

918B MULTISPEED AND CODE CONVERTER

TEST PROCEDURES

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1.03 This section contains self-test procedures to test each circuit pack (CP) of the converter. The tests are conducted using the two indicators (LEDs) on the face of the converter. The only test equipment needed is a KS-14510 VOM or equivalent.



Before removing a CP, ensure that the power is turned OFF.

1.04 When taking the converter out of service, interconnect the B and C cords.

1.05 A letter a, b, c, etc, added to a step number in these tests indicates an action which may or may not be required, depending on trouble conditions. The condition under which a lettered step or series of lettered steps should be performed is given in the ACTION column, and all steps governed by the same condition are designated by the same letter within a test. Where a condition does not apply, all steps designated by that letter should be omitted.

1. GENERAL

1.01 This section contains information concerning procedures to be used when testing the 918B multispeed and code converter. For overall procedures to be followed when investigating a trouble report, refer to the section entitled 918B Multispeed and Code Converter—Maintenance (103-814-301). The 918B multispeed and code converter will hereafter be referred to as the converter.

1.02 Whenever this section is reissued, the reasons for reissue will be listed in this paragraph.

2. MAINTENANCE TEST PROCEDURES

A. CP 6 Power Supply Test

2.01 The test equipment needed for this test is a KS-14510 VOM or equivalent.

2.02 This test checks fuse, line cord, indicators, and components of the power supply.

STEP	ACTION	VERIFICATION
1	Set PWR switch to ON.	Red indicator (R) is ON.
2a	If Step 1 is not met, check fuse.	
3a	Check ac power cord.	

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STEP	ACTION	VERIFICATION
4a	Check ac power to converter.	
5a	Place negative probe of VOM to CP 5, test point 14 (TP5-14), and positive probe to TP5-13.	+4.5 to +5.5 volts.
6a	Remove all cords, one a time.	
6a	<i>Set PWR switch to OFF when removing CPs and set to ON when reading VOM.</i>	+4.5 to +5.5 volts.
7b	If Step 6a is not met, check for +5 volt short to ground at CR1, Q1, C1, C2, or T1 (Fig. 1 and 2).	
8a	If Step 1 is not met, check the R indicator.	
9	Remove VOM and reinsert all CPs.	
9	<i>Set PWR switch to OFF when replacing CPs.</i>	
10	Connect TP5-14 to TST.	Green indicator (G) is ON.
11c	If Step 10 is not met, check G indicator.	
12	Place negative probe of VOM to TP5-14 and positive probe to TP5-1.	+10.8 to +13.2 volts.
13d	If Step 12 is not met, remove CP 2.	
14d	Check for +12 volt short to ground at J311 connector, C4, C5, or T1 (Fig. 1 and 2).	
15	Move negative probe of VOM from TP5-14 to TP5-6, and move positive probe from TP5-1 to TP5-14.	-10.8 to -13.2 volts
16e	If Step 15 is not met, remove CP 2 and CP 4.	
17e	Check for -12 volt short to ground at C3 or C6 (Fig. 1 and 3).	
18	Remove VOM and reinsert CPs.	

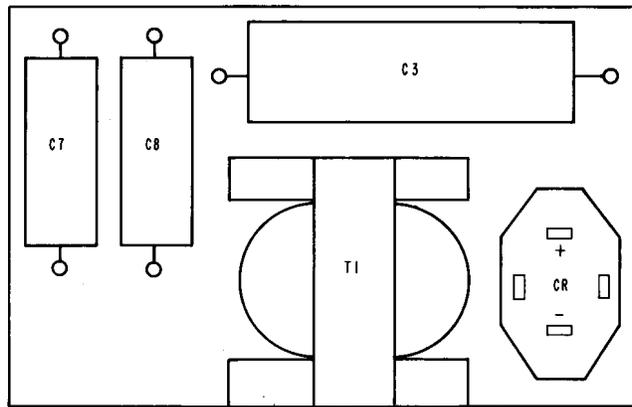


Fig. 1—Location of Components in Power Supply

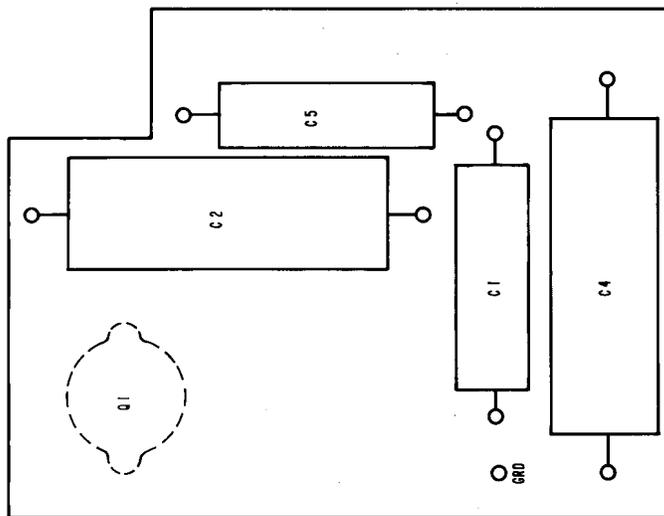


Fig. 2—View of Power Supply From Rear of Converter

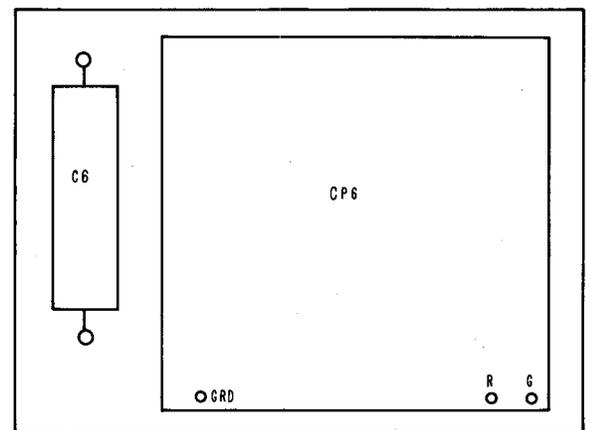


Fig. 3—View of Circuit Pack 6

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B. CP 5 Clock Test

2.03 This test checks the speed and code keys and their connections, and the clocks and their functions.

STEP	ACTION	VERIFICATION
1	Depress the SPARE key on the TTY.	
2	Connect TST to TP5-7.	R is ON, G is OFF.
3a	If Step 2 is not met, check SPARE key and its connection to terminal 29.	
4	Depress the 60 key on the TTY.	R is ON, G is OFF.
5b	If Step 4 is not met, check 60 key and its connection to terminal 33.	
6	Depress the 75 key on the TTY.	R is ON, G is OFF.
7c	If Step 6 is not met, check 75 key and its connection to terminal 34.	
8	Depress the 100 (5) key on the TTY.	R is ON, G is OFF.
9d	If Step 8 is not met, check 100 (5) key and its connection to terminal 28.	
10	Depress the 100 (8) key on the TTY.	R is OFF, G is ON.
11e	If Step 10 is not met, check 100 (8) key and its connection to terminal 35.	
12	Depress the 150 (8) key on the TTY.	R is OFF, G is ON.
13f	If Step 12 is not met, check 150 (8) key and its connection to terminal 30.	
14	Move test lead from TP5-7 to TP5-9.	R is OFF, G is ON.
15g	If Step 14 is not met, check for a short on UC1 or C1 lead.	
16	Connect TP5-14 to TP1-13.	R and G both ON (flickering may be observed).
17	Depress 100 (8) key on TTY.	R and G both ON.
18	Depress 100 (5) key on TTY.	R and G both ON.
19	Depress 75 key on TTY.	R and G both ON.
20	Depress 60 key on TTY.	R and G both ON.

STEP	ACTION	VERIFICATION
21	Move test lead from TP1-13 to TP3-11.	Machine spaces.
22	Move test lead from TP5-9 to TP5-4.	R and G both ON.
23	Move test lead from TP3-11 to TP3-14.	R is OFF, G is ON.
24	Move test lead from TP5-4 to TP5-10.	R is OFF, G is ON.
25	Move test lead from TP3-14 to TP3-13.	R and G both ON.
26	Move test lead from TP5-10 to TP5-5.	R is ON, G is OFF.
27	Move test lead from TP3-13 to TP1-1.	R and G both ON.
28	Move test lead from TP5-5 to TP5-12.	R and G both ON.

C. CP 1 Receive Speed Test

2.04 This test checks a character held in the output shift register on the receive speed CP. Each bit of the character can be determined using the test points on the front of the CP.

STEP	ACTION	VERIFICATION
1	Connect TP1-10 to TST.	R is OFF, G is ON.
2	Move test lead from TP1-10 to TP1-9.	R is OFF, G is ON.
3	Move test lead from TP1-9 to TP1-13.	R is ON, G is OFF.
4	If Step 2 is met, but Step 3 is <i>not</i> , go to test for CP 5 (clock).	
5	If neither Step 2 nor Step 3 is met, replace CP 1.	
6	Move test lead from TP1-13 to TP1-12.	R is ON, G is OFF.
7a	If Step 6 is <i>not</i> met, generate any character.	
8	Move test lead from TP1-12 to TP1-11.	R is OFF, G is ON.
9	If <i>neither</i> Step 6 <i>nor</i> Step 8 is met, replace CP 1.	
10	If Step 8 is met, but Step 6 is <i>not</i> , go to test for CP 5 (clock).	
11	Move test lead from TP1-11 to TP1-6.	R is ON, G is OFF.
12	Move test lead from TP1-6 to TP1-7.	R is ON, G is OFF.

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STEP	ACTION	VERIFICATION
13	Move test lead from TP1-7 to TP1-2.	R is ON, G is OFF.
14	Move test lead from TP1-2 to TP1-1.	R is ON, G is OFF.
15	Move test lead from TP1-1 to TP1-5.	R is ON, G is OFF.
16	Move test lead from TP1-5 to TP1-4.	R is ON, G is OFF.
17	Move test lead from TP1-4 to TP1-8.	R is ON, G is OFF.
18	Move test lead from TP1-8 to TP1-3.	R is ON, G is OFF.
19	Move test lead from TP1-3 to TP1-12.	R is ON, G is OFF.
20	Move test lead from TP1-12 to TP1-14.	R is OFF, G is ON.

2.05 Test points TP1-6, -7, -2, -1, -5, -4, -8, -3, -12, and -14 represent the generated character in the output shift register. By grounding TP1-11, a generated character is held in the output shift register. Each bit of the character is brought out to the test points and can be observed with the use of the indicators. A space lights the green indicator; a mark lights the red indicator. Removing TP1-11 from ground allows the character to read out of the output shift register. The test points and elements for five characters are shown in Table A. Proceed as follows:

STEP	ACTION	VERIFICATION
21	Connect TP1-11 to TP5-14.	
22	Generate a character from Table A.	
23	Connect TST to test points shown in Table A.	Indicators come on as shown in Table A.
24	Remove TP1-11 from TP5-14. (This allows character to read out.)	
25	Repeat Steps 21 through 24 for each character listed in Table A.	

TABLE A
CHARACTERS, ELEMENTS, AND TEST POINTS
FOR THE OUTPUT SHIFT REGISTER
IN THE CP 1 TEST

ELEMENTS	TEST POINTS	CHARACTERS				
		U	*	5	SPACE	DELETE
1	3	R	G	R	G	R
2	8	G	R	G	G	R
3	4	R	G	R	G	R
4	5	G	R	G	G	R
5	1	R	G	R	G	R
6	2	G	R	R	R	R
7	7	R	G	G	G	R
8	6	G	R	G	R	R
STOP	12	R	R	R	R	R
START	14	G	G	G	G	G

D. CP 3 Send Speed Test

2.06 This test checks the transmit translation by testing the bits of a character at the outputs of the core logic in the transmit path. Clock functions on this CP and parity generate are also tested.

STEP	ACTION	VERIFICATION
1	Connect TST to TP3-1.	R is ON, G is OFF.
2	Move test lead from TP3-1 to TP3-2.	R is ON, G is OFF.
3	Move test lead from TP3-2 to TP3-3.	R is ON, G is OFF.
4	Move test lead from TP3-3 to TP3-4.	R is ON, G is OFF.
5	Move test lead from TP3-4 to TP3-5.	R is ON, G is OFF.
6	Move test lead from TP3-5 to TP3-6.	R is ON, G is OFF.
7	Move test lead from TP3-6 to TP3-7.	R is ON, G is OFF.

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STEP	ACTION	VERIFICATION
8	Move test lead from TP3-7 to TP3-8.	R is ON, G is OFF.
9	Move test lead from TP3-8 to TP3-11.	R is ON, G is OFF.
2.07	<p>Test points TP3-2, -3, -6, -1, -8, -7, -5, -4, and -11 represent the generated character in the output shift register. By grounding TP3-14, a generated character is held in the output shift register. Each bit of the character is brought out to the test points and can be observed with the use of the indicators. A space lights the green indicator; a mark lights the red indicator. Removing TP3-14 from ground allows the character to read out of the output shift register. The test points and elements for five characters are shown in Table B. Proceed as follows:</p>	
STEP	ACTION	VERIFICATION
10	Connect TP3-14 to TP5-14.	
11	Generate a character from Table B.	
12	Connect TST to test points shown in Table B.	Indicators come on as shown in Table B.
13	Remove TP3-14 from TP5-14. (This allows character to be read out.)	
14	Repeat Steps 11 through 13 for each character listed in Table B.	
15	Move test lead from TP3-11 to TP3-14.	R is OFF, G is ON. (R is ON when the clock is running.)
16	Normalize the PARITY GEN key.	
17	Move test lead from TP3-14 to TP3-9.	R is OFF, G is ON.
18	Depress PARITY GEN key.	R is ON, G is OFF.
19	Move test lead from TP3-9 to TP3-12.	R is OFF, G is ON. (If flashing, signals are coming in.)
20	Move test lead from TP3-12 to TP3-13.	R is ON, G is OFF. (G is ON when clock is running.)
21	Generate any character.	R is ON, G flashes.
22	Move test lead from TP3-13 to TP3-11.	
23	Depress BREAK key.	R is OFF, G is ON.

TABLE B
CHARACTERS, ELEMENTS, AND TEST POINTS
FOR THE OUTPUT SHIFT REGISTER
IN THE CP 1 TEST

ELEMENTS	TEST POINTS	CHARACTERS				
		U	*	5	SPACE	DELETE
1	2	R	G	R	G	R
2	3	G	R	G	G	R
3	6	R	G	R	G	R
4	1	G	R	G	G	R
5	8	R	G	R	G	R
6	7	G	R	R	R	R
7	5	R	G	G	G	R
8	4	G	R	G	R	R
STOP	11	R	R	R	R	R

E. CP 2 Receive Code Test

2.08 This test checks the receive translation by testing the outputs of the core logic in the receive path. Parity detect is also tested.

STEP	ACTION	VERIFICATION
1	Depress the 100 (5) key	
2	Connect TP2-1 to TST.	R is OFF, G is ON.
3	Move test lead from TP2-1 to TP2-2.	R is OFF, G is ON.
4	Move test lead from TP2-2 to TP2-3.	R is OFF, G is ON.
5	Move test lead from TP2-3 to TP2-4.	R is OFF, G is ON.
6	Move test lead from TP2-4 to TP2-5.	R is OFF, G is ON.
7	Move test lead from TP2-5 to TP2-6.	R is OFF, G is ON.
8	Move test lead from TP2-6 to TP2-7.	R is OFF, G is ON.
9	Move test lead from TP2-7 to TP2-8.	R is OFF, G is ON.

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STEP	ACTION	VERIFICATION
10	Move test lead from TP2-8 to TP2-12.	R is ON, G is OFF.
11	Generate any character.	R is ON, G flashes once.
12	Move test lead from TP2-12 to TP2-9.	R is ON, G is OFF.
13	Generate any numerical character.	
14	Generate any alphabetical character.	R is ON, G flashes once.
15	Move test lead from TP2-9 to TP2-11.	
16	Generate any numerical character.	R is ON, G flashes once.
17	Normalize PARITY DET key.	
18	Move test lead from TP2-11 to TP2-10.	R is OFF, G is ON.
19	Depress PARITY DET key.	R is ON, G is OFF.

F. CP 4 Send Code Test

2.09 This test checks the HOLD key, the start pulse in the first, second, and third stores, and checks the case of the converter (FIGS/LTRS).

STEP	ACTION	VERIFICATION
1	Connect TST to TP4-7.	R is OFF, G is ON.
2	Move test lead from TP4-7 to TP4-8.	R is OFF, G is ON.
3	Move test lead from TP4-8 to TP4-9.	R is OFF, G is ON.
4	Move test lead from TP4-9 to TP4-10.	R is OFF, G is ON.
5	Move test lead from TP4-10 to TP4-11.	R is OFF, G is ON.
6	Move test lead from TP4-11 to TP4-13.	R is ON, G is OFF.
	<i>Note:</i> Steps 7 through 9 allow a start pulse to be observed in the third store.	
7	Generate a delete.	
8	Depress HOLD key.	
9	Generate an alphabetic character.	R is OFF, G is ON.
10	Move test lead from TP4-13 to TP4-6.	R is ON, G is OFF.
	<i>Note:</i> Steps 11 through 13 allow a start pulse to be observed in the second store.	

STEP	ACTION	VERIFICATION
11	Depress the HOLD key (to release).	
12	Generate a delete.	
13	Depress the HOLD key.	
14	Generate two alphabetic characters.	R is OFF, G is ON.
15	Move test lead from TP4-6 to TP4-1.	R is ON, G is OFF.
	Note: Steps 15 through 17 allow a start pulse to be observed in the first store.	
16	Depress the HOLD key (to release).	
17	Generate a delete.	
18	Depress the HOLD key.	
19	Generate 3 alphabetic characters.	R is OFF, G is ON.
20	Move test lead from TP4-1 to TP4-5.	R is ON, G is OFF if last character was numeric. R is OFF, G is ON if last character was alphabetic.
21	Move test lead from TP4-5 to TP4-14.	G is OFF.

3. REFERENCES

3.01 The following documents pertain to the 918B multispeed and code converter.

NUMBER	TITLE
SD-73107-01	Multispeed and Code Converter No. 918B
SECTION	TITLE
103-814-101	918B Multispeed and Code Converter—Description and Operation
103-814-301	918B Multispeed and Code Converter—Maintenance