



PHOTOFACT® with

CIRCUITRACE®

For Supplier Address See PHOTOFACT Index

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.



MODEL T4020A

GENERAL

MANUFACTURER'S SPECIFICATIONS

Frequency Range: 40 Channels; 26.965 to 27.405 MHz

Frequency Stability: $\pm .005\%$ [-30°C (-22°F) to $+50^{\circ}\text{C}$ (122°F)]

Frequency Control: Digitally synthesized phase lock loop

Circuitry: All solid-state

Receiver System: Single conversion superheterodyne with dual gate MOSFET RF amp, FET mixer, ceramic IF filter, and integrated circuit IF system

Audio Compression Amp: In both transmitter and receiver

Microphone: Dynamic w/built-in pre-amp; 600 ohms

Metering: Illuminated, with "S" units and relative power output display

PA System: 2.5 watts minimum into external 4-ohm speaker

External Speaker Jack: Disconnects internal speaker. For use w/optional 4 ohm speaker.

Input Voltage: 13.8 V DC $\pm 20\%$; negative ground only w/reverse polarity protection.

Circuit Protection: In-line 3 Amp fuse w/plug-in power cable

Dimensions: 2.46" high x 7.24" wide x 9.4" deep (6.2cm x 18.4cm x 24.1cm)

Weight: Less than 3 lbs. (1.33 kg)

TRANSMITTER

RF Power Output: 4.0 watts max. at 13.8 V DC.

RF Harmonic Attenuation (T.V.I. Suppression): More than 65 dB down

Audio Distortion: Less than 5% at 1000 Hz at knee of compression

Audio Frequency Response: $+1$ to -14 dB, 300 to 3000 Hz

Microphone Sensitivity: 26 mV ± 4 dB at knee of compression

Modulation Limiting: Less than 100% modulation for inputs up to 40 dB above Mic sensitivity

Output Impedance: 50 ohms

FCC Designator: CB1124 **Emission:** 6A3

RECEIVER

Input Impedance: 50 ohms

Sensitivity: 0.5 μV typical for 10 dB (S + N)/N (30% modulation at 1 kHz) EIA Method

Squelch Sensitivity: Less than 1 μV at Threshold, 100 to 1,000 μV at Maximum

Adjacent Channel Selectivity: More than 55 dB down at ± 10 kHz; EIA Method

Cross Modulation Rejection: More than 70 dB at ± 50 kHz

RF Blocking Protection: More than 70 dB at ± 50 kHz

Spurious & Image Rejection: More than 10 dB at image. More than 50 dB at all other spurious frequencies

Intermediate Frequency: 455 kHz

Automatic Gain Control (AGC): Less than 12 dB audio rise with signal levels of 1 to 200,000 μV ; EIA Method

Automatic Noise Limiter (ANL): Low distortion AGC tracking type

"Extender" (Catalog Numbers 4005, 4020 only): High sensitivity, antenna sampling impulse noise blanker w/automatic level control

Audio Output: 2.5 watts at less than 5% distortion (30% modulation at 1 kHz)

Speaker: 3-1/2" diameter, 4 ohms

FCC Designator: CB1124

Courtesy of the Manufacturer

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

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MOTOROLA MODELS T4000A/05A/10A/20A

ALIGNMENT INSTRUCTIONS

CAUTION: Use isolation transformer or observe polarity when connecting test equipment. Maintain line voltage at 120V AC. Allow a 15-minute warm-up period. Adjustments made with 13.8-volt DC input. Connect low sides of test equipment to ground unless specified otherwise. Connect 50-ohm dummy load or antenna before keying transmitter. Connect microphone.

Suggested Alignment Tools: GC Electronics:
 L101,L102,L103,L402,L403,L404,T500,T501.....9440
 T104,T105,T106.....5009

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to TP10 (Emitter of Q401).	Ch. 19		Check for 2.560MHz.
Input of frequency counter to TP11 (Emitter of Q405).	Ch. 19	L403	Adjust for 29.030MHz.
	Ch. 19, XMT	L404	Adjust for 29.485MHz.
Input of DC meter to TP2.	Ch. 1	L402	Adjust for 2.85V $\pm$.1 volt.
Input of DC meter to TP2.	Ch. 40, XMT		Check for a voltage less than 7.2 volts.
Input of frequency counter to TP3 (Emitter of Q407).	Ch. 1		Check for 26.510MHz $\pm$ 50Hz. Check all channels. See Truth Chart for correct frequencies.
	Ch. 1, XMT		Check for 26.965MHz $\pm$ 50Hz. Check all channels. (Should indicate channel frequency)

RECEIVER ALIGNMENT

Connect an AC VTVM or AF wattmeter across speaker voice coil. Adjust volume control to obtain a suitable indication. Set generator output low enough to prevent AGC limiting.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP12 (Gate of Q102). 455kHz, 1000Hz @ 30% modulation.	Ch. 19, Squelch MIN. Extend Off	T106,T105, T104	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19, Squelch MIN. Extend Off	L103,L102, L101	Adjust for maximum output. If necessary readjust T104, T105, and T106.
Output of signal generator thru .01uF to antenna jack. 24.000MHz no modulation. Input of DC meter to TP4 (Emitter of Q501).	Ch. 19, Squelch MIN. Extend On	T500,T501	Adjust T500 & T501 for maximum. Adjust generator so DC meter reads between .8 and 1 volt.
Output of signal generators thru .01uF to antenna jack. 24.000MHz.no modulation and 27.185MHz no modulation. Input of DC meter to TP4 (Emitter of Q501).	Ch. 19, Squelch MIN. Extend On	R520	Adjust 24MHz generator to obtain .8 to 1 volt on DC meter. Adjust R520 to a point so that there is a drop in noise at the speaker.

RECEIVER ADJUSTMENTS

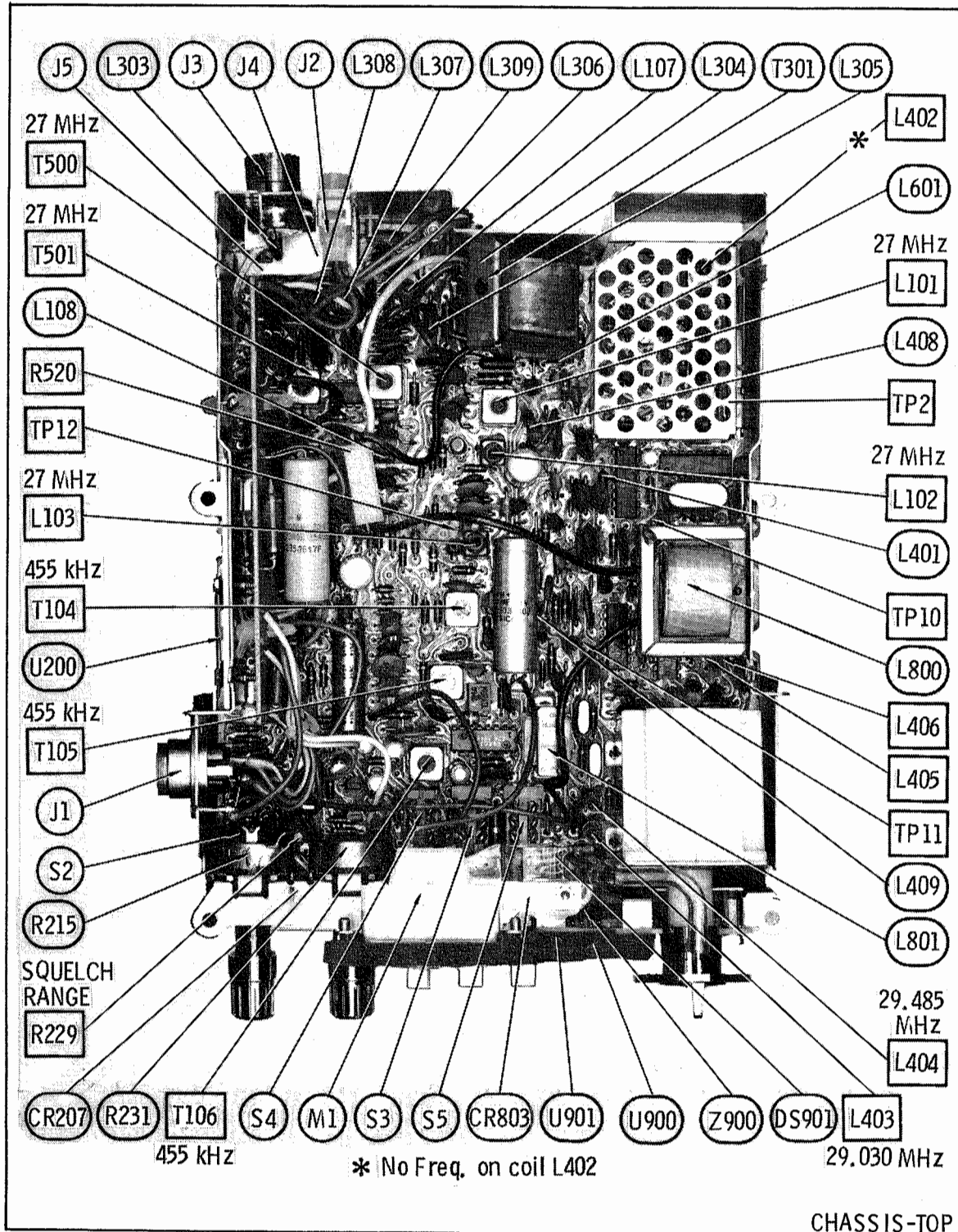
Connect an AC VTVM or AF wattmeter across speaker voice coil. Adjust volume control to obtain a suitable indication.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 300uV.	Ch. 19, Extend Off	R229	SQUELCH RANGE Set Squelch Control R231 fully clockwise. Adjust R229 so that squelch just breaks.

TRANSMITTER ALIGNMENT

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

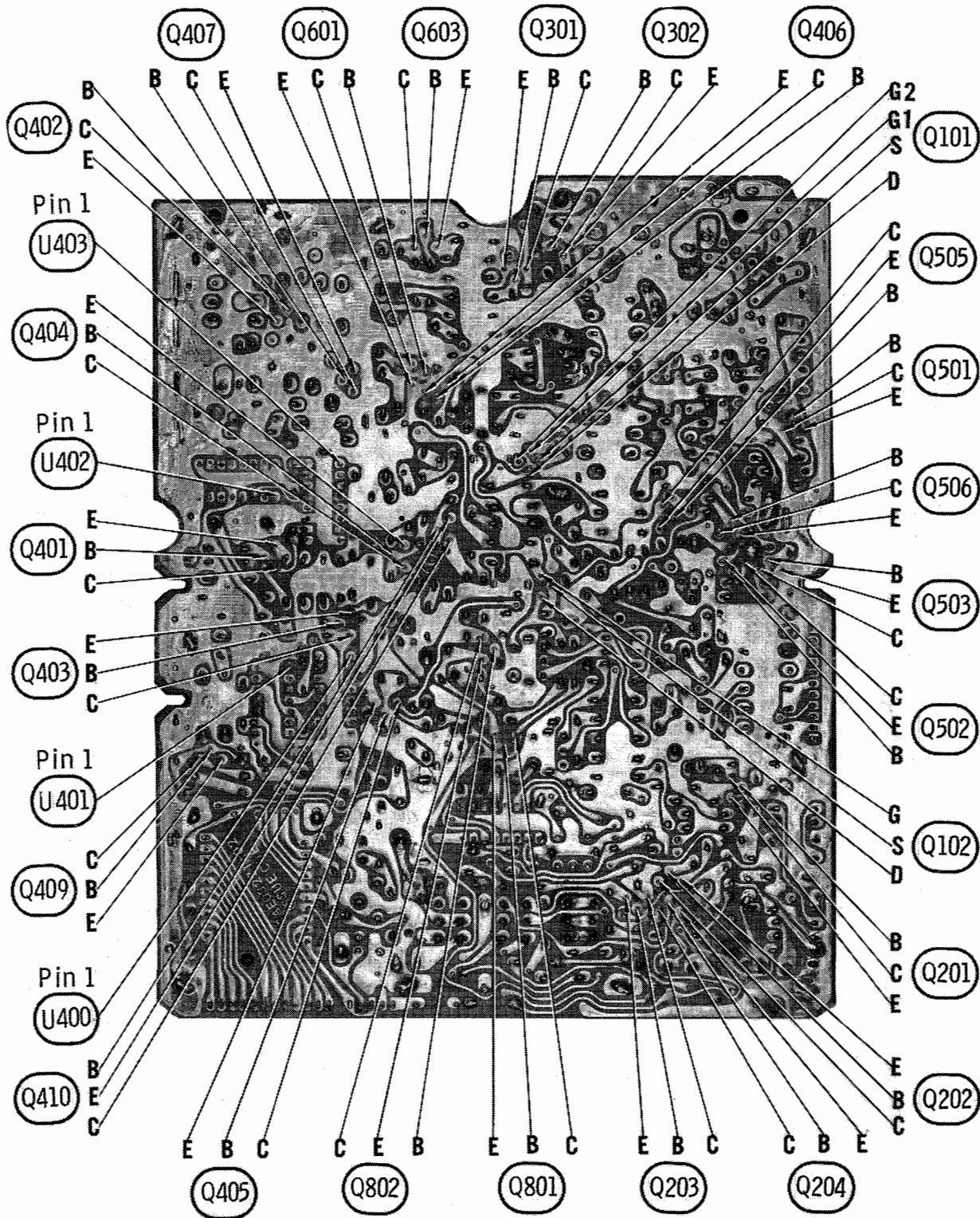
TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
	Ch. 19		Check for 3.5 to 4 watts.



MOTOROLA MODELS T4000A/05A/10A/20A

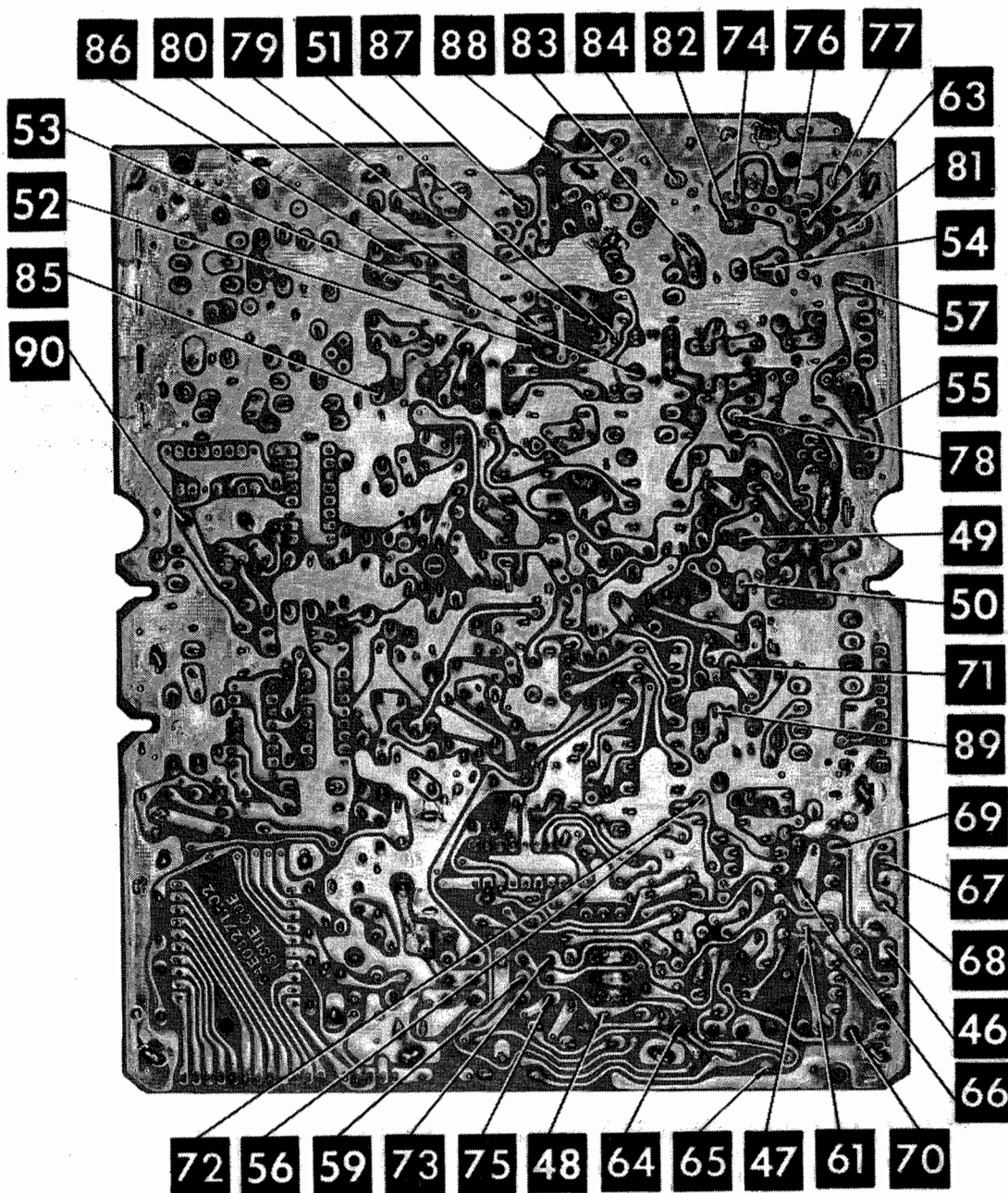
TRUTH CHART

C H A N N E L	1 = 5.11 Volts 0 = 0 Volts 10kHz pin 3 and pin 14 of U402 PROGRAM DIVIDER								REC VCO OUTPUT IN MHz AT TP3	XMT VCO OUTPUT IN MHz AT TP3	
	U401				U400						
	PINS										
	1	15			9	10	1	15			
1	1	1			1	1	0	0	26.510	26.965	
2	1	1			1	0	1	1	26.520	26.975	
3	1	1			1	0	1	0	26.530	26.985	
4	1	1			1	0	0	0	26.550	27.005	
5	1	1			0	1	1	1	26.560	27.015	
6	1	1			0	1	1	0	26.570	27.025	
7	1	1			0	1	0	1	26.580	27.035	
8	1	1			0	0	1	1	26.600	27.055	
9	1	1			0	0	1	0	26.610	27.065	
10	1	1			0	0	0	1	26.620	27.075	
11	1	1			0	0	0	0	26.630	27.085	
12	1	0			1	1	1	0	26.650	27.105	
13	1	0			1	1	0	1	26.660	27.115	
14	1	0			1	1	0	0	26.670	27.125	
15	1	0			1	0	1	1	26.680	27.135	
16	1	0			1	0	0	1	26.700	27.155	
17	1	0			1	0	0	0	26.710	27.165	
18	1	0			0	1	1	1	26.720	27.175	
19	1	0			0	1	1	0	26.730	27.185	
20	1	0			0	1	0	0	26.750	27.205	
21	1	0			0	0	1	1	26.760	27.215	
22	1	0			0	0	1	0	26.770	27.225	
23	0	1			1	1	1	1	26.800	27.255	
24	1	0			0	0	0	1	26.780	27.235	
25	1	0			0	0	0	0	26.790	27.245	
26	0	1			1	1	1	0	26.810	27.265	
27	0	1			1	1	0	1	26.820	27.275	
28	0	1			1	1	0	0	26.830	27.285	
29	0	1			1	0	1	1	26.840	27.295	
30	0	1			1	0	1	0	26.850	27.305	
31	0	1			1	0	0	1	26.860	27.315	
32	0	1			1	0	0	0	26.870	27.325	
33	0	1			0	1	1	1	26.880	27.335	
34	0	1			0	1	1	0	26.890	27.345	
35	0	1			0	1	0	1	26.900	27.355	
36	0	1			0	1	0	0	26.910	27.365	
37	0	1			0	0	1	1	26.920	27.375	
38	0	1			0	0	1	0	26.930	27.385	
39	0	1			0	0	0	1	26.940	27.395	
40	0	1			0	0	0	0	26.950	27.405	



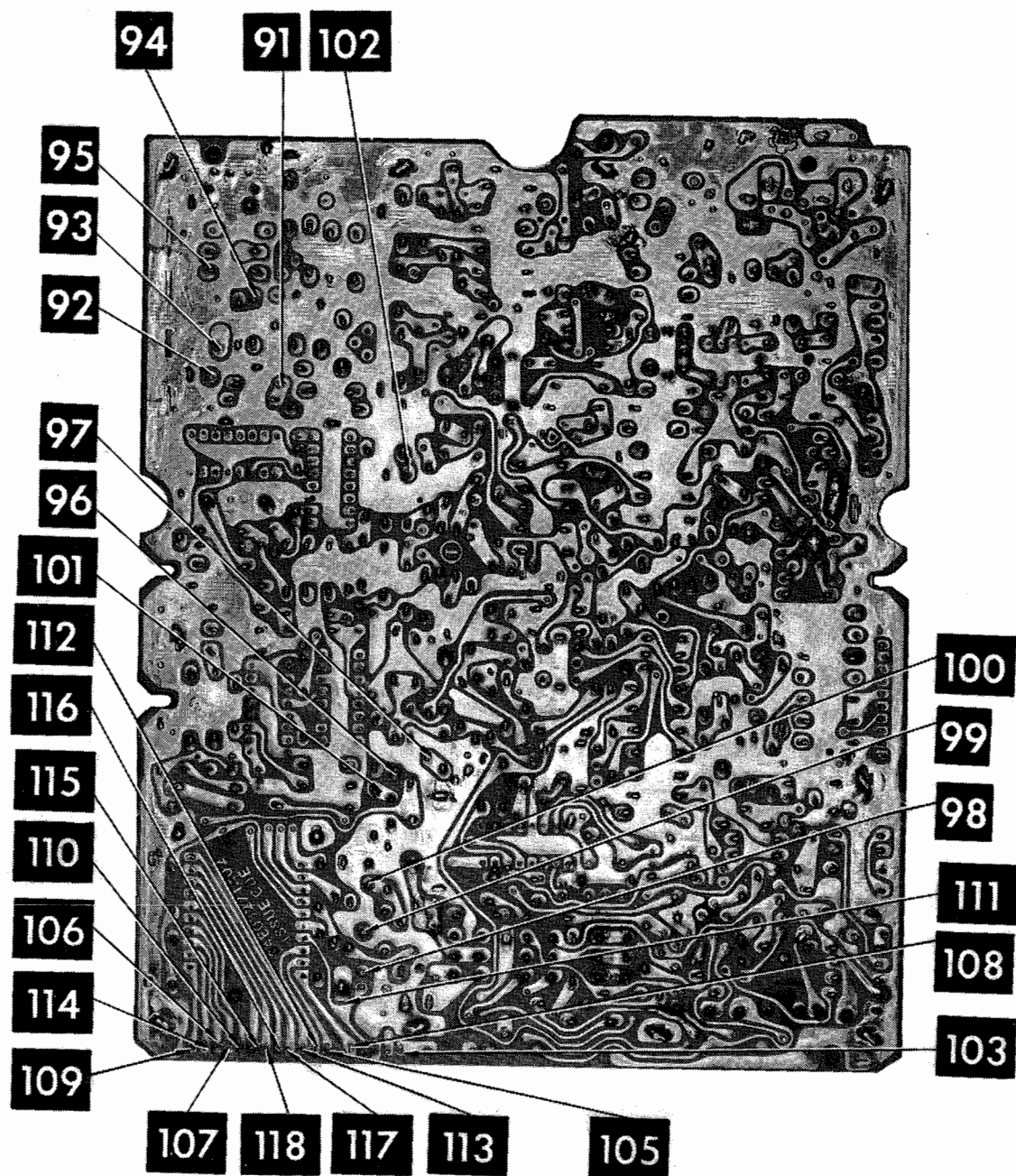


MAIN BOARD

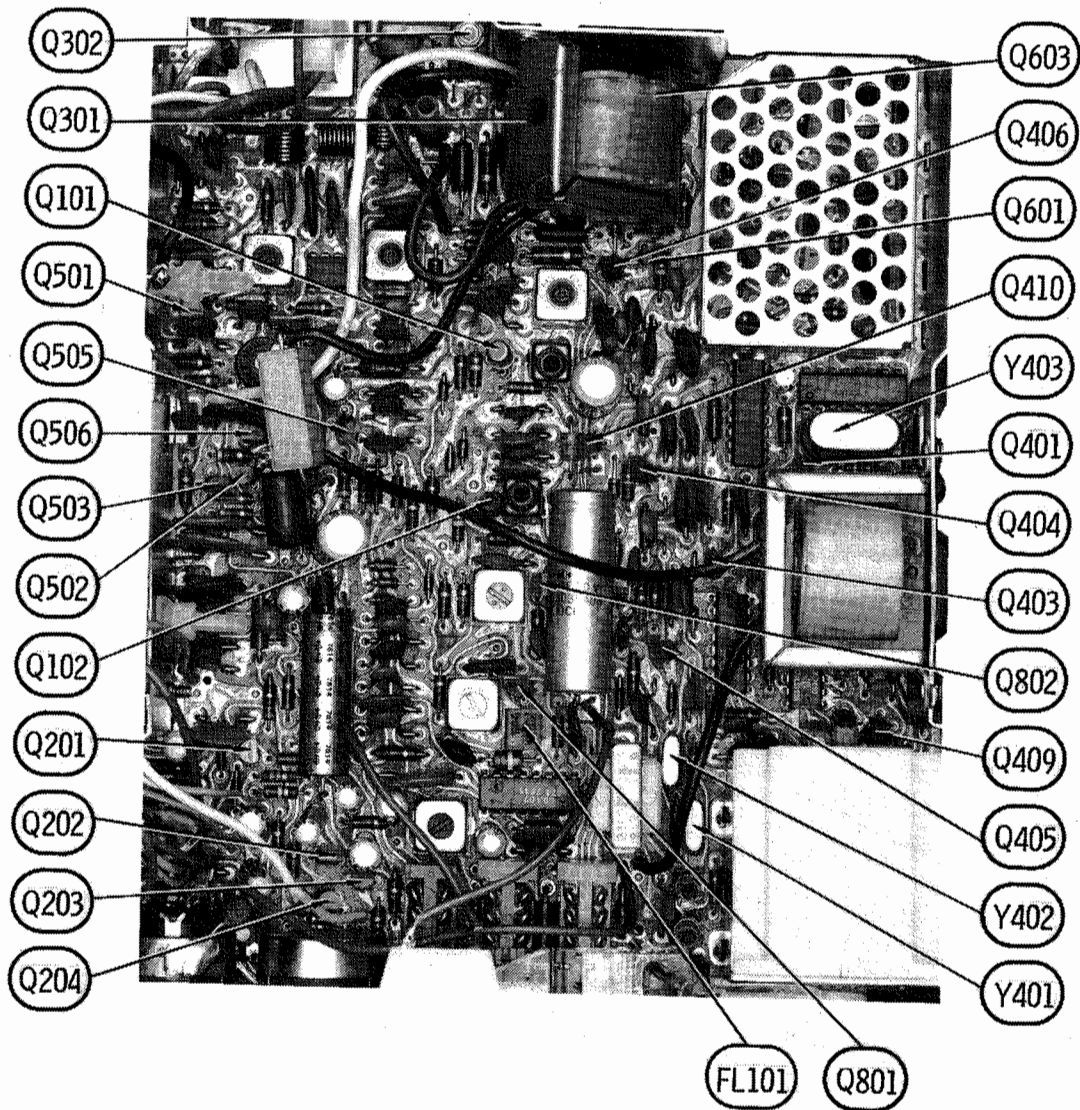


MOTOROLA MODELS T4000A/05A/10A/20A

MAIN BOARD

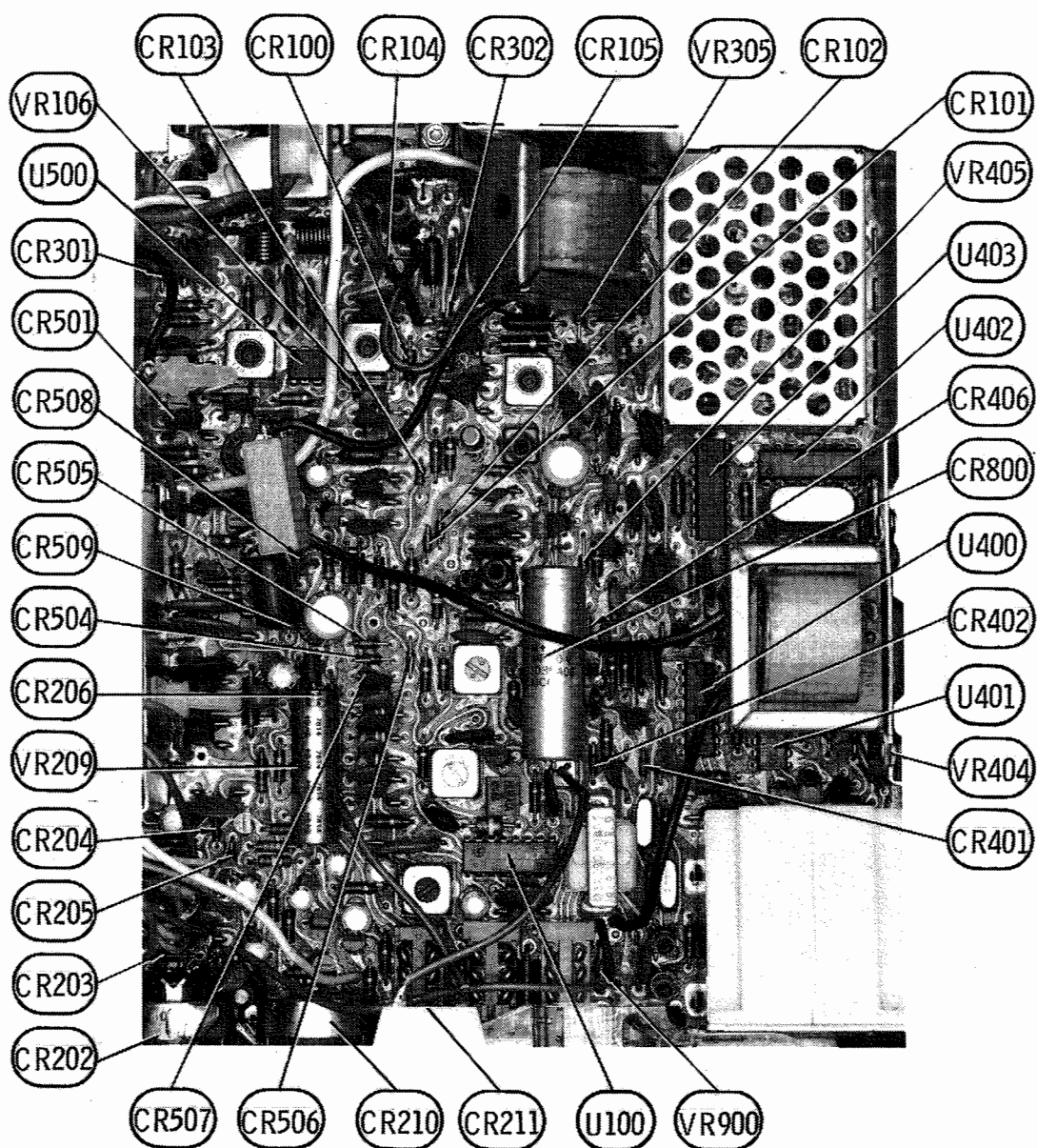


MAIN BOARD

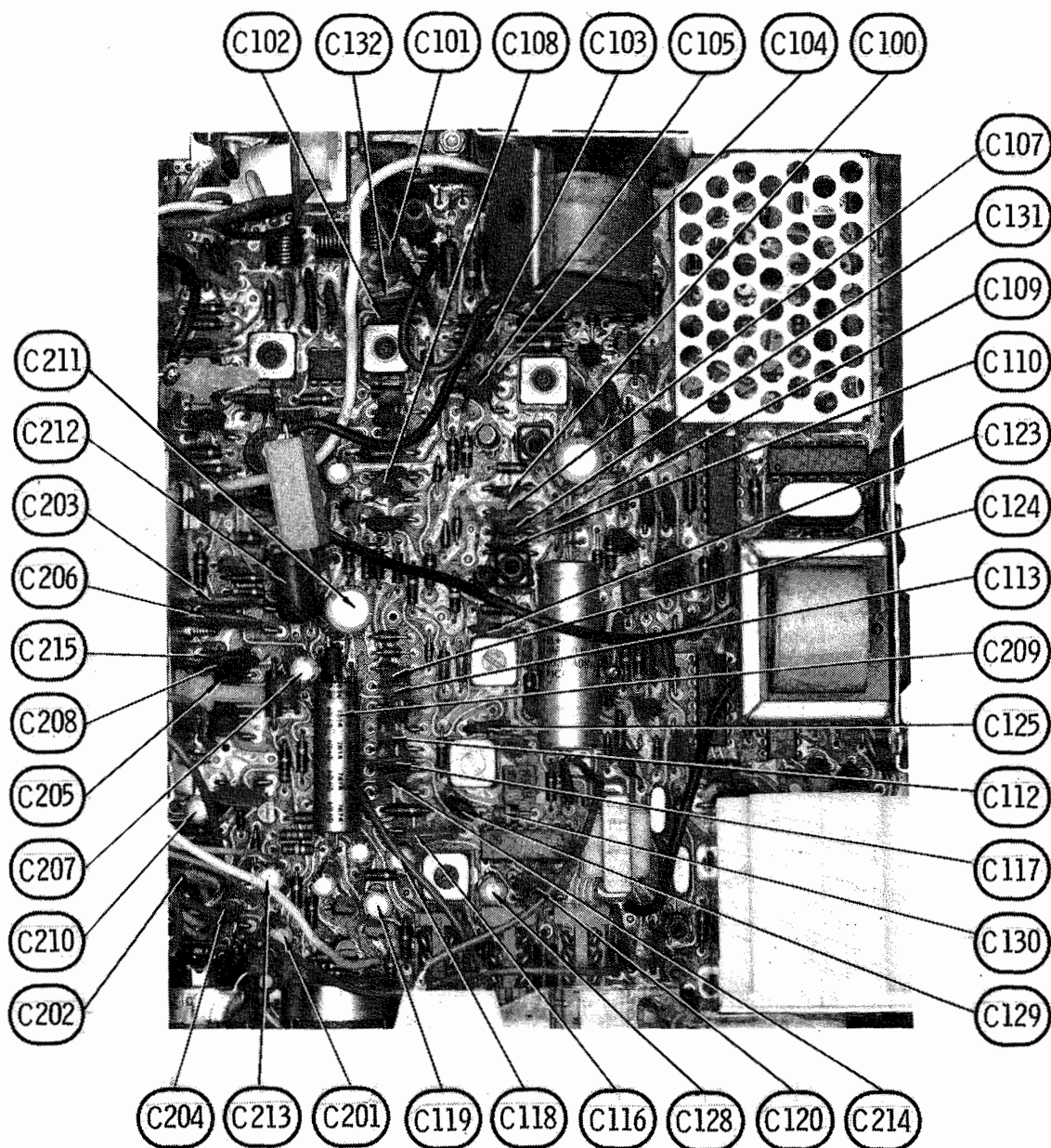


MOTOROLA MODELS 1400A/05A/10A/20A

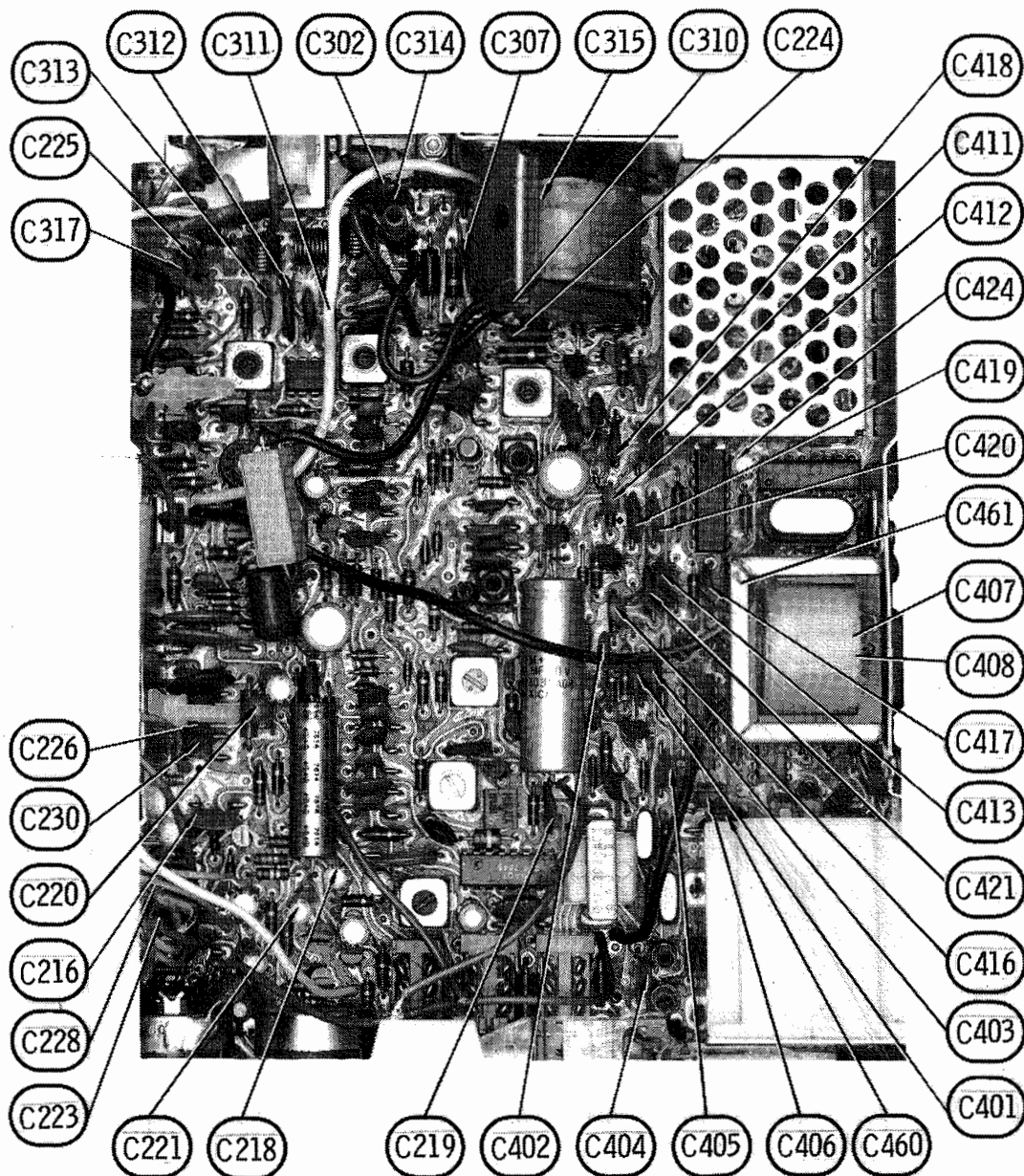
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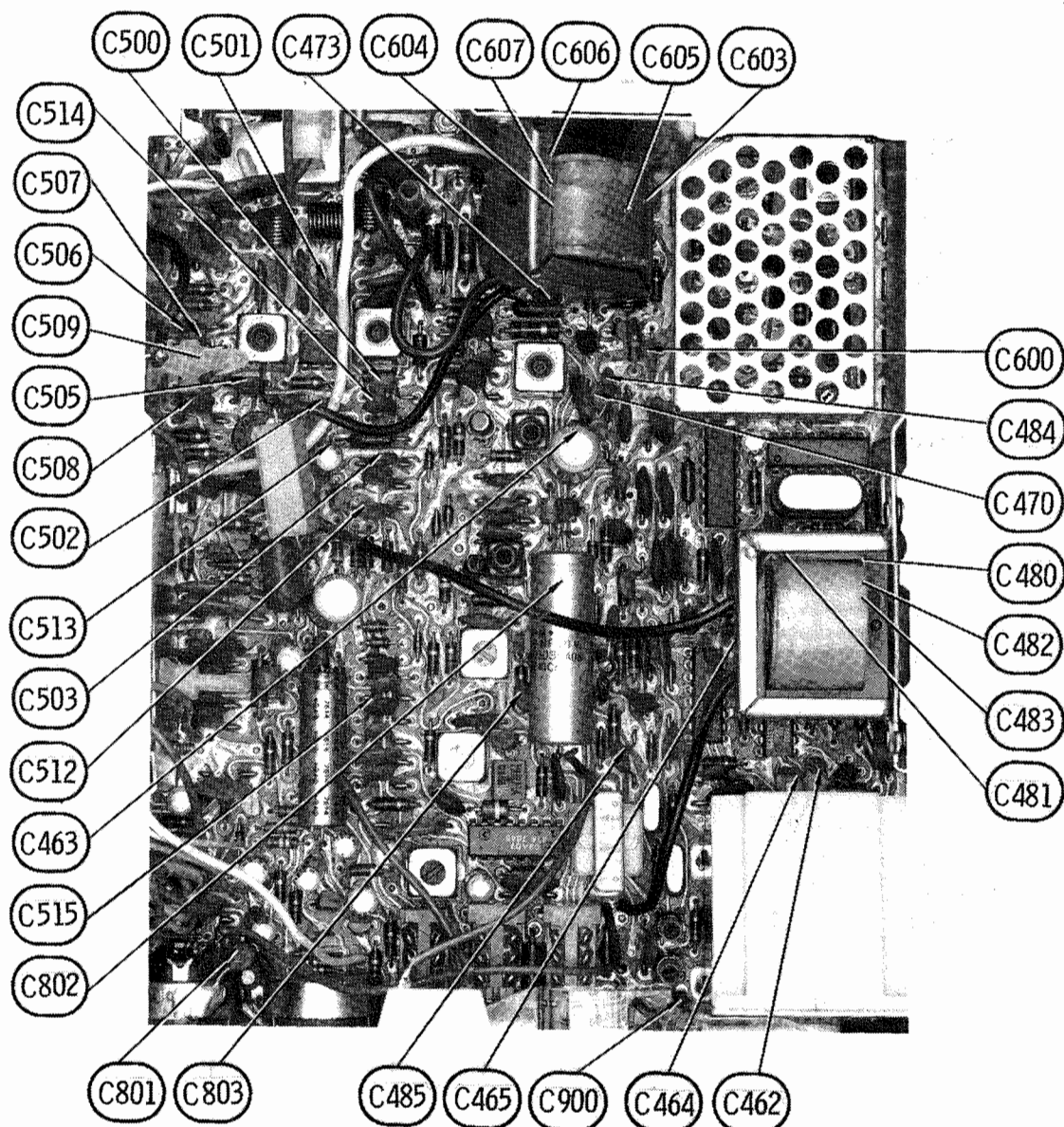
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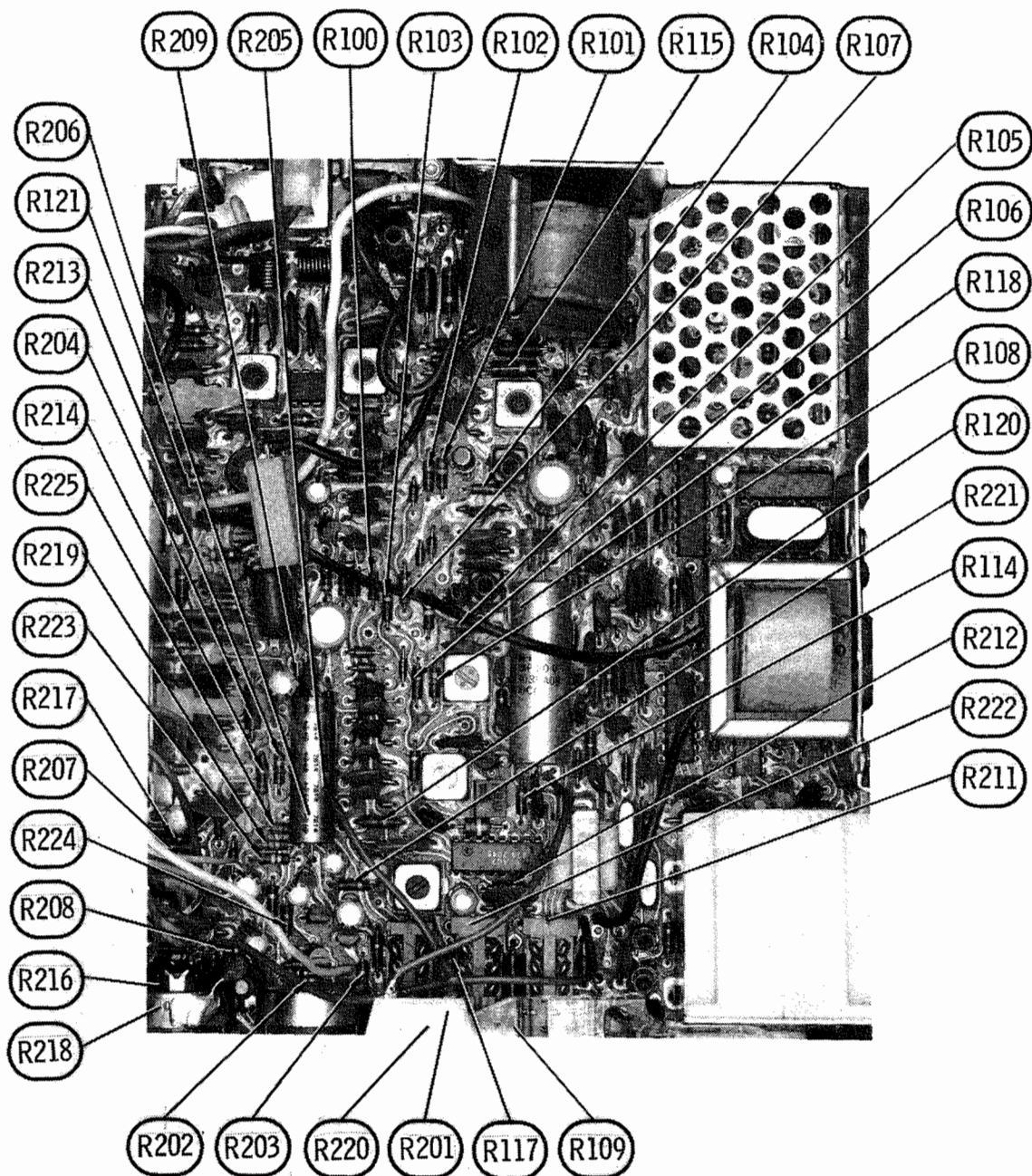
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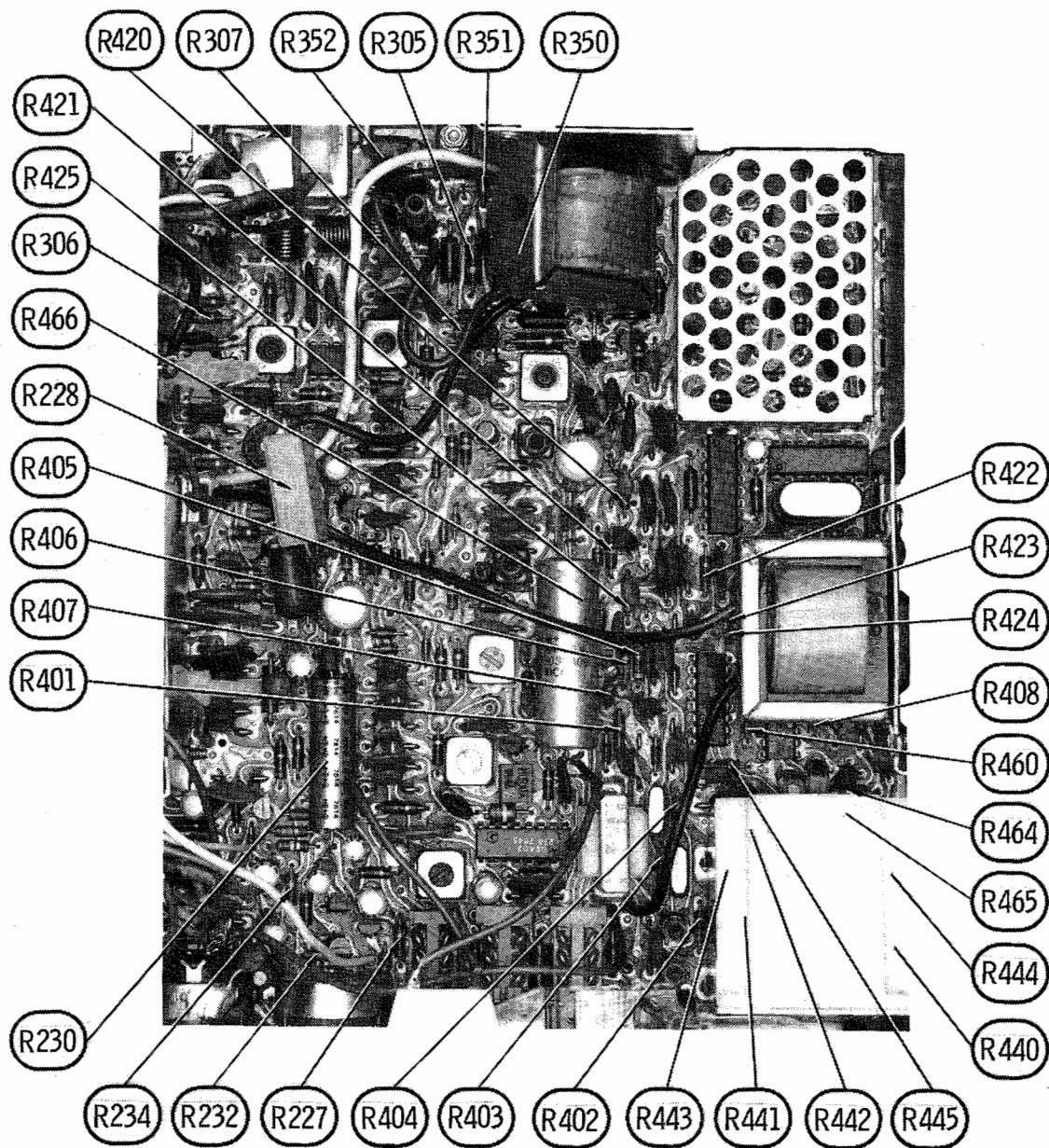
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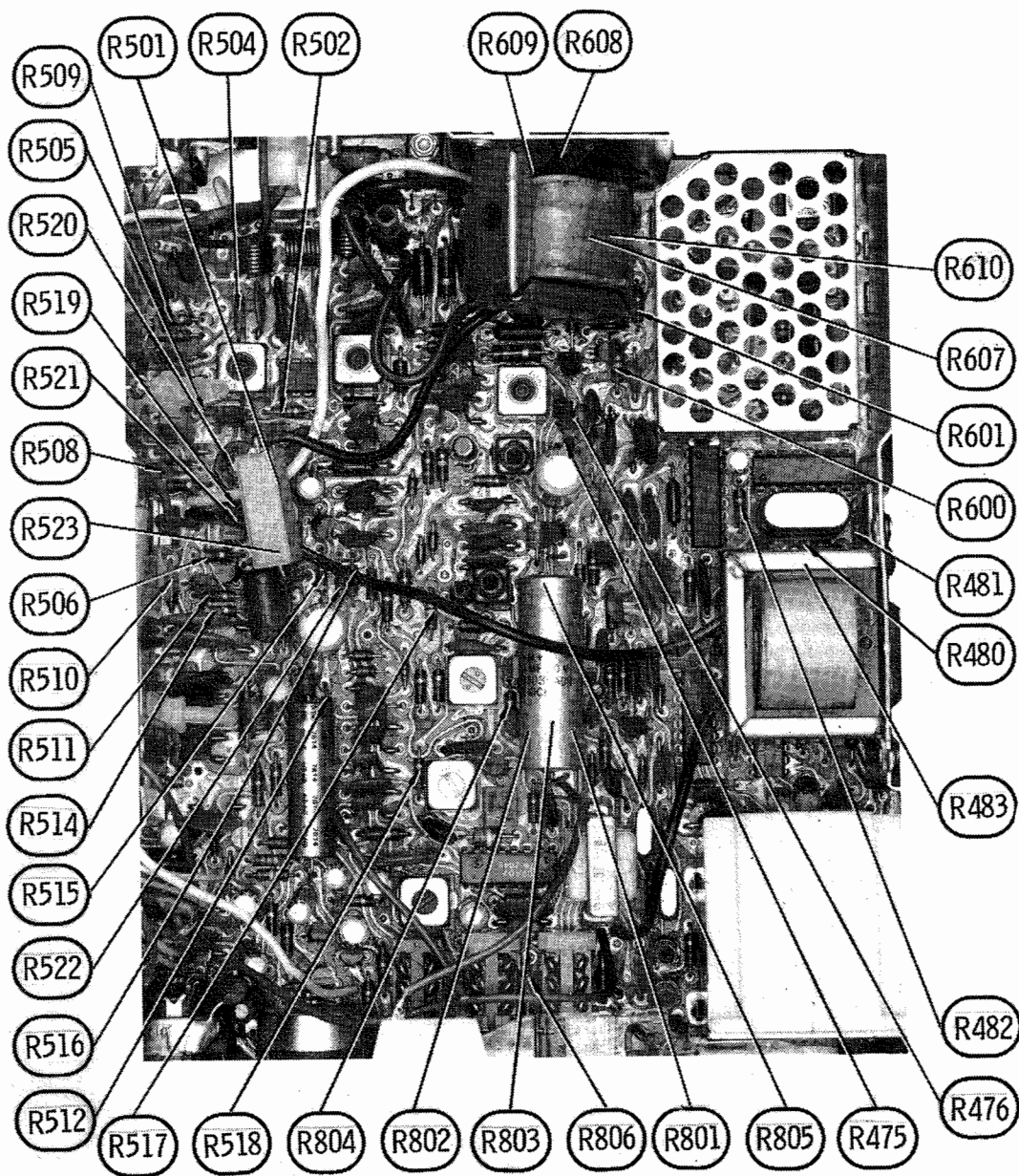
MAIN BOARD



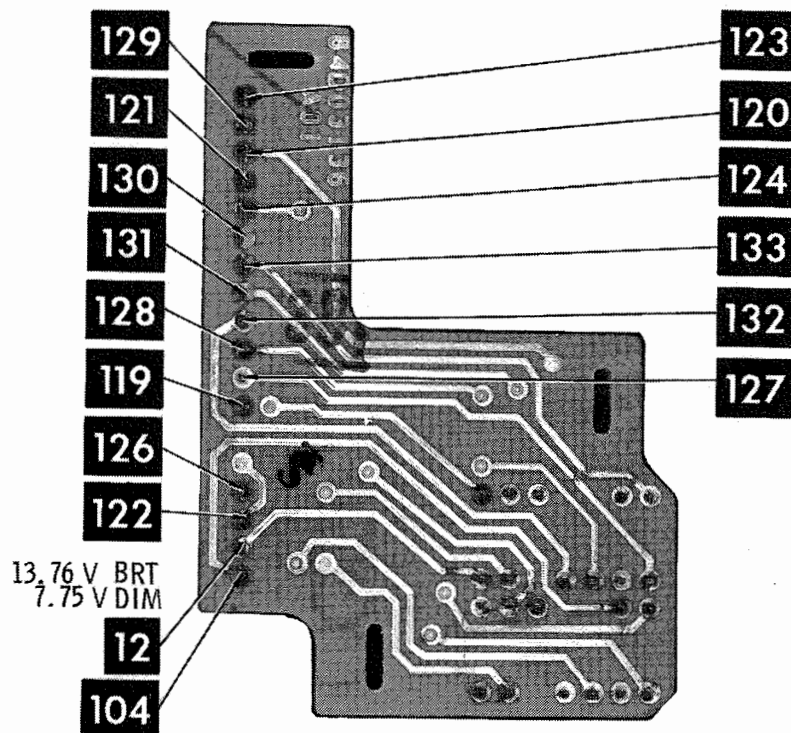
MAIN BOARD



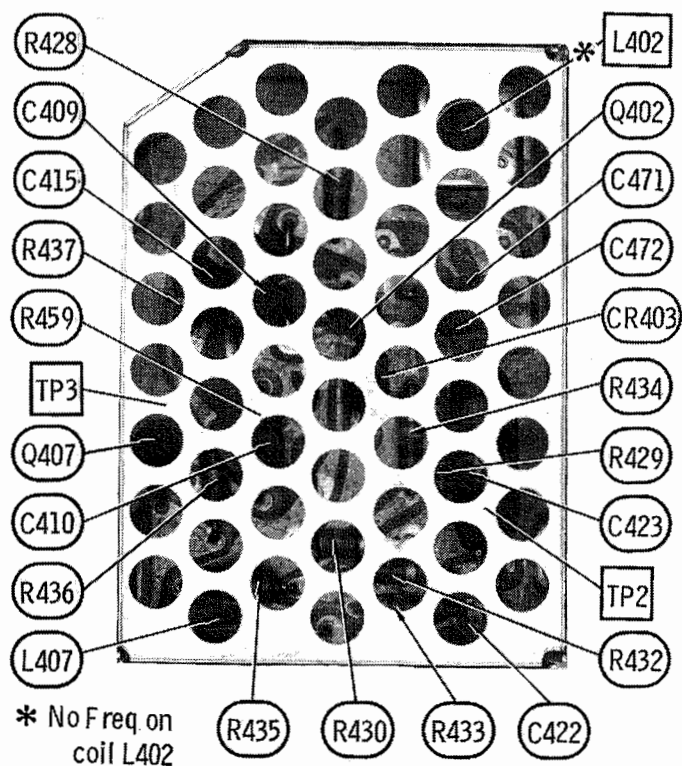
MAIN BOARD



MAIN BOARD

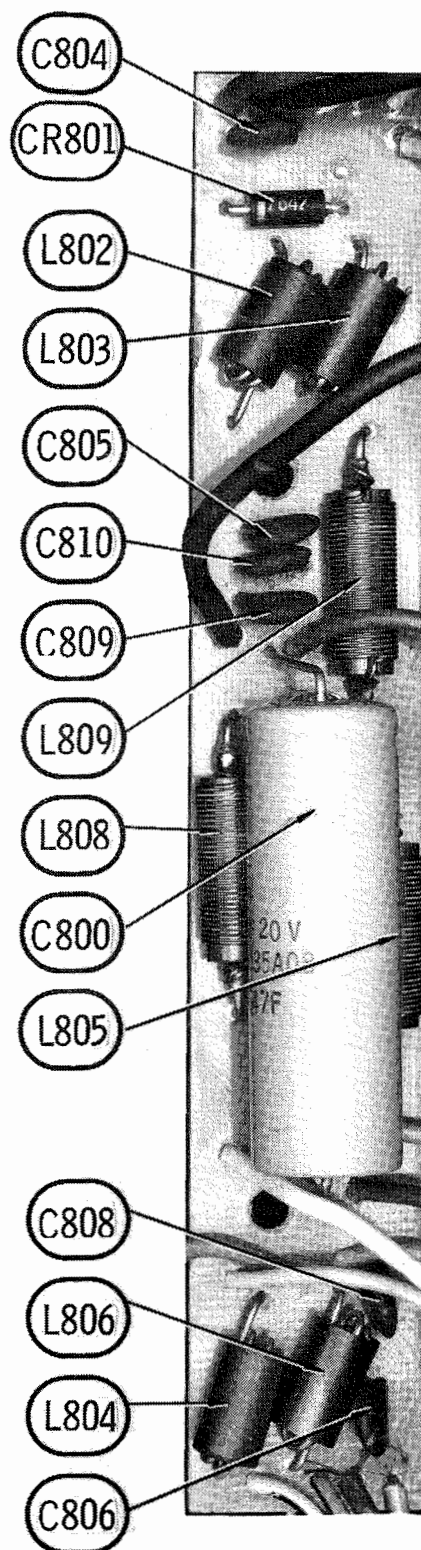
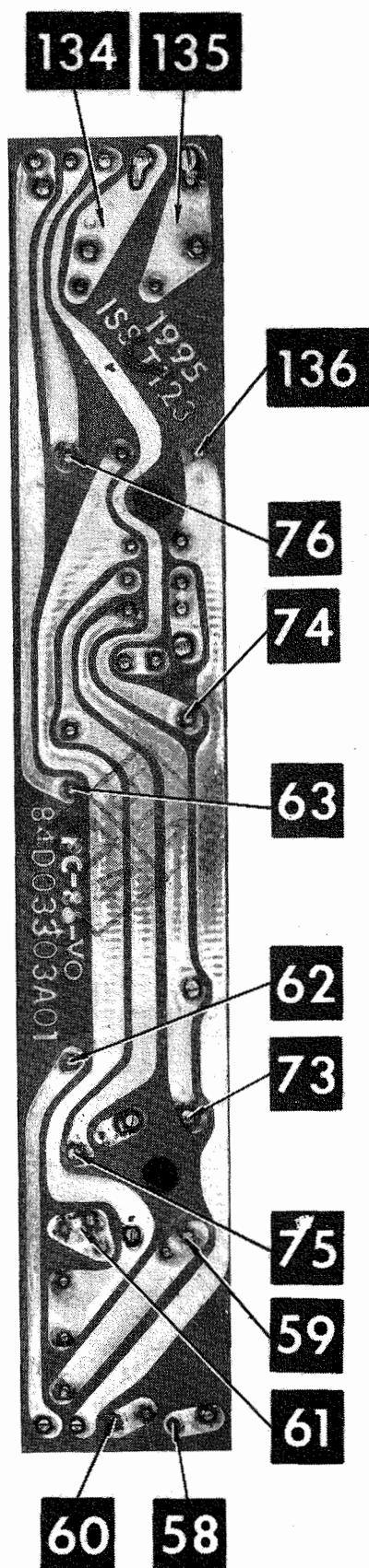


LED BOARD

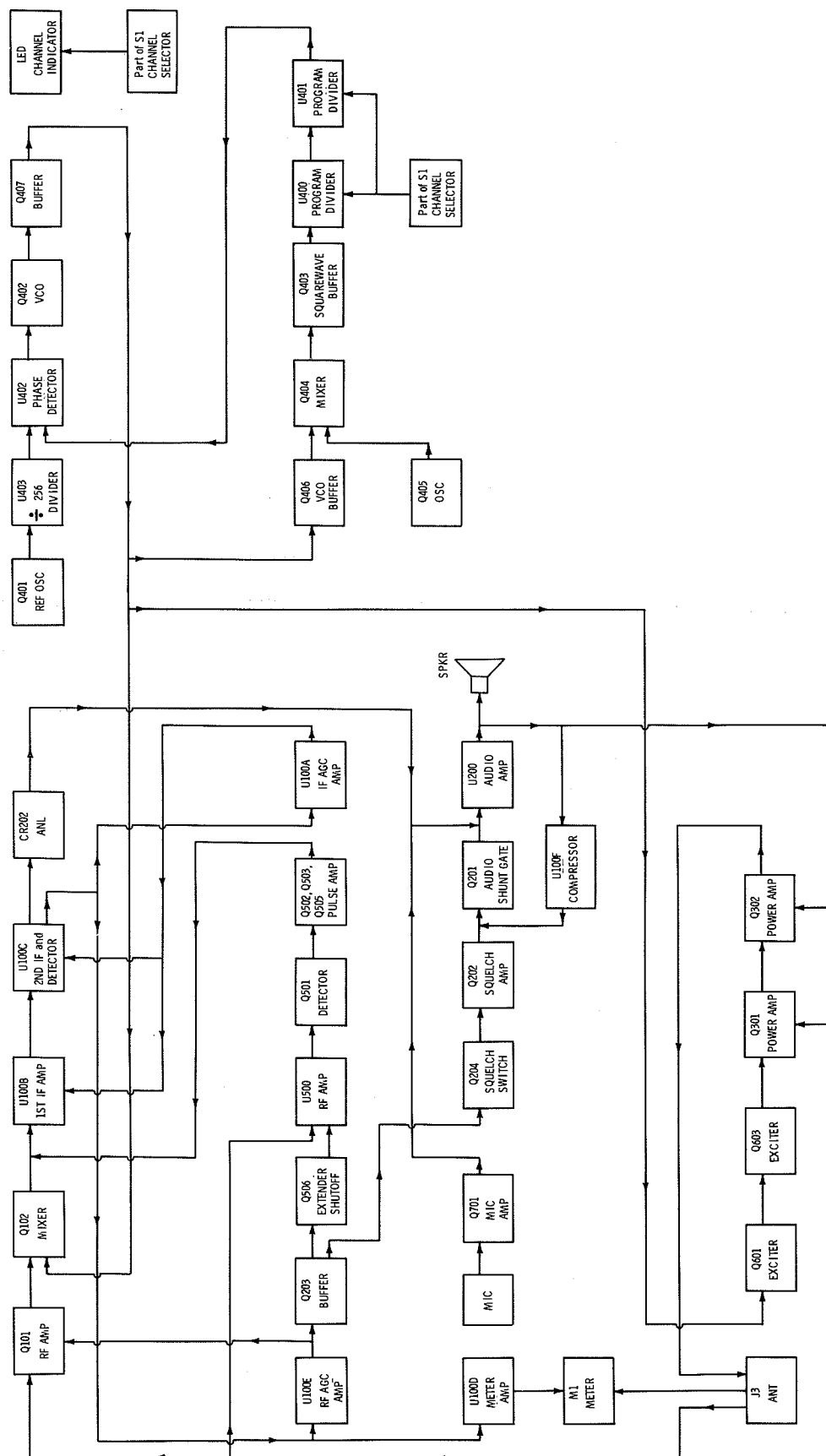


PART OF MAIN BOARD

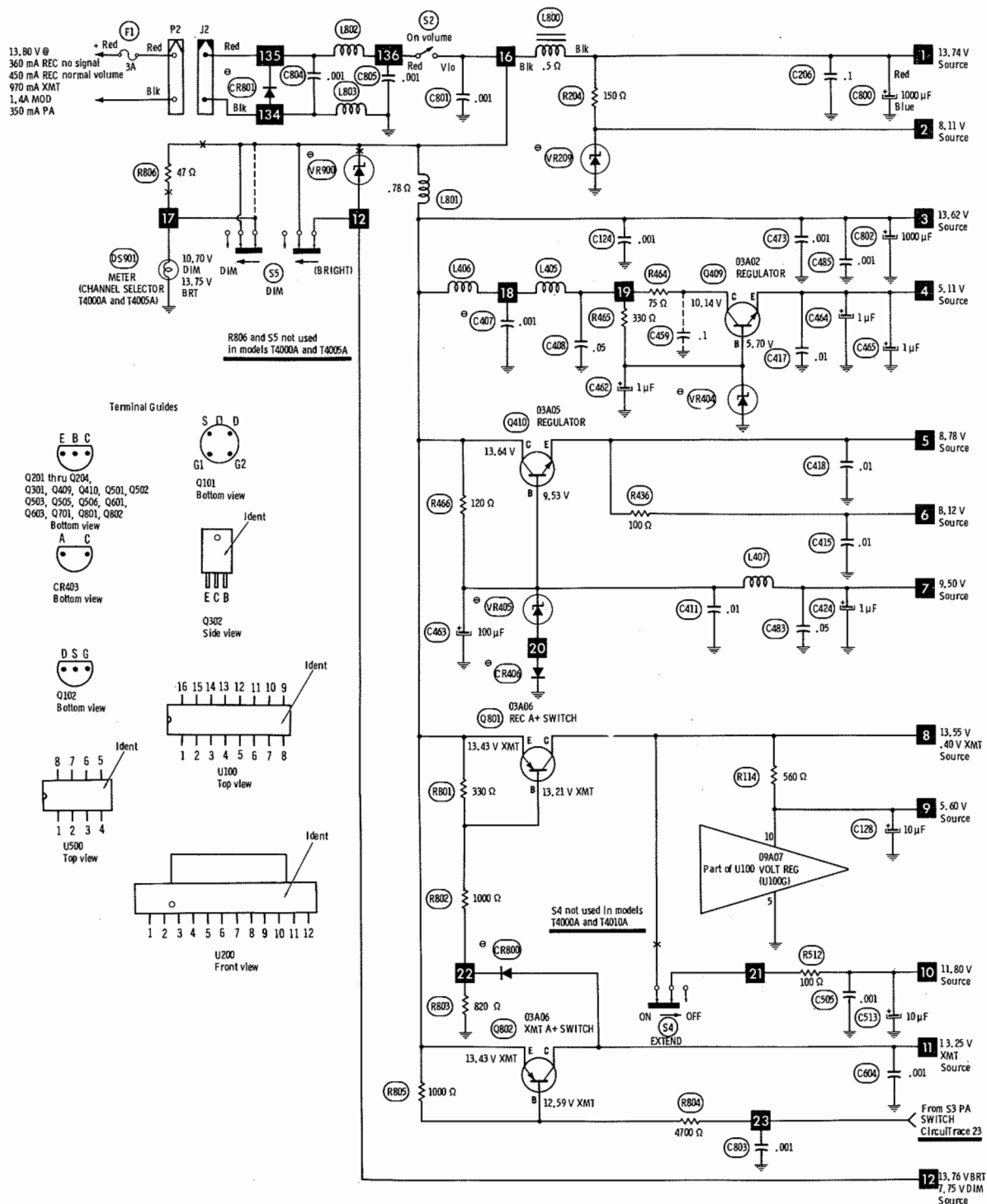
MOTOROLA MODELS 1400A/05A/10A/20A



POWER SUPPLY BOARD



BLOCK DIAGRAM



— Circuitry not used in some versions

--- Circuitry used in some versions

⊙ See parts list

⊛ Nominal value

⊕ Ground

⊞ Chassis

▽ Common tie point

A PHOTOFACT STANDARD NOTATION SCHEMATIC

WITH CIRCUITRACE®

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Measurements made in Channel 1 with
switching as shown unless noted.

Item numbers in rectangles appear in the
alignment/adjustment instructions.

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

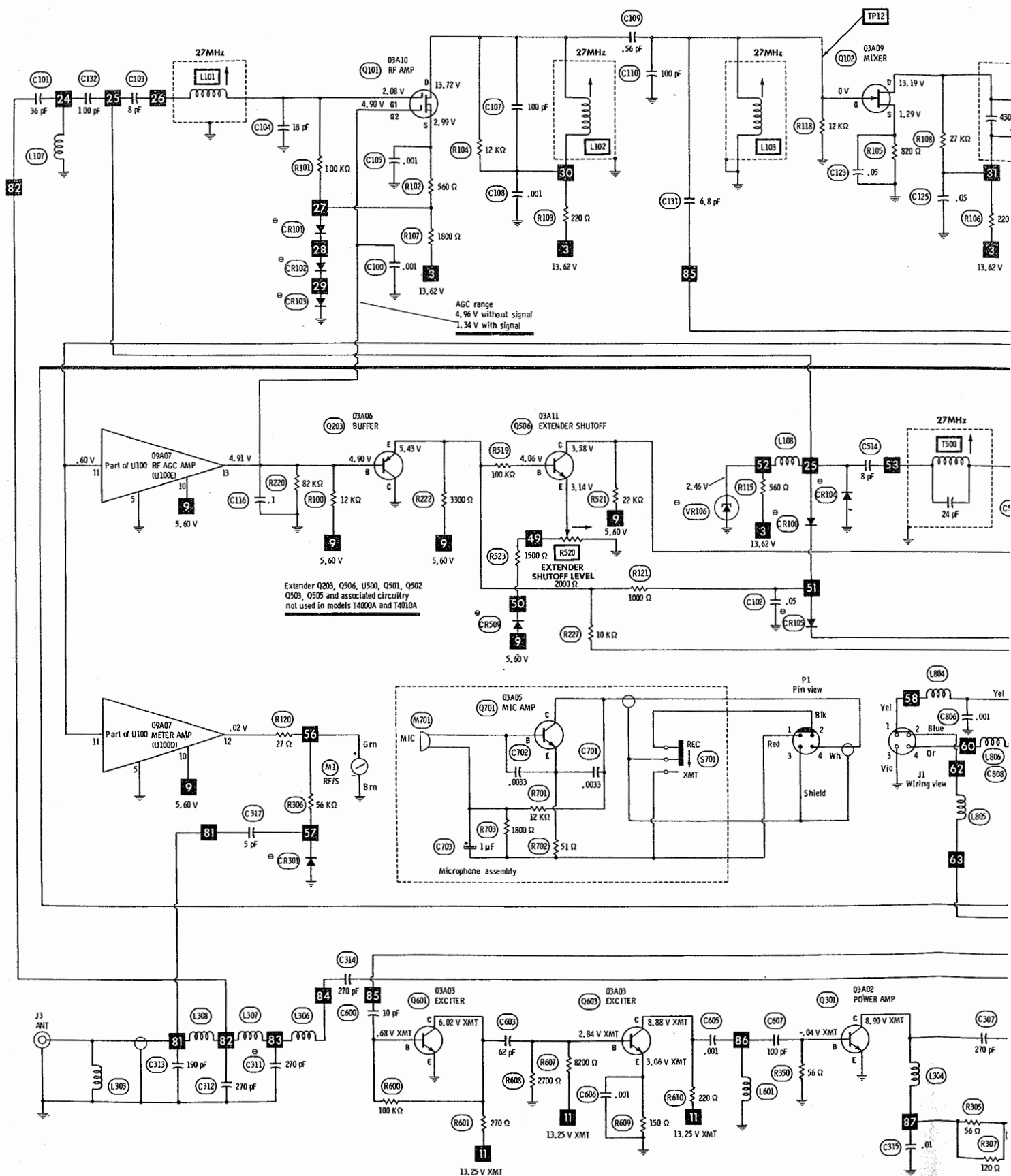
Controls adjusted for normal operation.

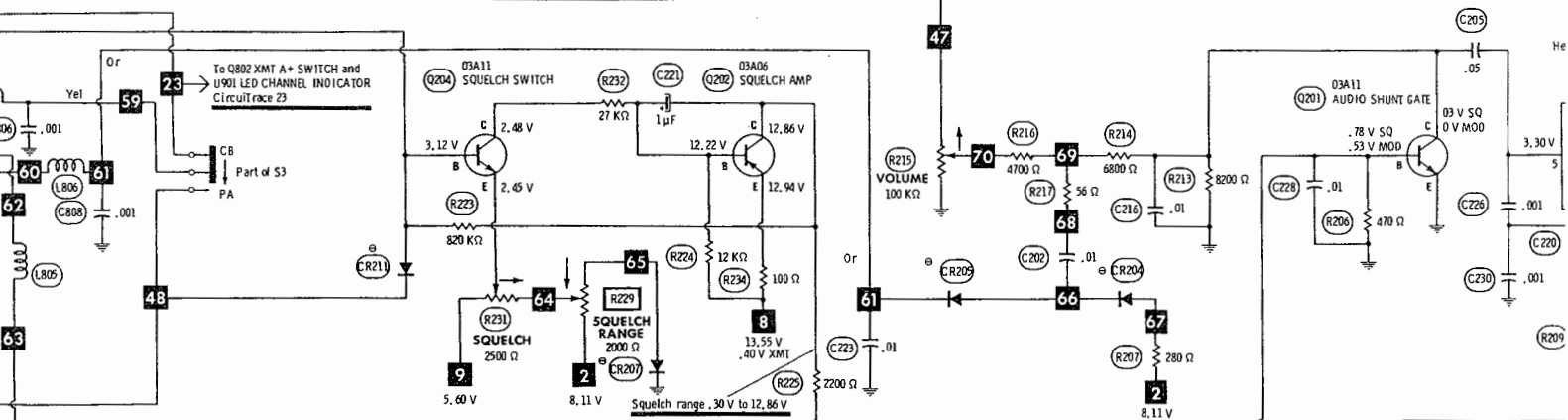
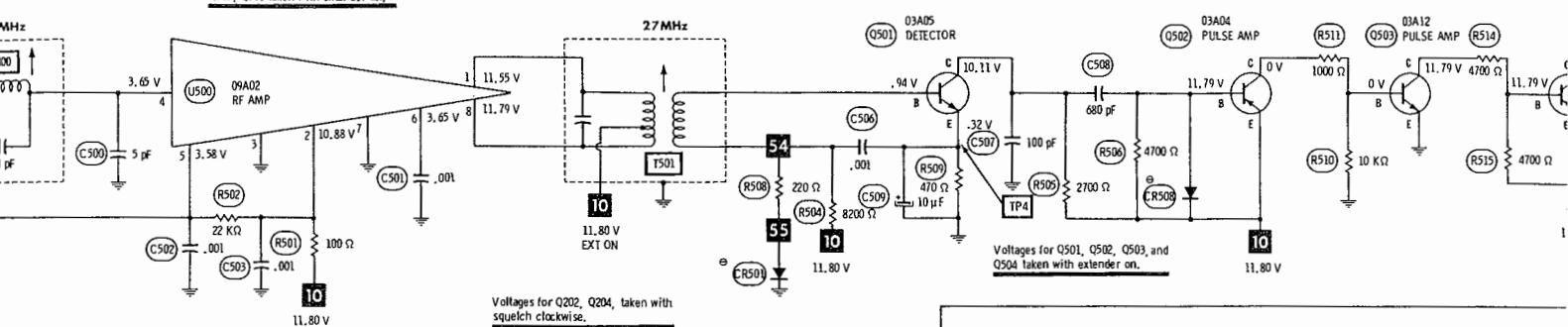
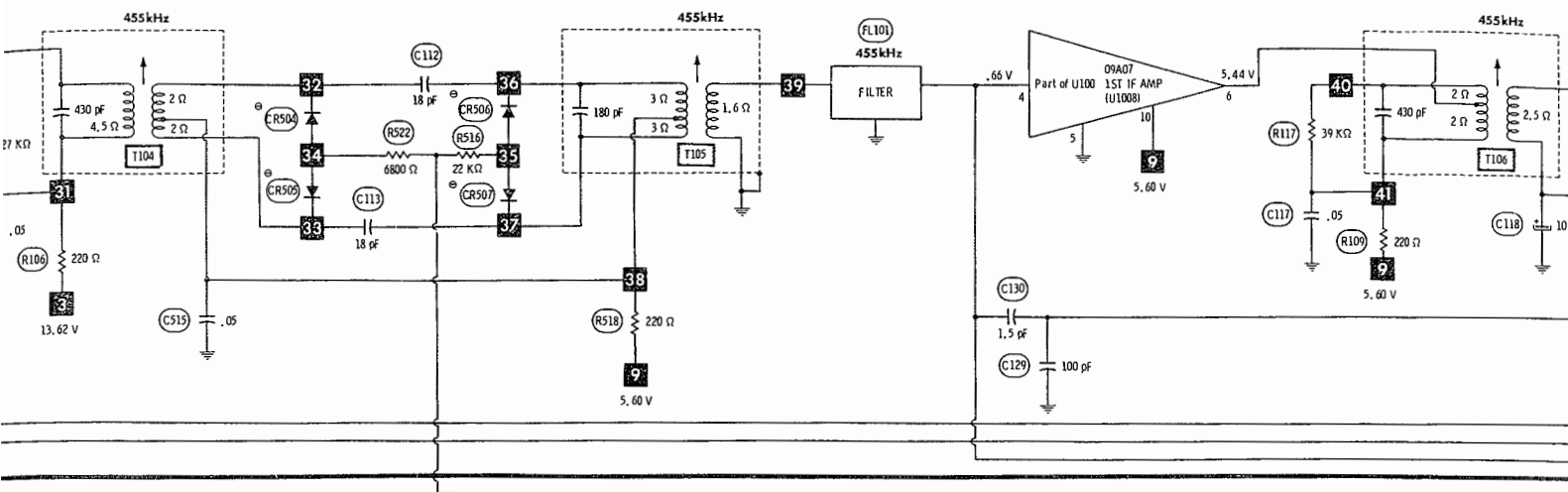
Arrow at control indicates direction of advance.

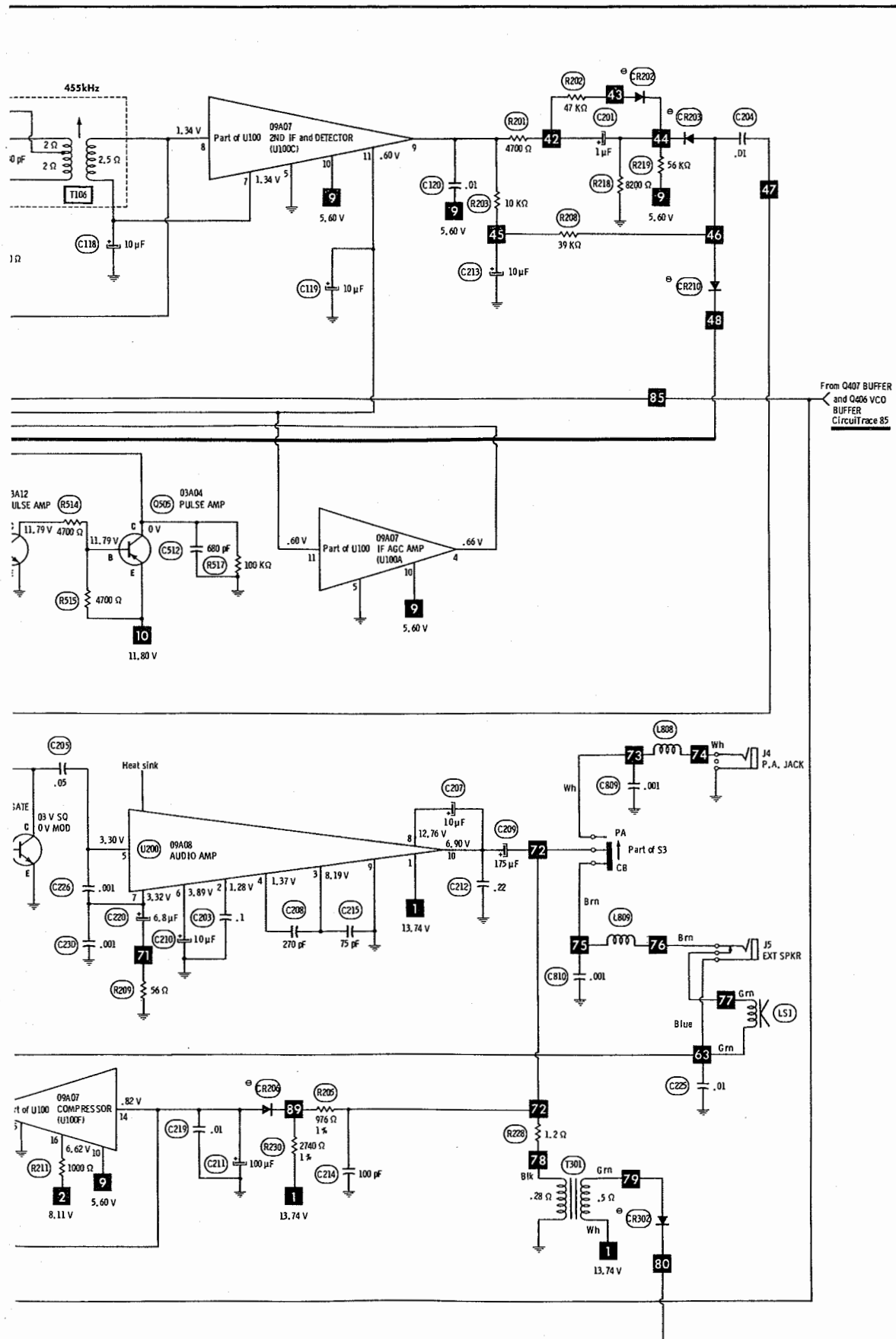
Terminal identification may not be found on unit.

Resistors are 1/2W or less, 5% unless noted.

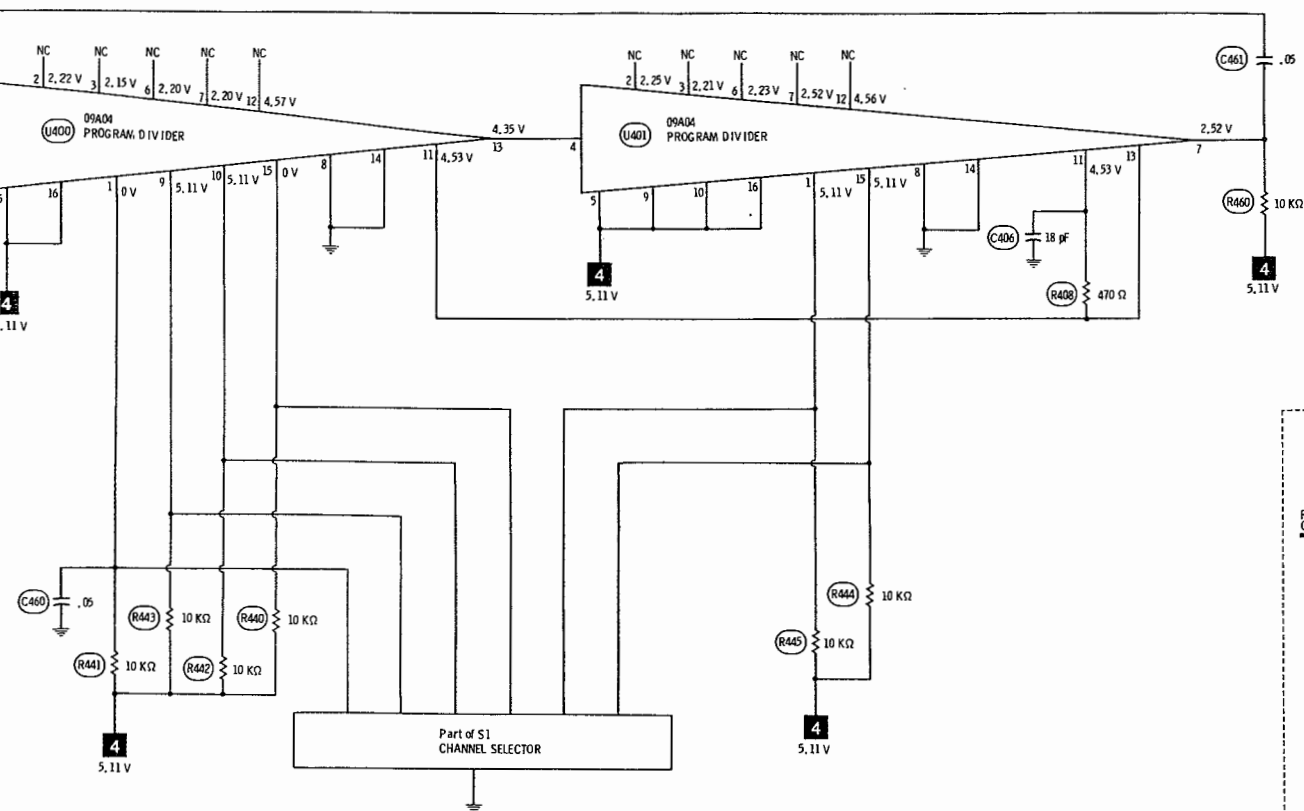
Value in () used in some versions.



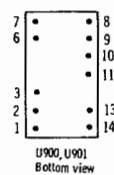
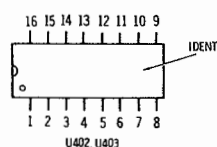
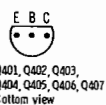
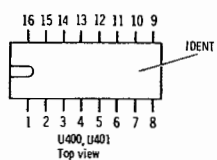
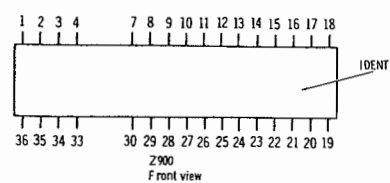




MOTOROLA MODELS T4000A/05A/10A/20A



Terminal Guides



PARTS LIST AND DESCRIPTION

(When ordering parts, state Model, Part Number, and Description.)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFG. PART No.	REPLACEMENT DATA									
			GENERAL ELECTRIC PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.	THORDARSON PART No.	WORKMAN PART No.	ZENITH PART No.
CR100		48-03005A07	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR101		48-03005A01	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR102		48-03005A01	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR103		48-03005A01	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR104		48-03005A06	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR105		48-03005A06	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR202		48-03005A03	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109	1N60	WEP134	ZEN-430
CR203		48-03005A03	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109	1N60	WEP134	ZEN-430
CR204		48-03005A01	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR205		48-03005A01	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR206		48-03005A01	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR207		48-03005A01	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR210		48-03005A01	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR212		48-03005A01	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR301		48-03005A06	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR302		48-03005A07	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR401		48-03005A07	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR402		48-03005A05	GE-90	PTC214	HEPR2503	RE 52	SK3100	RT-262	ECG614		WEP200	ZEN-453
CR403		48-03005A08	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR406		48-03005A06	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR501		48-03005A06 (15)	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR502		48-03005A01 (15)	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR503		48-03005A01 (15)	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR504		48-03005A06	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR505		48-03005A06 (15)	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR507		48-03005A06 (15)	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR508		48-03005A03 (15)	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109	1N60	WEP134	ZEN-430
CR509		48-03005A03	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR800		48-03005A06	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR801		48-03005A07	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
CR803		48-03005A06	GE-300	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177		WEP1062	
Q101		48-03003A10	GE-FET-2	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312		WEP920	ZEN-123
Q102		48-03003A09	GE-FET-4	PTC182	HEPF2004	RE 199	SK3050	RT-181	ECG222		WEP905	121-826
Q201	03A11	48-03003A11	GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	121-29000
Q202	03A06	48-03003A06	GE-48	PTC103*	25A733	RE 219	SK3138	RT-303	ECG294	25A733	WEP916	
Q203	03A06	48-03003A06	GE-48	PTC103*	25A733	RE 219	SK3138	RT-303	ECG294	25A733	WEP916	
Q204	03A11	48-03003A11	GE-210*	PTC178	HEPS0015*	RE 17*	SK3122	RT-302	ECG128*		WEP59*	121-722
Q301	03A02	48-03003A02	GE-210*	PTC121*	25C1364	RE 13*	SK3124	RT-308	ECG123A*	25C1364	WEP736*	121-29000
Q302	03A01	48-03003A01	GE-215	PTC186	25C1306	RE 203	SK3197	RT-146	ECG235	25C1306	WEP785	
Q401	03A12	48-03003A12	GE-11	PTC136	HEPS0025	RE 9	SK3018	RT-107	ECG107	25C535	WEP535	121-925
Q402	03A12	48-03003A12	GE-11	PTC136	HEPS0025	RE 9	SK3018	RT-107	ECG107	25C535	WEP535	121-925
Q403	03A12	48-03003A12	GE-11	PTC136	HEPS0025	RE 9	SK3018	RT-107	ECG107	25C535	WEP535	121-925
Q404	03A03	48-03003A03	GE-211*	PTC132	25C710	RE 13*	SK3018*	RT-308*	ECG123A*	25C710	WEP710	ZEN-114
Q405	03A12	48-03003A12	GE-11	PTC136	HEPS0025	RE 9	SK3018	RT-107	ECG107	25C535	WEP535	121-925
Q406	03A03	48-03003A03	GE-211*	PTC132	25C710	RE 13*	SK3018*	RT-308*	ECG123A*	25C710	WEP710	ZEN-114
Q407	03A12	48-03003A12	GE-11	PTC136	HEPS0025	RE 9	SK3018	RT-107	ECG107	25C535	WEP535	121-925
Q409	03A02	48-03003A02	GE-210*	PTC121*	25C1364	RE 13*	SK3124	RT-308	ECG123A*	25C1364	WEP736*	121-29000
Q410	03A05	48-03003A05	GE-20	PTC136	HEPS0016	RE 10	SK3020	RT-107	ECG108		WEP56	
Q501	03A05	48-03003A05 (15)	GE-20	PTC136	HEPS0016	RE 10	SK3020	RT-107	ECG108		WEP56	
Q502	03A04	48-03003A04 (15)	GE-269	PTC103*	HEPS0019*	RE 26*	SK3114	RT-305	ECG290		WEP911	121-879
Q503	03A12	48-03003A12 (15)	GE-11	PTC136	HEPS0025	RE 9	SK3018	RT-107	ECG107	25C535	WEP535	121-925
Q505	03A04	48-03003A04 (15)	GE-269	PTC103*	HEPS0019*	RE 26*	SK3114	RT-305	ECG290		WEP911	121-879
Q506	03A11	48-03003A11 (15)	GE-212	PTC121*	25C945	RE 192	SK3124	RT-107A	ECG199	25C945	WEP1945	121-29000
Q601	03A03	48-03003A03	GE-211*	PTC132	25C710	RE 13*	SK3018*	RT-308*	ECG123A*	25C710	WEP710	ZEN-114
Q603	03A03	48-03003A03	GE-211*	PTC132	25C710	RE 13*	SK3018*	RT-308*	ECG123A*	25C710	WEP710	ZEN-114
Q701	03A05	48-03003A05 (1)	GE-20	PTC136	HEPS0016	RE 10	SK3020	RT-107	ECG108		WEP56	
Q801	03A06	48-03003A06	GE-48	PTC103*	25A733	RE 219	SK3138	RT-303	ECG294	25A733	WEP916	
Q802	03A06	48-03003A06	GE-48	PTC103*	25A733	RE 219	SK3138	RT-303	ECG294	25A733	WEP916	
U100	09A07	51-03009A07							ECG787			
U200	HA1342A								ECG1239			
U400	09A08	51-03009A08							ECG1239			
U401	SN74LS193N	51-03009A04							ECG74LS194			
U402	09A04	51-03009A04							ECG74LS194			
U403	09A03	51-03009A03							ECG74LS194			
U500	09A05	51-03009A05							ECG40208			
VR106	09A02	51-03009A02 (15)							ECG746			
VR209		48-03073A10	GEZD-3.3			RE 100	SK3330		ECG5066A		WEP1150	
VR305		48-03073A06	GEZD-8.2	ZB8.28		RE 112		RT-257	ECG5072A	1N4738A	WEP1108	
VR404		48-03073A08	GEZD-12	ZB128		RE 118	SK3062	RT-243	ECG142A	1N4742A	WEP1112	
VR405		48-03073A02	GEZD-5.6	ZB5.68		RE 107		RT-236	ECG136A	1N4734A	WEP1104	
VR900		48-03073A09	GEZD-9.1	ZB9.18		RE 114		RT-240	ECG139A	1N4739A	WEP1109	103-372
		48-03073A05 (14)				RE 120			ECG144A		WEP1159	ZEN-507

MOTOROLA MODELS T4000A/05A/10A/20A

* Lead configuration may vary from original.

(1) Part of microphone.

(14) T4010A and TR4020A.

(15) T4005A and T4020A.

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C118	10 25V	23-03035A02	PC10-25	VTT10825	QV1-43	EV-1322
C119	10 25V	23-03035A02	PC10-25	VTT10825	QV1-43	EV-1322
C128	10 25V	23-03035A02	PC10-25	VTT10825	QV1-43	EV-1322
C201	1 25V	23-03035A01	PC1-50	VTT1A50	QV1-9	EV-1315
C207	10 25V	23-03035A02	PC10-25	VTT10825	QV1-43	EV-1322
C209	175 15V	23-03035A05			QE1-468	TVA-1160.4
C210	10 25V	23-03035A02	PC10-25	VTT10825	QV1-43	EV-1322
C211	100 25V	23-03035A04	PC100-25	VTT100625	QV1-97	EV-1330
C213	10 25V	23-03035A02	PC10-25	VTT10825	QV1-43	EV-1322
C218	2.2 25V	23-03035A12	PC2-100	VTT2R2A50	QV1-19	EV-1517
C220	6.8 15V	23-03034A04		TDC68M025FL	QDT1-55	SD25-6R89
C221	1 25V	23-03035A01	PC1-50	VTT1A50	QV1-9	EV-1315
C224	1 50V	23-03034A03	PC1-50	VTT1A50	QV1-9	EV-1315
C422	15 15V	23-03034A01		TDC156M020FL	QDT1-73	SD20-159
C424	1 25V	23-03035A01	PC1-50	VTT1A50	QV1-9	EV-1315
C462	1 25V	23-03035A01	PC1-50	VTT1A50	QV1-9	EV-1315
C463	100 25V	23-03035A04	PC100-25	VTT100625	QV1-97	EV-1330
C464	1 25V	23-03035A01	PC1-50	VTT1A50	QV1-9	EV-1315
C465	1 25V	23-03035A01	PC1-50	VTT1A50	QV1-9	EV-1315
C509	10 25V	23-03035A02	PC10-25	VTT10825	QV1-43	EV-1322
C513	10 25V	23-03035A02	PC10-25	VTT10825	QV1-43	EV-1322
C703	1 50V	(1)	PC1-50	VTT1A50	QV1-9	EV-1315
C800	1000 20V	23-03035A08	WBR1000-25	TC2510A	QE1-593	TVA-1211
C802	1000 20V	23-03035A08	WBR1000-25	TC2510A	QE1-593	TVA-1211

(1) Part of microphone.

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C100	.001 100V		DD-102		GP210		10TS-D10
C101	36 N220 100V 5%	21-03030A38					
C102	.05 25V		UK50-503		MAG5015		
C103	8 N220 100V +.5	21-03030A34			*		10TCR-V82
C104	18 N220 100V 5%	21-03030A33			*		10TCR-Q18
C105	.001 100V		DD-102		GP210		10TS-D10
C107	100 NPO 100V 5%		DTZ-100	NP0100	CN0310		10TCC-T10
C108	.001 100V		DD-102		GP210		10TS-D10
C109	.56 500V	21-03045A02					
C110	100 NPO 100V 5%		DTZ-100	NP0100	CN0310		10TCC-T10
C112	18 NPO 100V 5%				CN0418		10TCC-Q18
C113	18 NPO 100V 5%				CN0418		10TCC-Q18
C116	.1 25V		UK25-104		MAG2501		HY-750
C117	.05 16V		UK50-503		MAG5015		
C120	.01 16V		UK16-103		MAG1611		HY-420
C123	.05 16V		UK50-503		MAG5015		
C124	.001 100V		DD-102		GP210		10TS-D10
C125	.05 16V		UK50-503		MAG5015		
C129	100 5%		DTZ-100	NP0100	CN0310		10TCC-T10
C130	1.5 +.5		DTZ-1R5	NP01P5	CN0515		10TCC-V15
C131	6.8 NPO 100V 5%		DTZ-6R8	NP06P8	CN0568		10TCC-V68
C132	100 NPO 100V 5%		DTZ-100	NP0100	CN0310		10TCC-T10
C202	.01 16V 10%			WMF1S1	EWF1A110	QF1-91	1PB-S10
C203	.1 25V		UK25-104		MAG2501		HY-750
C204	.1 25V		UK25-104		MAG2501		
C205	.05 16V		UK50-503		MAG5015		HY-750
C206	.1 25V		UK25-104		MAG2501		HY-750
C208	270 N750 100V 5%				CN7327		10TCU-T27
C212	.22 25V 10%			WMF05P22	EWFO5022		431P2249R5
C214	100 N750 100V 5%		DTN-100	N100	CN7310		10TCU-T10
C215	75 N750 10%		DTN-75				10TCU-Q75
C216	.01 16V 10%			WMF1S1	EWF1A110	QF1-91	1PB-S10
C219	.01 16V		UK16-103		MAG1611		HY-420
C223	.01 16V		UK16-103		MAG1611		HY-420
C225	.01 16V		UK16-103		MAG1611		HY-420
C226	.001 100V		DD-102		GP210		10TS-D10
C228	.01 16V		UK16-103		MAG1611		HY-420
C230	.001 100V		DD-102		GP210		10TS-D10
C302	120 N470 100V 5%	21-03030A20			*		10TCT-T12
C307	270 N750 100V 5%				CN7327		10TCU-T27
C310	.001 100V		DD-102		GP210		10TS-D10
C311	270 N750 100V 5%				CN7327		10TCU-T27
	300 100V 5%	21-03030A30(2)					
C312	270 N750 100V 5%				CN7327		10TCU-T27
C313	190 N750 100V 5%	21-03030A22					
C314	270 N750 100 5%				CN7327		10TCU-T27
C315	.01 100V		DC-103	MGP01	TA110	QC2-141	TG-S10
C317	5 NPO 100V +.25				CN0-547		
C401	51 N220 100V 5%	21-03030A11					
C402	.001 100V		DD-102		GP210		10TS-D10
C403	120 N220 100V 5%	21-03030A20			*		10TCR-T12
C404	36 N220 100V 5%	21-03030A38					
C405	36 N220 100V 5%	21-03030A38					
C406	18 NPO 100V 5%				CN0418		10TCC-Q18
C407	.001 100V		DD-102		GP210		10TS-D10
C408	.05 25V		UK50-503		MAG5015		
C409	75 N220 100V 5%	21-03030A42			*		10TCR-Q75
C410	57 N220 100V 5%	21-03030A41					
C411	.01 100V		DC-103	MGP01	TA110	QC2-141	TG-S10

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C412	5 NPO 100V $\pm$.25	21-03030A14	DC-103	MGP01	CNO-547	QC2-141	10TCR-Q82
C413	82 N220 100V 5%				*		TG-S10
C415	.001 100V				TA110		
C416	5 NPO 100V $\pm$.25				CNO-547		
C417	.01 100V				TA110		TG-S10
C418	.01 100V	21-03030A16	OC-103	MGP01	TA110	QC2-141	TG-S10
C419	.05 16V				MAG5015		
C420	100 N220 100V 5%				*		10TCR-T10
C421	.05 25V				MAG5015		
C423	.056 100V 10%				EWFA1A156	QF1-185	1PB-S56
C460	.05 25V	21-03030A40	UK50-503	WNF1S56	MAG5015		
C461	.05 25V				MAG5015		
C470	5 NPO 100V $\pm$.25				CNO-547		
C471	15 N750 100V 5%				CN7415		10TCU-Q15
C472	43 N750 100V 5%	21-03030A40	DTN-15	N15			
C473	.001 100V				GP210		10TS-D10
C480	39 NPO 100V 5%				CNO439		10TCC-Q39
C481	820 100V 10%				GP382		10TS-T82
C482	220 N750 100V 5%				CN7322		10TCU-T22
C483	.05 25V	21-03030A34	DD-102	GP820	MAG5015		
C484	.001 100V				GP210		10TS-D10
C485	.001 100V				GP210		10TS-D10
C500	5 NPO 100V $\pm$.25				CNO-547		
C501	.001 100V				GP210		10TS-D10
C502	.001 100V	21-03030A34	DD-102	N100	GP210		10TS-D10
C503	.001 100V				GP210		10TS-D10
C505	.001 100V				GP210		10TS-D10
C506	.001 100V				GP210		10TS-D10
C507	100 N750 100V 5%				CN7310		10TCU-T10
C508	680 100V 10%	21-03030A03	DD-681	GP680	GP368		10TS-T68
C512	680 100V 10%				GP368		10TS-T68
C514	8 N220 100V $\pm$.5				*		10TCR-V82
C515	.05 12V				MAG5015		
C600	10 N330 100V 5%				*		10TCS-Q10
C603	62 N220 100V 5%	21-03030A12	UK50-503				
C604	.001 100V				GP210		10TS-D10
C605	.001 100V				GP210		10TS-D10
C606	.001 100V				GP210		10TS-D10
C607	100 N750 100V 5%				CN7310		10TCU-T10
C701	.0333	(3)	DTN-100	N100			
C702	.0033						
C801	.001 100V				GP210		10TS-D10
C803	.001 100V				GP210		10TS-D10
C804	.001 100V				GP210		10TS-D10
C805	.001 100V	(3)	DD-102		GP210		10TS-D10
C806	.001 100V				GP210		10TS-D10
C808	.001 100V				GP210		10TS-D10
C809	.001 100V				GP210		10TS-D10
C810	.001 100V				GP210		10TS-D10
C900	.05 25V		UK50-503		MAG5015		

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

(1) Used in some versions.

(2) Used in Model T4005A, T4020A only.

(3) Part of microphone.

MOTOROLA MODELS T4000A/05A/10A/20A

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA				
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
R215	Volume/Switch	100K	18-03076A01 18R03076A01 (5)	F2-100K, SNK100 SNK100, AK38, KR1	NP-100K-Z, NML-A-300, TT-2, NWE-13	P15A, SL37, SN1000, US26	BU11, CF52, SS6A, GC
R229	Squelch Range	2000	18-03072A02				U260R252B
R231	Squelch	2500	18-03076A02 18R03076A02 (5)	F1-2500, SNF100, AK38	NP-2500-S, NML-A-300, TT-2		BU11, CF86, SS6A
R520	Extender Shut-off Level	2000	18-03072A02				U260R252B

(5) Number on unit.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFR. PART No.			WORKMAN PART No.	MFR. PART No.
R228	1.2 3W 5% WW		17-03186A01	Z900	Resistor Network		51-03009A09 (1)(2)

(1) Consist of fourteen 1000 ohms resistors.

(2) Used in Models T4010A, T4020A.

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L101	Rec Antenna (27MHz)	24-03051A01	51A01NN2007626		
L102	RF Amp (27MHz)	24-03102A01			
L103	RF Amp (27MHz)	24-03102A01			
L107	RF Choke	24-03102A02			
L108	RF Choke (18uH)	24-03047A01			
L303	RF Choke (.82uH)	24-03047A05			
L304	RF Choke	24-03044A04			
L305	Power Amp	24-03229A01 (2)			
L306	RF Choke	24-03044A02			
L307	RF Choke	24-03044A02			
L308	RF Choke	24-03044A02			
L309	RF Choke (18uH)	24-03047A01			
L401	RF Choke (18uH)	24-03047A01			
L402	Phase Det Output	24-03051A04			
L403	Osc (29.030MHz)	24-03070A01			
L404	Osc (29.030MHz)	24-03070A01			
L405	RF Choke (18uH)	24-03047A01			
L406	RF Choke				
L407	RF Choke				
L408	RF Choke				
L409	RF Choke (18uH)	24-03047A01			
L601	RF Choke	24-03044A03			
L801	RF Choke (2.5uH)	25-03080A01	50A01NN2007704 50A02NN2007649 50A03NN2007705HK 51A02NN2007652HK 51A03NN20077033		
L802	RF Choke (2.5uH)	25-03080A01			
L803	RF Choke (2.5uH)	25-03080A01			
L804	RF Choke	24-03304A01			
L805	RF Choke (9uH)	24-03298A01			
L806	RF Choke (10uH)	24-03304A01			
L808	RF Choke (9uH)	24-03298A01			
L809	RF Choke (9uH)	24-03298A01			
T104	IF (455kHz)	24-03050A01			
T105	IF (455kHz)	24-03050A02			
T106	IF (455kHz)	24-03050A03			
T500	RF Amp Input(27MHz)	24-03051A02 (1)			
T501	RF Amp Output (27MHz)	24-03051A03 (1)			

(1) Used in Models T4005A, T4020A only.

(2) Includes resistor.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
L800	1.4A	.5	3mH	25-03079R01			
L801	1.4A	.78	2.5mH	25-03080A01			

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T301	8	60.5	25-03043A01	TR818		

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
LS1	3 1/2" PM 4 Ohms	50-03016A01	3A05	

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F1	3A Quick-Acting	65-03101A02		AGC3	HDJ	312003	150145	FG3-2

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA						
	MFGR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black
M701	59-03002A01 (1)			18-010		4	3	1	2	NC	3

(1) Complete microphone assembly, Part Number TMH6119A.

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
DS901	Lamp	65-03069A01	Meter (10.70V Dim - 13.75V Bright)
FL101	Filter	91-03000A01	455kHz
J1	Jack	9-03059A01	Mic (4 Pin)
J2	Jack	39-03062A01	Power
J3	Jack	9-03103A01	Antenna
J4	Jack	9-03111A01	PA
J5	Jack	9-03111A01	External Speaker
M1	Meter	72-03114A01	S-RF
S1	Switch	40-03292A01	Channel Selector
S2	Switch		Part of Volume Control
S3	Switch	40-03095A01	CB-PA
S4	Switch	40-03095A01	Extend
S5	Switch	40-03095A01 (2)	Lamp (Bright-Dim)
S701	Switch	40-03067A01	MIC Slide (DPDT)
U901	LED	48-03056A01 (2)	
U902	LED	48-03056A01 (2)	
Y401	Crystal	48-03091A01	29.030MHz
Y402	Crystal	48-03091A02	29.485MHz
Y403	Crystal	48-03092A01	25.600MHz
	Printed Circuit Board	84-03136A01	LED

(1) Used in Models T4000A & T4005A only.

(2) Used in Models T4010A & T4020A only.

CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.	ITEM	PART No.
MODEL		MODEL	
Button		Housing (Bottom)	15-03012A02
Escutcheon (Lower)	T4000A	Housing (Top)	15-03011A01
Escutcheon (Lower)	T4005A	Grille (Speaker)	13-03013A01
Escutcheon (Lower)	T4010A	Knob (Channel Selector) T4000A & T4005A	36-03074A04
Escutcheon (Lower)	T4020A	Knob (Channel Selector) T4010A & T4020A	36-03090A01
Escutcheon (Upper)	T4000A & T4005A	Knob (Control) (2 used)	36-03054A01
Escutcheon (Upper)	T4010A & T4020A	Button, Push	38-03055A01

WIRING DATA

General-use Hook-up Wire (available in 5 colors)	BELDEN No. 8523	Coiled Microphone Cable	
Shielded Hook-up Wire (spiral wrapped)	BELDEN No. 8421	3-conductor (1 shielded)	23AWG BELDEN No. 9471 (5')
(braided)	BELDEN No. 8401		BELDEN No. 8497 (6')
Speaker Cable (available in 4 colors)	BELDEN No. 8782		BELDEN No. 9472 (7-1/2')
Bonding Strap	BELDEN No. 8672		28AWG BELDEN No. 9466 (6')
AC Power Cord	(6') BELDEN No. 17106		31AWG BELDEN No. 9468 (10')
	(9') BELDEN No. 17109	4-conductor (unshielded)	23AWG BELDEN No. 8415 (6')
		5-conductor (1 shielded)	28AWG BELDEN No. 9467 (6')
			BELDEN No. 9465 (7-1/2')

MOTOROLA MODELS T4000A/05A/10A/20A