

PRESIDENT

HARRISON II

SERVICE MANUAL

SPECIFICATIONS

General		
Frequency coverage	26.565 ~ 27.405MHz	
Operating mode	F3E (FM), A3E (AM)	
Configuration	40 EU / 40 PL / 80 d / 40 EC / 40 UK+40 CEPT / 27 In	
Antenna Impedance	50 Ω	
Working temperature	-10°C~+55°C	
Frequency Tolerance	Better than 0.002%	
Input Voltage	13.2V & 26.4V DC	
Grounding Method	Negative ground	
Current Drain	Transmitter	13.2V : 2.0A Max. 26.4V : 1.5A Max.
	Receiver	About 300mA(max.) 0.8A (VOL Max.)
Dimensions (W x H x D) With projections	Microphone: 60 x 41 x 82 mm Body: 125 x 180 x 45 mm	
Weight	Approx.900g	
RECEIVER		
Receiving System	Dual conversion superheterodyne	
IF Frequencies	Double Conversion 1st 10.695MHz/ 2nd 455KHz	
Sensitivity	112dBm for 20dB SINAD in AM Mode	
	116dBm for 20dB SINAD in FM Mode	
Audio Output Power	3 watts max @8 Ω	
Audio Distortion	Less than 5% @ 1KHz	
Image Rejection	70dB	
Adjacent Channel Rejection	60dB	
Frequency Response	300Hz to 3000Hz	
Squelch	Threshold 0,2μV(-120dBm)/Tight 1mV(-47dBm)	
TRANSMITTER		
Output Power	FM/AM: 4.0 W	
Modulated signal distortion	Inferior to 5%	
Frequency Response	300Hz to 3000Hz	
Output Impedance	50ohms, Unbalanced	
Transmission interference	inferior to 4 nW (- 54 dBm)	

CIRCUIT DESCRIPTION

Frequency configuration

The receiver utilizes double conversion. The first IF is 10.695MHz and the second IF is 455kHz. The first local oscillator signal is supplied from the VCO module.

The VCO module in the transmitter generates the necessary frequencies. Fig. 1 shows the frequencies.

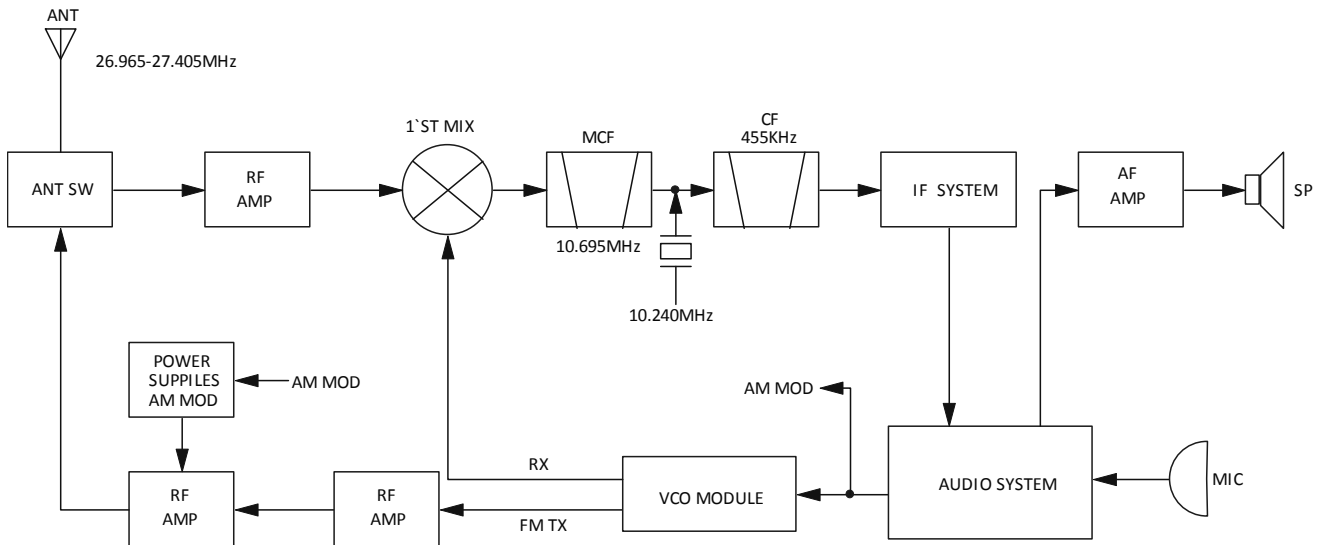


Fig. 1 Frequency configuration

Receiver

The frequency configuration of the receiver is shown in Fig. 2.

■ Front - end RF amplifier

An incoming signal from the antenna is applied to an RF amplifier (Q103) after passing through a transmit/receive switch circuit (D100, D110 and D118 are off). After the signal is filtered through a band pass filter (L103, L104 and L105) to eliminate unwanted signals before it is passed to the first mixer.

■ First Mixer

The signal from the RF amplifier is heterodyned with the first local oscillator signal from the RF module at the first mixer (Q104) to create a 10.695MHz first intermediate frequency (1st IF) signal. The first IF signal through the monolithic crystal filter (MCF : CB100) to further remove spurious signals.

The band-pass filters are tuned to a desired frequency by varicaps (D111, D112, D113). A tuning voltage corresponding to the desired signal is applied to each varicap through the D/A module of the U303A to tune to the receive frequency.

■ IF amplifier

The first IF signal go into second mixer Q113, second mixer mix first IF and 10.24MHz second IF output Y100. The signal is heterodyned again with a second local oscillator signal. The second IF signal is then fed through a 455kHz ceramic filter (CF100) to further eliminate unwanted signals. The signal is amplified by Q114 and Q105, and then the second IF signal enter U101 (FM processing IC) in FM mode or changed according to D117 and receive audio signal output.

CIRCUIT DESCRIPTION

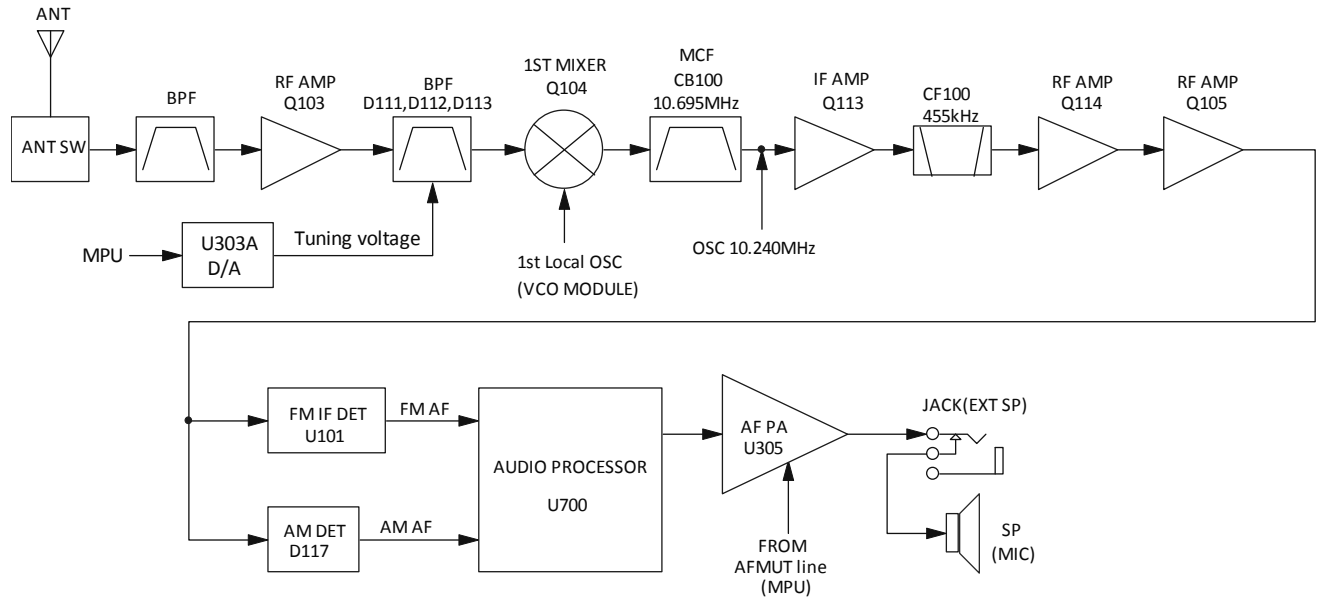


Fig. 2 Receiver section configuration

■ AF amplifier

The FM IC output the FM AF passes through the audio processor (U700) or The AM demodulated signal from Q105 goes to the audio processor (U700) through D117. After goes to AF power amplifier IC (U305). Is routed to an audio power amplifier (U305) where it is amplified and output to the speaker. To output sounds from the speaker, U700 sends a low signal to the SP.MUT line the turns U305.

■ Squelch

A squelch circuit is provided to prevent no-signal noise or weak signals from outputting to a speaker during transmission.

Transmitter

■ Transmit audio

The audio signal from the microphone goes through the audio processor (U4) and resulting signal goes to the VCO module through the RF modulation terminal for direct FM modulation. The AM modulation signal enter into RF amplifier after passing through power supplies Q36, Q37 and Q38.

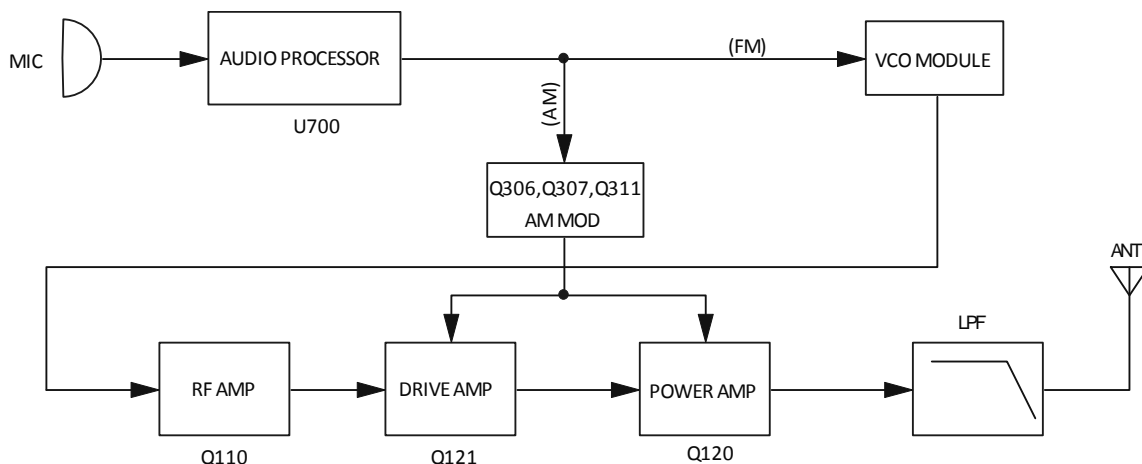


Fig. 5 Transmit circuit

CIRCUIT DESCRIPTION

■ Power Amplifier Circuit

The transmit output signal from the RF module passes through the amplified by Q110 and Q121. The amplified signal goes to the final amplifier (Q120) through a low-pass filter. The lowpass filter removes unwanted high-frequency harmonic components, and the resulting signal is transmitted through the antenna terminal.

Power Supply

The power supply voltage is maintained to 8.0V, 5.0V, and 3.3V by the series regulator (U501, U500, and U503). It is used as 8T and 8R.

8V is a common 8V.

5V is a common 5V.

3.3V supplies power to the VCO module.

8R is 8V for reception and output during reception.

8T is 8V for transmission and output during transmission.

Control Circuit

■ MPU

The control circuit consists of a microprocessor (U700) and its peripheral circuits. It controls the TX-RX unit. U700 mainly performs the following:

- 1) Switching between transmission and reception by the RF signal input.
- 2) Sending frequency program data to the VOC module.
- 3) Controlling squelch on/off by the DC voltage from the squelch circuit.
- 4) Controls the compander unit.
- 5) Controls the power supply unit.

■ Display Circuit

The MPU (U700) controls the display LCD and LEDs. The LCD driver (U800) and MPU (U700) communicate through the DAT, CLK, CS lines. The LEDs driver (U801) and MPU (U700) communicate through the LED lines.

PARTS LIST

LCD UNIT

Designators	Comment	Description	Footprint
C800	103P		S0402
C801	103P		S0402
C802	103P		S0402
C803	103P		S0402
C804	225PA		S0402
C805	225PA		S0402
C807	103P		S0402
C808	103P		S0402
C809	103P		S0402
C810	102P		S0402
C812	102P		S0402
C813	475PA/M		S0402A
D800	DLS0603-0003	ORANGE	SD0603(LED)
D801	DLS0603-0003	ORANGE	SD0603(LED)
D802	DLS0603-0003	ORANGE	SD0603(LED)
D803	DLS0603-0003	ORANGE	SD0603(LED)
D804	DLS0603-0003	ORANGE	SD0603(LED)
D805	DLS0603-0003	ORANGE	SD0603(LED)
D806	1SS400		SOD523
D807	DLS0603-0003	ORANGE	SD0603(LED)
D808	DLS0603-0003	ORANGE	SD0603(LED)
D809	DLS0603-0003	ORANGE	SD0603(LED)
D810	DLS0603-0003	ORANGE	SD0603(LED)
D811	DLS0603-0003	ORANGE	SD0603(LED)
D812	DLS0603-0003	ORANGE	SD0603(LED)
D813	DLS0603-0003	ORANGE	SD0603(LED)
D814	DLS0603-0003	ORANGE	SD0603(LED)
D815	DLS0603-0003	ORANGE	SD0603(LED)
D816	DLS0603-0003	ORANGE	SD0603(LED)
D817	DLS0603-0003	ORANGE	SD0603(LED)
D818	DLS0603-0003	ORANGE	SD0603(LED)
D821	DLS0603-0007	GREEN	SD0603(LED)
D822	DLS0603-0007	GREEN	SD0603(LED)
D823	DLS0603-0007	GREEN	SD0603(LED)
D824	DLS0603-0007	GREEN	SD0603(LED)
D825	DLS0603-0007	GREEN	SD0603(LED)
D826	DLS0603-0007	GREEN	SD0603(LED)
D828	DLS0603-0007	GREEN	SD0603(LED)
D829	DLS0603-0007	GREEN	SD0603(LED)
D830	DLS0603-0007	GREEN	SD0603(LED)
D831	DLS0603-0007	GREEN	SD0603(LED)
D832	DLS0603-0007	GREEN	SD0603(LED)
D833	DLS0603-0007	GREEN	SD0603(LED)
D834	DLS0603-0007	GREEN	SD0603(LED)
D835	DLS0603-0007	GREEN	SD0603(LED)
D836	DLS0603-0007	GREEN	SD0603(LED)
D837	DLS0603-0007	GREEN	SD0603(LED)
D838	DLS0603-0007	GREEN	SD0603(LED)
D839	DLS0603-0007	GREEN	SD0603(LED)
D842	DLS0603-0010	BLUE	SD0603(LED)
D843	DLS0603-0010	BLUE	SD0603(LED)
D844	DLS0603-0010	BLUE	SD0603(LED)
D845	DLS0603-0010	BLUE	SD0603(LED)
D846	DLS0603-0010	BLUE	SD0603(LED)
D847	DLS0603-0010	BLUE	SD0603(LED)
D848	DLS0603-0010	BLUE	SD0603(LED)

HARRISON II

Designators	Comment	Description	Footprint
D849	DLS0603-0010	BLUE	SD0603(LED)
D850	DLS0603-0010	BLUE	SD0603(LED)
D851	DLS0603-0010	BLUE	SD0603(LED)
D852	DLS0603-0010	BLUE	SD0603(LED)
D853	DLS0603-0010	BLUE	SD0603(LED)
D854	DLS0603-0010	BLUE	SD0603(LED)
D855	DLS0603-0010	BLUE	SD0603(LED)
D856	DLS0603-0010	BLUE	SD0603(LED)
D857	DLS0603-0010	BLUE	SD0603(LED)
D858	DLS0603-0010	BLUE	SD0603(LED)
D859	DLS0603-0010	BLUE	SD0603(LED)
D864	5V1		SOD523
DS800	HSR32936-UFTSZ-A0		
E800	47uF/25V		RBM6.3X5.5
E803	47uF/25V		RBM6.3X5.5
J800	CGJ-JCJ-0466		SIPM24
J801	CB-LJX-0142 CB-LJX-0143		SIP2T2
J802	CGJ-JCJ-0467		CGJ-JCJ-USB180
J803	CB-HKCZ-0012		SKY-6
J804	CB-LJX-0122		SIP2T5
L800	LMS0402-0002		S0402
L802	100R		S0402
L803	1K		S0402
L804	LMS0805-0018		S0805
Q800	RT1N141U		EMT3
Q801	RT1N141U		EMT3
Q802	RT1N141U		EMT3
R800	470R		S0603
R801	470R		S0603
R802	470R		S0603
R803	470R		S0603
R804	470R		S0603
R805	470R		S0603
R807	10R		S0603
R808	10R		S0603
R809	10R		S0603
R810	10R		S0603
R811	10R		S0603
R812	10R		S0603
R814	10R		S0603
R815	10R		S0603
R816	10R		S0603
R817	10R		S0603
R818	10R		S0603
R819	10R		S0603
R821	43.2K/F		S0603
R822	75K/F		S0603
R823	100R		S0402
R824	4R7		S2010
R825	49.9K/F		S0603
R826	49.9K/F		S0603
R827	100K		S0402
R828	100K		S0402
R829	100K		S0402
R830	100K		S0402
R831	100K		S0402
R832	100K		S0402
R833	100K		S0402
R834	100K		S0402

HARRISON II

Designators	Comment	Description	Footprint
R835	2K2		S0402
R836	2K2		S0402
R837	2K2		S0402
R838	2K2		S0402
R839	2K2		S0402
R840	2K2		S0402
R844	51K		S0402
R845	51K		S0402
R846	51K		S0402
R847	51K		S0402
R848	220R		S0402
R849	4K7		S0402
R850	4K7		S0402
R851	10R		S0402
R852	1K5		S0402
R853	10K		S0402
R854	10K		S0402
R855	1K		S0402
RP800	CGJ-YLKG-0080		R09448GS
S800	CGJ-QCKG-0032		K2-1101ST-L8
S801	CGJ-QCKG-0032		K2-1101ST-L8
S803	CGJ-QCKG-0032		K2-1101ST-L8
S804	CGJ-QCKG-0032		K2-1101ST-L8
S805	CGJ-QCKG-0032		K2-1101ST-L8
S806	CGJ-BMKG-0029		SW-R11N
U800	TM1622		LQFP64-7*7
U801	TM1829		SOP8

MAIN UNIT

Designators	Comment	Description	Footprint
C100	33P/J		S0603
C101	151P/J		S0402
C102	103P		S0402
C103	103P		S0402
C105	103P		S0402
C106	103P		S0402
C107	103P		S0402
C108	102P/J		S0402
C109	225PA		S0402
C110	103P		S0402
C111	103P		S0402
C112	103P		S0402
C113	225PA		S0402
C114	225PA		S0402
C115	102P/J		S0402
C116	103P		S0402
C117	221P/J		S0402
C118	221P/J		S0402
C119	102P		S0402
C120	103P		S0402
C121	475PA/M		S0402A
C122	475PC		S0603
C123	101P/J		S0402
C124	104PC		S0402
C125	121P/J		S0402
C126	121P/J		S0402
C127	225PA		S0402
C128	103P		S0402
C129	39P/J		S0402
C130	12P/J		S0402

HARRISON II

Designators	Comment	Description	Footprint
C131	12P/J		S0402
C132	12P/J		S0402
C133	62P/J		S0402
C134	62P/J		S0402
C135	62P/J		S0402
C136	475PC		S0603
C137	475PC		S0603
C138	105PC		S0402
C142	103P		S0402
C143	475PC		S0603
C144	103P		S0402
C145	102P/J		S0402
C146	7P/B		S0402
C147	7P/B		S0402
C148	102P/J		S0402
C149	221P/J		S0402
C150	151P/J		S0402
C151	221P/J		S0402
C152	103P		S0402
C153	104PC		S0402
C154	475PA/M		S0402A
C155	15P/J		S0402
C156	22P/J		S0402
C157	101P/J		S0402
C158	101P/J		S0402
C159	101P/J		S0402
C160	101P/J		S0402
C161	101P/J		S0402
C162	101P/J		S0402
C163	101P/J		S0402
C164	151P/J		S0402
C165	20P/J		S0402
C166	103P		S0402
C167	13P/J		S0402
C168	18P/J		S0402
C169	103P		S0402
C170	105PC		S0402
C171	103P		S0402
C172	103P		S0603
C173	103P		S0603
C174	103P		S0402
C175	103P		S0402
C176	0R		S0805
C179	225PA		S0402
C180	27P/J		S0402
C183	181P/J		S0402
C184	104PC		S0402
C185	104PC		S0402
C186	104PC		S0402
C187	104PC		S0402
C188	104PC		S0402
C189	104PC		S0402
C190	103P		S0402
C191	103P		S0402
C194	103P		S0402
C195	103P		S0402
C196	103P		S0402
C197	103P		S0402
C199	103P		S0402
C200	102P/J		S0402

HARRISON II

Designators	Comment	Description	Footprint
C201	102P/J		S0402
C202	103P		S0402
C203	102P/J		S0402
C204	102P/J		S0402
C205	821P/J		S0402
C206	33P/J		S0402
C207	33P/J		S0402
C208	33P/J		S0402
C209	223PC		S0402
C210	47P/J		S0402
C211	101P/J		S0402
C212	101P/J		S0402
C213	103P		S0402
C214	225PA		S0402
C215	221P/J		S0402
C216	102P/J		S0402
C217	20P/J		S0402
C218	102P/J		S0402
C219	102P/J		S0402
C220	225PA		S0402
C221	103P		S0402
C222	103P		S0402
C224	475PE		S0805
C225	103P		S0402
C226	82P/J		S0603
C227	24P/J		S0603
C228	43P/J		S0603
C229	5P/B		S0603
C230	472P		S0402
C233	561P2AJ		S0805
C234	331P/J		S0402
C236	103P		S0603
C241	331P/J		S0603
C242	271P/J		S0603
C244	224PC		S0402
C245	224PC		S0402
C247	121P/J		S0603
C249	103P		S0402
C252	561P/J		S0402
C253	561P/J		S0402
C254	102P/J		S0402
C256	151P/J		S0603
C257	15P/J		S0603
C258	121P/J		S0603
C260	121P/J		S0603
C261	181P2AJ		S0805
C262	331P2AJ		S0805
C269	472P		S0402
C270	103P		S0402
C300	103P		S0402
C301	103P		S0402
C302	105PC		S0402
C303	103P		S0402
C304	104PC		S0402
C305	104PC		S0402
C306	101P/J		S0402
C307	224PE		S0603
C308	103P		S0402
C309	472P		S0402
C310	472P		S0402

HARRISON II

Designators	Comment	Description	Footprint
C311	475PA/M		S0402A
C312	475PA/M		S0402A
C317	104PC		S0402
C318	104PC		S0402
C319	104PC		S0402
C320	103P		S0402
C321	102P		S0402
C322	104PC		S0402
C323	102P		S0402
C327	104PC		S0402
C328	102P		S0603
C329	226PE		S0805
C330	103P		S0402
C332	103P		S0603
C333	102P		S0603
C334	103P		S0603
C335	102P		S0603
C339	103P		S0402
C341	475PA/M		S0402A
C342	475PA/M		S0402A
C347	475PC		S0603
C351	103P		S0402
C354	475PC		S0603
C355	475PC		S0603
C363	102P		S0603
C371	104PC		S0402
C374	102P		S0402
C375	103P		S0603
C376	102P		S0402
C377	224PE		S0603
C378	475PC		S0603
C381	103P		S0603
C500	105P		S0805
C501	105P		S0805
C502	104P		S0603
C506	103P		S0402
C507	103P		S0402
C508	103P		S0402
C509	103P		S0402
C510	104P		S0603
C511	104P		S0603
C512	103P		S0402
C513	103P		S0402
C514	103P		S0402
C516	105P		S0805
C517	105P		S0805
C518	105P		S0805
C519	105P		S0805
C520	105P		S0805
C523	475PC		S0603
C525	333PE		S0402
C526	333PE		S0402
C527	102P		S0402
C528	105PC		S0402
C529	226PE		S0805
C530	106P		S1206
C531	106P		S1206
C532	104P		S0603
C533	104P		S0603
C535	226PE		S0805

HARRISON II

Designators	Comment	Description	Footprint
C536	106P		S1206
C537	106P		S1206
C538	106P		S1206
C700	103P		S0402
C701	22P/J		S0402
C702	104PC		S0402
C703	106PA/M		S0603
C704	104PC		S0402
C705	22P/J		S0402
C706	103P		S0402
C707	103P		S0402
C708	103P		S0402
C709	103P		S0402
C710	106PA/M		S0603
C711	103P		S0402
C712	103P		S0402
C713	221P/J		S0402
C714	221P/J		S0402
C715	104PC		S0402
C716	106PA/M		S0603
C717	104PC		S0402
C718	104PC		S0402
C719	103P		S0402
C720	103P		S0402
C721	106PA/M		S0603
C722	102P		S0402
C723	102P		S0402
C724	103P		S0402
C725	104PC		S0402
C730	104PC		S0402
C731	103P		S0402
C732	106PA/M		S0603
CB100	QI-0014		M10.7
CF100	FCI-0006		K455E5
D100	1SS400		SOD523
D101	1N728WS		M0805AK(1)
D102	1SS400		SOD523
D103	1SS400		SOD523
D104	1N728WS		M0805AK(1)
D105	1SS400		SOD523
D106	1SS400		SOD523
D110	1SS356		SOD323
D111	DS-0082	JDV2S14E	SOD523
D112	DS-0082	JDV2S14E	SOD523
D113	DS-0082	JDV2S14E	SOD523
D114	1SS400		SOD523
D115	DS-0251	LBAT54SWT1G	SOT323A
D116	DS-0251	LBAT54SWT1G	SOT323A
D117	DS-0251	LBAT54SWT1G	SOT323A
D118	1SS356		SOD323
D122	BA892		SOD523
D123	BA892		SOD523
D300	1SS400		SOD523
D301	5V1		SOD523
D302	12V		SOD523
D303	DS-0151	3V6	SOD523
D305	1SS355		SOD323
D307	1SS400		SOD523
D308	DS-0151	3V6	SOD523
D309	DS-0151	3V6	SOD523

HARRISON II

Designators	Comment	Description	Footprint
D330	DS-0305	ESDBL12VY1	DFN1006-2L
D331	DS-0305	ESDBL12VY1	DFN1006-2L
D500	DS-0104	B340A	SOD-106
D501	DS-0104	B340A	SOD-106
D502	DS-0256	RN142SMT2R	SOD523
D503	ICS-0599	SK510C	DO-214AB
D504	DS-0295	SMF6.0A	SMF
D505	SM540BF		SMB-FL
D506	DS-0288	SMF18A	SMF
D507	DS-0306	SMBJ30CA	DO-214AA(SMB)-V1
D700	DS-0151	3V6	SOD523
D701	DS-0223	DTEsDBLC5V0LED02	DFN1006
D702	DS-0223	DTEsDBLC5V0LED02	DFN1006
E100	CGJ-JCJ-0529		ANT
E300	470uF/25V		SRB0.160(8MM)
E301	100uF/25V		SRB0.125(6MM)
E303	470uF/25V		SRB0.160(8MM)
E500	220uF/35V		SRB0.160(8MM)
E501	220uF/35V		SRB0.160(8MM)
E502	470uF/25V		SRB0.160(8MM)
E503	220uF/16V		SRB0.125(6MM)
E505	220uF/16V		SRB0.125(6MM)
E506	330uF/35V		SRB0.200(10MM)
E507	330uF/35V		SRB0.200(10MM)
E508	470uF/10V		SRB0.125(6MM)
E509	220uF/35V		SRB0.160(8MM)
J100	CBPCB-GNB-0121		SIP2T5
J300	CGJ-JCJ-0035		SIP2T2
J500	LMA-0008		TSK13.3*15*3.8
J501	5V 2.1A		SIP2T2
J700	CGJ-JCJ-0042		SIP2T5
J701	CGJ-JCJ-0040		CON2.0-3
J702	CGJ-JCJ-0466		SIPM24
JK300	CGJ-JCJ-0118		PJ-302
JK301	CGJ-JCJ-0118		PJ-302
JK302	CGJ-JCJ-0411		EJ-2503-35-GP
L1	LWS1008-0032 (LWS1008-0028)	68NH (56NH)	LWS1008.2520
L100	LWS0805-0056		LWS0805.2012
L101	220nH		S0402
L103	LWS0805-0059		LWS0805.2012
L104	LWS0805-0059		LWS0805.2012
L105	LWS0805-0059		LWS0805.2012
L106	LWS2520-0011		LWS1008.2520
L107	LWS2520-0011		LWS1008.2520
L108	LWS2520-0011		LWS1008.2520
L109	22uH		S0603
L110	6.8uH		S0603
L111	LWS3225-0003		LWS1210.3225
L112	LWS3225-0006		LWS1210.3225
L114	8.2uH		S0603
L115	470nH		S0603
L119	LAI-0076		
L120	LAI-0076		
L121	LAI-0076		
L122	LAI-0076		
L123	LAI-0236		
L127	LAI-0239		
L128	LWS1008-0031		LWS1008.2520
L129	6.8uH		S0603
L130	LWS0805-0059		LWS0805.2012

HARRISON II

Designators	Comment	Description	Footprint
L131	220nH		S0402
L300	6.8uH		S0603
L301	6.8uH		S0603
L330	LMA-0009		AXIAL10
L331	LMA-0009		AXIAL10
L500	LWS0630-0002		INDUCTORS-7.8*7.0MM
L501	LWS0630-0002		INDUCTORS-7.8*7.0MM
L502	LWS127125-0001		L7*13
L503	LMS0402-0002		S0402
L504	LWS33-0009		L7*13
L505	LWS0530-0001		LWS-5952
L530	LMS1206-0002		S1206
L700	CB-LJX-0097		JMP
Q101	TS-0142	RT1N141U	EMT3
Q102	TS-0142	RT1N141U	EMT3
Q103	TS-0217	MMBTSC2714Y	SOT23
Q104	TS-0217	MMBTSC2714Y	SOT23
Q105	TS-0217	MMBTSC2714Y	SOT23
Q106	TS-0430	MMBTSC5345YW	SOT323
Q107	TS-0430	MMBTSC5345YW	SOT323
Q108	TS-0430	MMBTSC5345YW	SOT323
Q109	TS-0430	MMBTSC5345YW	SOT323
Q110	ST2SC3202Y		TO92-ECB
Q111	2SC4082		SC70
Q113	TS-0217	MMBTSC2714Y	SOT23
Q114	TS-0217	MMBTSC2714Y	SOT23
Q115	TS-0429	MMBTSC4075GW	SOT323
Q116	TS-0429	MMBTSC4075GW	SOT323
Q117	TS-0431	LMBT3906WT1G	SOT323
Q120	TI-0038 (ICI-0062)	FQP13N10 (IRF24N)	TO-220-V-123-B
Q121	2SC2314(F)		TO126-V-ECB-V2.0
Q301	TS-0142	RT1N141U	EMT3
Q303	TS-0142	RT1N141U	EMT3
Q304	TS-0142	RT1N141U	EMT3
Q306	2SA2022		TO-220-V-123-B
Q307	2SB1132		SOT89
Q308	TS-0429	MMBTSC4075GW	SOT323
Q309	TS-0142	RT1N141U	EMT3
Q310	TS-0431	LMBT3906WT1G	SOT323
Q311	2SC2712(GR)		SOT23
Q312	TS-0142	RT1N141U	EMT3
Q313	TS-0230	L2SD1781KRLT1G	SOT23
Q315	TS-0142	RT1N141U	EMT3
Q500	TS-0151	UMC5N	SOT353
Q501	TS-0151	UMC5N	SOT353
Q502	TS-0151	UMC5N	SOT353
Q700	TS-0142	RT1N141U	EMT3
Q701	TS-0142	RT1N141U	EMT3
Q702	TS-0142	RT1N141U	EMT3
R100	220R		S0805
R101	220R		S0402
R102	3K3		S0402
R103	3K3		S0402
R104	2K4/F		S0402
R105	4K7		S0402
R109	470R		S0402
R110	470R		S0402
R111	470R		S0402
R112	470R		S0402
R113	470R		S0402

HARRISON II

Designators	Comment	Description	Footprint
R114	470R		S0402
R115	1K		S0402
R116	4K7		S0402
R117	10K		S0402
R118	10K		S0402
R119	10K		S0402
R120	1K		S0402
R121	1K		S0402
R122	RTS-0023	33K NTC	S0402
R123	1K (NC)		S0603
R124	10K		S0402
R125	1K		S0402
R126	10K		S0402
R127	1K		S0603
R128	0R		S0603
R129	470R		S0402
R131	10K		S0402
R132	100K		S0402
R133	100K		S0402
R134	22K		S0402
R135	100K		S0402
R136	100K		S0402
R137	330R		S0402
R138	220R		S0402
R139	220R		S0402
R140	220R		S0402
R141	220R		S0402
R142	1M/F		S0402
R143	100K		S0402
R144	270K/F		S0402
R145	10R		S0402
R146	1K		S0402
R147	1K		S0402
R148	1K		S0402
R149	10K		S0402
R150	0R		S0402
R151	220R		S0402
R152	68K		S0402
R153	68K		S0402
R154	330K		S0402
R155	470R		S0402
R156	1K5		S0402
R157	1M/F		S0402
R158	10K		S0402
R159	3K3		S0402
R160	3K3/F		S0402
R161	220R		S0402
R162	680R		S0402
R163	680R		S0402
R164	100R		S0402
R165	22K		S0402
R166	220K		S0402
R167	2K2		S0402
R168	2K2		S0402
R169	2K2		S0402
R170	2K2		S0402
R171	510R		S0402
R172	10K		S0402
R173	1K8		S0402
R174	10K		S0402

HARRISON II

Designators	Comment	Description	Footprint
R175	47R		S0402
R176	15R		S0402
R177	33K		S0402
R178	39K		S0402
R179	47K		S0402
R180	47K		S0402
R181	47K		S0402
R182	47K		S0402
R183	68K/F		S0402
R184	1K		S0402
R185	47K		S0402
R186	330R		S0402
R187	330R		S0402
R188	470K		S0402
R189	5K6		S0402
R190	3K9		S0402
R191	150K		S0402
R192	2K4/F		S0402
R193	100K/F		S0402
R197	33K		S0402
R199	10K		S1206
R200	100R		S0805
R201	82R		S0805
R203	33R		S0603
R204	0R		S0402
R205	220K		S0402
R206	10K		S0603
R207	0R		S0402
R208	8K2		S0603
R209	100K		S0402
R210	220K		S0402
R211	0R		S0603
R213	680R/F		S0402
R214	3K3		S0402
R217	47K		S0402
R218	56R		S0402
R219	47K		S0402
R220	47K		S0402
R222	4K7		S0402
R232	0R		S0402
R300	1K		S0402
R301	10K		S0402
R302	10K		S0402
R303	22K		S0402
R304	2K2		S0402
R305	2K2		S0402
R306	10K		S0603
R307	3K9		S0402
R308	1K		S0402
R309	1K		S0402
R310	1K		S0402
R312	4R7		S0805
R318	10K		S0603
R321	22K		S0402
R322	10K		S0402
R323	10K		S0402
R324	10K		S0402
R325	30K		S0402
R326	6K8		S0603
R327	1K		S0402

HARRISON II

Designators	Comment	Description	Footprint
R328	10K		S0402
R329	47K		S0402
R330	2K2		S0402
R335	100K		S0402
R337	100K		S0402
R339	1M/F		S0402
R343	100K		S0402
R346	4K7		S0402
R348	4K7		S0402
R354	1K		S0402
R355	24K		S0402
R356	2K2		S0402
R361	2K2		S0402
R362	3K3		S0603
R363	3K3		S0402
R364	10K		S0402
R365	1K		S0402
R366	2K2		S0402
R367	5K6		S0402
R368	NC		S0402
R369	4K7		S0402
R372	220R		S0603
R375	100K		S0402
R380	33K		S0402
R381	2K2		S0603
R382	100R		S0805
R387	4R7		S0805
R404	470R		S0603
R500	10K		S0402
R501	12K/D		S0402
R502	1K2/D		S0402
R503	7K5		S0402
R504	7K5		S0402
R505	0.091R/F		S1206
R506	0.091R/F		S1206
R507	10K/F		S0402
R508	3K3/F		S0402
R700	1K		S0402
R701	1K		S0402
R702	1K		S0402
R703	1K		S0402
R704	1K		S0402
R705	1K		S0402
R706	1K		S0402
R707	1K		S0402
R708	220R		S0402
R709	220R		S0402
R710	4K7		S0402
R711	1K		S0402
R712	220R		S0402
R713	22K		S0402
R714	220R		S0402
R715	220R		S0402
R718	LMS0402-0002		S0402
R719	220R		S0402
R720	1M/F		S0402
R726	220R		S0402
R728	22K		S0402
R731	150K		S0402
R732	47K		S0402

HARRISON II

Designators	Comment	Description	Footprint
R733	68K		S0402
Shield101	CB-PBJ-0101		
Shield102	CB-PBJ-0058		
Shield103	CB-PBJ-0070		
Shield500	CB-PBJ-0067		
Shield501	CB-PBJ-0053		
U100	TS-0461	LM321A	SOT25
U101	ICS-0852	DHF445	SSOP16
U103	QA8558		QFN4X4-20E
U303	ICS-0733	LM2904	ICS-TSSOP-8
U305	ICI-0057	CD1517	SDIP18
U500	ICS-0025	ME6118A50B3G	SOT223-123
U501	ICS-0871	78D08AL	TO-252(DPAK)
U502	XL4015		TO-263
U503	ICS-0020	ME6206A33M3	SOT23-123
U504	ICS-0842	XL4301	SOP8-E
U700	QA8561		LQFP64-7*7
X100	QSSMD-0064	26MHz	TCXO-2520
Y100	QSSMD-0059	10.24Mhz	XTAL_SMD5032
Y101	FDI-0001		K450V2
Y700	QTSSMD-0049	12MHz	TCXO-3225

Testing Mode Adjusting Instruction

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Note : Testing voltage 13.8V/Equipment HP8921A

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Test mode: When radio is off , press and hold the **PTT+ AM/FM + EMG** key and turn on radio, LCD shows “TEST” in 5s, Press **EMG → AM/FM** then full display, enter into the testing mode. Turn the Rotary channel or microphone’s [UP or DN] to select menu. Press PTT then turn Rotary channel to adjust parameter.

AM/FM power adjustment: In testing mode, select [PL] channel, turn off the signal of modulation. Under the launching state, with the Rotary channel adjust the power to 3.9W

FM deviation adjustment: In testing mode, select [F2] channel , 1KHz 30mV.Under the launching state, with the Rotary channel adjust the deviation to 1.9KHz

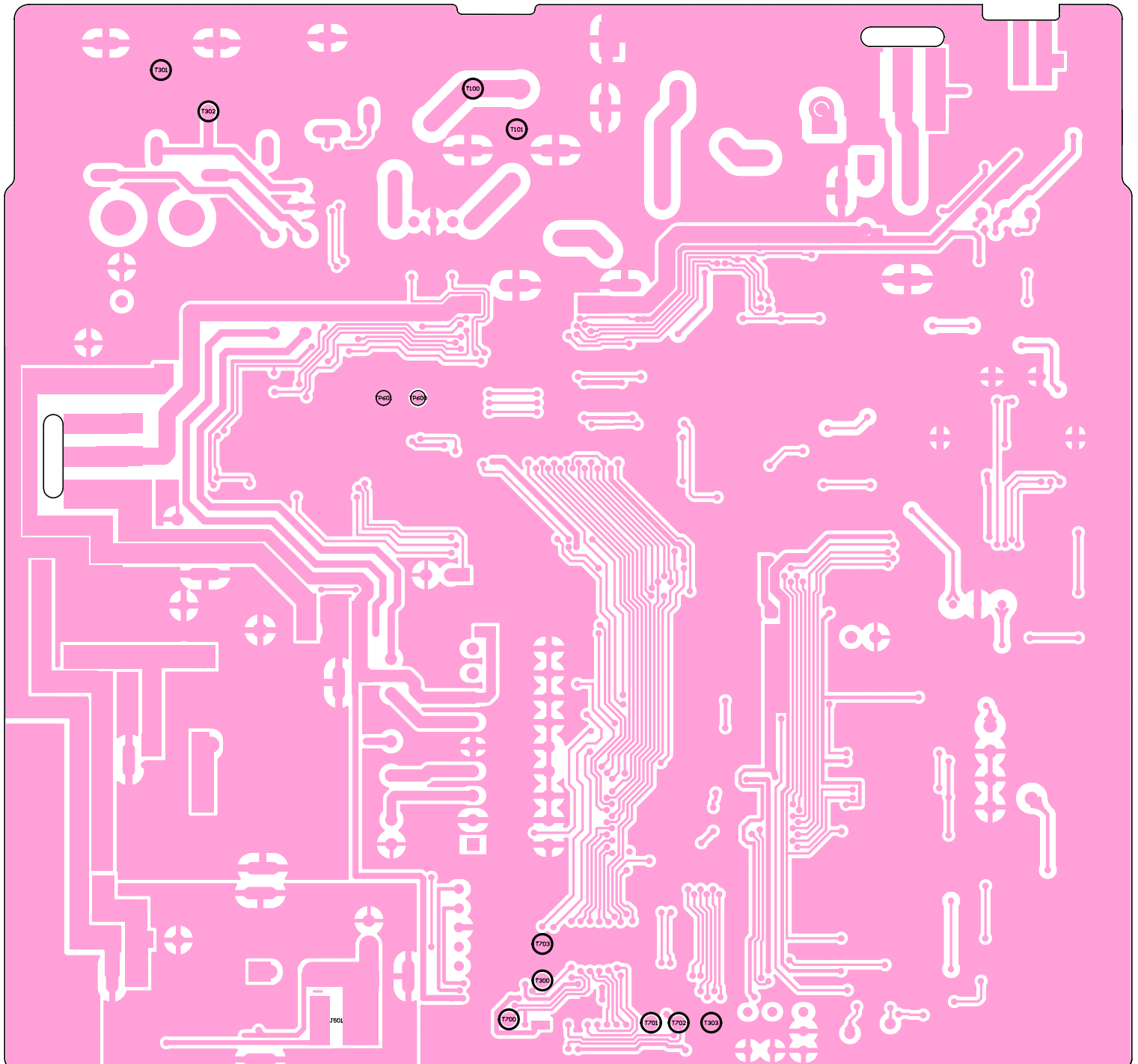
AM modulation adjustment: In testing mode, select [AL] channel, 1KHz 30mV. Under the launching state, with the Rotary channel adjust the amplitude to 90%

S-meter adjustment: In testing mode, select [rl] channel. Under the launching state, with the Rotary channel switch adjust the S-meter pointer at “S9” positions.

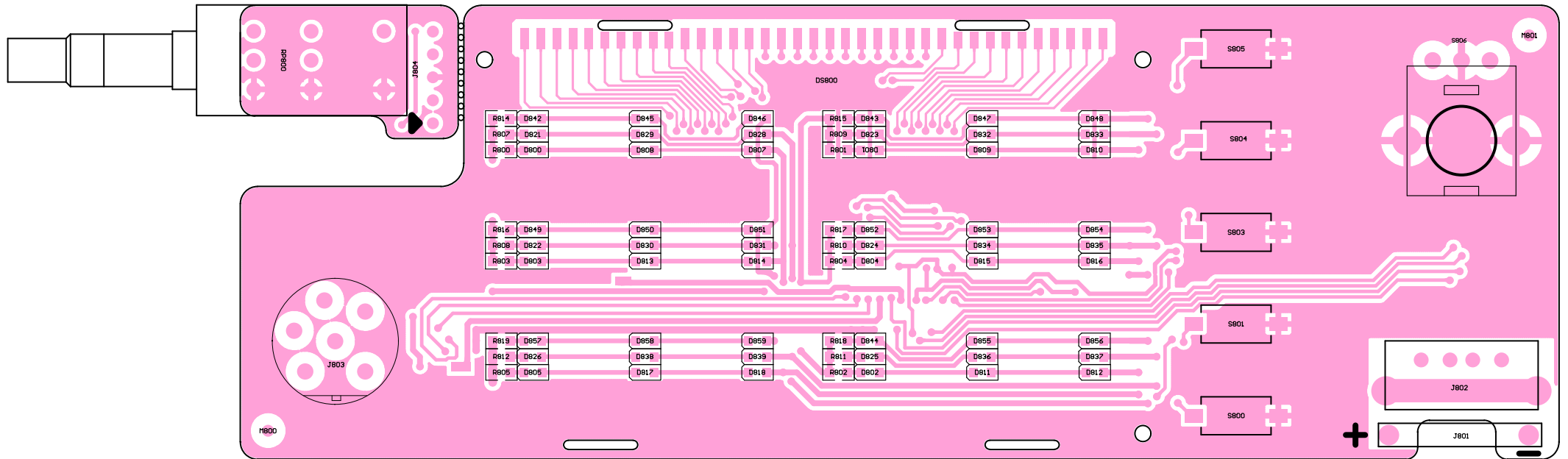
Default: 67 (-67dBm)

Equipment setting: In Rx status, RF Gen Freq: 27.255MHz , Amplitude: set value, AF Gne1 Freq: 1KHz, AF Gne1 To: 1.2KHz, AF Gne2 Freq: 1KHz, AF Gne2 To: OFF

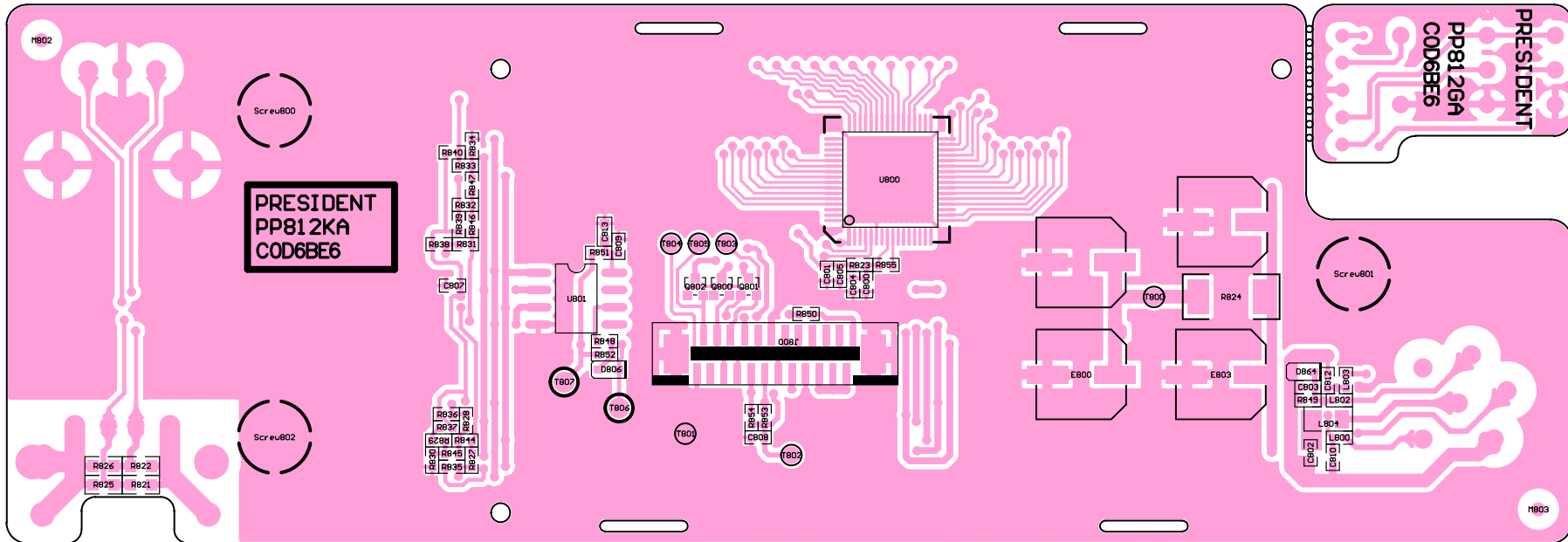
PC board views



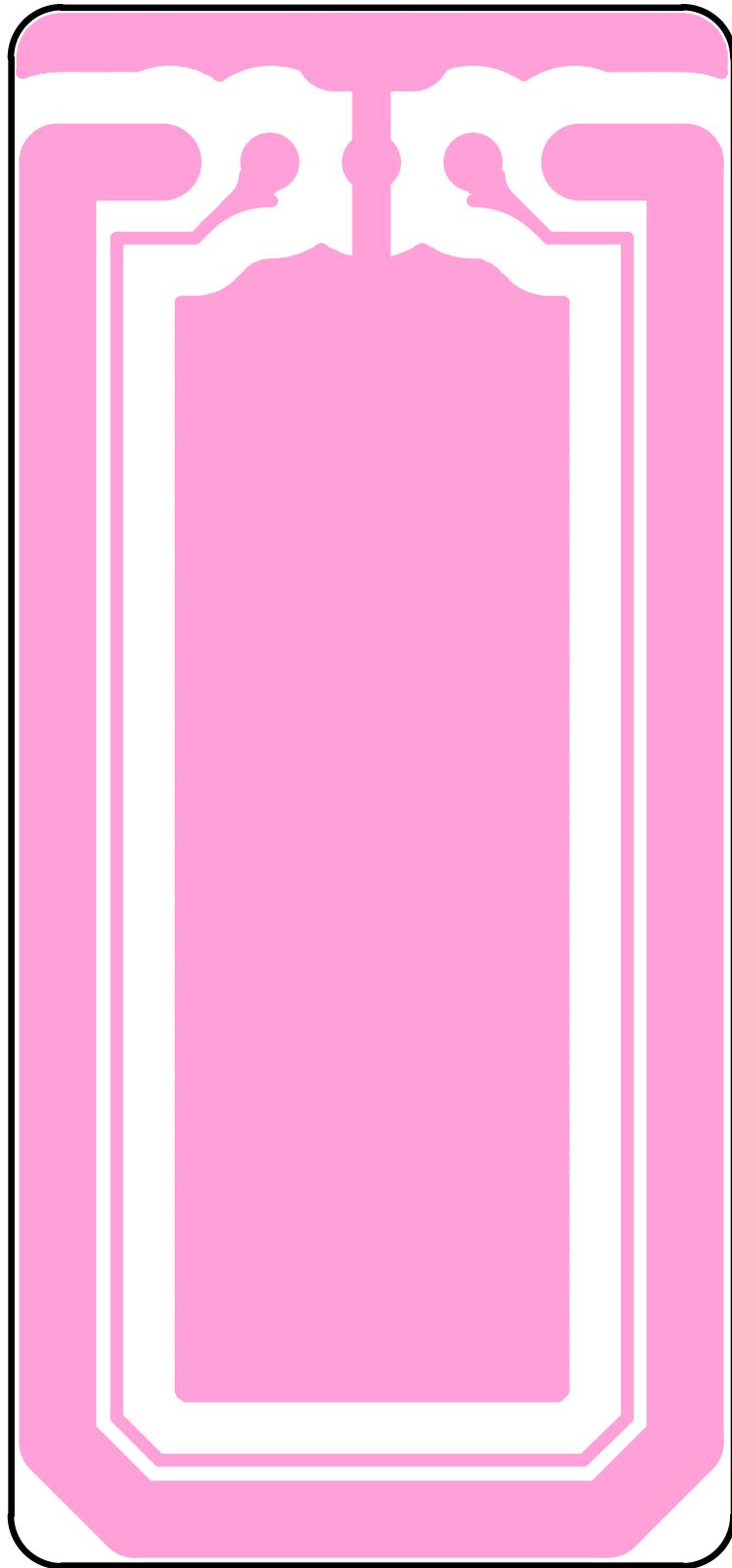
PC board views



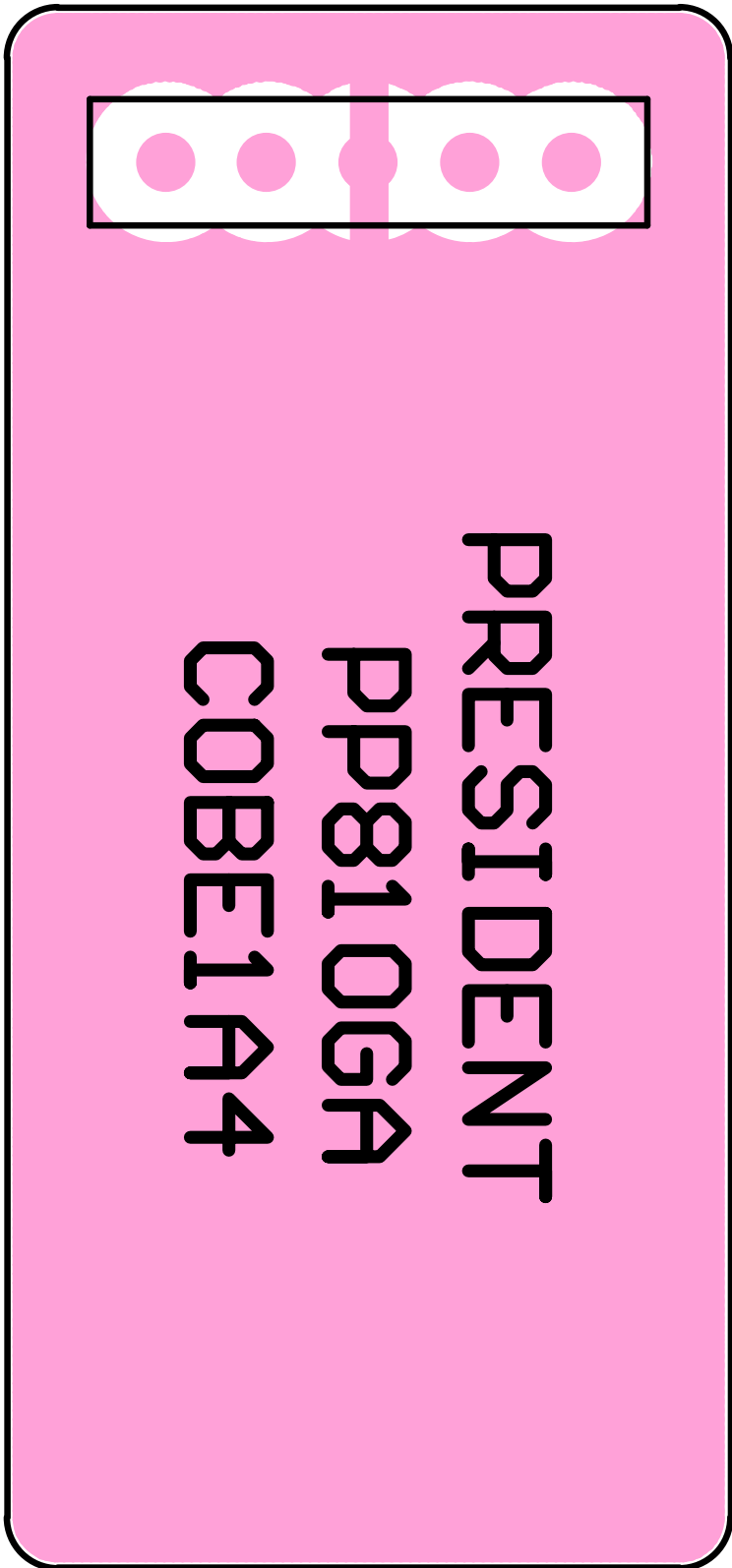
PC board views



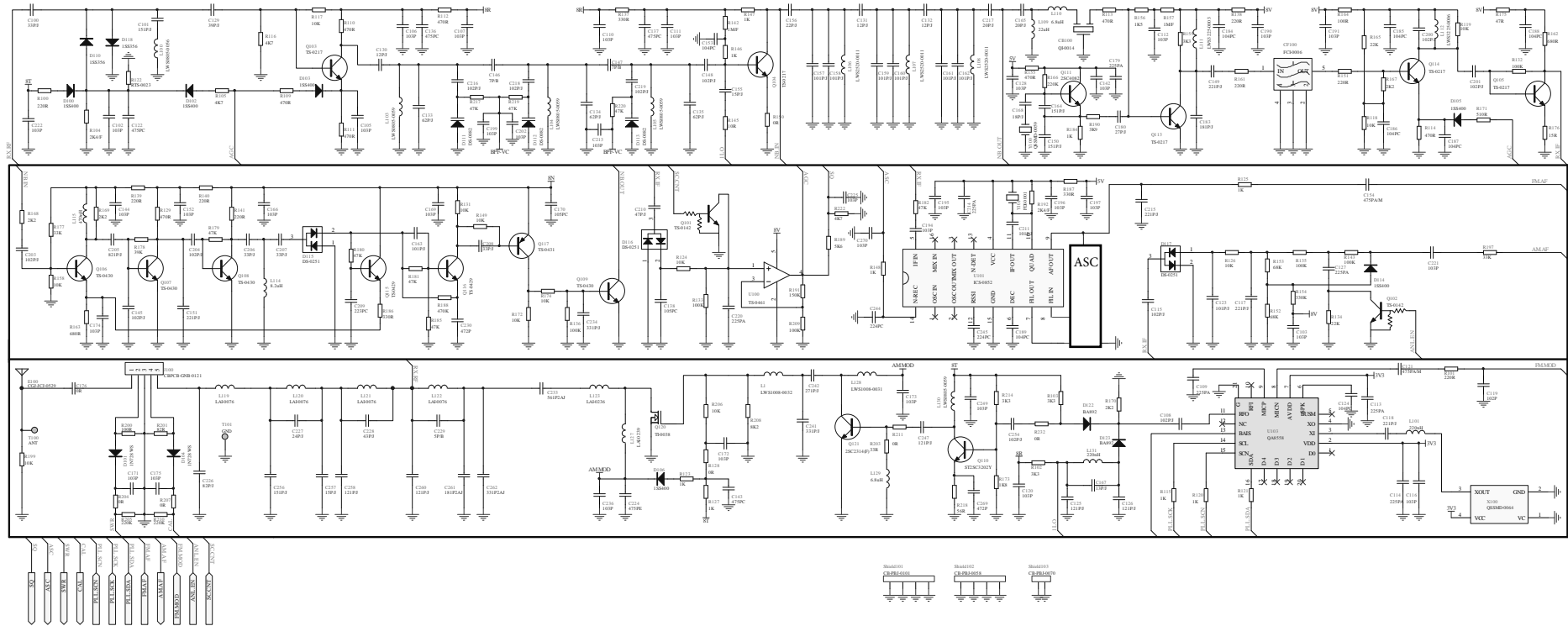
PC board views



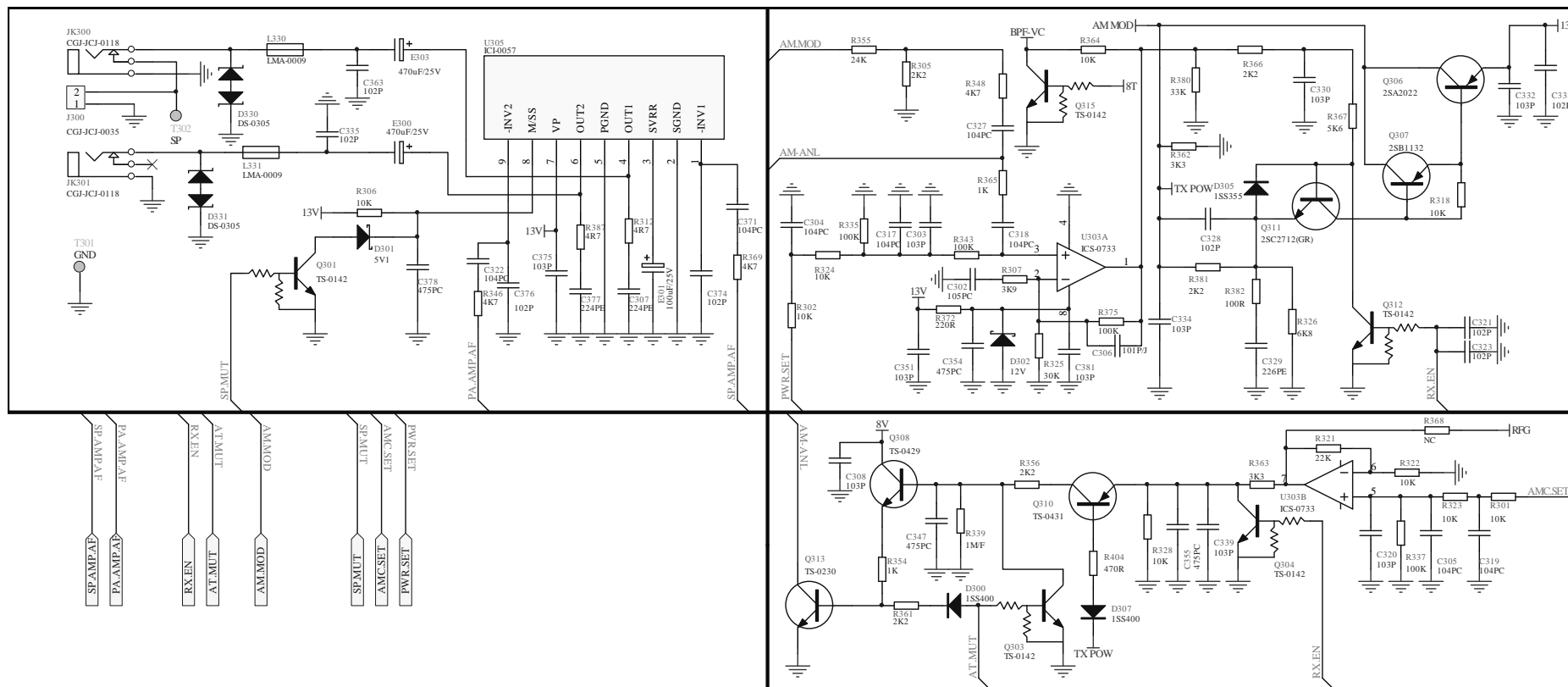
PC board views



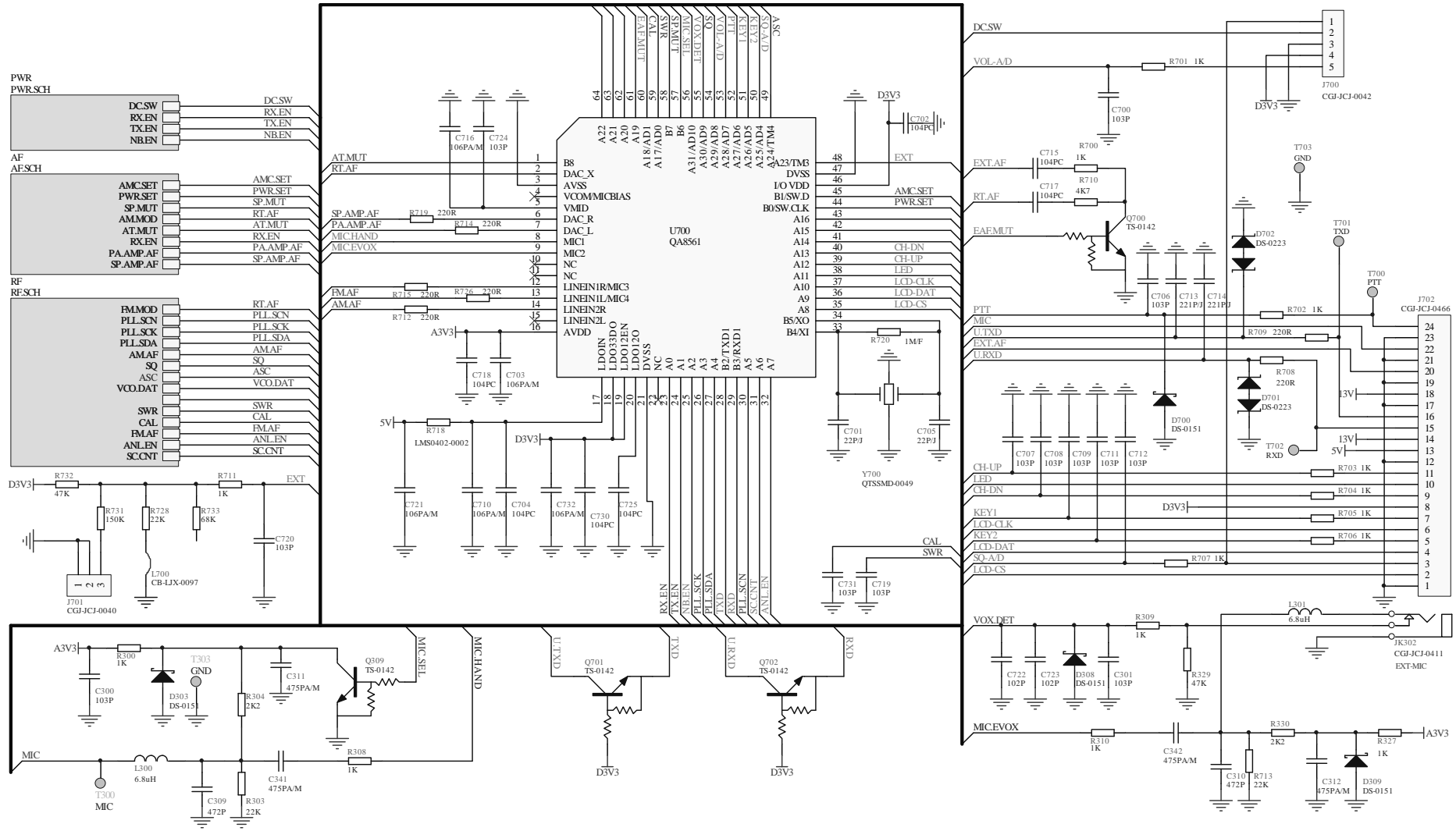
SCHEMATIC DIAGRAM



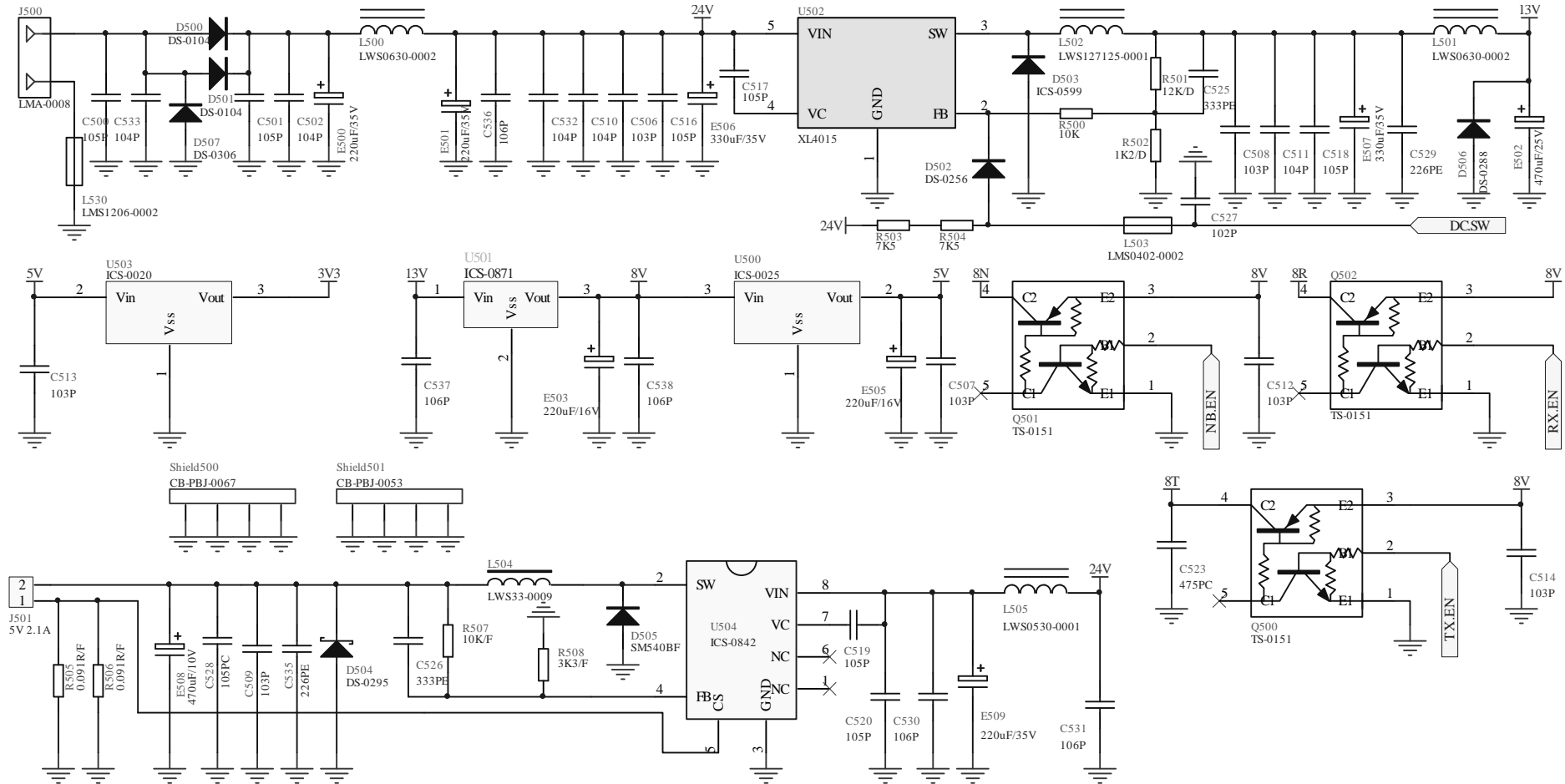
SCHEMATIC DIAGRAM



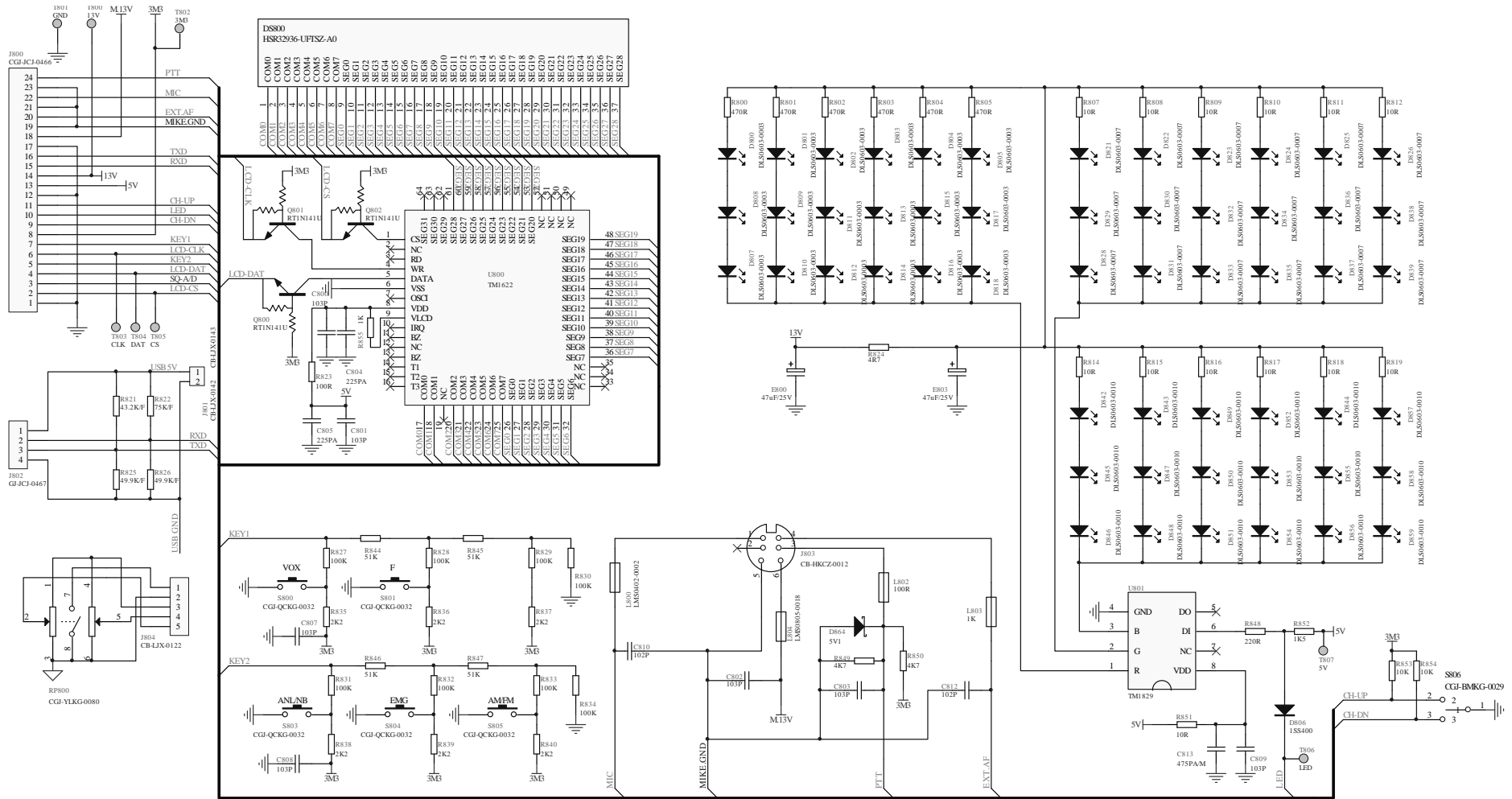
SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM



BLOCK DIAGRAM

