



SERVICE MANUAL

VHF TRANSCEIVER

IC-V101

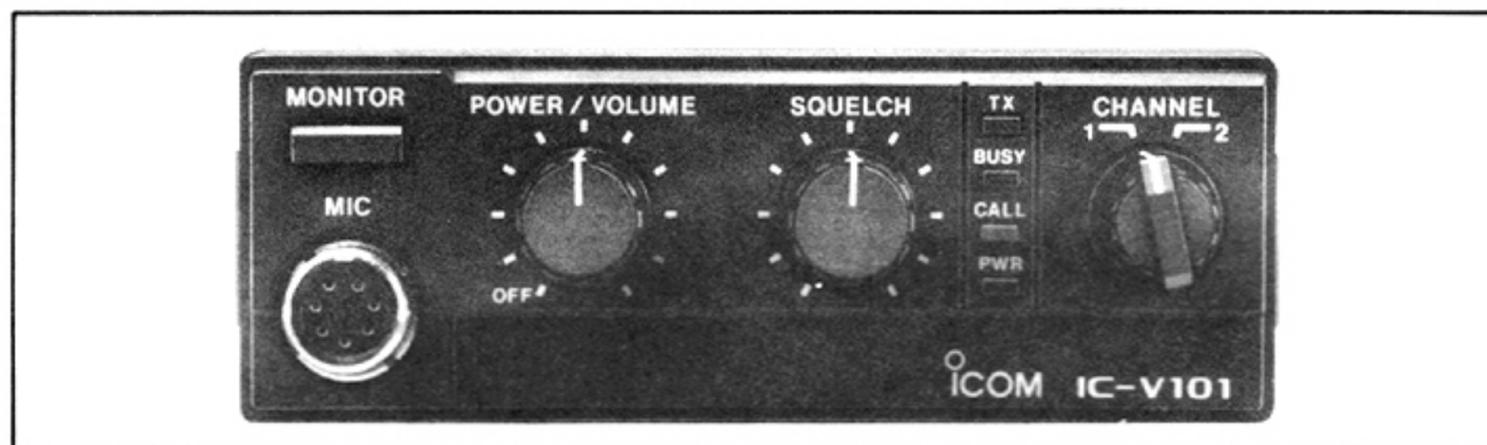
INTRODUCTION

This service manual describes the latest service information for the IC-V101 VHF TRANSCEIVER at the time of going to press.

If you require assistance or further information regarding the operation and capabilities of the IC-V101, contact your nearest authorized Icom Dealer or Icom Service Center.

VERSION

VERSION NUMBER	FREQUENCY COVERAGE	OUTPUT POWER	CHANNEL PITCH
# 01	146~174 MHz	10 W	12.5 kHz
# 02	148~160 MHz	25 W	12.5 kHz
# 03	156~168 MHz	25 W	12.5 kHz
# 04	164~174 MHz	25 W	12.5 kHz
# 05	164~174 MHz	25 W	25 kHz



ORDERING PARTS

Be sure to include the following four points when ordering replacement parts:

1. 10-digit order numbers
2. Component part number and name
3. Equipment model name and unit name
4. Quantity required

<SAMPLE ORDER>

1130000210 IC μ PC2002H IC-V101 LOGIC UNIT 5 pieces
8810002120 Screw FH M 2.6×6 IC-V101 331 shield plate 5 pieces

Addresses are provided on the inside back cover for your convenience.

DANGER

NEVER connect the transceiver to an AC outlet or to a DC power supply that uses more than 16 V. This will ruin the transceiver.

DO NOT expose the transceiver to rain, snow or any liquids.

DO NOT reverse the polarities of the power supply when connecting the transceiver.

DO NOT apply an RF signal of more than 20 dBm (100 mW) to the antenna connector. This could damage the transceiver's front end.

REPAIR NOTE

1. Make sure a problem is internal before disassembling the transceiver.
2. **DO NOT** open the transceiver until the transceiver is disconnected from a power source.
3. **DO NOT** force any of the variable components. Turn them slowly and smoothly.
4. **DO NOT** short any circuits or electronic parts. An insulated tuning tool **MUST** be used for all adjustments.
5. **DO NOT** keep power ON for a long time when the transceiver is defective.
6. **DO NOT** transmit power into a signal generator or a sweep generator.
7. **ALWAYS** connect a 40 dB ~ 50 dB attenuator between the transceiver and a deviation meter or spectrum analyzer when using such test equipment.
8. **READ** the instructions of test equipment thoroughly before connecting equipment to the transceiver.

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SECTION 1 SPECIFICATION

■ GENERAL

Frequency coverage	:	146 ~ 174 MHz (#01 version) 148 ~ 160 MHz (#02 version) 156 ~ 168 MHz (#03 version) 164 ~ 174 MHz (#04 version) 164 ~ 174 MHz (#05 version)
Number of channels	:	2 (Transmit, receive and CTCSS frequencies are programmable)
Usable temperature range	:	-25 °C ~ +55 °C (-13 °F ~ +131 °F)
Channel spacing	:	12.5 kHz (#01~#04) 25 kHz (#05)
Antenna impedance	:	50Ω (unbalanced)
Power supply requirement	:	13.8V DC (Negative ground)
Current drain	:	Receive standby 350 mA Receive max. audio 1.0 A Transmit 3.5 A (#01) 6.0 A (#02~#05)
Dimensions	:	140 (W) × 50 (H) × 163 (D) mm 5.5 (W) × 2.0 (H) × 6.4 (D) in (Projections not included)
Weight	:	1.3 kg (2.9 lb)

■ RECEIVER

Receive system	:	Double-conversion superheterodyne
Intermediate frequency	:	1st: 21.8 MHz 2nd: 455 kHz
Sensitivity	:	0.35 μV for 12 dB SINAD
Squelch threshold sensitivity	:	0.18 μV
Selectivity	:	-60 dB (#01~#04) -70 dB (#05)
Spurious rejection	:	-70 dB
Image rejection	:	-70 dB
Intermodulation rejection	:	-70 dB
Audio output power	:	3 W with a 4Ω load
Audio output impedance	:	4 Ω
Frequency stability	:	±1.5 kHz

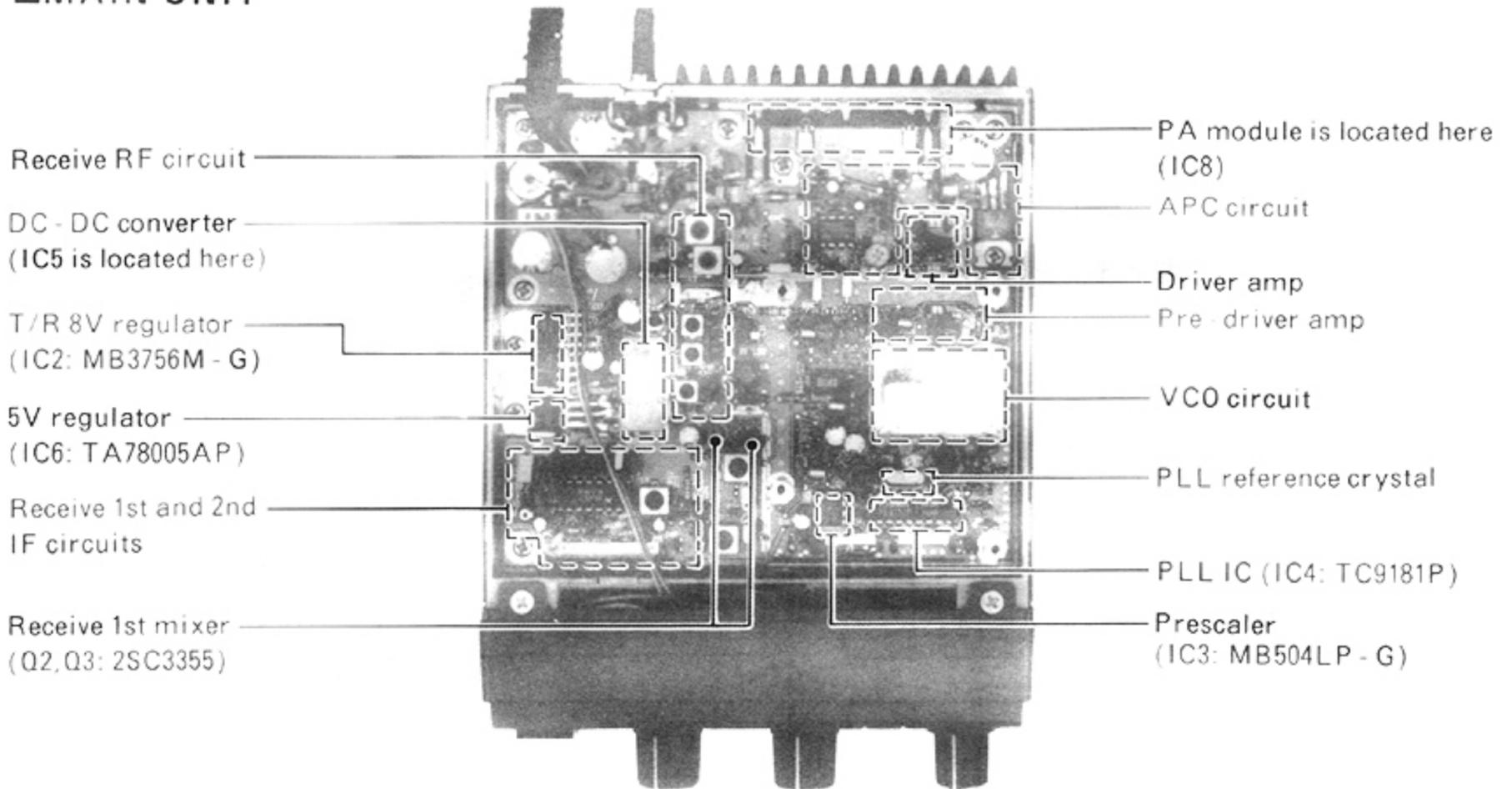
■ TRANSMITTER

RF output power	:	10 W (#01) 25 W (#02~#05)
Emission mode	:	8K50F3E (#01~#04) 16K0F3E (#05)
Modulation system	:	Variable reactance frequency modulation
Max. frequency deviation	:	±2.5 kHz (#01~#04) ± 5 kHz (#05)
Spurious emissions	:	0.25 μW
Harmonic emissions	:	0.25 μW
Frequency tolerance	:	±1.5 kHz
Adjacent channel power	:	-60 dB
Audio frequency response	:	-3 dB ~ +1 dB in a 6 dB/octave range from 300 Hz to 2550 Hz
Noise and hum	:	-35 dB (#01~#04) -40 dB (#05)
Limiting of modulator	:	70~100 % of maximum deviation

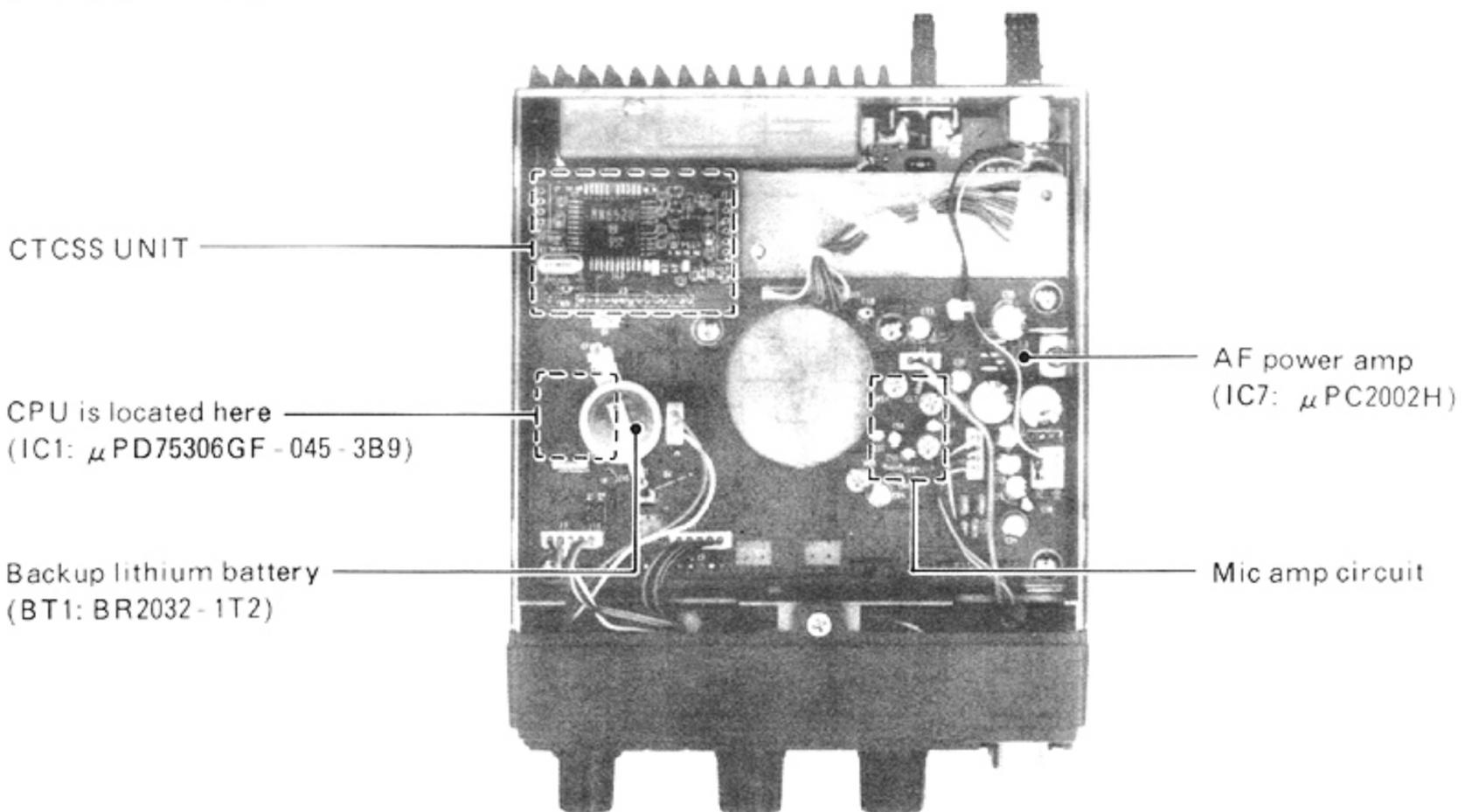
All specifications follow EIA RS-316B (transmitter) and RS-204C (receiver) procedures.
All stated specifications are subject to change without notice or obligation.

SECTION 2 INSIDE VIEWS

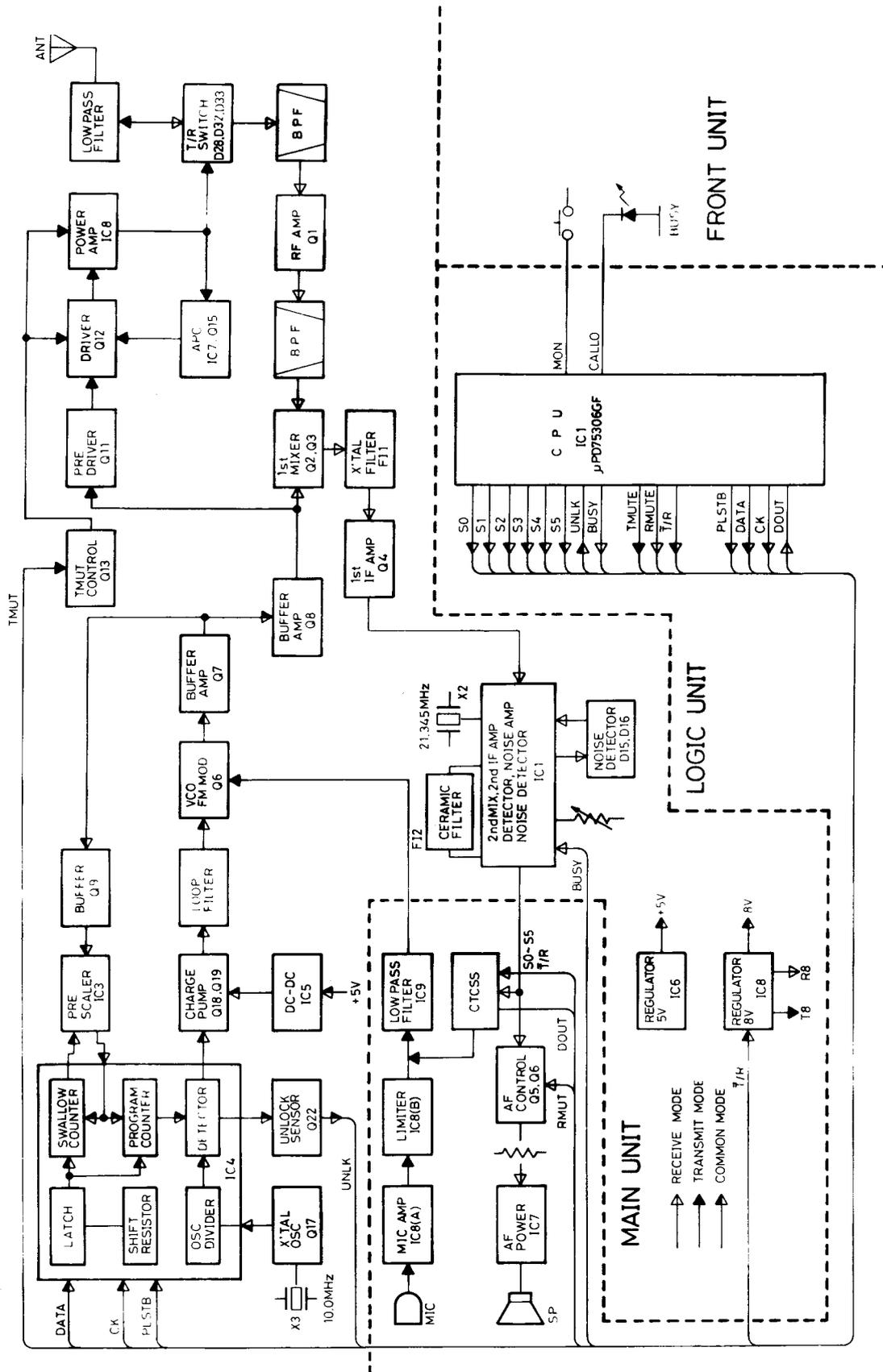
■ MAIN UNIT



■ LOGIC UNIT



SECTION 3 BLOCK DIAGRAM



SECTION 4 CIRCUIT DESCRIPTION

4-1 RECEIVER CIRCUITS

4-1-1 ANTENNA SWITCHING CIRCUIT (MAIN UNIT)

An antenna switching circuit switches the transmit/receive circuit and functions as a low-pass filter while receiving and as a resonator circuit while transmitting.

Received signals enter the MAIN UNIT from the antenna connector through a low-pass filter consisting of L27~L29, C103 and C107~C113. They are then applied to an antenna switching circuit consisting of D28, D32, D33 and other parts.

4-1-2 RF CIRCUIT (MAIN UNIT)

The RF circuit amplifies signals within the range of frequency coverage, and filters out out-of-band signals. A 1st mixer circuit converts the received signal to a fixed frequency of the 1st IF signal using a PLL output frequency.

Signals from the antenna switching circuit pass through a 2-stage bandpass filter consisting of D1~D4, L1, L2, C2, and C168, and are amplified at Q1. Signals then pass through a 3-stage bandpass filter consisting of D5~D10, L3~L5, C8~C10, C169 and C170. They are then applied to the 1st mixer circuit consisting of Q2, Q3, L6 and other parts for conversion to 21.8 MHz 1st IF signal. A local oscillator signal (generated at a VCO circuit, Q6) are buffer amplified at Q7 and Q8, and are applied to L6.

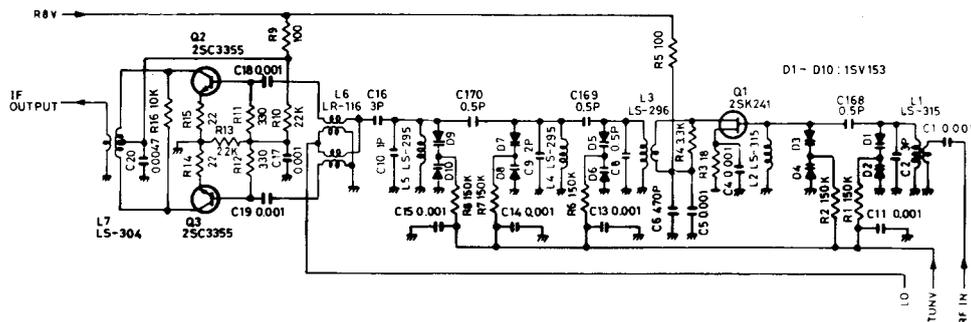


Fig.4-1 RF Circuit

4-1-3 IF CIRCUIT (MAIN UNIT)

A 1st IF circuit amplifies a signal which is converted in a 1st mixer circuit. And a 2nd mixer circuit converts the 1st IF signal to a 2nd signal. A double superheterodyne system (2 times conversion of a receive signal) improves the image rejection ratio and obtains stable receiver gain.

The 1st IF signal from L7 passes through a pair of crystal filters F11 to suppress out-of-band signals and unwanted heterodyned frequency signals. After passing through the filter, the 1st IF signal is amplified at IF amplifier Q4, and are applied to IC1.

IC1 contains the 2nd LO circuit, 2nd mixer circuit, limiter amplifier circuit, squelch trigger circuit and quadrature detector circuit. The 2nd LO circuit including X1, generates a 21.345 MHz 2nd LO signal which is used at the 2nd mixer section of IC1.

The 1st IF signal from Q4 applied to pin 16 of IC1, is mixed with the 2nd LO signal for converting the 1st IF signal to a 455 kHz 2nd IF signal.

The 2nd IF signal output from pin 3 and passes through high-quality ceramic filter (F12) to suppress unwanted heterodyned frequency signals. The signal is amplified at the limiter amplifier section (pin 5 of IC1) and applied to the quadrature detector circuit (pin 8 of IC1 and a ceramic resonator, X2) to demodulate the 2nd IF signal to AF signals.

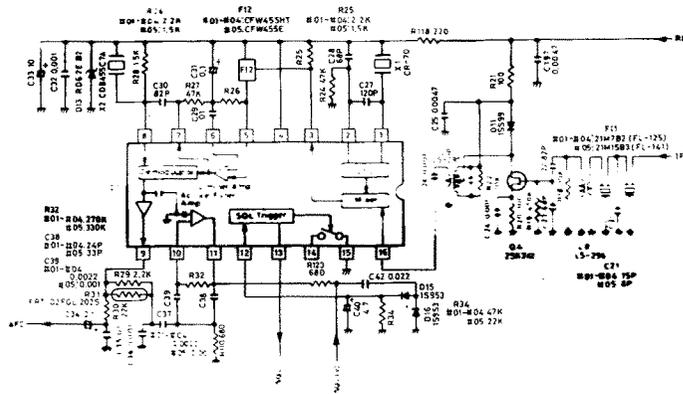


Fig.4-2 IF Circuit

4-1-4 AF CIRCUIT (LOGIC UNIT)

An AF circuit de-emphasizes a demodulated signals with -6dB/oct. and power amplifies the signals to drive a speaker. The AF circuit includes a mute circuit to mute the signals with a noise squelch and a tone squelch.

AF signals output from pin 9 of IC1 pass through a de-emphasis circuit (R30, C35) and are applied to the high-pass filter (IC6A and IC6B). The de-emphasis circuit is an integrator circuit which has -6dB/oct. frequency characteristics. IC6B suppresses subaudible tone signals.

Output signals from pin 1 of IC6A are amplified at IC6B and pass through the [VOL] control and an audio switch Q6, and are then amplified at power amplifier IC7 to drive the speaker. IC6B is also used as a high-pass filter, and Q5 and Q6 are audio switches which mute audio signals when the R-MUTE signal appears or the squelch closes.

4-1-5 SQUELCH CIRCUIT (MAIN UNIT)

A squelch circuit cut out AF signals when no RF signals are received. By detecting noise components in the AF signals, the squelch circuit switches the AF power amplifier.

A portion of signals from pin 9 of IC1 is applied to active filter pin 10 of IC1 where it collects noise components of 20 kHz or more. The noise components are then rectified by D15 and D16 for conversion to DC voltage and are applied to the squelch trigger circuit (pin12 of IC1). The [SQL] control is also connected to pin 12 of IC1 to adjust converted voltage.

A "HIGH" or "LOW" squelch control signal is output from pin 13 of IC1 and is then applied to pin 61 of the CPU (IC1) on the LOGIC UNIT.

Pin 52 of CPU (IC1) becomes "HIGH" as the R-MUTE signal while both pin 61 (SQL) and pin 60 (DET) receive "LOW." The R-MUTE signal is applied to Q5 and Q6 to mute the audio signals.

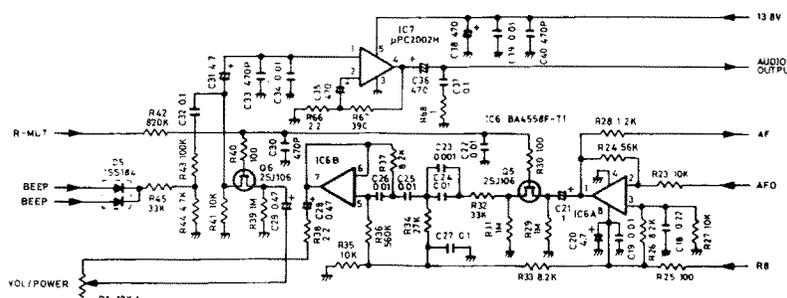


Fig.4-3 Audio Amplifier and Squelch Circuit

4-2 TRANSMITTER CIRCUITS

4-2-1 MICROPHONE AMPLIFIER CIRCUIT (LOGIC UNIT)

A microphone amplifier circuit amplifies audio signals with 6 dB/oct. pre-emphasis from the microphone to a level needed at the modulation circuit.

AF signals from the microphone pass through the pre-emphasis circuit (C47 and R47) which has 6dB/oct. frequency characteristics in the 300Hz ~ 3kHz frequency range. AF signals are then amplified at the low-noise amplifier (IC8A), pass through the mic gain pot (R51) and are amplified at the limiter amplifier (IC8B). R49 adjusts the symmetrical waveform of the limiter amplifier output.

Output signal from the limiter amplifier is similar to a rectangular waveform and includes harmonic components. Harmonic components are attenuated by the splatter filter (IC9) with 3 kHz cutting frequency.

AF signals from pin 1 of IC9 pass through the modulation adjusting trimmer pot (R55) and then are applied to a VCO circuit for performing frequency modulation.

4-2-2 MODULATION CIRCUIT (MAIN UNIT)

A modulation circuit modulates the VCO oscillating signal (RF signals) using the AF signals.

The entered signals at the VCO change the reactance of a diode, D18 to modulate an oscillated signal at the VCO (Q6).

4-2-3 BUFFER AMPLIFIER CIRCUIT (MAIN UNIT)

The oscillated signal from the VCO circuit is buffer amplified at Q7, passes through isolator L17, and is buffer amplified at Q8 and then passes through transmit/receive switching circuit D23 and D24. The signal is then amplified at pre-drivers Q10 and Q11, and at driver Q12 thus obtaining wide-band 200 mW drive power.

4-2-4 POWER AMPLIFIER CIRCUIT (MAIN UNIT)

A power amplifier circuits amplify the VCO oscillating signal to an output power level.

An amplified signal at Q12 is power amplified at IC8 and obtain more than 25 W (or 10 W depending on versions) RF output power.

The output power from IC8 passes through an antenna switching circuit, a high-pass filter, and is then applied to the antenna connector.

4-2-5 APC CIRCUIT (MAIN UNIT)

An APC circuit stabilizes an RF output power even when changing the supplied voltage.

The output power level from IC8 is detected by D30 and D31 and are converted to DC voltage. They are then applied to inverting amplifier IC7 to control the input current of IC8 using Q14 and Q15.

Divided T8V is applied to pin 3 of IC7 as the reference voltage that determines RF output power with R79.

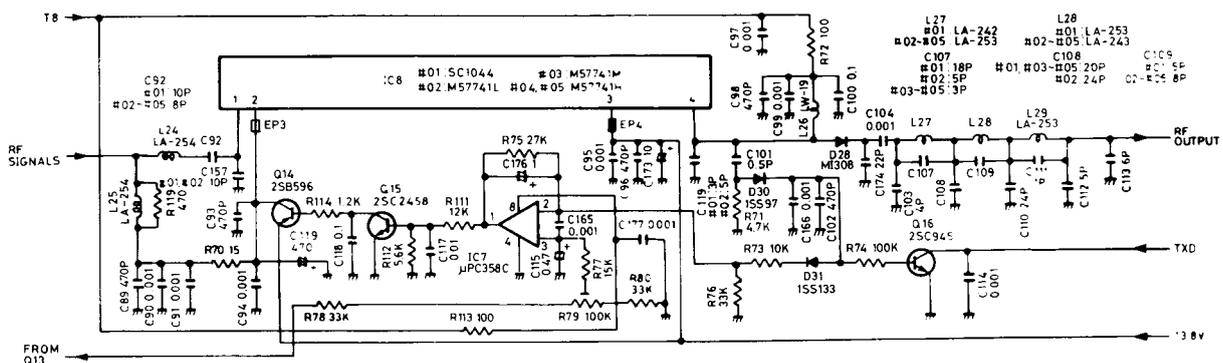


Fig.4-4 Power Amplifier and APC Circuit

4-3 PLL CIRCUITS

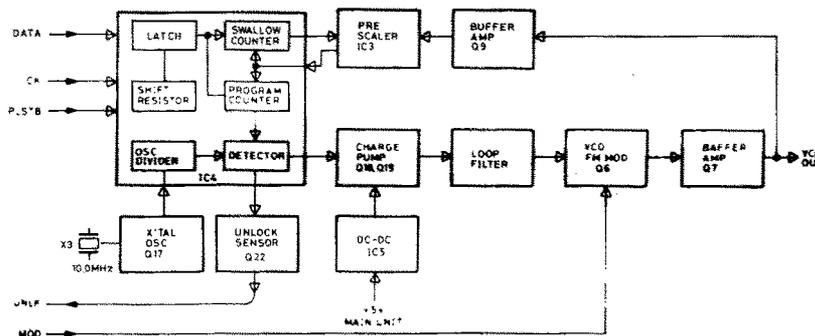
4-3-1 GENERAL DESCRIPTION

A PLL circuit stably oscillates the transmit frequency and the receive local frequency. The PLL output frequency is controlled by the divided ratio (N-data) of the programmable divider.

4-3-2 DUAL MODULUS PRESCALER (MAIN UNIT)

The dual modulus prescaler detects phase of the divided VCO frequency and a reference frequency. The PLL circuits consist of the prescaler (IC3) and the PLL IC (IC4). The ratio of dividing frequency is determined with N-data from the CPU.

The reference frequency of 5 kHz or 12.5 kHz is acquired by X3, and Q17, is divided at the OSC divider inside IC4. A signal from the VCO is buffer amplified at Q9, applied into IC3, and divided N times at IC3 and IC4. The divided signal is applied to the phase detector in IC4. Phase detection results in lock voltages being output from pins 14 and 15.



4-4 LOGIC CIRCUIT

The CPU (IC1) has two modes, user mode and clone mode. In user mode, the CPU operates as the transceiver. In clone mode, the CPU can be programmed operating frequency, CTCSS tone frequency and time-out timer by the DATA PROGRAMMER EX-704.

4-4-1 SERIAL-PARALLEL DATA CONVERTER (LOGIC UNIT)

Serial CTCSS data from CPU (IC1) is converted to parallel data at IC5 and applied to the TONE UNIT.

4-3-3 LOOP FILTER CIRCUIT (MAIN UNIT)

Output signal from IC4 (pins 14 and 15) is applied to a charge pump circuit consisting of Q18 and Q19, and is then applied to a lag-lead type loop filter consisting of R104, R105, C149 and C201. The signal passing through the loop filter is applied to varactor diodes D21 and D22 via an RF choke coil, L12 to control the VCO output frequency. D37 and D38 shorten the lockup time when changing from receive to transmit mode.

4-3-4 DC-DC CONVERTER (MAIN UNIT)

DC-DC converter IC5 makes a DC signal for approx. 20 V DC from 5 V DC. This obtains lock voltages for the PLL circuit and a voltage range of 1~20 V for bandpass tuning operation of the RF circuit.

4-3-5 UNLOCK CIRCUIT (MAIN UNIT)

When the PLL circuit is unlocked, pin 13 of IC4 is "LOW" and the "LOW" signal is applied to the CPU via the time constant circuit consisting of Q22, R95 and C184.

4-4-2 RESET CIRCUIT AND POWER SUPPLY CIRCUIT

The comparator IC4 drives Q4 on rising edge of 5 V supply and activates the pin 68 (IC1) for resetting.

When the power is turned OFF, a voltage from the lithium battery (BT1) is applied to the CPU to back up the RAM data.

4-4-3 CPU PORT ALLOCATIONS

■ INPUT PORT

PIN	PORT	NAME	DESCRIPTION
38	P00	INT4	Inputs a standby mode of CPU. HIGH : Normal operation. LOW : Standby mode.
42	P10	PTT	LOW : PTT switch is pushed.
43	P11	CLONE	The CPU enters the cloning mode when the port is "LOW."
44	P12	MONI	The CPU turns the CTCSS OFF when the port is "LOW."
60	P60	DET	The CPU reads that the same tone frequency is received when the port is "HIGH."
61	P61	BUSY	The CPU reads that the squelch opens when the port is "HIGH."
62	P62	UNLOCK	The CPU reads that the PLL is unlocked when the port is "LOW."

■ OUTPUT PORT

PIN	PORT	NAME	DESCRIPTION
34	P50	KS4	Matrix signal output. (Matrix is used for CH selection.)
35	P51	KS5	Matrix signal output.
37	P53	TMUT	Transmit mute output.
39	P01	CK	Clock output for serial data.
40	P02	DATA	Serial data output.
46	P20	BEEPO	Outputs a 1kHz pulse when a beep is emitted over the speaker.
47	P21	PLSTB	Strobe signal output for the PLL.
48	P22	CTSTB	Strobe signal output for the CTCSS tone encoder/decoder.
51	P31	T/R	Transmit/Receive switching output. Becomes "LOW" when transmitting.
52	P32	RMUT	Receiver mute output. Becomes "HIGH" when receiver audio output is muted.
53	P33	CALLO	Busy signal output. Outputs a signal synchronized with the BUSY input. Directly drives the [BUSY] indicator.
63	P63	CPO	CLONE DATA output.

4-5 CTCSS TONE SQUELCH CIRCUIT

AF signals are applied to the TONE UNIT via the AF IN terminal. IC1(A) and (B) function as a low-pass filter to pass only subaudible tone frequencies. IC2 is a tone encoder/decoder IC chip to produce a subaudible tone when transmitting and detect the tone when receiving.

IC2 receives binary tone data from the CPU through the ports (S0 ~ S5). When receiving the same subaudible tone as the tone data, the DET OUT port (IC2, pin 23) becomes "HIGH." When transmitting, the TX OUT port (IC2, pin 26) outputs the subaudible tone specified the tone data.

4-6 CTCSS ENCODER AND DECODER

Tone frequency can be selected among 37 frequencies (67~250.3 Hz). In transmit mode, the specified tone is transmitted concurrently with voice. In receive mode, the detector outputs voice only when the specified tone is received, turning on the audio circuit.

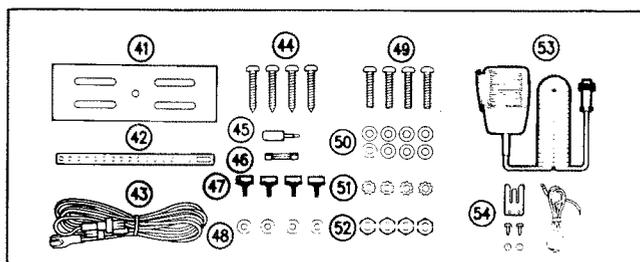
SECTION 5 MECHANICAL PARTS AND DISASSEMBLY

LABEL NO.	ORDER NO.	DESCRIPTION	QTY.
①	8110003730	Top cover (G) (complete)	1
②	8810002960	Screw BiH M3×6 ZK SUS	4
③	8010009600	Chassis (C)-1	1
④	8510006230	331 shield plate	1
⑤	8810002120	Screw FH M2.6×6	4
⑥	8510006352	MAIN shield case cover -2	1
⑦	8930018280	Standoff (A)	4
⑧	8850000420	Spring washer M3 Ni	4
⑨	8510006330	855 VCO case (top)	1
⑩	8510006320	855 VCO case	1
⑪	8310003360	Helical seal (A)	1
⑫	8510006340	MAIN shield case	1
⑬	8510004150	DC-DC shield case	1
⑭	8950000230	Insulating sheet TC45A (T=0.4)	1
⑮	6910000280	B17 insulating bush	1
⑯	8810003160	Set screw (A) M3×6	11
⑰	8930017490	Cable holder	1
⑱	8810003140	Set screw (A) M2.6×8	2
⑲	8930006470	Module holder	1
⑳	6950000040	M-type cap (black)	1

LABEL NO.	ORDER NO.	DESCRIPTION	QTY.
㉑	6510005150	Pin SLM61T-2.0 (included-㉔)	2
㉒	6510004780	Connector LR02-1V (included-㉔)	1
㉓	6950000180	Connector cover (included-㉔)	1
㉔	8810003180	Set screw (A) M3×10	2
㉕	8110003811	855 shield cover -1	1
㉖	8010009610	Chassis shield plate (A)-1	1
㉗	8930010230	Sponge (AV)	2
㉘	8810002170	Screw FH M3×6	5
㉙	6450000050	Speaker jack HSJ0296-01-150	1
㉚	8390006080	Half thread spacer C	6
㉛	8810003760	Icom screw C10	6
㉜	8110003740	Bottom cover (D) (complete)	1
㉝	2510000200	Speaker 66F09N-7 (included-㉞)	1
㉞	8210005460	334 front panel (F)	1
㉟	8610006450	Konb N109 (B)-1	1
㊱	8610006460	Konb N110 (A)	2
㊲	8610002410	Monitor button K75	1
㊳	8810001000	Screw PH M2×6	6
㊴	2210000510	Channel select switch SRRM42021B	1
㊵	8900001120	Cable (OPC-116) (complete)	1

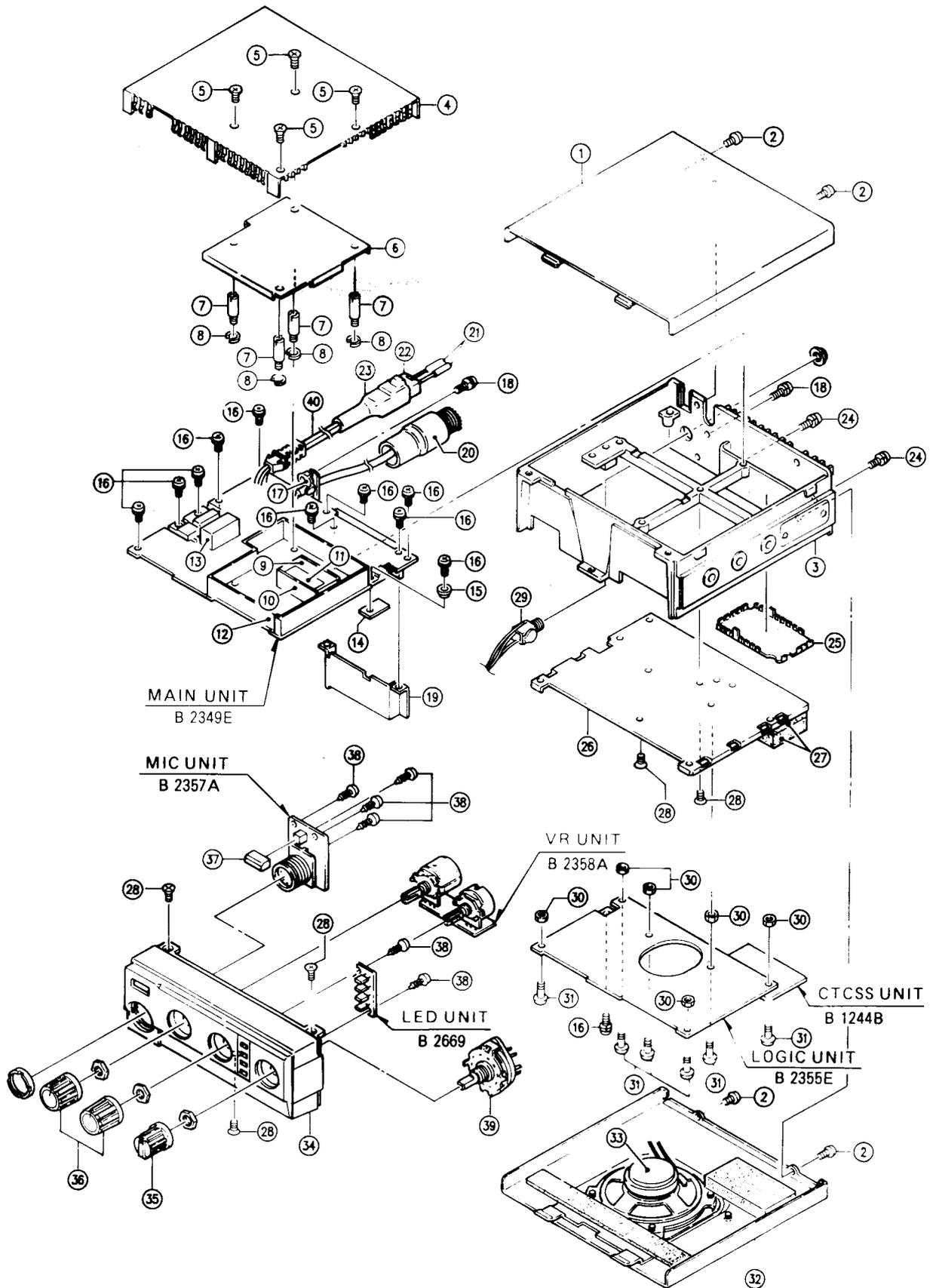
Screw abbreviations

PH : Pan head FH: Flat head
 BiH : Binding head
 BO : Self-tapping screw
 ZK : Black Ni SUS: Stainless
 BS : Brass



LABEL NO.	ORDER NO.	DESCRIPTION	QTY.
④①	Optional	MB-26 MOUNTING BRACKET	1
④②	8010004060	Mounting support plate	1
④③	8900000640	DC power cable OPC-044A	1
④④	8810000950	Mounting screws A0 5×16 (included-④)	4
④⑤	6450000010	External speaker plug PJ-2240P	1
④⑥	5210000070	Fuse 10A	1
④⑦	8820000461	Mounting bracket knobs M4×8 (included-④)	4

LABEL NO.	ORDER NO.	DESCRIPTION	QTY.
④⑧	8850000140	Flat washers M4 (included-④①)	4
④⑨	8810003870	Mounting screws M5×20	4
④⑩	8850000150	Flat washers M5	8
④⑪	8850000590	Star washers M5	4
④⑫	8830000120	Mounting nuts M5 (included-④①)	4
④⑬	Optional	HM-33 HAND MICROPHONE	1
④⑭	6910004210	Microphone hanger set	1set



SECTION 6 PARTS LIST

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110000630	IC	MC3357P
IC2	1110000390	IC	MB3756M-G
IC3	1110001560	IC	MB504LP-G
IC4	1130002960	IC	TC9181P
IC5	1110000900	IC	TL499ACP
IC6	1180000340	IC	TA78005AP
IC7	1110000070	IC	μ PC358C
IC8	1150000360	IC	SC1044 (#01)
	1150000270	IC	M57741L (#02)
	1150000250	IC	M57741M (#03)
	1150000260	IC	M57741H (#04)
	1150000260	IC	M57741H (#05)
Q1	1560000110	FET	2SK241-GR
Q2	1530001810	Transistor	2SC3355
Q3	1530001810	Transistor	2SC3355
Q4	1560000110	FET	2SK241-GR
Q5	1530000110	Transistor	2SC2458-GR
Q6	1560000110	FET	2SK241-GR
Q7	1530000520	Transistor	2SC2026
Q8	1530002210	Transistor	2SC3776-D
Q9	1530002210	Transistor	2SC3776-D
Q10	1530000520	Transistor	2SC2026
Q11	1530000530	Transistor	2SC2407
Q12	1530000810	Transistor	2SC2053
Q13	1520000070	Transistor	2SB561C
Q14	1520000030	Transistor	2SB596-Y(Z)
Q15	1530000110	Transistor	2SC2458-GR
Q16	1530000110	Transistor	2SC2458-GR
Q17	1530000110	Transistor	2SC2458-GR
Q18	1510000080	Transistor	2SA1048-GR
Q19	1530000110	Transistor	2SC2458-GR
Q20	1510000080	Transistor	2SA1048-GR
Q21	1560000010	FET	2SK184-Y
Q22	1530000110	Transistor	2SC2458-GR
D1	1720000040	Varicap	1SV153
D2	1720000040	Varicap	1SV153
D3	1720000040	Varicap	1SV153
D4	1720000040	Varicap	1SV153
D5	1720000040	Varicap	1SV153
D6	1720000040	Varicap	1SV153
D7	1720000040	Varicap	1SV153
D8	1720000040	Varicap	1SV153
D9	1720000040	Varicap	1SV153
D10	1720000040	Varicap	1SV153
D11	1790000240	Diode	1SS99
D13	1730000120	Zener	RD6. 2E B2
D15	1710000040	Diode	1S953
D16	1710000040	Diode	1S953
D17	1710000160	Diode	1SS133
D18	1710000600	Diode	1SS254
D19	1710000600	Diode	1SS254
D20	1710000580	Diode	1SS265
D21	1720000060	Varicap	1SV50 (1) E
D22	1720000060	Varicap	1SV50 (1) E
D23	1710000580	Diode	1SS265
D24	1710000580	Diode	1SS265
D25	1730000390	Zener	RD4. 7E B3
D26	1710000040	Diode	1S953
D27	1710000600	Diode	1SS254
D28	1710000290	Diode	MI308
D30	1790000250	Diode	1SS97
D31	1710000160	Diode	1SS133
D32	1710000290	Diode	MI308
D33	1710000290	Diode	MI308
D34	1710000040	Diode	1S953
D35	1710000010	Diode	15CD11

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
D36	1720000060	Varicap	1SV50 (1) E
D37	1710000160	Diode	1SS133
D38	1710000160	Diode	1SS133
D41	1730000310	Zener	RD15E B2
L1	6150003020	Coil	LS-315
L2	6150003020	Coil	LS-315
L3	6150002800	Coil	LS-296
L4	6150002780	Coil	LS-295
L5	6150002780	Coil	LS-295
L6	6140000930	Coil	LR-116
L7	6150002950	Coil	LS-304
L8	6150002730	Coil	LS-298
L9	6150002720	Coil	LS-297
L10	6180000810	Coil	LAL-03NA 2R2M
L11	6130002040	Coil	LB-216
L12	6180000830	Coil	LAL-03NA 3K3K
L13	6180000850	Coil	LAL 03NA 4R7K
L14	6180000850	Coil	LAL 03NA 4R7K
L15	6180000850	Coil	LAL 03NA 4R7K
L16	6110001570	Coil	LA-237
L17	6140000930	Coil	LR-116
L18	6110001570	Coil	LA-237
L19	6110001570	Coil	LA-237
L20	6110001560	Coil	LA-236
L21	6110001610	Coil	LA-244
L22	6110001530	Coil	LA-233
L23	6110001550	Coil	LA-235
L24	6110001680	Coil	LA-254
L25	6110001680	Coil	LA-254
L26	6170000180	Coil	LW-19
L27	6110001590	Coil	LA-242 (#01)
	6110001670	Coil	LA-253 (#02)
	6110001670	Coil	LA-253 (#03)
	6110001670	Coil	LA-253 (#04)
	6110001670	Coil	LA-253 (#05)
L28	6110001670	Coil	LA-253 (#01)
	6110001600	Coil	LA-243 (#02)
	6110001600	Coil	LA-243 (#03)
	6110001600	Coil	LA-243 (#04)
	6110001600	Coil	LA-243 (#05)
L29	6110001670	Coil	LA-253
L30	6170000150	Coil	LW-16
L31	6180001440	Coil	RFC S4 101K
L32	6180001460	Coil	LAL 03NA 681K
L33	6180000900	Coil	LAL 03NA 101K
L34	6180001120	Coil	FL 5H 101K
L35	6180000960	Coil	LAL 03NA 102K
L36	6110001610	Coil	LA-244
L37	6110001550	Coil	LA-235
L38	6110001550	Coil	LA-235
F11	2010001020	Filter	21M 7B2 (#01)
	2010001020	Filter	21M 7B2 (#02)
	2010001020	Filter	21M 7B2 (#03)
	2010001020	Filter	21M 7B2 (#04)
	2010001050	Filter	21M15B3 (#05)
F12	2020000150	Filter	CFW455HT (#01)
	2020000150	Filter	CFW455HT (#02)
	2020000150	Filter	CFW455HT (#03)
	2020000150	Filter	CFW455HT (#04)
	2020000120	Filter	CFW455E (#05)
X1	6050002000	Crystal	CR-70
X2	6070000010	Discriminator	CDB455 C7A
X3	6050004930	Crystal	CR-212 (#01)
	6050004930	Crystal	CR-212 (#02)

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
X3	6050004930	Crystal	CR-212 (#03)
	6050004930	Crystal	CR-212 (#04)
	6050004930	Crystal	CR-212 (#05)
R1	7010003680	Resistor	ELR20J 150K Ω
R2	7010003680	Resistor	ELR20J 150K Ω
R3	7010003190	Resistor	ELR20J 18 Ω
R4	7010003460	Resistor	ELR20J 3.3K Ω
R5	7010004070	Resistor	R20J 100 Ω
R6	7010003680	Resistor	ELR20J 150K Ω
R7	7010003680	Resistor	ELR20J 150K Ω
R8	7010003680	Resistor	ELR20J 150K Ω
R9	7010004070	Resistor	R20J 100 Ω
R10	7010004370	Resistor	R20J 22K Ω
R11	7010003340	Resistor	ELR20J 330 Ω
R12	7010003340	Resistor	ELR20J 330 Ω
R13	7010003440	Resistor	ELR20J 2.2K Ω
R14	7010003200	Resistor	ELR20J 22 Ω
R15	7010003200	Resistor	ELR20J 22 Ω
R16	7010004320	Resistor	R20J 10K Ω
R18	7010004320	Resistor	R20J 10K Ω
R19	7010003740	Resistor	ELR20J 470K Ω
R20	7010003280	Resistor	ELR20J 100 Ω
R21	7010001030	Resistor	R25J 100 Ω
R22	7010004320	Resistor	R20J 10K Ω
R23	7010003780	Resistor	ELR20J 1M Ω
R24	7010003620	Resistor	ELR20J 47K Ω
R25	7010003440	Resistor	ELR20J 2.2K Ω (#01)
	7010003440	Resistor	ELR20J 2.2K Ω (#02)
	7010003440	Resistor	ELR20J 2.2K Ω (#03)
	7010003440	Resistor	ELR20J 2.2K Ω (#04)
	7010003420	Resistor	ELR20J 1.5K Ω (#05)
R26	7010003440	Resistor	ELR20J 2.2K Ω (#01)
	7010003440	Resistor	ELR20J 2.2K Ω (#02)
	7010003440	Resistor	ELR20J 2.2K Ω (#03)
	7010003440	Resistor	ELR20J 2.2K Ω (#04)
	7010003420	Resistor	ELR20J 1.5K Ω (#05)
R27	7010003620	Resistor	ELR20J 47K Ω
R28	7010003420	Resistor	ELR20J 1.5K Ω
R29	7010003440	Resistor	ELR20J 2.2K Ω
R30	7010003580	Resistor	ELR20J 22K Ω
R31	7510000090	Thermistor	ERT-D2FGL202S
R32	7010003710	Resistor	ELR20J 270K Ω (#01)
	7010003710	Resistor	ELR20J 270K Ω (#02)
	7010003710	Resistor	ELR20J 270K Ω (#03)
	7010003710	Resistor	ELR20J 270K Ω (#04)
	7010003720	Resistor	ELR20J 330K Ω (#05)
R34	7010003620	Resistor	ELR20J 47K Ω (#01)
	7010003620	Resistor	ELR20J 47K Ω (#02)
	7010003620	Resistor	ELR20J 47K Ω (#03)
	7010003620	Resistor	ELR20J 47K Ω (#04)
	7010003580	Resistor	ELR20J 22K Ω (#05)
R35	7010003620	Resistor	ELR20J 47K Ω
R36	7010003660	Resistor	ELR20J 100K Ω
R37	7010003340	Resistor	ELR20J 330 Ω
R38	7010003490	Resistor	ELR20J 5.6K Ω
R39	7010003480	Resistor	ELR20J 4.7K Ω
R40	7010004070	Resistor	R20J 100 Ω
R41	7010003280	Resistor	ELR20J 100 Ω
R42	7010004030	Resistor	R20J 47 Ω
R43	7010003340	Resistor	ELR20J 330 Ω
R44	7010003340	Resistor	ELR20J 330 Ω
R45	7010003990	Resistor	R20J 22 Ω
R46	7010003440	Resistor	ELR20J 2.2K Ω
R47	7010004250	Resistor	R20J 3.3K Ω
R48	7010003280	Resistor	ELR20J 100 Ω
R49	7010003400	Resistor	ELR20J 1K Ω
R50	7010003260	Resistor	ELR20J 68 Ω
R51	7010004050	Resistor	R20J 68 Ω
R52	7010004120	Resistor	R20J 270 Ω
R53	7010004250	Resistor	R20J 3.3K Ω
R54	7010004230	Resistor	R20J 2.2K Ω
R55	7010003320	Resistor	ELR20J 220 Ω
R56	7010003440	Resistor	ELR20J 2.2K Ω
R57	7010003440	Resistor	ELR20J 2.2K Ω

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R58	7010003440	Resistor	ELR20J 2.2K Ω
R59	7010003440	Resistor	ELR20J 2.2K Ω
R60	7010003280	Resistor	ELR20J 100 Ω
R61	7010003280	Resistor	ELR20J 100 Ω
R62	7010003440	Resistor	ELR20J 2.2K Ω
R63	7010003550	Resistor	ELR20J 15K Ω
R64	7010004070	Resistor	R20J 100 Ω
R65	7010003280	Resistor	ELR20J 100 Ω
R66	7010003400	Resistor	ELR20J 1K Ω
R67	7010003280	Resistor	ELR20J 100 Ω
R68	7010003400	Resistor	ELR20J 1K Ω
R69	7010000130	Resistor	ELR25J 10 Ω
R70	7010004660	Resistor	R50XJ 15 Ω
R71	7010004270	Resistor	R20J 4.7K Ω
R72	7010003280	Resistor	ELR20J 100 Ω
R73	7010003530	Resistor	ELR20J 10K Ω
R74	7010004450	Resistor	R20J 100K Ω
R75	7010003590	Resistor	ELR20J 27K Ω
R76	7010003600	Resistor	ELR20J 33K Ω
R77	7010003550	Resistor	ELR20J 15K Ω
R78	7010004390	Resistor	R20J 33K Ω
R79	7310000790	Trimmer	RH0651C15J1UA (104)
R80	7010003600	Resistor	ELR20J 33K Ω
R81	7010003550	Resistor	ELR20J 15K Ω
R82	7510000090	Thermistor	ERT-D2FGL202S
R83	7010003530	Resistor	ELR20J 10K Ω
R84	7510000090	Thermistor	ERT-D2FGL202S
R85	7010003440	Resistor	ELR20J 2.2K Ω
R86	7010003510	Resistor	ELR20J 6.8K Ω
R87	7010003660	Resistor	ELR20J 100K Ω
R88	7010003660	Resistor	ELR20J 100K Ω
R89	7010003440	Resistor	ELR20J 2.2K Ω
R90	7010003280	Resistor	ELR20J 100 Ω
R91	7010003400	Resistor	ELR20J 1K Ω
R92	7010004170	Resistor	R20J 680 Ω
R93	7010003650	Resistor	ELR20J 82K Ω
R94	7010003480	Resistor	ELR20J 4.7K Ω
R95	7010003740	Resistor	ELR20J 470K Ω
R99	7010003640	Resistor	ELR20J 68K Ω
R100	7010003530	Resistor	ELR20J 10K Ω
R101	7010003540	Resistor	ELR20J 12K Ω
R102	7010003540	Resistor	ELR20J 12K Ω
R103	7010003400	Resistor	ELR20J 1K Ω
R104	7010003400	Resistor	ELR20J 1K Ω
R105	7010003580	Resistor	ELR20J 22K Ω
R106	7010003480	Resistor	ELR20J 4.7K Ω
R107	7010003660	Resistor	ELR20J 100K Ω
R108	7010003620	Resistor	ELR20J 47K Ω
R109	7010004320	Resistor	R20J 10K Ω
R110	7010003380	Resistor	ELR20J 680 Ω
R111	7010003540	Resistor	ELR20J 12K Ω
R112	7010003490	Resistor	ELR20J 5.6K Ω
R113	7010004070	Resistor	R20J 100 Ω
R114	7010003410	Resistor	ELR20J 1.2K Ω
R115	7010004070	Resistor	R20J 100 Ω
R116	7010003280	Resistor	ELR20J 100 Ω
R117	7010004320	Resistor	R20J 10K Ω
R118	7010004110	Resistor	R20J 220 Ω
R119	7010004150	Resistor	R20J 470 Ω (#01only)
R120	7010003400	Resistor	ELR20J 1K Ω
R121	7010003600	Resistor	ELR20J 33K Ω
R122	7010003640	Resistor	ELR20J 68K Ω
R123	7010003380	Resistor	ELR20J 680 Ω
C1	4010000500	Ceramic	DD104 B 102K 50V
C2	4010000500	Ceramic	DD104 SL 030C 50V
C4	4010000500	Ceramic	DD104 B 102K 50V
C5	4010000500	Ceramic	DD104 B 102K 50V
C6	4010000460	Ceramic	DD104 B 471K 50V
C8	4010000010	Ceramic	DD104 SL 0R5C 50V
C9	4010000040	Ceramic	DD104 SL 020C 50V
C10	4010000020	Ceramic	DD104 SL 010C 50V
C11	4010000500	Ceramic	DD104 B 102K 50V
C13	4010000500	Ceramic	DD104 B 102K 50V
C14	4010000500	Ceramic	DD104 B 102K 50V

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION
C15	4010000500	Ceramic DD104 B 102K 50V
C16	4010000050	Ceramic DD104 SL 680J 50V
C17	4010000500	Ceramic DD104 B 102K 50V
C18	4010000500	Ceramic DD104 B 102K 50V
C19	4010000500	Ceramic DD104 B 102K 50V
C20	4010000520	Ceramic DD108 B 472K 50V
C21	4010000150	Ceramic DD104 SL 150J 50V (#01)
	4010000150	Ceramic DD104 SL 150J 50V (#02)
	4010000150	Ceramic DD104 SL 150J 50V (#03)
	4010000150	Ceramic DD104 SL 150J 50V (#04)
	4010000100	Ceramic DD104 SL 100J 50V (#05)
C22	4010000320	Ceramic DD104 SL 680J 50V
C23	4010000300	Ceramic DD104 SL 680J 50V
C24	4010000500	Ceramic DD104 B 102K 50V
C25	4040000150	Barrier Layer UAT 05X 472K
C26	4010000500	Ceramic DD104 B 102K 50V
C27	4010000340	Ceramic DD105 SL 121J 50V
C28	4010000300	Ceramic DD104 SL 680J 50V
C29	4040000260	Barrier Layer UAT 05X 104M
C30	4010000320	Ceramic DD104 SL 680J 50V
C31	4550000320	Tantalum DN 1V 0R1M
C32	4010000500	Ceramic DD104 B 102K 50V
C33	4510001100	Electrolytic 16 MS7 10UF
C34	4510001970	Electrolytic 50 MS7 0R1UF
C35	4040000260	Barrier Layer UZE 08X 104M
C36	4310000010	Mylar F2D 50V 102K
C37	4310000050	Mylar F2D 50V 222K (#01)
	4310000050	Mylar F2D 50V 222K (#02)
	4310000050	Mylar F2D 50V 222K (#03)
	4310000050	Mylar F2D 50V 222K (#04)
	4310000010	Mylar F2D 50V 102K (#05)
C38	4010000190	Ceramic DD104 SL 240J 50V (#01)
	4010000190	Ceramic DD104 SL 240J 50V (#02)
	4010000190	Ceramic DD104 SL 240J 50V (#03)
	4010000190	Ceramic DD104 SL 240J 50V (#04)
	4010000220	Ceramic DD104 SL 330J 50V (#05)
C39	4310000050	Mylar F2D 50V 222K (#01)
	4310000050	Mylar F2D 50V 222K (#02)
	4310000050	Mylar F2D 50V 222K (#03)
	4310000050	Mylar F2D 50V 222K (#04)
	4310000010	Mylar F2D 50V 102K (#05)
C40	4510003100	Electrolytic 35 MS7 4R7UF
C42	4310000060	Mylar F2D 50V 223K
C43	4510002730	Electrolytic 10 SS 100UF
C44	4010000460	Ceramic DD104 B 471K 50V
C45	4610000780	Trimmer CV38D 2001
C46	4010000210	Ceramic DD104 SL 300J 50V
C47	4010000500	Ceramic DD104 B 102K 50V
C48	4010000460	Ceramic DD104 B 471K 50V
C50	4010000260	Ceramic DD104 SL 470J 50V
C51	4010000180	Ceramic DD104 SL 220J 50V
C52	4010003270	Ceramic DD104 UJ 030C 50V
C53	4010000010	Ceramic DD104 SL 0R5C 50V
C54	4010003270	Ceramic DD104 UJ 030C 50V
C55	4010000460	Ceramic DD104 B 471K 50V
C56	4010000500	Ceramic DD104 B 102K 50V
C57	4010000500	Ceramic DD104 B 102K 50V
C58	4010000180	Ceramic DD104 SL 220J 50V
C59	4010000500	Ceramic DD104 B 102K 50V
C60	4010000500	Ceramic DD104 B 102K 50V
C61	4010000460	Ceramic DD104 B 471K 50V
C62	4010000500	Ceramic DD104 B 102K 50V
C63	4010000160	Ceramic DD104 SL 180J 50V
C64	4010000500	Ceramic DD104 B 102K 50V
C65	4010000500	Ceramic DD104 B 102K 50V
C66	4010000500	Ceramic DD104 B 102K 50V
C67	4010000500	Ceramic DD104 B 102K 50V
C68	4010000160	Ceramic DD104 SL 180J 50V
C69	4010000160	Ceramic DD104 SL 180J 50V
C70	4010000500	Ceramic DD104 B 102K 50V
C71	4010000500	Ceramic DD104 B 102K 50V
C72	4010000100	Ceramic DD104 SL 80D 50V
C73	4010000500	Ceramic DD104 B 102K 50V
C74	4010000500	Ceramic DD104 B 102K 50V
C75	4010000460	Ceramic DD104 B 471K 50V
C76	4010000150	Ceramic DD104 SL 150J 50V

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION
C78	4010000500	Ceramic DD104 B 102K 50V
C79	4010000460	Ceramic DD104 B 471K 50V
C80	4010000500	Ceramic DD104 B 102K 50V
C81	4010000100	Ceramic DD104 SL 080D 50V
C82	4010000060	Ceramic DD104 SL 040C 50V (#01)
	4010000060	Ceramic DD104 SL 040C 50V (#02)
C83	4010000500	Ceramic DD104 B 102K 50V
C84	4010000500	Ceramic DD104 B 102K 50V
C86	4010000460	Ceramic DD104 B 471K 50V
C87	4010000460	Ceramic DD104 B 471K 50V
C88	4010000500	Ceramic DD104 B 102K 50V
	4010000500	Ceramic DD104 B 471K 50V
C89	4010000500	Ceramic DD104 B 102K 50V
C91	4010000500	Ceramic DD104 B 102K 50V
C92	4010003860	Ceramic DD06 SL 090D 500V (#01)
	4010003850	Ceramic DD06 SL 090D 500V (#02)
	4010003850	Ceramic DD06 SL 090D 500V (#03)
	4010003850	Ceramic DD06 SL 090D 500V (#04)
	4010003850	Ceramic DD06 SL 080D 500V (#05)
C93	401000460	Ceramic DD104 B 471K 50V
C94	4010000500	Ceramic DD104 B 102K 50V
C95	4010000500	Ceramic DD104 B 102K 50V
C96	4010000460	Ceramic DD104 B 471K 50V
C97	4010000500	Ceramic DD104 B 102K 50V
C98	4010000460	Ceramic DD104 B 471K 50V
C99	4010000500	Ceramic DD104 B 102K 50V
C100	4040000260	Barrier Layer UZE 08X 104M
C101	4010003770	Ceramic DD06 SL 0R5C 500V
C102	4010000460	Ceramic DD104 B 471K 50V
C103	4010003810	Ceramic DD06 SL 040C 500V
C104	4010004120	Ceramic DD07 B 102K 500V
C105	4010003960	Ceramic DD06 SL 390K 500V
C106	4010003900	Ceramic DD06 SL 200K 500V
C107	4010003890	Ceramic DD06 SL 180K 500V (#01)
	4010003820	Ceramic DD06 SL 050C 500V (#02)
	4010003800	Ceramic DD06 SL 030C 500V (#03)
	4010003800	Ceramic DD06 SL 030C 500V (#04)
	4010003800	Ceramic DD06 SL 030C 500V (#05)
C108	4010003900	Ceramic DD06 SL 200K 500V (#01)
	4010003920	Ceramic DD06 SL 240K 500V (#02)
	4010003900	Ceramic DD06 SL 200K 500V (#03)
	4010003900	Ceramic DD06 SL 200K 500V (#04)
	4010003900	Ceramic DD06 SL 200K 500V (#05)
C109	4010003820	Ceramic DD06 SL 050C 500V (#01)
	4010003850	Ceramic DD06 SL 080D 500V (#02)
	4010003850	Ceramic DD06 SL 080D 500V (#03)
	4010003850	Ceramic DD06 SL 080D 500V (#04)
	4010003850	Ceramic DD06 SL 080D 500V (#05)
C110	4010003920	Ceramic DD06 SL 240K 500V
C111	4010003780	Ceramic DD06 SL 010C 500V
C112	4010003820	Ceramic DD06 SL 050C 500V
C113	4010003830	Ceramic DD06 SL 060D 500V
C114	4010000500	Ceramic DD104 B 102K 50V
C115	4550000360	Tantalum DN 1V R47M
C117	4040000190	Barrier Layer UAT 05X 103K
C118	4040000260	Barrier Layer UZE 08X 104M
C119	4510002380	Electrolytic 16 SS 470UF (10X12.5)
C120	4510002380	Electrolytic 16 SS 470UF (10X12.5)
C121	4010000520	Ceramic DD108 B 472K 50V
C122	4510002380	Electrolytic 16 SS 470UF (10X12.5)
C123	4510002380	Electrolytic 16 SS 470UF (10X12.5)
C124	4010000500	Ceramic DD104 B 102K 50V
C125	4040000260	Barrier Layer UZE 08X 104M
C126	4510002640	Electrolytic 25 SS 47UF
C128	4040000260	Barrier Layer UZE 08X 104M
C129	4040000260	Barrier Layer UZE 08X 104M
C130	4010000640	Ceramic DD104 CH 040C 50V
C131	4010000500	Ceramic DD104 B 102K 50V
C132	4010000330	Ceramic DD105 SL 101J 50V
C133	4010000380	Ceramic DD107 SL 221J 50V
C134	4010000500	Ceramic DD104 B 102K 50V
C136	4040000190	Barrier Layer UAT 05X 103K
C137	4010000800	Ceramic DD105 CH 270J 50V
C138	4610000780	Trimmer CV38D 2001
C139	4010000500	Ceramic DD104 B 102K 50V
C140	4010000500	Ceramic DD104 B 102K 50V

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION			
C141	4510001970	Electrolytic	50	MS7	0R1UF
C142	4510000980	Electrolytic	25	MS9	47UF
C143	4510002850	Electrolytic	25	SS	22UF
C144	4010000500	Ceramic	DD104	B	102K 50V
C145	4510002730	Electrolytic	10	SS	100UF
C146	4510002730	Electrolytic	10	SS	100UF
C148	4040000250	Barrier Layer	UAT	08X	473M
C149	4550000260	Tantalum	DN	1V	100M
C150	4040000190	Barrier Layer	UAT	05X	103K
C151	4550000320	Tantalum	DN	1V	0R1M
C152	4510001970	Electrolytic	50	MS7	0R1UF
C153	4510002720	Electrolytic	10	SS	47UF
C154	4010000500	Ceramic	DD104	B	102K 50V
C155	4510001480	Electrolytic	50	MS5	2R2UF
C156	4010000500	Ceramic	DD104	B	102K 50V
C157	4010000120	Ceramic	DD104	SL	100P 50V #01
	4010000120	Ceramic	DD104	SL	100P 50V #02
C158	4010000500	Ceramic	DD104	B	102K 50V
C160	4020000090	Cylinder	UP125	SL	150J
C161	4010000220	Ceramic	DD104	SL	330J 50V
C162	4010000180	Ceramic	DD104	SL	220J 50V
C163	4010000180	Ceramic	DD104	SL	220J 50V
C165	4010000500	Ceramic	DD104	B	102K 50V
C166	4010000500	Ceramic	DD104	B	102K 50V
C167	4010000500	Ceramic	DD104	B	102K 50V
C168	4010000010	Ceramic	DD104	SL	0R5C 50V
C169	4010000010	Ceramic	DD104	SL	0R5C 50V
C170	4010000010	Ceramic	DD104	SL	0R5C 50V
C171	4010000500	Ceramic	DD104	B	102K 50V
C172	4040000260	Barrier Layer	UZE	08X	104M
C173	4510001100	Electrolytic	16	MS7	10UF
C174	40100003910	Ceramic	DD06	SL	220K 500V
C176	4510001470	Electrolytic	50	MS5	1UF
C177	4010000500	Ceramic	DD104	B	102K 50V
C178	4040000260	Barrier Layer	UZE	08X	104M
C179	4550000320	Tantalum	DN	1V	0R1M
C180	4010000500	Ceramic	DD104	B	102K 50V
C181	4010000500	Ceramic	DD104	B	102K 50V
C182	4510001690	Electrolytic	EP3	MS7	47UF
C183	4040000190	Barrier Layer	UAT	05X	103K
C184	4550001040	Tantalum	DN	1C	3R3M
C185	4310000060	Mylar	F2D	50V	223K
C186	4010000460	Ceramic	DD104	B	471K 50V
C188	4010000500	Ceramic	DD104	B	102K 50V
C189	4010000500	Ceramic	DD104	B	102K 50V
C190	4010000500	Ceramic	DD104	B	102K 50V
C191	4010000500	Ceramic	DD104	B	102K 50V
C193	4010000520	Ceramic	DD108	B	472K 50V
C194	4010000500	Ceramic	DD104	B	102K 50V
C195	4010000520	Ceramic	DD108	B	472K 50V
C196	4010000500	Ceramic	DD104	B	102K 50V
C197	4010000520	Ceramic	DD108	B	472K 50V
C199	4010003800	Ceramic	DD06	SL	030C 500V #01
	4010003820	Ceramic	DD06	SL	030C 500V #02
C200	4010000500	Ceramic	DD104	B	102K 50V
C201	4040000190	Barrier Layer	UAT	05X	103K
C202	4010000500	Ceramic	DD104	B	102K 50V
C203	4010000210	Ceramic	DD104	SL	300J 50V
C204	4010000300	Ceramic	DD104	SL	680J 50V
C206	4010000500	Ceramic	DD104	B	102K 50V
W4	7120000010	Jumper	JPW	02A	
W5	7120000010	Jumper	JPW	02A	
W6	7120000010	Jumper	JPW	02A	
W7	7120000010	Jumper	JPW	02A	
W8	7120000010	Jumper	JPW	02A	
W9	7120000010	Jumper	JPW	02A	
J1	6510003390	Connector	B03B-EH-S		
J2	6510010240	Connector	SB10P-HVQ-22		
J3	6510003140	Connector	SB5P-HVQ-22		
J4	6510003140	Connector	SB5P-HVQ-22		

[MAIN UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
EP1	0910024465	P. C. Board	B 2349E (MAIN)
EP3	6910000970	Bead Core	DL 20P 2.6-3-1.2H
EP4	6910000970	Bead Core	DL 20P 2.6-3-1.2H

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1140000950	IC	μ PD75306GF-045-389
IC2	1130000590	IC	μ PD4081BG-T1
IC3	1130004500	IC	TC4S11F (TE85R)
IC4	1110001550	IC	S-8054ALB-LM-T1
IC5	1130000830	IC	μ PD4094BG-T1
IC6	1110001220	IC	BA4558F T1
IC7	1110000210	IC	μ PC2002H
IC8	1110001220	IC	BA4558F T1
IC9	1110001220	IC	BA4558F T1
Q1	1530000980	Transistor	2SC3395-TA
Q2	1530000980	Transistor	2SC3395-TA
Q3	1510000580	Transistor	2SA1362 GR (TE85R)
Q4	1530001940	Transistor	2SC2712-BL (TE85R)
Q5	1590000380	FET	2SJ106-Y (TE85R)
Q6	1590000380	FET	2SJ106-Y (TE85R)
D1	1750000040	Diode	1SS190 (TE85R)
D2	1750000010	Diode	1SS181 (TE85R)
D3	1750000060	Diode	1SS196 (TE85R)
D4	1710000040	Diode	1S953
D5	1750000020	Diode	1SS184 (TE85R)
D6	1750000060	Diode	1SS196 (TE85R)
D7	1750000030	Diode	1SS187 (TE85R)
D8	1750000120	Diode	DWA010-TE
X1	6050004950	Crystal	CR-227
R1	7030000580	Resistor	MCR10EZHJ 47K Ω (473)
R2	7030000580	Resistor	MCR10EZHJ 47K Ω 473
R3	7030000580	Resistor	MCR10EZHJ 47K Ω 473
R4	7030000580	Resistor	MCR10EZHJ 47K Ω (473)
R5	7030000580	Resistor	MCR10EZHJ 47K Ω (473)
R6	7030000580	Resistor	MCR10EZHJ 47K Ω (473)
R7	7030000740	Resistor	MCR10EZHJ 1M Ω (105)
R8	7030000740	Resistor	MCR10EZHJ 1M Ω 105
R10	7030000580	Resistor	MCR10EZHJ 47K Ω 473
R11	7030000580	Resistor	MCR10EZHJ 47K Ω (473)
R12	7030000580	Resistor	MCR10EZHJ 47K Ω (473)
R13	7030000580	Resistor	MCR10EZHJ 47K Ω 473
R14	7030000740	Resistor	MCR10EZHJ 1M Ω 105
R15	7030000380	Resistor	MCR10EZHJ 1K Ω (102)
R16	7030000620	Resistor	MCR10EZHJ 100K Ω (104)
R18	7030000580	Resistor	MCR10EZHJ 47K Ω 473
R19	7030000580	Resistor	MCR10EZHJ 47K Ω (473)
R20	7030000580	Resistor	MCR10EZHJ 47K Ω (473)
R21	7030000580	Resistor	MCR10EZHJ 47K Ω (473)
R22	7030000580	Resistor	MCR10EZHJ 47K Ω 473
R23	7030000500	Resistor	MCR10EZHJ 10K Ω 103
R24	7030000590	Resistor	MCR10EZHJ 56K Ω (563)
R25	7030000260	Resistor	MCR10EZHJ 100 Ω (101)
R26	7030000490	Resistor	MCR10EZHJ 8.2K Ω (822)
R27	7030000500	Resistor	MCR10EZHJ 10K Ω (103)
R28	7030000390	Resistor	MCR10EZHJ 1.2K Ω (122)

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
R29	7030000740	Resistor	MCR10EZHZ 1MΩ (105)
R30	7030000620	Resistor	MCR10EZHZ 100KΩ (104)
R31	7030000740	Resistor	MCR10EZHZ 1MΩ (105)
R32	7030000560	Resistor	MCR10EZHZ 33KΩ (333)
R33	7030000490	Resistor	MCR10EZHZ 8.2KΩ (822)
R34	7030000550	Resistor	MCR10EZHZ 27KΩ (273)
R35	7030000500	Resistor	MCR10EZHZ 10KΩ (103)
R36	7030000710	Resistor	MCR10EZHZ 560KΩ (564)
R37	7030000490	Resistor	MCR10EZHZ 8.2KΩ (822)
R38	7030000060	Resistor	MCR10EZHZ 2.2Ω (2R2)
R39	7030000740	Resistor	MCR10EZHZ 1MΩ (105)
R40	7030000620	Resistor	MCR10EZHZ 100KΩ (104)
R41	7030000500	Resistor	MCR10EZHZ 10KΩ 103
R42	7030000730	Resistor	MCR10EZHZ 820KΩ (824)
R43	7030000620	Resistor	MCR10EZHZ 100KΩ (104)
R44	7030000460	Resistor	MCR10EZHZ 4.7KΩ (472)
R45	7030000560	Resistor	MCR10EZHZ 33KΩ (333)
R46	7030000380	Resistor	MCR10EZHZ 1KΩ (102)
R47	7030000460	Resistor	MCR10EZHZ 4.7KΩ (472)
R48	7030000460	Resistor	MCR10EZHZ 4.7KΩ (472)
R49	7310000750	Trimmer	RH0651C14J2WA (103)
R50	7030000390	Resistor	MCR10EZHZ 1.2KΩ (122)
R51	7310000810	Trimmer	RH0651CS5J10A (474)
R52	7030000260	Resistor	MCR10EZHZ 100Ω (101)
R53	7030000480	Resistor	MCR10EZHZ 6.8KΩ (682)
R54	7030000700	Resistor	MCR10EZHZ 470KΩ (474)
R55	7310000740	Trimmer	RH0651CS3J2KA (472)
R56	7030000670	Resistor	MCR10EZHZ 270KΩ (274)
R57	7030000630	Resistor	MCR10EZHZ 120KΩ (124)
R58	7030000580	Resistor	MCR10EZHZ 47KΩ (473)
R59	7030000560	Resistor	MCR10EZHZ 33KΩ (333)
R60	7310000820	Trimmer	RH0651C16J0RA (105)
R61	7030000570	Resistor	MCR10EZHZ 39KΩ (393)
R62	7030000570	Resistor	MCR10EZHZ 39KΩ (393)
R63	7030000260	Resistor	MCR10EZHZ 100Ω (101)
R64	7030000580	Resistor	MCR10EZHZ 47KΩ (473)
R65	7030000580	Resistor	MCR10EZHZ 47KΩ (473)
R66	7030000060	Resistor	MCR10EZHZ 2.2Ω (2R2)
R67	7030000330	Resistor	MCR10EZHZ 390Ω (391)
R68	7030000020	Resistor	MCR10EZHZ 1Ω (010)
R69	7030000620	Resistor	MCR10EZHZ 100KΩ (104)
R70	7030000620	Resistor	MCR10EZHZ 100KΩ (104)
R71	7030000740	Resistor	MCR10EZHZ 1MΩ (105)
R72	7030000670	Resistor	MCR10EZHZ 270KΩ (274)
R73	7030000620	Resistor	MCR10EZHZ 100KΩ (104)
C1	4030000650	Ceramic	GRM40 SL 150J 50PT
C2	4030000650	Ceramic	GRM40 SL 150J 50PT
C3	4030000700	Ceramic	GRM40 SL 470J 50PT
C4	4030001090	Ceramic	GRM40 B 471K 50PT
C5	4030001090	Ceramic	GRM40 B 471K 50PT
C6	4030001090	Ceramic	GRM40 B 471K 50PT
C7	4030001090	Ceramic	GRM40 B 471K 50PT
C8	4030001090	Ceramic	GRM40 B 471K 50PT
C9	4030001090	Ceramic	GRM40 B 471K 50PT
C10	4030000780	Ceramic	GRM40 SL 221J 50PT
C11	4030000700	Ceramic	GRM40 SL 470J 50PT
C12	4030001150	Ceramic	GRM40 F 104Z 25PT
C13	4030001150	Ceramic	GRM40 F 104Z 25PT
C14	4030001130	Ceramic	GRM40 B 103K 50PT
C15	4550002040	Tantalum	DN 1A 330M
C16	4030001130	Ceramic	GRM40 B 103K 50PT
C17	4030001090	Ceramic	GRM40 B 471K 50PT
C18	4510001140	Electrolytic	50 MS7 R22UF
C19	4030001130	Ceramic	GRM40 B 103K 50PT
C20	4510002970	Electrolytic	50 SS 4R7UF
C21	4510002940	Electrolytic	50 SS 1UF
C22	4030001130	Ceramic	GRM40 B 103K 50PT
C23	4310000010	Mylar	F2D 50V 102K
C24	4310000020	Mylar	F2D 50V 103K
C25	4310000020	Mylar	F2D 50V 103K
C26	4310000020	Mylar	F2D 50V 103K
C27	4030001150	Ceramic	GRM40 F 104Z 25PT
C28	4510002930	Electrolytic	50 SS R47UF
C29	4510002930	Electrolytic	50 SS R47UF

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
C30	4030001090	Ceramic	GRM40 B 471K 50PT
C31	4510002830	Electrolytic	25 SS 4R7UF
C32	4030001150	Ceramic	GRM40 F 104Z 25PT
C33	4030001090	Ceramic	GRM40 B 471K 50PT
C34	4030001130	Ceramic	GRM40 B 103K 50PT
C35	4510002320	Electrolytic	6R3 SS 470UF
C36	4510002380	Electrolytic	16 SS 470UF (10X12.5)
C37	4030001150	Ceramic	GRM40 F 104Z 25PT
C38	4510002380	Electrolytic	16 SS 470UF (10X12.5)
C39	4030001130	Ceramic	GRM40 B 103K 50PT
C40	4030001090	Ceramic	GRM40 B 471K 50PT
C46	4030001090	Ceramic	GRM40 B 471K 50PT
C47	4310000020	Mylar	F2D 50V 103K
C48	4510001970	Electrolytic	50 MS7 0R1UF
C49	4510001100	Electrolytic	16 MS7 10UF
C50	4030001130	Ceramic	GRM40 B 103K 50PT
C51	4510003100	Electrolytic	35 MS7 4R7UF
C52	4030001090	Ceramic	GRM40 B 471K 50PT
C53	4510001970	Electrolytic	50 MS7 0R1UF
C54	4510001170	Electrolytic	50 MS7 2R2UF
C55	4510003100	Electrolytic	35 MS7 4R7UF
C56	4310000050	Mylar	F2D 50V 222K
C57	4030001090	Ceramic	GRM40 B 471K 50PT
C58	4030001100	Ceramic	GRM40 B 102K 50PT
C59	4030001100	Ceramic	GRM40 B 102K 50PT
C60	4310000010	Mylar	F2D 50V 102K
C61	4310000020	Mylar	F2D 50V 103K
C62	4030000760	Ceramic	GRM40 SL 151J 50PT #01
	4030000760	Ceramic	GRM40 SL 151J 50PT #02
	4030000760	Ceramic	GRM40 SL 151J 50PT #03
	4030000760	Ceramic	GRM40 SL 151J 50PT #04
	4030000740	Ceramic	GRM40 SL 101J 50PT #05
C63	4030001130	Ceramic	GRM40 B 103K 50PT
C64	4510002940	Electrolytic	50 SS 1UF
C65	4030000700	Ceramic	GRM40 SL 470J 50PT
C66	4030000700	Ceramic	GRM40 SL 470J 50PT
C67	4030001090	Ceramic	GRM40 B 471K 50PT
C68	4030001090	Ceramic	GRM40 B 471K 50PT
C69	4030001090	Ceramic	GRM40 B 471K 50PT
C70	4030001090	Ceramic	GRM40 B 471K 50PT
C71	4030001090	Ceramic	GRM40 B 471K 50PT
C72	4030001150	Ceramic	GRM40 F 104Z 25PT
C73	4510002780	Electrolytic	16 SS 10UF
C75	4030001100	Ceramic	GRM40 B 102K 50PT
C76	4030001100	Ceramic	GRM40 B 102K 50PT
S1	2260000390	Switch	SKHLAB064A
BT1	3020000020	Lithium Battery	BR2032-1T2
J1	6510003410	Connector	B05B-EH-S
J2	6510003420	Connector	B06B-EH-S
J3	6510003410	Connector	B05B-EH-S
J4	6510003390	Connector	B03B-EH-S
J5	6510003400	Connector	B04B-EH-S
J6	6510005430	Connector	5512-14A
J7	6510010070	Connector	HKP 5FDS2
J8	6510010070	Connector	HKP 5FDS2
J9	6510010080	Connector	HKP 10FDS2
J10	6910003150	Connector	1MSA9202B-2-04T
J12	6510003390	Connector	B03B-EH-S
J13	6510003390	Connector	B03B-EH-S

[LOGIC UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
P1	6910003120	Connector	1MSA-9206H-T
P2	6910003120	Connector	1MSA-9206H-T
CP1	6510003080	Check Point	RT01T-1.0B
CP2	6510003080	Check Point	RT01T-1.0B
EP1	0910024555	P. C. Board	B 2355E LOGIC

[CTCSS UNIT]

REF. NO.	ORDER NO.	DESCRIPTION	
IC1	1110000960	IC	NJM4558M (T1)
IC2	1130001830	IC	MN6520
Q3	1530000980	Transistor	2SC3395-TA
X1	6050003110	Crystal	RF4A3 FAC
R1	7030000660	Resistor	MCR10EZHZ 220K Ω (224)
R2	7030000660	Resistor	MCR10EZHZ 220K Ω (224)
R3	7030000660	Resistor	MCR10EZHZ 220K Ω 224
R4	7030000660	Resistor	MCR10EZHZ 220K Ω 224
R5	7030000670	Resistor	MCR10EZHZ 270K Ω (274)
R6	7030000660	Resistor	MCR10EZHZ 220K Ω (224)
R7	7030000650	Resistor	MCR10EZHZ 180K Ω (184)
R8	7030000500	Resistor	MCR10EZHZ 10K Ω (103)
R9	7030000520	Resistor	MCR10EZHZ 15K Ω 153
R11	7030000500	Resistor	MCR10EZHZ 10K Ω 103
R12	7030000420	Resistor	MCR10EZHZ 2.2K Ω (222)
R13	7030000500	Resistor	MCR10EZHZ 10K Ω (103)
R14	7030000640	Resistor	MCR10EZHZ 150K Ω (154)
R15	7030000380	Resistor	MCR10EZHZ 1K Ω (102)
C1	4030001140	Ceramic	GRM40 F 103Z 50PT
C2	4030003330	Ceramic	GRM40 B 223K 50PT
C3	4030001090	Ceramic	GRM40 B 471K 50PT
C4	4030003320	Ceramic	GRM40 F 333Z 50PT
C5	4030003180	Ceramic	GRM40 SL 271J 50PT
C6	4550000920	Tantalum	TESVA 1D 474M1-8L
C7	4550000790	Tantalum	TESVD OJ 476M-12L
C8	4030001150	Ceramic	GRM40 F 104Z 50PT
C9	4030000660	Ceramic	GRM40 SL 180J 50PT
C10	4030000660	Ceramic	GRM40 SL 180J 50PT
C11	4550000920	Tantalum	TESVA 1D 474M1-8L
C12	4030001150	Ceramic	GRM40 F 104Z 25PT
C13	4550000920	Tantalum	TESVA 1D 474M1-8L
J3	6510005810	Connector	5513-14CPB
EP1	0910014232	P. C. Board	B 1244B (CTCSS)

[OTHER UNITS]

REF. NO.	ORDER NO.	DESCRIPTION	
[FRONT UNIT]			
S1	2210000510	Switch	SRRM42021B [CHANNEL]
[LED UNIT]			
R1	7010004140	Resistor	R20J 390 Ω
R2	7010004110	Resistor	R20J 220 Ω
R3	7010004140	Resistor	R20J 390 Ω
R4	7010004140	Resistor	R20J 390 Ω
DS1	5040000420	LED	GL-9PR2
DS2	5040000430	LED	GL-9PG2
DS3	5040000850	LED	GL-9HY2
DS4	5040000420	LED	GL-9PR2
EP1	0910026420	P. C. Board	B 2669 (LED)
[VR UNIT]			
R1	7210001160	Variable Resistor	RK1631111A72A
R2	7210001170	Variable Resistor	RK1631110RJPA
EP1	0910024591	P. C. Board	B 2358A (VR)
[MIC UNIT]			
S1	2230000530	Switch	SPPH23078A [MONITOR]
J2	6510004820	Connector	FM14RS 7SS
EP1	0910024581	P. C. Board	B 2357A (MIC)
[CHASSIS UNIT]			
C1	4010000520	Ceramic	DD108 B 472K 50V
J1	6450000050	Connector	HSJ0296-01-150
SP1	2510000200	Speaker	66F09N 7

SECTION 7 ADJUSTMENT PROCEDURES

7-1 PLL ADJUSTMENT

ADJUSTMENT	ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
PLL REFERENCE FREQUENCY	1 <ul style="list-style-type: none"> • Select any channel. • Connect a dummy load. • Transmitting 	Antenna connector	Loosely couple the frequency counter to the antenna connector.	Same frequency as the programmed one. To check the programmed frequency, use the EX - 704.	MAIN	C138
LOCK VOLTAGE	NOTE: Lock voltage affects the C/N ratio. If you adjust the lock voltage, set the frequency with the EX - 704.					
	1 <ul style="list-style-type: none"> • Operating frequency: 146.000 MHz • Receiving 	MAIN	Connect the voltmeter to W5.	3.0 V	MAIN	L11
	2 <ul style="list-style-type: none"> • Transmitting 			2.5 V		C45

7-2 RECEIVER ADJUSTMENT

ADJUSTMENT	ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
SENSITIVITY	NOTE: When the sensitivity is less than $0.35 \mu\text{V}$ (12 dB SINAD) on every channel, the following sensitivity adjustment is not necessary. Skip to 7-3 TRANSMITTER ADJUSTMENT.					
	1 <ul style="list-style-type: none"> • Select any channel. • Set the signal generator; Level : $0.35 \mu\text{V}$ (-116 dBm) Mod. : 1 kHz Dev. : ± 1.5 kHz (narrow version) ± 3.0 kHz (wide version) • [SQL] control : Max. CCW • [MONITOR] swich : ON • Receiving 	REAR PANEL	Connect the distortion meter with the 4Ω load to the [EXP SP] jack.	Minimum distortion level	MAIN	Adjust in sequence L1~L5, L7~L9

CCW: counterclockwise

LOCATION AND CONNECTION

MAIN UNIT

CAUTION :
DO NOT connect the signal generator while transmitting.

DC POWER SUPPLY
• Current capacity : 10 A or more
• Output voltage : 13.8 V \pm 10 %

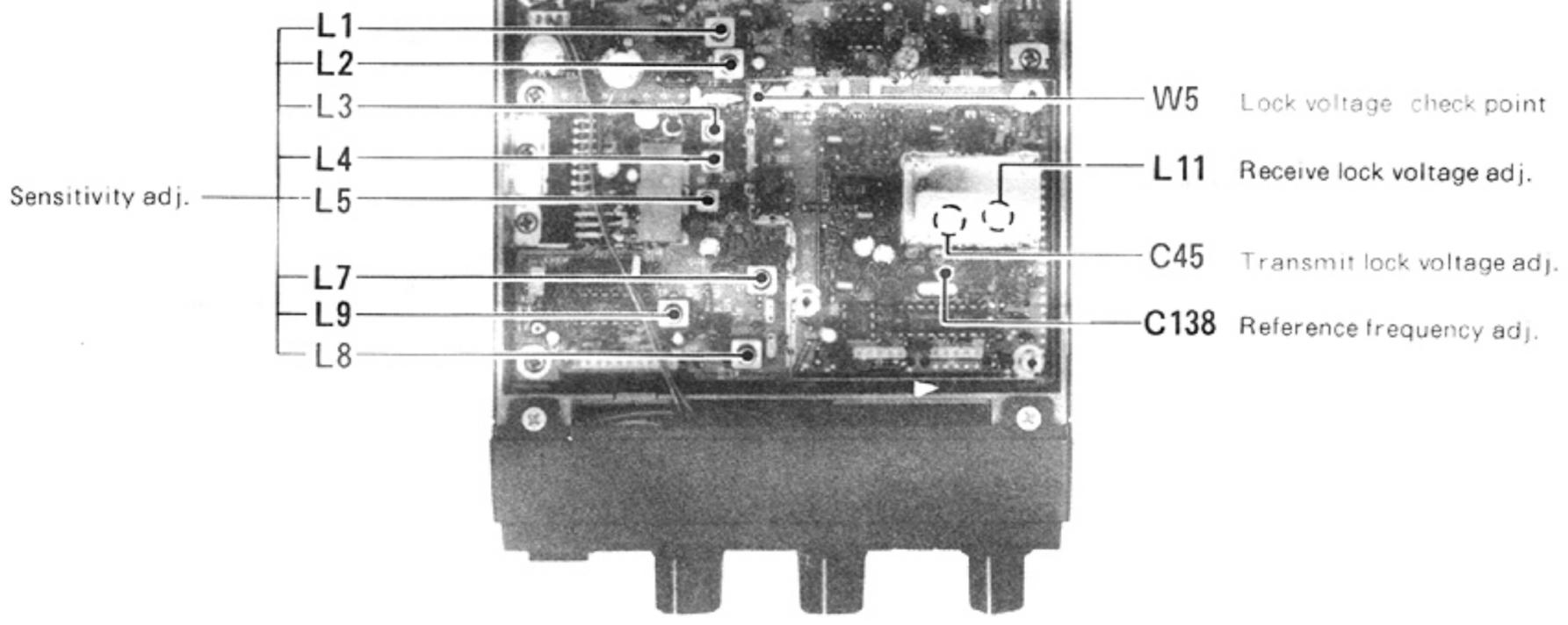
STANDARD SIGNAL GENERATOR
• Frequency range : 100 ~ 200 MHz
• Output level : 0.1 μ V ~ 100 μ V

DISTORTION METER
• Mesuring range : 1 % ~ 100 %

To EXT. SP jack

PLL

RX



7-3 TRANSMITTER ADJUSTMENT

ADJUSTMENT	ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
OUTPUT POWER	1 <ul style="list-style-type: none"> • Select any channel. • Transmitting 	REAR PANEL	Connect the RF power meter to the antenna connector.	10 W (10 W version) 25 W (25 W version)	MAIN	R79
FREQUENCY DEVIATION	1 <ul style="list-style-type: none"> • Select any channel. • Set the audio generator to the [MIC] jack. 1 kHz/ 50 mV • Set the FM deviation meter; HPF : OFF LPF : 20 kHz De-emphasis : OFF Detector : (P - P)/2 • R51 (LOGIC) : Max. CW • Transmitting 	REAR PANEL	Connect the FM deviation meter to the antenna connector via the attenuator.	± 2.0 kHz (narrow version) ± 4.2 kHz (wide version)	LOGIC	R55
	3 <ul style="list-style-type: none"> • Set the audio generator to the [MIC] jack. 1 kHz/ 5 mV 			± 1.5 kHz (narrow version) ± 3.0 kHz (wide version)		R51
SUBAUDIBLE TONE FREQUENCY DEVIATION	1 <ul style="list-style-type: none"> • Select tone encoder programmed channel, if programmed. • Apply no AF signal to the [MIC] jack. • Transmitting 	REAR PANEL	Connect the FM deviation meter to the antenna connector via the attenuator.	± 0.25 kHz (narrow version) ± 0.5 kHz (wide version)	LOGIC	R60

CW: Clockwise

LOCATION AND CONNECTION

LOGIC UNIT

CAUTION :
DO NOT connect the signal generator while transmitting.

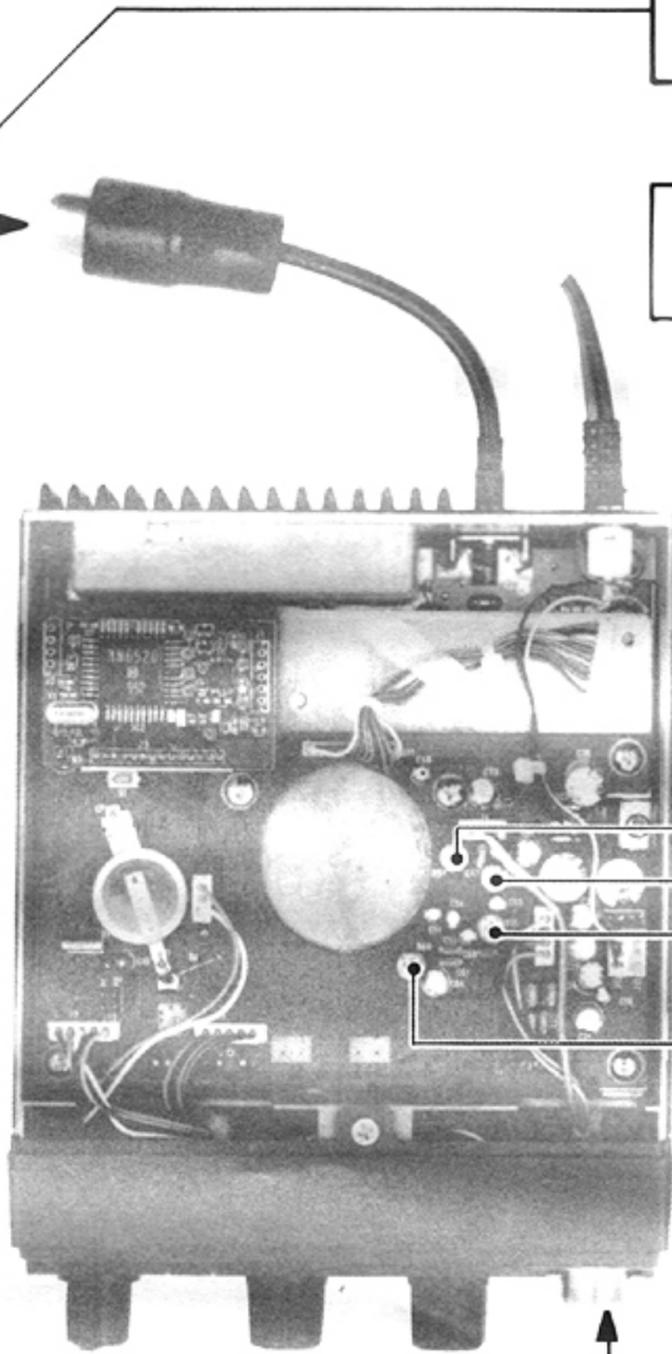
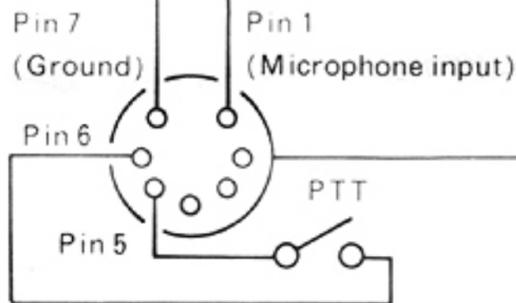
DC POWER SUPPLY
• Current capacity : 10 A or more
• Output voltage : 13.8 V \pm 10 %

ATTENUATOR 40 dB or 50 dB

FM DEVIATION METER
• Frequency range : 100 ~ 200 MHz
• Mesuring range : 0 ~ \pm 10 kHz

OSCILLOSCOPE
• Mesuring range : DC ~ 20 MHz

AUDIO GENERATOR
• Frequency range : 300 ~ 3000 Hz
• Output level : 0 ~ 200 mV



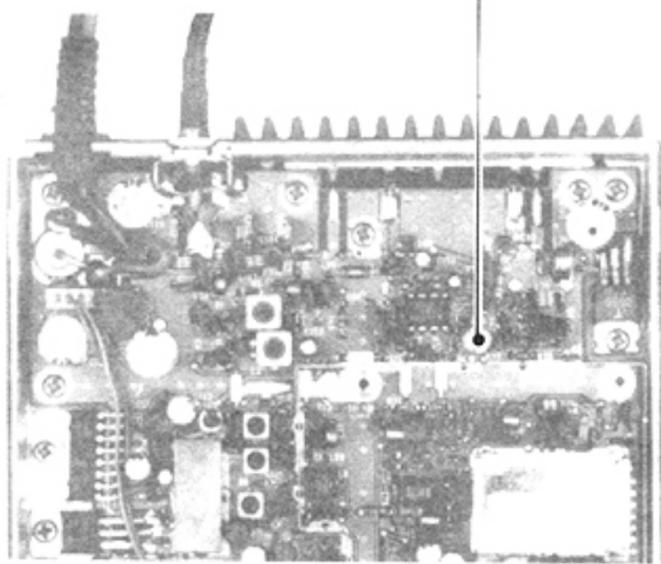
TX

R51
R49
R55
Deviation set

R60 CTCSS deviation set

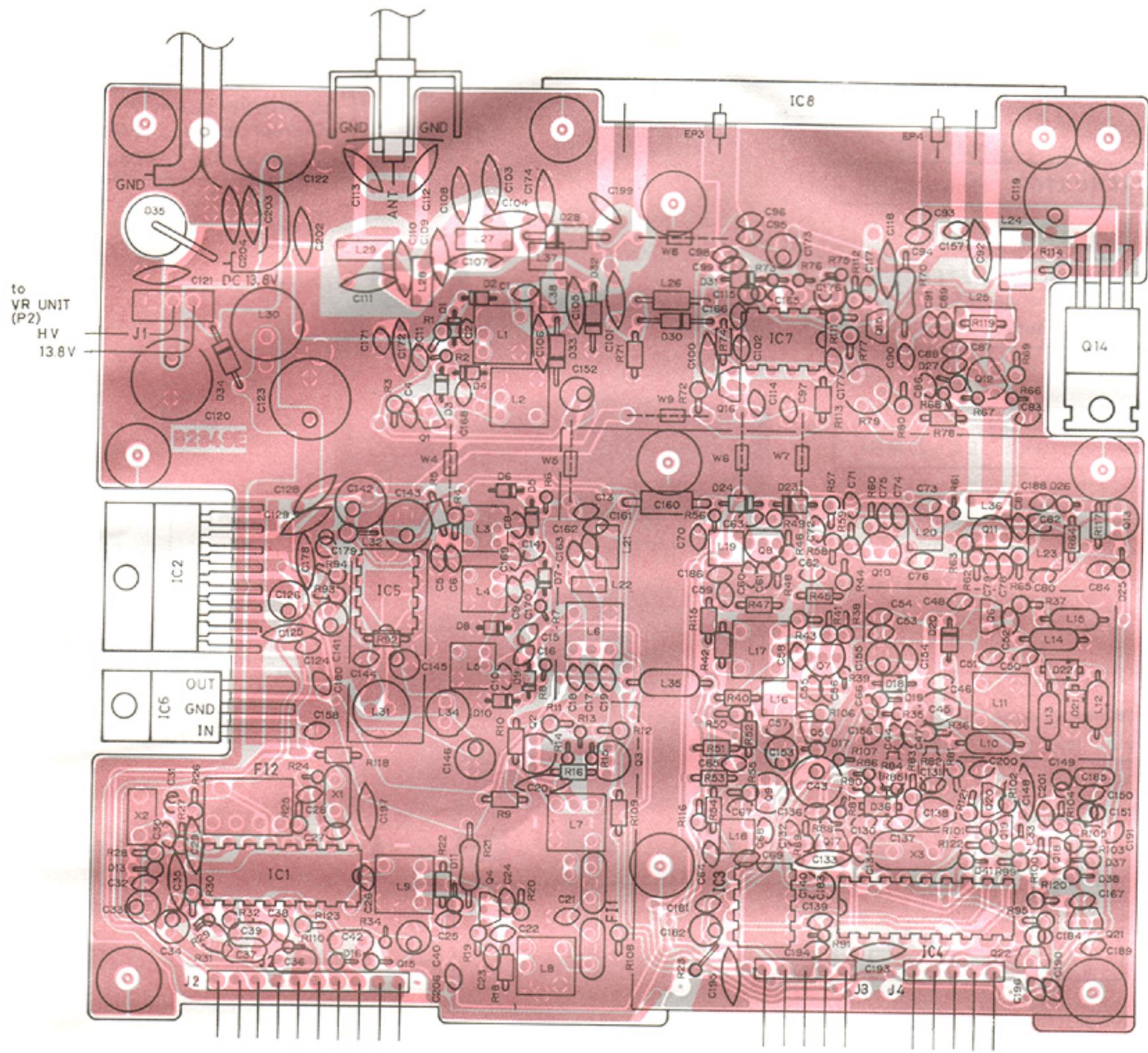
R79 Output power set

MAIN UNIT

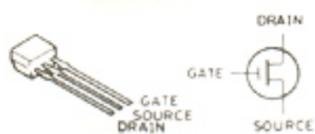


SECTION 8 BOARD LAYOUTS

8-1 MAIN UNIT



2SK241 GR
Q1, Q4, Q6



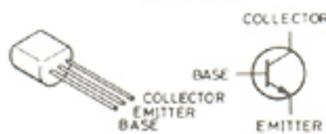
2SC3355
Q2, Q3



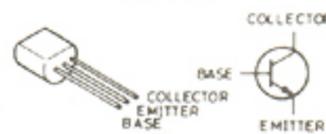
2SC2458 GR
Q5, Q15, Q16, Q17, Q19, Q22



2SC2026
Q7, Q10



2SC3776 D
Q8, Q9



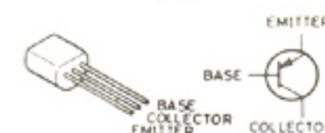
2SC2407
Q11



2SC2053
Q12



2SB561 C
Q13



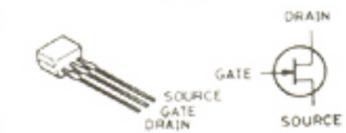
2SB596 Y
Q14



2SA1048 G
Q18, Q20



2SK184 Y
Q21

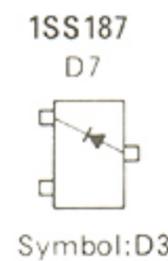
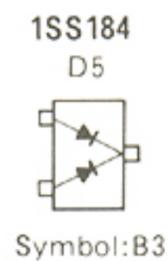
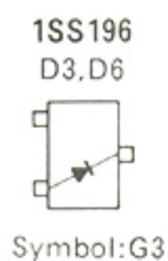
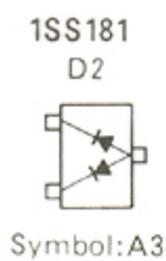
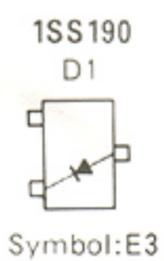
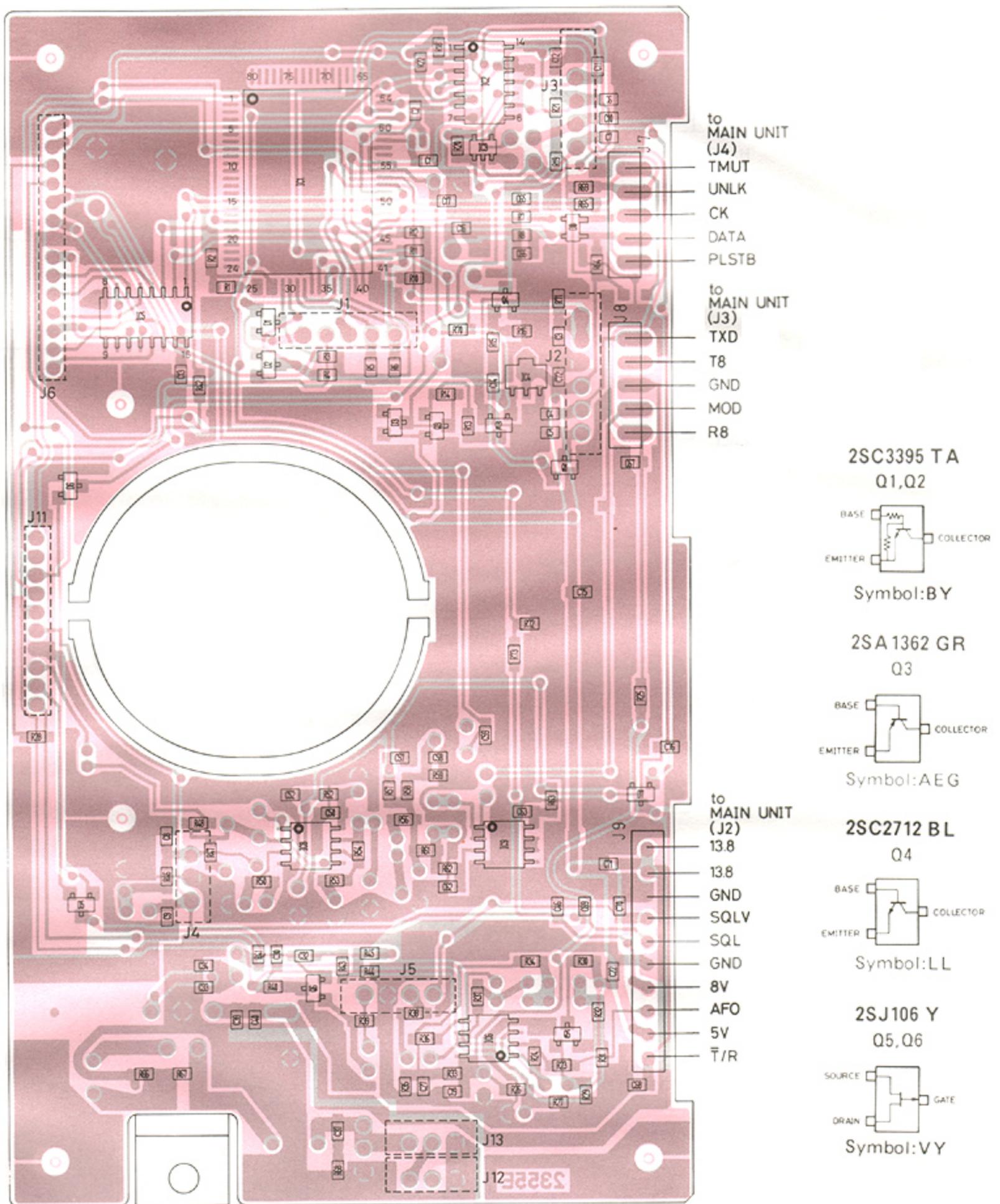


T/R 5V AF0 8V GND SOL SOLV GND 13.8 13.8
to LOGIC UNIT (J9)

R8 MOD GND T8 TXD
to LOGIC UNIT (J8)

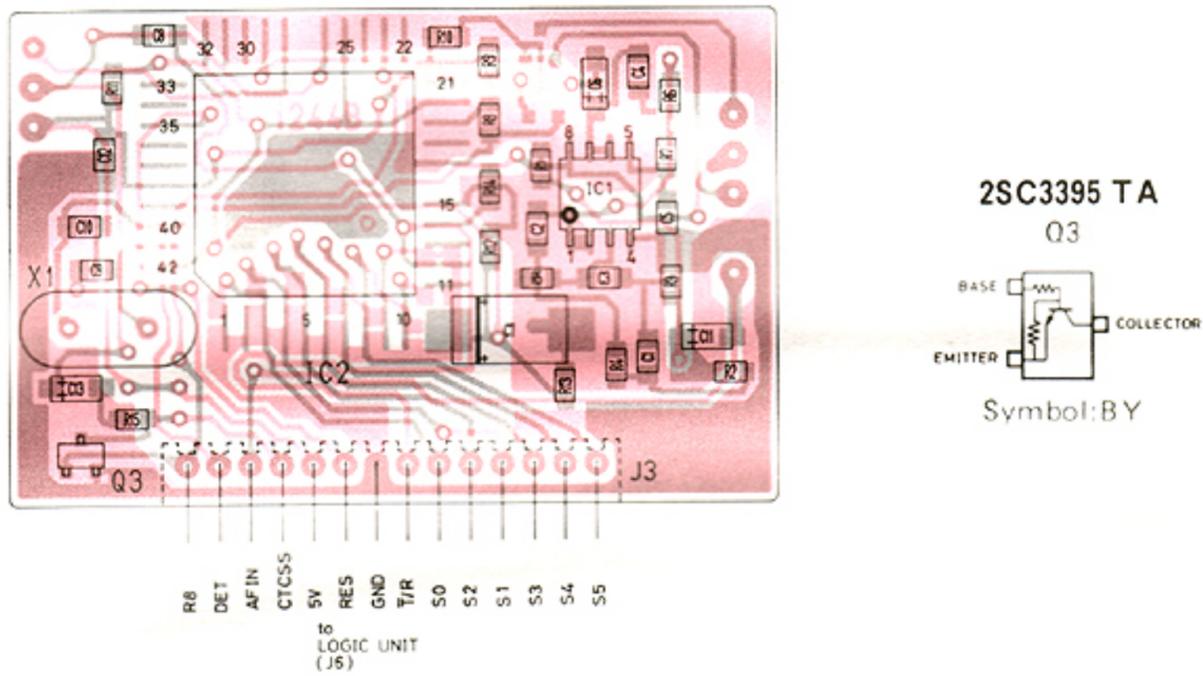
PLSTB DATA CK UNLK TMUT
to LOGIC UNIT (J9)

(Bottom View)



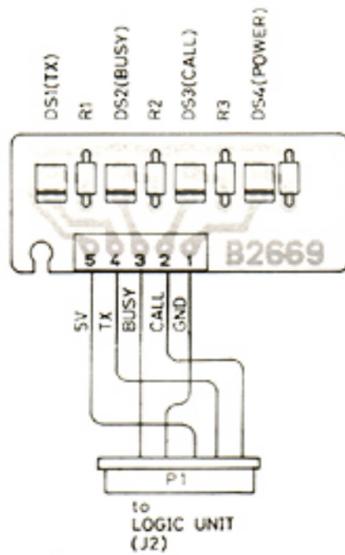
8-3 CTCSS AND FRONT UNITS

■ CTCSS UNIT

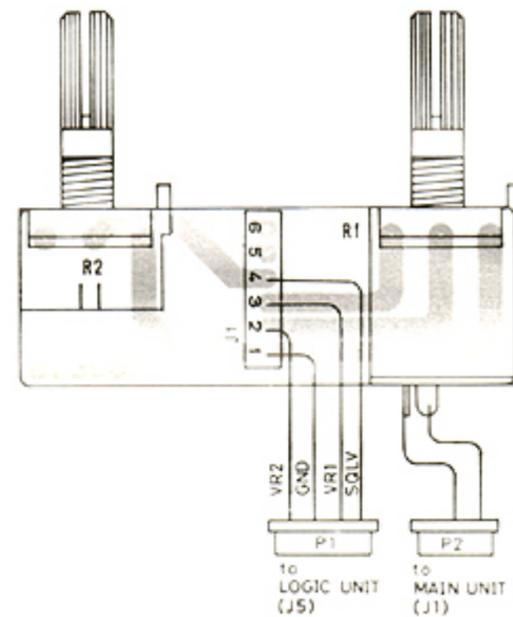


■ FRONT UNIT

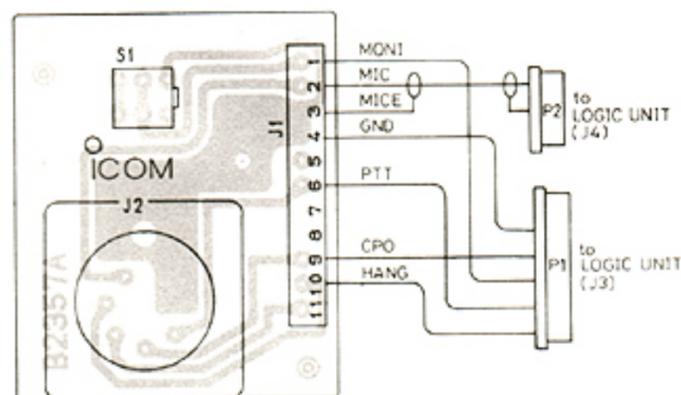
● LED UNIT



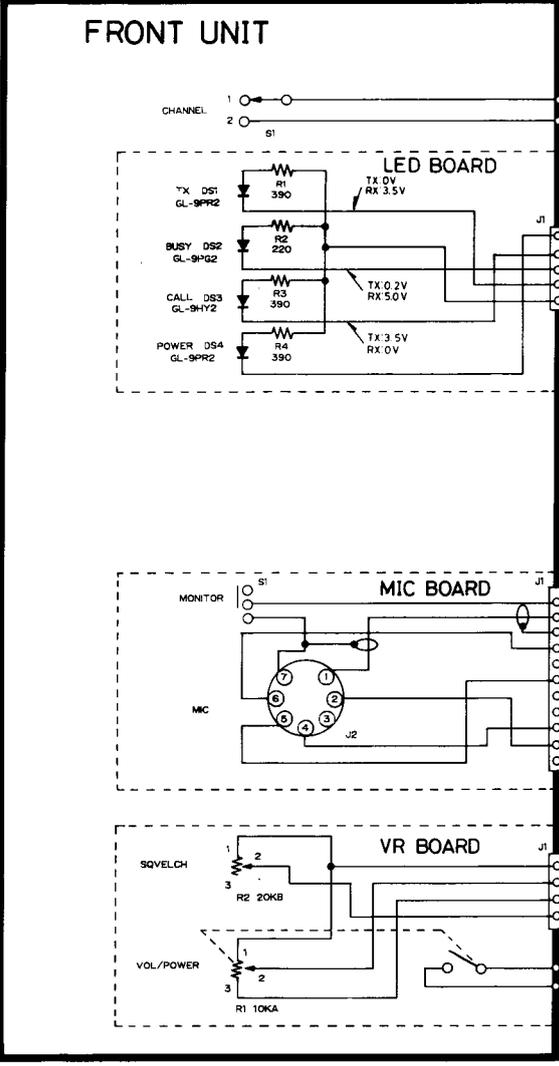
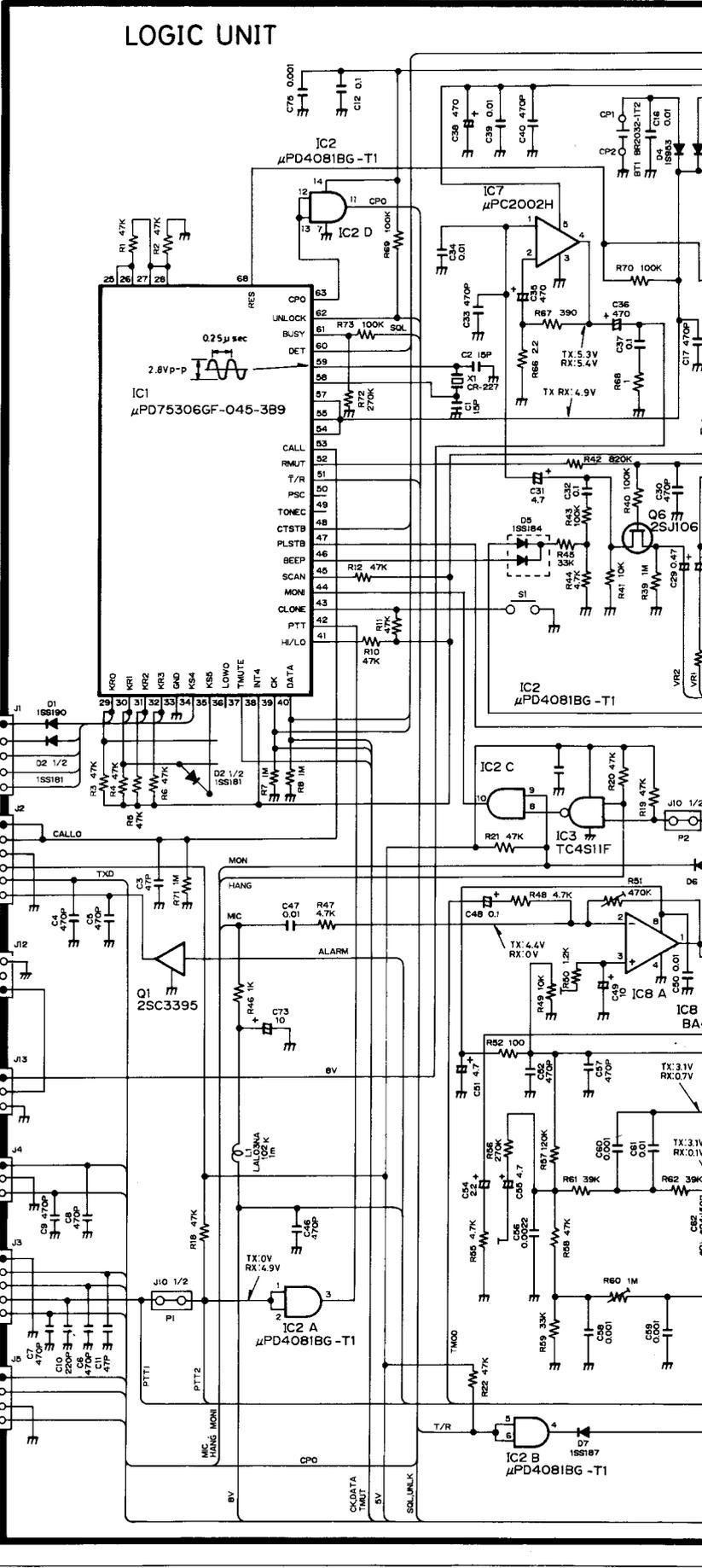
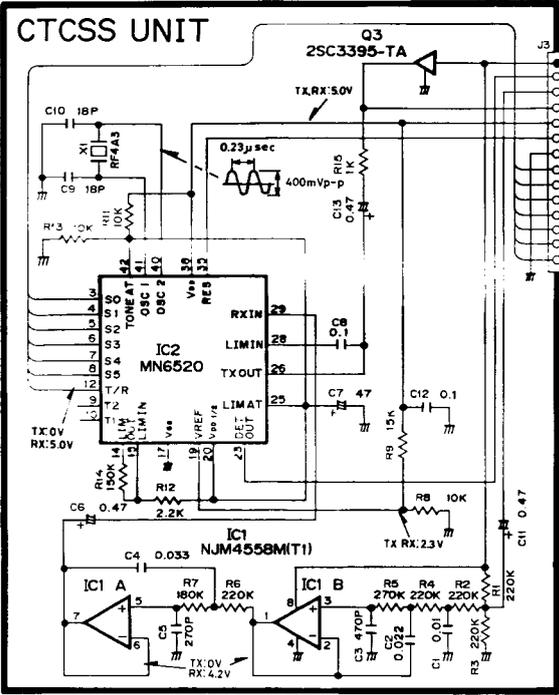
● VR UNIT

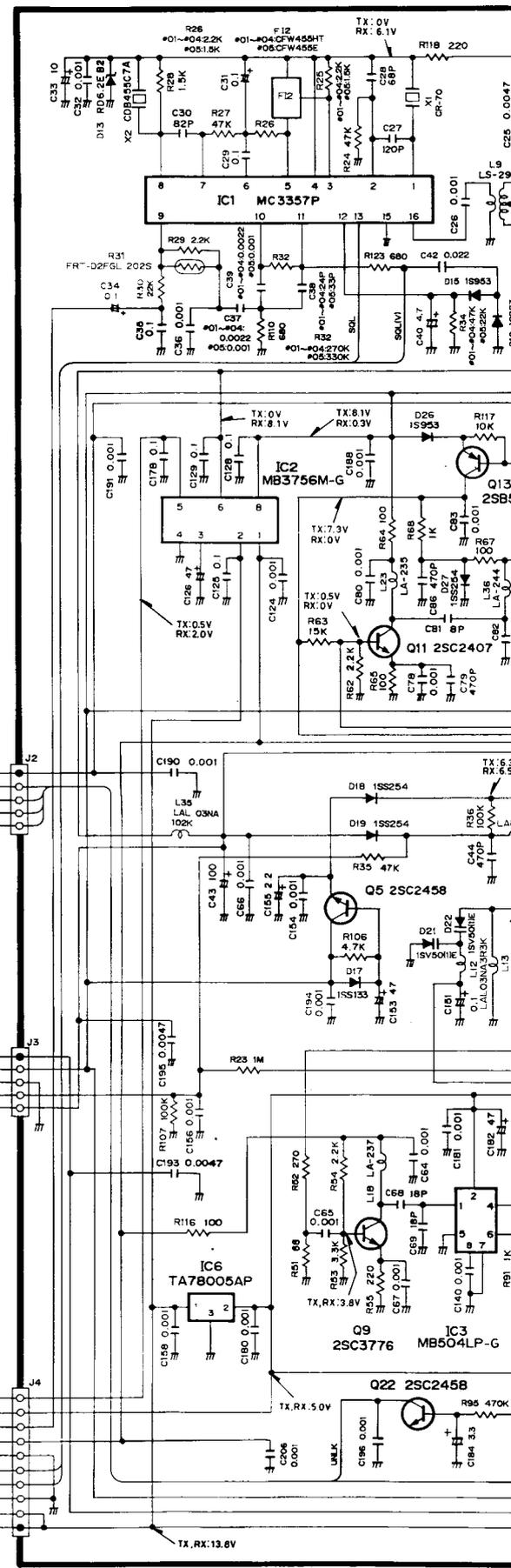
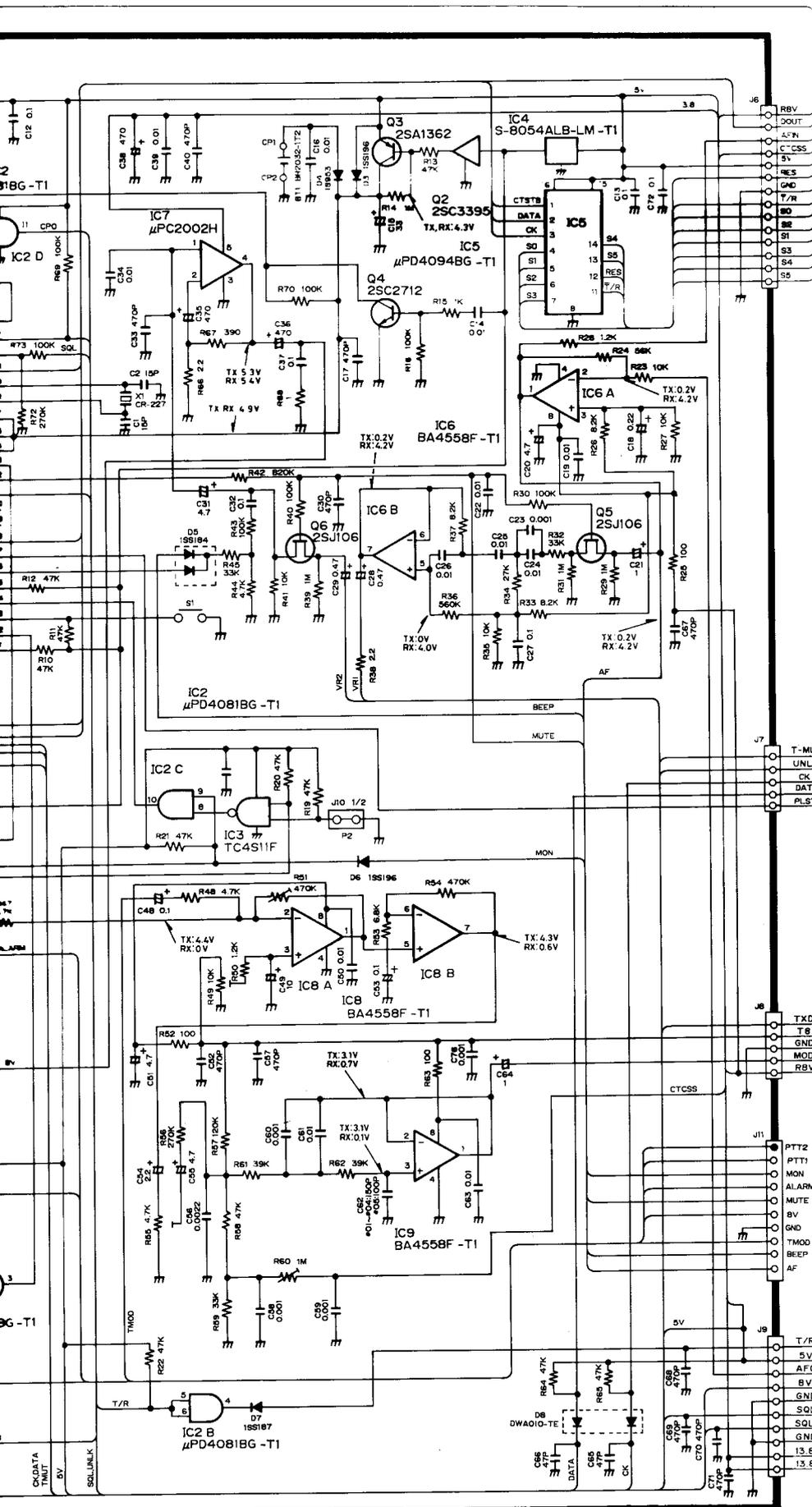


● MIC UNIT

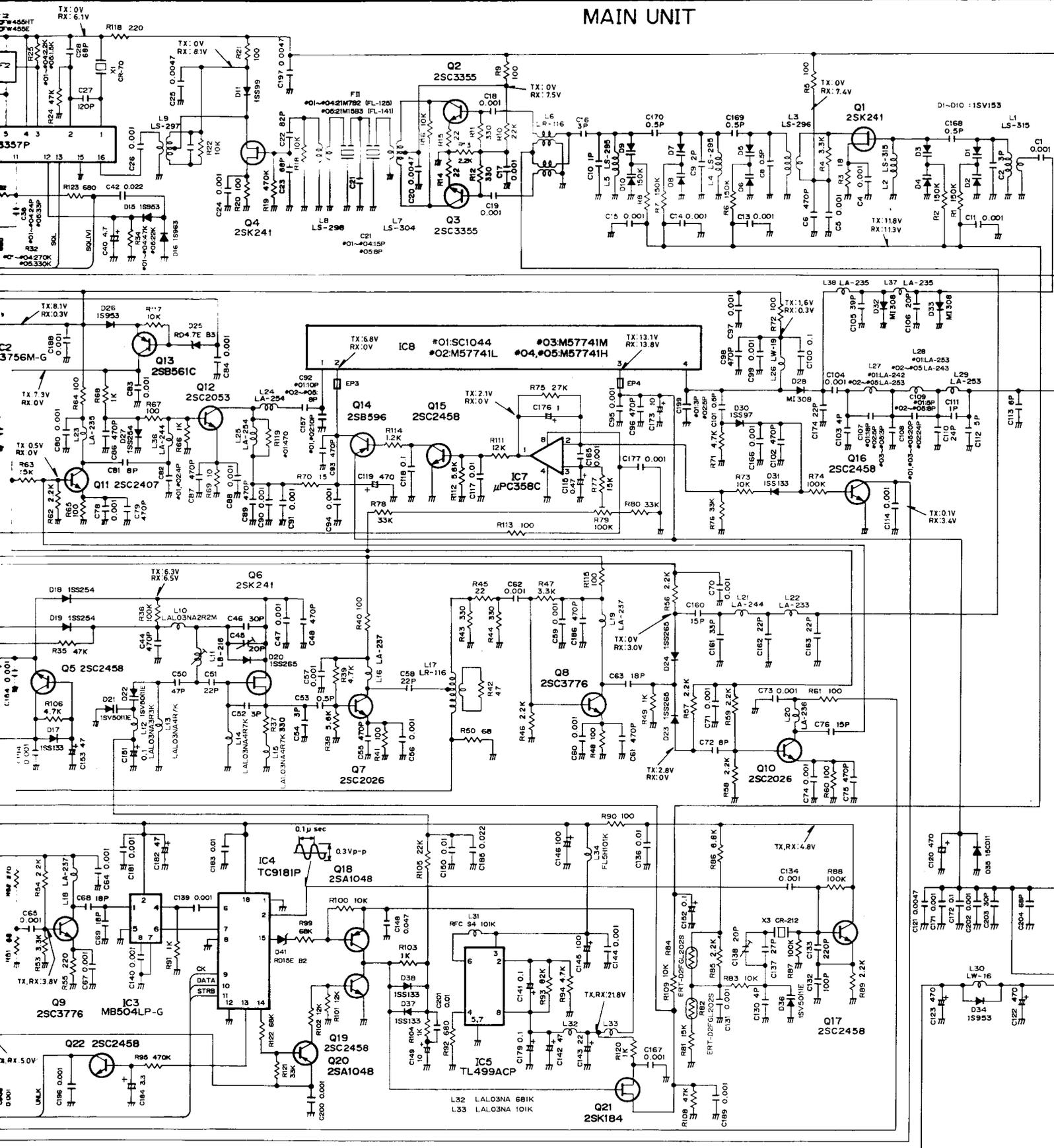


SECTION 9 VOLTAGE DIAGRAMS





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