



PX-888 VHF SERVICE MANUAL



XIAMEN PUXING ELECTRONICS
SCIENCE & TECHNOLOGY CO., LTD.

GENERAL

INTRODUCTION

SCOPE OF THIS MANUAL

This manual is intended for use by experienced technicians familiar with similar types of commercial grade communications equipment. It contains all required service information for the equipment and is current as if the publication data. Changes which may occur after publication are covered by either Service Bulletins OR Manual Revisions. These are issued as required.

ORDERING REPLACEMENT PARTS

When ordering replacement parts or equipment information, the full part identification number should be included. This applies to all parts: components, kits, or chassis.

PERSONNEL SAFETY

The following precautions are recommended for personnel safety:

- 1) DO NOT transmit until all RF connectors are verified secure and any open connectors are properly terminated.
- 2) SHUT OFF and DO NOT operate this equipment near electrical blasting caps or in an explosive atmosphere.
- 3) This equipment should be serviced by a qualified technician only.

SERVICE

This radio is designed for easy servicing .Refer to the schematic diagrams, printed circuit board views, and alignment procedures contained within.

CIRCUIT DESCRIPTION

— . FREQUENCY CONFIGURATION

The frequency configuration is shown in Figure 1.

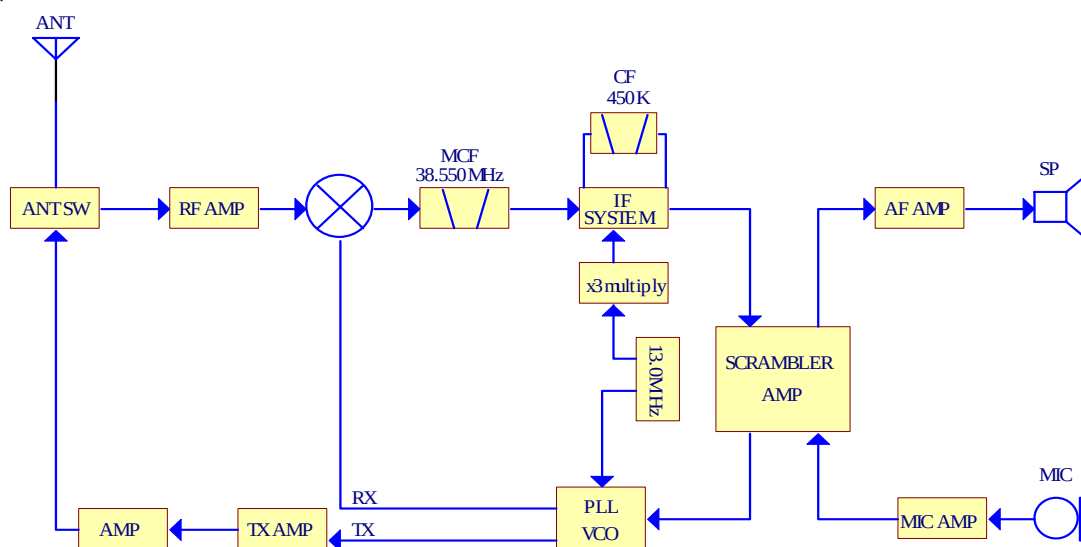


Fig.1 Frequency configuration

二.RECEIVER

1. RF amplifier

The signal from the antenna is passed through a transmission/reception selector circuit and a three levels LC band-pass filter, and 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.

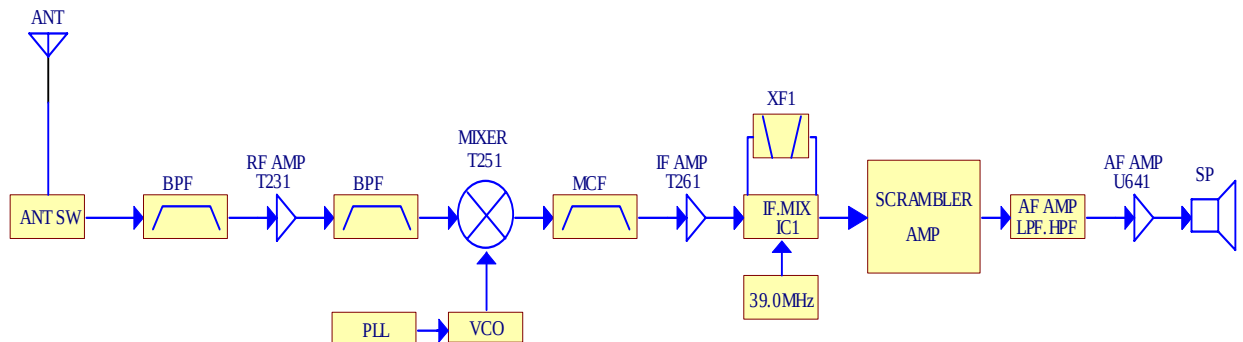


Fig.2 Receiver section configuration

2. First 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 two-stage monolithic crystal filters (MCF).

3. IF amplifier

The first IF signal is amplified by T261 and enters IC1. The IF system IC provides a second mixer, second local oscillator, limiting amplifier, quadrature detector and RSSI (Received Signal Strength Indicator). The second mixer mixes the first IF signal with the 39 MHz of the second local oscillator output and produces the second IF signal of 450KHz. The second IF signal is passed through the ceramic filter (XF1) to remove the adjacent channel signals. The filtered second IF signal is amplified by the limiting amplifier and demodulated by the quadrature detector with the ceramic discriminator. The demodulated signal is routed to the audio circuit.

4. Wide/Narrow Switching Circuit

Narrow and Wide settings can be made for each channel by switching the demodulation level. The WIDE (low level) and NARROW (high level) data is output from U811, pin 40.

When a WIDE (low level) data is received, T275 turn on. When a NARROW (high level) data is received, T275 turn off.

T275 turns off/on with the Wide/Narrow data and the U261 detector output level is switched to maintain a constant output level during wide or narrow signals.

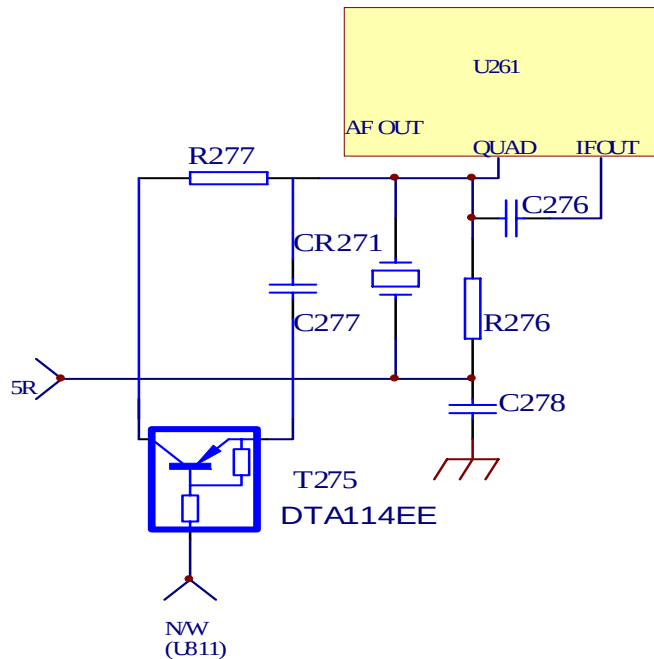


Fig.3 Wide/Narrow switching circuit

5. AF amplifier

The frequency characteristics of the audio signal output by the FM detector are corrected by filter and deemphasis circuit, then goes to the MCU for processing. The audio signal is then passed through an AF variable resistor and amplified by power amplifier U641 to obtain the desired output.

6. Squelch and mute circuits

Part of the AF signal the output detected by U261 enters the CPU for processing, and the noise component is amplified and rectified by a filter and an amplifier to produce a DC voltage corresponding to the noise level.

The DC signal from the U261 goes to the analog port of the microprocessor (U811). U811 determines whether to output sounds from the speaker by checking whether the input voltage is higher or lower than the preset value. To output sounds from the speaker, U811 sends a high signal to the P-AMP, and turns U641 on through T602, T646, T611 and T645.

7. S meter

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

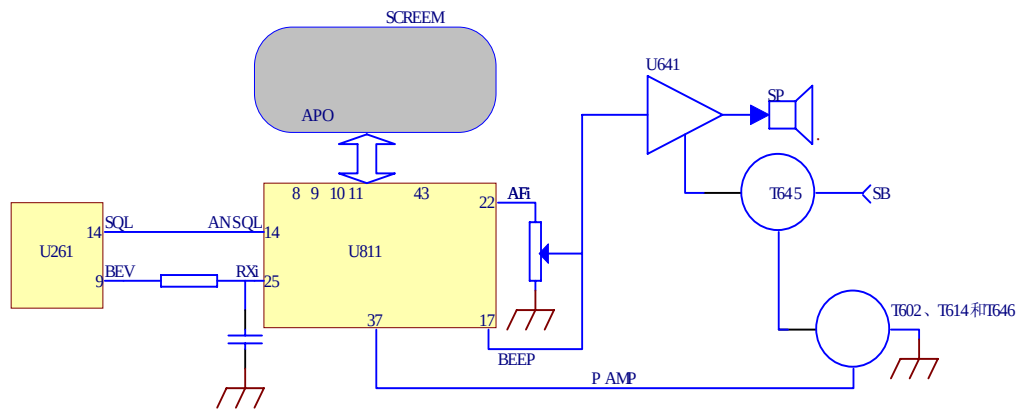


Fig.4 AF amplifier, squelch, and mute circuits

Receive Signalling

(1) QT/DQT

The output signal from U261 enters the microprocessor (U811), U811 determines whether the QT or DQT matches the preset value, and controls the P-AMP and the speaker output sounds according to the squelch results.

三. PLL CIRCUIT

1. PLL

The output from the 13.0 MHz reference oscillator consisting of X1 is divided by U371 to produce a 5 KHz or 6.25 KHz reference frequency. The comparison frequency is obtained by amplifying the VCO output by T355 and dividing it by a programmed counter. The output signal from the phase comparator (U311) is filtered through a low-pass filter and passed to the VCO to control the oscillator frequency.

2. VCO

The oscillator frequency is controlled by applying the VCO control voltage, obtained from the phase comparator, to the varactor diodes (D328 and D329 in transmit mode and D345 and D346 in receive mode). T326 turn on in transmit mode; T327 turn on in receive mode. The outputs from T341 and T333 are amplified by T391 and sent to the RF amplifiers (T392).

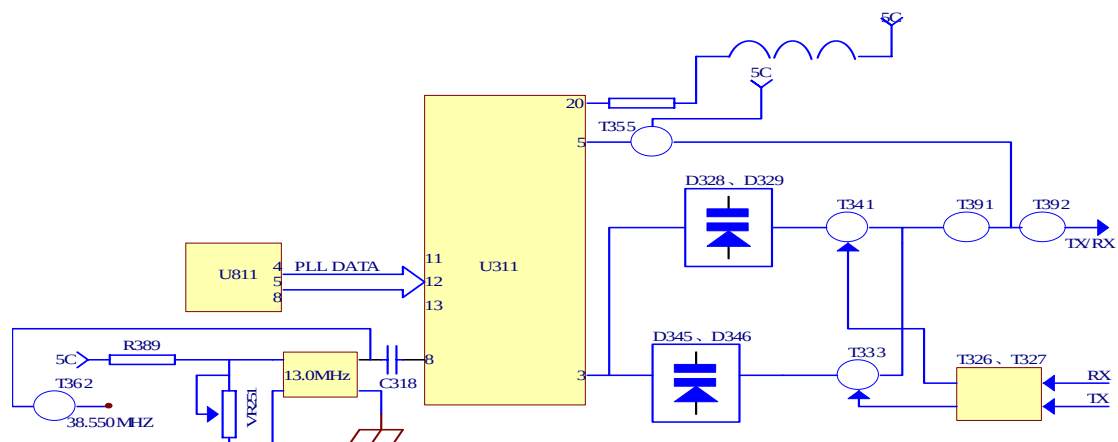


Fig.5 PLL circuit

四. Transmitter System

1. Microphone Amplifier

The signal from the microphone passes through U411. When encoding DTMF, it is turned OFF for muting the microphone input signal by T421.

The signal passes through U411 for the maximum deviation adjustment, and sent to U512 for signal processing, and goes to the VCO modulation input at last.

2. Drive and Final Amplifier

The signal from the T/R switch (D111) is amplified by the pre-drive (T111 and T121) and drive amplifier (T131) to 50Mw. The output of the drive amplifier is amplified by the RF power amplifier (T141) to 4 W (1W when the power is low). High/Low power is adjusted by the APC circuit. The output of the RF power amplifier is then passed through the harmonic filter and antenna switch (D156 and D157) and applied to the antenna terminal,

3. APC Circuit

The APC circuit always monitors the current flowing through the RF power amplifier (T141) and keeps a constant current. The voltage drop at R127, R128 and R129 is caused by the current flowing through the RF power amplifier and this voltage is applied to the differential amplifier U161 (1/2). U161 (2/2) compares the output voltage of U161 (2/2) with the reference voltage from U811. The output of U161 (2/2) control the VG of the RF power amplifier, Drive amplifier and Pre-Drive amplifier to make both voltages the same. The change of power high/low is carried out by the change of the reference voltage.

4. 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 D12, D13 and D14, is turned on during transmission and off during reception to switch the signal.

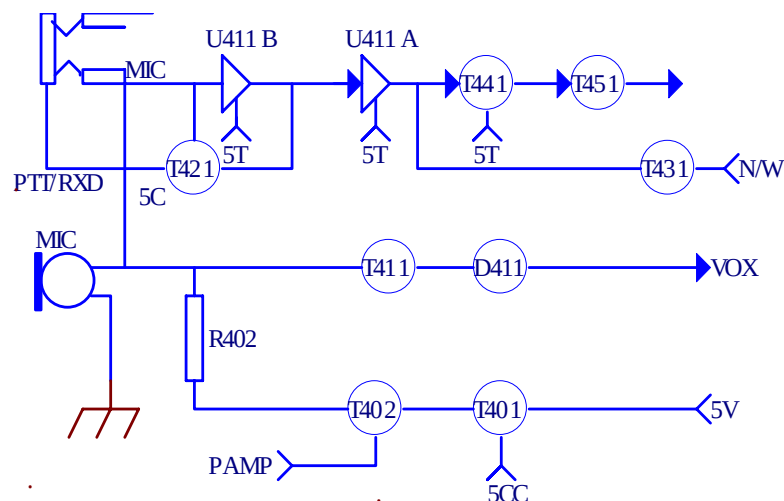


Fig.6 Transmission circuit

5. Encode Signaling

1) QT/DQT

QT, DQT data of the QTTCXO Line is output from pin 30 of the CPU. The signal passes through a low-pass CR filter and goes to the TCXO (X1).

The QT, DQT data of the QTVCO Line is output from pin 44 of the CPU. The signal passes through a low pass CR filter, mixes with the audio signal, and goes to the VCO modulation input.

五. Power Supply

There are four 5V power supplies for the microprocessor: 5M, 5C, 5R, and 5T. 5M for microprocessor is always output, but turns off when the power is turned off to prevent malfunction of the microprocessor.

5C is a common 5V and is output when SAVE is not set to OFF.

5R is 5V for reception and output during reception.

5T is 5V for transmission and output during transmission.

六. Control Circuit

The control circuit consists of a microprocessor (U811) and its peripheral circuits.

U811 mainly performs the following:

- 1) Switching between transmission and reception by the PTT signal input.
- 2) Reading system, group, frequency, and program data from the memory circuit.
- 3) Sending frequency program data to the PLL.
- 4) Control squelch on/off by the DC voltage from the squelch circuit.
- 5) Controlling the audio mute circuit by the decode data input.
- 6) Transmitting tone and encode data.

1. Keys and rotary encoder circuit

The signal from keys and rotary encoder input to microprocessor directly.

2. Reset and backup circuits

When the SB is turned on, a high-level pulse is output from the reset circuit consisting of T181, C883, and R833 to reset microprocessor. If the SB is turned off, the voltage detection U517 detects a 5 V drop, and outputs a low signal, it outputs data to U812 and enters backup mode.

3. Memory Circuit

Memory circuit consists of the CPU (U811) and an EEPROM (U521). An EEPROM has a capacity of 32k bits that contains the transceiver control program for the CPU and data such as transceiver channels and operating features.

4. Lamp circuit

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

5. Battery save circuit

The squelch is switched in during receive (SCAN OFF). The power circuit enters battery save mode if no key has been pressed for five seconds.

This circuit is controlled by microprocessor directly.

6. Low Battery Warning

The battery voltage is checked using by the microprocessor. The transceiver generates a warning tone when it falls below the warning voltage.

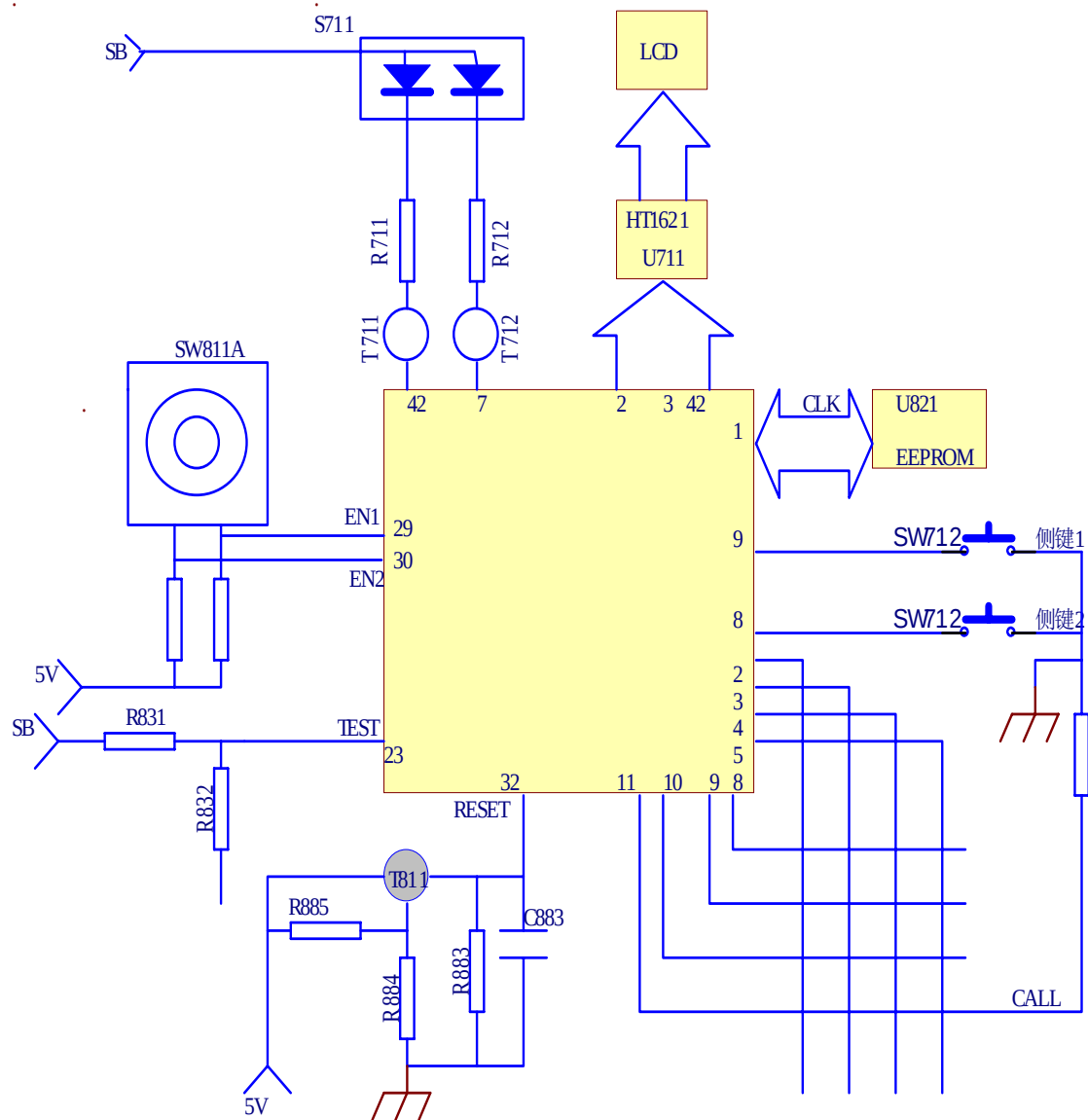


Fig.7 Control circuit

CPU PIN FUNCTION

Pin No.	Port name	I/O	Function
1	PC0	I/O	Voice clock cable and E2PROM data cable
2	PC1	I/O	Voice clock cable and keypad scan input
3	PC2	I/O	E2PROM clock cable and keypad scan input
4	PC3	I/O	PLL clock and keypad scan input
5	PC4	I/O	PLL data and keypad scan input
6	PC5	O	PLL control
7	PC6	O	backlight and keypad light control
8	PC7	O	Keypad scan output/side key 2 input
9	PB3	O	Keypad scan output/side key 1 input
10	PB4	O	Keypad scan output
11	PB5	O	Keypad scan output and 2/5 tone output
12	AVDD		MPU 5V Power supply
13	RX0	O	IF output control port
14	RX1	I	IF input control port
15	TX1	I	microphone mute control input
16	TX0	O	Microphone mute control output
17	TONE	O	BEEP output
18	LC		MPU power supply filter
19	AVSS		Power supply GND
20	D/A	O	Automatic power control and DTMF decode STD
21	PD0	I	PTT input and RX232 input
22	ARX	I	RX data input/audio amplifier adjust input
23	AD1	I	battery voltage test input
24	AD2	I	VOX test input
25	AD3	I	noise signal test input
26	OSC1	I	Oscillator input
27	OSC0	O	Oscillator output
28	VSS		Power supply GND
29	PD1	I	Channel encode data input
30	PD2	I/O	Channel encode data input and DCS audio signal output
31	PD3	O	MIC mute
32	RESET	I	MPU reset port
33	VDD		MPU 5V power supply
34	PA0	O	Audio distortion control and FM radio search control
35	PA1	I/O	green indicator control and DTMF decode SD
36	PA2	O	FM radio power supply control and RX232 output
37	PA3	O	audio amplifier power supply control output
38	PA4	O	RX/TX power supply control and red indicator control

39	PA5	O	VCO power supply control and MIC power supply control
40	PA6	O	Wide/narrow band control and FM radio reset control
41	PA7	I	2/5 tone decode input
42	PB0	O	backlight and keypad light control
43	PB1	O	LCD drive
44	PB2	I/O	DTMF decode ACK and CCTCS audio signal output

材料BOOM表

名称	型号规格	材料编码	数量	位号			
0P5	C0402	101040200	5	C240	VC226	C336	C352
				C349			
1P	C0402	101040210	3	C334	C332	C160	
2P	C0402	101040220	2	C219	C252		
3P	C0402	101040230	2	C238	C246		
4P	C0402	101040240	1	C348			
5P	C0402	101040250	2	C217	C255		
6P	C0402	101040260	3	C392	C169	C210	
7P	C0402	101040270	2	C239	C218		
8P	C0402	101040280	2	C397	C214		
9P	C0402	101040290	1	C287			
10P	C0402	101040210	10	C257	C434	C333	R357
				C335	C351	C358	C211
				C355	C155		
12P	C0402	101040210	2	C357	C154		
15P	C0402	101040210	1	C115			
18P	C0402	101040210	2	C253	C166		
20P	C0402	101040220	4	C955	C956	C123	C125
22P	C0402	101040220	2	C393	C168		
24P	C0402	101040220	2	C346	C212		
27P	C0402	101040220	4	C276	C811	C882	C133
30P	C0402	101040230	1	C167			
33P	C0402	101040230	2	C272	C537		
47P	C0402	101040240	3	C329	C380	C538	
68P	C0402	101040260	1	C975			
56P	C0402	101040250	1	C386			
82P	C0402	101040280	2	C974	C528		
100P	C0402	101040221	26	C421	C423	C424	C384
				C425	C426	C427	C831
				C428	C835	C836	C834
				C275	C328	C343	C317
				C313	C314	C315	C643
				C845	C833	C838	C832
				C837	C192		
102P	C0402	101040211	28	C377	C954	C953	C356
				C418	C830	C304	C256
				C713	C714	C405	C128
				C407	C408	C281	C181
				C957	C318	C312	C871
				C389	C205	C134	C191
103P	C0402	101040211	37	C201	C301	C451	C844
				C261	C548	C981	C345
				C413	C391	C401	C382
				C410	C414	C302	C251
				C645	C654	C659	C113

				C668	C673	C280	C913
				C961	C962	C843	C186
				C354	C885	C143	C171
104P	C0402	101040211	52	C891	C892	C863	C188
				C372	C373	C441	C977
				C444	C535	C540	C817
				C542	C602	C604	C840
				C546	C964	C416	C388
				C402	C979	C417	C644
				C422	C646	C514	C103
				C650	C656	C663	C818
				C951	C264	C284	C102
				C273	C274	C278	C326
				C319	C851	C145	R373
105P	C0402	101040211	1	C524			
120P	C0402	101040211	1	C539			
150P	C0402	101040211	2	C541	C886		
180P	C0402	101040212	1	C969			
182P	C0402	101040212	1	C965			
220P	C0402	101040220	6	C976	C387	C853	C712
				C858			
222P	C0402	101040220	2	C872	C893		
223P	C0402	101040221	5	C641	C529	C406	C431
				C967			
270P	C0402	101040221	1	C285	C286		
330P	C0402	101040230	3	C973	C381	C385	
332P	C0402	101040230	3	C442	C448	C980	
333P	C0402	101040231	2	C855	C404		
392P	C0402	101040231	2	C972	C856		
470P	C0402	101040240	59	C420	C419	C453	C325
				C202	C303	C446	C415
				C532	C533	C601	C260
				C612	C403	C409	C233
				C665	C394	C450	C112
				C439	C440	C963	C122
				C978	C449	C839	C137
				C429	C206	C320	C146
				C327	C342	C396	C104
				C398	C323	C324	C288
				R847	R848	C210	C114
				C127	C138	C157	C452
				C912			
472P	C0402	101040240	3	C672	C841	C842	
473P	C0402	101040240	7	C175	C176	C445	C526
				C525	C374	C894	
680P	C0402	101040260	2	C443	C968		
682P	C0402	101040260	2	C671	C674		

683P	C0402	101040260	1	C527			
820P	C0402	101040280	1	C447	C525		
6P	C0603	101060360	1	C151			
10P	C0603	101060310	1	C163			
13P	C0603	101060310	1	C164			
14P	C0603	101060310	1	C165			
22P	C0603	101060320	1	C161			
100P	C0603	101060311	1	C156			
104P	L0603	101060311	1	L333			
105P	C0603	101060311	2	C901	C857		
470P	C0603	101060340	1	C162			
56P	C0805	101080550	1	C152			
105P	C0805	101080510	1	C172			
6P	C0805	101080560	1	C331			
8P	C0805	101080580	1	C347			
39P	1206	101080530	1	L144			
1uF	C0805	101080510	4	E646	E319	E854	C142
0.1uF+5%	C0805	101080510	2	E364	E367		
2.2uF	C0805	101080520	1	E363	E421		
4.7uF	C0805	101080540	6	E401	E377	E431	E325
				E312	E181		
33uF/6.3V	A	101000102	1	E102			
10uF/16V	A	101000201	6	E643	E283	E642	E911
				E913	E871		
220uF	ELA6032	101000201	1	E651			
0R	R0402	102040200	9	R835	R532	R358	R363
				C330	C336	R400	R886
				R364			
1K	R0402	102040211	24	R650	R972	R971	R513
				R301	R669	R202	R963
				R302	R264	R545	R365
				R408	R526	R869	R242
				R458	R459	R859	R341
				R380	R712	R858	R460
1K5	R0402	102040210	3	R432	R115	R440	
1K8	R0402	102040210	1	R402			
2K	R0402	102040221	2	R542	R276		
2K2	R0402	102040220	12	R866	R612	R613	R891
				C640	R715	R716	R367
				R372	R892	R366	R371
2K7	R0402	102040220	1	R277			
3K3	R0402	102040230	9	R451	R657	R288	R872
				R394	R396	R398	R399
				R439			
3K9	R0402	102040230	2	R123	R653		

4K7	R0402	102040240	17	R818	R817	R287	R176
				R841	R656	R655	R101
				R868	R435	R177	R842
				R175	R102	R251	R324
				R827			
5K6	R0402	102040250	2	R968	R395		
6K8	R0402	102040260	3	R433	R854	R873	
8.2K	R0402	102040280	1	R871			
10K	R0402	102040210	24	R964	R444	R449	R189
				R717	R527	R541	R829
				R601	R382	R416	R361
				R648	R654	R658	R256
				R660	R718	R278	R181
				R975	R828	R830	R333
10R	R0402	102040210	5	R450	R462	R393	R124
				R644			
15K	R0402	102040211	6	R535	R328	R885	R111
				R867	R456		
18K	R0402	102040211	1	R404			
22K	R0402	102040220	7	R453	R376	R405	R893
				R463	R861	R965	
22R	R0402	102040220	3	R343	R114	R121	
27K	R0402	102040221	2	R388	R387		
30K	R0402	102040230	3	R431	R185	R529	
33K	R0402	102040230	5	R441	R442	R446	R448
				R434			
47K	R0402	102040240	15	R188	R547	R844	R127
				R843	R833	R671	R258
				R183	R138	R137	R374
				R857	R257	R323	
47R	R0402	102040240	4	R312	R126	R136	C132
68K	R0402	102040260	1	R229			
82K	R0402	102040280	4	R528	R884	R113	R378
100K	R0402	102040210	12	R540	R896	R549	R322
				R403	R525	R895	R230
				R342	R355	R226	R883
100R	R0402	102040210	11	R834	R304	R713	R326
				R714	R283	R445	R457
				R391	R321	R252	
120K	R0402	102040211	2	R832	R392		
150K	R0402	102040211	10	R957	R128	R198	R192
				R196	R197	R831	R958
				R194	R195		
150R	R0402	102040211	2	R362	R642		
180K	R0402	102040211	1	R187			
180R	R0402	102040211	1	R397			
220K	R0402		8	R261	R539	R661	R956

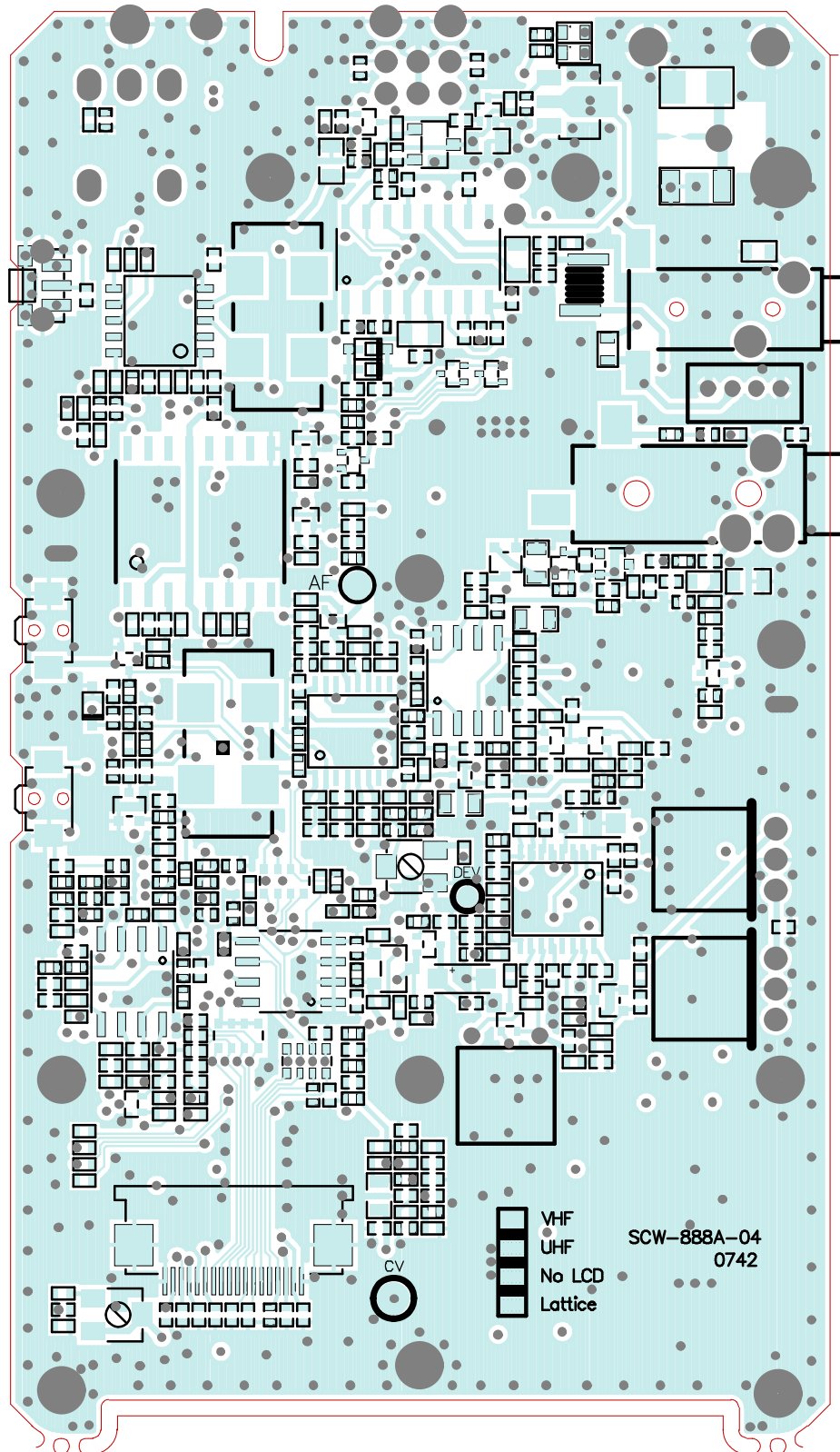
				R852	R184	R286	R285
220R	R0402	102040220	4	R335	R351	R389	R239
270R	R0402	102040220	3	R157	R158	R894	
330K	R0402	102040230	3	R546	R238	R662	
330R	C0402	102040230	2	C124	R122		
470R	R0402	102040240	3	R401	R356	R262	
470K	R0402	102040240	6	R651	R646	R853	R240
				R652	R649		
510R	R0402	102040250	1	R548			
560R	R0402	102040250	3	R813	R814	R368	R231
680K	R0402	102040260	2	R406	R381		
680R	R0402	102040260	1	R228			
820R	R0402	102040280	1	R421			
1M	R0402	102040212	5	R537	R417	R855	R856
				R182			
1M8	R0402	102040210	2	R443	R447		
0R	L0603	102060300	2	L335	L133		
4K7	L0603	102060340	2	L329	L346		
47R	R0603		1	R125			
470K	R0603	1020603406					
0R	R0805	102080500	3	R153	R645	R647	
0.39R	R1206	102080530	3	R171	R172	R173	
50K	RV1208	102000300	2	VR351	RV378		
100NH	L0603	01030047	7	L324	L320	L312	
				L386	L231	L112	L122
101T	L0603	01032011	5	L711	L402	L902	L851
				L886			
220nH	L0603	01030045	4	L392 1	L391	L351	L355
390nH	L0603	01030065	1	L123			
560NH	L0603	01030085	1	L382			
470nH	L0603	01030046	2	L381			
6.8uH	L0603	01030079	2	L328	L345		
27nH	L0805	01030026	1	R135			
2R2	L0805	01030015	1	L157			
39NH	L0805	01030024	1	L974			
56NH	L0805	01030032	1	L968			
100NH	L0805	01030067	5	L215	L225	L224	L212
				L288			
101T	L0805	01030064	3	L132	L142	L901	
R12	L0805	01030025	5	L216	L252	L326	L331
				L347			
R56	L1008	01030007	1	L253			
00nH绕线+	L0805	01030023	1	L344			
1R0	L1009	01030004	1	L131			
1uH	L1310	01030008	1	L164			
0.4*1.2*3	L3	01090018	1	L165			

0.4*1.5*5	L5	01090021	2	L161	L163		
0.4*1.5*6	L6	01090023	2	L162		L211	
0.4*1.5*8	L8T	01090025	1	L143			
GREEN	D0603	01110007	1	D814			
RED	D0603	01110009	1	D813			
SR154-400	D SMA	01110010	1	D611			
1SV221	D USC	01110003	1	D332			
KDV202E	D-USC	01110041	2	D970	D971		
B9	D ESC	01110029	4	D345	D346	D329	D328
KDS121E	D-ESM	01110255	1	D421			
KDS160E	D ESC	01110011	1	D324			
KDS114E	D-ESC	01110012	4	D111	D213	D212	D211
HVC131	D-ESC	01110004	2	D157	D156		
3V	D-USC	01110026	1	D969			
2SK3476	T-USM	01110127	1	T141			
0005	T-USM	01110125	1	T131			
3SK318	T-USM	01110133	2	T251	T231		
1SS372	T-USM	01110114	1	D422			
2SB624	T-TSM	01110117	3	T301	T103	T881	
2SA1362	T-TSM	01110118	1	T602			
2SC5066-M2	T-ESM	01110107	1	T391			
2SC4226	T-USM	01110110	3	T111	T355	T392	
KTC4082	T-USM	01110144	1	T261	T381		
2SC4617	T-ESM	01110102	4	T821	T451	T441	T321
2SC4988	T-SOT8	01110136	1	T121			
2SJ243	T ESM	01110101	1	T326			
2SK1588	T-SOT89	01110115	1	T645			
2SK1824	T-ESM	01110106	3	T432	T526	T433	
2SK508NV	T TSM	01110119	2	T341	T333		
5A	T-SOT89	01110204	1	U911			
DTA114EE	T-ESM	01110143	6	T961	T275	T401	T201
				T962	T963		
DTC114EE	T-ESM	01110131	7	T814	T813	T646	T191
				T611	T181	T102	
MA742	T-USM	01110017	1	D411			
MRF497	T-USM	01110145	1	T421			
UMC4	T USV	01110254	1	T327			
13MHz	FX-DS0971	01040002	1	CR311			
3.58MHz	FX-CS20	01040015	1	CR952			
32.768KHz	FX-DS0603	01040036	1	CR881			
C28	FX-6060-	01110212	1	CR271			
38.550MHz	FL-UM	01040020	2	FL252	FL251		
450K	FL-PBFC	01110207	1	FL261			
.194304MH	FX-CS20	01040033	1	CR951			
24C32	U-SOP8	01091023	1	U821			
AUDIO-16	U-SO1C16	01041056	1	U511			
FX/MX128	U-SSOP16	01091001	1	U512			

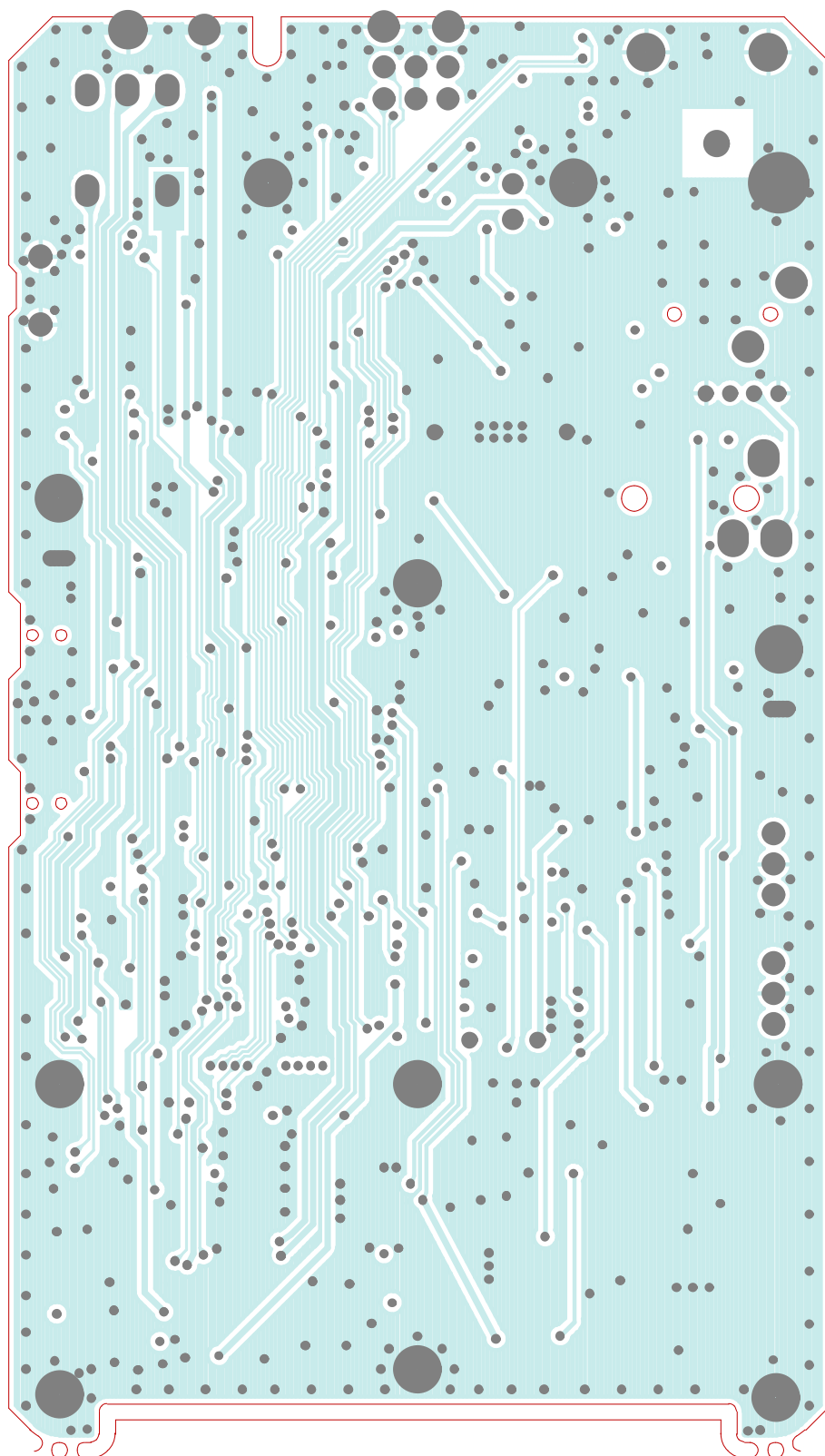
LC73881M	U-SSOP10	01091025	1	U951			
LM2904V	U-SSOP8	01091012	1	U161			
TA31136F	U-SSOP16	01091005	1	U261			
TA7368	U-SSOP10	01091017	1	U641			
U-EM44	U-QFP44	01041103	1	U811			
U-SC1088	U-SOP16	01041052	1	U961			
LM358	U-SOP8	01041020	1	U661			
LM4558	U-SOP8	01041004	1	U411			
LMX2332	U-SSOP20	01041045	1	U311			
100R	RP-1206-4	102000100	1	PR812			
1K	RP-1206-4	102000100	1	PR311			
47K	RP-1206-4	102000100	1	PR811			
JP18	JP-18-2	01110237	1	JP811			
ST-1041	JK-ST-114	01110355	1	JK611			
ST-3103	JK-ST-301	01110354	1	JK511			
1C062	JK-03						
RD91	S-R09760N	02020041	1	SW411			
MONI	S-SKRE	01111219	1	SW711			
S-SKRT	S-SKRT-1	01110220	1	SW712			
SW/VOL	S-RD82	02020043	1	SW811			
ANT	ANT	02020209	1	ANT111			
BATTERY	BATT TUCH	02090005	1	BAT111			

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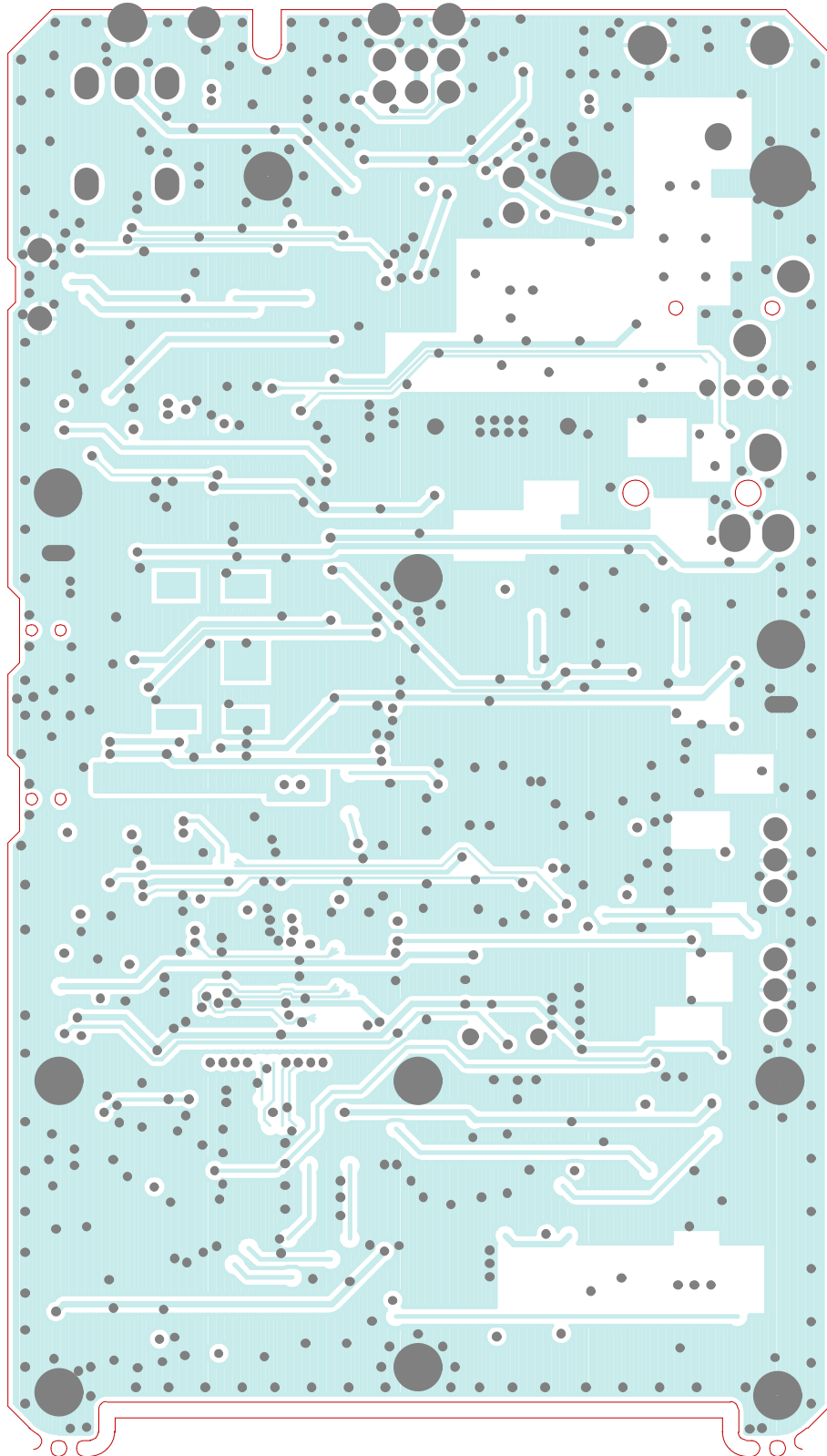
136—174MHz



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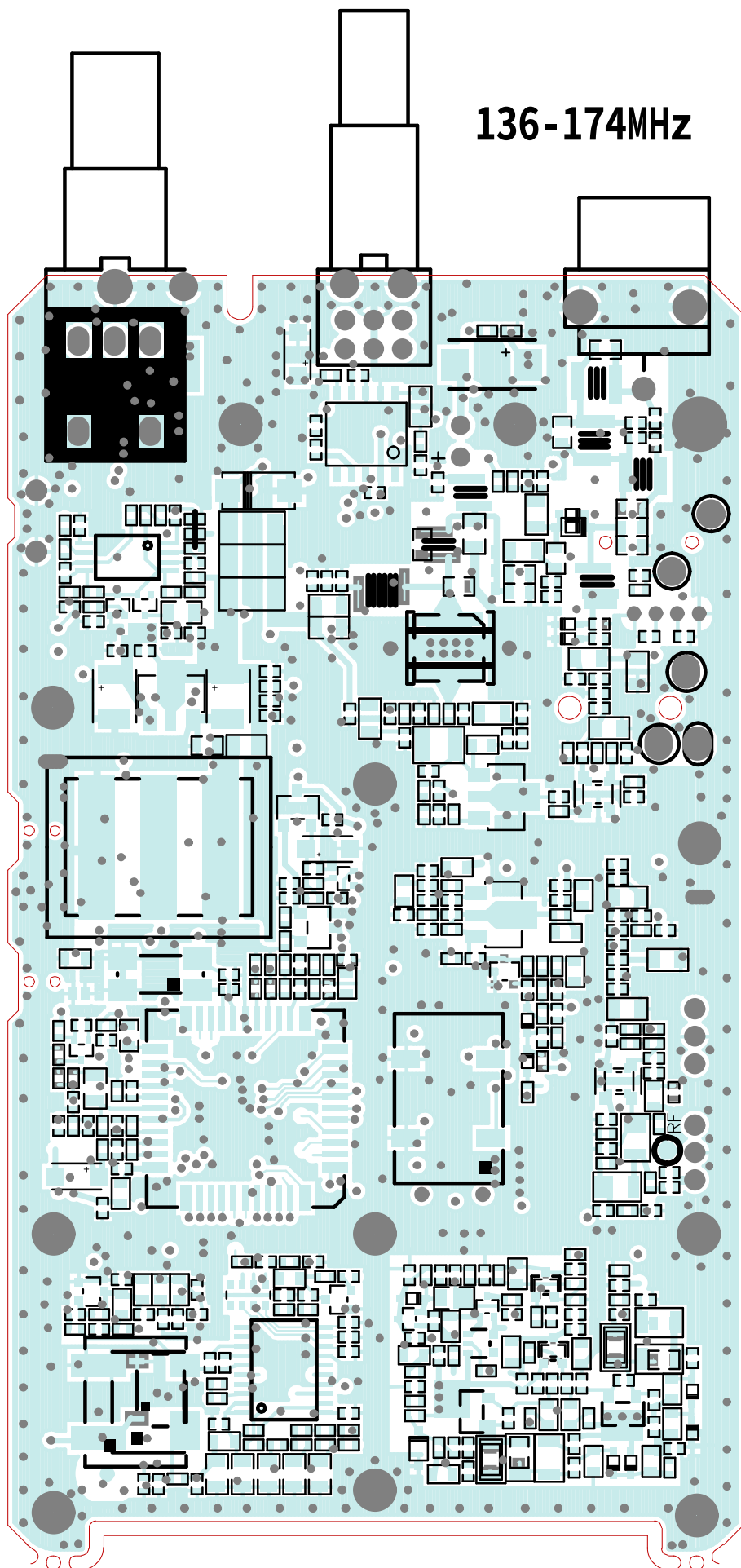


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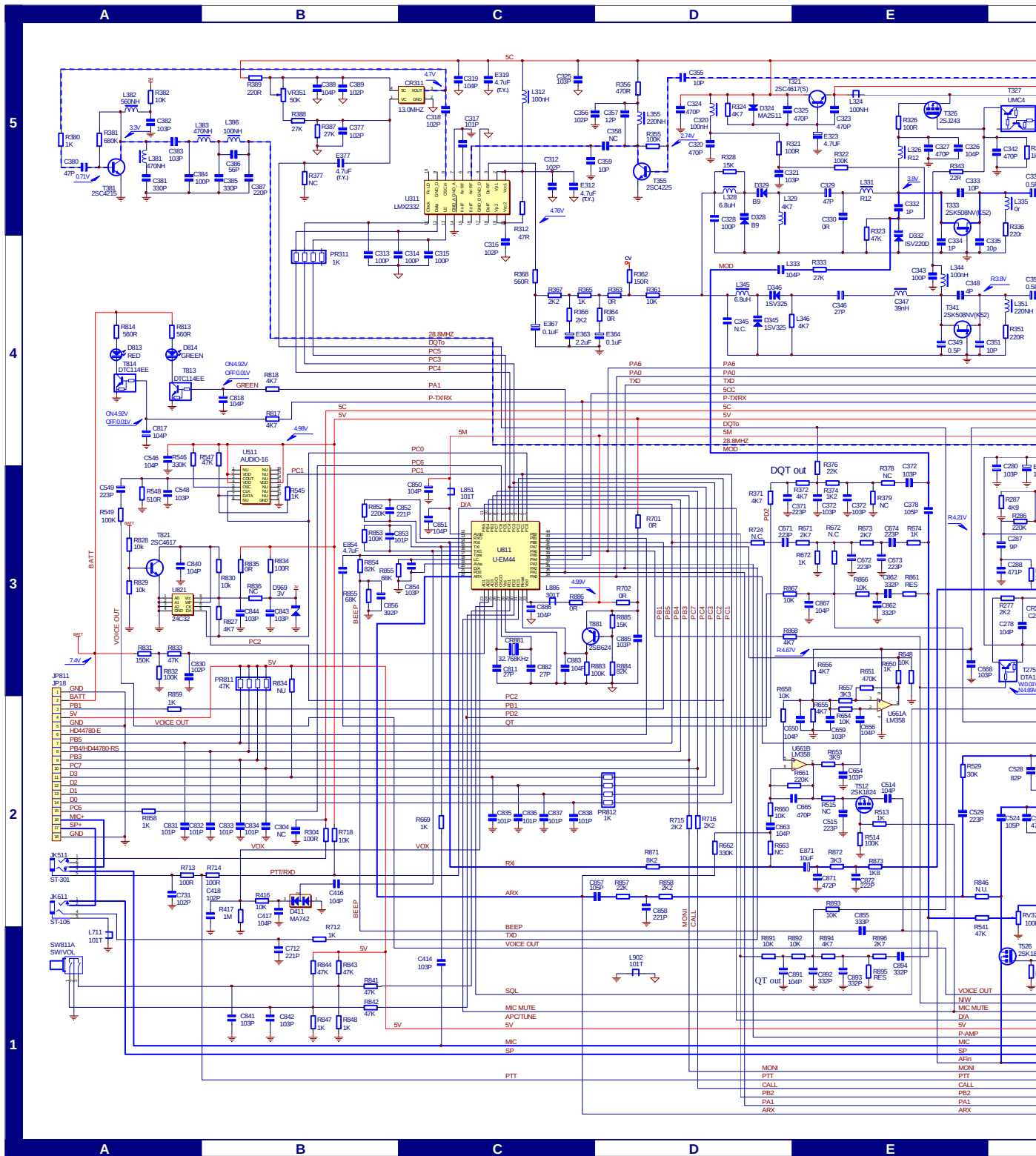


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136-174MHz



原理图



The image shows a complex electronic circuit board layout, likely for a radio receiver or amplifier. The board is populated with numerous components, including resistors, capacitors, integrated circuits (ICs), and transistors. The layout is organized into several functional blocks, with components labeled with alphanumeric codes (e.g., R1, C1, U1, T1, etc.). The board is divided into sections by grid lines, with labels F through K and 1 through 6 indicating the grid coordinates. The circuit includes a power supply section, a tuning section, and an audio output section. The components are interconnected by a network of traces, with some traces labeled with values like 5V, 12V, and 100V. The board also features several test points and connectors, including a 12V input, a 100V output, and a 5V output. The overall design is a professional-grade electronic circuit, suitable for high-performance applications.

原理图

