



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.



MODELS 670 (HY-RANGE I)
671 (HY-RANGE II)

ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools: GC ELECTRONICS
L11, L17, L18, L19 .. 5000, 8290
ALL Others 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 antenna jack, low side to ground.	27.115MHz 1000 Hz @ 30% modulation output	13	L13, L14, L15, L16, L17, L18, L19	
Frequency Counter TP2 to ground.			VCa	Set fine tuning to mid-range. Adjust for 11.750MHz.

RECEIVER ADJUSTMENTS

SIGNAL GENERATOR	GEN FREQ	CHANNEL	ADJUST	REMARKS
SQUELCH RANGE High side thru .01uF to antenna jack, low side to ground.	27.115MHz, 1000 Hz @ 30% modulation output 20,000 uV.	13	RV4	Set squelch control fully clockwise. Adjust so that squelch just breaks.
"S" Meter	27.115MHz 1000 Hz @ 30% modulation output 100 uF	13	RV5	Adjust for "S9" reading on panel meter.

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

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HY-GAIN MODELS 670, 671

TRANSMITTER

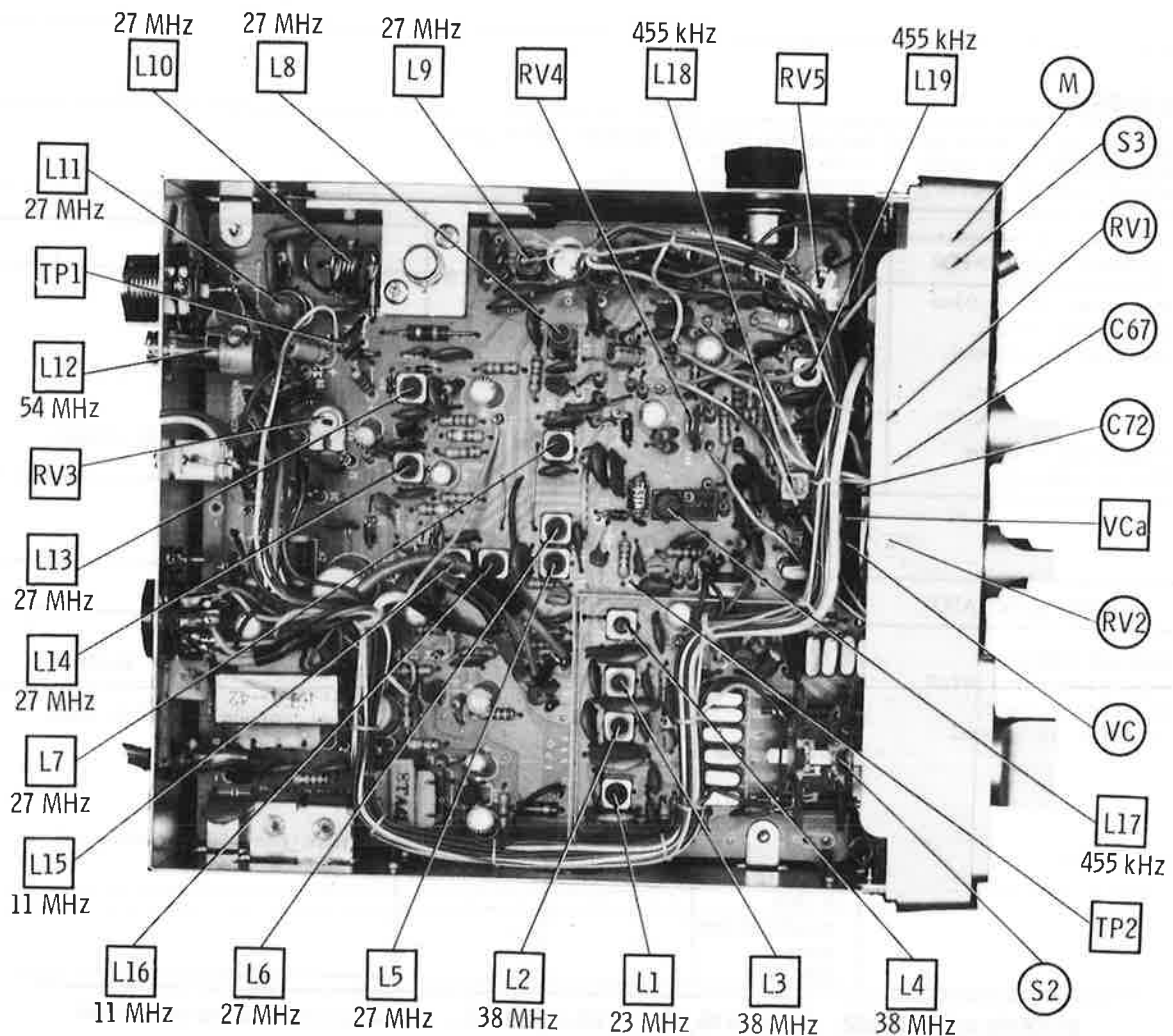
Connect an RF Wattmeter or 50-Ohm, 25-watt dummy load to antenna connector.
Adjustments made with 14-volt DC input.

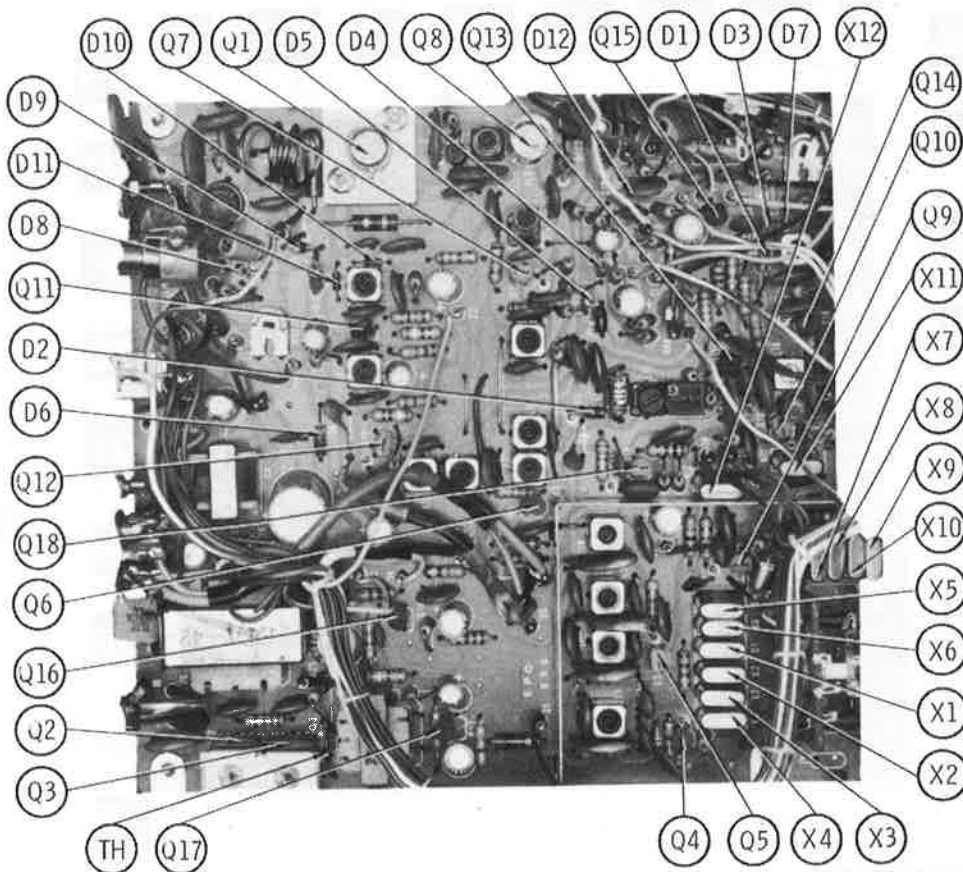
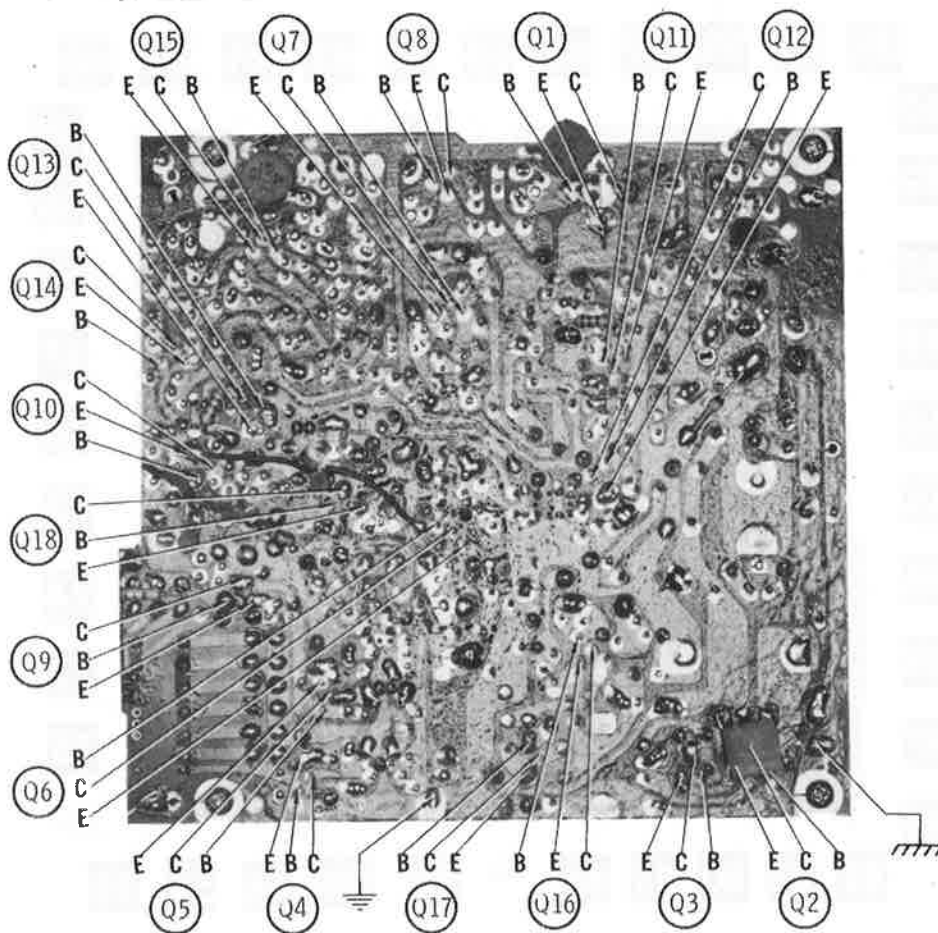
AM

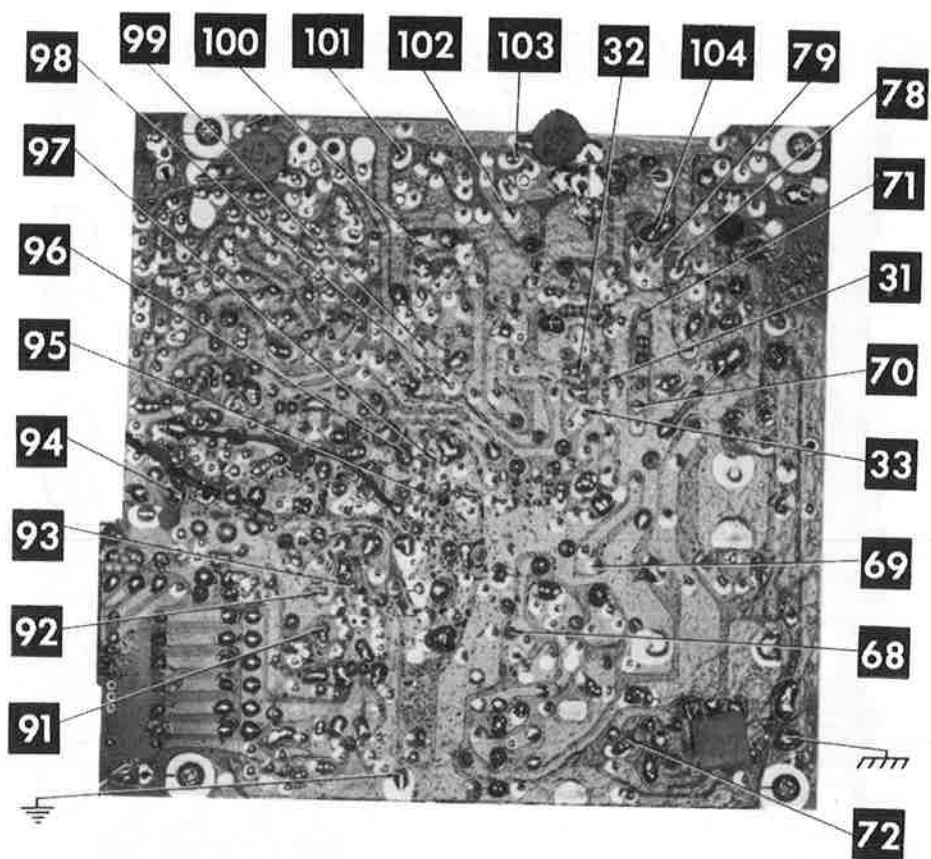
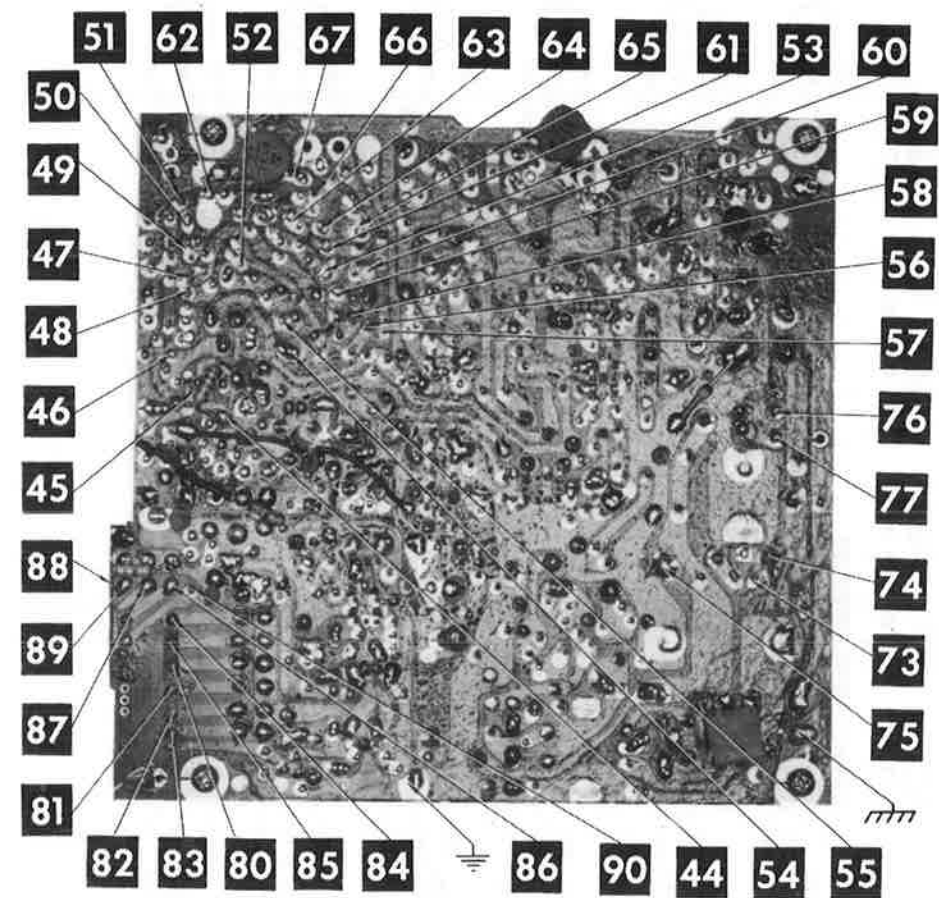
INDICATOR	ADJUST	REMARKS
OSCILLATOR, MIXER, BUFFER, FINAL RF Wattmeter	L1,L2,L3, L4,L5,L6, L7,L8,L9	Key transmitter. Adjust for maximum.
OUTPUT POWER RF Wattmeter	L10,L11	Key transmitter. Adjust for 4 watts output.
TVI TRAP TV (Ch. 2)	L12	Key transmitter. Adjust for MINIMUM interference on TV.
FINAL INPUT POWER Remove jumper at TP1 and connect 0-1000DC milliammeter between R86 and RFC4	L11	Adjust for 5 watts.
FREQUENCY Frequency Counter		Check all channels. +800Hz.

TRANSMITTER ADJUSTMENTS

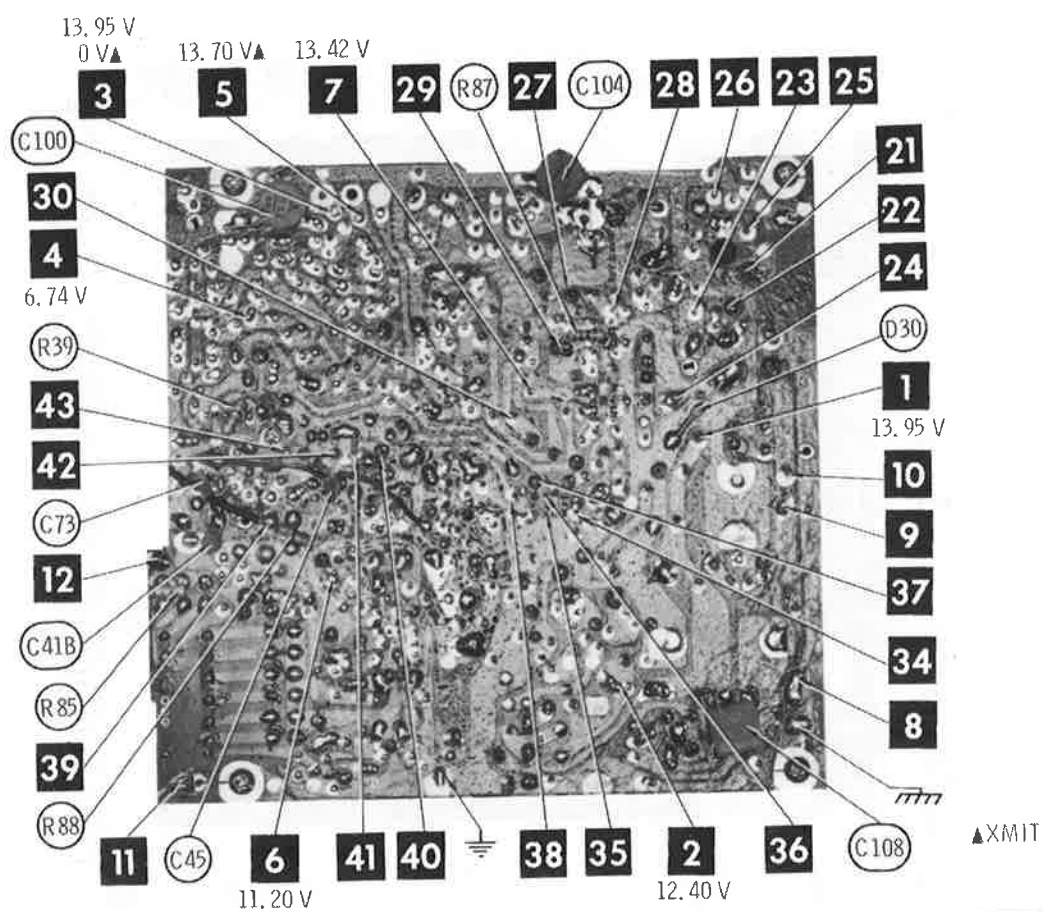
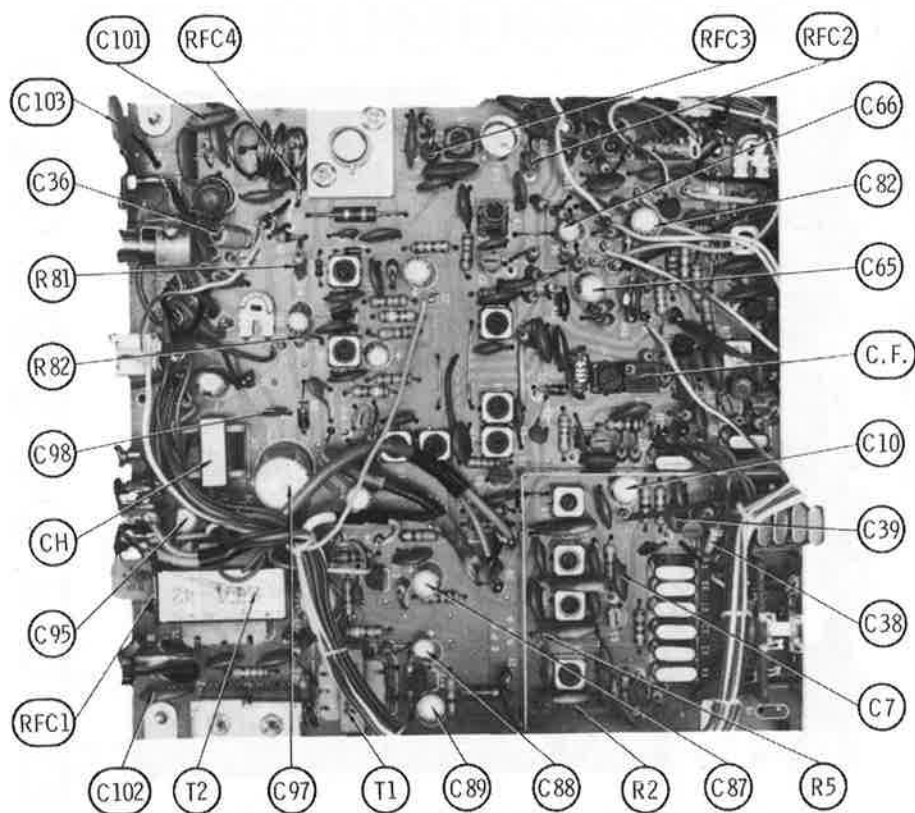
INDICATOR	ADJUST	REMARKS
RF PANEL METER RF Wattmeter	RV3	Set mode switch to AM. Key transmitter. Adjust so that panel RF meter agrees with RF wattmeter.

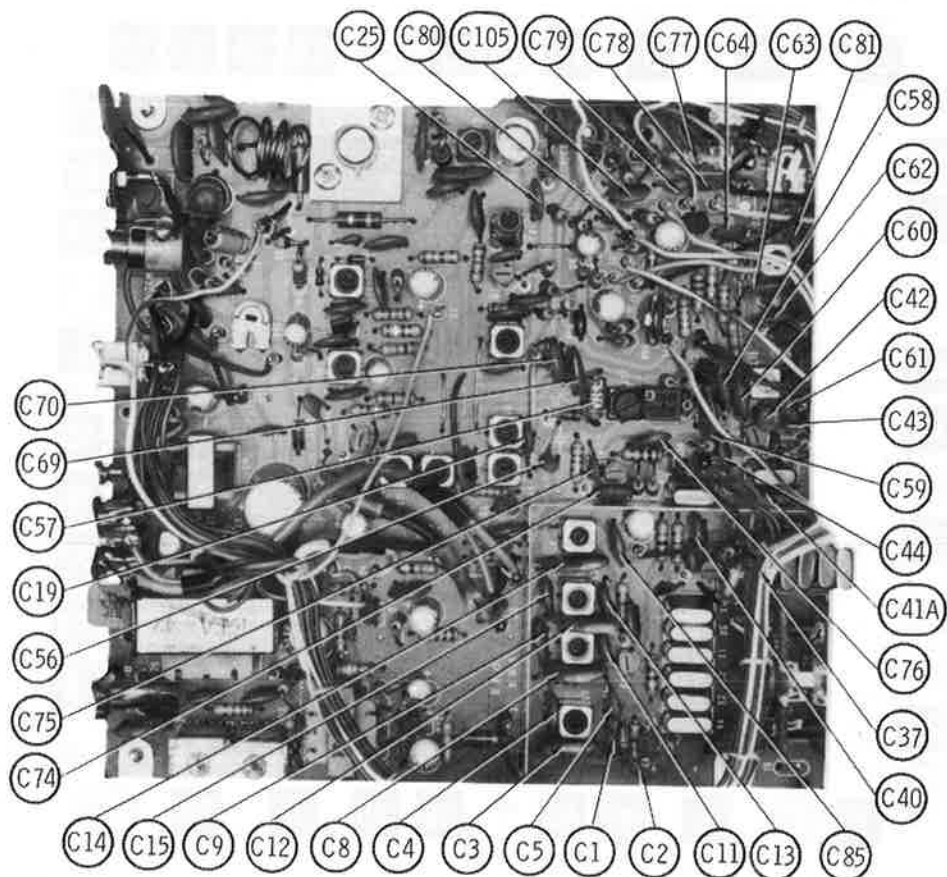
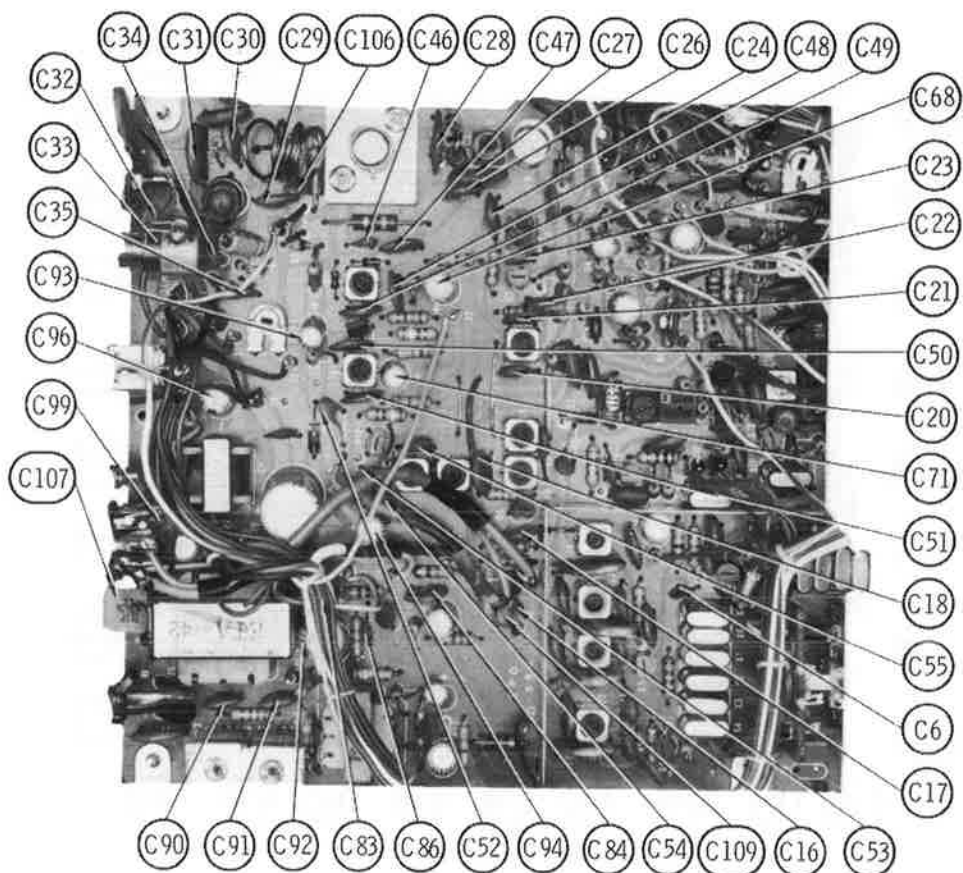


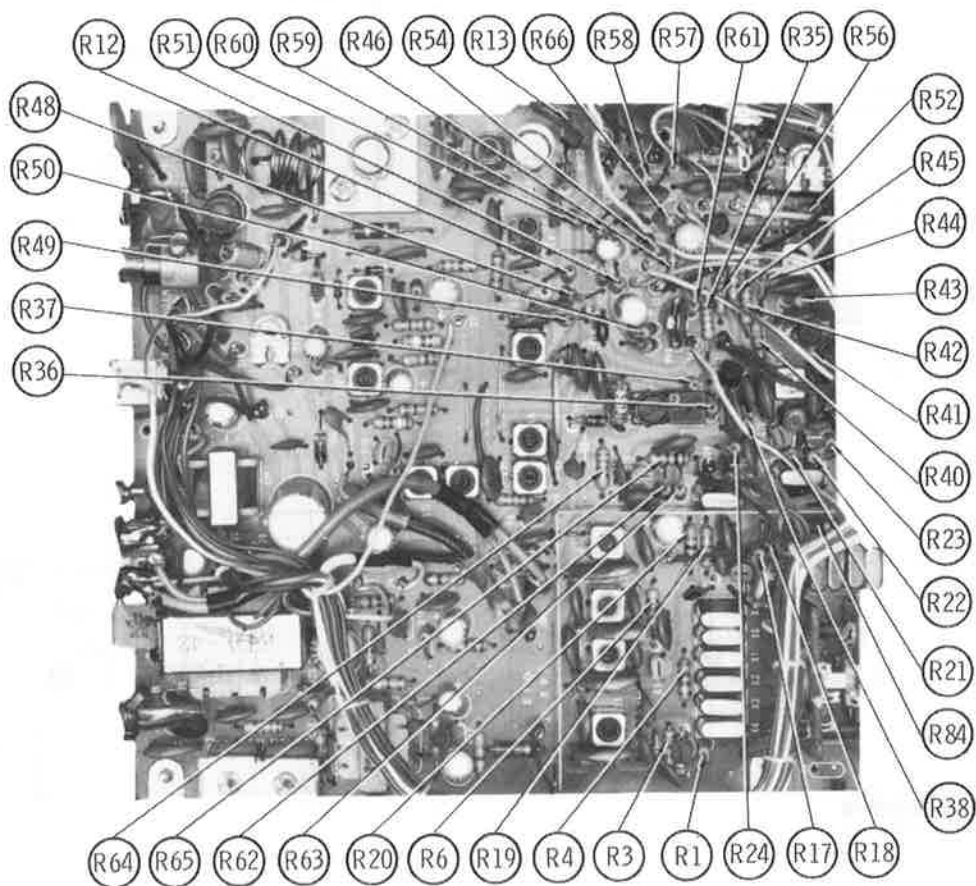
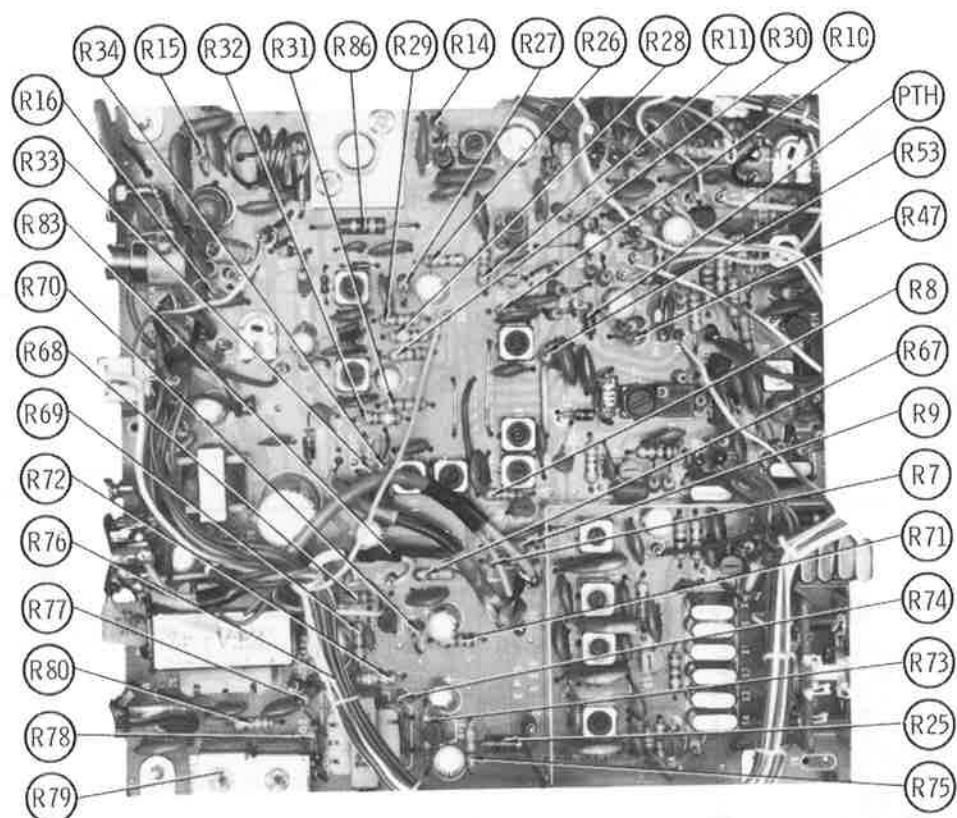


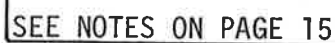


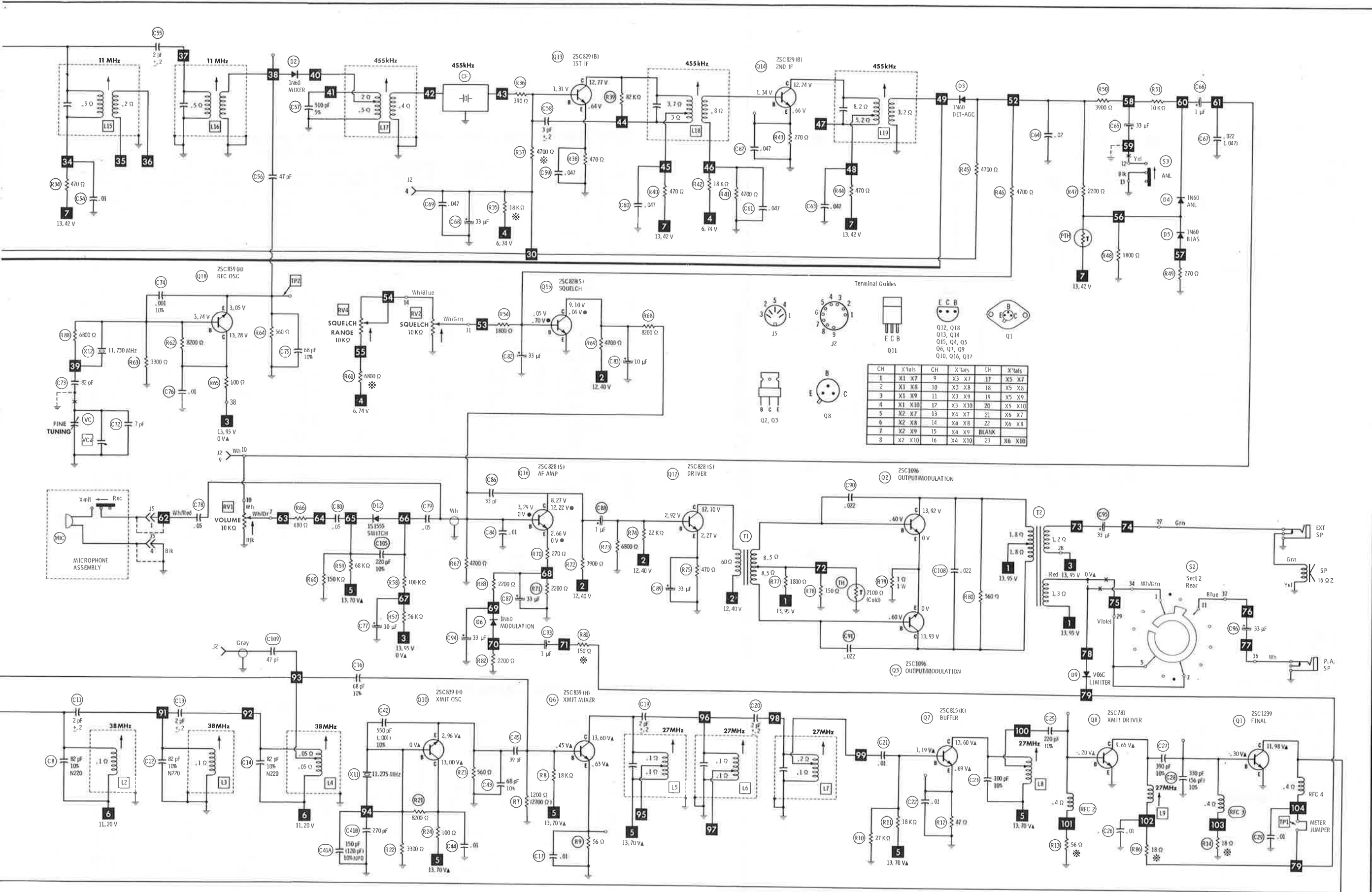
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HY-GAIN MODELS 670, 671

HY-GAIN MODELS 670, 671

PARTS LIST AND DESCRIPTION (CONTINUED)

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

CAPACITORS

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.
C1	2 +.2		CCTO-2R2	DTZ-2R2	NP02P2	CN0522	10TCC-V22
C2	220 10%		CCD-221	DD-221		GP322	10TS-T22
C3	82 10% N220		*			*	10TCR-Q82
C4	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C5	9 +.5			DTZ-6R8	NP06P8		10TCC-V68
C6	7 NPO		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C7	.01		*			*	10TCR-Q82
C8	82 10% N220		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C9	.01		CCTO-2R2	DTZ-2R2	NP02P2	CN0522	10TCC-V22
C11	2 +.2 N220		*			*	10TCR-Q82
C12	82 10% N220		CCTO-2R2	DTZ-2R2	NP02P2	CN0522	10TCC-V22
C13	2 +.2		*			*	10TCR-Q82
C14	82 10% N220		CCTO-2R2	DTZ-2R2	NP02P2	CN0522	10TCC-V22
C15	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C16	68 10%		CCTO-680	DTZ-68	NP068	CN0468	10TCC-Q68
C17	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C18	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C19	2 +.2		CCTO-2R2	DTZ-2R2	NP02P2	CN0522	10TCC-V22
C20	2 +.2		CCTO-2R2	DTZ-2R2	NP02P2	CN0522	10TCC-V22
C21	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C22	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C23	100 10%		CCTO-101	DTZ-100	NP0100	CN0310	10TCC-T10
C24	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C25	220 10%		CCD-221	DD-221		GP322	10TS-T22
C26	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C27	390 10%		CCD-391	DD-391	GP390	GP339	10TS-T39
C28	330 10%		CCD-331	DD-331	GP330	GP333	10TS-T33
C29	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C30	.01		CCD-103	DC-103	GP10000	MAG5011	10TS-T39
C31	390 10%		CCD-391	DD-391	GP390	GP318	10TS-T18
C32	180 10%		CCD-181	DD-181		CN0422	10TCC-Q22
C33	22		CCTO-220	DTZ-22	NP022	CN0422	10TCC-V22
C34	2 +.2		CCTO-2R2	DTZ-2R2	NP02P2	CN0522	10TS-D47
C35	.0047		CCD-472				10TCC-T18
C37	180 10% NPO			DTZ-180			
C38	560 10%		DM19-561J	CPR-560J	CD19FD561J03	SX356	424ME5600J501
C39	68		CCTO-680	DTZ-68	NP068	CN0468	10TCC-Q68
C40	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C41A	150 10% NPO		CCTO-151	DTZ-150		CN0315	10TCC-T15
C41B	270		CCD-271	DD-271	GP270	GP327	10TS-T27
C42	550 10%			DTZ-68	NP068	CN0468	10TCC-Q68
C43	68 10%		CCTO-680	DTZ-68	GP10000	MAG5011	2SS-S10
C44	.01		CCD-103	DC-103		CN0439	10TCC-Q39
C45	39		CCTO-390			CN0439	10TCC-Q39
C46	39		CCTO-390				2SS-S10
C47	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C48	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C49	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C50	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C51	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C52	22		CCTO-220	DTZ-22	NP022	CN0422	10TCC-Q22
C53	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C54	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C55	2 +.2		CCTO-2R2	DTZ-2R2	NP02P2	CN0522	10TCC-V22
C56	47		CCTO-470	DTZ-47	NP047	CN0447	10TCC-Q47
C57	510 5%		DM15-511J	CPR-510J	CD15FD511J03	SX351	424ME5100J501
C58	3 +.2		CCTO-3R3	DTZ-3R3	NP03P3	CN0533	10TCC-V33
C59	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C60	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C61	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C62	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C63	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C64	.02		CCD-203		GP120	5GA-S20	5GA-S20
C65	.022		CCD-203		GP120	5GA-S20	5GA-S20
C66	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C67	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C68	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C69	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C70	.047		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C71	7		CCTO-6R8	DTZ-6R8	NP06P8	CN0568	10TCC-V68
C72	82		CCTO-820	DTZ-82	NP082	CN0482	10TCC-Q82
C73	.001 10%		CCD-102	DD-102		GP210	10TS-D10
C74	.001 10%		CCD-680	DTZ-68	NP068	CN0468	10TCC-Q68
C75	68 10%		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C76	.01		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C77	.05		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C78	.05		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C79	.05		CCD-503	DC-503	MGP05	MAG5015	TGL-S50
C80	.05		CCD-203		GP120	5GA-S20	5GA-S20
C81	.02		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C82	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C83	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10

HY-GAIN MODELS 670, 671

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.
C86	33		CCT0-330	DTZ-33	NPO33	CN0433	10TCC-Q33
C90	.022		CCD-203			GP120	5GA-S20
C91	.022		CCD-203			GP120	5GA-S20
C98	.02		CCD-203			GP120	5GA-S20
C99	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C100	.047		CCD-403			GP140	5GA-S40
C101	.047		CCD-403			GP140	5GA-S40
C102	.047		CCD-403			GP140	5GA-S40
C103	.047		CCD-403			GP140	5GA-S40
C104	.047		CCD-403			GP140	5GA-S40
C105							
C106	27		CCT0-270			CN0427	10TCC-Q27
C107	.01		CCD-103	DC-103	GP10000	MAG5011	2SS-S10
C108	.0022		CCD-222			GP222	10TS-D22
C109	47		CCT0-470	DTZ-47	NPO47	CN0447	10TCC-Q47

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

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.	CTS-IRC PART No.	MALLORY PART No.
RV1	Volume/Switch	10K	ERV-96 (EVH- B8BK15A14)				
RV2	Squelch	10K	ERV-91 (RVH- B8AK15C14)				
RV3	"RF" Meter	20K	EVN- K4AA00B24	T-20K (3) or TSV-25K (3)	C-253 (3)	U201R253B	MTC24L4
RV4	Squelch Range	10K	EVL- T5AA00B14	TSV-10K (2) or T-10K (2)	C-103 (2)	X201R103B (2)	MTC14L1 (2)
RV5	"S" Meter	10K	EVN- K4AA00B14	TSV-10K (3) or T-10K (3)	C-103 (3)	U201R103B	MTC14L4

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

(3) For horizontal mounting, bend the two outside terminals to fit PC board. Use jumper to connect center terminal to PC board.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFR. PART No.			WORKMAN PART No.	MFR. PART No.
PTH	Posistor		EDP-1	TH	2100 Cold NTC		EDT-15

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	23MHz Osc.	ETR-247	ETR247453E		
L2	38MHz Synth.	ETR-248			
L3	38MHz Synth.	ETR-248			
L4	38MHz Synth.	ETR-249			

PARTS LIST AND DESCRIPTION (CONTINUED)

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

COILS (RF-IF)(cont)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L5	Xmit. Mixer (27MHz)	ETR-30	R-30453J R-31453E		
L6	Xmit. Mixer (27MHz)	ETR-30			
L7	Xmit. Mixer (27MHz)	ETR-31			
L8	Xmit. Buffer (27MHz)	ETR-22			
L9	Xmit. Buffer (27MHz)	ETR-197			
L10	Final (27MHz)	ETR-17	ETR-194452J ETR-104453E		
L11	Ant. (27MHz)	ETR-232			
L12	TVI Trap (54MHz)				
L13	Rec. Ant (27MHz)	ETR-194			
L14	Rec. RF (27MHz)	ETR-104			
L15	11MHz Mixer	ETR-125	ETR-125443J		
L16	11MHz Mixer	ETR-125			
L17	Input IF (455kHz)	ETI-85			
L18	Interstage IF (455kHz)	ETI-17			
L19	Output IF (455kHz)	ETI-18			
RFC1	Line Choke	ELR-11	ETI-184515		
RFC2	RF Choke	ELR-4			
RFC3	RF Choke	ELR-4			
RFC4	RF Choke	ELR-4			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
CH	650mA	.1	.21mH	ELA-2				

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA				NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD Part No.	
T1	2	1		ETA-41				

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA				NOTES
	PRI.	SEC.	MFGR. PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	36	16	ETA-42				

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	3 3/4 X 2 PM 16 ohms	EAST4		

HY-GAIN MODELS 670, 671

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
F1	1.5A Quick Acting			AGC 1 1/2	HDJ	31201.5	150145	FG 1 1/2-2

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M	Meter	EMM-46	Signal Strength/Power, Model 671 only
S2	Switch	EST-126	Channel Selector
S3	Switch	EST-4	ANL (On-Off), Model 671 only
X1	Crystal		23.290MHz
X2	Crystal		23.340MHz
X3	Crystal		23.390MHz
X4	Crystal		23.440MHz
X5	Crystal		23.490MHz
X6	Crystal		23.540MHz
X7	Crystal		14.950MHz
X8	Crystal		14.960MHz
X9	Crystal		14.970MHz
X10	Crystal		14.990MHz
X11	Crystal		11.275MHz
X12	Crystal		11.730MHz

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

ITEM	PART No.	ITEM	PART No.
Chassis	MC6P2	Mobile Mounting Bracket	MC46P6
Front Panel Mounting Bracket	MC46P3	Escutcheon	MC46A1
Cabinet, Upper	MC46P4	Knob, Channel	MNO-115
Cabinet, Lower	MC46P5	Knob, Volume	MNO-116
Microphone Holder	MC46P8	Knob, Squealch	MNO-117

ACCESSORIES

ITEM	MFGR. PART No.	REMARKS
DC Power Cable w/Fuse	ENO-43A	
Microphone	EAM-10B	Model 671
Microphone	EAM-10A	Model 670

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)