

**B** : Black  
**Y** : Yellow  
**SL** : Silver

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## CIRCUIT DESCRIPTION

### Frequency Configuration

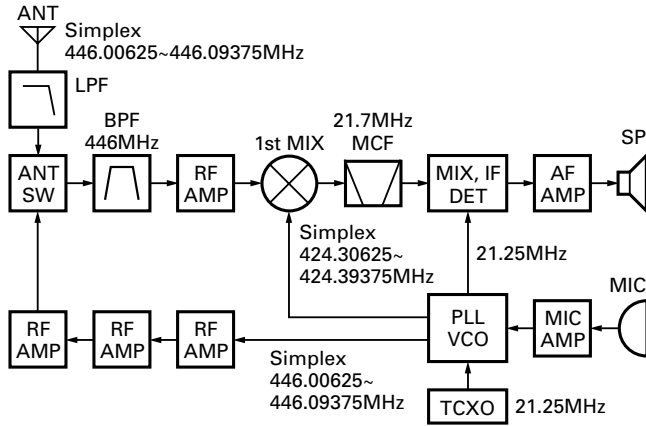


Fig. 1 Frequency configuration

Reception method	Double super heterodyne
1st IF frequency	21.7MHz (Lower)
2nd IF frequency	450kHz (Lower)
Transmission method	VCO direct amplification
Modulation	Variable reactance phase modulation

Table 1

### Receiver System

#### Front End

The high-frequency signal received from antenna passes through a LPF (Low pass filter : components between ANT and C73) to filter out unwanted high frequency signal. A switch diode system (D8, L32 and D10) allows this signal to pass through and enters the BPF (Band pass filter : L31) to eliminate unwanted signal when receiving.

The resulting signal is amplified by high-frequency amplifier (Q9) and goes to the first mixer (Q10).

#### First Mixer

The amplified signal that reaches Q10 is mixed with the first local signal from a VCO to produce a first IF signal (21.7MHz).

$$\begin{aligned} \text{(Receive frequency - First local frequency)} \\ = \text{First IF frequency} = 21.7\text{MHz} \end{aligned}$$

The first IF signal passes through MCF (Monolithic crystal filter) XF1 to eliminate unwanted components.

The first IF signal is amplified by IF amplifier (Q11) before going into FM IC (IC2).

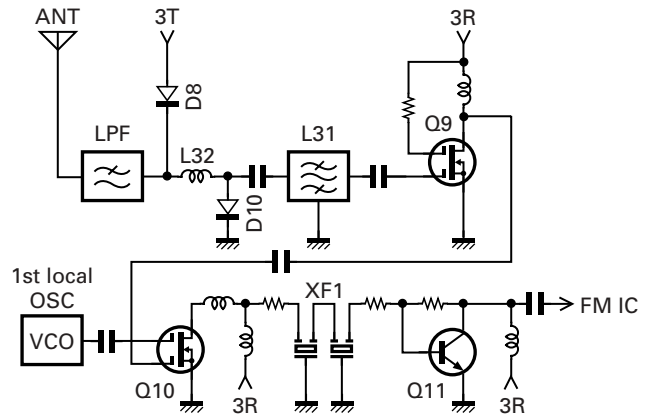


Fig. 3 Receiver front end and Mixer circuit

Item	Rating
Nominal center frequency (fo)	21.7MHz
Pass bandwidth	±3.75kHz or more at 3dB
Attenuation bandwidth	±14kHz or less at 40dB
Ripple	1dB or less
Insertion loss	3.5dB or less
Ultimate attenuation	80dB or more (fo ±910kHz)
Spurious responses	40dB or more (fo ±1MHz)
Terminating impedance	850Ω±5% // 5pF±0.5pF

Table 2 MCF (L71-0616-05) : TX-RX Unit XF1

Item	Rating
Nominal center frequency (fo)	450kHz
6dB bandwidth	±4.5kHz or more
50dB bandwidth	±10kHz or less
Ripple (450kHz ±3kHz)	3dB or less
Guaranteed attenuation (±100kHz)	40dB or more
Insertion loss	4dB or less
I/O matching impedance	2.0kΩ±10%

Table 3 Ceramic filter (L72-0974-05) : TX-RX Unit CF1

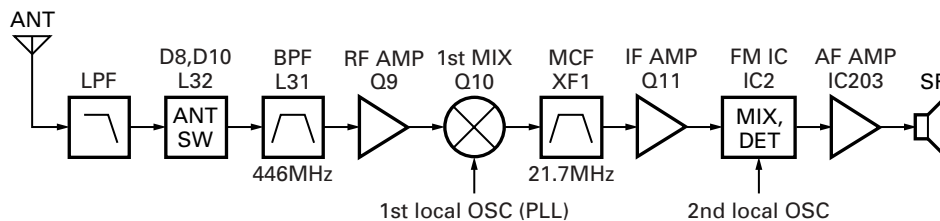


Fig. 2 Receiver section configuration

## CIRCUIT DESCRIPTION

### ■ IF Amplifier

The IF circuit consists of FM IC (IC2). This IC contains local line input buffer, Mixer, FM DET and audio frequency amplifier.

The First IF signal that comes from IF amplifier (Q11) then goes into the FM IC mixer. It is mixed with second local frequency (21.25MHz) that comes from the PLL IC reference oscillation crystal so as to produce a second IF signal. ( $21.7\text{MHz} - 21.25\text{MHz} = 2\text{nd IF} = 450\text{kHz}$ )

The 2nd IF signal then enters to ceramic filter (CF1) in order to eliminate unwanted components. The filtered signal is amplified by a limiter-amplifier, which consists of 6 differential amplifiers, to eliminate AM signal from 2nd IF.

The FM detector acts as a quadrature discriminator. The phase of the output signal from the limiter is shifted by 90 degrees by a quad coil (L36). This output signal is compared with the original non-shifted waveform to produce FM detection output.

### ■ Squelch Circuit

A squelch circuit is provided to prevent interference from noise or weak signal being output to the speaker during non-transmitting state.

This circuit contains an amplifier (Q13) and a rectifier (D11). The amplifier amplifies noise signals from FM detection output and passes them to a rectifier.

When there is no signal or weak signal being received, the FM IC detection will output high frequency noise and the rectifier will output high voltage level. When strong signal is received, the FM IC detection noise is suppressed and the rectifier output voltage level will be low.

MPU compares this rectifier output level to a predetermined level so as to determine when to turn on the speaker. Noise amplifier (Q13) and rectifier (D11) are used here instead of FM IC internal circuit to prevent temperature tolerance.

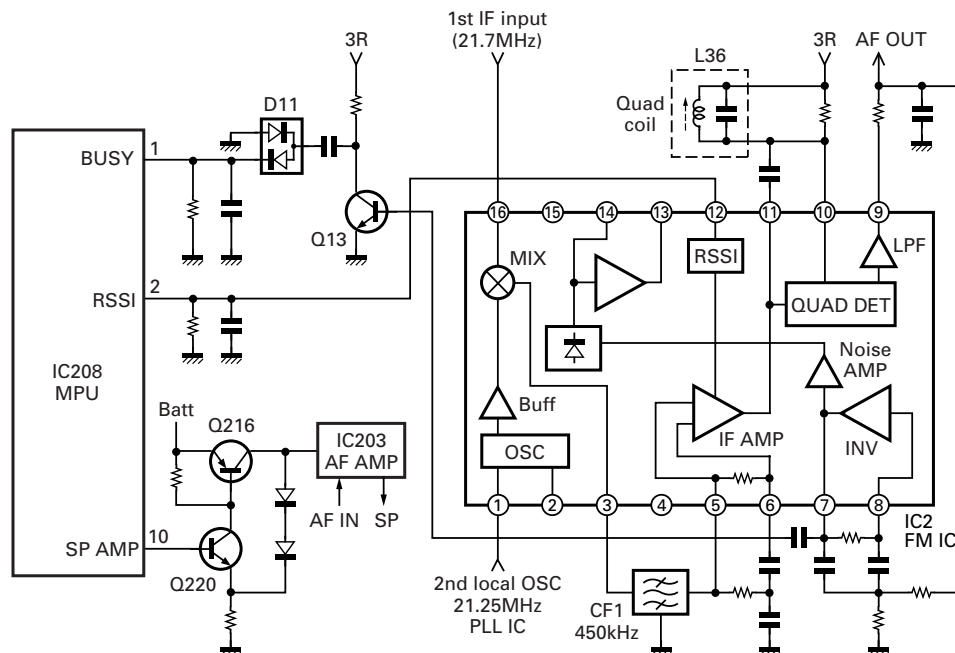


Fig. 4 IF amplifier and Squelch circuit

### ■ AF Amplifier

The FM detection output signal passes through the base band IC (IC209) which consists of band pass filter (300Hz~3kHz), de-emphasis circuit and amplifier. Next, the signal is passed to the volume control potential meter VR201 and then goes into the audio power amplifier (IC203) which drives the speaker to produce audio output.

### ■ Loudness ON/OFF Circuit

Loud On/Off switching circuit is controlled by AF switch (Q217, Q219, Q218). When Loud on, Q217 is On Q218 is Off. When Loud off, Q217 is off Q218 is on.

When the SP/MIC option is inserted, Loud circuit becomes Off automatically.

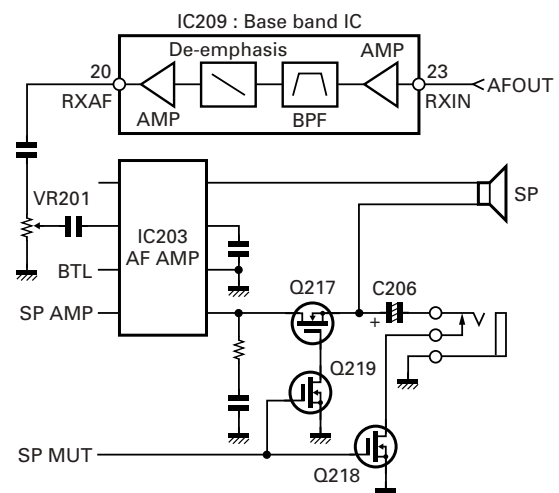


Fig. 5 AF amplifier and Loudness on/off circuit

## CIRCUIT DESCRIPTION

### Transmitter System

#### ■ Microphone Amplifier Circuit

The audio signal acquired from the microphone (MIC200) passes through the MIC amplifier (IC204) to perform signal amplification. An AGC (Automatic gain control) circuit is included to maintain output audio signal level.

The amplified signal passes through the amplifier, pre-emphasis circuit, limiter and Splatter filter contained inside base band IC (IC209) and reaches the VCO as modulation signal. The splatter filter will eliminate the distortion components outside the audio band.

#### ■ Modulation Circuit

The output signal of the base band IC passes through VR1 for Max Deviation Adjustment and goes to the modulation input of the VCO circuit for a variable reactance phase modulation.

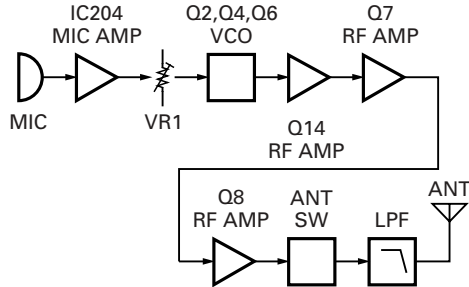


Fig. 6 Transmitter section configuration

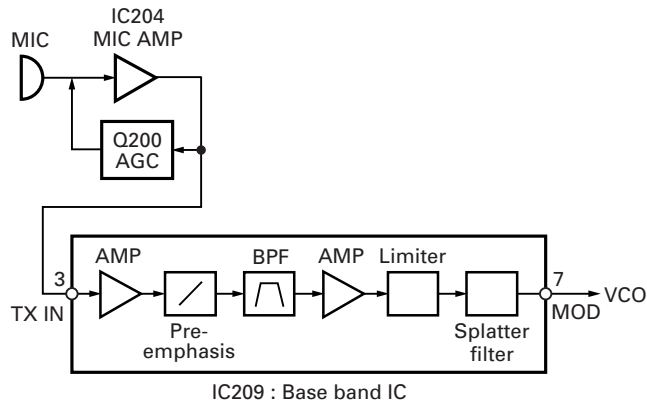


Fig. 7 Microphone amplifier circuit

#### ■ VOX Circuit

After amplified by MIC amplifier (IC204), MIC signal passes through VOX amplifier (Q201) to eliminate signal which is out of frequency range 300Hz~2.5kHz.

The resulting signal goes into rectifier (D203) and converts into DC level. This DC level is compared with preset value in MPU. If the level is higher than preset, MPU will start transmitting.

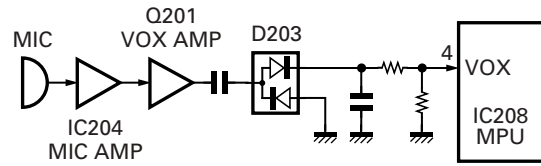


Fig. 8 VOX circuit

#### ■ Transmission Output Circuit

The VCO output is amplified by a high-frequency amplifier circuit (Q14, Q7 and Q8). The resulting signal will pass through a high-frequency antenna switch (D8), a low pass filter before being transmitted by the antenna.

The output power is about 500mW with 4.5V DC supply at battery terminal.

#### ■ Low Pass Filter Circuit

A three-stage low-pass filter is located between the antenna and the antenna switch circuit. It helps to remove the harmonic components that is generated by transmission circuit.

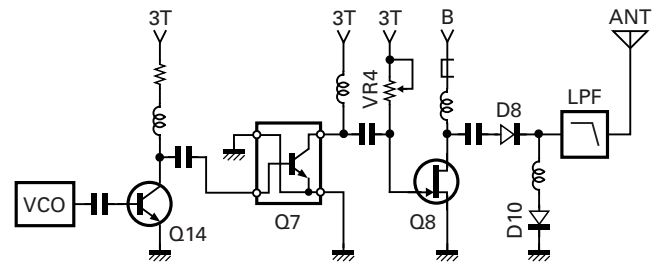


Fig. 9 Transmission output circuit

### PLL System

#### ■ VCO Circuit

The VCO circuit is housed in a shielding case.

The VCO circuit consists of an oscillation transistor (Q2), a variable capacitor diode (D2) for frequency control, a variable capacitor diode (D3) for variable reactance modulation, transmit/receive frequency switch diode (D1), control switch (Q1), ripple filter (Q3) and buffer amplifier (Q4).

The oscillation frequency is mainly determined by C12, C13, D2 and L3 (TX) or L3 and L2 (RX). D3 is used for modulation.

In RX mode, the TX/RX switch line goes low; switch Q1 and D1 turn off. The inductor L2 will be connected to oscillation circuit and Q2 will produce the first local frequency for reception purpose. (Receiving channel frequency subtracted by 21.7MHz equals to the receive frequency.)

In TX mode, the TX/RX switch line goes high; switch Q1 and D1 turn on. The inductor L2 is bypassed to ground through C2, D1 and C3. Q2 oscillation frequency becomes about 446MHz and the VCO will output the frequency which is needed for transmission.

The ripple filter (Q3) produces a 2.4V voltage supply for the oscillation transistor (Q2). D4 is used for speeding up the ripple filter operation when 3C line turns on.

## CIRCUIT DESCRIPTION

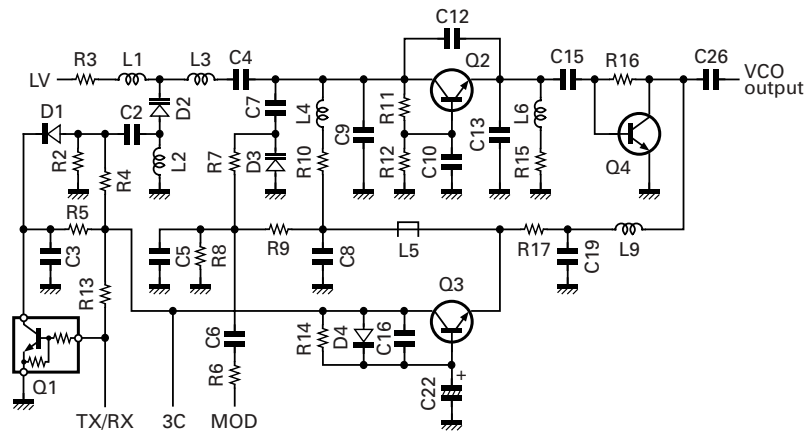


Fig. 10 VCO circuit

### ■ PLL Circuit

Frequency data is sent to the PLL IC (IC1) from MPU (IC208) through common data line either when the set is powered on, or when channel is changed, or when transmit is required. This data sets the dividers and CP (Charge Pump) of PLL IC.

The TCXO (X1) produces a 21.25MHz reference frequency and passes to PLL IC. Reference frequency is divided to produce a 12.5kHz for comparison of frequency inside PLL IC. The VCO output frequency is also passed to the PLL IC via Fin. The divider of the PLL IC, which is set by MPU, also divides this frequency. These two frequencies will be compared by the phase comparator circuit of PLL IC so as to detect the phase difference.

From the phase detection results, charge pump will be able to output the PWM (Pulse Width Modulation) pulse. This output voltage will then be used to control the VCO frequency through PLL Loop Filter.

This control voltage passes through the loop filter which is applied at the VCO control pin to control the oscillation frequency. Basically, the loop filter removes unwanted harmonics and noise produced at the output of the charge pump. It also determines the PLL response by synchronizing the amplitude and phase characteristics.

### ■ Unlock Detection Circuit

If the PLL cannot synchronize for some reason during operation, the PLL IC will output a low voltage level signal at LD (pin 5) to the MPU. MPU will stop transmitting or receiving to prevent wrong frequency transmitted or received.

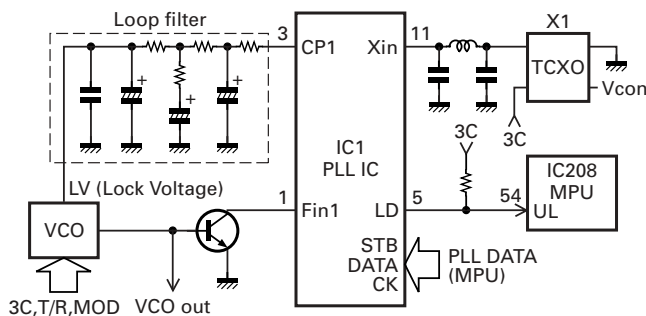


Fig. 11 PLL circuit

### Control System

#### ■ Reset Circuit

When a battery is inserted, the MPU power supply provides the operating voltage after about 0.5sec. The reset IC (IC202) output a low signal to reset the MPU so that MPU starts to work correctly.

When battery voltage is lower than 3.0V (set working voltage limits) or battery is removed, another reset IC (IC206) will send a reset to MPU so as to prevent this unit from working under non-guarantee low voltage condition.

#### ■ Battery Voltage Indication Circuit

The unit contains a battery voltage detection circuit. This circuit monitors battery voltage every half second and displays bars on LCD to indicate the battery level. Once battery voltage drops below 3.2V, indicator will start flashing on LCD and TX operation inhibits.

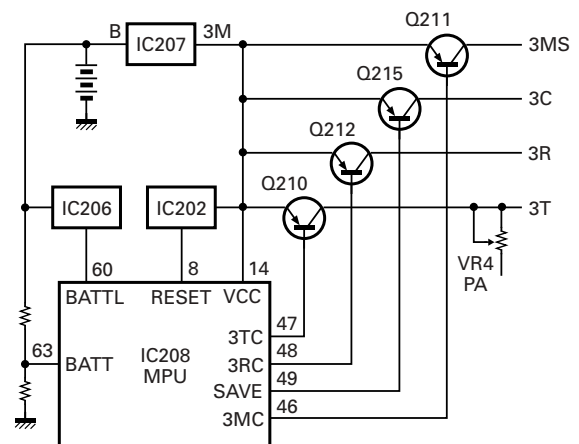


Fig. 12 Reset, battery voltage indication and Power supply circuit

## CIRCUIT DESCRIPTION

### Power Supply Circuit

The battery voltage directly supplies RF final amplifier (Q8) and AF amplifier (IC203) through AVR (Q216).

IC207 supplies 3V voltage to MPU, EEPROM and power key.

Switch Q211 delivers 3V supply 3MS to base band IC, MIC amplifier and VOX circuit when necessary.

Switch Q215 delivers 3V supply 3C to VCO and PLL circuit during receiving, transmitting or standby.

Switch Q212 delivers 3V supply 3R to FM IC, Mixer, RX amplifier and IF amplifier during receiving or standby.

Switch Q210 delivers 3V supply 3T to TX amplifier Q14, Q7, TX/RX switch and the power control circuit of Q8.

If there is no incoming signal or key press after 5 second, unit will enter its power save mode. In power save mode, 3C and 3R will be turned on and off respectively for power saving.

### Remote Control Circuit

The voltage at the MPU REM (pin 3) will be converted into a digital signal to carry out remote operation according to the predetermined voltages level.

The REM pin is set to about 3V by pull up resistor. When remote control switch is pressed, the voltage divided by the resistor in series with the pull up resistor will generate a voltage for MPU to recognize the operation.

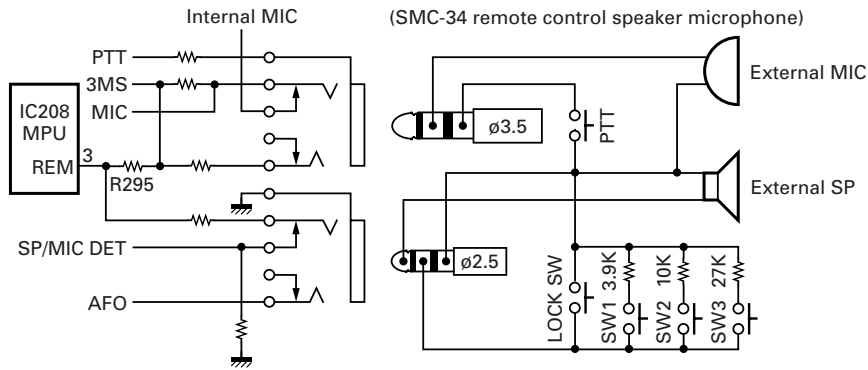


Fig. 13 Speaker, microphone jack and Remote control circuit

### CTCSS Circuit

The tone frequency is generated by MPU (pin 57). This PWM signal becomes a sinusoidal waveform after passing through a RC low pass network. It will mix with voice signal from base band IC and becomes modulation signal for VCO.

During receiving, the QT signal received from FM IC will go through the base band IC so that signal with less than

300Hz will be output via IC209 pin 21. Next, it will pass through the low pass filter (IC211) so as to eliminate unwanted noise. Then the filtered tone will be passed to the pin 64 of MPU where the digital filter inside the MPU will detect the tone. If the tone is matched, MPU will turn on the speaker.

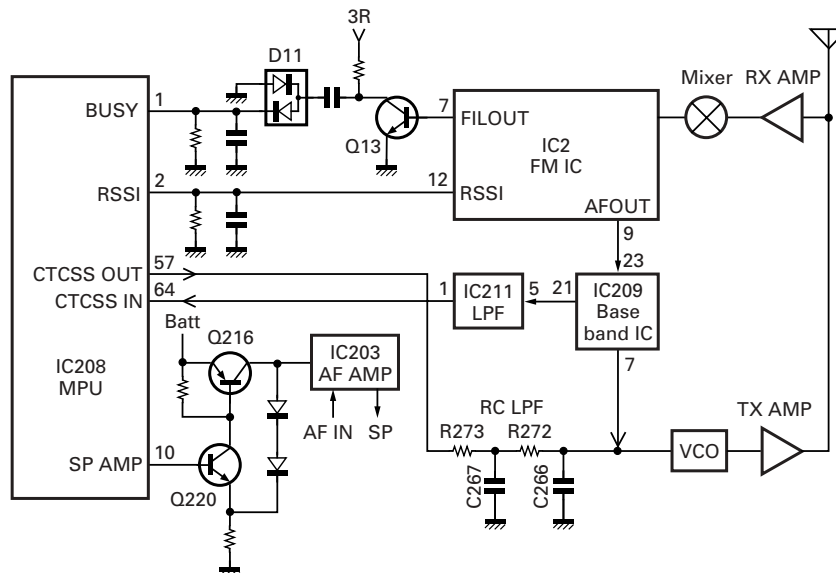


Fig. 14 CTCSS circuit

## COMPONENTS DESCRIPTION / TERMINAL FUNCTION

### TX-RX Unit (X57-6672-70) (A/2) : Control

Ref. No.	Use/Function	Operation/Condition/Compatibility
Q200	MIC Mute Switch	On when microphone mute
Q201	VOX Amplifier	
Q210	3T Switch	3T (3.0V)
Q211	3MS Switch	3MS (3.0V)
Q212	3R Switch	3R (3.0V)
Q213	Lamp LED switch	On when lamp LED on
Q215	3C Switch	3C (3.0V)
Q216	AF Amplifier AVR	Acts as a voltage regulator
Q217~219	AF Switch	Internal/external speaker switch
Q220	AF Switch	Acts as a voltage regulator
IC202	Voltage Detection	2.4V, MPU reset
IC203	AF Amplifier	2 pin : Input, 5 pin : Output 1, 8 pin : Output 2
IC204	MIC Amplifier	3 pin : Input, 4 pin : Output
IC206	Voltage Detection	3.0V, MPU reset
IC207	AVR	3M (3.0V)
IC208	MPU	
IC209	Baseband IC	Audio signal processing
IC210	EEPROM	Operating data storage
IC211	Low Pass Filter	CTCSS low pass filter
D200	Protection Diode	
D202	MIC Mute Diode	Acts as an OR gate
D203	Tone Signal Detection	Rectification
D204	Tone Signal Detection	Rectification
D205	Lamp LED	LCD back light illumination
D206	Protection Diode	
D208	Tone Signal Detection	Rectification
D209,210	Voltage Level Shift Diode	Acts as a zener diode

### TX-RX Unit (X57-6672-70) (B/2) : RF

Ref. No.	Use/Function	Operation/Condition/Compatibility
Q1	Switch	Off when RX
Q2	Oscillator	RX : 424.30625~424.39375MHz TX : 446.00625~446.09375MHz
Q3	Ripple Filter	
Q4,5	Buffer	
Q6	RF Amplifier	For RX/TX
Q7	RF Amplifier	For TX
Q8	RF Power Amplifier	Transmit power
Q9	RF Amplifier	For RX

Ref. No.	Use/Function	Operation/Condition/Compatibility
Q10	1st Mixer	RX Frequency – 1st local oscillation frequency
Q11	IF Amplifier	1st IF 21.7MHz
Q13	Noise Amplifier	
Q14	RF Amplifier	For TX
IC1	PLL IC	
IC2	FM IC	
D1	RF Switch	TX/RX switch
D2	Variable Capacitance Diode	VCO frequency control
D3	Variable Capacitance Switch	VCO modulation
D4	Speed Up	For ripple filter
D5	Diode	Unlock detect
D8,10	RF Switch	Antenna switch
D11	Rectifier	Convert noise to DC voltage

### TERMINAL FUNCTION

#### ■ CN1 and CN200

Pin No.	Pin Name	Function
1	GND	Ground
2	MOD	Voice modulation line
3	GND	Ground
4	TO	QT tone modulation line
5	GND	Ground
6	BUSY	RX busy detect
7	GND	Ground
8	3C	3V power supply for VCO and PLL
9	GND	Ground
10	UL	PLL unlock L : Unlock
11	3T	3V power supply for TX
12	CK	Clock line for PLL IC
13	3R	3V power supply for RX
14	DT	Data line for PLL IC
15	B	Battery voltage
16	EP	Enable line for PLL
17	B	Battery voltage
18	CRS	RX carrier level detect
19	B	Battery voltage
20	AFO	RX audio output line

## SEMICONDUCTOR DATA

### MPU : M38C24M6502HP (IC208)

#### ■ Pin Function

Pin No.	Pin Name	I/O	Function
1	BUSY	I	Busy input
2	RSSI	I	RSSI input
3	REM	I	Remote key input
4	VOX	I	VOX input
5	TUNE	I	Enter to tuning mode
6	OSCO	O	Oscillation output
7	FLASH (GND)	-	GND
8	RESET	I	Reset input
9	SPM	O	Speaker mute H : Mute
10	SPAMP	O	Speaker amp switch H : ON
11	GND	-	GND
12	Xin	-	Crystal (3.633MHz)
13	Xout	-	Crystal (3.633MHz)
14	Vcc	-	3V
15	MJDET	I	MIC jack detection
16	BTLC	O	BTL control H : ON
17	ESDA	I/O	EEPROM data
18	ESCL	O	EEPROM clock
19	PWR	I	[Power] key input
20	RxD	I	PC interface
21	TxD	O	PC interface
22	PTT	I	[PTT] key input
23	MODE	I	[MODE] key input
24	NC	-	NC
25	COM2	O	LCD common signal output (COM2)
26	COM1	O	LCD common signal output (COM1)
27	COM0	O	LCD common signal output (COM0)
28	NC	-	NC
29~44	S15~S0	O	LCD segment output (SEG15~SEG0)
45	LAMP	O	Lamp control H : ON
46	3MC	O	3C control L : ON
47	3TC	O	3T control L : ON
48	3RC	O	3R control L : ON
49	SAVE	O	Battery save control L : ON
50	CLK	O	Common clock
51	DAT	O	Common data
52	AKDIR	O	AK2346 DIR
53	PLLE	O	PLL IC enable
54	UL	I	PLL IC unlock
55	UP	I	[UP] key input

Pin No.	Pin Name	I/O	Function
56	DOWN	I	[Down] key input
57	QTOUT	O	CTCSS output
58	BEEP	O	Beep output
59	MICM	O	MIC mute H : Mute
60	BATTL	I	Low battery detection
61	GND	-	GND
62	VREF	-	3V reference voltage
63	BATT	I	Battery voltage
64	QTIN	I	CTCSS input

### 1k bit Serial EEPROM : AT24C01A10SI18 or CAT24WC01J18 (IC210)

#### ■ Pin Function

Pin No.	Pin Name	Function
1~3	A0~A2	Address inputs
4	VSS	Ground
5	SDA	Serial data
6	SCL	Serial clock input
7	WP	Write protect
8	VCC	Power supply

### Reset IC :

### BD4724G (IC202) and BD4730G (IC206)

#### ■ Pin Function

Pin No.	Pin Name	Function
1	NC	NC
2	VEE1	Reference voltage
3	VEE2	Reference voltage
4	OUT	Output voltage
5	VCC	Power supply

### Audio Power Amplifier : LM4865M (IC203)

#### ■ Pin Function

Pin No.	Pin Name	Function
1	VCC	Supply voltage
2	-VIN	input
3	HP_SEN	Detection of speaker and mic
4	DC_VOL/SW	DC voltage volume control
5	VO1	Output 1
6	GND	Ground
7	BYPASS	Bypass capacitor
8	VO2	Output 2



## PARTS LIST

\* New Parts.  $\Delta$  indicates safety critical components.

Parts without **Parts No.** are not supplied.

Les articles non mentionnés dans le **Parts No.** ne sont pas fournis.

Teile ohne **Parts No.** werden nicht geliefert.

**L** : Scandinavia

**Y** : PX (Far East, Hawaii)

**Y** : AAFES (Europe)

**K** : USA

**T** : England

**X** : Australia

**P** : Canada

**E** : Europe

**M** : Other Areas

**UBZ-LJ8 (Y50-5762-XX)**

**TX-RX UNIT (X57-6672-70)**

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination	
<b>UBZ-LJ8</b>						C15			CC73GCH1H0R5B	CHIP C	0.5PF	B
1	3A	*	A02-3788-13	CABINET ASSY (REAR)	BLACK	C16			CK73GB1H471K	CHIP C	470PF	K
1	3A	*	A02-3789-13	CABINET ASSY (REAR)	YELLOW	C17			CC73GCH1H030C	CHIP C	3.0PF	C
1	3A	*	A02-3790-13	CABINET ASSY (REAR)	SILVER	C18			CC73GCH1H080D	CHIP C	8.0PF	D
2	1A	*	A02-3794-03	CABINET ASSY (FRONT)	BLACK	C19			CK73GB1H471K	CHIP C	470PF	K
2	1A	*	A02-3795-03	CABINET ASSY (FRONT)	YELLOW	C20			CC73GCH1H030C	CHIP C	3.0PF	C
2	1A	*	A02-3796-03	CABINET ASSY (FRONT)	SILVER	C22			C92-0712-05	CHIP-TAN	22UF	6.3WV
4	3B	*	B09-0673-03	CAP (SP/MIC)		C23			CC73GCH1H050C	CHIP C	5.0PF	C
5	1A	*	B10-2742-03	FRONT GLASS	BLACK	C25			CK73GB1H471K	CHIP C	470PF	K
5	1A	*	B10-2748-03	FRONT GLASS	SILVER, YELLOW	C26			CC73GCH1H080B	CHIP C	8.0PF	B
7	2C	*	B62-1669-10	INSTRUCTION MANUAL		C27			CC73GCH1H020B	CHIP C	2.0PF	B
8	3A	*	D10-0646-04	LEVER	BLACK	C28			CC73GCH1H030B	CHIP C	3.0PF	B
8	3A	*	D10-0647-04	LEVER	YELLOW	C29,30			CK73GB1H471K	CHIP C	470PF	K
8	3A	*	D10-0648-04	LEVER	SILVER	C31			CK73GB1H182K	CHIP C	1800PF	K
-		*	D21-0860-14	SHAFT (LEVER)		C32			CC73GCH1H101J	CHIP C	100PF	J
12	1A		E37-0810-15	PARALLEL CORD (SP)		C33			C92-0555-05	CHIP-TAN	0.047UF	35WV
14	3A	*	F07-1871-02	COVER (BATT)	BLACK	C34			CK73GB1H102K	CHIP C	1000PF	K
14	3A	*	F07-1872-02	COVER (BATT)	YELLOW	C35			C92-0005-05	CHIP-TAN	2.2UF	6.3WV
14	3A	*	F07-1873-02	COVER (BATT)	SILVER	C36-38			CC73GCH1H101J	CHIP C	100PF	J
17	3A	*	G53-1557-03	PACKING (BATT COVER)		C39			C92-0695-05	CHIP-TAN	10UF	10WV
18	3B	*	G53-1558-04	PACKING (SP/MIC)		C40			C92-0502-05	CHIP-TAN	0.33UF	35WV
20	1C	*	J29-0700-03	BELT HOOK		C41			CC73GCH1H470J	CHIP C	47PF	J
22	1A	*	K29-9256-02	KEY TOP (4 KEYS)		C42			CK73GB1H102K	CHIP C	1000PF	K
23	1A	*	K29-9257-03	BUTTON KNOB (PTT)		C43			CC73GCH1H101J	CHIP C	100PF	J
24	2B	*	K29-9258-03	KNOB (VOL)		C44			CC73GCH1H080D	CHIP C	8.0PF	D
A	2A,3A		N09-2291-05	TAPTITE SCREW		C45			CC73GCH1H330J	CHIP C	33PF	J
C	2A	*	N14-0801-05	HEXAGON NUT (ANT)		C46			CC73GCH1H080D	CHIP C	8.0PF	D
D	2A	*	N17-1040-46	TOOTHED LOCK WASHER (ANT)		C47			CK73GB1H471K	CHIP C	470PF	K
E	2A		N67-2005-46	PAN HEAD SEMS SCREW W (ANT)		C50			CK73GB1H471K	CHIP C	470PF	K
B	2A,3B		N80-2014-45	PAN HEAD TAPTITE SCREW		C52			CC73GCH1H151J	CHIP C	150PF	J
26	1A		T07-0362-05	SPEAKER		C53			CK73GB1H471K	CHIP C	470PF	K
27	2A	*	T90-1016-05	ANTENNA		C55			CC73GCH1H070B	CHIP C	7.0PF	B
<b>TX-RX UNIT (X57-6672-70)</b>						C57			CK73GB1C104K	CHIP C	0.10UF	K
101	1B	*	B11-1298-03	ILLUMINATION GUIDE		C58			CC73GCH1H100C	CHIP C	10PF	C
102	1B	*	B38-0876-05	LCD		C59			CC73GCH1H300J	CHIP C	30PF	J
D205			B30-2143-05	LED (YG)		C60			CC73GCH1H220J	CHIP C	22PF	J
C2,3			CK73GB1H471K	CHIP C	470PF	K	C61		CK73GB1C104K	CHIP C	0.10UF	K
C4			CC73GCH1H3R5B	CHIP C	3.5PF	B	C62		CC73GCH1H300J	CHIP C	30PF	J
C5			CK73GB1H471K	CHIP C	470PF	K	C63		CK73GB1C104K	CHIP C	0.10UF	K
C6			CK73GB1A105K	CHIP C	1.0UF	K	C64,65		CK73GB1H471K	CHIP C	470PF	K
C7			CC73GCH1H0R5B	CHIP C	0.5PF	B	C66,67		CK73GB1A105K	CHIP C	1.0UF	K
C8			CK73GB1H471K	CHIP C	470PF	K	C68		CC73GCH1H180J	CHIP C	18PF	J
C9			CC73GCH1H030B	CHIP C	3.0PF	B	C70,71		CK73GB1H471K	CHIP C	470PF	K
C10			CK73GB1H471K	CHIP C	470PF	K	C73		CK73GB1H471K	CHIP C	470PF	K
C12			CC73GCH1H090B	CHIP C	9.0PF	B	C75		CC73GCH1H040B	CHIP C	4.0PF	B
C13			CC73GCH1H110J	CHIP C	11PF	J	C77		CC73GCH1H050B	CHIP C	5.0PF	B
C14			CC73GCH1H050C	CHIP C	5.0PF	C	C79		CC73GCH1H050B	CHIP C	5.0PF	B
							C80,81		CC73GCH1H010B	CHIP C	1.0PF	B
							C87		CK73GB1H471K	CHIP C	470PF	K
							C88		CC73GCH1H030B	CHIP C	3.0PF	B
							C89		CK73GB1H471K	CHIP C	470PF	K
							C90		CC73GCH1H101J	CHIP C	100PF	J
							C93		CK73GB1H471K	CHIP C	470PF	K
							C94		CC73GCH1H050C	CHIP C	5.0PF	C
							C96		CK73GB1H471K	CHIP C	470PF	K

## PARTS LIST

### TX-RX UNIT (X57-6672-70)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C98,99			CK73GB1H471K	CHIP C 470PF K		C251			CK73GB1C104K	CHIP C 0.10UF K	
C101			CC73GCH1H030B	CHIP C 3.0PF B		C252			CK73GB1H103K	CHIP C 0.010UF K	
C102			CK73GB1H471K	CHIP C 470PF K		C253			CK73GB1H222K	CHIP C 2200PF K	
C103			CC73GCH1H050B	CHIP C 5.0PF B		C254,255			CK73GB1A105K	CHIP C 1.0UF K	
C105			CC73GCH1H050C	CHIP C 5.0PF C		C258,259			CK73GB1A105K	CHIP C 1.0UF K	
C106			CK73GB1H103K	CHIP C 0.010UF K		C261			CC73GCH1H121J	CHIP C 120PF J	
C107			CK73GB1H471K	CHIP C 470PF K		C263			CK73GB1H182K	CHIP C 1800PF K	
C108			CC73GCH1H470J	CHIP C 47PF J		C264			CK73GB1H822K	CHIP C 8200PF K	
C109			CK73GB1H103K	CHIP C 0.010UF K		C265-267			CK73GB1C104K	CHIP C 0.10UF K	
C110			CK73GB1H471K	CHIP C 470PF K		C272,273			CK73GB1C473K	CHIP C 0.047UF K	
C112			CC73GCH1H150J	CHIP C 15PF J		C275			CK73GB1C223K	CHIP C 0.022UF K	
C113			CC73GCH1H030B	CHIP C 3.0PF B		C276			CK73GB1C563K	CHIP C 0.056UF K	
C114			CK73GB1H102K	CHIP C 1000PF K		C277			CK73GB1H681K	CHIP C 680PF K	
C115			C92-0695-05	CHIP-TAN 10UF 10WV		C279			CK73GB1A105K	CHIP C 1.0UF K	
C116,117			CK73GB1H103K	CHIP C 0.010UF K		C286			CK73GB1C104K	CHIP C 0.10UF K	
C118			CK73GB1A224K	CHIP C 0.22UF K		C288			CK73GB1H102K	CHIP C 1000PF K	
C122			CK73GB1C473K	CHIP C 0.047UF K		C290			CK73GB1C104K	CHIP C 0.10UF K	
C124,125			CK73GB1H102K	CHIP C 1000PF K		C292			CK73GB1C104K	CHIP C 0.10UF K	
C127			CK73GB1C333K	CHIP C 0.033UF K		C293			CK73GB1H222K	CHIP C 2200PF K	
C128			CK73GB1H182K	CHIP C 1800PF K		C294			CK73GB1H103K	CHIP C 0.010UF K	
C129			CK73GB1H102K	CHIP C 1000PF K		C295			CK73GB1H392K	CHIP C 3900PF K	
C130-133			CK73GB1H471K	CHIP C 470PF K		C296			CK73GB1C683J	CHIP C 0.068UF J	
C134			CK73GB1H182K	CHIP C 1800PF K		C297-302			CK73GB1H471K	CHIP C 470PF K	
C135			CC73GCH1H270J	CHIP C 27PF J		C303,304			CK73GB1H103K	CHIP C 0.010UF K	
C136			CK73GB1C104K	CHIP C 0.10UF K		C305			CK73GB1A105K	CHIP C 1.0UF K	
C138			C92-0695-05	CHIP-TAN 10UF 10WV		C306			CK73GB1H471K	CHIP C 470PF K	
C140,141			CK73GB1H102K	CHIP C 1000PF K		C307			CK73GB1A105K	CHIP C 1.0UF K	
C142			CK73GB1A105K	CHIP C 1.0UF K		103	1B	*	E29-1196-04	INTER CONNECTOR (LCD)	
C143			C92-0695-05	CHIP-TAN 10UF 10WV		CN1			E40-6213-05	PIN ASSY	
C144			CC73GCH1H4R5B	CHIP C 4.5PF B		CN200			E40-6214-05	PIN ASSY SOCKET	
C146			CC73GCH1H040B	CHIP C 4.0PF B		J200			E11-0457-05	PHONE JACK (2.5/3.5)	
C147			CK73GB1H471K	CHIP C 470PF K		F200			F53-0217-05	FUSE (3A)	
C148			CC73GCH1H101J	CHIP C 100PF J		104	1B	*	J21-8448-04	HARDWARE FIXTURE (LCD)	
C149			CC73GCH1H070B	CHIP C 7.0PF B		105	1A	*	J30-1212-04	SPACER (MIC ELEMENT)	
C150			CC73GCH1H050B	CHIP C 5.0PF B		CF1			L72-0974-05	CERAMIC FILTER (450K)	
C152,153			CC73GCH1H220J	CHIP C 22PF J		L1			L40-1001-86	SMALL FIXED INDUCTOR (10UH)	
C201			CK73GB1H103K	CHIP C 0.010UF K		L2			L40-6865-92	SMALL FIXED INDUCTOR (6.8NH)	
C206			C92-0665-05	TANTAL 100UF 6.3WV		L3			L40-3975-54	SMALL FIXED INDUCTOR (39NH)	
C208			CK73GB1C104K	CHIP C 0.10UF K		L4			L40-1001-86	SMALL FIXED INDUCTOR (10UH)	
C209			CK73GB1H471K	CHIP C 470PF K		L5		*	L92-0444-05	FERRITE CHIP	
C210			CK73GB1H102K	CHIP C 1000PF K		L6		*	L40-1001-86	SMALL FIXED INDUCTOR (10UH)	
C211			CK73GB1H471K	CHIP C 470PF K		L7,8		*	L41-1275-06	SMALL FIXED INDUCTOR (12NH)	
C212			C92-0695-05	CHIP-TAN 10UF 10WV		L9		*	L41-2275-06	SMALL FIXED INDUCTOR (22NH)	
C220			C92-0695-05	CHIP-TAN 10UF 10WV		L10		*	L41-2775-06	SMALL FIXED INDUCTOR (27NH)	
C221,222			CK73GB1C104K	CHIP C 0.10UF K		L11		*	L92-0444-05	FERRITE CHIP	
C224			CC73GCH1H680J	CHIP C 68PF J		L12		*	L40-4795-85	SMALL FIXED INDUCTOR (4.7UH)	
C225			C92-0587-05	CHIP-TAN 2.2UF 4WV		L13		*	L41-1075-06	SMALL FIXED INDUCTOR (10NH)	
C226			CK73GB1C223K	CHIP C 0.022UF K		L14		*	L40-6865-92	SMALL FIXED INDUCTOR (6.8NH)	
C227			CK73GB1A105K	CHIP C 1.0UF K		L15		*	L34-4568-05	AIR-CORE COIL	
C228,229			CK73GB1C104K	CHIP C 0.10UF K		L16		*	L92-0445-05	FERRITE CHIP	
C233-235			CK73GB1A105K	CHIP C 1.0UF K		L17		*	L40-8265-92	SMALL FIXED INDUCTOR (8.2NH)	
C236			C92-0775-05	CHIP-TAN 47UF 4WV		L18		*	L40-2285-54	SMALL FIXED INDUCTOR (220NH)	
C237			CK73GB1H471K	CHIP C 470PF K		L20		*	L41-1275-08	SMALL FIXED INDUCTOR (12NH)	
C238,239			CK73GB1H103K	CHIP C 0.010UF K		L21,22		*	L41-1575-08	SMALL FIXED INDUCTOR (15NH)	
C240-242			CK73GB1H471K	CHIP C 470PF K		L26		*	L40-2275-92	SMALL FIXED INDUCTOR (22NH)	
C243,244			CC73GCH1H150J	CHIP C 15PF J		L27		*	L40-2078-98	SMALL FIXED INDUCTOR (20NH)	
C245			CK73GB1A105K	CHIP C 1.0UF K		L28		*	L92-0444-05	FERRITE CHIP	
C246			CK73GB1H471K	CHIP C 470PF K		L29,30		*	L40-1875-92	SMALL FIXED INDUCTOR (18NH)	
C247			CC73GCH1H121J	CHIP C 120PF J							
C248,249			CK73GB1C473K	CHIP C 0.047UF K							

## PARTS LIST

TX-RX UNIT (X57-6672-70)

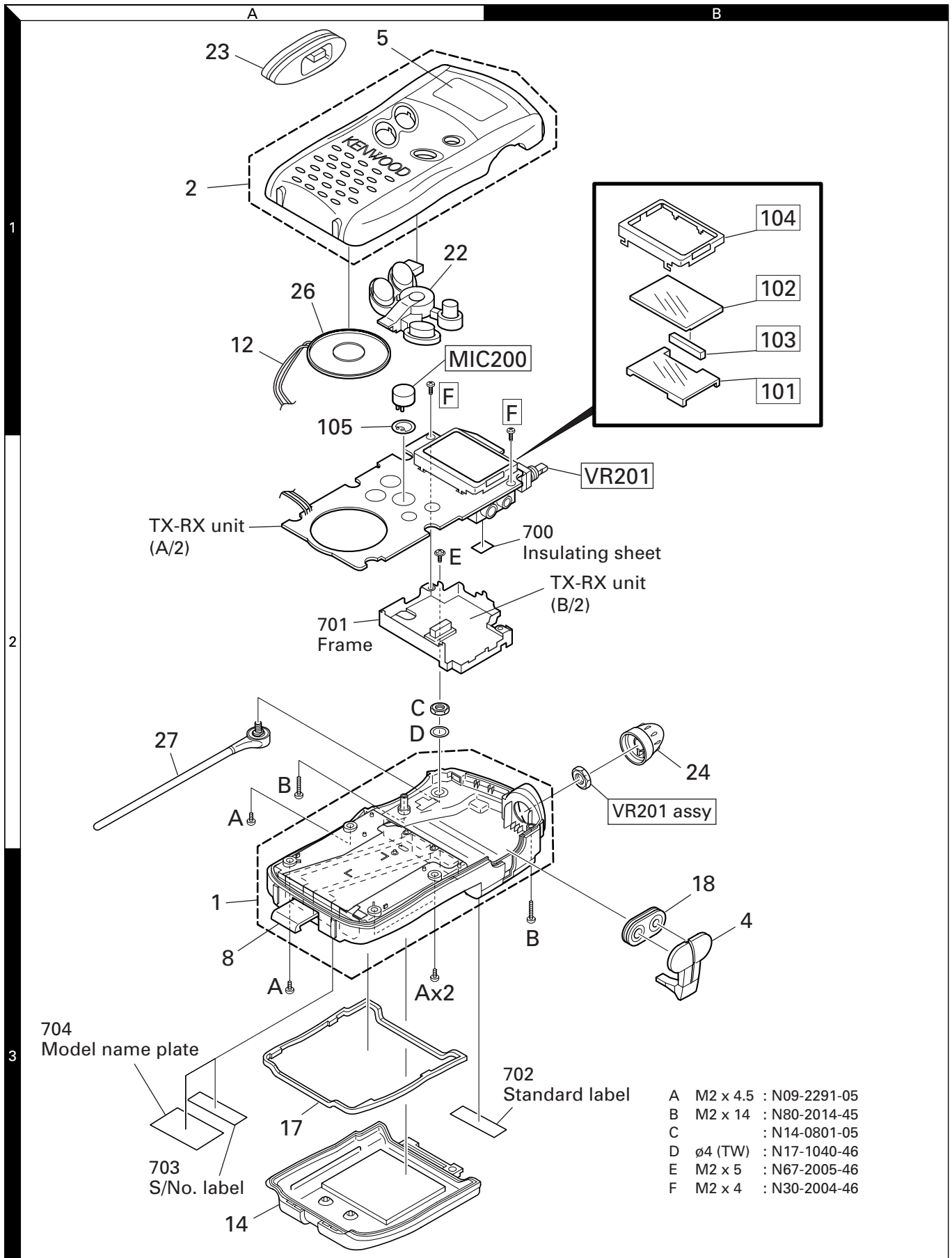
Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
L31		*	L79-1825-05	FILTER (447MHZ)		R61			RK73GB1J104J	CHIP R 100K J 1/16W	
L32			L34-4572-05	AIR-CORE COIL		R64,65			RK73GB1J105J	CHIP R 1.0M J 1/16W	
L33		*	L92-0444-05	FERRITE CHIP		R67			RK73GB1J222J	CHIP R 2.2K J 1/16W	
L34			L40-1095-34	SMALL FIXED INDUCTOR (1UH)		R68			RK73GB1J820J	CHIP R 82 J 1/16W	
L35		*	L40-1591-37	SMALL FIXED INDUCTOR (1.500UH)		R69			RK73GB1J821J	CHIP R 820 J 1/16W	
L36			L34-4554-05	COIL		R71			RK73GB1J471J	CHIP R 470 J 1/16W	
L37			L40-6865-92	SMALL FIXED INDUCTOR (6.8NH)		R72			RK73GB1J101J	CHIP R 100 J 1/16W	
L38			L40-2775-92	SMALL FIXED INDUCTOR (27NH)		R73			RK73GB1J334J	CHIP R 330K J 1/16W	
L41			L40-1581-35	SMALL FIXED INDUCTOR (150NH)		R74,75			R92-1252-05	CHIP R 0 OHM J 1/16W	
X1		*	L77-1930-05	TCXO(21.2497MHZ)		R77			RK73GB1J154J	CHIP R 150K J 1/16W	
X201		*	L77-1928-05	CRYSTAL RESONATOR (3.633MHZ)		R78			R92-1252-05	CHIP R 0 OHM J 1/16W	
X201		*	L77-1929-05	CRYSTAL RESONATOR (3.633MHZ)		R80,81			R92-1252-05	CHIP R 0 OHM J 1/16W	
XF1		*	L71-0616-05	MCF (21.7MHZ)		R82			RK73GB1J472J	CHIP R 4.7K J 1/16W	
F	1A,1B		N30-2004-46	PAN HEAD MACHINE SCREW		R83			RK73GB1J274J	CHIP R 270K J 1/16W	
R1			RK73GB1J103J	CHIP R 10K J 1/16W		R84			RK73GB1J151J	CHIP R 150 J 1/16W	
R2			RK73GB1J102J	CHIP R 1.0K J 1/16W		R85			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R3			RK73GB1J470J	CHIP R 47 J 1/16W		R86			RK73GB1J122J	CHIP R 1.2K J 1/16W	
R4			RK73GB1J102J	CHIP R 1.0K J 1/16W		R87			RK73GB1J332J	CHIP R 3.3K J 1/16W	
R5			RK73GB1J473J	CHIP R 47K J 1/16W		R88			RK73GB1J681J	CHIP R 680 J 1/16W	
R6			R92-1252-05	CHIP R 0 OHM J 1/16W		R89			RK73GB1J334J	CHIP R 330K J 1/16W	
R7,8			RK73GB1J473J	CHIP R 47K J 1/16W		R90			RK73GB1J473J	CHIP R 47K J 1/16W	
R9			RK73GB1J104J	CHIP R 100K J 1/16W		R91			RK73GB1J100J	CHIP R 10 J 1/16W	
R10			RK73GB1J470J	CHIP R 47 J 1/16W		R92			RK73GB1J153J	CHIP R 15K J 1/16W	
R11			RK73GB1J152J	CHIP R 1.5K J 1/16W		R95			RK73GB1J100J	CHIP R 10 J 1/16W	
R12			RK73GB1J822J	CHIP R 8.2K J 1/16W		R96			RK73GB1J222J	CHIP R 2.2K J 1/16W	
R13			RK73GB1J103J	CHIP R 10K J 1/16W		R97			R92-1252-05	CHIP R 0 OHM J 1/16W	
R14			RK73GB1J472J	CHIP R 4.7K J 1/16W		R98			RK73GB1J101J	CHIP R 100 J 1/16W	
R15			RK73GB1J221J	CHIP R 220 J 1/16W		R99,100			R92-1252-05	CHIP R 0 OHM J 1/16W	
R16			RK73GB1J683J	CHIP R 68K J 1/16W		R202			R92-1252-05	CHIP R 0 OHM J 1/16W	
R17			RK73GB1J101J	CHIP R 100 J 1/16W		R220			RK73GB1J471J	CHIP R 470 J 1/16W	
R18			RK73GB1J221J	CHIP R 220 J 1/16W		R221			RK73GB1J182J	CHIP R 1.8K J 1/16W	
R19			RK73GB1J104J	CHIP R 100K J 1/16W		R222			RK73GB1J183J	CHIP R 18K J 1/16W	
R20			RK73GB1J183J	CHIP R 18K J 1/16W		R223			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R21			RK73GB1J153J	CHIP R 15K J 1/16W		R224			RK73GB1J564J	CHIP R 560K J 1/16W	
R22			RK73GB1J221J	CHIP R 220 J 1/16W		R227			R92-1252-05	CHIP R 0 OHM J 1/16W	
R24			RK73GB1J122J	CHIP R 1.2K J 1/16W		R228			RK73GB1J103J	CHIP R 10K J 1/16W	
R25			RK73GB1J100J	CHIP R 10 J 1/16W		R229			RK73GB1J223J	CHIP R 22K J 1/16W	
R26			RK73GB1J332J	CHIP R 3.3K J 1/16W		R230			RK73GB1J184J	CHIP R 180K J 1/16W	
R27,28			R92-1252-05	CHIP R 0 OHM J 1/16W		R231			RK73GB1J562J	CHIP R 5.6K J 1/16W	
R29			RK73GB1J563J	CHIP R 56K J 1/16W		R232			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R30			RK73GB1J103J	CHIP R 10K J 1/16W		R233			R92-1252-05	CHIP R 0 OHM J 1/16W	
R31			R92-1252-05	CHIP R 0 OHM J 1/16W		R234			RK73GB1J224J	CHIP R 220K J 1/16W	
R32-34			RK73GB1J101J	CHIP R 100 J 1/16W		R235			RK73GB1J473J	CHIP R 47K J 1/16W	
R35			RK73GB1J223J	CHIP R 22K J 1/16W		R238			RK73GB1J181J	CHIP R 180 J 1/16W	
R37			RK73GB1J123J	CHIP R 12K J 1/16W		R239			RK73GB1J394J	CHIP R 390K J 1/16W	
R38			RK73GB1J273J	CHIP R 27K J 1/16W		R240			RK73GB1J274J	CHIP R 270K J 1/16W	
R43			RK73GB1J223J	CHIP R 22K J 1/16W		R241,242			RK73GB1J331J	CHIP R 330 J 1/16W	
R44			RK73GB1J472J	CHIP R 4.7K J 1/16W		R243			RK73GB1J101J	CHIP R 100 J 1/16W	
R46			RK73GB1J103J	CHIP R 10K J 1/16W		R247			RK73GB1J392J	CHIP R 3.9K J 1/16W	
R47			RK73GB1J123J	CHIP R 12K J 1/16W		R248-251			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R50,51			RK73GB1J221J	CHIP R 220 J 1/16W		R253			RK73GB1J101J	CHIP R 100 J 1/16W	
R52			RK73GB1J104J	CHIP R 100K J 1/16W		R256			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R53			RK73GB1J683J	CHIP R 68K J 1/16W		R257			RK73GB1J473J	CHIP R 47K J 1/16W	
R54			RK73GB1J104J	CHIP R 100K J 1/16W		R261			RK73GB1J684J	CHIP R 680K J 1/16W	
R55			RK73GB1J683J	CHIP R 68K J 1/16W		R262			RK73GB1J393J	CHIP R 39K J 1/16W	
R56,57			R92-1252-05	CHIP R 0 OHM J 1/16W		R263			RK73GB1J154J	CHIP R 150K J 1/16W	
R58			RK73GB1J270J	CHIP R 27 J 1/16W		R264,265			RK73GB1J333J	CHIP R 33K J 1/16W	
R59			RK73GB1J683J	CHIP R 68K J 1/16W		R266			RK73GB1J274J	CHIP R 270K J 1/16W	
R60			RK73GB1J273J	CHIP R 27K J 1/16W		R267			RK73GB1J822J	CHIP R 8.2K J 1/16W	
						R269			RK73GB1J392J	CHIP R 3.9K J 1/16W	

## PARTS LIST

### TX-RX UNIT (X57-6672-70)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R270			R92-1252-05	CHIP R 0 OHM J 1/16W		IC204			TC75S51F	MOS IC	
R271			RK73GB1J223J	CHIP R 22K J 1/16W		IC206		*	BD4730G	MOS IC	
R272,273			RK73GB1J472J	CHIP R 4.7K J 1/16W		IC207			TK71530ASCL	MOS IC	
R274			RK73GB1J122J	CHIP R 1.2K J 1/16W		IC208		*	M38C24M6502HP	MPU	
R275			RK73GB1J333J	CHIP R 33K J 1/16W		IC209			AK2346	MOS IC	
R278			RK73GB1J153J	CHIP R 15K J 1/16W		IC210		*	AT24C01A10SI18	ROM IC	
R279			RK73GB1J823J	CHIP R 82K J 1/16W		IC210		*	CAT24WC01J118	ROM IC	
R281			RK73GB1J333J	CHIP R 33K J 1/16W		IC211			NJM2100V	MOS IC	
R284			RK73GB1J153J	CHIP R 15K J 1/16W		Q1			DTC114EE	DIGITAL TRANSISTOR	
R285			RK73GB1J124J	CHIP R 120K J 1/16W		Q2			2SC5066(O)	TRANSISTOR	
R286,287			RK73GB1J104J	CHIP R 100K J 1/16W		Q3			2SC4617(S)	TRANSISTOR	
R288			RK73GB1J154J	CHIP R 150K J 1/16W		Q4-6			2SC5108(Y)	TRANSISTOR	
R289			RK73GB1J562J	CHIP R 5.6K J 1/16W		Q7		*	2SC5092	TRANSISTOR	
R290			R92-1252-05	CHIP R 0 OHM J 1/16W		Q8		*	2SK3656	FET	
R291			RK73GB1J103J	CHIP R 10K J 1/16W		Q9,10			3SK318	FET	
R292			RK73GB1J562J	CHIP R 5.6K J 1/16W		Q11			KTC4082	TRANSISTOR	
R293			RK73GB1J394J	CHIP R 390K J 1/16W		Q13			2SC4738(GR)	TRANSISTOR	
R294			R92-1252-05	CHIP R 0 OHM J 1/16W		Q14			2SC5108(Y)	TRANSISTOR	
R295			RK73GB1J103J	CHIP R 10K J 1/16W		Q200			2SC4919	TRANSISTOR	
R296			RK73GB1J222J	CHIP R 2.2K J 1/16W		Q201			2SC4738(GR)	TRANSISTOR	
R297			RK73GB1J101J	CHIP R 100 J 1/16W		Q210-212			DTA123JE	DIGITAL TRANSISTOR	
R298			RK73GB1J473J	CHIP R 47K J 1/16W		Q213			DTC114EE	DIGITAL TRANSISTOR	
R299			RK73GB1J100J	CHIP R 10 J 1/16W		Q215			DTA123JE	DIGITAL TRANSISTOR	
R300-302			RK73GB1J102J	CHIP R 1.0K J 1/16W		Q216			2SA1362(GR)	TRANSISTOR	
R303-307			RK73GB1J103J	CHIP R 10K J 1/16W		Q217,218		*	CPH3413	FET	
R308			RK73GB1J102J	CHIP R 1.0K J 1/16W		Q219			2SK1824	FET	
R310-312			RK73GB1J473J	CHIP R 47K J 1/16W		Q220			2SC4617(S)	TRANSISTOR	
R314			RK73GB1J472J	CHIP R 4.7K J 1/16W							
R315			RK73GB1J334J	CHIP R 330K J 1/16W							
R316			RK73GB1J102J	CHIP R 1.0K J 1/16W							
R317			RK73GB1J104J	CHIP R 100K J 1/16W							
R318			RK73GB1J103J	CHIP R 10K J 1/16W							
R319			RK73GB1J223J	CHIP R 22K J 1/16W							
R320			RK73GB1J820J	CHIP R 82 J 1/16W							
R321			RK73GB1J272J	CHIP R 2.7K J 1/16W							
VR1			R12-7490-05	TRIMMING POT. (47K)							
VR3			R12-7491-05	TRIMMING POT. (68K)							
VR4			R12-7488-05	TRIMMING POT. (22K)							
VR201	2B	*	R31-0642-05	VARIABLE RESISTOR (10K)							
S200			S70-0434-05	TACT SWITCH (PTT)							
MIC200	1A		T91-0555-05	MIC ELEMENT							
D1			HVC131	DIODE							
D2			1SV270	VARIABLE CAPACITANCE DIODE							
D3			1SV214	VARIABLE CAPACITANCE DIODE							
D4,5			MA2S111	DIODE							
D8			HVC131	DIODE							
D10			HSC277	DIODE							
D11			RB706F-40	DIODE							
D200			1SR154-400	DIODE							
D202			DAN222	DIODE							
D203,204			MA742	DIODE							
D206			KDZ3.3V	ZENER DIODE							
D208			MA742	DIODE							
D209,210			MA2S111	DIODE							
IC1			TB31202FN	MOS IC							
IC2			TA31136FN	MOS IC							
IC202		*	BD4724G	MOS IC							
IC203			LM4865M	BI-POLAR IC							

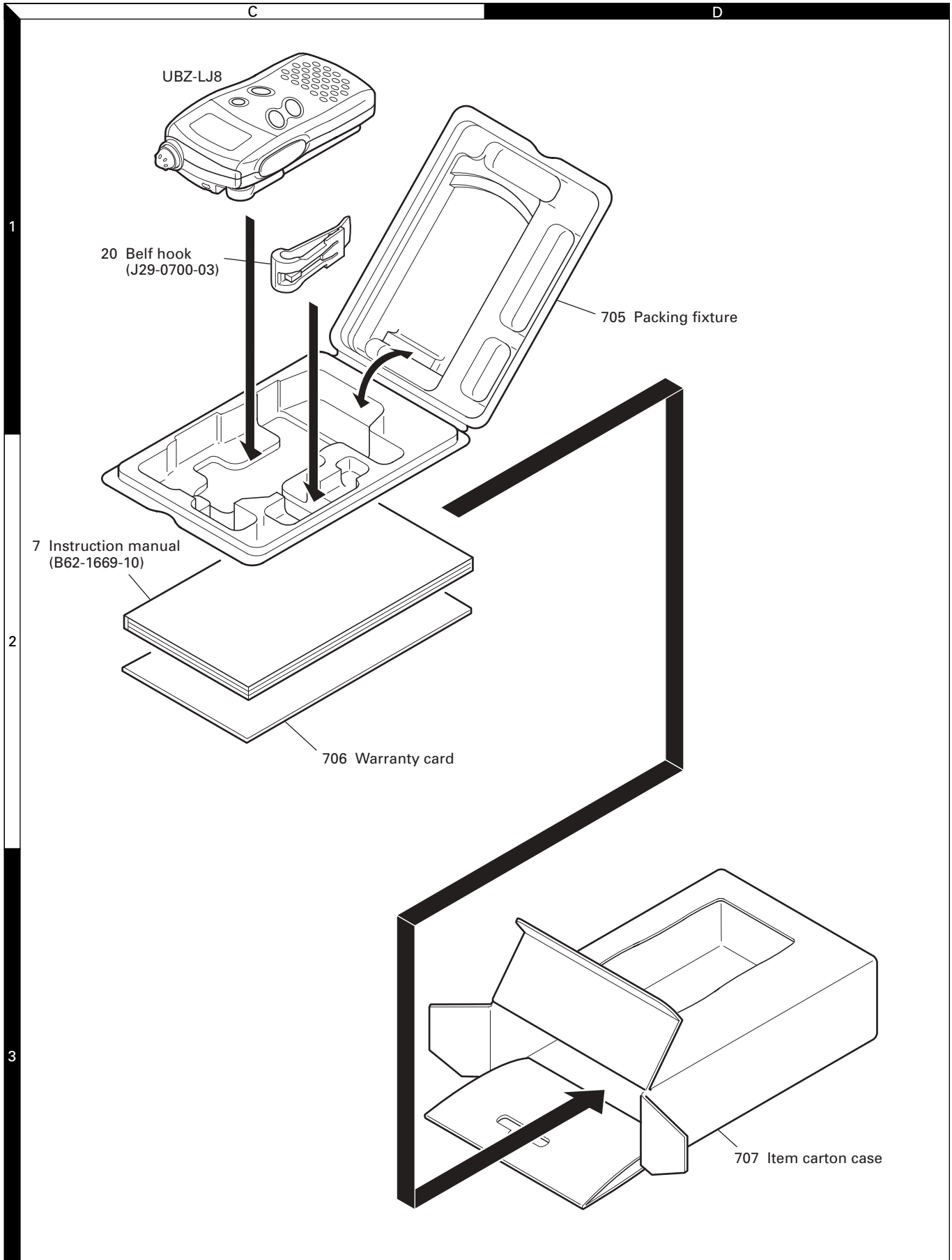
## EXPLODED VIEW



Parts with the exploded numbers larger than 700 are not supplied.

# UBZ-LJ8

## PACKING



## ADJUSTMENT

### Required Test Equipment

#### 1. DC V.M and Tester (DVM)

- 1) High input impedance

#### 2. RF VTVM (RF V.M)

- 1) Input impedance : 1M $\Omega$  min., 2pF max.
- 2) Voltage range : F.S = 10mV to 300V
- 3) Frequency range : 500MHz or more

#### 3. Frequency Counter (f. counter)

- 1) Input sensitivity : Approx. 500mV
- 2) Frequency range : 500MHz or more
- 3) Measurement stability : 0.2ppm or less

#### 4. DC Power Supply

- 1) Voltage : 0V to 10V, variable
- 2) Current : Approx. 1A

#### 5. Power Meter

- 1) Measurement range : Approx. 1W
- 2) Input impedance : 50 $\Omega$
- 3) Frequency range : 500MHz or more

#### 6. AF VTVM (AF V.M)

- 1) Input impedance : 1M $\Omega$  or more
- 2) Voltage range : F.S = 1mV to 3V
- 2) Frequency range : 50Hz to 10kHz

#### 7. AF Generator (AG)

- 1) Output frequency : 100Hz to 10kHz
- 2) Output voltage : 0.5mV to 1V

#### 8. Linear Detector or Deviation meter

- 1) Frequency range : 500MHz or more

#### 9. Distortion Meter

- 1) Frequency range : 30Hz to 100kHz
- 2) Input level : 50mV to 10Vrms
- 3) Measurement stability : 3% or less at 1kHz

#### 10. SSG

- 1) Frequency range : 30 to 500MHz
- 2) Modulation : FM
- 3) Output level : -133dBm (0.05 $\mu$ V) to -13dBm (50.1mV)

#### 11. Oscilloscope

- 1) Measurement range : DC to 30MHz

#### 12. Dummy Load

- 1) 8 $\Omega$ , 1W

### Setting

1. Power voltage : DC 4.5V  
Current protection : Approx. 300mA

2. Frequency

- Channel frequency (12.5kHz step) (MHz)

Channel	TX frequency	RX frequency
1	446.00625	446.00625
2	446.01875	446.01875
3	446.03125	446.03125
4	446.04375	446.04375
5	446.05625	446.05625
6	446.06875	446.06875
7	446.08125	446.08125
8	446.09375	446.09375

- Tone frequency (Hz)

No.	Frequency	No.	Frequency	No.	Frequency
1	67.0	14	107.2	27	167.9
2	71.9	15	110.9	28	173.8
3	74.4	16	114.8	29	179.9
4	77.0	17	118.8	30	186.2
5	79.7	18	123.0	31	192.8
6	82.5	19	127.3	32	203.5
7	85.4	20	131.8	33	210.7
8	88.5	21	136.5	34	218.1
9	91.5	22	141.3	35	225.7
10	94.8	23	146.2	36	233.6
11	97.4	24	151.4	37	241.8
12	100.0	25	156.7	38	250.3
13	103.5	26	162.2		

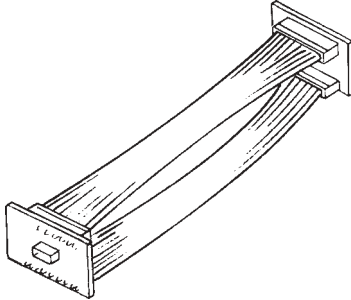
3. SSG standard modulation  
(Mod : 1kHz, DEV :  $\pm$ 1.5kHz)

## ADJUSTMENT

### Jigs

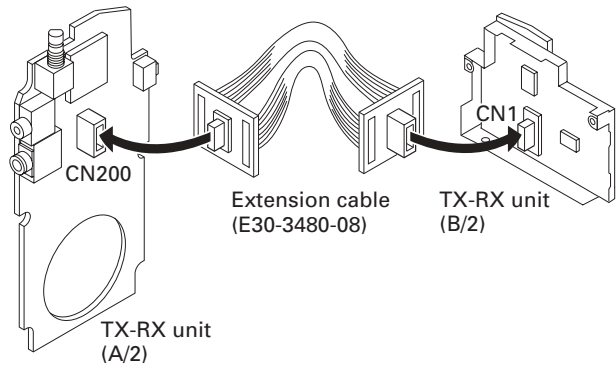
Use jigs for repair or adjustment.

#### ■ Extension Cable (E30-3480-08)



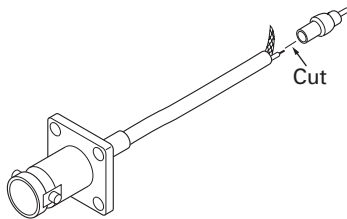
#### ■ Connection Jigs

Connect the extension cable as shown in the illustration below.

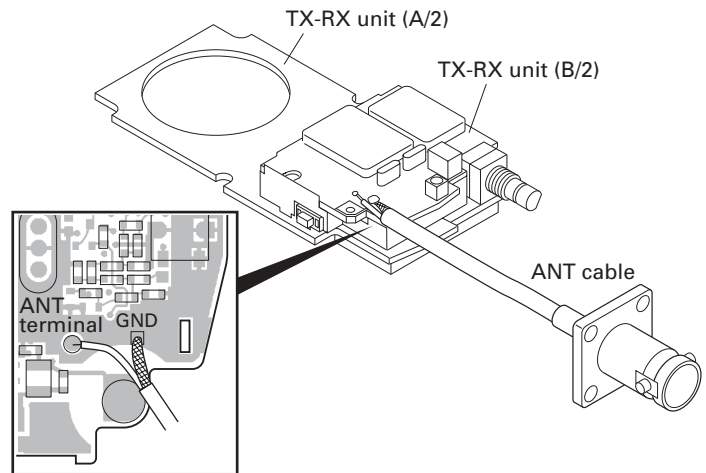


#### ■ ANT Cable (E30-3418-05)

Modify the cable as shown below.



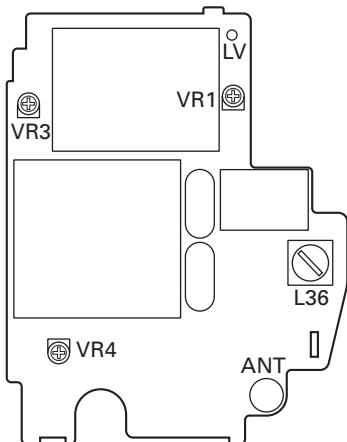
Solder the ANT cable to the ANT terminal and GND on the TX-RX unit (B/2).



### Adjustment Points

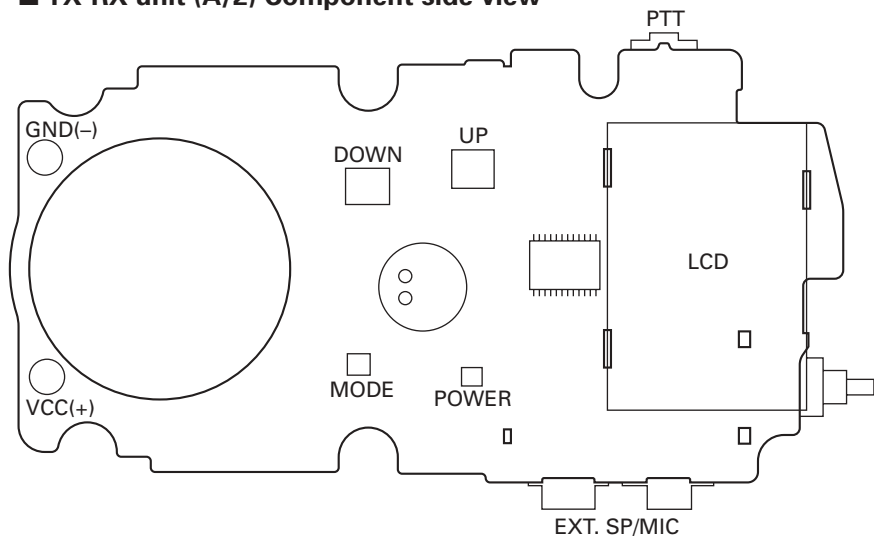
#### ■ TX-RX unit (B/2)

Component side view



VR1 : MAX deviation  
 VR3 : Reference oscillator frequency  
 VR4 : TX power adjustment  
 L36 : Quad coil adjustment

#### ■ TX-RX unit (A/2) Component side view



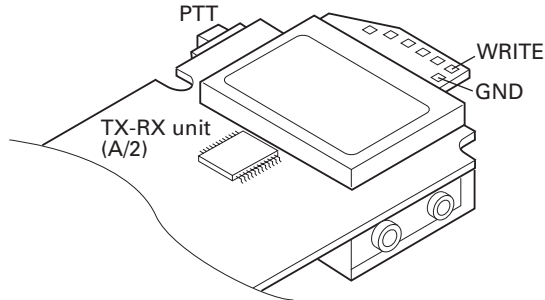
LV : VCO lock voltage terminal  
 VCC (+), GND (-) : External power supply terminal (Fasten it with an alligator clip.)



## ADJUSTMENT

### Adjustment Mode

#### ■ Storing the Adjustment Value for the CTCSS Deviation, Battery Voltage Detection, Busy (Squelch) Detection and VOX Gain Level



#### ■ How to Store the Adjustment Value to the IC210 (EEPROM) on the TX-RX Unit (A/2)

If the adjustment data in IC210 is corrupted or the IC itself is replaced for servicing, all the data must be re-adjusted and stored as follows.

1. Turn the transceiver OFF.
2. Enter the adjustment mode by shorting the "WRITE" and "GND" terminals, then press the [PTT] key and turn the transceiver ON. After turning the transceiver ON, remove the wire from the "WRITE" and "GND" terminals.  
Note : You must preset the tone number to "24"(151.4Hz) at the required channel prior to enter the adjustment mode.  
Otherwise, you cannot perform the "CTCSS Deviation" adjustment.
3. The adjustment menu appears. It begins with "CTCSS Deviation" adjustment.
4. The adjustment menu changes when you press the [UP] or [DOWN] key.
5. Press the [MODE] key to enter the selected adjustment menu. The adjustment value appears on the LCD and blinks.

6. Adjust the value according to the instructions on each item (Refer to "Adjustment instructions").
7. After adjusting the data value, press the [PTT] key to store the new data to the EEPROM (IC210). If you do not wish to store the adjusted data value to EEPROM (IC210), press the [MODE] key. No data will not be stored to the EEPROM (IC210) and the old data is retained.
8. You can press the [REM1] key on the speaker-microphone (if connected) to activate the Monitor function. (Please disable the monitor function in the Battery voltage detection menu.) The adjustment menu can be up or down by pressing the [REM2] or [REM3] key.
9. To exit "Adjustment mode", turn the transceiver OFF.

Note : Refer to the diagram on the page 18 to understand how each adjustment can be performed.

#### ■ Adjustment Instructions

##### • CTCSS Deviation adjustment

1. After entering the CTCSS Deviation adjustment mode, select the values with [UP]/ [DOWN] keys. Then press [PTT] key to write the new value to the EEPROM (IC210).
2. Press [PTT] keys again to transmit. Confirm the CTCSS deviation is 0.35kHz. If the deviation is not 0.35kHz, perform step 1 again to select different value, then measure the deviation.
3. Perform step 1 and 2 until you get the deviation value 0.35kHz.

##### • Battery voltage detection adjustment

Set the DC power supply voltage to 3.20V and connect the cable to the transceiver.

##### • Busy (Squelch) detection adjustment

Set your SSG (Synthesized Signal Generator) values as follows.

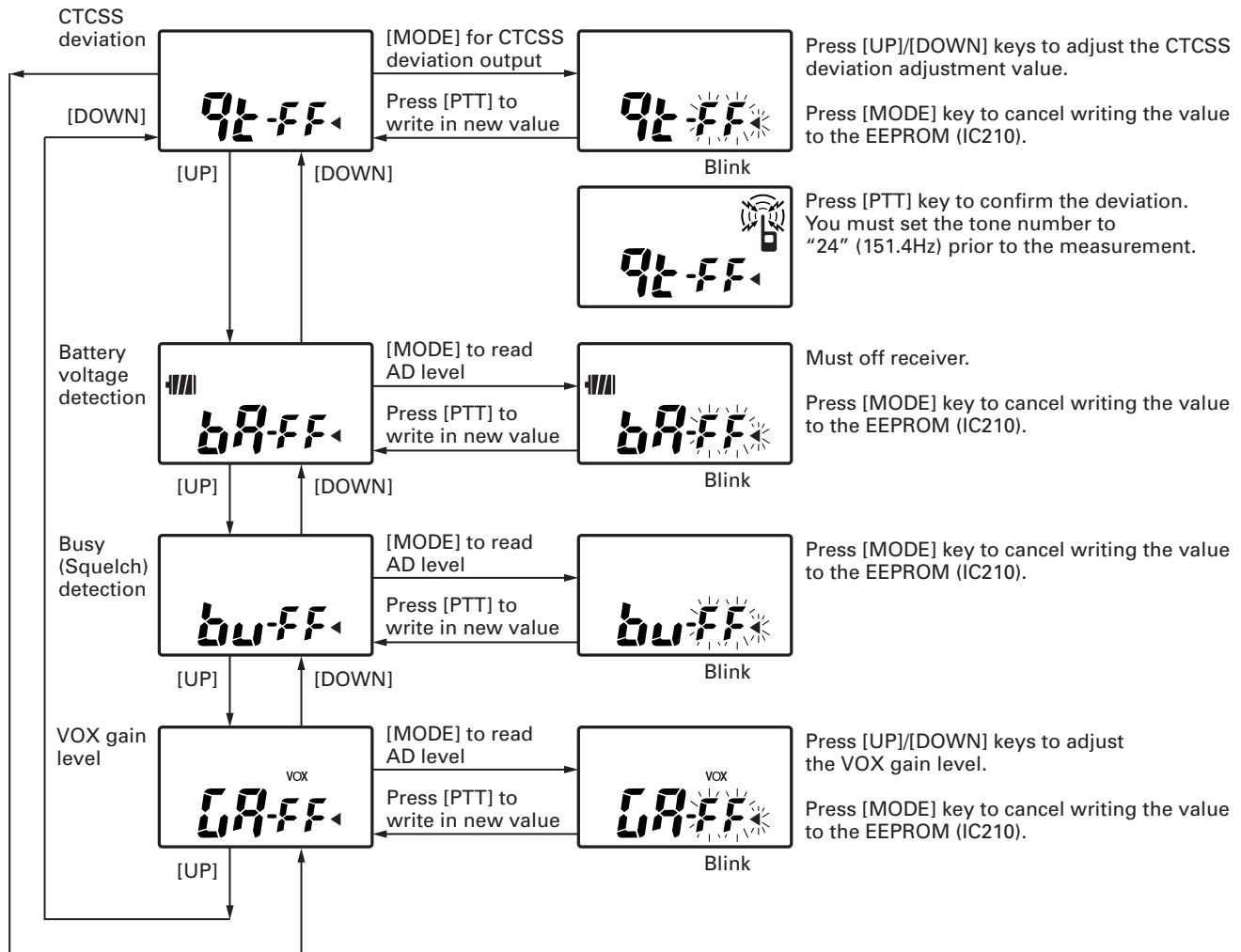
Frequency : 446.00625MHz (CH1)  
Modulation frequency : 1kHz  
Frequency deviation : 1.5kHz  
Signal output : -123dBm (0.158μV)

##### • VOX gain level adjustment

Set the initial VOX gain value to 3C (in hexadecimal).

## ADJUSTMENT

### ■ Adjustment Mode Flow Chart



#### Note :

- PLL unlock status is not examined while in Adjustment Mode.
- The transmission time is not limited in Adjustment Mode.
- The lamp function is not available in Adjustment Mode.
- The Key Lock function forces the transceiver to exit Adjustment Mode.
- You cannot set the Beep function OFF while in Adjustment Mode (the transceiver always beeps).

## ADJUSTMENT

### PLL Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. VCO lock voltage RX TX	1) 4CH : 446.04375MHz	DVM	TX-RX (B/2)	LV			Check	0.7~2.7V
	2) 4CH : 446.04375MHz PTT : ON							
2. Reference oscillator frequency	1) 4CH : 446.04375MHz PTT : ON	Power meter f. counter	TX-RX (B/2)	ANT	TX-RX (B/2)	VR3	446.04375MHz	±100Hz

### Transmitter Section

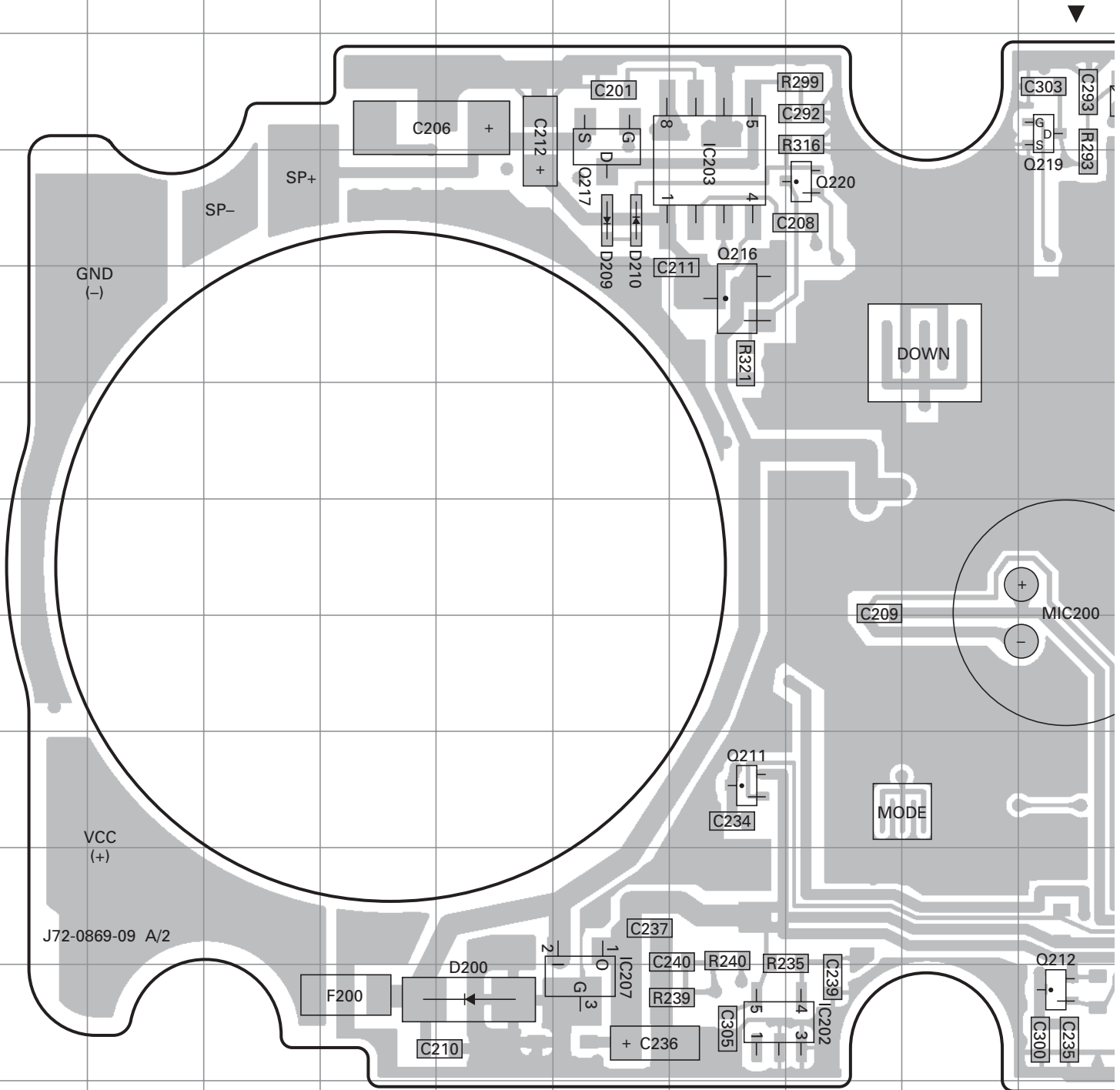
Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. TX power and current	1) 1CH : 446.00625MHz PTT : ON	Power meter Ammeter	TX-RX (B/2)	ANT	TX-RX (B/2)	VR4	500mW Current check	±10mW 500mA or less
2. MAX deviation	1) 1CH : 446.00625MHz AG : 1kHz/100mV PTT : ON	Power meter Linear detector	TX-RX (B/2) TX-RX (A/2)	ANT MIC		VR1	2.0kHz According to the larger +, -.	±0.05kHz
3. MIC sensitivity	1) 1CH : 446.00625MHz AG : 1kHz/5mV PTT : ON	AG AF V.M					Check	1.2~1.9kHz
4. CTCSS deviation	1) Enter the adjustment mode, then write the CTCSS deviation level. 1CH : 446.00625MHz Tone No. : 24 (151.4Hz) PTT : ON	Linear detector	TX-RX (B/2)	ANT		[UP], [DOWN]	Write the new adjustment value by pushing [PTT].	0.35kHz±0.05kHz
	2) Tone No. : 38 (250.3Hz) PTT : ON						Check	0.25~0.40kHz

### Receiver Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Quad-coil adjustment	1) 4CH : 446.04375MHz SSG output : -53dBm (501µV) SSG MOD : 1kHz SSG DEV : 1.5kHz AF VOL : 10 o'clock position	SSG Oscilloscope DVM	TX-RX (B/2) TX-RX (A/2)	ANT SP	TX-RX (B/2)	L36	Maximum AC level (peak to peak) using oscilloscope	0.9V or more
2. Sensitivity	1) 4CH : 446.04375MHz SSG output : -115dBm (0.398µV) SSG MOD : 1kHz SSG DEV : 1.5kHz AF VOL : 0.63V/8Ω CCITT filter : ON	SSG Distortion meter Oscilloscope AF V.M	TX-RX (B/2) TX-RX (A/2)	ANT SP			Check	SINAD : 20dB or more
3. Squelch	1) 4CH : 446.04375MHz SSG output : -116dBm (0.35µV)	SSG Oscilloscope AF V.M	TX-RX (B/2) TX-RX (A/2)	ANT SP			Check	Squelch open
	2) SSG output : -127dBm (0.1µV)						Check	Squelch close
4. BATT	1) BATT terminal : DC 3.35V±0.01V	DC power supply	TX-RX (A/2)	VCC (+) GND (-)			LCD check	▬ or ▬ light on
	2) BATT terminal : DC 3.80V±0.01V	DVM						▬ or ▬ light on

# UBZ-LJ8 PC BOARD

TX-RX UNIT (X57-6672-70) (A/2) Component side view (J72-0869-09 A/2)



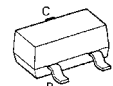
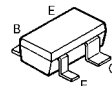
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC202	11G	Q212	11J	Q220	4H
IC203	4G	Q213	3O	D200	11E
IC207	11F	Q215	11L	D203	7L
IC209	7M	Q216	5G	D205	4P
Q201	7K	Q217	3F	D208	3K
Q210	11K	Q218	11O	D209	4F
Q211	9G	Q219	3J	D210	4F

DTA123JE  
DTC114EE  
KTC4082  
2SA1362  
2SC4617  
2SC4738  
2SC5066  
2SC5108

2SC5092

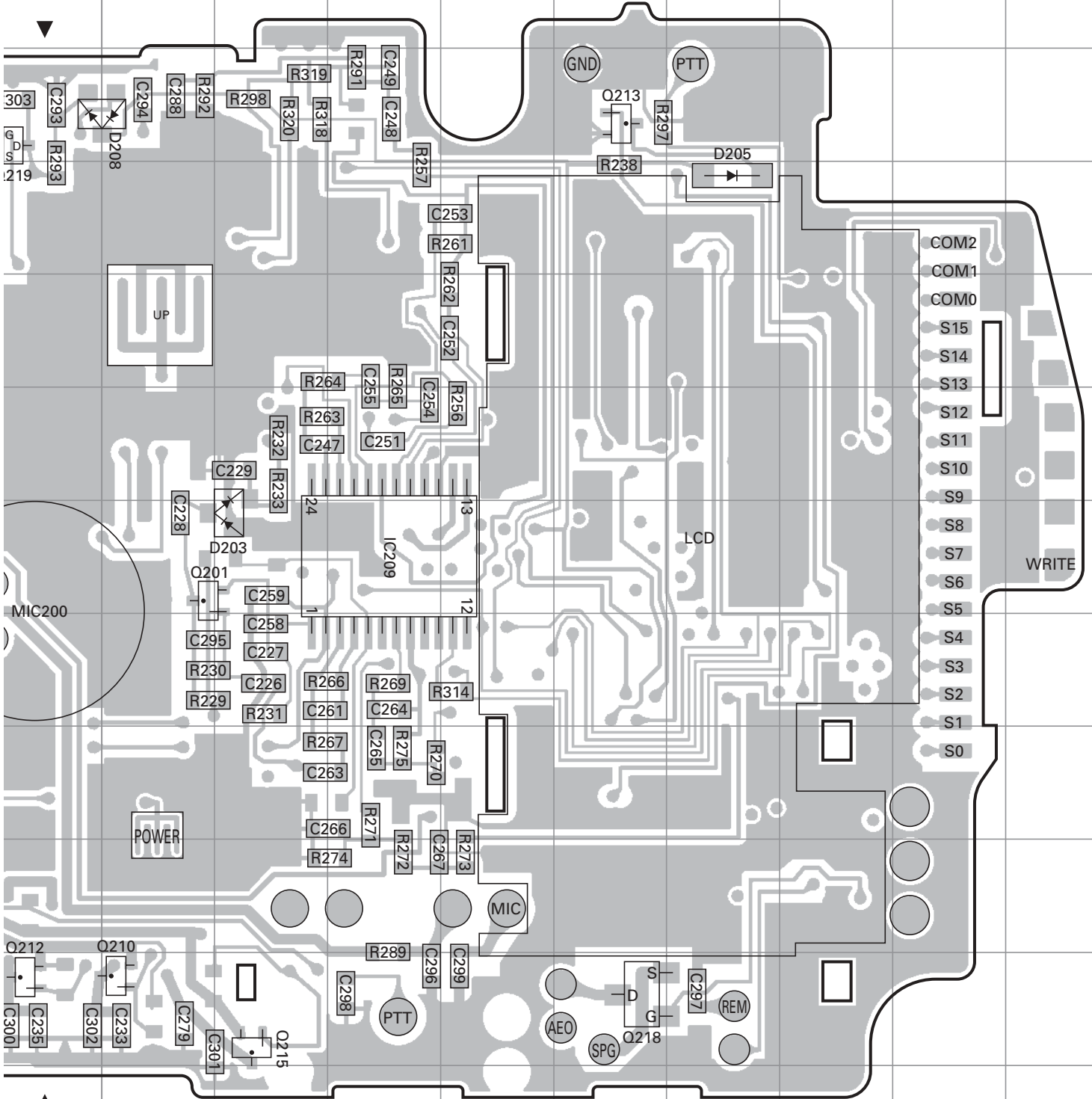
2SC4919

MA742



# PC BOARD UBZ-LJ8

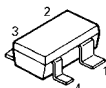
TX-RX UNIT (X57-6672-70) (A/2) Component side view (J72-0869-09 A/2)



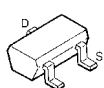
CPH3413



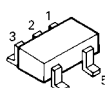
3SK318



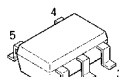
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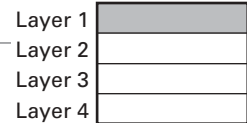
TC75S51F



BD4724G  
BD4730G



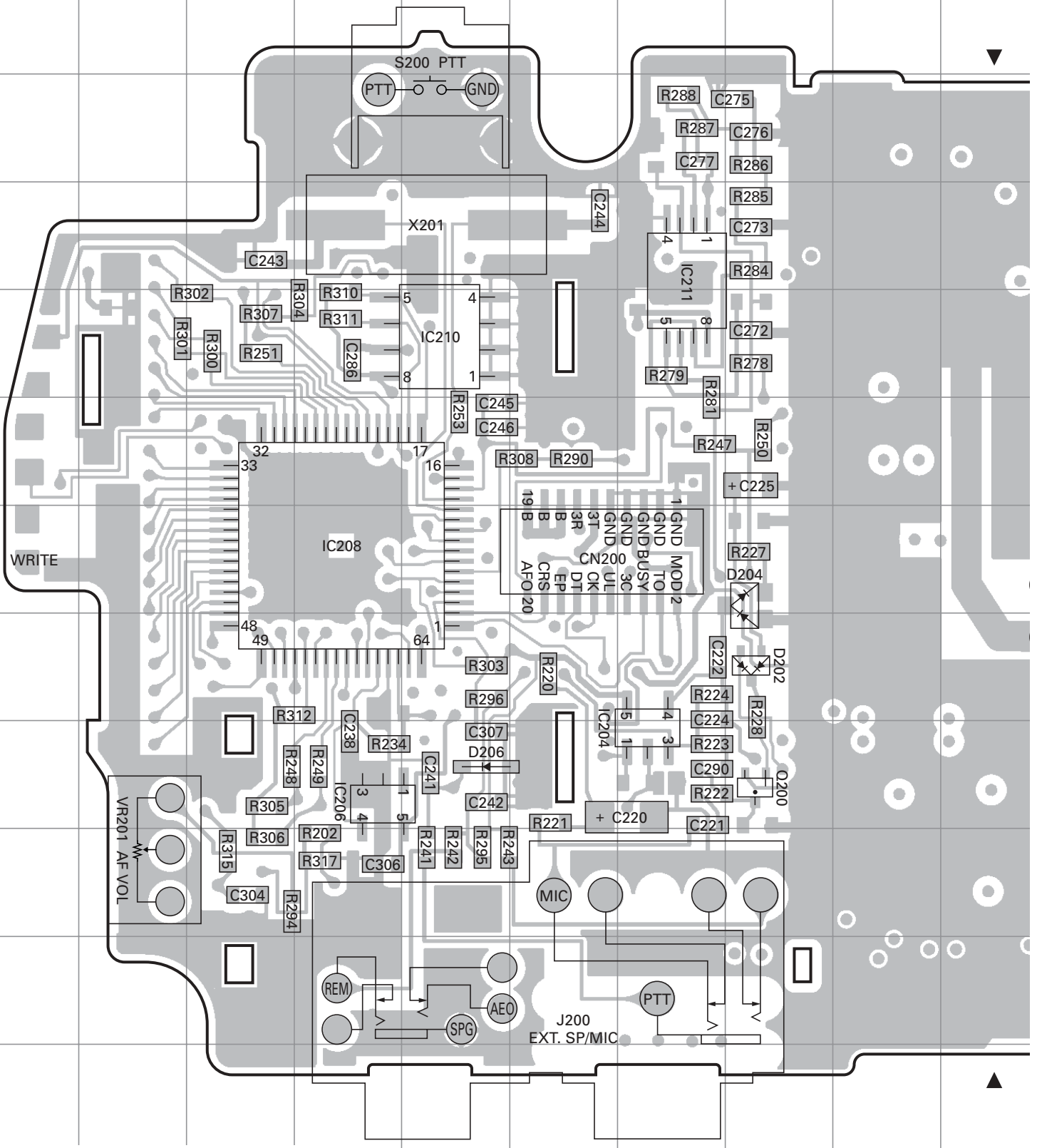
Component side



Foil side

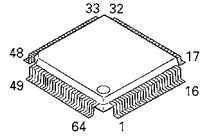
# UBZ-LJ8 PC BOARD

TX-RX UNIT (X57-6672-70) (A/2) Foil side view (J72-0869-09 A/2)

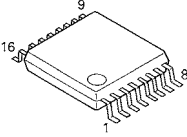


Ref. No.	Address	Ref. No.	Address
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IC206	9D	D202	8H
IC208	7D	D204	7H
IC210	5E	D206	9E
IC211	4G		

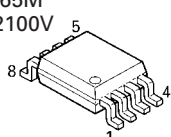
M38C24M6502HP



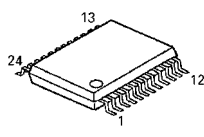
TB31202FN



AT24C01A10SI18  
LM4865M  
NJM2100V

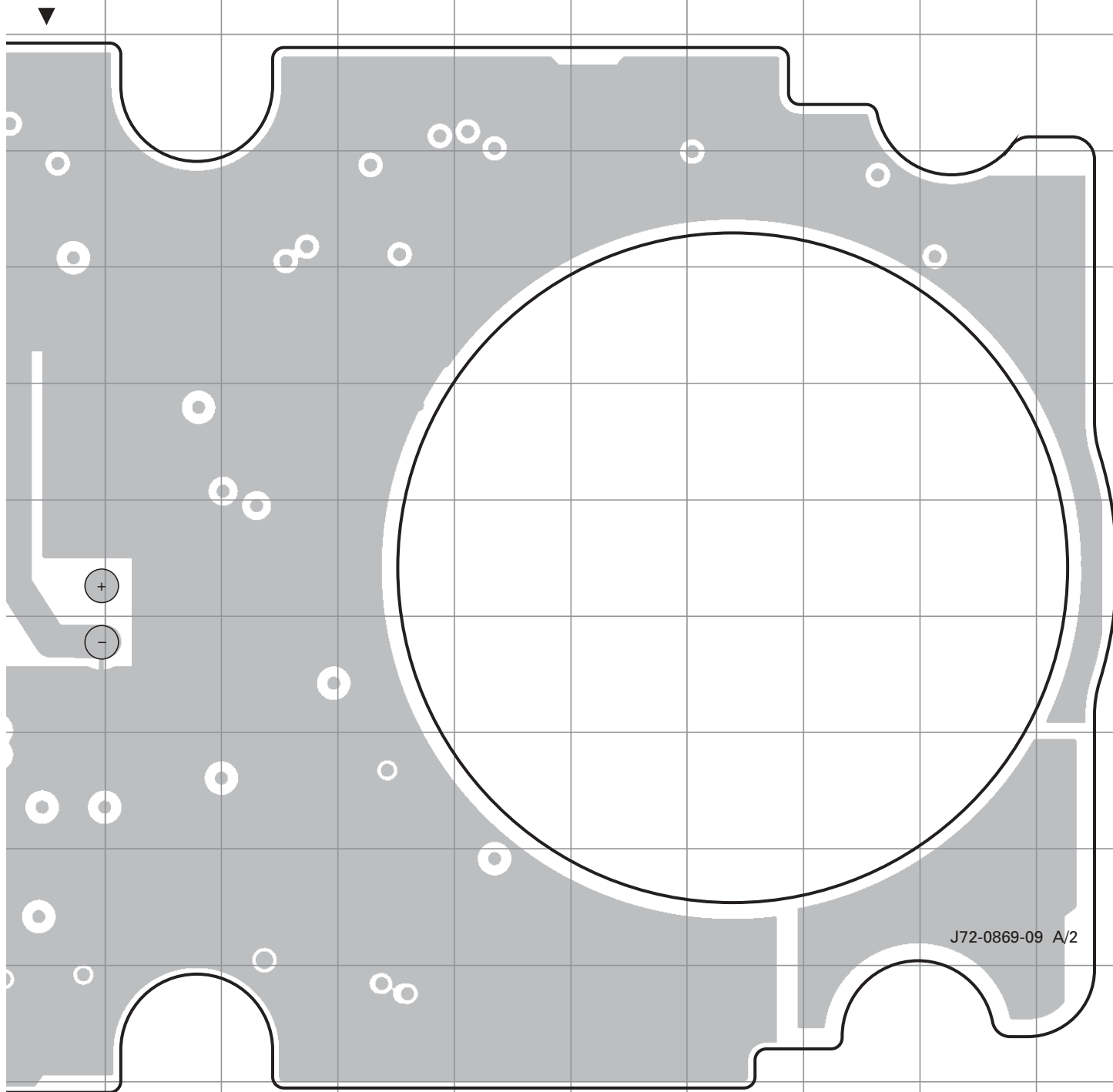


AK2346

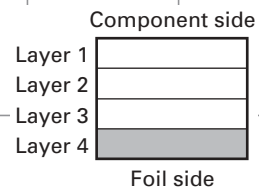


# PC BOARD UBZ-LJ8

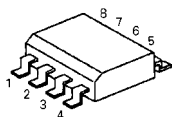
TX-RX UNIT (X57-6672-70) (A/2) Foil side view (J72-0869-09 A/2)



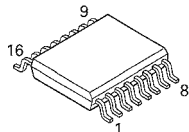
J72-0869-09 A/2



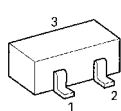
CAT24WC01JI18



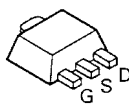
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TK71530ASCL



2SK3656



12

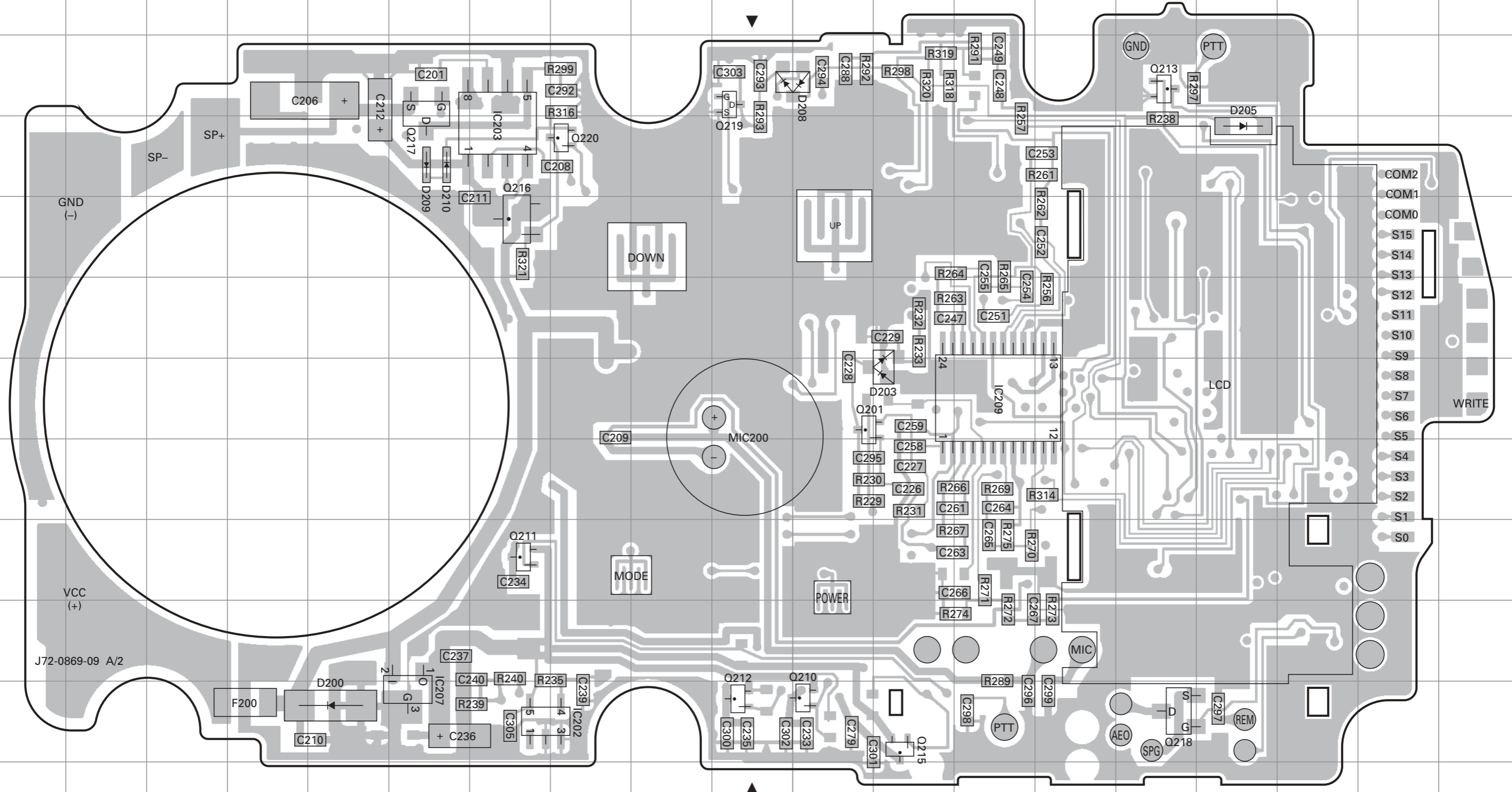
14

# UBZ-LJ8 PC BOARD

# PC BOARD UBZ-LJ8

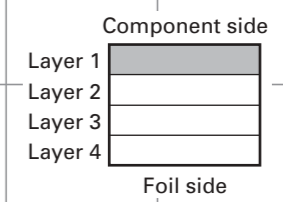
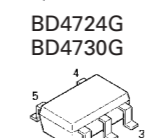
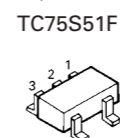
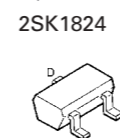
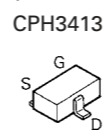
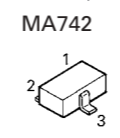
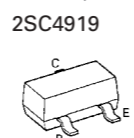
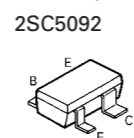
TX-RX UNIT (X57-6672-70) (A/2) Component side view (J72-0869-09 A/2)

TX-RX UNIT (X57-6672-70) (A/2) Component side view (J72-0869-09 A/2)



Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC202	11G	Q212	11J	Q220	4H
IC203	4G	Q213	3O	D200	11E
IC207	11F	Q215	11L	D203	7L
IC209	7M	Q216	5G	D205	4P
Q201	7K	Q217	3F	D208	3K
Q210	11K	Q218	11O	D209	4F
Q211	9G	Q219	3J	D210	4F

DTA123JE  
DTC114EE  
KTC4082  
2SA1362  
2SC4617  
2SC4738  
2SC5066  
2SC5108



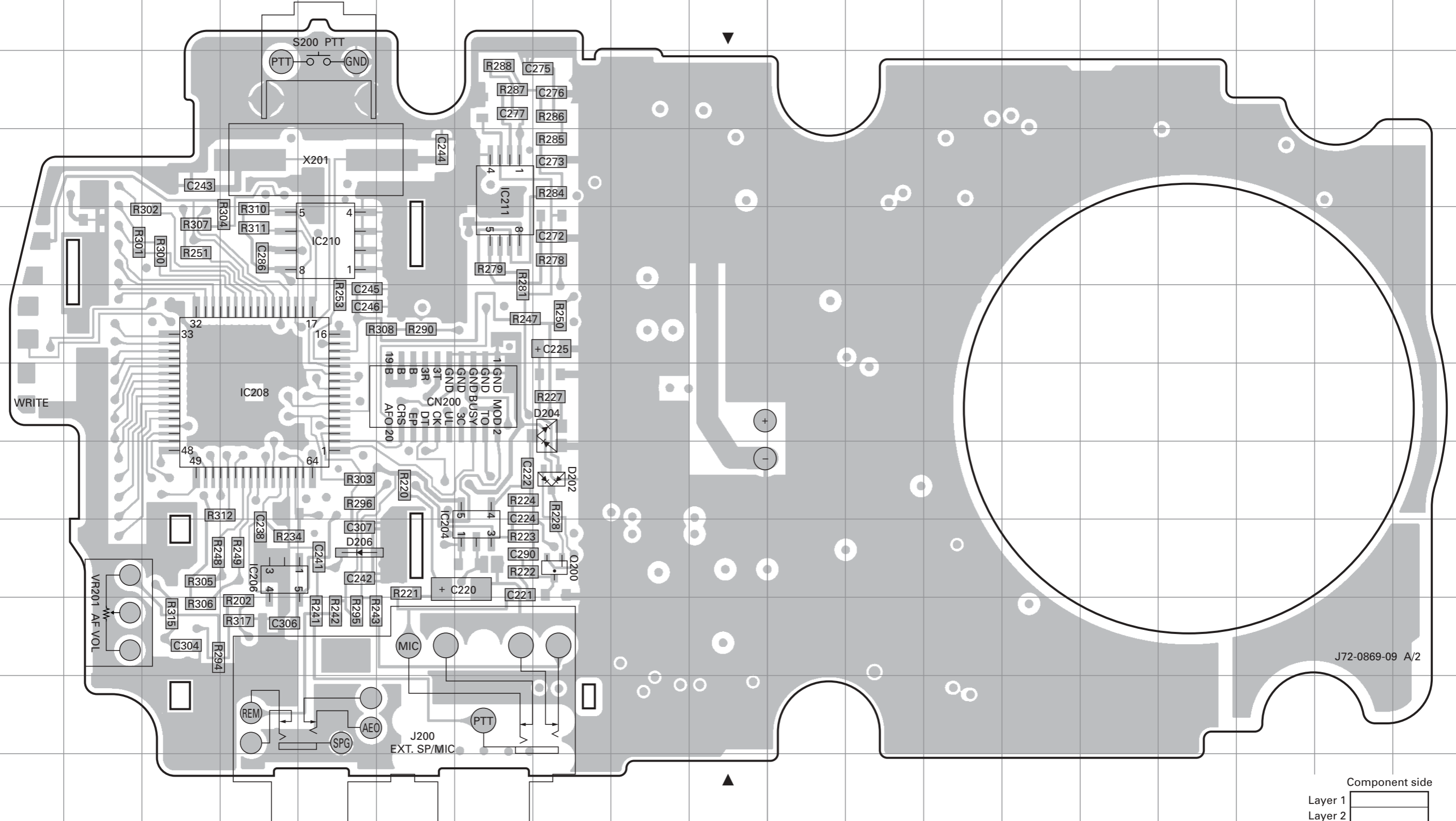


# UBZ-LJ8 PC BOARD

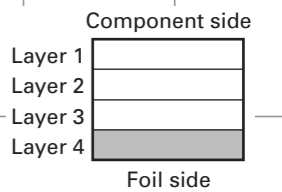
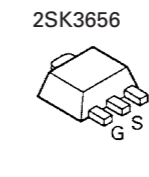
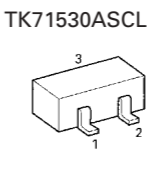
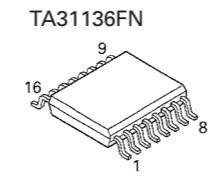
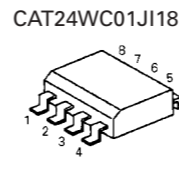
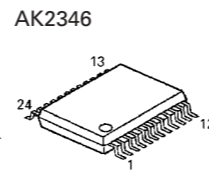
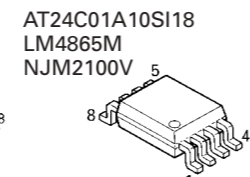
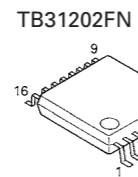
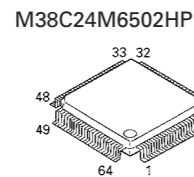
# PC BOARD UBZ-LJ8

TX-RX UNIT (X57-6672-70) (A/2) Foil side view (J72-0869-09 A/2)

TX-RX UNIT (X57-6672-70) (A/2) Foil side view (J72-0869-09 A/2)

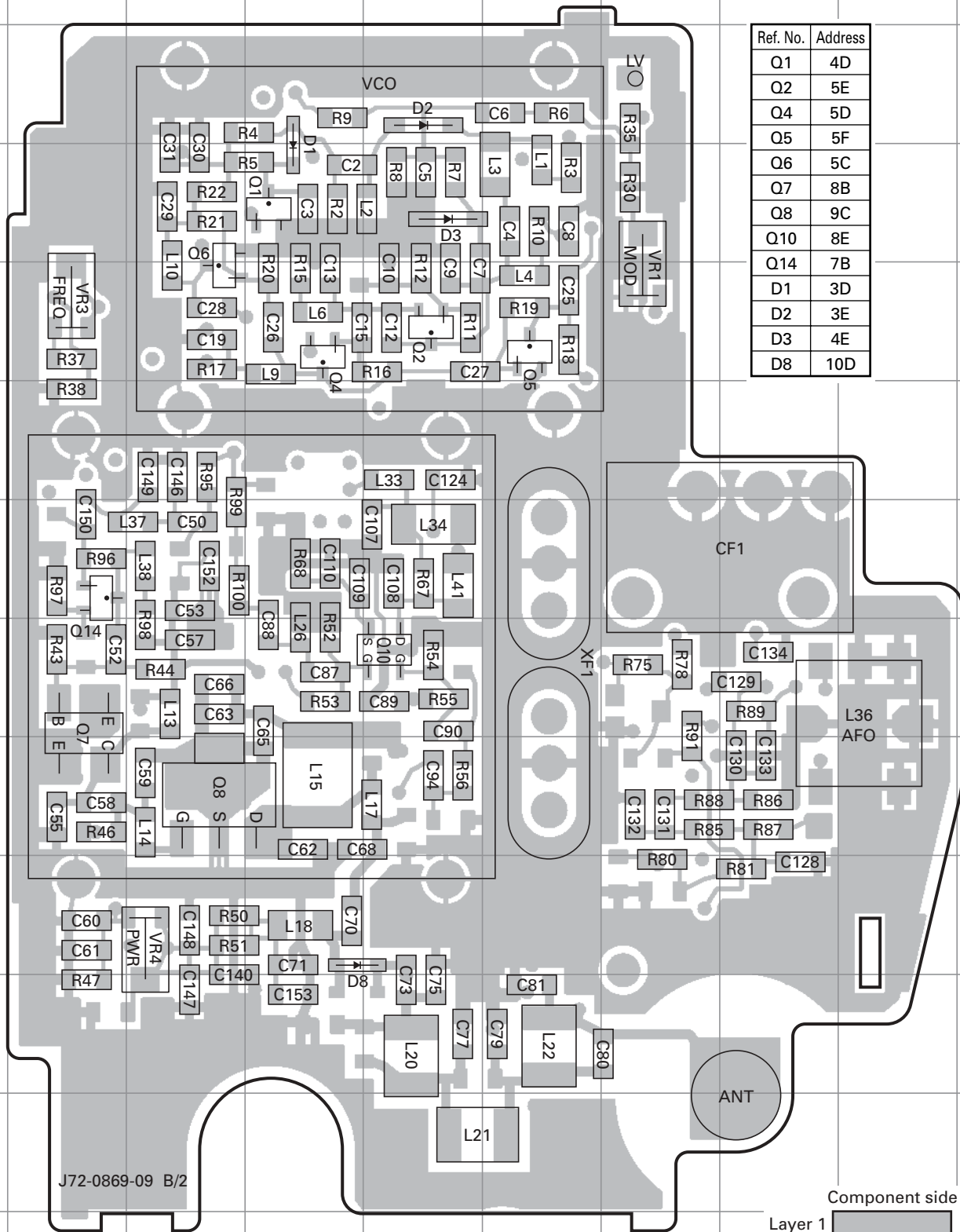


Ref. No.	Address	Ref. No.	Address
IC204	9G	Q200	9H
IC206	9D	D202	8H
IC208	7D	D204	7H
IC210	5E	D206	9E
IC211	4G		



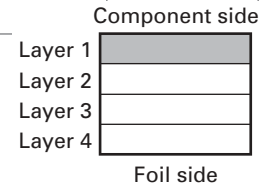
# UBZ-LJ8 PC BOARD

## TX-RX UNIT (X57-6672-70) (B/2) Component side view (J72-0869-09 B/2)



Ref. No.	Address
Q1	4D
Q2	5E
Q4	5D
Q5	5F
Q6	5C
Q7	8B
Q8	9C
Q10	8E
Q14	7B
D1	3D
D2	3E
D3	4E
D8	10D

J72-0869-09 B/2

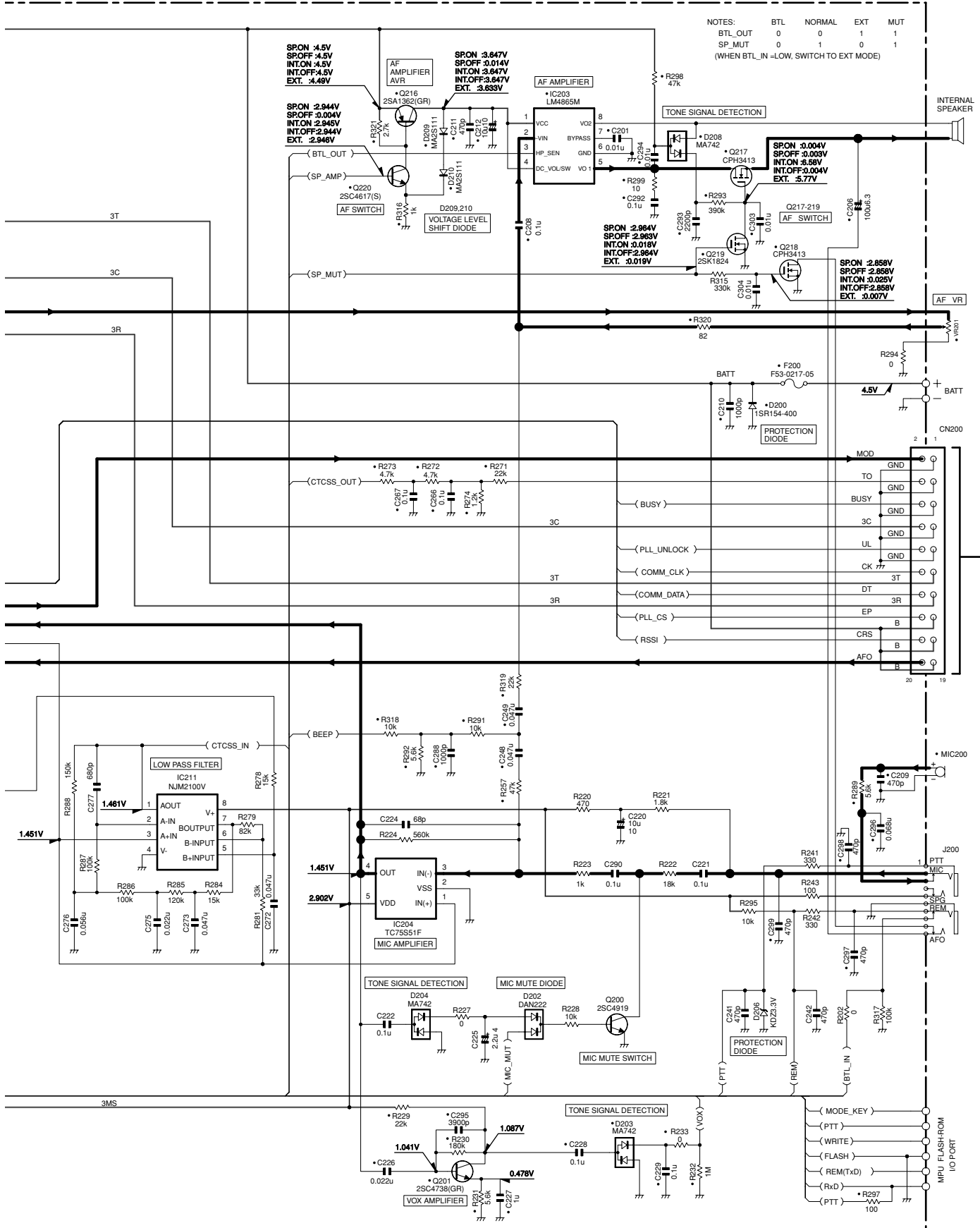






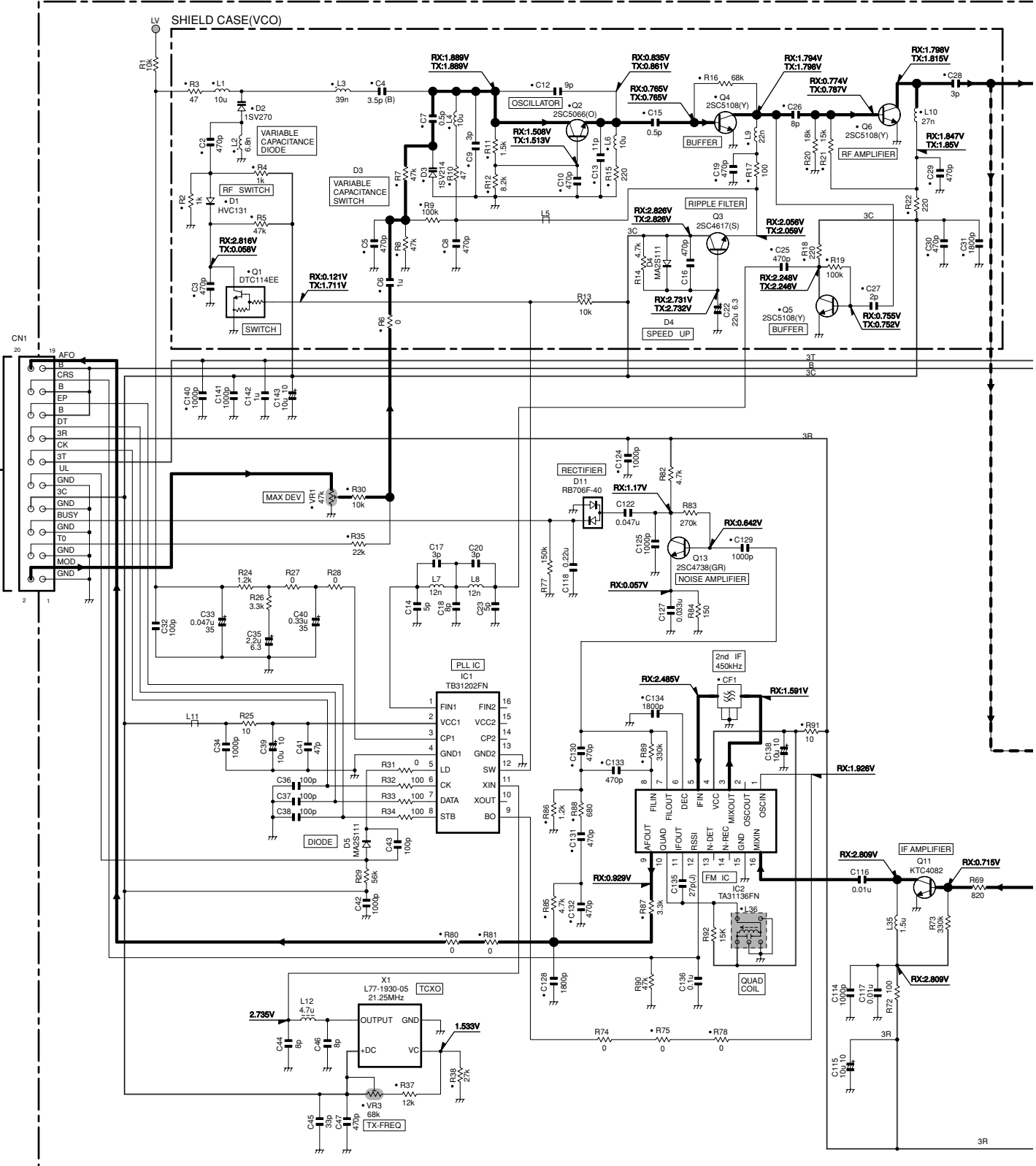
# SCHEMATIC DIAGRAM UBZ-LJ8

TX-RX UNIT : CONTROL SECTION (X57-6672-70) (A/2)



# UBZ-LJ8 SCHEMATIC DIAGRAM

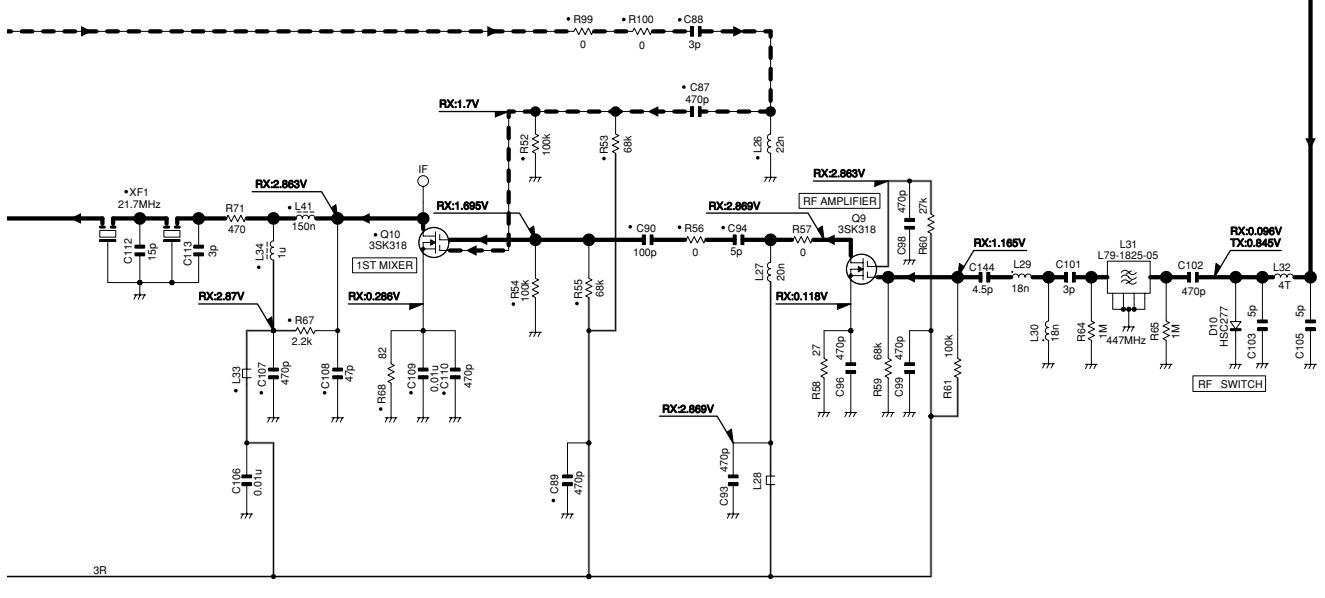
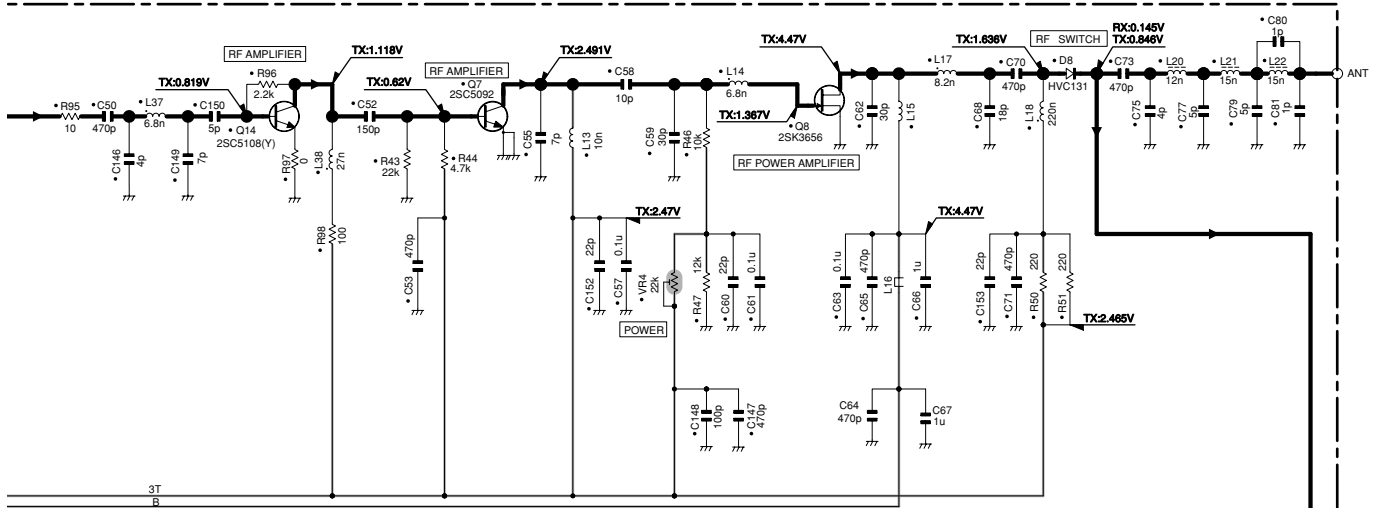
TX-RX UNIT :RF SECTION (X57-6672-70) (B/2)



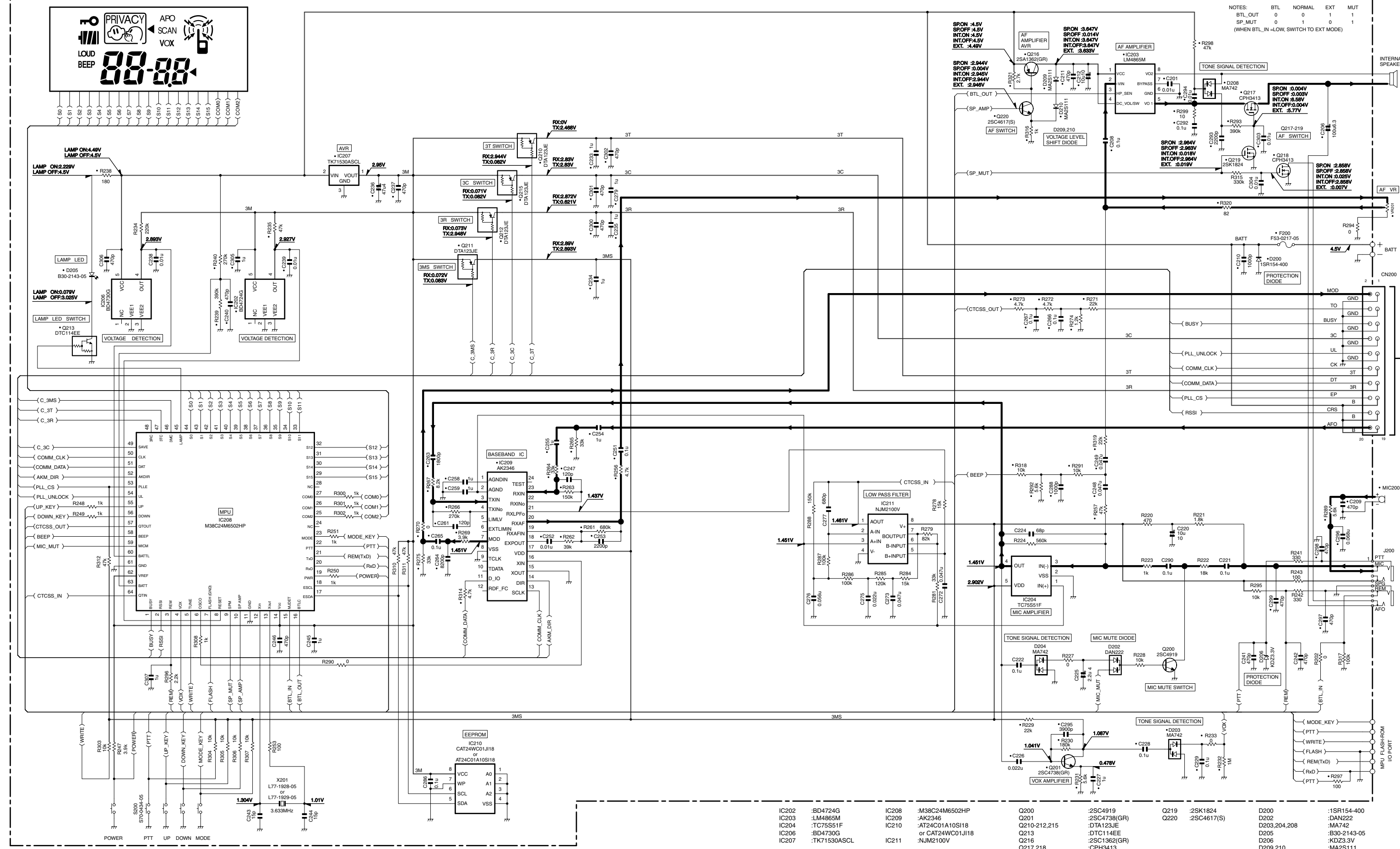
# SCHEMATIC DIAGRAM UBZ-LJ8

Note : The components marked with a dot (•) are parts of layer 1.

## TX-RX UNIT : RF SECTION (X57-6672-70) (B/2)

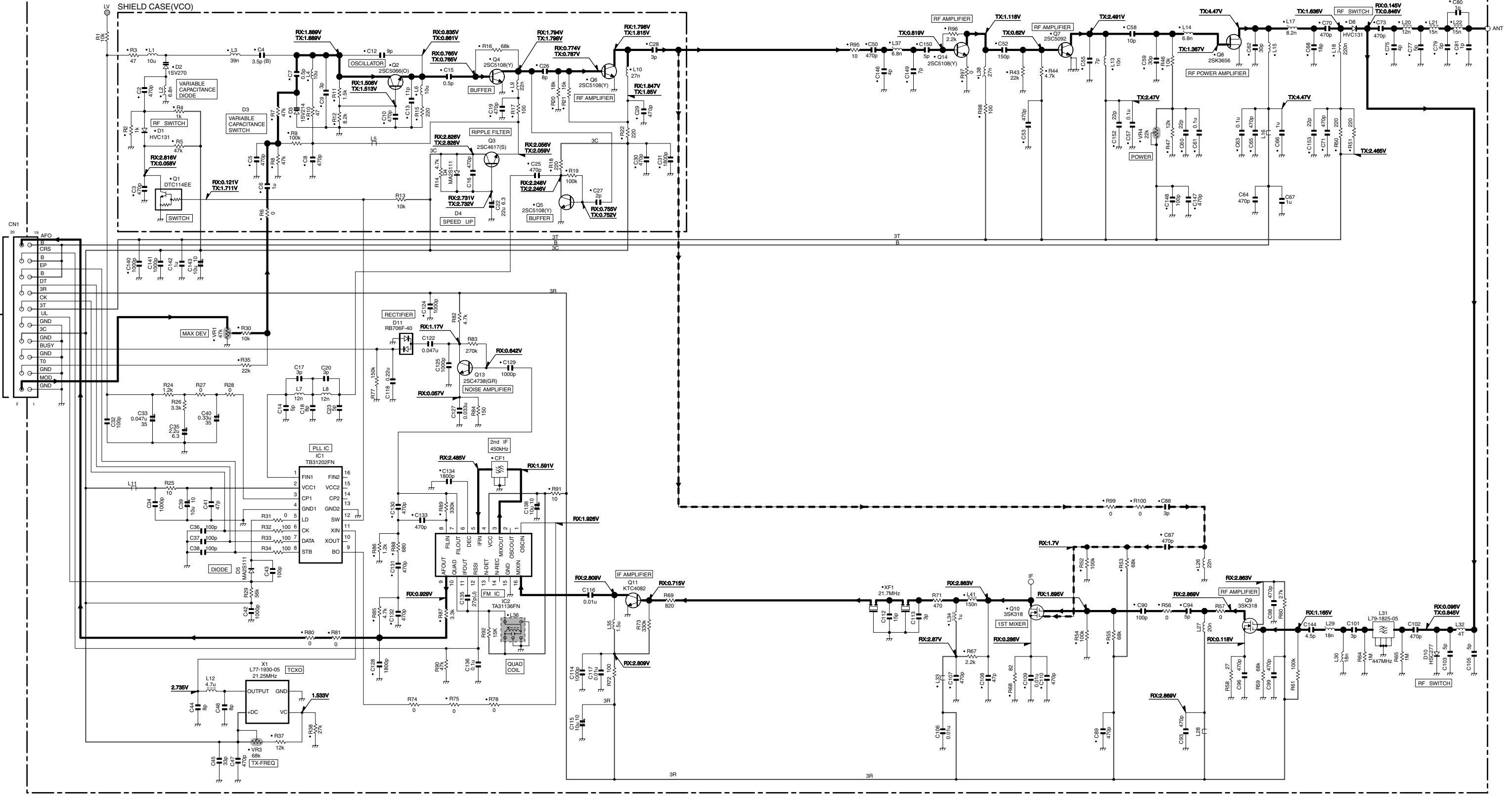


IC1	:TB31202FN	Q1	:DTC114EE	Q8	:2SK3656	D1	:HVC131	D10	:HSC277
IC2	:TA31136FN	Q2	:2SC5066(O)	Q9,10	:3SK318	D2	:1SV270	D11	:RB706F-40
		Q3	:2SC4617(S)	Q11	:KTC4082	D3	:1SV214		
		Q4-6,14	:2SC5108(Y)	Q13	:2SC4738(GR)	D4,5	:MA2S111		
		Q7	:2SC5092			D8	:HVC131		



NOTES: BTL NORMAL EXT MUT  
 BTL\_OUT 0 0 1 1  
 SP\_MUT 0 1 0 1  
 (WHEN BTL\_IN = LOW, SWITCH TO EXT MODE)

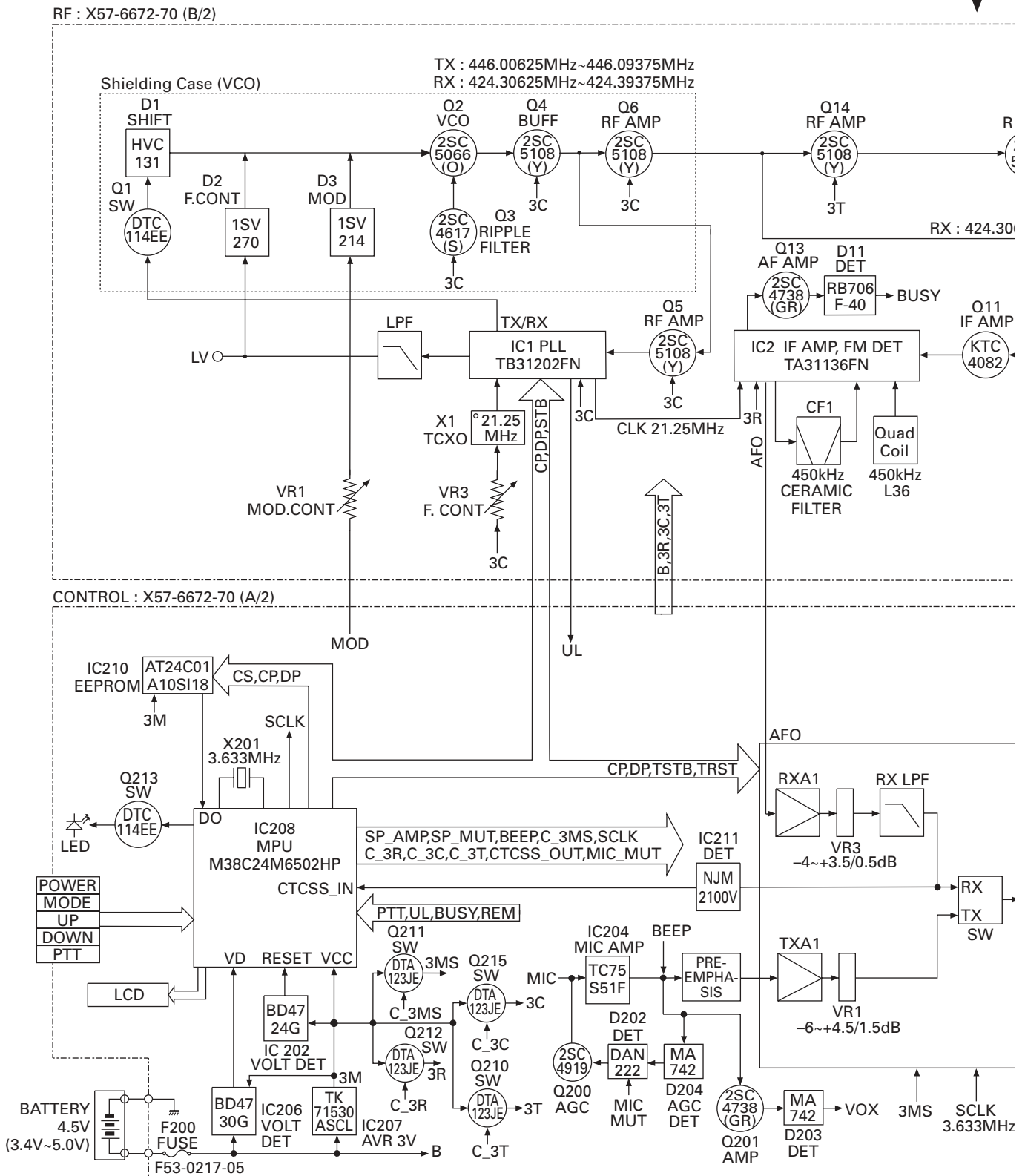
IC202	:BD4724G	IC208	:M38C24M6502HP	Q200	:2SC4919	Q219	:2SK1824	D200	:1SR154-400
IC203	:LM4865M	IC209	:AK2346	Q201	:2SC4738(GR)	Q210	:2SK1824	D202	:DAN222
IC204	:TC73551F	IC210	:AT24C01A10S1H	Q211	:D71-0212-215	Q212	:D71-0212-215	D203	:MA742
IC206	:BD4730G	IC206	:or CAT24WC01J18	Q216	:DTC114EE	D205	:DTC114EE	D206	:B30-2143-05
IC207	:TK71530ASCL	IC211	:NJM2100V	Q216	:2SC1362(GR)	D206	:KD23.3V	D206	:MA2S11V
				Q217, 218	:CPH413	D209, 210			



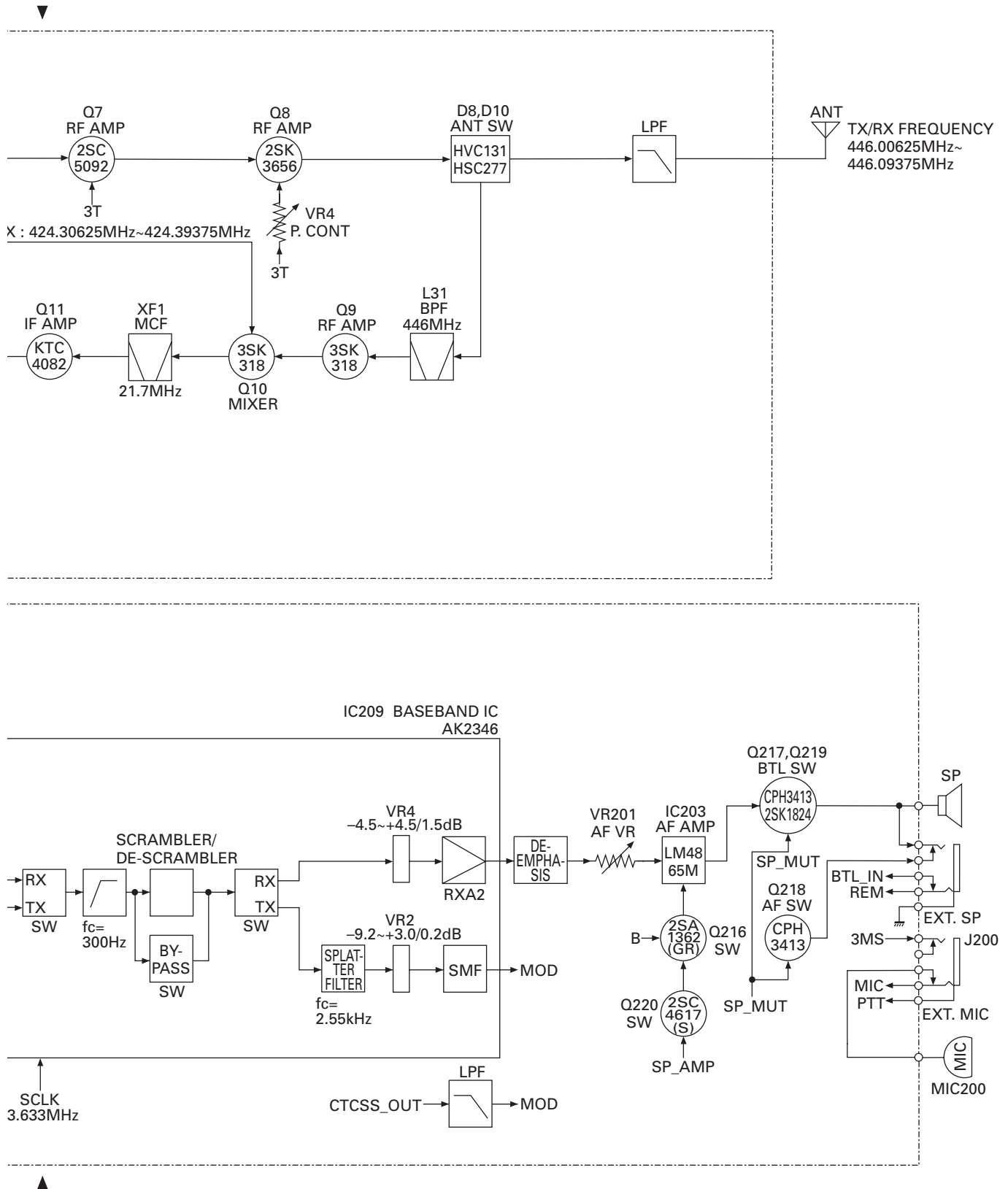
IC1	:TB1202FN	Q1	:DTC114EE	Q8	:2SK3656	D1	:HVC131	D10	:HSC277
IC2	:TA3138FN	Q2	:2SC5066(O)	Q9, 10	:3SK318	D2	:ISV270	D11	:RB70F-40
		Q3	:2SC4617(S)	Q11	:TKC4082	D3	:ISV214		
		Q4, 14	:2SC1081(Y)	Q13	:2SC4738(GR)	D4, 5	:MAK2S11V		
		Q7	:2SC5092	Q13		D8	:HVC131		



## BLOCK DIAGRAM

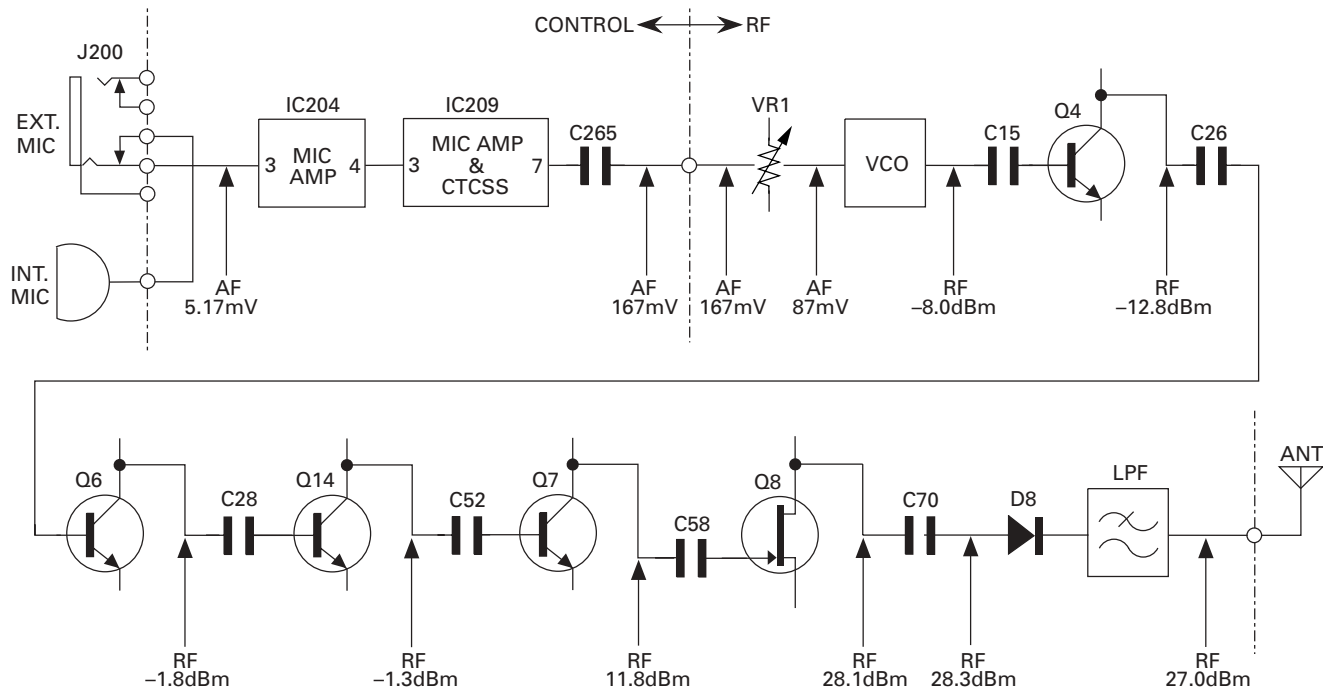


## BLOCK DIAGRAM



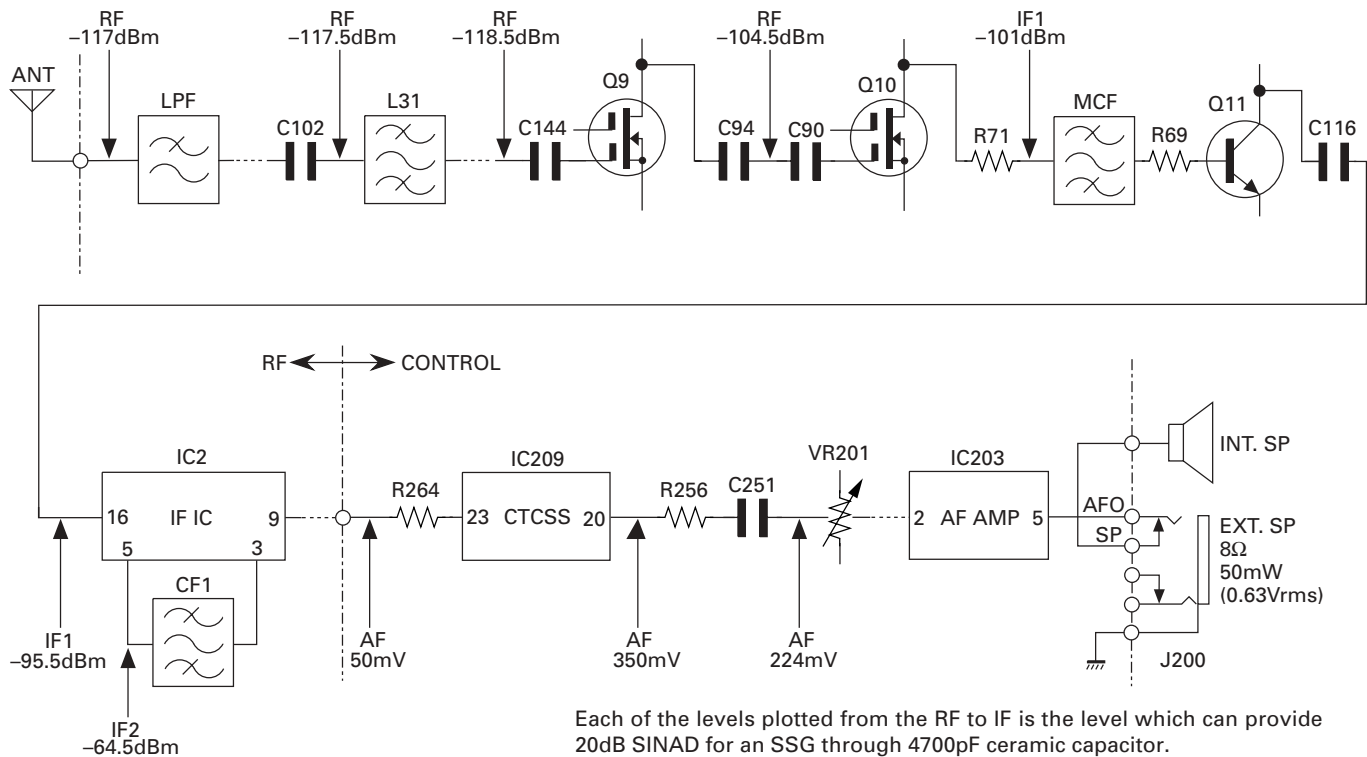
## LEVEL DIAGRAM

### Transmitter Section



Microphone input : 1kHz, 5.0mVrms, 1.5kHz DEV  
 AF : Measurements are taken by AF VTVM  
 RF : Measurements are taken by RF VTVM

### Receiver Section



Each of the levels plotted from the RF to IF is the level which can provide 20dB SINAD for an SSG through 4700pF ceramic capacitor.  
 The AF level is the value measured by an AF VTVM when an SSG signal of -53dBm is received and the AF output is adjusted to 0.63V using AF VOL.

## UBC-4 (BATTERY CHARGER) / UPB-1 (BATTERY PACK)

### UBC-4 External View



### UPB-1 External View



### UBC-4 Specifications

Usable temperature range ..... 5°C~40°C  
 Supply voltage (AC adapter) ..... AC 230V  
 Charging current..... Approx. 150mA  
 DC input voltage..... Approx. 9V  
 Charging time ..... UPB-1 : Approx. 8 hours  
 Weight (Charger only) ..... 70g

### UPB-1 Specifications

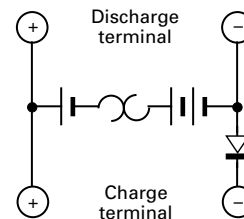
Dimensions [W x H x D] mm  
 (Projections included) ..... 44 (44) x 14.5 x 50.45 (51)  
 Weight ..... 68g  
 Nominal battery capacity ..... 3.6V, 700mAh

### UBC-4 Parts List

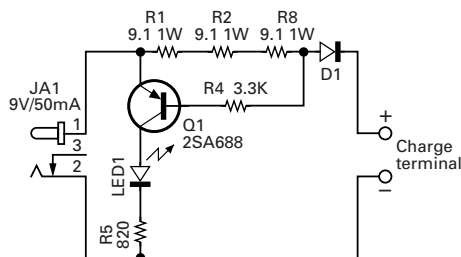
\* : New parts

New parts	Parts No.	Description	Destination
	W08-0587-08	Charger	
	W08-0590-08	AC adapter	E
*	W08-0955-08	AC adapter	T

### UPB-1 Schematic Diagram



### UBC-4 Schematic Diagram



# UBZ-LJ8

## SPECIFICATIONS

Frequency range .....	446.00625~446.09375MHz (8 channels)
Frequency stability .....	±2.5ppm (-20°C to +55°C)
Current	
Transmit mode .....	600mA or less
Receive mode (90mW output) .....	120mA or less (Loudness off)
Receive mode (No signal) .....	50mA or less
Battery save on .....	Approx. 10mA (Average)
Supply voltage (Rated voltage) .....	4.5V DC
Operating voltage .....	3.4V~5.0V DC
RF output power .....	500mW
Dimensions (W x H x D, Projections not included) .....	55.5 (2-3/16) x 103.9 (4-3/32) x 26 (1-1/64) mm (inches)
Weight (With 3 LR6 (AA) batteries) .....	Approx. 180g (6.3 oz)

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