SWITCHBOARD LAMPS AND LIGHT-EMITTING DIODES DESCRIPTION, ORDERING INFORMATION, AND METHOD OF PLACING

1. GENERAL

1.01 This section describes the M1 switchboard lamps, the 2U and 2Y carbon filament lamps, and the 552- and 553-type light-emitting diodes (LEDs). It also covers ordering information and method of placing.

1.02 This section is reissued to cover the 552- and 553-type LEDs. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

2U and 2Y Lamps

1.03 The 2U and 2Y lamps (Fig. 1) are carbon filament lamps used with No. 12, 30, 34, or similar-type lamp sockets. The 2U rated voltage is 24 volts. At this voltage the current consumption is 0.0475 ampere maximum and 0.035 ampere minimum and the minimum illumination is 100 end-foot candles. The 2Y rated voltage is 48 volts. At this voltage the current consumption is 0.042 ampere maximum and 0.030 ampere minimum and the minimum illumination is 200 end-foot candles.

Fig. 1—2-Type Carbon Filament Lamp

M1 Lamp

1.04 The M1 lamp (Fig. 2) is a tungsten filament lamp and is also used with No. 12, 30, 34, or similar-type lamp sockets. The M1 rated voltage is 48 volts. At this voltage the current consumption is 0.044 ampere maximum and 0.036 ampere minimum and the minimum illumination is 500 end-foot candles.

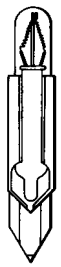

Fig. 2—M1 Tungsten Filament Lamp

552-Type LEDs

1.05 The 552-type LED (Fig. 3) is considered an indicator and is for use in a 265 or similar-type lamp mounting strip (Fig. 4) where wide-angle viewing is required. The 552A (red), 552B (green), and 552C (yellow) LEDs operate on 48 $\pm$4 volts at a nominal current of 7.5 mA dc. They are direct replacements for the 2Y and M1 lamps. The 552D (red), 552E (green), and 552F (yellow) LEDs operate on 24 $\pm$2 volts at a nominal current of 10 mA dc. They are direct replacements for the 2U or similar 24V filament lamps. The 552-type LED is designed to replace both lamp and lamp cap; hence, no additional lamp cap is required.

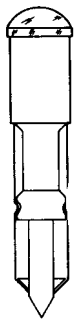

Fig. 3—552-Type Light-Emitting Diode

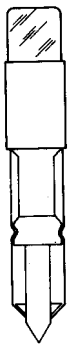

Fig. 5—553-Type Light-Emitting Diode

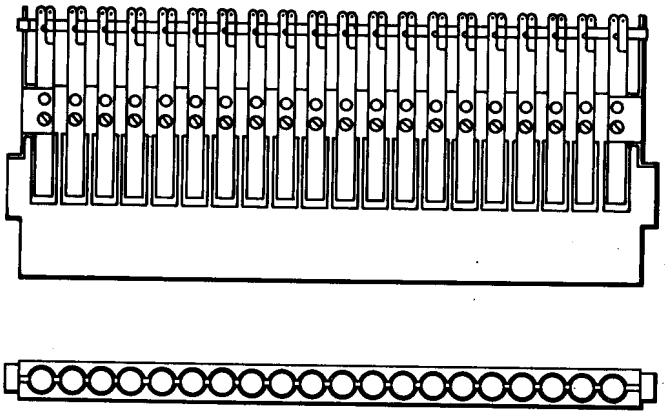

Fig. 4—265 Lamp Mounting Strip

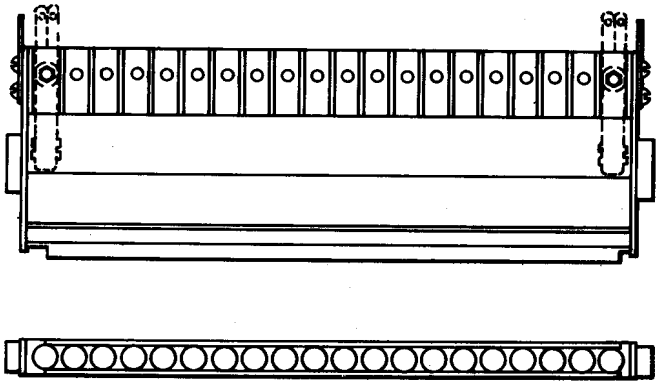

Fig. 6—283 Lamp Mounting Strip

553-Type LEDs

1.06 The 553-type LED (Fig. 5) is considered an illuminator and is for use in a 283 or similar-type lamp mounting strip (Fig. 6) where it is desirable to backlight a designation strip. The 553A (red) and 553B (green) LEDs operate on 48 ±4 volts at a nominal current of 7.5 mA dc. They are direct replacements for the 2Y and M1 lamps.

Designation Strips

1.07 The conventional designation strips now in use on 283 or similar-type lamp mounting strips are not compatible with LEDs because of the opacity of the present strip material. A similar strip is now available which is more translucent and is compatible with the use of LEDs. (See 3.03.)

2. LIST OF TOOLS

CODE OR SPEC NO.	DESCRIPTION
TOOLS	
319B	Lamp cap extractor
553A	Lamp extractor
KS-6320	Orange stick

3. ORDERING INFORMATION

3.01 When ordering replacement lamps, give both the code number and the name of the part; for example, 552A Light-Emitting Diode. Do not refer to the section number when ordering parts.

3.02 Table A lists type, code, color, and other information needed to order LEDs.

3.03 When ordering new designation strips, use the existing piece-part number with the specification that the material shall be: Lexan, grade 8A03-112, 0.015 inch thick with matte finish on one side. Print on the side opposite the matte finish.

4. METHOD

4.01 When placing lamps, secure the most effective illumination for existing conditions. It is desirable that adjacent lamps associated with circuits of the same kind be of approximately the same brilliance.

Placing 2U, 2Y, and M1 Lamps for Maximum Effective Illumination

4.02 ***Mountings Equipped With Glass Lamp Caps:*** Partially insert the lamp into its socket. Place the lamp cap over the lamp and push the lamp and lamp cap firmly into position. In so doing, the tip of the lamp remains in contact with the cap.

> ***Caution: The cap shall be firmly seated; otherwise, lamps and lamp caps are more apt to be broken if struck by plugs. If in any particular location an appreciable amount of lamp breakage seems to have resulted from this cause, leave a slight clearance between the lamp and the cap. Provide the necessary clearance by first setting the lamp in position by using a cap, the back surface of which is covered with paper (or other material) of suitable thickness. Then substitute a regular lamp cap for the one used in placing the lamp.***

4.03 ***Combined Lamp Socket Mounting and Designation Strip:*** Insert the lamp into its socket far enough so that the tip of the lamp will be close to the designation strip when the latter is in position.

4.04 ***8AW Lamp Cap Used With 93A Designation Strip:*** Since the metallic shell of the 8AW lamp cap projects relatively deeply into the lamp socket mounting, contact between the lamp terminals and this shell must be avoided. It is therefore necessary, where this type of cap is used, to insert the lamps far enough to insure avoidance of such contact.

4.05 ***Mountings Equipped With LUCITE* or Polycarbonate Lamp Caps:*** When using LUCITE or polycarbonate lamp caps, the procedure in 4.02 cannot be followed due to the concave inner surface of the cap. To insure electrical

TABLE A

TYPE OPERATION	LED CODE	COLOR	TYPICAL-TYPE LAMP SOCKET USED IN	NOMINAL VOLTAGE	REPLACES LAMP TYPE
Indicator	552A	Red	265	48	2Y&M1
Indicator	552B	Green	265	48	2Y&M1
Indicator	552C	Yellow	265	48	2Y&M1
Indicator	552D	Red	265	24	2U&A1
Indicator	552E	Green	265	24	2U&A1
Indicator	552F	Yellow	265	24	2U&A1
Illuminator	553A	Red	283	48	2Y&M1
Illuminator	553B	Green	283	48	2Y&M1

contact, insert the lamp flush with the front of the strip or lamp socket before placing the cap.

*Registered trademark of Du Pont, E.I., deNemours & Company, Inc.

4.06 ***Use of LUCITE Lamp Caps in Central Office and Private Branch Exchange Switchboards:*** The LUCITE caps may be damaged and their translucence impaired by heat dissipated from high-wattage lamps. If damage to the 2BR, 2BS, or 2BT LUCITE lamp cap is evident, the cap should be replaced by the 2EE, 2EF, or 2EG polycarbonate lamp cap, respectively.

Placing Lamps for Other Than Maximum Effective Illumination

4.07 In normal cases where the maximum obtainable effective illumination is not desired or where the requirements are not critical, insert the lamp into its socket and push it into position with the thumb.

4.08 For those cases where less illumination is desired than would be obtained under the conditions covered in 4.07, push the lamp further into its socket with the KS-6320 orange stick.

Placing 552- and 553-Type LEDs

4.09 LEDs, like other semiconductors, are sensitive to their thermal environment, and while high temperatures will not necessarily cause immediate failure, it will significantly decrease the life of the device. It is therefore necessary to avoid their use in high-temperature ambients. This means that LEDs cannot be used indiscriminately in a panel that uses 2Y or M1 lamps because of the heat generated by the lamps. LEDs should be used in full rows; ie, all functional positions within a given lamp strip should be LEDs. It is not, however, necessary to replace all lamps in a given panel with LEDs. Both can be used within the same panel, provided the LEDs are inserted in full strips and are separated from operating lamps by three or more spaces or unused lamp mounting strips.

4.10 The 552-type LEDs can be inserted in the socket by hand and removed with the 319B lamp cap extractor used presently to remove lamp caps. The standard 553A lamp extractor can be used for insertion and extraction of the 553-type LEDs the way it is used for the switchboard lamps. The LED should be held in the 553A lamp extractor using the spring-loaded depressor and inserted into the lamp mounting until the face of the LED is flush with the designation strip holder.

Proper Polarity of LEDs

4.11 One contact on the LED has been marked with a plus sign to indicate the positive terminal. Care must be taken to assure insertion with the proper polarity for these bipolar devices. If the LED is inserted with the polarity reversed, no damage will be caused; however, it will not operate in that position.

4.12 It shall be noted that the LEDs operate at considerably less current than incandescent lamps. A typical lamp operates at approximately 35 mA; whereas, LEDs operate at 7.5 mA nominal at normal switchboard voltages. For this reason, the use of LEDs may cause potential problems in cases where circuit modifications have been made to include other elements in series with the lamp which require operating currents in excess of 7.5 mA. In addition, the LED will appear to be on at very low currents; consequently, it is necessary to have an open circuit condition for the LED to be in the off state.