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Messenger 108 Service Manual Addition

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# MESSENGER 108

## SERVICE MANUAL ADDITION



### GENERAL

This service manual addition contains a components layout, a schematic diagram and a complete parts list for the Johnson Messenger 108 Citizens Radio Transceiver. Refer to the Johnson Messenger 109 Service Manual, Part Number 001-0062-001, to be used with this addition, for complete transceiver service and alignment information.

### DESCRIPTION

The Johnson Messenger 108 Citizens Radio Transceiver, Part Number 242-0108-xxx, is a one channel version of the Johnson Messenger 109 with a power input of 1.5 watts.

The Messenger 108 is equipped with a nonrechargeable pen cell battery pack but no battery condition meter is provided. Other changes to be noted are, there is no external antenna jack, no external speaker jack and the weatherproofing has been improved by sealing the squelch and volume controls on the top of the transceiver.

### NOTE

The Messenger 108 is supplied with a nonrechargeable battery pack but an external charge jack is provided in the event that rechargeable batteries are used.

### SERVICE

- a. Refer to the Messenger 109 Service Manual for complete service information.
- b. The RF power meter, RF signal generator or dummy load may be coupled to the junction of L4 and C79, with the antenna removed, through an  $18 \pm 1$  pF capacitor in series with the center conductor of a 50 ohm cable. Refer to the Messenger 109 Service Manual for alignment instructions.
- c. Audio input for modulation is inserted and measured across a 16 ohm resistor in place of the speaker.
- d. The supply voltage required to operate the transceiver is 11 VDC. The maximum transmit current drain is 250 mA with no modulation.
- e. The DC power input to the final transmitter stage, Q14 is 1.5 watts maximum at 11 VDC.



**E. F. JOHNSON COMPANY**  
WASECA, MINNESOTA 56093

12-72FJ Part No. 001-0062-003

Printed in U.S.A.

## PARTS LIST

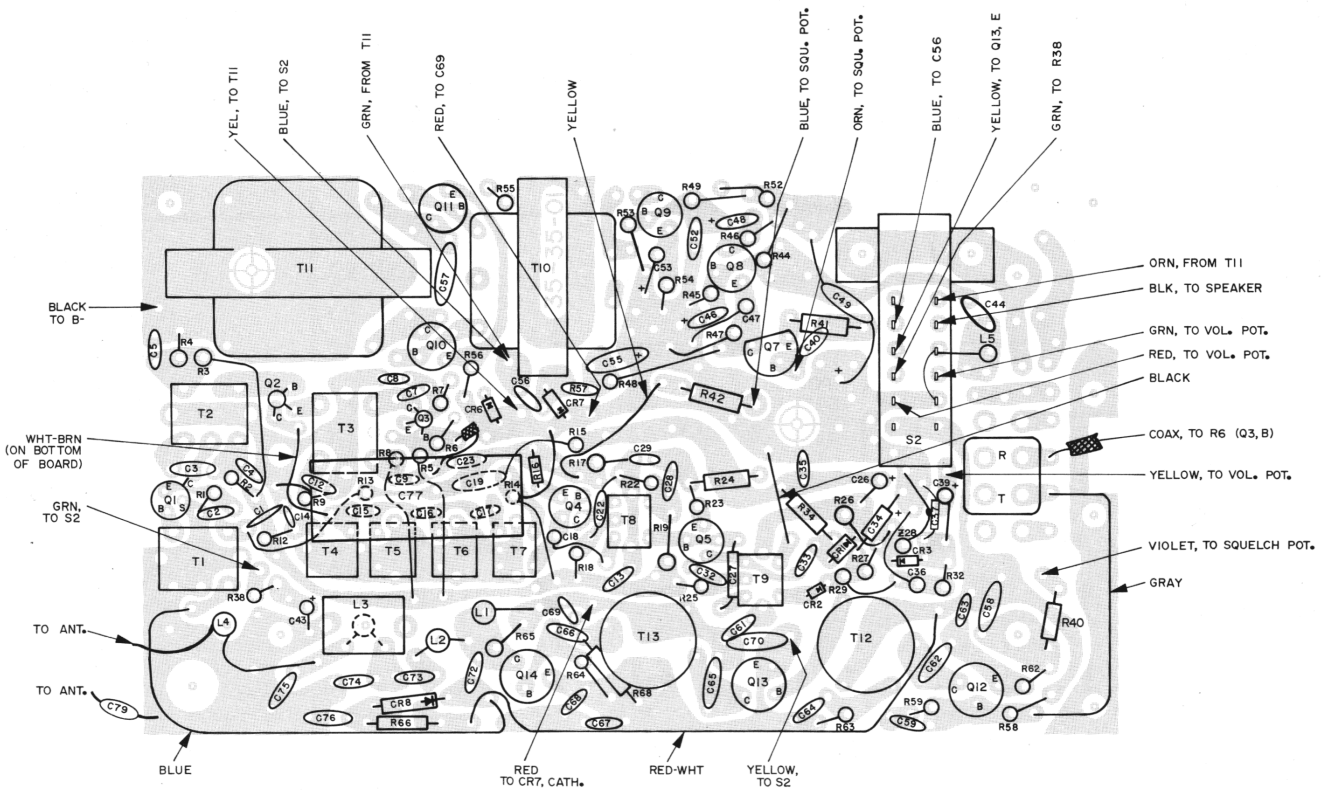
SYMBOL NO.	DESCRIPTION	PART NO.	SYMBOL NO.	DESCRIPTION	PART NO.
ACCESSORY PACKAGE ITEMS			C17	Same as C15	
	Operating Manual	002-0108-001	C18	1 pF J 500V composition	510-9002-109
	Part 95 rules - Citizens Radio Service	022-1635-001	C19	0.047 MF M 16V Y5S disc	510-3010-473
	FCC Form 505 - License application form	022-1636-001	C22	Same as C19	
	Warranty registration card	041-0419-017	C23	0.010 MF M 16V Y5S disc	510-3010-103
	Reduced schematic	564-3000-108	C26	6.8 MF M 35V dipped	510-2045-689
ANTENNA			C27	1 pF J 500V composition	510-9002-109
E1	Whip antenna	022-1793-001	C28	0.010 MF M 16V Y5S disc	510-3010-103
MP10	Molded bushing	032-0182-001	C29	Same as C28	
ASSEMBLIES			C32	Same as C28	
U1	Case front assembly	023-2343-011	C33	150 pF J 100V 1DM10	510-0002-151
	Includes:		C34	0.047 MF M 16V Y5S disc	510-3010-473
	Grille cloth	018-0802-001	C35	0.010 MF M 16V Y5S disc	510-3010-103
	Insert #4-40	013-1145-001	C36	1 MF M 35V tubular	510-2005-109
	Case front, beige	032-0166-010	C37	0.022 MF M 16V Y5S disc	510-3010-223
	Speaker grill	017-0529-007	C39	1 MF M 35V tubular	510-2005-109
	Overlay, upper	559-2021-003	C40	4700 pF M 50V Y5U disc	510-3002-472
U2	Case back assembly	023-2340-006	C43	6.8 MF M 35V dipped	510-2045-689
	Includes:		C44	0.047 MF 16V Y5S disc	510-3010-473
	Stake nut	013-1277-001	C46	0.010 MF M 16V Y5S disc	510-3010-103
	Terminal lug	016-0456-029	C47	56 MF M 6V tubular	510-2001-560
	Stake nut	013-1277-002	C48	6.8 MF M 35V dipped	510-2045-689
	Banana plug, subassembly	023-2846-021	C49	47 MF 25V aluminum	510-4006-012
	Terminal lug	586-3004-021	C52	0.022 MF M 16V Y5S disc	510-3010-223
	Threaded insert, expansion #4	537-2501-001	C53	56 MF M 6V tubular	510-2001-560
	Stake nut	013-1277-003	C55	1 MF M 35V dipped	510-2045-109
	Case back, beige	032-0167-006	C56	0.22 MF K 15V molded	510-2033-228
U3	Beige pen cell battery pack	023-2637-001	C57	0.33 MF 50V Y5U	510-3051-334
	Includes:		C58	0.047 MF M 16V Y5S disc	510-3010-473
	Battery case, beige	032-0168-003	C59	22 pF J 200V N750 ceramic	510-3020-220
	Header assembly	023-2353-001	C61	4700 pF M 50V Y5U disc	510-3002-472
	Screw, fil. hd. #6-32	013-1130-005	C62	22 pF J 200V N750 ceramic	510-3020-220
	Standoff	013-1134-001	C63	150 pF J 200V N750 ceramic	510-3020-151
	Instruction label	559-4017-003	C64	1000 pF M 50V Y5U disc	510-3002-102
	Battery holder	032-0162-001	C65	43 pF J 200V N150 ceramic	510-3016-430
Z28	Thermistor assembly	023-2042-005	C66	1000 pF M 1KV Y5S disc	510-3061-102
	Includes:		C67	0.047 MF M 16V Y5S disc	510-3010-473
	8000 ohm thermistor	569-3001-001	C68	2200 pF M 50V Y5U disc	510-3002-222
	3900 ohm resistor	569-1002-392	C69	4700 pF M 50V Y5U disc	510-3002-472
BRACKET			C70	Same as C69	
BK4	Speaker mounting bracket	017-0534-011	C72	43 pF J 200V N150 ceramic	510-3016-430
CAPACITORS			C73	68 pF J 100V 1DM10	510-0002-680
C1	4700 pF M 50V Y5U disc	510-3002-472	C74	560 pF J 100V 1DM15	510-0001-561
C2	Same as C1		C75	680 pF J 100V 1DM15	510-0001-681
C3	27 pF J 200V N150 ceramic	510-3016-270	C76	1000 pF M 50V Y5U disc	510-3002-102
C4	4700 pF M 50V Y5U disc	510-3002-472	C77	470 MF 25V aluminum	510-4006-001
C5	Same as C4		C79	24 pF J 100V 1DM10	510-0002-240
C7	27 pF J 200V N150 ceramic	510-3016-270	CRYSTALS		
C8	510 pF J 100V 1DM15	510-0001-511	Y1	CH11T HC-25/U B	519-0011-011
C9	4700 pF M 50V Y5U disc	510-3002-472	Y2	CH11R 455 IF HC-25/U B	519-0011-311
C12	0.22 MF Z 3V Y5T disc	510-3009-224	DIODES		
C13	0.010 MF M 16V Y5S disc	510-3010-103	CR1	1N67A 80V 30MA germanium	523-1000-067
C14	4700 pF M 50V Y5U disc	510-3002-472	CR2	Same as CR1	
C15	2.2 pF D 40V P100 ceramic	510-3161-229	CR3	1N881 silicon diode	523-1000-881
C16	Same as C15		CR6	1N2326 germanium TC diode	523-1002-326
			CR7	1N881 silicon diode	523-1000-881
			CR8	Same as CR7	

## PARTS LIST (cont'd)

SYMBOL NO.	DESCRIPTION	PART NO.	SYMBOL NO.	DESCRIPTION	PART NO.
HARDWARE					
EP3	0.14 x 0.13 ferrite bead	517-2002-001	R43	5K 1/4 W std. D 1/2	562-0018-010
EP4	Insulating washer	574-5005-006	R44	33K ohm K 1/4 W CC	569-1002-333
EP11	3/8 in. coil shield	578-0002-001	R45	10K ohm K 1/4 W CC	569-1002-103
EP50	Black ext. plas. tubing	042-0240-770	R46	680 ohm K 1/4 W CC	569-1002-681
HW1	Shoulder screw	013-1133-001	R47	3.9K ohm K 1/4 W CC	569-1002-392
HW4	Captive screw	013-1130-007	R48	6.8K ohm K 1/4 W CC	569-1002-682
HW11	Shoulder screw	013-1013-008	R49	15K ohm K 1/4 W CC	569-1002-153
HW13	Nut, spanner	013-1313-001	R52	470 ohm K 1/4 W CC	569-1002-471
MP1	Switch button	032-0158-001	R53	2.7K ohm K 1/4 W CC	569-1002-272
MP2	0.437 knob 0.125 shaft (both knobs)	013-1311-002	R54	330 ohm K 1/4 W CC	569-1002-331
MP5	Heat sink for TO-1	539-0007-001	R55	4.7K ohm K 1/4 W CC	569-1002-472
MP3	O-ring	018-0497-019	R56	4.7 ohm K 1/2 W CC	569-1004-479
MP12	Cover	032-0247-001	R57	5.6K ohm K 1/4 W CC	569-1002-562
NP4	108 overlay lower	559-2022-002	R58	5.1K ohm J 1/4 W CC	569-1001-512
X1	Crystal block	126-0110-102	R59	510 ohm J 1/4 W CC	569-1001-511
INDUCTORS			R62	51 ohm J 1/4 W CC	569-1001-510
L1	13 UHY choke	542-3003-001	R63	68 ohm K 1/4 W CC	569-1002-680
L2	0.70-1.2 UH var. ind.	542-1006-004	R64	47 ohm K 1/4 W CC	569-1002-470
L3	0.14-0.21 UH var. ind.	542-1006-001	R65	10K ohm K 1/4 W CC	569-1002-103
L4	1.3-1.7 UH var. ind.	542-1008-007	R66	1.0K ohm K 1/4 W CC	569-1002-102
L5	20 UHY choke	542-3002-002	R68	15 ohm K 1/4 W CC	569-1002-150
PC BOARD			SPEAKER		
U4	Printed circuit board	035-0035-001	LS1	Speaker 2-3/4 16 ohm 0.3W	589-1003-001
RESISTORS			SWITCH		
R1	1.0K ohm K 1/4 W CC	569-1002-102	S2	Push-to-talk switch	583-4003-001
R2	470 ohm K 1/4 W CC	569-1002-471	TRANSFORMERS		
R3	12K ohm K 1/4 W CC	569-1002-123	T1	10MM 27 MHz ant. transformer	592-5015-001
R4	2.2K ohm K 1/4 W CC	569-1002-222	T2	10MM 27 MHz mix transformer	592-5015-002
R5	6.8K ohm K 1/4 W CC	569-1002-682	T3	10MM 27 MHz osc. transformer	592-5015-004
R6	1.2K ohm K 1/4 W CC	569-1002-122	T4	7MM 455 kHz IF transformer	592-5020-002
R7	680 ohm K 1/4 W CC	569-1002-681	T5	Same as T4 A	
R8	2.2K ohm K 1/4 W CC	569-1002-222	T6	Same as T4 A	
R9	1.0K ohm K 1/4 W CC	569-1002-102	T7	7MM 455 kHz IF transformer	592-5020-003
R12	470 ohm K 1/4 W CC	569-1002-471	T8	7MM 455 kHz IF transformer	592-5020-004
R13	1.0K ohm K 1/4 W CC	569-1002-102	T9	Same as T8	
R14	82K ohm K 1/4 W CC	569-1002-823	T10	Input/driver transformer	592-1007-004
R15	1.0K ohm K 1/4 W CC	569-1002-102	T11	Out/mod transformer	
R16	330 ohm K 1/4 W CC	569-1002-331	T12	25-40 MHz osc. transformer	592-5014-001
R17	1.0K ohm K 1/4 W CC	569-1002-102	T13	25-50 MHz driver transformer	592-5014-002
R18	470 ohm K 1/4 W CC	569-1002-471	TRANSISTORS		
R19	12K ohm K 1/4 W CC	569-1002-123	Q1	SI NPN 50 MHz amp TO92	576-0003-018
R22	2.2K ohm K 1/4 W CC	569-1002-222	Q2	SI NPN gen. purp. TO92	576-0003-011
R23	47 ohm K 1/4 W CC	569-1002-470	Q3	Same as Q2	
R24	470 ohm K 1/4 W CC	569-1002-471	Q4	Same as Q2	
R25	Same as R24		Q5	Same as Q2	
R26	75K ohm J 1/4 W CC	569-1001-753	Q7	Same as Q2	
R27	5.6K ohm K 1/4 W CC	569-1002-562	Q8	SI PNP 50 MHz amp TO92	576-0003-017
R29	15K ohm K 1/4 W CC	569-1002-153	Q9	Same as Q8	
R32	10K ohm K 1/4 W CC	569-1002-103	Q10	GE PNP 32V 1A 1W TO1	576-0002-004
R34	56K ohm K 1/4 W CC	569-1002-563	Q11	Same as Q10	
R37	10K 1/4 W A 1/2 SPST	562-0018-011	Q12	SI NPN HF osc. TO39	576-0004-006
R38	330 ohm K 1/4 W	569-1002-331	Q13	0.4W 27 MHz amp. TO39	576-0004-004
R39	560 ohm K 1/4 W CC	569-1002-561	Q14	3.4W 27 MHz amp. TO39	576-0004-005
R40	330 ohm K 1/4 W CC	569-1002-331			
R41	100 ohm K 1/4 W CC	569-1002-101			
R42	820 ohm K 1/4 W CC	569-1002-821			

### CRYSTAL PART NUMBERS

Channel	Operating Frequency	Transmitter Crystal Part No.	Receiver Crystal Part No.	Channel	Operating Frequency	Transmitter Crystal Part No.	Receiver Crystal Part No.
1	26.965	519-0011-001	519-0011-301	13	27.115	519-0011-013	519-0011-313
2	26.975	-002	-302	14	27.125	-014	-314
3	26.985	-003	-303	15	27.135	-015	-315
4	27.005	-004	-304	16	27.155	-016	-316
5	27.015	-005	-305	17	27.165	-017	-317
6	27.025	-006	-306	18	27.175	-018	-318
7	27.035	-007	-307	19	27.185	-019	-319
8	27.055	-008	-308	20	27.205	-020	-320
9	27.065	-009	-309	21	27.215	-021	-321
10	27.075	-010	-310	22	27.225	-022	-322
11	27.085	-011	-311	23	27.235	-023	-323
12	27.105	-012	-312				



PRINTED CIRCUIT BOARD  
(SOLDER SIDE VIEW)