820R	R0402	1	R421						
1M	R0402	6		R182	R537	R417	R662	R855	
			R856						
1M8	R0402	2	R443	R447					
0R	R0603	1		L133					
4K7	R0603	1		L346					
47R	R0603	1	R125						
0R	R0805	3	R645	R153	L253				
0.39R	R1206	3	R171	R172	R173				
10K	RP-1206-4	1	PR811						
1K	RP-1206-4	2	PR812	PR311					
50K	RV1208	2	VR351	RV378					
INDUCTANCE									
27NH	L0603	1	R135						
100NH	L0603	12	L231	L112	L122	L320	L312	L386	
			L213	L212	L227	L224	L288	L324	
220NH	L0603	5	L392	L391	L351	L355	L335		
390NH	L0603	1	L123						

470nH	L0603	2	L381	L383					
560nH	L0603	1	L382						
101T	L0603	5	L711	L402	L902	L851	L886		
6.8uH	L0603	3	L328	L345	L329				
101T	L0805	3	L132	L142	L901				
R10	L0805	2	L347		L344				
R12	L0805	3	L216	L331	L326				
2R2	L0805	1	L157						
1R0	L0805	2	L131	L252					
1uH	L1310	1	L164						
COIL									
0.4*1.2*3T	3T	1	L165						
0.4*1.5*5T	5T	2	L163	L161					
0.4*1.5*6T	6T	3	L162	L143	L211				
DIODE									
B9	D_ESC	4	D328	D329	D346	D345			
MA2S111	D_ESC	1	D324						
1SV220	D_USC	1	D332						
GREEN	D0603	1	D813						
RED	D0603	1	D814						
HSC277	D-ESC	4	D211	D212	D111	D213			KDS114E代
HVC131	D-ESC	2	D155	D157					
DAN222	D-ESM-DAN222	1	D421						
DYNATRON									
2SC4617	T_ESM	1	T321						

2SJ243	T_ESM	1	T326						
2SK508NV	T_TSM	2	T333	T341					
UMC4	T_USV	1	T327						
3476	T-2-5N1A-2SK3476	1	T141						
2SK1824	T-ESM-2SK1824	2	T431	T526					
DTA114EE	T-ESM-DTA114EE	4	T201	T401	T815	T275			KRA302E代
DTC114EE	T-ESM-DTA114EE	8	T611	T646	T828	T813	T814	T102	KRC402E代
			T181	T191					
2SC4988	T-SOT89-2SC4988	1	T121						2SC3357代
2SK1588	T-SOT89-2SK1588	1	T645						
3078	T-SOT89-2SK3078	1	T131						
5A	T-SOT89-5A	1	U911						
2SA1362	T-TSM-2SB624	1	T602						
2SB624	T-TSM-2SB624	3	T881	T103	T301				
3SK318	T-US4	2	T231	T251					
1SS372	T-USM-1SS372	1	D422						
MA742	T-USM-1SS372	1	D411						
2SC4215(HF)	T-USM-2SC3356(R25)	2	T381	T261					KTC4082代
2SC4226	T-USM-2SC3356(R25)	4	T355	T111	T392	T391			
MRF497	T-USM-MRF497	1	T421						KTC4082代
IC									
U-EM44	U-QFP44	1	U811						
AUDIO-16	U-SOIC16	1	U511						
24C32	U-SOP8	1	U821						

LM358	U-SOP8	1	U661						
LM4558	U-SOP8	1	U411						
TA7368	U-SSOP10-225-1.0	1	U641						
FX/MX128	U-SSOP16-225	1	U512						
TA31136F	U-SSOP16-225	1	U261						
LMX2332	U-SSOP20-225	1	U311						
LM2904V	U-SSOP8	1	U161						
OTHER									
38.550MHz	FL-UM-5-3S	2	FL251	FL252					
3.58MHz	FX-CS20	1	CR537						
32.768KHz	FX-DS0603	1	CR881						
13.0MHz	FX-DS0971	1	CR311						
S-SKRE	S-SKRE	2	SW713	SW711					
S-SKRT	S-SKRT-1	1	SW712						
JP18	JP-18-2	1	JP811						
BATTERY	BATT TUCHER-PX34	1	BAT111						
C28	FX-6060-2S	1	CR271						
450H	FL-PBFC455R	1	FL261						
ST-106	JK-ST-106	1	JK611						
ST-301	JK-ST-301-6-F	1	JK511						
RD91	S-R09760NS	1	SW411						
SW/VOL	S-RD82-T02	1	SW811						
ANT	ANT	1	ANT111						