

100 AND 200 POINT LINE FINDERS
10-, 16-, AND 20-CAPACITY LINE FINDER SHELVES
CONTROL AND LOCKOUT FEATURES
NO. 355A OFFICE
EQUIPMENT DESIGN REQUIREMENTS
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 manufacture and installation of 100- and 200-point line finders and line finder units for use in 355A dial offices. Lists are also included to permit ordering this equipment for use as additions to 35E97 offices.

1.02 This specification is reissued to incorporate previous appendix changes.

Description

1.03 This line finder equipment provides means for finding a calling subscriber line and connecting it to a first selector. The lines served by one group of line finders may be flat rate, restricted or extended scope, postpay, prepostpay, or prepay coin or message rate on an individual line basis. Provision is made for combining two or three of any of the above classes in the same group where desirable except for prepay coin lines which have to be segregated.

1.04 *The line finders* are 200-point for mounting on units of 16 or 20 capacity and 100-point for mounting on units of ten capacity. Present standard units employ solderless type banks. However, "A&M Only" supplementary 10-capacity, 200-point line finder units with mechanized soldered type banks are available for addition to existing initial 10-capacity, 200-point units. All of these units serve the following classes of subscriber lines:

Flat rate — individual, PBX, or party line
Message rate — individual

Coin box — postpay dial
Coin box — prepostpay dial
Coin box — prepay dial

Flat rate lines, PBX trunks, and message rate lines may be operated on either an extended or restricted scope basis. Coin box lines may be operated on an extended or restricted scope basis but all coin lines in an office must have the same scope.

1.05 *The 200-point line finder units* will mount 3- or 4-wire line finders and are furnished in two arrangements, one in which 20 per cent of the lines are arranged for permanent signal lockout and the other in which all the lines are arranged for lockout. In either case, lines arranged for lockout are wired universally and may or may not be equipped for lockout, lines equipped for lockout being furnished in groups of five circuits each. In addition to the line finders, the units are arranged to mount the subscriber line equipment, the control units, common control equipment, testing equipment, alarm equipment, and fuse panel. The 200-point units are arranged for 16- or 20-finder capacity. All units mount on a switch frame 6 feet, 1/2 inch wide.

1.06 *The 100-point line finder units* mount 3- or 4-wire line finders and are furnished in two arrangements, one in which 20 per cent of the lines are arranged for permanent signal lockout and the other in which all the lines are arranged for lockout. In either case, lines arranged for lockout are wired universally and may or may not be equipped for lockout. In addition to the line finders, the units are arranged to mount the subscriber line equipment, two control units, and other common control equipment, testing equipment, alarm equipment, and

fuse panel. Both units mount on a switch frame 6 feet, 1/2 inch wide.

1.07 Two common control circuits are provided per unit of 100- or 200-point line finders. The control circuits, which include a distributor switch, direct a chosen line finder to the calling line and then preselect another line finder in preparation for the next call. Each control circuit controls half the line finders and ordinarily serves a fixed group of half of the lines, but in case of trouble, or if all the finders served by one control are busy, the call or calls will be automatically transferred to the other group of line finders.

1.08 In the following paragraphs, a *line finder group* refers to the finders associated with one control unit and serving as first preference the half of the lines, referred to as a *line group*, which appear on the lower five levels of all finders in that group. These "groups" are designated "A" and "B" and are distinct from the office line finder and line groups which constitute all of the finders and lines on a 100- or 200-point line finder unit, and are numbered 1 up in the office.

1.09 No slip is provided in the multiple between successive banks. Reversals are provided between the banks of the "A" and "B" line finder groups so that the hunting for a line is not only usually limited to the lower five levels in the home group but the lines in the "B" group are arranged in such a way that the lines on each level as well as the levels themselves are completely reversed.

(a) **200-line Units:** In these line finder units, the reversal described below is obtained on units with solderless type banks by means of bank multiple wire extensions between the two shelves. Extra lengths of the bank multiple wire are provided in the machine wiring process between the last banks of the two shelves. This bank wire is tied together in a local form between shelves.

(1) In connecting the lines to the banks of the 200-line unit, the "T" and "R" leads for the first 100 lines are connected to levels 1 to 10 of the lower line bank of the "A" line finder group and are connected in reverse order on each level to levels 10 to 1, inclusive of the lower line bank of the "B" line finder group. For ex-

ample, lines 11 to 10 appear on the first level of the lower line bank of the "A" line finder group in that order. These same lines appear on the tenth level of the lower line bank of the "B" line finder group in reverse order, that is, 10 to 11.

(2) The second 100 lines, numbered 111 to 100, appear in a similar manner on the upper line banks of the two line finder groups. The "S" leads for the two hundred appear in similar order on the lower and upper terminals respectively of the top banks; and the "A" leads for 4-wire line finders similarly appear on the bottom banks.

(3) With this arrangement, the "A" group of line finders ordinarily serves the first 50 lines of each 100 (that is, 11 to 50 and 111 to 150) while the "B" group of line finders ordinarily serves the second 50 lines of each 100 (that is, 61 to 100 and 161 to 200).

(b) **100-line Units:** In these line finder units, the reversal described below is provided in a bank multiple wire extension behind the control units between finders 5 and 6.

(1) In connecting the lines to the banks of the 100-line unit, the "T" and "R," and "S" and "A" leads for the 100 lines are connected to levels 1 to 10 of the line banks (lower) and "S" and "A" banks (upper), respectively, of the "A" line finder group and are connected in reverse order to levels 10 to 1, inclusive, of these banks of the "B" line finder group. For example, lines 11 to 10 appear on the first level of the banks in the "A" line finder group in that order. These same lines appear on the tenth level of the banks of the "B" line finder group in reverse order, that is, 10 to 11.

(2) With this arrangement, the "A" group of finders ordinarily serves the first 50 lines (11 to 50) while the "B" group finders ordinarily serves the second 50 lines (61 to 100).

1.10 Line load control is an arrangement for insuring the service on certain essential lines, by denying originating service temporarily to others during an overload. In order to do this, the lines served by each line finder unit are divided into three classifications. Class "A"

will include those lines whose originating service must be insured. This class will usually comprise about 20 per cent of the lines on each unit and ordinarily levels 1 and 10 of the line finders will be assigned to this class. Classes "B" and "C", usually comprising 40 per cent each, may be denied service temporarily in order to make the facilities available to the class "A" lines. Levels 2 to 9 will ordinarily be assigned to classes "B" and "C" on a consecutive basis. However there may be some cases where it may be advantageous to assign more than four levels to either class "B" or "C," so that the shop should be prepared to connect "ST" leads for any six levels to either the B or C relay on either a consecutive or nonconsecutive basis.

1.11 Line load control is applied on these units by connecting the "ST" leads of those levels assigned to either class "B" or class "C" through the contacts of the B or C line load control relay on the line finder unit. These two relays should be mounted on a line finder unit and wired only where specified by the telephone company. Keys and lamps for controlling these relays are located in the line load control cabinet per ED-30819-01, Fig. 3 or 4. In the event that it is desired to locate restoring keys per Fig. 9 and lamps per Fig. 10 of SD-32069-01 on the line finder units of a large 355A office, this arrangement shall be considered special and the apparatus shall be mounted on the units on a job basis.

1.12 *Ten-cent initial charge coin lines:* Because of the difficulty of modifying the 2-step combination line and cut-off relay to

serve prepayment ten-cent initial coin charge lines in 355A dial offices, it is necessary that auxiliary line circuit, SD-30882-01, be used preceding the line circuit. No change in the coin box trunk circuit is required.

1.13 In offices where common control or non-compatible TOUCH-TONE is added, an auxiliary terminal strip shall be added to the jack of each line finder associated with flat rate or one party message rate lines. The connecting information is shown on converter trunk SD-32326-01 and register trunk and link SD-32353-01 circuits.

2. SUPPLEMENTARY INFORMATION

814-000-000 — Step-by-Step Systems Index
AA128.006 — List of General Equipment Requirements Sections
J38805 (814-005-151) — 355A Dial Office

3. DRAWINGS

For additional drawings forming a part of this specification, see listings under Subdivisions of Equipment and Detailed Index.

ED-30055-01 — Bank Support
ED-30278-01 — Wiper Cords
ED-30589-01 — Assembly of Switch Frame
ED-30695-01 — 200-point, 3- or 4-wire Line Finder Unit Arranged for Lockout on 20 Per Cent of Lines
ED-31909-01 — 200-point Line Finder — 4-wire
ED-31984-01 — 100-point Line Finder — 3- or 4-wire
ED-32000-01 — 200-point Line Finder — 3-wire
SD-31780-01 — 355A Dial Office

SUBDIVISIONS OF EQUIPMENT AND DETAILED INDEX

CIRCUIT DRAWING	EQUIPMENT CODE	RATING OF UNIT	TITLE	EQUIPMENT DRAWING
SD-31909-01	ED-31909-01	A&M Only	200-point Line Finder — 4-wire	—
SD-31984-01	ED-31984-01	A&M Only	100-point Line Finder — 3- or 4-wire	—
SD-32000-01	ED-32000-01	A&M Only	200-point Line Finder — 3-wire	—
SD-31777-01	J32006A	A&M Only	200-point Line Relay Unit — 10 per cent Lockout	ED-30587-01
SD-31777-01	J32006B	A&M Only	100-point Line Relay Unit — 10 per cent lockout	ED-30588-01
SD-31777-01	J32006C	A&M Only	200-point Line Relay Unit — 100 per cent Lockout	ED-30658-01
SD-31777-01	J32006E	A&M Only	Line Equipment Arranged With or Without Line Lockout Relays	ED-30695-01

4. EQUIPMENT

ED-31909-01 — 200-point, 4-wire Line Finder With Tone (or Level) Distinction for One or Two Groups of Lines

ED-31984-01 — 100-point, 3- or 4-wire Line Finder With No Tone (or Level) Distinction or With Tone (or Level) Distinction for One or Two Groups of Lines (See Note A)

Note

A. This line finder may be used for additions on jobs having line finders per ED-31778-01 or ED-31875-01.

ED-32000-01 — 200-point, 3-wire Line Finder With No Tone (or Level) Distinction or With Tone (or Level) Distinction for One or Two Groups of Lines (See Note A)

Note

A. This line finder may be used for additions on jobs having line finders per ED-31731-01.

J32006A (A&M Only) — Unit for 16 or 20, 200-point Line Finders With Associated Control Equipment and Subscriber Line Equipment — Arranged for Lockout on 10 Per Cent of Lines

Equipment — ED-30587-01

List 5 — Assembly, wiring, and equipment required in addition to list 1 or 2 for 15 subscriber lines (21 to 00 and 121 to 100) not arranged for permanent signal lockout, per SD-31777-01, Fig. 1, with "X" wiring and surface wiring for "BAT," "GRD," and "ST" leads only.

Note

A. The line relays and line finders shall be equipped in alternate order between the two groups of a unit and on partially equipped units. The groups of line circuits which include the test lines 50 and 100 shall be equipped first. (See 5.07.)

J32006B (A&M Only) — Unit for Ten, 100-point Line Finders With Associated Control Equipment and Subscriber Line Equipment — With 3- or 4-wire Multiple Banks and Arranged for Lockout on 10 Per Cent of Lines

Equipment — ED-30588-01

List 8 — Assembly, wiring, and equipment required in addition to list 1 for 15 subscriber lines (21 to 00) not arranged for permanent lockout per SD-31777-01, Fig. 1, with "X" wiring and surface wiring for "BAT," "GRD," and "ST" leads only.

Note

A. The line relays and the line finders shall be equipped in consecutive order on the unit and on partially equipped units. The group of line circuits which include the test line 50 shall be equipped first.

J32006C (A&M Only) — Unit for 16 or 20, 200-point Line Finders With Associated Control Equipment and Subscriber Line Equipment — Arranged for Lockout on All Lines

Equipment — ED-30658-01

List 3 — Assembly, wiring, and equipment required in addition to list 1 or 2 for five subscriber lines not arranged for permanent signal lockout, per SD-31777-01, Fig. 1, with "X" wiring, surface wiring for all leads except "T," "R," and "S."

List 4 — Assembly, wiring, and equipment required in addition to list 1 or 2 for five subscriber lines arranged for permanent signal lockout, per SD-31777-01, Fig. 2, with "X" wiring, surface wiring for all leads except "T," "R," and "S."

Note

A. The line relays and line finders shall be equipped in alternate order between the two groups of a unit and on partially equipped units. The groups of line circuits which include the test lines 50 and 100 shall be equipped first. (See 5.07.)

J32006E (A&M Only) — Line Equipment for Line Finder Units Arranged With or Without Line Lockout Relays for Use With J32006F, J32006J, J32006K, J32006L, J32006M, and J32006N

Equipment — ED-30695-01

List 1 — Assembly, wiring, and equipment for ten subscriber lines not arranged for permanent signal lockout, per SD-31777-01, Fig. 1, with "X" wiring, surface wiring only.

List 2 — Assembly, wiring, and equipment for five subscriber lines equipped with permanent signal lockout, per SD-31777-01, Fig. 2, with "X" wiring, surface wiring only.

List 3 — Assembly, wiring, and equipment for five subscriber lines arranged, for but not equipped with permanent signal lockout, per SD-31777-01, Fig. 1, with "X" wiring, surface wiring only.

List 4 — Wire, KS-13614, List 4 condenser, and 25A terminal punching per SD-31777-01, Fig. 1, and 2, "S" option only, required in addition to list 1, 2, or 3 to arrange one line for class-of-service tone in 35E97 offices (see note A).

Note

A. In 35E97 offices, lines that require class-of-service tone per SD-31777-01, Fig. 1 and 2, "S" option, shall be equipped with a KS-13614, List 4 condenser by suspending the condenser between the proper terminal of the line circuit relay and a 25A terminal punching located beneath a mounting screw of the relay. Condenser and terminal punching shall be mounted and wired by the installer on lines designated by the telephone company.

5. GENERAL NOTES

5.01 Line finder units are normally equipped before shipment with line finders, line finder jacks, line relays, control equipment, mul-

multiple banks, terminal strips, alarm equipment, fuse panel, and local cable.

5.02 The units on each frame shall be equipped from top down.

5.03 The units shall be designated LG1, LG2, LG3, etc, in numerical sequence throughout the office. The designations shall be stamped on the right frame upright in accordance with Section AA613.011.

5.04 The wire used for local wiring on the line finder switches and control units for 200-point line finders have red insulation for the ground lead and white insulation for the battery lead. All other leads shall have green insulation, except for the limited use of color codes where necessary for lead identification, such as in local forms between apparatus on the front and rear of the mounting plate.

5.05 Line circuits to be arranged for operation with trunks from selector levels of 701A, 711A, 702A, or 740 type PBXs either with or without PBX long trunk circuit, or, from selector levels of 700C or 710C PBXs with a PBX long trunk circuit, or from selector levels of 700C or 710C PBXs having PBX equipment which has been modified to reduce the unguarded interval when the central office disconnects first, shall be modified by the installer as follows: On the L relay of nonlockout lines; remove the strap between terminals 1B and 6BR, and on the L relay of lines equipped for lockout, remove the strap between terminals 1B and 8BR.

5.06 The line relays on partially equipped units shall be furnished in the order given in the table below for each type of unit. The line relay unit containing the test lines should in all cases be equipped first as shown. Where line groups contain lines of two or more classes, consideration also should be given to such factors as (a) the proper association of lines with levels involving normal postspring operation, and (b) any desired provision of space for ultimate growth within each class of lines, although from a circuit standpoint it is not necessary to assign lines of a given class to consecutive levels.

16- & 20-FINDER CAP. 200- POINT UNIT	LINES FOR ADD. 10-FINDERS FOR 200- POINT UNIT (A&M ONLY)	10-FINDER CAP. 100- POINT UNIT	EQUIPMENT	RATING	DETAILS LAST SHOWN IN ISSUE	REPLACING EQUIPMENT
51-50		51-50	J32006B,L1 to L7	Mfr Disc.	4	J32006G
161-160		11-10	L8	A&M Only	6	—
11-10		01-00	L9 to L11	Mfr Disc.	4	J32006G
01-00		21-20	J32006C,L1			
21-20		91-90	& L2	Mfr Disc.	5	J32006J
91-90		31-30	L3 & L4	A&M Only	6	—
31-30		81-80	L5 to L8	Mfr Disc.	5	J32006J
81-80		41-40	J32006D	Mfr Disc.	9	—
41-40		71-70	L1 to L4	Mfr Disc.	4	J32006H
71-70		61-60	L7 & L8	Mfr Disc.	4	J32006H
61-60	161-160		J32006E	A&M Only	8	—
111-110	111-110		J32006F	Mfr Disc.	8	J32007D
101-100	101-100		L1 to L3	Mfr Disc.	7	J32006K
121-120	121-120		L4	A&M Only	8	—
191-190	191-190		L5 to L8	Mfr Disc.	7	J32006K
131-130	131-130		L9	A&M Only	8	—
181-180	181-180		L13 & L14	A&M Only	8	—
141-140	141-140		L15 to L19	Mfr Disc.	7	J32006K
171-170	171-170		J32006G	Mfr Disc.	7	J32006L
151-150	151-150		J32006H	Mfr Disc.	7	J32006N
			J32006J	Mfr Disc.	8	J32007D
			L1 to L3	Mfr Disc.	7	J32006M
			L4	A&M Only	8	—
			L5 to L7	Mfr Disc.	7	J32006M
			L8	A&M Only	8	—
			L9 to L12	Mfr Disc.	7	J32006M
			L13 & L14	A&M Only	8	—
			L15 to L19	Mfr Disc.	7	J32006M
			J32006K	Mfr Disc.	8	J32007D
			L6,L11			
			to L16	A&M Only	8	—
			J32006L	Mfr Disc.	8	J32007D
			L4 & L9	A&M Only	8	—
			J32006M	Mfr Disc.	8	J32007D
			L6,L11			
			to L16	A&M Only	8	—
			J32006N	Mfr Disc.	8	—
			L4 & L9	A&M Only	8	—

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
ED-31909-01	A&M Only	8	—
ED-31922-01	Mfr Disc.	8	—
ED-31922-01			
G6,G7	A&M Only	8	—
ED-31984-01	A&M Only	8	—
ED-32000-01	A&M Only	8	—
J32006A,L1			J32006F,
to L4	Mfr Disc.	4	L10
			to L14
L5	A&M Only	5	—
L6	Mfr Disc.	1	J32006A,L8
			& L9
L7 to L10	Mfr Disc.	4	J32006F,
			L10
			to L14
			J32006L
			L4 & L9
			J32006M
			L6,L11
			to L16
			J32006N
			L4 & L9

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