NUMBER-CHECKING EQUIPMENT
EQUIPMENT DESIGN REQUIREMENTS
NO. 1 CROSSBAR SYSTEM

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 manufacture and installation of number-checking equipment associated with the DSA switchboard in No. 1 crossbar offices.

1.02 This section is reissued to incorporate previous appendix changes.

Capacity

1.03 The capacity of the number-checking link is ten NC senders and ten or more KP "A" switchboard positions. Beyond ten senders, additional NC links are required. The equipment may be common to six offices served by single or multioffice terminating markers.

Description

Key Pulsing "A" Switchboard

1.04 When the DSA operator wishes to check the number given by the calling subscriber she operates a number-checking key together with the talk key of the cord used in answering the call. The keyshelf is equipped with a number-checking key for each office (10,000 number series) in the building served by the "A" board. This operation causes a number-checking link to connect the position directly to an idle key-pulsing, number-checking sender which then causes the sender lamp in the position key-set circuit to light indicating that the sender is ready for keying. When keying of the four digits of the number is completed, the number-checking sender connects to a terminating marker serving the particular office and arranged for number-checking service, through a terminating marker connector. The sender then passes to this marker the number and an indication that it is a number-checking call. The marker checks the sleeve of the subscriber line keyed by the operator and applies 135-cycle tone to the sleeve. If this line is the one which originated the call, the tone flows over the originating path through the answering cord, the number-checking position circuit, number-checking link, number-checking sender and terminating marker connector to the winding of a relay in the terminating marker. The operation of this relay controls relays in the sender and causes a number-checking lamp in the "A" position to light steadily. If there is a discrepancy between the number given by the calling subscriber and the line used in originating the call, the tone path is incomplete at the line link frame and the marker relay fails to operate. In this case, the number-checking lamp in the "A" switchboard gives a flashing signal.

1.05 The number-checking link consists of one or more 10-vertical, 6-wire crossbar switches and associated control relays. Positions appear on the horizontal multiple of the crossbar switch and number-checking senders on the verticals. One switch can serve a maximum of ten senders and ten or more positions depending upon the number of senders. For example, where five senders are required, they should be connected to verticals 0 to 4 and multipled to verticals 5 to 9 with the position horizontal multiple split between verticals 4 and 5. Ten positions may then be connected to the horizontal multiple across verticals 0 to 4 and ten positions across verticals 5 to 9. This arrangement provides for access of twenty positions to five senders. Similarly, thirty positions may obtain access to three senders by splitting the switch verticals into three groups 0 to 2, 3 to 5, 6 to 8. Other combinations may be obtained as required.

1.06 Where more than ten positions are to be served by from six to ten senders, a supplementary switch is necessary. The senders connected to the verticals of the crossbar switch of the number-checking link unit are multipled to the verticals of the supplementary switch. A maximum of ten positions may then be connected to the horizontals of each switch providing for access of twenty positions to from six to ten senders. Similarly, thirty positions may obtain access to six senders with a regular and supplementary switch by confining the first split to six verticals of the regular switch, the second split to four verticals of the regular and two of the supplementary switch, and the third split to six verticals of the supplementary switch.

1.07 Where more than ten number-checking senders are required, a second group of senders and associated number-checking link equipment is furnished.

1.08 The above equipment is made up of the following units and mounting plates.

Equipment Units	Frame Space Occupied. No. of 2" Mtg Plts
NC link including one crossbar switch	9
Supplementary crossbar switch	5
Contact protection per sup. crossbar switch when number of switches per NC link is five or less	1
Contact protection per NC link when number of switches per link is more than five	1
Supplementary relays for each thirty positions beyond first ten positions associated with NC link	1
NC sender	8

1.09 The number-checking equipment is mounted on one or more miscellaneous frames, located preferably near the terminating marker connectors.

Subdivisions of Equipment

J21556A (AT&TCo Std.) - Number-checking Link Unit
J21556B (AT&TCo Std.) - KP Number-checking Sender Unit

2. SUPPLEMENTARY INFORMATION

816-000-000 - No. 1 Crossbar System Index
Floor Plan Data - Section 9.2, Sheet 6

3. DRAWINGS

Key Sheet

SD-25000-01 - No. 1 Crossbar System

Framework

ED-25020-01 - Miscellaneous Mounting Details and Cable Brackets
ED-25028-01 - Unit Assembly

Equipment

ED-26746-01 - Miscellaneous Frame
ED-25212-01 - Designation Cards
ED-25295-01 - KP Number-checking Sender Unit
ED-25367-01 - Number-checking Link Unit

Wiring and Cabling

ED-25109-01 - Local Cable for Number-checking Link Unit
ED-25296-01 - Local Cable for KP Number-checking Sender Unit
ED-25302-01 - Switchboard Cabling Details

4. EQUIPMENT

J21556A (AT&TCo Std) - Number-checking Link Unit

Equipment - ED-25367-01
Local Cable - ED-25109-01

List 1 - Framework, assembly, wiring, and common equipment for one number-checking link unit

	Wire	Equip
Framework ED-25028-01, Item 59		1
No. Chk. Link Ckt SD-25321-01:		
Switch Fig. 5, Less "W" App.	1	1
Control Relays Fig. 2, Less "V" App. & S Rels.	1	1
Split Relays Fig. 3	1	0
Chain Split Relay Fig. A	1	0
Sdr Rels Figs. D,E, & F	10	0

List 2 - Equipment per SD-25321-01, Fig. 2, S relay only, required in addition to list 1 for each number-checking position served up to and including 10

List 3 - Equipment per SD-25321-01, Fig. D, E, or F required in addition to lists 1 and 2 for each number-checking sender equipped up to and including 10

List 4 - Equipment per SD-25321-01, Figs. 3 and A required in addition to lists 1, 2, and 3 when more than ten number-checking positions are associated with one number-checking link switch (split horizontals)

Notes

A. List 1 covers the basic link arranged for ten senders and ten or more positions. Furnish list 2 for each NC position in largest position group or multiple split (Max. of ten). Furnish list 3 for each NC sender (Max. of ten).

B. When the link is required to serve more than ten positions, furnish list 4 on the link unit for first ten positions and mounting plate per Fig. 2 of ED-25367-01 for each additional thirty positions. Equip this plate as required per circuit Figs. 3 and B or C.

C. Furnish supplementary crossbar switches as required by the combination of senders and positions served by the link control circuit.

D. When the number of crossbar switches associated with the link control circuit is five of less, furnish "W" contact protection. This involves a mounting plate per Fig.3 of ED-25367-01 for each supplementary switch. When the number of switches per link control circuit exceeds five, furnish contact protection "V." This involves a mounting plate per Fig. 4 of ED-25367-01 per link unit.

E. The horizontal multiple on the number-checking link switch shall be strapped through all ten verticals. When the number of positions is in excess of ten, the multiple shall be cut as required in accordance with job requirements.

F. The "B" leads from the position circuits are run to a terminal strip. On the local cable side the leads are looped at the position of the (SP) relay and brought back to the terminal strip, and thence to the (S) relays. This terminal strip thus provides a convenient point at which to extend the multiple to the armatures of additional (SP) relays when required.

G. Leads "T0" to "T9" from the (S) relays and leads "T0" to "T9" from the (T) relays shall be connected to punchings 1 to 10 respectively of the (C) terminal strip. The leads from the (S) relays represent senders and those from the (T) relays represent "A" positions. In order to establish an order of preference for selecting senders, punchings representing unequipped senders but equipped positions must be multipled to punchings representing equipped senders. Each sender shall be preferred by an equal number of positions as nearly as possible. No strapping is required where ten senders serve ten positions.

5. GENERAL NOTES

Equipment

5.01 The number-checking link unit and associated supplementary equipment will accommodate a maximum of ten key-pulsing number-checking senders and ten or more DSA switchboard positions arranged for number checking. In the majority of cases a capacity of ten number-checking senders will be sufficient to serve the DSA switchboard positions arranged for number checking. In offices where more than ten senders are required a second number-checking link unit and supplementary equipment shall be furnished with a second group of number-checking senders.

5.02 A designation card, per ED-25212-01, Fig. 6G, and a 63E designation strip shall be provided for each ten or portion of ten number-checking positions,(each horizontal split)and mounted on the frame upright at the left of the number-checking link unit or associated supplementary switches. This card shall indicate the "A" switchboard position number and the position group or split number on the unit.

5.03 A designation card, per ED-25212-01, Fig. 6H, and a 63E designation strip shall be provided for each ten number-checking senders and mounted on the frame upright at the right of the number-checking link unit or associated supplementary switch. This card shall indicate the sender number of the ten number-checking senders associated with the unit.

5.04 Number-checking senders working with one marker group shall be assigned to a minimum of two terminating marker connectors on different frames served by different office interrupter frames. Number-checking senders associated with more than one marker group are assigned a terminating marker connector appearance in each marker group and multipled as covered by the terminating marker connector circuit.

Wiring and Cabling

5.05 No. 24 gauge type "C" wire shall be used for the unit local cable except battery and ground distributing leads which shall be No. 22 gauge type "C" wire. Connections to supplementary switches, contact protection and the position split multiple relays shall be made with loose type "C" wire, No. 22 or 24 gauge as required.

5.06 The code numbers of the switchboard cables ordinarily used in cabling the number-checking equipment are shown on the switchboard cabling detail drawing, but this information should be checked to insure conformity with the latest circuit requirements and job conditions.

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

The following equipment has been replaced as indicated. Where "A&M Only" items appear, the issue numbers shown are those of the issue in which the rating was first applied.

Equipment	Rating	Details Last Shown in Issue	Replacing Equipment
J21556B	Mfr Disc.	2	-

Bell Telephone Laboratories, Incorporated

Dept. 6261