

FM TRANSCEIVER

UBZ-LF68

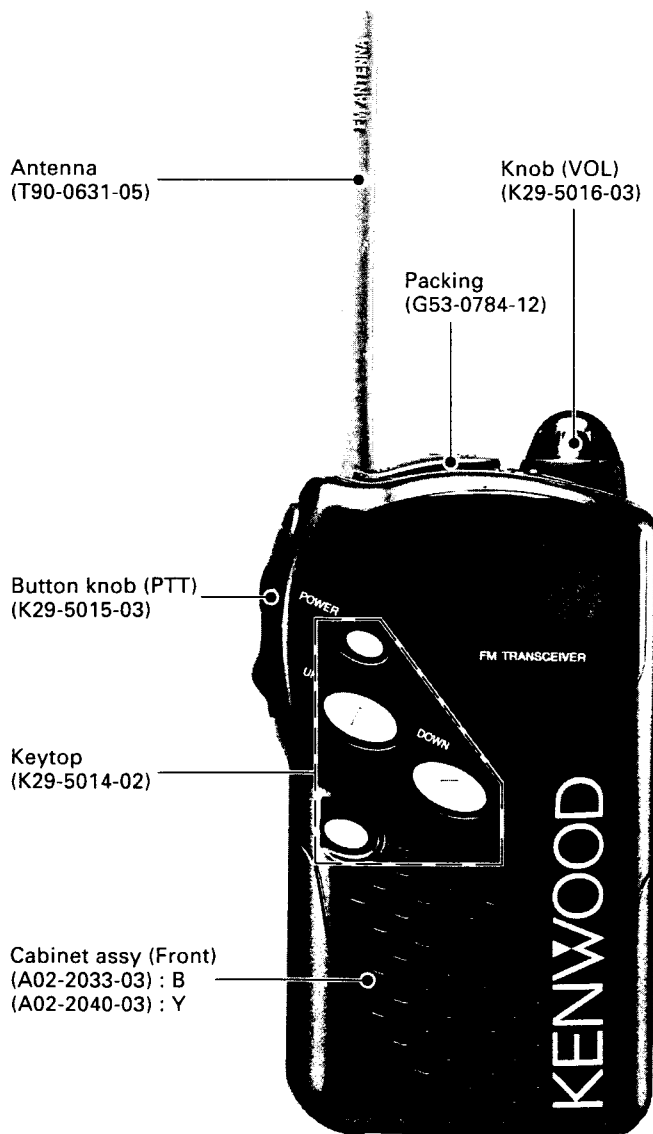
SERVICE MANUAL

KENWOOD

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CIRCUIT DESCRIPTION

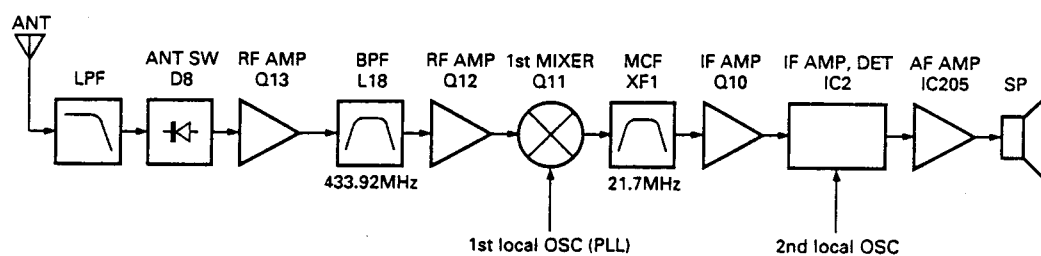


Fig. 2 Receiver section configuration

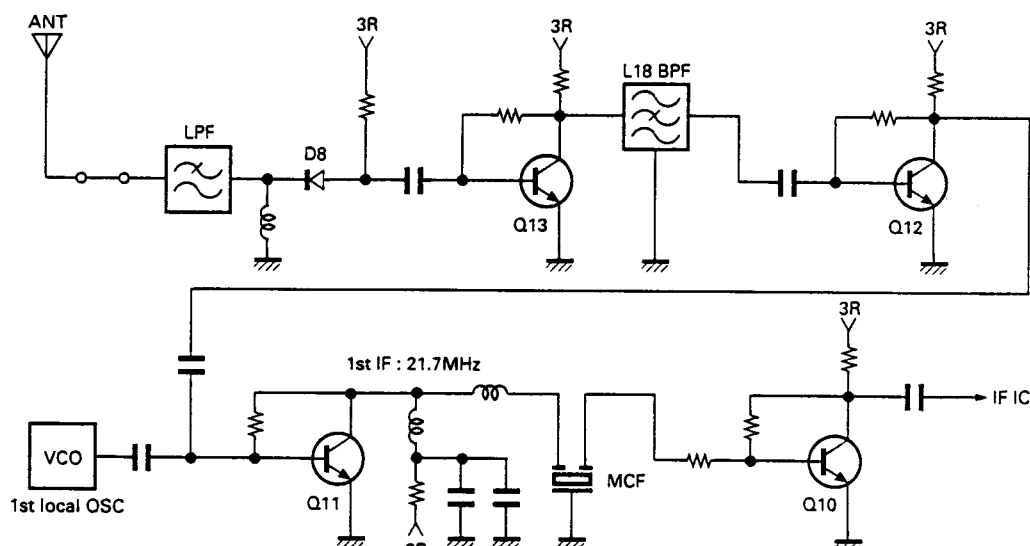


Fig. 3 Receiver circuit

■ IF Amplifier

The IF circuit consists of IC2. The IF IC contains local input, mixer, limiter amplifier, FM DET, and low-frequency amplifier.

The IF signal coming from the IF amplifier (Q10) goes to the IF IC mixer and is mixed with the second local signal (21.25MHz) to produce a second IF signal. ($21.7\text{MHz} - 21.25\text{MHz} = 450\text{kHz}$)

The second local signal is common to the PLL reference oscillation.

The second IF signal enters ceramic filter CF1 to eliminate unwanted signal components.

The second IF signal passing through the ceramic filter passes through the limiter amplifier consisting six differential amplifiers and is detected.

The FM detection is quadrature detection. The phase of the output signal from the limiter amplifier is shifted by 90 degrees by a ceramic discriminator and compared with the original waveform to produce detection output.

CIRCUIT DESCRIPTION

■ Squelch Circuit

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

The FM detection output is amplified by the operational amplifier in the base band IC (IC207), passes through a high-pass filter consisting of CR to remove noise components contained in the detection output, and converted to pulses by a comparator in the IC.

The output is input to the microcomputer. If a specified number of pulses is output (no-signal or weak signal), the audio amplifier IC power is turned off by the DC SW (Q210, Q202) to turn the output to the speaker off. To reduce noise output from the speaker when switching the audio amplifier off, the FET SW (Q203) directly connected to the speaker is turned off.

The squelch level is written into the EEPROM (IC203).

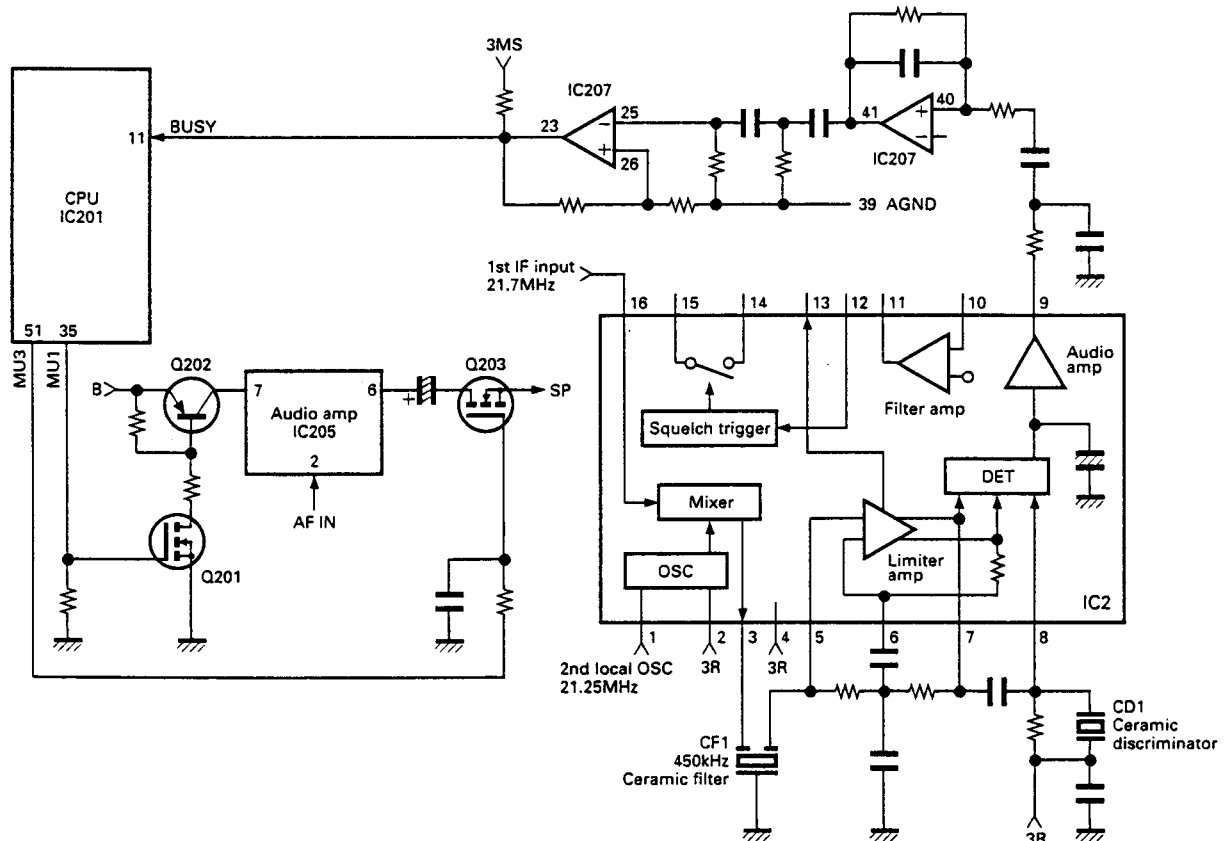


Fig. 4 IF and squelch circuits

■ AF Amplifier

The FM detection output passes through the amplifier contained in the base band IC (IC207), band-pass filter (300 to 3kHz), de-emphasis circuit, amplifier, and AF volume (VR201), and is amplified to the specified level by the AF amplifier (IC205).

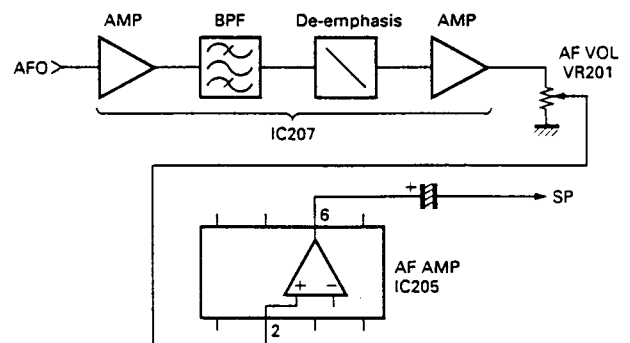


Fig. 5 AF circuit

CIRCUIT DESCRIPTION

Transmitter System

■ Microphone Amplifier Circuit

The audio signal from the microphone passes through the amplifier contained in the base band IC (IC207), 6dB/oct pre-emphasis circuit, band-pass filter (300 to 3kHz), amplifier, and limiter. The distortion components outside the audio band are eliminated by the splatter filter.

■ Modulation Circuit

The microphone amplifier output passes through VR206 for modulation adjustment and goes to the modulation input of the VCO circuit for variable reactance phase modulation.

■ Transmission Output Circuit

The VCO output is amplified by a high-frequency amplifier (Q5, Q6, Q7), passes through a high-frequency switch diode (D8) (which conducts in transmit mode), passes through a low-pass filter and goes to the antenna.

The transmission output is adjusted to 10mW at the transmission output pin by adjusting the operating voltage of Q7 by a semi-fixed volume (VR204).

Since the output from the transmission output circuit is kept at 3V, the transmission output does not fluctuate even when the power supply voltage changes.

■ Low-Pass Filter Circuit

A two-stage chebyshev type low-pass filter is located between the antenna and transmit/receive switching circuit. It removes harmonic components contained in the transmission output.

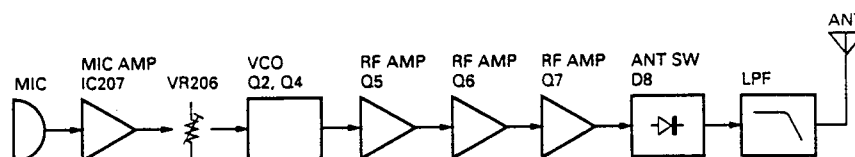


Fig. 6 Transmitter section configuration

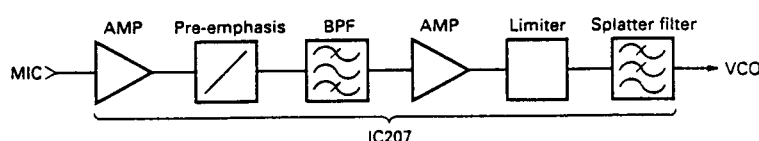


Fig. 7 Microphone amplifier circuit

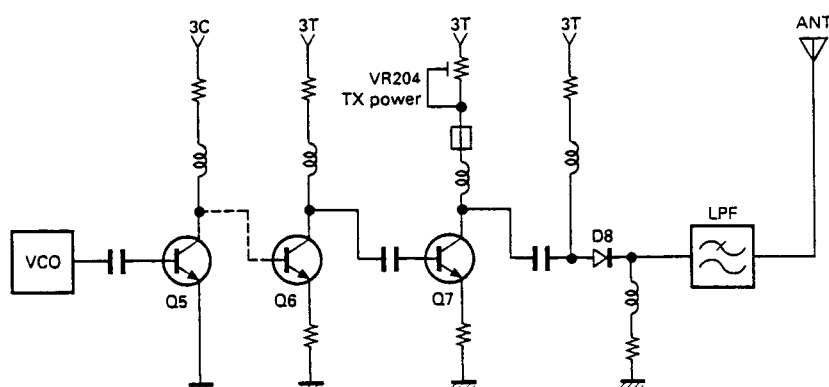


Fig. 8 Transmission output circuit

CIRCUIT DESCRIPTION

PLL System

■ VCO Circuit

The VCO is housed in a shield case.

The VCO circuit consists of a transistor (Q2), a variable capacity diode (D1) for frequency control, a variable capacity diode (D3) for modulation, transmit/receive frequency shift diode (D2), control transistor (Q1), and oscillator buffer amplifier (Q4).

In receive mode, the shift signal T/R goes high, Q1 turns on, and the shift diode (D2) contacts. Q2 produces the first local frequency for reception. (Receive channel frequency – 21.7MHz)

In transmit mode, the shift signal T/R goes low, Q1 turns off and D2 does not conduct. Q2 produces about 430MHz and the VCO frequency equals the transmit channel frequency.

The 3.0V circuit voltage is produced by ripple removing filter circuit Q3.

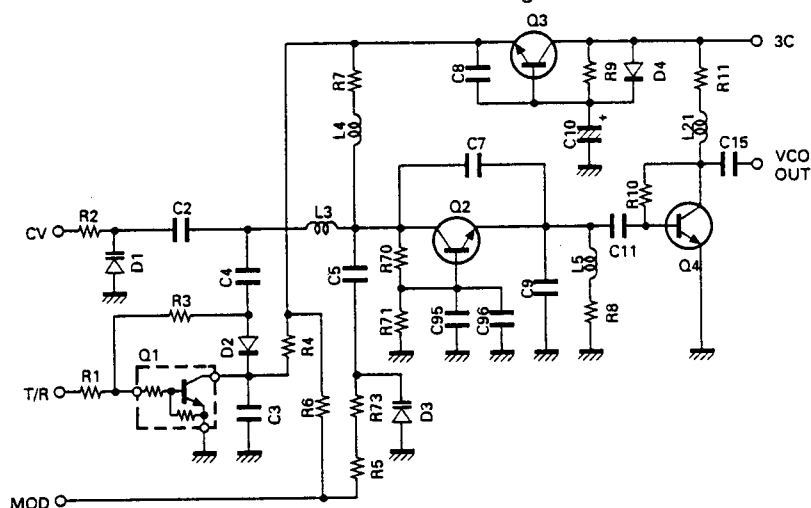


Fig. 9 VCO circuit

■ PLL Circuit

Frequency data is sent to the PLL IC (IC1) from the microcomputer as serial data when the power turns on, when the channel is changed, or when transmission begins. It sets the variable divider in the PLL IC.

The crystal oscillator X1 and the CMOS oscillator in the PLL IC produce a 21.25MHz reference frequency. It is divided to produce a 12.5kHz PLL comparison frequency.

The VCO input is divided by the divide ratio set by the divider in the PLL IC to generate 12.5kHz. It is compared with the reference comparison frequency by the phase comparator to detect a phase difference.

The charge pump circuit in the PLL IC converts it to a control voltage that can drive the VCO directly.

The control voltage passes through a loop filter which passes low frequency and is applied to the VCO control pin to control the oscillator frequency. The loop filter removes unwanted harmonics and noise contained in the output from the phase comparator and determines PLL response and synchronizing characteristics by the amplitude and phase characteristics (Fig. 10).

■ Unlock Detection Circuit

If the PLL cannot be synchronized for some reason or other when switching the channel or changing between transmission and reception, the PLL IC outputs a low unlock detection signal. This signal goes to the microcomputer to inhibit transmission when the PLL is unlocked.

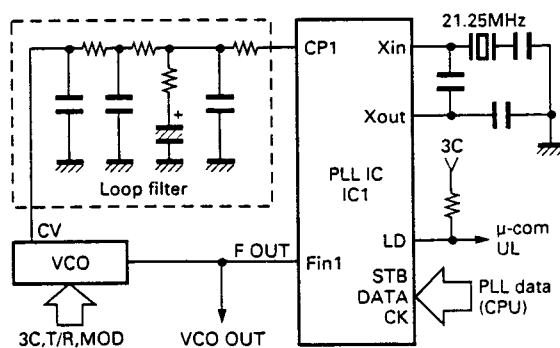


Fig. 10 PLL circuit

CIRCUIT DESCRIPTION

Control System

■ Reset Circuit

When a battery is inserted, the microcomputer (IC201) power supply provides the operating voltage after about 500 μ s. The voltage output IC (IC202) sets the reset pin to high to reset the microcomputer after about 500 μ s.

When the battery is removed, the voltage detection IC (IC206) detects the drop of the B power supply voltage, changes the detection output to low, and sends the signal to the VD pin of the microcomputer to stop its operation.

■ Battery Voltage Detection Circuit

The unit detects a low battery voltage and flashes the BATT indicator on the LCD. The battery voltage is divided and applied to the analog value input pin (BATT) of the microcomputer, and converted to a digital signal. It is compared with the reference voltage from the 3M power supply, and if it is lower than the preset value, the BATT indicator on the LCD flashes.

It is factory-set to flash when the battery terminal voltage falls to 3.5V.

■ Power Supply Circuit

The power supply voltage is maintained to 3.0V by the series regulator (IC204). It is used as microcomputer power 3M.

The transmission power 3T is supplied to the transmission output circuit when the microcomputer turns Q204 on only in transmit mode.

The reception power 3R is provided to the receive and IF circuits when the microcomputer turns Q205 (1/2) on only in receive mode.

The transmission/reception power 3C is supplied to the VCO and PLL circuits when the microcomputer turns Q205 (2/2) on in transmit and receive modes.

The power switch linking power supply 3MS is supplied to the base band IC (IC207) and divider (IC208) when the microcomputer turns Q209 on when the power switch is pressed.

If no signal is received for 10 seconds, the microcomputer enters the power save mode, and turns common power 3C and reception power 3R on for one cycle and off for three cycles according to the signals from the microcomputer to save the battery power. If the power save mode continues for two hours, the power switches off automatically and common power 3C, reception power 3R, and power switch linking power supply 3MS are turned off.

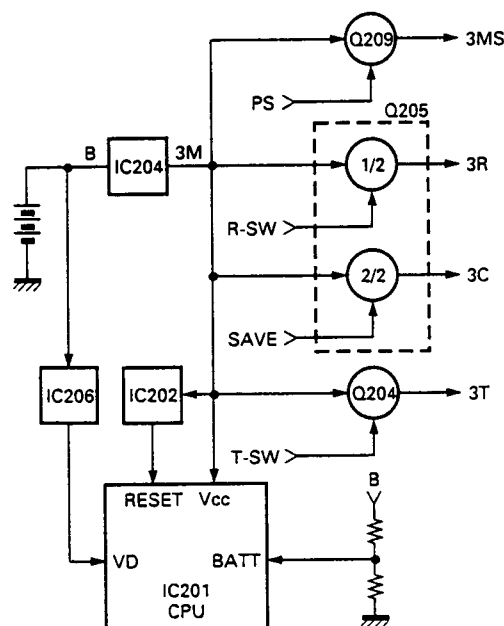


Fig. 11 Reset, battery voltage detection and power supply circuits

CIRCUIT DESCRIPTION

■ Remote Control Circuit

The voltage at the CPU (IC201) REM (remote) pin is converted to a digital signal to carry out remote operation according to the voltage.

The REM pin is set to about 3.0V by R201. When the remote control microphone switch is pressed, the voltage divided by the resistor in series to the switch and R201 is generated to indicate which switch is pressed.

(*1): The voltage passes through R203 from the internal 3MS line (3.0V).

■ CTCSS

The tone frequency of the base band IC (IC207) is set by serial data from the CPU (IC201).

In receive mode, the FM demodulation output goes to the IC207 RXIN pin. If the tone frequency matches, the IC207 DET OUT pin goes low and the signal is applied to the microcomputer port. MU1 goes high and the AF amplifier power turns on. If the tone frequency does not match, no sound is output from the speaker.

In transmit mode, the tone set by the microcomputer is output from the IC207 TX TONE pin and the level is set by VR203. The resulting signal passes through the summing amplifier in IC207 to modulate the VCO.

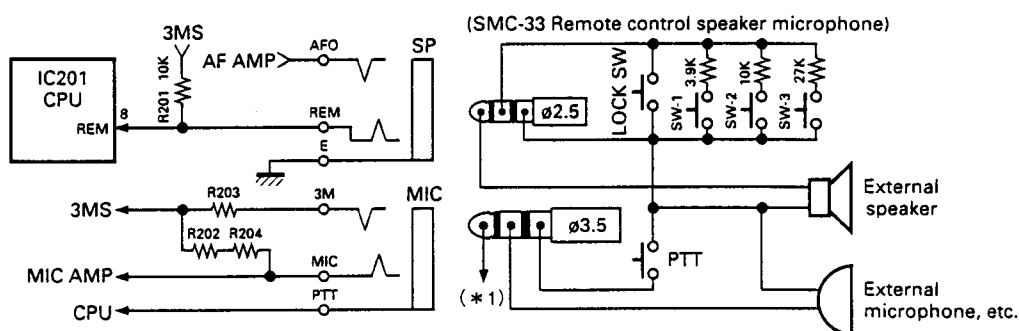


Fig. 12 Speaker, microphone jack and remote control circuits

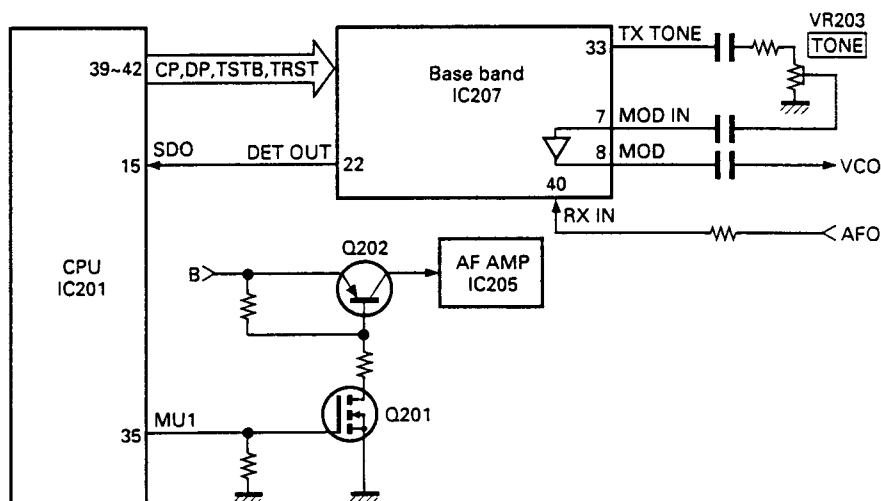
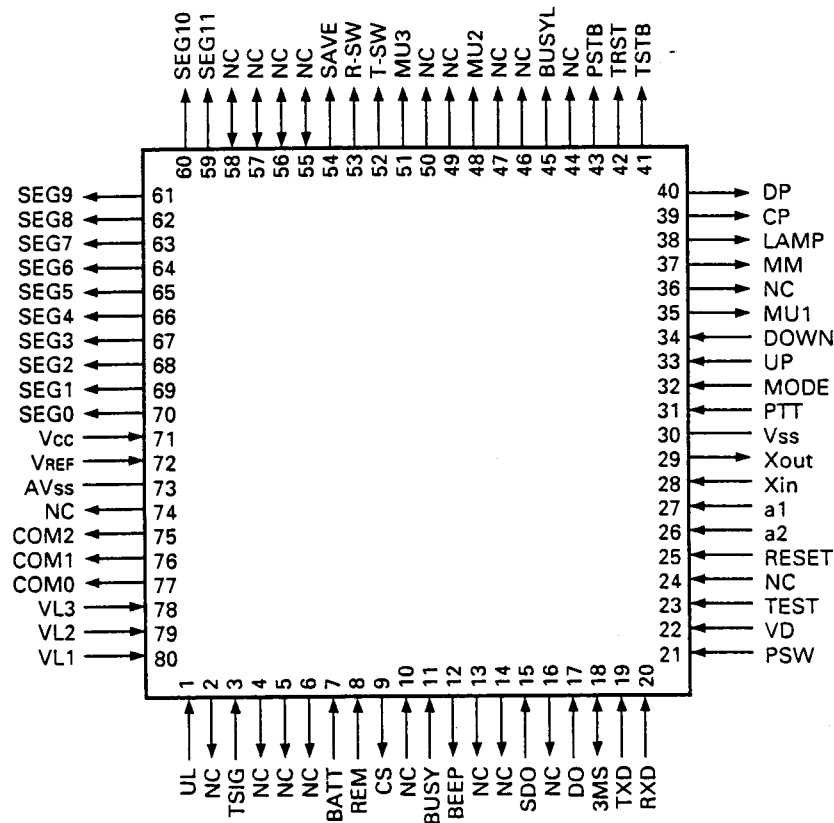


Fig. 13 CTCSS circuit

SEMICONDUCTOR DATA

CPU : M38223M4127GP (IC201)

■ Terminal connection diagram



■ Terminal function

Pin No.	Pin name	Active level	Power on		Power off		Function
			Initial state	I/O	Initial state	I/O	
1	UL	H	HiZ	I	HiZ	I	PLL lock detect input. "H" : Lock
2			L	O	L	O	Not used.
3	TSIG		HiZ	I	HiZ	I	Tone detect signal A/D input.
4~6			L	O	L	O	Not used.
7	BATT		HiZ	I	HiZ	I	Battery voltage A/D input.
8	REM		HiZ	I	HiZ	I	Remote control microphone key A/D input.
9	CS		L	O	L	O	EEPROM chip select output.
10			HiZ	I	HiZ	I	Not used.
11	BUSY	L	HiZ	I	HiZ	I	Busy pulse input.
12	BEEP		L	O	L	O	Beep output. "L" : No beep is output
13,14			L	O	L	O	Not used.
15	SDO	L	HiZ	I	HiZ	I	Tone detection input. "L" : Match
16			L	O	L	O	Not used.
17	DO		HiZ	I	HiZ	I	EEPROM data input.
18	3MS	L	L	O	HiZ	I	3MS power switch output. "L" : On
19	TXD		HiZ	I	HiZ	I	RS-232C data output. (Connected to REM)
20	RXD		HiZ	I	HiZ	I	RS-232C data input. (Connected to PTT)

SEMICONDUCTOR DATA

Pin No.	Pin name	Active level	Power on		Power off		Function
			Initial state	I/O	Initial state	I/O	
21	PSW	L	HiZ	I	HiZ	I	POWER key input. "L" : On
22	VD	L,H	HiZ	I	HiZ	I	Power supply voltage input. (Both edges)
23	TEST	L	HiZ	I	HiZ	I	Test input.
24			HiZ	I	HiZ	I	Not used.
25	RESET	L		I		I	Reset input.
26	a2		L	I	HiZ	HiZ	Destination bit input (Not used).
27	a1	L	HiZ	I	HiZ	I	Write.
28	XIN			I		I	Connect a crystal oscillator.
29	XOUT			O		O	Connect a crystal oscillator.
30	VSS						Connect GND.
31	PTT	L	HiZ	I	HiZ	I	PTT key input. "L" : On
32	MODE	L	HiZ	I	HiZ	I	MODE key input. "L" : On
33	UP	L	HiZ	I	HiZ	I	UP key input. "L" : On
34	DOWN	L	HiZ	I	HiZ	I	DOWN key input. "L" : On
35	MU1	L	L	O	L	O	Audio amplifier power switch output. "H" : On
36			L	O	L	O	Not used.
37	MM	H	H	O	L	O	Microphone mute switch output. "H" : Mute
38	LAMP	H	L	O	L	O	Lamp on output. "H" : On
39	CP		L	O	L	O	Common serial clock output.
40	DP		L	O	L	O	Common serial data output.
41	TSTB	H	L	O	L	O	AK2342 strobe signal output.
42	TRST	L	H	O	L	O	AK2342 reset output. "L" : Reset
43	PSTB	H	L	O	L	O	PLL IC strobe output.
44			L	O	L	O	Not used.
45	BUSYL	L	L	O	L	O	Jig busy LED on output. "L" : On
46,47			L	O	L	O	Not used.
48	MU2	L	H	O	L	O	Receive audio mute switch output. "H" : Mute
49,50			L	O	L	O	Not used.
51	MU3	H	L	O	H	O	Speaker mute switch output. "L" : Mute
52	T-SW	L	H	O	H	O	Transmit circuit power output. "L" : On
53	R-SW	L	H	O	H	O	Receive circuit power output. "L" : On
54	SAVE	L	H	O	H	O	Common circuit power output. "L" : On
55~58				I/O		I/O	Not used.
59~70	SEG11~SEG0			O		O	LCD segment output (S11~S0).
71	VCC			I		I	Microprocessor power input.
72	VREF			I		I	A/D converter reference voltage input.
73	AVSS						A/D converter circuit GND input.
74	COM3			O		O	Not used.
75~77	COM3~COM9			O		O	LCD common signal output.
78~80	VL3~VL1			I		I	LCD power input 3~1.

DESCRIPTION OF COMPONENTS

TX-RX Unit (X57-4872-71) (A/2) : Control

Ref. No.	Use/Function	Operation/Condition/Compatibility
Q201,202	DC switch	AF power off when mute.
Q203	AF switch	Off when mute.
Q204	3T switch	3T (3.0V)
Q205	3R, 3C switch	3R (3.0V), 3C (3.0V)
Q206	Lamp LED switch	On when lamp LED on.
Q207	AF switch	On when microphone mute.
Q208	AF switch	On when mute.
Q209	3MS switch	3MS (3.0V)
IC201	CPU	
IC202	Voltage detection	2.4V
IC203	EEPROM	
IC204	AVR	3M (3.0V)
IC205	AF amplifier	2 : Input, 6 : Output
IC206	Voltage detection	3.0V
IC207	CTCSS	
IC208	Divider	7.3728MHz → 3.6864MHz
D205	Lamp LED	
D206	Separator	
D207	Microphone tone quality detection	
D209	Tone signal detection	

TX-RX Unit (X57-4872-71) (B/2) : RF

Ref. No.	Use/Function	Operation/Condition/Compatibility
Q1	DC switch	On when reception.
Q2	Oscillator	RX : 411.375~413.750MHz, TX : 433.075~434.750MHz
Q3	Ripple filter	
Q4	Buffer	
Q5	RF amplifier	
Q6,7	RF amplifier	Transmit power
Q8	RF amplifier	
Q10	IF amplifier	1st IF 21.7MHz
Q11	1st mixer	RX frequency – Local oscillation frequency
Q12,13	RF amplifier	For receive
Q14	Buffer	
IC1	PLL IC	
IC2	FM IC	
D1	Variable capacity diode	VCO frequency control
D2	RF switch	
D3	Variable capacity diode	VCO modulation
D4	Speed up	For 3C.
D5,6	RF switch	On when transmit.
D8	RF switch	TX/RX switch
D9	Amplitude restriction	Surge absorption

UBZ-LF68

PARTS LSIT

* New Parts. Δ 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 K : USA P : Canada
Y : PX (Far East, Hawaii) T : England E : Europe
Y : AAFES (Europe) X : Australia M : Other Areas

UBZ-LF68 TX-RX UNIT (X57-4872-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination
UBZ-LF68					
1	3B	*	A02-1955-03	CABINET ASSY (REAR)	B
1	3B	*	A02-1956-03	CABINET ASSY (REAR)	Y
2	1B	*	A02-2033-03	CABINET ASSY (FRONT)	B
2	1B	*	A02-2040-03	CABINET ASSY (FRONT)	Y
-			B42-3537-04	STICKER	
5	1D		B46-0310-03	WARRANTY CARD	
6	1D	*	B62-0710-00	INSTRUCTION MANUAL	
-		*	B72-1139-14	MODEL NAME PLATE	
-		*	B72-1265-04	MODEL NAME PLATE (FRANCE)	
9	3A	*	D10-0623-04	LEVER	B
9	3A	*	D10-0624-04	LEVER	Y
10	3A		D21-0832-04	SHAFT (LEVER)	
-			E23-0903-05	TERMINAL (CHARGE)	
13	2A		E23-0989-04	TERMINAL (+,-)	
14	2A		E23-0990-04	TERMINAL (-)	
15	2A		E23-0991-04	TERMINAL (+)	
17	3A	*	F07-1406-02	COVER (BATT)	B
17	3A	*	F07-1407-02	COVER (BATT)	Y
18	2A		F20-1161-04	SHEET (R CABINET, TERMINAL)	
20	2A		G13-1368-04	CUSHION (R CABINET, SHAFT)	
21	2B		G13-1501-04	CUSHION (BATT TERMINAL)	
22	3A		G13-1502-04	CUSHION (COVER)	
23	2B	*	G53-0784-12	PACKING (R CABINET TOP)	
24	3B	*	G53-0785-03	PACKING (R CABINET BATT)	
26	2D	*	H12-3005-02	PACKING FIXTURE	
27	2D		H25-0085-04	BAG	
28	3C	*	H52-0889-02	ITEM CARTON CASE	B
28	3C	*	H52-0914-02	ITEM CARTON CASE	Y
30	2C	*	J29-0607-14	HOOK ASSY	B
30	2C	*	J29-0610-14	HOOK ASSY	Y
32	1B	*	K29-5014-02	KEYTOP (4KEYS)	
33	1A	*	K29-5015-03	BUTTON KNOB (PTT)	
34	2B	*	K29-5016-03	KNOB (VOL)	
A	2C		N08-0528-04	DRESSED SCREW (HOOK)	
B	3A, 3B	*	N09-2291-05	SCREW (CABINET)	
C	2B		N14-0565-15	HEXAGON NUT (ANT)	
D	2B		N30-2004-46	PAN HEAD MACHIN SCREW (ANT-RF)	
ANT	2A	*	T90-0631-05	ANTENNA	
SP	1A		T07-0303-05	LOUDSPEAKER (FULLRANGE)	
TX-RX UNIT (X57-4872-71)					
101	2B	*	A13-1616-23	FRAME	
-		*	B11-1134-03	FILTER	
102	1B	*	B38-0778-05	DISPLAY ASSY	
C1			CK73GB1H471K	CHIP C 470PF	K
C2			CC73GCH1H080B	CHIP C 8.0PF	B
C3			CK73GB1H471K	CHIP C 470PF	K
C4			CC73GCH1H020B	CHIP C 2.0PF	B

Ref. No.	Address	New parts	Parts No.	Description	Destination
C5			CC73GCH1H0R5B	CHIP C 0.5PF	B
C7		*	CC73GCH1H120G	CHIP C 12PF	G
C8			CK73GB1H471K	CHIP C 470PF	K
C9			CC73GCH1H160G	CHIP C 16PF	G
C10			C92-0566-05	CHIP-TAN 10UF 6.3WV	
C11			CC73GCH1H0R5B	CHIP C 0.5PF	B
C13			CK73GB1H471K	CHIP C 470PF	K
C14, 15			CC73GCH1H100D	CHIP C 10PF	D
C16			CK73GB1H471K	CHIP C 470PF	K
C17			CC73GCH1H040C	CHIP C 4.0PF	C
C18			CC73GCH1H390J	CHIP C 39PF	J
C20, 21			CK73GB1H471K	CHIP C 470PF	K
C22			CC73GCH1H040C	CHIP C 4.0PF	C
C24-26			CK73GB1H471K	CHIP C 470PF	K
C27			CC73GCH1H030C	CHIP C 3.0PF	C
C28			CK73GB1H102K	CHIP C 1000PF	K
C29			CC73GCH1H101J	CHIP C 100PF	J
C32			CK73GB1H471K	CHIP C 470PF	K
C33			CC73GCH1H101J	CHIP C 100PF	J
C34			CC73GCH1H070D	CHIP C 7.0PF	D
C35			CC73GCH1H150J	CHIP C 15PF	J
C36			CC73GCH1H070D	CHIP C 7.0PF	D
C38			C92-0001-05	CHIP C 0.1UF 35WV	
C40			C92-1024-05	CHIP-TAN 3.3UF 6.3WV	
C41			CK73GB1H562K	CHIP C 5600PF	K
C42			CC73GCH1H150J	CHIP C 15PF	J
C44			CC73GCH1H390J	CHIP C 39PF	J
C45			CK73GB1H471K	CHIP C 470PF	K
C46			CK73GB1H102K	CHIP C 1000PF	K
C47			CC73GCH1H390J	CHIP C 39PF	J
C48			CK73FB1E104K	CHIP C 0.10UF	K
C50			CK73GB1H471K	CHIP C 470PF	K
C53			CC73GCH1H020C	CHIP C 2.0PF	C
C54-56			CC73GCH1H101J	CHIP C 100PF	J
C57			CK73GB1H471K	CHIP C 470PF	K
C69, 70			CK73FB1E104K	CHIP C 0.10UF	K
C72			CK73GB1H102K	CHIP C 1000PF	K
C75			CK73GB1H471K	CHIP C 470PF	K
C77			CC73GCH1H040C	CHIP C 4.0PF	C
C78			CC73GCH1H390J	CHIP C 39PF	J
C80			CK73GB1H102K	CHIP C 1000PF	K
C82			CC73GCH1H101J	CHIP C 100PF	J
C83			CC73GCH1HR75C	CHIP C 0.75PF	C
C84			CC73GCH1H100D	CHIP C 10PF	D
C86			CK73GB1H471K	CHIP C 470PF	K
C87			CC73GCH1H101J	CHIP C 100PF	J
C88			CC73GCH1H060D	CHIP C 6.0PF	D
C89			CK73GB1H471K	CHIP C 470PF	K
C91, 92			CK73GB1H471K	CHIP C 470PF	K
C95			CK73GB1H471K	CHIP C 470PF	K
C96			CK73FB1E473K	CHIP C 0.047UF	K
C99			CK73FB1E104K	CHIP C 0.10UF	K
C100			CK73FB0J105K	CHIP C 1.0UF	K

B : Black
Y : Yellow

PARTS LIST

TX-RX UNIT (X57-4872-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
C101			CK73GB1H102K	CHIP C 1000PF K		C271			CK73GB1H102K	CHIP C 1000PF K	
C103			CK73GB1H102K	CHIP C 1000PF K		TC1			C05-0371-05	TRIMMER CAPACITOR	
C107			C92-0004-05	CHIP-TAN 1.0UF 16WV		-		*	E29-1144-04	INTER CONNECTOR (LCD)	
C108			CK73FB1E104K	CHIP C 0.10UF K		CN2		*	E04-0193-05	PIN SOCKET (ANT)	
C110			CC73GCH1H330J	CHIP C 33PF J		CN5			E40-5775-05	PIN ASSY SOCKET (16P)	
C111			C92-0619-05	CHIP-TAN 47UF 4WV		CN201,202			E23-0962-05	TERMINAL (SP)	
C201			CK73GB1H471K	CHIP C 470PF K		CN204,205			E23-0342-05	TERMINAL (TEST)	
C202			C92-0566-05	CHIP-TAN 10UF 6.3WV					E40-5774-05	PIN ASSY (16P)	
C203,204			CC73GCH1H330J	CHIP C 33PF J		CN206			E11-0457-05	PHONE JACK (SP/MIC)	
C205,206			CK73EB1C105K	CHIP C 1.0UF K		J201					
C208			CK73GR1C473K	CHIP C 0.047UF K		-		*	F10-2172-04	SHIELDING CASE (VCO)	
C210			CK73GB1H102K	CHIP C 1000PF K		103	28		G13-0828-04	CUSHION	
C211			CK73GB1H103K	CHIP C 0.010UF K		-			J21-4486-04	HARDWARE FIXTURE (LCD)	
C212			CK73GB1H471K	CHIP C 470PF K		-			J30-1212-04	SPACER	
C213			C92-0617-05	CHIP-ELE 220UF 4WV							
C214			C92-0047-05	CHIP-ELE 47UF 6.3WV		CD1			L79-1051-05	FILTER (450KHZ)	
C215			CK73GB1H102K	CHIP C 1000PF K		CF1		*	L72-0938-05	CERAMIC FILTER (450KHZ)	
C216			CK73GB1H471K	CHIP C 470PF K		L3			L33-1337-05	CHOKE COIL (27NH)	
C217			C92-0544-05	CHIP-TAN 10UF 4WV		L4,5			L40-1095-34	SMALL FIXED INDUCTOR (1UH)	
C218			C92-0567-05	CHIP-TAN 68UF 6.3WV		L6			L40-2271-34	SMALL FIXED INDUCTOR (22NH)	
C219			CK73GR1C473K	CHIP C 0.047UF K		L7			L40-1571-34	SMALL FIXED INDUCTOR (15NH)	
C220			CK73GB1H103K	CHIP C 0.010UF K		L8			L40-2271-34	SMALL FIXED INDUCTOR (22NH)	
C222			CK73GB1H102K	CHIP C 1000PF K		L9			L92-0131-05	CORE	
C224			CK73GB1H471K	CHIP C 470PF K		L10			L40-1095-34	SMALL FIXED INDUCTOR (10NH)	
C225			CK73GB1H103K	CHIP C 0.010UF K		L11			L40-5675-34	SMALL FIXED INDUCTOR (56NH)	
C226			CK73GB1H471K	CHIP C 470PF K		L12,13			L40-1872-80	SMALL FIXED INDUCTOR (18NH)	
C227,228			CK73FB1E104K	CHIP C 0.10UF K		L15			L40-8285-34	SMALL FIXED INDUCTOR (820NH)	
C229			CK73EB1C105K	CHIP C 1.0UF K		L16			L40-1571-34	SMALL FIXED INDUCTOR (15NH)	
C230			CK73FB1E104K	CHIP C 0.10UF K		L17			L40-1071-34	SMALL FIXED INDUCTOR (10NH)	
C231			CK73GB1H103K	CHIP C 0.010UF K		L18		*	L79-1442-05	FILTER (433.92MHZ)	
C232			CC73GCH1H470J	CHIP C 47PF J		L19			L40-1875-34	SMALL FIXED INDUCTOR (18NH)	
C233,234			CK73GB1E223K	CHIP C 0.022UF K		L20			L40-1071-34	SMALL FIXED INDUCTOR (10NH)	
C235			CC73GCH1H101J	CHIP C 100PF J		L21			L40-2271-34	SMALL FIXED INDUCTOR (22NH)	
C236			CC73GCH1H151J	CHIP C 150PF J		L22			L40-1095-34	SMALL FIXED INDUCTOR (10NH)	
C237			CK73EB1C105K	CHIP C 1.0UF K		L23			L40-5681-37	SMALL FIXED INDUCTOR (0.56UH)	
C239,240			CK73EB1C105K	CHIP C 1.0UF K		L201			L92-0131-05	CORE	
C244			CK73FB1H103K	CHIP C 0.010UF K		L202			L92-0144-05	CORE	
C246			CC73GCH1H221J	CHIP C 220PF J		X1			L77-1605-15	CRYSTAL RESONATOR (21.25MHZ)	
C249			CK73EB1C105K	CHIP C 1.0UF K		X201			L77-1613-05	CRYSTAL RESONATOR (7.3728MHZ)	
C250			CC73GCH1H101J	CHIP C 100PF J		XF1		*	L71-0486-05	CRYSTAL FILTER (21.7MHZ)	
C251			CK73FF1C105Z	CHIP C 1.0UF Z		E	18		N39-2030-46	PAN HEAD MACHINE SCREW	
C252			CK73FB1E104K	CHIP C 0.10UF K		CP1			R90-0714-05	MULTI-COMP 10K X 4	
C253			CC73GCH1H101J	CHIP C 100PF J		R1			RK73GB1J102J	CHIP R 1.0K J 1/16W	
C254			CK73FB1E104K	CHIP C 0.10UF K		R2			RK73GB1J471J	CHIP R 470 J 1/16W	
C257			CK73FF1C105Z	CHIP C 1.0UF Z		R3			RK73GB1J272J	CHIP R 2.7K J 1/16W	
C258			CC73GCH1H271J	CHIP C 270PF J		R4			RK73GB1J473J	CHIP R 47K J 1/16W	
C259			CC73GCH1H101J	CHIP C 100PF J		R5,6			RK73GB1J104J	CHIP R 100K J 1/16W	
C261			CK73FB1E104K	CHIP C 0.10UF K		R7			RK73GB1J220J	CHIP R 22 J 1/16W	
C262			CK73GB1H561K	CHIP C 560PF K		R8			RK73GB1J151J	CHIP R 150 J 1/16W	
C263			CK73FF1C105Z	CHIP C 1.0UF Z		R9			RK73GB1J472J	CHIP R 4.7K J 1/16W	
C264			C92-0002-05	CHIP-TAN 0.22UF 35WV		R10			RK73GB1J473J	CHIP R 47K J 1/16W	
C265			CK73FF1C105Z	CHIP C 1.0UF Z		R11			RK73GB1J102J	CHIP R 1.0K J 1/16W	
C266			C92-0567-05	CHIP-TAN 68UF 6.3WV		R12			R92-1252-05	CHIP R 0 OHM	
C267			CK73FB1E823K	CHIP C 0.082UF K		R13			RK73GB1J153J	CHIP R 15K J 1/16W	
C268			CK73GB1H102K	CHIP C 1000PF K		R14			RK73GB1J183J	CHIP R 18K J 1/16W	
C269			CK73GB1H471K	CHIP C 470PF K		R15			RK73GB1J821J	CHIP R 820 J 1/16W	
C270			CK73GB1H103K	CHIP C 0.010UF K							

PARTS LSIT

TX-RX UNIT (X57-4872-71)

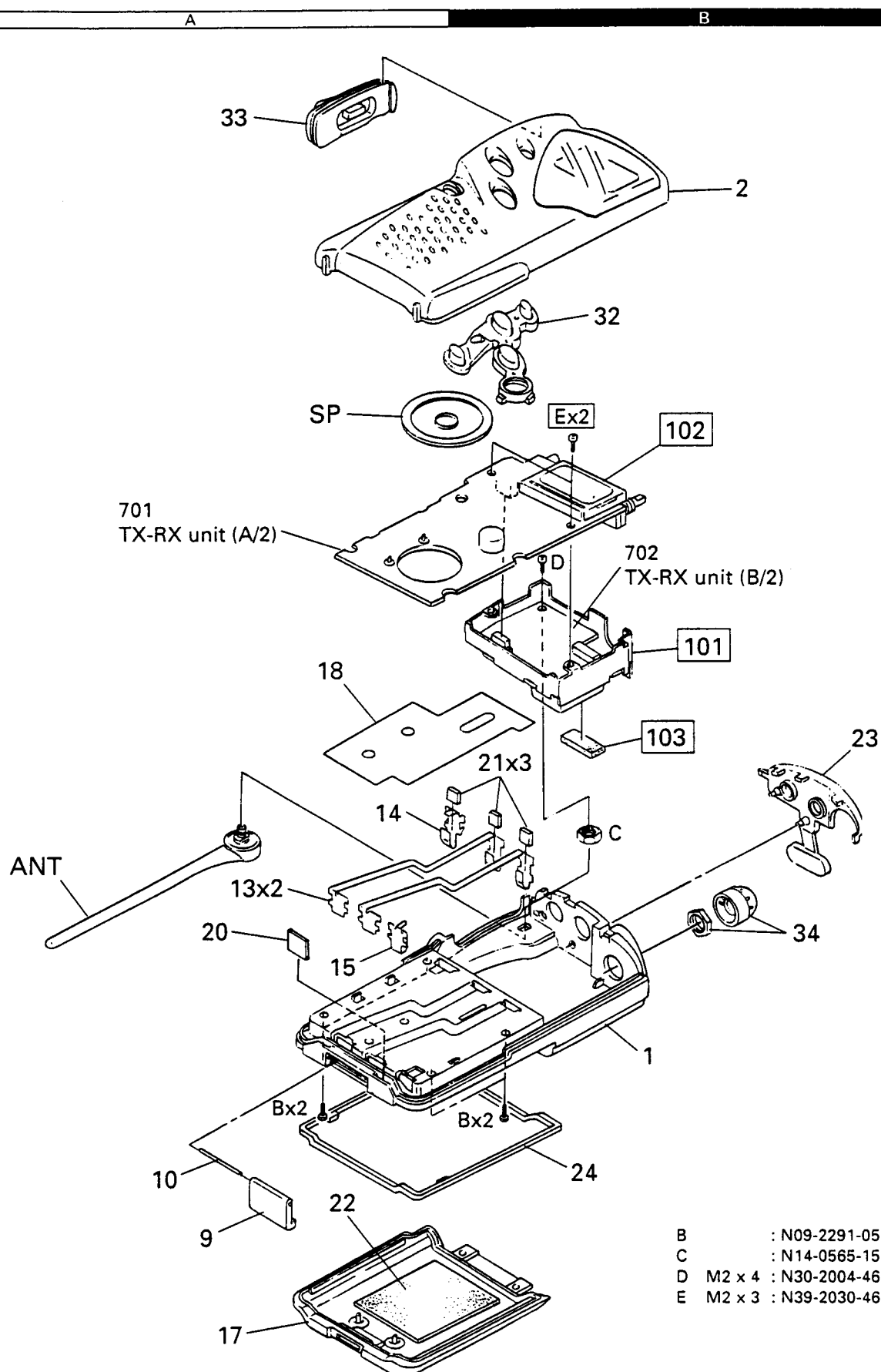
Ref. No.	Address	New parts	Parts No.	Description	Destination	Ref. No.	Address	New parts	Parts No.	Description	Destination
R16			RK73GB1J222J	CHIP R 2.2K J 1/16W		R214,215			RK73GB1J124J	CHIP R 120K J 1/16W	
R18			RK73GB1J472J	CHIP R 4.7K J 1/16W		R216			RK73GB1J153J	CHIP R 15K J 1/16W	
R19			RK73GB1J183J	CHIP R 18K J 1/16W		R217			RK73GB1J392J	CHIP R 3.9K J 1/16W	
R20			RK73GB1J333J	CHIP R 33K J 1/16W		R218			RK73GB1J274J	CHIP R 270K J 1/16W	
R21			RK73GB1J100J	CHIP R 10 J 1/16W		R219			RK73GB1J474J	CHIP R 470K J 1/16W	
R22			RK73GB1J180J	CHIP R 18 J 1/16W		R220			RK73GB1J473J	CHIP R 47K J 1/16W	
R23			RK73GB1J102J	CHIP R 1.0K J 1/16W		R221			RK73GB1J820J	CHIP R 82 J 1/16W	
R24			RK73GB1J472J	CHIP R 4.7K J 1/16W		R222			RK73GB1J100J	CHIP R 10 J 1/16W	
R25			RK73GB1J100J	CHIP R 10 J 1/16W		R223			RK73GB1J474J	CHIP R 470K J 1/16W	
R26			RK73GB1J182J	CHIP R 1.8K J 1/16W		R226-228			RK73GB1J472J	CHIP R 4.7K J 1/16W	
R27			RK73GB1J222J	CHIP R 2.2K J 1/16W		R231			RK73GB1J473J	CHIP R 47K J 1/16W	
R28			RK73GB1J223J	CHIP R 22K J 1/16W		R232			RK73GB1J104J	CHIP R 100K J 1/16W	
R29			RK73GB1J101J	CHIP R 100 J 1/16W		R233			RK73GB1J473J	CHIP R 47K J 1/16W	
R30			RK73GB1J102J	CHIP R 1.0K J 1/16W		R236			RK73FB2A221J	CHIP R 220 J 1/10W	
R31			RK73GB1J272J	CHIP R 2.7K J 1/16W		R237			RK73GB1J473J	CHIP R 47K J 1/16W	
R35			RK73GB1J333J	CHIP R 33K J 1/16W		R238			RK73GB1J103J	CHIP R 10K J 1/16W	
R36			RK73GB1J221J	CHIP R 220 J 1/16W		R239			RK73GB1J273J	CHIP R 27K J 1/16W	
R37			RK73GB1J104J	CHIP R 100K J 1/16W		R240			RK73GB1J103J	CHIP R 10K J 1/16W	
R48			RK73GB1J102J	CHIP R 1.0K J 1/16W		R241			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R54			RK73GB1J470J	CHIP R 47 J 1/16W		R242			RK73GB1J272J	CHIP R 2.7K J 1/16W	
R55			RK73GB1J471J	CHIP R 470 J 1/16W		R243			RK73GB1J474J	CHIP R 470K J 1/16W	
R56			RK73GB1J334J	CHIP R 330K J 1/16W		R244,245			RK73GB1J104J	CHIP R 100K J 1/16W	
R57			RK73GB1J152J	CHIP R 1.5K J 1/16W		R246			RK73GB1J823J	CHIP R 82K J 1/16W	
R59			RK73GB1J330J	CHIP R 33 J 1/16W		R248			RK73GB1J473J	CHIP R 47K J 1/16W	
R61			RK73GB1J274J	CHIP R 270K J 1/16W		R249			RK73GB1J154J	CHIP R 150K J 1/16W	
R62			RK73GB1J471J	CHIP R 470 J 1/16W		R255			RK73GB1J564J	CHIP R 560K J 1/16W	
R63			RK73GB1J390J	CHIP R 39 J 1/16W		R257			RK73GB1J563J	CHIP R 56K J 1/16W	
R64			RK73GB1J104J	CHIP R 100K J 1/16W		R260			RK73GB1J183J	CHIP R 18K J 1/16W	
R65			RK73GB1J271J	CHIP R 270 J 1/16W		R265			RK73GB1J124J	CHIP R 120K J 1/16W	
R66			RK73GB1J470J	CHIP R 47 J 1/16W		R266			RK73GB1J333J	CHIP R 33K J 1/16W	
R67			RK73GB1J333J	CHIP R 33K J 1/16W		R267			RK73GB1J274J	CHIP R 270K J 1/16W	
R68			RK73GB1J222J	CHIP R 2.2K J 1/16W		R268-271			RK73GB1J473J	CHIP R 47K J 1/16W	
R70			RK73GB1J103J	CHIP R 10K J 1/16W		R272			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R71			RK73GB1J153J	CHIP R 15K J 1/16W		R273			RK73GB1J223J	CHIP R 22K J 1/16W	
R73			RK73GB1J104J	CHIP R 100K J 1/16W		R274			RK73GB1J393J	CHIP R 39K J 1/16W	
R75,76			RK73GB1J105J	CHIP R 1.0M J 1/16W		R275			RK73GB1J473J	CHIP R 47K J 1/16W	
R79			RK73GB1J334J	CHIP R 330K J 1/16W		R279			RK73GB1J333J	CHIP R 33K J 1/16W	
R80			RK73GB1J222J	CHIP R 2.2K J 1/16W		R280			RK73GB1J104J	CHIP R 100K J 1/16W	
R83			RK73GB1J103J	CHIP R 10K J 1/16W		R281			RK73GB1J473J	CHIP R 47K J 1/16W	
R84			RK73GB1J223J	CHIP R 22K J 1/16W		R282			RK73GB1J273J	CHIP R 27K J 1/16W	
R85			RK73GB1J152J	CHIP R 1.5K J 1/16W		R283,284			RK73GB1J473J	CHIP R 47K J 1/16W	
R86			RK73GB1J473J	CHIP R 47K J 1/16W		R286			RK73GB1J273J	CHIP R 27K J 1/16W	
R87			RK73GB1J472J	CHIP R 4.7K J 1/16W		R288			RK73GB1J471J	CHIP R 470 J 1/16W	
R88			RK73GB1J182J	CHIP R 1.8K J 1/16W		R292			RK73GB1J102J	CHIP R 1.0K J 1/16W	
R92			R92-1252-05	CHIP R 0 OHM		R293			RK73GB1J105J	CHIP R 1.0M J 1/16W	
R201			RK73GB1J103J	CHIP R 10K J 1/16W		R294			RK73GB1J473J	CHIP R 47K J 1/16W	
R202			RK73GB1J471J	CHIP R 470 J 1/16W		R295			RK73GB1J334J	CHIP R 330K J 1/16W	
R203			RK73GB1J101J	CHIP R 100 J 1/16W		R296			RK73GB1J823J	CHIP R 82K J 1/16W	
R204			RK73GB1J182J	CHIP R 1.8K J 1/16W		R297			RK73GB1J474J	CHIP R 470K J 1/16W	
R205			RK73GB1J101J	CHIP R 100 J 1/16W		R298			RK73GB1J561J	CHIP R 560 J 1/16W	
R206			RK73GB1J823J	CHIP R 82K J 1/16W		R299			RK73GB1J273J	CHIP R 27K J 1/16W	
R207			RK73GB1J332J	CHIP R 3.3K J 1/16W		R300,301			RK73GB1J473J	CHIP R 47K J 1/16W	
R208			R92-1252-05	CHIP R 0 OHM		R303			RK73GB1J392J	CHIP R 3.9K J 1/16W	
R209			RK73GB1J222J	CHIP R 2.2K J 1/16W		VR201			R31-0608-05	VARIABLE RESISTOR (10K)	
R210			RK73GB1J473J	CHIP R 47K J 1/16W		VR203			R12-6721-05	TRIMMING POT. (220K:10K)	
R211,212			RK73GB1J472J	CHIP R 4.7K J 1/16W		VR204			R12-6703-05	TRIMMING POT. (220:POWER)	
R213			RK73GB1J224J	CHIP R 220K J 1/16W		VR206			R12-6717-05	TRIMMING POT. (47K:MOD)	

PARTS LIST

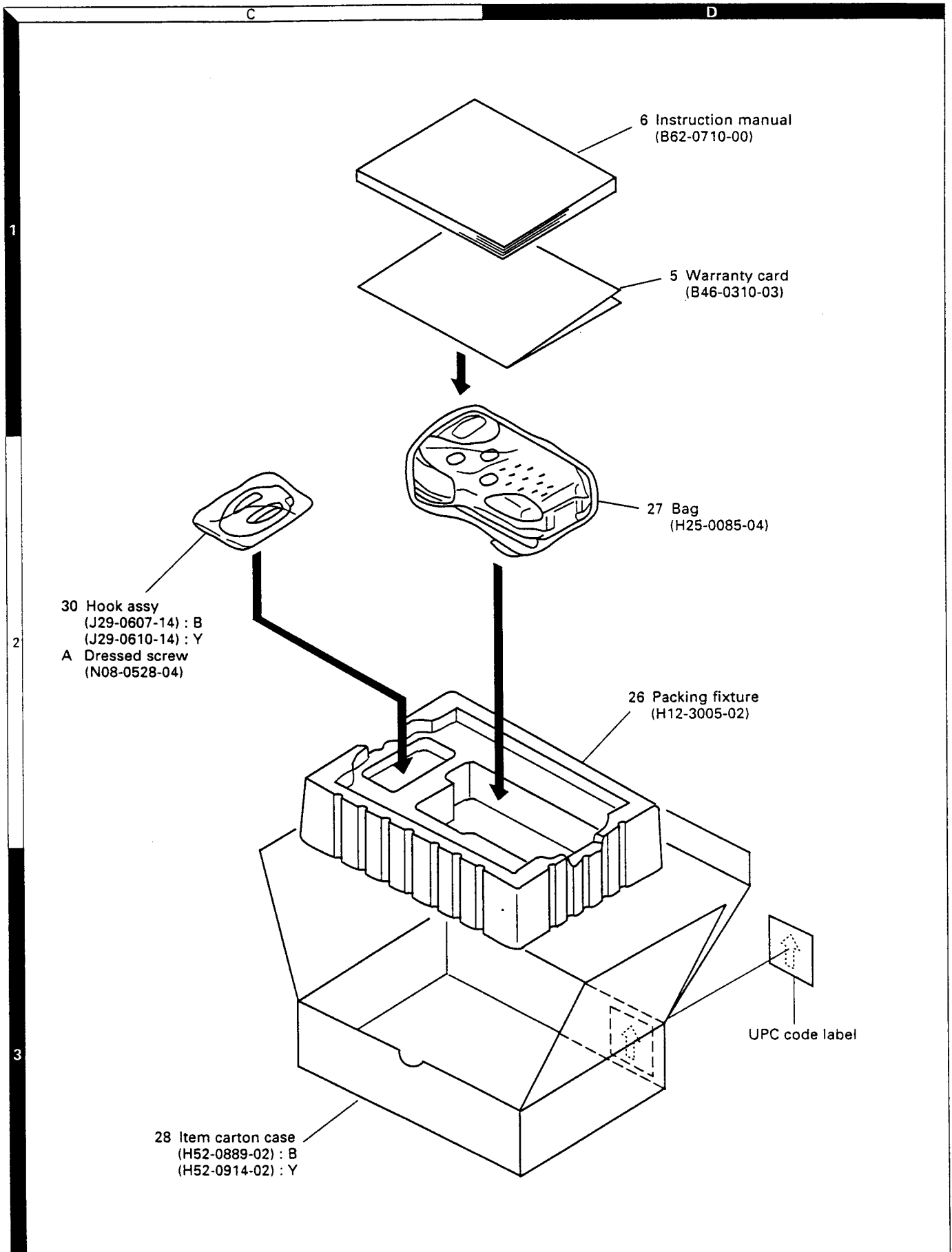
TX-RX UNIT (X57-4872-71)

Ref. No.	Address	New parts	Parts No.	Description	Destination
S202			S70-0434-05	TACT SWITCH (PTT)	
MIC			T91-0555-05	MICROPHONE	
01			MA376 * J	VARI CAP	
02			HVU131	DIODE	
03			MA360	VARI CAP	
04			1SS355	DIODE or MA110	
05			RN731V	DIODE	
06			1SS356	DIODE	
08			1SS312	DIODE	
09			MA742	DIODE	
0205			B30-2143-05	LED	
0206			1SS312	DIODE	
0207			MA742	DIODE	
0209			MA742	DIODE	
IC1			TB31202FN	IC	
IC2			MC3372SV	IC	
IC201		*	M38223M4127GP	IC (CPU)	
IC202			PST9124NR	IC (SYSTEM RESET)	
IC203		*	AT93C4610SI1.8	IC (1kbit EEPROM)	
IC204			S-81330HG-KB	IC	
IC205			NJM2070M	IC (AF AMP)	
IC206			PST9130NR	IC (SYSTEM RESET)	
IC207		*	AK2342A	IC (CTCSS ENCODER/DECODER)	
IC208			TC7W74FU	IC (D-TYPE FLIP FLOP)	
Q1			DTC114YE	DIGITAL TRANSISTOR	
Q2			2SC5066(O)	TRANSISTOR	
Q3			2SC4117(BL)	TRANSISTOR	
Q4-6			2SC5066(O)	TRANSISTOR	
Q7			2SC4226(R24)	TRANSISTOR	
Q8			2SC5066(O)	TRANSISTOR	
Q10			2SC4215(Y)	TRANSISTOR	
Q11-13			2SC5066(O)	TRANSISTOR	
Q14			2SC4215(Y)	TRANSISTOR	
Q201			2SK1824	FET	
Q202			2SB815(6.7)	TRANSISTOR	
Q203			2SK1588	FET	
Q204			DTA123JK	DIGITAL TRANSISTOR	
Q205			FMA5	TRANSISTOR	
Q206			2SK1824	FET	
Q207.208			2SD1757K	TRANSISTOR	
Q209			DTA123JU	DIGITAL TRANSISTOR	

EXPLODED VIEW



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 Ω 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. 20mW
- 2) Input impedance : 50 Ω
- 3) Frequency range : 500MHz or more

6. AF VTVM (AF V.M)

- 1) Input impedance : 1M Ω 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 : -133 to -13dBm

11. Oscilloscope

- 1) Measurement range : DC to 30MHz

12. Dummy Load

- 1) 8 Ω , 1W

13. Spectrun analyzer

14. Tracking generator

Setting

1. Power voltage : DC 4.5V

Current protection : Approx. 300mA

2. Frequency (12.5kHz step)

Channel frequency (MHz)

Channel	Frequency	Channel	Frequency	Channel	Frequency
01	433.075	24	433.650	47	434.225
02	433.100	25	433.675	48	434.250
03	433.125	26	433.700	49	434.275
04	433.150	27	433.725	50	434.300
05	433.175	28	433.750	51	434.325
06	433.200	29	433.775	52	434.350
07	433.225	30	433.800	53	434.375
08	433.250	31	433.825	54	434.400
09	433.275	32	433.850	55	434.425
10	433.300	33	433.875	56	434.450
11	433.325	34	433.900	57	434.475
12	433.350	35	433.925	58	434.500
13	433.375	36	433.950	59	434.525
14	433.400	37	433.975	60	434.550
15	433.425	38	434.000	61	434.575
16	433.450	39	434.025	62	434.600
17	433.475	40	434.050	63	434.625
18	433.500	41	434.075	64	434.650
19	433.525	42	434.100	65	434.675
20	433.550	43	434.125	66	434.700
21	433.575	44	434.150	67	434.725
22	433.600	45	434.175	68	434.750
23	433.625	46	434.200		

Tone frequency (Hz)

No.	Frequency	No.	Freque	No.	Frequency	No.	Frequency
01	67.0	11	97.4	21	136.5	31	192.8
02	71.9	12	100.0	22	141.3	32	203.5
03	74.4	13	103.5	23	146.2	33	210.7
04	77.0	14	107.2	24	151.4	34	218.1
05	79.7	15	110.9	25	156.7	35	225.7
06	82.5	16	114.8	26	162.2	36	233.6
07	85.4	17	118.8	27	167.9	37	241.8
08	88.5	18	123.0	28	173.8	38	250.3
09	91.5	19	127.3	29	179.9		
10	94.8	20	131.8	30	186.2		

3. SSG standard modulation

(MOD : 1kHz, DEV : ± 3.0 kHz)

ADJUSTMENT

PLL Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. VCO lock voltage	1) 1CH : 433.075MHz	Power meter DVM	RF	LV			Check	0.3~2.7V
2. Reference oscillator frequency	1) 1CH : 433.075MHz PTT : ON	Power meter f. counter	RF	ANT (CN2)	RF	TC1	433.075300MHz	±100Hz

Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. TX power	1) 35CH : 433.925MHz PTT : ON	Power meter Ammeter	RF	ANT (CN2)	CONT	VR204 (Power)	9.6mW Current check	±0.1mW 70mA or less
2. Modulation	1) 35CH : 433.925MHz AG : 1kHz/50mV PTT : ON	Power meter Linear detector	RF	MIC		VR206 (MOD)	4.2kHz According to the larger +, -.	±0.05kHz
	2) AG : 1kHz/5mV PTT : ON	AG AF V.M					Check	2.5~4.0kHz
3. CTCSS	1) TONE No. : 24 (151.4Hz) PTT : ON				CONT	VR203 (TONE)	±0.5kHz LCD check	±0.05kHz 35-24 group on
	2) TONE No. : 01 (67.0Hz) PTT : ON						Check LCD check	±0.35~0.7kHz 35-01 group on

Receiver Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Sensitivity	1) 34CH : 433.900MHz SSG frequency : 433.900MHz SSG output : -121dBm SSG MOD : 1kHz SSG DEV : 3.0kHz MONI SW ON : While pressing MODE and DOWN keys, POWER ON VOL : 0.63V/8Ω	SSG Distortion meter Oscilloscope AF V.M	RF Top panel	ANT (CN2) SP			Check	SINAD 12dB or more
2. Squelch	1) 34CH : 433.900MHz SSG output : -132dBm	SSG Oscilloscope AF V.M	RF	ANT (CN2)			Check	Squelch close
	2) SSG output : -126dBm							Squelch open
3. BATT	1) BATT terminal : DC3.45V±0.005V						LCD check	BATT mark blinking
	2) BATT terminal : DC3.55V±0.005V							BATT mark off

ADJUSTMENT

Writing the Battery Detection and Busy Detection (Squelch) Levels

The operation setting levels of these items are stored in IC203 (EEPROM) on the Control unit (X57-4872-71) (A/2) (factory set). If IC203 fails and is replaced, the levels must be adjusted as follows;

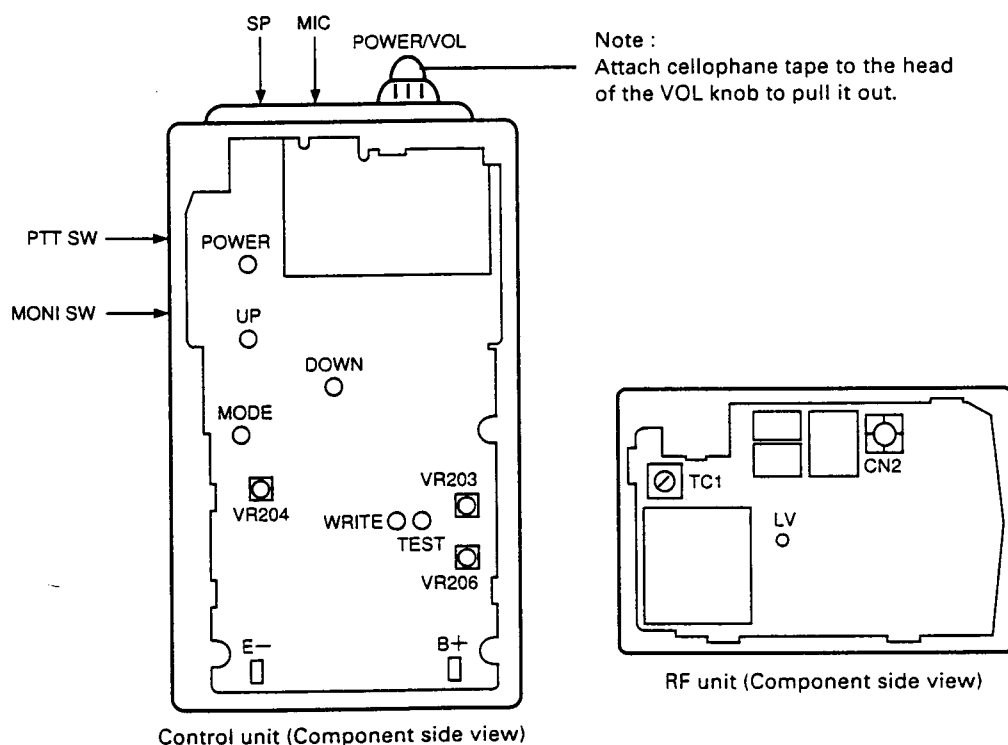
■ Writing battery detection

1. Set the power supply voltage to 3.5V.
2. While grounding the WRITE pattern, press the UP button.
3. When the data is written correctly, the "pururu" sound is output. (If it fails, the "pupupu" sound is output.)

■ Writing busy (squelch) detection

1. SSG frequency : 433.900MHz
Output : -127dBm
2. While grounding the WRITE pattern, press the PTT button.
3. When the data is written correctly, the "pururu" sound is output. (If it fails, the "pupupu" sound is output.)

Adjustment Points

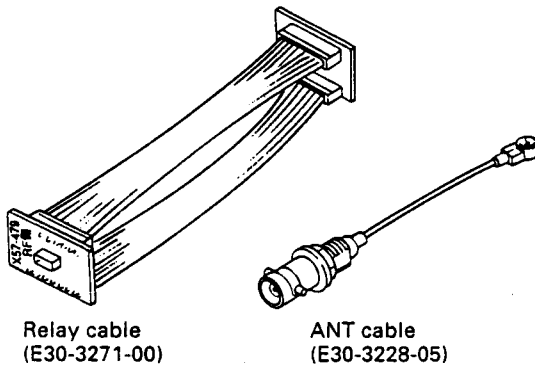


TC1 : Transmission frequency
 VR203 : TONE (CTCSS)
 VR204 : Power (Transmission power)
 VR206 : Deviation (Modulation)
 B, E : External power supply pin (Fasten it with an alligator clip.)
 WRITER : Writing

ADJUSTMENT / TERMINAL FUNCTION

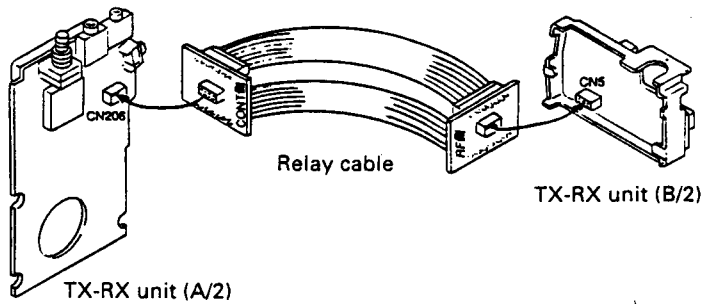
Jigs

Use jigs for repair or adjustment.

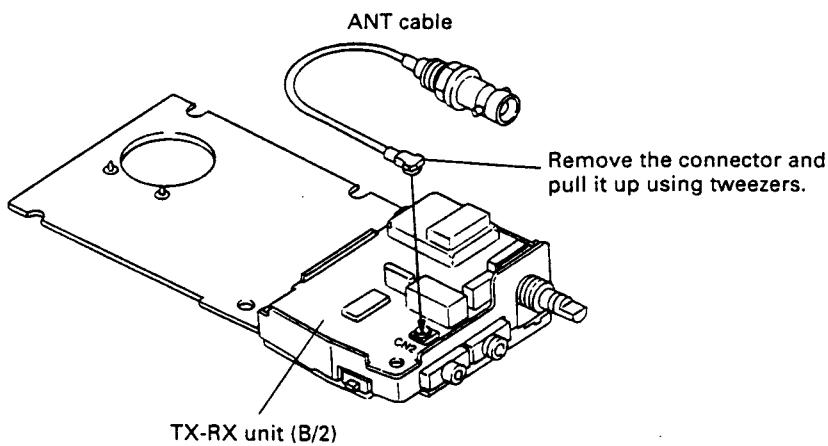


Connecting Jigs

1. If the relay cable is inserted incorrectly, the unit does not work. Be sure to connect the cable correctly as shown in the illustration below.



2. TX/RX



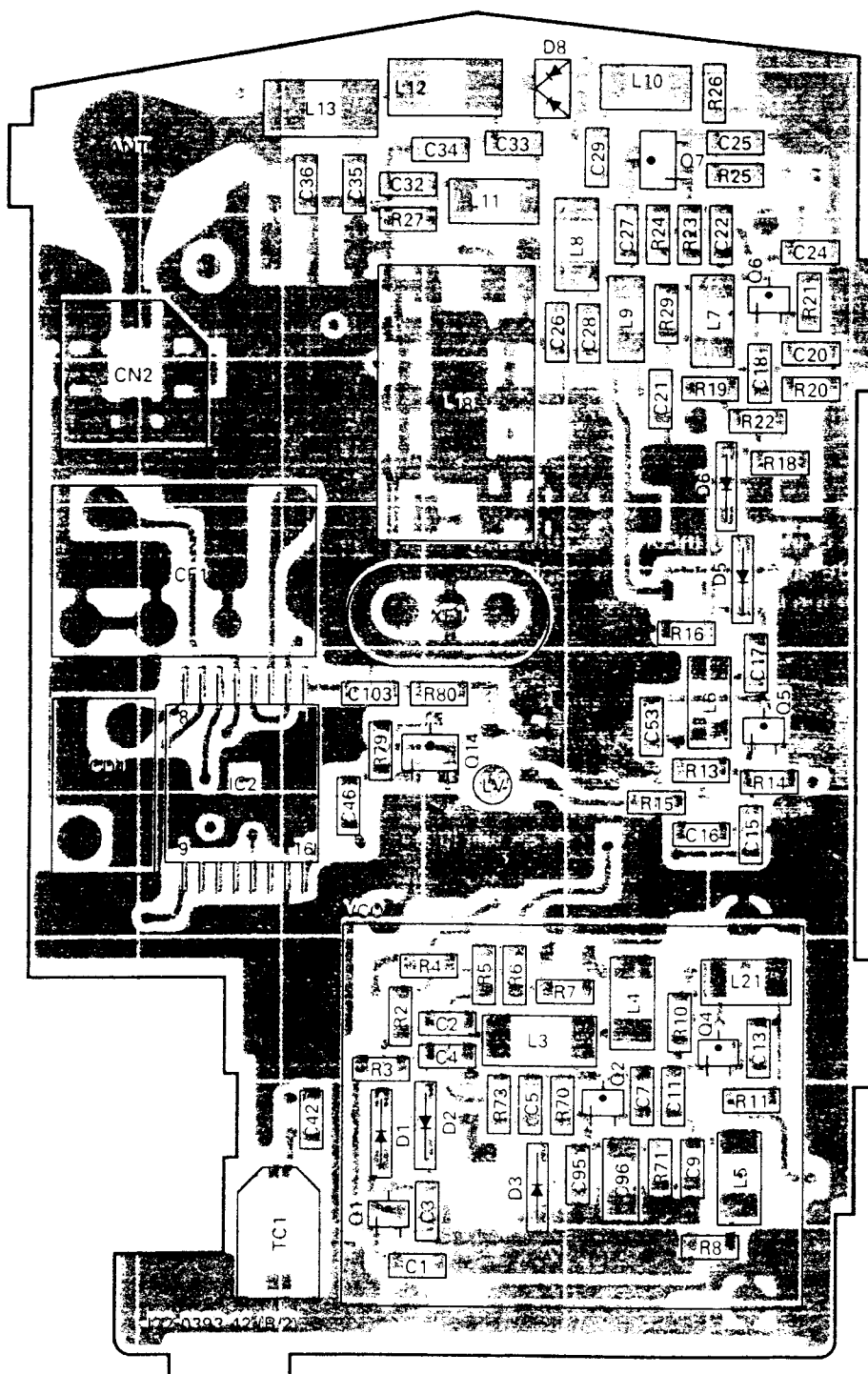
TERMINAL FUNCTION

■ CN206 and CN5

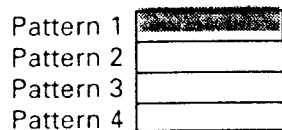
Pin No.	Pin name	Function
1	E	GND
2	PA	TX power adjustment
3	E	GND
4	3R	RX power supply
5	3T	TX power supply
6	UL	PLL unlock line
7	PSTB	PLL strobe line
8	3C	Common power supply
9	CP	Serial clock line
10	MOD	Modulation line
11	DP	Serial data line
12	CARS	Carrier sense line
13	E	GND
14	AFO	Audio line
15	E	GND
16	E	GND

UBZ-LF68 PC BOARD VIEW

TX-RX UNIT (X57-4872-71) (B/2) Component side view



Component side



Foil side

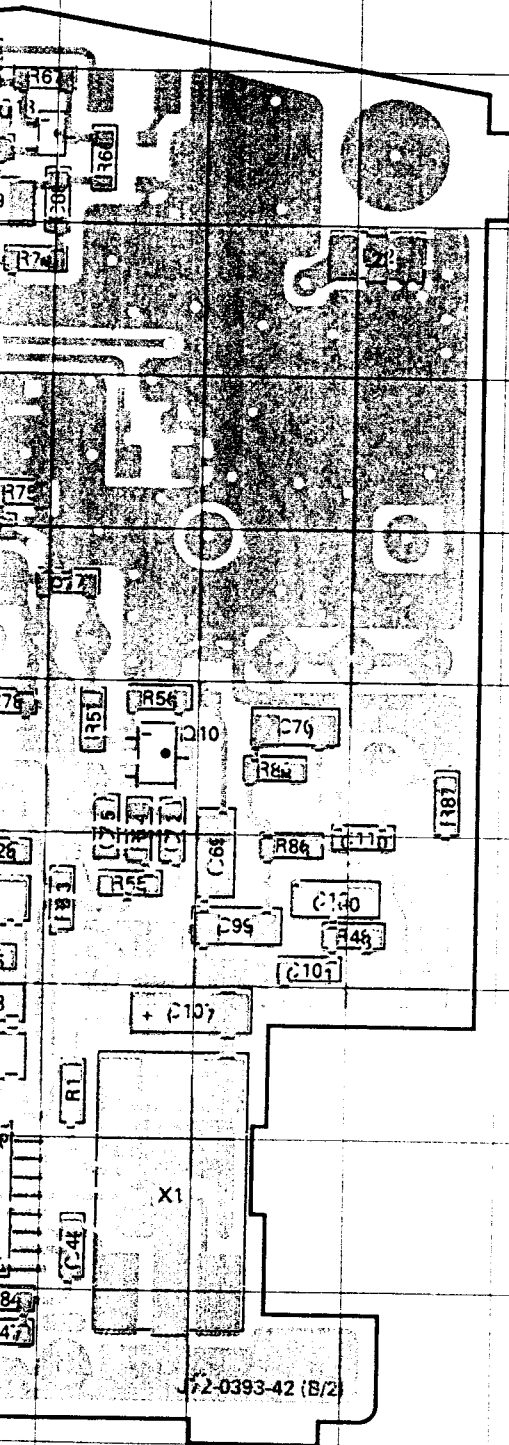
Ref. No.	Address	Ref. No.	Address
IC2	7D	Q14	7F
Q1	10E	D1	10E
Q2	10G	D2	10F
Q4	9H	D3	10F
Q5	7H	D5	6H
Q6	4H	D6	5H
Q7	3G	D8	3F

LB

Ref. No.	Address	Ref. No.	Address
IC1	10D	Q12	6C
Q3	10B	Q13	3D
Q8	9C	D4	11B
Q10	7E	D9	3C
Q11	7C		

(B/2) Foil side view

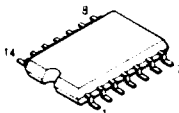
TX-RX UNIT (X57-4872-71) (I



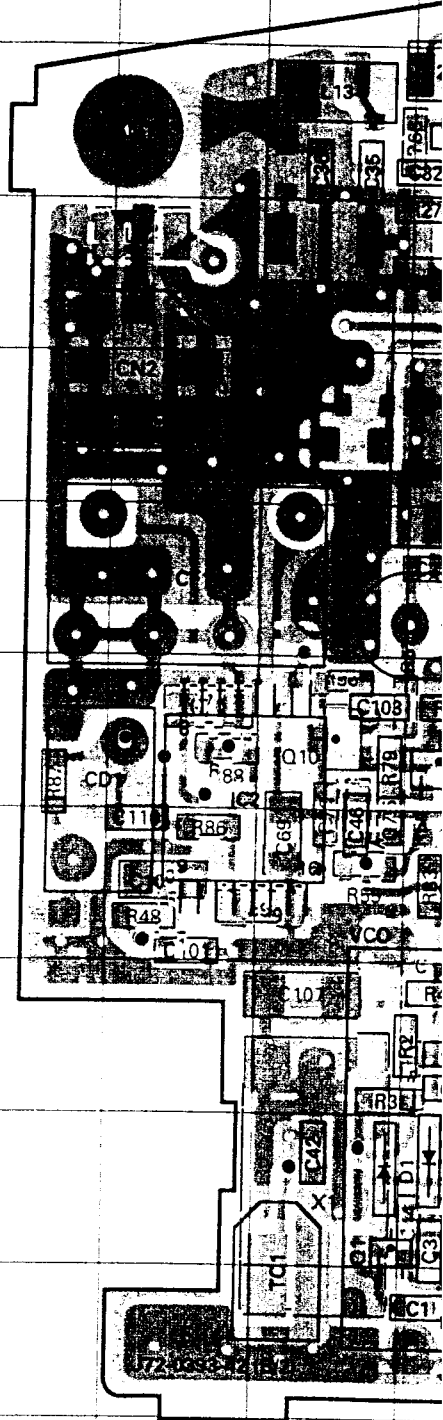
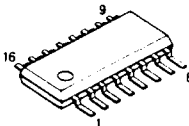
DTC114YE
2SC4117
2SC4215
2SC4226
2SC5066



TB31202FN



MC3372SV



Ref. No.	Address	Ref. No.	Address
IC1	10D	Q12	6C
Q3	10B	Q13	3D
Q8	9C	D4	11B
Q10	7E	D9	3C
Q11	7C		

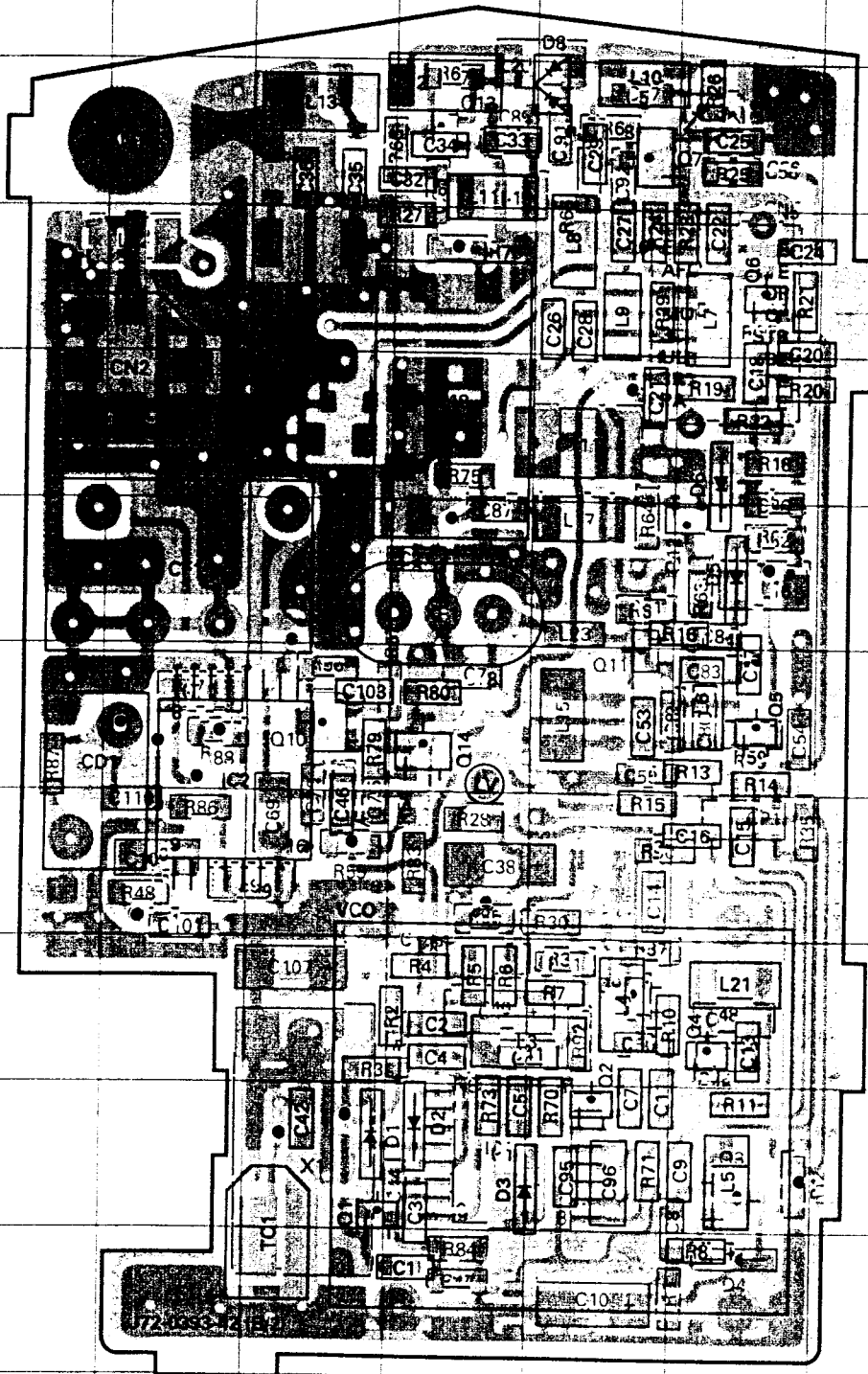
Component side	Foil side
Pattern 1	
Pattern 2	
Pattern 3	
Pattern 4	

● Connect 1 and 4

Ref. No.	Address	Ref. No.	Address
IC1	10O	Q12	6C
IC2	7M	Q13	3D
Q1	10N	D4	11B
Q2	10P	D9	3C
Q4	9Q		
Q5	7Q		

PC BOARD VIEWS UBZ-LF68

TX-RX UNIT (X57-4872-71) (B/2) Component side view + Foil side



Component side

Pattern 1

Pattern 2

Pattern 3

Pattern 4

Foil side

● Connect 1 and 4

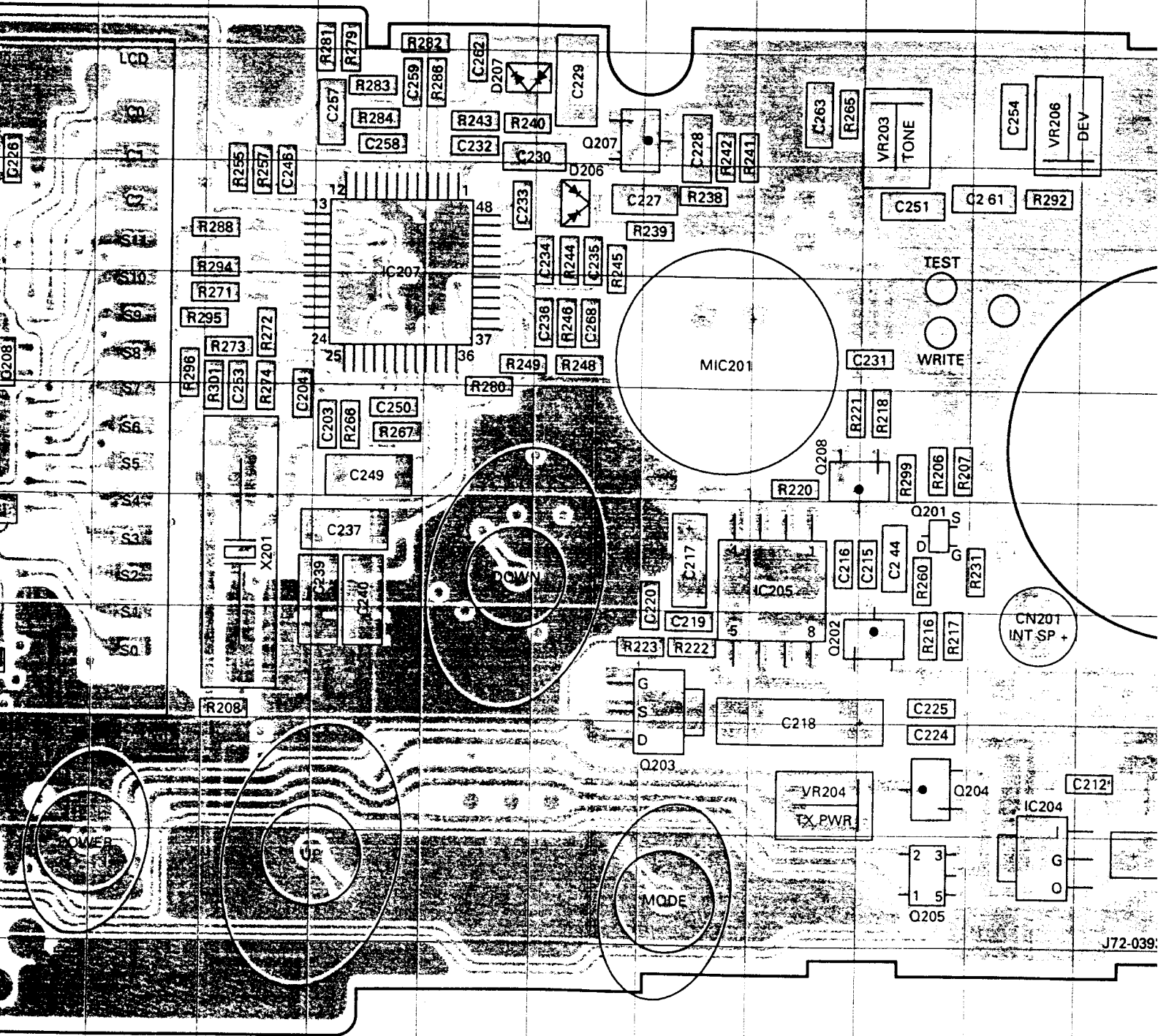
Ref. No.	Address	Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC1	100	Q6	4Q	Q13	30	D5	6Q
IC2	7M	Q7	3P	Q14	70	D6	5Q
Q1	10N	Q8	9P	D1	10N	D8	3P
Q2	10P	Q10	7N	D2	100	D9	3Q
Q4	9Q	Q11	7P	D3	100		
Q5	7Q	Q12	6Q	D4	11Q		

TX-RX UNIT (X57-4872-71) (A/2) Component side view



D VIEW

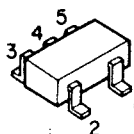
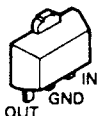
A/2) Component side view



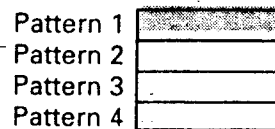
2SK1588

S-81330HG-KB

FMA5

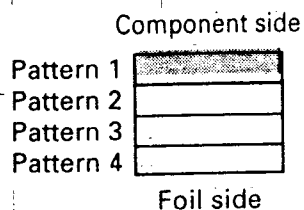


Component side



Foil side

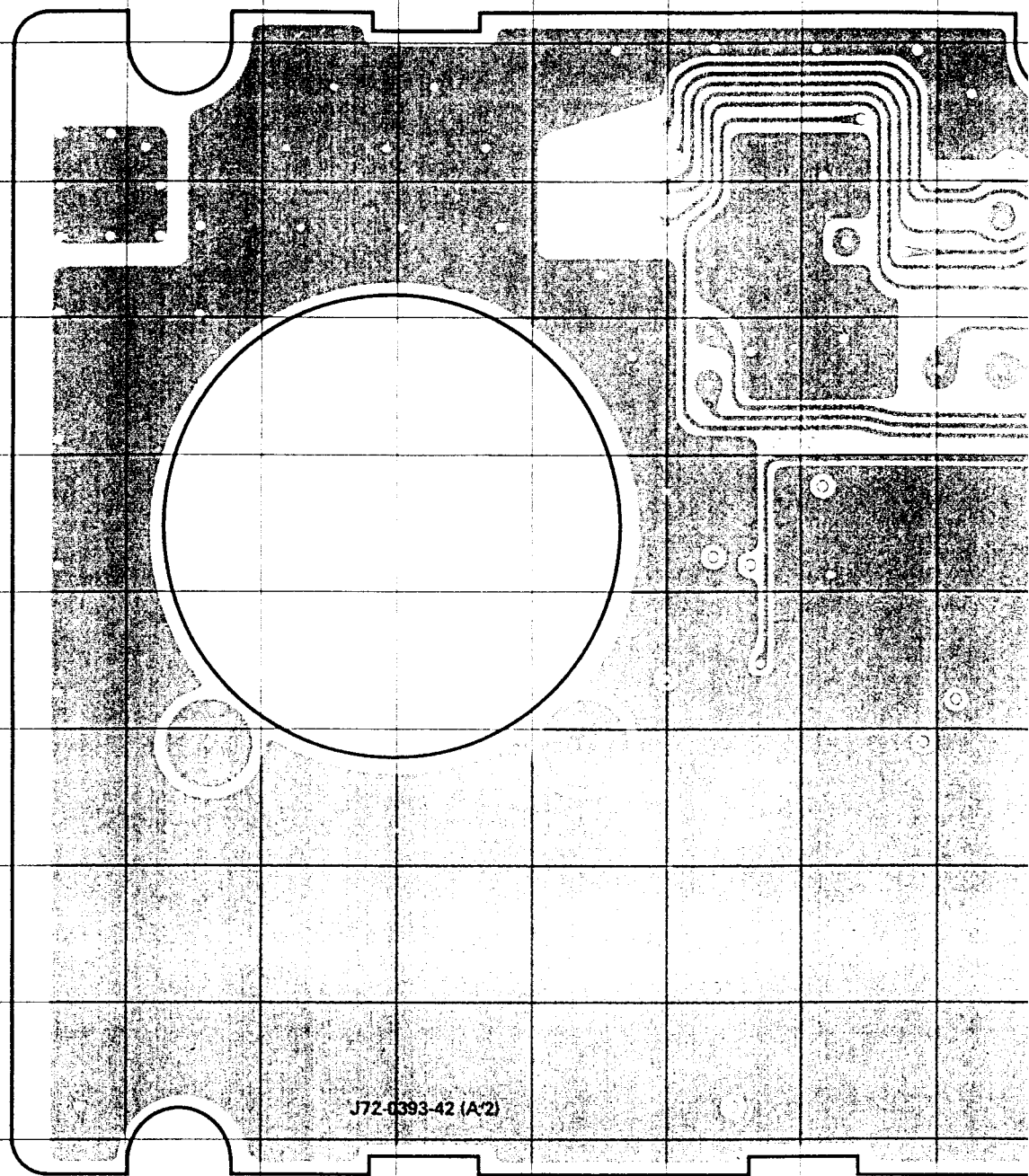
Ref. No.	Address
IC202	4D
IC204	10N
IC205	7L
IC206	4D
IC207	5H
IC208	6D
Q201	7M

26

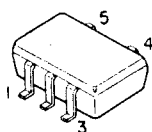
3A

3B

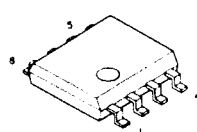
TX-RX UNIT (X57-4872-71) (A/2) Foil side view



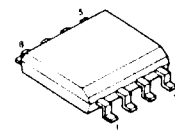
PST9124NR
PST9130NR



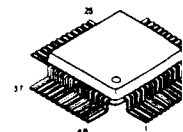
NJM2070M
TC7W74FU



AT93C4610SI1.8

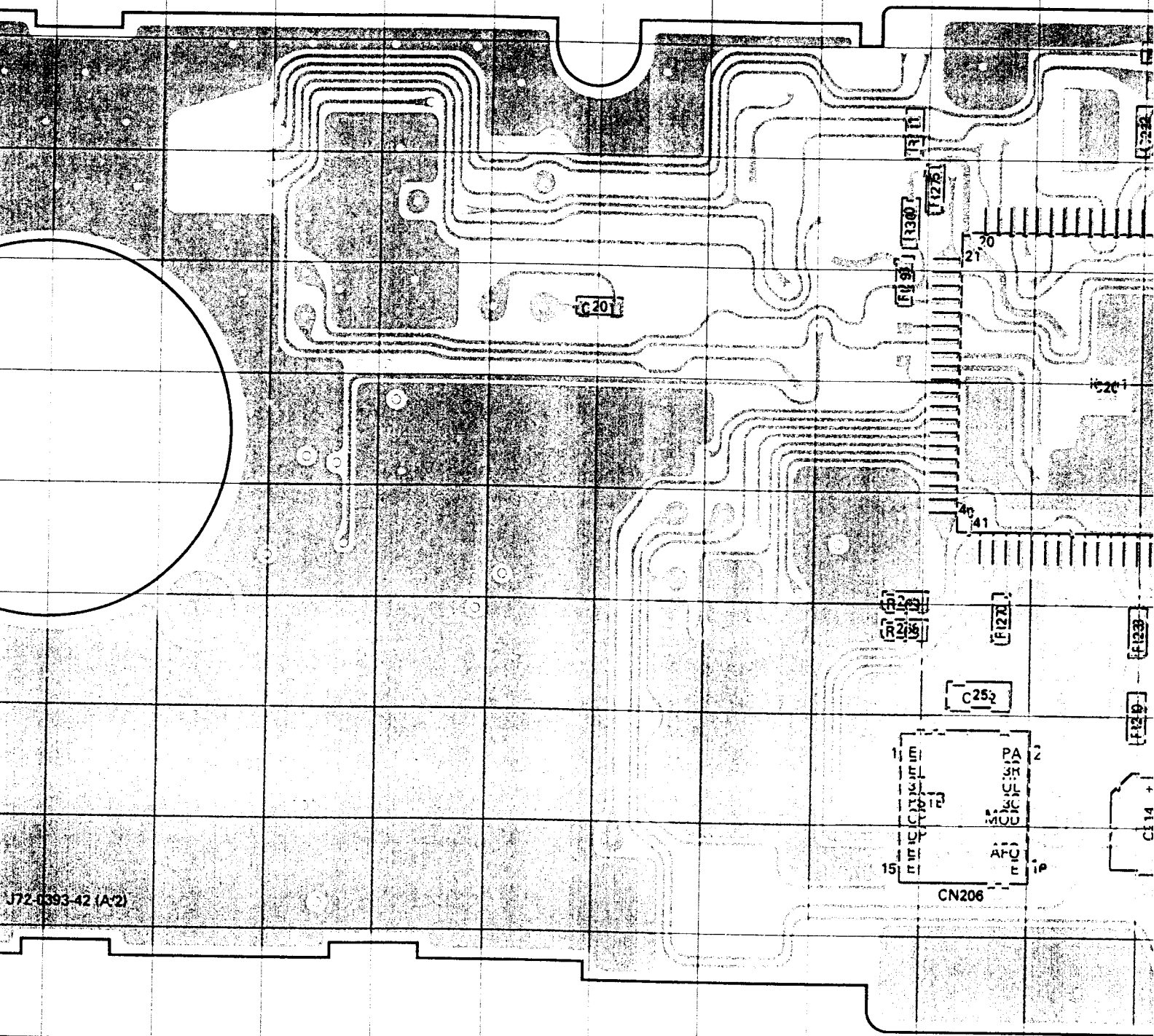


AK2342A



D E F G H I J K L M N

-71) (A/2) Foil side view

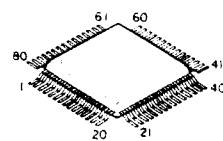
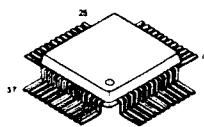
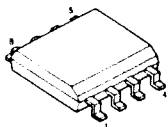
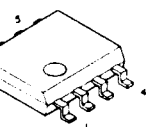


M2070M
W74FU

AT93C4610SI1.8

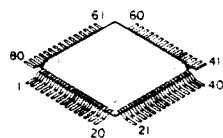
AK2342A

M38223M4127GP



Pattern
Pattern
Pattern
Pattern

M38223M4127GP



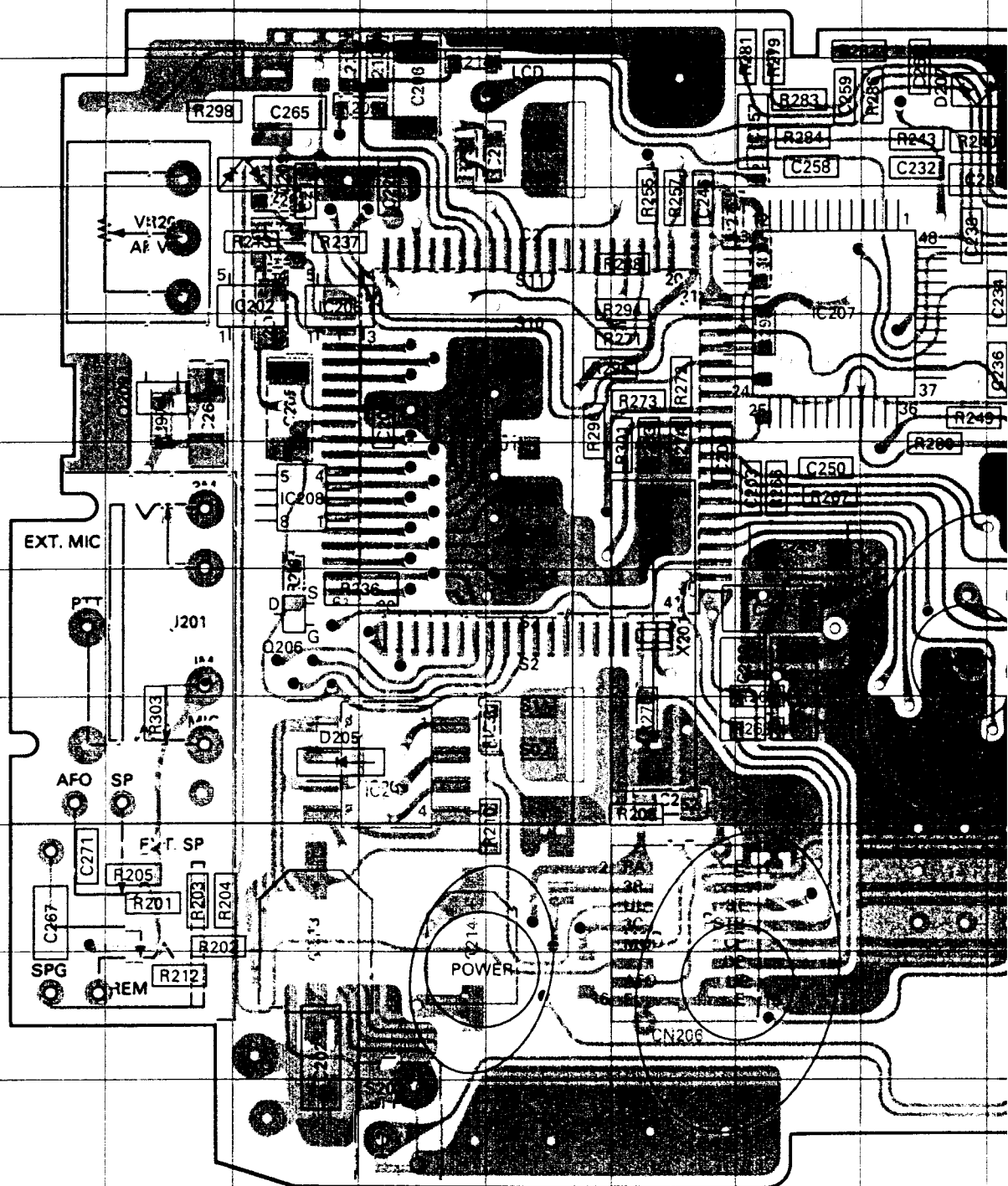
Component side

Pattern 1	
Pattern 2	
Pattern 3	
Pattern 4	

Foil side

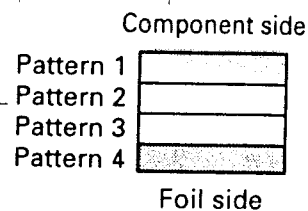
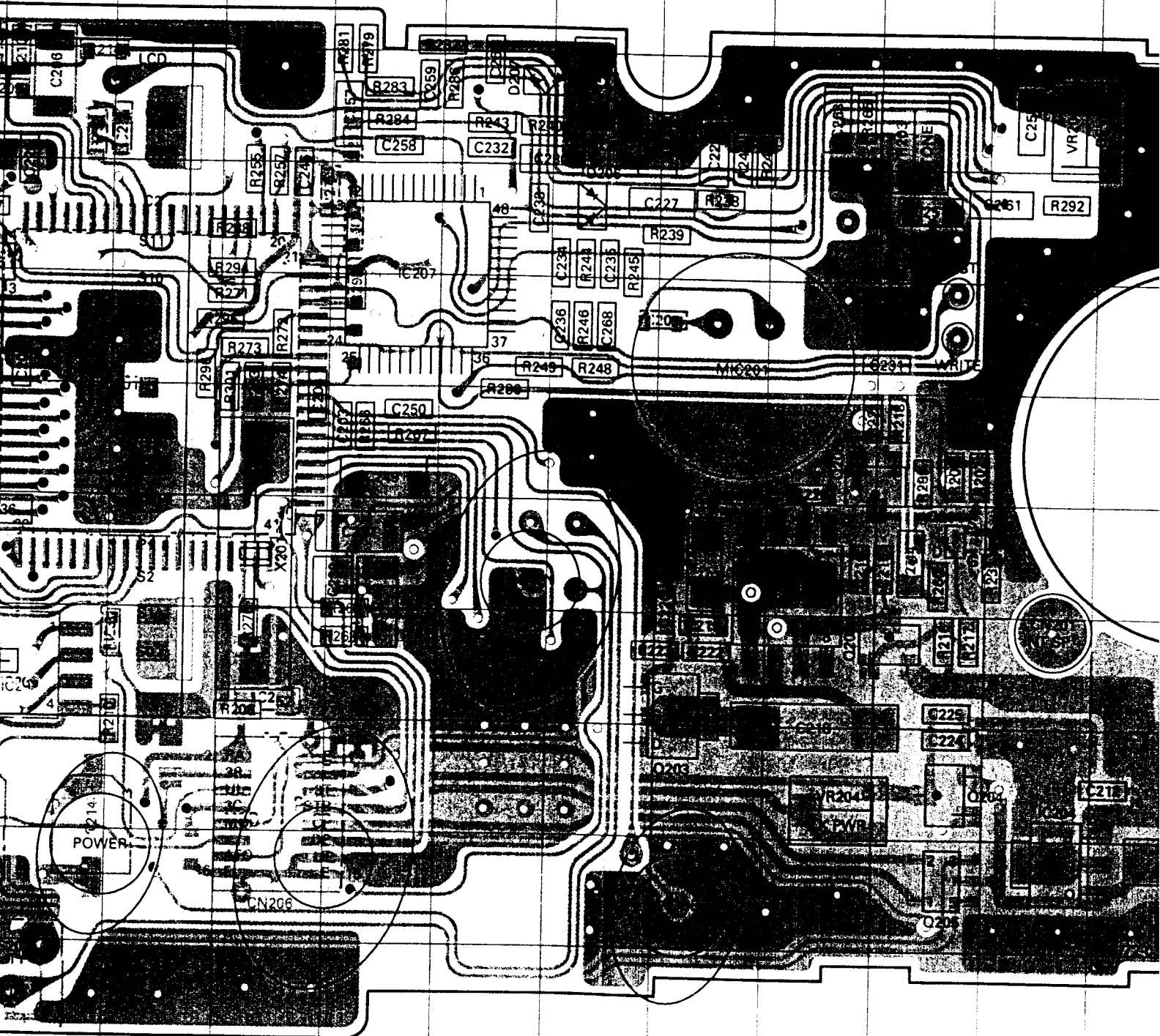
Ref. No.	Address
IC201	6N
IC203	80

TX-RX UNIT (X57-4872-71) (A/2) Component side view + Foil side



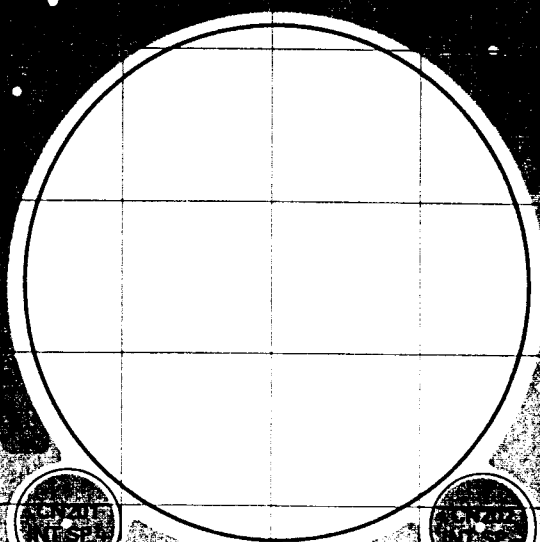
RD VIEW

(A/2) Component side view + Foil side



● Connect 1 and 4

Ref. No.	Add
IC201	6
IC202	4
IC203	8
IC204	10
IC205	7
IC206	4
IC207	5



Foil side

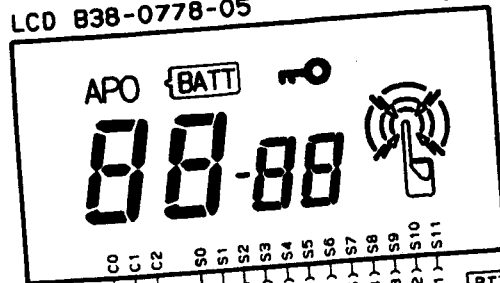
30

Ref. No.	Address	Ref. No.	Address	Ref. No.	Address
IC201	6F	IC208	6D	Q207	3J
IC202	4D	Q201	7M	Q208	6L
IC203	8E	Q202	8M	Q209	5C
IC204	10N	Q203	8K	D205	8D
IC205	7L	Q204	9M	D206	4J
IC206	4D	Q205	10M	D207	3I
IC207	5H	Q206	7D	D209	3D

BB

CONTROL UNIT(X57-4872-71)(A/2)

LCD B38-0778-05



POWER MODE UP DOWN

ID ROM IC203 AT93C4610S11.8

CPU IC201 M38223M4127GP

A/D PORT

PORT

LAMP ON: 2.13V
LAMP OFF: 4.5V

D205 B30-2143-05

Q206 2SK1824

LAMP ON: 3.0V
LAMP OFF: 0V

IC202 PST9124MR

IC204 S-81330H0-KB

REG

IC206 PST9130MR

Q209 DTA123JU 0.06V

RX: 0.12V
TX: 2.98V

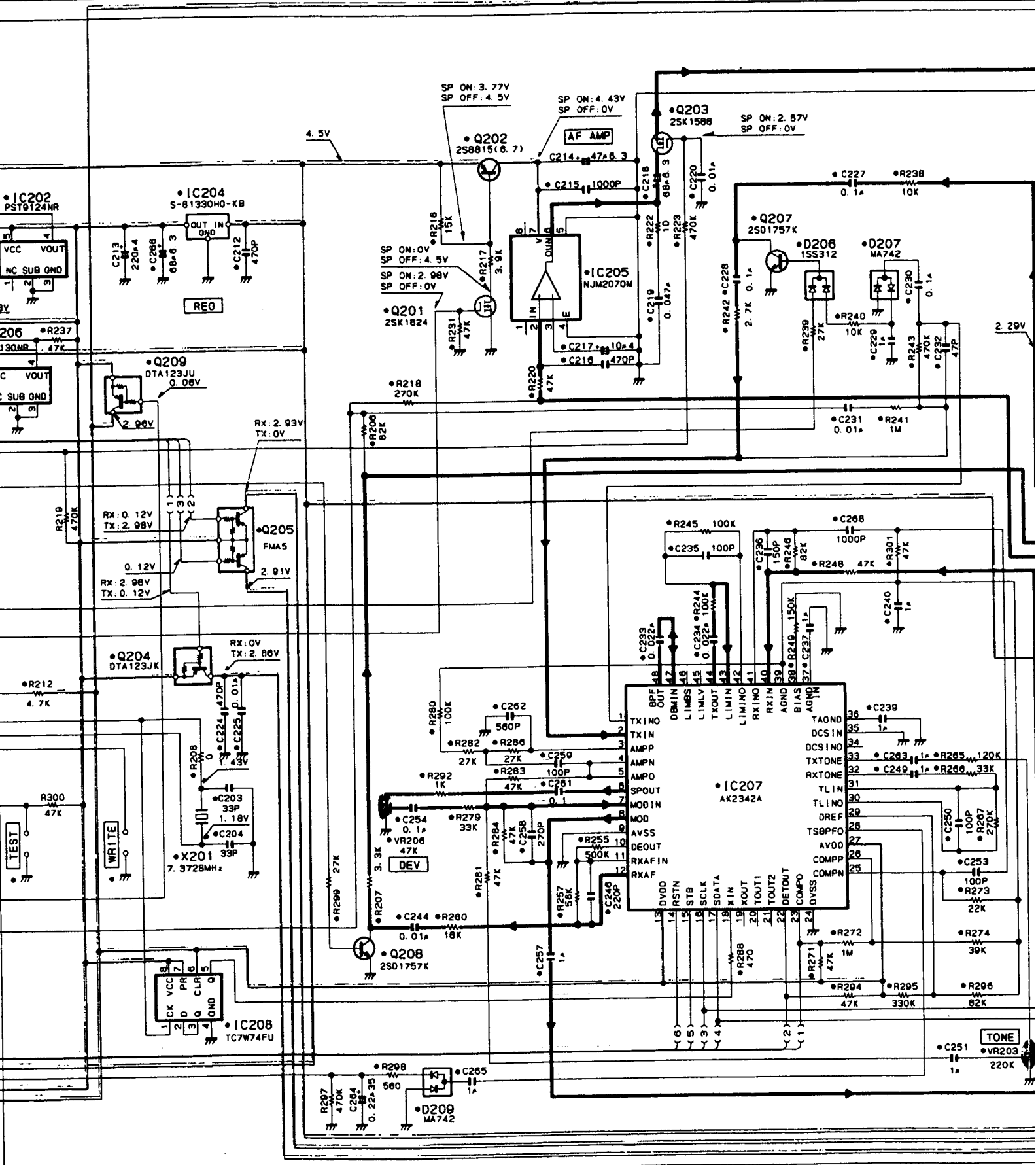
0.12V
RX: 2.98V
TX: 0.12V

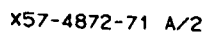
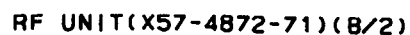
Q204 DTA123JK

X201 7.3728MHZ

BB 8C

SD





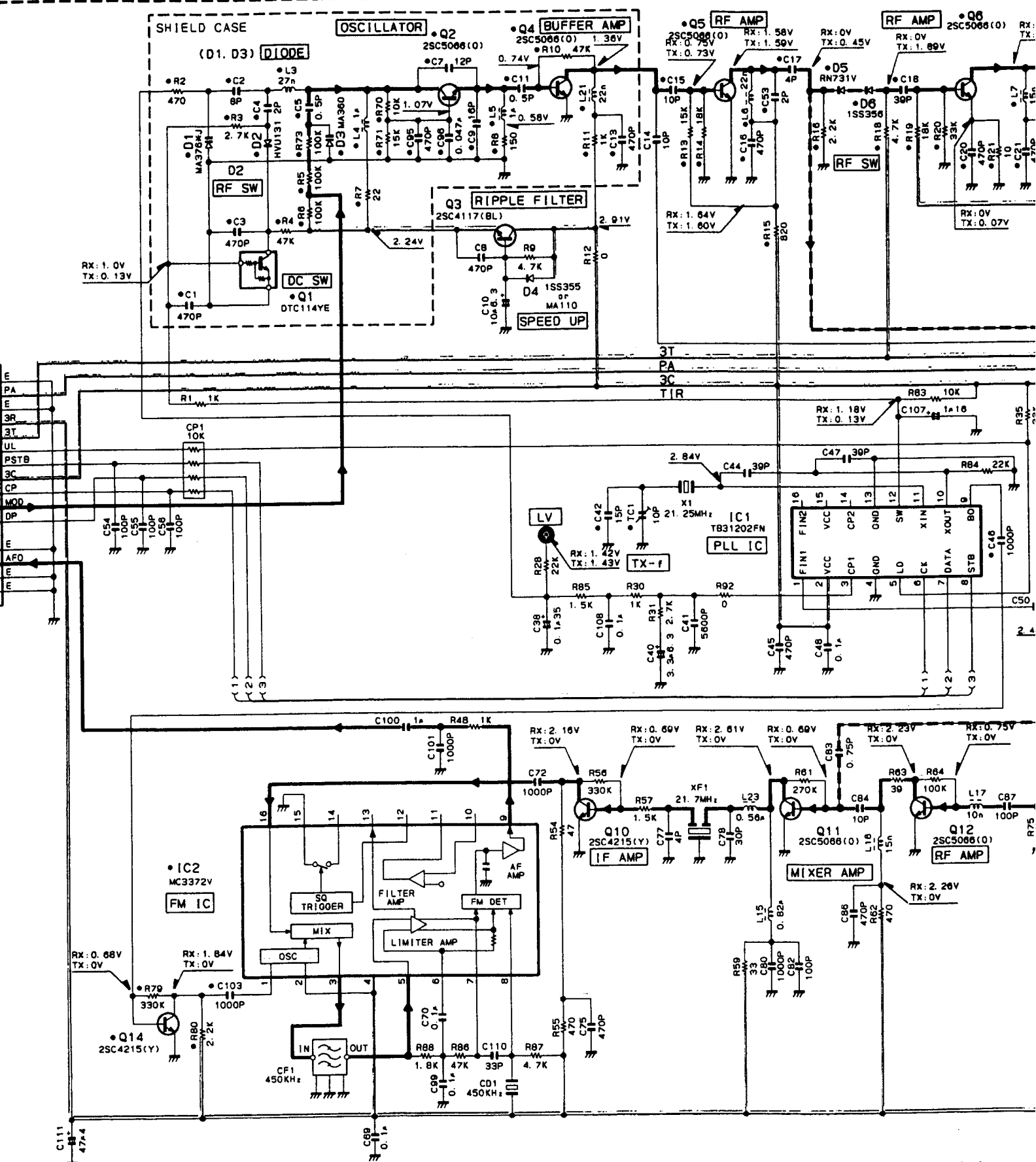
IC204 : S-81330HG-KB
IC205 : NJM2070M
IC206 : PST9130NR
IC207 : AK2342A
IC208 : TC7W74FU

Q201. 206	: 2SK
Q202	: 2SB
Q203	: 2SK
Q204	: DTA
Q205	: FMA

SF 56

5H

UNIT(X57-4872-71)(B/2)



IC204 : S-81330HQ-KB
 IC205 : NJM2070M
 IC206 : PST9130NR
 IC207 : AK2342A
 IC208 : TC7W74FU

Q201. 206 : 2SK1824
 Q202 : 2S8815(6.7)
 Q203 : 2SK1588
 Q204 : DTA123JK
 Q205 : FMA5

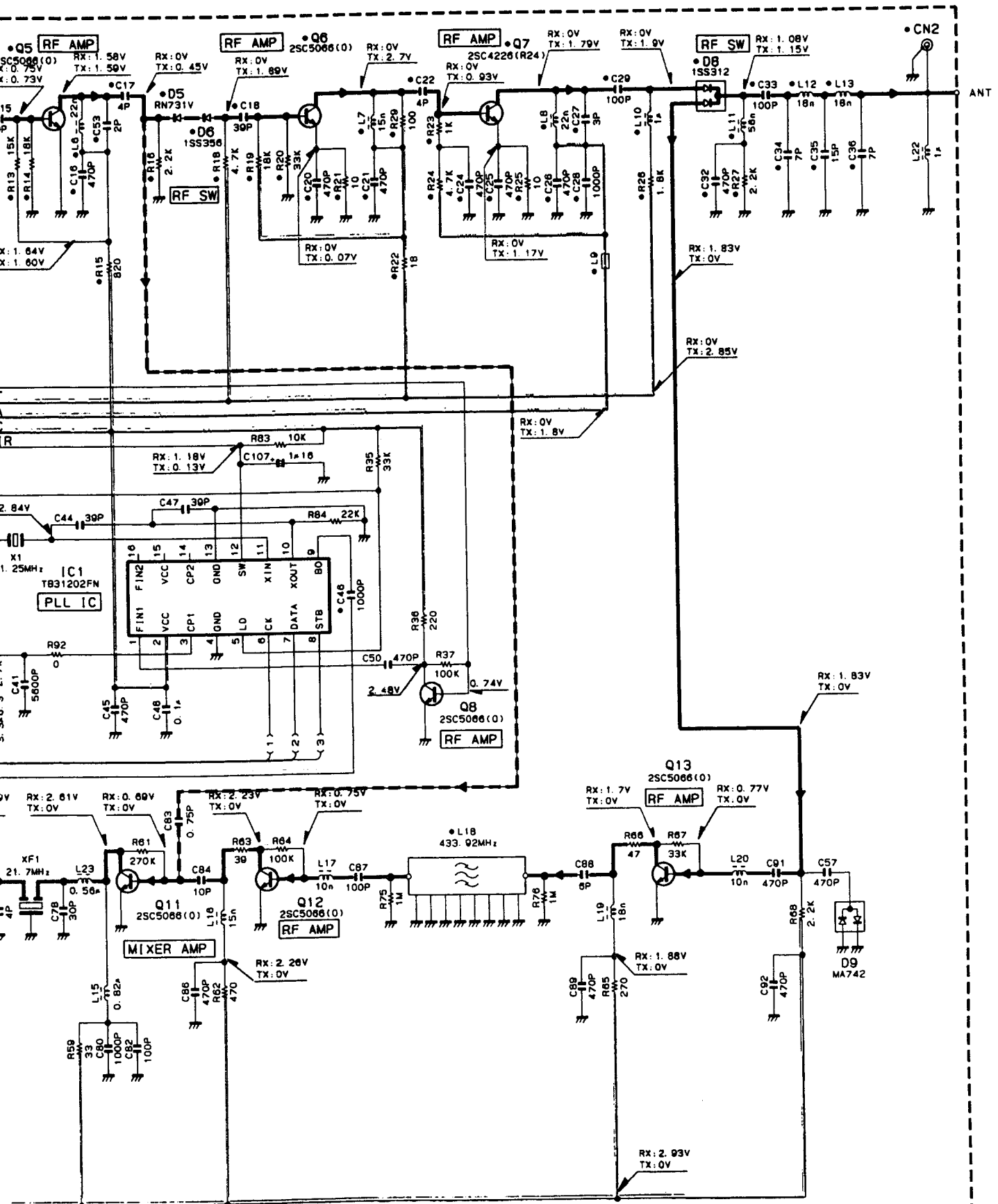
Q207. 208 : 2SD1757K
 Q209 : DTA123JU
 D205 : B30-2143-05
 D206 : 1SS312
 D207. 209 : MA742

X57-4872-71 B/2

IC1 : TB31202FN
 IC2 : MC3372V

Q1 : DTC114
 Q2. 4~6. 8. 11~13 : 2SC5066(0)
 Q3 : 2SC4117(BL)
 Q7 : 2SC4215(Y)
 Q10. 14 : 2SC4215(Y)

SCHEMATIC DIAGRAM UBZ-LF68



57-4872-71 B/2

IC1 : TB31202FN
IC2 : MC3372V

Q1 : Q2, 4~6, 8, 11~13
Q3 :
Q7 :
Q10, 14 :

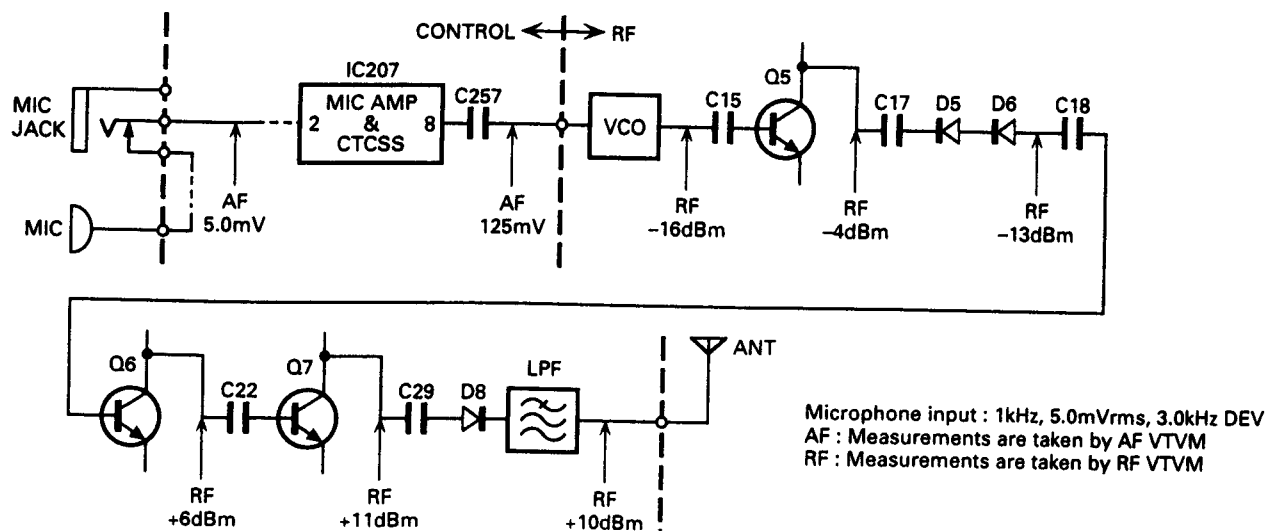
DTC114YE
2SC5066(0)
2SC4117(BL)
2SC4226(R24)
2SC4215(Y)

D1 : MA376WJ
D2 : HVU131
D3 : MA360
D4 : 1SS355 or MA110
D5 : RN731V

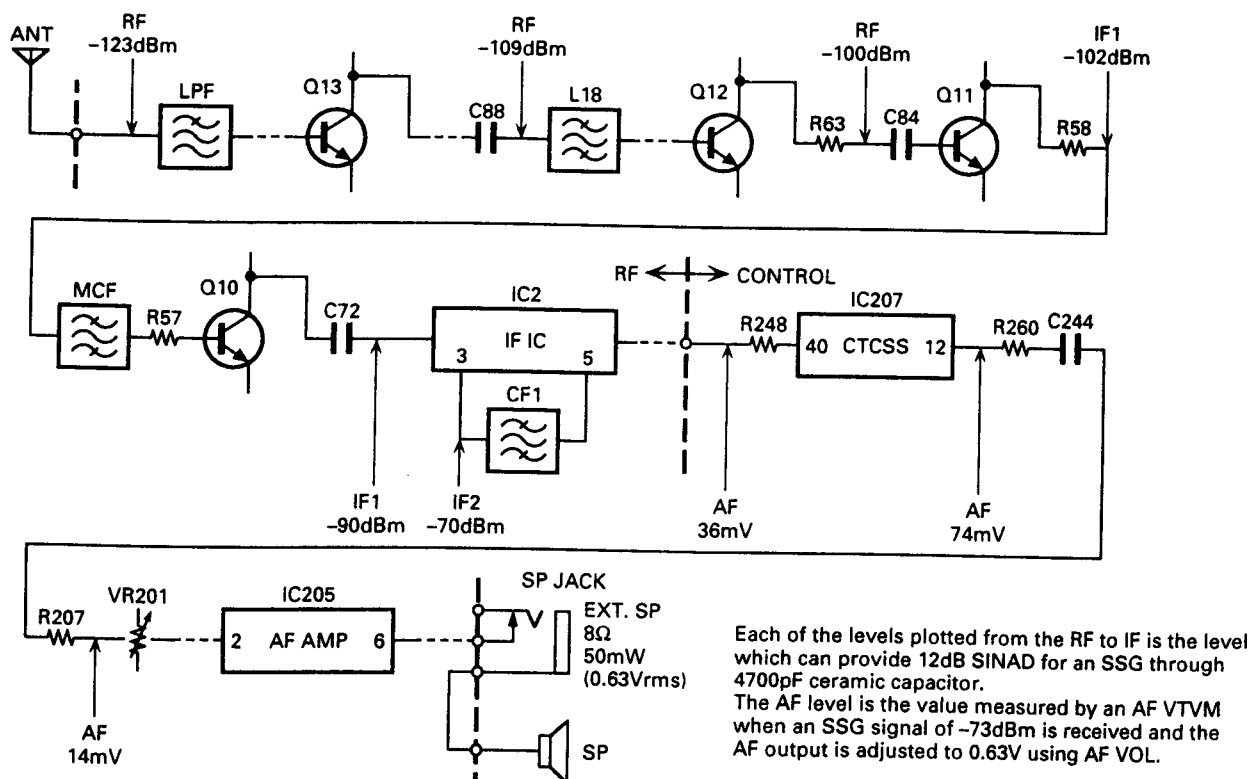
D6 : 1SS356
D8 : 1SS312
D9 : MA742

LEVEL DIAGRAM

Transmitter Section



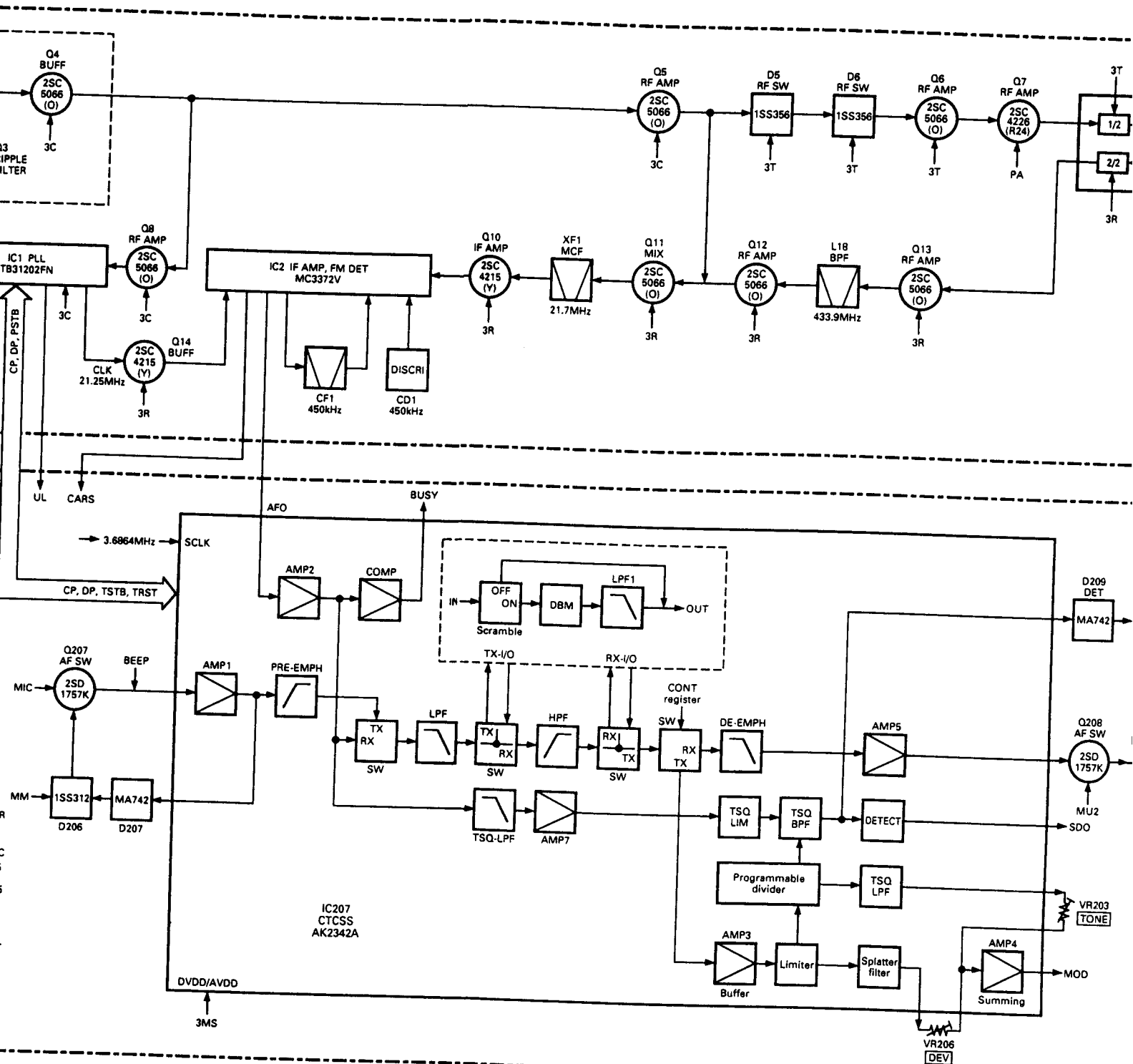
Receiver Section



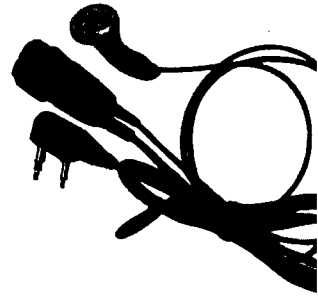


67

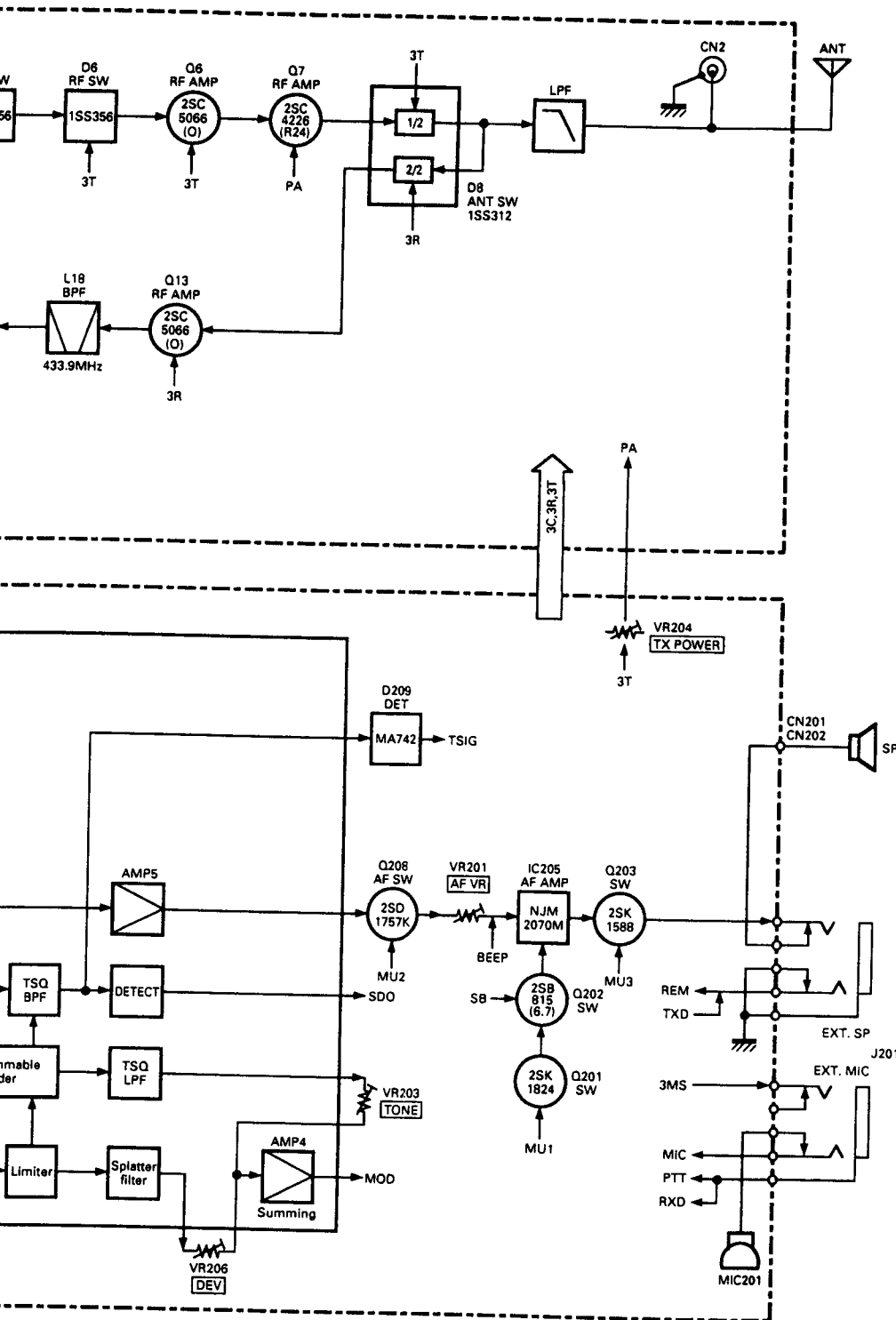
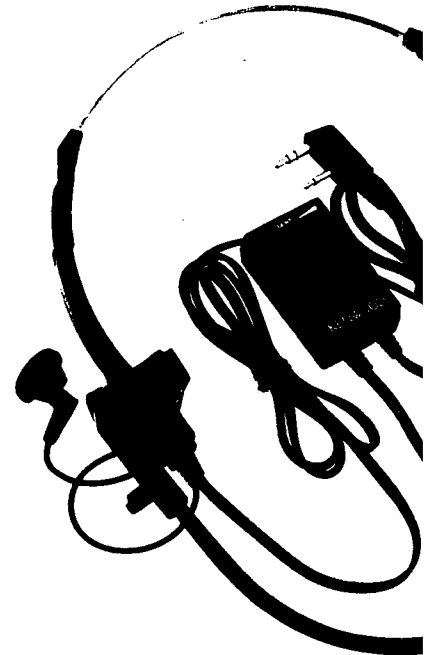
BLOCK DIAGRAM



EMC-3 External View



HMC-3 External View



HMC-3 Specifications

Electrical characteristic

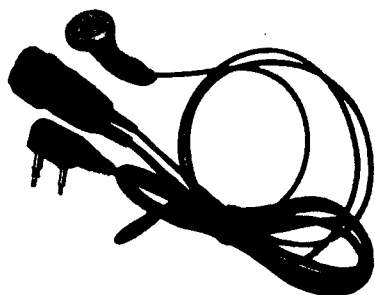
- Earphone
 - Diameter
 - Impedance
 - Maximum input power
- Microphone
 - Output sensitivity -67.5dB (0c
 - Output impedance

UBZ-LF68 6H

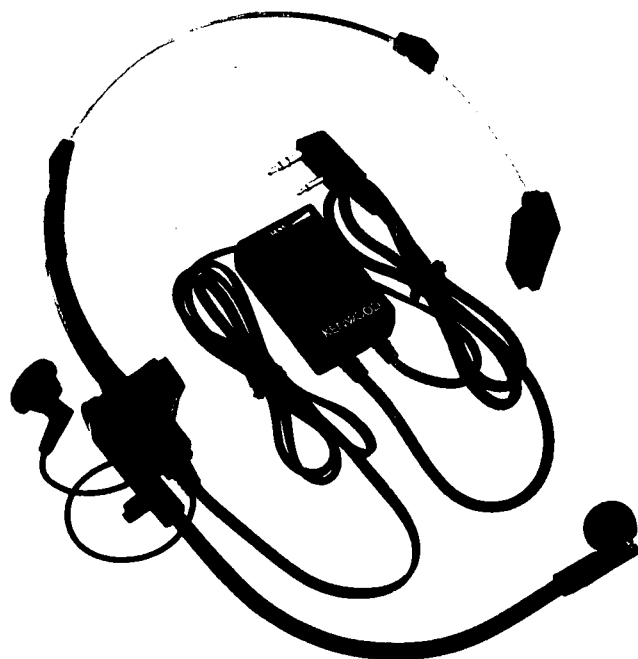
61

EMC-3 (CLIP MIC W/EARPHONE) / HMC-3 (HEAD SET)

EMC-3 External View



HMC-3 External View

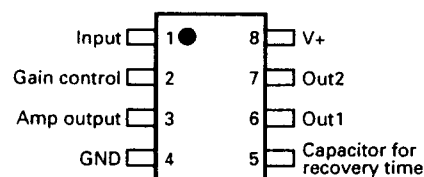


HMC-3 Parts List

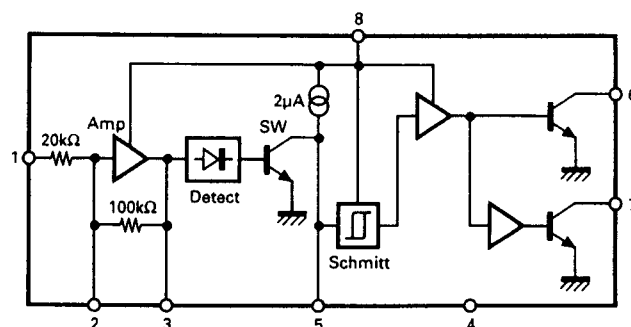
Ref. No.	New parts	Parts No.	Description
		A02-0840-08	Case (Front)
		A02-0841-08	Case (Rear)
		E30-2088-08	Cable with plug
		E30-3002-08	Relay cord
		F09-0418-08	Microphone pad
		F09-0419-08	Ear pad
		J29-0427-18	Clip
VR1		R05-4422-08	Potentiometer 50kΩ
S1		S31-1416-08	Slide switch PTT/VOX
S2		S70-0440-08	Tact switch PTT
		T18-0056-08	Earphone assy
		T91-0373-28	Microphone assy
		W02-1907-08	VOX/PTT unit
Q1		FMG2	Digital transistor
Q2		FMW2	Digital transistor
Q3		2SC2712(GR)	Chip transistor
IC1		NJM2072M	IC
D1		1SS133	Diode
D2		RD4.3MB3	Zener diode

HMC-3 Semiconductor Data

■ IC1 : NJM2072M Terminal connection diagram



■ IC1 : NJM2072M Equivalent circuit



HMC-3 Specifications

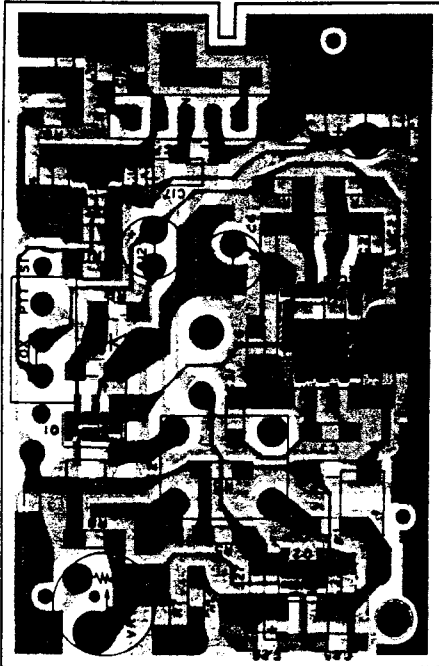
Electrical characteristic

- Earphone
 - Diameter ø19mm
 - Impedance 19Ω (1000Hz)
 - Maximum input power 50mW
- Microphone
 - Output sensitivity -67.5dB (0dB=1V/μbar 1000Hz)
 - Output impedance 1.6kΩ (1000Hz)

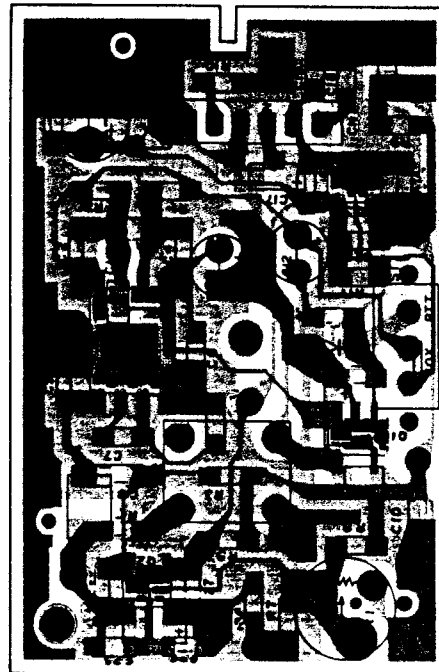
HMC-3 (HEAD SET)

HMC-3 PC Board Views

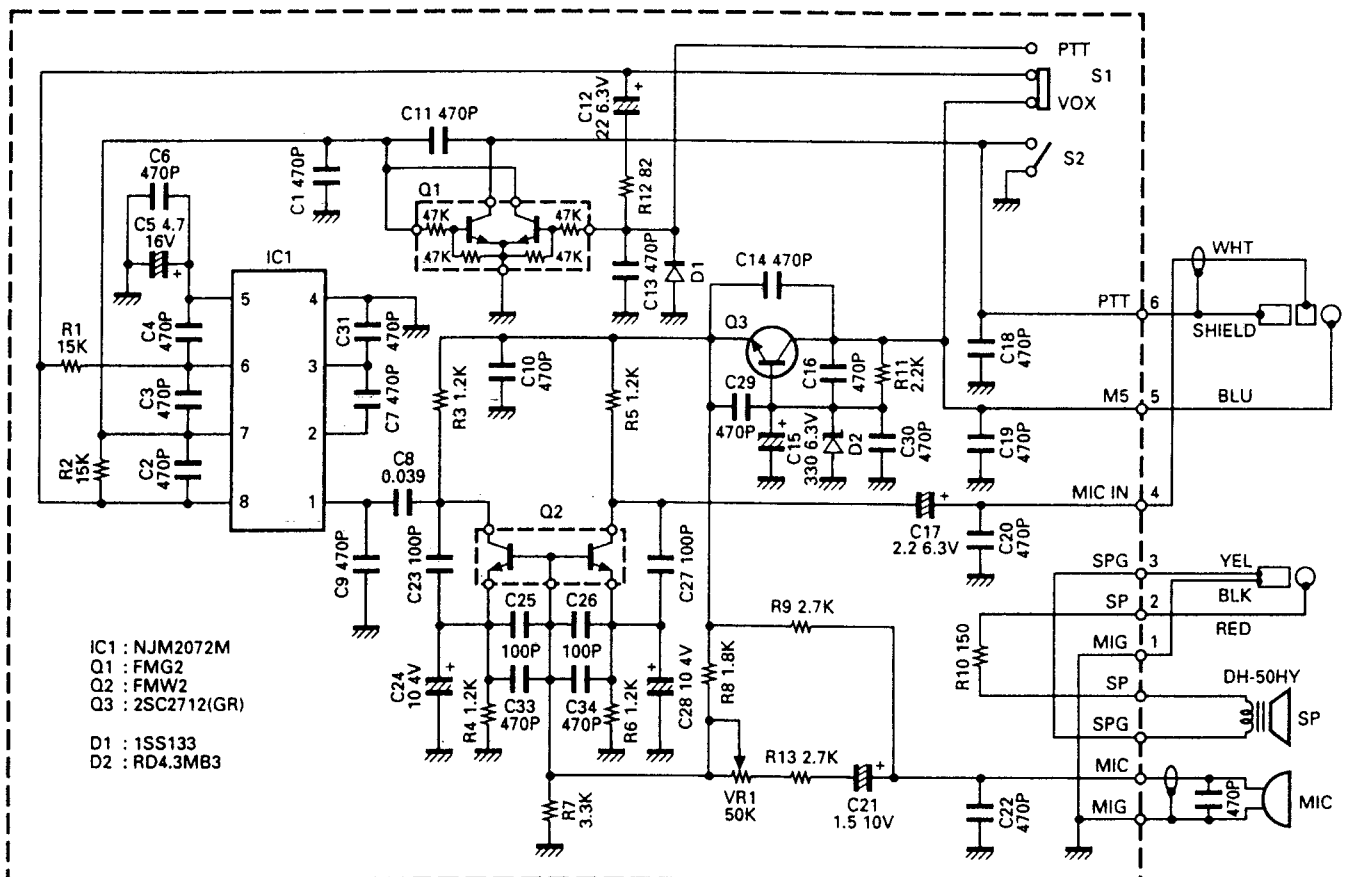
Component side view



Foil side view



HMC-3 Circuit Diagram



SMC-34 (REMOTE CONTROL SPEAKER MICROPHONE)

Diagram illustrating the exploded view of a portable electronic device, showing the following components and their assembly order:

- Clip
- Flat Spring
- Rivet
- Washer
- Clip Base
- Spring Pin
- Ass'y
- Case (REAR)
- O Ring
- Spring
- Jumper Cable
- Switch Cover
- Wire (YELLOW)
- Switch Unit
- Potention M. (VR1)
- Chip Condenser
- Mic Element
- Packing
- Screen
- Spacer
- Case (FRONT)
- O Ring
- Washer
- Nob (VOLUME)
- Washer
- Tapping Screw
- Knob (PTT)
- Packing
- Knob (Lock Switch)
- Wire (RED)
- Wire (BLUE)
- Tapping Screw
- Cord With Plug
- Wire (BLACK)
- Main Unit
- Packing
- Speaker
- Screen

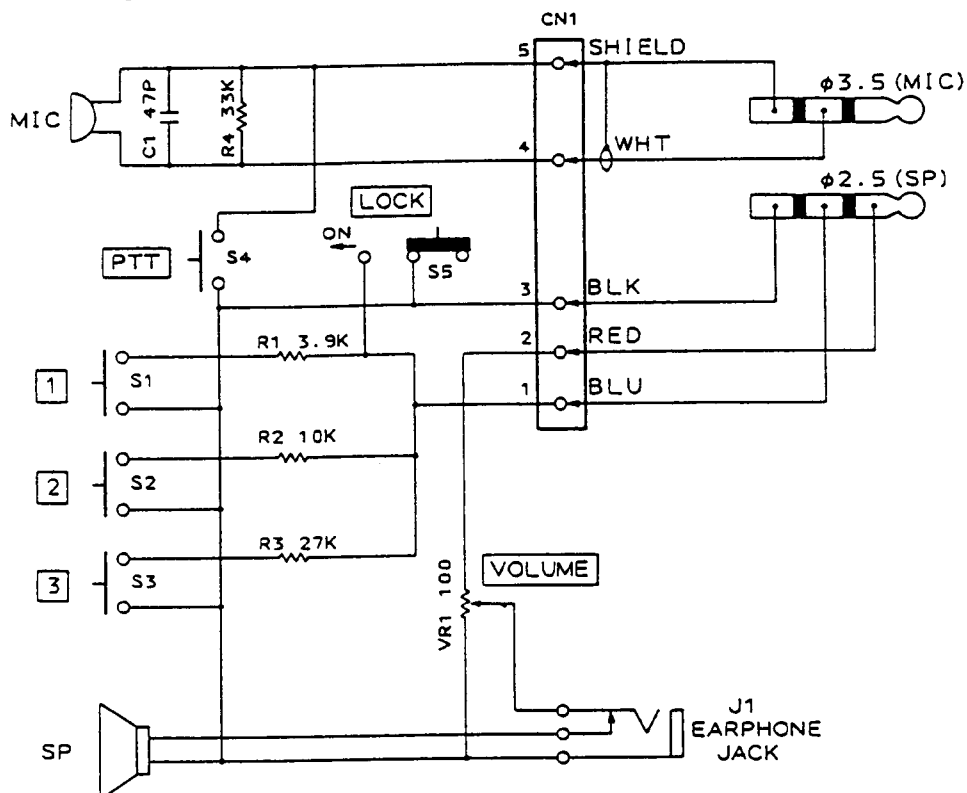
Technical drawing of a cable assembly with dimensions and labels:

- Dimensions:**
 - 130.0
 - 300.0
 - 17.0
 - 60.0
 - 2
 - 10
 - 35.0
 - 115.0
 - 7.5.000
 - 2.5.000
- Labels:**
 - Shield
 - White
 - N.C
 - Black
 - Blue
 - Red
 - Connector
 - Housing
 - Contact
 - Bushing
 - Fix Metal
 - Tube
 - Vinyl Tube
 - Seal
 - White
 - Black
 - Red
 - Blue
 - to CN1

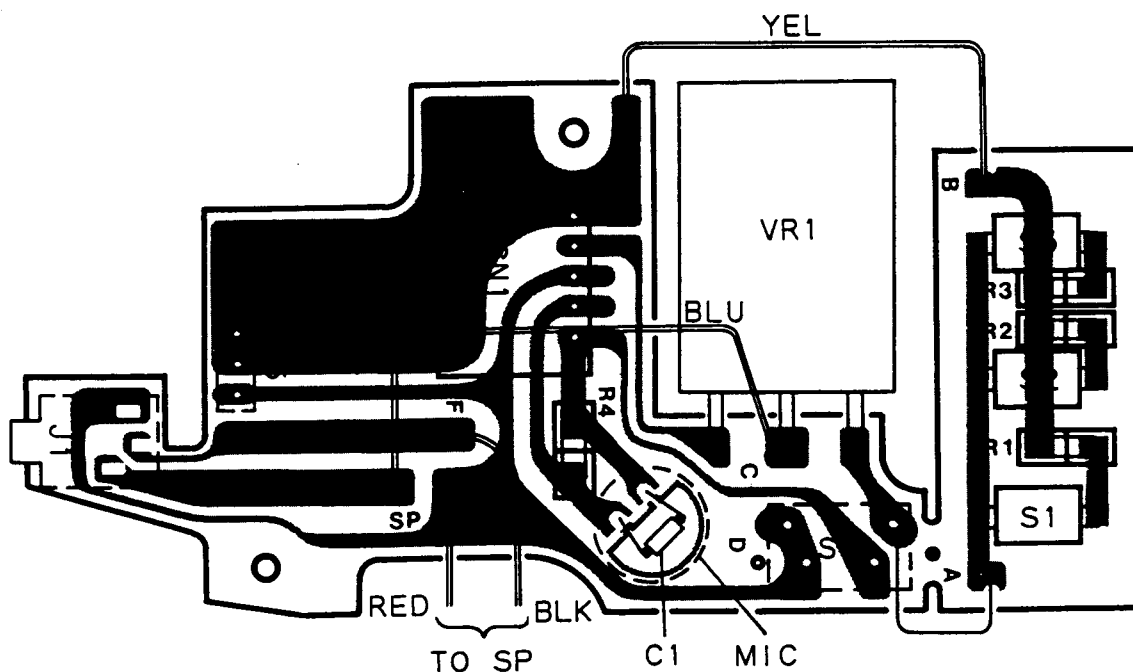
UBZ-LF68

SMC-34 (REMOTE CONTROL SPEAKER MICROPHONE)

SMC-34 Circuit Diagram



SMC-34 PC Board View

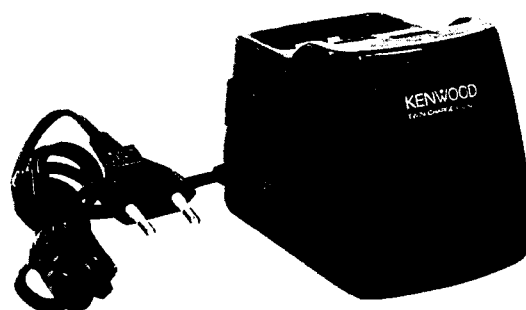


SMC-34 (REMOTE CONTROL SPEAKER MICROPHONE) / UBC-2 (BATTERY CHARGER)

SMC-34 Parts List

Ref. No.	New parts	Parts No.	Description
J1		A02-1696-08	Case (Front)
		A02-1699-08	Case assy (Rear)
		E30-3136-08	Cord with plug
		E11-0453-08	Earphone jack (2.5ø)
		J29-0469-08	Clip
		K29-4822-08	Switch cover (1, 2, 3)
VR1		K29-4823-08	Knob (Volume)
		K29-4824-08	Knob (PTT)
		R05-0408-08	Potentio M. 100Ω (B)
S1~3		S70-0408-05	Tact switch (1, 2, 3)
S4		S70-0421-08	Tact switch (PTT)
S5		S62-0431-08	Slide switch (LOCK)
		T07-0295-08	Speaker
		T91-0530-08	MIC element
		W02-1743-08	Unit assy

UBC-2 External View



UBC-2 Specifications

Usable temperature range 5°C~40°C
 Supply voltage AC 230V
 Current 230V 3.6W
 Charging time About 8 hours
 Weight 380g

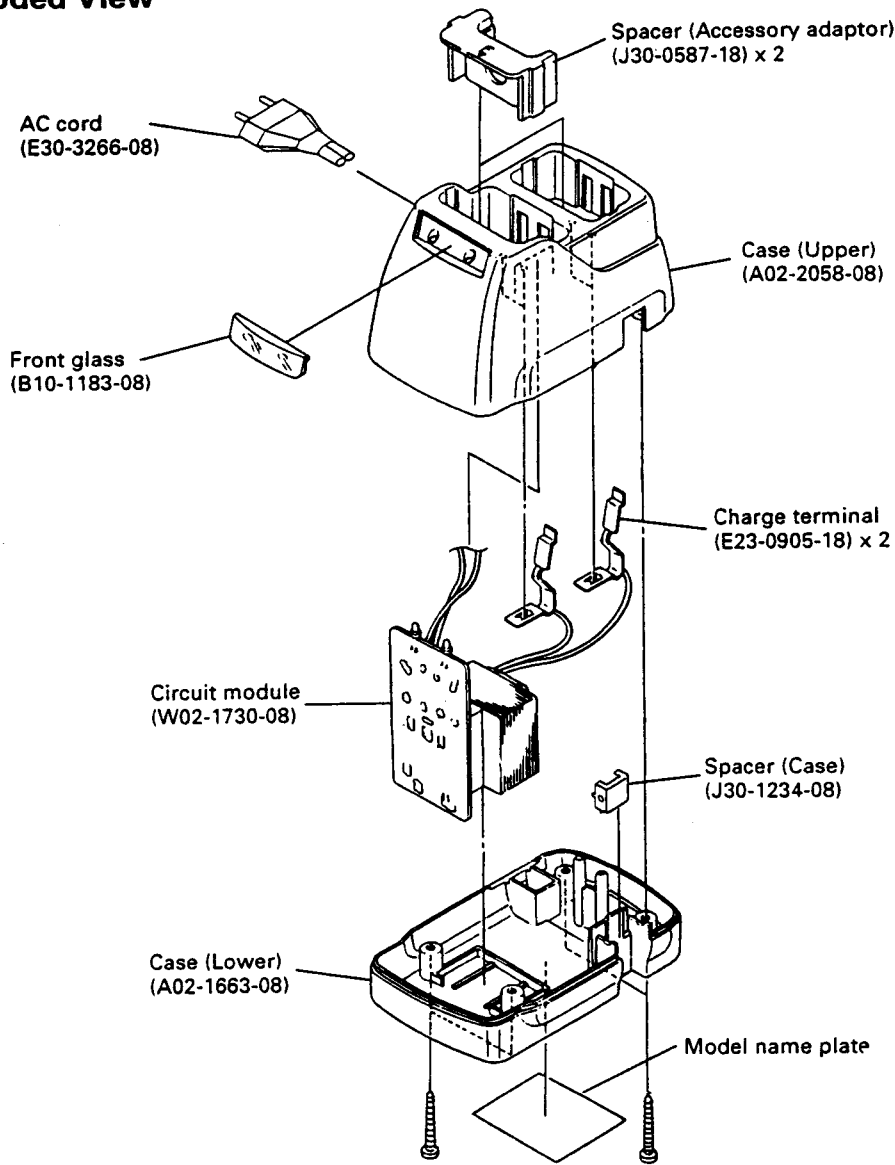
UBC-2 Parts List

Ref. No.	New parts	Parts No.	Description
	*	A02-2058-08	Case (Upper)
		A02-1663-08	Case (Lower)
		B10-1183-08	Front glass
		B30-2035-08	LED (Red)
	*	E23-0905-18	Charge terminal
		E30-3266-08	AC cord
	*	J30-0587-18	Spacer (Accessory adaptor)
		J30-1234-08	Spacer (Case)
	*	L07-1035-08	Power transformer
		W02-1730-08	Circuit module

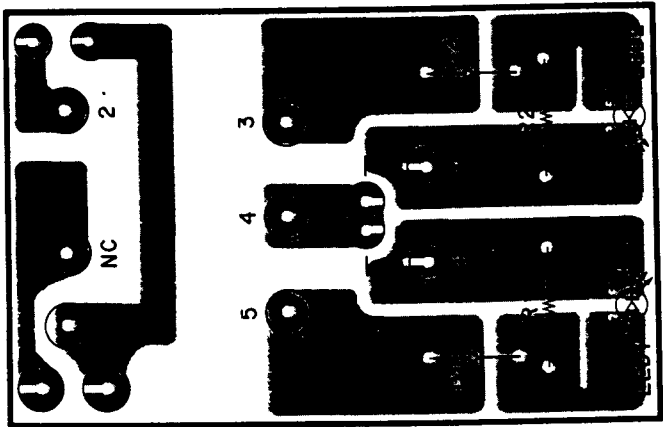
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UBC-2 (BATTERY CHARGER)

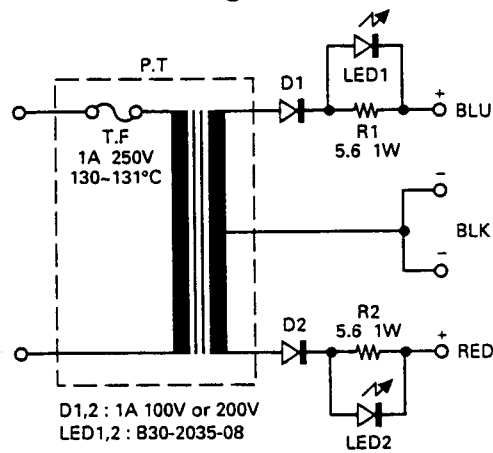
UBC-2 Exploded View



UBC-2 PC Board View

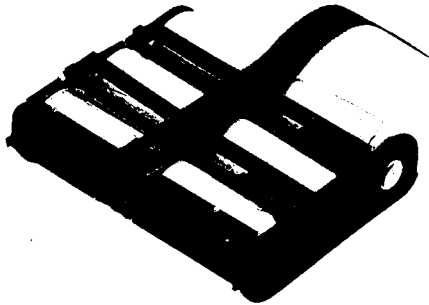


UBC-2 Circuit Diagram



UPB-1 (BATTERY PACK) / USC-3 (SOFT CASE)

UPB-1 External View



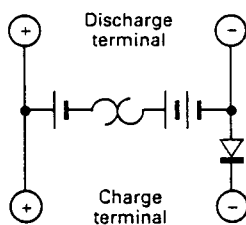
USC-3 External View



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

UPB-1 Circuit Diagram



UBZ-LF68

SPECIFICATIONS

Frequency range	433.075 to 434.750MHz, 25kHz step
Mode	F3E
Current	
Transmit mode	70mA or less
Receive mode (90mW output)	120mA or less
Receive mode (No signal)	50mA or less
Battery save on	Approx. 10mA (Average)
Supply voltage (Rated voltage)	4.5V
Transmit output power	10mW
Audio output (10% distortion, 8 Ω load)	90mW or higher
Receiver sensitivity	-14dB μ (12dB SINAD)
Dimensions (W x H x D, projections not included)	56 x 101 x 26 (mm)
Weight	Approx. 190g (3R6 batteries and belt hook included)

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