NUMBER NETWORK AND IDENTIFIER FRAMES AUTOMATIC NUMBER IDENTIFICATION — TYPE C NO. 1, 350A, 355A AND 35E97 OFFICES EQUIPMENT DESIGN REQUIREMENTS STEP-BY-STEP SYSTEMS

1 GENERAL

Scope

1.01 This specification, together with the supplementary information listed herein, covers the framework, equipment, and circuits to be used in the engineering, manufacture, and installation of the number network and identifier frames in No. 1, 350A, 355A, and 35E97 step-by-step offices.

1.02 This specification is reissued to include additional drawing reference information under Equipment, Section 3; to make corrections in the cross-connect information; and to make minor nomenclature changes.

Capacity

1.03 ***The number network and identifier (NN-ID) frames*** for use with this system are available in 9-foot, 0-inch and 11-foot, 6-inch height having capacities for 2000 and 2600 numbers, respectively. In addition, each of these frames may be equipped with a ***one-way originating line*** unit providing for a maximum of 20 number networks for use with one-way originating lines.

Description

1.04 ***The automatic number identification — type C system*** (ANI-C) provides a high-speed, one-at-a-time identification of a calling

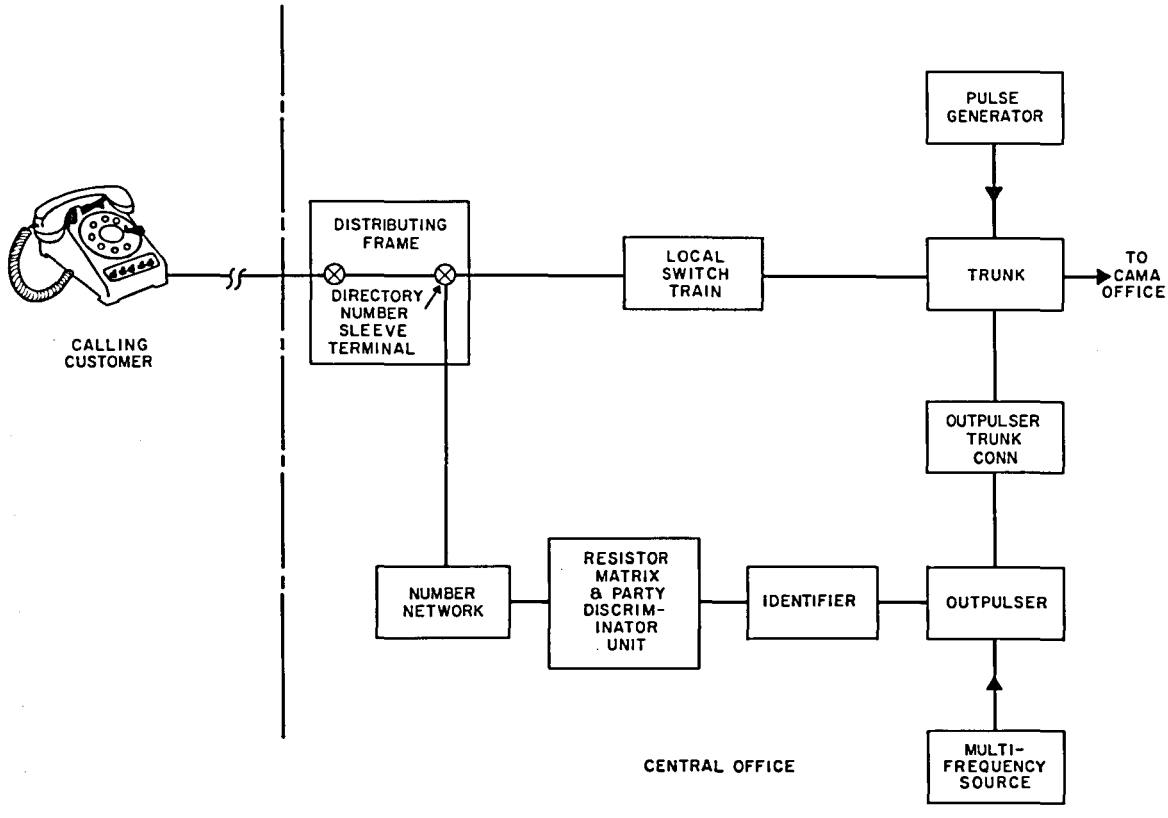

Fig. 1 — Step-by-Step Systems Automatic Number Identification — Type C, Block Diagram

customer directory number on CAMA calls from single, 2-party lines, PBX trunks, and one-way originating lines.

1.05 This system, as shown in Fig. 1, includes the number networks, identifier, resistor matrix, outpulser, outpulser-trunk connector, trunks, and pulse generator.

1.06 On a CAMA call a 340-volt pulse of approximately 150 μsec duration is placed on the sleeve of an ANI-C trunk by the pulse generator located on the first ANI trunk frame. This pulse traverses the local switch train to the sleeve terminal of the calling customer number on the distributing frame which is cabled to its corresponding number network on the NN-ID frame. The identification pulse "fires" the associated glow lamp network and sets the identifier-detectors. The detectors operate register relays in the outpulser. The outpulser checks for a complete registration and outpulses this information to the CAMA office over the trunk on a multifrequency basis. A call from a multiparty line or otherwise unidentifiable line is automatically routed to an operator for identification.

1.07 All frames are of the bulb-angle type, either 9 feet, 0 inch or 11 feet, 6 inches high with 10-inch guardrails, and are arranged for 23-inch mounting plates.

1.08 ***The number network and identifier frames (NN-ID)*** shown in Fig. 2 and 3 provide a mounting and interconnecting arrangement for either ten or thirteen 200-number network units. Also mounted on the NN-ID frame are the resistor matrix and party discrimination unit, identifier unit, and one-way originating line unit.

1.09 ***The 200-number network unit*** is shown in Fig. 4. It occupies space equivalent to four 2-inch by 23-inch mounting plates and is provided with either right or left 100-number assemblies, or both, as ordered by the telephone company.

1.10 ***The isolation networks (IN-)*** consist of printed circuit cards which carry printed paths to complete the tens and units circuits and provide a mounting for a diode matrix array. The diodes isolate and divide the number treatment (NT) terminal outputs to provide thousands, hundreds, and service mark information.

1.11 The resistor matrix and party discrimination unit is a single 2- by 23-inch unit arranged for 11 wired-in component assemblies together with conventional relay circuitry. Ten of the wired-in component assemblies make up the resistor matrix portion of the unit and serve to convert the decimal output from the number networks to a 2-out-of-5 code for use in the identifier. The remaining (11th) component assembly provides for a service-observing mark on observed calls in offices so equipped. The relay circuitry provides the party discrimination feature. The unit is located immediately above the last (uppermost) number network unit position on each NN-ID frame and is employed as a terminating point for the central frame local cable from the number network units.

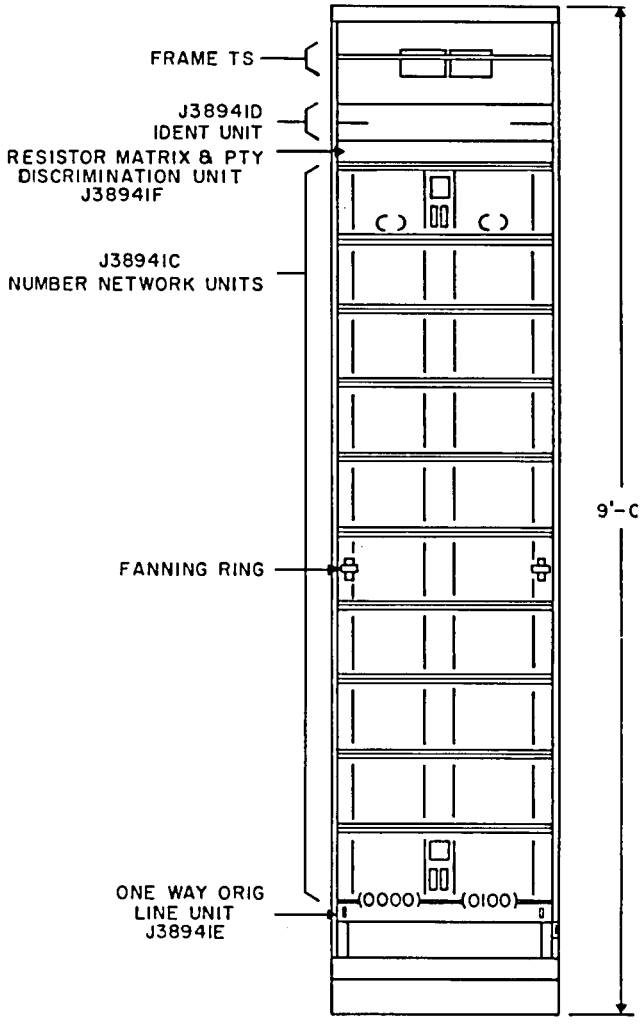

Fig. 2 – ANI-C Number Network and Identifier Frame (9 Feet, 0 Inch High)

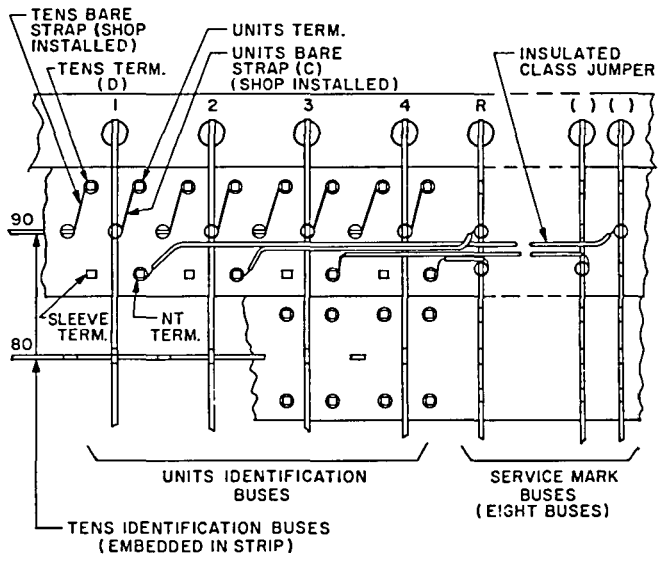

Fig. 5 – C, D, and NT Terminal Strapping

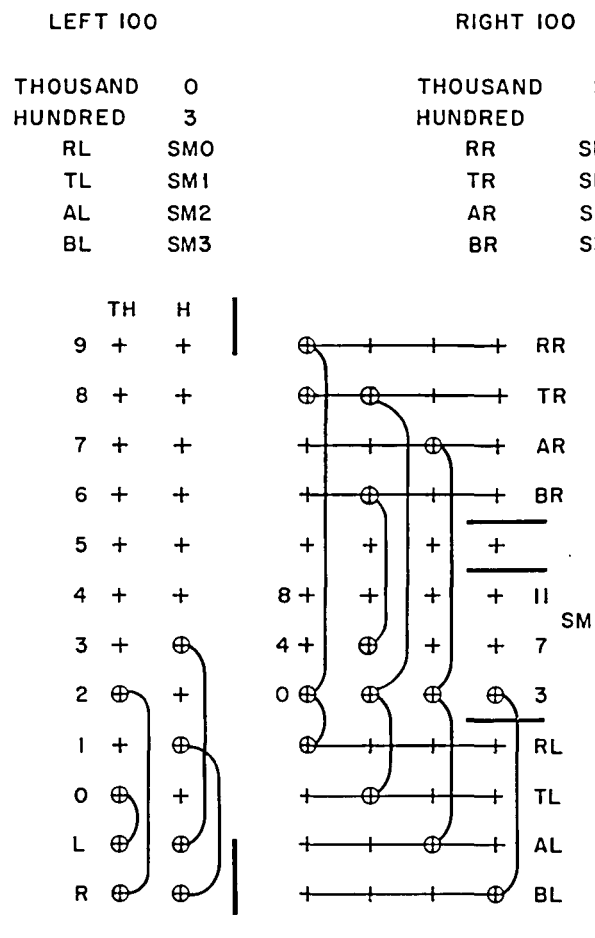

Fig. 6 – 200-Number Network Unit Terminal Strip Cross-Connect Details

minal strip. Each 100-number assembly on the unit may be individually cross-connected without regard to physical location on the frame.

1.18 Fig. 6 depicts the front of the unit terminal strip with strapping installed to designate the 100-number assemblies.

1.19 Numbers requiring ***billing to a pilot number*** must first be isolated from their respective tens and units buses and then cross-connected to the pilot billing number as shown in Fig. 7 and the following examples.

Examples

1. The pilot number is on the same tens level in a given 100-number network assembly as the number(s) to be pilot-number billed.

   (a) Tens straps may be left in position, as they are common to the same tens bus within the strip.

   (b) Units straps of the number(s) to be pilot-number billed are removed and the C terminals are series-strapped to the corresponding terminal of the pilot number with 24BU blue wire.

   (c) Number treatment (NT) terminals are interconnected in the same manner as the units (C) terminals previously described. The wire color is determined from Table A according to the units digit of the pilot number.

2. The pilot number is on a different tens level than the numbers to be pilot-number billed, but within the same 100-number network assembly.

   (a) In this example the tens (D), units (C), and number treatment (NT) terminals of number(s) to be billed to a pilot number must be disconnected from their respective buses and strapped to the corresponding terminals of the pilot number. Items 2A and B in Fig. 7 are shown to further define desirable wiring routes.

   (b) Orange 24BU wire is used for the tens strapping and blue for the units. As in Example 1, the color for the NT strap is determined from Table A according to the units digit of the pilot number.

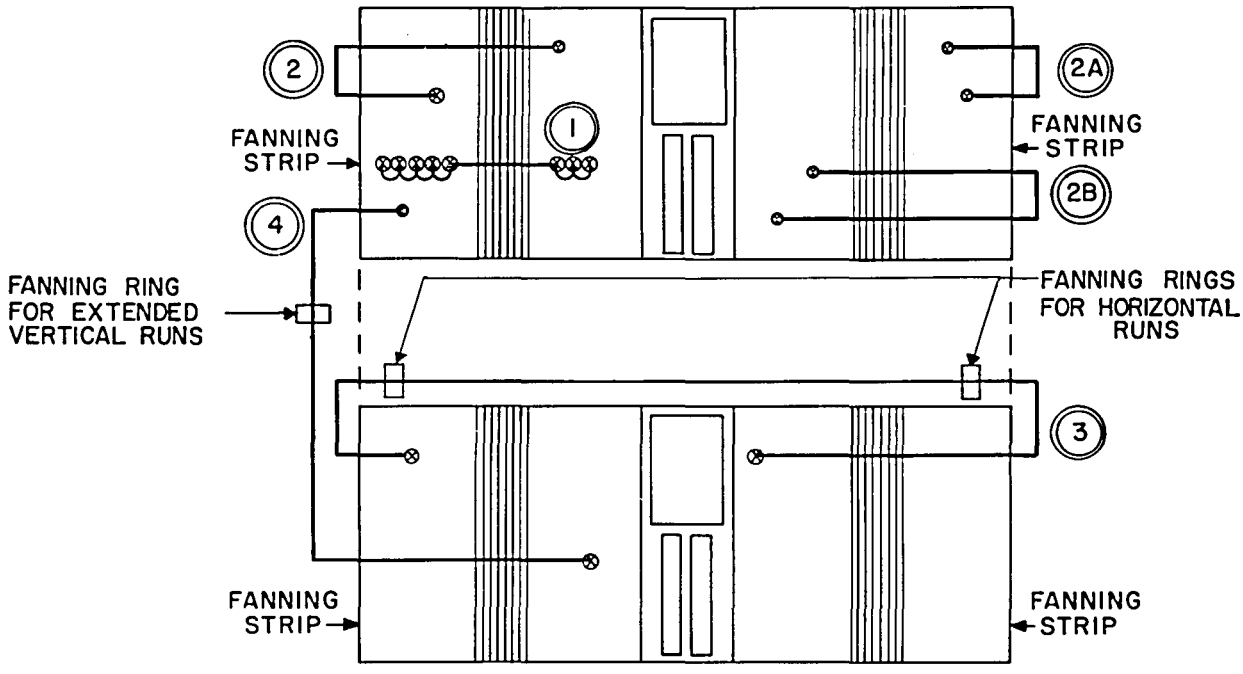

Fig. 7 – Typical Wiring Patterns for Pilot-Number Billing

3. The number to be pilot-number billed is on the 100-number network assembly opposite the one on which the pilot billing number occurs.

   (a) The cross-connections of the tens (D), units (C), and number treatment (NT) terminals of the number(s) to be pilot-number billed are disconnected from their associated buses.

   (b) The respective tens and units terminals are cross-connected with orange (tens) and blue (units) wire. The NT terminals are joined with the color as determined from Table A according to the units digit of the pilot number (see Note D).

4. The number to be pilot-number billed is on a different 200-number network unit from the pilot number. This condition is satisfied by provisions of Example 3, except that in addition to routing shown via the unit fanning strips, maximum use should be made of the frame fanning rings.

Notes

A. Horizontal wire runs on the face of a unit shall be dressed in such a manner that all wires lie in the open channel formed by the center and lower-most terminals on each tens number strip.

B. To avoid crossing of wires, all wire runs shall be made in a horizontal direction on the face of a 100-number network assembly. No wiring shall cross the center panel of a 200-number network unit to gain access to the opposite side. (See item 1, Fig. 7 for proper dress.)

C. Within the field formed by the service mark buses, wire runs shall be made in such a manner as to arrive at the nearest available terminal on the assigned bus without undue obstruction of the horizontal runs.

D. The color code for the NT terminal wiring shall be in accordance with Table A.

   (1) Where series strapping of the NT terminals is used for pilot-number billing, the color is determined by the units digit of the pilot number.

   (2) In cases where the numbers to be pilot-number billed are on the same 100-number network assembly, and it is elected to individually wire each number (NT terminal) to the service mark bus serving the pilot number, the color shall be in accordance with Table A

and determined by the units digit of each individual number wired directly to the bus.

1.20 The possible variations in wiring patterns which can result from pilot number billing make it impractical to attempt to cover each situation specifically. A general guide to follow is that of minimizing the total length of wire interconnecting a pilot number and its associated stations.

1.21 ***One-way originating lines*** not having associated connector equipment are handled in much the same manner as described for pilot number billing. The principle difference is the need for an additional cross-connection on the distributing frame to connect network on the originating line unit to the sleeve of the line involved. As with pilot number billing, the NT, C, and D wiring is restricted to the frame on which the billing number is located.

1.22 A continuous operating ***fluorescent light*** fixture is specified for use with the NN-ID frames. Its function is to maintain the ion population within the glow lamps at a level sufficient to permit firing of the lamps within the specified time limits.

Floor Plan Arrangement

1.23 The preferred arrangement for the NN-ID frames is a common location in the building. Circuit restrictions regarding cable length between the first and subsequent NN-ID frames make it advisable that space be reserved in the immediate vicinity of the first NN-ID frame for any foreseeable additions.

1.24 Back-to-back frame arrangements are quite suitable and have the advantage of reducing the number of fluorescent light fixtures required. Instead of one fixture per frame required with a straight line-up, the back-to-back arrangement permits adequate illumination of two frames with a single fixture.

1.25 The NN-ID frames will frequently be installed adjacent to other frames having guardrails of a different width. In such cases consideration must be given to the provision of junction details.

2. SUPPLEMENTARY INFORMATION

814-000-000 — Step-by-Step Systems Index
AA128.002 — List of Equipment Design Requirements Sections
AA128.006 — Checking List — General Equipment Requirements
J38942 — 814-204-151 — Outpulser and Test Equipment Frame
J38943 — 814-507-150 — ANI Trunk Frame — Step-by-Step
Floor Plan Data — Section 5.2, Sheet 72
Current Drain Data —
SD-31359-02 — No. 1 Step-by-Step
SD-31364-02 — No. 350A Step-by-Step
SD-31780-02 — No. 355A Step-by-Step
SD-32325-02 — 35E97 Step-by-Step

3. DRAWINGS

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

Keysheets

SD-31359-01 — No. 1 Step-by-Step
SD-31364-01 — 350A Step-by-Step
SD-31780-01 — 355A Step-by-Step
SD-32325-01 — 35E97 Step-by-Step

Circuits

SD-32374-01 — Number Network and Identification Circuit
SD-80728-01 — Battery Distributing Circuit

Equipment

ED-25529-10 — Guardrail Junction Details
ED-32315-30 — ANI-Type C Identifier Resistor Component Assembly
ED-32317-30 — ANI-Type C Resistor Matrix and Service Observing Component Assemblies
ED-32318-30 — ANI-Type C Isolation Network
ED-32324-30 — ANI-Type C Ten-Number Network Strip
ED-32328-10 — ANI-Type C Number Network and Identifier Frame-Switchboard Cabling Plans and Details
ED-32342-30 — ANI-Type C Number Network and Identifier Frame — Illumination Details (See Note A.)
J38941A-( ) — Number Network and Identifier Frame — 9 Feet, 0 Inch High

J38941B-( ) — Number Network and Identifier Frame — 11 Feet, 0 Inch High
J38941C-( ) — ANI-Type C — 200-Number Network Unit
J38941D-( ) — Identifier Unit
J38941E-( ) — One-Way Originating Line Unit
J38941F-( ) — Resistor Matrix and Party Discrimination Unit

4. EQUIPMENT

J38941A (AT&TCo Std) — Number Network and Identifier Frame — 9 Feet 0 Inch High

Equipment and Local Cable — J38941A-( )

List 1 — Framework, assembly, and common equipment for one 9-foot, 0-inch number network and identifier frame arranged and wired but not equipped for a maximum of ten 200-number network units. (See Note B.)

	WIRE	EQUIP
Number Network and Identifier Circuit, SD-32374-01		
Fig. 1	200	0
Fig. 2	10	0
Fig. 3, 4, 7	1	0

List 2 — Supplementary local cable required in addition to list 1 for the first NN-ID frame to accommodate an identifier unit. (See Note A.)

Notes

A. When lists 1 and 2 are provided together on a shop-wired frame, the wiring shall be formed into a single frame local cable.

B. The 200-number network units J38941C, identifier unit J38941D, one-way originating line unit J38941E, and resistor matrix and party discrimination units are ordered separately as required.

J38941B (AT&TCo Std) — Number Network and Identifier Frame — 11 Feet, 0 Inch High

Equipment and Local Cable — J38941B-( )

List 1 — Framework, assembly, and common equipment for one 11-foot, 6-inch number network and identifier frame arranged and wired, but not equipped, for a maximum of thirteen 200-number network units. (See Note B.)

	WIRE	EQUIP
Number Network and Identifier Circuit, SD-32374-01		
Fig. 1	260	0
Fig. 2	13	0
Fig. 3, 4, 7	1	0

List 2 — Supplementary local cable required in addition to list 1 for the first NN-ID frame to accommodate an identifier unit. (See Note A.)

Notes

A. When lists 1 and 2 are provided together on a shop-wired frame, the wiring shall be formed into a single-frame local cable.

B. The 200-number network units J38941C, identifier unit J38941D, one-way originating line unit J38941E, and resistor matrix and party discrimination units are ordered separately as required.

J38941C (AT&TCo Std) — ANI-Type C — 200-Number Network Unit

Equipment — J38941C-( )

List 1 — Assembly, wiring, and common equipment for one 200-number network unit arranged for, but not equipped with, two 100-number network assemblies.

	WIRE	EQUIP	SEE NOTES
Number Network and Identifier Circuit, SD-32374-01, Fig. 1	20	0	
Fig. 2	1	1	A

List 2 — Equipment and wiring required in addition to list 1 for the left 100-number network assembly per SD-32374-01, Fig. 1; ten required.

List 3 — Equipment and wiring required in addition to list 1 for the right 100-number network assembly per SD-32374-01, Fig. 1; ten required.

Note

A. App Fig. 2 is composed of two identical plug-in component assemblies. Additional component assemblies, ED-32318-30, may be ordered for spare as required by the telephone company.

J38941D (AT&TCo Std) — Identifier Unit

Equipment — J38941D-( )

List 1 — Assembly and wiring and equipment for identifier unit arranged for, but not equipped with, 33 detector component assemblies, ED-32315-30, providing for directory number identification plus tip, ring, multiparty, and additional service marks as required.

	WIRE	EQUIP	SEE NOTES
Number Network and Identifier Circuit, SD-32374-01 Detector Component Assembly, Fig. 5	33	0	A

List 2 — Detector component assemblies required in addition to list 1 per SD-32374-01, Fig. 5. (See Note A.)

Note

A. Quantities shall be ordered in accordance with detector functions requirements as shown in Table B.

TABLE B

DETECTOR FUNCTIONS	ALWAYS REQD	MAX REQD
Thousands	5	5
Hundreds	5	5
Tens	5	5
Units	5	5
Ring	–	1
Tip	--	1
Multiparty	–	1
Service Marks	–	9
Service Observing	–	1

J38941E (AT&TCo Std) — One-Way Originating Line Unit

Equipment — J38941E-( )

List 1 — Assembly, wiring, and equipment required for one, one-way originating line unit with a maximum capacity of 200 lines per SD-32374-01, two Fig. 6.

Notes

A. A single one-way originating line unit having a capacity of 20 lines may be installed on an NN-ID frame without reducing the frame 200-number network unit capacity.

B. The one-way outgoing line unit must be located on the same frame as the billing directory number because of capacitance limitations on the NT, C, and D cross-connections.

C. Sleeve terminals are cabled to a special terminal strip for one-way lines on the HIDF or HCDF. Cross-connections from these terminals to the circuit sleeve of the one-way lines complete the sleeve circuits to the identification networks.

J38941F (AT&TCo Std) — Resistor Matrix and Party Discrimination Unit

Equipment — J38941F-( )

List 1 — Assembly and wiring required to provide 1-out-of-10 to 2-out-of-5 output information to the identifier unit, and party discrimination and checking features per SD-32374-01, Fig. 3 and 4.

List 2 — Apparatus per SD-32374-01, Fig. 7 required in addition to list 1 required on first NN-ID frame for service observing.

List 3 — Apparatus and wiring required in addition to list 1 per SD-32374-01, Fig. 4, Z option, to serve 2-party message rate lines.

5. GENERAL NOTES

5.01 The NN-ID frame is arranged for solderless-wrapped connections (SWC). All cross-connections made on the face of units on this frame shall be of the solderless-wrap type to facilitate installation and telephone company changes as required.

5.02 Vertical wiring runs between 200-number network units shall be run in the space between the unit fanning strips and the frame uprights. Where horizontal runs are required, wires shall be dressed in close proximity to the horizontal supporting members of the 200-number network unit framework.

5.02 Power is supplied to the NN-ID frame from fuses located on the OP-TST frame fuse panel.

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