

**PERFORATOR CABINET
PERFORATOR AND READER CABINET
CALL COUNT PROCESS CONTROL REGISTER EQUIPMENT
BILLING DATA TRANSMITTER FRAME
AUTOMATIC MESSAGE ACCOUNTING
EQUIPMENT DESIGN REQUIREMENTS
NO. 1, NO. 5 AND TANDEM CROSSBAR,
NO. 4 TYPE TOLL SWITCHING, 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 perforator cabinets and call count process control register equipment used in No. 1 and No. 5 crossbar, crossbar tandem, No. 1 step-by-step, step-by-step intertoll dialing offices with CAMA and No. 4A or 4M toll offices. It also covers the billing data transmitter frame used in No. 1 and No. 4A crossbar and crossbar tandem offices.

1.02 This specification is being reissued to add information for the billing data transmitter frame.

CAPACITY

1.03 The capacity of the perforator and recorder cabinets and the number of cabinets required in offices arranged for AMA are as follows:

- (a) A single perforator cabinet accommodates two perforators. The perforator is shown on the recorder circuit and is associated, in No. 1 crossbar offices, with a district junctor frame in No. 5 and

tandem crossbars, step-by-step, and No. 4A or 4M toll offices with 100 trunks. A maximum of 11 perforator cabinets housing one emergency and 20 regular perforators may be furnished for a transverter group of equipment. A maximum of six cabinets accommodating one emergency and ten regular perforators for No. 1 step-by-step offices and a maximum of three cabinets accommodating one emergency and five regular perforators for step-by-step intertoll dialing offices with CAMA may be furnished for an identifier group.

- (b) The perforator and reader cabinet accommodates a perforator, reader, and other apparatus associated with the maintenance recorder used in No. 1 crossbar offices, one cabinet, being required for each originating marker group of equipment.

- (c) The billing data transmitter frame for use in No. 1 crossbar and crossbar tandem offices, consists of two billing data transmitters. Each billing data transmitter serves up to ten regular AMA recorders plus the emergency recorder. It is designed as a placement for the AMA paper tape perforators. The billing data is gathered by the BDT and transmitted to a No. 1 automatic message accounting recording center where it is recorded on magnetic tape.

NOTICE

Not for use or disclosure outside the
Bell System except under written agreement

DESCRIPTION

1.04 The *perforator cabinet* shown in Fig. 1 is a single-sided, floor-supported steel enclosure. In the upper part, under a hinged cover with a transparent plastic window, are mounted the two perforators and associated fuse panels. In the space below, behind a hinged door, are the paper supply bins and the motor-driven take-up reels for storing the perforated tape.

1.05 The paper tape is supplied to the perforators in folded form from input bins. There are two such bins per perforator, each holding about 3000 feet of folded paper. The two bins are located one above the other so that the bottom end of the paper tape in the top bin can be spliced to the top end of the paper in the lower bin. In this way, a total of 6000 feet of tape is available to each perforator without renewing the supply. In practice, a second carton of paper is introduced after the top one is exhausted. At that time, the lower bin is shifted to the upper position, a fresh carton inserted in the second bin which is placed in the lower position, and the two lengths of tape spliced together. A 604C tool mounted on a dolly per ED-40006-01 is used for splicing the paper. The reels for taking up the perforated tape are motor driven under the control of a switch which is actuated by a movable arm in contact with the paper tape. When the output from the perforator reaches a certain amount, the motor is started and the reel rotated until the slack in the tape is taken up, whereupon the motor is stopped.

1.06 The *perforator and reader cabinet* encloses the perforator and reader associated with the maintenance recorder frame. The latter is used in No. 1 crossbar offices to supply a printed record of permanent signals, sender test calls, and line verification test calls. Information pertaining to these calls is entered on tape by the perforator, and the tape then fed through the reader. The latter, in conjunction with a printer circuit on the maintenance recorder frame, operates a teletypewriter located in the maintenance center. The record in perforated form is thus transcribed in printed form for the immediate use of the maintenance force. The paper tape to the perforator is supplied in folded form from a single input bin. The output from the reader is discharged by gravity into an output bin.

1.07 The perforator and reader cabinet is a single-sided, floor-supported steel enclosure having

the same construction and overall dimensions as the central office perforator cabinet described in 1.04. In the upper part, under a hinged cover with a transparent plastic window, are mounted a single perforator and its associated fuse panel. Directly below is mounted a reader. In the space below the reader are the input and output paper bins and the control relay and fuse protection for the reader motor. The starting and stopping of the reader motor is controlled by a movable arm in contact with the paper tape at a point between the output of the perforator and the input to the reader. When the tape output from the perforator reaches a predetermined amount, one of two mercury switches, fastened to the movable arm, operates and starts the reader. When the paper becomes taut, the other mercury switch operates to stop the reader after allowing any entry in progress to be completed. When sufficient slack paper again accumulates between the perforator and reader, the motor is again started.

1.08 Both the perforator cabinet and the perforator and reader cabinet use the same framework as is used in the accounting center with minor modifications to accommodate such variations as the fuse panels, door reader shelf, etc. The cabinets are 4 feet 4 inches high, 1 foot 10-1/2 inches wide, and 2 feet 8 inches deep. Each end of a cabinet line-up is finished with an end panel.

1.09 Forming a part of both the perforator and reader is a slide, which engages with a rubber-supported track in the cabinet as an aid in plugging the machine into its multicontact jack. A battery to operate the perforator magnets is supplied from an individual fuse panel located in back of the perforator. A pushbutton AT key is mounted beside each perforator for use in advancing the drum when starting paper through the perforator. The key is shown on SD-25872-01, Fig. 1 and SD-25601-01, Fig. 1.

1.10 A small jack and lamp cabinet contains the fuse alarm lamps, talking line jacks, test battery supply, etc. One of these cabinets is mounted on top of the first, fourth, and eighth perforator cabinets of a line-up in No. 1 and 5 crossbar and tandem crossbar offices; on the first and fourth cabinets in No. 1 step-by-step offices; on the first cabinet in step-by-step intertoll dialing office with CAMA; and on the first, fourth, seventh and tenth cabinets in No. 4A or 4M toll offices. A variation in this treatment may be necessary where the cabinets are in two lines;

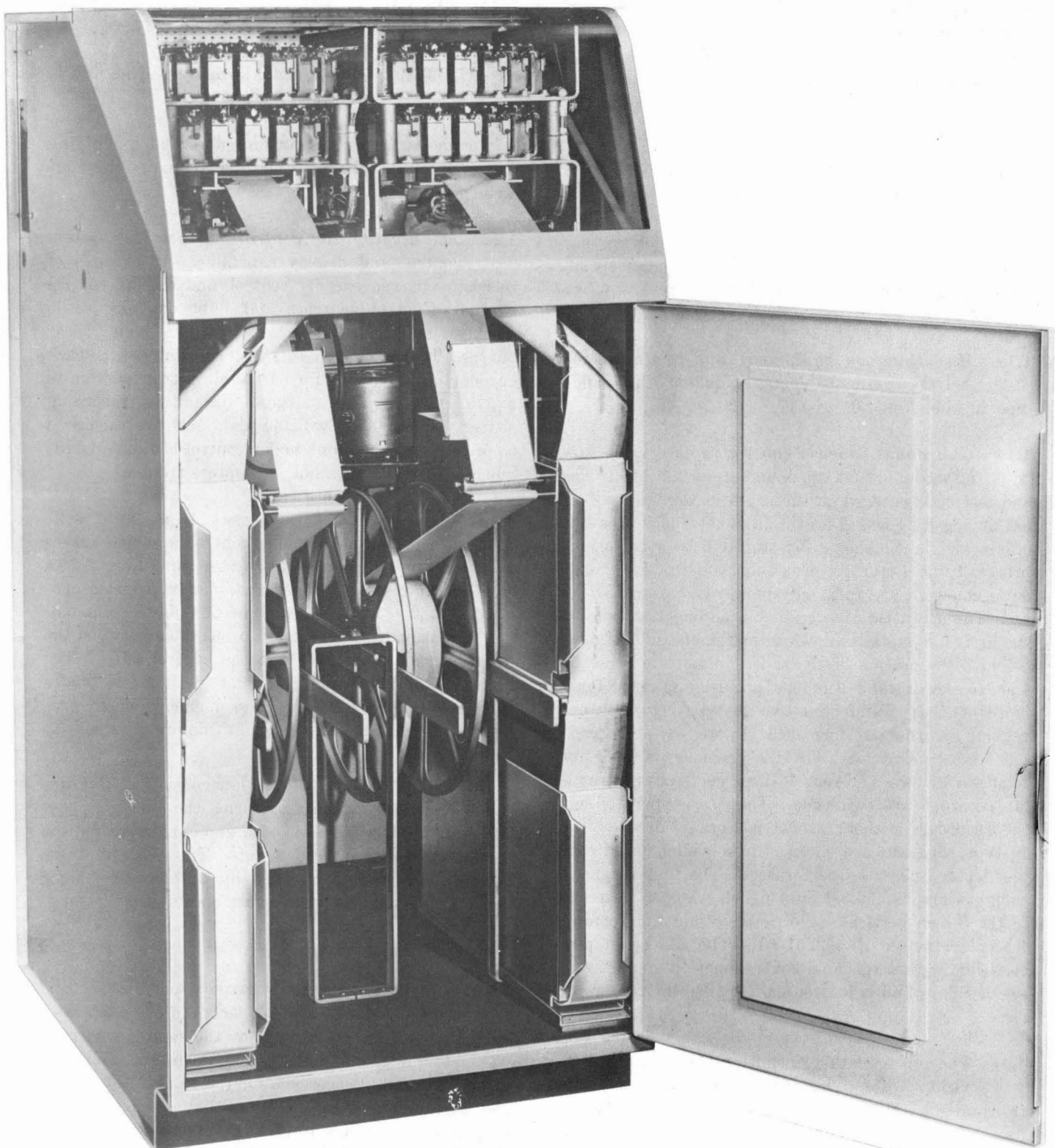


Fig. 1 — Central Office Perforator Cabinet

for example, should the first line in a No. 1 crossbar office be limited to eight perforator cabinets plus the maintenance recorder cabinet, it would be necessary to locate the third lamp cabinet on the ninth perforator cabinet in order that the second line-up could have access to test battery, telephone jacks, etc.

1.11 Equipment for testing and cleaning the central office perforators, and the reader associated with the maintenance recorder, is furnished in accordance with J49803 on an area basis. Carrying cases, as listed in Part 5, are available for transporting the perforators and reader from the central office to the test center.

1.12 Miscellaneous equipment and material for the perforator cabinets, including the paper tape, are listed in 4.01 to 4.17.

1.13 Call count process control registers are furnished to count the number of initial entries and test calls entered on the tapes of regular recorders during a 24-hour period. In No. 1 and 5 crossbar offices and in No. 1 step-by-step offices, a call count process control storage circuit and a set of four magnetic counters are furnished per group of transverters. The magnetic counters are used one at a time on successive days, thus allowing for the elapse of 4 days prior to the cutting of the tape. In tandem crossbar and No. 4A or 4M toll offices, provision is made for a lapse of 2 days and here two 14-type registers per regular recorder are furnished. In step-by-step inter-toll dialing offices with CAMA, provision is made for a lapse of 4 days and four 14-type registers per regular recorder are furnished. These are operated via the recorders without use of a storage circuit. The 14-type registers are enclosed in a wallmounted cabinet located near the perforators. The four magnetic counters are assembled on a panel, which is fastened to the 5-inch vertical cable rack serving the perforator cabinets (see ED-92861-10). The call count process control storage unit covered herein comprises a set of relays and is located on the miscellaneous relay rack.

1.14 The billing data transmitter frame makes provisions for mounting two billing data transmitters. Each BDT consists of the following units:

(a) J99381A—Display and Control Unit—One unit is required for each BDT

(b) J99381B—Encoder Unit—Two units are required for each BDT

(c) J99381C—Power and Alarm Unit—One unit is required for each BDT.

A modular fuse panel is mounted at the top of the frame and a miscellaneous plate is located in the middle of the frame.

1.15 The *display and control* unit provides system control and display capability. It consists of recorder control, encoder control, and display control boards. Control switches and light emitting diode displays are mounted on the faceplates of these boards. Two 202T data sets, one associated with each encoder, are provided for normal data transmission to a No. 1 automatic message accounting recording center (AMARC). Two 202S data sets are furnished to provide a dial-up link under control of the AMARC when the normal data link encounters trouble.

1.16 The *encoder* unit consists of an 8-bit self-checked programmable controller which serves as the microprocessor for the system and directs data to all other pieces of the encoder under program control. A 480 scan point and a 64 distribute point matrix are provided to serve as an interface between the programmable controller and the central office. The unit also contains an interface for the data sets and a 2048, 9-bit/word random access memory which provides a buffer for the billing data before it is sent to the AMARC.

1.17 The *power and alarm* unit consists of a power converter which transforms the -48 volt central office battery to +5, +15, and -15 volts for the encoder and associated data sets. The fuses for these voltages are located on this unit and provide major central office alarms when a fuse operates.

Floor Plan Arrangement

1.18 The maintenance recorder perforator and reader cabinet, and the central office perforator cabinets should preferably be on the same floor as the associated districts, trunks, and recorders, and they should be readily accessible for the removal of tape to the accounting office. Whether they are placed in a separate room will depend on building conditions and the amount of AMA equipment. In any case, the leads to the perforator magnets shall not exceed 1000 feet and to the paper advancemagnet (PAM) 350 feet.

The cabinets are single sided and normally are located against a wall or partition with the maintenance recorder cabinet in No. 1 crossbar offices at the head end of the line-up. A clearance of about 18 inches, minimum, is required at the head end of the line-up for entrance of cable. Clearance, with respect to an adjoining wall or column, is also needed at the right end of the line-up facing the front to permit the door in the end cabinet to be swung open approximately 180 degrees.

1.19 The location of the billing data transmitter frame is not critical but it should be close to the associated AMA recorders.

2. SUPPLEMENTARY INFORMATION

814-000-000—Step-by-Step Systems Index
 816-000-000—No. 1 Crossbar System Index
 817-000-000—Tandem Crossbar System Index
 818-000-000—No. 4 Type Toll Switching Systems Index
 819-000-000—No. 5 Crossbar System Index
 800-600-000—List of General Equipment Requirements
 J22455—816-105-150—Maintenance Recorder Frame
 J22457—816-104-100—Crossbar System No. 1—Automatic Message Accounting—General
 J22462—814-115-151, 816-108-150, 817-120-150, 818-108-150, 819-114-150—Recorder Frame
 J29253—817-010-100—General Outline—Tandem Crossbar System
 J29259—819-005-150—General Outline—No. 5 Crossbar System
 J49803—801-026-101—Testing Equipment Accounting Center No. 1—Automatic Message Accounting System
 J60103—818-031-150—Limiting Conductor Lengths—No. 4A and 4M Toll Systems
 J69202—818-005-150—General No. 4A Toll Switching System
 J69210—818-101-150—Conversion of No. 4A or 4M Offices to Provide CAMA Operation
 J86617—802-802-161—504B Plant—AC Supply Units With Emergency Operation From Battery
 Floor Plan Data—Section 9.2, Sheet 14
 Section 11.2, Sheet 3
 Section 5.2, Sheet 40
 Section 10.1, Sheet 42
 Section 9.2, Sheet 22 (BDT)

3. DRAWINGS

WE J drawings should be ordered by referring to the prefix and base number and requesting the current suffix dash (-) number.

Keysheets

SD-25000-01—No. 1 Crossbar System
 SD-25435-01—Tandem Crossbar
 SD-25760-01—No. 5 Crossbar System
 SD-32230-01—No. 1 Step-by-Step System—AMA
 SD-68400-01—No. 4A Toll Switching System
 SD-68470-01—No. 4M Toll Switching System

Circuits

SD-25574-01—Miscellaneous Circuit—Crossbar System No. 5
 SD-25601-01—Maintenance Recorder Circuit
 SD-25632-01—Miscellaneous Circuit for Perforator Cabinet and Perforator and Reader Cabinet—Crossbar System No. 1, Crossbar Tandem, Step-by-Step No. 1, Step-by-Step Intertoll Dialing Offices With CAMA and Toll Switching System No. 4A or 4M.
 SD-25642-01—Maintenance Reader and Printer Circuit
 SD-25872-01—Recorder Circuit
 SD-94863-01—Miscellaneous Circuit Billing Data Transmitter Frame
 SD-99001-01—Call Count Process Control Storage and Register Circuit

Equipment

ED-26301-11—Perforator Cabinet Assembly and Equipment
 ED-26303-10—Jack and Lamp Cabinet for Perforator Cabinet
 ED-26304-10—No-Voltage Alarm Unit
 ED-26339-11—Maintenance Recorder Perforator and Reader Cabinet—Equipment
 ED-92861-10—Call Count Process Control Register Equipment
 J22456A-()—Call Count Process Control Storage Unit
 J22456D-()—Billing Data Transmitter Frame

4. EQUIPMENT**Perforator Cabinets and Jack and Lamp Cabinet*****ED-26301-11—Central Office Perforator Cabinet and End Panels***

Group 1—Central office perforator cabinet arranged for two perforators.

Group 2—Equipment required per line-up arranged for left-to-right cabling.

Group 3—Equipment required per line-up for right-to-left cabling.

Group 6—Equipment required in first perforator cabinet in line-up in No 1 or No. 5 crossbar, tandem crossbar, No. 1 step-by-step, or No. 4A or 4M toll office.

Group 8—Equipment required per perforator in No. 5 crossbar office.

Group 9—Equipment required per perforator in No. 1, tandem crossbar, and No. 4A or 4M toll offices.

Group 10—Equipment required per perforator in No. 1 step-by-step office.

Group 11—One 16-inch reel.

Group 12—One 22-inch reel.

Group 13—Equipment always required in addition to group 8, 9, or 10 to provide for paper take-up alarm.

Notes

A. One perforator cabinet per group 1 is required for each two perforators in No. 1 and 5 crossbar, tandem crossbar, No. 1 step-by-step, and No. 4A or 4M toll offices, starting with the emergency and 0 perforators. Each cabinet includes the following items:

Cabinet framework for two perforators, including door assembly

Tracks for two perforators

Two—Paper guides

Two—Tape tensioners

115-volt Outlets

B. Groups 2 and 3 are furnished per cabinet line-up for left-to-right and right-to-left growth, respectively.

C. Group 6 covers among other items a terminal punching mounted in the first perforator cabinet

of each line-up to supply protective ground to the cabinet frameworks.

D. Groups 8, 9, and 10 are furnished for each perforator and include:

One—Perforator, KS-13882 L2

One—Jack for perforator

One—Fuse panel

Two—Input tape bins

One—Motor drive unit

One—Trip arm assembly

One—Advance tape switch (AT)

ED-26303-10—Jack and Lamp Cabinet

Group 1—Assembly and equipment for first jack and lamp cabinet in a No. 5 office.

Group 2—Assembly and equipment for second jack and lamp cabinet in a No. 5 office.

Group 3—Assembly and equipment for first jack and lamp cabinet in a No. 1 office.

Group 4—Assembly and equipment for second jack and lamp cabinet in a No. 1 or tandem crossbar office.

Group 5—Assembly and equipment for third jack and lamp cabinet in a No. 1 or tandem crossbar office.

Group 6—Assembly and equipment for first jack and lamp cabinet in a tandem crossbar office.

Group 7—Assembly and equipment for first jack and lamp cabinet in a No. 1 step-by-step office.

Group 8—Assembly and equipment for second jack and lamp cabinet in a No. 1 step-by-step office.

Group 9—Assembly and equipment for first jack and lamp cabinet in a No. 4A or 4M office.

Group 10—Assembly and equipment for second jack and lamp cabinet in a No. 4A or 4M office.

Group 11—Assembly and equipment for third jack and lamp cabinet in a No. 4A or 4M office.

Group 12—Assembly and equipment for fourth jack and lamp cabinet in a No. 4A or 4M office.

Group 13—Assembly and equipment for first jack and lamp cabinet in a step-by-step inter-toll dialing office with CAMA.

Note

- A. The jack and lamp cabinets are equipped with the necessary apparatus, including the lamps and stamped designations. They are fastened in position by means of four screws through holes in the top of the perforator cabinet. These holes and a fifth hole for the wiring are drilled by the installer.

ED-26339-11—Maintenance Recorder Perforator and Reader Cabinet

Group 1—Maintenance recorder perforator and reader cabinet.

Note

- A. Group 1 is furnished in No. 1 crossbar offices as part of the maintenance recorder, reader, and printer circuits. It includes:

Cabinet framework for one perforator and one reader, including door assembly

Tracks for perforator and reader

Jacks for perforator and reader

One—Perforator, KS-13882 L2

One—Reader, KS-13835 L4

One—Input tape bin, ED-40010-01,G1

One—Output tape bin, ED-40158-01,G2

One—Fuse panel

One—Trip arm assembly

One—Paper guide

One—AC relay, fuse, and mountings

Tape Bins, Reel, and Motor Drive Unit

4.01 Input Tape Bin ED-40010-01,G1: Two input bins are furnished with each central office perforator and one with the maintenance recorder perforator. Spare input bins are furnished, as specified by the telephone company.

4.02 Output Tape Bin ED-40158-01,G2: This bin is used in the maintenance recorder cabinet to receive the perforated paper. It is furnished with the cabinet.

4.03 Output Reel ED-40293-70,G1 or G2: The output reel is furnished with each perforator in

the central office perforator cabinets. This will be a 16-inch reel per ED-40293-70,G2 (capacity 500 feet) or a 22-inch reel per ED-40293-70,G1 (capacity 925 feet), as specified by the customer. The perforator cabinets are arranged accordingly. Spare reels are also furnished as specified.

4.04 Motor Drive unit ED-40263-01,G1: One of these units is furnished with each perforator in the central office perforator cabinet to drive the 16-inch reels. Spare drive units are furnished as specified.

Call Count Process Control Register Equipment**ED-92861-10—Call Count Process Control Register Equipment**

Group 1—Call count process control register cabinet arranged for two transverter groups of 20 recorders each for tandem and No. 4A or 4M toll offices. (See Note A.)

Group 2—Mounting plate required in addition to group 1 to provide for four regular recorders.

Group 3—Wiring and apparatus required in addition to group 2 for each regular recorder equipped.

Group 4—Call count process control register panel serving a transverter group in a No. 1 or 5 crossbar or step-by-step office. (See Note B.)

Group 5—Call count process control register cabinet arranged to count initial entries per recorder for No. 5 crossbar CAMA offices when a recorder serves CAMA traffic only or step-by-step intertoll dialing offices with CAMA.

Group 6—Mounting plate and apparatus required in addition to group 5 for each two regular recorders serving CAMA traffic only. Required for No. 5 crossbar CAMA offices. (See Note C.)

Group 7—Mounting plate and apparatus required in addition to group 5 for each two regular recorders serving CAMA traffic only. Required for step-by-step intertoll dialing offices with CAMA. (See Note D.)

Group 8—Apparatus per SD-99001-01, Fig. 5 option W only required in addition to group 4 in order to provide an additional day peg count. (See Note B.)

Notes

- A. Group 1 has call count register capacity for 40 recorders in two transverter groups. Group 2 covers a single mounting plate with capacity for eight 14-type registers for four recorders. Group 3 covers two 14-type registers with surface wiring for one recorder.
- B. Group 4 provides four magnetic counters, four networks, a terminal strip, and mounting panel. Group 8 provides an additional counter and network. The apparatus is wired per SD-99001-01, Fig. 5, by the installation force.
- C. Group 6 provides equipment for two Fig. 68 per SD-25574-01. This equipment is to be installer wired.
- D. Group 7 provides equipment for two Fig. 16 per SD-25632-01. This equipment is to be installer wired.

J22456A—AT&TCo Std—Call Count Process Control Storage Unit

List 1—Assembly, wiring, and equipment per SD-99001-01, Fig 4 and 6 for one call count process control storage unit for transverters 0, 1, 2, and 3.

List 2—Wiring and apparatus per SD-99001-01, Fig. 1, 2, or 3 required in addition to list 1 or 3 for each transverter equipped.

List 3—Mounting plate and mounting bars required in addition to list 1 for transverters 4, 5, 6, and 7.

J22456D—AT&TCo Std—Billing Data Transmitter Frame for use In No. 1 Crossbar, No. 4A Crossbar, and Crossbar Tandem Offices

List 1—Framework, assembly, wiring, and equipment for one billing data transmitter frame arranged to mount two billing data transmitters.

	WIRE	EQUIP	NOTES
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Misc Ckt, SD-94863-01:

Fig. 1, 2, 3, 4	1	1	A,B,C
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Notes

- A. List 1 provides the basic framework, fuse panel, and miscellaneous panel. Provision has been made

to mount two BDT on the frame; however, they must be ordered separately. Each BDT requires one J99381A unit, two J99381B units, and one J99381C unit. Refer to the unit equipment drawings for detailed ordering information.

- B. Two separate -48 volt, 20-ampere battery feeders are required for the supply to the frame fuse panel from two separate -48 volt distributing fuses.

- C. This frame has a 12-inch frame base.

Miscellaneous Equipment and Material

4.05 Perforator KS-13882 L2 is used in the central office and is furnished as listed under the perforator cabinet and the maintenance recorder cabinet. Spare perforators are furnished, as specified by the telephone company.

4.06 Reader KS-13835 L4 is used in No. 1 crossbar offices with the maintenance recorder and is furnished with the maintenance recorder cabinet.

4.07 Carrying case KS-14131 is used for transporting the perforators from the central office to the test center for lubrication, cleaning, and check of adjustment. It is furnished as specified.

4.08 Tool 649A is used with the KS-14131 carrying case to hold the perforator pins in an operated position so they will not jar out of place during shipment. One tool is required with each carrying case; it is furnished as specified.

4.09 Carrying case KS-14253 is used for transporting the reader from the central office to the test center. It is furnished when specified.

4.10 Tape mailing case KS-15542 of lightweight construction is used for mailing or carrying perforated KS-13887 tapes from the central office to the accounting center. The case will be per KS-15542 L1 or L2 as specified. The list 1 case will hold the following quantity of tapes:

QUANTITY	DIAMETER OF ROLLS	TAPE PER ROLL
2	16 inches	500 feet
4	12 inches	240 feet
5	11 inches	190 feet

QUANTITY	DIAMETER OF ROLLS	TAPE PER ROLL
6	10 inches	150 feet
8	9 inches	110 feet
12	8 inches	75 feet

The list 2 case will hold two 22-inch rolls of 925 feet each or approximately twice as many rolls of other sizes, as the case, per list 1.

4.11 Tape Handling Block P-171289: This is used in transferring the folded tape from the cartons to the input bins. It is furnished, as specified; normally one per floor plan group of perforator cabinets.

4.12 Perforator Paper KS-13887: This is an oiled and folded paper tape 3 inches wide used in the perforators. It is furnished in 3000-foot packs, three packs per carton, as specified.

4.13 Tape splicer, 604C tool is used in splicing the unperforated tape at the input bins in the perforator cabinet. The adhesive is supplied in the form of a thin narrow tape. A short length of this sealing tape is placed crosswise between the overlapping ends of the two lengths of paper tape that are to be joined, and heat and pressure are applied. The 604C tool holds the paper tapes and sealing tape in correct alignment while applying heat and pressure; it also includes means for trimming the free ends of the paper that extend beyond the splice, and a cutter for perforating the splice window which serves to operate a contact in the perforator. The electric heating element draws about 1/3 of an ampere. A 10-foot cord forming part of the tool may be plugged into one of the appliance outlets in the perforator cabinets or into a wall or adjacent frame outlet.

4.14 Heat sealing tape KS-13981 is used with the 604C tool in splicing the perforator tape. It is furnished in 150-foot rolls, as specified.

4.15 Splicer dolly ED-40006-01,G1 is available for holding the splicer tool at a convenient level and moving it in front of the perforator cabinets, as desired. In general, one splicer dolly and 604C tool are required for each floor plan group of perforator cabinets. Both items are furnished, as specified.

4.16 A commercial table 2 by 3 feet or larger should be furnished for each group of perforators as a working surface when transferring paper

tape from the cartons to the input bins, and when unloading the reels and transferring the tape to spare spools and to the mailing cases.

4.17 Tape reader KS-14343 is a template for identifying and reading the digits within a single line of perforations on the tape. It is used as an aid in analyzing trouble conditions, and is furnished as specified by the telephone company.

5. GENERAL NOTES AND INDEXES

Cabinet Alignment

5.01 The cabinets are lined up on the floor with shims, as required, and then fastened together with five screws and nuts through holes in the ends of the cabinets. The cabinets are not bolted to the floor.

Wiring and Cabling

5.02 All wiring is terminated directly on the apparatus within the perforator cabinets and consist of:

- (a) Switchboard cables from recorder frames terminating on the perforator and reader jacks.
- (b) Miscellaneous leads from the MDF, alarm equipment, master timing frame, etc, terminating largely in the jack and lamp cabinet.
- (c) Battery and ground leads between the fuse panel and the perforator jacks.

The latter are contained in a small local cable supplied with the cabinet. Battery, ground, and ac supply are covered in subsequent paragraphs.

5.03 The 48-volt signaling battery in crossbar and No. 4A or 4M toll offices shall be obtained over two 00 feeders supplied from separate 100-ampere fuses located in the main cross aisle at a point which is near the head of the perforator cabinet line-up and convenient for cabling. The 00 cables are carried on overhead cable racks to a point above the first cabinet in the line-up where two No. 2 cables are attached. Ground is supplied over a single 00 feeder in a corresponding manner, except the entrance conductor is a No. 6 cable instead of a No. 2. These entrance leads are then extended through the cabinet line-up and connected to the fuse panels on an odd and even basis as covered on the switchboard cabling drawings. A tap from the ground lead is connected to a terminal punching in the first perforator cabinet of the line-up

for the purpose of grounding the cabinet frameworks. Where the cabinets are in more than one line-up, a set of entering leads for each line-up is bridged on the overhead 00 feeders. The latter have sufficient capacity to serve the maximum number of perforators likely to be installed in one location. For those cases where, due to cabinet location, the signaling battery cannot be obtained from a feeder in the main cross aisle on the same floor, it will be necessary to run directly to the battery control board. A single battery feeder engineered for voltage drop is run to a KS-5534 fuse cabinet mounted on the cable rack above the perforator cabinets. Ground is supplied over a 00 lead from the power room. The above conditions are covered on SD-80909-01 for No. 1 and tandem crossbar, on SD-81197-01 for No. 4A or 4M, and on SD-81063-01 for No. 5 crossbar. No. 1 step-by-step offices and step-by-step intertoll dialing offices with CAMA are treated in the same manner, except the distributing fuses are located on the battery distributing fuse board (SD-80728-01).

5.04 The aisle pilot lamp for the fuse alarms in crossbar and No. 4A or 4M toll offices is normally located in the main aisle beneath the KS-5534 100-ampere fuse cabinet. Where the 48-volt supply is brought up from the battery control board and the KS-5534 fuse cabinet is mounted on the cable rack above the perforators, the aisle pilot mounting is located adjacent to the 100-ampere fuses, unless the perforator cabinets are in a separate room, in which case the fuse alarms may be connected to the floor alarm cabinet, or an aisle pilot mounting may be located outside the perforator room and the cabinets treated as a separate aisle. In step-by-step offices the aisle pilot for the fuse alarms is placed on an adjacent aisle pilot lamp mounting, unless the perforator cabinets are in a separate room, in which case the aisle pilot is treated as covered in the preceding sentence.

5.05 The ac supply for the take-up reel motors and the reader motor in the maintenance recorder cabinet, shall be obtained from the battery-operated emergency ac power plant. The following values shall be used in determining power plant drain.

	AMPERES FULL LOAD
Output Reel Motor	0.25
KS-5773 Reader Motor	1.70

One set of leads from the emergency ac power plant shall be furnished for each line of cabinets not

exceeding six perforator cabinets and a maintenance recorder cabinet. Where a line-up exceeds this limit, two sets of leads or branch circuits shall be furnished, and the ultimate load of the line-up divided approximately equal over the two circuits. This requirement is introduced for the purpose of limiting the number of perforators in the larger offices that might be affected by the failure of a branch circuit fuse, and is independent of marker group association of the recorders. Job conditions may make it desirable to exceed the recommended limit of six cabinets, as for example, a full marker group in two lines of five and seven cabinets each. Cases exceeding this limit should be discussed with the telephone company.

5.06 The ac leads shall be of a size to supply a normal minimum voltage of 110 at the first cabinet. The calculation for voltage drop may be made on a dc basis, since the reactance effect is small and may be neglected. Normally No. 12 or No. 10 gauge wire will suffice. If a larger gauge is indicated on a particular job, the conditions should be referred to Bell Laboratories. The ac supply circuits shall be fused at the emergency power plant with fusetrans having the next higher rated capacity beyond the connected motor load, plus a 2-ampere miscellaneous load.

5.07 The entering ac supply leads in the form of armored cable terminate in the first cabinet. Between cabinets, No. 14 gauge wire per KS-5482-01 is used and run in rigid conduit furnished with the perforator cabinets. In No. 5 offices, 2-conductor armored cable is run from a ceiling outlet connecting with the emergency ac supply and is terminated in the first perforator cabinet (see ED-81404-01). In No. 1 crossbar offices having six or less perforator cabinets, 2-conductor armored cable from the emergency ac supply unit is terminated in a box mounted on the left wall of the maintenance recorder cabinet, at which point a splice is made to two short lengths of 2-conductor armored cable going to the first perforator cabinet and to the fuse box for the reader motor. In No. 1 cross offices having more than six perforator cabinets, 4-conductor armored cable is used as far as the junction box in the maintenance recorder cabinet. At this point, one set of leads is treated as indicated above; the other set is spliced to No. 14 gauge armored cable which is carried down the line-up to the first cabinet served by the second ac circuit as shown on ED-26305-10. In tandem and No. 4A or 4M offices where there is no maintenance recorder cabinet and

no space in which to locate a splicing box, 2-conductor armored cable is used throughout, or 4-conductor armored cable may be used from the emergency ac supply unit to the outlet box containing the no-voltage alarm equipment and 2-conductor cable used from the point to the perforator cabinets. The two armored cables are brought through the end panel as described above, the cable for the first half of the line-up being diverted inside the end panel from the point of entrance to the 1-3/8 inch hole in the upper center of the side of the cabinet assembly. From this point, it is carried directly to the Hubbell outlet in the first cabinet. The second armored cable is threaded through the rear hole in the side panels of the cabinets served by the first ac circuit and terminated in the first Hubbell outlet of the second portion of the line-up (see ED-26305-11). For cabinet line-ups requiring but one ac supply circuit, including step-by-step offices, the armored cable is brought into the line-up through the slot in the end panel below the cable opening and extended to the Hubbell outlet in the first perforator cabinet.

5.08 The above description covers the usual case where the cable is brought in at the head end of the line-up, that is, at the maintenance recorder cabinet or at the cabinet for the E and O perforators. A variation will occur where the ultimate line-up is installed initially and, because of floor plan conditions, it becomes necessary to locate the cable rack at what would normally be the growing end. For the case involving a single ac circuit, the entering supply leads are terminated in the outlet box in the last cabinet and continued with No. 14 gauge wire through the line-up to the first perforator cabinet or to the fuse box in the maintenance recorder cabinet.

5.09 *To provide for growth in the cabinet line-up,* certain leads as detailed on the cabling drawings shall be furnished long enough to reach the next cabinet or the next jack and lamp cabinet. The ends of the leads shall be taped, and the excess length beyond the last installed cabinet stored inside the end panel. Switchboard cables from recorders installed on an addition need not be fastened to the cable brackets in the existing cabinets. Instead, they are pulled through the cabinets and allowed to rest loosely on the floor of the runway. In this way, existing perforators and fuse panels need not be disturbed during the addition.

5.10 An *ac no-voltage alarm circuit* is furnished with each branch circuit supplying power to the reel motors, for the purpose of indicating a blown

or open fuse at the emergency 115-volt ac supply unit in the power room. It takes the form of a small transformer having the primary winding bridged across the brace circuit and the secondary side connected to two varistors and a normally operated relay associated with the central office alarm system. The failure of a branch circuit fuse actuates the central office alarm system in the usual way, and lights an NV lamp at the transverter trouble indicator frame, master test frame, or trouble recorder frame. A designation strip above the NV lamp associates the alarm with the perforator cabinets, and where there is more than one lamp, gives the number of the ac branch circuit to the reel motors. The transformer along with a 100-type resistance are housed in a junction box mounted on the vertical 5-inch cable rack serving the cabinet line-up. The varistors, normally operated relay, test jack, and NV lamp are mounted on the transverter trouble indicator frame in No. 1 crossbar offices, on the transverter trouble indicator or trouble recorder frame in tandem offices, on the master test frame jack bay in No. 5 offices, and on the trouble recorder frame in step-by-step and No. 4A or 4M toll offices. The transformer circuit is shown on SD-25632-01 for No. 1, 4A, or 4M crossbar tandem and step-by-step offices, and on SD-25574-01 for No. 5 offices. The mounting and wiring of the transformer and resistance are shown on ED-26304-10. This feature can be added in existing offices by cutting the armored cable at the proper point on the vertical cable rack, removing the armor, and terminating the two ends in the box. If the necessary several inches of slack cannot be obtained in the overhead run, the leads shall be extended by short pieces of KS-5482-01 wire using solder or approved solderless connections.

5.11 A paper take-up alarm is provided for the purpose of monitoring the operation of the paper take-up mechanism in the perforator cabinet and to activate the major alarm if the paper tape fails to properly accumulate on the take-up reel. Failure of the paper tape to be taken up on the storage reel can occur when the take-up motor fails, take-up reel jams, or the paper tape becomes caught on the inside of the cabinet. Any of these conditions will cause the take-up control arm to remain in its lowest position. When the take-up arm remains in this position for at least one minute, an alarm lamp is lighted on the master timing frame indicating which cabinet is in trouble and the major alarm is activated. The lamp signal and alarm can only be retired by correcting the trouble condition in the cabinet.

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 are those of the issue in which the rating was first applied.

EQUIPMENT	RATING	DETAILS LAST SHOWN IN ISSUE	REPLACING EQUIPMENT
ED-26301-10, G4	Mfr.Disc	4	ED-26301-10, G8
ED-26301-10, G5	Mfr.Disc	4	ED-26301-10, G9
ED-26301-10, G7	Mfr.Disc	6	ED-26301-11, G6

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