LINE LOAD CONTROL

GENERAL DESCRIPTIVE INFORMATION

NO. 5 CROSSBAR OFFICES

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1. GENERAL

1.01 This section describes the line load control arrangements for the No. 5 Crossbar Switching System. Studies made in connection with the rendering of service during emergencies indicate the need for controlling the traffic load carried by the central office equipment. The No. 5 Crossbar Switching System, as originally designed, provides that the customer lines located in vertical group 02 of each line link frame will have dial tone service preference over all other customers on the same line link frame. This arrangement permits preferred service treatment to 40 lines per line link frame. But such preference does not assure against long dial tone delays in case of severe traffic overloads on the equipment. With the line load control feature, traffic volume may be manually controlled as necessary by denying originating service to certain customers in the office. Terminating service will not be denied to any customer, and arrangements now provided for caring for overloads during normal times, such as shortened timing intervals, will still function independently of the load control feature. The design of the load control feature is such that it can be applied to existing as well as new installations.

1.02 This section is reissued for the following reasons:

(a) To include information for the assignment of lines to the A, B, and C classes on a line group basis.

(b) To make minor changes as required. Since this reissue covers a general revision, arrows ordinarily used to indicate changes have been omitted.

2. DESCRIPTION

2.01 The line load control arrangements for No. 5 Crossbar Switching System provide for a division of lines into A, B, and C classes, with the A class representing approximately 10 percent of the lines, and the B and C classes each constituting about 45 percent. Lines whose service is to be maintained under all conditions are assigned to class A. The remaining lines are divided as evenly as possible between the B and C classes. Only the class B and C lines are subject to originating service denial from line load control. The line load control facilities consist basically of two parts, one indicates an overload condition on the system and the other provides the manual controls for controlling the overload.

A. Overload Indicating Arrangements

2.02 The lamps and load meter described below can be arranged for optional location either in a line load control cabinet or on the recorder bay of the master test frame.

Line Link Frame Overload

2.03 A timing circuit in the line, line link, and connector circuits measures the delay in serving dial tone calls in that frame. After a delay of 5.0 to 9.3 seconds in serving any or all waiting calls, this timing circuit causes a red G lamp to be lighted, indicating an overload on the line link frame. This lamp will remain lighted thereafter until all waiting calls have been served. One such lamp is provided for each line link frame.

All Originating Registers Busy

2.04 A red originating register short timing (ORST) lamp is provided per marker group and is lighted whenever a marker, in attempting to serve a dial tone call, finds all originating registers busy. The ORST lamp is controlled by the group-busy circuit for use with originating registers, which in addition to controlling this lamp, lights a similar lamp at the master test frame and causes the originating registers to transfer to "short timing." The originating register short timing feature will remain effective until originating registers have been continuously available for a period of 9 to 17 seconds.

All Markers Busy

2.05 A red marker busy alarm (MBA) lamp is provided per group of combined markers or dial tone markers. This lamp is controlled from the all markers busy circuit and is lighted when all markers have been busy for the standard timed interval of 40 to 60 seconds. The all markers busy circuit lights a similar lamp at the master test frame and brings in a minor alarm. The MBA lamp will remain lighted as long as the "all markers busy" condition persists and until the associated alarm is retired.

Office Load Meter

2.06 As an additional indication of the level of load in the office, an office load meter is provided per marker group to indicate the approximate total office 48-volt load.

B. Line Load Control Arrangements

Division of Lines Into A, B, and C Classes

2.07 Arrangements are provided to assign lines to the A, B, and C classes on either a vertical group, serving 50 lines, or a line group, serving 5 lines, basis. Where the group includes verticals assigned for test purposes, the capacity is reduced to 40 and 4 lines respectively. The provision for assignment by line group is required where the originating class of service is determined on an individual line basis rather than on the basis of a vertical file (ten lines).

2.08 It is assumed that a minimum of about 10 percent of the lines will be kept in service under all conditions (class A). The remaining lines, consisting of roughly 90 percent of the lines in an office, will be divided into two approximately equal classes, B and C. This equipment division is only for purposes of administration. Ordinarily it will not be desirable or possible to make any distinction between the class B and C lines.

2.09 In addition to the essential service customers assigned to class A, ground start coin lines and terminal hunting lines should also be assigned to this class.

Line Load Control Circuit

2.10 A common control circuit provides keys and lamps normally located in the maintenance center for administering the application of line load control. This circuit and the associated line link frame wiring are shown in Fig. 1. Master keys and lamps designated CLB and CLC are provided separately for class B and class C lines. In addition, two keys and two lamps are provided for each line link frame. One designated "B" controls the application of line load control to the lines in class B of the associated line link frame. Similarly, the operation of the C key denies service to the lines in class C. By the operation of a master key, for example CLB, together with the operation of the individual B keys for each line link frame, all lines assigned to class B are denied originating service. While these keys are operated their associated guard lamps are lighted to indicate that line load control is in effect for class B lines.

2.11 When the overload condition on a particular line link frame has ended, as indicated by the fact that the G lamp (previously mentioned), for this frame is not lighted, normal service may be restored to the frame by restoring its B key. In this case, line load control will be maintained on those line link frames whose associated B keys remain operated. At the end of the overload period,

it is necessary to restore each line link frame B key individually and to restore the master CLB key in order to provide normal service to class B lines.

2.12 The operation for applying line load control to class C lines is the same as discussed above except that master key CLC and individual line link frame C keys are used.

C. Equipment Arrangements

2.13 The overload indicating lamps, the line load control keys and lamps, the office load meter, and a set of frame line talking jacks can be located in a cabinet suitable for mounting on a wall or pillar convenient to maintenance activities. An alternative method provides for locating the overload indicating lamps, the line load control keys and lamps, and the office load meter in a jack, lamp, and key panel unit which is mounted above the plant register unit on the recorder bay of the master test frame. For either the cabinet or test frame locations, the relay equipments associated with the common control circuit are arranged for miscellaneous relay rack mounting. The frame relays for the line link frames are located on the basic line link frame. Provisions have been made for extending the master control key operation to a shelter area in the telephone building. Multiples of the master keys and lamps of classes B and C and a multiple of the alarm release key are extended to the shelter area and located in a wall-mounted steel cabinet. If desired, this cabinet can also contain an office load meter.

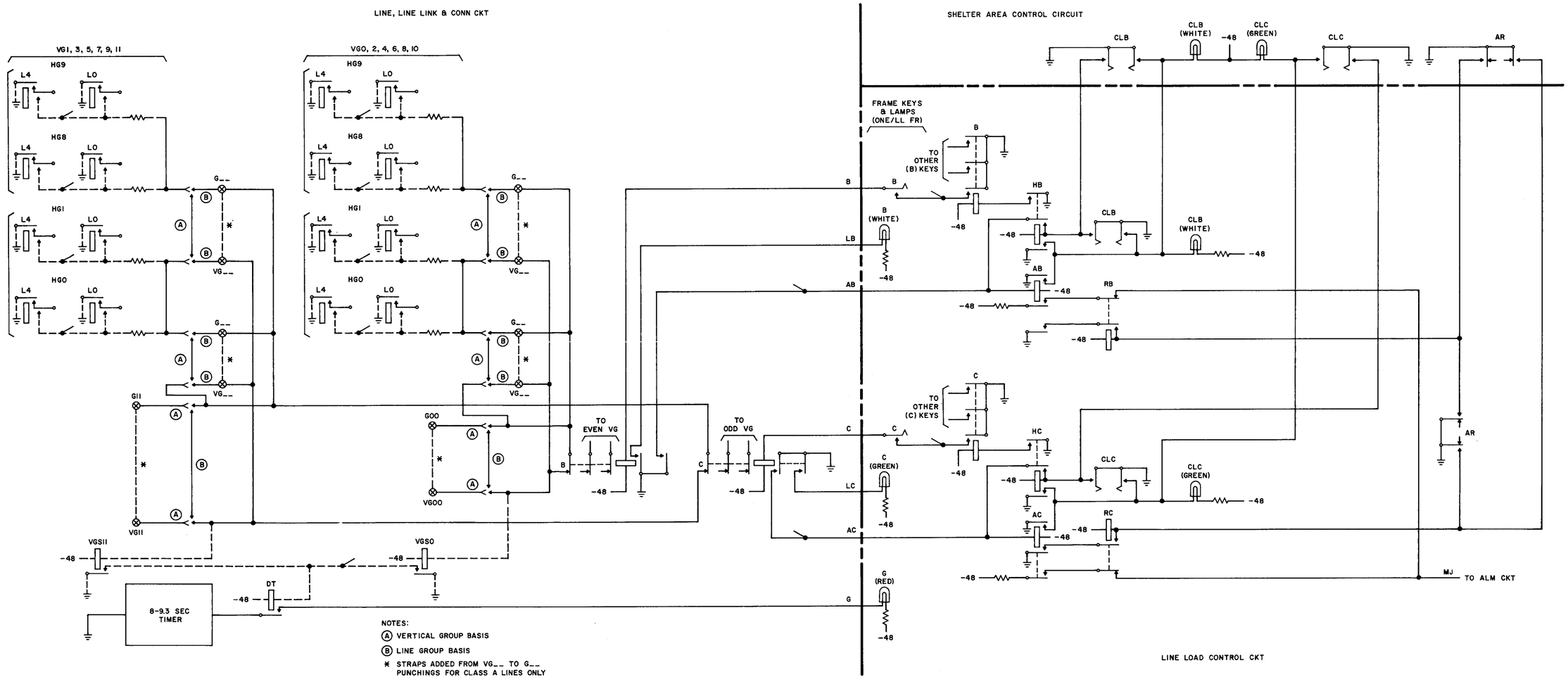

Fig. 1 — Line Load Control Functional Schematic