



RTC-970

SURROUND SOUND TUNER PREAMPLIFIER

Technical Manual

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THE ROTEL CO.,LTD.

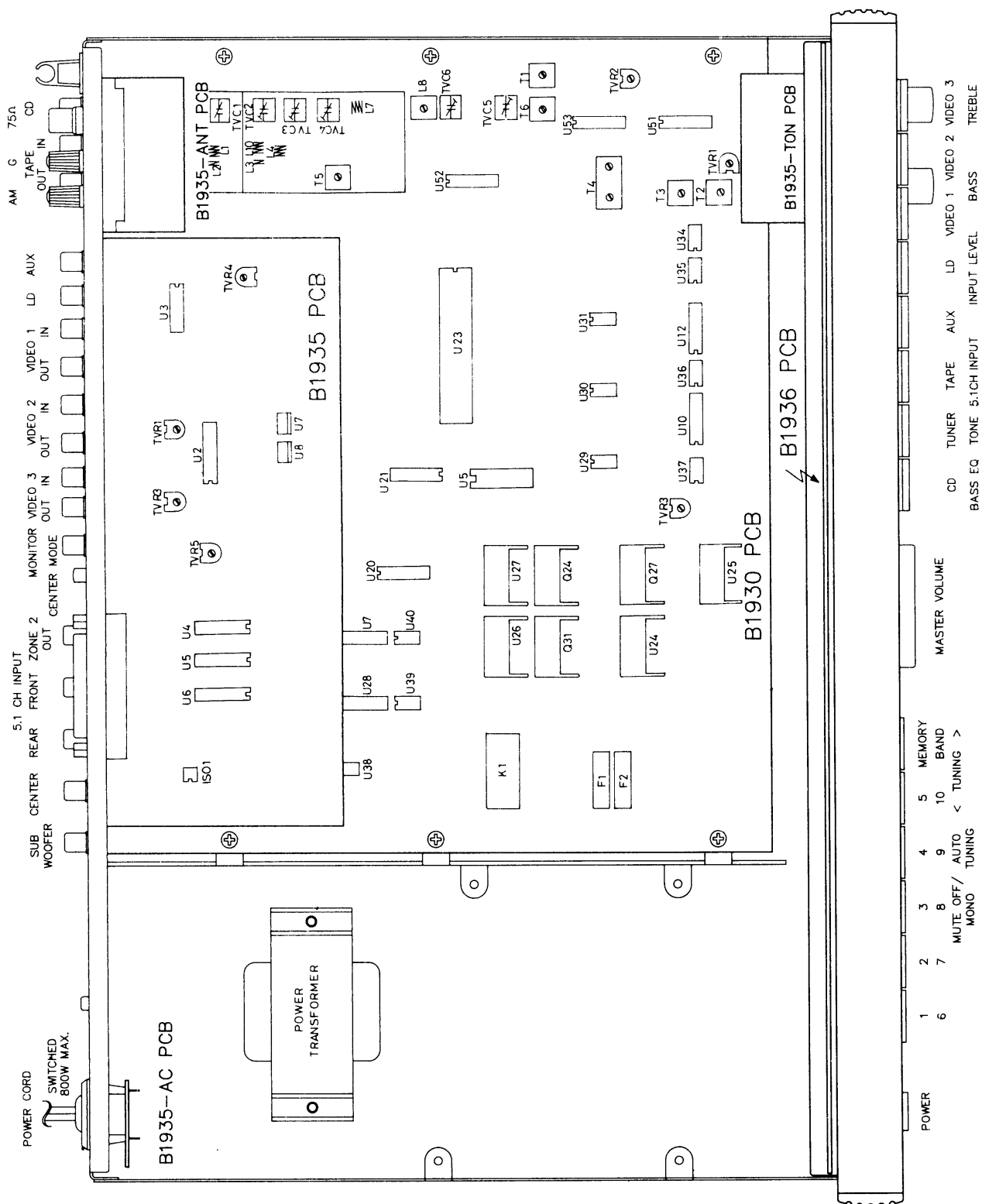
4F,BUNZAN-SHINSEN-BLDG 10-10, SHINSEN-CHO, SHIBUYAKU TOKYO JAPAN

ROTEL ELECTRONICS CO.,LTD.

3F-2, NO.35, FU HSING NORTH ROAD, TAIPEI, TAIWAN, REPUBLIC OF CHINA

MN20002358

Chassis Layout



SPECIFICATIONS: RTC 970 SURROUND SOUND PROCESSOR

AUDIO

Frequency Response	5-20,000 Hz, ± 0.5 dB
Signal to Noise Ratio, Front / Surround	85 dB, IHF A / 70 dB, IHF A
Input Impedance	20 k Ohms
Output Impedance	< 500 ohms
Total Harmonic Distortion	0.03 % (1 kHz)
Intermodulation Distortion	0.03 % (400 Hz / 7 kHz, 4:1)
Output (maximum)	≥ 6 volts

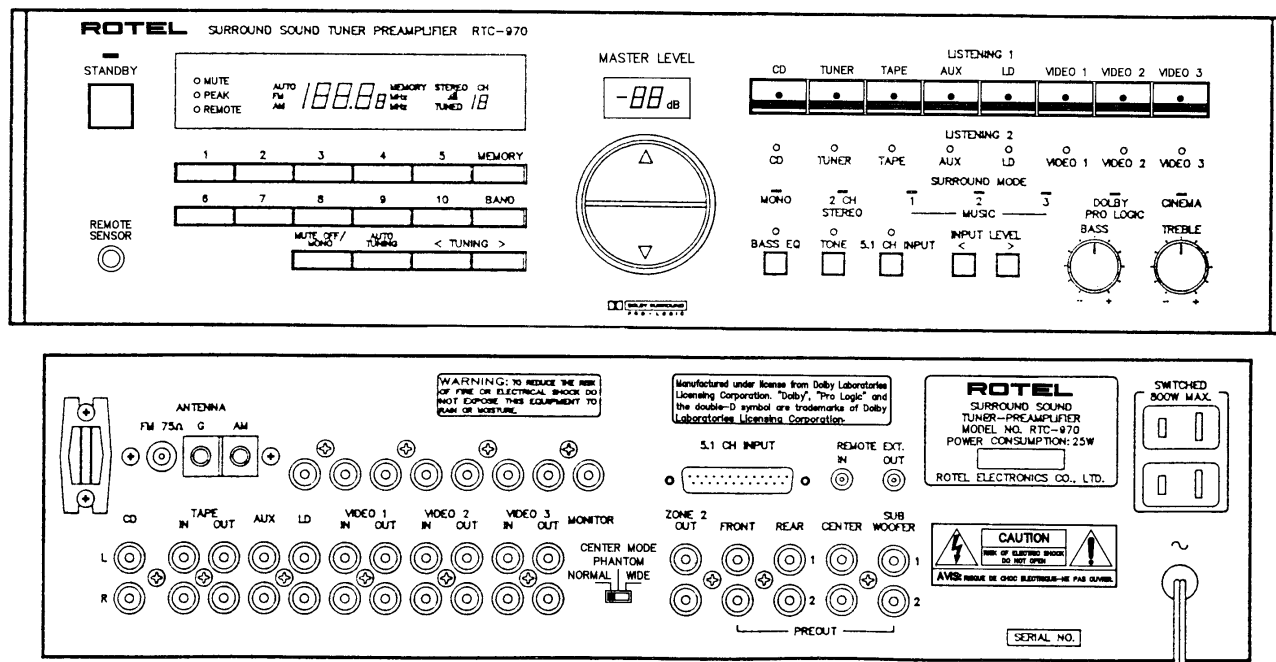
AM/FM TUNER

Sensitivity, FM (50 dB S/N)	4 microvolts, 25 dBf
Selectivity, Alternate Channel	65 dB @ 400 kHz
Frequency response, FM	30-15,000 Hz ± 0.5 dB
Capture ratio	2 dB
Total Harmonic Distortion	0.3 % Stereo, 0.15% Mono
Image rejection	76 dB
Channel Separation	> 40 dB @ 1 kHz
Sensitivity AM	900uV

VIDEO

Frequency Response	3 Hz-10 MHz, - 3 dB
Signal to Noise Ratio	70 dB
Input Impedance (Composite)	75 ohms
Output Impedance (Composite)	75 ohms
Output (Composite)	1 volt, peak to peak, 75 ohm load
Power Consumption	25 watts
Power Requirements (AC)	115 volts 50/60 Hz <i>or</i> 230 volts 50/60 Hz
Weight	5.8 Kg, 12.76 Lb.
Dimensions	440 x 121 x 337 mm (W x H x D) 17-3/8" x 4-13/16" x 13-5/16" (W x H x D)

All specifications are accurate at the time of printing. Rotel reserves the right to make improvements without notice.



FM IF and RF Alignment

Instruments : FM Signal Generator (400Hz,100% Modulated), THD Analyzer, Oscilloscope, AC VTVM, DC Voltmeter, Tuning Meter.

Terminated : DC Voltmeter--- Between C244(+),(-) on B1930 P.C.B.
Tuning Meter--- TP3 on B1930 P.C.B.

step	Generator		Tuning Dial Setting	Adjust	Adjust for
	Coupling	Frequency			
1	No use		87.5MHz	L7	3.2V reading on DC Voltmeter
2			108MHz	TVC4	6.8V reading on DC Voltmeter
3	Repeat steps 1 and 2 until no further improvement is noticed.				
4	Antenna terminal	90MHz	90MHz	L1,L10,L4	Maximum reading on AC VTVM
5		106MHz	106MHz	TVC1,TVC2, TVC3	Maximum reading on AC VTVM
6	Repeat steps 4,5 and 6 until no further improvement is noticed.				
7	Antenna terminal	90MHz	90MHz	T4(A)	Adjust center on Tuning Meter
8	1mV input			T4(B)	Minimum reading on THD Analyzer
9	Repeat steps 7 and 8 until no further improvement is noticed(Muting off)				
10	Antenna terminal 10uV input	90MHz	90MHz	TVR2	Muting Level (Muting on) Tuned Indicator light on

MW IF and RF Alignment

Instruments : AM Signal Generator (400Hz,30% modulated), AC VTVM, Oscilloscope, DC Voltmeter.

Terminated : DC Voltmeter --- Between C242(+),(-)on B1930 P.C.B.

step	Generator		Tuning Dial Setting	Adjust	Adjust for
	Coupling	Frequency			
1	No use		530KHz	LO003	1.2V $\pm$ 0.1V reading on DC Voltmeter
2			1610Hz	TVC5	9V $\pm$ 0.1V reading on DC Voltmeter
3	Repeat steps 1 and 2 until no further improvement is noticed.				
4	Test loop radiate signal into loop antenna	450KHz	530KHz	LA003	Maximum reading on AC VTVM
5		600KHz	600KHz	LA003	
6		1400kHz	1400KHz	TVC6	
7	Repeat steps 4,5 and 6 until no further improvement is noticed.				

Audio Section Alignment

Instruments :Audio Signal Generator 1KHz 320mV, THD Analyzer,
Oscilloscope,AC VTVM,
Please set Volume level to 0dB poing before alignment.

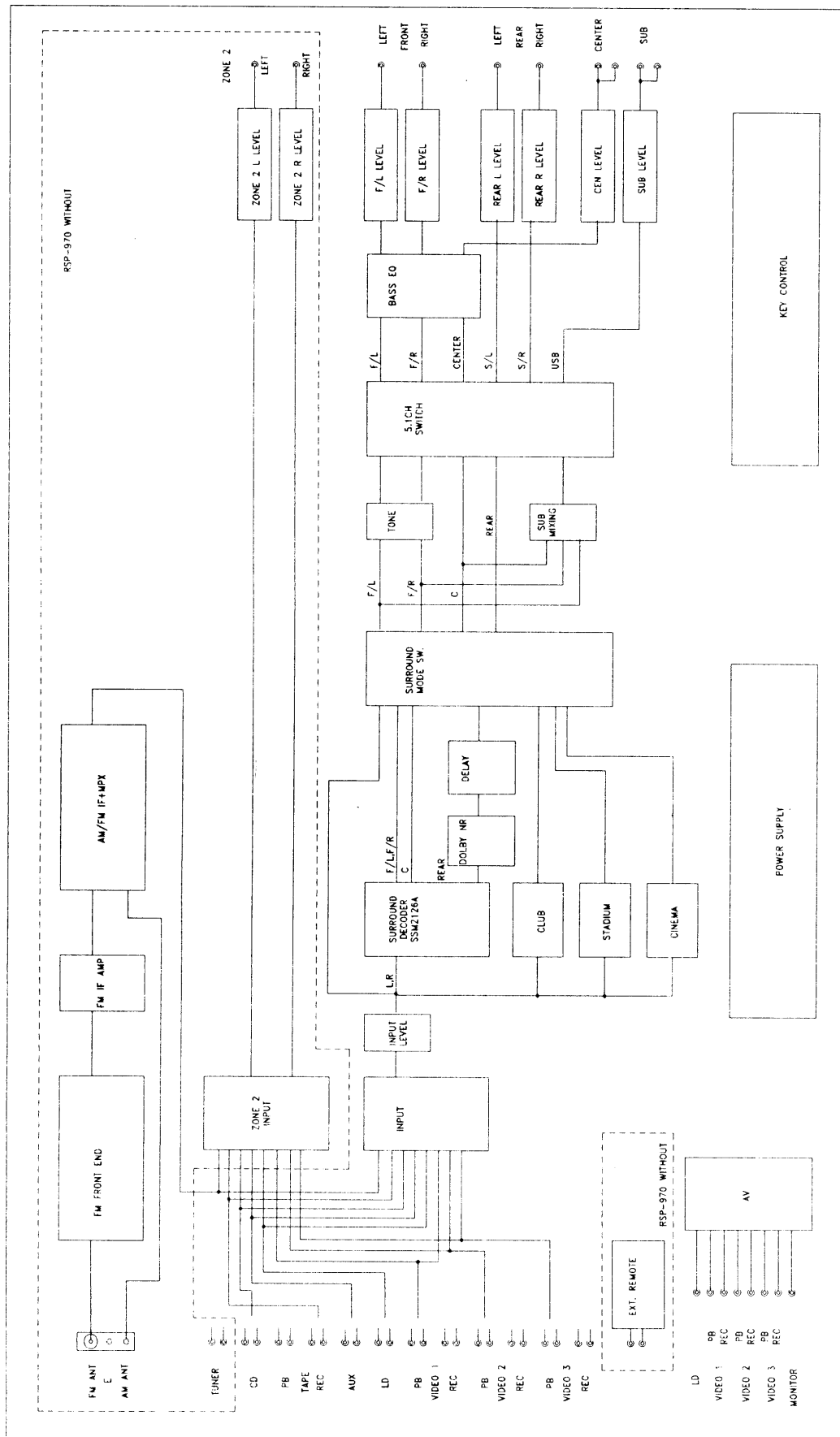
step	Generator		Output				
	Input	S mode	F/L	F/R	Center	Rear	Sub
1	CD L	Stereo	300mV	-	-	-	
2	CD R	Stereo	-	300mV	-	-	
3	Change input to Tape,Aux,LD,Video 3,Video 2,Video 1 input and repeatstep 1 and2.						
4	CD L R L+R L- R	Pro-logic	300mV	-	-	-	-
			-	300mV	-	-	-
			-	-	300mV	-	-
			-	-	-	300mV	-
5	CD L R L+R L- R	Hall	300mV	-	-	300mV	-
			-	300mV	-	300mV	-
			-	-	300mV	300mV	-
			-	-	-	300mV	-
6	CD L R L+R L- R	Club	300mV	-	-	-	-
			-	300mV	-	-	-
			-	-	-	-	-
			-	-	-	300mV	-
7	CD L R L+R L- R	Cinema Stadium	300mV	-	-	-	-
			-	300mV	-	-	-
			-	-	-	-	-
			-	-	-	300mV	-
8	CD L 80Hz	Stereo	300mV	-	-	-	300mV
9	CD L+R 100Hz	Stereo	± 12dB	± 12dB	Set Tone in,and Turn BASS control from center to min. and max.		
10	CD L+R 10KHz	Stereo	± 12dB	± 12dB	Set Tone in,and Turn TREBLE control from center to min. and max.		
11	CD L+R 60Hz	Stereo	+7dB	+7dB	+7dB	Set Bass EQ on	
12	CD L+R	Pro-logic	300mV←	300mV←	(300mV)	Set CenterSwitch to Phantom mode	
13	5.1CH	5.1CH	300mV output for each channel separate				
14	Balance CHK	Pro-logic	75mV(I)	75mV(III)	75mV(II)	110mV (IV,V)	75mV(VI)

FM MPX Alignment

Instruments :FM Stereo Generator, AC VTVM, Oscilloscope,
Frequency Countor, and THD Analyzer.

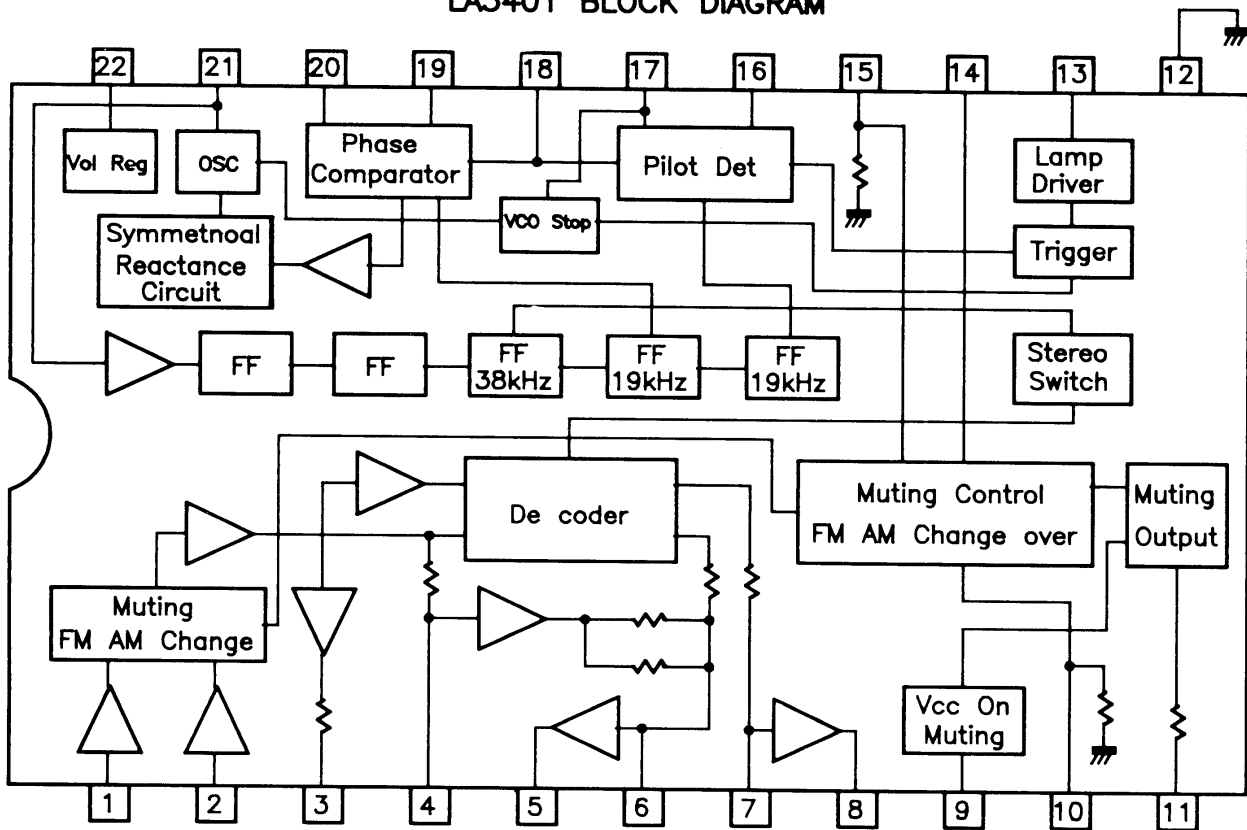
step	Generator		Tuning Dial Setting	Adjust	Adjust for
	Coupling	Frequency			
1	Antenna terminal 1mV input	98MHz Pilot--10% 1KHz- 90% MOD.	98MHz	TVR1	Best separation
2	Repeat steps 1 and 2 until no further improvement is noticed. Check the stereo indicator can be operated normally when pilot signal is reduce from 10% to 5%				

Functional Block Diagram

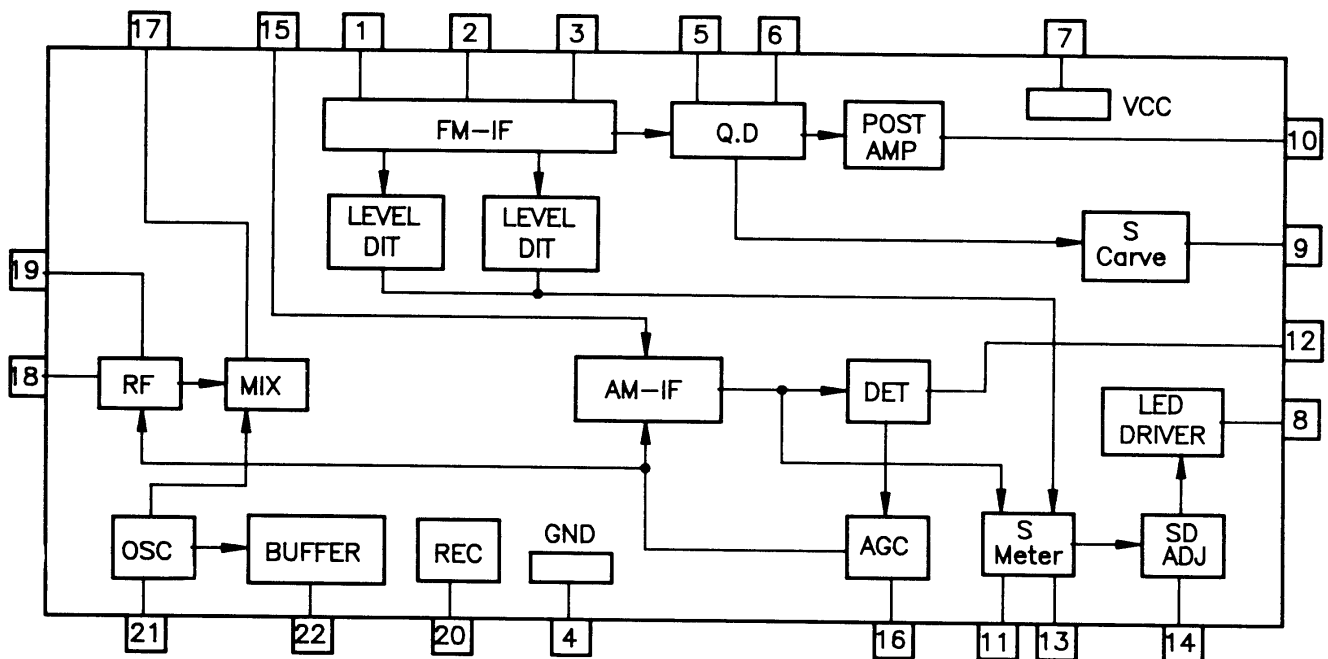


IC Block Diagram

LA3401 BLOCK DIAGRAM

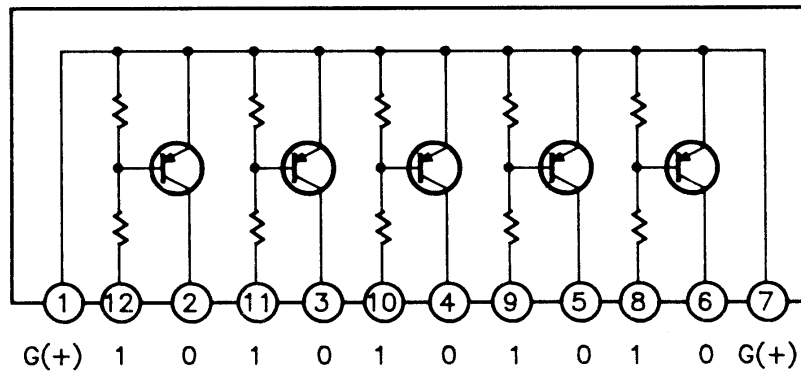


LA1265 BLOCK DIAGRAM



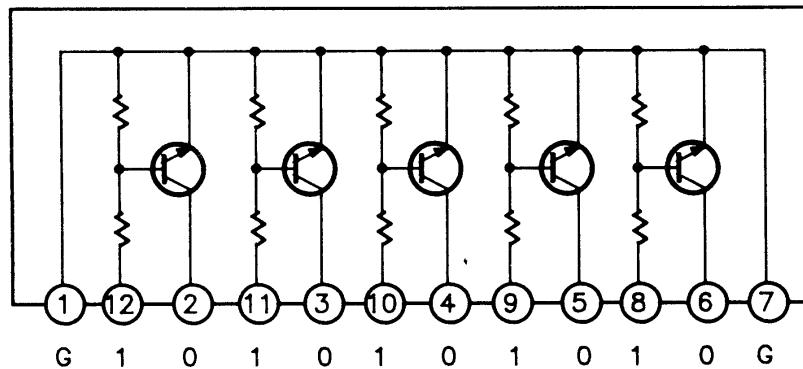
IC Block Diagram

DT5A144E BLOCK DIAGRAM



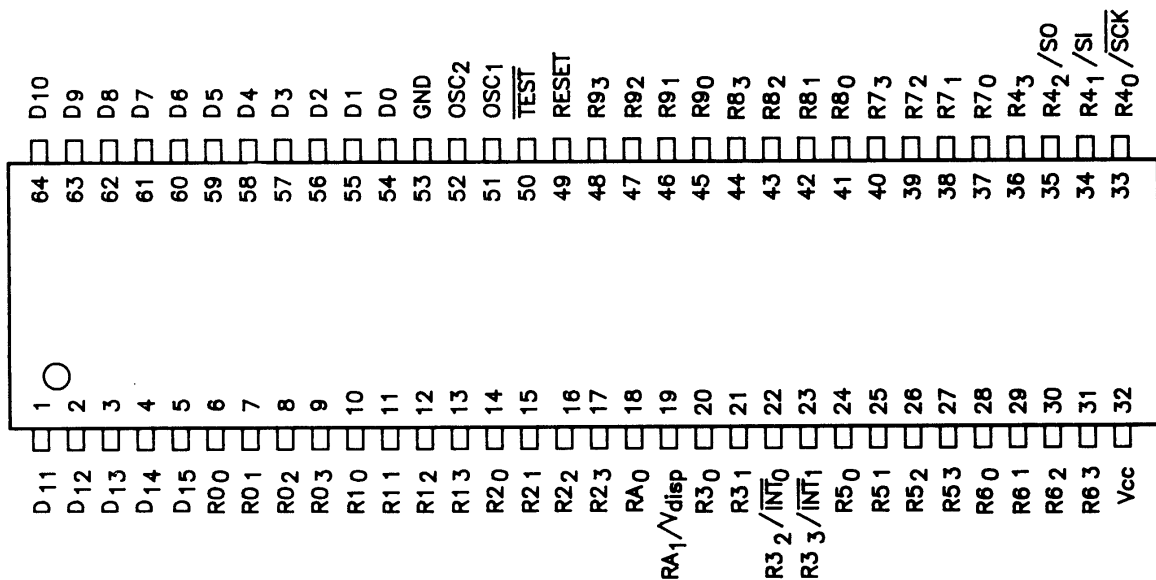
G(+):GND
O :OUT
I :IN

DTD5C144E BLOCK DIAGRAM



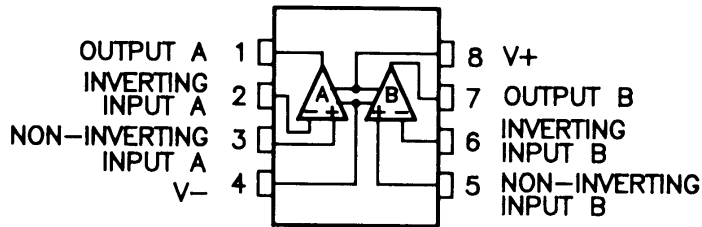
G :GND
O :OUT
I :IN

HD404019S BLOCK DIAGRAM

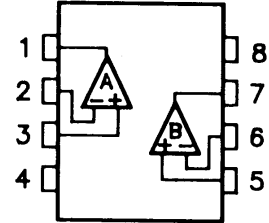


IC Block Diagram

NJM5532 BLOCK DIAGRAM

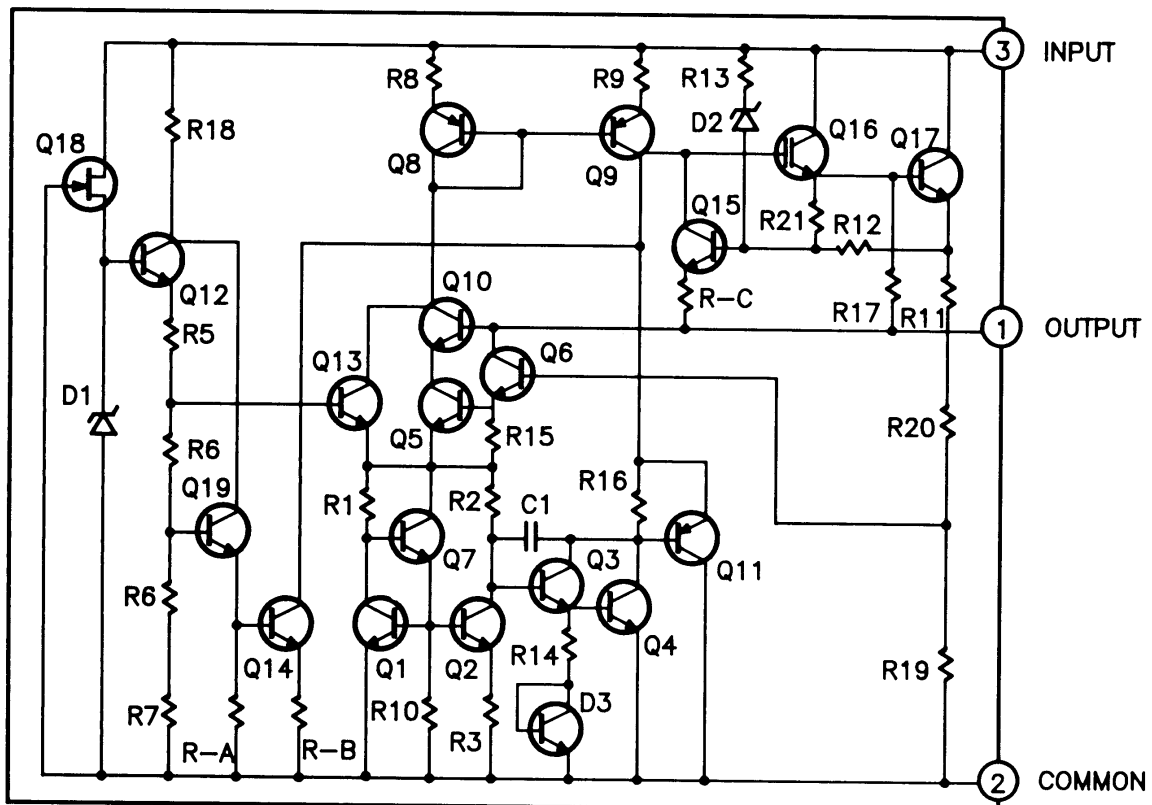


NJM4558DD BLOCK DIAGRAM



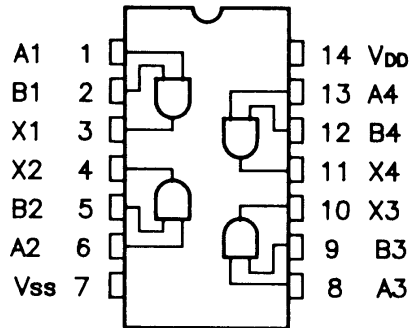
- | | |
|-------------|-------------|
| 1. A OUTPUT | 5. B+INPUT |
| 2. A-INPUT | 6. B-OUTPUT |
| 3. A+INPUT | 7. B OUTPUT |
| 4. V- | 8. V+ |

NJM7805A / NJM7812A BLOCK DIAGRAM

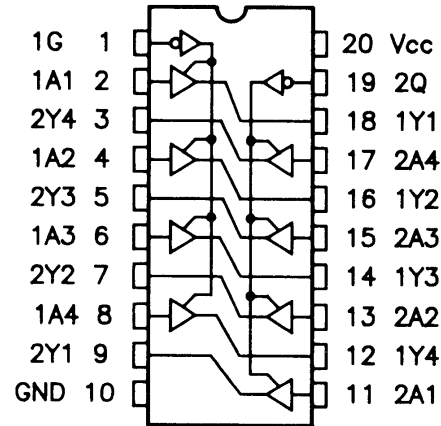


IC Block Diagram

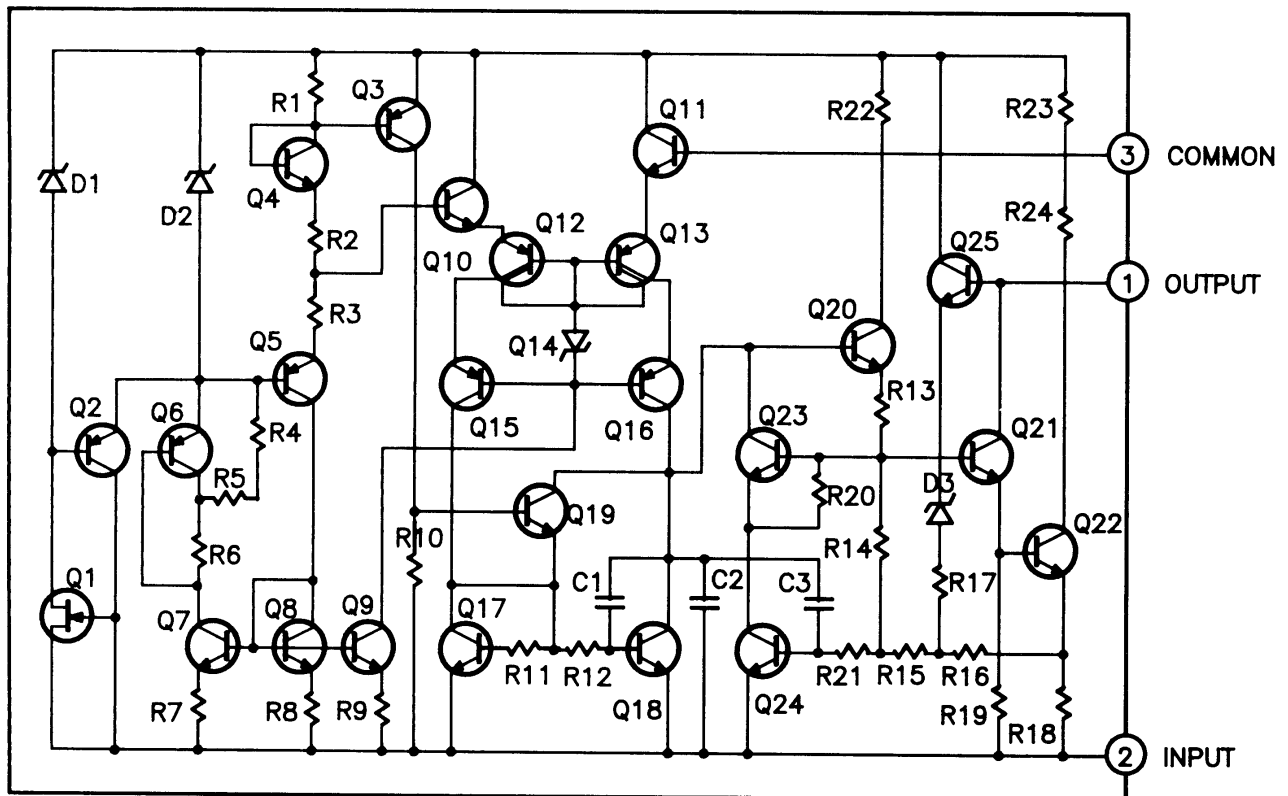
TC4081BP BLOCK DIAGRAM



TC74HC244A BLOCK DIAGRAM

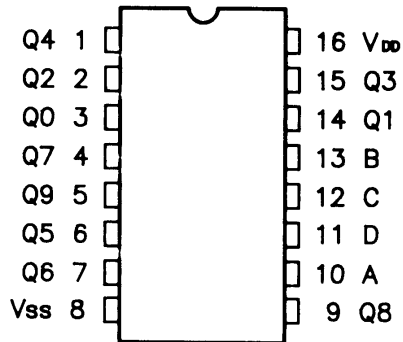


NJM7912A BLOCK DIAGRAM

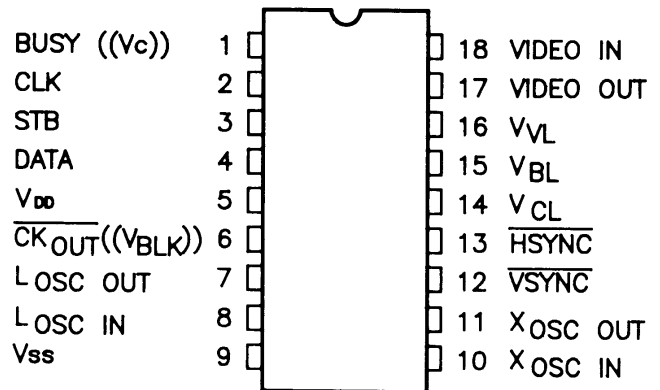


IC Block Diagram

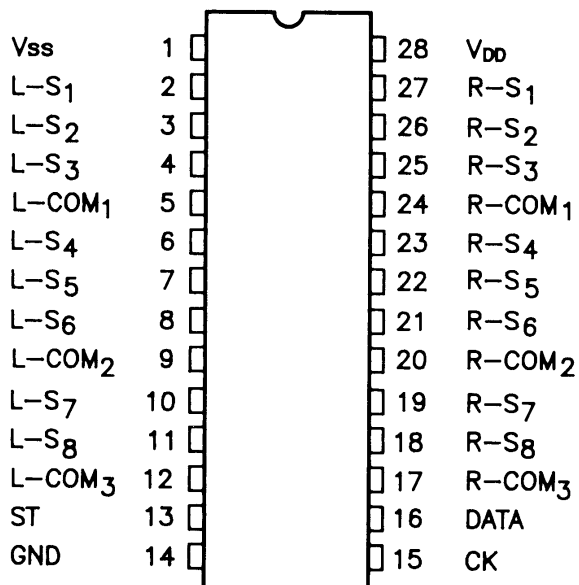
TC4028BP BLOCK DIAGRAM



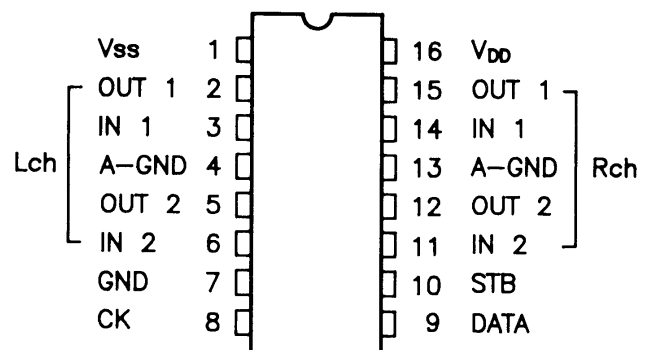
uPD6450 BLOCK DIAGRAM



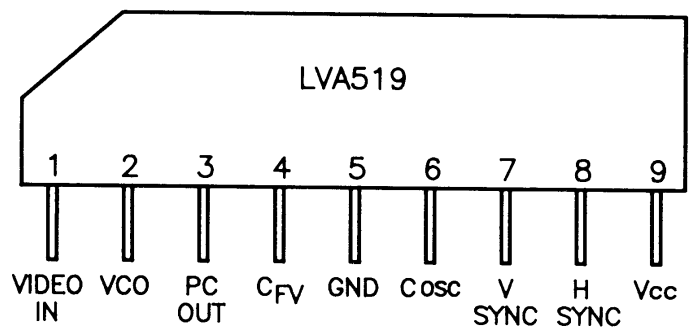
TC9163N BLOCK DIAGRAM



TC9213P BLOCK DIAGRAM

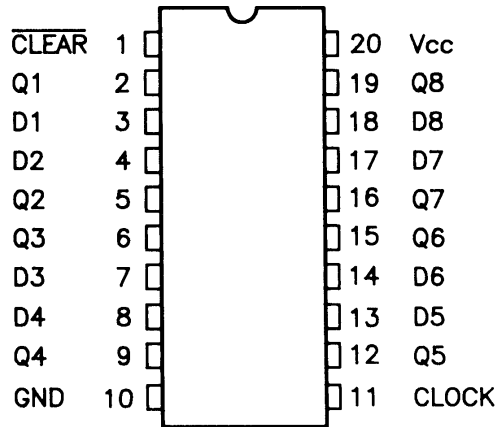


LVA519 BLOCK DIAGRAM

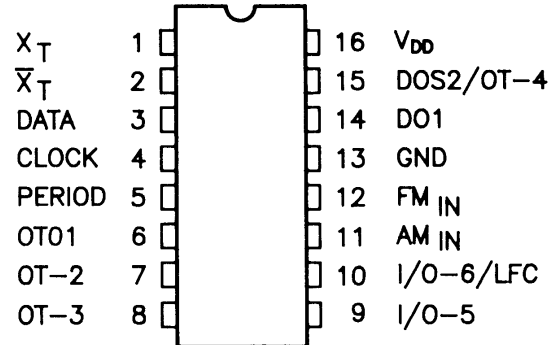


IC Block Diagram

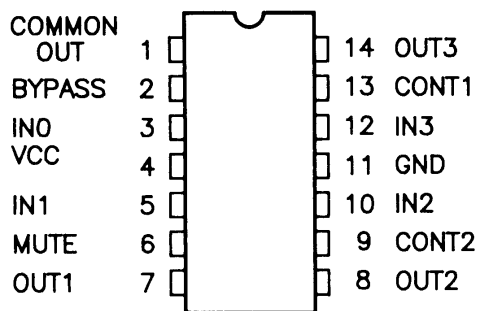
TC74HC273AP BLOCK DIAGRAM



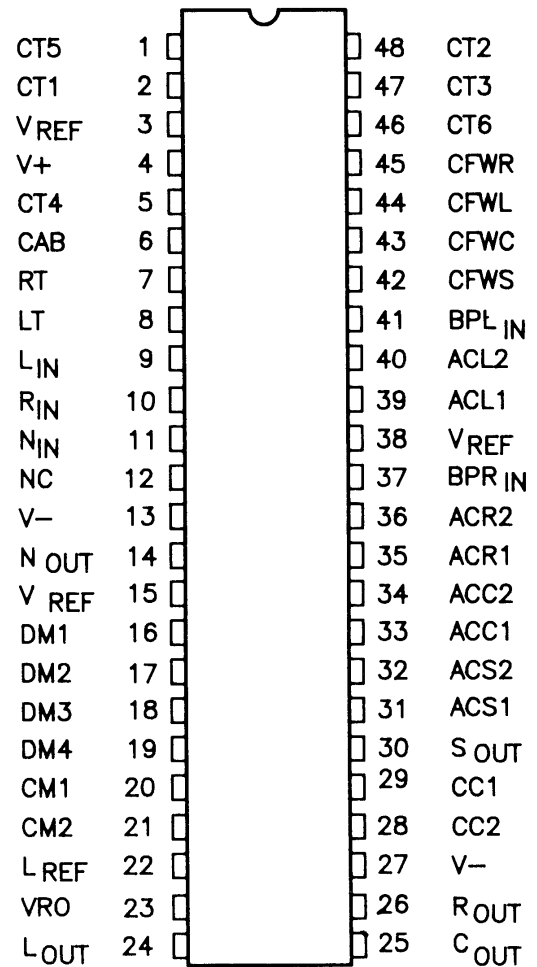
TC9216P BLOCK DIAGRAM



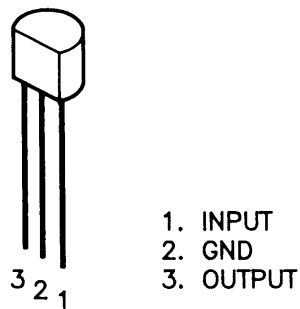
LA7951 BLOCK DUAGRAM



SSM-2126 BLOCK DIAGRAM

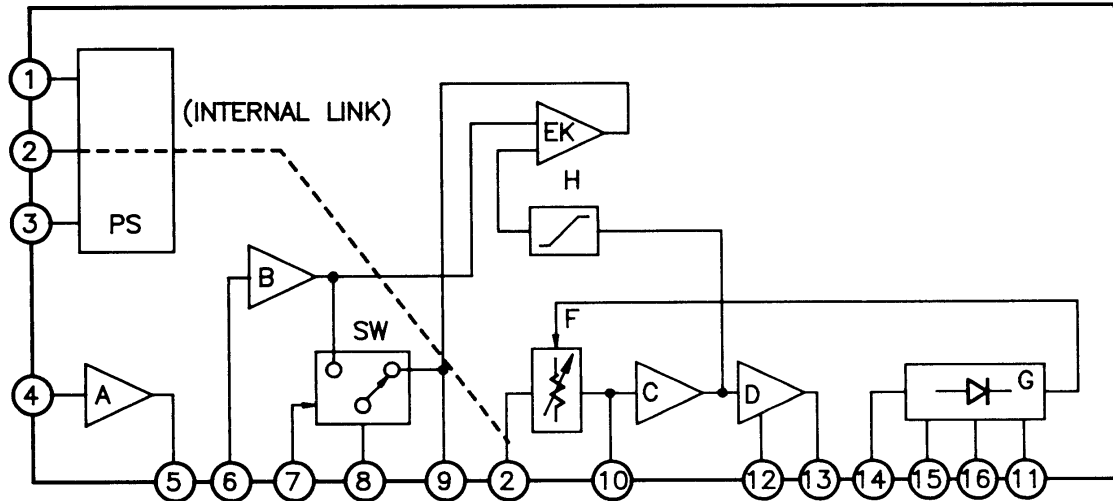


NJM78LS05 BLOCK DIAGRAM

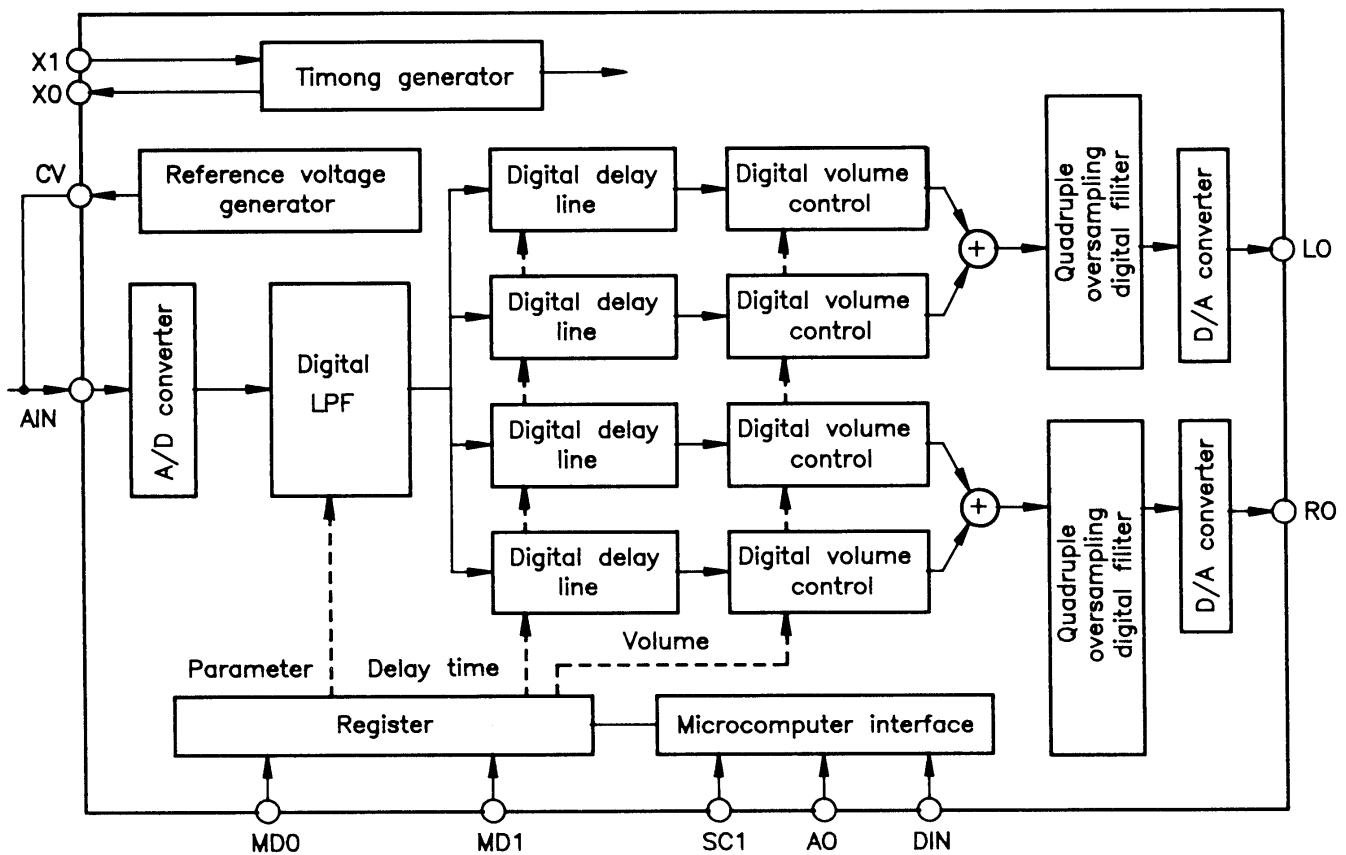


IC Block Diagram

TA7629P BLOCK DIAGRAM

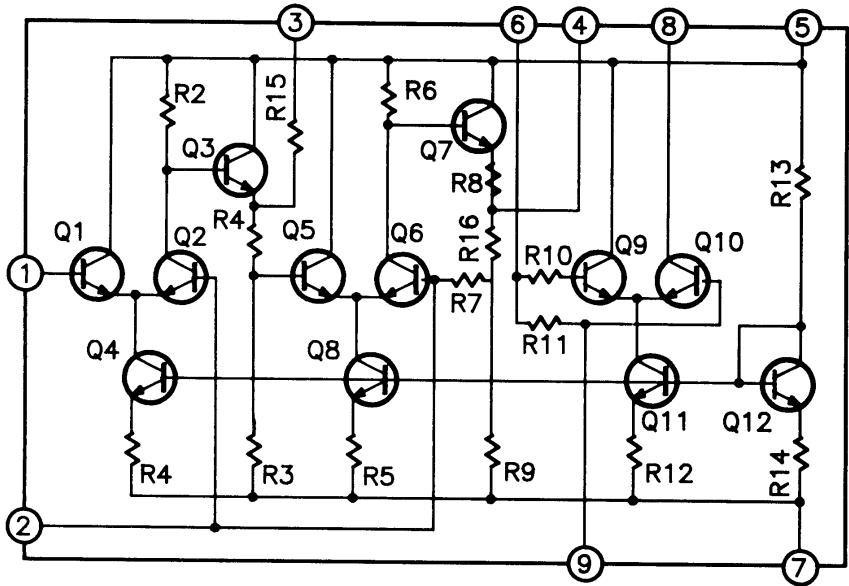


YM3428 BLOCK DIAGRAM

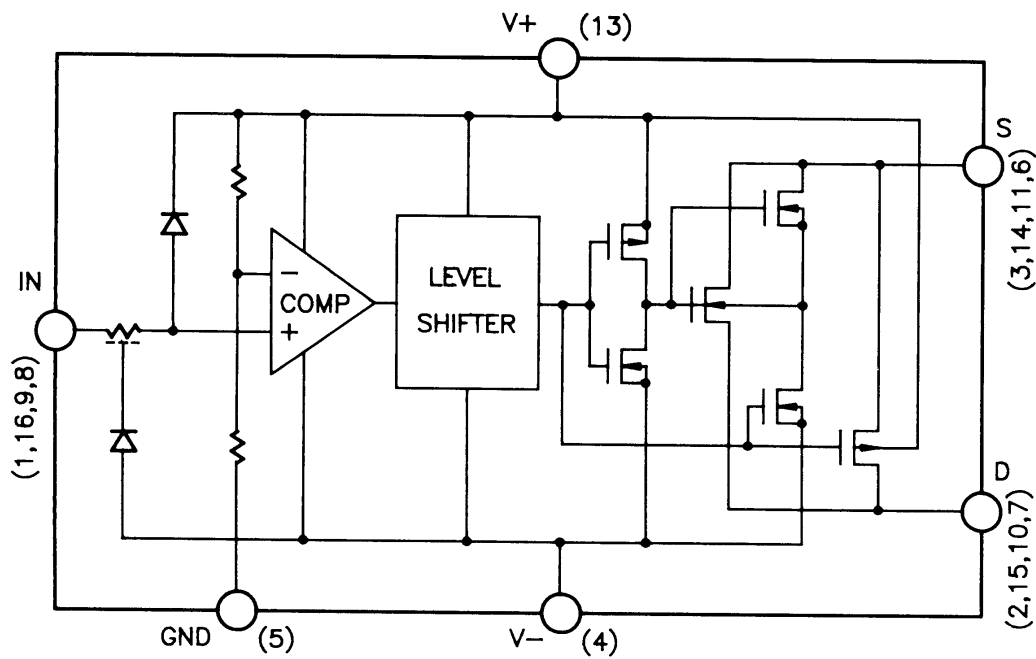


IC Block Diagram

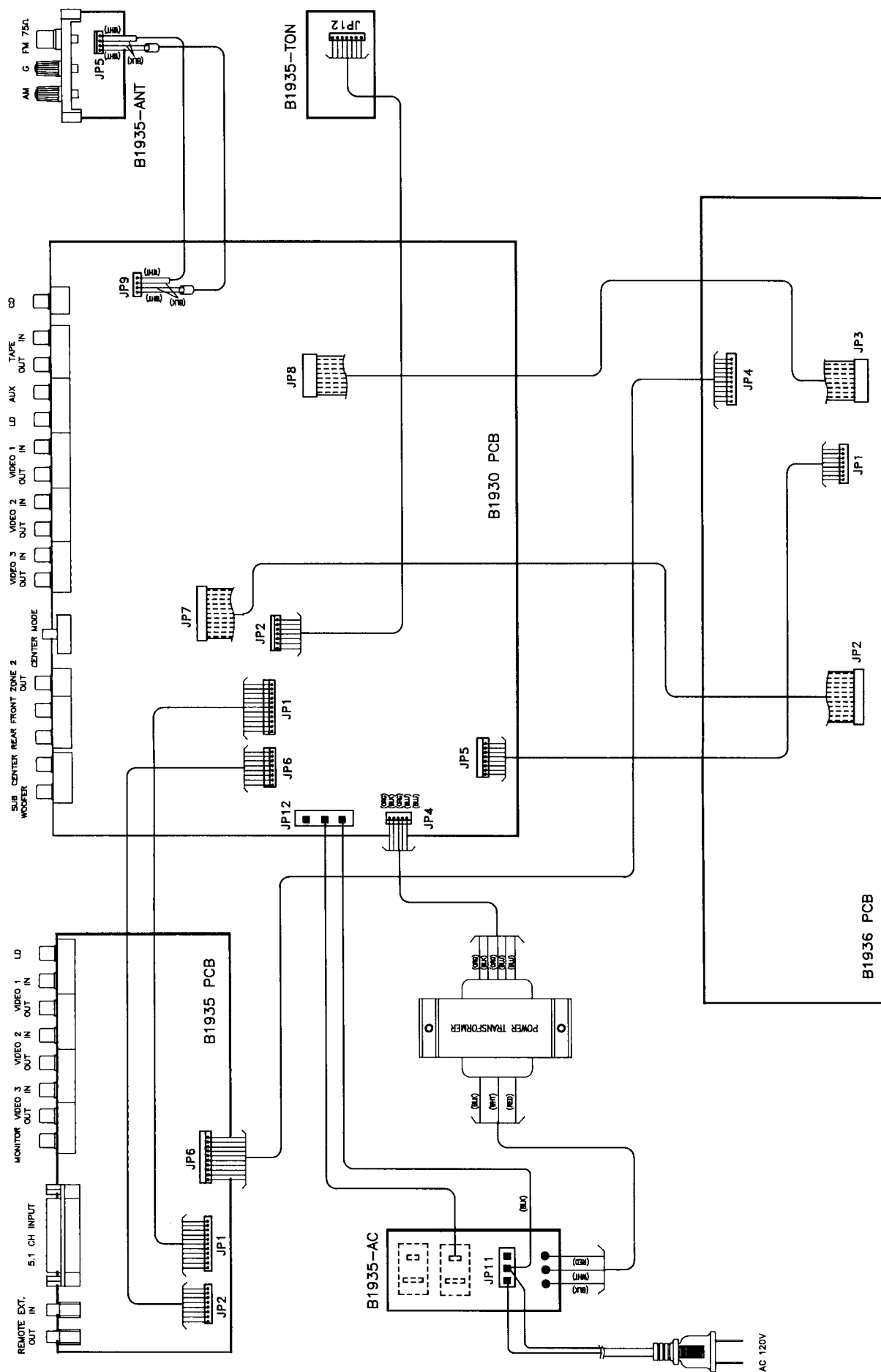
AN278 BLOCK DIAGRAM



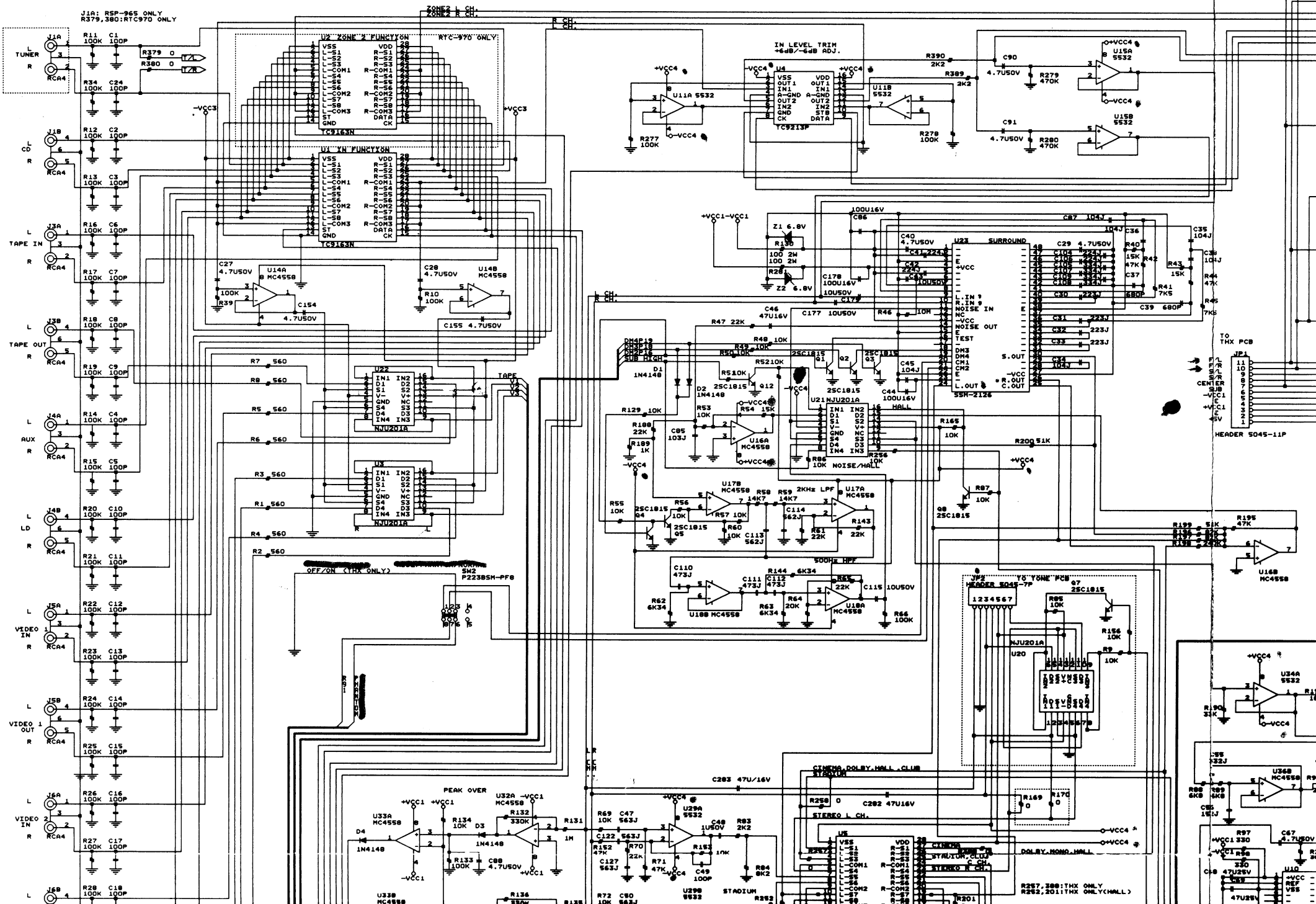
NJM201A BLOCK DIAGRAM

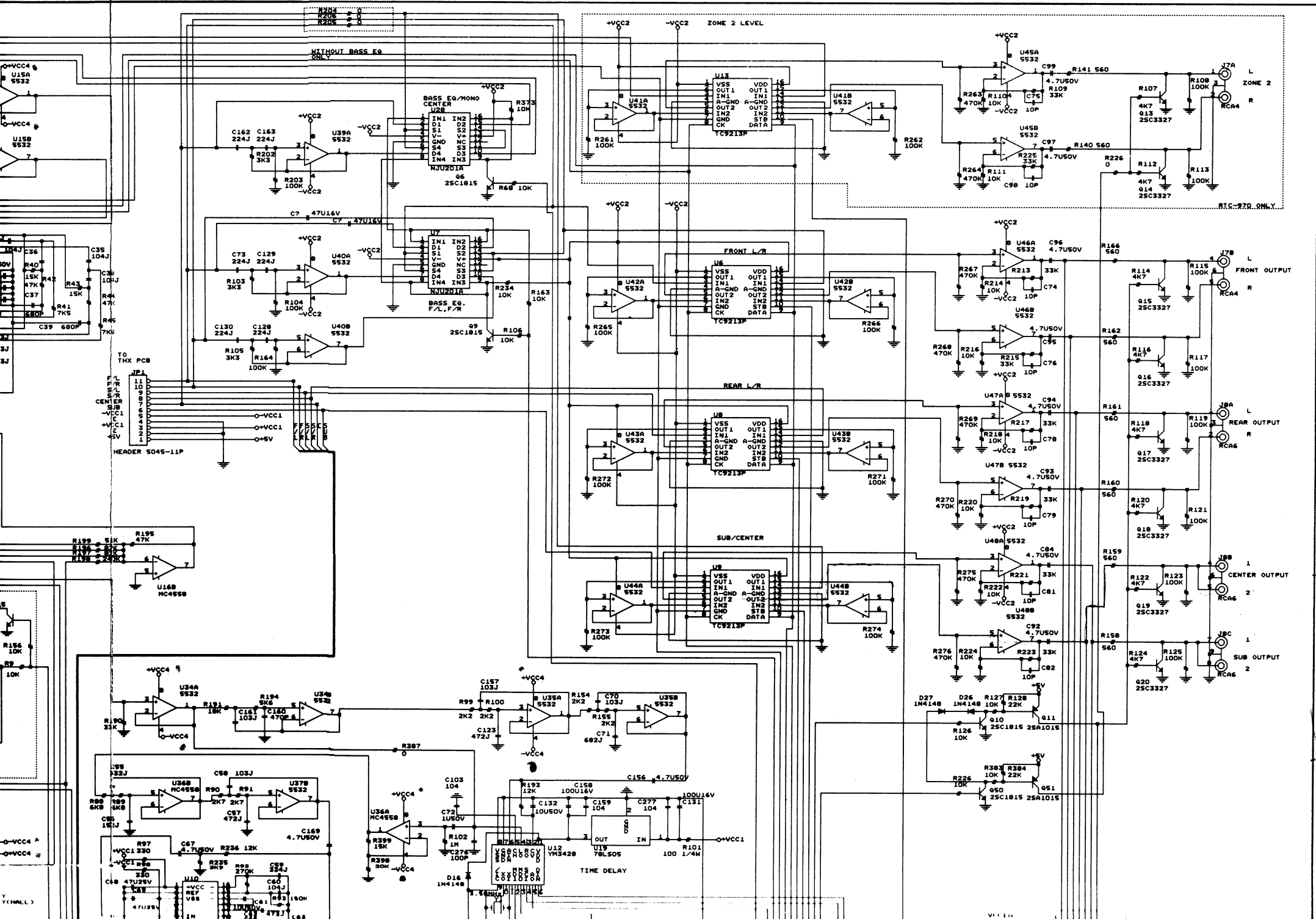


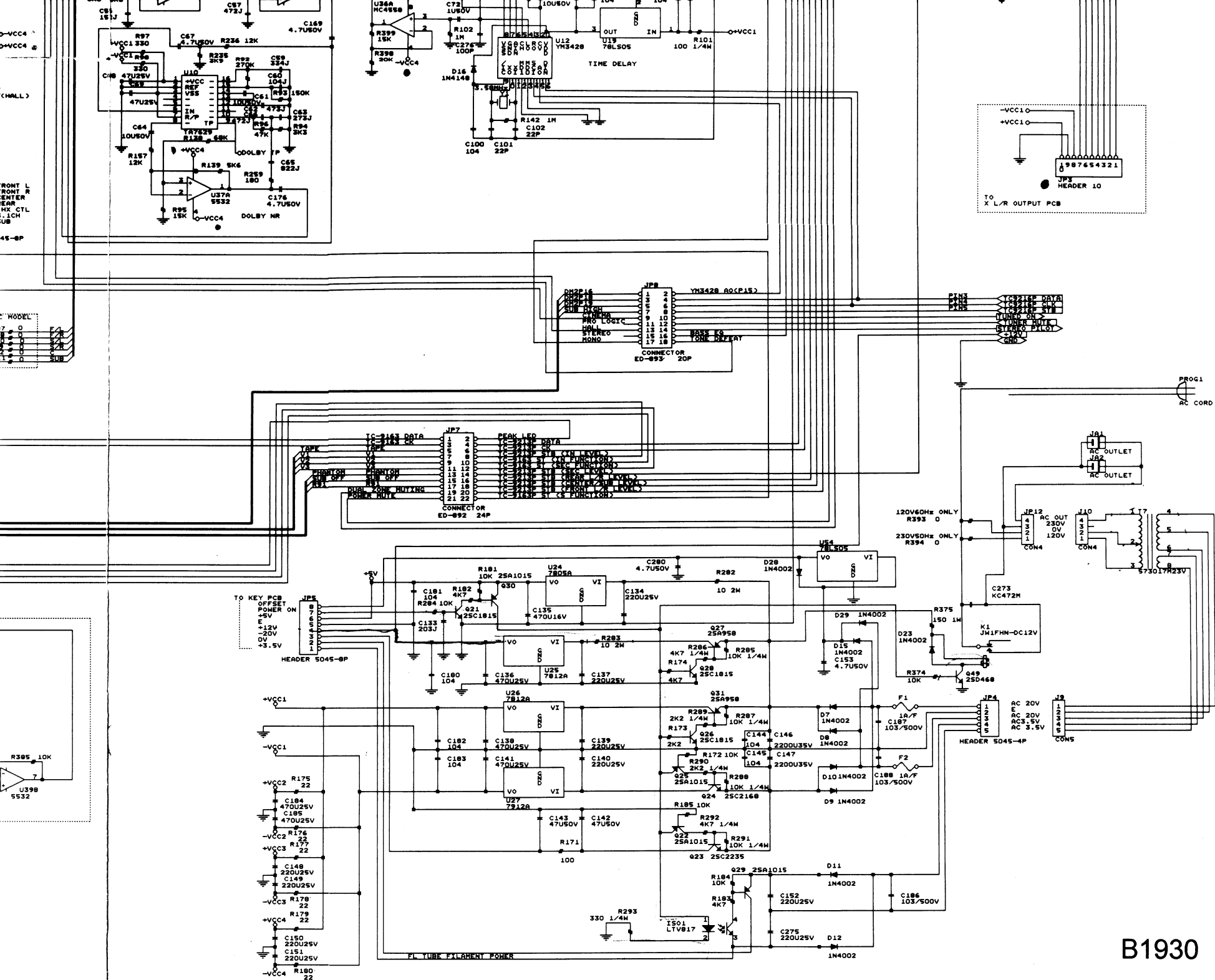
Wiring Diagram



Schematic Diagram Model No. RTC-970 (1/4)

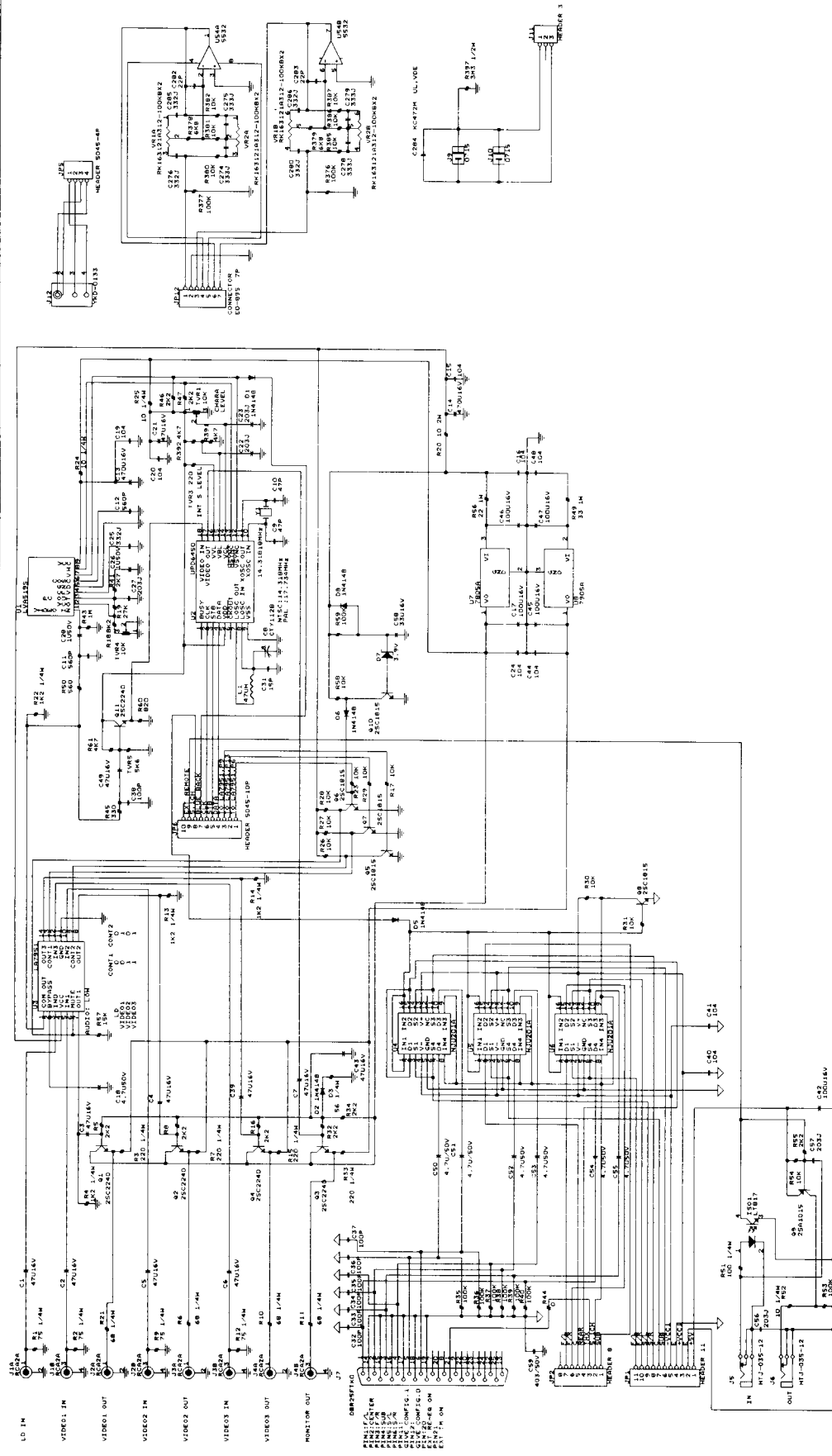






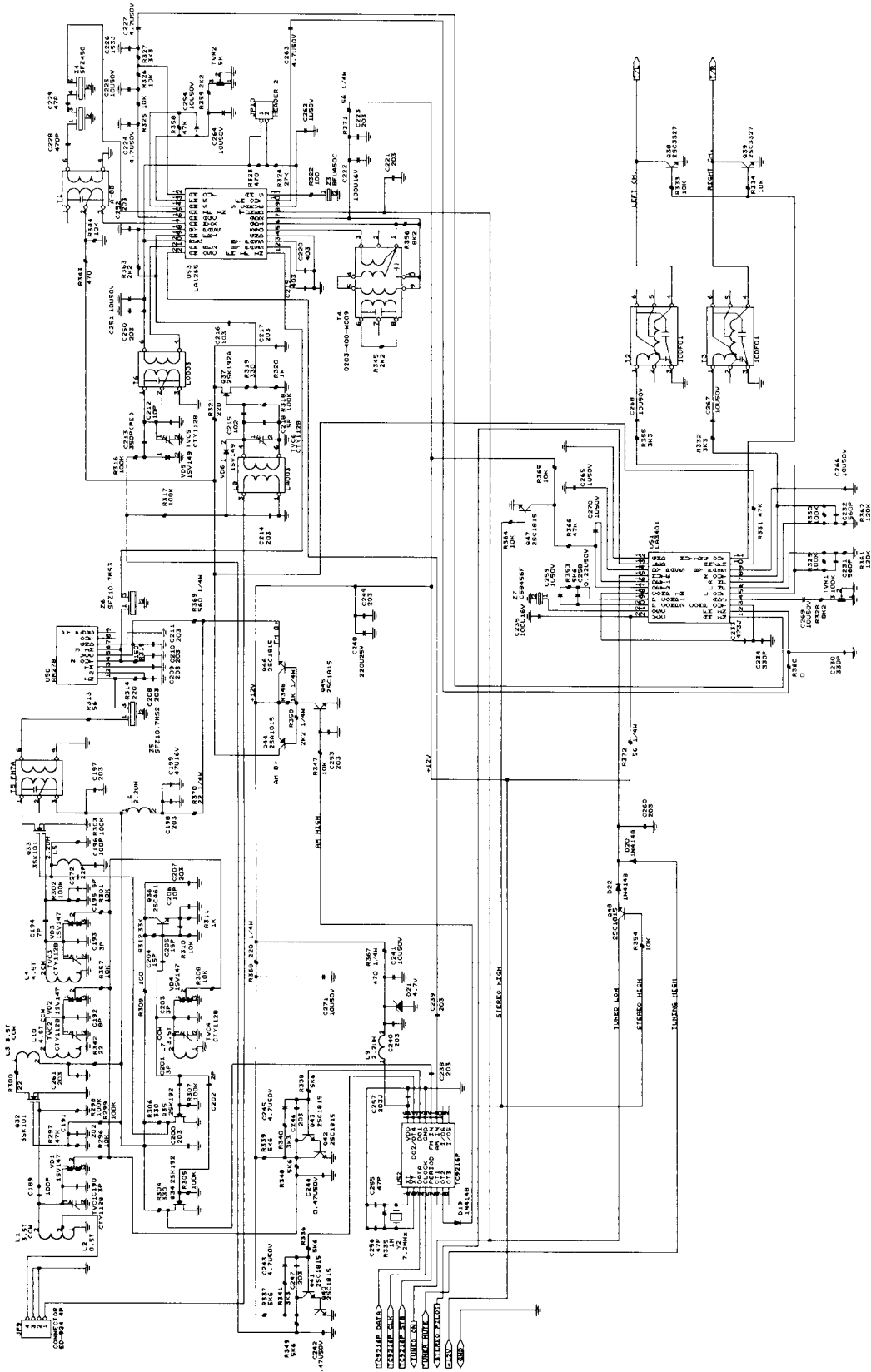
B1930

Schematic Diagram **Model No. RTC-970** **(2/4)**



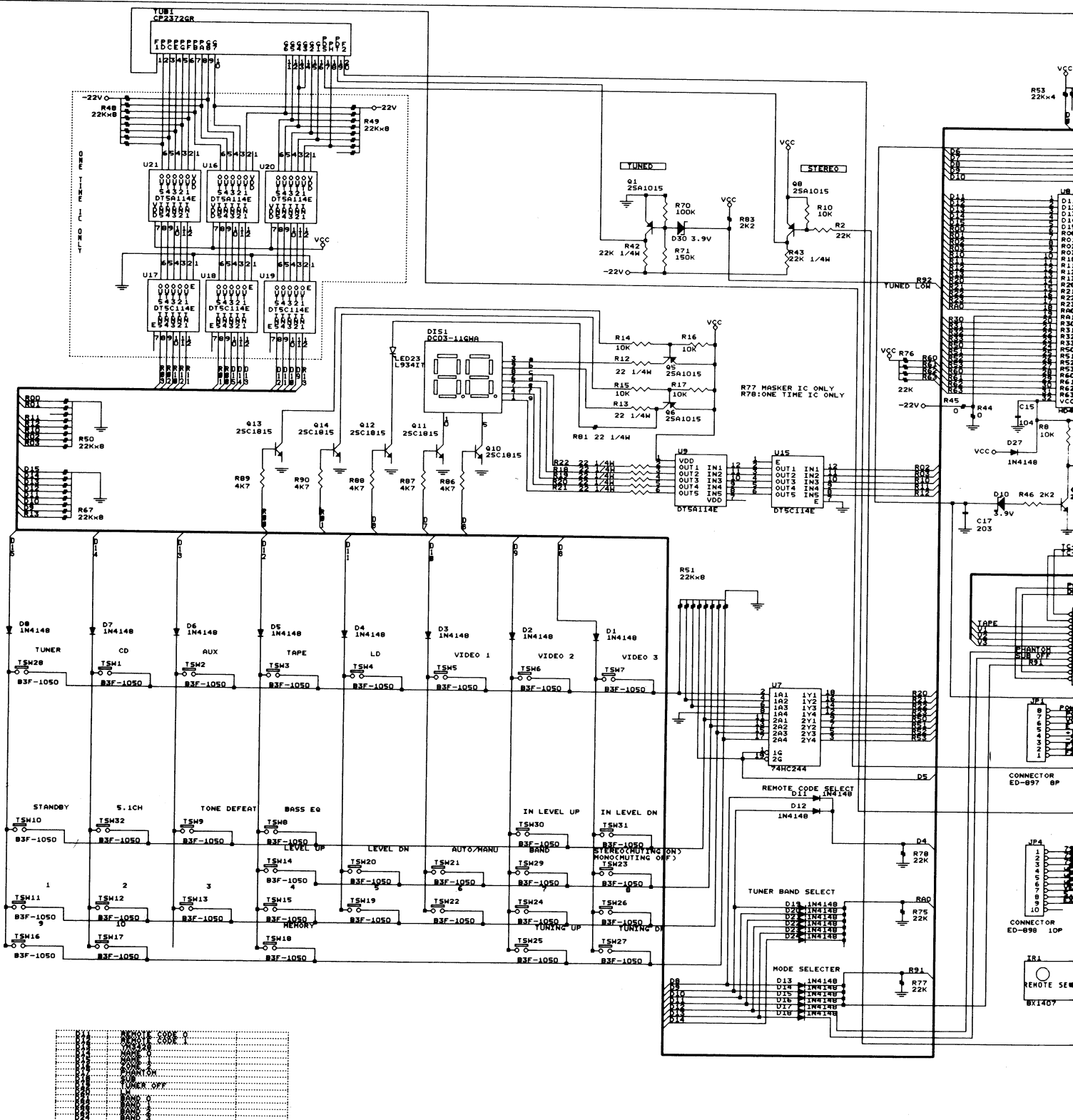
B1935

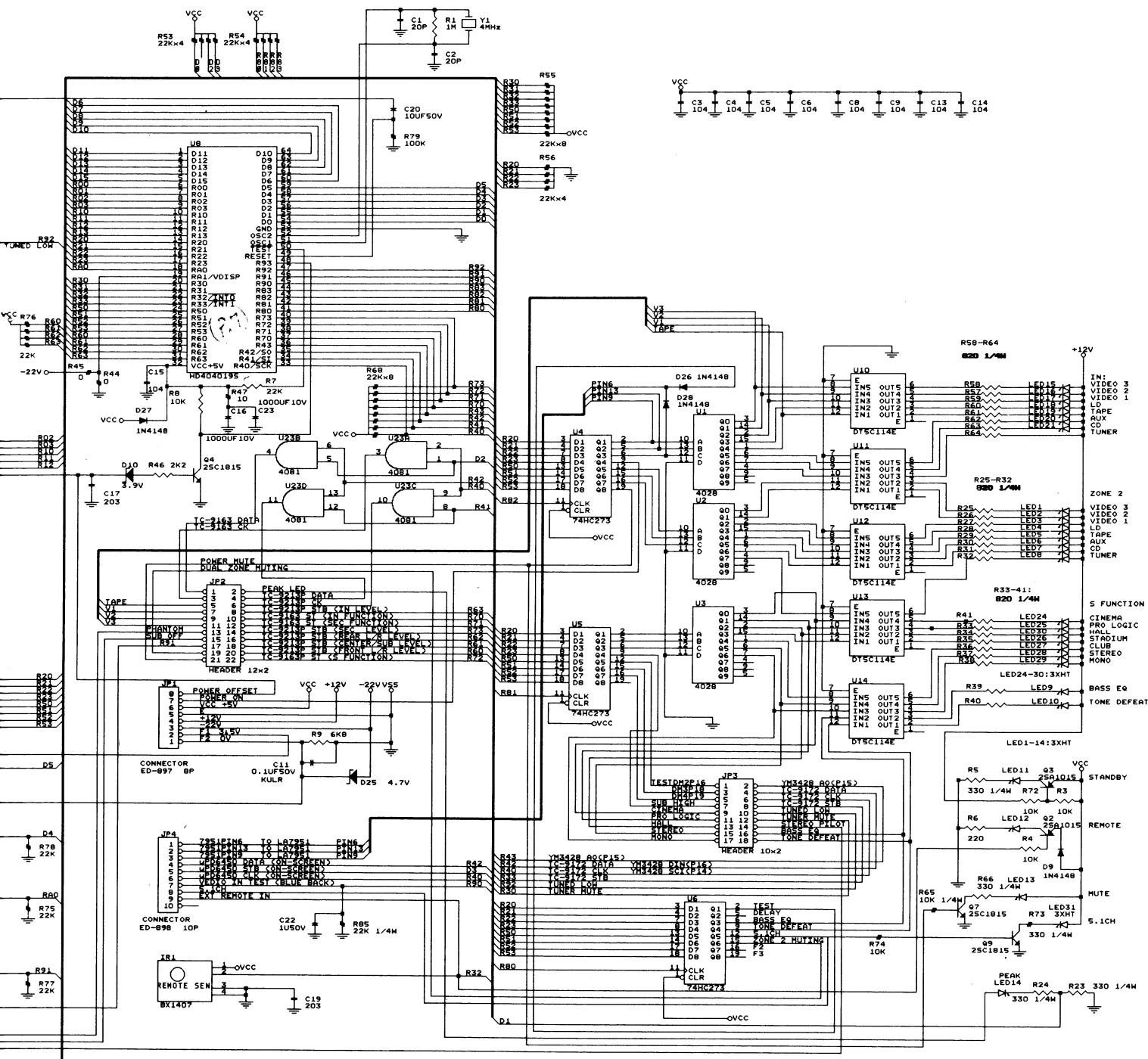
Schematic Diagram Model No. RTC-970 (3/4)



B1930-TU

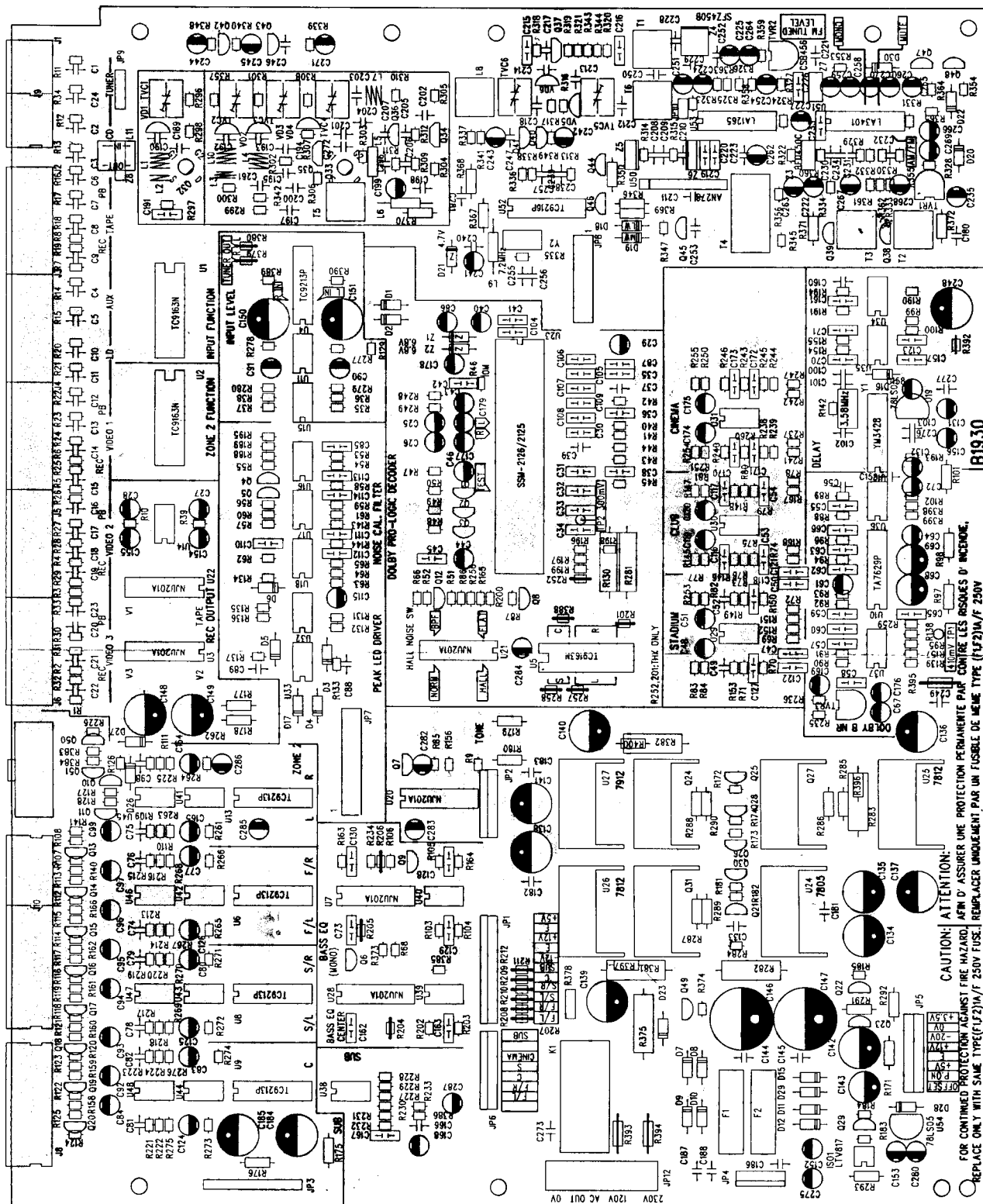
Schematic Diagram Model No. RTC-970 (4/4)



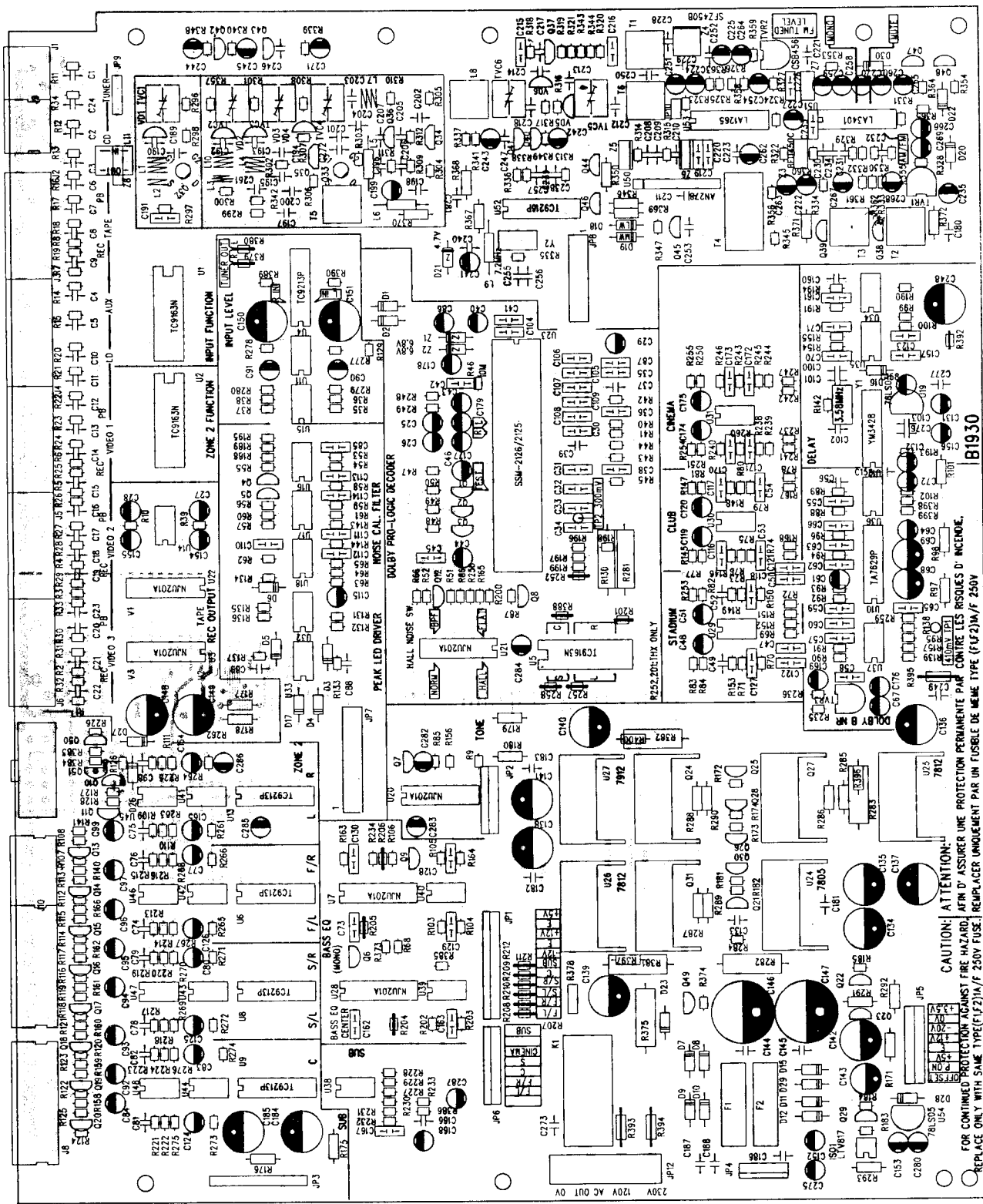


B1936

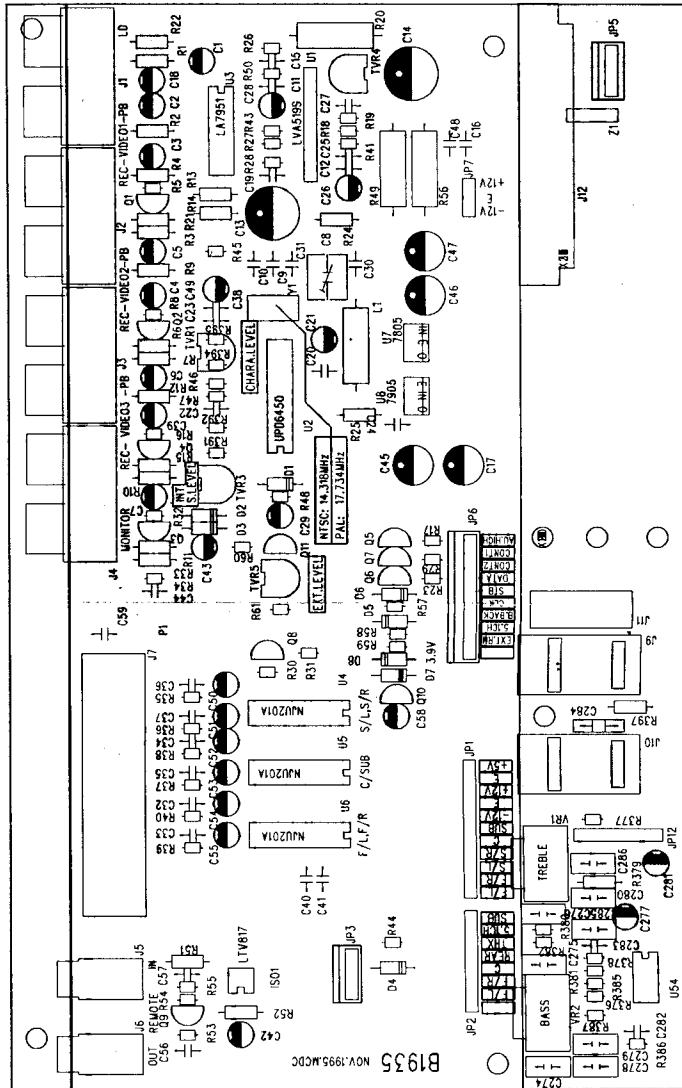
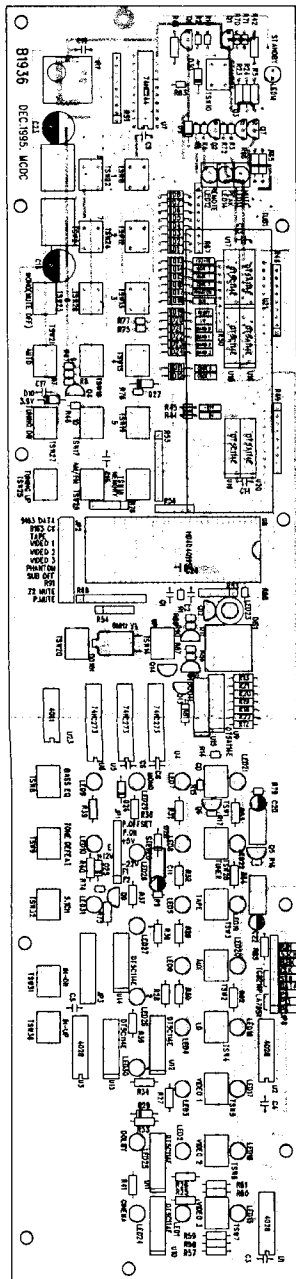
Printed Circuit Boards (Top Side)



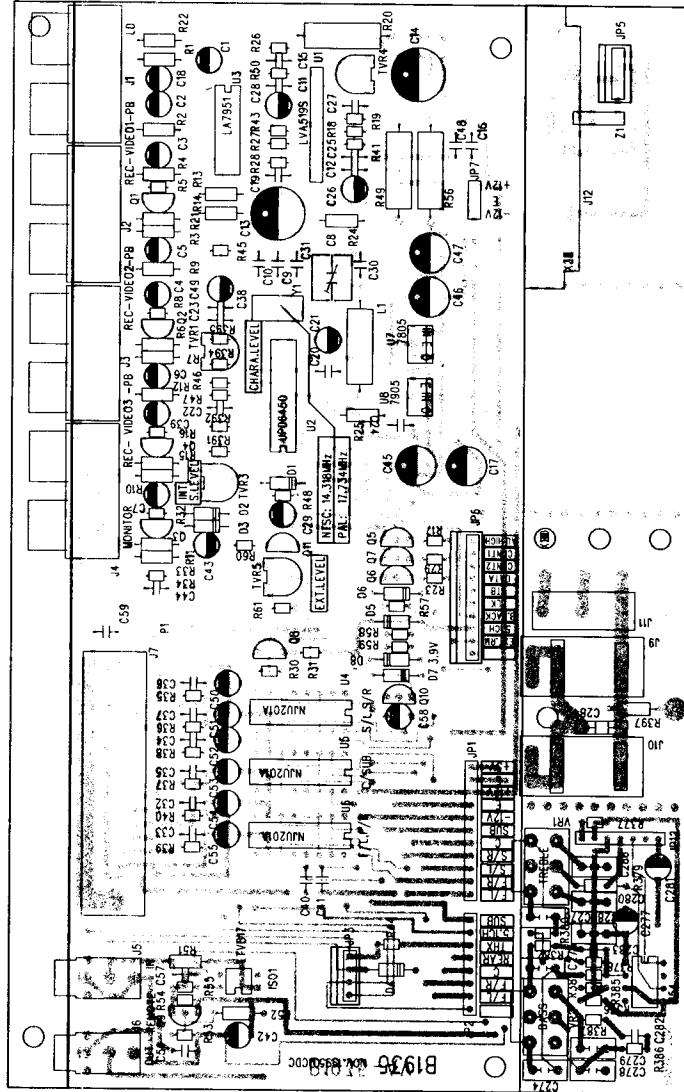
Printed Circuit Boards (Solder Side)



Printed Circuit Boards (Top Side)



Parts List



SYMBOL	PARTS NO.	DESCRIPTION
		OTHERS
	75547RT0C97	AL PLATE L-547
	78C2082*0	FRONT PLATE C-2092
	78C2084*0	LEFT CHASSIS C-2084
	78C2085*0	RIGHT CHASSIS C-2085
	78C2086*0	BOTTOM CHASSIS C-2086
	AU00001237	UPPER COVER AU-1237
	78C2093*1B	REAR PLATE C-2093
	SR00000882	UPPER COVER SPACER SR-882
	81R50114*0	ORNAMENTAL SIDE BOARD OMI-1284
		FOOT CUSHION 4TSH-19M2
	AW000000336	ACRY AW-336
	85387RT930	FILTER A-387
	85387RT930	ACRYLIC WINDOW A-485
	85456RTC97	ACRYLIC WINDOW A-486
	85W568RTC9	LIGHT DIFFUSER WASHER A-506
	80341*PP00	PUSH KNOB 16P KB-341
	80342*PP00	PUSH KNOB 8P KB-342
	80343*PP00	PUSH KNOB 5P KB-343
	80345*PP00	POWER KNOB KB-345
	89WA-489***	POWER KNOB WASHER A-489
		POWER SHELL FRAGMENT A-490
	80344*PP00	VOLUME PUSH KNOB KB-344
	89WA-486***	VOLUME KNOB WASHER A-486
		SWITCH CONTACT A-487
		SPRING D-141
	80361*PP00	KNOB KB-361
	80WA491***	LIGHT DIFFUSER A-491
	86PA489***	LIGHT DIFFUSER A-499
	86PA488***	LIGHT DIFFUSER A-488
	70EM3970*0	TRANSFORMER 57307M23V
	78C2060*0	HOLDER U-TYPE C-2060
	6522181P25	ACCORD SPT-2 P16
	98B71*****	BUSHING B-7
	85A371*****	SOCKET ANTENNA TERMINAL A-271
	66HD89405F	CONNECTOR ED-894 5P
	66HD89224F	CONNECTOR ED-892 24P
	66HD89320F	CONNECTOR ED-893 20P
	78U715****	AC RECEPTACLE 0716 3 ϕ NIFLATCH
		ISOLATION COVER D-143
	PL00001063	STYROFOAM PL-1063
	91**RTC97	INSIDE COVER RTC970
	91C02RTC97	OUTSIDE CARTON RTC970
		SPONGE D-146
	85522RTC97	FILTER A-522
		FUSE 1A/250V F ULCSA
		FUSE 1A/250V F VDE
	60B1930***	P.C.B B1930 FR4
	60B1935***	P.C.B B1935-TON FR4
	60B1935**	P.C.B B1935-AC FR4
	60B1935**	P.C.B B1935-ANT FR4
	60B1936**	P.C.B B1936 FR4
	AG00000482	REMOTE CONTROL
		TELETYPE UNIT RT-970
	MH10004200	OWNER'S MANUAL RTC-970
	53LAAM3140	LOOP ANT. H05-3140PH
	53TAFM***	T-TYPE ANT 300 Ω
	9875T300**	COAXI PLUG 75 Ω

Parts List

NOTE:THE COMPONENTS INDENTIFIED BY Δ MARK ARE FOR SAFFTY. REPLACE ONLY WITH ORIGINAL PARTS.DO NOT SUBSTITUTE.

SYMBOL	PARTS NO.	DESCRIPTION
B1930 P.C.B ASSEMBLY		
CARBON RESISTORS T-TYPE ALL RESISTORS RATED ARE +/-5% TOLERANCE AND 1/4W		
R101	300100C4TJ	100 OHM
R171	300100C4TJ	100 OHM
R175-180	300022C4TJ	22 OHM
R285	30010KC4TJ	10K OHM
R286	3004K7C4TJ	4K7 OHM
R287.288	30010KC4TJ	10K OHM
R289.290	3002K2C4TJ	2K2 OHM
R291	30010KC4TJ	10K OHM
R292	3004K7C4TJ	4K7 OHM
R293	300330C4TJ	330 OHM
R346	30001KC4TJ	1K OHM
R350	3002K2C4TJ	2K2 OHM
R367	300470C4TJ	470 OHM
R368	300220C4TJ	220 OHM
R369	300560C4TJ	560 OHM
R370	300022C4TJ	22 OHM
R371.372	300056C4TJ	56 OHM
R97.98	300330C4TJ	330 OHM
CARBON RESISTORS T-TYPE ALL RESISTORS RATED ARE +/-5% TOLERANCE AND 1/6W		
R1-8	300560C6TJ	560 OHM
R9	30010KC6TJ	10K OHM
R10	30100KC6TJ	100K OHM
R11-34	30100KC6TJ	100K OHM
R18	4004K7C6TJ	4K7 OHM
R39	30100KC6TJ	100K OHM
R40.43	30015KC6TJ	15K OHM
R41.45	3007K5C6TJ	7K5 OHM
R42.44	30047KC6TJ	47K OHM
R46	30010MC6TJ	10M OHM
R47	30022KC6TJ	22K OHM
R48-53	30010KC6TJ	10K OHM
R54	30015KC6TJ	15K OHM
R55-57	30010KC6TJ	10K OHM
R60	30010KC6TJ	10K OHM
R61	30022KC6TJ	22K OHM
R64	30020KC6TJ	20K OHM
R65	30022KC6TJ	22K OHM
R66	30100KC6TJ	100K OHM
R68.69	30010KC6TJ	10K OHM
R70	30022KC6TJ	22K OHM
R71.73	30047KC6TJ	47K OHM
R72	30010KC6TJ	10K OHM
R74	4004K7C6TJ	4K7 OHM
R75.76	30047KC6TJ	47K OHM
R77	3006K8C6TJ	6K8 OHM
R78	4004K7C6TJ	4K7 OHM
R79.80	30047KC6TJ	47K OHM
R81	3006K8C6TJ	6K8 OHM
R82.84	3008K2C6TJ	8K2 OHM
R83	3002K2C6TJ	2K2 OHM
R85-87	30010KC6TJ	10K OHM
R88.89	3006K8C6TJ	6K8 OHM
R90.91	3002K7C6TJ	2K7 OHM
R92	30270KC6TJ	270K OHM
R93	30150KC6TJ	150K OHM
R94	3003K3C6TJ	3K3 OHM
R95	30015KC6TJ	15K OHM
R96	30047KC6TJ	47K OHM
R99.100	3002K2C6TJ	2K2 OHM
R102	30001MC6TJ	1M OHM
R103.105	3003K3C6TJ	3K3 OHM
R104	30100KC6TJ	100K OHM
R106	30010KC6TJ	10K OHM
R107	4004K7C6TJ	4K7 OHM

SYMBOL	PARTS NO.	DESCRIPTION
R108	30100KC6TJ	100K OHM
R109	30033KC6TJ	33K OHM
R110.111	30010KC6TJ	10K OHM
R112.114	4004K7C6TJ	4K7 OHM
R113	30100KC6TJ	100K OHM
R119	30100KC6TJ	100K OHM
R116	4004K7C6TJ	4K7 OHM
R119	30100KC6TJ	100K OHM
R120.122	4004K7C6TJ	4K7 OHM
R121.123	30100KC6TJ	100K OHM
R124	4004K7C6TJ	4K7 OHM
R125	30100KC6TJ	100K OHM
R126.127	30010KC6TJ	10K OHM
R128	30022KC6TJ	22K OHM
R129	30010KC6TJ	10K OHM
R131	30001MC6TJ	1M OHM
R132	30330KC6TJ	330K OHM
R133	30100KC6TJ	100K OHM
R134	30010KC6TJ	10K OHM
R135	30001MC6TJ	1M OHM
R136	30330KC6TJ	330K OHM
R137	30100KC6TJ	100K OHM
R138	30068KC6TJ	68K OHM
R139	3005K6C6TJ	5K6 OHM
R140.141	300560C6TJ	560 OHM
R142	30001MC6TJ	1M OHM
R143	30022KC6TJ	22K OHM
R145.147	3002K2C6TJ	2K2 OHM
R146.148	30047KC6TJ	47K OHM
R149	30010KC6TJ	10K OHM
R150	30022KC6TJ	22K OHM
R151.152	30047KC6TJ	47K OHM
R153	30010KC6TJ	10K OHM
R154.155	3002K2C6TJ	2K2 OHM
R156	30010KC6TJ	10K OHM
R157	32012KC6TJ	12K OHM
R158-162	300560C6TJ	560 OHM
R163	30100KC6TJ	100K OHM
R165	30010KC6TJ	10K OHM
R166	300560C6TJ	560 OHM
R167	30047KC6TJ	47K OHM
R168	30047KC6TJ	47K OHM
R172	30010KC6TJ	10K OHM
R173	3002K2C6TJ	2K2 OHM
R174	4004K7C6TJ	4K7 OHM
R181	30010KC6TJ	10K OHM
R182.183	4004K7C6TJ	4K7 OHM
R184.185	30010KC6TJ	10K OHM
R188	30022KC6TJ	22K OHM
R189	30001KC6TJ	1K OHM
R190	30033KC6TJ	33K OHM
R191	30018KC6TJ	18K OHM
R193	32012KC6TJ	12K OHM
R194	3005K6C6TJ	5K6 OHM
R195	30047KC6TJ	47K OHM
R196.197	30082KC6TJ	82K OHM
R198	30240KC6TJ	240K OHM
R199.200	30051KC6TJ	51K OHM
R202	3003K3C6TJ	3K3 OHM
R203	30100KC6TJ	100K OHM
R214.216	30010KC6TJ	10K OHM
R217	30033KC6TJ	33K OHM
R218	30010KC6TJ	10K OHM
R219	30033KC6TJ	33K OHM
R220	30010KC6TJ	10K OHM
R221.223	30033KC6TJ	33K OHM
R224	30010KC6TJ	10K OHM
R225	30033KC6TJ	33K OHM
R227-230	30022KC6TJ	22K OHM
R231.232	30056KC6TJ	56K OHM

Parts List

SYMBOL	PARTS NO.	DESCRIPTION
R234	30010KC6TJ	10K OHM
R235	3003K9C6TJ	3K9 OHM
R236	32012KC6TJ	12K OHM
R237	30068KC6TJ	68K OHM
R238	30056KC6TJ	56K OHM
R239	30220KC6TJ	220K OHM
R240	3003K9C6TJ	3K9 OHM
R241	30010KC6TJ	10K OHM
R242	30068KC6TJ	68K OHM
R243	30100KC6TJ	100K OHM
R244	30056KC6TJ	56K OHM
R245	30220KC6TJ	220K OHM
R246	3003K9C6TJ	3K9 OHM
R247	30010KC6TJ	10K OHM
R250.251	3003K3C6TJ	3K3 OHM
R253	3002K2C6TJ	2K2 OHM
R254.255	3003K3C6TJ	3K3 OHM
R256	30010KC6TJ	10K OHM
R259	300180C6TJ	180 OHM
R260-262	30100KC6TJ	100K OHM
R263.264	30470KC6TJ	470K OHM
R265	30100KC6TJ	100K OHM
R266	30100KC6TJ	100K OHM
R267-270	30470KC6TJ	470K OHM
R271-274	30100KC6TJ	100K OHM
R275.276	30470KC6TJ	470K OHM
R277.278	30100KC6TJ	100K OHM
R279.280	30470KC6TJ	470K OHM
R284	30010KC6TJ	10K OHM
R296	30010KC6TJ	10K OHM
R297	30047KC6TJ	47K OHM
R298.299	30100KC6TJ	100K OHM
R300	300022C6TJ	22 OHM
R301	30010KC6TJ	10K OHM
R302.303	30100KC6TJ	100K OHM
R304.306	300330C6TJ	330 OHM
R305.307	30100KC6TJ	100K OHM
R308.310	30010KC6TJ	10K OHM
R309	300470C6TJ	470 OHM
R311	30001KC6TJ	1K OHM
R312	30033KC6TJ	33K OHM
R313	300056C6TJ	56 OHM
R314	300220C6TJ	220 OHM
R315	300150C6TJ	150 OHM
R316-318	30100KC6TJ	100K OHM
R319	300330C6TJ	330 OHM
R320	30001KC6TJ	1K OHM
R321	300220C6TJ	220 OHM
R322	300100C6TJ	100 OHM
R323	300470C6TJ	470 OHM
R324	30027KC6TJ	27K OHM
R325.326	30010KC6TJ	10K OHM
R327	3003K3C6TJ	3K3 OHM
R328	3008K2C6TJ	8K2 OHM
R329.330	30100KC6TJ	100K OHM
R331	30047KC6TJ	47K OHM
R332	3003K3C6TJ	3K3 OHM
R333	30010KC6TJ	10K OHM
R334	30010KC6TJ	10K OHM
R335	30001MC6TJ	1M OHM
R336-339	3005K6C6TJ	5K6 OHM
R340.341	3003K3C6TJ	3K3 OHM
R342	300220C6TJ	220 OHM
R343	300470C6TJ	470 OHM
R344.347	30010KC6TJ	10K OHM
R345	3002K2C6TJ	2K2 OHM
R348.349	3005K6C6TJ	5K6 OHM
R353	3005K6C6TJ	5K6 OHM
R354.357	30010KC6TJ	10K OHM
R355	3003K3C6TJ	3K3 OHM
R356	3008K2C6TJ	8K2 OHM

SYMBOL	PARTS NO.	DESCRIPTION
R358	30047KC6TJ	47K OHM
R359	3002K2C6TJ	2K2 OHM
R361.362	30120KC6TJ	120K OHM
R363	3002K2C6TJ	2K2 OHM
R364	30010KC6TJ	10K OHM
R365	30010KC6TJ	10K OHM
R366	30047KC6TJ	47K OHM
R373.374	30010KC6TJ	10K OHM
R383.385	30010KC6TJ	10K OHM
R384	30022KC6TJ	22K OHM
R386	30010KC6TJ	10K OHM
R389	3002K2C6TJ	2K2 OHM
R390	3002K2C6TJ	2K2 OHM
R398	30020KC6TJ	20K OHM
R399	30015KC6TJ	15K OHM
METAL RESISTORS T-TYPE RESISTORS RATED ARE +/-1% TOLERANCE AND 1/6W		
R62.63	326K34C6TF	6K34 OHM
R144	326K34C6TF	6K34 OHM
R58.59	3214K7C6TF	14K7 OHM
CARBON RESISTORS T-TYPE ALL RESISTORS ARE RATED +/-5% TOLERANCE 1W		
R375	32015001RJ	50 OHM
CARBON RESISTORS T-TYPE ALL RESISTORS ARE RATED +/-5% TOLERANCE 2W		
R130	32001002RJ	100 OHM
R281	32001002RJ	100 OHM
DIODE		
D1-6	131N4148*T	1N4148
D2	13Z4P7P5*T	4.7V/0.5W
D7-12	131N4002*T	1N4002
D15	131N4002*T	1N4002
D16.17	131N4148*T	1N4148
D19.20	131N4148*T	1N4148
D22	131N4148*T	1N4148
D23	131N4002*T	1N4002
D26.27	131N4148*T	1N4148
D28.29	131N4002*T	1N4002
D30	131N4148*T	1N4148
Z1.2	13Z6P8P5*T	6.8V/0.5W
VCD		
VD1-4	141SV147**	1SV147
VD5.6	141SV149**	1SV149
CAPACITORS		
C1-24	42100P50RJ	100P/50V SL CERAMIC
C4	40100U16R6	100U/16V ELEC
C30-33	41223U50RJ	0.022U/50V MYLAR
C34-36	41104U50RJ	0.1U/50V MYLAR
C37.39	46680P50DJ	680P/50V PP D-TYPE
C38	41104U50RJ	0.1U/50V MYLAR
C45	41104U50RJ	0.1U/50V MYLAR
C87	41104U50RJ	0.1U/50V MYLAR
C40	404K7U50R6	4.7U/50V ELEC
C41.42	46224U50DJ	224U/50V METALIGED FILM
C43	40010U50R6	10U/50V ELEC
C45	41104U50RJ	0.1U/50V MYLAR
C46	40047U16R6	47U/16V ELEC
C47	41563U50RJ	0.056U/50V MYLAR
C48	40001U50R6	1U/50V ELEC
C49	42100P50RJ	100P/50V SL CERAMIC

Parts List

Parts

NOTE: THE COMPONENTS IDENTIFIED BY Δ MARK ARE FOR SAFETY. REPLACE ONLY WITH ORIGINAL PARTS. DO NOT SUBSTITUTE.

SYMBOL	PARTS NO.	DESCRIPTION
C50	41563U50RJ	0.056U/50V MYLAR
C51	40001U50R6	1U/50V ELEC
C52	42100P50RJ	100P/50V SL CERAMIC
C53.54	41563U50RJ	0.056U/50V MYLAR
C55	41332U50RJ	0.0033U/50V MYLAR
C56	41152U50RJ	0.0015U/50V MYLAR
C57	41392U50RJ	0.0039U/50V MYLAR
C58	41103U50RJ	0.01U/50V MYLAR
C59	46334U50DJ	334/50V METALIGED FILM
C60	41104U50RJ	0.1U/50V MYLAR
C61	40010U50R6	10U/50V ELEC
C62	41473U50RJ	0.047U/50V MYLAR
C63	41273U50RJ	0.027U/50V MYLAR
C64	40010U50R6	10U/50V ELEC
C65	41822U50RJ	0.0082U/50V MYLAR
C66	41472U50RJ	0.0047U/50V MYLAR
C67	404K7U50R6	4.7U/50V ELEC
C68.69	40047U50R6	47U/50V ELEC
C70	41103U50RJ	0.01U/50V MYLAR
C71	41682U50RJ	0.0068U/50V MYLAR
C72	40001U50R6	1U/50V ELEC
C73	46224U50DJ	224/50V METALIGED FILM
C74-76	42010P50RJ	10P/50V SL CERAMIC
C78.79	42010P50RJ	10P/50V SL CERAMIC
C81.82	42010P50RJ	10P/50V SL CERAMIC
C84	404K7U50R6	4.7U/50V ELEC
C85	41103U50RJ	0.01U/50V MYLAR
C86	40100U16R6	100U/16V ELEC
C87	41104U50RJ	0.1U/50V MYLAR
C88-97	404K7U50R6	4.7U/50V ELEC
C98	42010P50RJ	10P/50V SL CERAMIC
C99	404K7U50R6	4.7U/50V ELEC
C100	49104U50D	104/50V CERAMIC CARACITORS
C101.102	42022P50RJ	22P/50V SL CERAMIC
C103	49104U50D	104/50V CERAMIC CARACITORS
C104.106	46224U50DJ	224/50V METALIGED FILM
C105	46334U50DJ	334/50V METALIGED FILM
C107-109	46334U50DJ	334/50V METALIGED FILM
C110-112	41473U50RJ	0.047U/50V MYLAR
C113.114	41562U50RJ	0.0056U/50V MYLAR
C115	40010U50R6	10U/50V ELEC
C116.117	41222U50RJ	0.0022U/50V MYLAR
C118	41563U50RJ	0.056U/50V MYLAR
C119.120	40001U50R6	1U/50V ELEC
C121.122	41563U50RJ	0.056U/50V MYLAR
C123	41472U50RJ	0.0047U/50V MYLAR
C127	41563U50RJ	0.056U/50V MYLAR
C128-130	46224U50DJ	224/50V METALIGED FILM
C131	40100U16R6	100U/16V ELEC
C132	404P7U50R6	4.7U/50V ELEC
C133	41203U50RJ	0.02U/50V MYLAR
C134	40220U25R6	220U/25V ELEC
C135	40470U16R6	470U/16V ELEC
C136.138	40470U25R	470U/25V ELEC
C139.140	40220U25R6	220U/25V ELEC
C141	40470U25R	470U/25V ELEC
C142.143	40047U50R6	47U/50V ELEC
C144.145	49104U50D	104/50V CERAMIC CARACITORS
C146.147	402K2U35R6	2200U/35V ELEC
C148-152	40220U25R6	220U/25V ELEC
C153-156	404P7U50R6	4.7U/50V ELEC
C157	41103U50RJ	0.01U/50V MYLAR
C158	40100U16R6	100U/16V ELEC
C160	46470P50DJ	470P/50V PP D-TYPE
C161	41103U50RJ	0.01U/50V MYLAR
C162.163	46224U50DJ	224/50V METALIGED FILM
C166	41683U50RJ	0.068U/50V MYLAR
C167	41153U50RJ	0.015U/50V MYLAR
C168.169	404P7U50R6	4.7U/50V ELEC
C170.172	41392U50RJ	0.0039U/50V MYLAR
C171.173	41222U50RJ	0.0022U/50V MYLAR

SYMBOL	PARTS NO.	DESCRIPTION
C174.175	404P7U50R6	4.7U/50V ELEC
C177.179	40010U50R6	10U/50V ELEC
C178	40100U16R6	100U/16V ELEC
C180-183	49104U50D	104/50V CERAMIC CARACITORS
C184.185	40470U25R	470U/25V ELEC
C186-188	41103U5ARJ	0.01U/500V MYLAR
C189	42100P50RJ	100P/50V SL CERAMIC
C190	42003P50RN	3P/50V NP0 CERAMIC
C191	42202U50RJ	0.002U/50V CERAMIC
C192.195	42005P50RN	5P/50V NP0 CERAMIC
C193	42003P50RN	3P/50V NP0 CERAMIC
C194	42007P50RN	7P/50V NP0 CERAMIC
C196	42100P50RJ	100P/50V SL CERAMIC
C197.198	42203U50RJ	0.02U/50V CERAMIC
C199	40047U16R6	47U/16V ELEC
C200	42203U50RJ	0.02U/50V CERAMIC
C201	42003P50RN	3P/50V NP0 CERAMIC
C202	42002P50RN	P/50V NP0 CERAMIC
C203	42003P50RN	P/50V NP0 CERAMIC
C204.205	42015P50RN	15P/50V NP0 CERAMIC
C206	42010P50RN	10P/50V NP0 CERAMIC
C207-211	42203U50RJ	0.02U/50V CERAMIC
C213	43350P50RJ	350P/50V PS
C214	42102U50RJ	0.001U/50V CERAMIC
C216	42103U50RJ	0.01U/50V CERAMIC
C217	42203U50RJ	0.02U/50V CERAMIC
C218	42005P50RN	5P/50V NP0 CERAMIC
C219.220	42403U50RJ	0.04U/50V CERAMIC
C221.223	42203U50RJ	0.02U/50V CERAMIC
C222	40100U16R6	100U/16V ELEC
C224	404P7U50R6	4.7U/50V ELEC
C225	40010U50R6	10U/50V ELEC
C226	41153U50RJ	0.015U/50V MYLAR
C227	404P7U50R6	4.7U/50V ELEC
C228	42470P50RJ	470P/50V SL CERAMIC
C229	42047P50RJ	47P/50V SL CERAMIC
C230	42330P50RJ	330P/50V SL CERAMIC
C231.232	46560P50DJ	EUR 560P/50V PP D-TYPE
C231.232	46820P50DJ	USA 820P/50V PP D-TYPE
C233	41473U50RJ	0.047U/50V MYLAR
C234	42330P50RJ	330P/50V SL CERAMIC
C235	40100U16R6	100U/16V ELEC
C238-240	42203U50RJ	0.02U/50V CERAMIC
C241	40010U50R6	10U/50V ELEC
C242.244	404P7U50R6	0.47U/50V ELEC
C243.245	404P7U50R6	4.7U/50V ELEC
C246.247	42203U50RJ	0.02U/50V CERAMIC
C248	40220U25R6	220U/25V ELEC
C249.250	42203U50RJ	0.02U/50V CERAMIC
C251	40010U50R6	10U/50V ELEC
C252.253	42203U50RJ	0.02U/50V CERAMIC
C254	40010U50R6	10U/50V ELEC
C255.256	42047P50RJ	47P/50V SL CERAMIC
C257	42203U50RJ	0.02U/50V CERAMIC
C258	40P22U50R1	0.22U/50V LEC
C259	40001U50R6	1U/50V ELEC
C260.261	42203U50RJ	0.02U/50V CERAMIC
C262	40001U50R6	1U/50V ELEC
C263	404P7U50R6	4.7U/50V ELEC
C264	40010U50R6	10U/50V LEC
C265	40001U50R6	1U/50V ELEC
C266-269	40010U50R6	10U/50V LEC
C27-29	404K7U50R6	4.7U/50V ELEC
C270	40001U50R6	1U/50V ELEC
C271	40047U16R6	47U/16V LEC
C272	42022P50RN	22P/50V NP0 CERAMIC
C273	49472U12VK	0.0047/125V VDE
C275	40220U25R6	220U/25V ELEC
C276	42100P50RJ	100P/50V SL CERAMIC
C277	49104U50D	104/50V CERAMIC CARACITORS
C280	404P7U50R6	4.7U/50V ELEC

SYMBOL
C282-284
C285.286
Q1-10
Q11
Q12
Q13-20
Q21
Q22
Q23
Q24
Q25
Q26
Q27
Q28
Q29.30
Q31
Q32.33
Q34.35
Q36
Q37
Q38.39
Q40-43
Q44
Q45-48
Q49
Q50
Q51
T1
T2.3
T4
T5
T6
L8
Z3
Z4
Z7
Z5
Z6
Z8
L5.6.9
L1.3.7
L4
L10
IS01
U1.2.5
U3
U4.6
U7
U8.9
U10
U11
U12
U13
U14
U15
U16-18

Parts List

SYMBOL	PARTS NO.	DESCRIPTION
C282-284	40047U16R6	47U/16V LEC
C285.286	40010U50R6	10U/50V ELEC
TRANSISTORS		
Q1-10	122SC1815*	2SC1815
Q11	122SA1015*	2SA1015
Q12	122SC1815*	2SC1815
Q13-20	122SC3327*	2SC3327
Q21	122SC1815*	2SC1815
Q22	122SA1015*	2SA1015
Q23	122SC2235*	2SC2235
Q24	122SC2168*	2SC2168
Q25	122SA1015*	2SA1015
Q26	122SC1815*	2SC1815
Q27	122SA958**	2SA958
Q28	122SC1815*	2SC1815
Q29.30	122SA1015*	2SA1015
Q31	122SA958**	2SA958
Q32.33	123SK101**	3SK101
Q34.35	122SK192A*	2SK192A
Q36	122SC461**	2SC461
Q37	122SK192A*	2SK192A
Q38.39	122SC3327*	2SC3327
Q40-43	122SC1815*	2SC1815
Q44	122SA1015*	2SA1015
Q45-48	122SC1815*	2SC1815
Q49	122SD468**	2SD468
Q50	122SC1815*	2SC1815
Q51	122SA1015*	2SA1015
IFT		
T1	528072****	A-8B (8072)
T2.3	5210DFF01*	10DFF01
T4	520203W009	0203-W009
T5	528074****	FM-7A (8074)
T6	52LO003***	LO-003 (W166)
L8	52LA003***	LA-003 (W053)
FILTER		
Z3	51BFU450C*	C
Z4	51SFZ450B*	450B
Z7	51CSB456F*	456F11
Z5	5110P7MS2R	10.7MS2
Z6	5110P7MS3R	10.7MS3
Z8	51FF88108L	08
CHOKE		
L5.6.9	73C2P2U**T	2.2uH
COIL		
L1.3.7	7331505P6R	3.5x5 ϕ x0.6
L4	7341505P6F	4.5x5 ϕ x0.6
L10	7341505P6R	5.5x5 ϕ x0.6
IC		
IS01	11LTV817**	LTV817
U1.2.5	11TC9163N*	TC9163N
U3	11NJU201A*	NJU201A
U4.6	11TC9213**	TC9213
U7	11NJU201A*	NJU201A
U8.9	11TC9213**	TC9213
U10	11TA7629**	TA7629
U11	11JRC5532D	JRC5532D
U12	11YM3428**	YM3428
U13	11TC9213**	TC9213
U14	11JRC4558D	JRC4558D
U15	11JRC5532D	JRC5532D
U16-18	11JRC4558D	JRC4558D

SYMBOL	PARTS NO.	DESCRIPTION
U19	1178LS05**	78LS05
U20.21.22	11NJU201A*	NJU201A
U23	11SSM2126*	SSM-2126
U24	117805A***	AN7805A
U25.26	117812A**	AN7812A
U27	117912A**	AN7912A
U28	11NJU201A*	NJU201A
U29.30.31	11JRC5532D	JRC5532D
U32.33	11JRC4558D	JRC4558D
U34.35	11JRC5532D	JRC5532D
U36	11JRC4558D	JRC4558D
U37-48	11JRC5532D	JRC5532D
U50	11AN278***	AN278
U51	11LA3401**	LA3401
U52	11TC9216P*	TC9216P
U53	11LA1265**	LA1265
U54	1178LS05**	78LS05
XTAL		
Y1	153M58HZ**	CERAMIC 3.58MHz
Y2	157M2HZ***	QUARTZ 7.2MHz
TRIMMER		
TVC1-6	48CTY11208	Y112B/ITP-8P
TVR		
TVR1	31104063HP	6 ϕ H-TYPE 100K
TVR3	31103063HP	6 ϕ H-TYPE 10K
TVR2	31502063HP	6 ϕ H-TYPE 5K
K1		UL/CSA/VDE RELAY DEG OMIH-SS-112L
J1	55202V**G2	RCA JACK 202V-03 2P
J2-J6	55214V**G4	RCA JACK 214V-03 4P
J8	55204V**G4	RCK JACK 204V-03 4P
J7	55206V**G6	RCA JACK 206V-03 6P
F1.2	595G00121F	FUSE 1A/250V F
SW2	22P223BSB*	SWITCH P223BSM-PF8
	77FZN023**	SHIELD COVER N-023
	77FZN024**	SHIELD CORD N-024
B1935 P.C.B ASSEMBLY		
CARBON RESISTORS T-TYPE ALL RESISTORS RATED ARE +/- 5% TOLERANCE AND 1/4W		
D3	300056C4TJ	56 OHM
R1.2	300075C4TJ	75 OHM
R3	300220C4TJ	220 OHM
R4	3001K2C4TJ	1K2 OHM
R6	300068C4TJ	68 OHM
R7	300220C4TJ	220 OHM
R9	300075C4TJ	75 OHM
R10	300068C4TJ	68 OHM
R11	300056C4TJ	56 OHM
R12	300075C4TJ	75 OHM
R13.14	3001K2C4TJ	1K2 OHM
R15	300220C4TJ	220 OHM
R21	300068C4TJ	68 OHM
R22	3001K2C4TJ	1K2 OHM
R24.25	300010C4TJ	10 OHM
R33	300220C4TJ	220 OHM
R51	300100C4TJ	100 OHM
R52	300010C4TJ	10 OHM

SYMBOL	PARTS NO.	DESCRIPTION
CARBON RESISTORS T-TYPE ALL RESISTORS RATED ARE +/- 5% TOLERANCE AND 1/6W		
R5.8	3002K2C6TJ	2K2 OHM
R16	3002K2C6TJ	2K2 OHM
R17	30010KC6TJ	10K OHM
R18	3008K2C6TJ	8K2 OHM
R19	30027KC6TJ	27K OHM
R23	30010KC6TJ	10K OHM
R26-31	30010KC6TJ	10K OHM
R32	3002K2C6TJ	2K2 OHM
R34	3002K2C6TJ	2K2 OHM
R35-40	30100KC6TJ	100K OHM
R391.392	3004K7C6TJ	4K7 OHM
R41	3002K7C6TJ	2K7 OHM
R43	30001MC6TJ	1M OHM
R45	300330C6TJ	330 OHM
R46.47	3002K2C6TJ	2K2 OHM
R50	300560C6TJ	560 OHM
R53	30100KC6TJ	100K OHM
R54	30010KC6TJ	10K OHM
R55	3002K2C6TJ	2K2 OHM
R57	30015KC6TJ	15K OHM
R58	30010KC6TJ	10K OHM
R59	30100KC6TJ	100K OHM
R60	300820C6TJ	820 OHM
R61	3004K7C6TJ	4K7 OHM
TVR3	300220C6TJ	220 OHM
TVR5	3005K6C6TJ	5K6 OHM
CARBON RESISTORS T-TYPE ALL RESISTORS RATED ARE +/- 5% TOLERANCE AND 1W		
R49	32003301RJ	33 OHM
R56	32002201RJ	22 OHM
CARBON RESISTORS T-TYPE ALL RESISTORS RATED ARE +/- 5% TOLERANCE AND 2W		
R20	32001002RJ	10 OHM
DIODE		
D1.2.4-6.8	131N4148**	1N4148
D7	1323P9P5*T	3.9V/0.5W
CAPACITORS		
C1-7	40047U16R6	47U/16V ELEC
C9.10	42047P50RJ	47P/50V SL CERAMIC
C11.12	46560P50DJ	560P/50V PP D-TYPE
C13.14	40470U16R6	470U/16V ELEC
C15.16	43104U50DJ	104/50V CERAMIC CARACITORS
C17	40100U16R6	100U/16 V ELEC
C18.50-55	404P7U50R6	4.7U/50V ELEC
C19.20	43104U50DJ	104/50V CERAMIC CARACITORS
C21	40047U16R6	47U/16V ELEC
C22.23	41203U50RJ	0.02J/50V MYLAR
C24	43104U50DJ	104/50V CERAMIC CARACITORS
C25	41332U50RJ	0.0033J/50V MYLAR
C26.28	40001U50R6	1U/50V ELEC
C27	41203U50RJ	0.02J/50V MYLAR
C30.31	42007P50RJ	7P/50V SL CERAMIC
C32-38	42100P50RJ	100P/50V SL CERAMIC
C39	40047U16R6	47U/16V ELEC
C40.41	43104U50DJ	104/50V CERAMIC CARACITORS
C42	40100U16R6	100U/16 V ELEC
C43	40047U16R6	47U/16V ELEC
C44	43104U50DJ	104/50V CERAMIC CARACITORS
C45-47	40100U16R6	100U/16 V ELEC
C48	43104U50DJ	104/50V CERAMIC CARACITORS
C49	40047U16R6	47U/16V ELEC

SYMBOL	PARTS NO.	DESCRIPTION
C56.57	41203U50RJ	0.02J/50V MYLAR
C58	40033U16R6	33U/16V ELEC
C59	42403U50RJ	0.04U/50V SL CERAMIC
TRANSISTOR		
Q1-4	122SC2240*	2SC2240
Q5-8	122SC1815*	2SC1815
Q9	122SCA1015	2SA1015
Q10	122SC1815*	2SC1815
Q11	122SC2240*	2SC2240
IC		
IS01	11LTV817**	LTV817
U1	11LVA519S*	LVA519S
U2	11UPD6450*	UPD6450
U3	11LA7951**	LA7951
U4-6	11NJU201A*	NJU201A
U7	11AN7805A*	AN7805A
U8	11AN7905A*	AN7905A
	60B1935***	P.C.BOARD B1935
C8	48CTY112B*	TRIMMER CTY112B
J1-4	55212V**G2	RCA JACK 212V-12
J5.6	5503512*G1	PHONE JACK 3.5φ HTJ-035-12
J7	55DB25****	DB25 JACK DBR25FTK0
JP2	66HD89608F	CONNECTOR ED-896 8P
JP6	66W504510F	WAFER 5045-10P
L1	73C047U**T	CHOKE 47uH
P1	66HD89911F	CONNECTOR ED-899 11P
TVR1.4	3110K063HN	TVR 6φ H-TYPE 10K
Y1	1514M31818	XTAL 14.31818MHz
B1935-TON P.C.B ASSEMBLY		
CARBON RESISTORS T-TYPE ALL RESISTORS RATED ARE +/- 5% TOLERANCE AND 1/4W		
R379	3006K8C4TJ	10 OHM
CARBON RESISTORS T-TYPE ALL RESISTORS RATED ARE +/- 5% TOLERANCE AND 1/6W		
R376.377	30100KC6TJ	100K OHM
R378	3006K8C6TJ	6K3 OHM
R380-382	30010KC6TJ	10K OHM
R385-387	30010KC6TJ	10K OHM
CAPACITORS		
C274.275	42333U50RJ	033U/50V MYLAR
C276	42332U50RJ	0.0033U/50V MYLAR
C278.279	42333U50RJ	0.033U/50V MYLAR
C280	42332U50RJ	0.0033U/50V MYLAR
C282.283	42022P50RJ	22P/50V SL CERAMIC
C285.286	42332U50RJ	0.0033U/50V MYLAR
IC		
U54	11JRC5532*	RC5532D
VR1.2	36K163A312	RK163121A312-100KBx2
JP12	66HD89507F	CONNECTOR ED-895 7P
	60B1935TON	P.C.B B1935-TON
B1935-ANT P.C.B ASSEMBLY		
J12	55YDK31133	TERMINAL YKD31-0133
JP5	66W504504F	WAFER 5045-4P
	60B1935ANT	P.C.B B1935-ANT

SYMBOL
B1935
METAL RATED
R397 C284 J11
B1936
CARBO RATED
R5 R12.13 R18-22 R23.24 R25-41
R42.43 R57-64 R65 R66 R73
R81 R85
CARBO RATED
R1 R2.3.4 R6 R7 R8
R9 R10 R14-17 R46 R47
R48-51 R53.54 R55 R56 R67.68
R70 R71 R72.74 R75 R76
R77.78 R79 R83 R86-90
D1-9 D10 D11 D13 D16.17. D22 (EU D23.24(D25 D26.27. D30
C1.2 C3-6 C8.9 C11

Parts List

SYMBOL	PARTS NO.	DESCRIPTION
B1935-AC P.C.B ASSEMBLY		
METAL RESISTORS T-TYPE ALL RESISTORS RATED ARE +/- 5% TOLERANCE AND 1/2W		
R397	3003M3M2TJ	3M3 OHM
C284	49472U12VK	VDE 0.0047/125V
J11	66W396103F	WAFER 3961-3P
	60B1935AC*	PLASTIE P.C.B SUPPORT CS-1016 P.C.B B1935-AC
B1936 P.C.B ASSEMBLY		
CARBON RESISTORS T-TYPE ALL RESISTORS RATED ARE +/- 5% TOLERANCE AND 1/4W		
R5	300330C4TJ	330 OHM
R12.13	300022C4TJ	22 OHM
R18-22	300022C4TJ	22 OHM
R23.24	300330C4TJ	330 OHM
R25-41	300820C4TJ	820 OHM
R42.43	30022KC4TJ	22K OHM
R57-64	300820C4TJ	820 OHM
R65	30010KC4TJ	10K OHM
R66	300330C4TJ	330 OHM
R73	300330C4TJ	330 OHM
R81	300022C4TJ	22 OHM
R85	30022KC4TJ	22K OHM
CARBON RESISTORS T-TYPE ALL RESISTORS RATED ARE +/- 5% TOLERANCE AND 1/6W		
R1	30001MC6TJ	1M OHM
R2.3.4	30010KC6TJ	10K OHM
R6	320220C6TJ	220 OHM
R7	30022KC6TJ	22K OHM
R8	30010KC6TJ	10K OHM
R9	3006K8C6TJ	6K8 OHM
R10	30022KC6TJ	22K OHM
R14-17	30010KC6TJ	10K OHM
R46	3002K2C6TJ	2K2 OHM
R47	300010C6TJ	10 OHM
R48-51	33022K8PRJ	RESISTOR NETWORKS 22Kx8
R53.54	33022K4PRJ	RESISTOR NETWORKS 22Kx4
R55	33022K8PRJ	RESISTOR NETWORKS 22Kx8
R56	33022K4PRJ	RESISTOR NETWORKS 22Kx4
R67.68	33022K8PRJ	RESISTOR NETWORKS 22Kx8
R70	30100KC6TJ	100K OHM
R71	30150KC6TJ	150K OHM
R72.74	30010KC6TJ	10K OHM
R75	30022KC6TJ	22K OHM
R76	33022K4PRJ	RESISTOR NETWORKS 22Kx4
R77.78	30022KC6TJ	22K OHM
R79	30100KC6TJ	100K OHM
R83	3002K2C6TJ	2K2 OHM
R86-90	3004K7C6TJ	4K7 OHM
DIODE		
D1-9	131N4148*T	1N4148
D10	13Z3P9P5*T	3.9V/0.5W
D11	131N4148*T	1N4148
D13	131N4148*T	1N4148
D16.17.18	131N4148*T	1N4148
D22 (EUR)	131N4148*T	1N4148
D23.24(USA)	131N4148*T	1N4148
D25	13Z4P7P5*T	4.7V/0.5W
D26.27.28	131N4148*T	1N4148
D30	13Z3P9P5*T	3.9V/0.5W
CAPACITORS		
C1.2	42020P50RJ	20P/50V SL CERAMIC
C3-6	49104U50DJ	104/50V CERAMIC CARACITORS
C8.9	49104U50DJ	104/50V CERAMIC CARACITORS
C11	400P1U50R1	0.1U/50V KULR ELEC

SYMBOL	PARTS NO.	DESCRIPTION
C13-15	49104U50DJ	104/50V CERAMIC CARACITORS
C16	4001KU10R6	1000U/10V ELEC
C17.19	42203U50RJ	0.02/50V CERAMIC
C20	40010U50R6	10U/50V ELEC
C22	40001U50R6	1U/50V ELEC
C23	4001KU10R6	1000U/10V ELEC
TRANSISTOR		
Q1.2.3	122SA1015*	2SA1015
Q5.6.8	122SA1015*	2SA1015
Q4.7.9-14	122SC1815*	2SC1815
IC		
U1-3	11MC14028*	MC14028BCP
U4-6	1174HC273*	74HC273
U7	1174HC244*	74HC244
U8	11HD404019	HD404019S
U9	11DT5A114E	DT5A114E
U10-15	11DT5C114E	DT5C114E
U16	11DT5A114E	DT5A114E
U17-19	11DT5C114E	DT5C114E
U20.21	11DT5A114E	DT5A114E
U23	11TC4081**	TC4081
TSW1-32	26TC1050**	TACT SWITCH B3F-1050
IR1	62BX1407**	RECEIVER BX1407
Y1	158MHZ****	X'TAL 8MHz
LED23		LED SLEEVE 1P A-503
LED12-14	16934IT***	LED SLEEVE 3P A-504
LED12-14	16934IT***	LED L-934IT
LED23	16934IT***	LED L-934IT
LED1-11	163XHT****	LED RED 3XHT
LED24-31	163XGT****	LED RED 3XHT
LED15-22	163XGT****	LED GREEN 3XGT
DIS1	16DC0311GW	LED GREEN
TUB1	17CP2372GR	TUBE CP2372GR
		EVA SPONGE 5x8x70 5x70
JP1	66HD89708F	CONNECTOR ED-897 8P
JP2	66P254124F	PIN 2541 24P
JP3	66P254120F	PIN 2541 20P
JP4	66HD89810F	CONNECTOR ED-898 10P
		5P JACK SIB-105-S001-01
U8	66S64P****	SOCKER,IC 64P
	60B1936***	P.C.B B1936 FR4