



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 13-785

ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools:

GC ELECTRONICS

L2, L3, T1, T2, T3.....5000, 8290
ALL other tunable Transformers and Coils.....9440

MIDLAND MODEL 13-785

RECEIVER

Connect an AC VTVM or AF Wattmeter across speaker voice coil.
Adjustments made with 12-volt DC input.
Adjust volume control to obtain suitable reading.

SIGNAL GENERATOR	GEN FREQ	CHANNEL	ADJUST	REMARKS
High side thru .01uF to base of TR2, low side to ground.	455kHz, 1000Hz @ 30% modulation.	Any	T1,T2,T3	Set generator output to maintain a 1V output across voice coil. Adjust for maximum.
High side thru .01uF to external antenna, low side to ground.	27.035MHz, 1000Hz @ 30% modulation, output 2uV.	7	L2, L3	Adjust for maximum.

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

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RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF Wattmeter across speaker voice coil.
These adjustments made with 12-volt DC input.
Adjust volume control to obtain a suitable reading.

SIGNAL GENERATOR	GEN FREQ	CHANNEL	ADJUST	REMARKS
IF GAIN High side thru .01uF to external antenna, low side to ground.	27.035MHz, 1000Hz, @ 30% modulation, output 1.2uV.	7	VR3	Adjust for maximum sensitivity without regeneration.
"S" High side thru .01uF to external antenna, low side to ground.	27.035MHz, 1000Hz @ 30% modulation, output 1000uV.	7	VR1	Adjust for "S" 9 on panel meter

TRANSMITTER

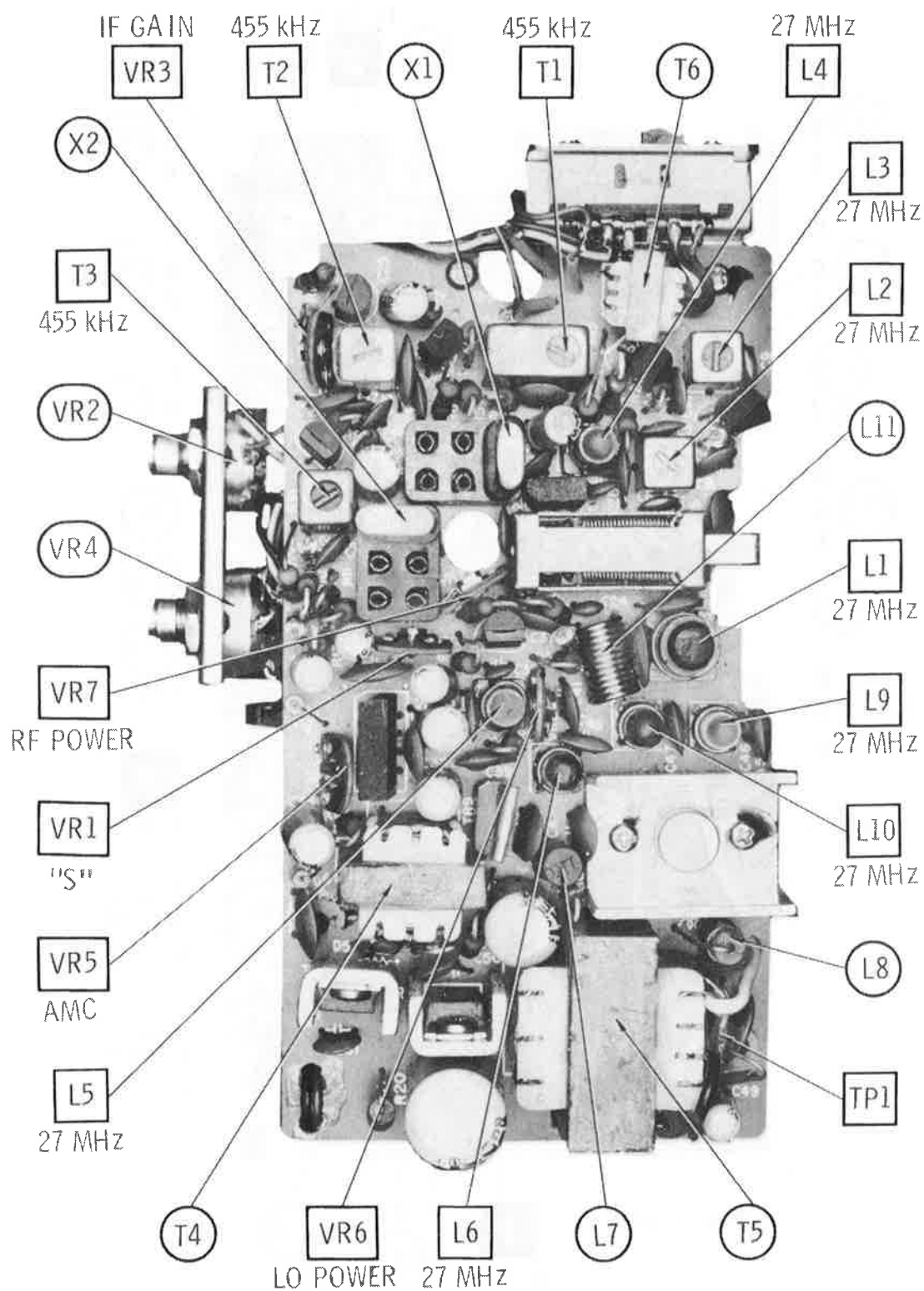
Connect an RF Wattmeter or 50-ohm, 25-watt dummy load to antenna connector.
Adjustments made with 12-volt DC input.

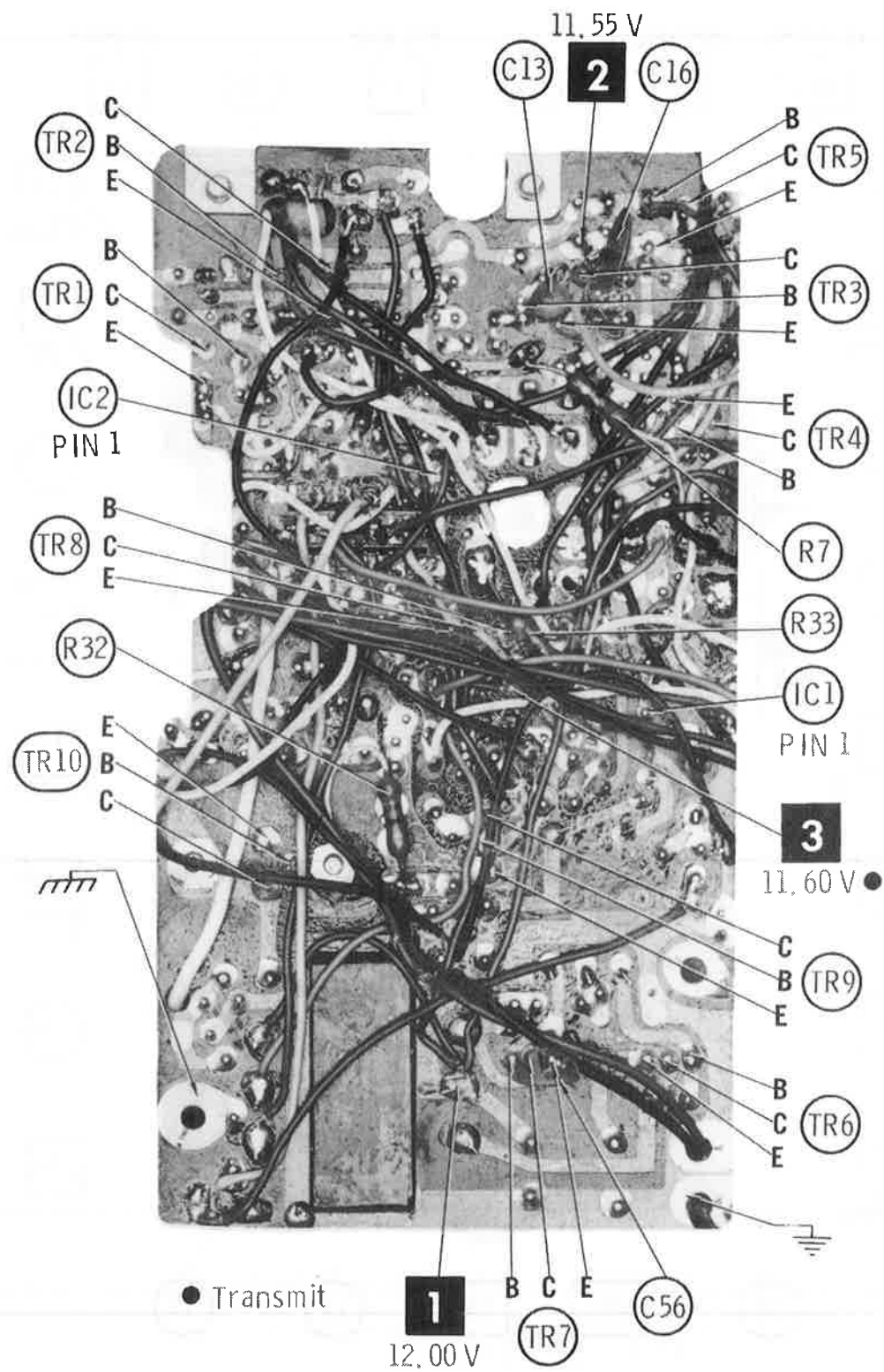
INDICATOR	ADJUST	REMARKS
OSCILLATOR, DRIVER, FINAL RF Wattmeter	L5,L6,L9, L10	Channel selector to channel 7. Key transmitter Adjust for maximum.
OUTPUT POWER RF Wattmeter	L1	Extend antenna fully. Key transmitter. Adjust for maximum watts output.
FINAL INPUT POWER Remove jumper at TP1 and connect 0-500 DC milliammeter	L9	High-Lo switch to Hi. Adjust for 5 watts (Max.)
	VR6	Set Hi-Lo switch to Lo. Adjust for 2 watts output.

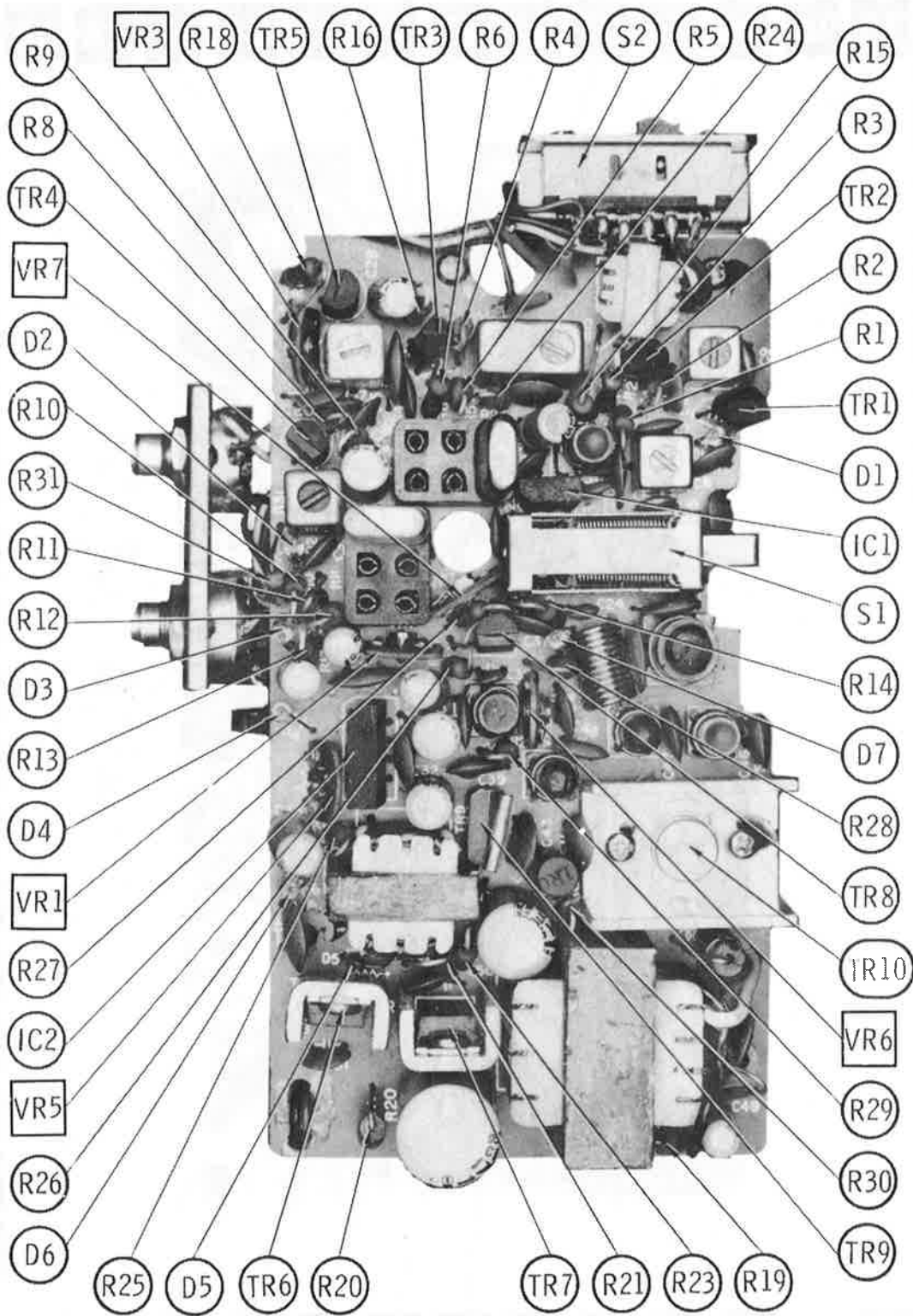
TRANSMITTER ADJUSTMENTS

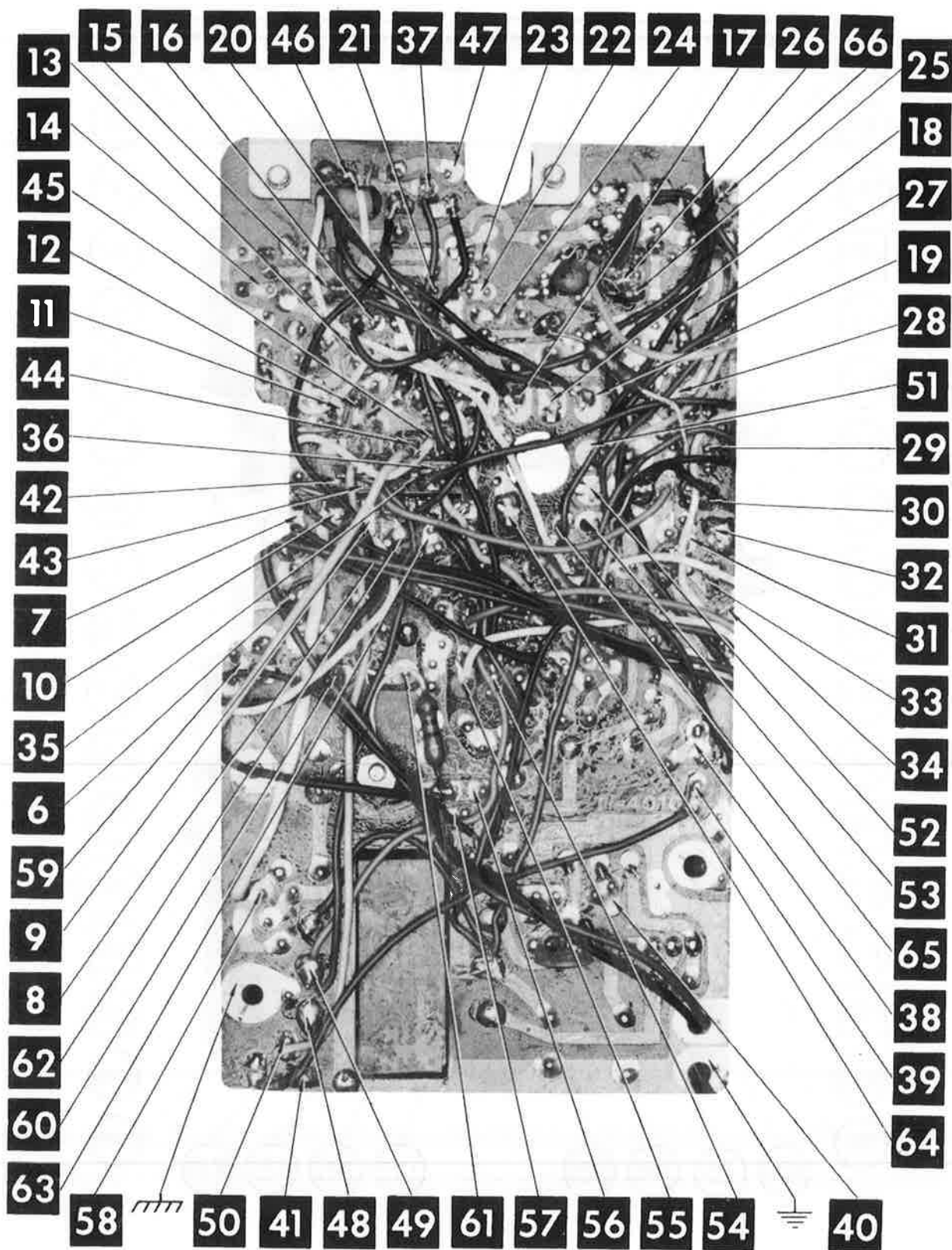
Connect an RF Wattmeter or 50-ohm, 25-watt dummy load to antenna connector.
Adjustments made with 12-volt DC input.

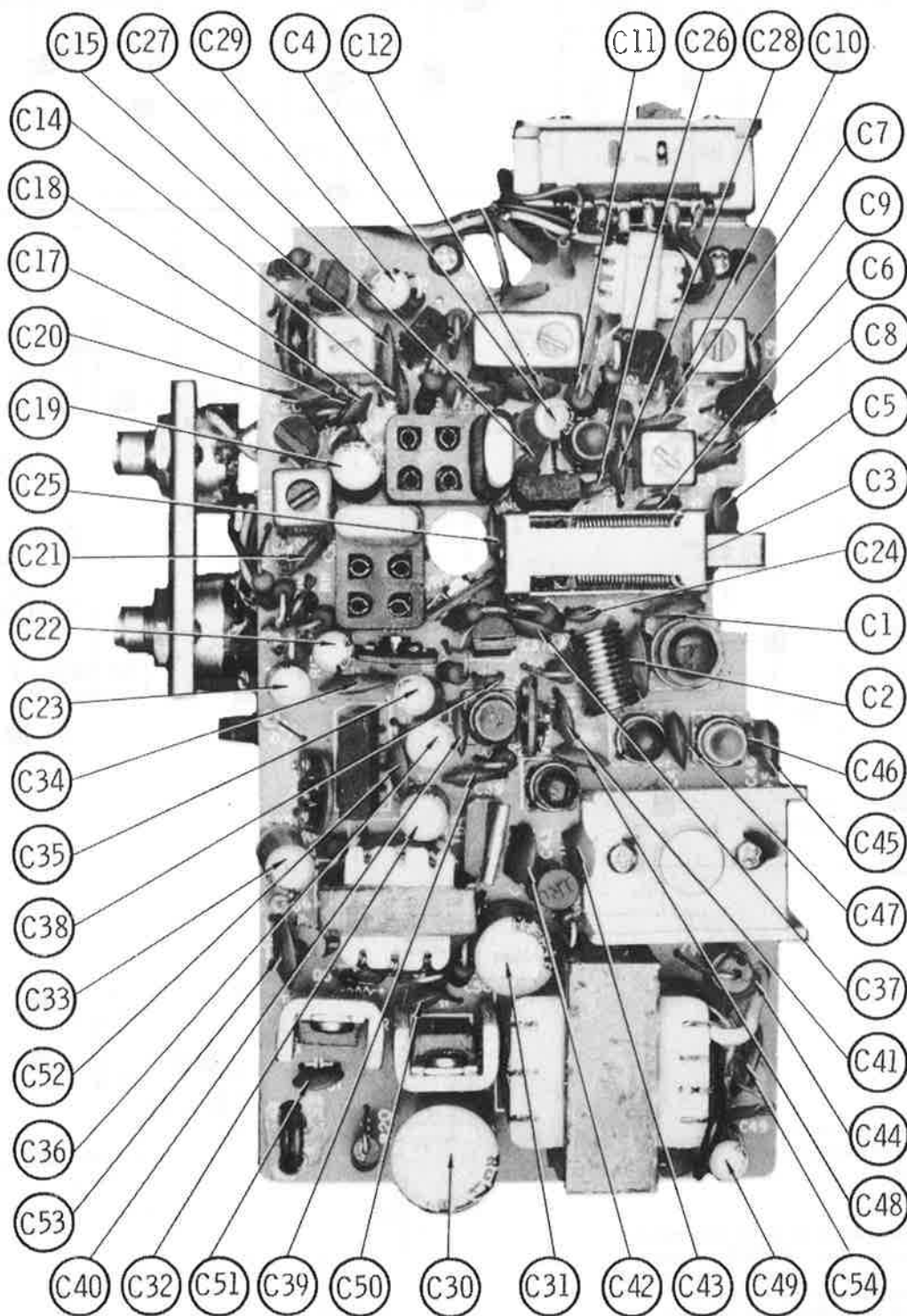
INDICATOR	ADJUST	REMARKS
AMC Modulation Meter connected to external antenna.	VR5	Deactivate VR5 inject a 1000Hz signal to microphone input set output for 110% modulation. Adjust VR5 for 100% modulation maximum.
RF PANEL METER RF Wattmeter	VR7	Key transmitter. Adjust so that panel RF meter reads 50% into red wedge.

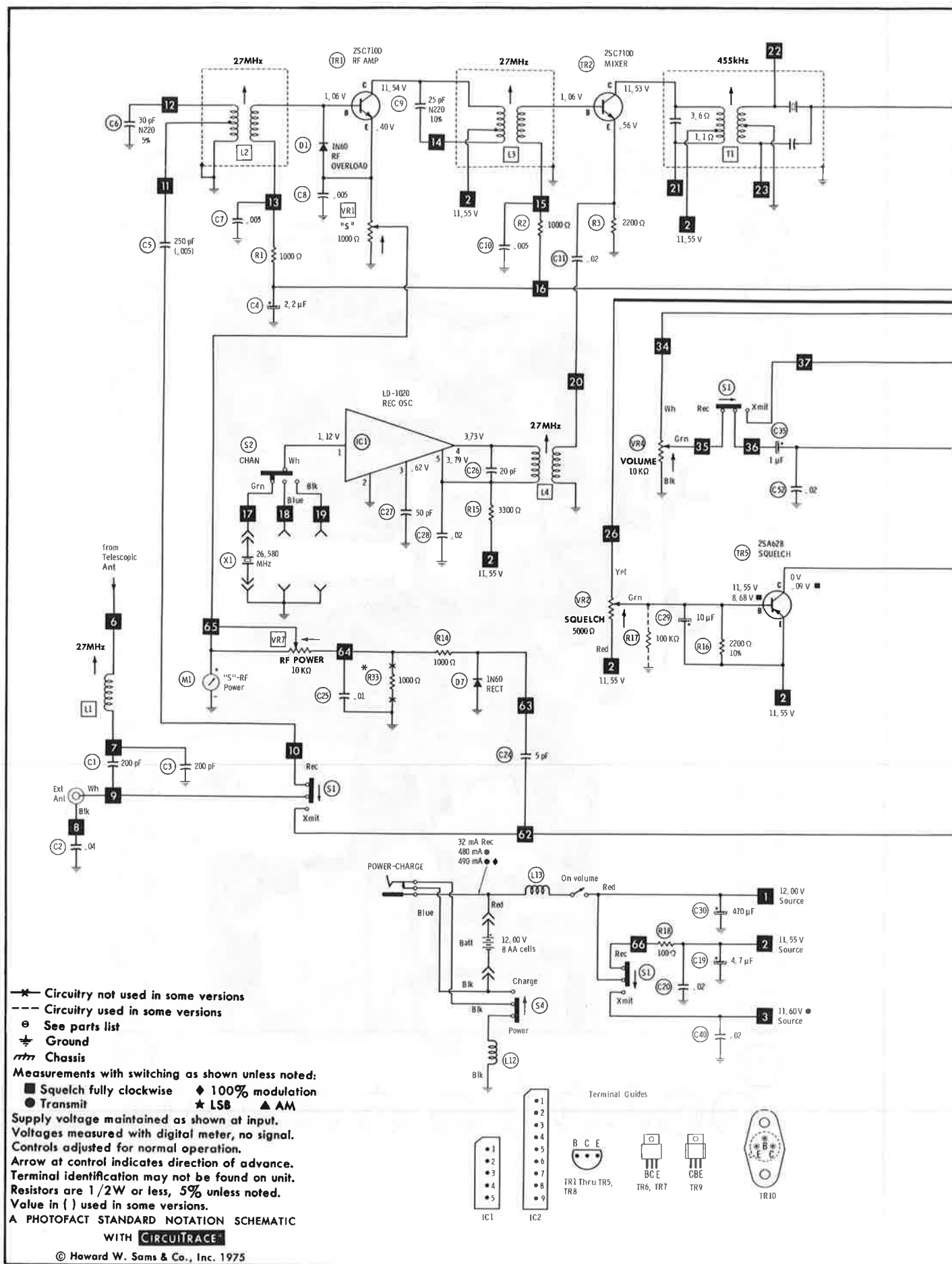


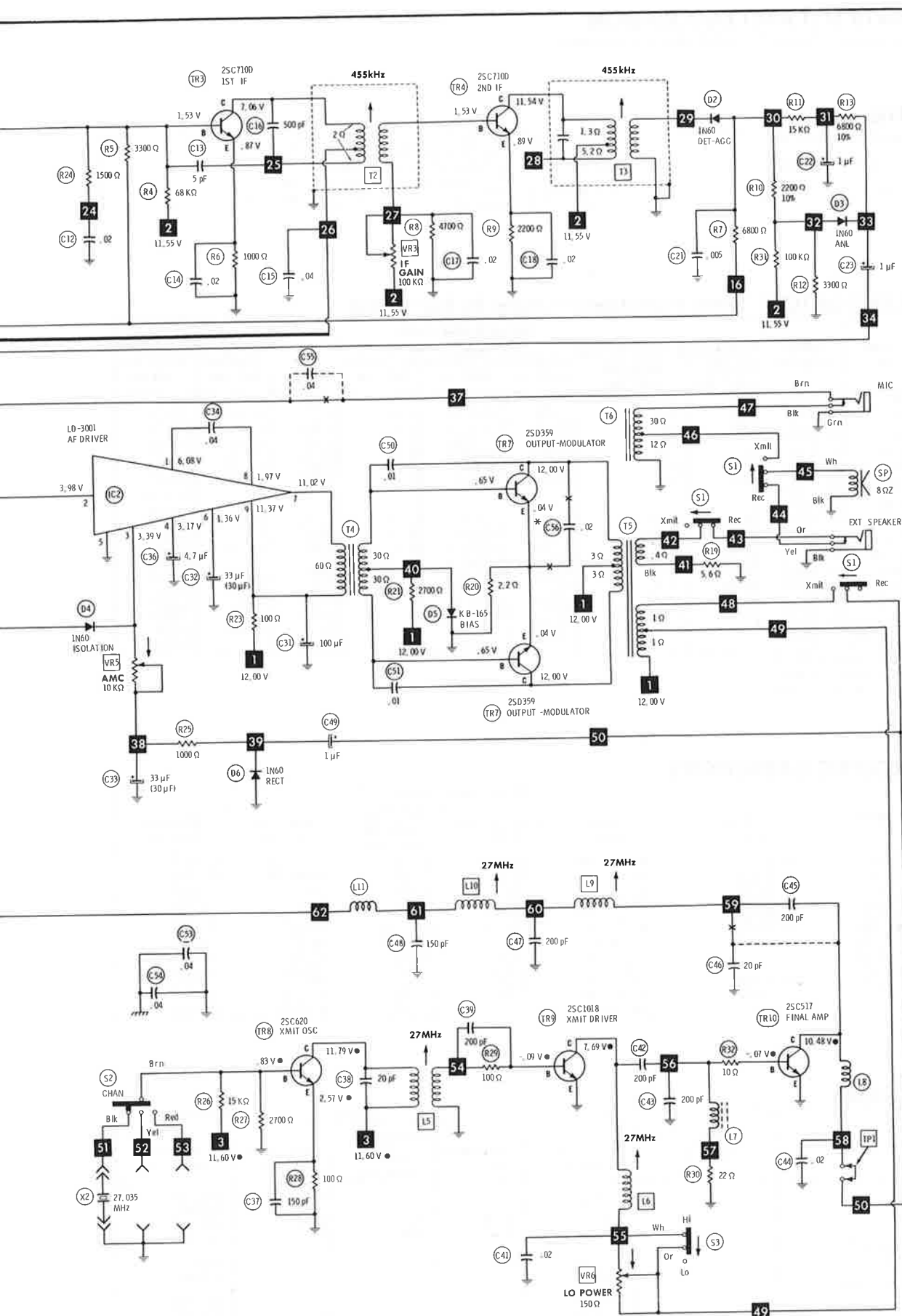












MIDLAND MODEL 13-785

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 8524 (Stranded) Available in 12 Colors
Shielded Antenna Lead	Use BELDEN No. 8240 (Solid) Miniature (RG-58/U) 8259 (Stranded) Miniature (RG-58A/U)
Shielded Cable	Use BELDEN No. 8499 Single-conductor Shielded (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	09-306019	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D2	1N60	09-306019	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D3	1N60	09-306019	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D4	1N60	09-306019	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D5	KB-165	09-307085	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D6	1N60	09-306019	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D7	1N60	09-306019	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
IC1	LD1020	09-308077								ECG1012
IC2	LD3001	09-308065								ECG1016
TR1	2SC710D	09-302012	GE-20	TR-24	PTC121	HEPS0016	RE 13	SK3018	RT-102	ECG123A
TR2	2SC710D	09-302012	GE-20	TR-24	PTC121	HEPS0016	RE 13	SK3018	RT-102	ECG123A
TR3	2SC710D	09-302012	GE-20	TR-24	PTC121	HEPS0016	RE 13	SK3018	RT-102	ECG123A
TR4	2SC710D	09-302012	GE-20	TR-24	PTC121	HEPS0016	RE 13	SK3018	RT-102	ECG123A
TR5	2SA628	09-300063	GE-22	TR-30	PTC103	HEPS0013	RE 26	SK3118	RT-115	ECG159
TR6	2SD359(1)	09-305140	GE-66	TR-92	PTC110	HEPS5000	RE 21	SK3041	RT-154	ECG152
TR7	2SD359(1)	09-305140	GE-66	TR-92	PTC110	HEPS5000	RE 21	SK3041	RT-154	ECG152
TR8	2SC620	09-302165	GE-20	(IR)2SC644	PTC125	HEPS0015	RE 13	SK3020	RT-102	ECG123
TR9	2SC1018(2)	09-302102			PTC110	HEPS3020		SK3054	RT-186	ECG299
TR10	2SC517(3)	09-302056			PTC176	HEPS3001		SK3049		ECG224

(1) Rating 10 watts @ 800 mA.

(2) Rating 4 watts @ 1 amp.

(3) Rating 10 watts @ 2 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.
C4	2.2 6.3V	77-332225	RME-A-J-002	EP30-2	PC2-100	VTT2R2A50	EV-1317
C19	4.716V	77-337475	RME-A-J-005	EP30-5	PC5-50	VTT4R7A50	EV-1319
C22	1 6.3V	77-332105	RME-A-J-001	EP6-1	PC1-50	TT6X1	EV-1315
C23	1 6.3V	77-332105	RME-A-J-001	EP6-1	PC1-50	TT6X1	EV-1315
C29	10 6.3V	77-332106	RME-A-D-010	EP6-10	PC10-25	VTT10A25	EV-1222
C30	470 16V	77-337477	RME-L-E-500	EP15-500	PC500-16	VTT470J16	EV-1250
C31	100 16V	77-337107	CTA-1450		WBR50-450	TC79B	TVA-1713
C32	33 6.3V		ME-3-D-035	EP15-25	PC30-25	VTT33A10	EV-1125
C33	33 16V		ME-4-G-035	EP30-25	PC30-25	VTT33D25	EV-1325
C35	1 6.3V	77-332105	RME-A-J-001	EP6-1	PC1-50	TT6X1	EV-1315
C36	4.7 16V	77-337475	RME-A-J-005	EP30-5	PC5-50	VTT4R7A50	EV-1319
C49	1 50V		RME-A-J-001	EP50-1	PC1-50	MTV1CB50	EV-1615

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			ARCO PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C1	200		CCD-201	DD-201	GP200	GP320	10TS-T20
C2	.04		CCD-403			GP140	56A-S40
C3	200		CCD-201	DD-201	GP200	GP320	10TS-T20
C5	250		CCD-271	DD-271	GP270	GP327	10TS-T27
C6	30 5% N220						
C7	.005		CCD-502				10TS-D50
C8	.005		CCD-502				10TS-D50
C9	25 10% N220						
C10	.005		CCD-502				10TS-D50
C11	.02		CCD-203			GP120	56A-S20
C12	.02		CCD-203			GP120	56A-S20
C13	5		CCT0-050				10TCC-V50
C14	.02		CCD-203			GP120	56A-S20

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 PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
C15	.04		CCD-403			GP140	56A-S40
C16	500		CCD-501	DD-501	GP500	GP350	10TS-T50
C17	.02		CCD-203			GP120	56A-S20
C18	.02		CCD-203			GP120	56A-S20
C20	.02		CCD-203			GP120	56A-S20
C21	.005		CCD-502				10TS-D50
C24	5		CCTO-050				10TCC-V50
C25	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C26	20		CCTO-200	DTZ-20	NP020	CN0420	10TCC-Q20
C27	50		CCTO-510	DTZ-50	NP050	CN0450	10TCC-Q50
C28	.02		CCD-203			GP120	56A-S20
C34	.04		CCD-403			GP140	56A-S40
C37	150		CCD-151	DD-151		CN0315	10TCC-T15
C38	20		CCTO-200	DTZ-20	NP020	CN0420	10TCC-Q20
C39	200		CCD-201	DD-201	GP200	GP320	10TS-T20
C40	.02		CCD-203			GP120	56A-S20
C41	.02		CCD-203			GP120	56A-S20
C42	200		CCD-201	DD-201	GP200	GP320	10TS-T20
C43	200		CCD-201	DD-201	GP200	GP320	10TS-T20
C44	.02		CCD-203			GP120	56A-S20
C45	200		CCD-201	DD-201	GP200	GP320	10TS-T20
C46	20		CCTO-200	DTZ-20	NP020	CN0420	10TCC-Q20
C47	200		CCD-201	DD-201	GP200	GP320	10TS-T20
C48	150		CCD-151	DD-151		CN0315	10TCC-T15
C50	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C51	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C52	.02		CCD-203	DC-203		MAG5012	2SS-S20
C53	.04		CCD-403			GP140	56A-S40
C54	.04		CCD-403			GP140	56A-S40
C56	.02		CCD-203	DC-203		MAG5012	2SS-S20

MIDLAND MODEL 13-785

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.
VR1	"S"	1000	13-164116				
VR2	Squelch	5000	13-164117				
VR3	IF Gain	100K	13-164118				
VR4	Volume/Switch	10K	13-160114				
VR5	AMC	10K	13-166061				
VR6	Lo Power	150	13-161024				
VR7	RF Power	10K	13-166061				

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	Antenna Load (27MHz)	13-176446			
L2	RF Amp Input (27MHz)	13-176447			
L3	Mixer Input (27MHz)	13-176309	2E160078 3E45008		
L4	Rec Osc Output (27MHz)	13-170204			
L5	Xmit Osc Output (27MHz)	13-170205			
L6	Driver Output (27MHz)	13-176448			
L7	RF Choke	13-178192	1R0		
L8	Final Output	13-178193			
L9	Pi Filter (27MHz)	13-176449			
L10	Pi Filter (27MHz)	13-176448			
L11	RF Choke	13-176450			
L12	RF Choke	13-176451			
L13	RF Choke	13-176451			
T1	IF Input (455kHz)	13-179056	3L-16F		
T2	Interstage IF (455kHz)	13-090352	WST351		
T3	IF Output (455kHz)	13-090353	WST352		

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.	
T4	1	1		13-096178			

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T5	128	8	13-096179			
T6	50 tap @ 8		13-176452			

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP	2 1/4" PM 8 ohms	13-060070	22A0528	

CRYSTALS

CHANNEL	CTS KNIGHTS PART No.		CHANNEL	CTS KNIGHTS PART No.		CHANNEL	CTS KNIGHTS PART No.	
	RECEIVE	TRANSMIT		RECEIVE	TRANSMIT		RECEIVE	TRANSMIT
1	B20M26.510	A20M26.965	9	B20M26.610	A20M27.065	17	B20M26.710	A20M27.165
2	B20M26.520	A20M26.975	10	B20M26.620	A20M27.075	18	B20M26.720	A20M27.175
3	B20M26.530	A20M26.985	11 (1)	B20M26.630	A20M27.085	19	B20M26.730	A20M27.185
4	B20M26.550	A20M27.005	12	B20M26.650	A20M27.105	20	B20M26.750	A20M27.205
5	B20M26.560	A20M27.015	13	B20M26.660	A20M27.115	21	B20M26.760	A20M27.215
6	B20M26.570	A20M27.025	14	B20M26.670	A20M27.125	22	B20M26.770	A20M27.225
7	B20M26.580	A20M27.035	15	B20M26.680	A20M27.135	23	B20M26.800	A20M27.255
8	B20M26.600	A20M27.055	16	B20M26.700	A20M27.155			

(1) Midland Part Number - Receive X-1 13-128355, Transmit X-2 13-128354.

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M1	Meter	13-200060	Battery/Power Out/"S"
S1	Switch	13-183200	Receive/Transmit
S2	Switch	13-183201	Channel Selector
S3	Switch	13-1830202	Power, Hi-Low
S4	Switch	13-1830202	Charge
	Socket	13-159198	Crystal

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

ITEM	PART No.	ITEM	PART No.
Panel, Front	13-030263	Case, Battery	13-030124
Case, Rear	13-073116	Button, Push-To-Talk	13-115108
Plate, Front	13-020605	Button, Volume/Squelch	13-110176
Plate, Top	13-020606	Antenna, Telescopic	13-040069
Box, Battery	13-030125		

ACCESSORIES

ITEM	MFGR. PART No.	REMARKS
Earphone	13-038064	