

SPECIFIC STANDARD
FOR
SWITCHBOARD BD-95

PROJECT 4409G

3 NOVEMBER 1955

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FORT MONMOUTH, N. J.

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REP-708

SIGNAL CORPS ENGINEERING LABORATORIES
FORT MONMOUTH, NEW JERSEY

3 NOVEMBER 1955

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PREFACE

Signal Corps Repair Standards (formerly Signal Corps Repaired Equipment Requirements) are prepared by the Maintenance Engineering Branch, Procurement-Maintenance Engineering Division, Signal Corps Engineering Laboratories, and cover various items of signal equipments which are subject to repair, test and inspection. These repair standards are documents which set forth the specific repair requirements and test standards to be applied to the individual equipments being repaired and tested.

Signal Corps Repair Standards are prepared for the specific use of the fifth echelon Signal Repair Shops in repairing and determining the quality and acceptability of repaired signal equipments covered by these standards. The use of Signal Corps Repair Standards is recommended as a guide and reference for any agency having occasion to repair, test or inspect an item of signal equipment for which a repair standard has been prepared.

Signal Corps Repair Standard No. REP-1001 is a general standard and is subsidiary to any individual standard prepared. No individual standard is to be considered complete in itself, but is to be used in conjunction with Signal Corps Repair Standard No. REP-1001, "General Standards for Repaired Signal Equipment."

Reports of any discrepancies or any other constructive comments bearing upon this repair standard are invited. A series of Comments and/or Notes pages will be found in the back of this standard which are designed to facilitate reporting any inaccuracies noted. All such reports or comments as well as requests for additional copies, should be addressed to:

**COMMANDING OFFICER
Signal Corps Engineering Laboratories, SIGEL-PMM-3
Fort Monmouth, New Jersey.**

REPORT

The first part of the report discusses the general situation of the project and the progress made during the period covered by the report. It also mentions the various difficulties encountered and the steps taken to overcome them. The second part of the report contains a detailed description of the work done during the period, including the design and construction of the various parts of the project. The third part of the report discusses the results of the work done and the conclusions drawn therefrom. The fourth part of the report contains a list of references and a list of the names of the persons who have assisted in the work.

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SPECIFIC STANDARD
FOR
SWITCHBOARD BD-95

I. STATEMENT COVERING APPLICABILITY

This Specific Standard covers inspection requirements to be used in determining the quality and acceptability of repaired Switchboard BD-95.

II. APPLICABLE REFERENCES

A. Repair Standards: Applicable paragraphs of General Standards REP-1001, REP-1006 and REP-1007 form a part of this Specific Standard.

B. Modification Work Orders: All applicable Modification Work Orders pertaining to this equipment shall be performed.

III. TEST AND ADDITIONAL EQUIPMENT

The following equipments, or suitable equivalents, will be employed in determining compliance with the requirements of this Specific Standard.

A. Test Equipment

Equipment	Stock Number	Quan. Req.	REP
1. Signal Generator SG-15/PCM	3F3901.1-15	1	775
2. Multimeter TS-352/U	3F4325-352	1	420
3. Decibel Meter ME-22/PCM	3F3307.11-1	1	1128
4. Test Set I-181	3F4181	1	369
5. Test Set TS-190/U	3F4316.1	1	348

B. Additional Equipment

Equipment	Stock Number	Quan. Req.	REP
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1. Plug	5935-192-4760	1	-
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2. Plug	4C7409	1	-
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IV. REQUIREMENTS

A. General Test Conditions: All tests shall be conducted under the following conditions:

1. A source of 26 \pm 2 volts DC shall be connected to the Switchboard BD-95. Positive DC shall be connected to the "GRD" (Stromberg-Carlson model) or the "+" (Kellogg model) battery binding post, and negative DC shall be connected to the BATT (Stromberg-Carlson) or "-" (Kellogg model) battery binding post.

2. All keys shall be in normal position unless otherwise stated.

3. Connecting circuits shall not be split. That is, each connecting circuit shall serve the complete twenty lines.

4. The GEN switch shall be in the "in" position. ("power Gen" position)

B. Electrical Requirements

1. Test of Make of Ringing Key. Multimeter TS-352/U connected across the tip of Line 1 and the G binding post of the power generator binding posts shall indicate an open circuit.

a. Operate the A key at Line 1 to the RP position. Multimeter TS-352/U shall read not more than 4 ohms.

b. Operate the GEN key to the hand generator (out) position. Multimeter TS-352/U shall indicate an open circuit.

c. Restore the GEN key to the POWER GEN (in) position, and repeat the above tests of paragraphs 1 and 1a on all lines. It is not necessary to repeat the tests of sub-paragraph 1b.

d. Repeat the above tests of paragraphs 1 through 1c with Multimeter TS-352/U connected across the ring of the lines and the \pm binding post of the POWER GEN binding posts.

2. Tests of Break of Ringing Key. With the A key operated to the RP position, Multimeter TS-352/U connected across the T and R binding posts of Line 1 shall indicate an open circuit.

a. Repeat the above test on all lines.

3. Test of Break of NA Relay. Operate the NA key to the ON (in) position; the night alarm bell shall not sound.

4. Continuity. The resistance between the following points, when measured with Multimeter TS-352/U, shall not exceed 4 ohms.

From	To
T binding post, Line 1	Tip, Operator's Test Jack
R binding post, Line 1	Sleeve, Operator's Test Jack

(Note: A key, Line 1, in RP position; GEN KEY in "out" position; and plug, FSN 5935-192-4760, inserted in Operator's Test Jack for the above two measurements).

R punching, operator's terminals in rear	Ring, Operator's Telephone Jack
--	---------------------------------

T punching, operator's terminals at rear of switchboard	Tip, Operator's Telephone Jack
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(Note: Use Plug, S/N 4C7409, for connections to Operator's Telephone Jack for the above two measurements).

5. **Insulation Resistance.** The insulation resistance between the points listed below shall be at least 5 megohms. The measurements shall be made with Multimeter TS-352/U connected as a voltmeter, set on the 250 volt scale, and in series with a 90 volt battery. Readings of approximately 4 volts indicate an insulation resistance of 5 megohms. Lower voltage readings indicate a higher insulation resistance.

a. Between each terminal of one capacitor and the terminals of the second capacitor in the same can.

b. Between the tip of each line and the tip and ring of each higher numbered line.

c. Between the ring of each line and the tip and ring of each higher numbered line.

C. Operational Requirements

1. **Battery Pilot Lamp.** Operate the battery cut-off key to the "out" position; the battery pilot lamp shall light. Restoring the battery cut-off key to the "in" position shall extinguish the pilot lamp. Reoperate the battery cut-off key to the "out" position.

2. **Line Ring-Up and Lock-Up Relays.** Connect negative 24-volt battery to the BAT binding post of Test Set I-181, positive battery to the GRD binding post of Test Set I-181, and the T and R binding posts of Test Set I-181 to the T and R binding posts respectively of Line 1 of Switchboard BD-95. The line lamp of Line 1 shall light when the current is increased to a maximum value of 9 milliamperes.

a. Operate the A key of Line 1 to the RP position; the line lamp of Line 1 shall remain lighted.

b. Restore the A key of Line 1 to the normal position, and operate the NA key to the ON (in) position. The night alarm bell shall sound. Restore the NA key to the OFF (out) position; the night alarm bell shall cease ringing.

3. Supervisory Ring-Up and Lock-Up Relays. With conditions as stated in paragraph 1 above, operate the A key of Line 1 to the Connecting Circuit 1 (CC1) position. The line lamp of Line 1 shall be extinguished and the supervisory lamp associated with Connecting Circuit 1 shall light.

a. Insert Plug FSN 5935-192-4760 into the Test Jack of Line 1, and then restore the A key of Line 1. The supervisory lamp of Connecting Circuit 1 shall remain lighted and the line lamp of Line 1 shall not light.

b. Operate the operator's listening key A to the Connecting Circuit 1 position; the supervisory lamp associated with Connecting Circuit 1 shall be extinguished.

c. Repeat the tests of paragraphs 2, 2a, and 2b above using the B and C keys of Line 1 and utilizing Connecting Circuits 2 through 5. However, when performing the test of paragraph 2a, do not insert the plug in the Test Jack. The supervisory lamp associated with the Connecting Circuit in use shall light, and shall be extinguished by the operation of the Operator's Listening Key associated with the particular Connecting Circuit. Without the plug inserted in the test jack of Line 1, the line lamp shall relight as the A key of Line 1 is restored to normal.

4. Repeat the tests of paragraphs 1 and 2 above on all line circuits. It is not necessary to repeat the test of the night alarm bell of paragraph 1b.

D. Transmission Requirements

(NOTE: Power can be removed from the board for the following test).

1. Repeating Coil. Connect Signal Generator SG-15/PCM to the tip and ring of the operator's telephone jack by means of Plug S/N 4C7409, and connect Decibel Meter ME-22/PCM to the T and R binding posts of Line 1. Strap the "+" and "-" operator's terminals on the rear of the switchboard, operate the A key of Line 1 to the Connecting Circuit 1 (TPI) position, and the A key of the operator's listening keys to the Connecting Circuit 1 (TPI) position. With the signal generator delivering a 1000 cycles per sec signal at a level of 0 dbm, the decibel meter shall indicate a loss of not greater than 1.5 db through the repeating coil.

a. Restore the A operator's listening key to the normal position; Decibel Meter ME-22/PCM shall indicate a no-signal condition by the indicator moving counterclockwise to the end of the scale.

2. Test of the Operator's Listening Keys.

Disconnect the connecting circuit terminals of connecting circuits 2 through 5, and connect Signal Generator SG-15/PCM to the tip and ring of the operator's telephone jack by means of Plug S/N 4C7409. Set the signal generator to deliver a 1000 cycles per second signal at a level of 0 dbm. Tone shall be heard in Test Set TS-190/U connected across the T and R terminals of connecting circuits 2 through 5 when the operator's listening key is operated to the particular connecting circuit position. Tone shall not be heard when the associated listening key is restored to normal.

RIM/jea

COMMENTS AND / OR NOTES

SCEL

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