



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 CB143

ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools:

GC ELECTRONICS

T4, T101 thru T105.....5000, 8290

ALL other tunable coils and transformers.....9440

RECEIVER

Connect an AC VTVM or AF Wattmeter across speaker voice coil.

Adjustments made with 14-volt DC input.

Adjust volume control to obtain suitable reading.

SIGNAL GENERATOR	GEN FREQ	CHANNEL	ADJUST	REMARKS
High side thru .01uF to TP2, low side to ground.	455kHz, 1000Hz @ 30% modulation	Any	T103, T104, T105	Set generator output to maintain .5V output across speaker voice coil. Adjust for maximum.
High side thru .01uF to antenna jack, low side to ground.	27.115MHz, 1000Hz @ 30% modulation output 2uV	13	T1, T2, T101, T102, T3	Adjust for maximum.

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF Wattmeter across speaker voice coil.

These adjustments made with 14-volt DC input.

Adjust volume control to obtain a suitable reading.

SIGNAL GENERATOR	GEN FREQ	CHANNEL	ADJUST	REMARKS
SQUELCH RANGE High side thru .01uF to antenna jack, low side to ground.	27.115MHz, 1000Hz @ 30% modulation, output 500uV.	13	VR3	Set squelch control fully clockwise. Adjust so that squelch just breaks.
"S" Meter High side thru .01uF to antenna jack, low side to ground.	27.115MHz, 1000Hz @ 30% modulation, output 1000uV.	13	R402	Adjust for "S" reading on panel meter

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

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5CY283

PAGE MODEL CB143

TRANSMITTER

Connect an RF Wattmeter or 50-ohm, 25-watt dummy load to antenna connector.
Adjustments made with 14-volt DC input.

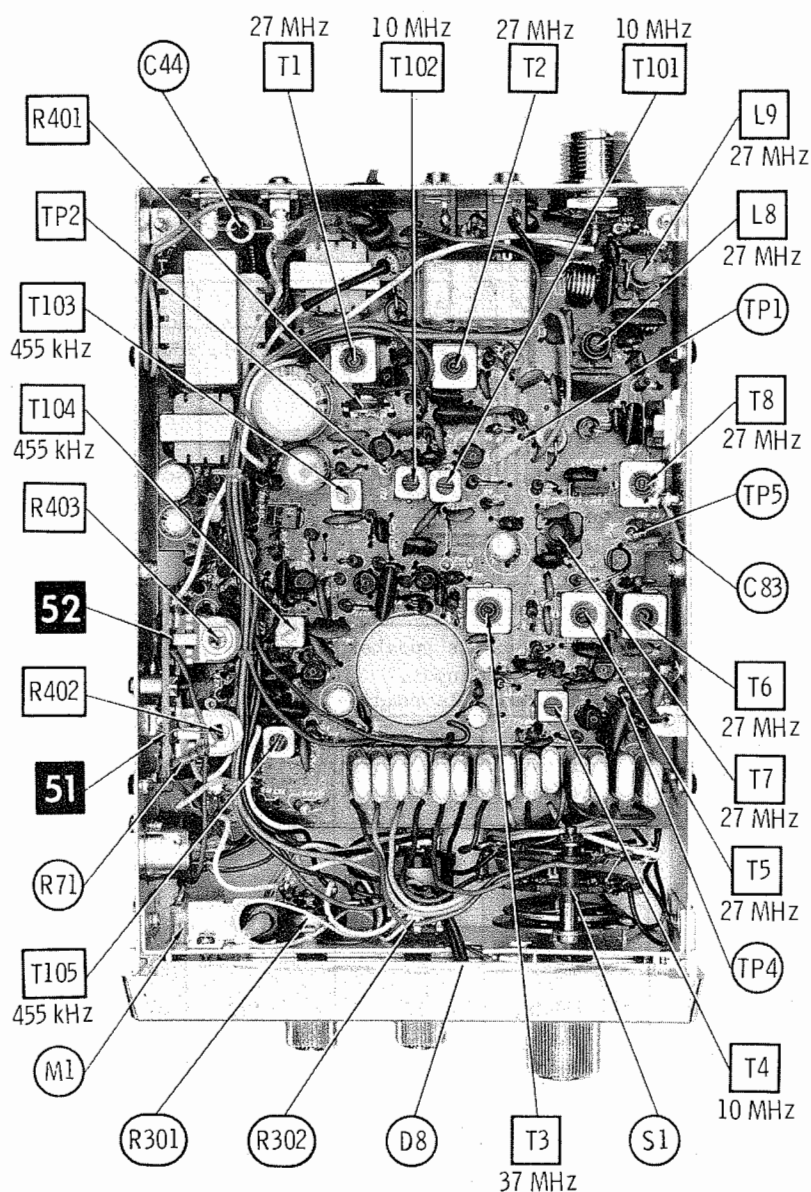
INDICATOR	ADJUST	REMARKS
OSCILLATOR, MIXER, BUFFER, DRIVER, FINAL RF Wattmeter	T4,T5,T6, T7,T8,L8, L9	Channel selector to Ch. 13. Key transmitter. Adjust for maximum.
FINAL INPUT POWER Connect 0-1500 DC milliammeter between L105 and source.	L8	Adjust for 3 watts (maximum).

TRANSMITTER ADJUSTMENTS

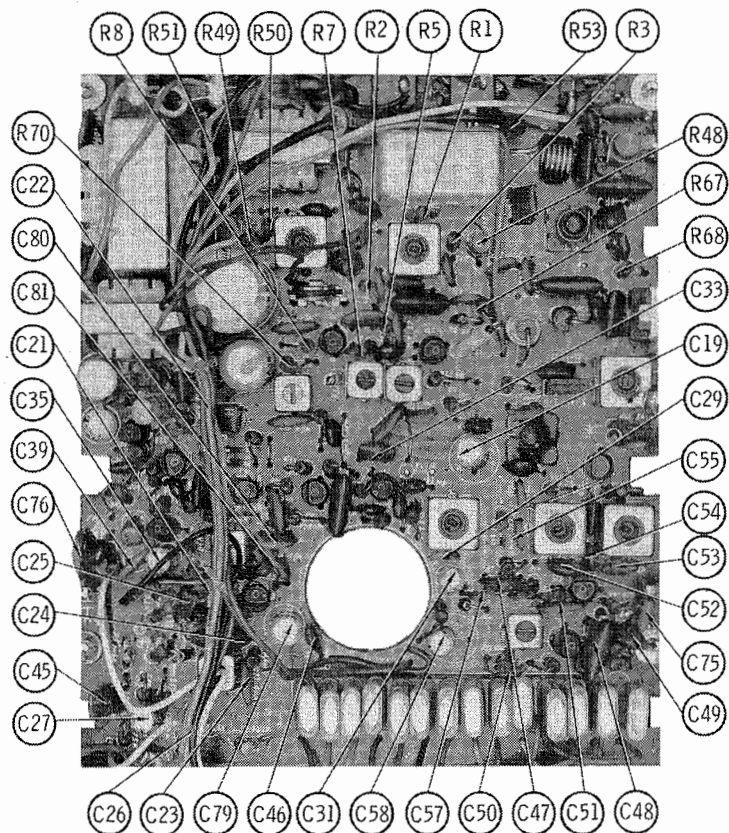
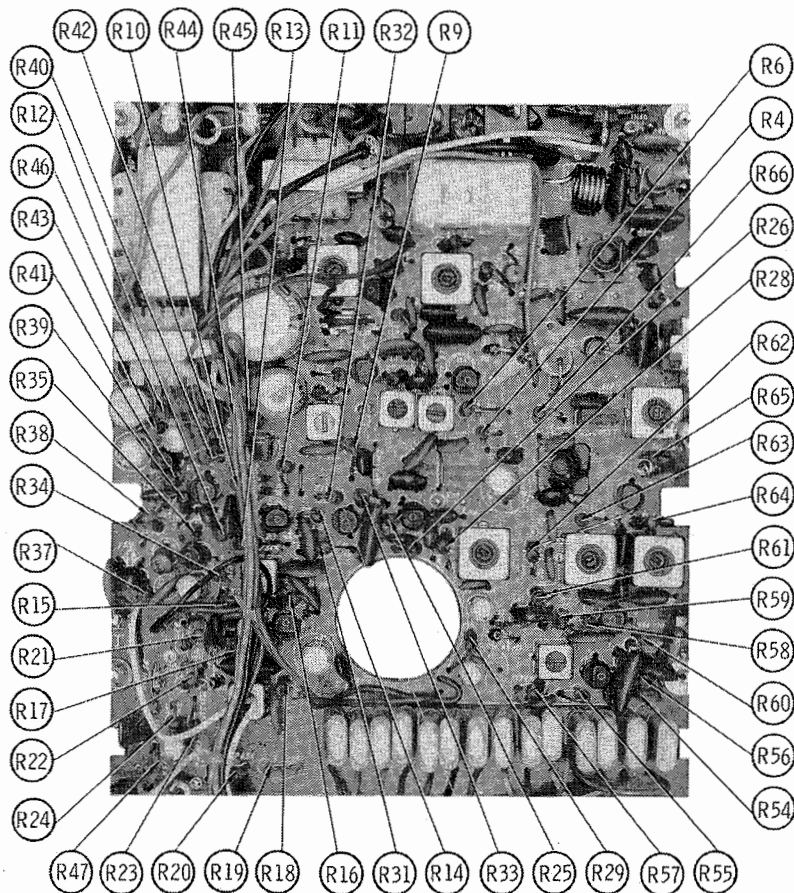
Connect an RF Wattmeter or 50-ohm, 25-watt dummy load to antenna connector.
Adjustments made with 14-volt DC input.

INDICATOR	ADJUST	REMARKS
RF PANEL METER RF Wattmeter	R403	Key transmitter. Adjust so that panel RF meter agrees with RF wattmeter.

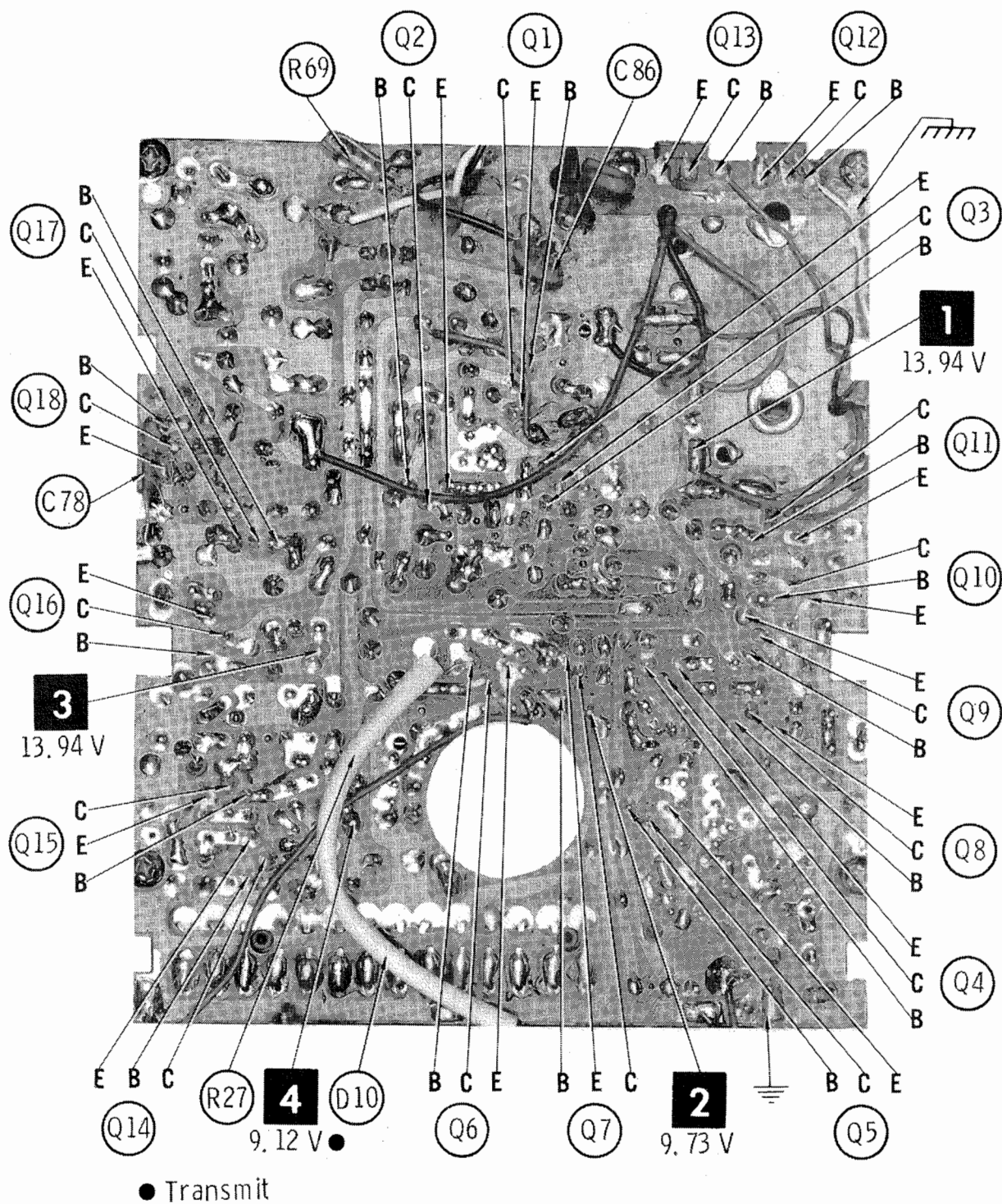
A Howard W. Sams CIRCUITRACE® Photo



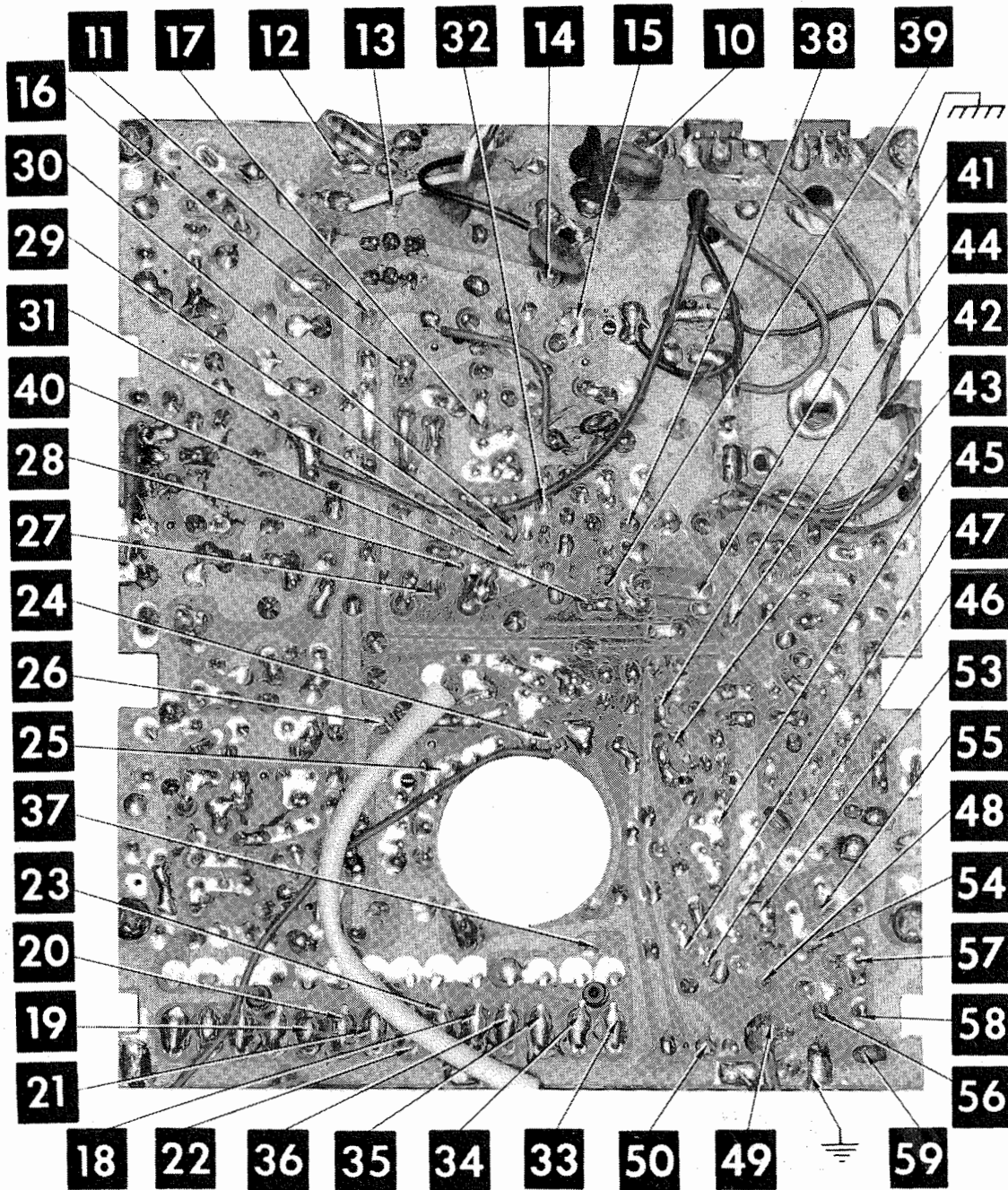
CHASSIS - TOP



MAIN BOARD

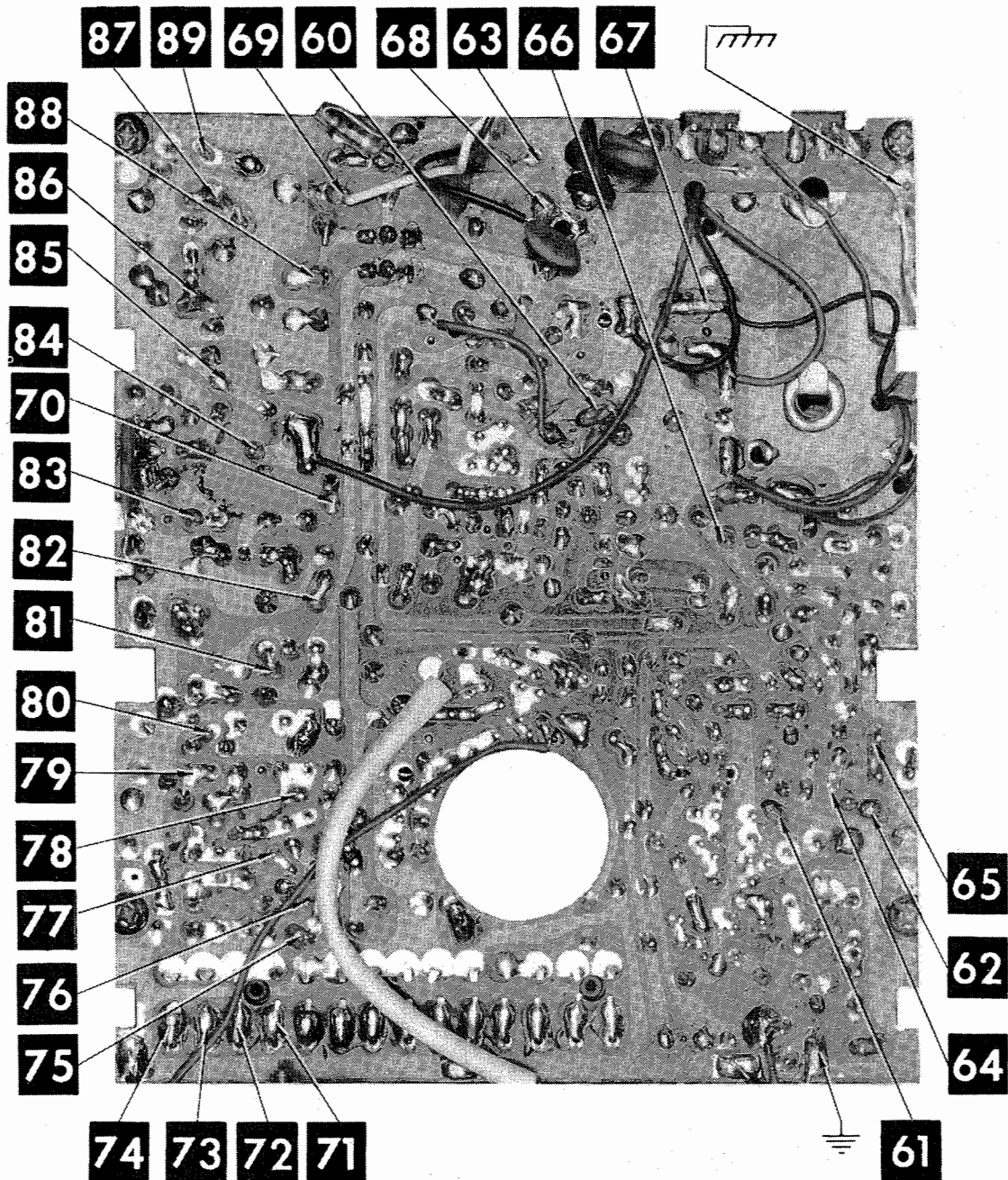


MAIN BOARD

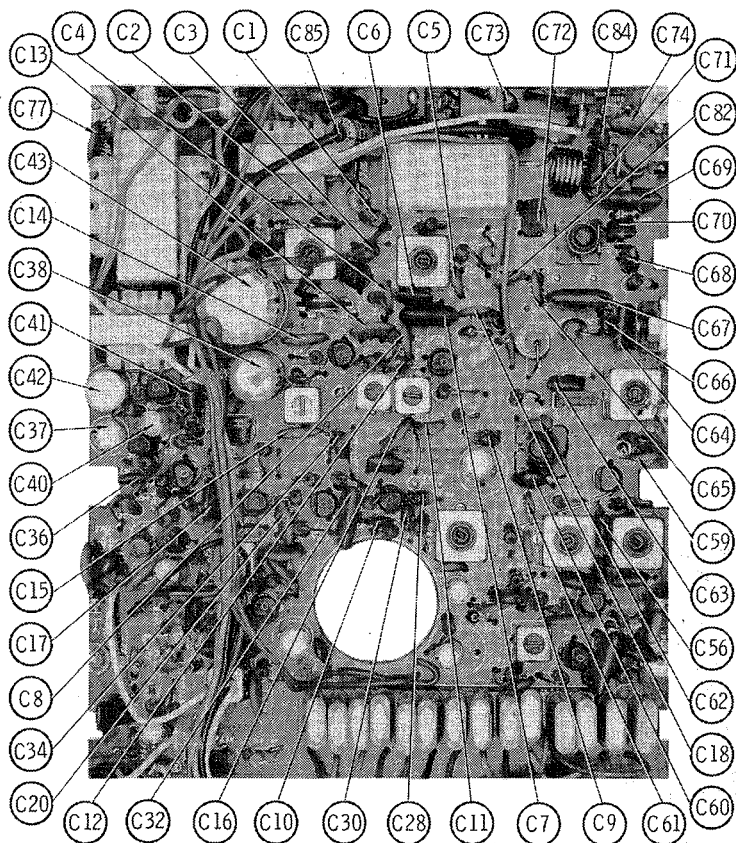
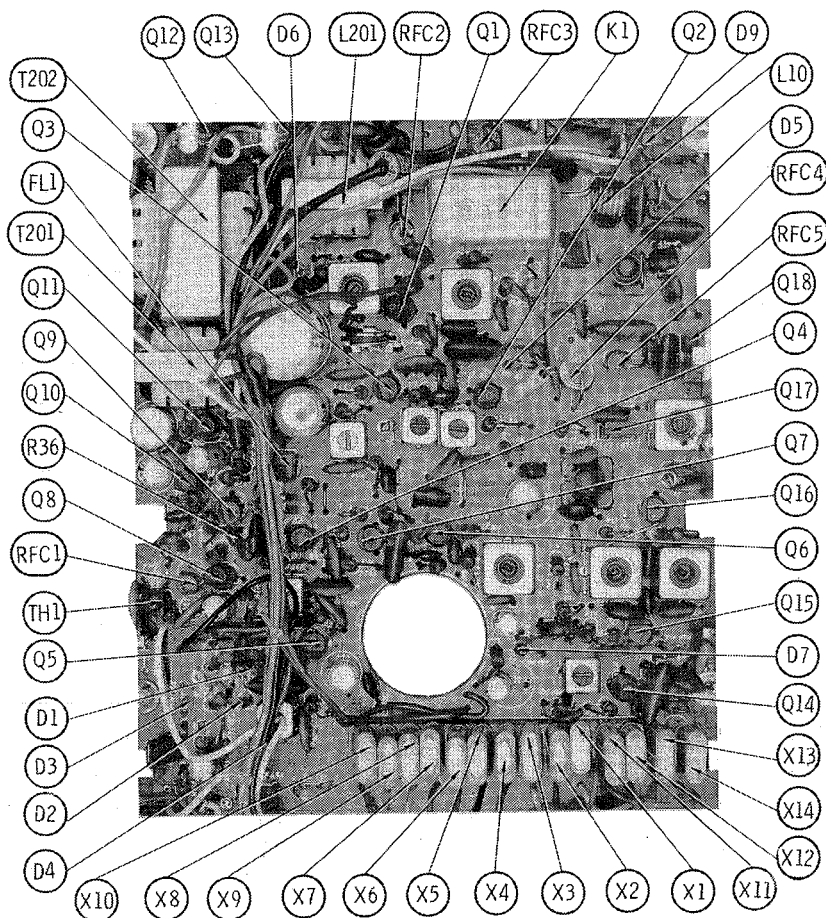


PAGE MODEL CB143

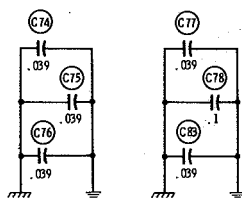
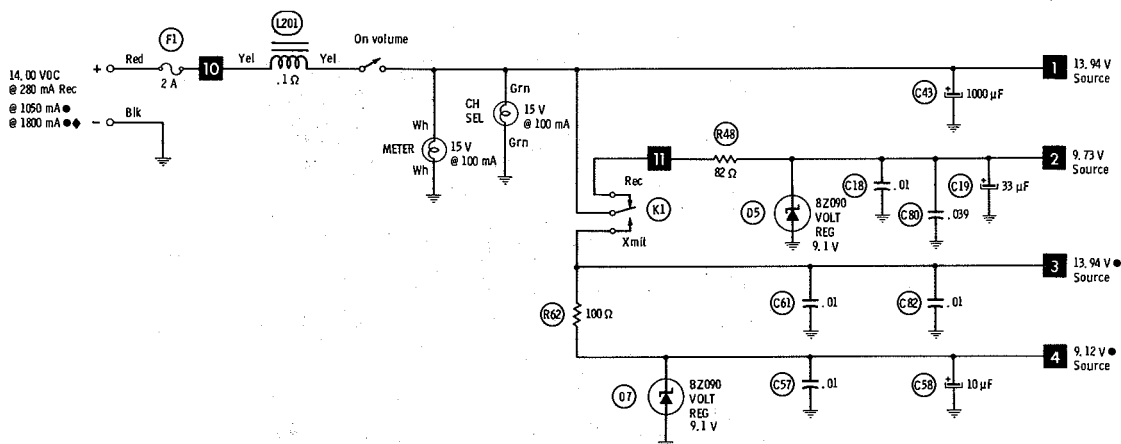
MAIN BOARD



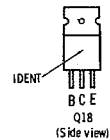
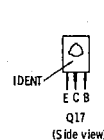
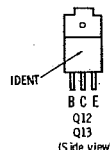
MAIN BOARD



MAIN BOARD



Terminal Guides
Bottom view unless noted.



Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement
1	X1, X7, X11	7	X2, X9, X13	13	X4, X7, X11	19	X5, X9, X13
2	X1, X8, X12	8	X2, X10, X14	14	X4, X8, X12	20	X5, X10, X14
3	X1, X9, X13	9	X3, X7, X11	15	X4, X9, X13	21	X6, X7, X11
4	X1, X10, X14	10	X3, X8, X12	16	X4, X10, X14	22	X6, X8, X12
5	X2, X7, X11	11	X3, X9, X13	17	X5, X7, X11		
6	X2, X8, X12	12	X3, X10, X14	18	X5, X8, X12	23	X6, X10, X14

— 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.

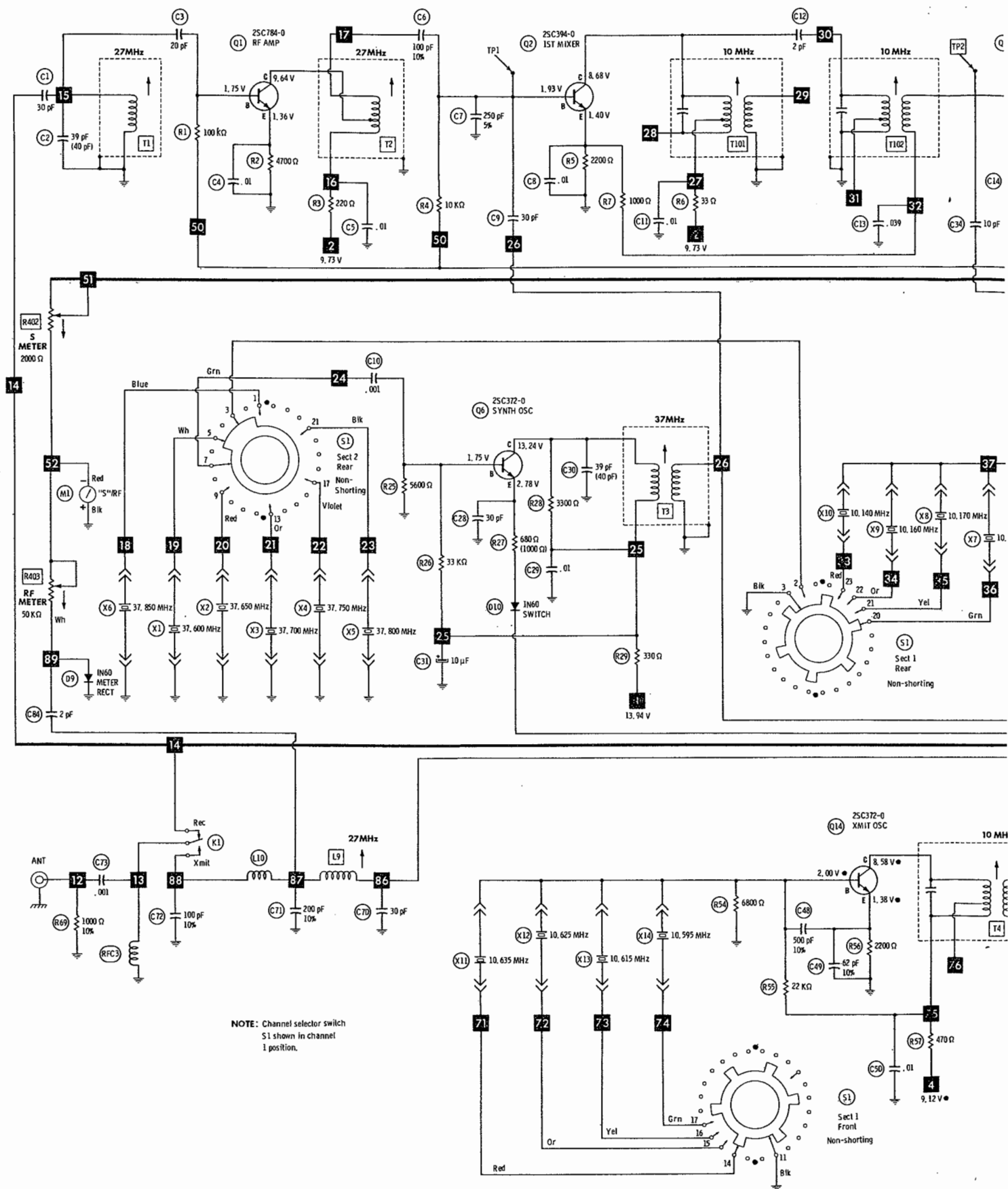
Resistors are 1/2W or less, 5% unless noted.

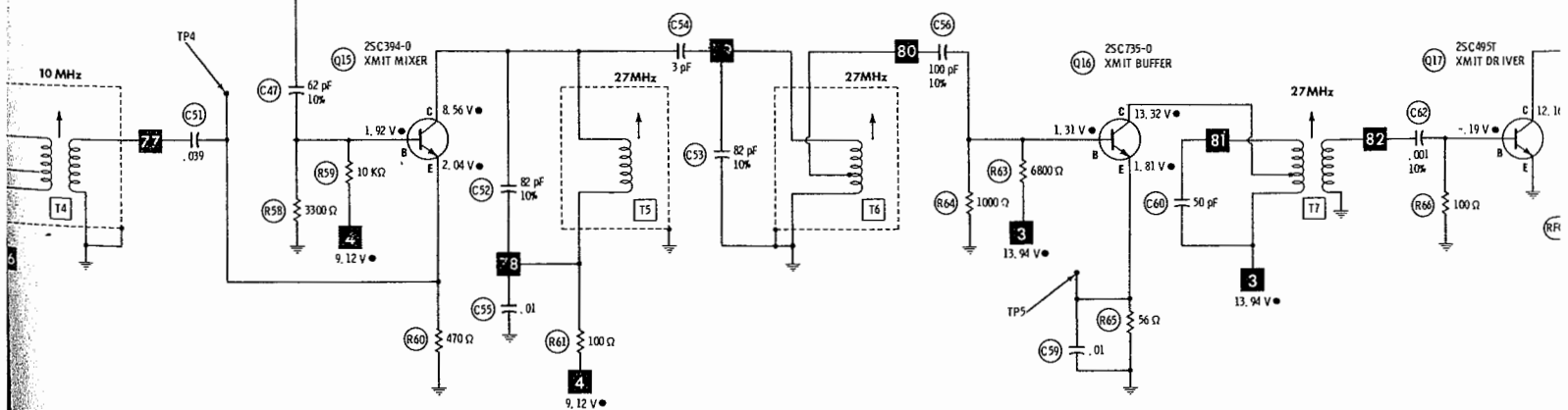
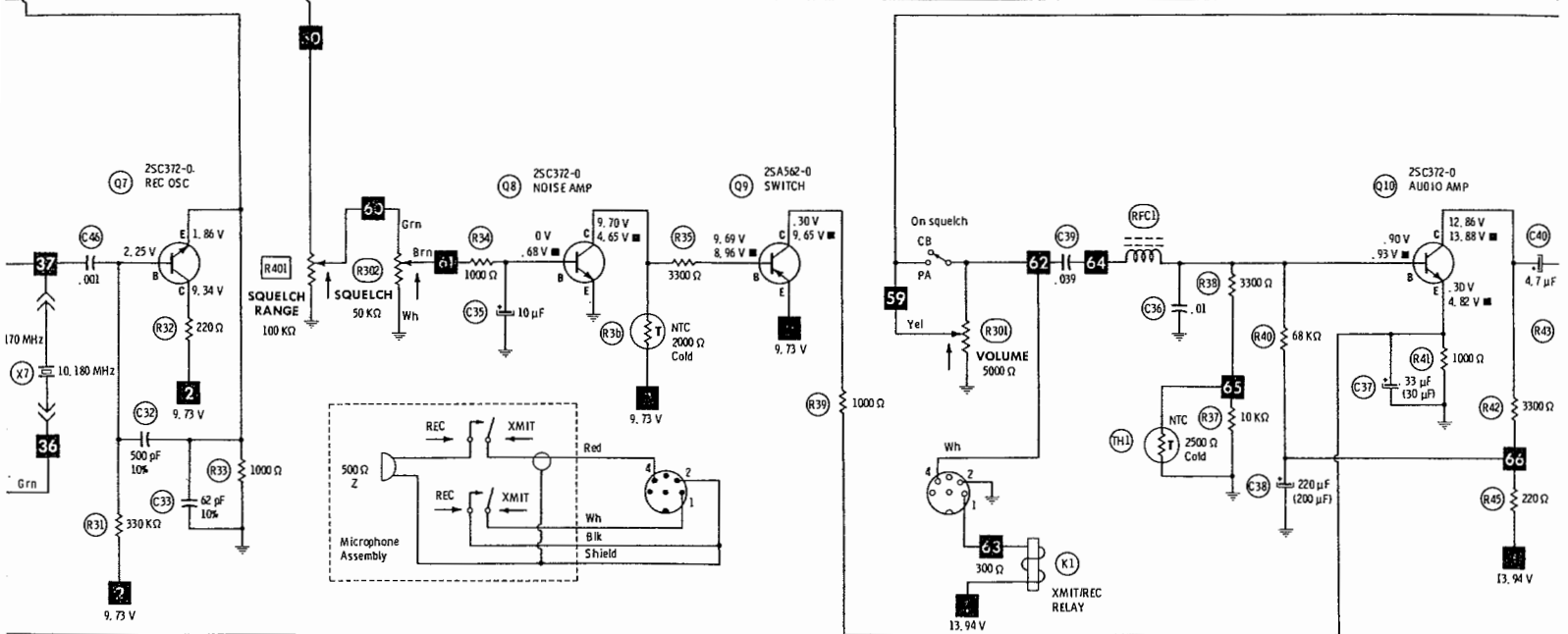
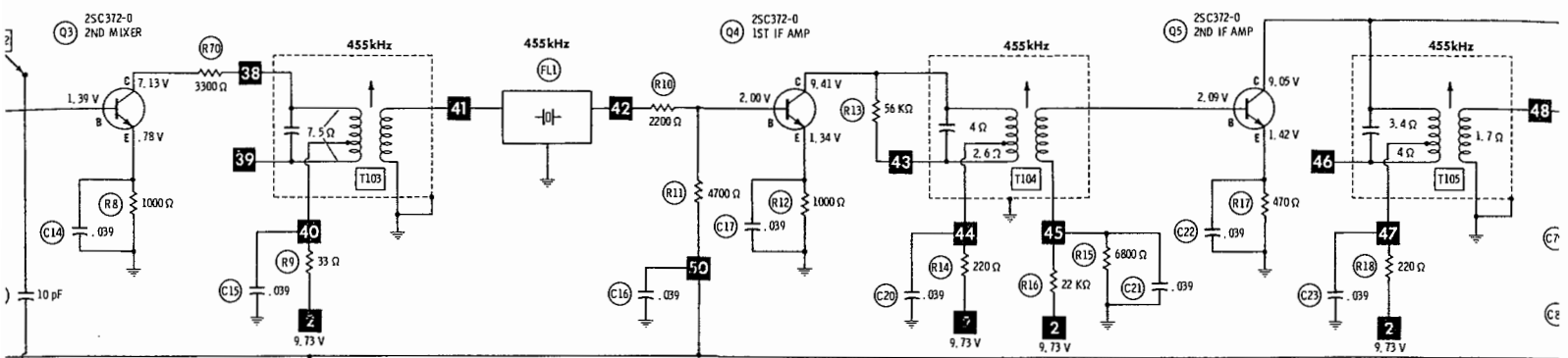
Value in () used in some versions.

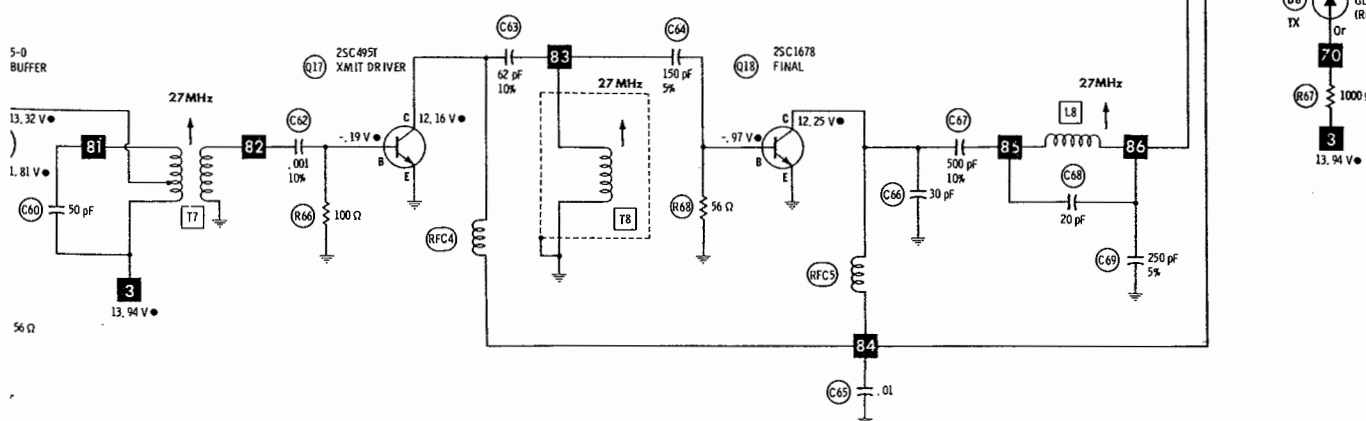
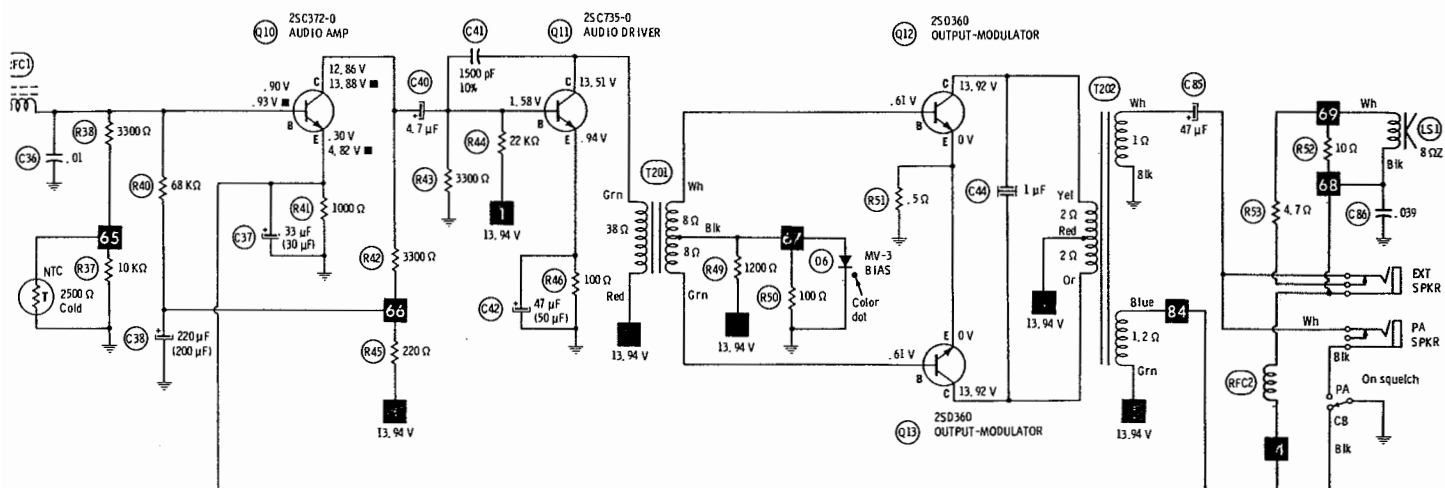
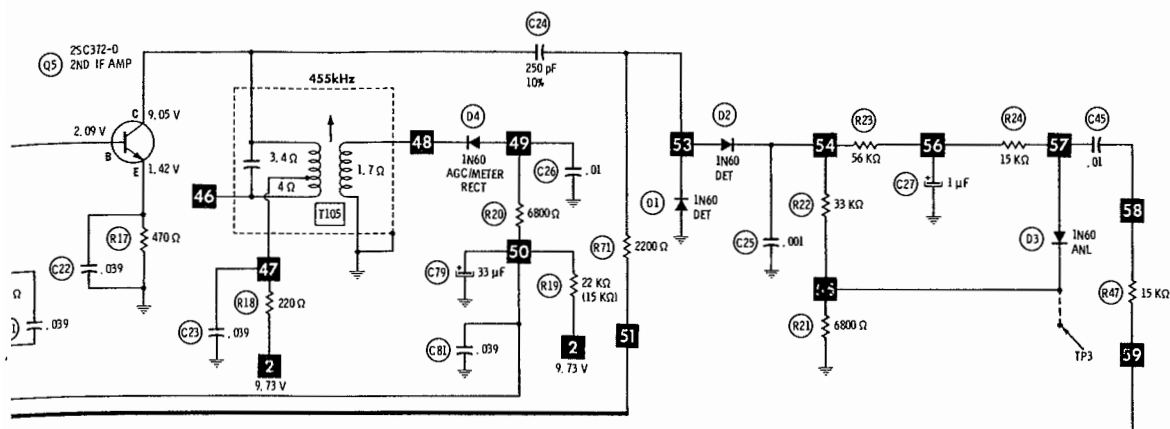
A PHOTOFAC STANDARD NOTATION SCHEMATIC

WITH CIRCUITRACE[®]

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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 12 Colors
Power Cord, 2-Wire	Use BELDEN No. 8524 (Stranded) Available in 12 Colors
Shielded Antenna Lead	Use BELDEN No. 17106 (Plastic) or 17126 (Rubber) -6 feet
	17109 (Plastic) or 17129 (Rubber) -9 feet
Coiled Microphone Cable	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)
	8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene
	8491 4-Conductor (2 shielded, 2 unshielded) Neoprene

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA							
			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.
D1	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D2	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D3	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D4	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D5	BZ090		GEZD-9.1	Z1209	PTC505	HEPZ0412	RE 114	SK3060	RT-240	ECG139
	9.1V Zener									
D6	MV-3		GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D7	BZ090		GEZD-9.1	Z1209	PTC505	HEPZ0412	RE 114	SK3060	RT-240	ECG139
	9.1V Zener									
D8	GL-31AR (RED)									
D9	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D10	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
Q1	2SC784-0		GE-11	TR-69	PTC132	HEPS0016	RE 9	SK3018	RT-108	ECG107
Q2	2SC394-0		GE-60	(IR)2SC372	PTC121	HEPS0014	RE 9	SK3018	RT-107A	ECG229
Q3	2SC372-0		GE-20	TR-24	PTC139	HEPS0015	RE 13	SK3018	RT-105	ECG123A
Q4	2SC372-0		GE-20	TR-24	PTC139	HEPS0015	RE 13	SK3018	RT-105	ECG123A
Q5	2SC372-0		GE-20	TR-24	PTC139	HEPS0015	RE 13	SK3018	RT-105	ECG123A
Q6	2SC372-0		GE-20	TR-24	PTC139	HEPS0015	RE 13	SK3018	RT-105	ECG123A
Q7	2SC372-0		GE-20	TR-24	PTC139	HEPS0015	RE 13	SK3018	RT-105	ECG123A
Q8	2SC372-0		GE-20	TR-24	PTC139	HEPS0015	RE 13	SK3018	RT-105	ECG123A
Q9	2SA562-0		GE-21	TR-54	PTC103	HEPS0019	RE 26	SK3114	RT-115	ECG290
Q10	2SC372-0		GE-20	TR-24	PTC139	HEPS0015	RE 13	SK3018	RT-105	ECG123A
Q11	2SC735-0	(1)	GE-63	TR-24	PTC123	HEPS0014	RE 78	SK3124	RT-107A	ECG289
Q12	2SD360	(1)	GE-66	TR-76	PTC110	HEPS0000	RE 21	SK3041	RT-197	ECG235
Q13	2SD360	(1)	GE-66	TR-76	PTC110	HEPS0000	RE 21	SK3041	RT-197	ECG235
Q14	2SC372-0		GE-20	TR-24	PTC139	HEPS0015	RE 13	SK3018	RT-105	ECG123A
Q15	2SC394-0		GE-60	(IR)2SC372	PTC121	HEPS0014	RE 9	SK3018	RT-107A	ECG229
Q16	2SC735-0		GE-63	TR-24	PTC123	HEPS0014	RE 78	SK3124	RT-107A	ECG289
Q17	2SC495T	(2)	GE-28	TR-50	PTC163	HEPS0000	RE 40	SK3054	RT-194	ECG295
Q18	2SC1678	(3)	GE-216		PTC186				RT-197	ECG235

- (1) Rating 10 watts @ 800mA.
(2) Rating 5 watts @ 800mA.
(3) Rating 10 watts @ 3 amps.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA					
		MFR. PART No.	ARCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C19	33 16V		ME-4-G-035	EP30-25	PC30-25	VTT33025	EV-1325
C27	1 50V		ME-1-G-001	EA30-1	WBR1-50	TT25X1	TVA-1200
C31	10 16V		RME-B-G-010	EP15-10	PC10-25	VTT10A25	EV-1222
C35	10 16V		RME-B-G-010	EP15-10	PC10-25	VTT10A25	EV-1222
C37	33 16V		ME-4-G-035	EP30-25	PC30-25	VTT33025	EV-1325
C38	220 16V		RME-J-E-250	EP15-250	PC250-25	VTT220G16	EV-1240
C40	4.7 25V		RME-A-J-005	EP30-5	PC5-50	VTT4R7A50	EV-1319
C42	47 16V		RME-E-E-050	EP15-50	PC50-16	VTT47D16	EV-1226
C43	1000 16V		RME-N-E-1000	EP15-1000	PC1000-16	VTT1000L16	EV-1260
C44	1 63V NP		CTA-7425	EN50-105	WNP1-50	TCN501A	TVAN-1560
C58	10 16V		RME-B-G-010	EP15-10	PC10-25	VTT10A25	EV-1222
C79	33 16V		ME-4-G-035	EP30-25	PC30-25	VTT33025	EV-1325
C85	47 16V		RME-E-E-050	EP15-50	PC50-16	VTT47D16	EV-1226

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			ARCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.
C1	30		DM10-300J	CPR-30J	CD6ED300J03	SX430
C2	39		DM10-390J	CPR-39J	CD6ED390J03	SX439
C3	20		DM10-200J	CPR-20J	CD6CD200J03	SX420
C4	.01		CCD-103	DC-103	GP10000	MAG5011
C5	.01		CCD-103	DC-103	GP10000	MAG5011
C6	100 10%		DM10-101J	CPR-100J	CD10FD101J03	SX310
C7	250 5%		DM10-251J		CD10FD251J03	
C8	.01		CCD-103			
C9	30		DM10-300J	CPR-30J	CD6ED300J03	SX430
C10	.001		1MDF-1-102	CPJ-102	OPMS6D1	EWFA210

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS (cont)

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA				
			ARCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C11	.01		CCD-103				10TS-S10
C12	2				WMFTW2	EWFA20	156P20504
C13	.039 25V		CCD-403			GP140	5GA-S40
C14	.039 25V		CCD-403			GP140	5GA-S40
C15	.039 25V		CCD-403			GP140	5GA-S40
C16	.039 25V		CCD-403			GP140	5GA-S40
C17	.039		6DP-3-393		DPMS6S39	PVC6139	6PS-S39
C18	.01		CCD-103				10TS-S10
C20	.039 25V		CCD-403			GP140	5GA-S40
C21	.039 25V		CCD-403			GP140	5GA-S40
C22	.039 25V		CCD-403			GP140	5GA-S40
C23	.039 25V		CCD-403			GP140	5GA-S40
C24	250 10%		DM10-251J		CD10FD251J03		
C25	.001		1MDF-1-102	CPJ-102	DPMS6D1	EWFA210	1PB-D10
C26	.01		1MDF-1-103	CPJ-103	DPMS4S1	EWFA110	1PB-S10
C28	30		DM10-300J	CPR-30J	CD6ED300J03	SX430	
C29	.01		CCD-103				10TS-S10
C30	30		DM10-300J	CPR-30J	CD6ED300J03	SX430	
C32	500 10%		DM15-501J		CD15FD501J03		
C33	62 10%		DM10-620J	CPR-62J	CD6ED620J03	SX462	424MC62RQJ501
C34	10		DM10-100J		CD6CD100D03		
C36	.01		1MDF-1-103	CPJ-103	DPMS4S1	EWFA110	1PB-S10
C39	.039 25V		CCD-403			GP140	5GA-S40
C41	500 10%		DM15-501J		CD15FD501J03		
C45	.01		1MDF-1-103	CPJ-103	DPMS4S1	EWFA110	1PB-S10
C46	.001		1MDF-1-102	CPJ-102	DPMS6D1	EWFA210	1PB-D10
C47	62 10%		DM10-620J	CPR-62J	CD6ED620J03	SX462	424MC62RQJ501
C48	500 10%		DM15-501J		CD15FD501J03		
C49	62 10%		DM10-620J	CPR-62J	CD6ED620J03	SX462	424MC62RQJ501
C50	.01		CCD-103				10TS-S10
C51	.039 25V		CCD-403			GP140	5GA-S40
C52	82 10%		DM10-820J	CPR-82J	CD10ED820J03	SX482	424MC82RQJ501
C53	82 10%		DM10-820J	CPR-82J	CD10ED820J03	SX482	424MC82RQJ501
C54	3		CCTO-3R3	DTZ-3R3	NP03P3	CN0533	10TCC-V33
C55	.01		CCD-103				10TS-S10
C56	100 10%		DM10-101J	CPR-100J	CD10FD101J03	SX310	424MC1000J501
C57	.01		CCD-103				10TS-S10
C59	.01		CCD-103				10TS-S10
C60	50		DM10-500J		CD6ED500J03		
C61	.01		CCD-103				10TS-S10
C62	.001 10%		CCD-102	DD-102	GP1000	GP210	2SS-D10
C63	62 10%		DM10-620J	CPR-62J	CD6ED620J03	SX462	424MC62RQJ501
C64	150 5%		DM10-151J	CPR-150J	CD7FD151J03	SX315	424MC1500J501
C65	.01		CCD-103				10TS-S10
C66	30		DM10-300J	CPR-30J	CD6ED300J03	SX430	
C67	500 10%		DM15-501J		CD15FD501J03		
C68	20		DM10-200J	CPR-20J	CD6CD200J03	SX420	
C69	250 5%		DM10-251J		CD10FD251J03		
C70	30		DM10-300J	CPR-30J	CD6ED300J03	SX430	
C71	200 10%		DM10-201J	CPR-200J	CD10FD201J03	SX320	424ME2000J501
C72	100 10%		DM10-101J	CPR-100J	CD10FD101J03	SX310	424MC1000J501
C73	.001		1MDF-1-102	CPJ-102	DPMS6D1	EWFA210	1PB-D10
C74	.039 25V		CCD-403			GP140	5GA-S40
C75	.039 25V		CCD-403			GP140	5GA-S40
C76	.039 25V		CCD-403			GP140	5GA-S40
C77	.039 25V		CCD-403			GP140	5GA-S40
C78	.1 25V			DC-104	MGP1	GP140	5GA-S40
C80	.039 25V		CCD-403			MAG5001	TG-P10
C81	.039 25V		CCD-403			GP140	5GA-S40
C82	.01		CCD-103			GP140	5GA-S40
C83	.039 25V			DC-104	MGP1	MAG5001	10TS-S10
C84	2		CCTO-2R2	DTZ-2R2	NP02P2	CN0522	TG-P10
C86	.039 25V		CCD-403			GP140	10TCC-V22

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

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA			
			MFGR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	TRW PART No.
R301	Volume/Power Switch	5000				
R302	Squelch/PA Switch	50K				
R401	Squelch Range	100K		TSV-100K or T-100K	C-104	MTC15L1
R402	"S" Meter	2000		TSV-2.5K or T-2500	C-252	X201R252B
R403	"RF" Meter	50K		TSV-50K or T-50K	C-503	MTC54L1

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.
R36	2000 Cold NTC	MV-3		R51	.5 Ohms 1/2W 1W		
TH1	2500 Cold NTC	33D26		R52	10 Ohms 1W	CB2-10	

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.	
L8	Final Tank (27MHz)	TKXN-34385-HM			
L9	Pi Filter (27MHz)	HL-129			
L10	Antenna	HL-129			
T1	Rec. Antenna (27MHz)	TKXN-34386-HM			
T2	Rec RF (27MHz)	TKXN-34387-Y			
T3	Synth. Osc (37MHz)	TKXN-34384-8M			
T4	Xmit Osc (10MHz)	85AC2531A			
T5	Harmonic Sup (27MHz)	TKXN-34386-HM			
T6	Xmit Mixer (27MHz)	TKXN-3387-Y			
T7	Xmit Buffer (27MHz)	85AC2531			
T8	Xmit Driver	TKXN-34385-HM			
T101	10MHz IF				
T102	10MHz IF				
T103	Input IF (455kHz)	LMC3054			
T104	Interstage IF (455kHz)	LPC4201A			
T105	Output IF (455kHz)	LMC4202A			
RFC1	RF Choke (10uH)	L4-100K			
RFC2	RF Choke	HL-109			
RFC3	RF Choke	HL-109			
RFC4	RF Choke	H-111			
RFC5	RF Choke	H-110			

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.	
L201	1800mA	.1	1.25mH	EI-19-001			

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T202	32	8	EI-28-001			

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP	2 1/2" PM 8 Ohms			

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	2 Amp Fast Acting			AGC2	HDJ	312002	150145	FG2-2

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
FL1	Ceramic Filter	CFY455	455kHz
K1	Relay	MTS-2	Xmit/Rec (300 ohm)
M1	Meter		S/RF

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	37.600		DA14M37.600	1,2,3,4	X8	10.170		DC22M10.170	2,6,10,14,18,22
X2	37.650		DA14M37.650	5,6,7,8	X9	10.160		DC22M10.160	3,7,11,15,19
X3	37.700		DA14M37.700	9,10,11,12	X10	10.140		DC22M10.140	4,9,12,16,20,23
X4	37.750		DA14M37.750	13,14,15,16	X11	10.635		DC20M10.635	1,5,9,13,17,21
X5	37.800		DA14M37.800	17,18,19,20	X12	10.625		DB20M10.625	2,6,10,14,18,21
X6	37.850		DA14M37.850	21,22,23	X13	10.615		DB20M10.615	3,7,11,15,19
X7	10.180		DC22M10.180	1,5,9,13,17,21	X14	10.595		DB20M10.595	4,8,12,16,20,23

ACCESSORIES

ITEM	MFGR. PART No.	REMARKS
Microphone	IC900	