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(BD-104-T1)

SERVICE TEST INSTRUCTIONS

SWITCHBOARD BD-104-T1 (OPERATOR'S)

RESTRICTED

PREPARED AT

SIGNAL CORPS

GENERAL DEVELOPMENT LABORATORY

FORT MONMOUTH, NEW JERSEY

JUNE 20, 1942

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FOR
SWITCHBOARD BD-104-T1 (OPERATOR'S)

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SECTION I

GENERAL DESCRIPTION

1. *GENERAL USE.* Switchboard BD 104 T1 (Operator's) is a telephone operator trainer designed to be used with common battery or magneto type switch boards. It enables an instructor to simulate various traffic conditions and to present them to the student operator in such a manner as to familiarize him with actual conditions met in the field.

2. *GENERAL DESCRIPTION.* Switchboard BD-104-T1 (Operator's) provides terminating facilities for twelve common battery or magneto line circuits from a switchboard or switchboards being utilized for training purposes. Across the upper rear of the switchboard case are mounted 26 binding posts in two rows of 13 each. (See Figure 1) Twenty-four of these binding posts are associated with the 12 line circuits. Two binding posts per circuit are employed utilizing one from each row. The remaining two binding posts are wired to the hand generator leads so that, if desired, the ringing circuit can be multipled to associated trainers. Each set of two binding posts associated with each line is wired to two jacks. There are 24 of these jacks mounted in two rows of 12 each across the face of the switchboard. (See Figure 2) The top row of 12 jacks is designated *COMMON BATTERY.* The bottom row of 12 is designated *LOCAL BATTERY.* The jacks designated *COMMON BATTERY* are for use in establishing common battery line connections. The jacks designated *LOCAL BATTERY* are for use in establishing magneto line connections. A line drop and a plug terminated cord are associated with each set of two jacks. The cord and plug serve no purpose other than to actuate the jack springs and to enable the instructor to keep track of the calls he has set up. A row of 12 plunger type, non-locking keys designated *RINGING KEYS* is mounted between the drop signals and the two rows of jacks. Each key is associated with one of the twelve line circuits. The line drops signal incoming call. A designation strip over the line drops provides means for designating the lines (type of circuit and number) terminated on each Switchboard BD-104-T1 (Operator's) line circuit. The hand ringing generator is mounted within the switchboard case with the crank handle protruding from, but recessed below the surface of, the right side of the case. (See Figures 3 and 4)

SECTION II

EMPLOYMENT

3. *CONNECTING EQUIPMENT*

a. Place Switchboard BD-104-T1 (Operator's) in a position behind the student operator so that the instructor can watch the student.

b. Connect each line circuit of Switchboard BD-104-T1 (Operator's) to a line from the student's switchboard.

c. Establish a talking circuit between the student's switchboard and the instructor's by one of the following methods:

(1) Connect a Telephone EE-8 placed at Switchboard BD-104-T1 (Operator's) to a line of the student's switchboard. Insert any cord circuit answering plug of the student's switchboard into the jack of the selected line. Operate the listening key associated with the selected cord circuit and leave it operated during the training. Either the hand set or a head and chest set may be used with the Telephone EE-8.

(2) When a second operator's jack or supervisory jack is available on the students switchboard the instructor can use a head and chest set with a long cord plugged directly into the operator's telephone circuit of the student's switchboard.

4. *OPERATION.*

a. Ringing. In order to ring out on a line it is necessary to press the key associated with the line and at the same time operate the hand generator. If ringing machine current is available it may be connected to the *GROUPING* binding posts. Ringing is then accomplished by pressing the key only.

b. *Simulated common-battery-line to common-battery-line call.*

Select any two common battery lines incoming from the student's switchboard, other than the line used for a talking circuit when Telephone EE-8 is used. Assume that these lines are numbered #1 and #2. Plug the cord of line #1 into the *COMMON BATTERY* jack of line #2. This action will light the line lamp associated with line #2 on the student's switchboard. Inform the student over the talking circuit (described above) that a connection to line #1 is desired. Application of ringing current by the student to line #1 will actuate the drop on the Switchboard BD-104-T1 (Operator's) associated with line #1. Now plug the cord of line #2 into the *COMMON BATTERY* jack of line #1. This action will extinguish the calling supervisory lamp on the student's switchboard. The removal of either plug will operate line supervisory equipment on the student's switchboard.

c. *Simulated local-battery-line to local-battery-line call.*

Select any two local battery lines incoming from the student's switchboard. Assume that these lines are numbered #11 and #12. Plug the cord of line #11 into the *LOCAL BATTERY* jack associated with line #12. Press the *RINGING* key associated with line #12, while rotating the hand generator crank handle. The drop signal on the student's switchboard associated with line #12 will fall. When the student answers, request a connection to line #11 over the talking circuit. Ringing current applied by the student to line #11 will cause the drop signal associated with line #11 on the trainer to fall. Insert the plug of the cord associated with line #12 into the *LOCAL BATTERY* jack associated with line #11. Since no supervision is obtained on local battery connections, the insertion of Switchboard BD-104-T1 (Operator's) plugs into *LOCAL BATTERY* jacks will cause no corresponding reaction on the student's switchboard. When the instructor wishes to signal a

ring off or recall on this connection he has only to operate the associated *RINGING* key and the hand generator. The *RECALL* lamp on the student's switchboard will light.

d. *Simulated calls between common battery lines and local battery lines.* Calls of this type may be easily simulated by making connections with due regard to the operational characteristics of each type of circuit.

SECTION III

DETAILED FUNCTIONING OF PARTS

5. *CIRCUIT DESCRIPTION.* #34C superivsory signal is wired across the line in series with a #139A condenser through a contact of a #218 A jack. Ringing current over a line from the student's switchboard operates the supervisory signal causing the drop to fall. Insertion of one of the plug ended cords in the #215A jack shorts out the condenser and connects the winding of the #34C supervisory signal directly across the line. This completes a circuit through the line lamp of any common battery line which may be associated with the trainer line circuit. Insertion of a cord plug into the #218A jack disconnects from the line the winding of the #34C supervisory signal which is in series with the #139A condenser. The binding posts designated *GROUPING* are wired to the generator leads. If it is desired to multiple the ringing circuit to associated Switchboards BD-104-T1 (Operator's) these binding posts afford the necessary means.

SECTION IV

SERVICING AND REPAIR

6. *MAINTENANCE.* There will be very little maintenance work required on Switchboard BD-104-T1 (Operator's) due to its simplicity. It is anticipated that any troubles which may develop will be due to opens or bad contacts on the jack springs. Ordinary routine inspections should keep the switchboard practically trouble-free.

FIG. 1

SWITCHBOARD BD-104-T1 (Operator's Trainer)

Rear View . Showing Terminating and Grouping Facilities

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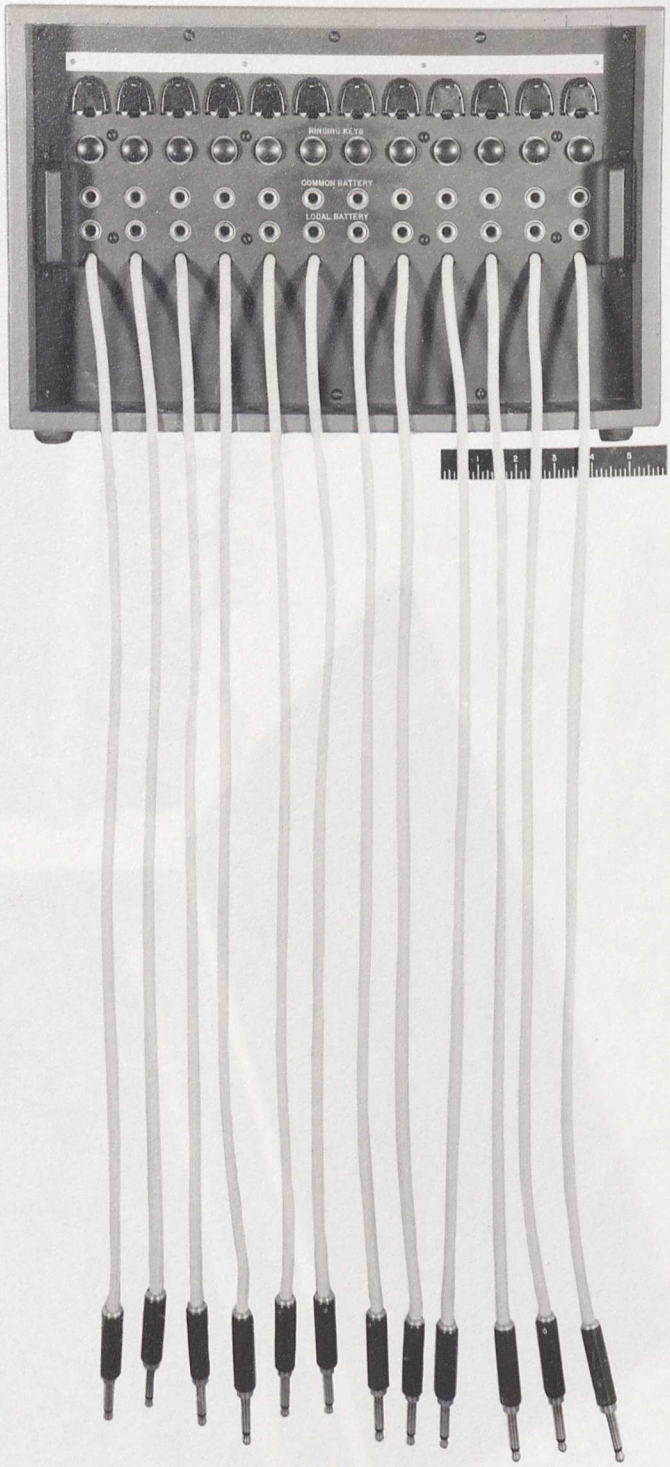

FIG. 2

SWITCHBOARD BD-104-T1 (Operator's Trainer)
Front Panel . Prepared for Operation

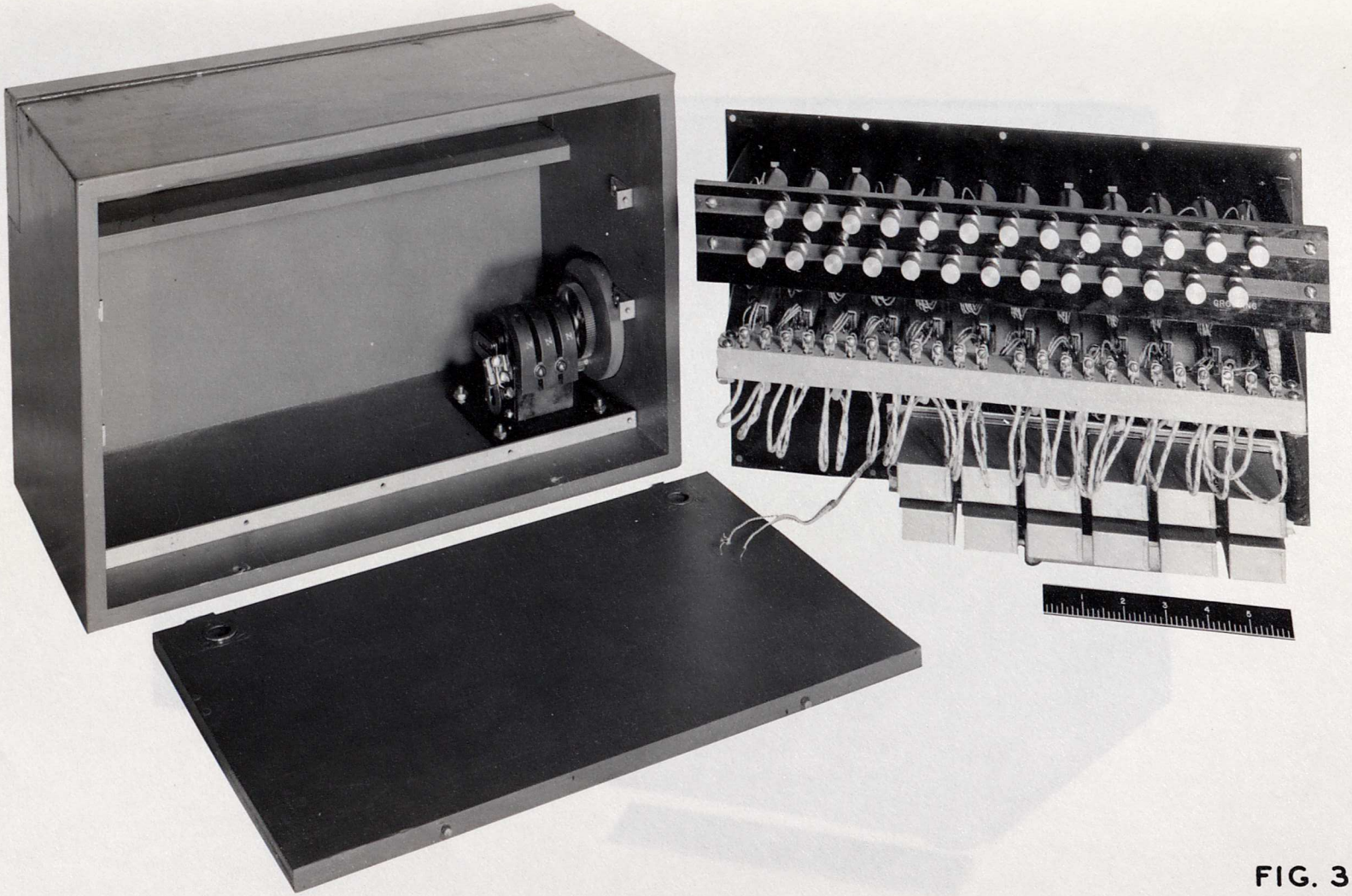

FIG. 3

SWITCHBOARD BD-104-T1 (Operator's Trainer)
Removed from Case . Showing Interior Construction

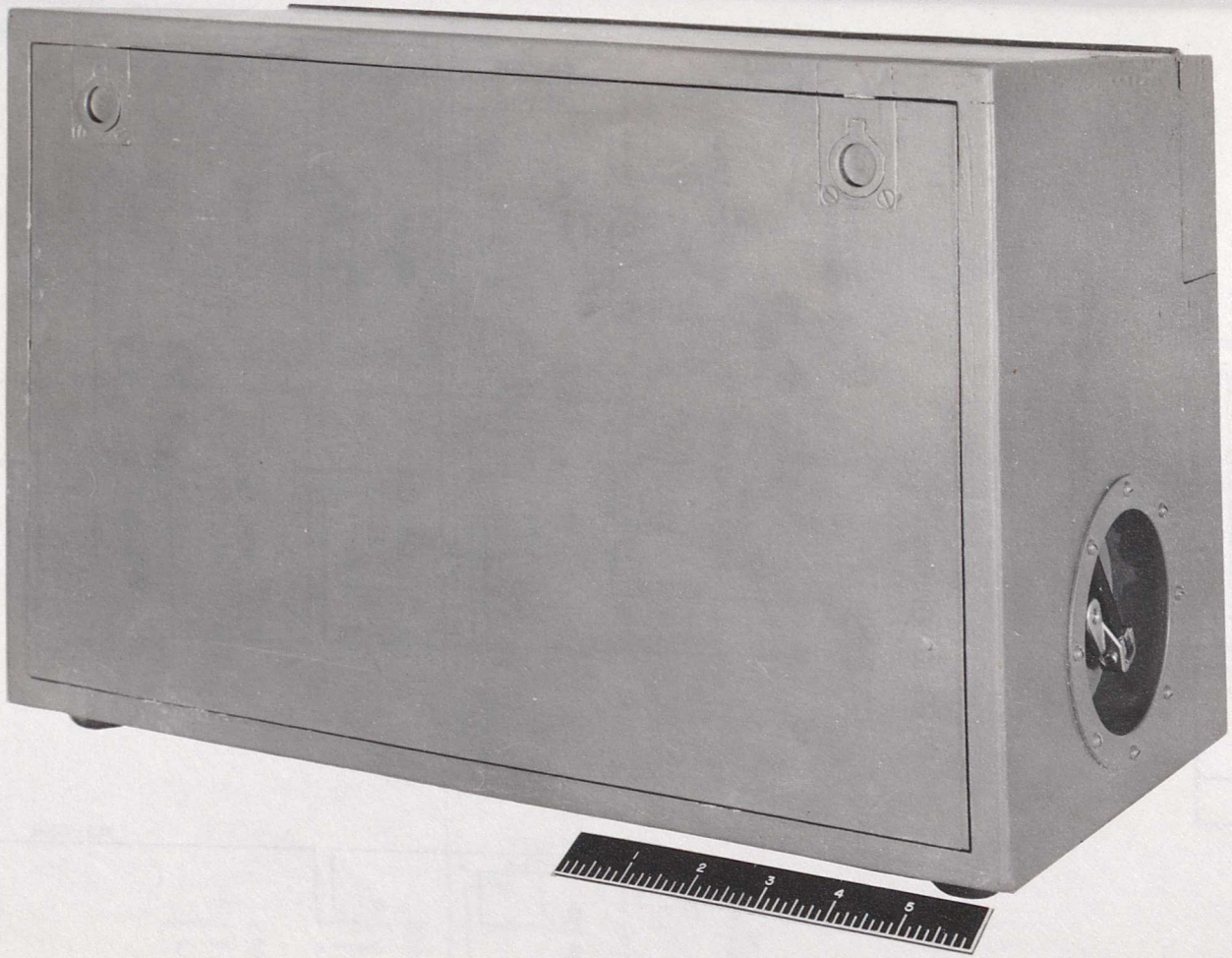

FIG. 4

SWITCHBOARD BD-104-T1 (Operator's Trainer)
Prepared for Transportation

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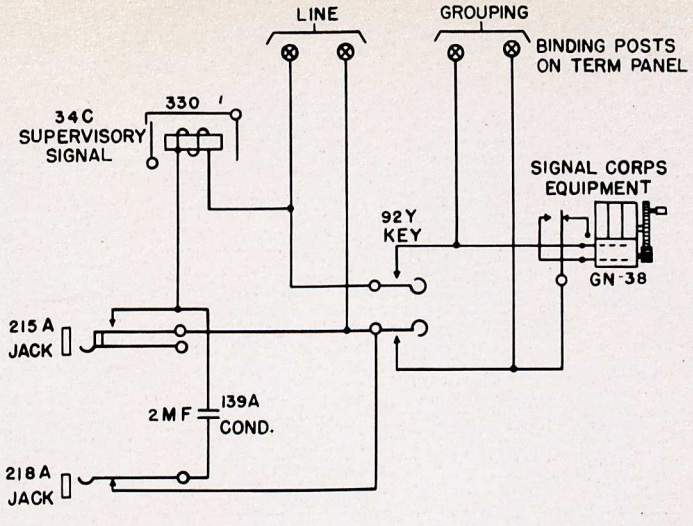
SCHEMATIC DIAGRAM



WIRING DIAGRAM

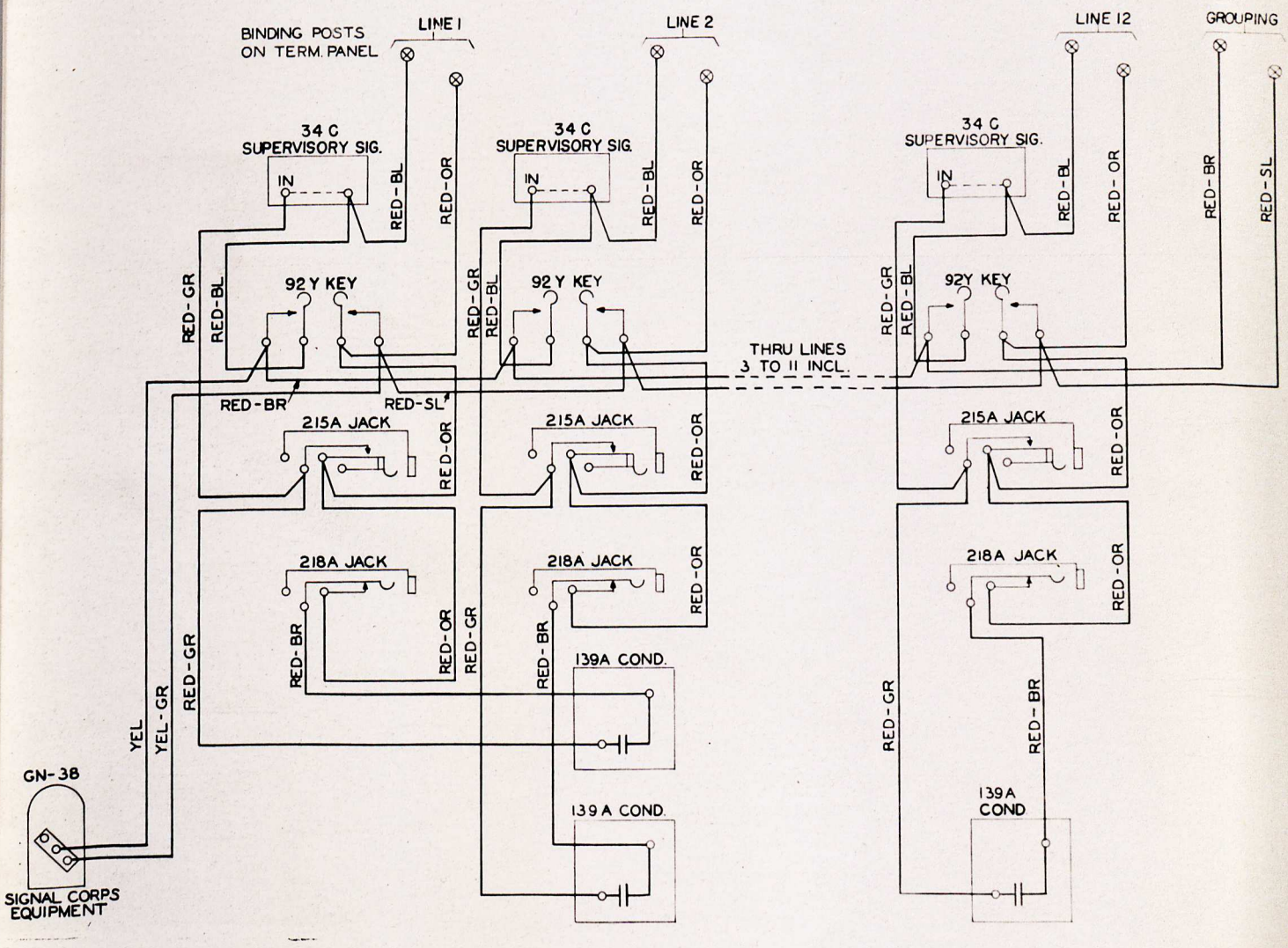


FIGURE 5

SCL-1213

ES-D-104547

SWITCHBOARD BD-104-T1 SCHEMATIC & WIRING DIAGRAMS