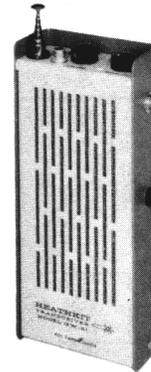




**PHOTOFACT<sup>®</sup> with**

**CIRCUITRACE<sup>®</sup>**

TRADE NAME : Heath Models GW-21, GWW-21  
 SUPPLIER : Heath Co., A Subsidiary of Daystrom, Inc.  
 Benton Harbor, Michigan  
 TYPE SET : 9 Transistor Single Channel Transceiver  
 POWER SUPPLY : 9 Volts DC  
 RATING : 14MA @ 9VDC (Receive)  
 40MA @ 9VDC (Transmit)  
 TUNING RANGE : Any one of Channel 1 thru 23



### ALIGNMENT INSTRUCTIONS

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools: A1, A2, A3.....GENERAL CEMENT #8195, 8274, 5066. . WALSCO #2515, 2531, 2532  
 A4, A5, A6, A7....GENERAL CEMENT #8282, 8606, 9295.. WALSCO #2526, 2543, 2544

#### RECEIVER ALIGNMENT

Connect output meter across voice coil.  
 Set Volume and Squelch controls for maximum output.

	SIGNAL GENERATOR	CHANNEL	ADJUST	REMARKS
1.	High side to antenna terminal, common to ground. Tune to 455KC (400v Mod.)		A1, A2, A3	Adjust for maximum.
2.	Same as step 1. Set generator output frequency to correspond to transmitter crystal frequency.		A4, A5	Adjust for maximum.

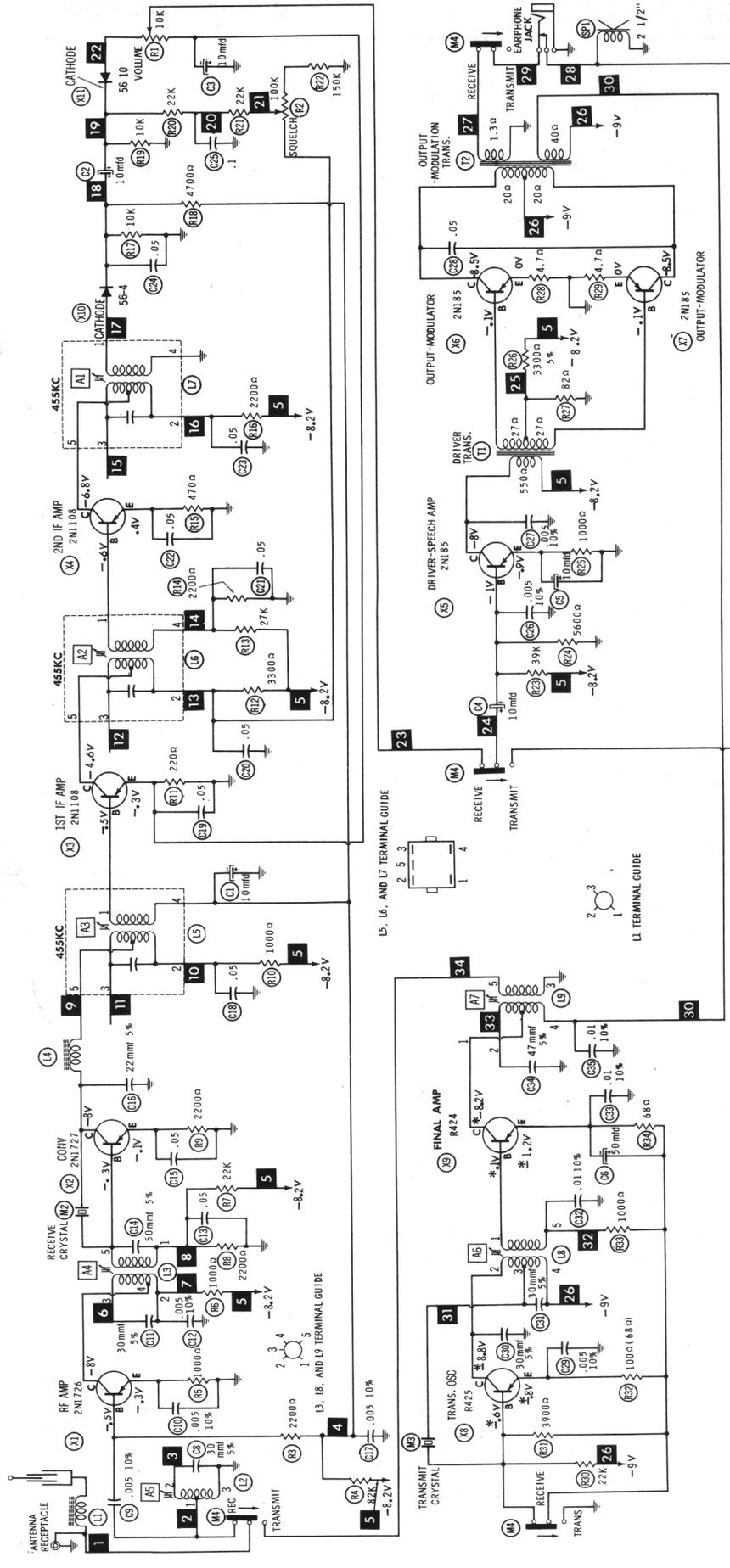
#### TRANSMITTER ALIGNMENT

**ONLY THOSE PERSONS PROPERLY LICENSED ARE PERMITTED TO MAKE REPAIRS OR ADJUSTMENTS WHICH MAY RESULT IN ILLEGAL OPERATION. (REFER TO FCC RULES & REGULATIONS PART 19, SUBPART D, SECTION 19.71)**

	SPECIAL INSTRUCTIONS	INDICATOR	ADJUST	REMARKS
1.	Maintain supply voltage at 9 volts. Connect dummy load or antenna.	RF Wattmeter or Field Strength Meter.	A6, A7	Key Transmitter. Adjust for maximum indication. Slight readjustment of A7 may be necessary when antenna is reconnected and extended to its full length.

HEATH MODELS GW-21, GWW-21

**HOWARD W. SAMS & CO., INC.** Indianapolis 6, Indiana



RESISTANCE READINGS  
RECEIVE-TRANSMIT SWITCH SHOWN IN RECEIVE POSITION

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N1726	10K	1000Ω	11150Ω
X2	2N1726	2200Ω	2200Ω	11300Ω
X3	2N1108	7500Ω	220Ω	13500Ω
X4	2N1108	2200Ω	470Ω	12400Ω
X5	2N185	5600Ω	1000Ω	1740Ω
X6	2N185	100Ω	4.7Ω	115Ω
X7	2N185	100Ω	4.7Ω	115Ω
X8	R425	900Ω	*100Ω	*1.3Ω
X9	R424	*1150Ω	*68Ω	*138Ω

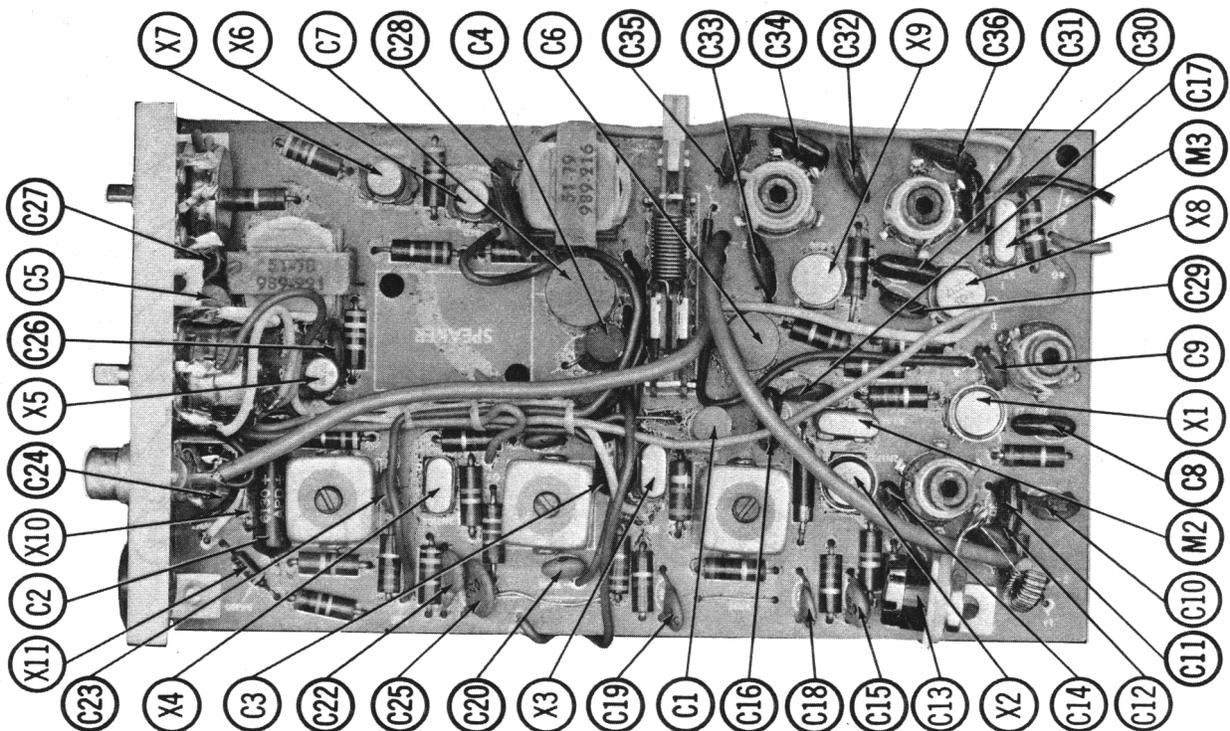
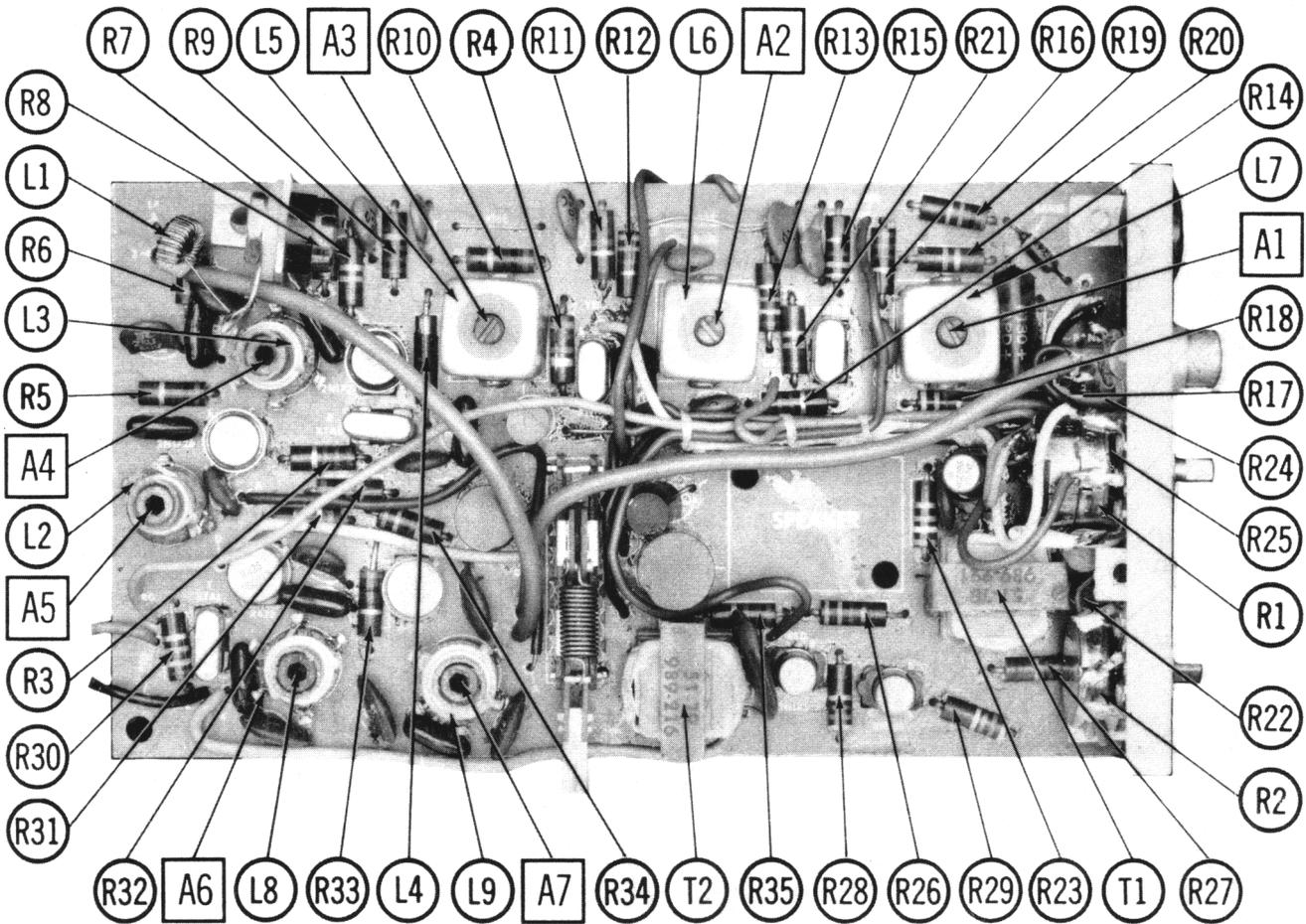
ALL MEASUREMENTS TAKEN IN RECEIVE POSITION UNLESS OTHERWISE DESIGNATED.  
\* TAKEN IN TRANSMIT POSITION.  
† MEASURED FROM - TERMINAL ON BATTERY.

1. Voltage measurements taken with vacuum tube voltmeter.
2. All controls set for normal operation.
3. All terminals viewed from bottom unless otherwise designated.
4. Numbers assigned to terminals may not be found on the unit.
5. Supply voltage maintained at rated value for voltage readings.

A PHOTOFAC STANDARD NOTATION SCHEMATIC  
with CIRCUTRACE  
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HEATH MODELS GW-21, GWW-21





# PARTS LIST AND DESCRIPTION

## TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			DELCO PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	
X1	2N1726	RF Amplifier	DS34	GE-1		PNP
X2	2N1727	Converter	DS34	GE-1		PNP
X3	2N1108	1st IF Amp.	DS25	GE-1		PNP
X4	2N1108	2nd IF Amp.	DS25	GE-1		PNP
X5	2N185	Driver-Speech Amp.	DS26	GE-2	2N406	PNP
X6	2N185	Output-Modulator	DS26	GE-2	2N408	PNP
X7	2N185	Output-Modulator	DS26	GE-2	2N408	PNP
X8	R425	Trans.-Osc.	DS34	GE-1		PNP
X9	R424	Final Amp.	DS34	GE-1		PNP

## POWER RECTIFIERS & SIGNAL DIODES

ITEM No.	MEASURED CURRENT	ORIGINAL Part or Type No.	RECTIFIERS			NOTES
			MALLORY PART No.	RCA PART No.	SARKES TARZIAN PART No.	
X10		56-4				Detector
X11		56-10				Squelch

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING		HEATH PART No.	REPLACEMENT DATA					
	CAP.	VOLT.		AEROVOX PART No.	CORNELL-DUBILIER PART No.	GENERAL ELECTRIC PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.
C1	10	12	25-115	BCD12010	ECPB408	MT1-5	PET1760	MLV10-12	VL-1127
C2	10	15	25-54	PTT66	NLW10-15	MT1-5	TT15X10	MLV10-15	TE-1155
C3	10	15	25-54	PTT66	NLW10-15	MT1-5	TT15X10	MLV10-15	TE-1155
C4	10	12	25-115	BCD12010	ECPB408	MT1-5	PET1760	MLV10-12	VL-1127
C5	10	12	25-115	PTT53	NLW10-15	MT1-5	TT12X10	MLV10-12	TE-1128
C6	50	10	25-116	BCD10050	ECPB415	MT1-16	PET1575	MLV50-10	VL-1134
C7	100	12	25-117	BCD12100	ECPB417	MT1-19	TT12X100	MLV100-12	VL-1140

## FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C8	30 5%		ADM-15-300	TCZ-30	22R5Q3	CM-15-300J		1FM-43
C9	.005 10%		DI-5000			CCD-502	JF-250	10TS-D50
C10	.005 10%		DI-5000			CCD-502	JF-250	10TS-D50
C11	30 5%		ADM-15-300	TCZ-30	22R5Q3	CM-15-300J		1FM-43
C12	.005 10%		DI-5000			CCD-502	JF-250	10TS-D50
C13	.05		TTD-05	CK-503	H05S5			TG-S50
C14	50 5%		ADM-15-500	TCZ-30	22R5Q5	CM-15-500J	MCE-225	1FM-45
C15	.05		TTD-05	CK-503	H05S5			TG-S50
C16	22 5%		ADM-15-220	TCZ-22	22R5Q22	CM-15-220J		1FM-422
C17	.005 10%		DI-5000			CCD-502	JF-250	10TS-D50
C18	.05		TTD-05	CK-503	H05S5			TG-S50
C19	.05		TTD-05	CK-503	H05S5			TG-S50
C20	.05		TTD-05	CK-503	H05S5			TG-S50
C21	.05		TTD-05	CK-503	H05S5			TG-S50
C22	.05		TTD-05	CK-503	H05S5			TG-S50
C23	.05		TTD-05	CK-503	H05S5			TG-S50
C24	.05		TTD-05	CK-503	H05S5			TG-S50
C25	.1		TTD-1	CK-104	H05P1			TG-P10
C26	.005 10%		DI-5000			CCD-502	JF-250	10TS-D50
C27	.005 10%		DI-5000			CCD-502	JF-250	10TS-D50
C28	.05		TTD-005	CK-503	H05S5			TG-S50
C29	.005 10%		DI-5000			CCD-502	JF-250	10TS-D50
C30	30 5%		ADM-15-300	TCZ-30	22R5Q3	CM-15-300J		1FM-43
C31	30 5%		ADM-15-300	TCZ-30	22R5Q3	CM-15-300J		1FM-43
C32	.01 10%	#21-47						
C33	.01 10%	#21-47						
C34	47 5%		ADM-15-470	TCZ-47	22R5Q47	CM-15-470J		1FM-447
C35	.01 10%	#21-47						
C36	.01 10%	#21-47						

# Heath Part Number.

## CONTROLS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	USE	RESISTANCE	REPLACEMENT DATA					
			HEATH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	Volume & Switch	10K	19-69					MLC14A-S
R2	Squelch	100K	10-125					MLC15L

## PARTS LIST AND DESCRIPTION (CONTINUED)

### COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		HEATH PART No.	MERIT PART No.	MILLER PART No.	STANCOR PART No.	WORKMAN PART No.	
L1	Toroid	40-430					
L2	Ant. Coil	40-388					
L3	RF	40-389					
L4	Choke (15uh)	45-51					
L5	1st IF	52-44					
L6	2nd IF	52-45					
L7	3rd IF	52-46					
L8	Trans. Osc.	40-390					
L9	Final	40-391					

### TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA					NOTES
			HEATH PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
	PRI.	SEC.						
T1	2.4	1	51-78					

### TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
			HEATH PART No.	MERIT PART No.	STANCOR PART No.	THORDARSON PART No.	TRIAD PART No.	
	PRI.	SEC.						
T2	640Ω CT	8-10Ω	51-79					

### SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		HEATH PART No.	QUAM PART No.	
SP1	2 1/2" PM 8-10Ω	1401-61		

### BATTERIES

ITEM No.	VOLTAGE	HEATH PART No.	REPLACEMENT DATA			NOTES
			BURGESS	EVEREADY	MALLORY	
M1	9V		2U6	216	M1604 (Zinc Carbon) MNI604 (Manganese) TRI46 (Mercury)	

### MISCELLANEOUS

ITEM No.	PART NAME	HEATH PART No.	NOTES
M2	Crystal		Receive (Part numbers are consecutive from #404-67 for channel 1 thru #404-89 for channel 23) Transmit (Part numbers are consecutive from #404-157 for channel 1 thru #404-179 for channel 23) Receive-Transmit
M3	Crystal		
M4	Switch Printed Board	1064-15 85-37F582	

### CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	462-143	Receive-Transmit
Knob	462-154	Squelch, Volume
Cabinet	100-M374	

### 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. 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) 8496 3 Conductor- 1 Shielded for Press-to-Talk (Vinyl)
Ignition Noise Suppression . . . . .	Use BELDEN No. 7300-Series Spark-Plug Sets
Bonding Strap . . . . .	Use BELDEN No. 8661 (3/8 In.)