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# TM 11-2035

WAR DEPARTMENT TECHNICAL MANUAL

## TELEGRAPH SWITCHBOARD SB-6/GG

46372

**RESTRICTED. DISSEMINATION OF RESTRICTED MATTER.**  
The information contained in restricted documents and the essential characteristics of restricted materiel may be given to any person known to be in the service of the United States and to persons of undoubted loyalty and discretion who are cooperating in Government work, but will not be communicated to the public or to the press except by authorized military public relations agencies. (See also par. 28, AR 380-5, 15 Mar 1944.)

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WAR DEPARTMENT

16 AUGUST 1944

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WAR DEPARTMENT,  
WASHINGTON 25, D. C., 16 August 1944.

TM 11-2035, Telegraph Switchboard SB-6/GG, is published for the information and guidance of all concerned.  
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BY ORDER OF THE SECRETARY OF WAR:

G. C. MARSHALL,  
*Chief of Staff.*

OFFICIAL:

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*Major General,  
The Adjutant General.*

DISTRIBUTION:

IC 11 (5).  
(For explanation of symbols see FM 21-6.)

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## DESTRUCTION NOTICE

**WHY** —To prevent the enemy from using or salvaging this equipment for his benefit.

**WHEN**—When ordered by your commander.

**HOW** —1. Smash—Use sledges, axes, handaxes, pickaxes, hammers, crowbars, heavy tools.  
2. Cut—Use axes, handaxes, machetes.  
3. Burn—Use gasoline, kerosene, oil, flame throwers, incendiary grenades.  
4. Explosives—Use firearms, grenades, TNT.  
5. Disposal—Bury in slit trenches, fox holes, other holes. Throw in streams. Scatter.

### USE ANYTHING IMMEDIATELY AVAILABLE FOR DESTRUCTION OF THIS EQUIPMENT.

**WHAT**—1. Smash—Cabinet, jacks, and wiring.  
2. Cut —Wiring.  
3. Burn —Cabinet, jacks, and wiring.  
4. Bend —Jacks.  
5. Bury or scatter—Cabinets, jacks, and wiring.

## DESTROY EVERYTHING

# RESTRICTED

## SECTION I

### DESCRIPTION

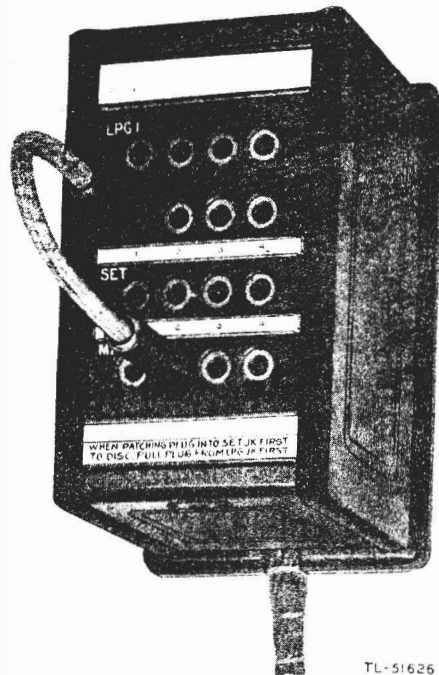


Figure 1. Telegraph Switchboard SB-6 GG, front view.

#### 1. PURPOSE.

Telegraph Switchboard SB-6 GG is a jack patching switchboard used for interconnecting local d-c lines, loops or extensions, and teletypewriter sets or equipments. It provides means for easily and quickly changing these interconnections by use of patching cords. Telegraph Switchboard SB-6 GG is used in case of failure of either the circuits or the equipment, or when it is desired to rearrange the circuit or equipment layout. It also provides means to assist in making simple tests of associated line facilities.

#### 2. EQUIPMENT ARRANGEMENTS.

a. Telegraph Switchboard SB-6 GG consists of a 4-line circuit jack cabinet for mounting on a wall or other suitable flat surface. Figure 1 shows the front of this switchboard with a patching cord in place. With a patching cord of suitable length, interconnection can be made between as many as four adjacent cabinets.

b. The switchboard consists of a fiber-faced jack panel mounting the apparatus for four line circuits. The apparatus for each line circuit consists of two looping jacks and one set jack. The teletypewriter set or equipment is connected to the set jack. In addition, a miscellaneous jack is mounted below each set jack. The cabinet is shown in figure 2 with the jack panel removed. This figure also shows the formed cable between the jacks on the removable panel and the terminal plate to which the external conductors are wired. The bottom panel of the switchboard has a lockscrew which holds the jack panel in place when the cabinet is assembled.

#### 3. POWER REQUIREMENTS.

Telegraph Switchboard SB-6 GG requires no power since it provides no supervisory features and furnishes no line current.

#### 4. DIMENSIONS AND WEIGHT.

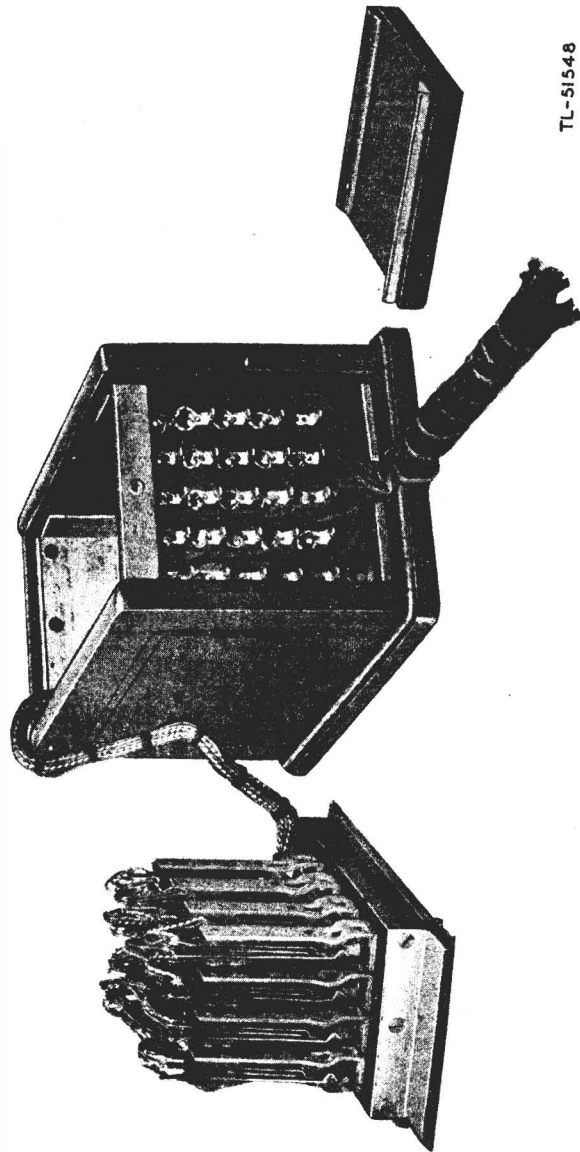
The dimensions and weight of the switchboard are:

Height—7-5 16"

Depth —4-3 4"

Width —4-5 8"

Weight—4 lbs.



TL-51548

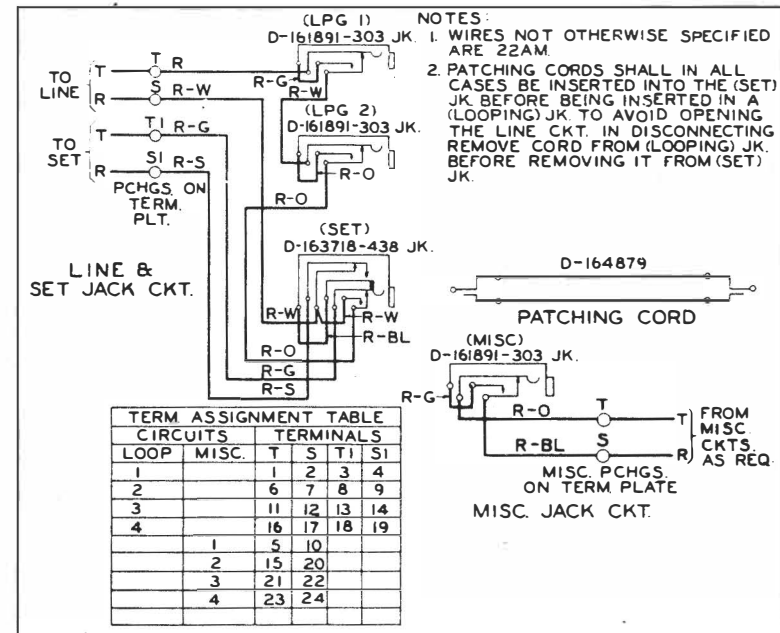
Figure 2. View of switchboard with jack panel and bottom panel removed.

## SECTION II INSTALLATION AND OPERATION

### 5. INSTALLATION.

a. Before mounting Telegraph Switchboard SB-6 GG, remove the panel at the bottom of the cabinet which is held in place by a lock-screw. The circuit label (fig. 3) is located on the back of this panel. Figure 2 shows the terminal plate which is exposed when this panel is removed. Connections for the lines, set jacks, and miscellaneous jacks are made to the lugs according to figure 3. Solder the conductors of the incoming local line or extension circuit and the wires from the teletypewriter sets or equipments to the punchings on the terminal plate as required.

b. Connect wires from auxiliary or spare teletypewriter sets to punchings connected with miscellaneous jacks.



TL-51549

Figure 3. Circuit label.

c. When a ground test jack is desired, solder a conductor connected to ground to both punchings connected with one of the miscellaneous jacks.

d. Replace the bottom panel which was removed from the cabinet. Mount the cabinet either on a mounting board or on a wall using the available screw holes.

## 6. OPERATION.

a. Each line circuit consists of LPG1, LPG2, and SET jacks internally wired in series so that a teletypewriter set can be connected to the desired line circuit where it will normally be assigned. When desired, this teletypewriter can be patched to other line circuits by inserting one end of a patching cord into the SET jack and by inserting the other end of the patching cord into one of the LPG jacks in another line circuit. The equipment should always be patched to the desired line circuit rather than trying to patch the line to another jack circuit. In case the above patch is made for reason of a set failure, the defective set is removed from the line circuit by inserting a dummy plug into the associated SET jack (fig. 4).

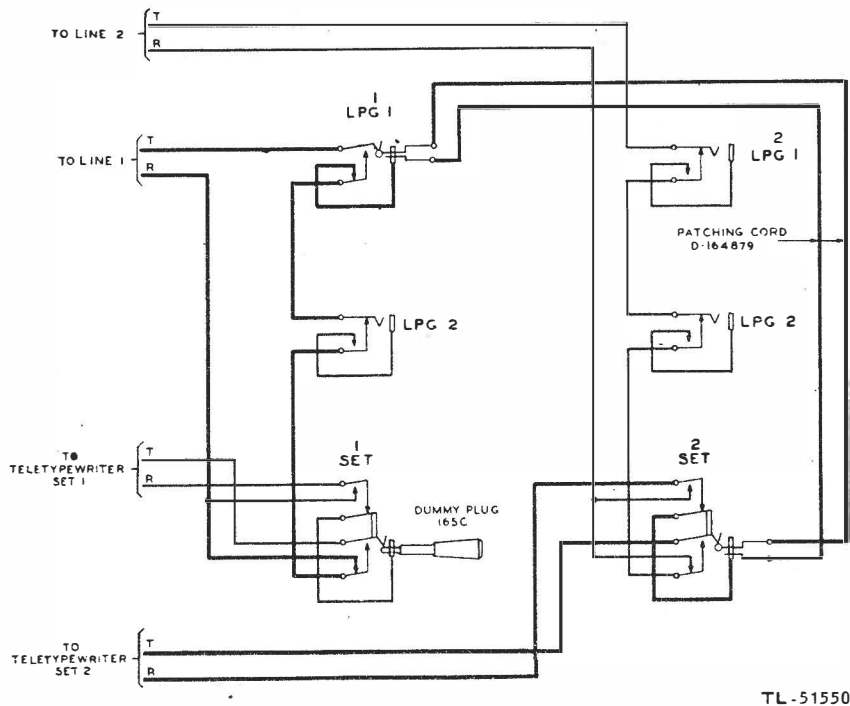


Figure 4. Patching cord, connection between a set jack and a line circuit jack.

b. When it is desired to use an auxiliary set in place of one of the existing sets in use, insert one end of the patching cord into the MISC jack to which the auxiliary set is connected. Insert the other end of the patching cord into either the LPG1 or the LPG2 jack of the line to be used. Disconnect the existing set by inserting a dummy plug into the SET jack to which the set to be removed is connected. This type of connection is shown in figure 5.

c. When it is desired to add an auxiliary set in the local line loop or extension circuit in addition to the existing set in use, insert one end of the patching cord into the MISC jack to which the auxiliary set is connected. Insert the other end of the patching cord into either the LPG1 or the LPG2 jack of the line to which the set is to be added. This connection is the same as that shown in figure 5, with the omission of the dummy plug.

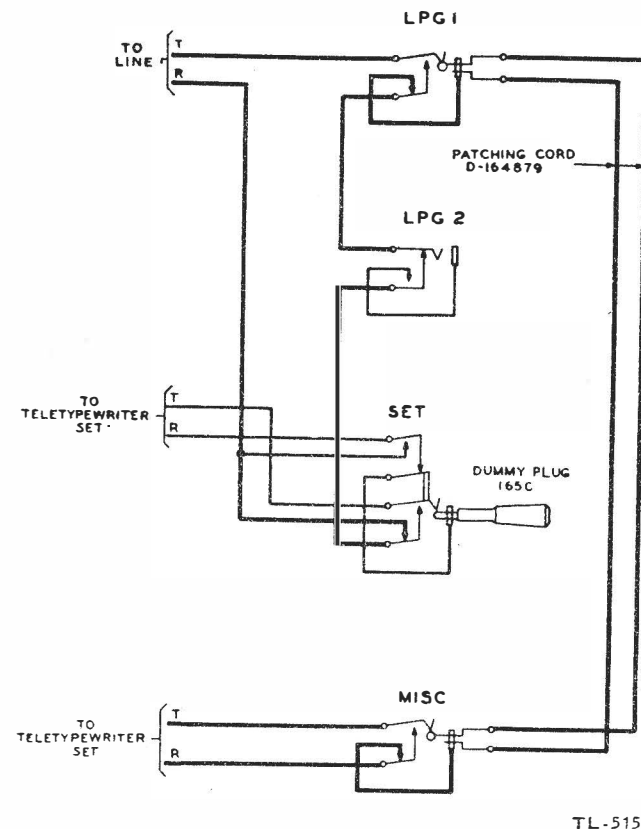


Figure 5. Patching cord, connection between a miscellaneous jack and a line circuit jack.

d. When it is desired to remove a patching cord added either in accordance with subparagraphs **a**, **b**, or **c** above and to restore service to the previous condition, use the following procedure:

- (1) Remove the dummy plug.
- (2) Remove the patching cord, first from the LPG1 or LPG2 jack and then from the SET or MISC jack.

#### 7. OPERATING TESTS.

The following operations are to be performed only upon the request of the circuit control office.

**a. Open Test.** Insert one dummy plug into the LPG1 or LPG2 jack of the line circuit under test. Insert another dummy plug into the SET jack; this disconnects the teletypewriter equipment from the line circuit.

**b. Short Test.** Insert a dummy plug into the SET jack of the line under test. This removes the teletypewriter equipment from the circuit and allows the line circuit to be completed through the jacks and wiring of the cabinet.

**c. Test Ground on Tip Side of Line Conductor.** To place a test ground on the tip side of the line conductor, insert one end of a patching cord into the MISC jack as connected in paragraph 5c. Insert the other end of the patching cord into the LPG1 jack of the line under test. Insert a dummy plug into the LPG2 jack of the line under test.

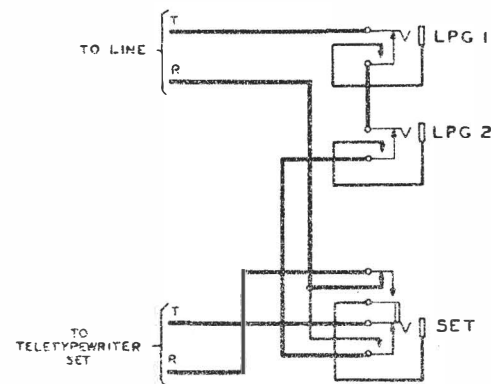
**d. Test Ground on Ring Side of Line Conductor.** To place a test ground on the ring side of the line conductor, insert one end of a patching cord into the MISC jack as connected in paragraph 5c. Insert the other end of the patching cord into the LPG2 jack of the line under test. Insert one dummy plug into the LPG1 jack and another dummy plug into the SET jack of the line under test.

## SECTION III FUNCTIONING OF PARTS

#### 8. CIRCUIT FEATURES.

**a.** The two looping jacks and the set jack for each loop are so wired that when no plugs are in the jacks each line is connected through the jacks to the teletypewriter set or equipment with which it is normally used. This is illustrated in figure 6.

**b.** The circuit arrangement for emergency purposes is such as to allow any set jack to be connected to either looping jack of any line under emergency conditions or for other purposes. The circuit arrangement is also such as to allow any of the miscellaneous jacks to be connected to a looping jack of any line circuit. This is illustrated in figure 4.



TL-51600

Figure 6. Normal connection between line and set.



## SECTION IV MAINTENANCE

**NOTE:** Equipment failure or unsatisfactory performance of this equipment will be reported on W.D., A.G.O. Form No. 468. If form is not available, see TM 38-250.

### 9. CIRCUIT.

**a. To Prepare Telegraph Switchboard for Servicing.** (1) Loosen the lockscrew which holds the panel at the bottom of the cabinet and remove the panel.

(2) Remove the jack panel which is connected to the terminals with a flexible cable. These terminals are exposed when the panel is removed.

**b. To Check Trouble.** Use the circuit label located on the back of the panel showing the wiring of the switchboard. Apparatus is labelled on the unit in accordance with the designation shown on the circuit label. The color code of the wires joining the various pieces of apparatus is also indicated on this circuit label for use in locating trouble.

### 10. JACKS.

**a. Tools.** The following is a list of tools required for general maintenance of jacks:

<u>W. E. Co.</u> <u>Tool</u>	<u>Description</u>
373C	Contact burnisher holder.
374A	Contact burnisher blade.
—	3" cabinet screwdriver (3" blade, 3/16" tip).
KS-7782	Duck bill pliers.
70J	Gauge.

**b. Contacts.** Auxiliary contacts of jacks may be cleaned by using the 373C tool equipped with a 374A burnisher blade. These contacts are not accessible from the front of the jack mounting. Where mounting conditions do not permit access to the auxiliary contacts for burnishing from the wiring side, the jack must be removed from its mounting, using the 3-inch cabinet screwdriver to remove the mounting screws.

**c. Requirements.** After burnishing contacts, check that contact separation of not less than 0.005 inch and contact follow of not less than 0.010 inch exists. Also check that contact pressure between closed contacts is at least 30 grams. When measuring pressure between normally operated contacts, insert a plug into the jack and then measure the pressure. Use the KS-7782 duck bill pliers to adjust the springs as required, placing the pliers as near to the pile-up as possible. Check the contact pressure using the 70J gauge. Check that pile-up screws are tight, using the 3-inch screwdriver. If the crimped end of the spring prevents plugging into the jack, readjust the crimp using the KS-7782 pliers. Use a jack in good condition for comparison as to shaping and positioning this spring.

## 11. PLUGS.

**a. Materials Required for Cleaning and Polishing.** The following is a list of the materials required:

- Metal polish (paste type).
- Cotton sleeving.
- Cleaning cloth.

**b. Procedure.** (1) Dirty plugs are likely to produce a high resistance in the circuit which will adversely affect service or may cause an open circuit. They may be cleaned by using a paste polish and cotton sleeving.

(2) Cut a 3-foot length of cotton sleeving. Fasten the midpoint securely to a suitable part of the framework, leaving two free ends for cleaning purposes. Place a small amount of paste evenly over about one-half of the length of one of the sleeveings. It is necessary to use only a small amount of paste for satisfactory cleaning work and any excess amount should be avoided to prevent the paste accumulating on the plug.

(3) Hold the sleeving containing the metal paste with one hand. Place the sleeve of the plug to be cleaned on the sleeving near the end that is being held, and make a complete turn with the sleeving around the plug. Draw the sleeving taut so that when the plug is moved, pressure may be brought to bear on the plug. Hold the plug slightly on the bias. Move the plug downward from the point of fastening of the sleeving. This movement should cause the sleeving to pass from the sleeve of the plug to the tip. With several such movements the sleeve of the plug should be cleaned.

(4) Place the tip of the plug on the sleeving and make a complete turn with the sleeving over the tip. Move the plug forward several times, turning the plug so that these motions clean the tip.

(5) After the plug has been cleaned, place the plug upon the other sleeving and repeat the above operations, thus giving the plug a

finishing cleaning to remove all the paste from the plug. An alternate method for this purpose is to use a clean piece of cheesecloth and wipe the plug thoroughly.

## 12. MOISTUREPROOFING AND FUNGIPROOFING.

**a. General.** The operation of Signal Corps equipment in tropical areas where temperature and relative humidity are extremely high requires special attention. The following items represent problems which may be encountered in operation:

(1) Hook-up wire and cable insulation break down. Fungus growth accelerates deterioration.

(2) Moisture forms electrical leakage paths on terminal boards and insulating strips, causing flash-overs and crosstalk.

**b. Treatment.** A moistureproofing and fungiproofing treatment has been devised which, if properly applied, provides a reasonable degree of protection against fungus growth, insects, corrosion, salt spray, and moisture. The treatment involves the use of a moisture- and fungi-resistant varnish applied with a spray gun or brush. Refer to TB SIG 13, Moistureproofing and Fungiproofing Signal Corps Equipment, for a detailed description of the varnish-spray method of moistureproofing and fungiproofing.

**CAUTION:** Varnish spray may have toxic effects if inhaled. To avoid inhaling spray, use respirator if available; otherwise, fasten cheesecloth or other cloth material over nose and mouth.

### **c. Step-by-step Instructions for Treating Telegraph Switchboard SB-6/GG.**

#### **(1) PREPARATION.**

(a) Make all repairs and adjustments necessary for proper operation of the equipment.

(b) Clean all dirt, dust, rust, fungus, oil, grease, etc., from the equipment to be processed.

#### **(2) DISASSEMBLY.**

(a) Loosen the screw in middle of front edge of the bottom panel and remove the panel, exposing the terminal plate.

(b) Take out the fiber-faced jack panel and place it face downwards alongside of box. The panel is removed by sliding it down slightly and lifting it out.

(c) Tighten all terminal screws.

(3) **MASKING.** Mask the jacks in groups of four jacks using paper or cloth held in place with masking tape. The masking should extend from the panel to just below insulator pile-ups. Mask all jack holes on the front of the panel.

(4) **DRYING.** Dry for two to three hours in oven or under heat lamps at 160°F.

(5) **VARNISHING.** Apply with a brush three coats of moisture-proofing and fungiproofing varnish to the cabling, terminal plate, all soldered connections, insulated spacers of the jacks, inside surfaces of box, and edges of fiber face of jack panel.

(6) **REASSEMBLY.**

(a) Remove all masking tape.

(b) Clean all contacts with varnish remover, and burnish the contacts.

(c) Reassemble and test the operation of the switchboard.

(7) **MARKING.** Mark the switchboard with "MFP" and the date of treatment.

EXAMPLE: MFP—8 June 1944.

### **13. LUBRICATION.**

None required.

## SECTION V SUPPLEMENTARY DATA

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## 14. MAINTENANCE PARTS LIST FOR TELEGRAPH SWITCHBOARD SB-6/GG.

NOTE: Order maintenance parts by stock number, name, and description. Only maintenance parts can be requisitioned.

REF. SYMBOL	SIGNAL CORPS STOCK NO.	NAME OF PART AND DESCRIPTION	QUAN. PER UNIT	RUNNING SPARES	ORGN. STOCK	3D ECH	4TH ECH	5TH ECH	DEPOT STOCK
	4A2593-6/L1	CIRCUIT LABEL: WE No. P-416642.	1				*	*	*
	3E4035-44	CORD: patching; 2-conductor; 2' long; equipped with 2 WE No. 347 plugs; WE No. D-164879.	2			*	*	*	*
LPG1. LPG2. MISC.	4C4903.03A.1	JACK: switchboard; WE No. D-161891-303A.	12			*	*	*	*
SET	4C4904.38C.1	JACK: switchboard; WE No. D-163718-438C.	4			*	*	*	*
	4C7365C	PLUG: make-busy; WE No. 165C.	2			*	*	*	*
	6L9106-5	SCREW: wood; roundhead; iron; No. 6 x 5/8"; (zinc chromate; mounts jacks).	16			*	*	*	*
	1E1022.11	LOCAL WIRING CABLE FORM: per Bell dwg. ES-807954.	1				*	*	*

	4A2593-6/S1	STRIP: designation; WE No. D-162035-M.	2				*	*	*
	4A2593-6/S2	STRIP: designation; WE No. D-162035-Y.	2				*	*	*
	4A2593-6/S3	STRIP: face; cellulose acetate sheet; 0.010" thick x 0.297" x 2-5/16" long; (for WE No. D-162035-M designation strip).	2				*	*	*
	4A2593-6/S4	STRIP: face; cellulose acetate sheet; 0.010" thick x 0.297" x 3-7/32" long; (for WE No. D-162035-Y designation strip).	2				*	*	*
	6L9104-4Z	SCREW: wood; flathead; iron; No. 4 x 1/2"; (zinc chromate; mounts designation strip).	4				*	*	*
	6L6356-3Z	SCREW: machine; flathead; iron; No. 3-56 x 3/16"; (zinc chromate; mounts designation strip).	4			*	*	*	*
	4A2593-6/P1	TERMINAL PANEL ASSEMBLY: per Bell dwg. ES-807930, Detail Assembly No. 10C.	1			*	*	*	*

\* Indicates stock available.