

DJ-X10

Service Manual

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ALINCO, INC.

SPECIFICATIONS

Frequency range	0.1 ~ 1999.999950 MHz		
Radio systems received	WFM, NFM, AM, USB, LSB, CW		
Frequency steps	50 Hz, 100 Hz, 1 kHz, 2 kHz, 5 kHz, 6.25 kHz, 9 kHz, 10 kHz, 12.5 kHz, 15 kHz, 20 kHz, 25 kHz, 30 kHz, 50 kHz, 100 kHz, 125 kHz, 150 kHz, 200 kHz, 250 kHz, 500 kHz		
Sensitivity (Typ.)	AM	0.1 ~ 0.5 MHz	10 μ V(20 dB μ)
		0.5 ~ 5 MHz	1.5 μ V(3.5 dB μ)
		5 ~ 30 MHz	1 μ V(0 dB μ)
		30 MHz ~ 1000 MHz (1 kHz 30 %mod 10 dB S/N)	1 μ V(0 dB μ)
	SSB	0.5 ~ 5 MHz	0.5 μ V(-6 dB μ)
		5 ~ 30 MHz	0.25 μ V(-12 dB μ)
		30 MHz ~ 1000 MHz (10 dB S/N)	0.5 μ V(-6 dB μ)
	NFM	5 ~ 30 MHz	0.35 μ V(-9 dB μ)
		30 ~ 1000 MHz	0.25 μ V(-12 dB μ)
		1000 ~ 1300 MHz	1.5 μ V(3.5 dB μ)
		1300 ~ 1999 MHz (1 kHz 3.5 kHz 12 dB SINAD)	10 μ V(20 dB μ)
	WFM	30 ~ 1000 MHz (12 dB SINAD)	1.5 μ V(3.5 dB μ)
Memory channels	1200		
Search pass mode channels	1000		
Priority channel	1		
Memory banks	30		
Channels per bank	40		
Search bands	20		
Scan speed	Approx. 25 CH/sec		
Antenna connector	BNC, 50 Ω		
Power supply	4.8V DC (Ni-Cd)/6V DC (AA dry cell)		
External power supply	8 ~ 15V DC		
Rated AF output	Min. 100 mW, 10% THD		
Power consumption	At rated output	Approx. 200 mA	
	Squelched	Approx. 140 mA	
	BS ON	Approx. 30 mA	
Weight	Approx. 320 g		
Dimensions	57 x 150 x 27.5 mm (without projections)		
Operating temperature range	-10 ~ +50°C		
Frequency stability	\pm 10 ppm		

CIRCUIT DESCRIPTION

1) Frequency

- Signals in the 0.1 ~ 449.99 MHz and 1500 ~ 2000 MHz bands are converted into the 736.25 MHz first IF signal by the first local oscillator signal.
- Signals in the 450 ~ 1499.99 MHz band are converted into the 275.45 MHz first IF signal by this same first local oscillator signal.
- The first IF signal is converted into the 45.05 MHz second IF signal from the two second local oscillator signals (671.2 and 230.4 MHz) by the second mixer circuit.
- Depending on the mode, the second IF signal is input to one of the two IF amplifier ICs. In one mode, the second IF signal is mixed with a 34.35 MHz third local oscillator signal and converted into a third IF signal of 10.7 MHz, while in the other, it is mixed with a 44.595 MHz third local oscillator signal and converted into the third IF signal of 455 kHz.

2) Receiver Block

Front-End Circuit

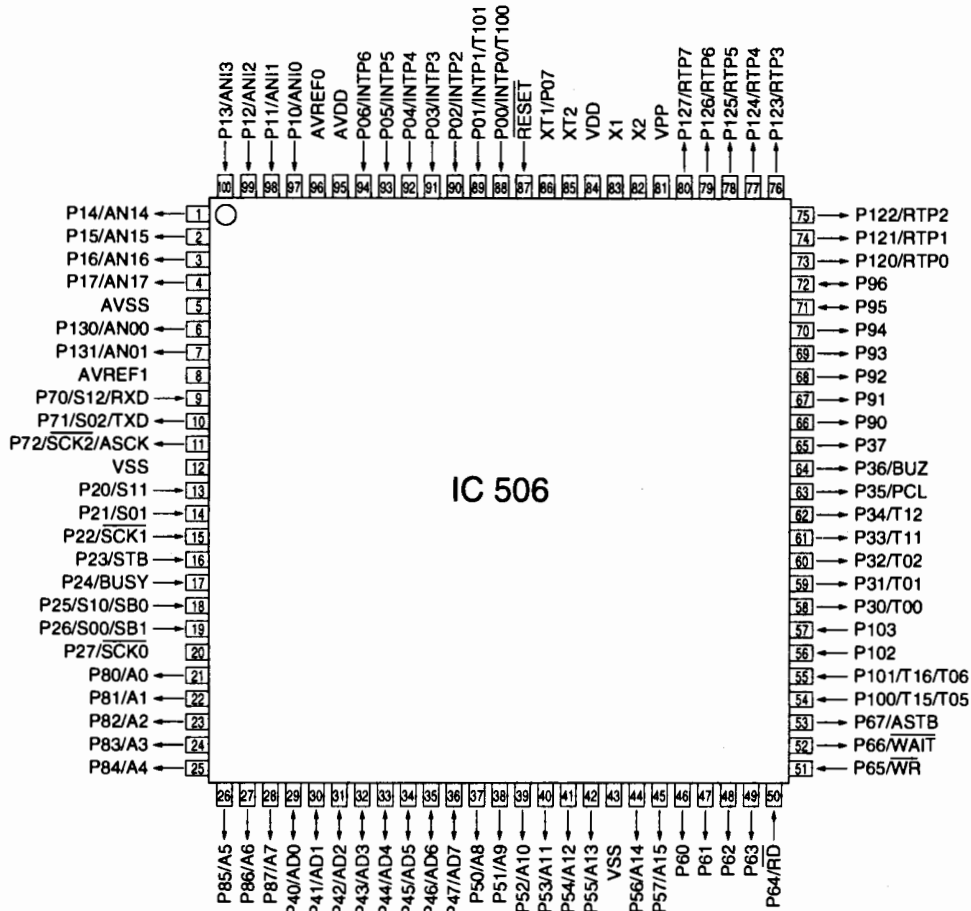
- The received signal from the antenna goes through the antenna circuits (D128, D124 and D125) and is screened by seven band pass filters consisting of several antenna switches (D131, D111, D127, D112, D126, D114, D130, D115, D134, D119, D135, D121, D136, D122 and D133) to remove unwanted signals.
- The RF signal is amplified by each of the RF amplifiers Q123 (0.1 ~ 222 MHz), Q125 (222 ~ 797 MHz), Q126 (797 ~ 2000 MHz) and Q118. It is then converted into the first IF signal by the first mixer circuit (T101, T100, D109 and D116).
- The adjacent signals in first IF signal, the 275.45 MHz IF signal and the 736.25 MHz IF signal are filtered out respectively by the band switch (D110 and D102), the IF filter (L113, L110, L107 and L101) and the IF filter (FL102 and FL101). Then, the signals are input into the second mixer circuit (Q102).
- In the second mixer circuit, the 12.8 MHz reference signal is mixed with either a 230.4 MHz second local oscillator signal (amplified 18 times) or a 691.2 MHz second local oscillator signal (amplified 54 times) selected by a switch (D101), and is converted into a 45.05 MHz second IF signal.
- In the WFM mode, the second IF signal goes through an IF filter (L301) and is input into pin No. 16 of an IF IC (IC305). A 10.7 MHz third IF signal converted by the IC's internal mixer is output from pin No. 14, filtered of adjacent signals by a ceramic filter (FL302) and input into pin No. 12. Next, it is demodulated by IC's internal limiter amplifier and quadrature detection circuit, and output from pin No. 8 as an AF signal.

- In the NFM, AM, SSB and CW modes, the second IF signal goes through an IF filter (XF300 and XF301) and is input to pin No. 16 of an IF IC (IC304). A 455 kHz third IF signal converted by the IC's internal mixer is output from pin No. 3 and is filtered of adjacent signals by a ceramic filter (FL301). Thereafter, a switch (D306 and D309) selects the mode. In the NFM mode, the signal is input to pin No. 5, demodulated by IC's internal limiter amplifier and quadrature detection circuit, and output from pin No. 9 as an AF signal. In the AM mode, the signal is amplified by an AGC amplifier (Q313) and input to pin No. 7 of an IF IC (IC305). It is amplified inside the circuit, demodulated by the detection circuit and output from pin No. 8 as an AF signal. In the SSB mode, the signal goes through a ceramic filter (FL303) and is amplified by an AGC amplifier (Q313) and an IF amplifier (Q316). It is then mixed with a carrier signal, which is generated by the BFO circuit (X302 and Q318) and fed through a buffer (Q317), demodulated by a balanced modulation circuit consisting of diodes (Q315, D314 and D313), and output as an AF signal.
- The AF signal for each of the modes is selected with a switch (IC308) and amplified by an AF signal amplifier (IC309). It is controlled by an AF mute circuit (Q319) and adjusted for volume by an electronic volume (IC306). It is then amplified by an audio amplifier (IC307) and input to the speaker.

3) PLL Synthesizer Circuit

- The signal from a 12.8 MHz crystal (X100) oscillator circuit (Q100) is input to a PLL IC (IC101) to obtain a 10 MHz reference oscillation signal frequency. The comparison frequency is output from a VCO circuit (Q114, L108, D104, D105, D107 and D108), amplified by an amplifier (Q115, Q113 and Q116) and divided by a divider inside the PLL IC. It is then compared against the reference frequency to make the PLL synthesizer.
- The VCO output signal (675 ~ 1225 MHz) is amplified by a buffer amplifier (Q115, Q113 and Q120) and input into the first mixer as the first local oscillator signal.
- Frequencies of 9 kHz steps or less are varied by the VCXO circuit (X300, D304 and D305) of the D/A converter (IC303).

4) CPU Terminal Functions: μ PD78076 (E:XA0536) (T:XA0550)



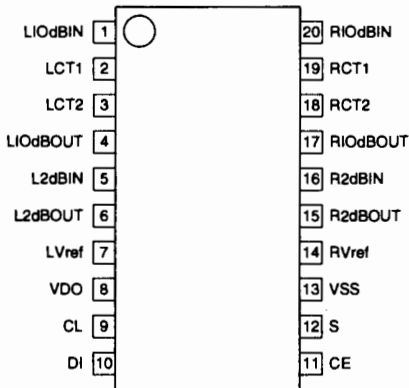
No.	Name	Pin Name	I/O	Description	H	L	Hi Z	Pull UP
1	P14/AN14	C0	O	16KEY MATRIX				
2	P15/AN15	CB1	O	16KEY MATRIX				
3	P16/AN16	CB2	O	16KEY MATRIX				
4	P17/AN17	CB3	O	16KEY MATRIX				
5	AVSS	GND		GND				
6	P130/AN00	BARTU	O	NOT USED				
7	P131/AN01	VCXOIN	O	VCXO CONTROL				
8	AVREF1	VCC		VCC				
9	P70/S12/RXD	RXD	I	CLONE RX INPUT				
10	P71/S02/TXD	TXD	O	CLONE TX OUTPUT				
11	P72/SCK2/ASCK	PCNTS	O	DC DC POWER CONTROL	ON	OFF		
12	VSS	GND		GND				
13	P20/S11	RB0	I	16KEY MATRIX	OFF	ON		
14	P21/S01	RB1	I	16KEY MATRIX	OFF	ON		
15	P22/SCK1	RB2	I	16KEY MATRIX	OFF	ON		
16	P23/STB	RB3	I	16KEY MATRIX	OFF	ON		
17	P24/BUSY	RB4	I	16KEY MATRIX	OFF	ON		
18	P25/S10/SB0	RB5	I	16KEY MATRIX	OFF	ON		
19	P26/S00/SB1	SRCHK	I	SRCH KEY	OFF	ON		
20	P27//SCK0	NOVOEDET		NOT USED				
21	P80/A0	A0	O	EEPROM ADDRESS				
22	P81/A1	A1	O	EEPROM ADDRESS				
23	P82/A2	A2	O	EEPROM ADDRESS				
24	P83/A3	A3	O	EEPROM ADDRESS				
25	P84/A4	A4	O	EEPROM ADDRESS				
26	P85/A5	A5	O	EEPROM ADDRESS				
27	P86/A6	A6	O	EEPROM ADDRESS				
28	P87/A7	A7	O	EEPROM ADDRESS				
29	P40/AD0	DD0	I/O	EEPROM DATA				
30	P41/AD1	DD1	I/O	EEPROM DATA				
31	P42/AD2	DD2	I/O	EEPROM DATA				

No.	Name	Pin Name	I/O	Description	H	L	Hi Z	Pull UP
32	P43/AD3	DD3	I/O	EEPROM DATA				
33	P44/AD4	DD4	I/O	EEPROM DATA				
34	P45/AD5	DD5	I/O	EEPROM DATA				
35	P46/AD6	DD6	I/O	EEPROM DATA				
36	P47/AD7	DD7	I/O	EEPROM DATA				
37	P50/A8	A8	O	EEPROM ADDRESS				
38	P51/A9	A9	O	EEPROM ADDRESS				
39	P52/A10	A10	O	EEPROM ADDRESS				
40	P53/A11	A11	O	EEPROM ADDRESS				
41	P54/A12	A12	O	EEPROM ADDRESS				
42	P55/A13	A13	O	EEPROM ADDRESS				
43	VSS	GND		GND				
44	P56/A14	A14	O	EEPROM ADDRESS				
45	P57/A15	/RES	O	EEPROM LCD RESET				
46	P60	STB4	O	STB FOR IC500				
47	P61	SHIFT	O	NOT USED				
48	P62	OECNT	O	OUT CONTROL IC500				
49	P63	/CE	O	CHIP ENABLE EEPROM				
50	P64//RD	RD	I	OUT ENABLE EEPROM				
51	P65//WR	/WE	I	WRITE ENABLE EEPROM				
52	P66//WAIT	OPTSTB	O	STB FOR OPTION				
53	P67//ASTB	OPTCT	O	CONTROL FOR OPTION	ON	OFF		
54	P100/T15/T05	RDY	I	EEPROM STATUS				
55	P101/T16/T06	OPTDET	I	OPTION DETECT	ON	OFF		
56	P102	WIDES	I	ENABLE BAND				
57	P103	LOCK	I	PLL LOCK		UNLOCK		
58	P30/T00	BEEP	O	BEEP				
59	P31/T01	AFS	O	AMP CONTROL	ON	OFF		
60	P32/T02	MUTE	O	MUTE	ON	OFF		
61	P33/T11	STB3	O	STB FOR IC300				
62	P34/T12	STB2	O	STB FOR IC306				
63	P35/PCL	STB1	O	STB FOR IC103				
64	P36/BUZ	LE	O	STB FOR IC101				
65	P37	BUSLS	O	BUSY LED CONTROL	ON	OFF		
66	P90	DB4	O	DATA LCD				
67	P91	DB5	O	DATA LCD				
68	P92	DB6	O	DATA LCD				
69	P93	DB7	O	DATA LCD				
70	P94	E/SCLK	O	E/SCLK LCD				
71	P95	RW/SID	I/O	RW/SID LCD				
72	P96	RS/CS	I/O	RS/CS LCD				
73	P120/RTP0	DATA	O	DATA FOR 4094				
74	P121/RTP1	CLK	O	CLK FOR 4094				
75	P122/RTP2	BATSV	O	BATT SAV CONTROL	ON	OFF		
76	P123/RTP3	RFL	O	FILTER CONTROL	OFF	ON		
77	P124/RTP4	RFM	O	FILTER CONTROL	OFF	ON		
78	P125/RTP5	RFH	O	FILTER CONTROL	OFF	ON		
79	P126/RTP6	BARS	O	NOT USED				
80	P127/RTP7	IFS	O	IF SWITCH	OFF	ON		
81	VPP	GND						
82	X2			XTAL MAIN				
83	X1			XTAL MAIN				
84	VDD	VDD						
85	XT2			XTAL SUB				
86	XT1/P07			XTAL SUB				
87	/RESET	/RST	I	RESET CPU				
88	P00/INTP0/T100	LAMPK	I	LAMP KEY	OFF	ON		0
89	P01/INTP1/T101	BRDET	I	BAT DETECT				0
90	P02/INTP2	POWK	I	POWER KEY	OFF	ON		0
91	P03/INTP3	MONK	I	MONITOR KEY	OFF	ON		0
92	P04/INTP4	FUNK	I	FUNCTION KEY	OFF	ON		0
93	P05/INTP5	A	I	ROTARY ENCORDER				0
94	P06/INTP6	B	I	ROTARY ENCORDER				0
95	AVDD	VDD		VDD				
96	AVREF0	VCC		VCC				
97	P10/ANI0	SQD	I	SQ				
98	P11/ANI1	SM	I	S-METER				
99	P12/ANI2	JRDET	I	NOT USED				
100	P13/ANI3	BATDET	I	LOW BAT DETECT				

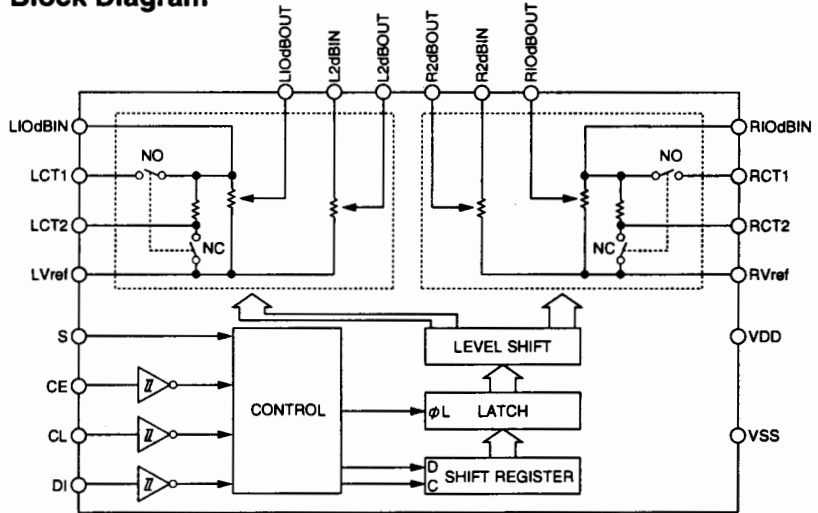
SEMICONDUCTOR DATA

1) LC75366M (XA0345)

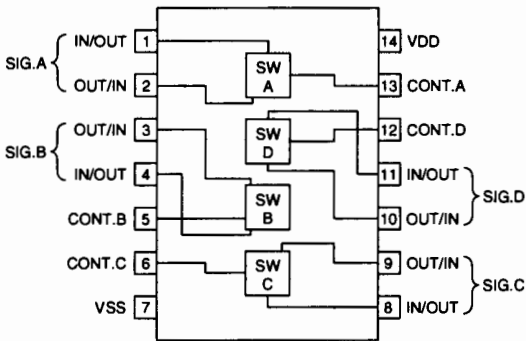
Pin Assignment



Block Diagram

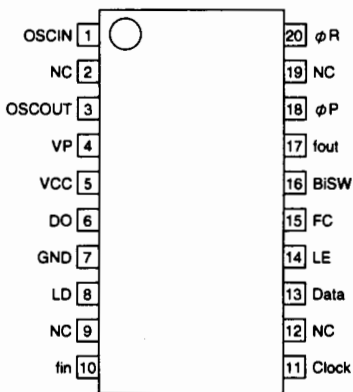


2) NJU4066BM (XA0095)

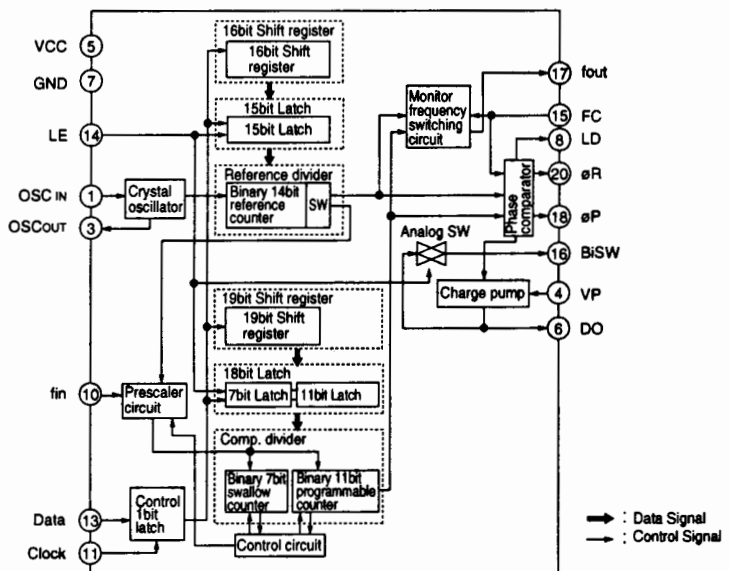


3) MB1511 (XA0173)

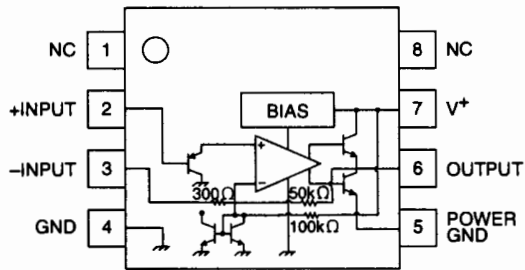
Pin Assignment



Block Diagram

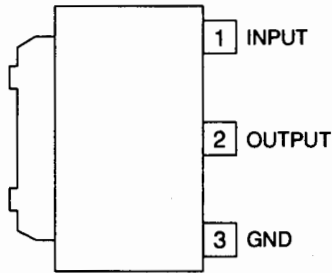


4) NJM2070MT (XA0210)

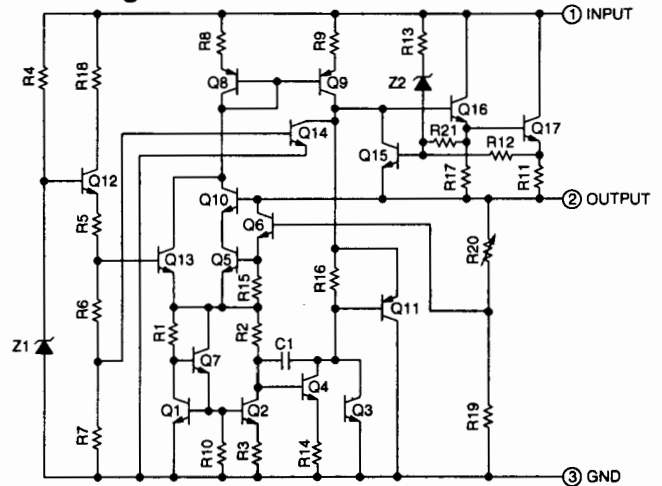


5) TA7806F (XA0267)

Pin Assignment

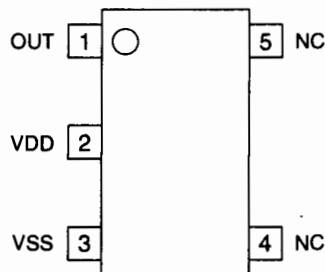


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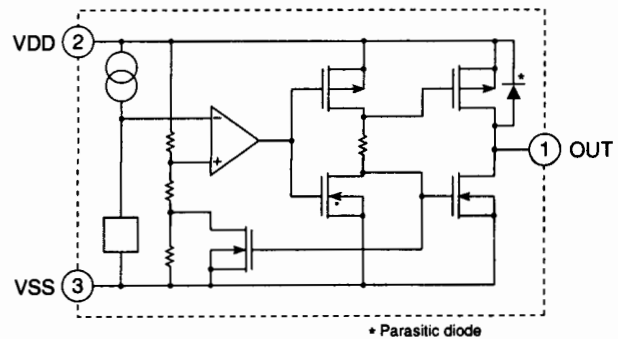


6) S-80733SLAXT2 (XA0357)

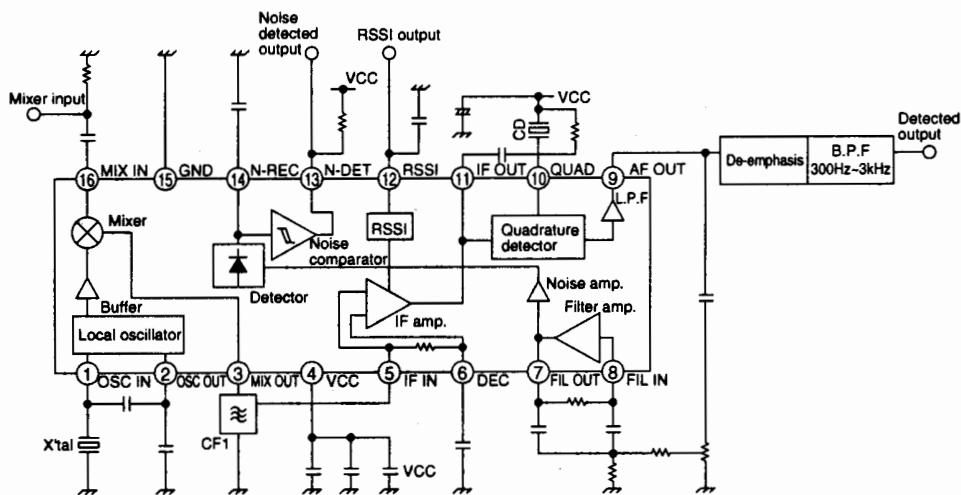
Pin Assignment



Block Diagram

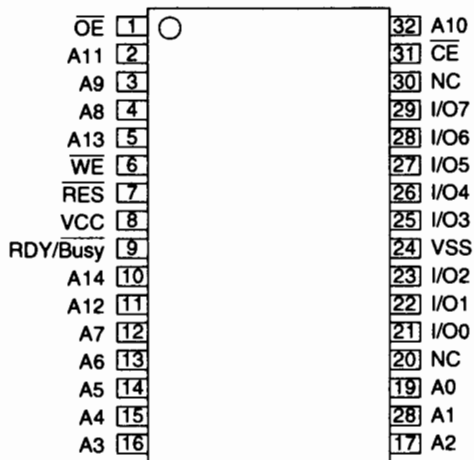


7) TA31136FN (XA0404)

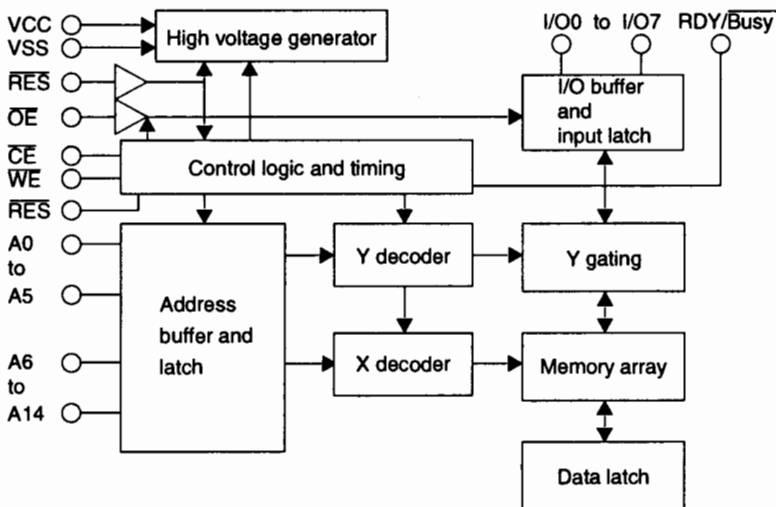


8) HN58V257A (XA0462)

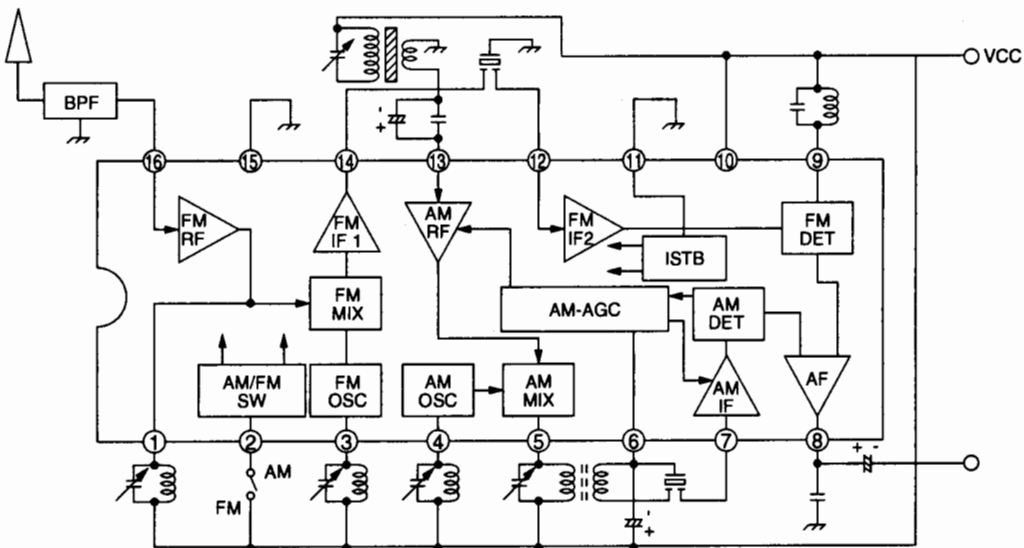
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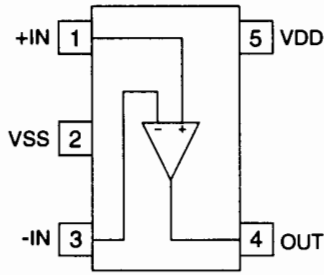
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9) TA7792F (XA0464)

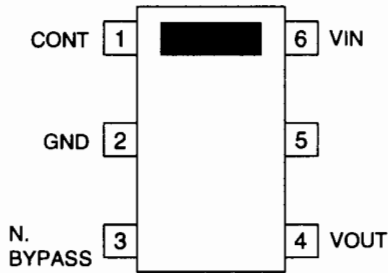


10) TC75S51F (XA0465)

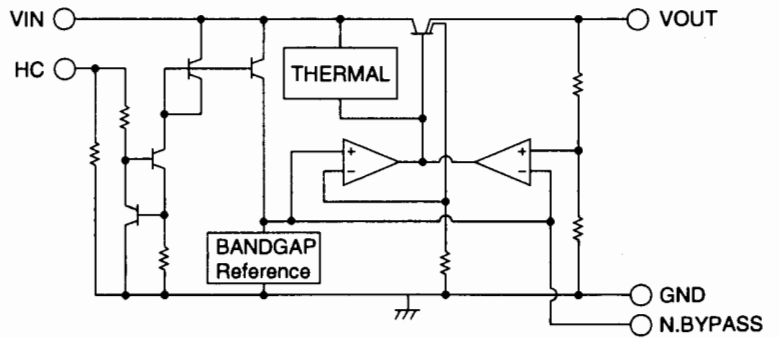


11) TK11235AM (XA0467)

Pin Assignment

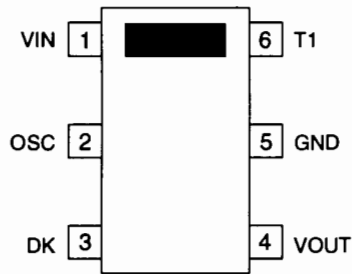


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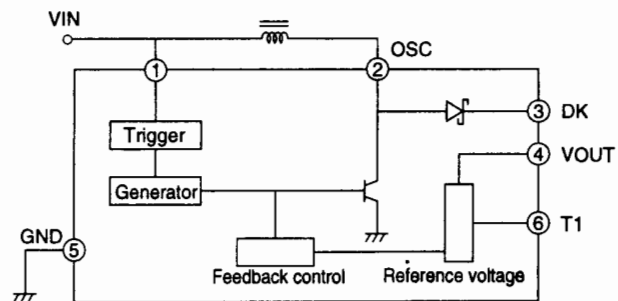


12) TK11819M (XA0468)

Pin Assignment

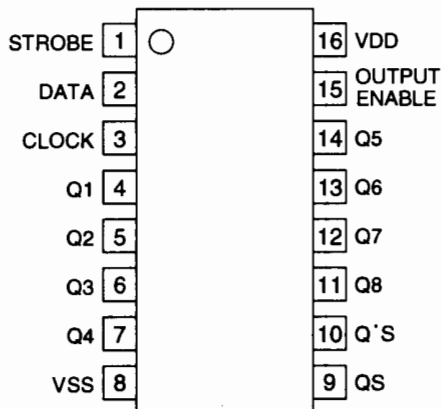


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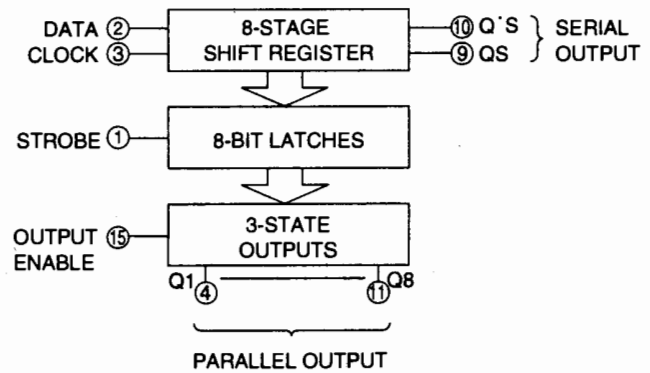


13) BU4094BCFV (XA0506)

Pin Assignment

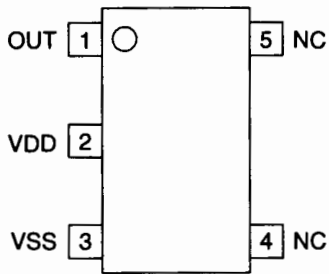


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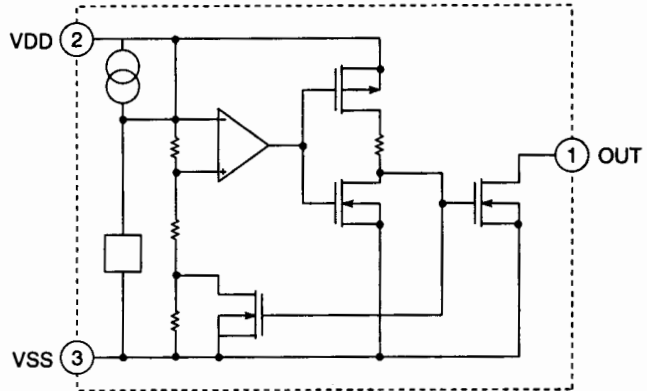


14) S-80725SN-2 (XA0528)

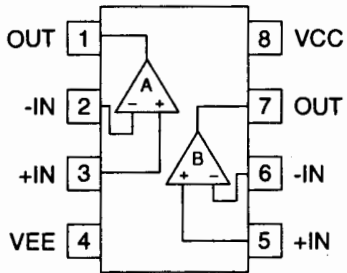
Pin Assignment



Block Diagram

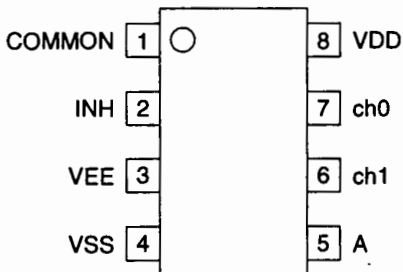


15) TA75W01FU-2 (XA0349)

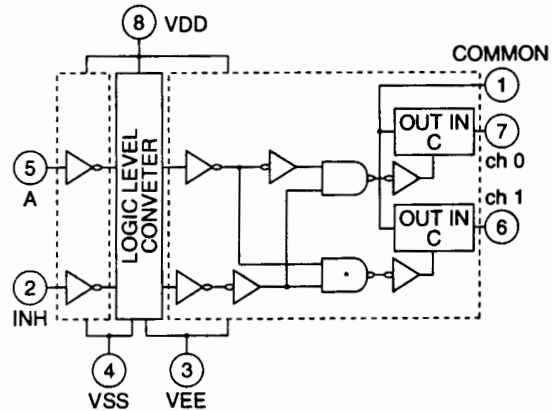


16) TC4W53FU (XA0348)

Pin Assignment

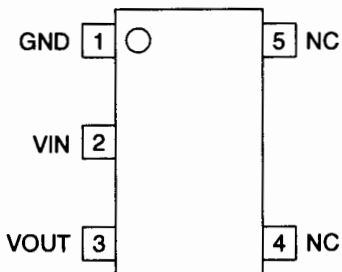


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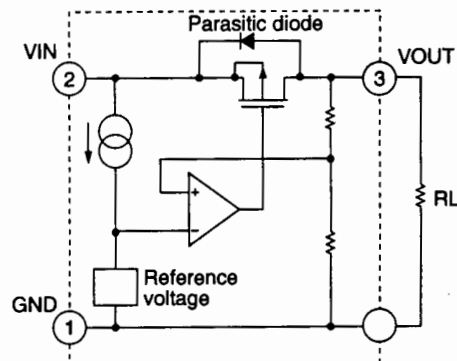


17) S-812XXSG (XA0358)

Pin Assignment



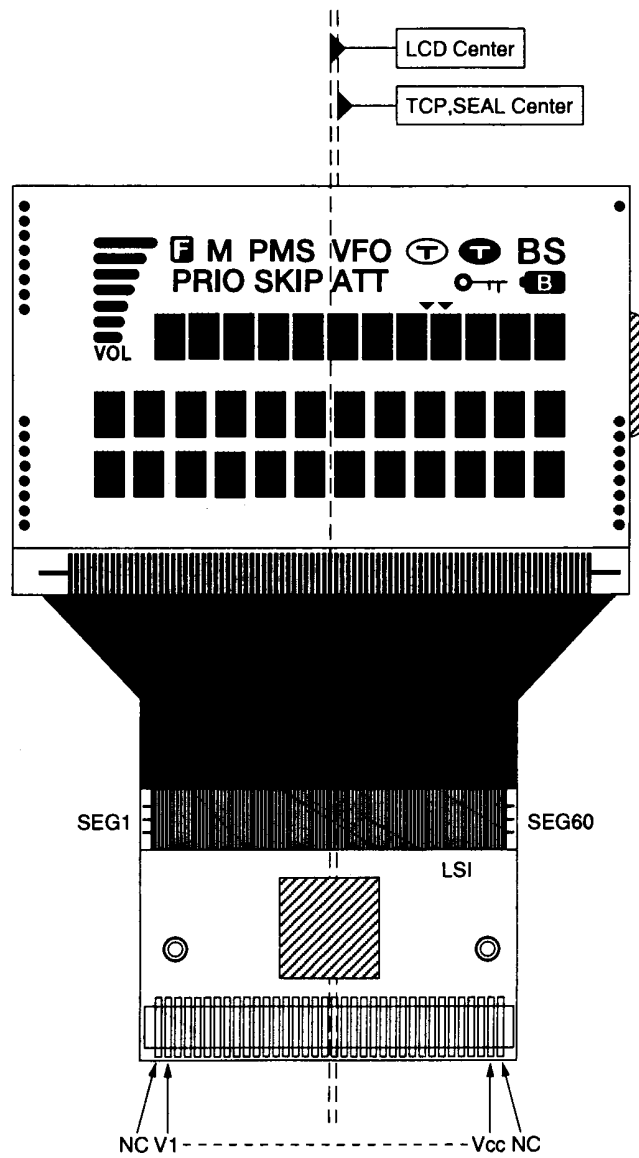
Block Diagram



18) Transistor, Diode, and LED Outline Drawings

DA204U XD0130	DAN202U XD0230	MA742TX XD0250	MA741WK XD0252	1SS295 XD0306	1SS312 XD0307
1SV231 XD0260	1SS356 XD0272	MA111 XD0290	MA729 XD0291	U2FWJ44N XD0294	HVU350 XD0313
DTB123YK XU0155	XP1501TX XU0172	UN9112 XU0182	UN5212 XU0184	DTA143ZE XU0185	DTC143ZE XU0186
2SC4649 XT0108	2SC4181 XT0149	2SC4738 XT0150	2SC5006 XT0151	2SC5007 XT0152	2SC5008 XT0153
BRPG1201W XL0028	SML-310MT XL0036	PG1101F XL0045	2SK425 XE0033	UMC5N XU0152	
2SA1213-Y XT0088					

19) LCD Diagram

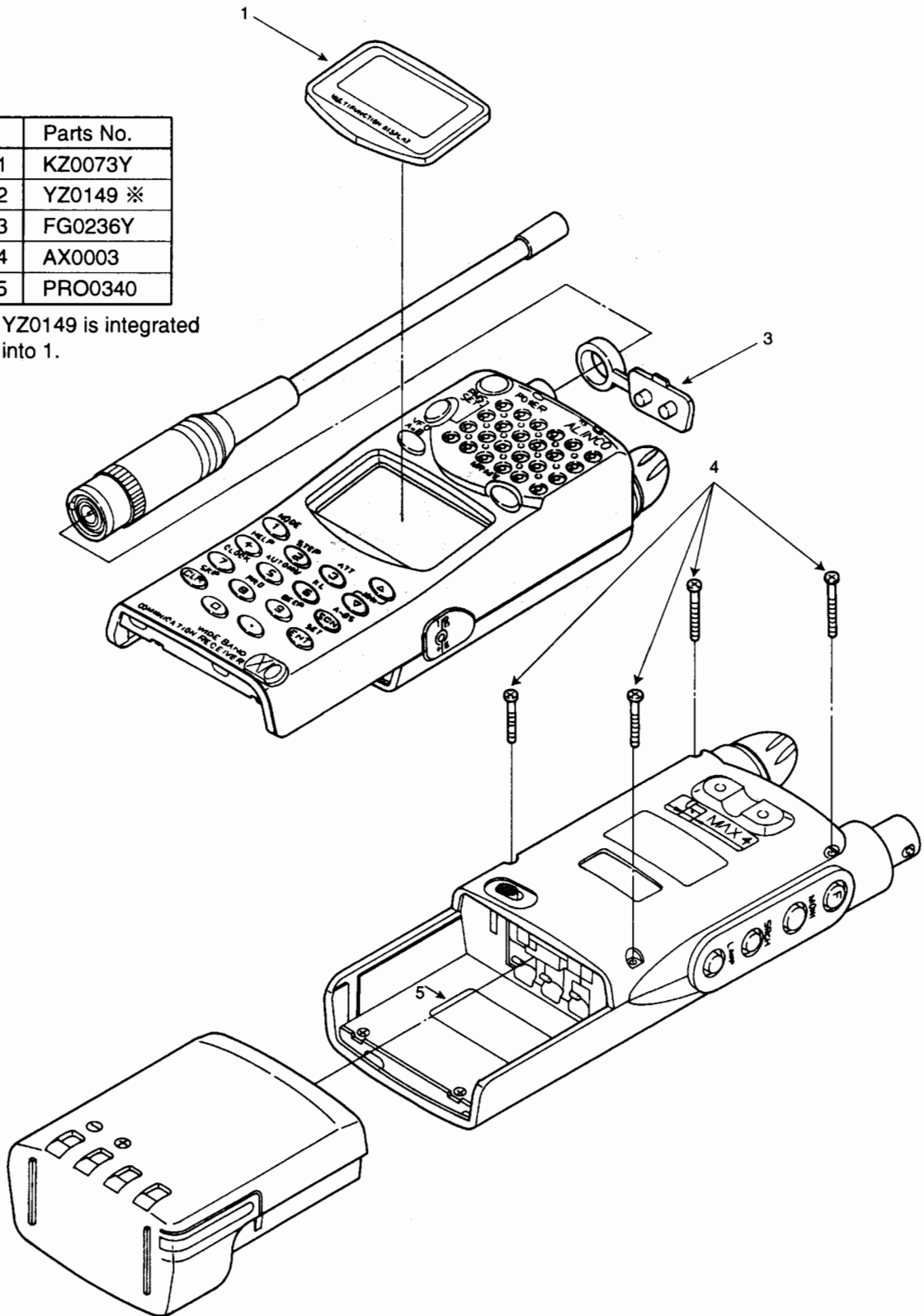


EXPLODED VIEW

1) Front/Rear View

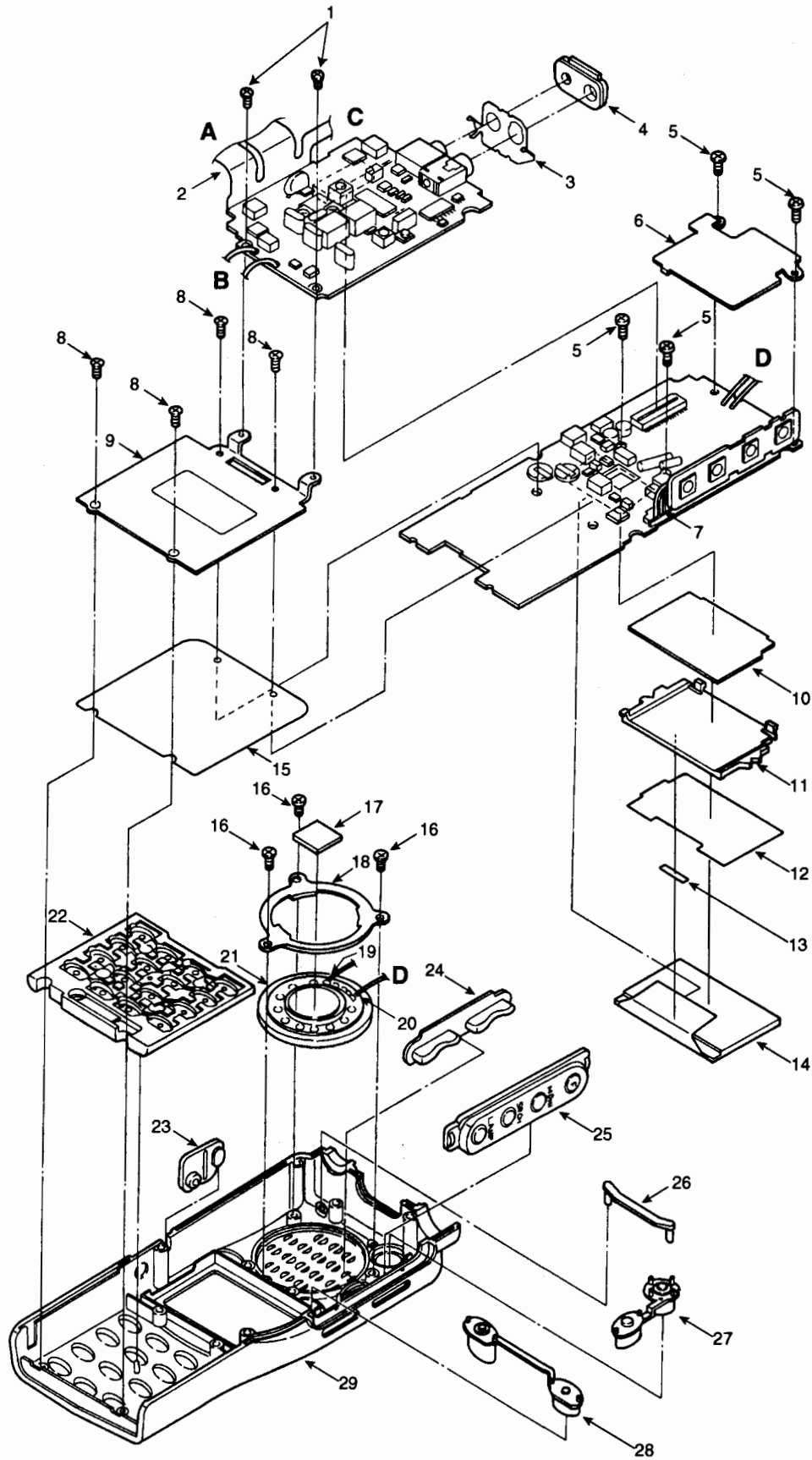
	Parts No.
1	KZ0073Y
2	YZ0149 ※
3	FG0236Y
4	AX0003
5	PRO0340

※YZ0149 is integrated into 1.



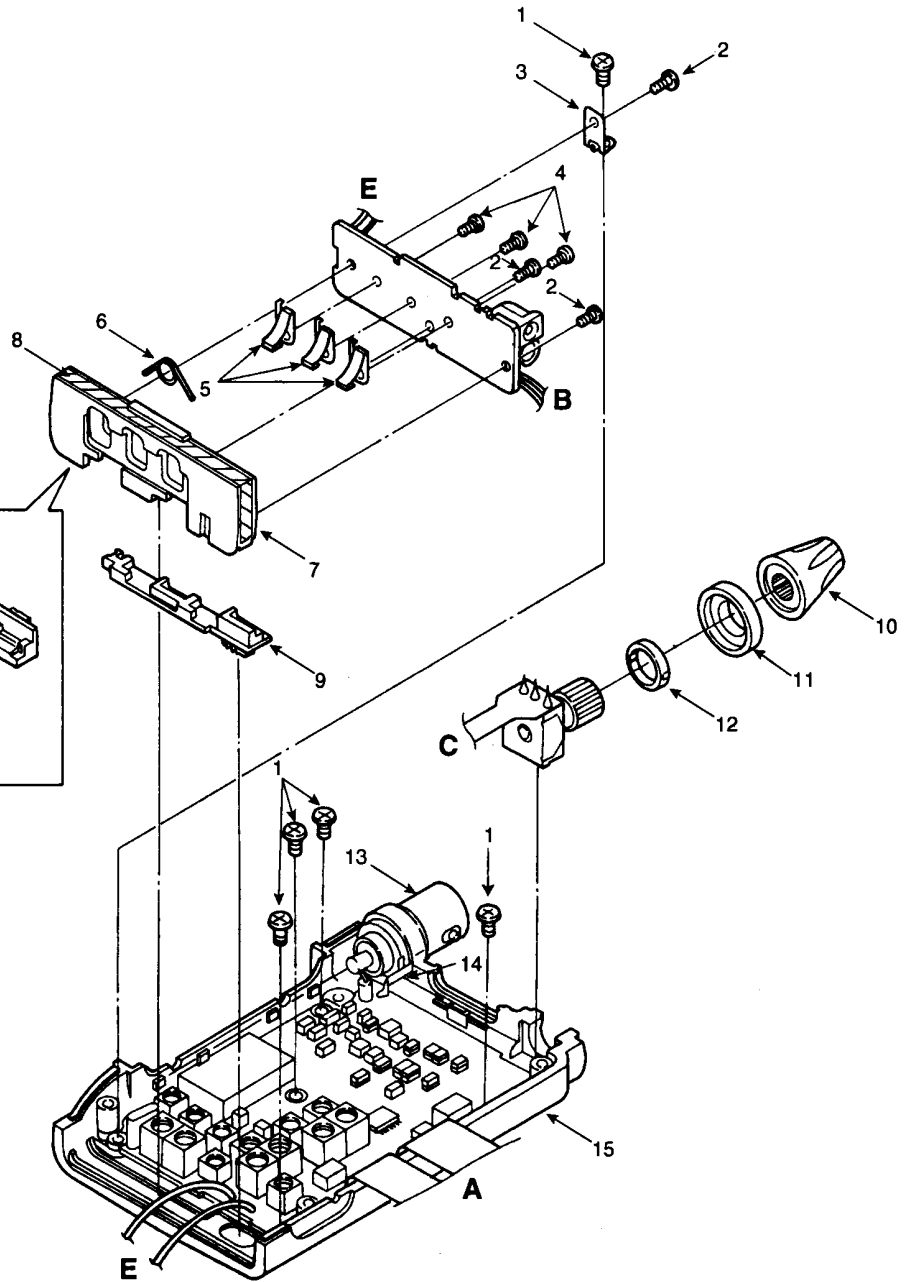
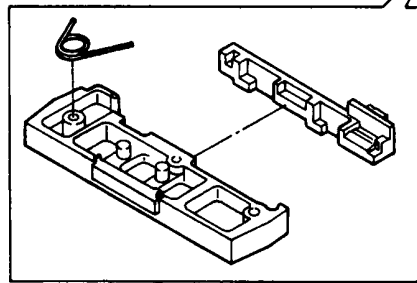
2) IF Unit/CPU Unit

	Parts No.
1	AF0020
2	uP0282
3	FM0100
4	FG0178Y
5	AP0004
6	TN006Z
7	uP0281
8	AX0002
9	FM0098
10	TL0017
11	DG0027
12	TL0020
13	TX0004
14	EL0037
15	TZ0064
16	AX0001
17	FG0218
18	ST0052
19	MKCL00AA
20	MNCLH2AA
21	ES0011
22	FG0255
23	FG0180Y
24	FG0176Y </td
25	FG0235
26	FG0242
27	FG0243Y
28	FG0177Y
29	KZ0051Y



3) Charge/RF Unit

	Parts No.
1	AK0001
2	AX0001
3	TS0141
4	AF0020
5	SD0045
6	SC0008A
7	FP0093A
8	TS0110 (T/E version only)
9	FP0094
10	NK0042Y
11	FG0181Y
12	AN0012Y
13	UE0193AZ
14	FM0112
15	KB0064Y



PARTS LIST

Ref. No.	Parts No.	Parts Name	Ver.	Ref. No.	Parts No.	Parts Name	Ver.	Ref. No.	Parts No.	Parts Name	Ver.	Ref. No.	Parts Name	Ver.	
C801	CU0031	C1608JH103KTA		D501	XL0036	SML-310M/T166		R544	PK3060	ERJ3G5Y102V		R544	ERJ3G5Y102V		
C802	CS0234	TMCMB1V15SMTR		D502	XL0036	SML-310M/T166		R546	PK3001	ERJ3G5Y102V		R546	ERJ3G5Y102V		
C803	CU0104	C2012JB1E104M		D503	XL0036	SML-310M/T166		R547	PK3008	ERJ3G5Y102V		R547	ERJ3G5Y102V		
C804	CU0034	C2012CH1H101K		D504	XL0045	PG1101F-TR		R548	PK3042	ERJ3G5Y102V		R548	ERJ3G5Y102V		
C805	CU0023	C1608CH1H101JTA		D506	XL0045	PG1101F-TR		R549	PK3042	ERJ3G5Y102V		R549	ERJ3G5Y102V		
C806	CU0023	C1608CH1H101JTA		D507	XL0045	PG1101F-TR		R550	PK3042	ERJ3G5Y102V		R550	ERJ3G5Y102V		
C807	CE0336	6MAY-3305WB		D508	XL00291	MA1729-TX		R551	PK3054	ERJ3G5Y102V		R551	ERJ3G5Y102V		
D801	XD0294	LPFWJ44M(TE:12R)		D509	XL00291	MA1729-TX		R552	PK3038	ERJ3G5Y102V		R552	ERJ3G5Y102V		
D802	XD0294	LPFWJ44M(TE:12R)		D511	XL0028	BRPG1201W-TR		R553	PK3056	ERJ3G5Y102V		R553	ERJ3G5Y102V		
D803	XD0294	LPFWJ44M(TE:12R)		IC500	XA0506	UA0506		R554	PK3056	ERJ3G5Y102V		R554	ERJ3G5Y102V		
D804	XD0294	LPFWJ44M(TE:12R)		IC501	XA0358	S-412375S-QE-T2		R555	PK3047	ERJ3G5Y102V		R555	ERJ3G5Y102V		
D805	XD0130	DA204UJT106		IC502	XA0357	S-407335S-AN-T2		R556	PK3059	ERJ3G5Y102V		R556	ERJ3G5Y102V		
D806	XD0294	LPFWJ44M(TE:12R)		IC503	XA0467	TK112354MITL		R557	PK3008	ERJ3G5Y102V		R557	ERJ3G5Y102V		
JK601	UU0015	HEC27B1-010020		IC504	XA0468	TK11818MITL		R558	PK3026	ERJ3G5Y101V		R558	ERJ3G5Y101V		
R801	RK0004	ERJ3G5Y102V		IC505	XA0468	TK11818MITL		R559	PK3001	ERJ3G5Y10R00V		R559	ERJ3G5Y10R00V		
R802	RK3038	ERJ3G5Y102V		IC506	XA0465	TC75551F(T68S)		R573	PK3001	ERJ3G5Y10R00V		R573	ERJ3G5Y10R00V		
R803	RK3046	ERJ3G5Y102V		IC506	XA0536	UPD78076G		R574	PK3050	ERJ3G5Y103V		R574	ERJ3G5Y103V		
R804	RK4014	ERJ12VJ100H		IC506	XA0550	HN58V257-A-12		R575	RA0009	EXB8V102JV		R575	EXB8V102JV		
				IC510	XA0528	S-407255N2		RA500	RA0009	EXB8V102JV		RA500	EXB8V102JV		
				C520	CU0047	OC0502		RA501	RA0010	EXB8V102JV		RA501	EXB8V102JV		
				C521	CU0047	OC0502		RA502	RA0010	EXB8V102JV		RA502	EXB8V102JV		
				C522	CU0021	LD0500		RA503	RA0010	EXB8V102JV		RA503	EXB8V102JV		
				C523	CU0015	LD0500		RA504	RA0010	EXB8V102JV		RA504	EXB8V102JV		
				C524	CU0015	LD0500		RA505	RA0010	EXB8V102JV		RA505	EXB8V102JV		
				C525	CU0015	LD0500		RA506	RA0010	EXB8V102JV		RA506	EXB8V102JV		
				C526	CU0068	TMCMA1A22SMTR		SW500	UU0019	SKQLLC		SW500	SKQLLC		
				C527	CU0047	TMCMA1A22SMTR		SW502	UU0019	SKQLLC		SW502	SKQLLC		
				C528	CU0047	TMCMA1A22SMTR		SW503	UU0018	SOP-112HST		SW503	SOP-112HST		
				C529	CU0059	TMCMA1A22SMTR		SW504	UU0019	SKQLLC		SW504	SKQLLC		
				C530	CU0047	TMCMA1A22SMTR		SW510	UU0019	SKQLLC		SW510	SKQLLC		
				C531	CU0047	TMCMA1A22SMTR		SW511	UU0018	SOP-112HST		SW511	SOP-112HST		
				C532	CU0047	TMCMA1A22SMTR		SW512	UU0018	SOP-112HST		SW512	SOP-112HST		
				C533	CU0023	C1608JH103KTA		TH600	XS0033	TESS1473M475H5Q		TH600	TESS1473M475H5Q		
				C534	CU0047	C1608CH1H103KTA		VPS00	RH0138	MVR224XB8R222		VPS00	MVR224XB8R222		
				C535	CU0047	C1608CH1H103KTA		XS00	XO0042	DT28-32-768KHZ		XS00	DT28-32-768KHZ		
				C536	CU0023	C1608CH1H101JTA		X801	XO0077	38C-3.686400MHZ		X801	38C-3.686400MHZ		
				C537	CU0023	C1608CH1H101JTA									
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				C542	CU0023	C1608CH1H101JTA									
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				C551	CU0023	C1608CH1H101JTA									
				C552	CU0059	C1608JF1E104ZTA									
				C553	CU0023	C1608CH1H101JTA									
				C554	CU0023	C1608CH1H101JTA									
				C555	CU0023	C1608CH1H101JTA									
				C556	CU0023	C1608JF1E104ZTA									
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				C565	CU0023	C1608CH1H101JTA									
				C570	CU3114	EMK107BJ105ZA-T									
				CN500	UE0256	CFP0508-0201									
				CN501	UE0255	6027B-032003									
				CN503	UE0241	AXN44C038P									
				CN504	UP0281	DJGS-CPLP-TT									
				D500	XL0038	SML-310M/T166									

Ref. No.	Parts No.	Parts Name	Description	Ver.	Ref. No.	Parts No.	Parts Name	Ver.	Ref. No.	Parts No.	Parts Name	Ver.
AF0020	0243F4eNT	Mechanical Parts			SW506	UU0018	PIT Unit		C167	CJ3002	C1608CHH100CTA	
AX0003	OP2-16F-eDC3		BODY		SW507	UU0018	SOP-112xHST		C168	CJ3004	C1608CHH100CTA	
FG0178Y	Jack rubber		BODY		SW508	UU0018	SOP-112xHST		C169	CJ3005	C1608CHH100CTA	
FG0180Y	DC cap		BODY		SW509	UU0018	SOP-112xHST		C170	CJ3006	C1608CHH100CTA	
FG0181Y	Dial cap		BODY						C171	CJ3007	C2012JFC105ZT-N	
FG0238Y	Jack cap		BODY						C172	CJ3008	C1608CHH100CTA	
FM0100	Jack metal fixture		BODY						C173	CJ3009	C1608CHH100CTA	
KZ0073Y	LCD panel		BODY						C174	CJ3010	C1608CHH100CTA	
NK0042Y	Dial knob		BODY						C175	CJ3011	C1608CHH100CTA	
FR0340	Caution label		BODY						C176	CJ3012	C1608CHH100CTA	
FR0303	Battery rubber		Battery case						C177	CJ3013	C1608CHH100CTA	
KD0031	Battery case		Battery case						C178	CJ3014	C1608CHH100CTA	
KF0030	Battery lid		Battery case						C179	CJ3015	C1608CHH100CTA	
PD0028	Caution label		Battery case						C180	CJ3016	C1608CHH100CTA	
SD0046	Caution label		Battery case						C181	CJ3017	C1608CHH100CTA	
SD0047	Battery spring A		Battery case						C182	CJ3018	C1608CHH100CTA	
SD0048	Battery spring B		Battery case						C183	CJ3019	C1608CHH100CTA	
SD0049	Battery spring C		Battery case						C184	CJ3020	C1608CHH100CTA	
AF0020	CP2-4F-eB1		Battery case						C185	CJ3021	C1608CHH100CTA	
AX0001	Terminal Frame		Charge unit						C186	CJ3022	C1608CHH100CTA	
FR0063A	Release knob		Charge unit						C187	CJ3023	C1608CHH100CTA	
FR0064Y	Release knob		Charge unit						C188	CJ3024	C1608CHH100CTA	
SC0008	Release spring		Charge unit						C189	CJ3025	C1608CHH100CTA	
SD0045	Battery terminal		Charge unit						C190	CJ3026	C1608CHH100CTA	
SD0046	Earth metal fixture		Charge unit						C191	CJ3027	C1608CHH100CTA	
TS0141	Charge earth fixture		Charge unit						C192	CJ3028	C1608CHH100CTA	
TS0110	Specification Sheet E		Charge unit						C193	CJ3029	C1608CHH100CTA	
	Specification Sheet T		Finished						C194	CJ3030	C1608CHH100CTA	
	FCC PART15 seal		Finished						C195	CJ3031	C1608CHH100CTA	
	CE seal		Finished						C196	CJ3032	C1608CHH100CTA	
EA0069Z	Antenna		Finished						C197	CJ3033	C1608CHH100CTA	
EG0026	EP37N		Finished						C198	CJ3034	C1608CHH100CTA	
EW0011	EDC3		Finished						C199	CJ3035	C1608CHH100CTA	
EW0012	EDC6		Finished						C200	CJ3036	C1608CHH100CTA	
EW0013	EDC8		Finished						C201	CJ3037	C1608CHH100CTA	
AP0004	P2-5F-eC7		Finished						C202	CJ3038	C1608CHH100CTA	
AX0001	P2-4F-eB1		Front unit						C203	CJ3039	C1608CHH100CTA	
ES0011Z	OP2-5F-eN1		Front unit						C204	CJ3040	C1608CHH100CTA	
FG0176Y	SU-36W-824		Front unit						C205	CJ3041	C1608CHH100CTA	
FG0218	VOL rubber		Front unit						C206	CJ3042	C1608CHH100CTA	
FG0218	VOL key rubber		Front unit						C207	CJ3043	C1608CHH100CTA	
FG0218	Cushion		Front unit						C208	CJ3044	C1608CHH100CTA	
FG0235	PIT rubber		Front unit						C209	CJ3045	C1608CHH100CTA	
FG0242	Reset rubber		Front unit						C210	CJ3046	C1608CHH100CTA	
FG0243Y	18key rubber		Front unit						C211	CJ3047	C1608CHH100CTA	
FG0255	Power key rubber		Front unit						C212	CJ3048	C1608CHH100CTA	
FG0261	Rear panel		Front unit						C213	CJ3049	C1608CHH100CTA	
FG0268	Front case		Front unit						C214	CJ3050	C1608CHH100CTA	
KZ0060	Front case		Front unit						C215	CJ3051	C1608CHH100CTA	
MKCL02AA	#30K02-020-02		Front unit						C216	CJ3052	C1608CHH100CTA	
MT0052	#30K02-025-02		Front unit						C217	CJ3053	C1608CHH100CTA	
MNCLH2AA	SP metal fixture		Front unit						C218	CJ3054	C1608CHH100CTA	
SL0062Z	CPU shield		Front unit						C219	CJ3055	C1608CHH100CTA	
TZ0064	Panel sheet		Front unit						C220	CJ3056	C1608CHH100CTA	
	Schematic diagram		Front unit						C221	CJ3057	C1608CHH100CTA	
PS0275	Instruction manual		Packing						C222	CJ3058	C1608CHH100CTA	
#6035	Belt clip B unit		Packing						C223	CJ3059	C1608CHH100CTA	
HK0418	Carton		Packing						C224	CJ3060	C1608CHH100CTA	
HP0028	Carton 5 sets		Packing						C225	CJ3061	C1608CHH100CTA	
HP0031	Protection bag 5x165x280		Packing						C226	CJ3062	C1608CHH100CTA	
HJ0077	Protection bag 5x100x200		Packing						C227	CJ3063	C1608CHH100CTA	
HJ0084	Figure 5 sets		Packing						C228	CJ3064	C1608CHH100CTA	
HJ0095	Protection N-Cd		Packing						C229	CJ3065	C1608CHH100CTA	
PT0004A	Lot number seal for box		Packing						C230	CJ3066	C1608CHH100CTA	
AK0001	Dial nut		Packing						C231	CJ3067	C1608CHH100CTA	
AK0012Y	BNC earth		Packing						C232	CJ3068	C1608CHH100CTA	
XG0064Y	BNC antenna connector		Rear unit						C233	CJ3069	C1608CHH100CTA	
UE0193AZ			Rear unit						C234	CJ3070	C1608CHH100CTA	
			Rear unit						C235	CJ3071	C1608CHH100CTA	
			Rear unit						C236	CJ3072	C1608CHH100CTA	
			Rear unit						C237	CJ3073	C1608CHH100CTA	
			Rear unit						C238	CJ3074	C1608CHH100CTA	
			Rear unit						C239	CJ3075	C1608CHH100CTA	
			Rear unit						C240	CJ3076	C1608CHH100CTA	

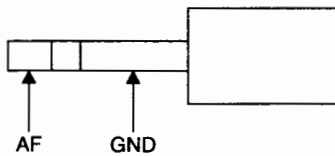
ADJUSTMENT

1) Required measuring instruments and tools

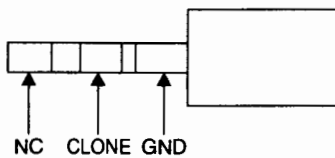
1. Digital voltmeter
2. Regulated power supply of 10 V, 1 A or more
3. Oscilloscope
4. Frequency counter
5. External speaker
6. 0.1 MHz ~ 2 GHz SG
7. Audio analyzer
Level meter, distortion factor meter, linear detector
8. Spectrum analyzer

1 m coaxial cable with BNC connector

Speaker cable with 3.5ø plug



Cloning cable with 2.5ø stereo plug on both ends



Power supply cable for external power supply terminal (For DJG5)

2) Adjustment

All SSG outputs are indicated in EMF.

The SP is 8 Ω . Output is 50 mW.

Level meter filter must be HPF (30 ~ 50 Hz) and LPF (10 ~ 15 kHz).

■ Power supply 10 V

After connecting and turning ON the power supply:

Turn the BS OFF.

Transfer adjustment data by cloning.

■ Frequency adjustment

Encircled numbers correspond to memory Nos. in the memory A0 bank.

1. PLL reference frequency

- While receiving on $f=198.70$ (NFM ①), using the frequency counter, measure TP104 in the RF Unit and adjust TC100 to obtain $934.95\text{MHz} \pm 1\text{kHz}$.

2. VCXO frequency

- While receiving on $f=198.70$ (step=100Hz, NFM ①), using the frequency counter, measure TP304 in the IF Unit, and adjust VR303 and VR300 to obtain $44.595\text{MHz} \pm 200\text{Hz}$.
- When receiving on $f=198.701\text{MHz}$ ②, adjust to $44.6049\text{MHz} \pm 200\text{Hz}$.
- Switch ① 198.700 MHz and ② 198.7001 MHz and set amplitude to 9.9 kHz from VR303. Adjust to 44.5950 MHz when at 198.700 MHz from VR300.

3. SSB BFO frequency

- While receiving on $f=198.70$ (USB ③), using the frequency counter, measure TP308 in the IF Unit and adjust TC300 to obtain $456.0\text{kHz} +200\text{Hz} / -600\text{Hz}$.

4. PLL lock check

- Check that voltage is 8 ~ 15 V using the digital voltmeter on $f=300.0$ (NFM ④) and measuring TP103 in the RF Unit.
- Check that voltage is in 3 ~ 25 V using the digital voltmeter on $f=449.940$ (NFM ⑤) and measuring TP103 in the RF Unit.

5. Local level adjustment

- Connect the spectrum analyzer to antenna connector.
Set to maximum value while receiving on $f=198.70$ ⑥ and adjusting L103, L105, L106, and FL100 in the RF Unit.

6. NFM distortion

- Apply SG=60dBu 1kHz. Measure SP terminal. Adjust L307 in the IF Unit.
While receiving on $f=198.70$, using the distortion factor meter and oscilloscope, set distortion factor to minimum before making other adjustments, and set max. AF output to 6%.
- When receiving on 3.5kHz DEV(NFM ⑥), always turn adjustment core of L307 counter-clockwise. Be careful not to crack the core when turning clockwise.

7. NFM sensitivity

- Apply SG=6dBu 1kHz and 3.5kHz DEV (NFM ⑥). Measure SP terminal. Adjust FI102, FL101, and L102 in the RF Unit.

While receiving on f=198.70, using the distortion factor meter oscilloscope, repeat adjustment until obtaining optimum SINAD.

- Apply SG=0dBu 1kHz and 3.5kHz DEV(NFM ⑦). Measure SP terminal. Adjust L113, L110, L107, and L101 in the RF Unit.

While receiving on f=510.03, using the distortion factor meter oscilloscope, repeat adjustment until obtaining optimum SINAD.

8. WFM distortion

- Apply SG=60dBu 1kHz and 22.5kHz DEV(WFM ⑧). Measure SP terminal. Adjust L305 in the IF Unit.

While receiving on f=198.7, using the distortion factor meter oscilloscope, set distortion factor to minimum and max. AF output to 6%.

9. WFM sensitivity

- Apply SG=10dBu 1kHz and 22.5kHz DEV(WFM ⑧). Measure SP terminal. Adjust L304 and L309 in the IF Unit.

While receiving on f=198.70, using the distortion factor meter oscilloscope, repeat adjustment until obtaining optimum SINAD.

10. SQ level adjustment

- Apply SG=-3dBu. Measure SP BUSY terminal. Adjust VR302 in the IF Unit.

While receiving on f=198.70(NFM ⑨), adjust on LCD SQ level 1, turn VR304 clockwise to close squelch. Then, turn counter-clockwise to open and fix. However, close with SQ.

11. NFM S meter adjustment

- Apply SG=25dBu, unmodulated(NFM ⑨). Measure LCD terminal. Adjust VR302 in the IF Unit.

While receiving on f=198.70, turn SG OFF when S meter is full scale. Check S meter does not light up.

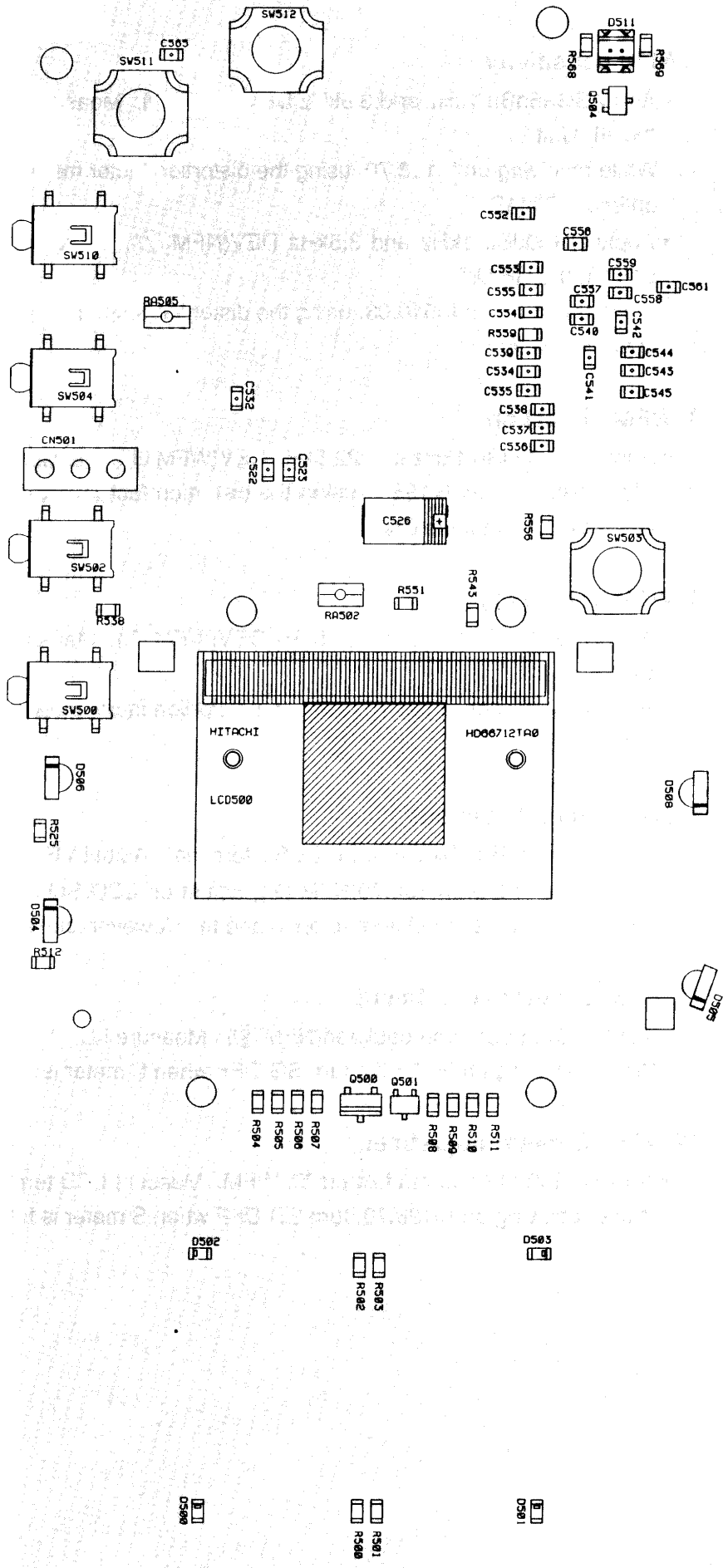
12. WFM S meter adjustment

- Apply SG=32dBu, unmodulated ⑩, WFM. Measure LCD terminal. Adjust VR301 in the IF Unit.

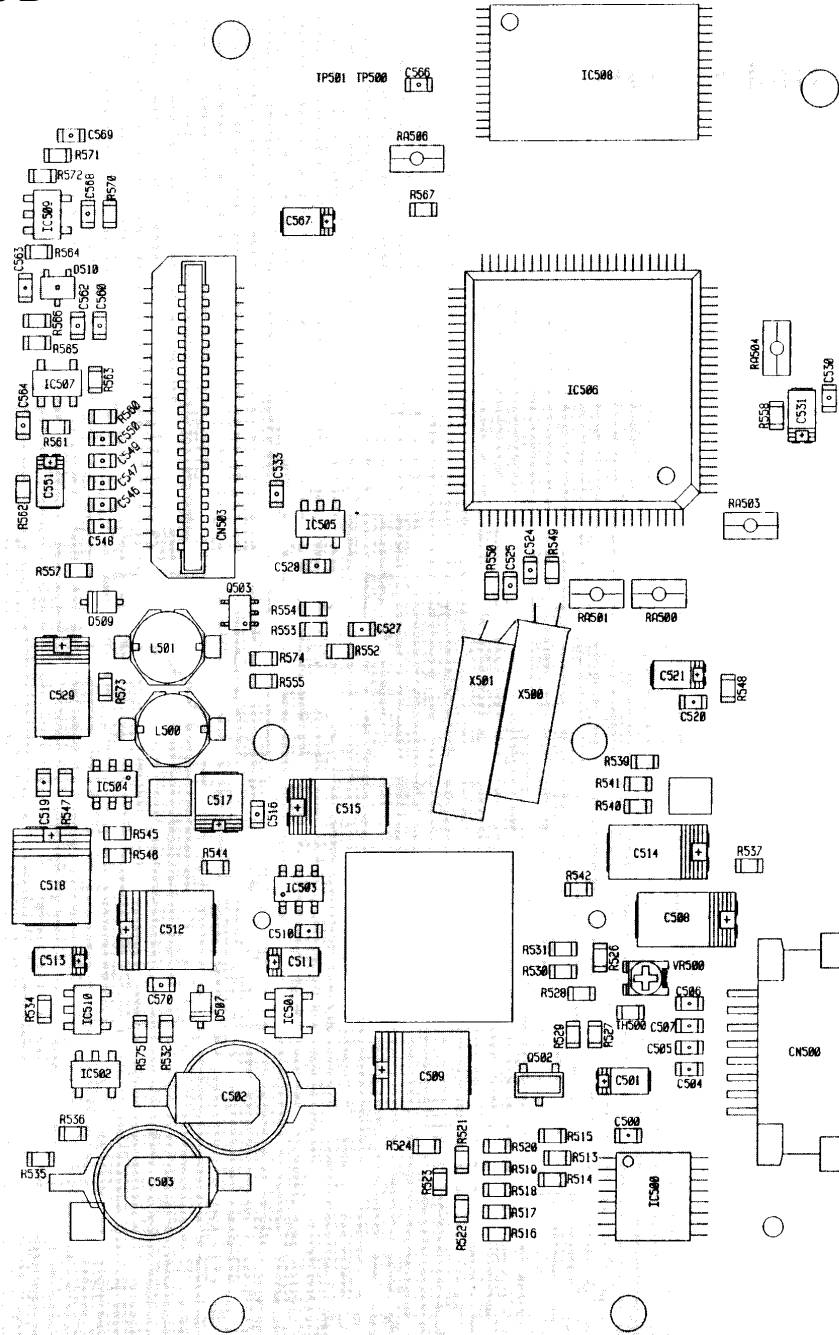
While receiving on f=198.70, turn SG OFF when S meter is full scale. Check S meter does not light up.

PC BOARD VIEW

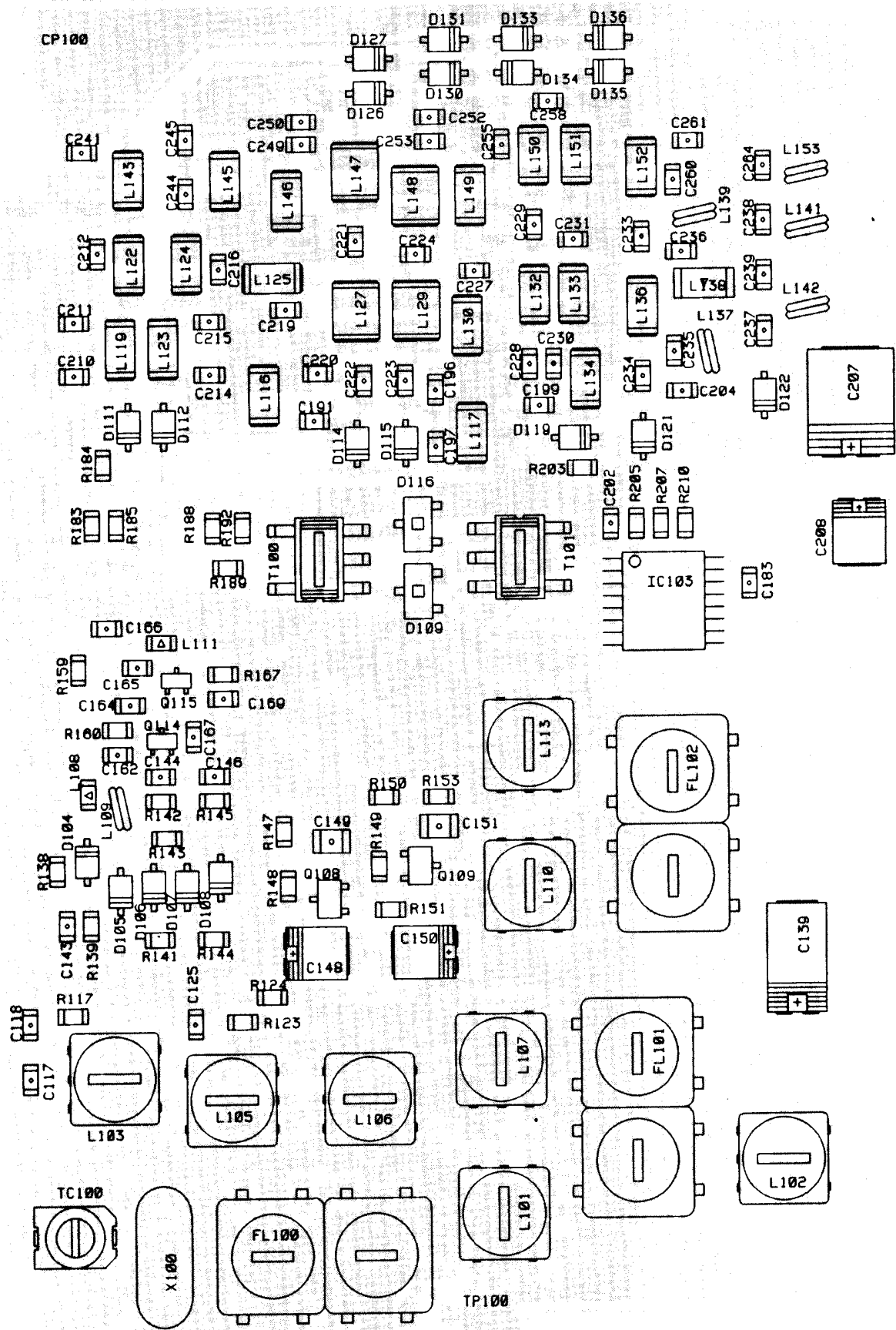
CPU Unit Side A



CPU Unit Side B

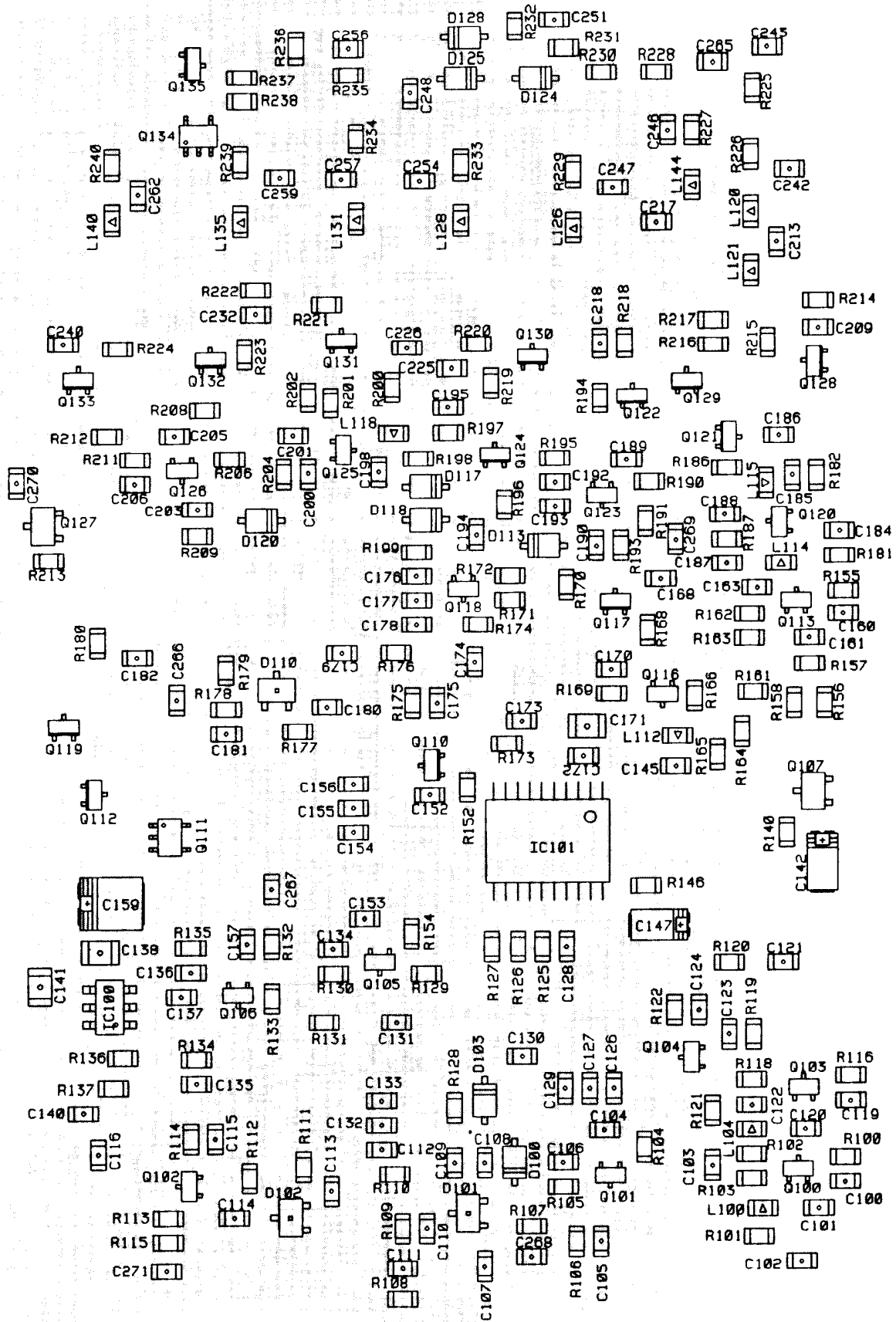


RF Unit Side A

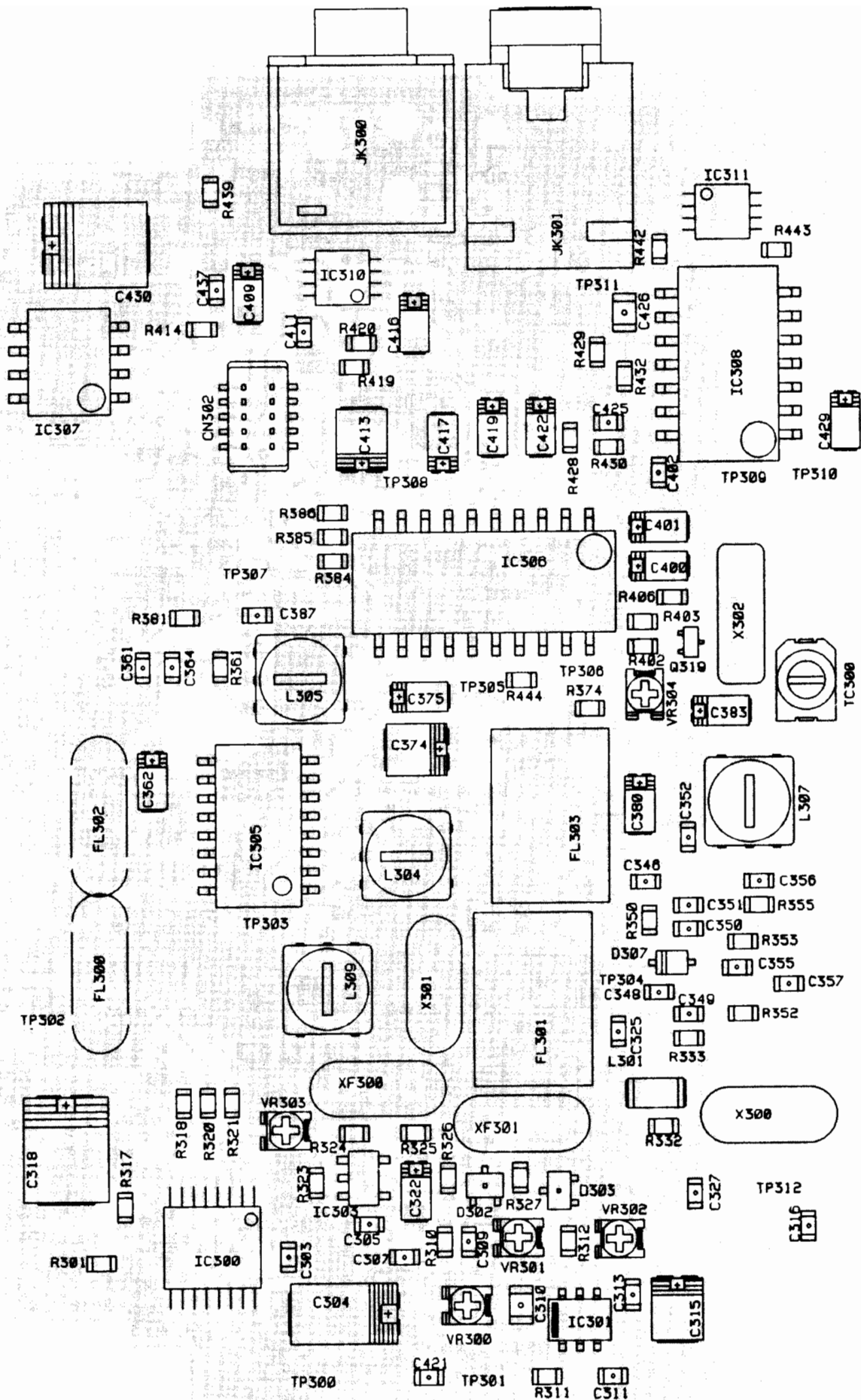


RF Unit Side B

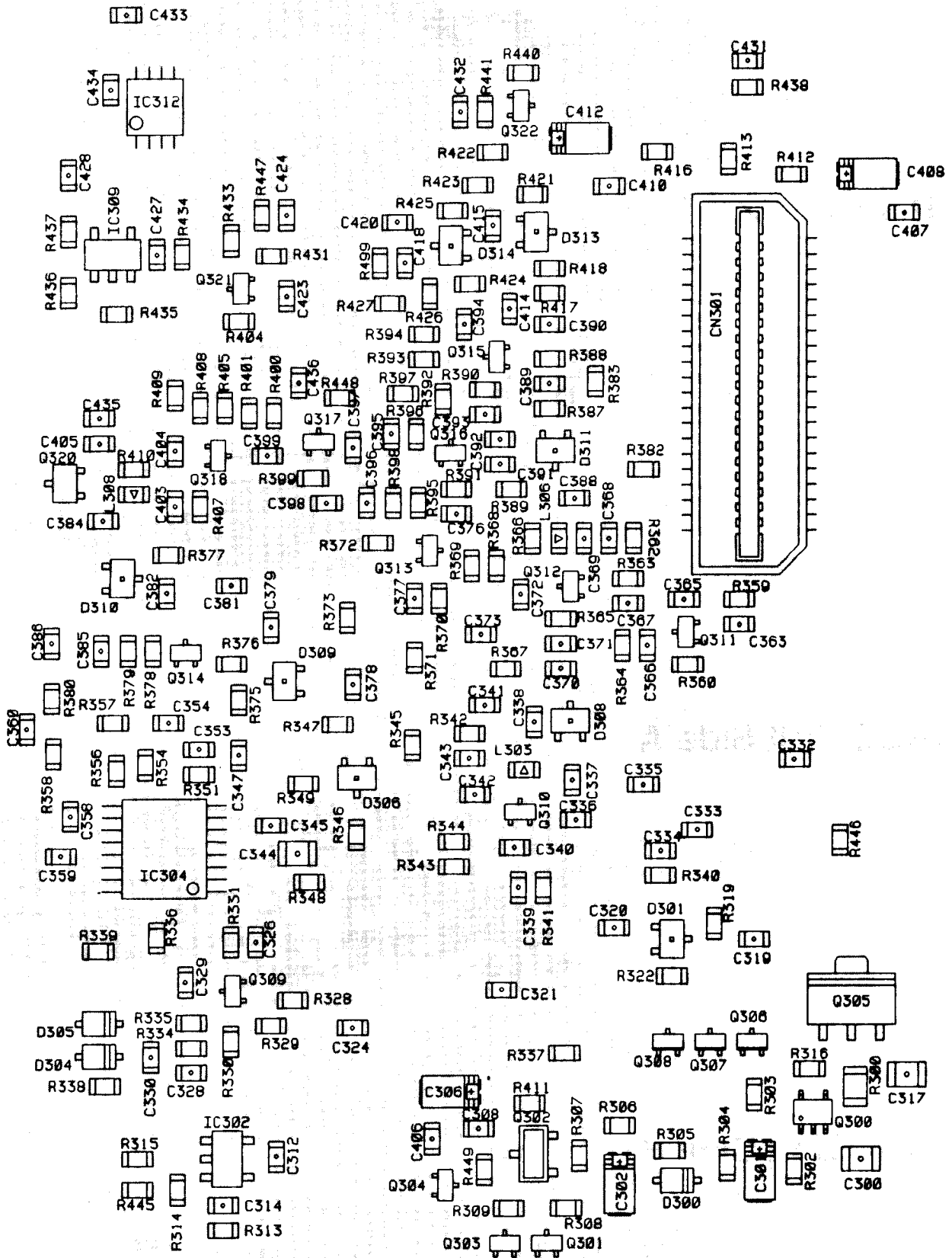
CN100



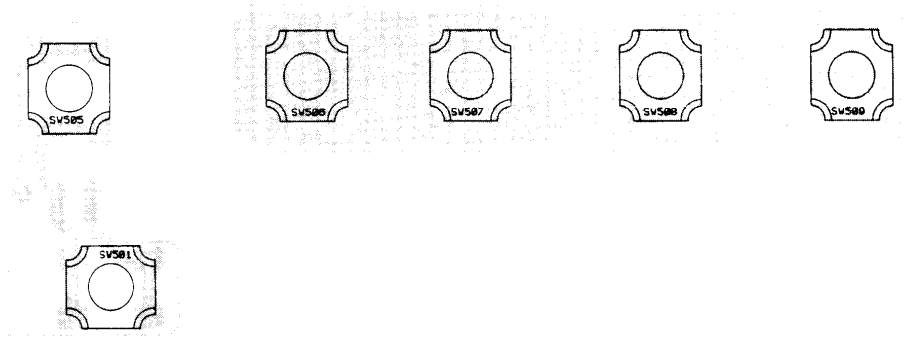
CN300



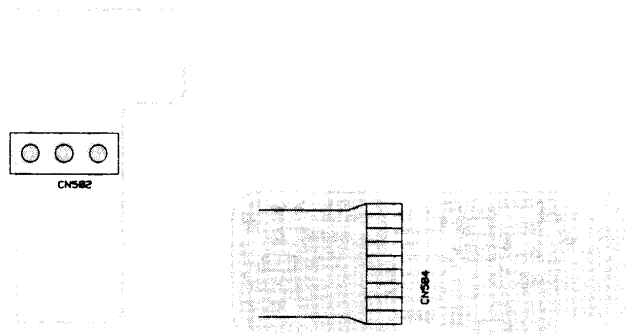
IF Unit Side B



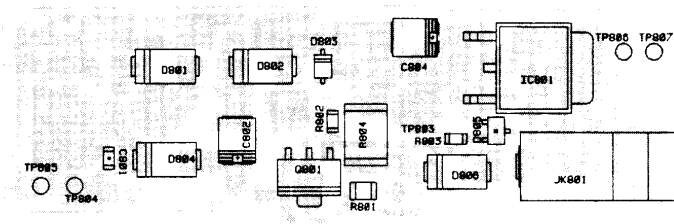
PTT SW Unit Side A



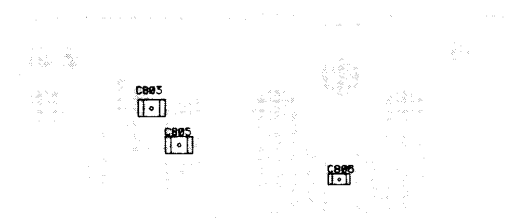
PTT SW Unit Side B



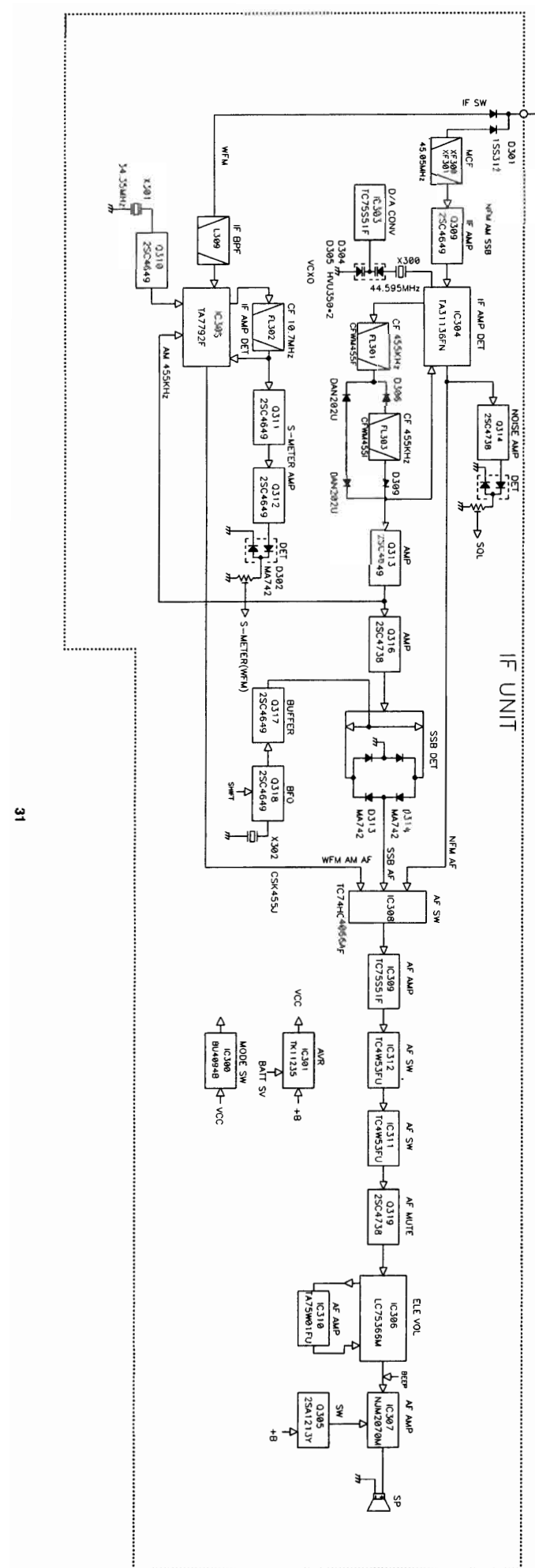
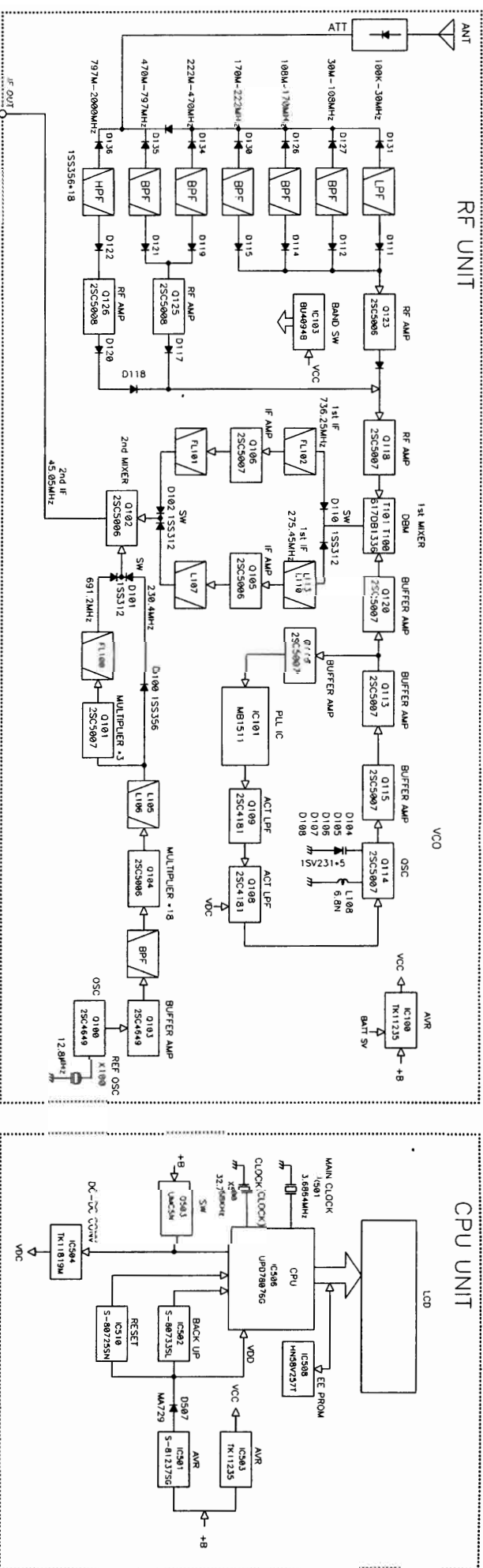
CHARGE Unit Side A



CHARGE Unit Side B

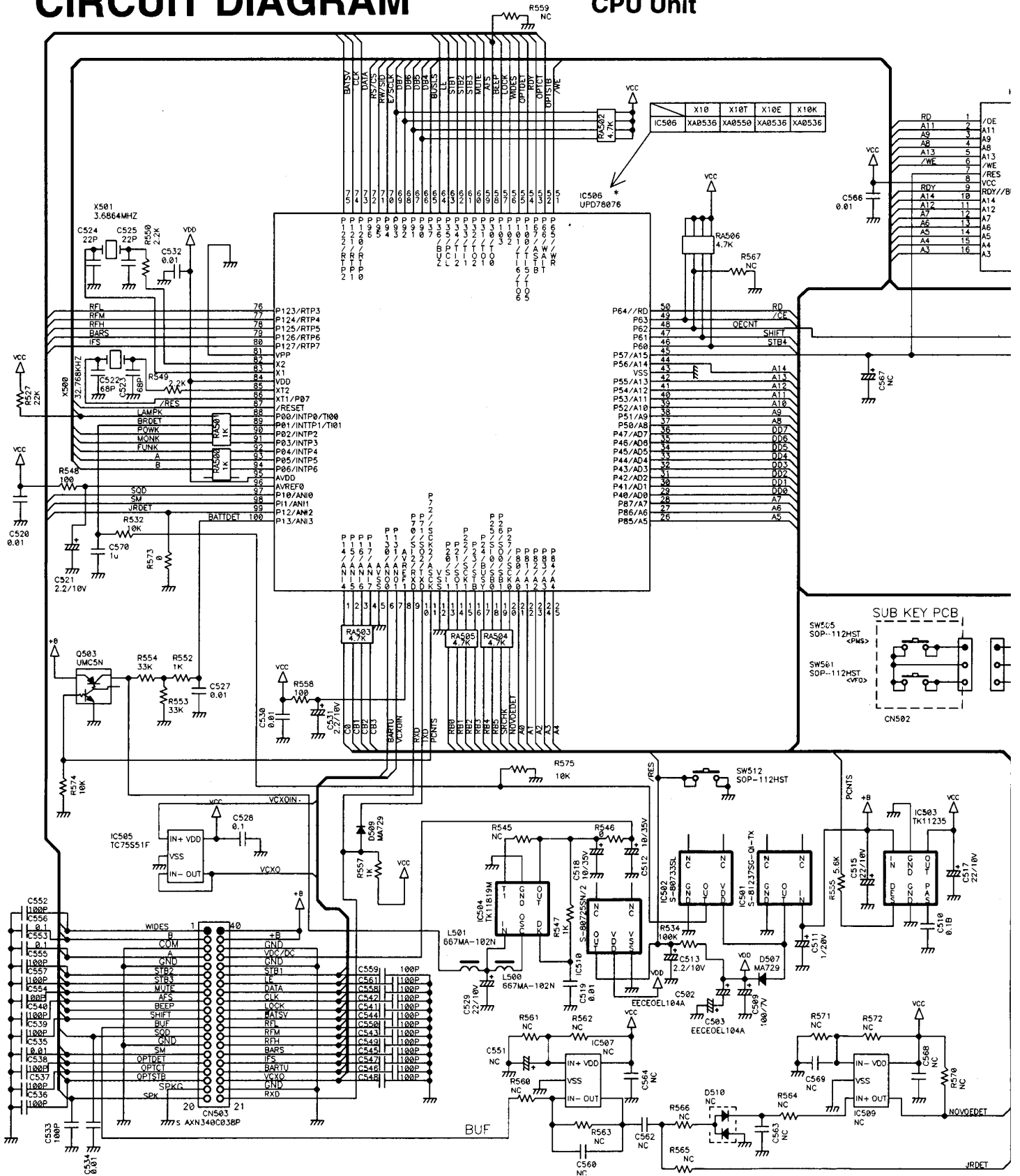


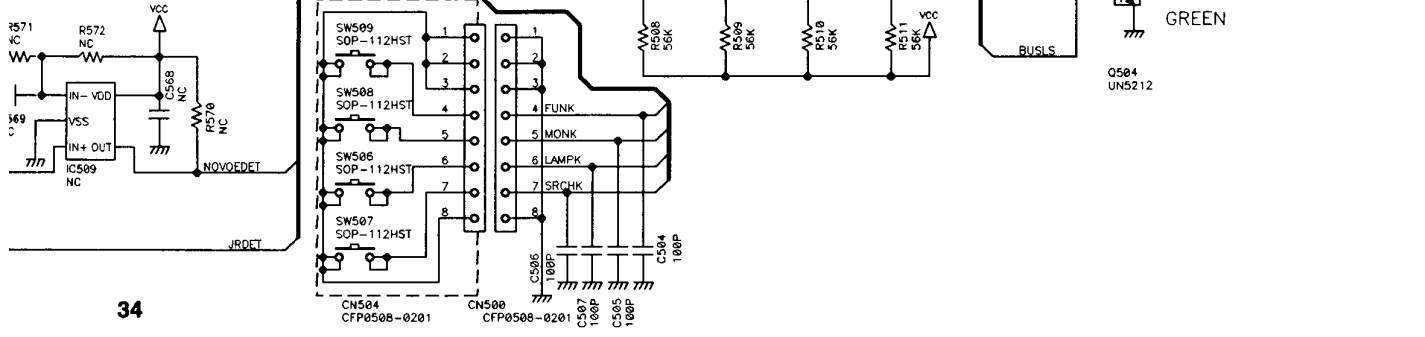
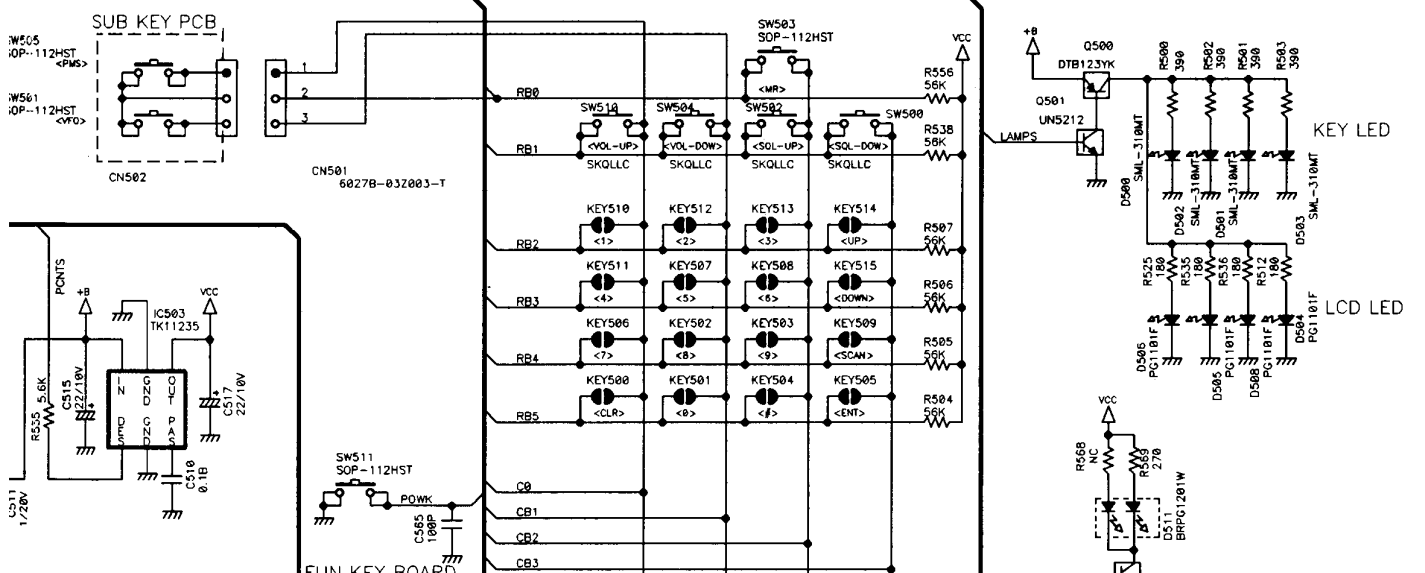
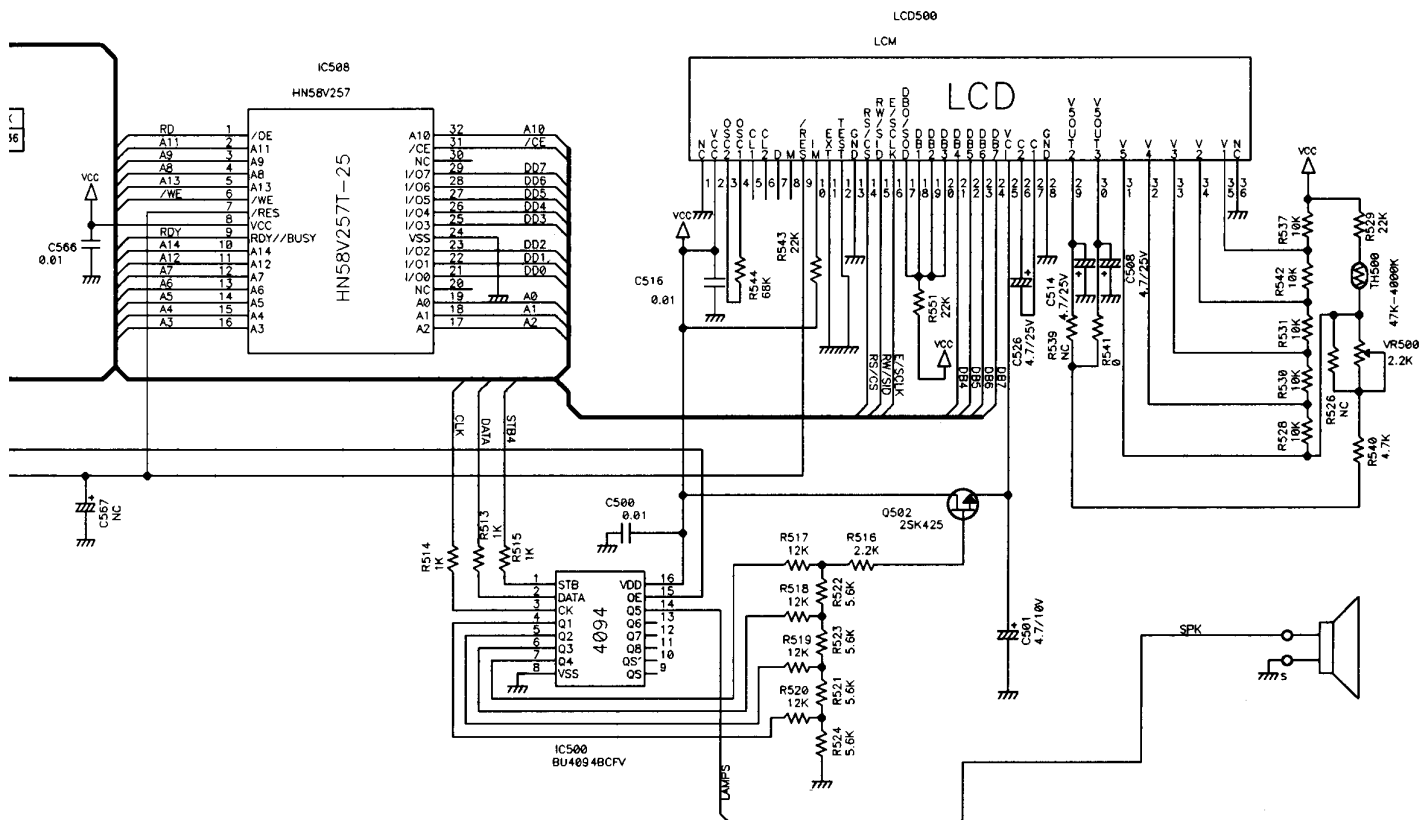
BLOCK DIAGRAM



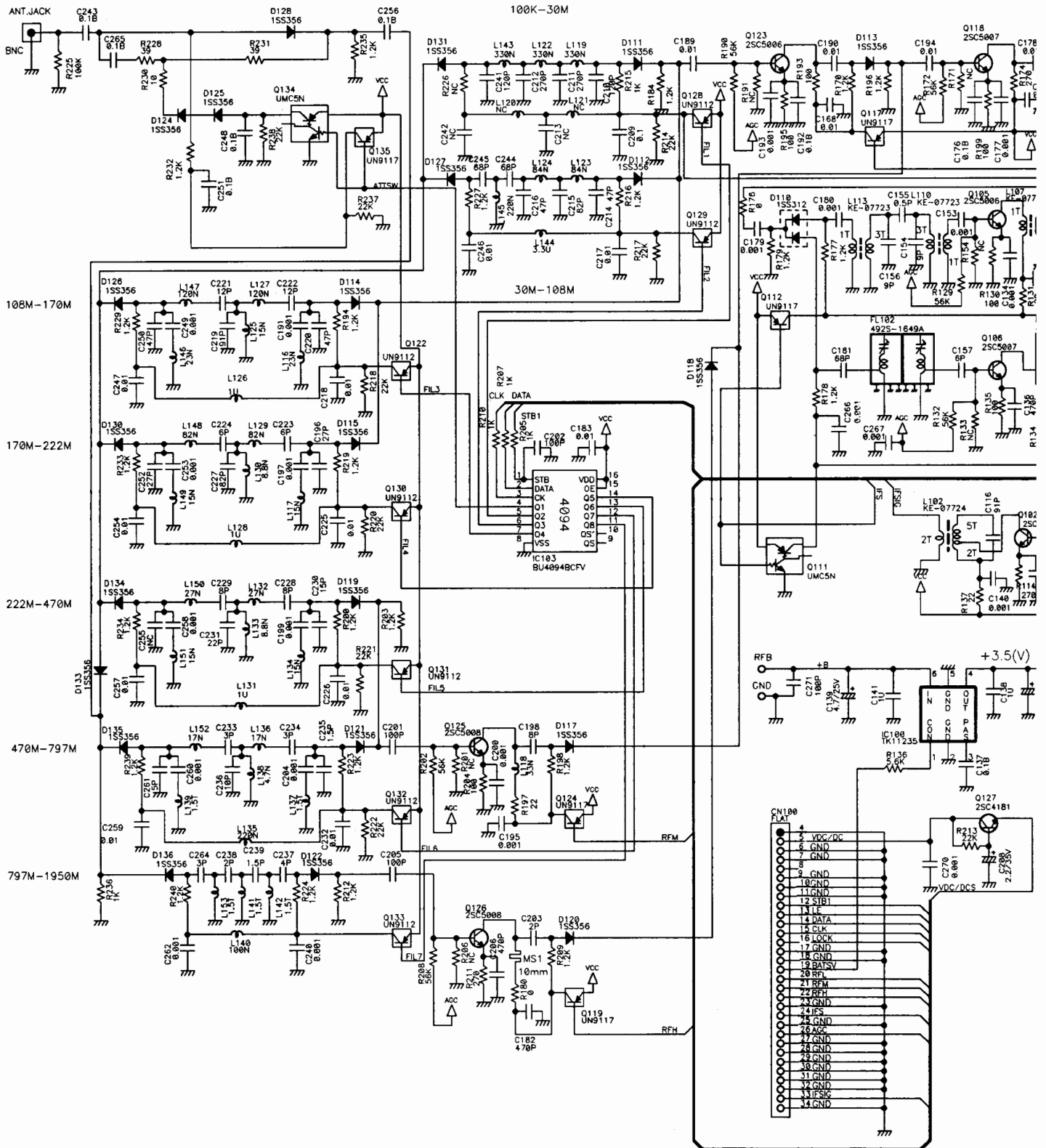
CIRCUIT DIAGRAM

CPU Unit

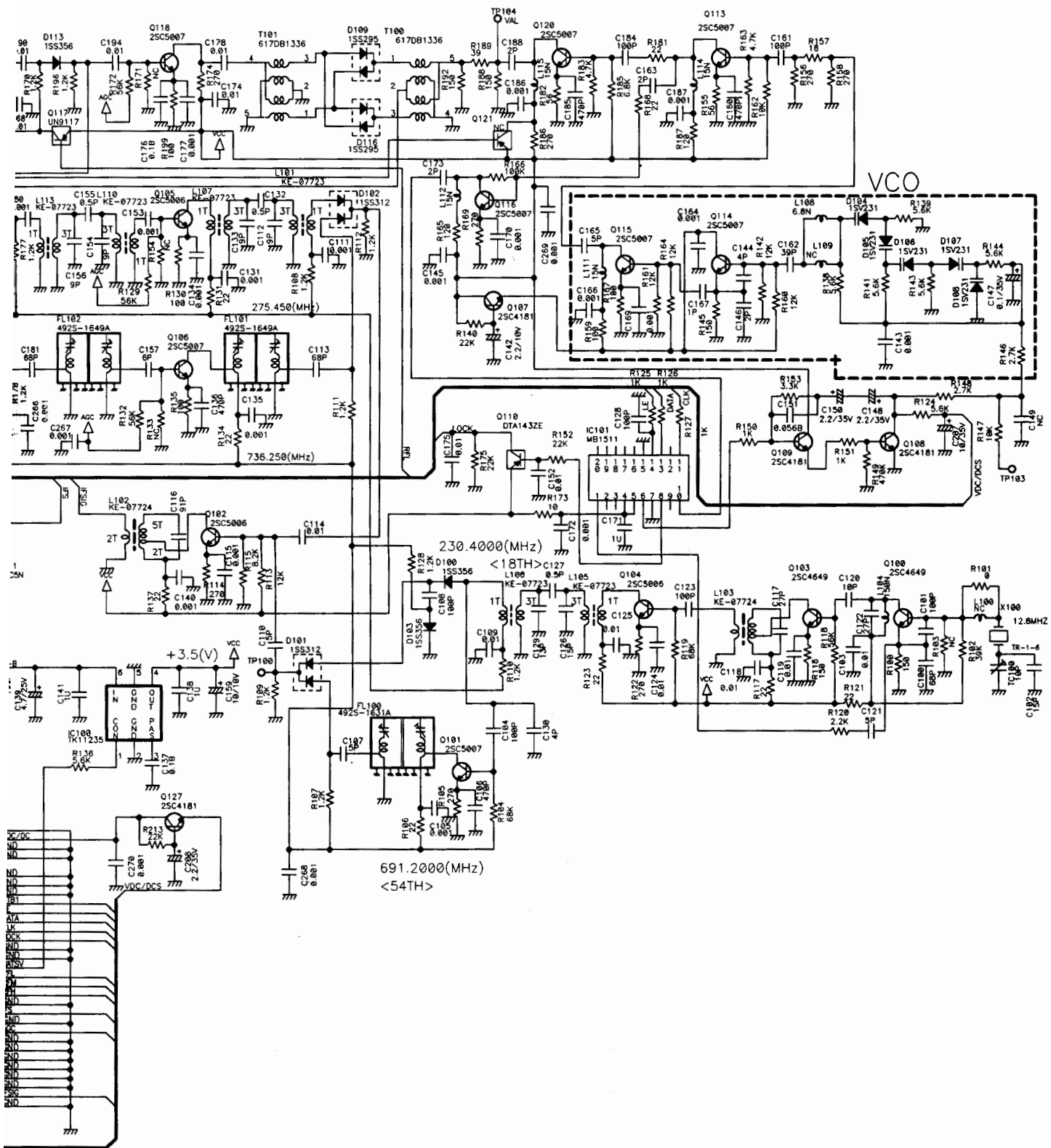




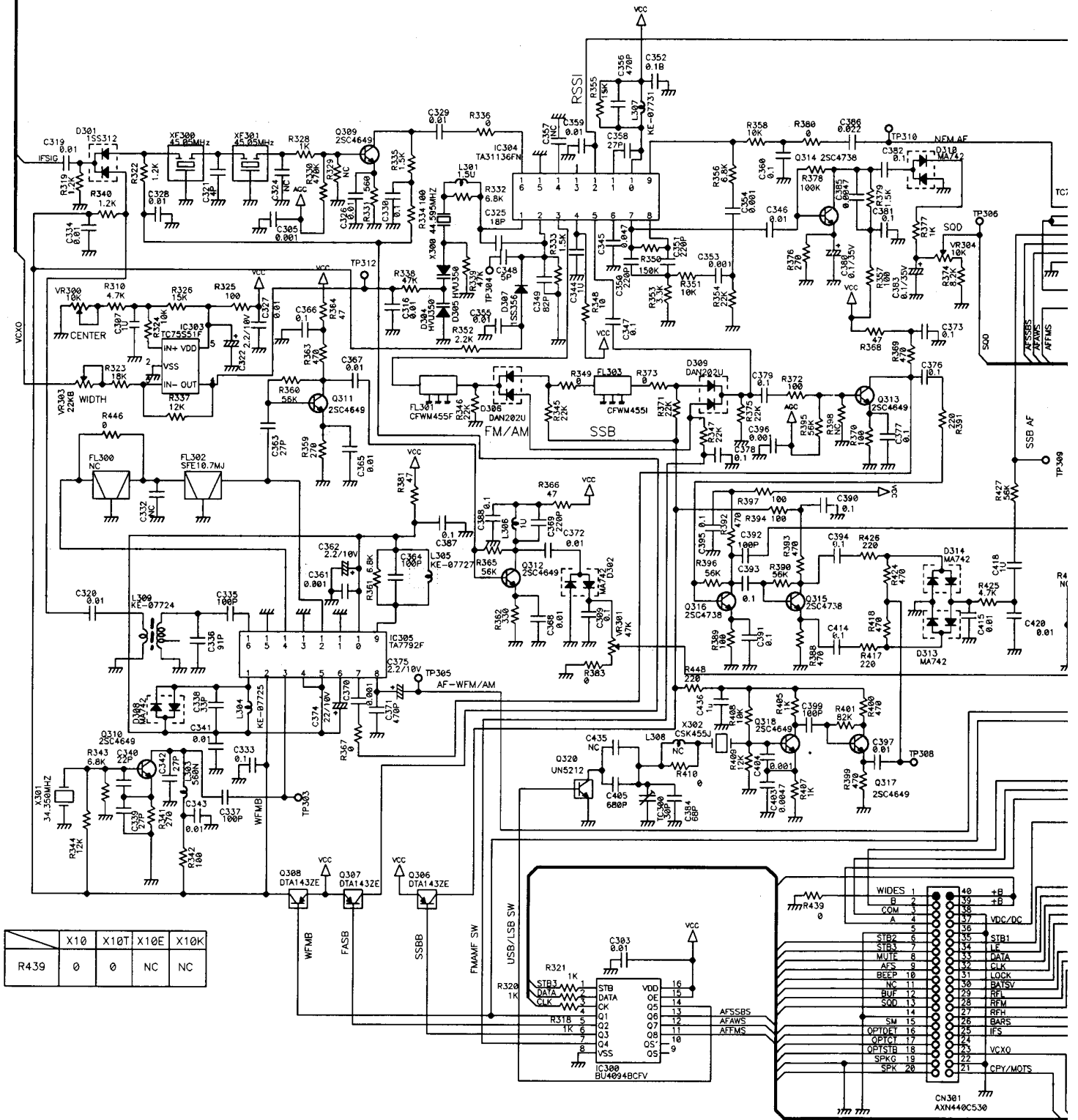
RF Unit



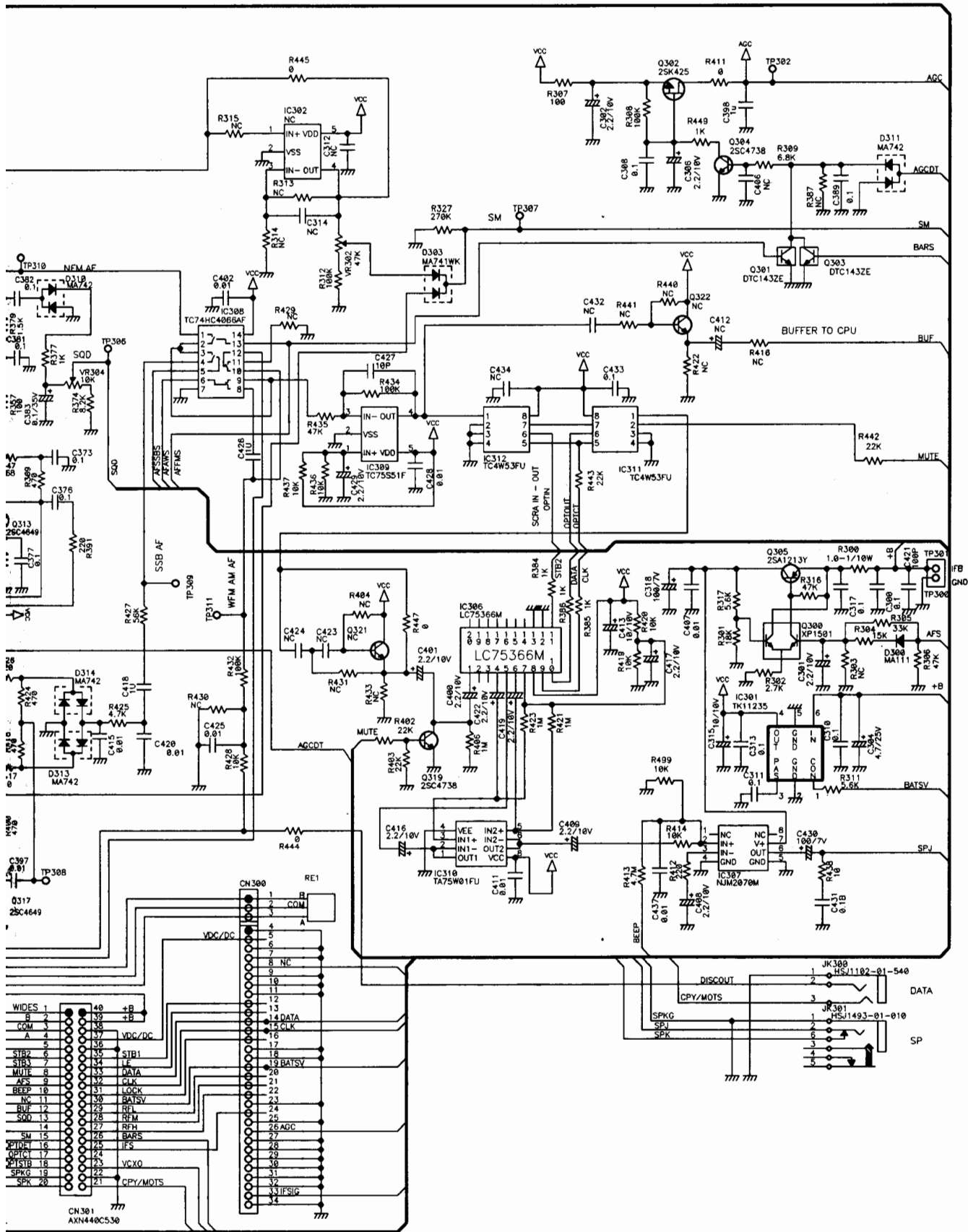
Pin	Signal
1	VCC/DCS
2	VCC/DCS
3	VCC/DCS
4	VCC/DCS
5	VCC/DCS
6	GND
7	GND
8	GND
9	GND
10	GND
11	GND
12	STB1
13	LF
14	DATA
15	CLK
16	LOCK
17	GND
18	GND
19	GND
20	RFB
21	RFM
22	RFH
23	GND
24	FSK
25	GND
26	ACC
27	GND
28	GND
29	GND
30	GND
31	GND
32	GND
33	RFSC
34	GND



IF Unit



	X10	X10T	X10E	X10K
R439	0	0	NC	NC



CHARGE Unit

