



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.



STANDARD COMMUNICATIONS MODEL HORIZON 29A

MODEL Horizon 29A

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

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Printed in U. S. of America

7CE526

ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools: L205, L206, L207.....5000, 8290 ALL Other Tunable Coils and Transformers....9440	GC ELECTRONICS:
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SYNTHESIZER

INDICATOR	CHANNEL	ADJUST	FREQUENCY	REMARKS
OSCILLOSCOPE (To 30MHz) Input of oscilloscope and counter to TP1, common to ground.	19	L5	5.120MHz	Adjust for maximum amplitude at 5.120MHz.
Input of DC VTVM to TP5, common to ground.	19	L2		Adjust for 2.10V DC on VCO.
Input of counter to TP1, common to ground.	19	VR205	21.610MHz	Key transmitter. Adjust for frequency.
OSCILLOSCOPE (To 30MHz) Input of oscilloscope and counter to TP1, common to ground.	19	L1	21.610MHz	Adjust for maximum amplitude at 21.610MHz.
Input of DC VTVM to TP5, common to ground.	19	L2		Readjust for 2.10V DC on VCO.

RECEIVER

Connect an AC VTVM or AF Wattmeter across speaker voice coil.
 Adjustments made with 13.8-volt DC input.
 Adjust volume control to obtain suitable reading.

SIGNAL GENERATOR	GEN FREQ	CHANNEL	ADJUST	REMARKS
High side thru .01uF to base of TR203. low side to ground.	455kHz, 1000Hz @ 30% modulation output	Any	L205,L206, L207	Set noise blanker off. Set squelch maximum counterclockwise. Set generator output low enough to prevent AGC limiting.
High side thru .01uF to antenna jack. low side to ground.	27.185MHz, 1000Hz @ 30% modulation Output 1uV.	19	L201,L202, L203,L204	Set generator output low enough to prevent AGC limiting.

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF Wattmeter across speaker voice coil.
 These adjustments made with 13.8-volt DC input,
 Adjust volume control to obtain a suitable reading.

SIGNAL GENERATOR	GEN FREQ	CHANNEL	ADJUST	REMARKS
AGC High side thru .01 uF to antenna jack, low side to ground.	27.185MHz, 1000Hz @ 30% modulation, output 50,000uV.	19	VR202	Adjust volume control to obtain 0 db. Decrease generator to 50uV. Adjust so that signal does not drop more than 10db.
SQUELCH RANGE High side thru .01 uF to antenna jack, low side to ground.	27.185MHz, 1000Hz @ 30% modulation, Output 500uV.	19	VR208	Set squelch control fully clockwise. Adjust VR208 so that squelch just breaks.

RECEIVER ADJUSTMENTS (cont)

SIGNAL GENERATOR	GEN FREQ	CHANNEL	ADJUST	REMARKS
NOISE BLANKER High side thru .01 uF to antenna jack, low side to ground.	23.5MHz, 1000Hz @ 30% modulation,	Any	L221,L222	Noise blanker on. Input of VTVM to TP204, common to ground. Set generator output to obtain reading. Adjust for maximum.
DELTA TUNE Frequency counter	Delta tune - center frequency at TP1, 21.610MHz	19	VR214 VR206	Input of counter to TP1, common to ground. Set Delta tune fully counterclockwise. Adjust for 21.6085MHz. Input of counter to TP1, common to ground. Set Delta tune fully clockwise. Adjust for 21.6115MHz.
S METER High side thru .01uF to antenna jack, low side to ground.	27.185MHz 1000Hz @ 30% modulation. Output 100uV	19	VR212	Adjust for S9 on panel meter.

TRANSMITTER

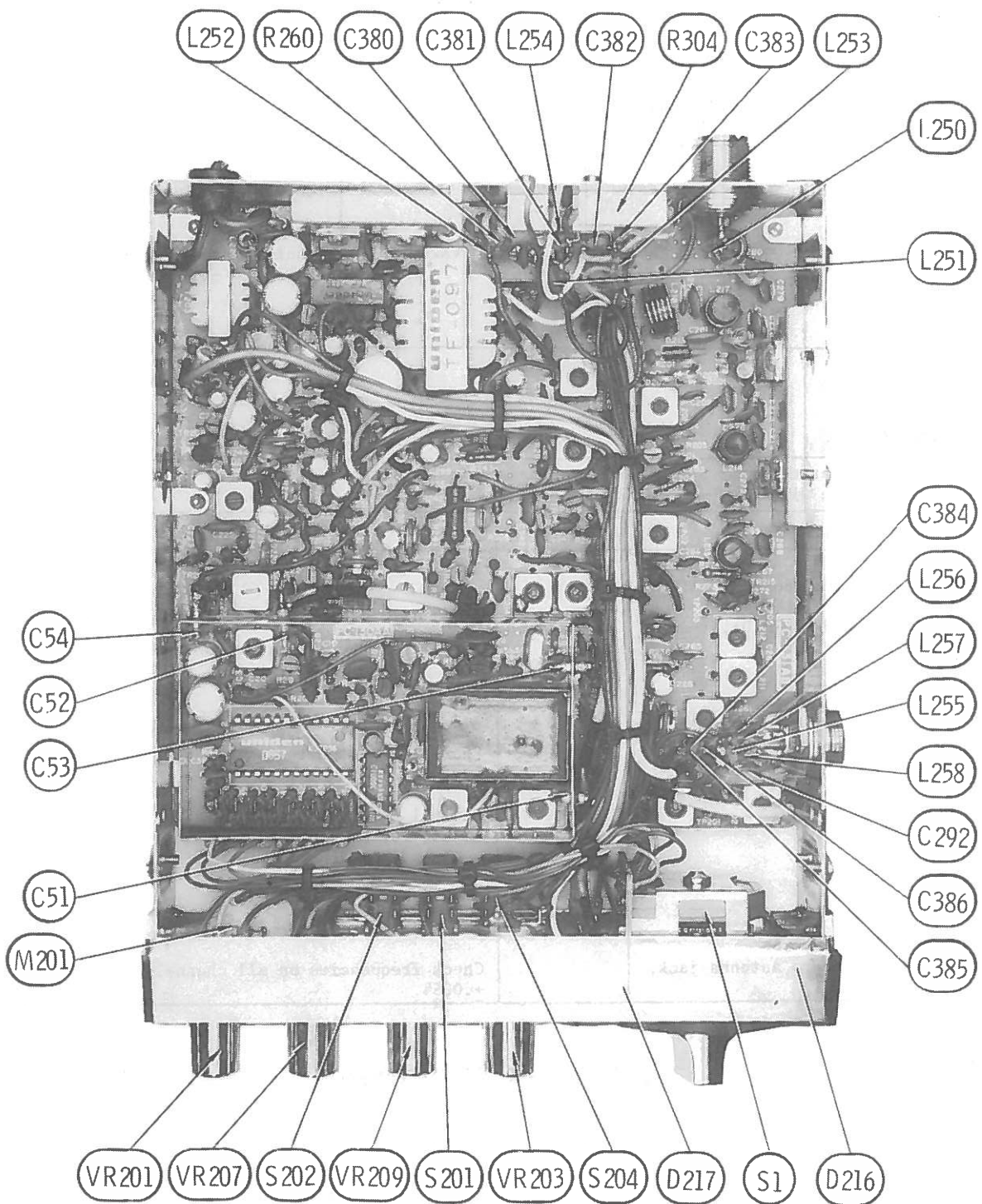
Connect an RF Wattmeter or 50-ohm, 25-watt dummy load to antenna connector.
Adjustments made with 13.8-volt DC input.

INDICATOR	ADJUST	REMARKS
OSCILLATOR, MIXER, BUFFER, DRIVER, FINAL Input of RF VTVM to TP201, common to ground.	L208	Key transmitter. Adjust for maximum.
Input of RF VTVM to TP203, common to ground.	L209,L210, L211,L212	Channel selector to Ch. 19. Key transmitter. Adjust for maximum.
RF Wattmeter	L213,L214, L217	Channel selector to Ch. 19. Key transmitter. Adjust for maximum.
OUTPUT POWER RF Wattmeter	L217	Key transmitter. Adjust for 3.8 watts output.
FREQUENCY CHECK Input of counter to antenna jack, common to ground.		Check frequencies on all channels, must be $\pm .005\%$.

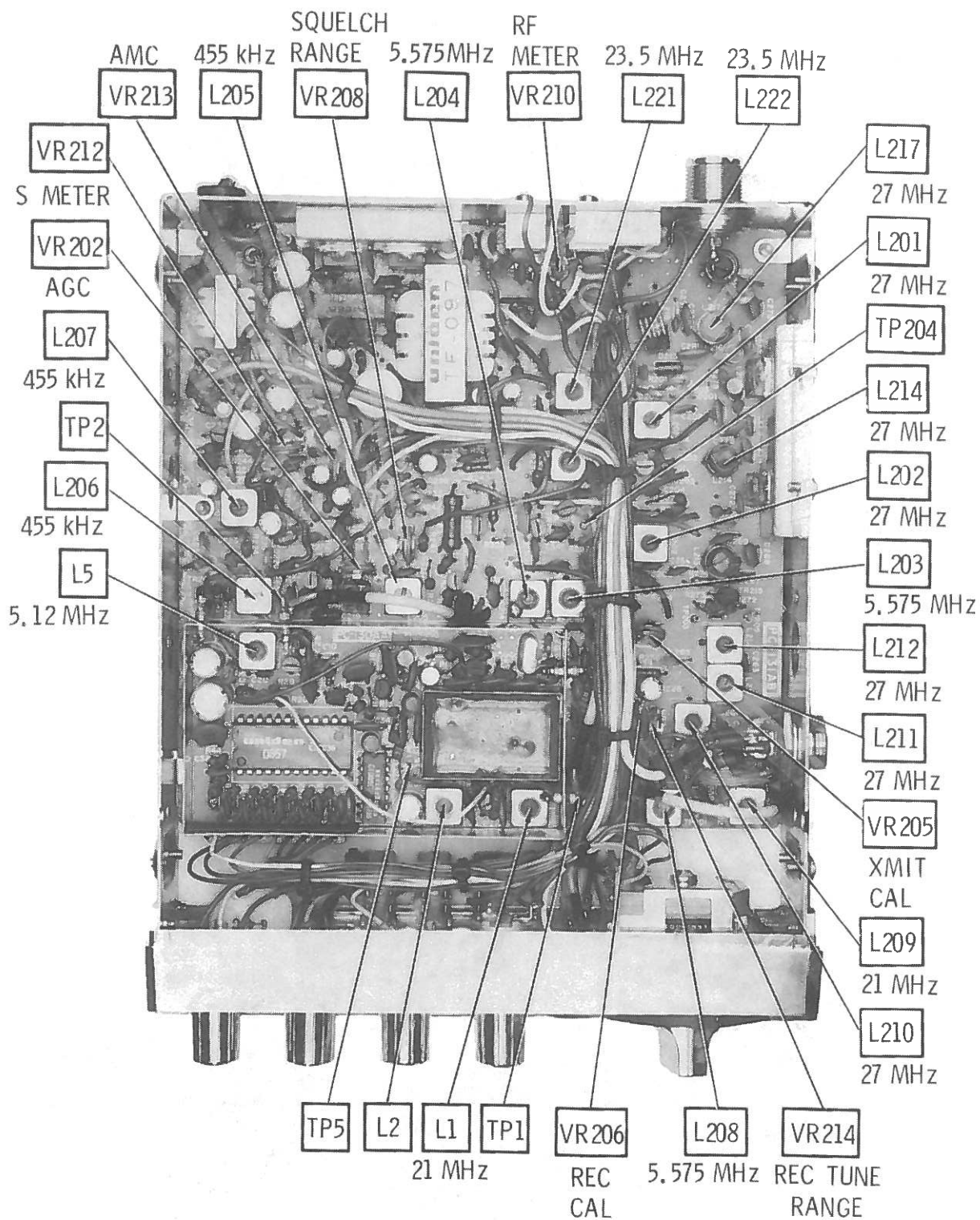
TRANSMITTER ADJUSTMENTS

Connect an RF Wattmeter or 50-ohm, 25-watt dummy load to antenna connector.
Adjustments made with 13.8-volt DC input.

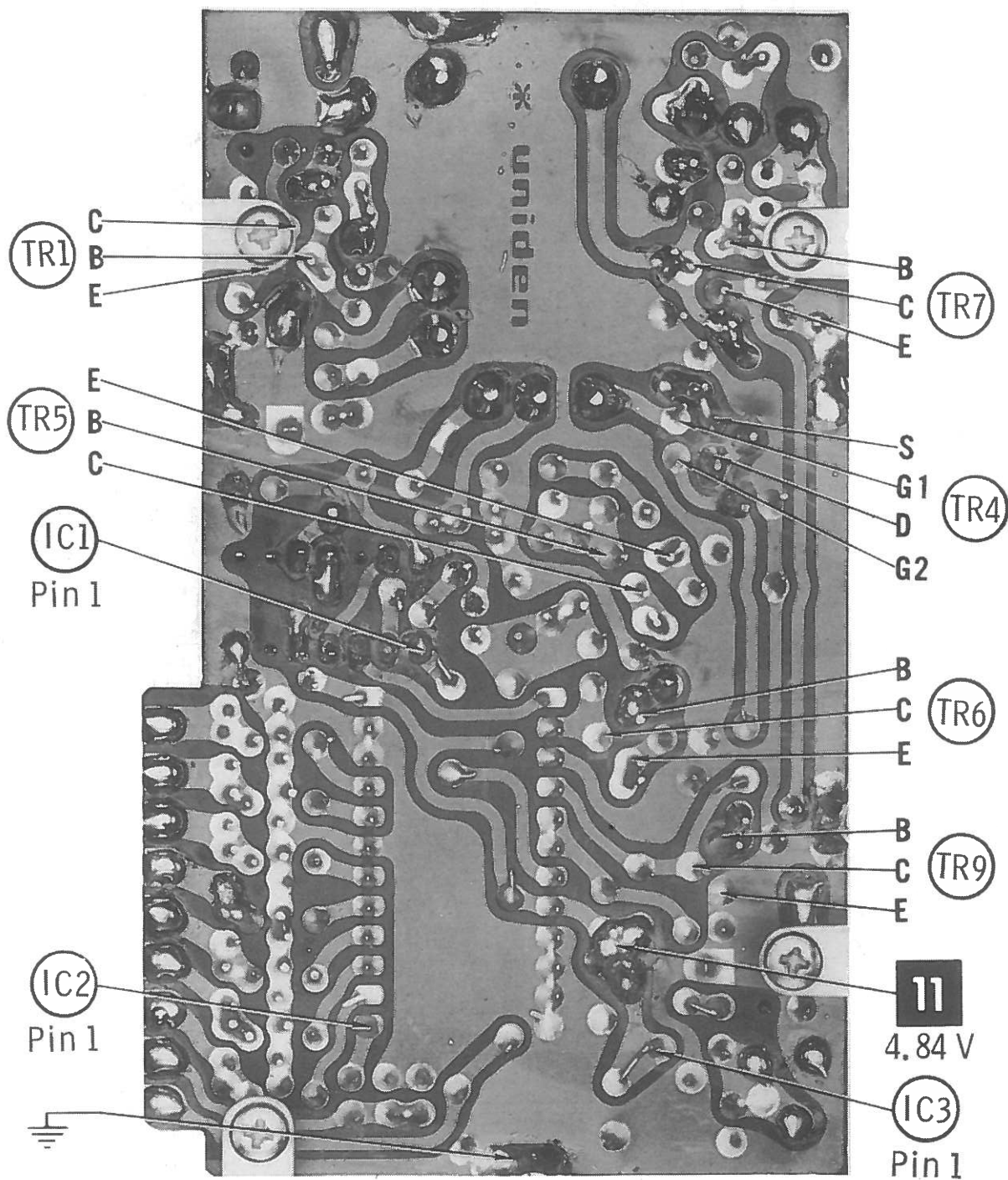
INDICATOR	ADJUST	REMARKS
AMC Input of modulation meter to antenna jack, common to ground	VR213	Disable AMC. Inject a 1000Hz signal at mic input to produce 110% modulation. Restore AMC operation. Adjust VR213 for 90% modulation maximum.
RF PANEL METER RF Wattmeter	VR210	Key transmitter. Adjust so that panel RF meter needle is at right edge of black scale.



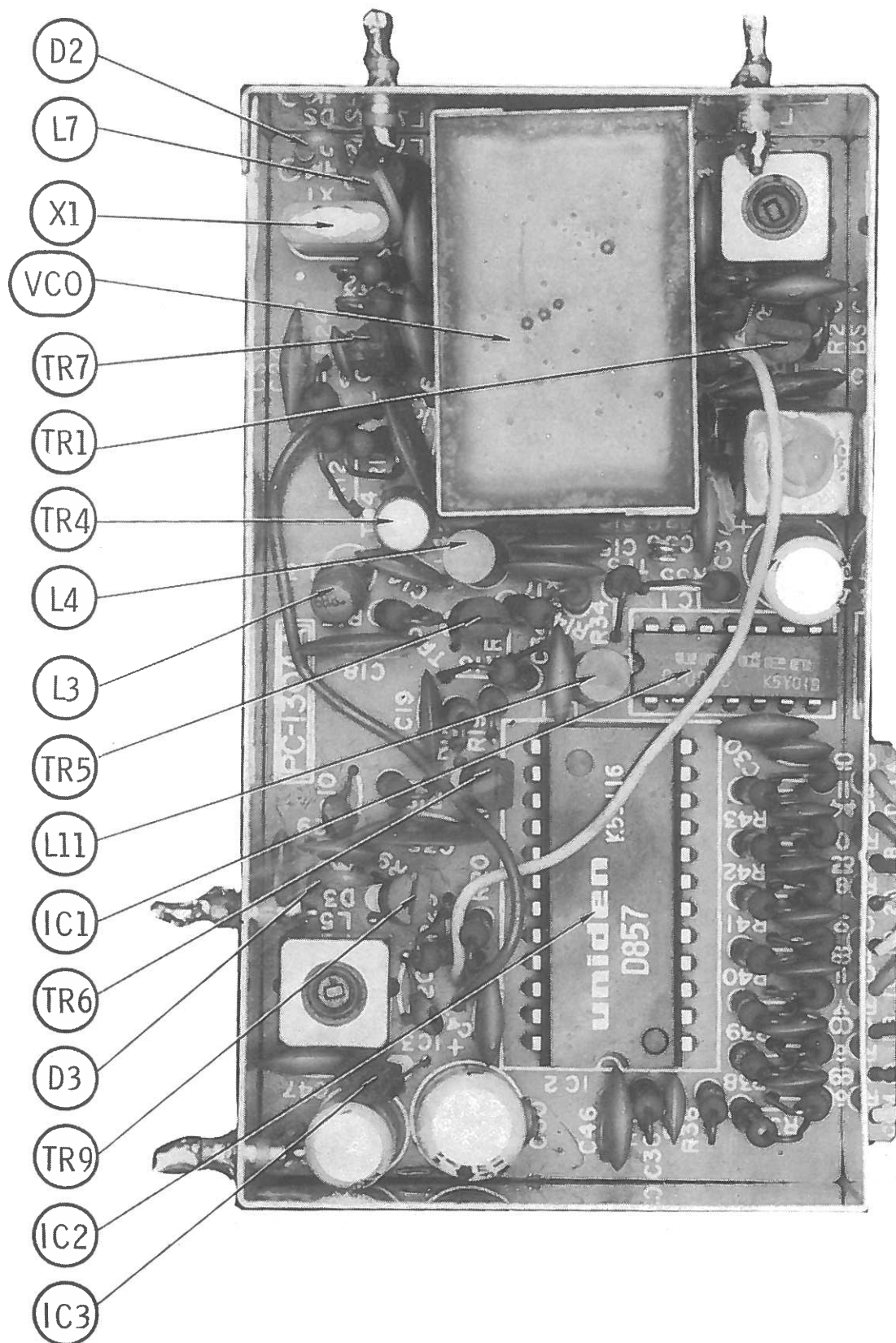
CHASSIS-BOTTOM



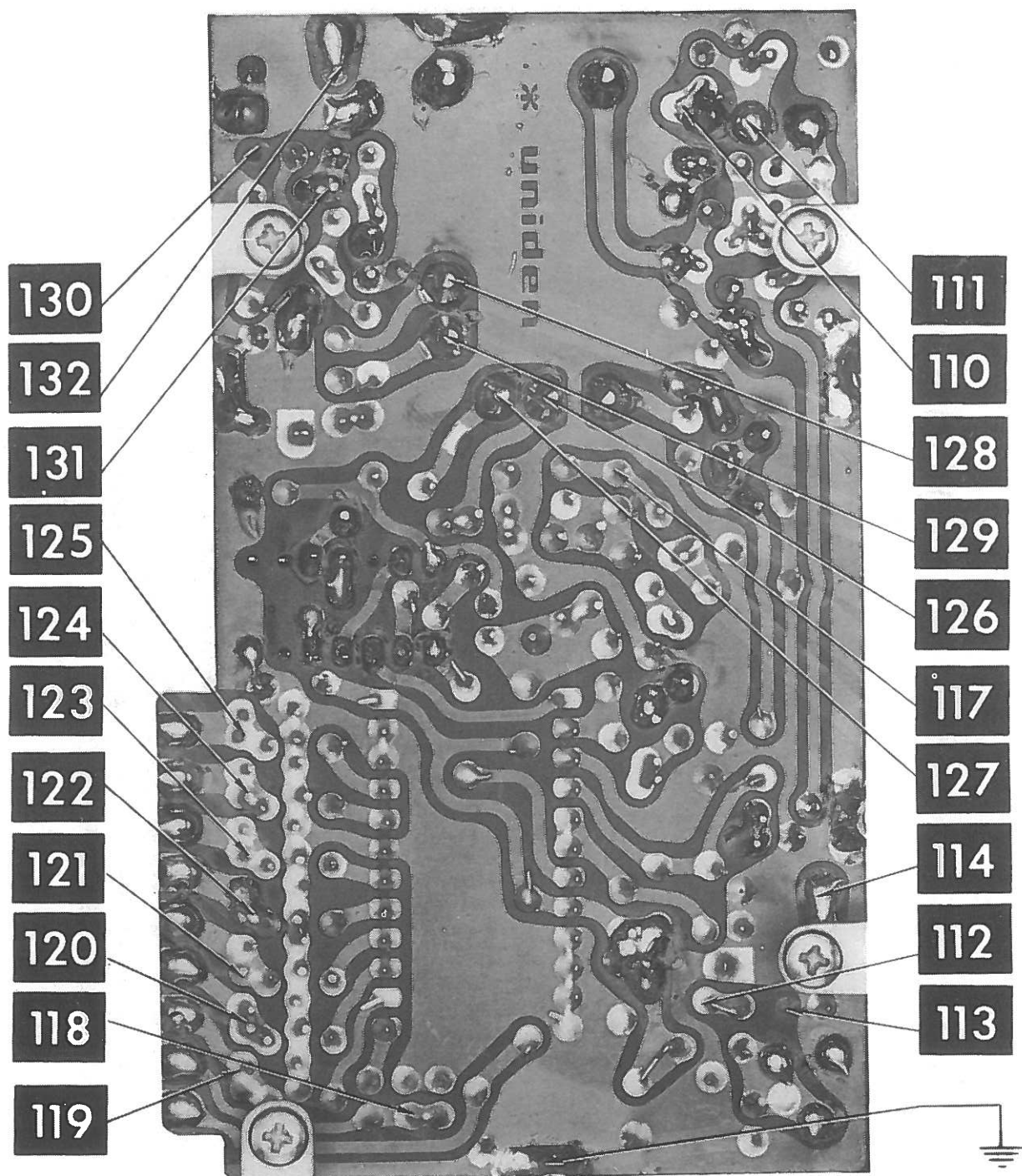
CHASSIS-BOTTOM



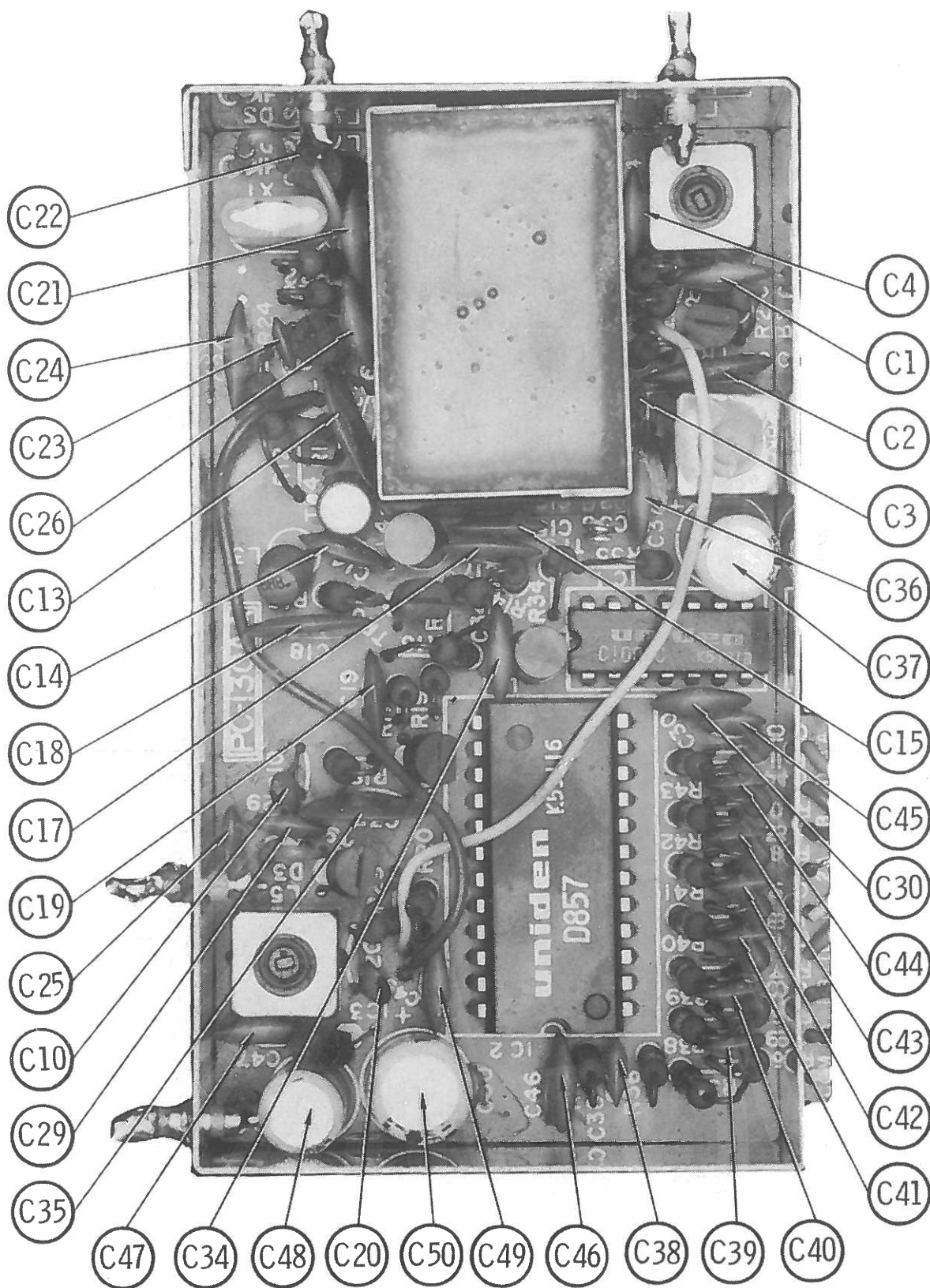
SYNTHESIZER BOARD



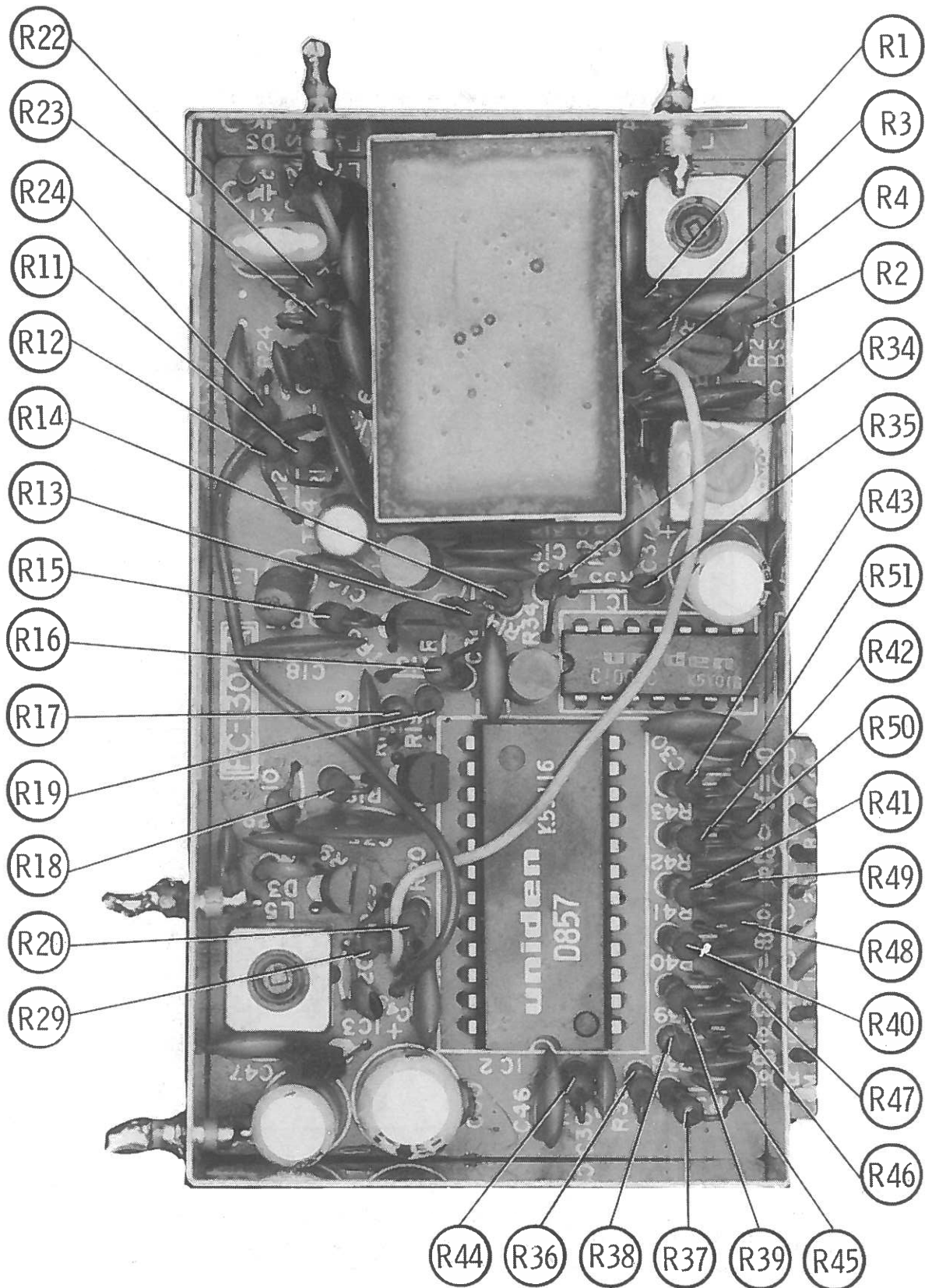
SYNTHESIZER BOARD



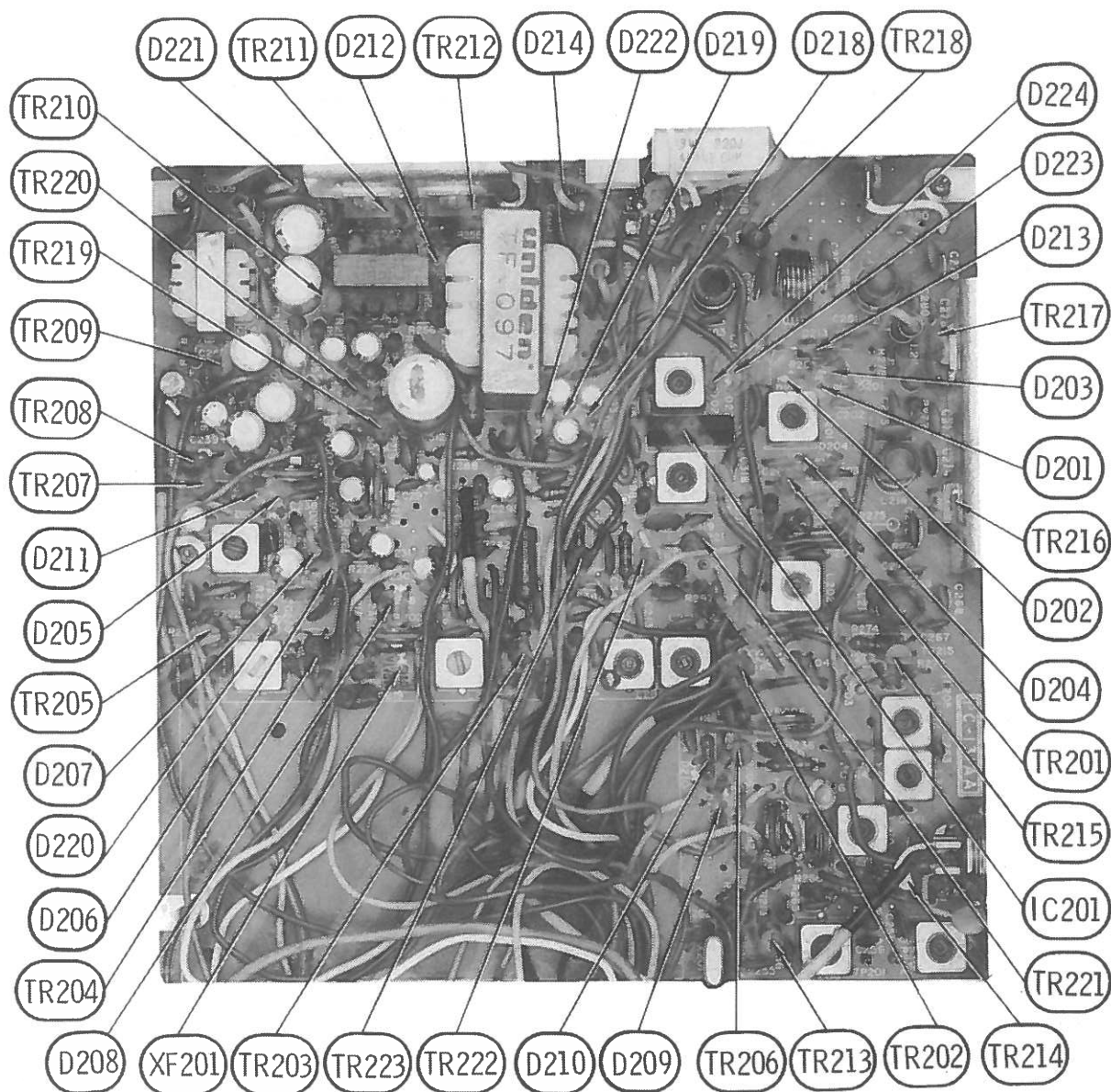
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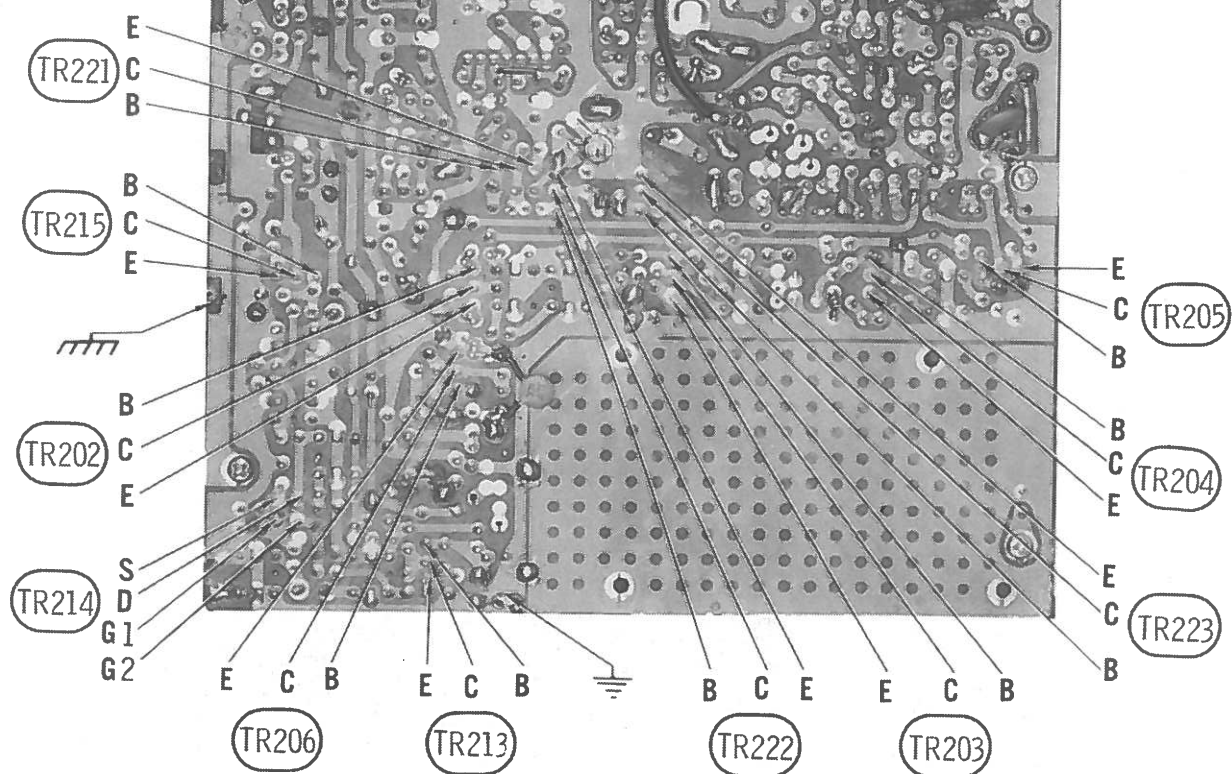
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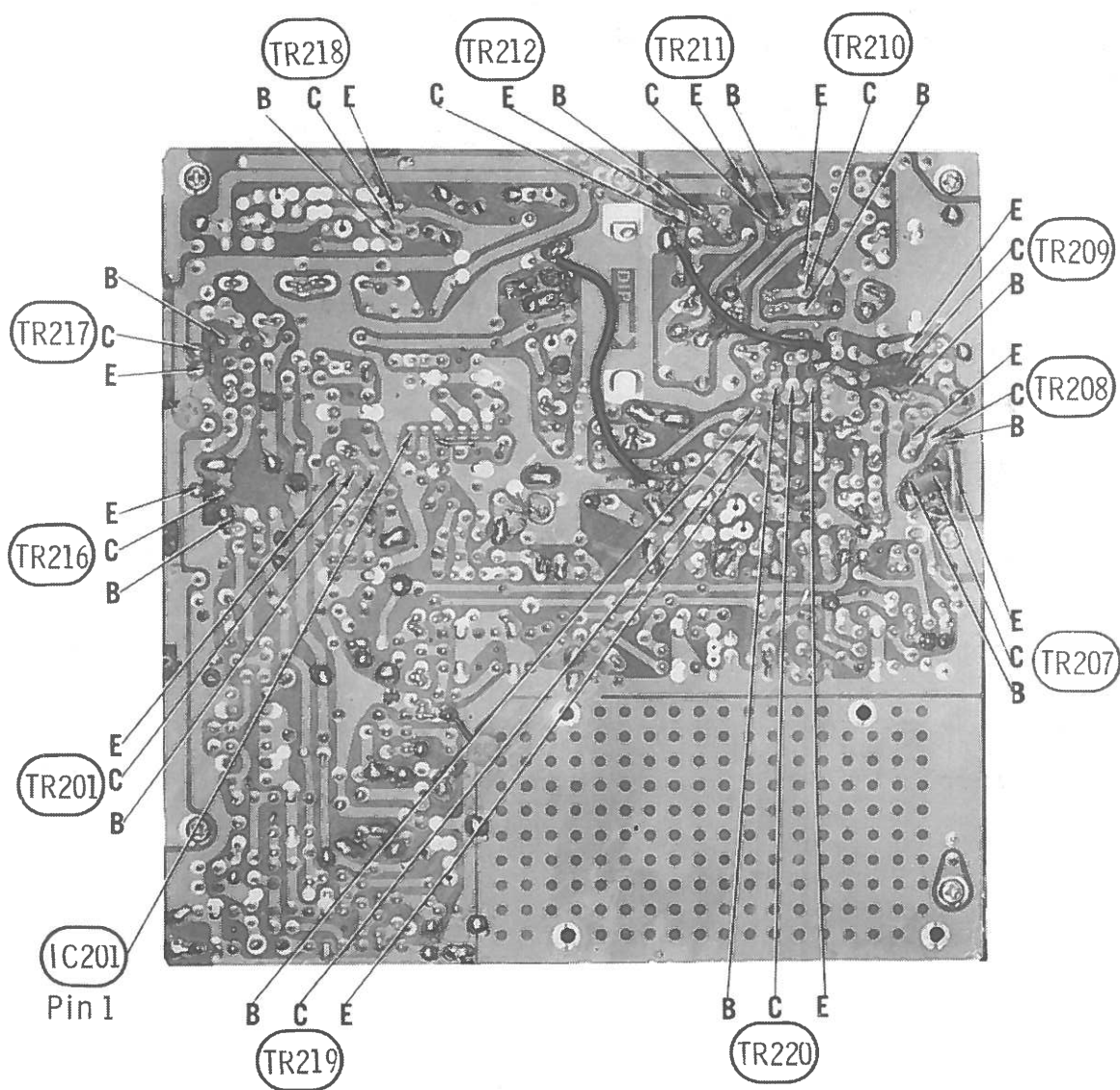
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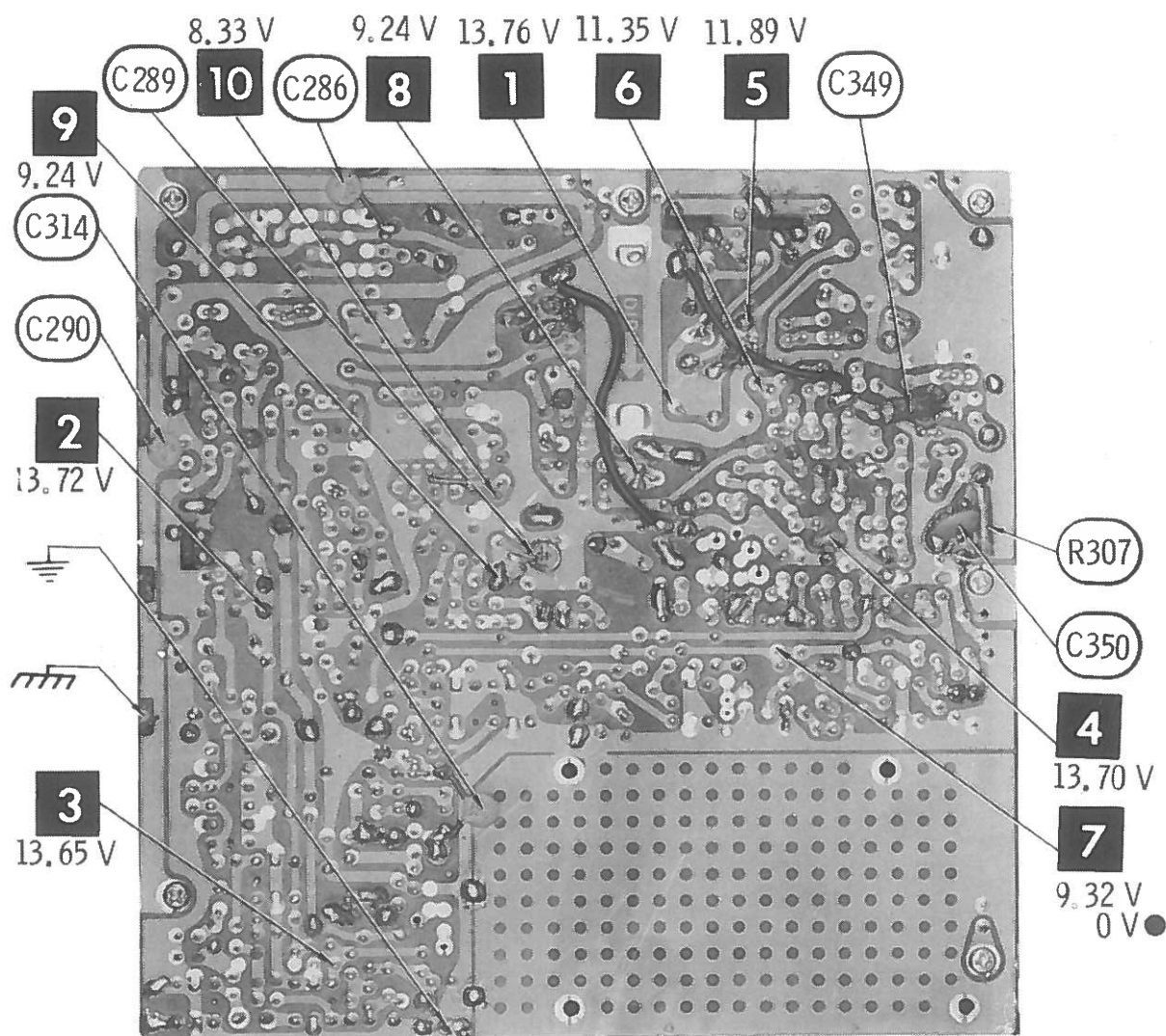
MAIN BOARD



MAIN BOARD

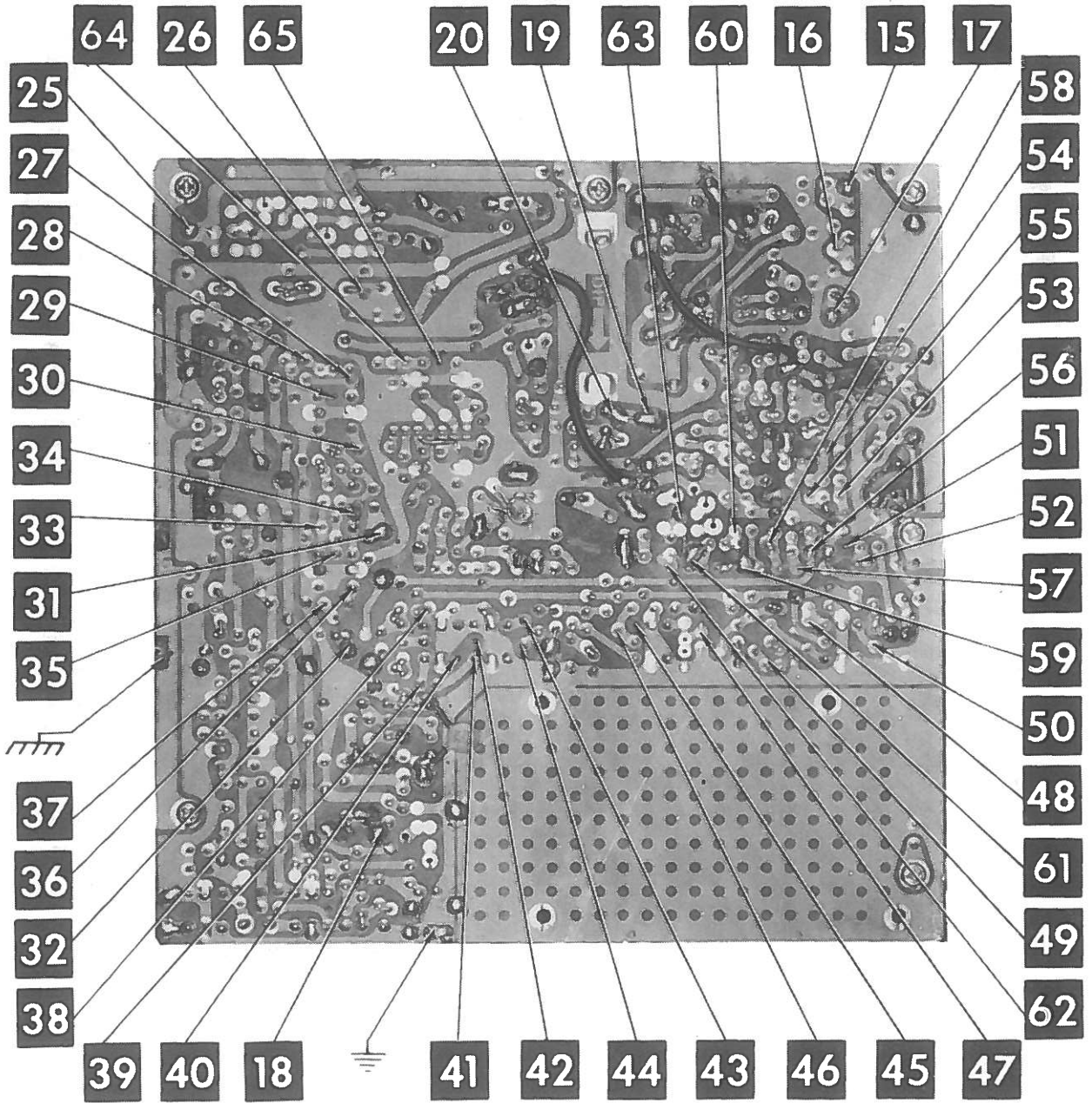


MAIN BOARD



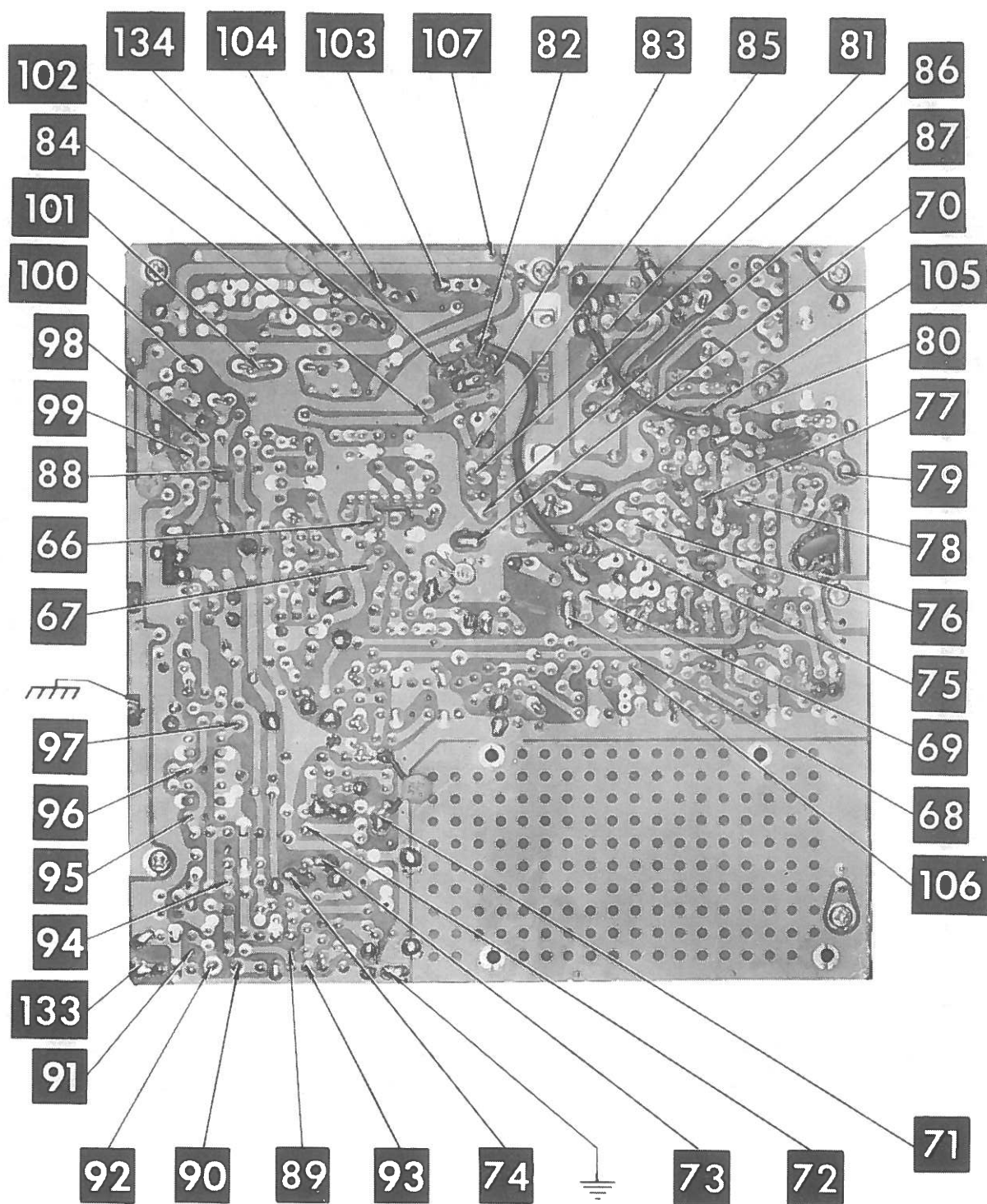
● Transmit

MAIN BOARD

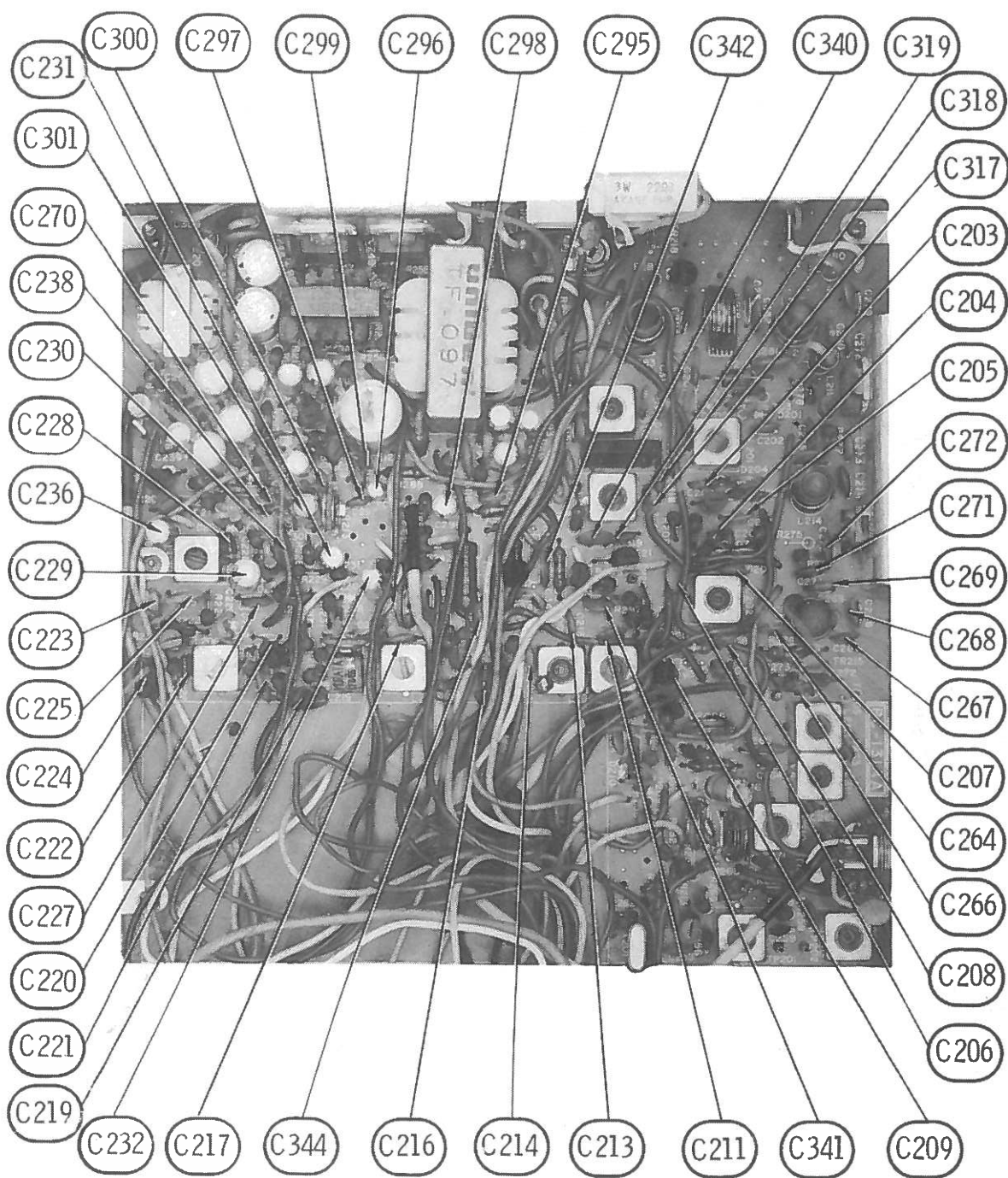


STANDARD COMMUNICATIONS MODEL HORIZON 29A

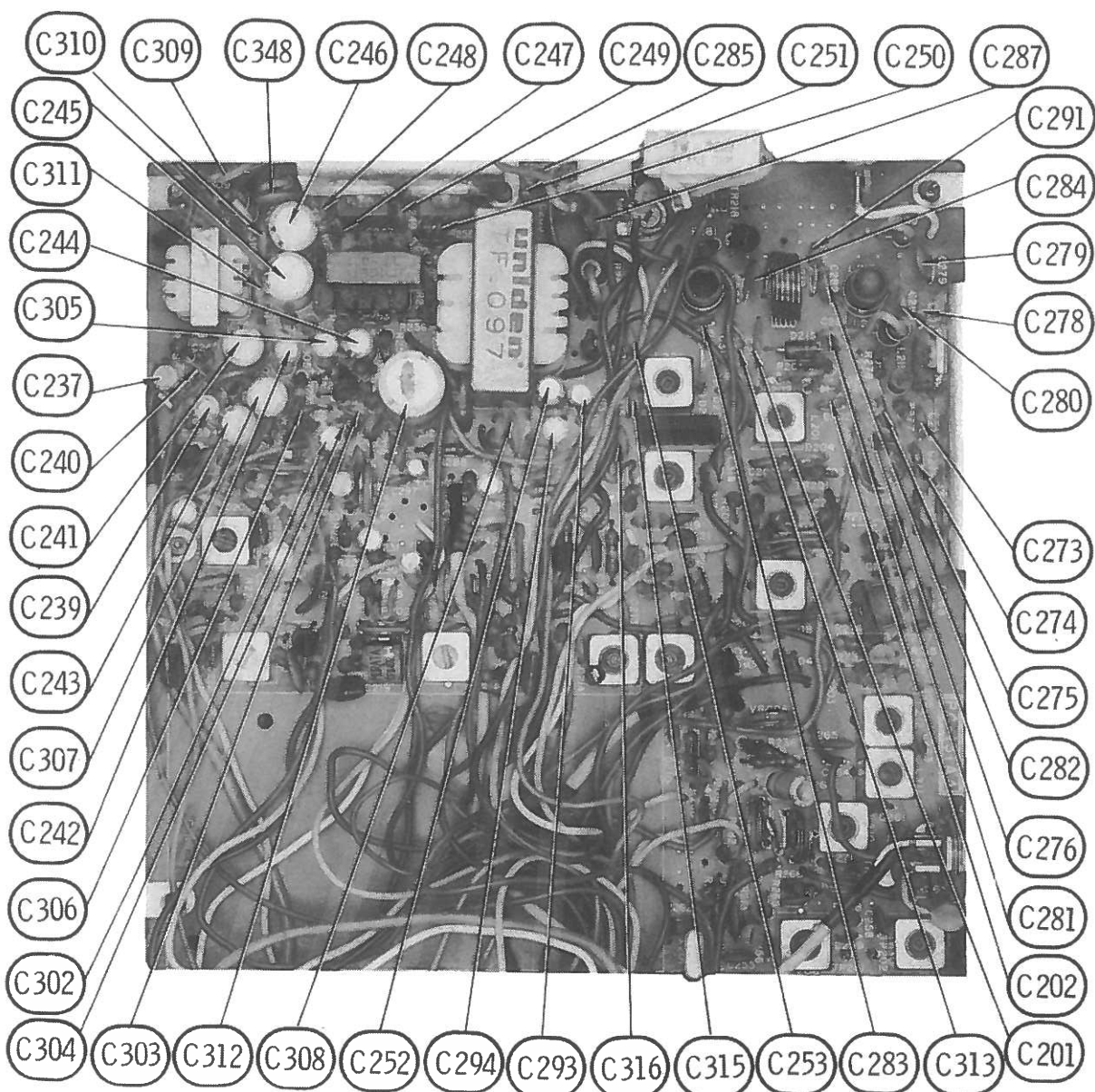
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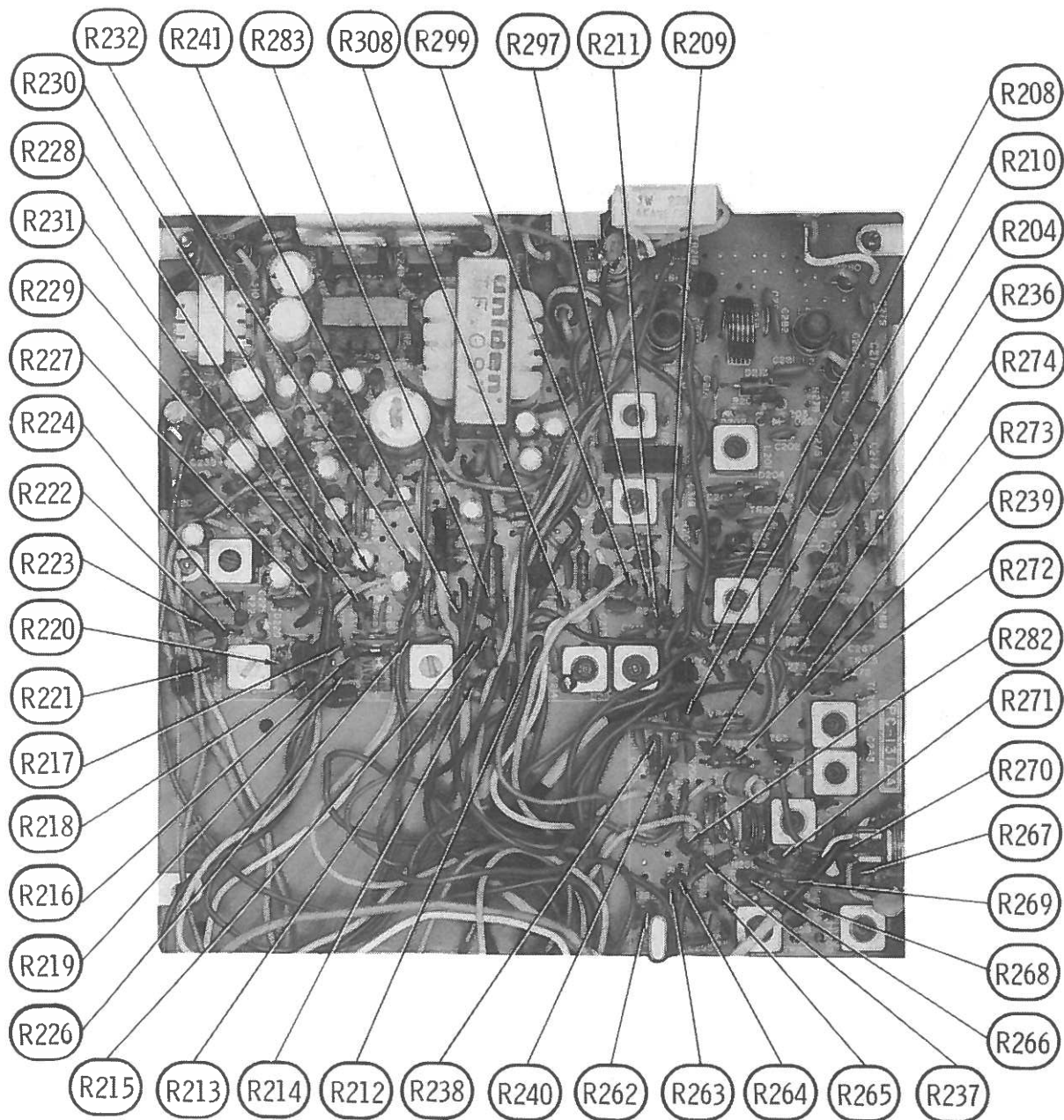
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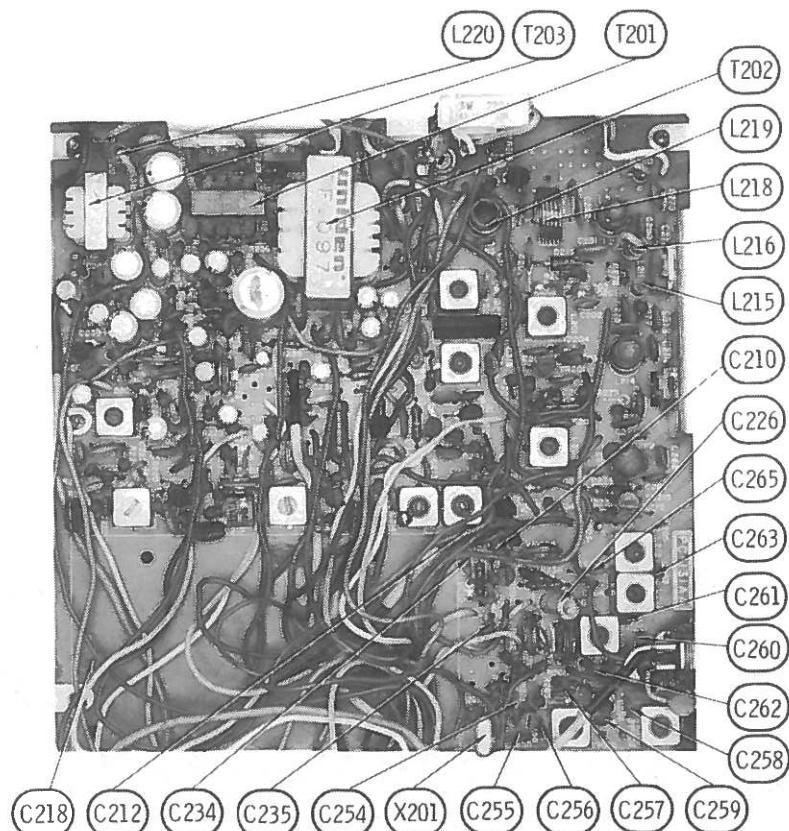
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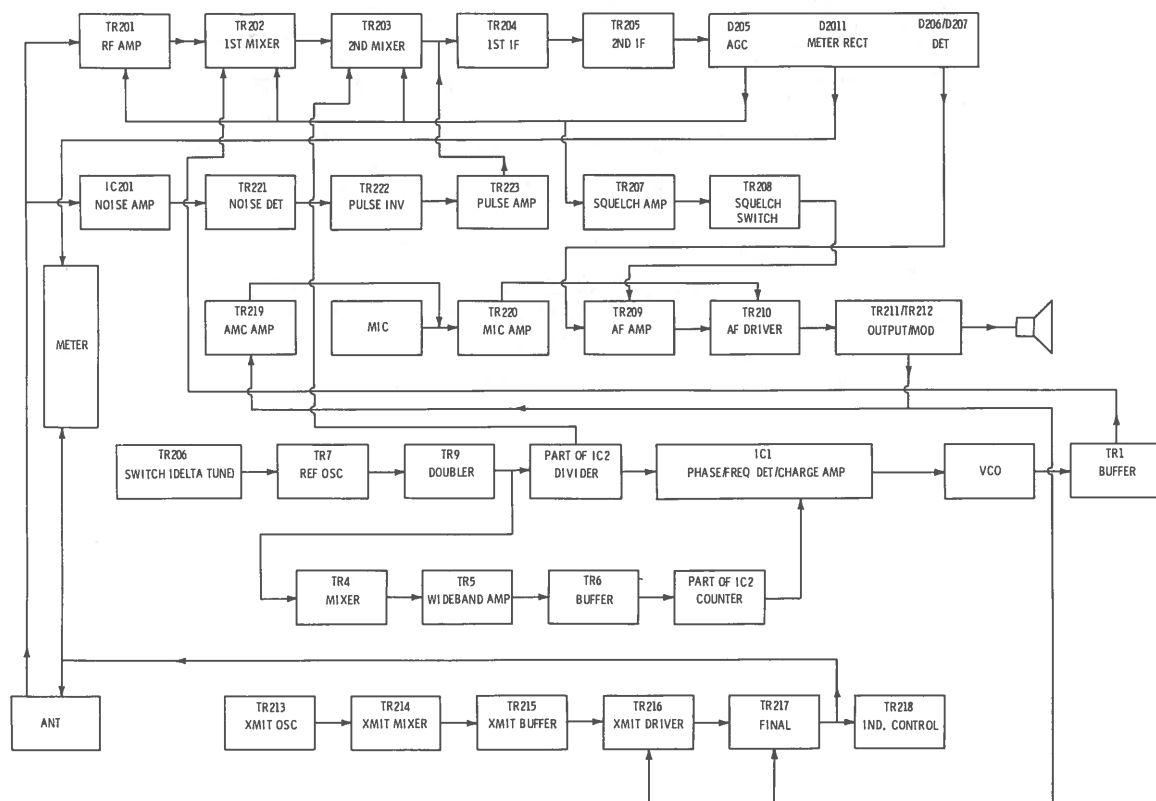
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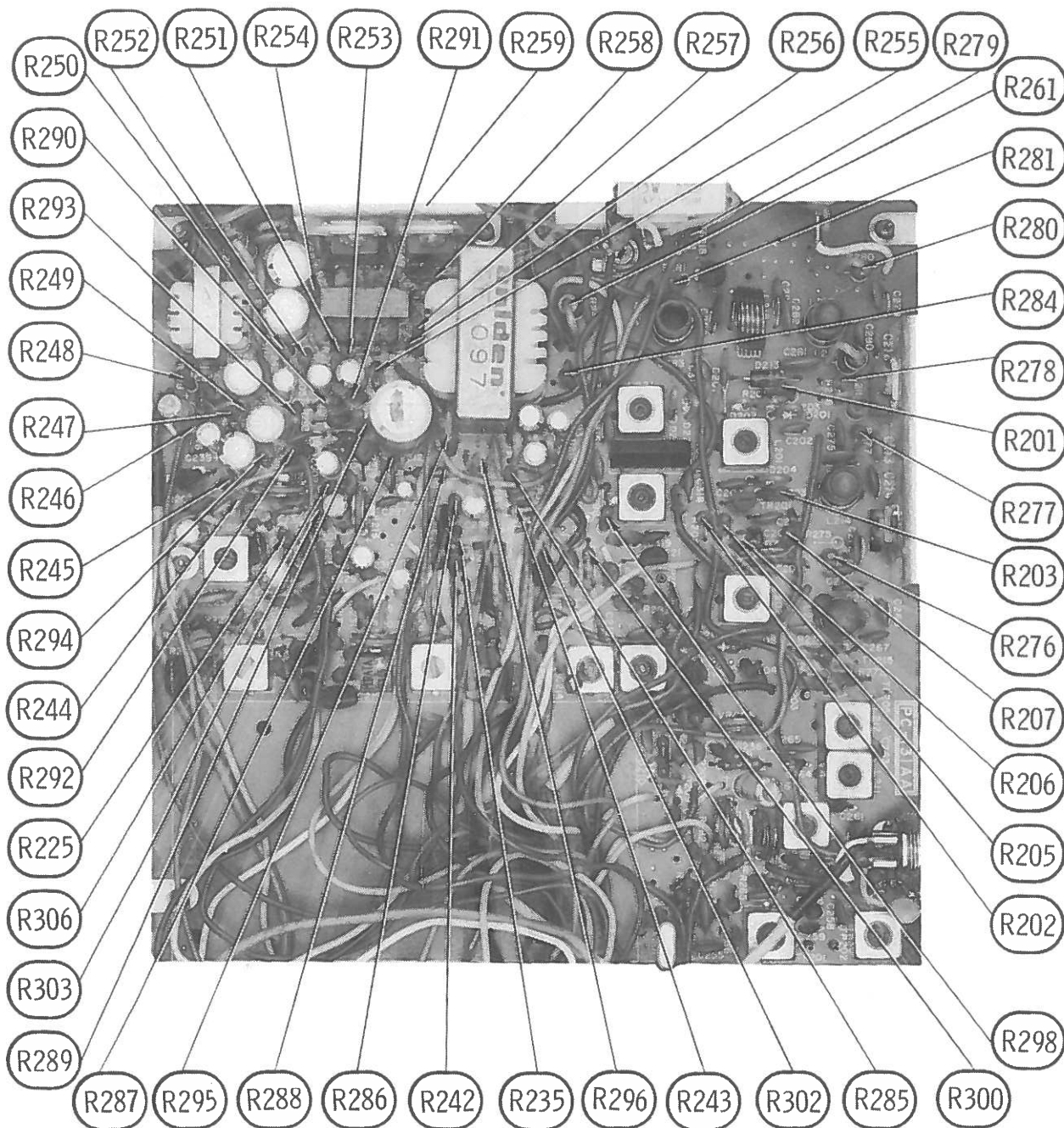
MAIN BOARD



MAIN BOARD

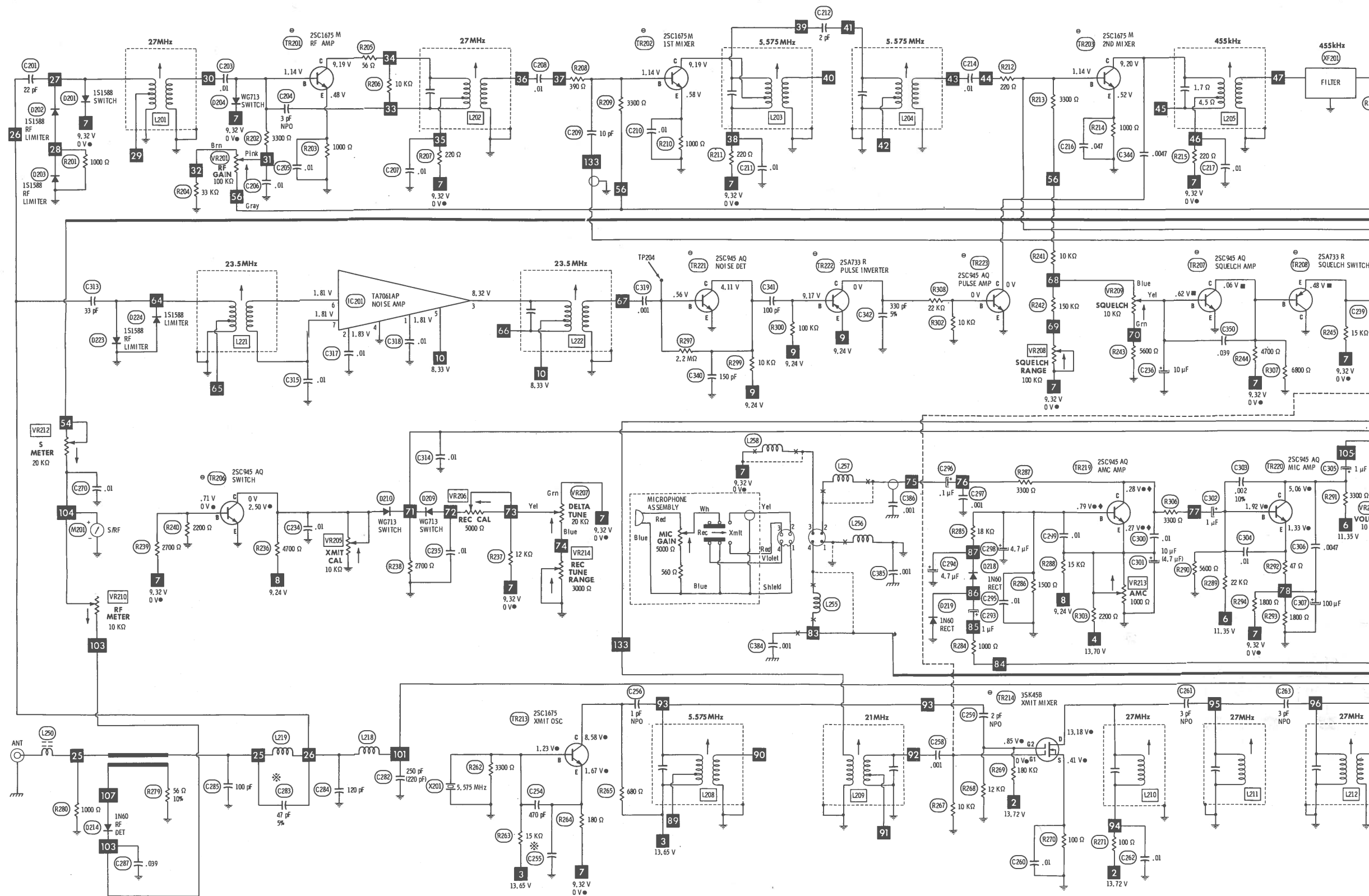


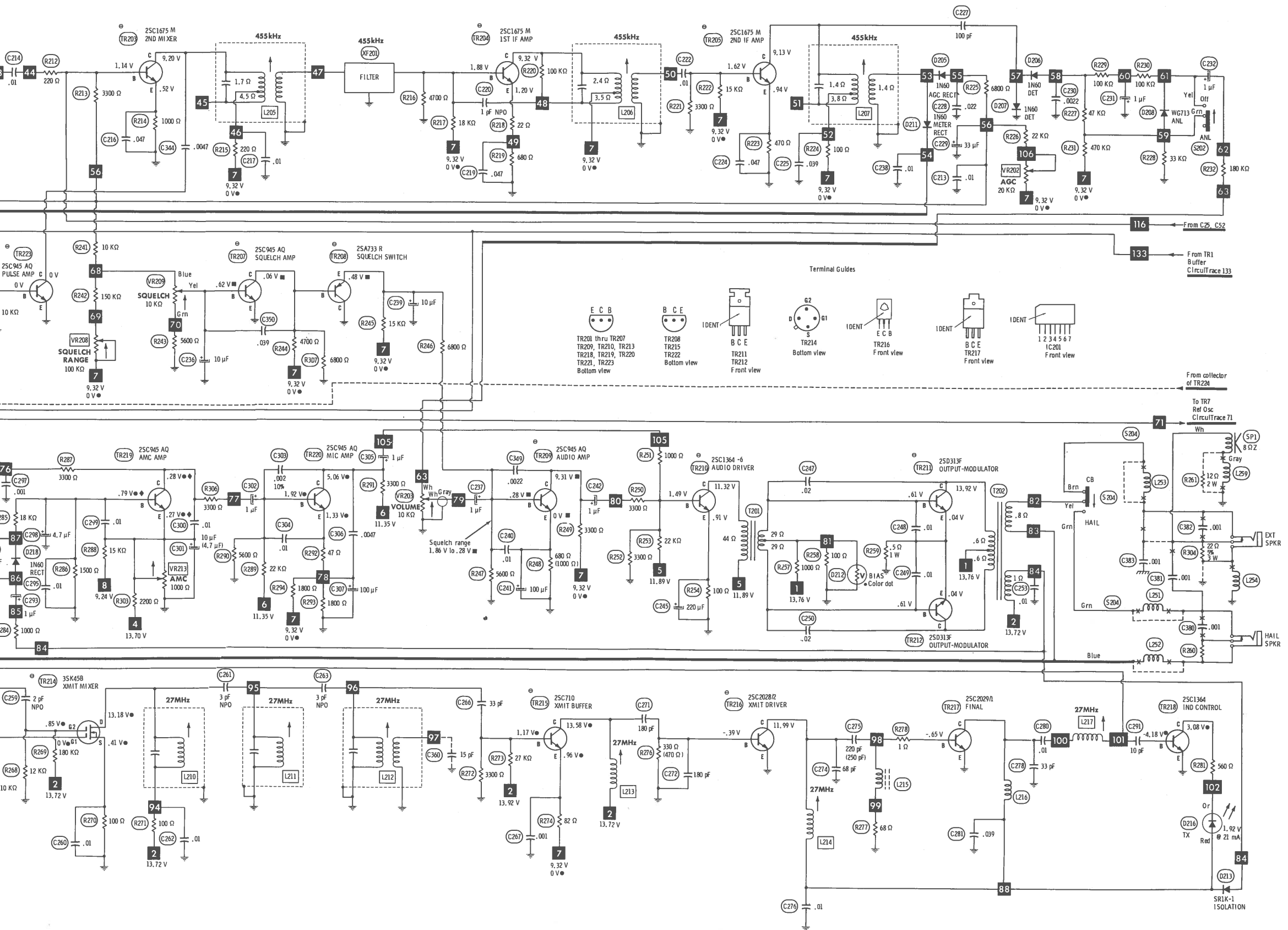
BLOCK DIAGRAM

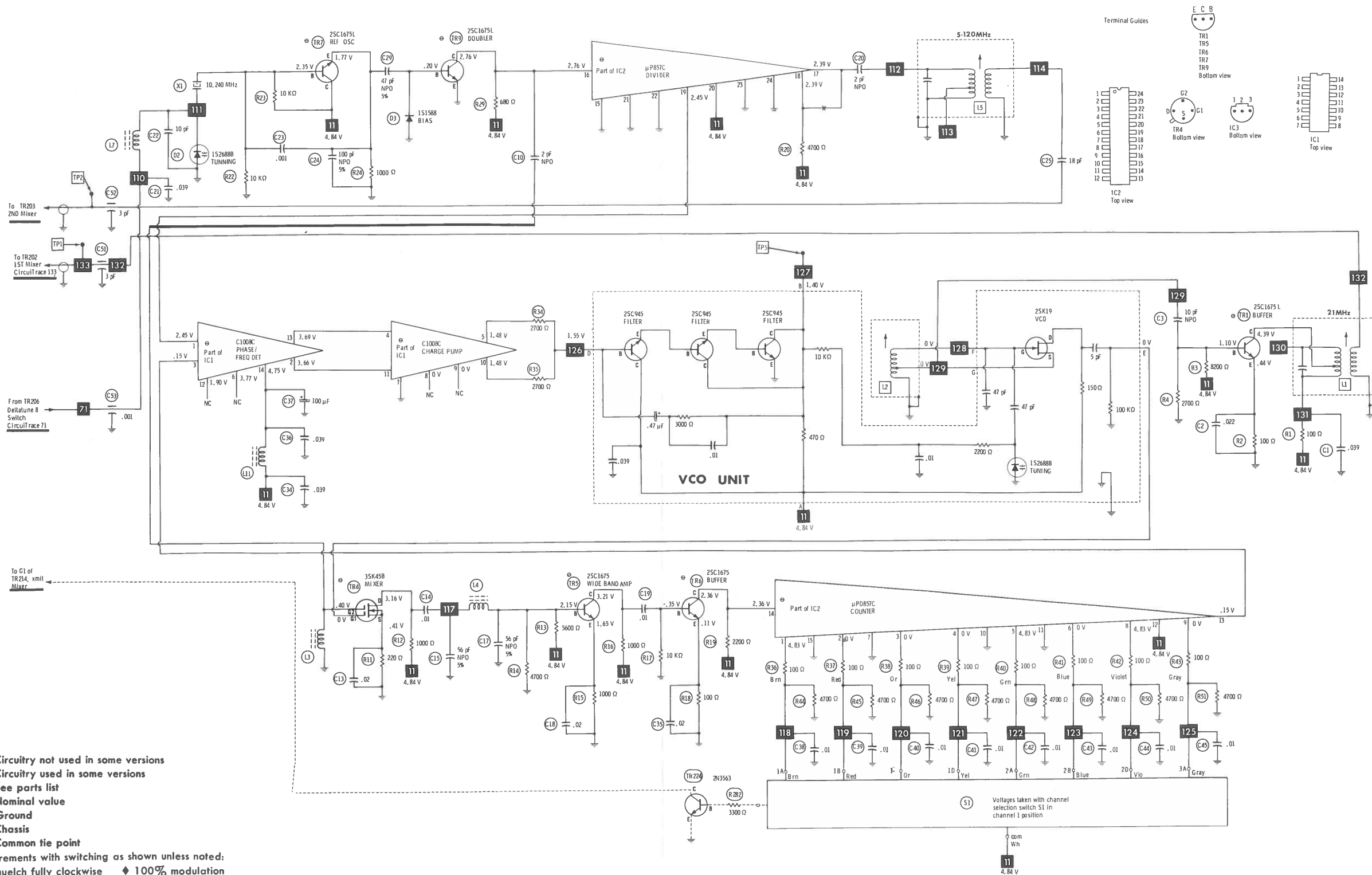


MAIN BOARD









— Circuitry not used in some versions
 - - - Circuitry used in some versions
 ● See parts list
 * Nominal value
 ⊥ Ground
 Chassis
 ▽ Common tie point
 Measurements with switching as shown unless noted:
 ■ Squelch fully clockwise ♦ 100% modulation
 ● Transmit

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.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
 WITH CIRCUITRACE®

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STANDARD COMMUNICATIONS MODEL HORIZON 29A

PARTS LIST AND DESCRIPTION

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

WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 13 Colors 8524 (Stranded) Available in 13 Colors
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
Bonding Strap	Use BELDEN No. 8661 (3/8 inch)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	IR WORKMAN PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D2	1S2688B	DDAY006002	GE-90	D201		HEPR2503	RE 195	SK3126	RT-262	
D3	1S1588	DDAY047005	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D201	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D202	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D203	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D204	WG713	DDAY004001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D205	1N60	DDAY001004	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D206	1N60	DDAY001004	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D207	1N60	DDAY001004	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D208	WG713	DDAY004001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D209	WG713	DDAY004001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D210	WG713	DDAY004001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D211	1N60	DDAY001004	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D212	MV-1	DDFY007001								
D213	SR1K-1	DDAY002001	GE-504A	5A4D	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D214	1N60	DDAY001004	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D216	TLR104	DDAY007001								
D217	TLG103	DDAY032001								
D218	1N60	DDAY001004	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D219	1N60	DDAY001004	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D220	CZ092	DDAY010002	GEZD-9.1	Z1209	ZB9.1A	HEPZ0412	RE 114	SK3060	RT-240	ECG139
D221	SR1K-1	DDAY002001	GE-504A	5A4D	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D222	CZ092	DDAY010002	GEZD-9.1	Z1209	ZB9.1A	HEPZ0412	RE 114	SK3060	RT-240	ECG139
D223	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D224	1S1588	DDAY047001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
IC1	UPC1008C	DDEY032001								
IC2	UPD857c	DDEY037001								
IC3	F78L05AV									
IC201	TA7061AP	DDEY004001	GEIC-92		PTC781		RE 344-M			
TR1	2SC1675L	DDBY259001	GE-20	TR-24	PTC132	HEPS0015	RE 13	SK3018	TVCM-78	ECG1100
TR4	3SK45-B	DDCY104001	GE-FET-4		PTC181	HEPF2004	RE 199	SK3050	RT-107A	ECG229
TR5	2SC1675L	DDBY259001	GE-20	TR-24	PTC132	HEPS0015	RE 13	SK3018	RT-107A	ECG229
TR6	2SC1675L	DDBY259001	GE-20	TR-24	PTC132	HEPS0015	RE 13	SK3018	RT-107A	ECG229
TR7	2SC1676L	DDBY259001	GE-20	TR-24	PTC132	HEPS0015	RE 13	SK3018	RT-107A	ECG229
TR9	2SC1675L	DDBY259001	GE-20	TR-24	PTC132	HEPS0015	RE 13	SK3018	RT-107A	ECG229
TR201	2SC1675M	DDBY259002	GE-20	TR-24	PTC132	HEPS0015	RE 13	SK3018	RT-107A	ECG229
TR202	2SC1675M	DDBY259002	GE-20	TR-24	PTC132	HEPS0015	RE 13	SK3018	RT-107A	ECG229
TR203	2SC1675M	DDBY259002	GE-20	TR-24	PTC132	HEPS0015	RE 13	SK3018	RT-107A	ECG229
TR204	2SC1675M	DDBY259002	GE-20	TR-24	PTC132	HEPS0015	RE 13	SK3018	RT-107A	ECG229
TR205	2SC1675M	DDBY259002	GE-20	TR-24	PTC132	HEPS0015	RE 13	SK3018	RT-107A	ECG229
TR206	2SC945AQ	DDBY224003	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR207	2SC945AQ	DDBY224003	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR208	2SA733R	DDBY003003	GE-65	TR-20	PTC127	HEPS0019	RE 26	SK3138	RT-226A	ECG159
TR209	2SC945AQ	DDBY224003	GE-20 *	(IR)2SC633A	PTC121 *	HEPS0025 *	RE 13 *	SK3122	RT-302	ECG123A *
TR210	2SC1364-6	DDBY23301	GE-20	TR-24	PTC127	HEPS0015	RE 13	SK3124	RT-172	ECG123A
TR211	2SD313E		GE-66	TR-76	PTC154		RE 205	SK3054	RT-156	ECG196
TR212	2SD313E		GE-66	TR-76	PTC154		RE 205	SK3054	RT-156	ECG196
TR213	2SC1675M	DDBY259002	GE-20	TR-24	PTC132	HEPS0015	RE 13	SK3018	RT-107A	ECG229
TR214	3SK45B	DDCY104001	GE-FET-4		PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
TR215	2SC710D	DDBY209003	GE-211 *	(IR)2SC710	PTC115	HEPS0016 *	RE 13 *	SK3018 *	RT-308 *	ECG123A *
TR216	2SC2028A/20	DDBY256001	GE-270		PTC180		RE 209			ECG295
TR217	2SC2029/1		GE-215		PTC186		RE 203	SK3197		ECG235
TR218	2SC2029B/	DDBY257001	GE-215		PTC186		RE 203	SK3197		ECG235
TR219	2SC1364-6	DDBY233001	GE-20	TR-24	PTC121	HEPS0015	RE 13	SK3124	RT-172	ECG123A
TR220	2SC945AQ	DDBY224003	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR221	2SC945AQ	DDBY224003	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR222	2SC945AQ	DDBY224003	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR223	2SA733R	DDBY003003	GE-65	TR-20	PTC127	HEPS0019	RE 26	SK3138	RT-126A	ECG159
TR224	2SC945AQ	DDBY224003	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
TR225	2N3563	AHT800031CO	GE-61	TR-21	PTC132	HEPS0020	RE 9	SK3018	RT-108	ECG107

* Lead configuration may vary from original.

(1) Used in some versions.

(10) Rating, 30 WATT @ 3.0 AMP.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFRG. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C12	.47 35V	CSEAG64780		TDC474M050EL	QDT1-19	SD50-R479
C37	100 10V	CELFI11010	PC100-10	VTT100E10	QV1-93	EV-1130
C48	47 16V	CELFI314700	PC50-16	VTT47D16	QV1-73	EV-1226
C50	470 6.3V	CELFI904710	PC500-16	VTT470J16	QV1-149	EV-1150
C226	33 16V	CELFI313300	PC30-25	VTT33D25	QV1-63	EV-1325
C229	33 10V	CELFI13300	PC30-25	VTT33A10	QV1-61	EV-1125
C231	1 50V	CELFI811090	PC1-50	VTT1B63	QV1-11	EV-1615
C232	1 50V	CELFI811090	PC1-50	VTT1B63	QV1-11	EV-1615
C236	10 16V	CELFI311000	PC10-25	VTT10A25	QV1-41	EV-1222
C237	1 50V	CELFI811090	PC1-50	VTT1B63	QV1-11	EV-1615
C239	10 16V	CELFI311000	PC10-25	VTT10A25	QV1-41	EV-1222
C241	100 10V	CELFI111010	PC100-10	VTT100E10	QV1-93	CV-1130
C242	1 50V	CELFI811090	PC1-50	VTT1B63	QV1-11	EV-1615
C243	47 16V	CELFI314700	PC50-16	VTT47D16	QV1-73	EV-1226
C244	22 16V	CELFI312200	PC25-25	VTT22A16	QV1-55	CV-1224
C245	220 6.3V	CELFI902210	PC250-10	MTV250CK6		TVA-1102
C246	100 16V	CELFI311010	PC100-16	VTT100F16	QV1-95	EV-1230
C252	22 16V	CELFI312200	PC25-25	VTT22A16	QV1-55	EV-1224
C293	1 50V	CELFI811090	PC1-50	VTT1B63	QV1-11	EV-1615
C294	4.7 16V	CELFI314790	PC5-50	VTT47R7A50	QV1-27	EV-1319
C296	.1 16V	CAAH311046		TDC104M050EL	QDT1-2	SD50-R109
C298	4.7 16V	CELFI314790	PC5-50	VTT47R7A50	QV1-27	EV-1319
C301	10 16V	CELFI311000	PC10-25	VTT10A25	QV1-41	EV-1222
C302	1 50V	CELFI811090	PC1-50	VTT1B63	QV1-11	EV-1615
C305	1 50V	CELFI811090	PC1-50	VTT1B63	QV1-11	EV-1615
C307	100 10V	CELFI111010	PC100-10	VTT100E10	QV1-93	EV-1130
C312	470 16V	CELFI314710	PC500-16	VTT470J16	QV1-151	EV-1250

CAPACITORS

ITEM No.	RATING	MFRG. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C1	.039	CKFB513930			GP140		5GA-S40
C2	.022	CKAE812236	DC-203	MGP02	TA120	QC2-157	TG-S20
C3	10 5% NPO 50V	CCCB811004	DTZ-10	NP010	CN0410		10TCC-Q10
C4	.039	CKFB513930			GP140		5GA-S40
C5	47 5% NPO	CCTB814704	DTZ-47	NP047	CN0447		10TCC-Q47
C6	47 5% NPO	CCCB814704	DTZ-47	NP047	CN0447		10TCC-Q47
C7	.01	CKAE811036	DC-103	MGP01	TA110	QC2-141	TG-S10
C8	.01	CKAE811036	DC-103	MGP01	TA110	QC2-141	TG-S10
C9	5	CCCB812091	DTZ-4R7	NP04P7	CN0547		10TCC-V47
C10	2 +.25 NPO 50V	CCCB812091	DTZ-2R2	NP02P2	CN0522		10TCC-V22
C11	.039	CKFB513930			GP140		5GA-S40
C13	.02	CKAE812236	DC-203	MGP02	TA120	QC2-157	TG-S20
C14	.01	CKAE811036	DC-103	MGP01	TA110	QC2-141	TG-S10
C15	56 NPO 5%	CCCB815604			CN0456		10TCC-Q56
C17	56 5% NPO	CCCB815604			CN0456		10TCC-Q56
C18	.02	CKAE812236	DC-203	MGP02	TA120	QC2-157	TG-S20
C19	.01	CKAE811036	DC-103	MGP01	TA110	QC2-141	TG-S10
C20	2 +.25 NPO 50V	CCCB812091	DTZ-2R2	NP02P2	CN0522		10TCC-V22
C21	.039	CKFB513930			GP140		5GA-S40
C22	10	CCCB811004	DTZ-10	NP010	CN0410		10TCC-Q10
C23	.001	CKAE811026	DD-102		GP210		10TS-D10
C24	100 5% NPO	CCCB811014	DTZ-100	NP0100	CN0310		10TCC-T10
C25	18	CCGB811805			CN0418		10TCC-Q18
C26	.039	CKFB513930			GP140		5GA-S40
C29	47 5% NPO	CCCB814704	DTZ-47	NP047	CN0447		10TCC-Q47
C30	.039	CKFB513930			GP140		5GA-S40
C34	.039	CKFB513930			GP140		5GA-S40
C35	.02	CKAE812236	DC-203	MGP02	TA120	QC2-157	TG-S20
C36	.039	CKFB513930			GP140		5GA-S40
C38	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C39	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C40	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C41	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C42	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C43	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C44	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C45	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C46	.039	CKFB513930			GP140		5GA-S40
C47	.039	CKFB513930			GP140		5GA-S40
C49	.039	CKFB513930			GP140		5GA-S40
C51	3	CCZY006001					
C52	3	CCZY006001					
C53	.001	CCZY023001					
C54	.001	CCZY023001					
C201	22	CCCB812205	DTZ-22	NP022	CN0422		10TCC-Q22
C202	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C203	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C204	3 NPO	CCCB813091	DTZ-3R3	NP03P3	CN0533		10TCC-V33
C205	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C206	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C207	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C208	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C209	10	CCGB811005	DTZ-10	NP010	CN0410		10TCC-Q10

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFG. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C210	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C211	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C212	2 NPO	CCCB812091	DTZ-2R2	NPO2P2	CNO522		10TCC-V22
C213	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C214	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C216	.047 10%	CQME814735		DPMS2S47	EWFA1A147	QF1-171	1PB-S47
C217	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C218	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C219	.047 10%	CQME814735		DPMS2S47	EWFA1A147	QF1-171	1PB-S47
C220	1 NPO	CCCB811091			CNO510		10TCC-V10
C221	.039	CKFB513930			GP140		5GA-S40
C222	.01	CQME811035		WMF1S1	EWFA1A110	QF1-91	1PB-S10
C223	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C224	.047 10%	CQME814735		DPMS2S47	EWFA1A147	QF1-171	1PB-S47
C225	.039	CKFB513930			GP140		5GA-S40
C227	100	CCGB811015	DTZ-100	NPO100	CNO310		10TCC-T10
C228	.022	CQME812235		DPMS2S22	EWFA1A122	QF1-127	1PB-S22
C230	.0022	CKFB511020	DD-202	GP2000	GP220	QC2-93	5GA-D20
C234	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C235	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C238	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C240	.01	CQME811035		WMF1S1	EWFA1A110	QF1-91	1PB-S10
C247	.02	CQME812235		DPMS2S2	PVC212		2PS-S20
C248	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C249	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C250	.02	CQME812235		DPMS2S2	PVC212		2PS-S20
C251	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C253	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C254	470	CCGB814715	DD-471	GP470	GP347		10TS-T47
C255	220	CCGB812215	DD-221		GP322		10TS-T22
C256	1 NPO	CCCB811091			CNO510		10TCC-V10
C257	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C258	.001	CKFB511020	DD-102		GP210		10TS-D10
C259	2 NPO	CCCB812091	DTZ-2R2	NPO2P2	CNO522		10TCC-V22
C260	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C261	3 NPO	CCCB813091	DTZ-3R3	NPO3P3	CNO533		10TCC-V33
C262	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C262	3 NPO	CCCB813091	DTZ-3R3	NPO3P3	CNO533		10TCC-V33
C264	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C265	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C266	33	CCGB813305	DTZ-33	NPO33	CNO433		10TCC-Q33
C267	.001	CKFB511020	DD-102		GP210		10TS-D10
C268	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C269	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C270	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C271	180	CCGB811815	DD-181		GP318		10TS-T18
C272	180	CCGB811815	DD-181		GP318		10TS-T18
C273	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C274	68	CCGB816805	DD-680	GP68	GP468		10TS-Q68
C275	220	CCGB812215	DD-221		GP322		10TS-T22
C276	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C278	33	CCGB813305	DTZ-33	NPO33	CNO433		10TCC-Q33
C279	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C280	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C281	.039	CKFB513930			GP140		5GA-S40
C282	250	CCGB812515	DD-221		GP322		10TS-T22
C283	47 5%	CCGB815605	DTZ-47	NPO47	CNO447		10TCC-Q47
C284	120	CCGB811215	DTZ-120		CNO312		10TCC-T12
C285	100	CCGB811015	DD-101	GP100	GP310		10TS-T10
C286	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C287	.039	CKFB513930			GP140		5GA-S40
C289	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C290	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C291	10	CCGB811005	DTZ-10	NPO10	CNO410		10TCC-Q10
C292	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C295	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C297	.001	CKFB511020	DD-102		GP210		10TS-D10
C299	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C300	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C303	.0022 10% 50V	CQME812225		DPMS6D22	EWFA1A110	QF1-91	6PS-D22
C304	.01 10% 50V	CQME811035		WMF1S1	EWFA1A110		1PB-S10
C306	.0047	CKFB514720	DD-472	GP4700	GP247		5GA-D47
C308	.039	CKFB513930			GP140		5GA-S40
C309	.01 16V	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C310	.039	CKFB513930			GP140		5GA-S40
C311	.039	CKFB513930			GP140		5GA-S40
C313	33	CCGB813305	DTZ-33	NPO33	CNO433		10TCC-Q33
C314	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C315	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C316	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C317	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C318	.01	CKFB511030	DC-103	MGP01	TA110	QC2-141	TG-S10
C319	.001	CKFB511020	DD-102		GP210		10TS-D10
C340	150	CCGB811515	DD-151		GP315		10TS-T15
C341	100	CCGB811015	DD-101	GP100	GP310		10TS-T10
C342	330 10%	CCGB813315	DD-331	GP330	GP330		10TS-T33
C344	.0047	CKFB514720	DD-472	GP4700	GP247		5GA-D47
C348	.039	CKFB513930			GP140		5GA-S40
C349	.0022	CQME812225		DPMS6D22	EWFA1A110		6PS-D22
C350	.039	CKFB513930			GP140		5GA-S40

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFRG. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C360	15	CCC811505	DTZ-15	NP015	CN0415		10TCC-Q15
C380	.001	CKFB511020	DD-102		GP210		10TS-D10
C381	.001	CKFB511020	DD-102		GP210		10TS-D10
C382	.001	CKFB511020	DD-102		GP210		10TS-D10
C383	.001	CKFB511020	DD-102		GP210		10TS-D10
C384	.001	CKFB511020	DD-102		GP210		10TS-D10
C385	.001	CKFB511020	DD-102		GP210		10TS-D10
C386	.001	CKFB511020	DD-102		GP210		10TS-D10

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

ITEM No.	FUNCTION	RESIST-ANCE	REPLACEMENT DATA				
			MFRG. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
VR201	RF Gain	100K	RRVY040001				
VR202	AGC	20K	RRVY145008	T-20K (2)	C-253 (2)	MTC24L1 (2)	X201R253B (2)
VR203	Volume/Switch	20K	RRVY027001				
VR205	Xmit Cal	10K	RRVY145007	T-10K (2)	C-103 (2)	MTC14L1 (2)	X201R103B (2)
VR206	Rec Cal	5000	RRVY145006	T-5000 (2)	C-502 (2)	MTC53L1 (2)	X201R502B (2)
VR207	Delta Tune	20K	RRVY064001				
VR208	Squelch Range	100k	RRVY145010	T-100K (2)	C-104 (2)	MTC15L1 (2)	X201R104B (2)
VR209	Squelch	10K	RRVY077001				
VR210	RF Meter	10K	RRVY133006				
VR212	S Meter	20K	RRVY145008	T-20K (2)	C-253 (2)	MTC24L1 (2)	X201R253B (2)
VR213	ANC	1000	RRVY145004	T-1000 (2)	C-102 (2)	MTC13L1 (2)	X201R102B (2)
VR214	Rec Tune Range	3000	RRVY145065	T-5000 (2)	C-502 (2)	MTC33L1 (2)	X201R302B (2)
	Mic Gain	5000	(1)	B16-114 (18)			

(1) Part of Mic Assembly.

(2) Cut off one of the end terminals and bend to fit PC board.

(18) Use original knob.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	VCO Buffer (21MHz)	LLAY091001			
L2	VCO Osc	LLAY149001			
L3	RF Choke (6.8uH)	LLZY002011			
L4	RF Choke (100uH)	LLZY001013			
L5	Divider (5.120MHz)	LLAY150001			
L7	RF Choke (470uH)	LLZY001021			
L11	RF Choke (470uH)	LLZY001021			
L201	Rec Antenna (27MHz)	LLAY029001			
L202	Rec RF (27MHz)	LLAY041001			
L203	Rec Mixer (5.575MHz)	LLAY147001			
L204	Rec Mixer (5.575MHz)	LLAY147001			
L205	IF (455kHz)	LLAY116001			
L206	IF (455kHz)	LLAY106001			
L207	IF (455kHz)	LLAY107001			
L208	Xmit Osc (5.575MHz)	LLAY147001			
L209	Xmit Mixer (21MHz)	LLAY046001			
L210	Harmonic Suppressor (27MHz)	LLAY148001			
L211	Harmonic Suppressor (27MHz)	LLAY148001			
L212	Harmonic Suppressor (27MHz)	LLAY146001			
L213	Xmit Buffer (27MHz)	LLCY019001			
L214	Xmit Driver (27MHz)	LLCY017001			
L215	RF Choke (2.2uH)	LLZY002005			
L216	RF Choke (2.2uH)	LLDY012001			
L217	Xmit Final (27MHz)	LLCY019001			
L218	Pi Filter	LLCY006001			
L219	RF Choke	LLCY110001			
L220	RF Choke	LLDY017001			
L221	Noise Amp (23.5MHz)	LLAY029001			
L222	Noise Amp (23.5MHz)	LLAY077001			
L250	Harmonic Suppressor (.055uH)	A00449061			
L251	RF Choke (2.7uH)	LLZY002012			
L252	RF Choke (2.7uH)	LLZY002012			
L253	RF Choke (2.7uH)	LLZY002012			
L254	RF Choke (2.7uH)	LLZY002012			
L255	RF Choke (2.7uH)	LLZY002012			
L256	RF Choke (2.7uH)	LLZY002012			
L257	RF Choke (2.7uH)	LLZY002012			
L258	RF Choke (2.7uH)	LLZY002012			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFRG. PART No.	THORDARSON PART No.	TRIAD PART No.	
T203	1.6A	.2	1.5mH	TTFY017001 TF-017 (1)	TR507		(1) Number on unit.

PARTS LIST AND DESCRIPTION (CONTINUED)

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

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T201	.4	1		TTFY011001 TF-011 (1)	TR635		(1) Number on unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T202	23	1 2 8 23	TTFY097001 TF-097 (1)	TR837		(1) Number on unit.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	3" PH 8 Ohms	SSWY038001	3A05Z8	

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	
F201	2Amp Fast Acting	ZFSY001001		AGC2	HDJ	312002	150145	FG2-2	

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	
MIC	ANKY049001				18-092							

CRYSTALS

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL	ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X1	10.240		CA45W10.240	Ref Osc	X201	5.575	QQXY069001	CB150W5.575	Xmit Osc

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M201	Meter	ZMTY066001	S-RF
S1	Switch	SSRY117001	Channel Selector
S201	Switch	SSWY070001	NB
S202	Switch	SSWY070001	ANL
S204	Switch	SSWY070001	CB/Hail
XF201	Filter	FFLY009001	455kHz (CFU-455)
	Printed Circuit Board	PPCY129011	VCO (PC129AA)
	Printed Circuit Board	PPCY130011	PLL (PC130AA)
	Printed Circuit Board	PPCY131001	Main (PC131AA)

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

ITEM	PART No.	ITEM	PART No.
Case, Top	MDBP202287	Knob, Channel Selector	MDMP403882
Case, Bottom	HDBP202283	Knob, Control	MDMP403362
Front Panel	MDMP203361	Channel Disk	MDMP403867
Microphone Hanger	JYY018001	DC Power Cord	WZDZ070002
Mounting Bracket	MDBP302289		