

S-C TYPE 82 PUSHBUTTON DIAL

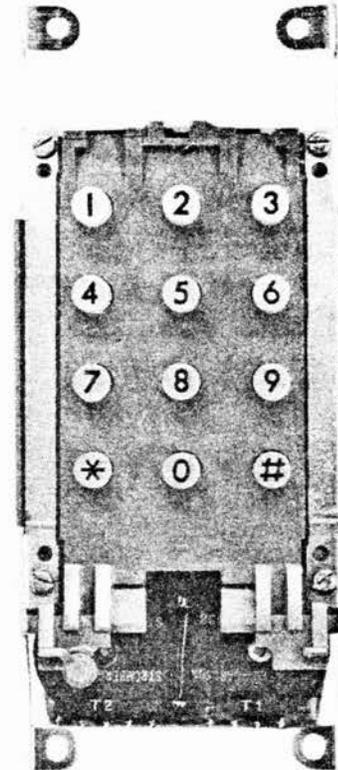
INSTALLATION, MAINTENANCE, PARTS IDENTIFICATION AND LISTS

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Figure 1. S-C Type 82 Pushbutton Dial.

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1. INTRODUCTION

1.01 This section provides installation, maintenance and parts identification for the S-C type 82 pushbutton dial. This dial is used in the Stromberg-Carlson SLENDERET[®] Telephone.

1.02 This section is new.

2. DESCRIPTION AND IDENTIFICATION

2.01 Description.

a. The S-C type 82 pushbutton dial (fig. 1) is equipped with twelve pushbuttons, ten of which are engraved with numerals from zero to nine, one pushbutton engraved with an asterisk and the last with a number sign. With the exception of mounting brackets, common contact assembly, contact dust cover, and miscellaneous screws, the parts are not separable or replaceable.

2.02 Identification.

The S-C type 82 pushbutton dial available, its stock number and package number is listed below:

S-C TYPE 82 PUSHBUTTON DIAL IDENTIFICATION

TYPE	STOCK NO.	PACKAGE NO.	PUSHBUTTON IDENT.
82A2A	200053-421	703020-149	Twelve buttons engraved 1 thru 0, plus* and #

2.03 Operation.

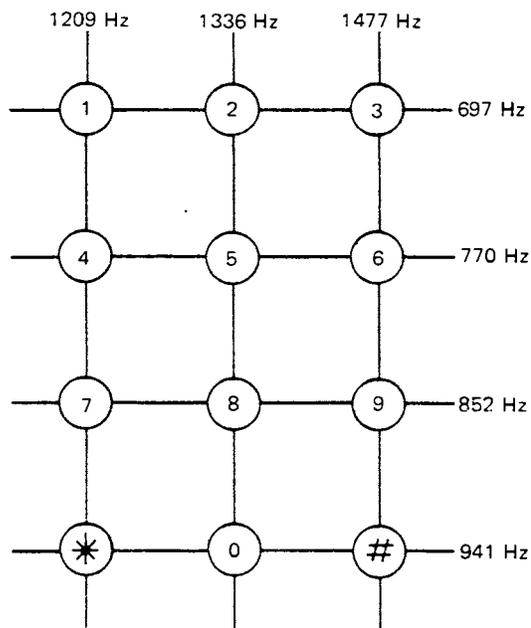
When a pushbutton is depressed, it operates one horizontal and one vertical crank. This closes respective contacts, connecting each tuning capacitor to a specific transformer tap. The horizontal crank also operates the actuator slide, which operates the common switch assembly causing the following:

- a. Opens the transmitter circuit.
- b. Reduces side tone by adding resistance in series with the receiver.
- c. Applies power to the oscillator.

d. Removes the dc path from the coils, which starts the oscillator.

2.04 Frequencies.

The frequencies of the vertical and horizontal switches (pushbuttons) are shown in figure 2 and table 1.



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Figure 2. Pushbutton Dial Frequencies.

TABLE 1

PUSHBUTTON DIAL FREQUENCIES

DIGIT	LOW TONE Hz	HIGH TONE Hz
1	697	1209
2	697	1336
3	697	1477
4	770	1209
5	770	1336
6	770	1477
7	852	1209
8	852	1336
9	852	1477
0	941	1336
*	941	1209
#	941	1477

3. INSTALLATION AND CONNECTIONS

The S-C type 82 pushbutton dial is installed by four mounting screws one used at each end of the two mounting brackets, and seven network terminal screws, through the network assembly into mating threaded screw holes in the pushbutton dial. Proper electrical connection is made to the network by tightening the terminal screws firmly. Wiring diagram for the pushbutton dial is shown in figure 3.

4. MAINTENANCE

4.01 Cleaning.

The pushbuttons and the dial face may be cleaned with a water-dampened cloth only. Do not use any harsh solvents or cleaners which may damage the pushbuttons or dial face.

4.02 Common Switch Replacement.

- a. Remove dust cover retaining screw and dust cover (fig. 9, item 6 and 7).
- b. Remove common switch retaining screw (fig. 9, item 4).
- c. Unsolder contact springs at printed-wiring board.
The use of a "solder sucker" is recommended to remove excessive solder. Remove common contact assembly (fig. 9, item 5).
- d. Position new common switch assembly and replace retaining screw.
- e. Solder contact springs to printed wiring board at contact points. Make certain that excessive solder does not flow between adjacent portions of the printed wiring.
- f. Adjust the common switch contact springs in accordance with paragraph 4.03.
- g. Replace dust cover and dust cover retaining screw.

4.03 Common Switch Adjustment.

- a. The actuating slide must be held against its stop by the tension spring with a minimum force of 10 grams in the nonoperated position, and there shall be a minimum of 0.005 inch clearance between the slide and any break spring.

b. In the nonoperated position, all closed contacts must have a contact pressure of 10 grams minimum and there shall be a minimum of 0.020 inch separation between the open contacts. Springs must clear the bottom of the slide slots by at least 0.005 inch.

c. In the fully operated position of any pushbutton, the closed contacts must have a contact pressure of 10 grams minimum, and there shall be a minimum separation of 0.020 inch between all open contacts.

d. The operating sequence must be as shown below, when starting from the nonoperated position and progressing to the fully operated position. See figure 4 for contact spring identification:

Step A. Springs 3 and 4 break

Step B. Springs 1 and 2 make

Step C. Springs 5 and 6 break

Step D. Springs 7 and 8 break

4.04 Maintenance Checks.

- a. Check all pushbuttons for tone feed-back. Two tones should be heard for each pushbutton depressed.
- b. If tone troubles are suspected and centralized test equipment is available, dial test code for dial check.

5. TEST AND ADJUSTMENTS

5.01 Test Setup.

- a. Figure 5 shows a typical test circuit for shop testing and a dial assembly. The dial is attached to an S-C 861A type network by means of terminal screws that go through the network printed wiring and into threaded holes in the pushbutton dial assembly. Power is supplied through a S-C No. 6C Current Flow Test Set or equivalent connected as shown to terminals 3 and 4 of the S-C type 861A network.

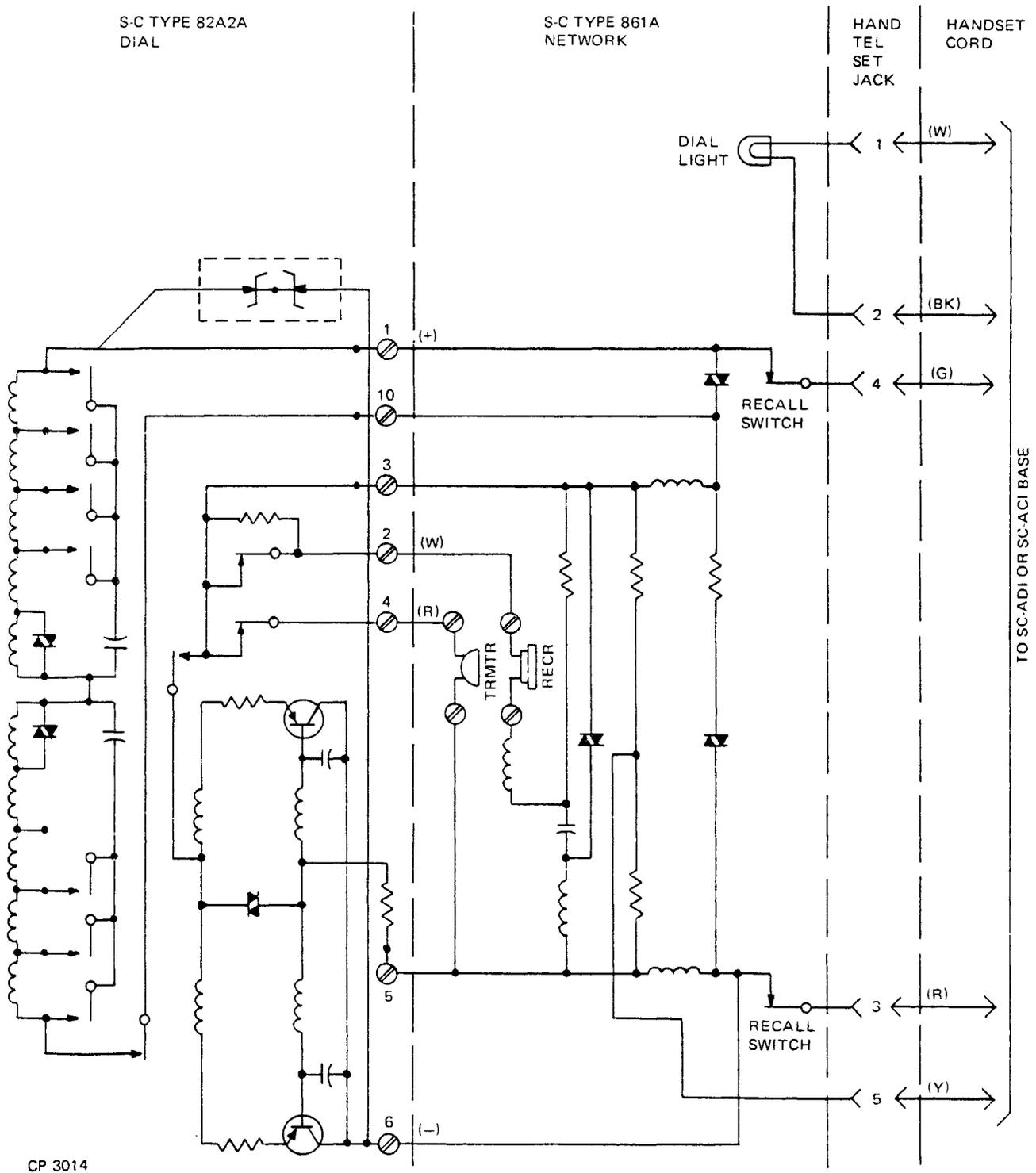


Figure 3. Wiring Diagram, S-C Type 82 Typical Application.

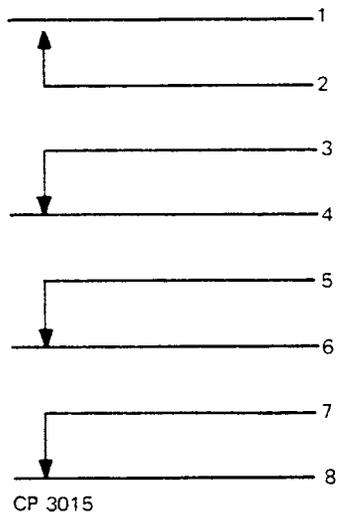


Figure 4. Common Switch Spring Combination and Contact Numbering.

b. It is necessary to use an S-C 861A network connected to the pushbutton dial, and both the receiver and transmitter units connected to the network. (See figure 6).

c. It is recommended that the terminal block for the handset cord be used in the mating connector of the network, so that connection can be made to terminals 3 and 4 of figure 7.

d. Terminal identification of the S-C type 82 pushbutton dial is shown in figure 8.

5.02 Test Procedures.

Frequency measurements, signal amplitude measurements, and adjustments are made on the basis of one frequency being generated at a time. The generated wave is measured in time rather than frequency to speed up observations. (See table 2).

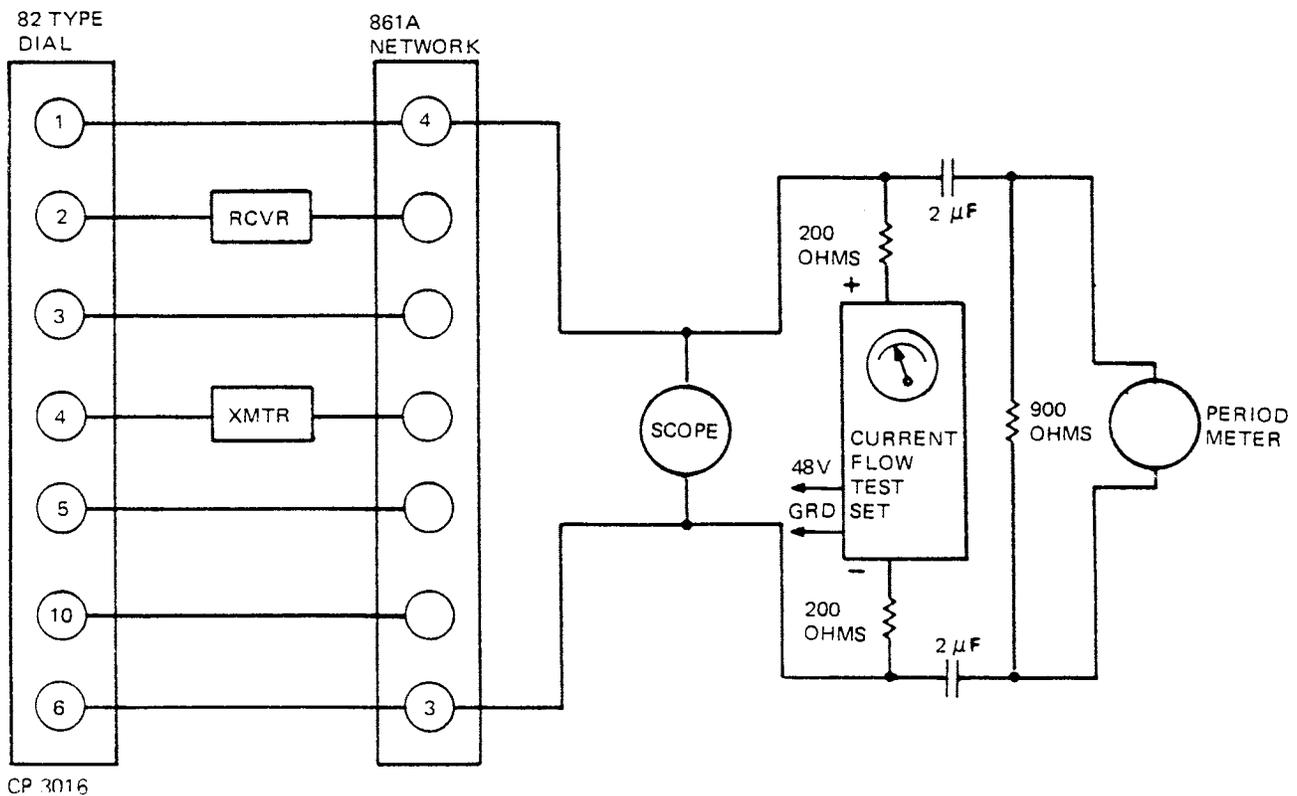


Figure 5. Test Setup.

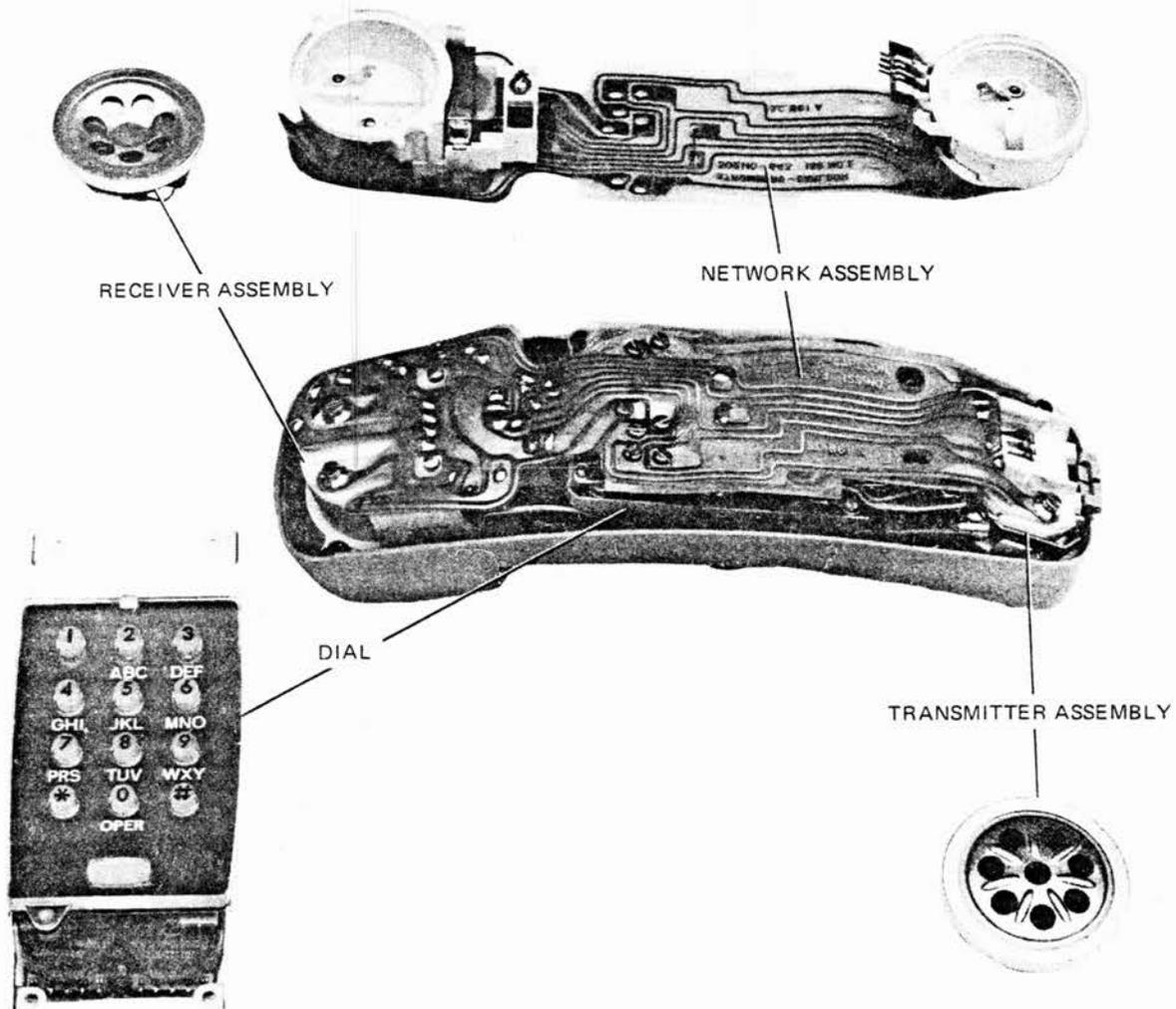
a. Frequency Check.

1. Connect dial under test to test circuit, as shown in figure 5.
2. Operate switch on test set and adjust line current to 20 milliamperes.
3. Wait at least 30 seconds before beginning test.
Depress pushbuttons 4 and 5 simultaneously and adjust threaded core of transformer T-1 (fig. 1) to obtain a reading of 1303.8 microseconds on the period meter. Release pushbuttons.
4. Depress pushbuttons 8 and 0 simultaneously and adjust threaded core of transformer T-2 (fig. 1) to obtain a reading of 749.9 microseconds on the period meter. Release pushbuttons.

5. Observe the period and output level for each of the frequencies. Reading must be within the limits shown in table 2. Tests are made at 75 degrees F.

b. Dual Frequency Output Test.

1. Connect dial to test circuit as shown in figure 5.
2. Operate switch on test set and adjust line current to 20 milliamperes.
3. Depress each pushbutton with the index finger.
Both frequencies should be present during the time the pushbutton is depressed.
4. The dual frequency output is observed at the L-1 and L-2 terminals by using a Tektronix model RM 561 oscilloscope, or equivalent.



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Figure 6. S-C 2220B Handset Components.

c. Rise Time.

Rise time is defined as the time required for the dial signal to reach full amplitude. Full amplitude should be reached within 15 milliseconds from the time the pushbutton is depressed.

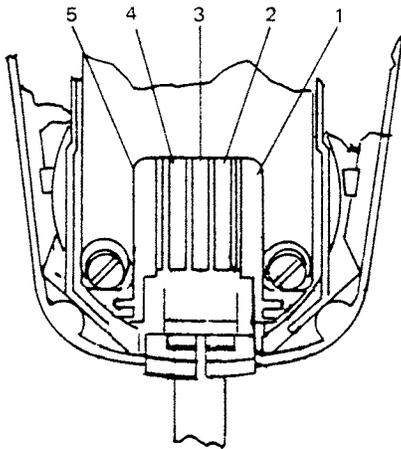
d. Parasitic Suppression.

Parasitic suppression is defined as an undesired high-frequency signal superimposed on the desired signal, and is caused by an open feedback capacitor. Observation of parasitic suppression should be made during tests outlined in paragraph 5.02a5.

e. Voltage Breakdown.

The dial shall withstand the application of 500 Vac between contact springs and the metal frame.

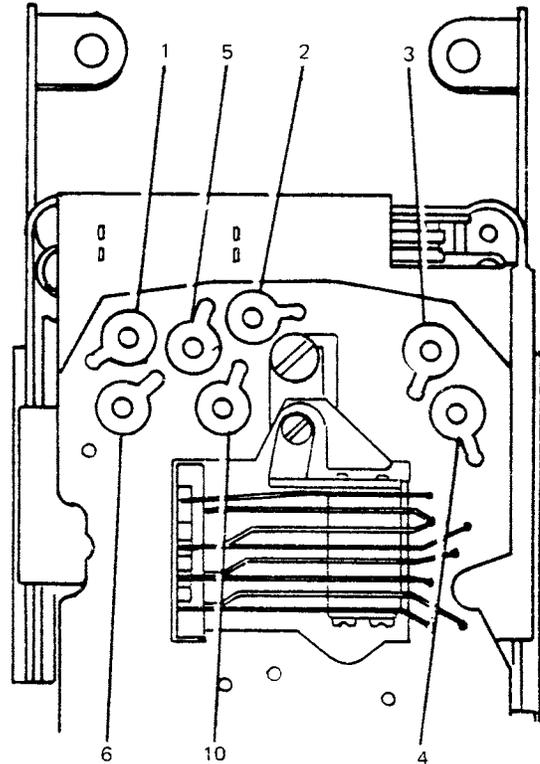
f. If the dial cannot be adjusted using the above procedures, it should be returned to Stromberg-Carlson Corporation, for factory repairs.



TERMINAL ORDER IS FROM RIGHT TO LEFT

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Figure 7. Network Terminal Connector Contact Identification.



CP 3018

Figure 8. S-C Type 82 Pushbutton Dial Terminal Identification.

6. PARTS LIST

An individual replaceable component can be identified by using the following procedure:

- a. Locate the part on figure 9, showing the part identification number.
- b. Refer to table 3 and locate the item number to obtain the description and stock number.

TABLE 2

FREQUENCY OUTPUT LEVEL AND PERIOD TIME

BUTTONS DEPRESSED	TEST STANDARDS PERIOD IN MICROSECONDS		RMS OUTPUT VOLTS		REPAIR/REPLACEMENT LIMITS PERIOD IN MICROSECONDS	
	MIN	MAX	MIN	MAX	MIN	MAX
2-3	1433.7	1448.2	0.497	0.798	1429.6	1452.4
4-5	1299.5	1308.0	0.515	0.826	1294.0	1313.7
7-8	1173.7	1184.8	0.540	0.865	1170.3	1188.4
0-*		1073.5	0.565	0.896	1060.1	1076.8
1-4	825.1	832.6	0.656	1.040	822.6	835.1
8-0	748.2	761.6	0.679	1.077	744.3	755.6
6-9	675.7	681.7	0.711	1.127	673.7	683.7

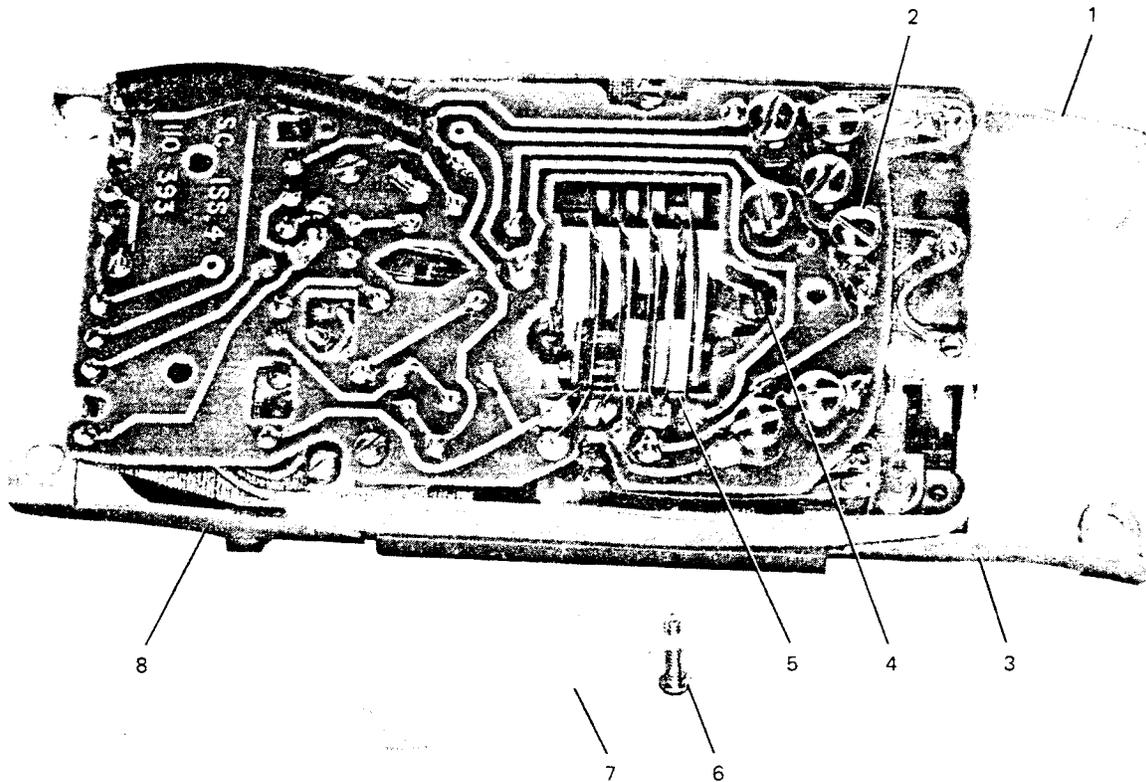


Figure 9. S-C Type 82 Pushbutton Dial, Parts Identification.

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TABLE 3

S-C TYPE 82 PUSHBUTTON DIAL PARTS LIST

<i>ITEM NO</i>	<i>DESCRIPTION</i>	<i>STOCK NUMBER</i>
1	Dial Retaining Bracket, Right	300002-191
2	Terminal Screws, 3-56 x 3/32 PHBMS	540136-242
3	Dial Retaining Bracket, Left	300022-181
4	Common Contact Retaining Screw, 2-56 x 1/8 RHIMS	500052-000
5	Common Contact Assembly	200280-579
6	Dust Cover Retaining Screw, 2-56 x 5/16 RHIMS	500352-000
7	Protector and Dust Cover	300002-381
8	Bracket Retaining Screws, 3-28 x 13/32 Thread Cutting, (Not shown)	304038-751

