

SWITCHING SYSTEMS MANAGEMENT
NO. 3 ELECTRONIC SWITCHING SYSTEM
ASSIGNMENT ADMINISTRATION
GENERAL ASSIGNMENT RECOMMENDATIONS

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each concentrator contains three switch groups; each switch group contains eight switches; and each switch contains eight levels. One line, trunk, or service circuit can be connected to one level. Each level is identified by an office equipment number (OEN).

1.04 For a detailed description of the No. 3 ESS switching network, see DFMP, Division H, Section 11a, System Description.

1.05 Refer to the following DFMPs, Division H, for other assignment administration procedures:

- Section 11o(2), New Offices
- Section 11o(3), Working Offices
- Section 11o(4), Office Additions
- Section 11o(5), Office Records.

2. ASSIGNMENT RECOMMENDATIONS

2.01 Assignment restrictions in the No. 3 ESS are few. Any OEN can be assigned as follows:

- (a) To any telephone number or class of service.
- (b) To any line which (1) is essential or a member of a hunt group, (2) has custom calling service, or (3) is attached to a special line circuit.
- (c) To any line which has TOUCH-TONE® calling or a special billing number.
- (d) To any trunk or service circuit.

1. GENERAL

1.01 This section (a) lists rules which the network administrator must follow in making line and trunk assignments in the No. 3 ESS and (b) describes the distributing frame and the arrangement of office equipment in the No. 3 Electronic Switching System (ESS) office.

1.02 Whenever this section is reissued, this paragraph will contain the reason.

1.03 Each network frame contains one concentrator group. A concentrator group can contain a maximum of 384 lines, trunks, and service circuits. Each concentrator group contains two concentrators;

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2.02 One restriction which does exist, however, is that ground start lines must be assigned to only particular OENs as outlined later in this section.

2.03 The following paragraphs outline assignment recommendations concerning particular characteristics of a customer line or a trunk group. Translation forms used for initial input of translation information are mentioned. The identification of No. 3 ESS translation forms has the format ESS 3XXX, where X is any digit from 0 to 9. For further information on the translation forms mentioned, see the No. 3 ESS Translation Guide, TG-3.

Telephone Numbers

2.04 The assignment of telephone numbers is done on the ESS 3100 form. Telephone numbers appear in numerical order. Beside each telephone number, the assigned OEN, equipment, and features are listed. Information on this form is used to build translation information in memory for each line. Before preparing the form, the network administrator must assign an OEN to each telephone number.

Class of Service

2.05 All classes of service which can be provided by the No. 3 ESS office are defined by line class codes established on the ESS 3306 form. Any class can be assigned to any OEN. However, classes should be evenly distributed for good load balance.

Essential Service

2.06 Unlike other switching systems, the No. 3 ESS does not have particular terminals designated for essential service. In the No. 3 ESS, any line designated in translations as essential will receive preferential treatment when dynamic service protection is in effect. The line may be assigned to any OEN. Lines are designated as essential on the ESS 3100 form. It is currently recommended that the number of lines marked as essential not exceed 10 percent of all working lines in the office.

Hunt Groups

2.07 In the No. 1 and the No. 2 ESSs, it is possible to use one telephone number for all members of a multiline hunt group. In the No. 3 ESS, each member of a multiline hunt group **must** have a telephone number. Series completion (telephone number hunt) is also available in the No. 3 ESS. Hunt groups consisting of 16 or more members **must** be multiline hunt groups and not series completion groups. A group of less than 16 may be either series completion or multiline hunt; however, if there is a good possibility that a hunt group may grow to 16 or more members, it should be originally established as multiline hunt. A single line may be assigned as the only member of a multiline hunt group to obtain individual data on the line for special studies. (See DFMP, Division H, Section 11h, Network Administration and Maintenance Measurements.) Only one member of a particular series completion group or multiline hunt group should be assigned to a particular switch and concentrator if possible in order to maintain reasonable accessibility. Hunt groups are assigned by using the ESS 3100 and 3105 forms.

Custom Calling Service

2.08 Lines with any custom calling feature (Call Waiting, Call Forwarding, Speed Calling, Threeway Calling) may be assigned to any office equipment number. However, custom calling features cannot be assigned to 2-party, 4-party, and 8-party lines; and not all features can be assigned to multiline hunt group lines.

Special Line Circuits

2.09 Some lines may be cross-connected to special line circuits. Special line circuits available in the No. 3 ESS are as follows:

- (a) **Public Emergency Line Circuit (SD-26164-01):** This circuit is used to terminate up to ten different simultaneous calls to a public emergency line (eg, fire department) and to ring the station or stations on this line. After determining the emergency, the answering station operates a key which causes the circuit to sound a siren.
- (b) **Group Alerting Line Circuit (SD-95883-01):** This circuit provides means, independent of the switching network,

to alert a special group of customers over regular message telephone lines. This circuit, typically used for volunteer fire departments, may be activated from up to three remote control points.

(c) ***Emergency Line Circuit (SD-96469-01):***

This circuit is used to allow telephone company operators to complete direct emergency calls (independent of the switching machine) to police, fire, or other emergency lines. It also allows these operators to bridge across existing calls to these lines. Since the circuit is applied only to terminal hunting groups, additional incoming calls from the switching machine will hunt for an idle terminal.

(d) ***Noise Immunity Line Circuit (SD-3H208-01):***

The noise immunity line circuit is used when excessive environmental noise is present which exceeds the operating characteristics provided by the normal line sensor. Both loop and ground start types of circuits are available.

(e) ***Dial Tone First Coin Line Circuit (SD-3H205-01):***

This circuit is used with each dial tone first coin line.

2.10 Any OEN may be assigned to a line connected to a special line circuit. The network administrator should keep a record of lines assigned to a special line circuit.

Trunk Groups

2.11 The assignment of trunk group numbers is done on the ESS 3202 form. Trunk group numbers appear in numerical order. Beside each trunk group number appear columns in which to enter (a) the circuit code of trunk circuits in the group, (b) the traffic schedule on which the measurements for the trunk group will appear, and (c) the highest member number of the trunk group. The highest member number chosen may be higher than the number of trunks in the group. Choosing a realistically higher number allows for growth of the trunk group without memory rearrangements which must be accomplished by the Network Maintenance force.

2.12 The network administrator should make a realistic evaluation of trunk growth when making spare trunk number assignments. If trunk assignments are performed by someone other than

the network administrator, that person should be consulted before making spare member number assignments.

2.13 Individual trunks are assigned to OENs on the ESS 3201 form. A trunk may be assigned to any OEN. The network administrator is responsible for assigning the OEN, trunk group number, member number, and circuit code on the ESS 3201. Other columns of this form are completed by the Western Electric engineer for an initial job or an addition.

Trunk Circuit Codes

2.14 All members of a particular trunk group must have the same circuit code. A separate inactive trunk group number may be established for each circuit code used in the office in which to place new trunks for testing before reassigning them to working trunk groups.

Customer Digit Receivers

2.15 Customer digit receivers—dial pulse (CDR-DP) and customer digit receivers—TOUCH-TONE (CDR-TT) have different circuit codes, but they may be assigned to the same trunk group. CDRs-TT may be assigned to a CDR-DP group, but CDRs-DP must never be assigned to a CDR-TT group. If a CDR-TT is placed in a CDR-DP group, no wiring changes are necessary to disable the TOUCH-TONE applique of the CDR-TT; however, the CDR-TT circuits should be the highest member numbers of the CDR-DP group.

2.16 When a single-party line with TOUCH-TONE calling or a 2-party, 4-party, or 8-party line with one or more parties with TOUCH-TONE calling goes off-hook, the line is connected to a CDR-TT and receives dial tone. If a party on the 2-party line which does not have TOUCH-TONE calling generates TOUCH-TONE signals, the ESS will disregard them. However, this screening is not possible on the 4-party and 8-party lines.

2.17 If the number of customers with TOUCH-TONE service is expected to increase during the life of the office job, (a) the number of CDRs-TT should be engineered for requirements at the end of the job and (b) the number of CDRs-DPs should be engineered for requirements at the beginning of the job or end of the job, whichever is the greater number.

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Ground Start

2.18 Ground start lines are the only lines assigned to particular OENs. The office equipment to which ground start lines may be assigned are designated in Fig. 2. (A further explanation of Fig. 2 follows in Part 4.) All office equipment is installed as loop start; however, only the office equipment designated as ground start in Fig. 2 may be converted from loop start to ground start.

Special Office Equipment Requirements

2.19 A certain quantity of customer lines assigned to the ESS 3100 must be designated as test line terminals. These lines are used for testing purposes prior to the cutover of the office. The OENs which should be selected are covered in DFMP, Division H, Section 11o(2), New Offices. The quantity of lines selected should equal 7 times the number of concentrator groups in the office.

2.20 The network administrator must allot a quantity of OENs to be used for no-test. The OENs which are to be used for no-test are at the discretion of the network administrator. The quantity should be 2 for an office with 1 to 7 concentrator groups and 4 for an office with 8 to 15 concentrator groups.

2.21 The trunk test panel in the No. 3 ESS office requires three OENs. The numbers may be any in the office; however, the network administrator should assign each line in a different concentrator for load balance purposes if possible.

2.22 The OENs used for special testing purposes should never be assigned. These OENs are concentrator group 1, concentrator 0, switch group 0, switch 0, level 0 (10000) and concentrator group 8, concentrator 0, switch group 0, switch 0, level 0 (80000).

3. LOADING RECOMMENDATIONS

3.01 The improved link arrangement in the No. 3 ESS spreads the effect of load imbalance. The loading unit is a 192 terminal concentrator. Concentrator groups are switched by third-stage junctor switches which reduce the need to balance between concentrator groups.

3.02 In general, a numerical balance of lines, trunks, and service circuits should give a

statistical load balance on the 192 terminal concentrator. Switches within the concentrator are multiplied on the A-links in such a way that an excessive load in one switch does not propagate its effect on other switches.

3.03 Blockage occurrences are identified by the dial tone blockage and incoming blockage reports. See DFMP, Division H, Section 11h, Network Administration and Maintenance Measurements.

3.04 Load balance is discussed further in DFMP, Division H, Section 11e, Load Balance.

3.05 Trunks should be assigned on the basis of whether the trunk is a member of an incoming, outgoing, or 2-way trunk group.

3.06 Incoming trunks from certain switching machines may be selected for use sequentially at the outgoing office. One particular trunk may always be the first selected trunk; another may always be the second selected trunk if the first one is busy; etc. Other switching systems select trunks randomly.

3.07 It is important that only one first choice incoming trunk be assigned to a switch in order that no switch receive excessive load. If two sequentially selected trunks must be assigned to the same switch, a trunk high in the sequence of its trunk group should be selected if the other trunk is low in the sequence of its trunk group.

3.08 Therefore, the network administrator should be aware of the method by which trunks are selected by switching systems which have trunks incoming to the No. 3 ESS office.

3.09 The No. 3 ESS selects all outgoing trunks, 2-way trunks, and service circuits on a least-used basis. These trunks and service circuits, which have equal load among the members of a trunk group, may be assigned accordingly.

3.10 Lines which are members of hunt groups may generate much heavier usage than nonhunt lines. Two members of the same hunt group should not be assigned to the same switch. If possible, no two hunt group lines should be assigned to the same switch, even if they are members of different hunt groups.

3.11 The network administrator should divide customer lines into classes which would logically seem to generate different loads before making line assignments.

3.12 In addition to hunt groups, lines may be divided into residence, business, and coin. The network administrator could first assign equal numbers of hunt groups among switches, then residence, then business, then coin. This procedure would help avoid loading switches unevenly on a numeric basis.

4. THE LOW PROFILE COMBINED DISTRIBUTING FRAME

4.01 All cross-connects in the No. 3 ESS office are performed on the low profile combined distributing frame (LPCDF) (Fig. 1). The term **low profile** refers to the fact that the frame is only 9 feet high. The term **combined** is used because not only cross-connects between outside plant and office equipment are performed on the frame, but also cross-connects between office equipment and trunk circuits and service circuits.

4.02 The LPCDF is installed as two frames, referred to as mod 0 and mod 1. Each frame is 6 feet 2 inches wide, 2 feet deep, and 9 feet high. An office with ten or less network frames may have only mod 0 installed.

4.03 The back side of the LPCDF is the **vertical side**. It is used to terminate outside plant cable pairs. The vertical side of each mod has nine vertical divisions, each of which can be equipped with up to five 303-type connectors. Each connector contains 100 pairs of terminals. A fully equipped vertical side contains 4,500 terminal pairs on each mod.

4.04 The front side of the LPCDF is the **horizontal side**. It is used to terminate inside office equipment and circuits. The vertical side has ten horizontal divisions on each mod. Each horizontal division can be equipped with up to eight 89-type connecting blocks. When both mod 0 and mod 1 are installed, one connecting block can be installed

between the mods and each horizontal division can contain up to 17 connecting blocks. Each 89-type connecting block contains (a) 96 pairs of terminals in locations used for network frame connections and (b) 100 pairs of terminals in locations used for trunk circuits and service circuits. A fully equipped horizontal side contains 7,840 or more terminal pairs on each mod. The exact number of terminal pairs depends on the arrangement of 96-pair and 100-pair connecting blocks.

4.05 A connection is made from an outside plant cable pair on the vertical side to a trunk circuit on the horizontal side by use of a jumper. Another jumper is used to connect the trunk circuit to a piece of office equipment. Both connections are on the horizontal side. Service circuits are connected to office equipment on the horizontal side. A customer's line comes in as a cable pair on the vertical side and is connected to a piece of office equipment on the horizontal side.

4.06 The office equipment on the LPCDF is divided corresponding to the division of the No. 3 ESS switching network (see Fig. 2). The LPCDF is equipped for one concentrator group for each concentrator group installed in the switching network. There can be a maximum of 15 concentrator groups in a No. 3 ESS office. A concentrator group consists of the 384 office equipment pairs which appear on one network frame.

5. OFFICE RECORDS

5.01 Each No. 3 ESS is equipped to generate a complete set of office records on line, without an interface with Western Electric. Records can be requested on a page basis directly from the No. 3 ESS.

5.02 The use of the mechanized office records system is recommended over the use of manual records.

5.03 Information on the mechanized office records system is given in DFMP, Division H, Section 11o(5), Office Records.

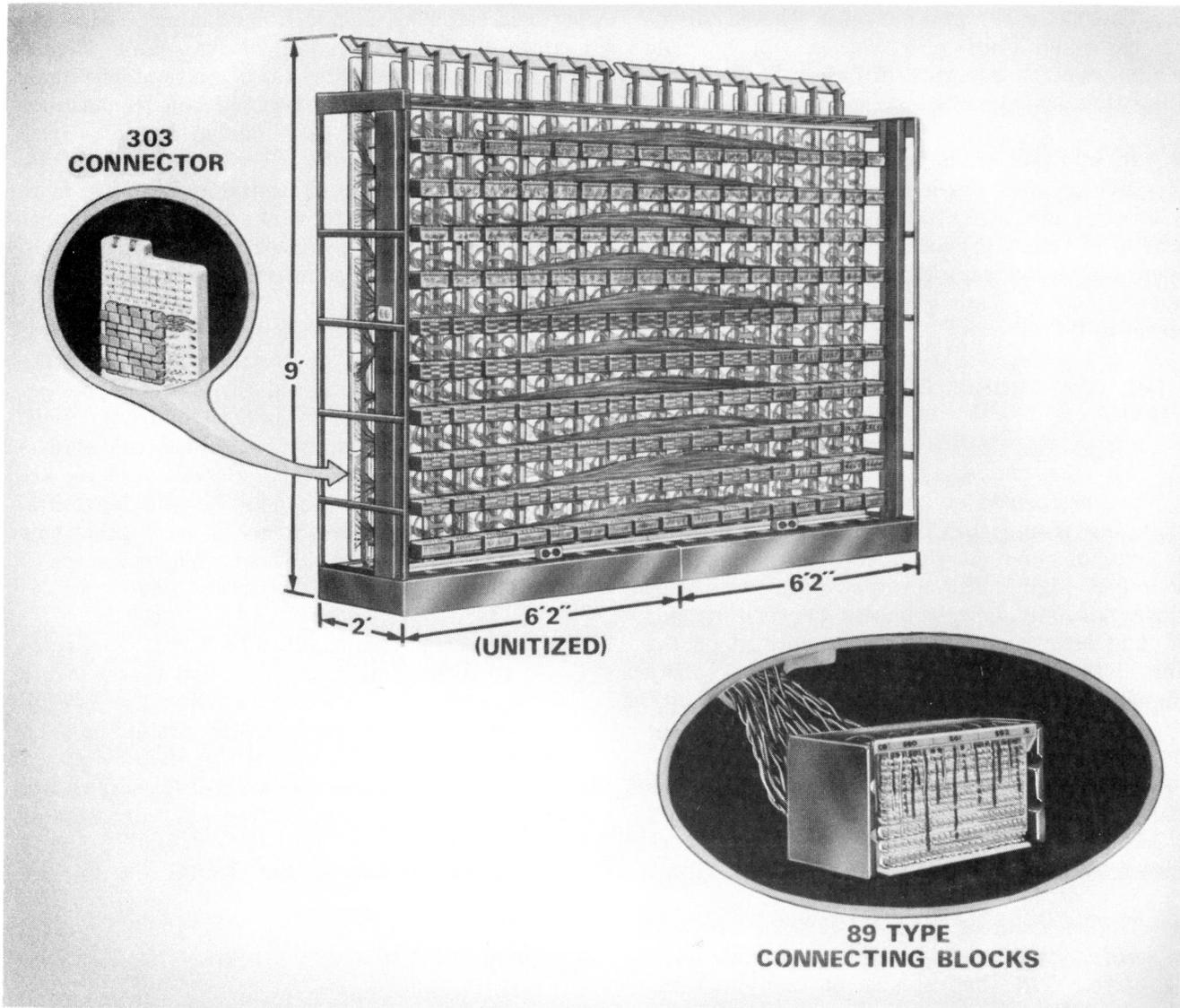


Fig. 1—Low Profile Combined Distributing Frame (LPCDF)

