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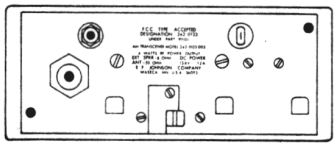
JOHNSON MESSENGER 122-123A
SERVICE MANUAL REVISIONS

The following additions and changes are to be made to the Messenger 122-123A Transceiver Service Manual, Part No. 001-0122-001, with a rear cover date of 5-74.

ENGINEERING CHANGES

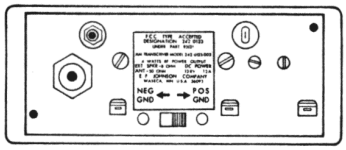
The Messenger 123A has been adapted to operate from either positive or negative ground supply voltage. The positive/negative ground transceiver, Part No. 242-0123-003, can be divided into three versions with the final version being the Messenger 123SJ, Part No. 242-0123-004.

The first version is an interim model which has a Messenger 123A front panel upper overlay and an exposed positive/negative ground conversion switch with a locking plate as shown in Figure 1. This model had a limited production of approximately 1500 units before it was discontinued and replaced by the Messenger 123B.



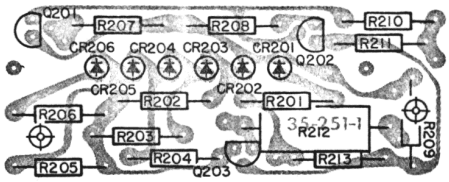
Positive/Negative Ground Messenger 123A
Figure 1

The Messenger 123B is the second version of the positive/negative ground transceiver. The Messenger 123B has a new front panel overlay and a submerged positive/negative ground conversion switch on the rear panel as shown in Figure 2.



Messenger 123B
Figure 2

The Messenger 123SJ is the final version and has the same positive/negative ground conversion switch as the Messenger 123B but it also has a solid state LED, "S"/power meter. The Messenger 123SJ replaces the Messenger 123B. Electrically all three transceivers are identical, the printed circuit board has been isolated from the chassis rail and the switching circuit has been added. Refer to the schematic for the switching circuit and the solid state meter circuit board components layout.



LED METER BOARD
SOLDER SIDE VIEW

The LED meter circuit operates much the same as the old meter. In the receive condition, the received signal is rectified by the base emitter junction of Q2 and applied to the base of Q201 at a level set by R81, the meter adjust. The negative voltage on its base causes Q201 to conduct. With Q201 conducting, Q202 cuts off. The positive voltage on the collector of Q202 then forward biases Q203 into conduction. The path of conduction is from ground through one or more of the LED's in the emitter of Q203, through Q203 to B+. The number of LED's that turn on depends upon the amplitude of the received signal at Q2. CR201 is "on" all the time.

In the transmit condition, some of the RF carrier leaks through CR16 and is coupled through T1 and Q1 to Q2 where it is rectified and causes a meter indication in the same manner as a received signal. When the transmitter is modulated, a sample of the modulation is applied to the base of Q203 which aids the conduction of Q203 caused by the RF carrier.

The following changes are made to the Messenger 123A to make a Messenger 123B.

Components Added	Schematic Location	Part Description	Part Number
C100	D2	4700 pF ±20%, Z5U	510-3001-472
CR100	D2	1N4818, 200V, 1.5A	523-0013-201
CH3	--	Front panel	023-2618-032
NP14	--	Upper overlay, M123B	559-2032-031
S100	D2	DPDT slide switch	583-3001-005

The following changes are made to the Messenger 123B to make a Messenger 123SJ.

Components Added	Schematic Location	Part Description	Part Number
CR201	D4	Red, light emitting diodes	549-4001-002
CR202	D4	↓	↓
CR203	D4		
CR204	D4		
CR205	D4		
CR206	D4		
DS201	D4	2193D 14.4V, 0.12A	549-3001-003
Q201	D4	Silicon PNP 50 MHz amp	576-0003-017
Q202	D4	Silicon NPN amp	576-0003-011
Q203	D4	Silicon NPN amp	576-0003-011
R201	D4	680 ohm ±10%, 1/4 W	569-1002-681

Components Added	Schematic Location	Part Description	Part Number
R202	D4	1.2K ohm ±10%, 1/4 W	569-1002-122
R203	D4	1K ohm ±10%, 1/4 W	569-1002-102
R204	D4	680 ohm ±10%, 1/4 W	569-1002-681
R205	D4	390 ohm ±10%, 1/4 W	569-1002-391
R206	D4	10 ohm ±10%, 1/4 W	569-1002-100
R207	D4	820 ohm ±10%, 1/4 W	569-1002-821
R208	D4	220 ohm ±10%, 1/4 W	569-1002-221
R209	D4	150K ohm ±10%, 1/4 W	569-1002-154
R210	D4	33K ohm ±10%, 1/4 W	569-1002-333
R211	D4	4.7K ohm ±10%, 1/4 W	569-1002-472
R212	D4	68 ohm ±10%, 1 W	569-1006-680
R213	D4	47K ohm ±10%, 1/4 W	569-1002-473
U201	--	PC board	035-0251-001
NP14	--	Upper overlay (M123SJ)	559-2032-111
NP15	--	Lower overlay (M123SJ)	559-2033-001

Parts Deleted	Schematic Location	Part Description	Part Number
DS1	B9	6.3V bulb	549-3001-007
DS2	B10	6.3V bulb	549-3001-007

The following changes have been made to all three transceivers.

REVISION

Messenger 123A G Revision
Messenger 123B B Revision (after July 1975)
Messenger 123SJ B Revision

Components Deleted	Schematic Location	Part Description	Part Number	Reason for Change
C15	A8	4700 pF ±20%, 50V	510-3204-472	Audio distortion
CR2	A6	1N4148 silicon diode	523-1500-883	Audio distortion

Components Changed	Schematic Location	From	To	New Part Number	Reason for Change
C27	B7	0.0022μF	0.047μF	510-3010-473	Self-modulation
C35	B9	0.01μF	0.022μF	510-3202-223	Audio distortion
C36	B9	0.01μF	0.022μF	510-3202-223	Audio distortion
C42	C2	6.8 pF	8.2 pF	520-3220-829	Improve T7 tuning
C43	C2	27 pF	22 pF	510-3216-220	Improve T7 tuning
CR2	A6	1N881	1N4148	523-1500-883	Availability
CR5	A8				
CR11	C9				
CR14	C4				
CR15	C4				
CR17	B4				
J1	B10	1001	1011	515-2001-011	
J3	D1			023-3370-001	
Q11	B9	2001	2029	576-0002-029	
Q12	B9	2001	2029	576-0002-029	
Q15	C6	4006	4035	576-0004-035	
R7	A5	2.2KΩ	1KΩ	562-0019-102	Increased tuning range
R17	B2	2.2K	1.5K	569-1504-152	LF oscillator bias regulation
R21	B2	2.2K	2.7K	569-1504-272	LF oscillator bias regulation

Components Changed	Schematic Location	From	To	New Part Number	Reason for Change
R26	B4	1.5KΩ	1KΩ	569-1504-102	Increased squelch threshold
R39	B9	510Ω	470Ω	569-1503-471	Audio distortion
R41	B9	33Ω	27Ω	569-1502-330	Audio distortion
R47	C2	2.7K	2.2K	569-1504-222	HF oscillator bias regulation to prevent oscillator dropout
R58	D4	62Ω	27Ω	569-1504-270	Improve CR13 regulation at low voltages
RT71	A8	470Ω	8K thermistor	569-3001-001	Audio distortion at cold temps
T7	C3	5004	5006	592-5015-006	Oscillator dropout at high temperatures
Front panel		plated	painted	023-2618-031 (M123A) includes:	Availability
			Upper overlay	559-2032-011	
			Lower overlay	559-2033-041	
				023-2618-032 (M123B) includes:	
			Upper overlay	559-2032-031	
			Lower overlay	559-2033-041	
				023-2618-033 (M123SJ) includes:	
			Upper overlay	559-2032-111	
			Lower overlay	559-2033-001	

Components Added	Schematic Location	Part Description	Part Number	Reason for Change
R71	A8	470Ω ±10%, 1/4 W	569-1002-471	Audio distortion (Changed to RT71)
C96	A6	56 pF ±5% 200V N750	510-3020-560	Audio distortion

CORRECTIONS

Page 6 paragraph 2.2 RECEIVER:

Selectivity 6 kHz bandwidth at -6 dB (EIA 2 signal generator method)

Page 15 Figure 5-2:

The transistor symbol should be NPN.

Page 20 Table 5-5:

Channel No. 11 High Limit should be 27,086.083 kHz and the Low Limit should be 27,083.917 kHz.

Channel No. 23 High Limit should be 27,256.090 kHz.

Page 21 paragraph 5.6:

A sample of the DC output voltage from Q101 is fed back to the base of the voltage amplifier, Q103, by R105.

PARTS LIST CORRECTIONS

S2	Crystal switch assembly on "C" or later models	583-2029-103
MK1	Microphone assembly (M122)	023-2708-005
R13	10KΩ, 1/8 W SPST ON/OFF (M123A)	562-0016-004