



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

ONLY THOSE PERSONS PROPERLY LICENSED ARE PERMITTED TO MAKE REPAIRS OR ADJUSTMENTS WHICH MAY RESULT IN ILLEGAL OPERATION. (REFER TO FCC RULES AND REGULATIONS PART 95, SUBPARTS 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 623

ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools:

GC ELECTRONICS

ALL Tunable Coils and Transformers #9302

ALL Others 8290, 5000

NOTE:

It will be necessary to obtain a 4 pin, and a 6 pin extended board from the manufacturer to perform alignment on this unit.

Power Supply Adjustment

The following voltages should be taken with a DC VTVM:

Test Point (A.) 220VDC $\pm$ 20VDC

Test Point (B.) -48VDC $\pm$ 8VDC

Test Point (C.) -12VDC $\pm$.75VDC

Test Point (D.) +15VDC $\pm$ 1VDC

Test Point (E.) -28VDC $\pm$ 0VDC Adjust R518 to obtain this voltage.

PHASE LOCK LOOP CONTROL SET-UP.

Be sure to perform power supply adjustments first.

Set Channel Selector to Channel #1.

Set Volume Maximum Counterclockwise.

Set Mode Switch to AM.

Set Meter Switch to PWR.

Set Fine Tune Maximum Counterclockwise.

Set Squelch to maximum Counterclockwise.

Set Noise Blanker In.

Set CAL to Mid-range.

Set Mic Gain to Maximum Counterclockwise.

Set RF Gain to Maximum Clockwise.

Connect an RF Wattmeter or 50-Ohm, 25-Watt dummy load to Antenna Connector.

Adjustments made with 120-volt AC input to power supply.

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

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HY-GAIN MODEL 623

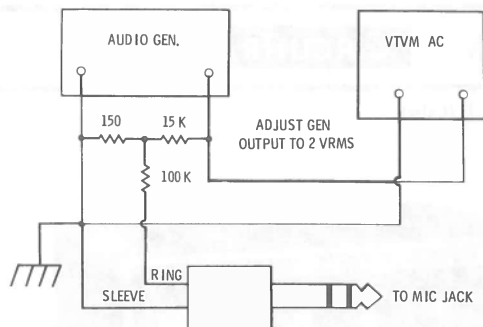


Fig. 1

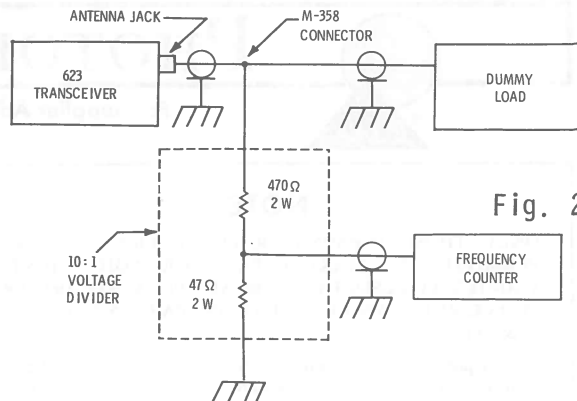


Fig. 2

PHASE LOCK LOOP ADJUSTMENTS

INDICATOR	CHANNEL	ADJUST	FREQUENCY	REMARKS
Frequency Counter	1	C301	1.000000 MHz	Remove programmable divider board from main board and replace with 4-pin extender board. Mount divider board on extender board. Do Not connect the 4-pin socket to top of board. Connect Counter to TP-F. Restore divider board to normal position.
DC VTVM	1	L603		Connect meter to TP-G. Adjust for 2.00VDC. Check voltage on each channel. Should be 2.00VDC on Ch. 1 and rise in small increments to 3.80VDC on Ch. 23.
Frequency Counter	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23		330.00kHz 340.00kHz 350.00kHz 370.00kHz 380.00kHz 390.00kHz 400.00kHz 420.00kHz 430.00kHz 440.00kHz 450.00kHz 470.00kHz 480.00kHz 490.00kHz 500.00kHz 520.00kHz 530.00kHz 540.00kHz 550.00kHz 570.00kHz 580.00kHz 590.00kHz 620.00kHz	Connect Counter thru isolation probe to TP-H. Check Phase Lock Loop for these frequencies.

RECEIVER

NOTE: Perform Power Supply and Phase Lock Loop adjustments first.
Use 6 pin Extender Board, on RF Board. Keep blue wire attached to pin on RF Board.
Control settings same as Phase Lock Loop-except-Fine Tune to mid-range.

SIGNAL GENERATOR	GEN FREQ	CHANNEL	ADJUST	REMARKS
High side thru a .01uF to Antenna Jack, low side to ground.	27.115MHz 1000Hz @ 30% Modulation	13	T101	Adjust Generator frequency for maximum "S" meter indication. Adjust generator output to obtain an "S" 5 reading on Panel Meter and adjust for maximum.
High side thru a .01uF to Antenna Jack, low side to ground.	27.005MHz 1000Hz @ 30% modulation	4	L101	Adjust Generator frequency for maximum "S" meter indication. Adjust generator output to obtain an "S" 5 reading on Panel Meter and adjust for maximum.
High side thru .a .01uF to Antenna Jack, low side to ground.	27.215MHz 1000Hz # 30% modulation	21	L102	Adjust Generator frequency for maximum "S" meter indication. Adjust generator output to obtain an "S" 5 reading on Panel Meter and adjust for maximum.

RECEIVER ADJUSTMENTS

All Control Settings are the same as for Phase Lock Loop.
 Except- Set Fine Tune to mid-range.
 The Adjustments below should be made in the sequence shown.

SIGNAL GENERATOR	GEN FREQ	CHANNEL	ADJUST	REMARKS
Audio Board Audio Bias DC VTVM (Early) IF Board AGC Meter Zero DC VTVM			R441	Connect meter to TP-J. Adjust for 8.2VDC.
			R233	Set R232 maximum clockwise. Connect meter + to TP-C. Connect meter - to TP-L. Adjust for -0.35VDC.
			R232	Adjust for Zero on Panel Meter.
(Late) IF Board Meter Zero DC VTVM			R257	Adjust for Zero on Panel Meter.
RF BOARD RF Gain Range High side thru .01uF to Antenna Jack, low side to ground.	27.115MHz 1000Hz @ 30% modulation, output 1uV.	13	R109	Adjust for "S" 3 reading on Panel Meter.

TRANSMITTER

NOTE: Power Supply and Phase Lock Loop adjustments first.
 All Control settings are the same as for Phase Lock Loop.
 Except - Set channel Selector to Ch. #18, Fine Tune to mid-range.

AM

INDICATOR	ADJUST	REMARKS
XMIT. AMP, DRIVER, FINAL Panel Meter	T504 T503 C524 C525	Key transmitter. Adjust for maximum.
DC VTVM	T504 T503	Connect meter to TP-M. Key transmitter. Retune for maximum voltage, this voltage should be between -32 & -45VDC.
PANEL METER	C524 C525	Key transmitter. Readjust for maximum.
RF VTVM (AC Probe)	R415	Connect meter across dummy load and antenna. Adjust for null.
FINE TUNE DC-VTVM	R515	Set Channel Selector to Ch. #1. Set Fine Tune Control maximum counterclockwise. Short out R512 and R514. Connect VTVM to center tap of Fine Tune Control and ground. Adjust R515 for 5.6VDC.
18MHz CRYSTAL OSCILLATOR Frequency Counter (Response to 30MHz) Wattmeter	L601	Connect test equipment as shown in Figure 2. Set Fine Tune Control fully clockwise. Turn fine tune Control 1 1/4 turns counterclockwise. Key transmitter. Adjust L601 for 26.965MHz. Set Fine Tune Control maximum counterclockwise. Key transmitter. Note frequency. Set Fine Tune Control maximum clockwise. Key transmitter. Note frequency. Calculate difference between the frequencies and divide by two. Subtract this figure from 26.965MHz. Set Fine Tune Control fully counterclockwise. Key transmitter. Adjust L601 for calculated frequency.

HY-GAIN MODEL 623

TRANSMITTER

All Control settings are the same as for AM except Channel Selector to Ch. #1 and Meter Switch to CAL.

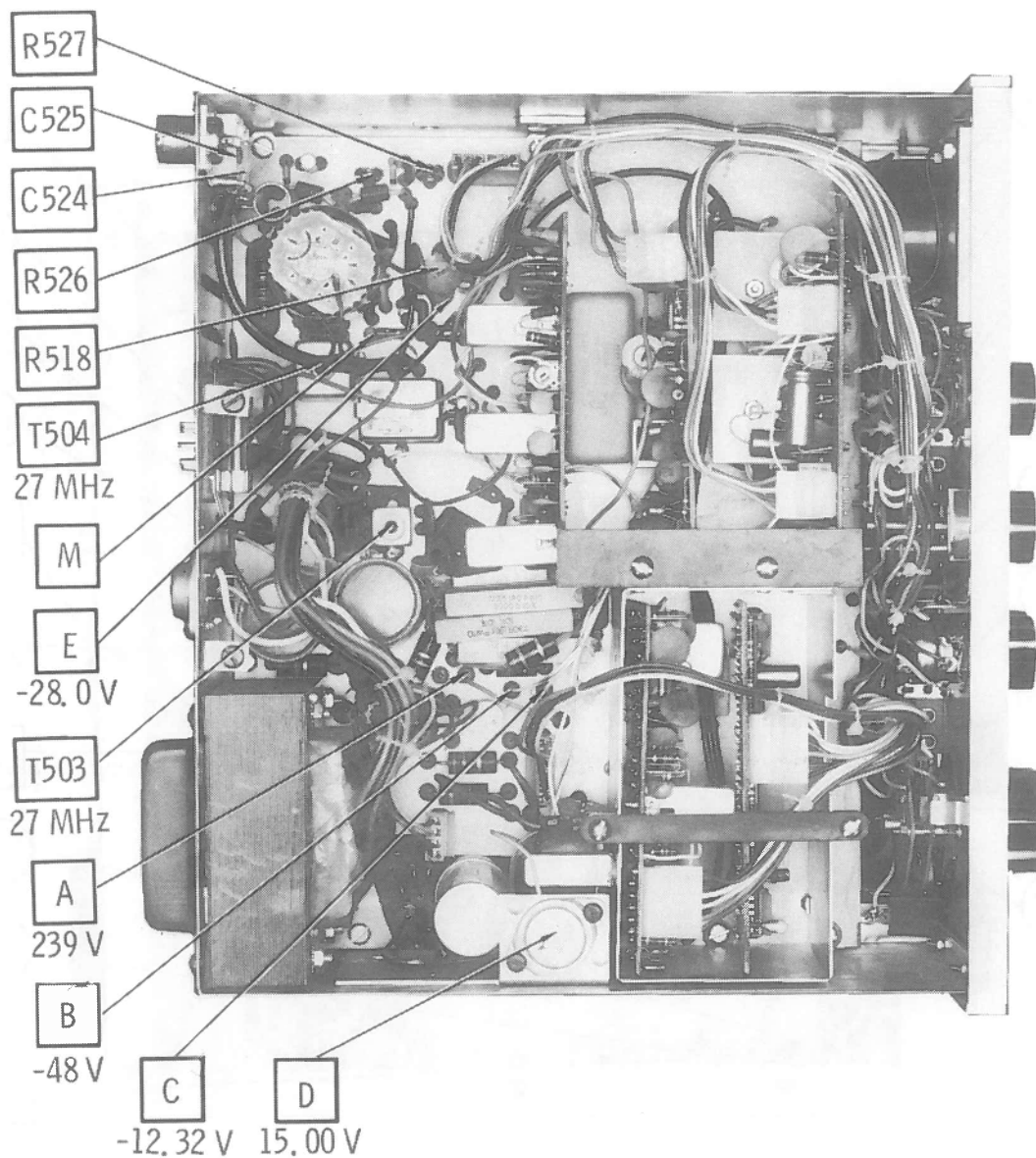
SSB

INDICATOR	ADJUST	REMARKS
CARRIER CRYSTAL OSCILLATOR AC VTVM & Panel Meter	R530 R528	Connect test equipment as shown in Figure 1. Mode Switch to USB. Place Oscillator Board on Extender Board (6 Pin). Set Audio Generator output for 1000Hz at 2V rms, on AC VTVM. Insert plug into Mic Jack and key transmitter. Adjust Mic Gain Control (R530) for a 4 watt output. Sweep Audio Generator for a peak reading on wattmeter (should peak between 1000Hz and 1600Hz.) Adjust panel meter to full scale with CAL Control (R528).
	C623	Set Audio Generator to 300Hz. Adjust for a center scale reading. Repeak generator to see that a full scale reading can be obtained.
	R530 R528	Set Mode Switch to LSB. Reset Audio Generator to 1000Hz at 2V rms. Key transmitter. Adjust Mic Gain Control (R530) for a 4 watt output. Sweep Audio Generator for a peak reading on wattmeter (should peak below 1000Hz). Adjust Panel Meter to full scale with CAL Control (R528).
	C621	Set Audio Generator to 300Hz. Adjust for a center scale reading. Repeak generator to see that a full scale reading can be obtained. Remove extender board.
18MHz CRYSTAL OSCILLATOR Frequency Counter (Response to 30MHz) RF VTVM	T604	Set Mode Switch to USB. Turn R415, located on Audio Board, fully counterclockwise, to unbalance the Balanced Modulator. If counter will not count, remove 10:1 voltage divider. Key transmitter. Adjust for 26.965MHz.
	R602	Set Mode Switch to LSB. Key transmitter. Adjust for 26.965MHz.
	R415	Connect RF VTVM to Antenna Jack and ground. Set Mode Switch to USB. Key transmitter. Adjust for null.

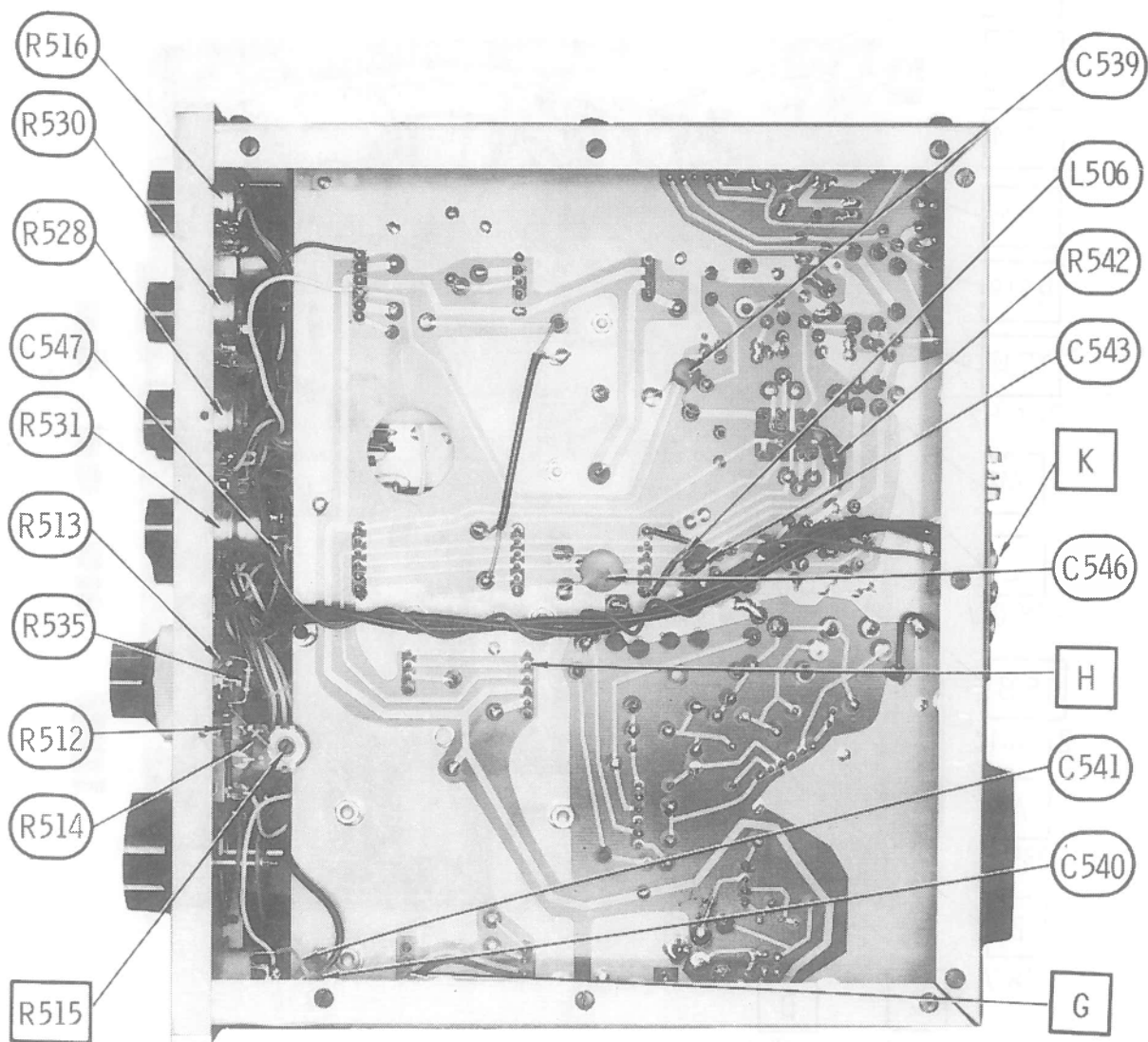
TRANSMITTER ADJUSTMENTS

All Control settings are the same as for AM except Channel Selector to Ch. #1. Meter Switch to SWR.

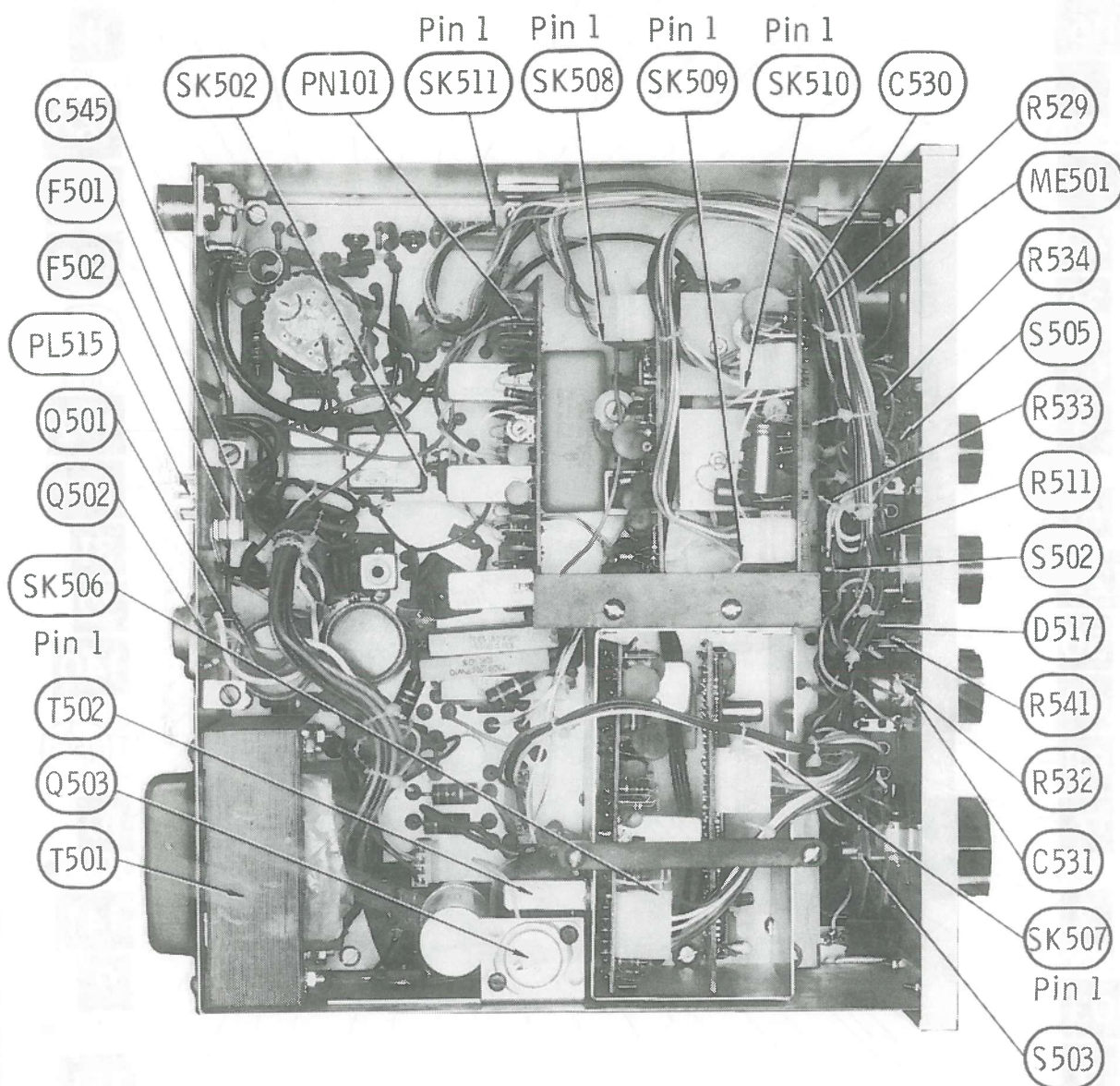
INDICATOR	ADJUST	REMARKS
METER Panel Meter Wattmeter	R526	Set Meter Switch to SWR. Key transmitter. Adjust for null on Panel Meter.
	R528	Set Meter Switch to CAL. Key transmitter. Adjust CAL (R528) to obtain full scale reading. Repeat for increased accuracy.
	R527	Set Meter Switch to PWR. Key transmitter. Adjust for agreement of Panel Meter to Wattmeter.



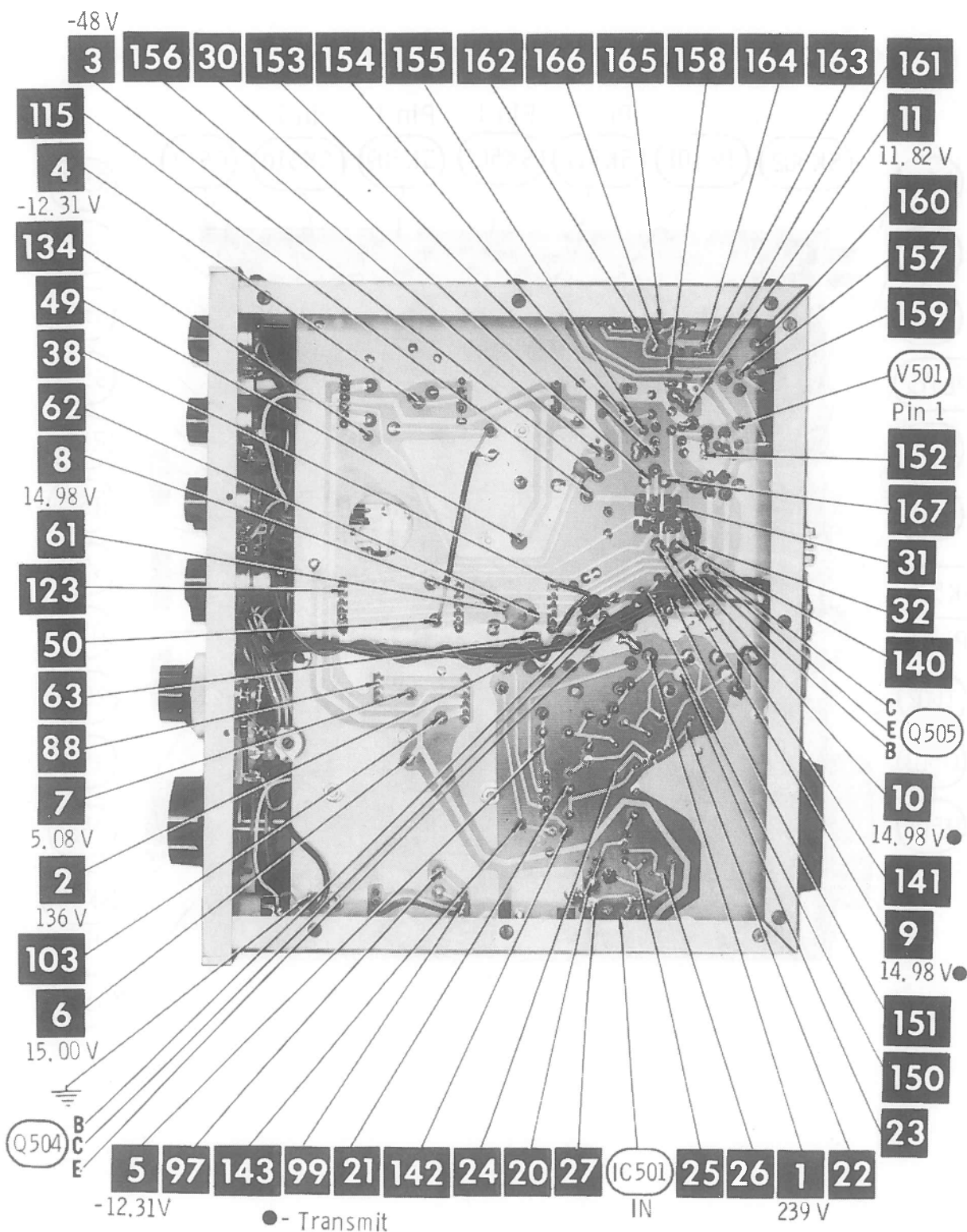
CHASSIS-TOP VIEW

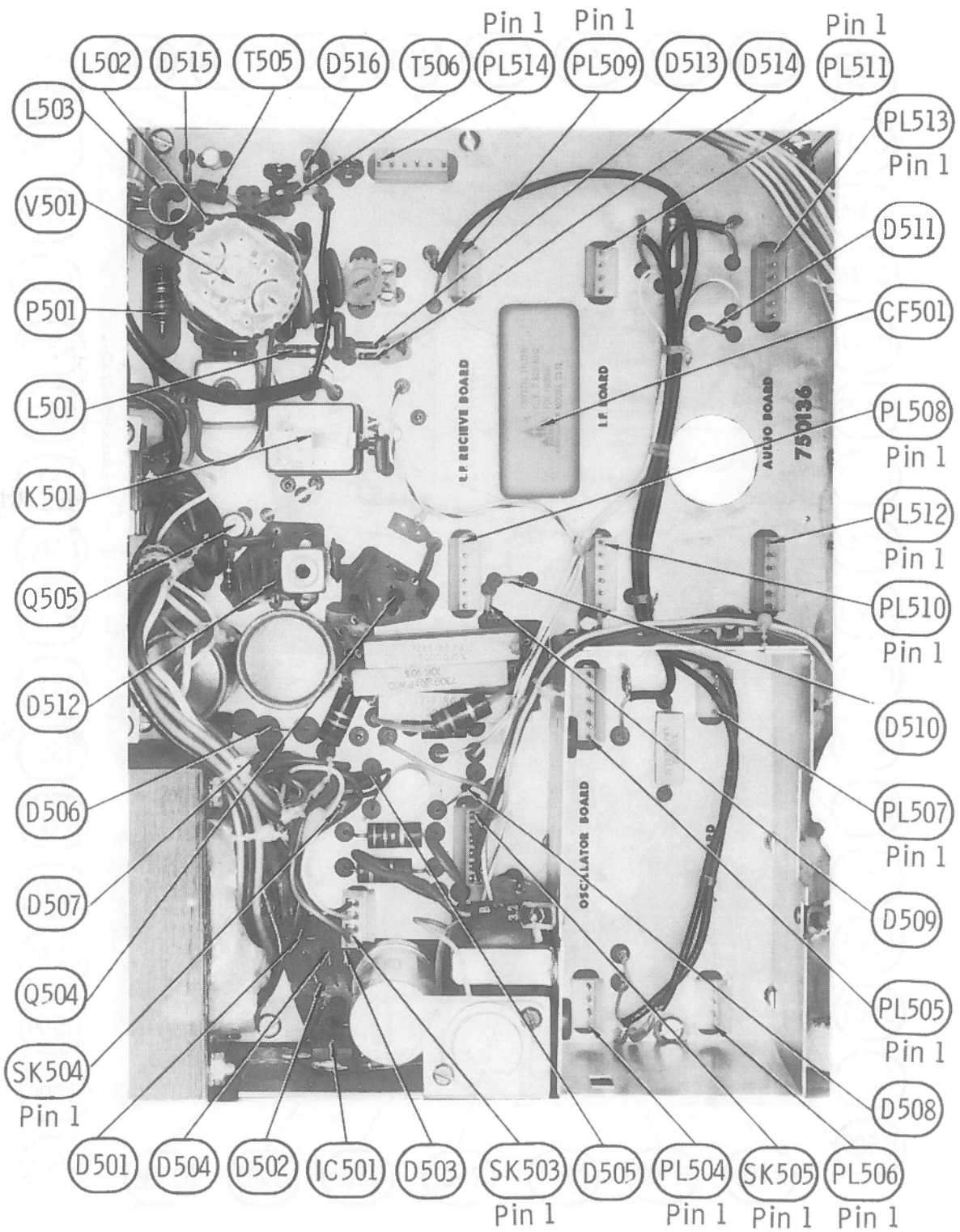


CHASSIS-BOTTOM VIEW

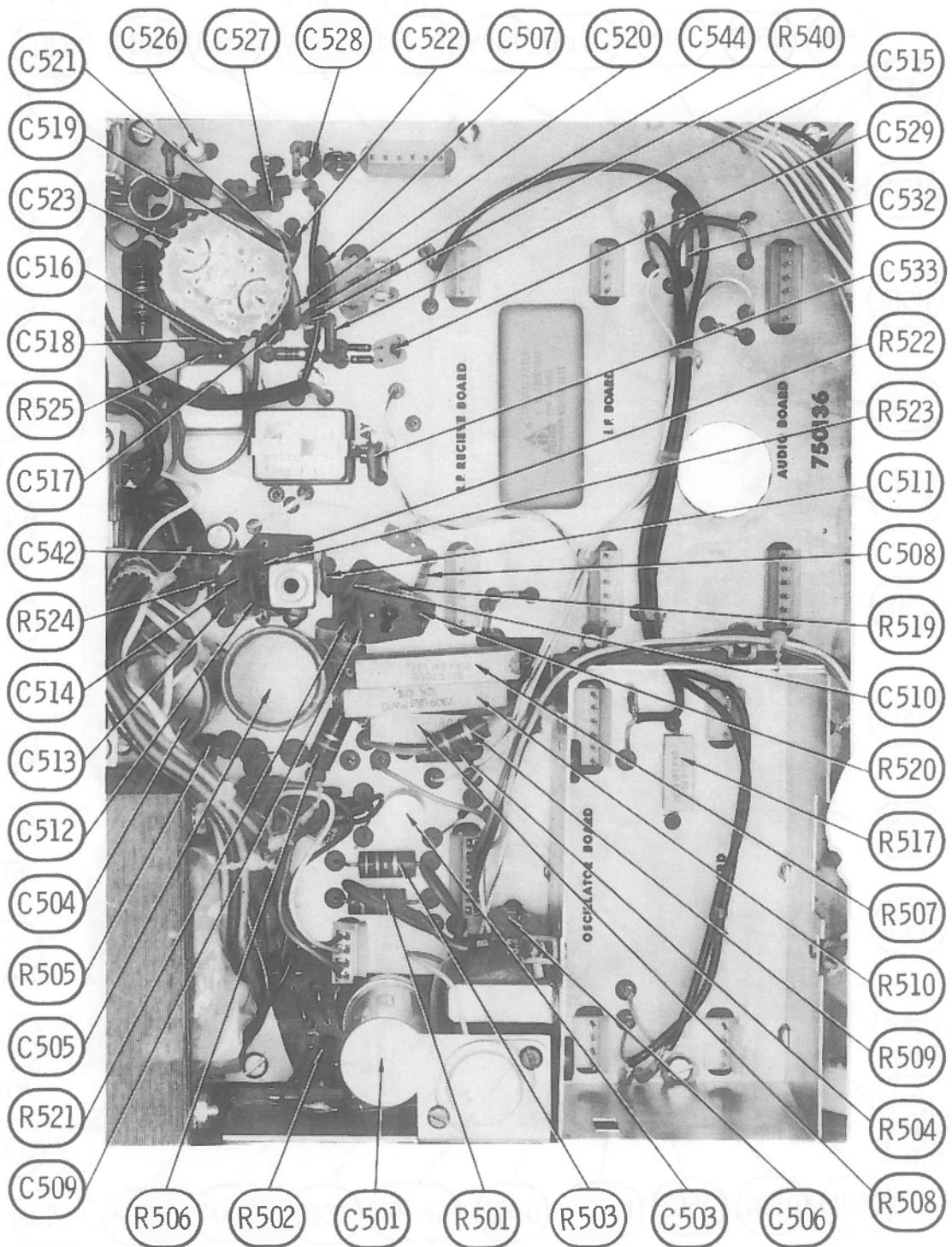


CHASSIS-TOP VIEW

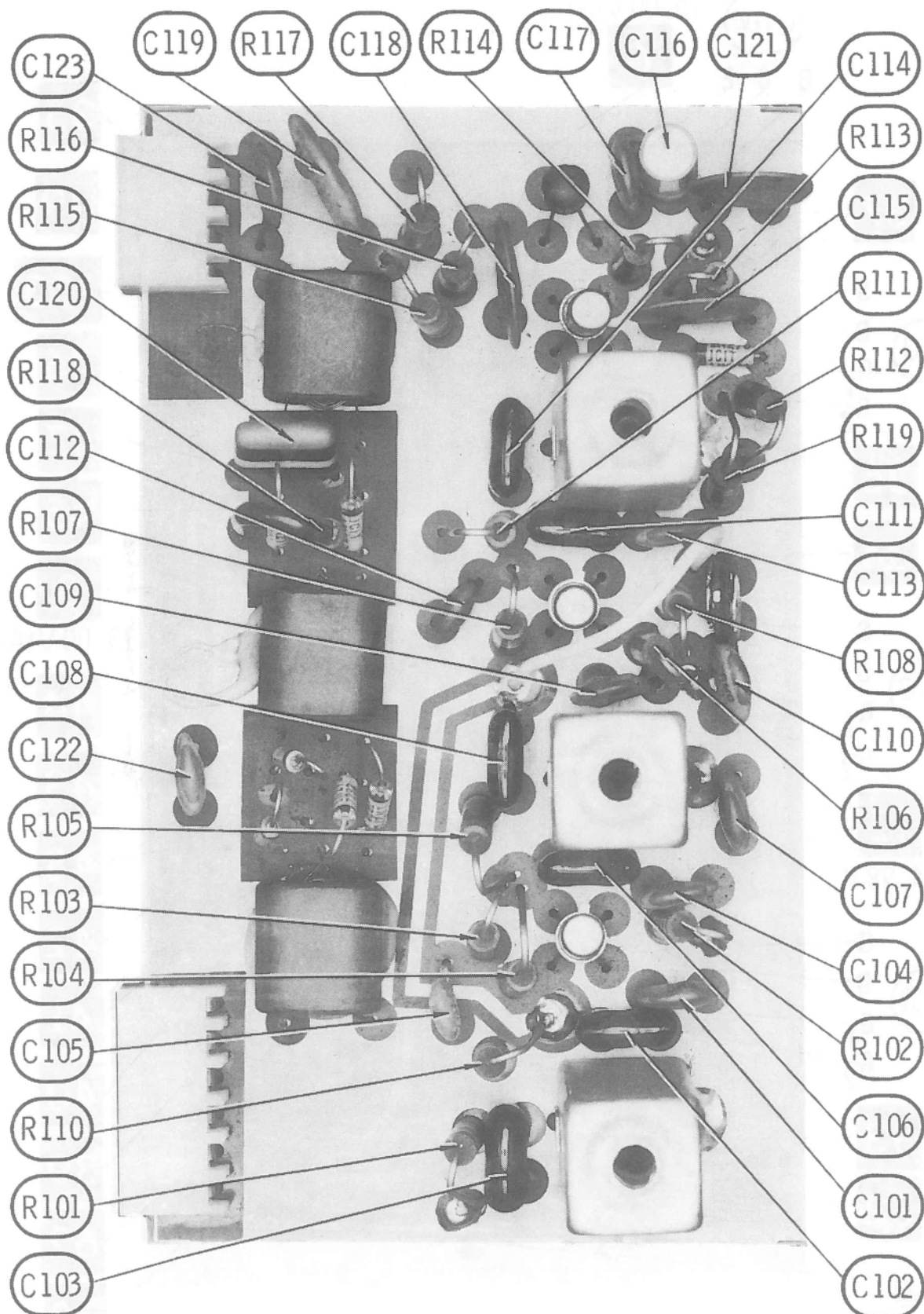




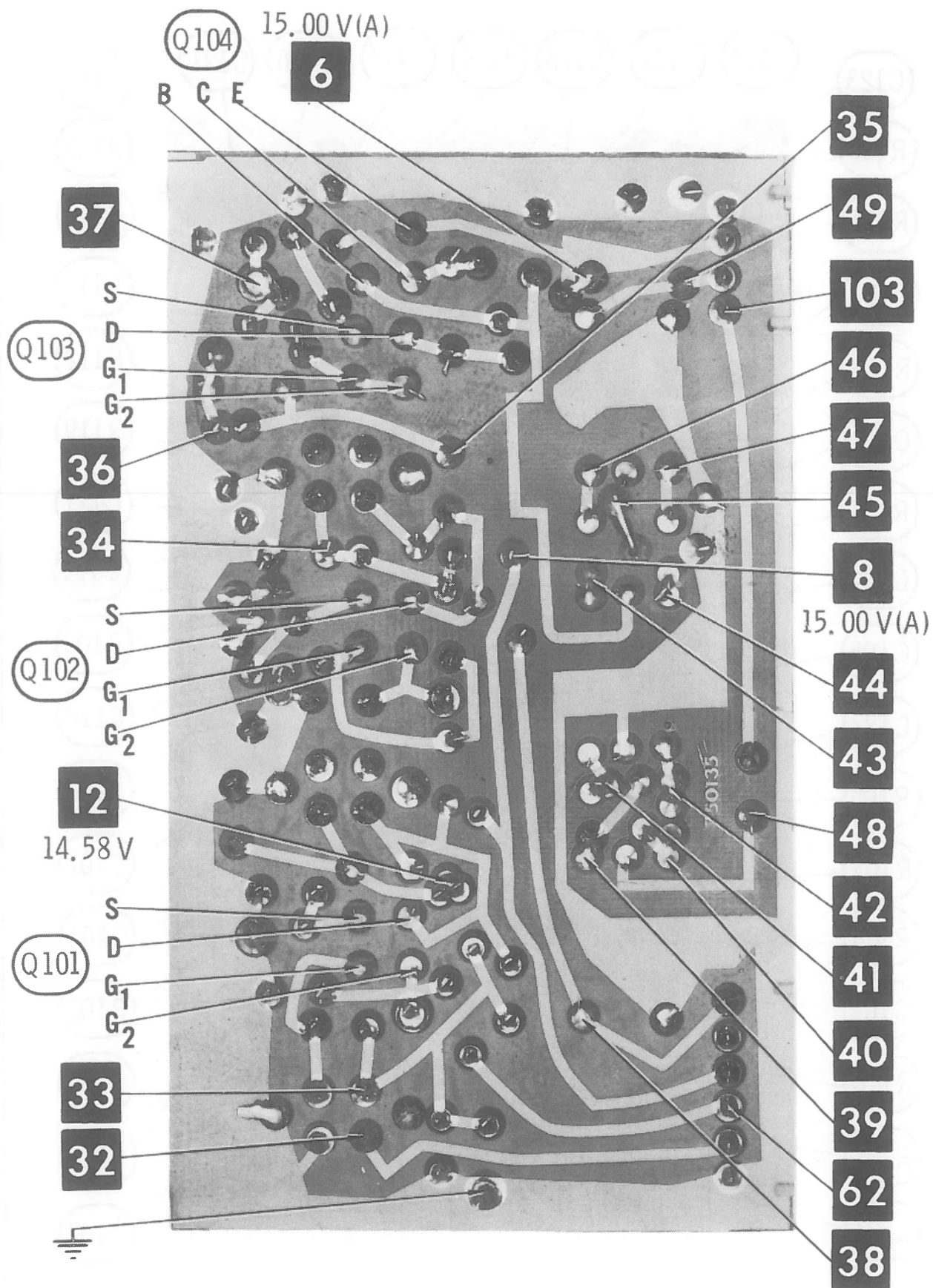
MAIN BOARD

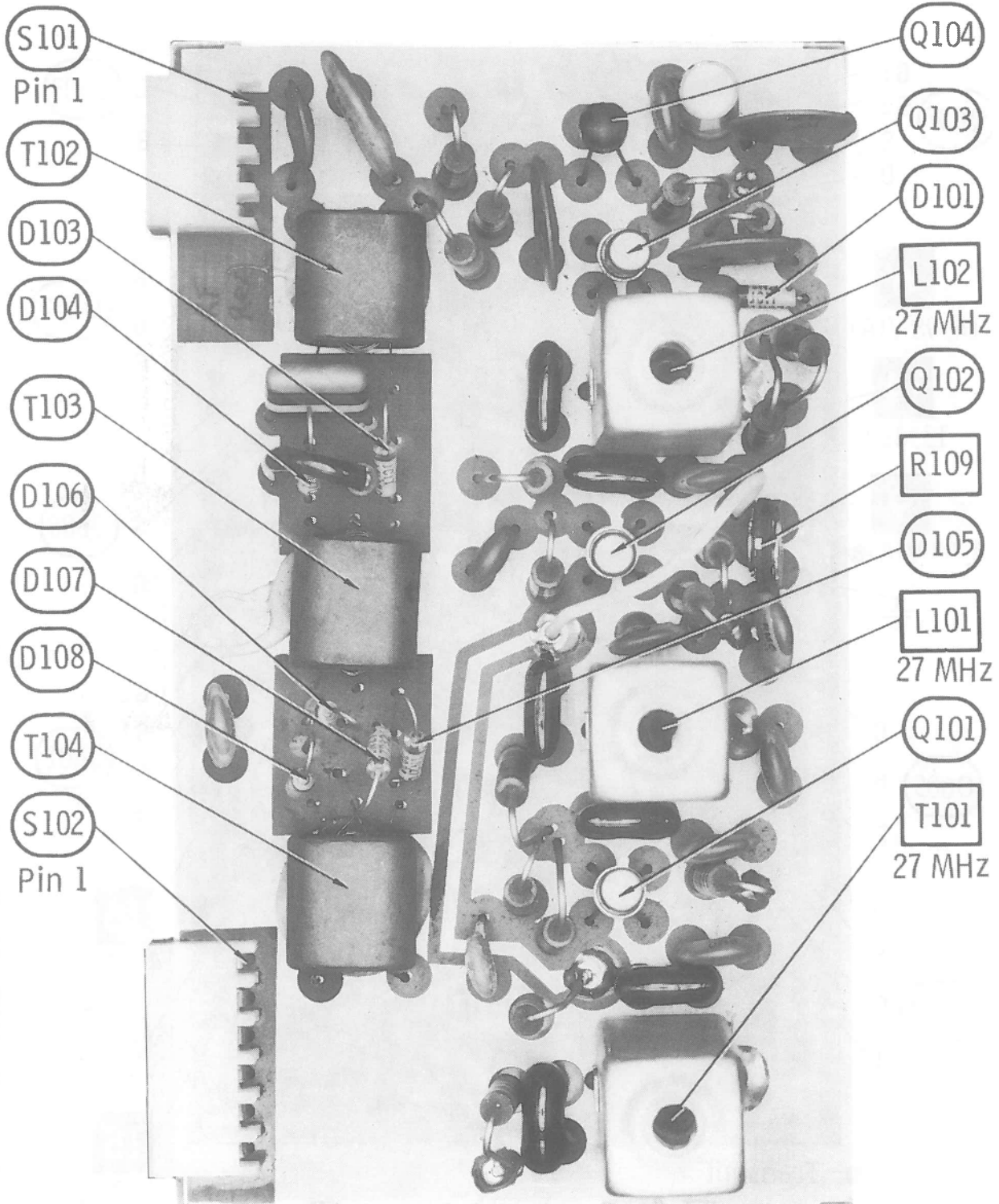


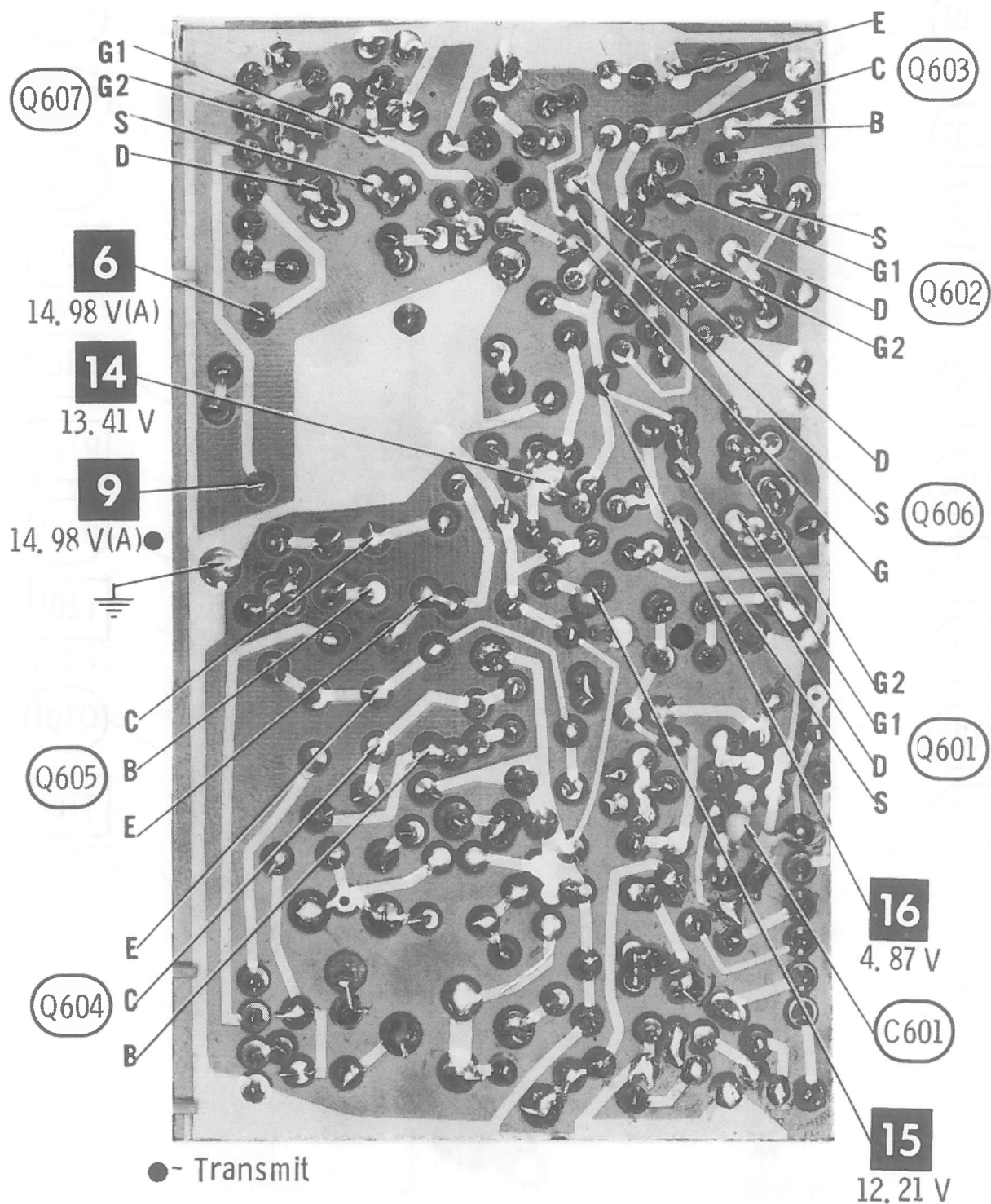
MAIN BOARD



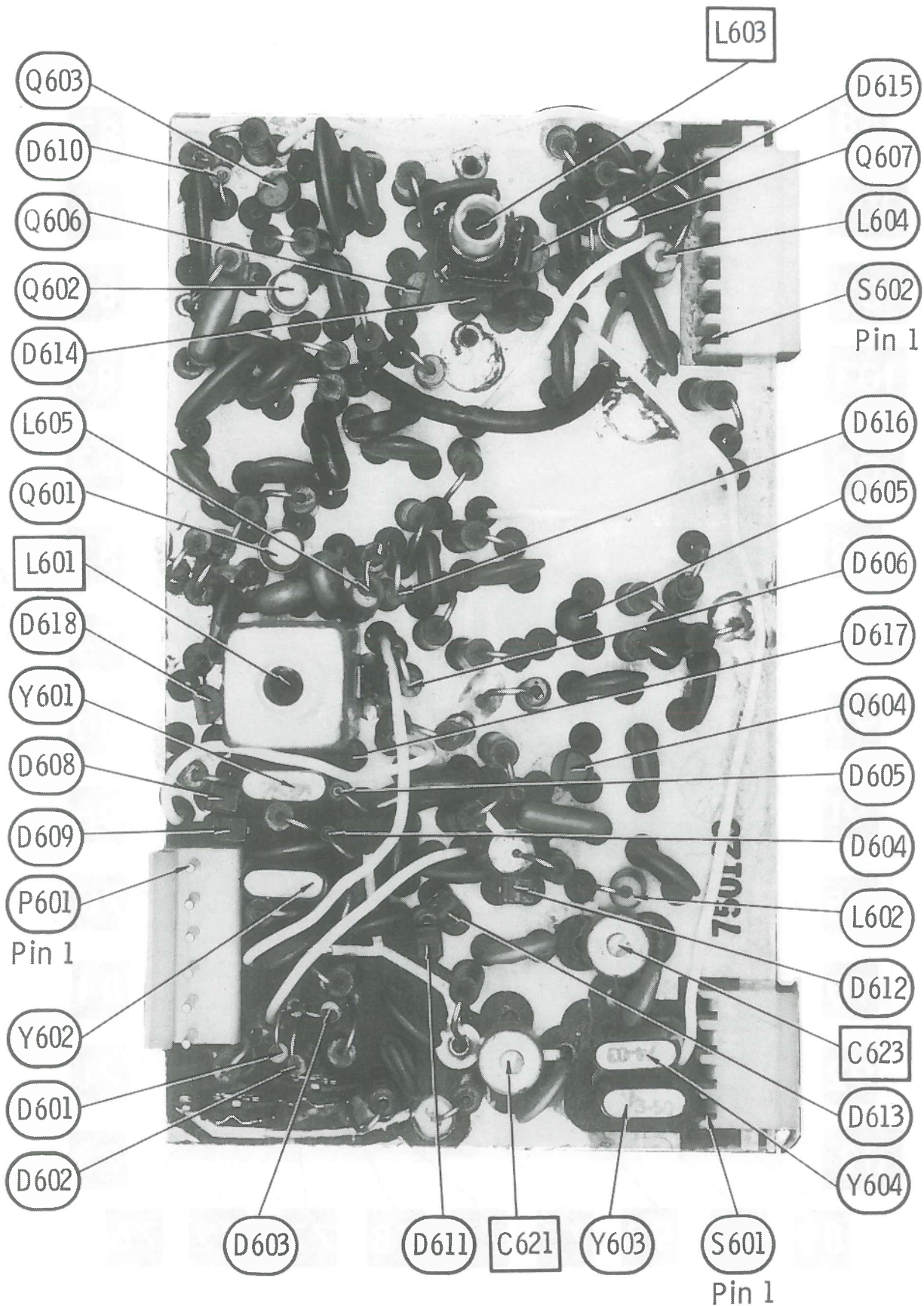
RF BOARD



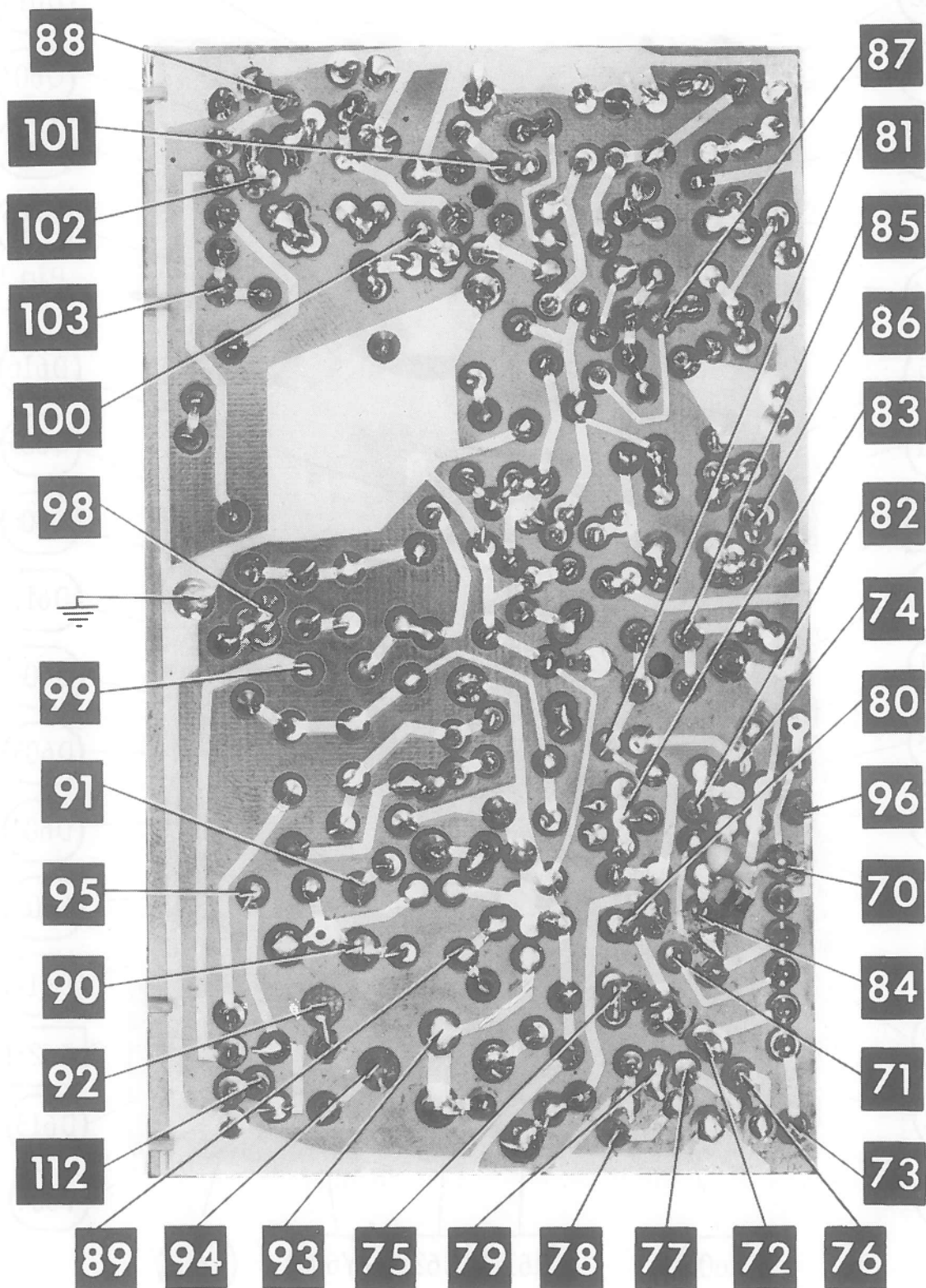




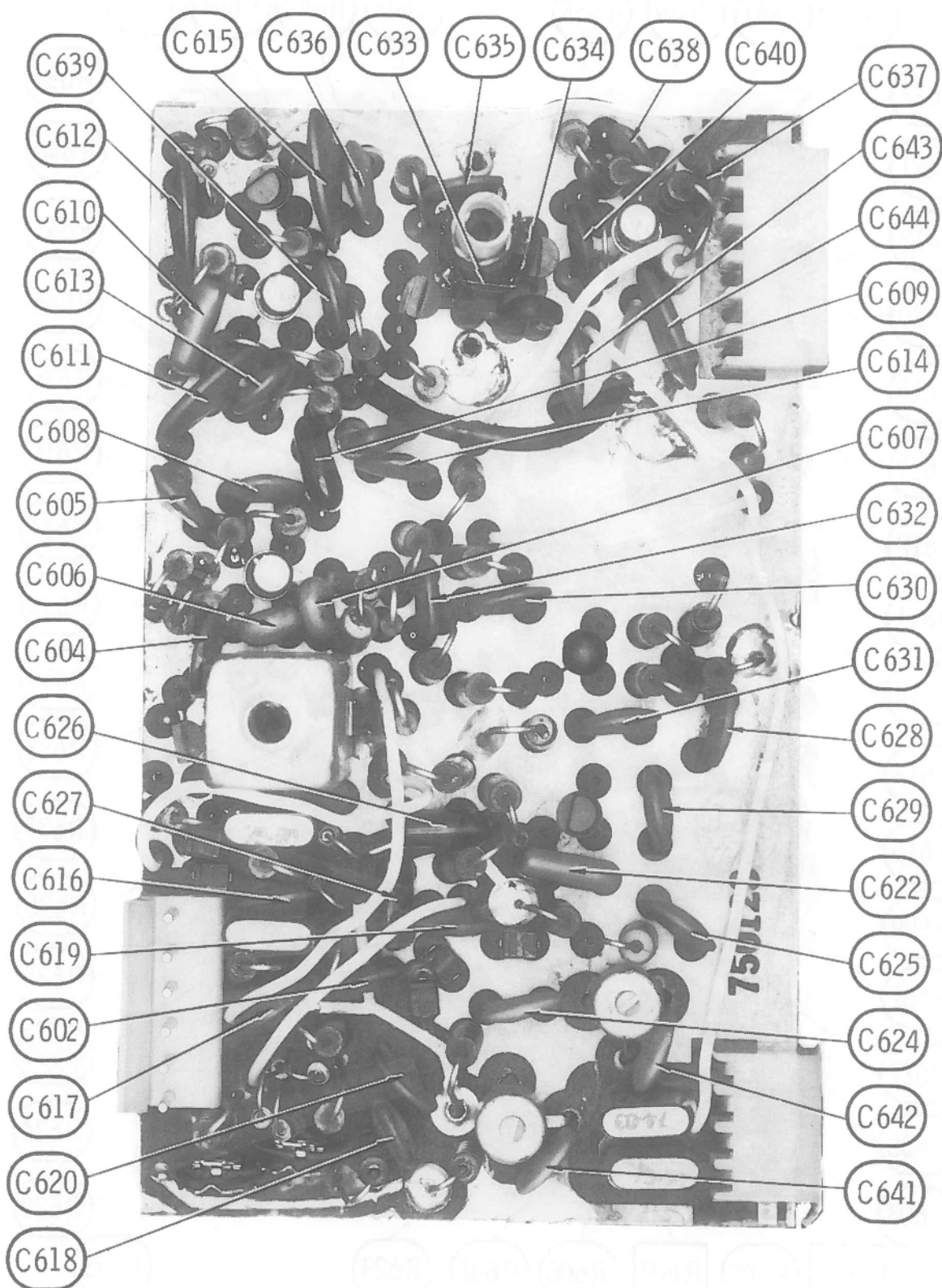
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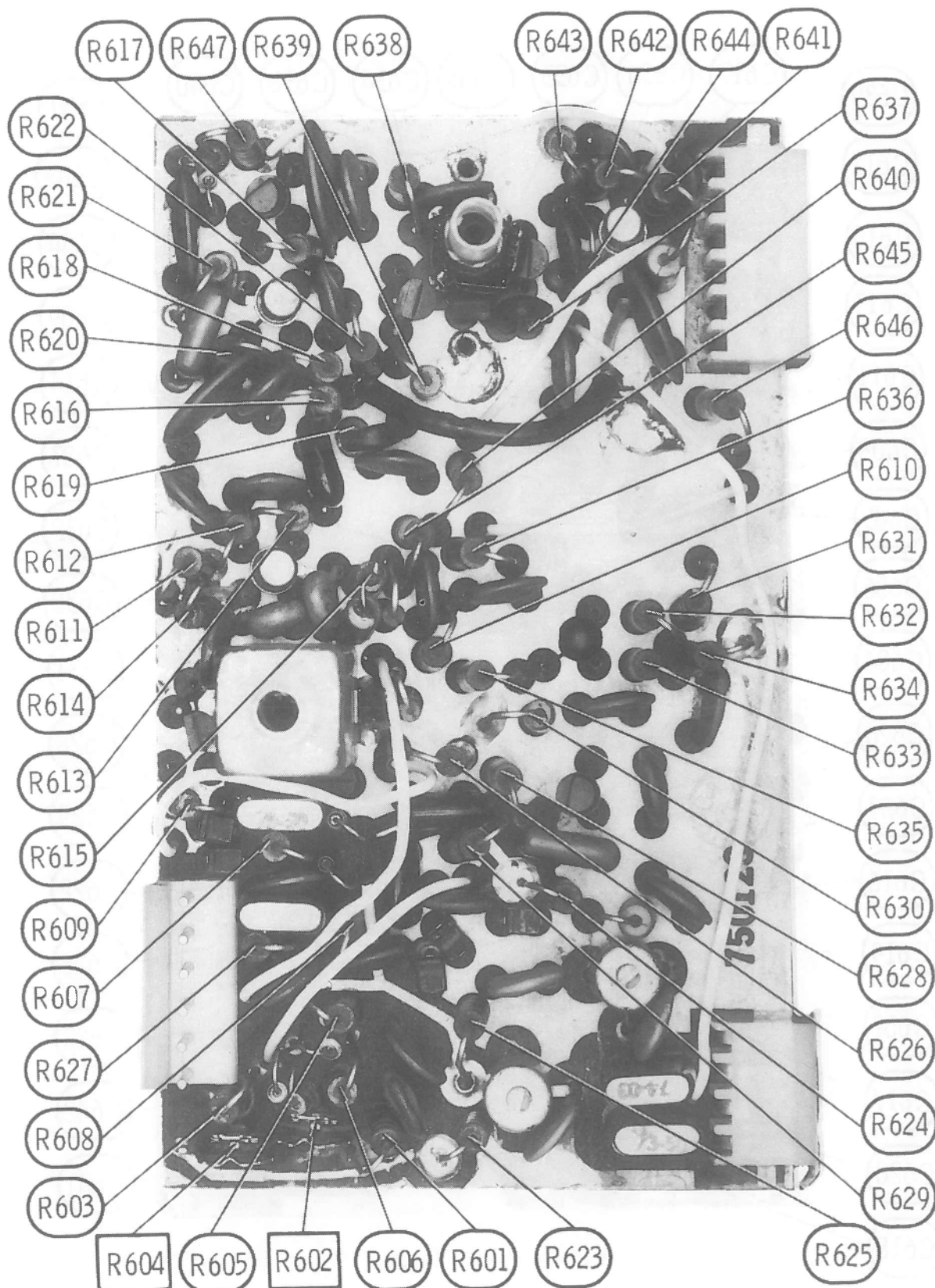
OSCILLATOR BOARD



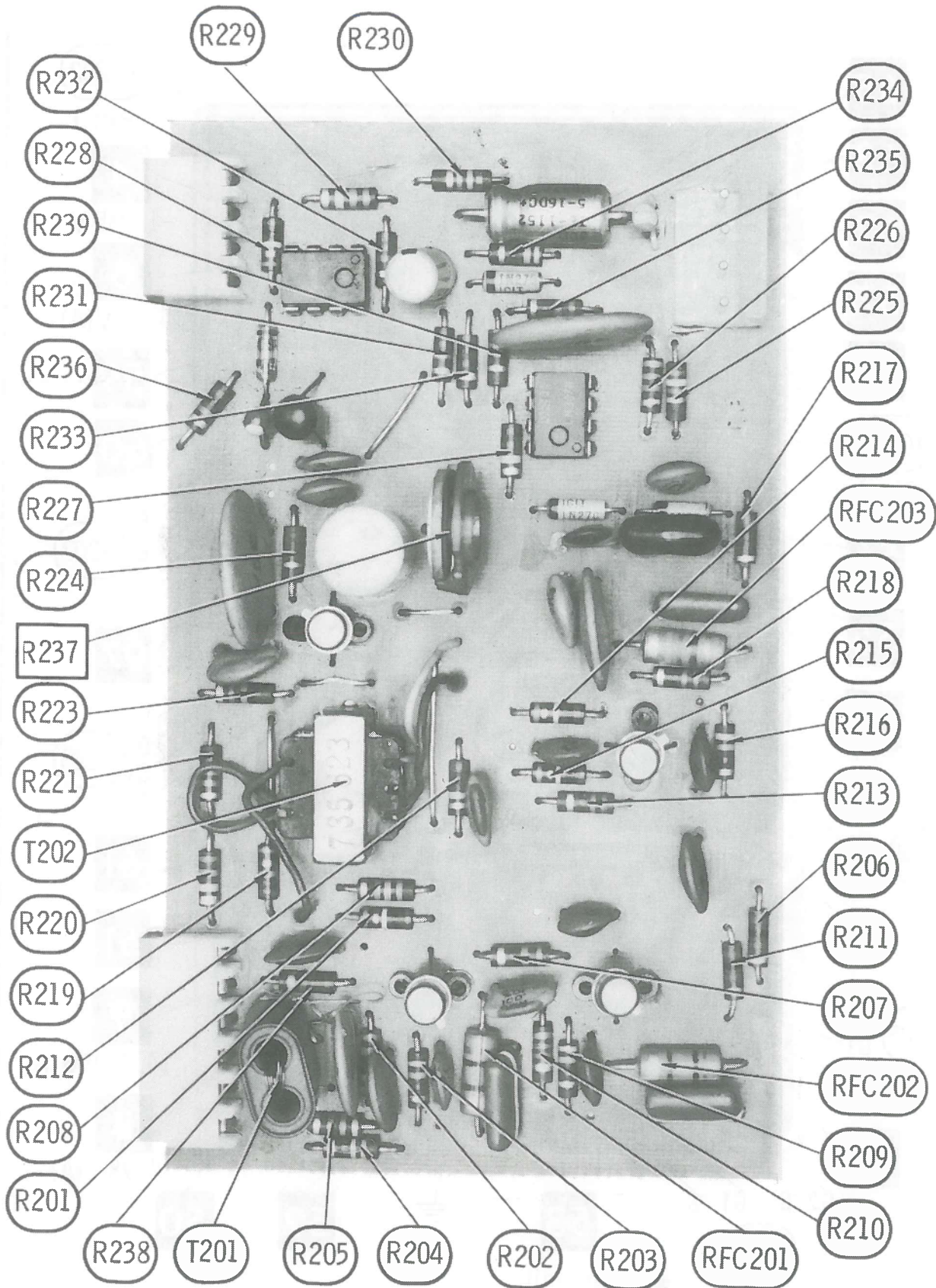
OSCILLATOR BOARD



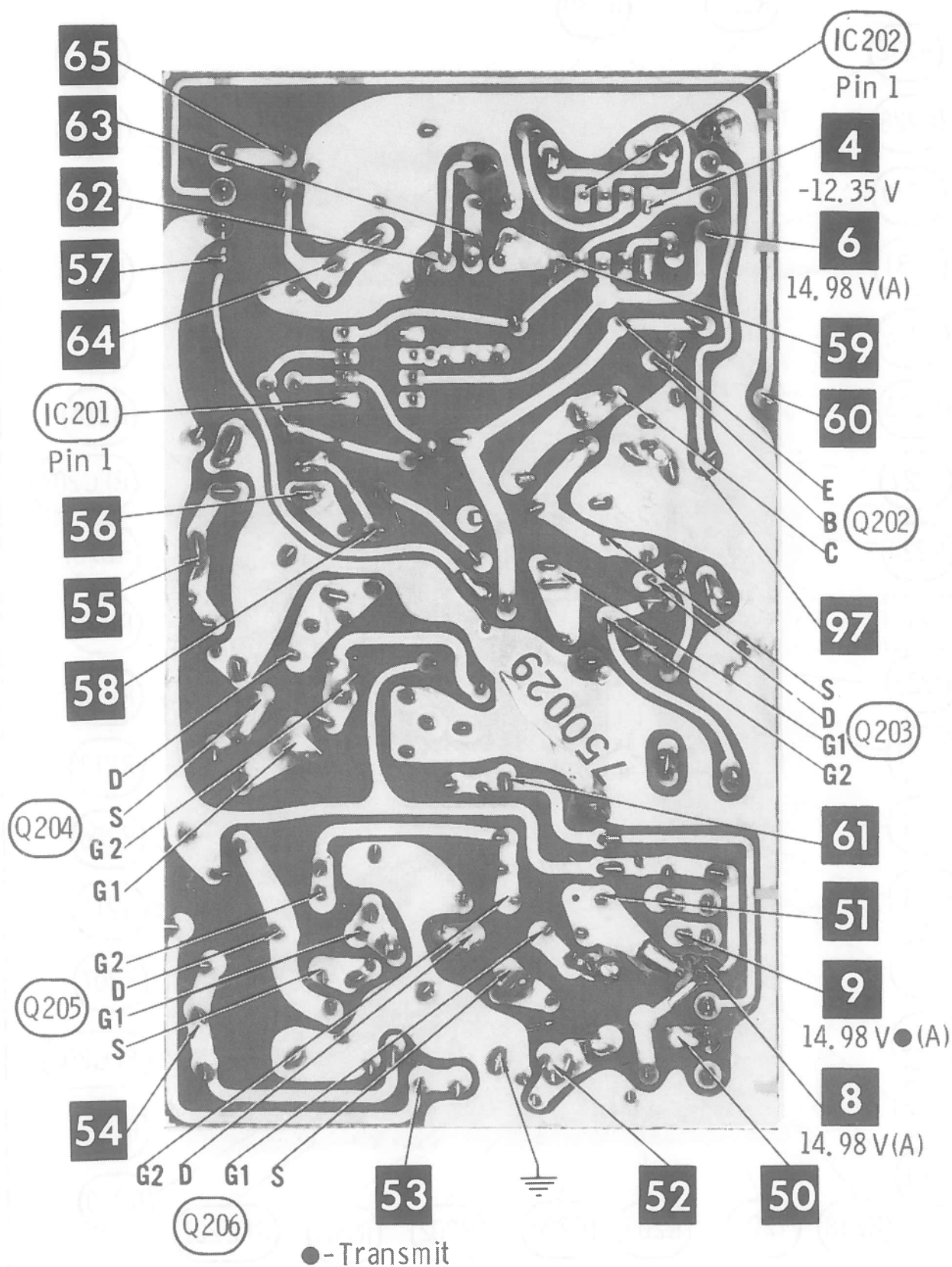
OSCILLATOR BOARD



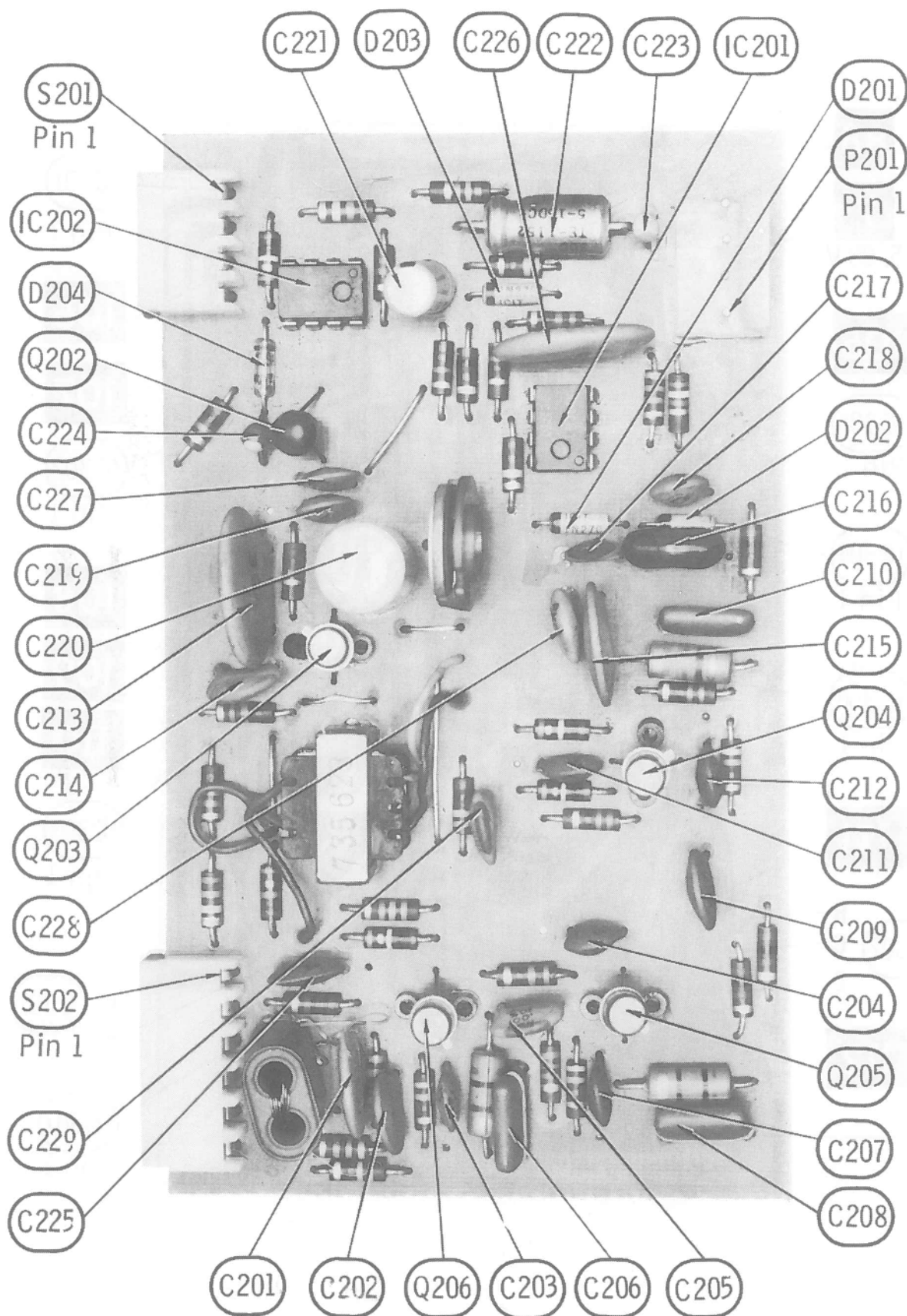
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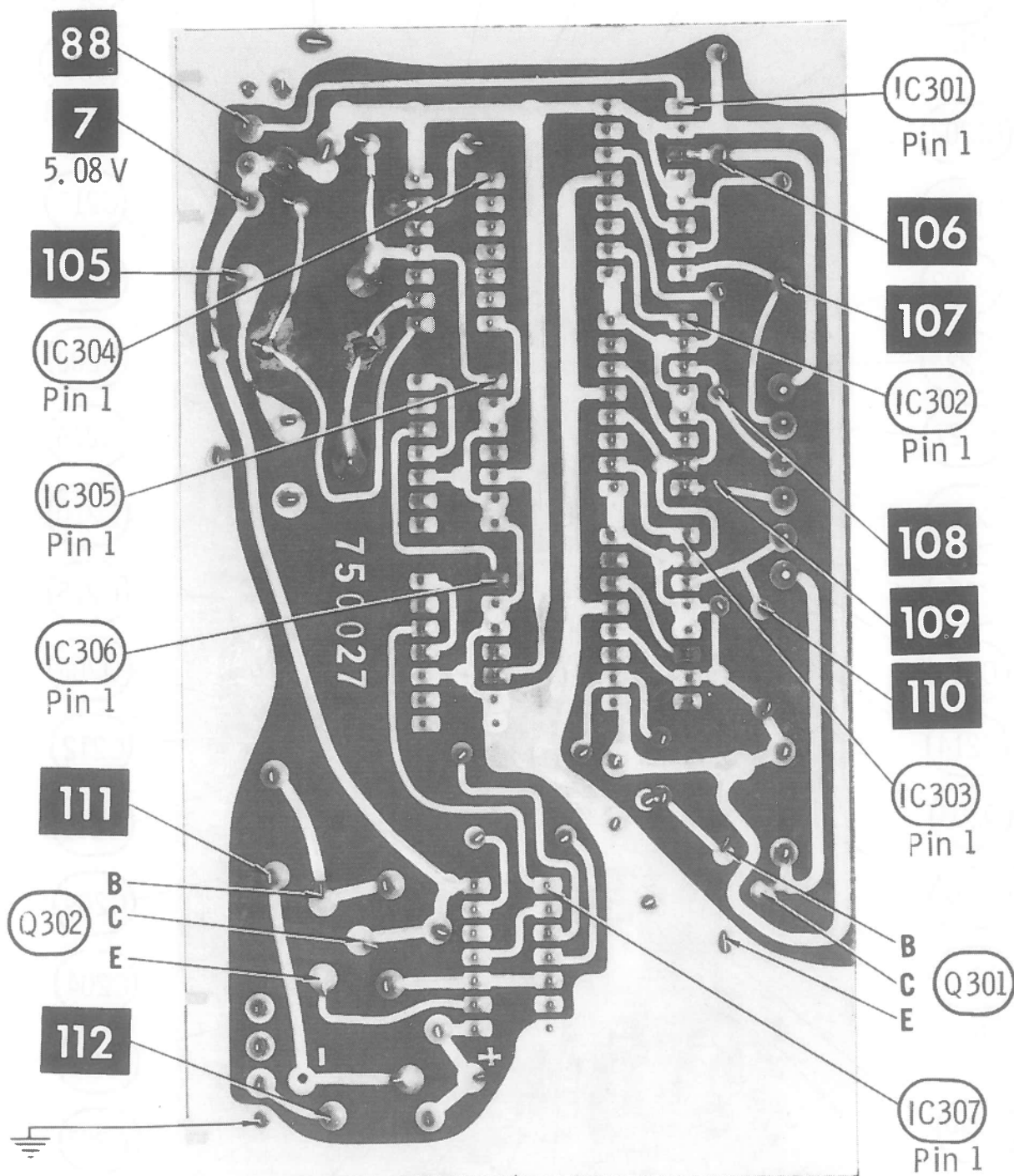
IF BOARD (LATE VERSION)



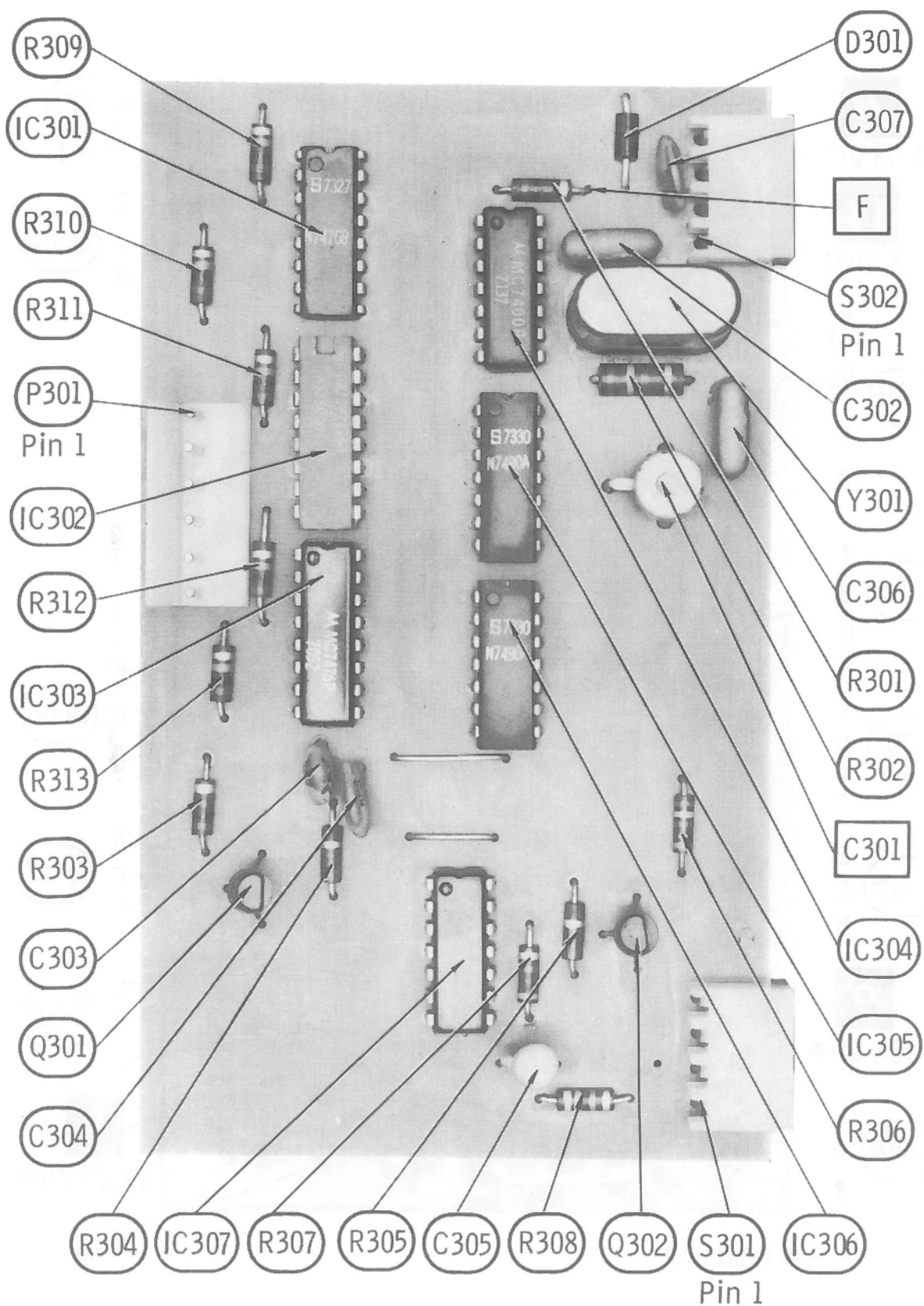
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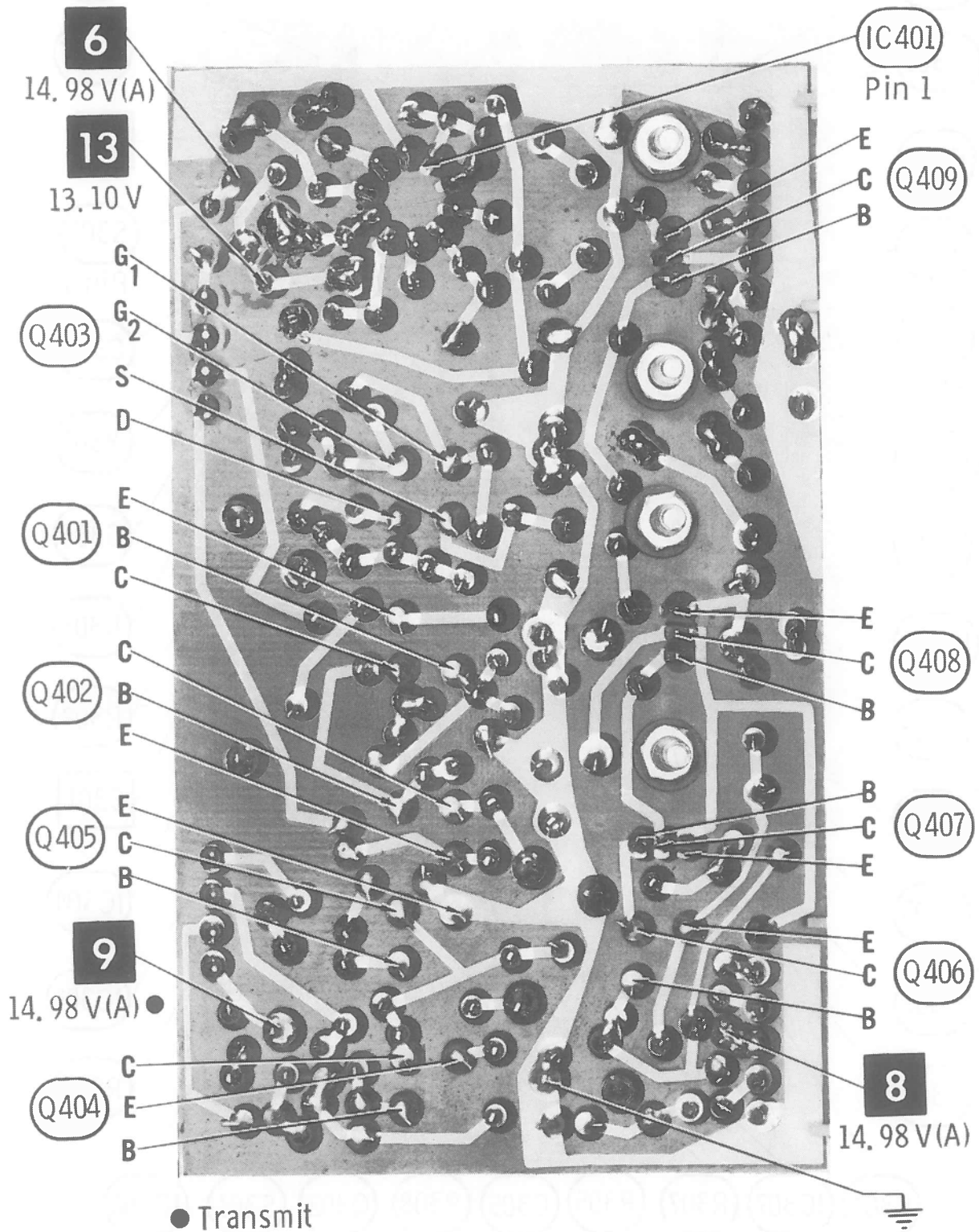
IF BOARD (LATE VERSION)

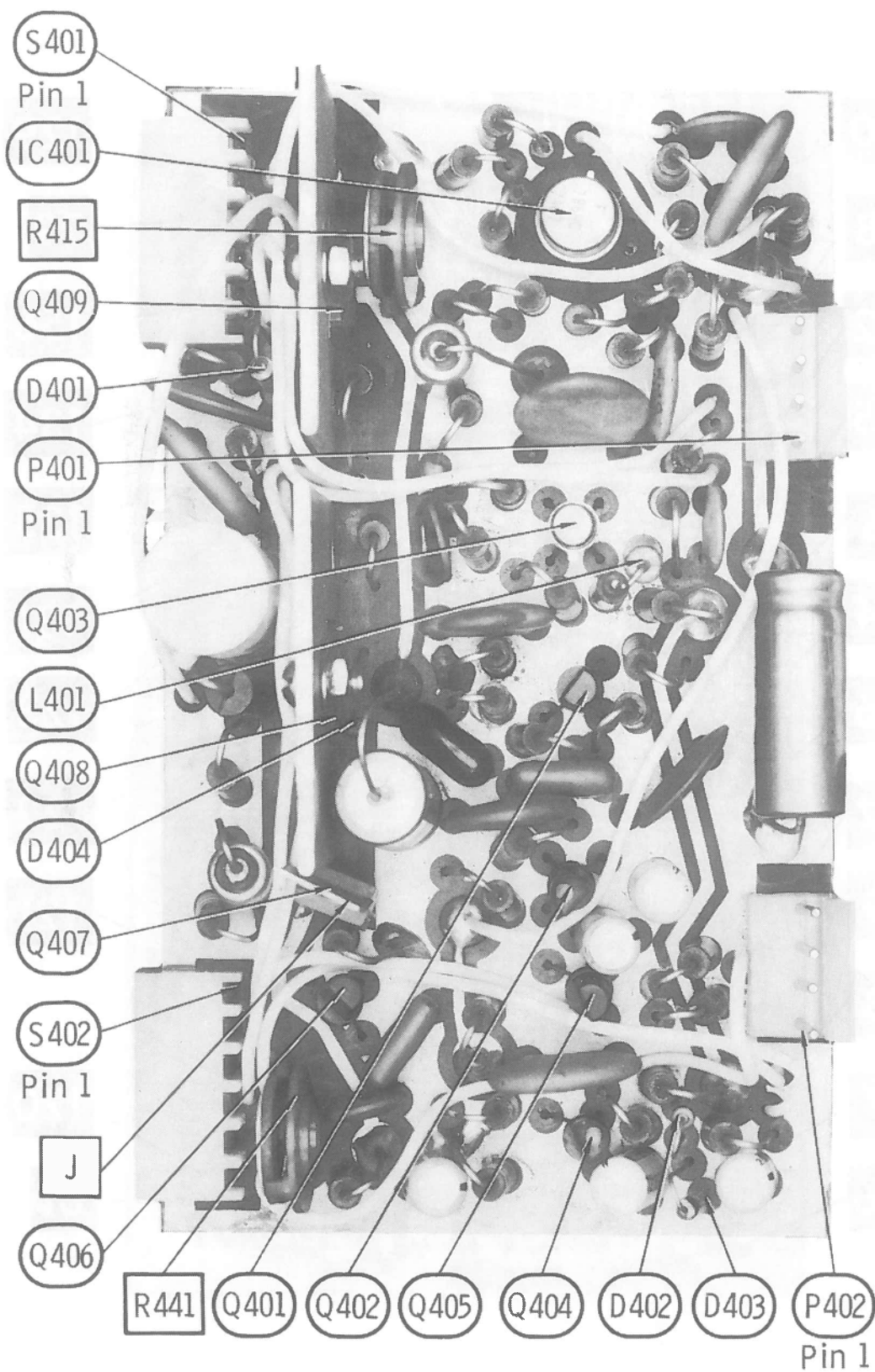


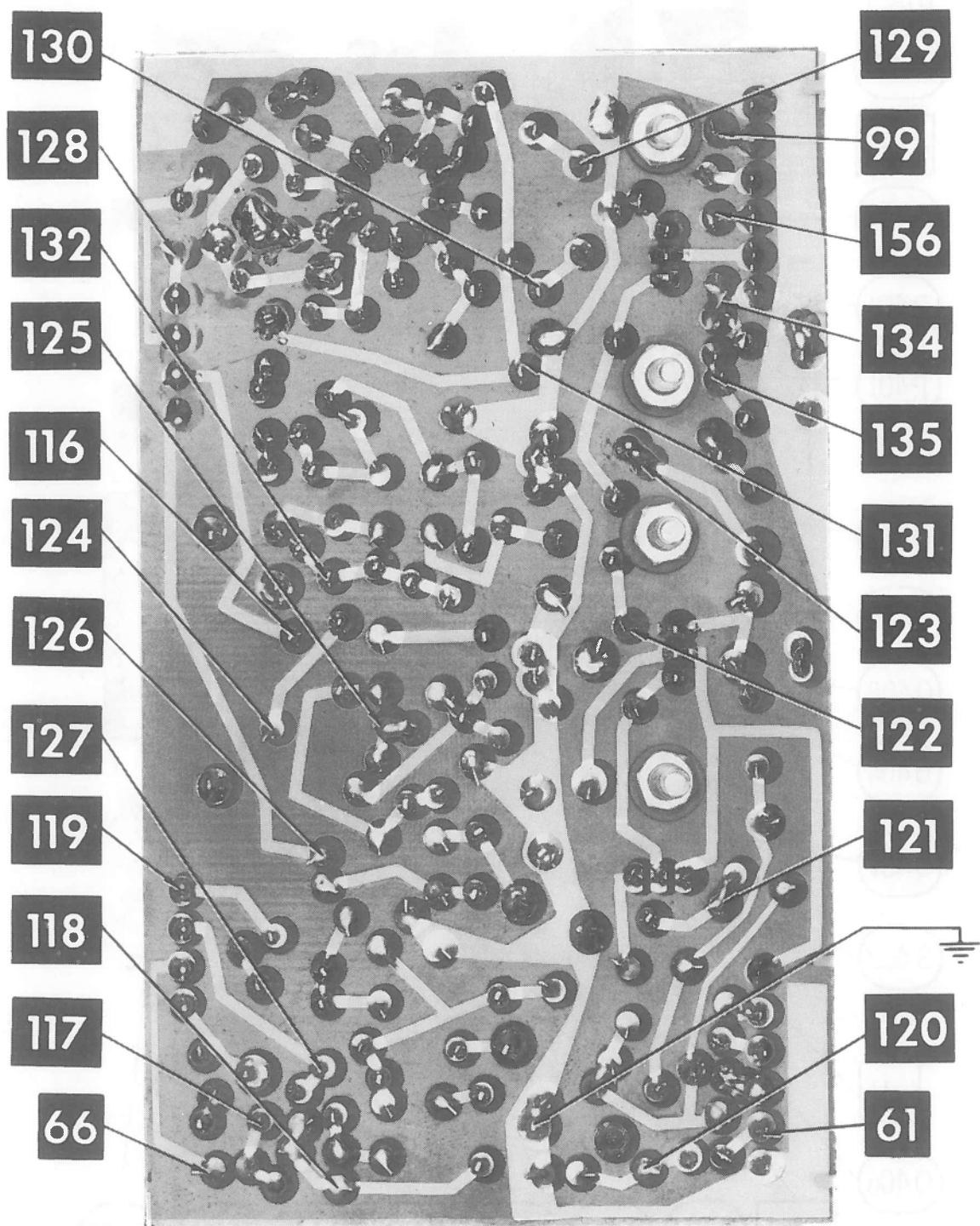
PROGRAM DIVIDER BOARD



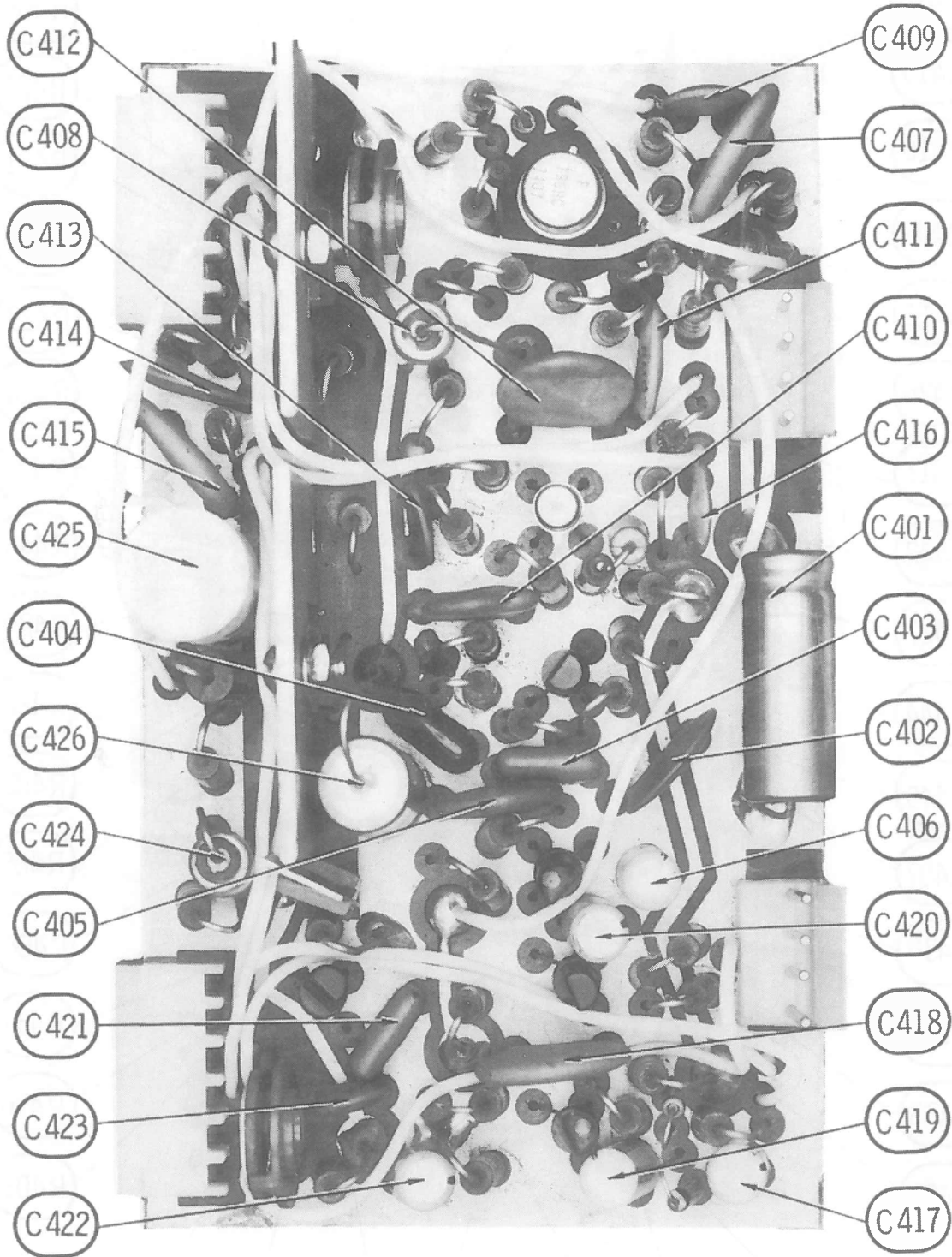
PROGRAM DIVIDER BOARD



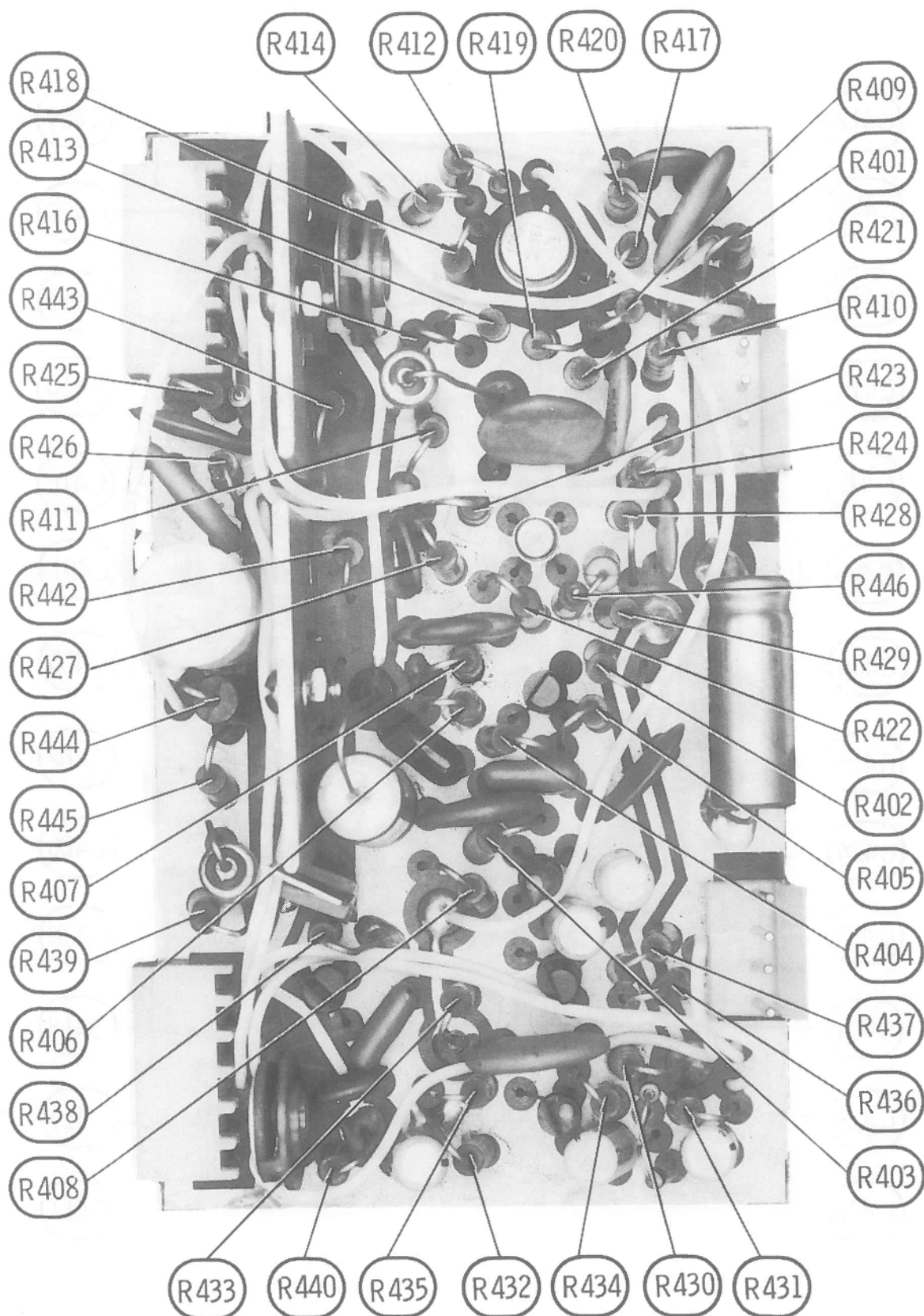




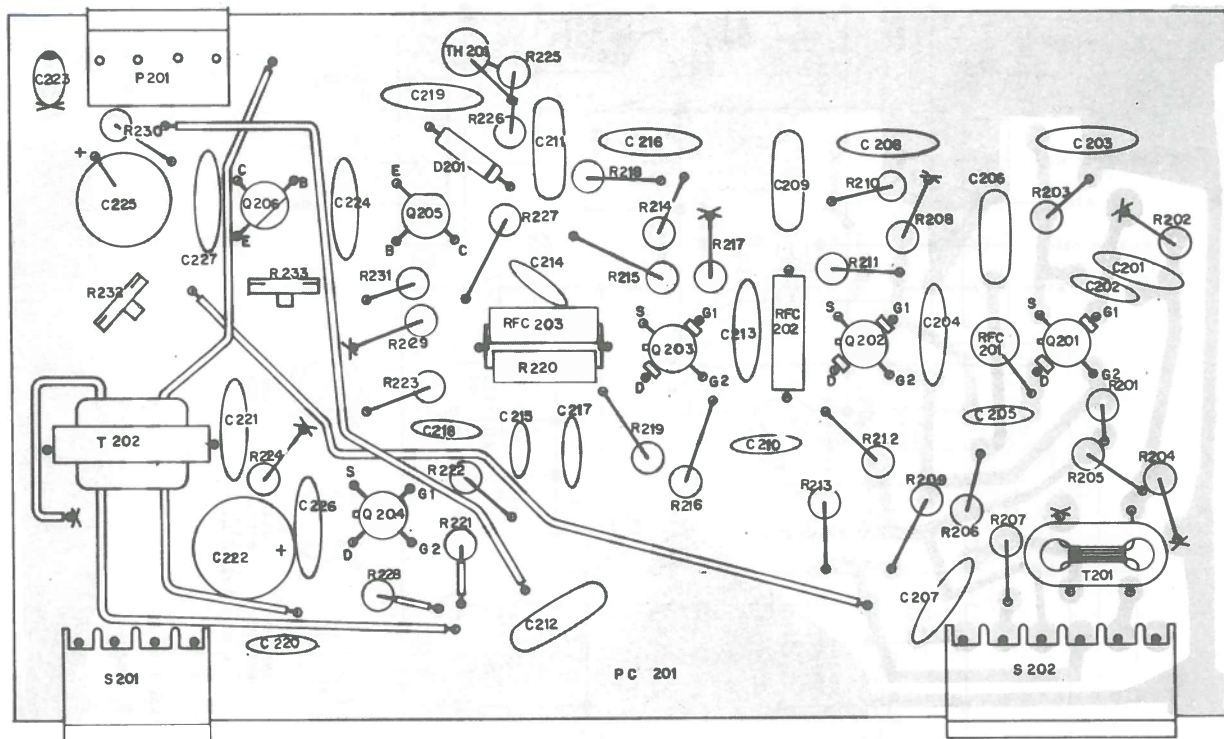
AUDIO BOARD



AUDIO BOARD

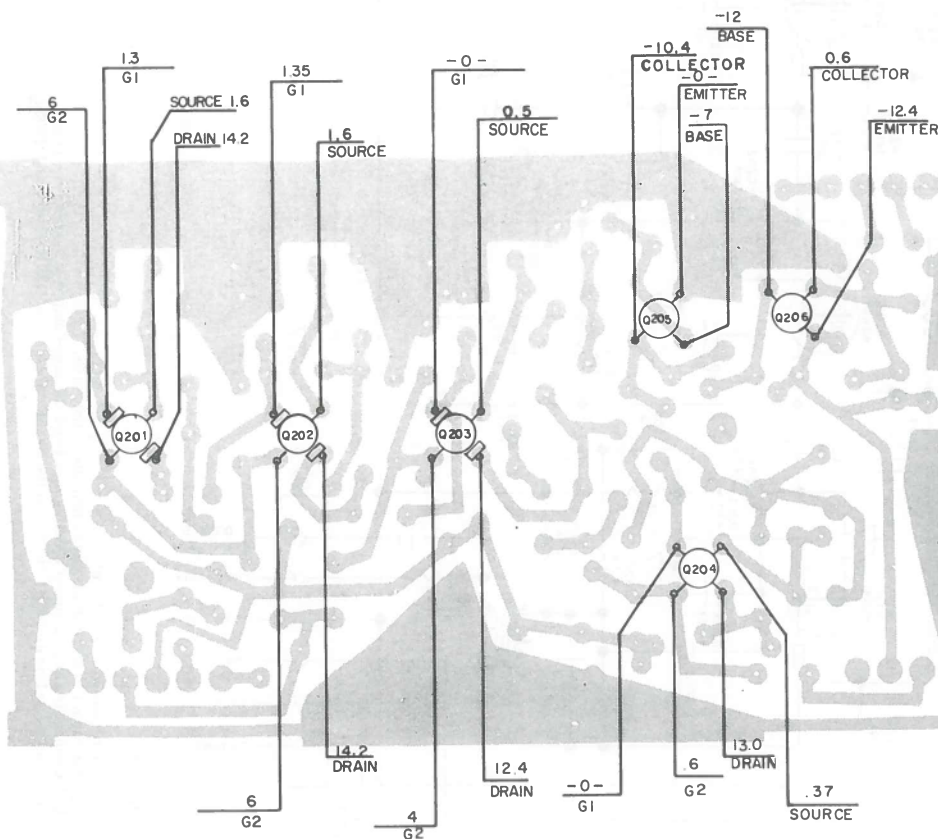


AUDIO BOARD



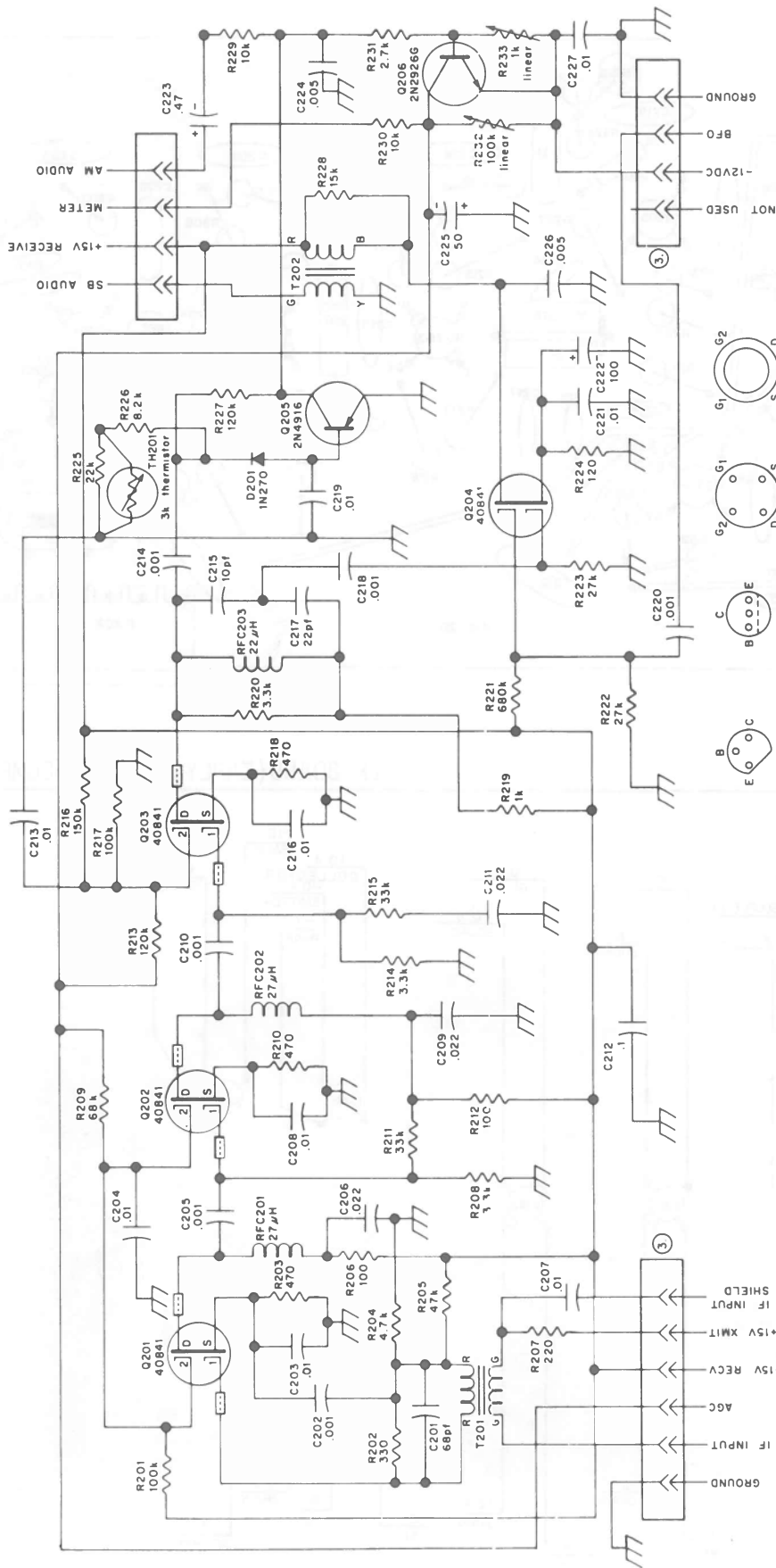
Courtesy of the Manufacturer

IF BOARD (EARLY VERSION) - COMPONENTS



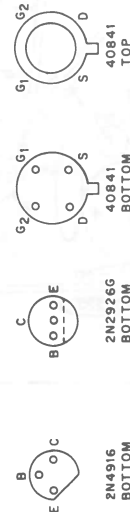
Courtesy of the Manufacturer

IF BOARD (EARLY VERSION) - VOLTAGES

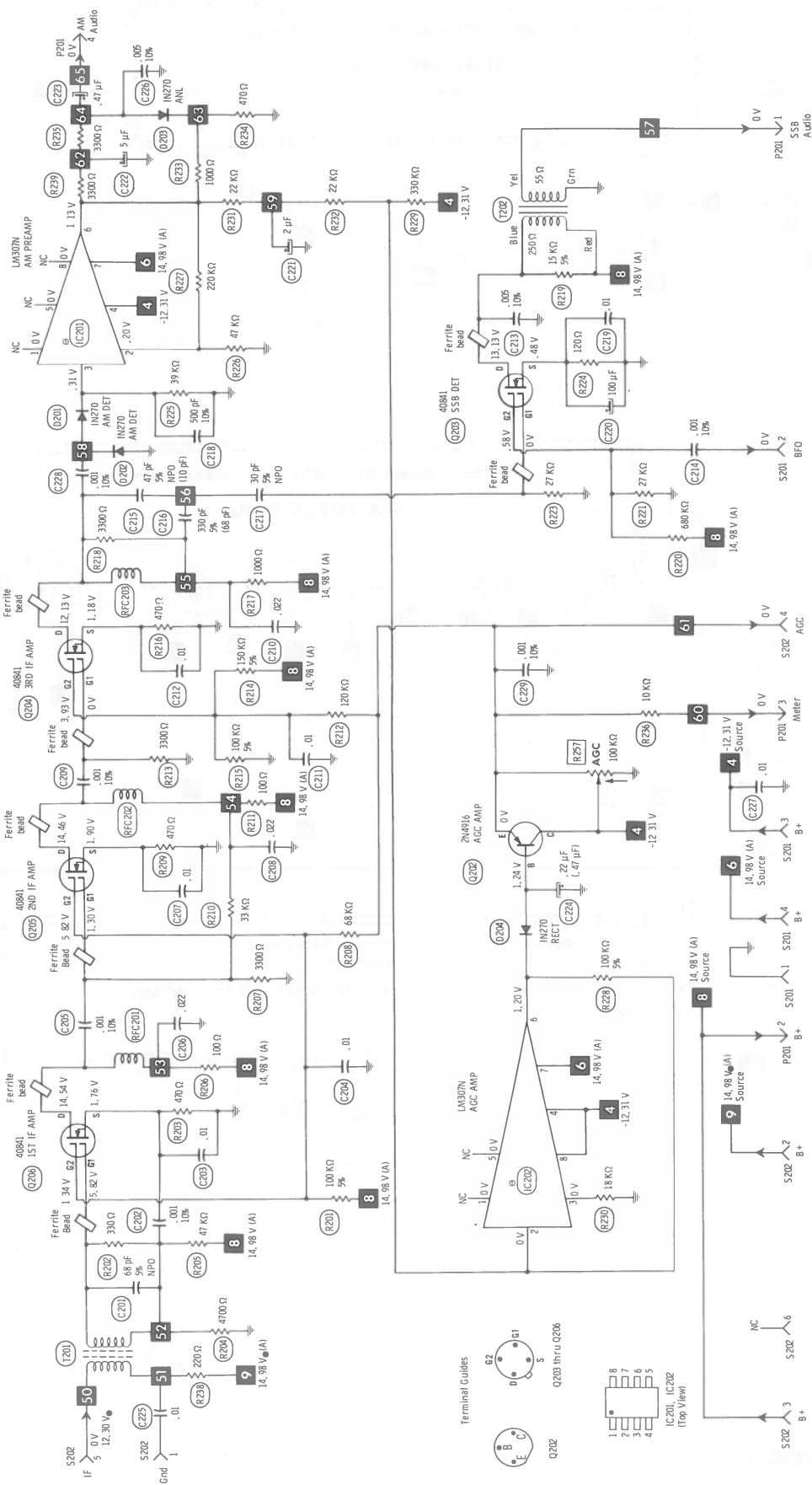


NOTES:

1. All resistors are 1/2 watt.
2. All capacitors are in μ f unless indicated otherwise.
3. Connectors are as shown when viewed from the non-component side of the board.
4. There are ferrite beads --- on the drain and gate 1 of Q201, Q202, and Q203.



IF BOARD PC201 (Late Version)

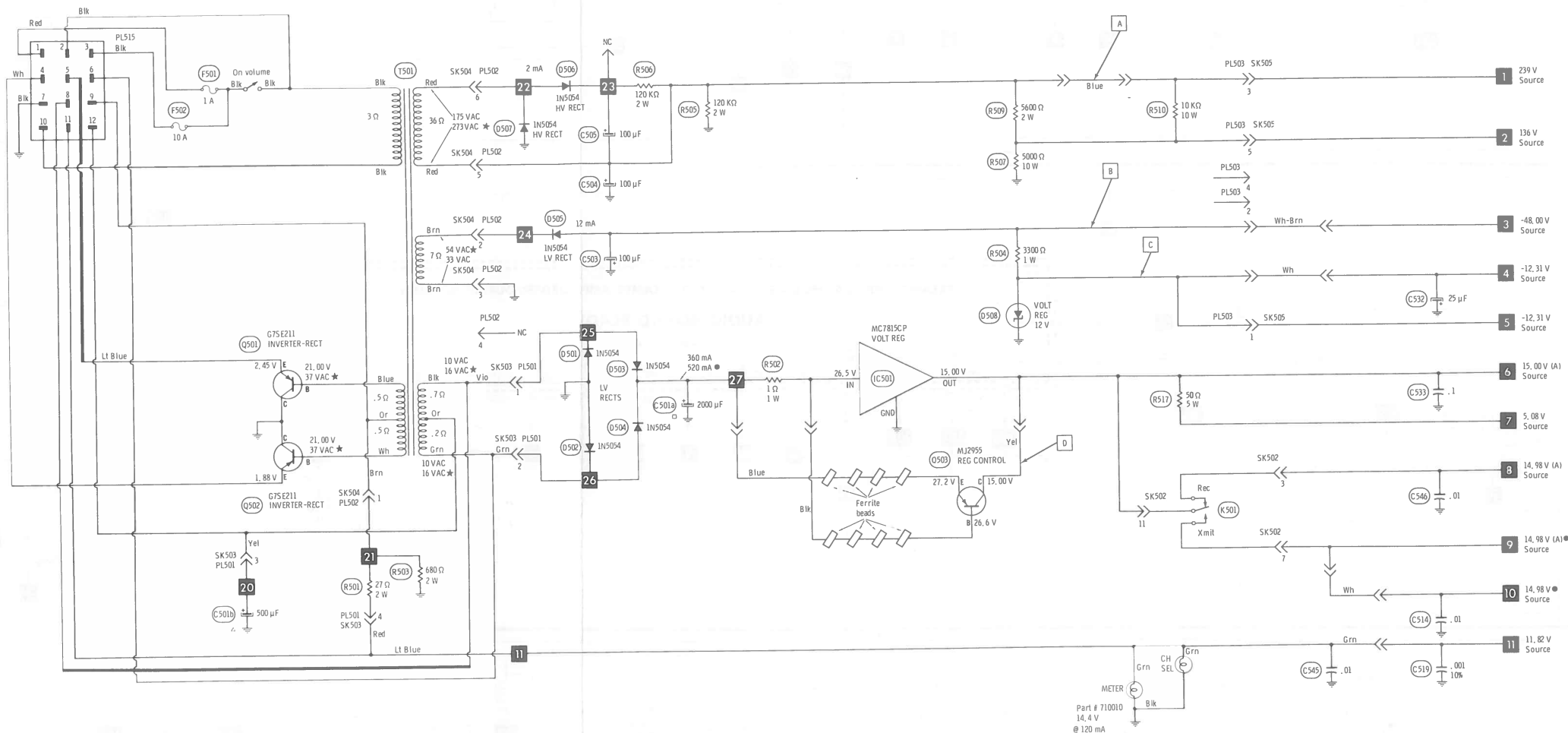
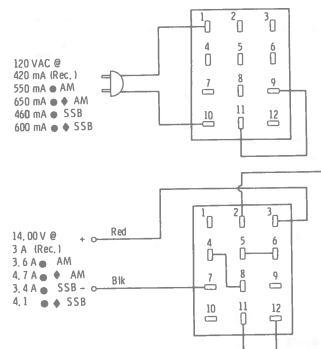


A PHOTOFAC STANDARD NOTATION SCHEMATIC
with **Circuitrace**
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HY-GAIN MODEL 623

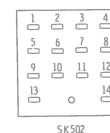
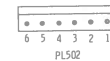
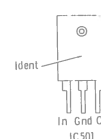




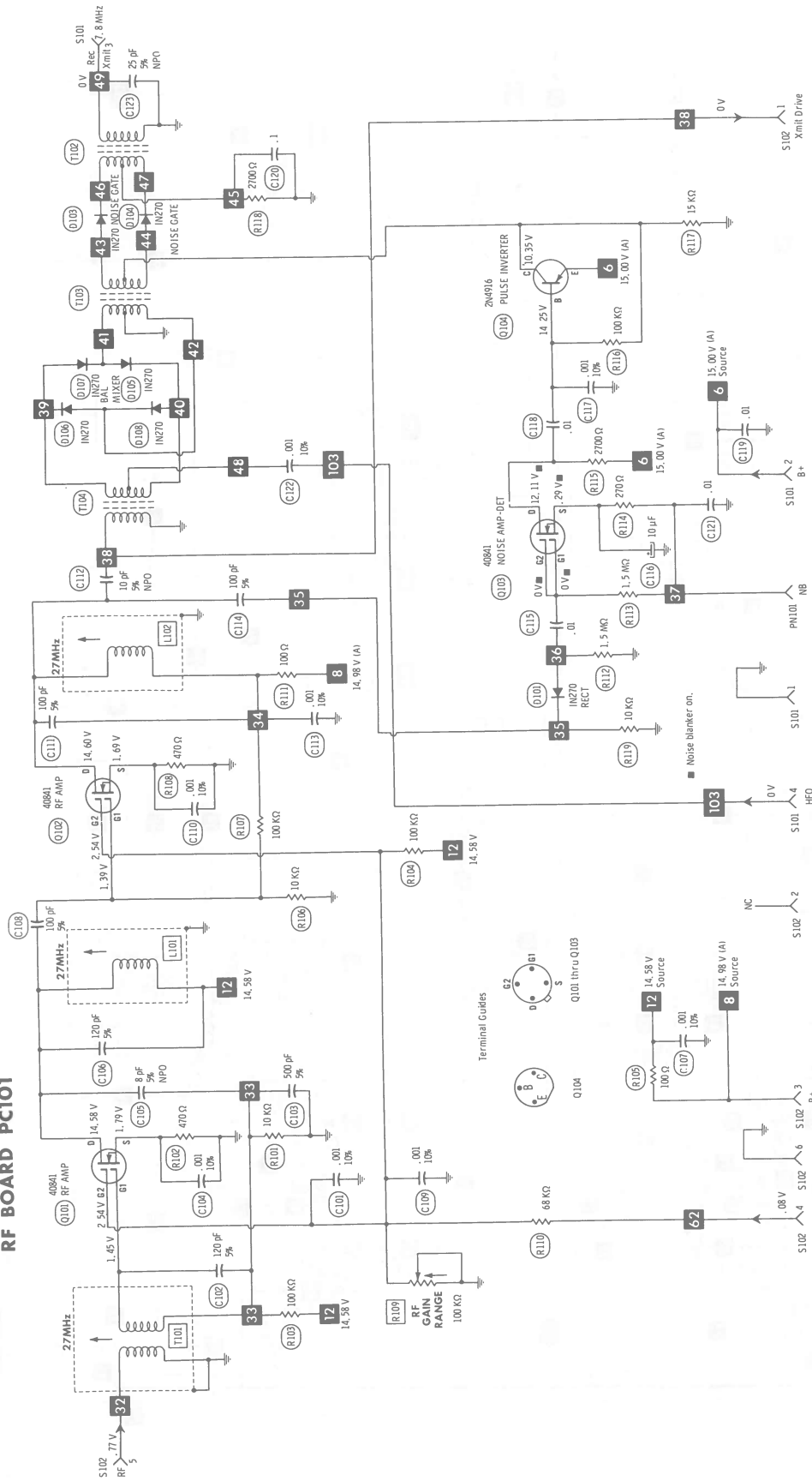
- ◆ 100% modulation.
- Noise blanker.
- ▲ Squelch control fully clockwise.
- Transmit.
- ★ Measured with 14.00 VDC Input
- Indicates chassis.
- Indicates ground. (Voltage reference unless otherwise noted).
- Indicates connection used in some versions.
- Indicates connection not used in some versions.
- Omitted in some versions.
- See parts list.
- Value varies; replace with original value.
- RF-IF coil resistance less than one ohm not given.
- Measurements taken with switching as shown unless otherwise noted.
- Values shown in () used in some versions.
- Resistors are 1/2 W. or less, 5% unless otherwise noted.
- Supply voltage maintained at rated value for measurements.
- Voltage measured with VTVM, no signal applied, controls adjusted for normal operation.
- Arrow on control indicates direction of advance.
- Numbers assigned to terminals may not be found on unit.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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Terminal Guides



RF BOARD PC101

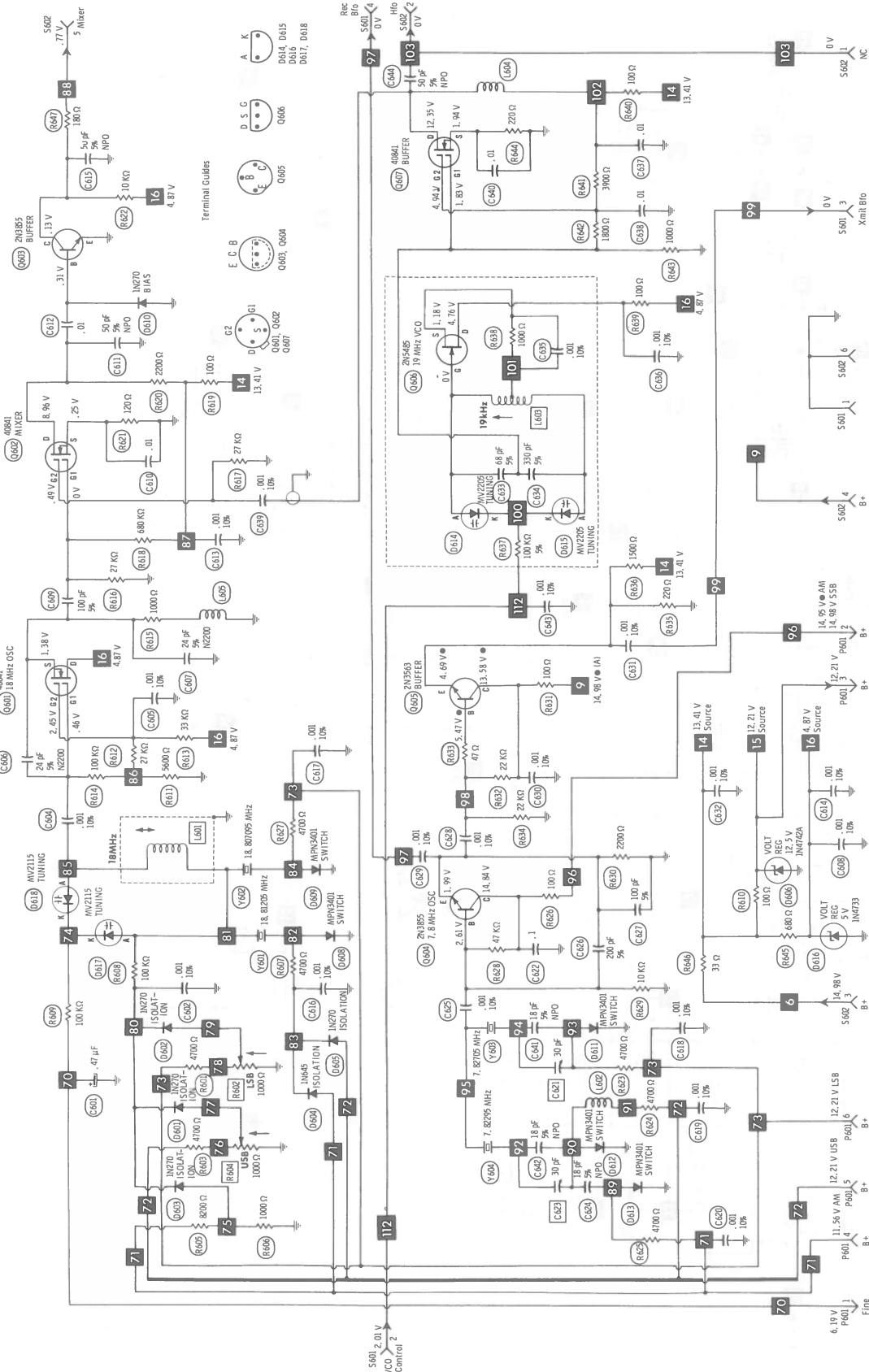


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HY-GAIN MODEL 623

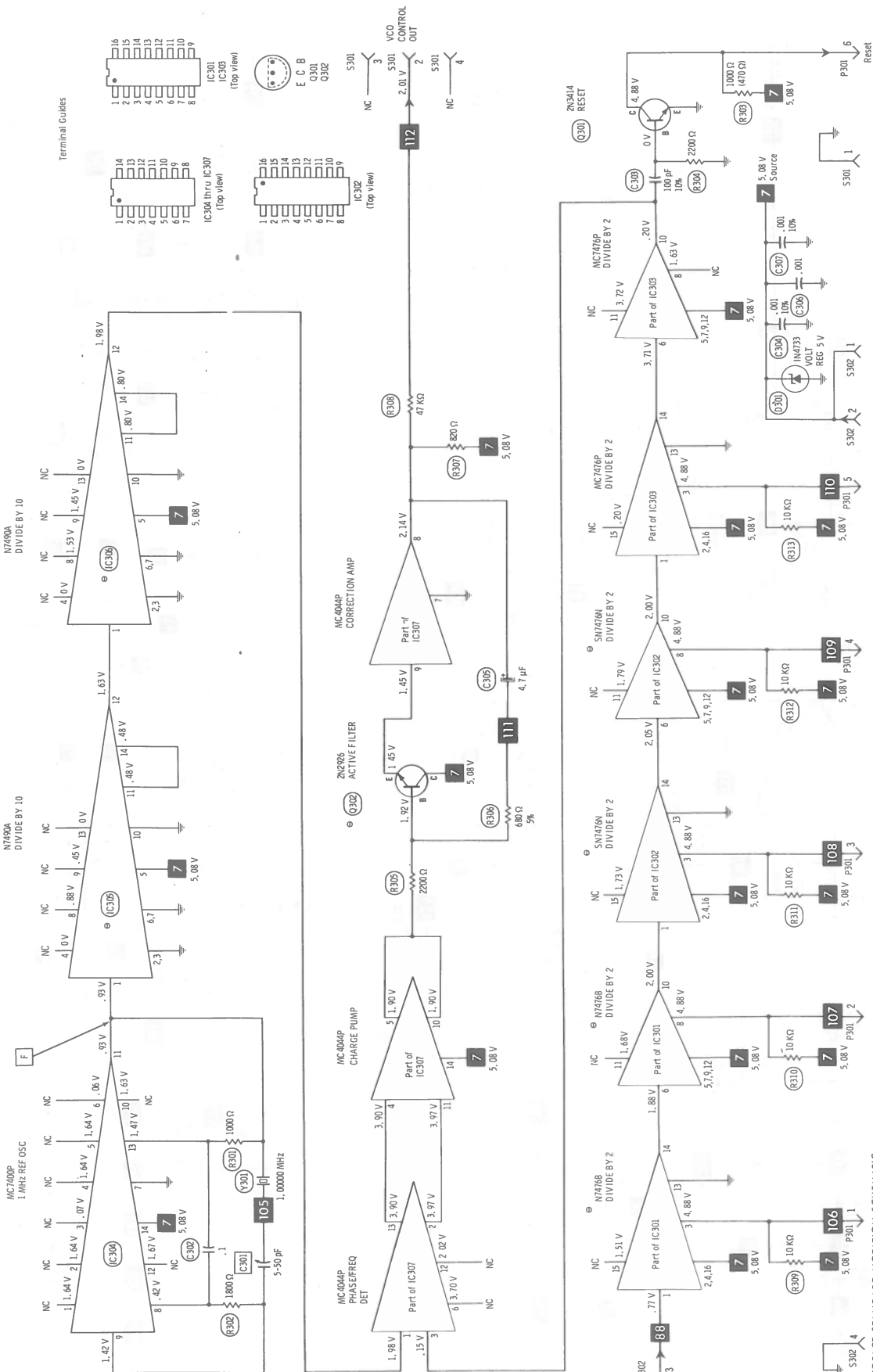
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OSC BOARD PC601



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PROGRAMMABLE DIVIDER BOARD PC301



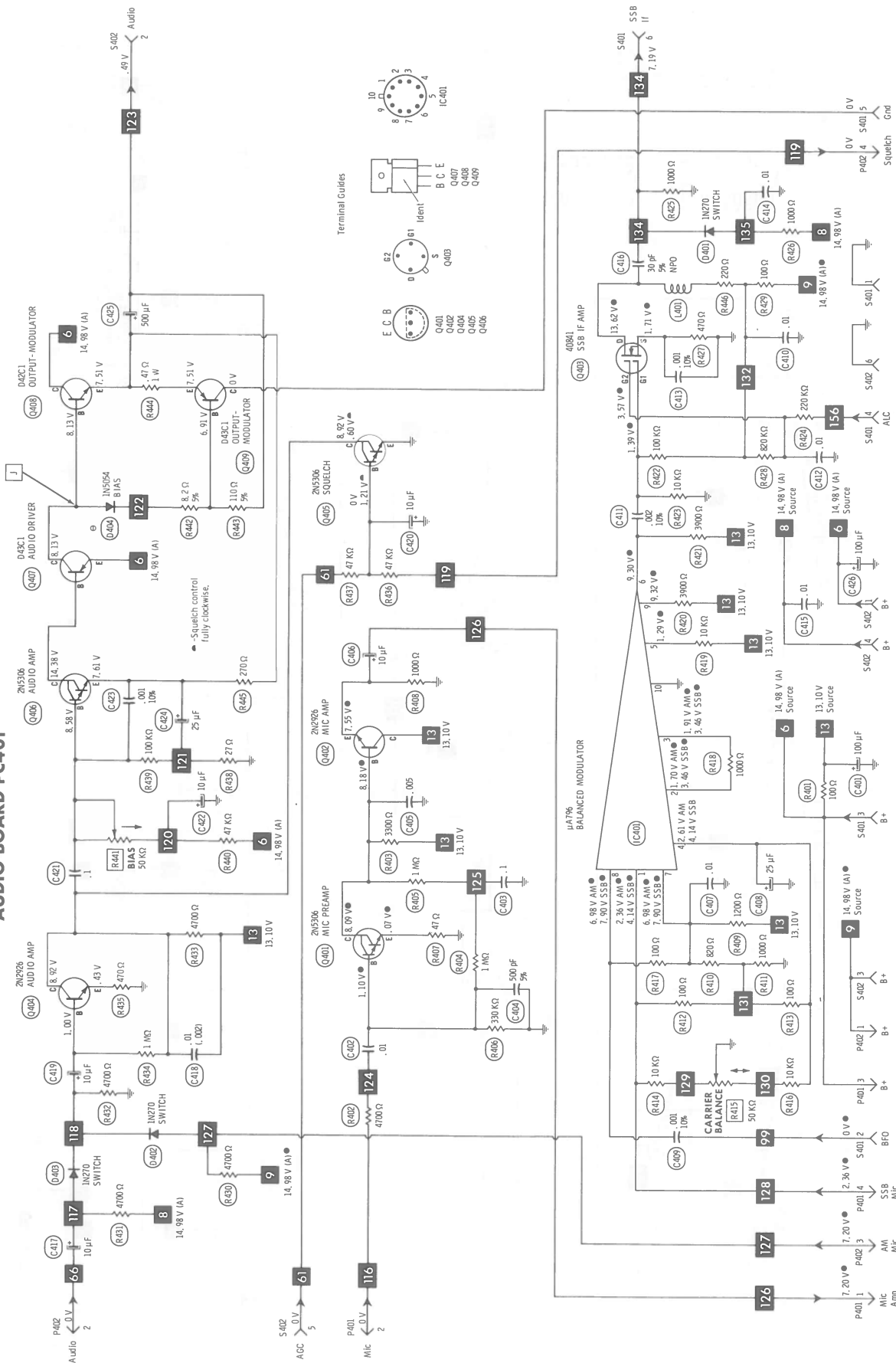
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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HY-GAIN MODEL 623

AUDIO BOARD PC401



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PARTS LIST AND DESCRIPTION

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

TUBES

AMPEREX			GENERAL ELECTRIC		RCA		SYLVANIA	
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V501	Final Amp	12JT6A						

SEMICONDUCTORS (Select replacement transistor for best results)

			REPLACEMENT DATA							
ITEM No.	TYPE No.	MFR. PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
RF BOARD										
D101	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D103	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D104	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D105	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D106	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D107	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D108	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
Q101	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222
Q102	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222
Q103	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222
Q104	2N4916	760269	GE-22	TR-19	PTC103	HEPS0013	RE 26	SK3025	RT-115	ECG 159
OSCILLATOR BOARD										
D601	1N270	765722	1N34AS	1N34A	PTC181	HEPR9134	RE 47	SK3087	RT-200	ECG109
D602	1N270	765722	1N34AS	1N34A	PTC181	HEPR9134	RE 47	SK3087	RT-200	ECG109
D603	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D604	1N645	761113	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D605	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D606	1N4742A	760304	GEZD-12	Z1212	PTC507	HEPZ0415	RE 118	SK3062	RT-243	ECG142
12.5V Zener										
IF BOARD (EARLY VERSION)										
D201	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
Q201	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222
Q202	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222
Q203	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222
Q204	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222
Q205	2N4916	760269	GE-22	TR-19	PTC103	HEPS0013	RE 26	SK3025	RT-115	ECG159
Q206	2N2926G	720240	GE-62	TR-51	PTC139	HEPS0015	RE 13	SK3018	RT-102	ECG123A
IF BOARD (LATE VERSION)										
D201	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D202	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D203	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D204	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
IC201	LM307N	760048								
	uL741 (1)									
IC202	LM307N	760048								
	uL741 (1)									
Q202	2N4916	760269	GE-22	TR-19	PTC103	HEPS0013	RE 26	SK3025	RT-115	ECG159
Q203	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222
Q204	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222
Q205	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222
Q206	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222
PROGRAM DIVIDER BOARD										
D301	1N4733	760298								
	5V Zener	(10)								
IC301	N7476B									
	MC7476P(1)	760015								
IC302	SN7476N									
	MC7476P(1)	760015								
IC303	MC7476P	760015								
IC304	MC7400P	760011								
IC305	N7490A									
	MC7490P(1)	760013								
IC306	N7490A									
	MC7490P(1)	760013								
IC307	MC4044P	760014								
Q301	2N341A	760251	GE-20	TR-24	PTC123	HEPC3806P	RE 13	SK3124	RT-102	ECG123A
Q302	2N2926		GE-62	TR-51	PTC139	HEPS0033	RE 13	SK3018	RT-102	ECG123A
	2N2626(1)	760236				HEPS0015				

HY-GAIN MODEL 623

PARTS LIST AND DESCRIPTION (CONTINUED)

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

SEMICONDUCTORS (Select replacement transistor for best results) (cont)

			REPLACEMENT DATA							
ITEM No.	TYPE No.	MFR. PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL RECTIFIER PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
AUDIO BOARD										
D401	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D402	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D403	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D404	1N5054		GE-510	R210	PTC205		RE 51	SK3081	RT-201	ECG125
IC401	1N5054A(1) uA796	765713								
	V5E7796393	760009								
Q401	2N5306	760012(9)	GE-64	TR-69	PTC153	HEPS9100	RE 33		RT-144	ECG172
Q402	2N2926	760239	GE-62	TR-51	PTC139	HEPS0015	RE 13	SK3018	RT-102	ECG123A
Q403	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222
Q404	2N2926	760239	GE-62	TR-51	PTC139	HEPS0015	RE 13	SK3018	RT-102	ECG123A
Q405	2N5306	760012(9)	GE-64	TR-69	PTC153	HEPS9100	RE 33		RT-144	ECG172
Q406	2N5306	760012(9)	GE-64	TR-69	PTC153	HEPS9100	RE 33		RT-144	ECG172
Q407	D43C1	760276	GE-29	TR-56	PTC111	HEPS5006	RE 43		RT-196	ECG187
Q408	D42C1(5)	760275	GE-28	TR-55	PTC110	HEPS5000	RE 42	SK3083	RT-197	ECG186
Q409	D43C1(5)	760276	GE-29	TR-56	PTC111	HEPS5006	RE 43		RT-196	ECG187
MAIN BOARD										
D501	1N5054	765713	GE-510	R210	PTC205		RE 51	SK3081	RT-201	ECG125
D502	1N5054	765713	GE-510	R210	PTC205		RE 51	SK3081	RT-201	ECG125
D503	1N5054	765713	GE-510	R210	PTC149		RE 51	SK3081	RT-201	ECG125
D504	1N5054	765713	GE-510	R210	PTC205		RE 51	SK3081	RT-201	ECG125
D505	1N5054	765713	GE-510	R210	PTC205		RE 51	SK3081	RT-201	ECG125
D506	1N5054	765713	GE-510	R210	PTC205		RE 51	SK3081	RT-201	ECG125
D507	1N5054	765713	GE-510	R210	PTC205		RE 51	SK3081	RT-201	ECG125
D508	1N4742	760304	GEZD-12	Z1212	PTC507	HEPZ0415	RE 118	SK3062	RT-243	ECG142
	12V Zener									
D509	1N270	755722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D510	1N270	755722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D511	1N270	755722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D512	1N645	761113	GE-504A	8D4	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D513	1N645	761113	GE-504A	8D4	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D514	1N645	761113	GE-504A	8D4	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D515	1N270	755722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D516	1N270	755722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D517	1N645	761113	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
IC501	MC7815CP					HEPC6114P				
	uA7800(1)	760017								
Q501	G7SE211									
	75E211(1)	760018								
Q502	G7SE211									
	75E211(1)	760018								
Q503	MJ2955	760021	GE-74			HEPS7001	RE 82		RT-148	ECG219
Q504	2N3563	760253	GE-61	TR-83	PTC133	HEPS0020	RE 10	SK3018	RT-108	ECG108
Q505	2N3866(11)	760284	GE-46	TR-65	PTC158		RE 79	SK3048		ECG195
D608	MPN3401	760007								
D609	MPN3401	760007								
D610	1N270	765722	1N34AS	1N34A	PTC207	HEPR9134	RE 47	SK3087	RT-200	ECG109
D611	MPN3401	760007								
D612	MPN3401	760007								
D613	MPN3401	760007								
D614	MV2205	760006				HEPR2502				
D615	MV2205	760006				HEPR2502				
D616	1N4733(10)	760298								
	5V Zener									
D617	MV2115	760019				HEPR2505				
D618	MV2115	760019				HEPR2505				
Q601	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222
Q602	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222
Q603	2N3855	760249	GE-62	TR-24	PTC115	HEPS0015	RE 9	SK3039	RT-108	ECG107
Q604	2N3855	760249	GE-62	TR-24	PTC115	HEPS0015	RE 9	SK3039	RT-108	ECG107
Q605	2N3563	760253	GE-61	TR-83	PTC133	HEPS0020	RE 10	SK3018	RT-108	ECG108
Q606	2N5485	760268	GE-FET-2	FE-100	PTC152	HEPF0021	RE 45	SK3116	RT-175	ECG132
Q607	40841	760005	GE-FET-4		PTC181	HEPF2004		SK3050	RT-181	ECG222

(1) Used in some versions.

(5) Half of complementary pair Q408 and Q409.

(9) Darlington pair.

(10) 5% 1 watt.

(11) Rating - 5watt @ 400mA.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA					
		MFGR. PART No.	ARCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C116	10 15V	721894	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C220	100 15V	721893	RME-E-E-100	EP15-100	PC100-16	MTV100CD15	EV-1230
C221	2 50V	721892	RME-A-J-002	EP50-2	PC2-100	VTT2R2A50	EV-1517
C222	5 15V	721888	ME-1-B-005	EA6-5	WBR5-50	MTA5D50	TVA-1099.84
C223	.47	722169				TDC474M050EL	SD50-R479
C224	.47	722169				TDC224M050EL	SD50-R229
C305	4.7 20V	720050				TDC474M050EL	SD35-R479
C401	100 25V	725678	ME-7-G-100	EA30-100	WBR100-25	MTA100F35	TVA-1207
C406	10 15V	721894	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C408	25 15V	721881	ME-2-E-025	EA15-25	WBR25-25	MTA25D20	TVA-1148
C417	10 15V	721894	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C419	10 15V	721894	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C420	10 15V	721894	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C422	10 15V	721894	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C424	25 15V	721881	ME-2-E-025	EA15-25	WBR25-25	MTA25D20	TVA-1148
C425	500 15V	721120	RME-L-E-500	EP15-500	PC500-16	MTV500DN15	EV-1250
C426	100 25V	725678	ME-7-G-100	EA30-100	WBR100-25	MTA100F35	TVA-1207
C501a	2000 35V	720069			BB0088A	FP070A	TVA-2231
b	500 25V						
C503	100 50V	720071	RME-K-J-100	EP50-100	PC100-50	MTV100DE50	EV-1530
C504	100 250V	720070	CTM-1651		WBR100-250	TC1265A	TVA-1522
C505	100 250V	720070	CTM-1651		WBR100-250	TC1265A	TVA-1522
C506	10 450V	721109	CTM-1822		WBR10-450	TC72A	TVA-1705
C526	10 15V	721894	RME-B-E-010	EP15-10	PC10-25	VTT10A25	EV-1222
C529	2.2 10%	722260				TDC224M050EL	SD50-2R29
C532	25 15V	721881	ME-2-E-025	EA15-25	WBR25-25	MTA25D20	TVA-1148
C601	.47 10%	722169				TDC474M050EL	SD50-R479

HY-GAIN MODEL 623

CAPACITORS

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA				
			ARCO/ELMenco PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C101	.001 10%	721625	CCD-102	DD-102		GP210	10TS-D10
C102	120 5%		DM10-121J	CPR-120J	CD10FD121J03	SX312	424MC1200J501
C103	500 5%		DM15-501J		CD15FD501J03		
C104	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C105	8 5% NPO						
C106	120 5%		DM10-121J	CPR-120J	CD10FD121J03	SX312	424MC1200J501
C107	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C108	100 5%		DM10-101J	CPR-100J	CD10FD101J03	SX310	424MC1000J501
C109	.001		CCD-102	DD-102		GP210	10TS-D10
C110	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C111	100 5%		DM10-101J	CPR-100J	CD10FD101J03	SX310	424MC1000J501
C112	10 5% NPO			DTZ-10	NP010	CN0470	10TCC-Q10
C113	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C114	100 5%		DM10-101J	CPR-100J	CD10FD101J03	SX310	424MC1000J501
C115	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C117	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C118	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C119	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C120	.1		1MDF-3-104		DPMS2P1	EWFTA010	1PB-P10
C121	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C122	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C123	25 5% NPO			DTZ-25	NP025	CN0425	10TCC-Q25
C201	68 5% NPO			DTZ-68	NP068	CN0468	10TCC-Q68
C202	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C203	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C204	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C205	.001 10%		CCD-102	DD-102		GP210	10TS-D10

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS(cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			ARCO/ELMENCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C206	.022	720181	1MDF-1-223	CPJ-223	DPMS2S22	EWF1A122	1PB-S22
C207	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C208	.022		1MDF-1-223	CPJ-223	DPMS2S22	EWF1A122	1PB-S22
C209	.001 10%		CCD-102	DD-102	GP210	GP210	10TS-D10
C210	.022		1MDF-1-223	CPJ-223	DPMS2S22	EWF1A122	1PB-S22
C211	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C212	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C213	.005 10%		CCD-502				10TS-D50
C214	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C215	47 5% NPO			DTZ-47	NP047	CNO447	10TCC-Q47
C216	330 5% 500V		DM15-331J	CPR-330J	CD15FD331J03	SX333	424ME3300J501
C217	30 5% NPO						
C218	500 10%						
C219	.01		CCD-501	DD-501	GP500	GP350	10TS-T50
C225	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C226	.005 10%		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C227	.01		CCD-502				10TS-D50
C228	.001		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C301	5-50		CCD-102	DD-102		GP210	10TS-D10
C302	.1	720051					
C303	100 10%		1MDF-3-104		DPMS2P1	EWF1A010	1PB-P10
C304	.001 10%		CCTO-101	DTZ-100	NP0100	CNO310	10TCC-T10
C306	.001		CCD-102	DD-102		GP210	10TS-D10
C307	.001 10%		1MDF-1-102	CPJ-102	DPMS6D1	EWF1A210	1PB-D10
C402	.01		CCD-102	DD-102		GP210	10TS-D10
C403	.1		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C404	500 5%		1MDF-3-104		DPMS2P1	EWF1A010	1PB-P10
C405	.005		DM15-501J		CD15FD501J03		
C407	.01		CCD-502				10TS-D50
C409	.001 10%		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C410	.01		CCD-102	DD-102		GP210	10TS-D10
C411	.002 10%		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C412	.02		CCD-202			GP220	10TS-D20
C413	.001 10%		CCD-203			GP120	5GA-S20
C414	.01		CCD-102	DD-102		GP210	10TS-D10
C415	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C416	30 5% NPO	721627	CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C418	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C421	.1		1MDF-3-104		DPMS2P1	EWF1A010	1PB-P10
C423	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C507	.005 10%		CCD-502				10TS-D50
C508	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C509	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C510	.01						
C511	68 5% NPO		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C512	.01		CCD-103	DTZ-68	NP068	CNO468	10TCC-Q68
C513	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C514	.001 10%		CCD-102	DD-102	GP10000	MAG5011	2SS-S10
C515	.1		1MDF-3-104		DPMS2P1	EWF1A010	1PB-P10
C516	20 5% NPO			DTZ-20	NP020	CNO420	10TCC-Q20
C517	150 5%		DM10-131J	CPR-130J	CD7FD131J03	SX313	424MC1300J501
C518	5 10%		CCTO-050				10TCC-V50
C519	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C520	.005 10%		CCD-502				10TS-D50
C521	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C522	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C523	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C524	15-20	720078 720077					
C525	100-550						
C527	5 10%		CCTO-050				10TCC-V50
C528	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C530	.001		CCD-102	DD-102		GP210	10TS-D10
C531	.022		1MDF-1-223	CPJ-223	DPMS2S22	EWF1A122	1PB-S22
C533	.1		1MDF-3-104		DPMS2P1	EWF1A010	1PB-P10
C539	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C540	.001		CCD-102	DD-102		GP210	10TS-D10
C541	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C542	68 5% NPO			DTZ-68	NP068	CNO468	10TCC-Q68
C543	100 5%		DM10-101J	CPR-100J	CD10FD101J03	SX310	424MC1000J501
C544	200 5%		DM10-201J	CPR-200J	CD10FD201J03	SX320	424ME2000J501
C545	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C546	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-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				
			ARCO/ELMENCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C547	.01	720079	CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C602	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C604	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C605	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C606	24 5% N2200						
C607	24 5% N2200	720079					
C608	.001 10%	720046	CCD-102	DD-102	CD10FD101J03	GP210	10TS-D10
C609	100 5%		DM10-101J	CPR-100J	DPMS4S1	SX310	424MC1000J501
C610	.01		1MDF-1-103	CPJ-103	NP050	EWFA1A110	1PB-S10
C611	50 5% NPO			DTZ-50	GP10000	CN0450	10TCC-Q50
C612	.01		CCD-103	DC-103		MAG5011	2SS-S10
C613	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C614	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C615	50 5% NPO			DTZ-50	NP050	CN0450	10TCC-Q50
C616	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C617	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C618	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C619	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C620	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C621	4-30	720046					
C622	.1	720046	1MDF-3-104		DPMS2P1	EWFA010	1PB-P10
C623	4-30						
C624	18 5% NPO					CN0418	10TCC-Q18
C625	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C626	200 5%		DM10-201J	CPR-200J	CD10FD201J03	SX320	424ME2000J501
C627	100 5%		DM10-101J	CPR-100J	CD10FD101J03	SX310	424MC1000J501
C628	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C629	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C630	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C631	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C632	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C633	68 5%		DM10-680J	CPR-68J	CD6ED680J03	SX468	424MC680J501
C634	330 5%		DM15-331J	CPR-330J	CD15FD331J03	SX333	424ME3300J501
C635	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C636	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C637	.01	720046	CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C638	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C639	.001 10%		CCD-102	DD-102	GP10000	GP210	10TS-D10
C640	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C641	18 5% NPO					CN0418	10TCC-Q18
C642	18 5% NPO					CN0418	10TCC-Q18
C643	.001 10%			DD-102		GP210	10TS-D10
C644	50 5% NPO		CCD-102	DTZ-50	NP050	CN0450	10TCC-Q50

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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.
R109	RF Gain Range	100K	720063	720063			
R232	"S"	100K	720063				
R233	AGC	1000	720045				
R257	AGC	100K	720042				
R415	Carrier Balance	50K	721487	TSV-50K or T-50K	C-503	MTC54L1	X201R503B
R441	Bias	50K	721487	TSV-50K or T-50K	C-503	MTC54L1	X201R503B
R513	Fine Tuning	10K	720120				
R515	Fine Tuning Range	10K	721462	TSV-10K (3) or T-10K (3)	C-103 (3)	MTC14L4	U201R103B
R516	RF Gain	10K	720053	F1-10K, SN100	A47-10K-S, RN-3 or [NP-10K-S, NML-A-300]	BU1,CF9,SS6A	UA14L,SN750 or [RU14L,SL38, SN750]
R518	Bias	10K	721462	TSV-10K (3) or T-10K (3)	C-103 (3)	MTC14L4	U201R103B

PARTS LIST AND DESCRIPTION (CONTINUED)

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

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

ITEM No.	FUNCTION	RESIST-ANCE	REPLACEMENT DATA				
			MFGR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
R526 R527 R528	SWR Null RF Meter SWR CAL.	220 10K 10K	720066 720067 720053	F1-10K, SN100	A47-10K-S,RN-3 or [NP-10K-S, NML-A-300]	BU1,CF9,SS6A	UA14L,SN750 or [RU14L,SL38, SN750]
R530	MIC Gain	500K	720052	F1-500K, SN100	A47-500K-S,RN-3 or [NP-500K-S, NML-A-300]	BU1,CF16,SS6A	UA55L,SN750 or [RU55L,SL38, SN750]
R531	Squelch/NB	10K	720054	F1-10K, SN100,KR-1	A47-10K-S,RN-3, SWE-12 or NP-10K-S, NML-A-300, NWE-12]	BU1,CF9,SS6A,GC	UA14L,SN750,US41 or [RU14L,SL38, SN750,US41]
R532	Volume/Power Switch	10K	720055	F2-10K, SN100,KR-1	A47-10K-Z,RN-3, SWE-12 or [NP-10K-Z, NML-A-300, NWF-12]	BU1,CF61,SS6A,GC	UA14A,SN750,US41 or [RU14A,SL38, SN750,US41]
R602 R604	LSB USB	1000 1000	720045 720045				

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFGR. PART No.			WORKMAN PART No.	MFGR. PART No.
R507 R508	5000 10W 1500 10W	10W-SQ5K 10W-SQ1.5K	721516 720068	R510 R517	10K 10W 50 5W	10W-SQ10K 5W-SQ50	721524 721503

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L101	1st RF Amp (27MHz)	720057			(1) IF Board-Early Version. (2) IF Board-Late Version.
L102	2nd RF Amp (27MHz)	720058			
L401	RF Choke (15uH)	721929		72F155AP	
L501	RF Choke (22uH)	721925		72F225AP	
L502	RF Choke (22uH)	721925		72F225AP	
L503	RF Choke (22uH)	721925		72F225AP	
L506	RF Choke (.33uH)	721922		4586	
L601	18MHz Osc.	720044			
L602	RF Choke (220uH)	721927		72F224AP	
L603	VCO Osc.	720043			
L604	RF Choke (12uH)	720047		74F126AP	
L605	RF Choke (22uH)	721925		72F225AP	
P501	Parasitic Choke (4 Turns)	720072			
RFC201	RF Choke (27uH)	720056		72F275AP	
RFC202	RF Choke (27uH)	720056		72F275AP	
RFC203	RF Choke (22uH)	720083 (1)		72F225AP	
RFC203	RF Choke (22uH)	720179 (2)		72F225AP	
T101	RF Input (27MHz)	720057			
T102	Mixer Output (7.8MHz)	720062			
T103	Mixer Output (7.8MHz)	720060			
T104	Mixer Input (19MHz)	720061			
T201	Input IF (7.8MHz)	720059			

PARTS LIST AND DESCRIPTION (CONTINUED)

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

TRANSFORMER

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T202	2.5	1		735623 735623 (1)			(1) Number on unit.

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T502	1	25		730016 A3332 (1)			(1) Number on unit.

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TRANSFORMER (Power)

ITEM No.	RATING			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T501	120V AC @ .65A AC	175V AC @ .145A AC	74V AC-CT @4.7A AC	730017 730017 (1)			(1) Number on unit.
	SEC. 3	SEC. 4	SEC. 5				
	33V AC @ .024A AC	20V AC-CT @.88A AC					

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP501	4" PM, 3.2 Ohms	730015	4A05	

PARTS LIST AND DESCRIPTION (CONTINUED)

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

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
F501	1 Amp, MDL, S10-b10	710019	710206	MDL-1	4401	313001	357002	FG1-2
F502	10 Amp, 3AG	710235	710206	MDL-10	4401	313010	357002	

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF501	Crystal Filter	780055	7.825MHz
K501	Relay	730006	Transmit/Receive
ME501	Meter	790003	S/Rf/SWR
S502	Switch	700011	Mode
S503	Switch	700020	Channel Selector
S505	Switch	700021	Power/Calibrate/SWR
Y301	Crystal	780054	1MHz
Y601	Crystal	780052	18,812,050Hz
Y602	Crystal	780053	18,807,950Hz
Y603	Crystal	780051	7,827,050Hz
Y604	Crystal	780050	7,822,950Hz
PC101	Printed Circuit Board	750135	RF
PC201	Printed Circuit Board	750016	IF, Early Version
PC201	Printed Circuit Board	750029	IF, Late Version
PC301	Printed Circuit Board	750027	Programmable Divider
PC401	Printed Circuit Board	765722	Audio Amplifier
PC601	Printed Circuit Board	750123	Oscillator

ACCESSORIES

ITEM	MFGR. PART No.	REMARKS
AC Power Cord	S-312-CCTL	(12 Pin Plug)

WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 12 Colors
	8524 (Stranded) Available in 12 Colors
Power Cord, 2-Wire	Use BELDEN No. 17106 (Plastic) or 17126 (Rubber) -6 feet
	17109 (Plastic) or 17129 (Rubber) -9 feet
Shielded Antenna Lead	Use BELDEN No. 8214 Lowest-loss (RG-8/U Type)
	8237 Low-loss (RG-8/U)
	8240 (Solid) Miniature (RG-58/U)
	8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene
	8491 4-Conductor (2 shielded, 2 unshielded) Neoprene
Ignition Noise Suppression	Use BELDEN No. 7300-Series Spark-Plug Sets
Bonding Strap	Use BELDEN No. 8661 (3/8 inch)