# PLUGGING-UP FRAME CENTRAL "A" SWITCHBOARD OFFICE EQUIPMENT DESIGN REQUIREMENTS NO. 1 AND NO. 5 CROSSBAR, PANEL AND STEP-BY-STEP SYSTEMS

## 1. GENERAL

### Scope

**1.01** This specification, together with the supplementary information listed herein, covers the equipment design requirements for the framework, equipment, and circuits to be used in the engineering, manufacture, and installation of the plugging-up frame for plugging-up line equipment in crossbar No. 1, panel, and step-by-step offices served by a central "A" switchboard and the plugging-up line for use in crossbar No. 5 offices.

**1.02** This specification is being reissued to add a new BSP division number 815-037-150, and to bring it into conformity with the general Plant Series plan.

### Capacity

**1.03** The older plugging-up line unit J93005E is arranged for ten plugging-up line circuits.

**1.04** The new plugging-up frame can accommodate the following equipment:

| | |
|---|---|
| 10 plugging-up line units J93005H (4 circuits each) | |
| 1 common equipment unit J93005J | |
| 1 telephone circuit | |
| 1 auxiliary signal circuit | |
| 10 test trunks | |
| 1 test trunk unit J93006BA (2 circuits)<br>1 selector switch unit J23060D (3 circuits) | crossbar No. 1 and panel offices |
| 1 test connector unit ED-31104-01 (3 circuits) | step-by-step offices |

**1.05** Plugging-up line unit J93005G for use in No. 5 crossbar offices accommodates three plugging-up lines.

### Description

**1.06** The plugging-up frame provides means for the maintenance force in a crossbar No. 1, panel, or step-by-step office served by a distant central "A" switchboard to handle the trouble observation and test of subscriber lines in trouble. In offices having a local "A" switchboard, these lines are normally handled at the intercepting positions of the switchboard and the plugging-up frame is not required. However, in an office having a local "A" switchboard if there are space limitations in the switchboard or other considerations, the plugging-up frame may be used. In crossbar No. 5 offices the plugging-up line units are located on the relay rack and connect to jack, key, and lamp equipment located in the jack bay of the master test frame.

**1.07** Lines in trouble are connected to plugging-up line circuits by means of cords and plugs at the main distributing frame. One end of a plugging-up cord is inserted in place of heat coils or in line jacks and the other end is inserted in a jack in a jack box cabled to the plugging-up line relay equipment.

### Panel and SxS Offices

**1.08** In panel and step-by-step offices the plugging-up lines connect to intercept trunks which terminate in the "A" board. Incoming calls to lines plugged-up and in trouble are intercepted. In offices having a local "A" board, both the intercept jacks and the trouble observation and test jacks are located in the "A" board if possible. When the plugging-up frame is used in an office served by a distant central "A" board the trouble observation and test jacks are

mounted on the plugging-up frame and only the intercepting jacks are located in the central "A" board. The trouble intercepting traffic is often concentrated by means of trunk finders to reduce the number of interoffice trunk pairs required.

### Crossbar No. 1 Offices

**1.09** In crossbar No. 1 offices with or without an "A" switchboard, the plugging-up lines are used for trouble observation and test only. They do not connect to intercept trunks which are separate trunks to which calls are routed when the terminating marker recognizes a plugged-up line.

### Equipment Provided

**1.10** The plugging-up frame is 2'-0-5/8" long and 11'-6" high, employing the standard 23" relay rack framework. The frame accommodates from the bottom up five plugging-up line units, an apparatus mounting board which accommodates miscellaneous apparatus of the telephone and auxiliary signal circuits, two jack, key, and lamp panels, accommodating the jack, key, and lamps for terminating the plugging-up line circuits, the common equipment unit, and five more plugging-up line units. In crossbar No. 1 and panel offices, a test trunk unit and a selector switch, when desired, are provided at the top of the frame for use in establishing connections to the plugging-up lines from the test desk. In step-by-step offices, a test connector unit is provided at the top of the frame for this purpose.

**1.11** The two jack, key, and lamp panels, one for each twenty plugging-up lines, are located approximately 4'-4" from the floor and directly under the jack panel on the common unit to facilitate patching the plugging-up lines to the telephone circuit or to a test trunk to the test desk.

**1.12** The auxiliary signal circuit on the frame operates a buzzer to attract the attention of the maintenance man in conjunction with the lamp signals of the plugging-up lines and the test trunks from the test desk. A key is provided as part of the auxiliary signal circuit. The operation of the key causes the office alarms to operate in response to signals from the plugging-up frame.

### Test Trunk and Selector Units and Test Connectors

**1.13** A test trunk unit and an associated selector unit may be provided in a crossbar No. 1 or panel office, at the option of the telephone company for use in selecting plugging-up lines for test purposes from the test desk without the aid of an attendant at the plugging-up frame. Any plugged up lines may be reached by dialing the number of the plugging-up line. The test selector may be used for access to permanent signal holding trunks as well as plugging-up lines. In step-by-step offices, test connectors may be provided at the option of the telephone company for use in conjunction with the regular test distributor for access to the plugging-up lines. Any plugged up line may be reached by dialing the number with which it is designated plus the test distributor code.

### Crossbar No. 5

**1.14** The plugging-up line circuit with automatic cut-thru feature provided for crossbar system No. 5 is used to disconnect a subscriber line, which is out of order from the subscriber line circuit and extend it to the master test frame. The plugging-up line circuit is patched to the "out of order" subscriber line circuit at the MDF or CDF. The keys, lamps, and jacks used with the plugging-up line circuits are mounted in the jack bay of the master test frame which is located in the maintenance center and facilities have been provided for this equipment on the master test frame. This circuit can automatically restore the connection between the subscriber line and the subscriber line circuit if the trouble is cleared. While the automatic cut-thru feature is always provided on crossbar No. 5 plugging-up line unit J93005G, its use is optional on plugging-up line unit J93005H used in crossbar No. 1, panel, or step-by-step offices.

### Subdivisions of Equipment

ED-30243-02 — Test Connector (Step-by-Step Offices)

ED-91183-01 — Frame Assembly (Crossbar No. 1 and Panel Offices)

ED-91837-71 — Frame Assembly (Step-by-Step Office)

J23060D — Selector Switch Unit (Crossbar No. 1 and Panel Offices)

J58801AF — Test Connector Shelf Unit

J93005E (A&M Only) — Plugging-up Line Unit With Automatic Cut-thru (Crossbar No. 1, Panel, and Step-by-Step Offices)

J93005G (AT&TCo Std.) — Plugging-up Line Unit with Automatic Cut-thru Feature (Crossbar No. 5 Office)

J93005H (AT&TCo Std.) — Plugging-up Line Unit (Crossbar No. 1, Panel, and Step-by-Step Offices)

J93005J (AT&TCo Std.) — Common Equipment Unit (Crossbar No. 1, Panel, and Step-by-Step Offices)

J99206BA — Test Trunk Unit for Selecting Permanent Signal Holding Trunks and Plugging-up Lines (Crossbar No. 1 and Panel Offices)

## 2. SUPPLEMENTARY INFORMATION

814-000-000 — Step-by-Step Systems Index
815-000-000 — Panel Systems Index
816-000-000 — No. 1 Crossbar System Index
819-000-000 — No. 5 Crossbar System Index
AA128.006 — List of General Equipment Requirements Sections
J29259 (819-005-150) — General Outline — No. 5 Crossbar System
J97025 (AA381.319) — Relay Rack — Angle Type — Framework and Cabling
Floor Plan Data — Section 9.2, Sheet 11

## 3. DRAWINGS

WECo J drawings should be ordered by referring to the prefix and base number and requesting the current dash (—) number.

### Key Sheets

SD-21300-01 — Panel System — Battery Cutoff

SD-25000-01 — Crossbar System No. 1

SD-25760-01 — Crossbar System No. 5

SD-31359-01 — Step-by-Step Systems 4-, 5-, or 6-digit Offices

SD-31364-01 — Step-by-Step System — 350A Dial Offices

### Framework

ED-25081-01 — Relay Rack Unit Framework

ED-30391-01 — Assembly of Jack, Lamp, and Key Panel — P.U. Lines

ED-30754-01 — Assembly of Relay Rack Mounted Switch Shelf Unit

ED-90395-01 — Assembly of Relay Rack Units

ED-91183-01 — Assembly of Angle-type Relay Rack (10″ Sheet Metal Base)

ED-91837-71 — Assembly of Angle-type Relay Rack (1′-0″ Sheet Metal Base)

ED-92243-01 — Relay Rack Unit Framework

### Equipment

ED-30243-02 — Test Connector Equipment

ED-31104-01 — Equipment Wiring and Cabling of Test Connector Unit

ED-90940-01 — Plugging-up Frame (Panel and Step-by-Step) (A&M Only)

ED-91574-01 — Plugging-up Frame (A&M Only)

ED-91577-01 — Plugging-up Line With Automatic Cut-thru (A&M Only)

ED-92477-01 — Plugging-up Line Unit (Crossbar No. 1, Panel, and Step-by-Step Offices)

ED-92480-01 — Plugging-up Frame Common Equipment

ED-92482-01 — Plugging-up Frame

J93005G-( ) — Plugging-up Line Unit (Crossbar No. 5)

### Wiring

ED-30394-01 — Cabling Schematic for Plugging-up Line Panel (A&M Only)

ED-90440-01 — Local Cable for Relay Rack Unit

ED-90943-01 — Cabling Plan (A&M Only)

ED-92224-01 — Cabling Drawing — Typical

## 4. EQUIPMENT

***ED-30243-02 — Test Connector (Step-by-Step Offices)***

*Group 7* — Test Connector (See Notes A and 5.05)

***ED-91183-01 — Frame Assembly (Crossbar No. 1 and Panel Offices)***

***Group 2*** — Framework for one plugging-up frame (See Note B)

***ED-91837-71 — Frame Assembly (Step-by-Step Offices)***

***Group 7*** — Framework for one plugging-up frame (See Note B)

***Notes***

A. The test connectors are mounted on the plugging-up frame by means of a test connector unit per ED-31104-01. (See note 5.05.)

B. Framework assembly ED-91183-01, G2, is intended primarily for use in No. 1 crossbar offices and ED-91837-71 for use in step-by-step offices.

***J23060D — Selector Switch Unit for Selecting Permanent Signal Holding Trunks and Plugging-up Lines (Crossbar No. 1 and Panel Offices)***

***List 1*** — Basic unit.

***List 2*** — Equipment for one selector switch.

***J58801AF (AT&TCo Std) — Test Connector Shelf Unit Arranged to Mount on 23-inch Relay Rack for Two Connectors With Facilities for Alarm Equipment***

***List 1*** — Shelf Unit.

***J93005E (A&M Only) — Unit of Plugging-up Lines with Automatic Cut-thru***

Equipment — ED-91577-01

***List 1*** — Framework, assembly, wiring, and common equipment for one unit of ten plugging-up lines with automatic cut-thru.

| | WIRE | EQUIP |
|---|---|---|
| Framework ED-25081-01, Fig. 2 | | 2 |
| P.U. Line Ckt. SD-96084-01, Figs. 1 & 2 | 10 | 0 |

***List 2*** — Equipment per SD-96084-01, Fig. 1, required in addition to list 1 for one line for crossbar, panel, or step-by-step offices.

***List 3*** — Equipment per SD-96084-01, Fig. 2, required in addition to lists 1 and 2 for one line for crossbar offices.

***J93005G (AT&TCo Std.) — Unit of Plugging-up Lines with Automatic Cut-thru (Crossbar No. 5 Office)***

Equipment — J93005G-( )

***List 1*** — Framework, assembly, wiring, and common equipment for one unit of three plugging-up lines with automatic cut-thru.

| | WIRE | EQUIP | SEE NOTE |
|---|---|---|---|
| Framework P-266951 | | 2 | |
| P.U. Line Ckt. SD-25741-01, Fig. 1 | 3 | 3 | A |

***Note***

A. The plugging-up line unit shall be surface-wired per ES-857036.

***J93005H (AT&TCo Std.) — Plugging-up Line Unit (Crossbar No. 1, Panel and Step-by-Step Offices)***

Equipment — ED-92477-01

***List 1*** — Framework, assembly, wiring, and common equipment for one unit of four plugging-up lines.

| | WIRE | EQUIP | SEE NOTE |
|---|---|---|---|
| Framework ED-92243-01, G3 | | 1 | |
| Plugging-up Line Circuit SD-95597-01, Fig. 1 Less "V" and "X" Options | 4 | 4 | A,B, C |

***List 2*** — Apparatus and wiring per SD-95597-01, Fig. 1, "V" option required in addition to list 1 for automatic cut-thru (see note B).

***List 3*** — Apparatus and wiring per SD-95597-01, Fig. 1, "X" option required in addition to list 1 for trouble intercept indication

in crossbar No. 1 offices only (see note C).

*Note*

A. The plugging-up line unit shall be surface-wired per ES-857036.

B. When list 2 is not furnished "T" wiring of SD-95597-01, Fig. 1 shall be connected.

C. List 3 shall be provided for trouble intercept indication in crossbar No. 1 offices. In a panel or step-by-step office or any combination of crossbar No. 1, panel and step-by-step offices using this circuit in common, "W" wiring shall be connected for access to the intercept trunk circuit.

D. A jack, key, and lamp panel per ED-92482-01, Fig. 3 shall be provided to accommodate each twenty jack, key, and lamp circuits per SD-95597-01, Fig. 2, and mounted on the plugging-up frame as shown in Figs. 1 and 2 of ED-92482-01.

***J93005J (AT&TCo Std.) — Common Equipment Unit (Crossbar No. 1, Panel and Step-by-Step Offices)***

Equipment — ED-92480-01

***List 1*** — Framework, assembly, wiring, and common equipment for one unit for the telephone circuit, auxiliary signal circuit, and ten test trunks for the plugging-up frame.

| | WIRE | EQUIP | SEE NOTE |
|---|---|---|---|
| Framework ED-92243-01, G5 | | 1 | |
| Tel. Ckt. SD-90588-01: | | | |
| Figs. 1 & B | 1 | 1 | A |
| Fig. D, "C" condenser only | 1 | 1 | A |
| Auxiliary Sig. Ckt. SD-90594-01: | | | |
| Fig. 1, "M," "N," "S," "V," "X," & "Y," | | | B |
| wiring (less buzzer) | 1 | 1 | A |
| Fig. 2, Q & R wiring | 2 | 0 | B |
| Test Trunk Ckt. SD-90589-01: | | | |
| Fig. 1, "X" and "Y" wiring | 10 | 0 | |

***List 2*** — Equipment per SD-90594-01, Fig. 2 required in addition to list 1 for each 20 plugging-up lines.

***List 3*** — Equipment per SD-90589-01, Fig. 1, required in addition to list 1 for one test trunk when interoffice ground potential difference is less than 15 volts.

***List 4*** — Equipment per SD-90589-01, Fig. 1, "Y" apparatus, required in addition to lists 1 and 3 when the interoffice ground potential difference is greater than 15 volts.

*Notes*

A. The handset, handset hanger, connecting block, induction coil, and subset of the telephone circuit and the buzzer of the auxiliary signal circuit are mounted on an apparatus mounting board per ED-92480-01, Fig. 2.

B. The local cable shall contain all wiring options which shall be connected as required.

***J99206BA — Test Trunk Unit for Selecting Permanent Signal Holding Trunks and Plugging-up Lines (Crossbar No. 1 and Panel Offices)***

***List 1*** — Unit equipped with one test trunk.

***List 2*** — Equipment for second test trunk.

***List 3*** — Mounting plate cover and cover guides required in addition to list 1 in panel and crossbar No. 1 offices.

## 5. GENERAL NOTES

**5.01** ***Location of Plugging-up Frame Equipment:*** The arrangement of the plugging-up frame equipment is shown on ED-91574-01 for unit J93005E and on ED-92482-01 for units J93005H, J93005J, J99206BA, J23060D, and ED-31104-01.

**5.02** The preferred locations of the frame are at the maintenance center, near the test desk or near the MDF.

**5.03** Where desired, because of the small number of plugging-up lines required, the equipment may be mounted on the same bay with miscellaneous relay rack equipment. In this case space should be reserved on the bay for the ultimate quantities.

**5.04** Patching cords 4W6A, 4W7A, or 4W11A for use in plugging customer lines to the jack boxes on the main frame shall be furnished as specified by the telephone company. Patching cords shall be furnished one for each test line equipped on the common equipment unit for the telephone circuit as specified by the telephone company.

### Test Connector

**5.05** The test connector shelf unit per J58801AF and ED-31104-01 is arranged to mount on 23-inch angle-type relay rack, provides for mounting two test connectors, and is equipped with two sets of banks wired to a bank terminal strip and with alarm equipment. It shall be located on the plugging-up frame at the top of the bay above the plugging-up line equipment as indicated on ED-92482-01. If more than two test connectors should be required per 100 or less plugging-up lines, a second test connector shelf unit shall be furnished on another plugging-up frame or relay rack bay, and the banks of the two units multipled by switchboard cable between the bank terminal straps of the two units.

### List of "A&M Only" & "Mfr. Disc." Equipment

**5.06** The following equipment has been replaced as indicated:

| EQUIPMENT | RATING | COVERED IN ISSUE | REPLACING EQUIPMENT |
|---|---|---|---|
| J93005A | Mfr. Disc. | 3 | J93005D |
| J93005B | Mfr. Disc. | 3 | J93005E |
| J93005C | Mfr. Disc. | 1 | J93005F |
| J93005D | Mfr. Disc. | 3 | J93005H |
| J93005E | A&M Only | 3 | J93005H |
| J93005F | Mfr. Disc. | 2 | J93005J |

Bell Telephone Laboratories, Inc.

Dept. 6261