GROUP ALERTING SYSTEM
TRANSMISSION DESIGN CONSIDERATIONS

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1. GENERAL

1.01 This section outlines the transmission design features required for the operation of Group Alert Systems. The Group Alerting System is intended for use in local dial offices and provides the facilities for signaling one or more groups of telephone subscribers simultaneously and making an oral or recorded announcement. The system provides for voice transmission on a one-way basis. It is designed primarily for the use of volunteer firemen and other civil defense groups.

1.02 Schematic information is contained in SD-95883-01. The auxiliary line circuit schematic is SD-95884-01. Two KS-16754-L3 amplifiers must also be provided at the local central office and at each distant office requiring amplification. Information on installation and operation of the control station equipment is contained in Section C70.184. The Central Office equipment is described in Section AA388.016.

2. DESCRIPTION OF OPERATION

2.01 The system may be arranged to alert up to 480 subscribers. When the number of lines in a system is divided over two or more central offices, the total number of lines the system may accommodate is somewhat reduced because of transmission requirements, as discussed in Par. 312. A block diagram of the basic system is shown in Fig. 1.

2.02 Subscriber loops may be connected in up to eight groups. Each group may be alerted separately, or all groups may be alerted at once. A ninth line group may be provided but the last line group is always reserved for monitor and test functions.

2.03 The alert is initiated at a control station on a subscriber's premises using a telephone set, and on an optional basis, can be switched to an answering set for a recorded announcement.

2.04 An alternate control line can be provided and may be selected by the control station in the event of failure of the first line. When an answering set is provided, a monitor line may also be furnished back to the control station. It is connected to the associated keyset and may be used to check recorded announcements. These features are shown in block diagram form in Fig. 2.

2.05 Two alternate control stations may be provided, and lock-out features prevent the use of more than one control station at the same time. All control stations must be served from the same local central office. These are also shown in Fig. 2.

2.06 The control station can alert a particular line group or all line groups by dialing the appropriate single digit code. Codes 2-8 are used to alert single line groups. By proper cross connection, one code may be used for all-group alerting. The alert is automatically terminated by a central office time-out preset for an interval of approximately 3, 5 or 8 minutes. The control station may terminate a message by dialing "O" or extend it by redialing the appropriate code.

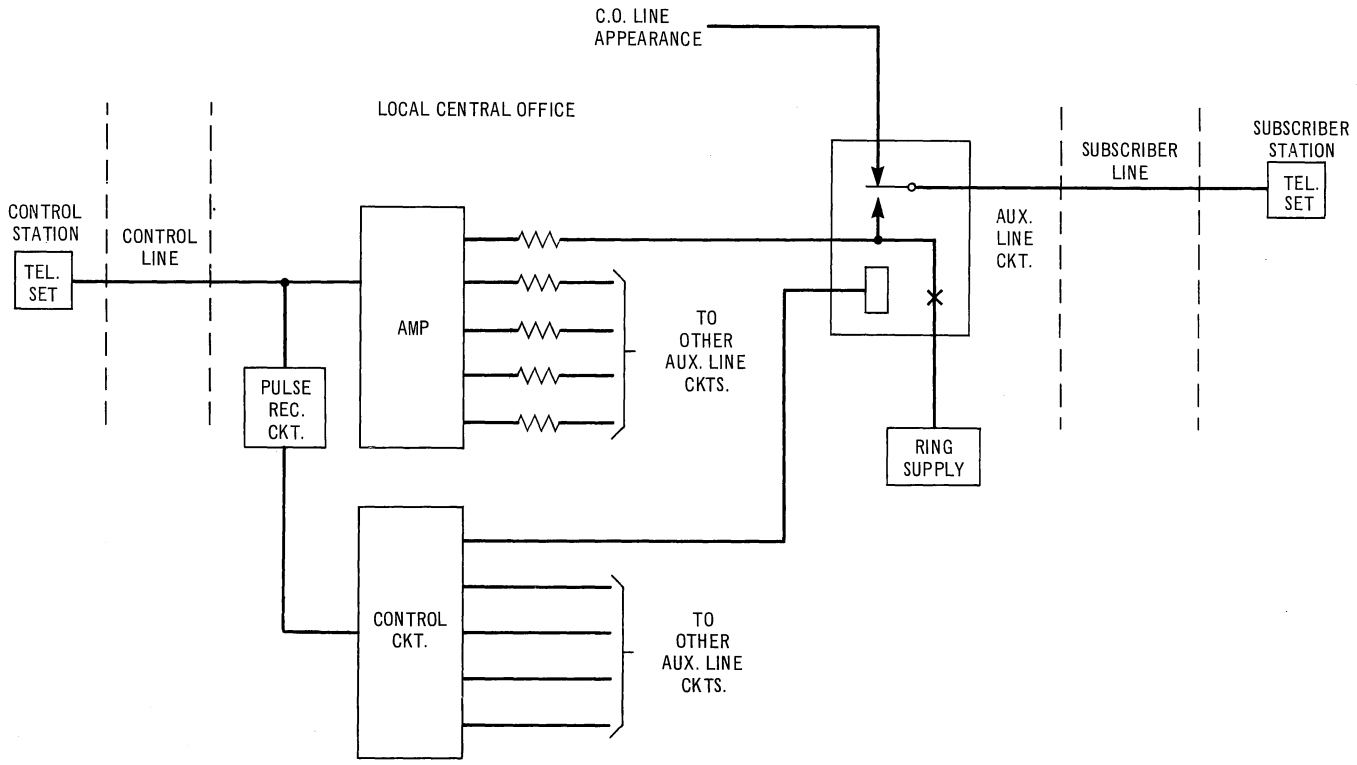


Fig. 1 – Group Alert System Block Diagram of Basic Arrangement

2.07 The system can be arranged for up to four groups at a distant central office. They may be complete groups called by individual codes, or they may be part of a group served by the main central office. Cross-connection arrangements permit associating any individual line with any number of groups.

2.08 Alarm features are provided to detect opens in control loops and interoffice trunks. Alarms are also provided for ringing failure and selector failure. Two amplifiers are provided in parallel in the central office, with either able to handle the load, but they are not equipped with alarms.

3. TRANSMISSION DESIGN

(A) Control Loops

3.01 Control loops on local private lines have a loop resistance limit of 1500 ohms and should be constructed to the transmission standards for subscriber loops.

3.02 The 1000-cycle loss of each control loop must be determined and should not exceed 10 db. The register circuit associated with each control loop in the central office has a 1C pad socket, and each control circuit must be built out to 10 db loss at 1000 cycles.

3.03 Alternate control circuits should meet the requirements of Par. 3.01 and Par. 3.02. Monitor circuits, although terminated at the same points as the control circuits, are required only to meet the standard for subscriber loop design and are not built out with pads.

(B) Interoffice Trunks

3.04 Interoffice trunks may be standard local loaded or nonloaded trunks. The maximum external conductor loop resistance must not exceed 1500 ohms.

3.05 If the interoffice trunk loss is relatively small, subscriber lines may be connected without amplification. The limitations are shown in Table 1. For greater losses or a larger number

of lines at the distant office, amplification will be required at the distant office.

TABLE 1

TRUNK LOSS (db)	MAXIMUM LINES
0	23
2	16
4	11
6	7

3.06 Repeat coils are provided at both ends of the interoffice trunk for loaded or non-loaded facilities. The type of facility must be known in advance in order to specify the proper option. The coils for loaded trunks provide the best match with H88 loading systems.

3.07 When back up trunks are provided, they should be identical to the primary trunk concerning electrical length and absolute delay. If alternate routes are used, special treatment may be required.

(C) Subscriber Lines

3.08 There are no requirements on the subscriber line except that it meets good exchange transmission design. Subscriber lines may be individual lines, full selective or semi-selective party lines. However, only one telephone can be alerted on a given line.

(D) Over-all Design

3.09 Design is based on an average output of −9VU at the control station. All control lines are padded out to 10 db, so the average input to the local office amplifier is −19VU. System line-up is therefore based on an input to the local office amplifier of −19 dbm of 1000-cycle tone. A simplified level diagram is shown in Fig. 3. Note that bus bar levels are readings made with a standard 600-ohm db meter but are not db referred to 1 mw because of the low impedance of the bus bar.

3.10 The local office amplifiers should each be adjusted to deliver −11 db across the output bus bar with no load connected and the other amplifier output also disconnected. When fed in parallel with the same tone, the amplifiers should deliver −8 db across the bus bar with no load, if the outputs are in parallel and properly phased.

3.11 With a maximum load bus bar levels should drop no more than 2 db. Bus bar levels are reduced 8 db at each subscriber line access, so subscribers with 8 db loops should receive an average level of −24VU to −27VU.

3.12 When interoffice trunks are connected to the bus bar, maximum allowable load must be reduced by about eight subscriber lines for each trunk, in order to maintain average transmission levels.

3.13 When interoffice trunks are short and no amplification is provided at the distant office, transmission levels should be satisfactory if subscriber lines are limited as covered in Table 1.

3.14 When amplifiers are provided in the distant office, gains are adjusted after the local office equipment is aligned. With the local office amplifiers arranged to deliver −8 db of 1000-cycle tone to their bus bar, the distant office amplifiers are adjusted for the same output levels. The gain settings will depend on the interoffice trunk loss. Each amplifier is again adjusted individually for −11 db output. With the amplifiers connected in parallel, the output measured at the bus bar should again be −8 db, if the amplifiers are properly phased.

3.15 The number of subscriber lines that can be connected to the bus bar in the distant office is limited by signalling considerations. Levels delivered to the subscriber stations should therefore be very satisfactory.

4. GROUPING ARRANGEMENTS

(A) Local Office

4.01 Grouping arrangements and numbers of subscriber lines are limited by switching and control arrangements to a maximum of eight groups and 480 lines. Since the transmission arrangement is designed for the load provided by 480 lines, the connection of interoffice trunks

to the output reduces the maximum number of lines somewhat, but does not affect grouping arrangements.

4.02 A ninth line group is used for test and monitor purposes. When less than eight groups are needed, one extra line group should always be furnished for this use.

4.03 A subscriber line may be connected to any or all line groups. All lines may be connected to a common line group. This is done by appropriate cross connections.

(B) Distant Office

4.04 Signalling in the distant office is under the control of signal equipment in the local office. Grouping is limited to a maximum of four. Subscriber lines may be cross-connected to any one of the four groups.

4.05 The number of subscriber lines that may be connected in the distant office is limited by the signalling arrangement to those not used in the local office. Because of this limitation, transmission in the distant office should be at least as good and possibly better than provided in the local office.

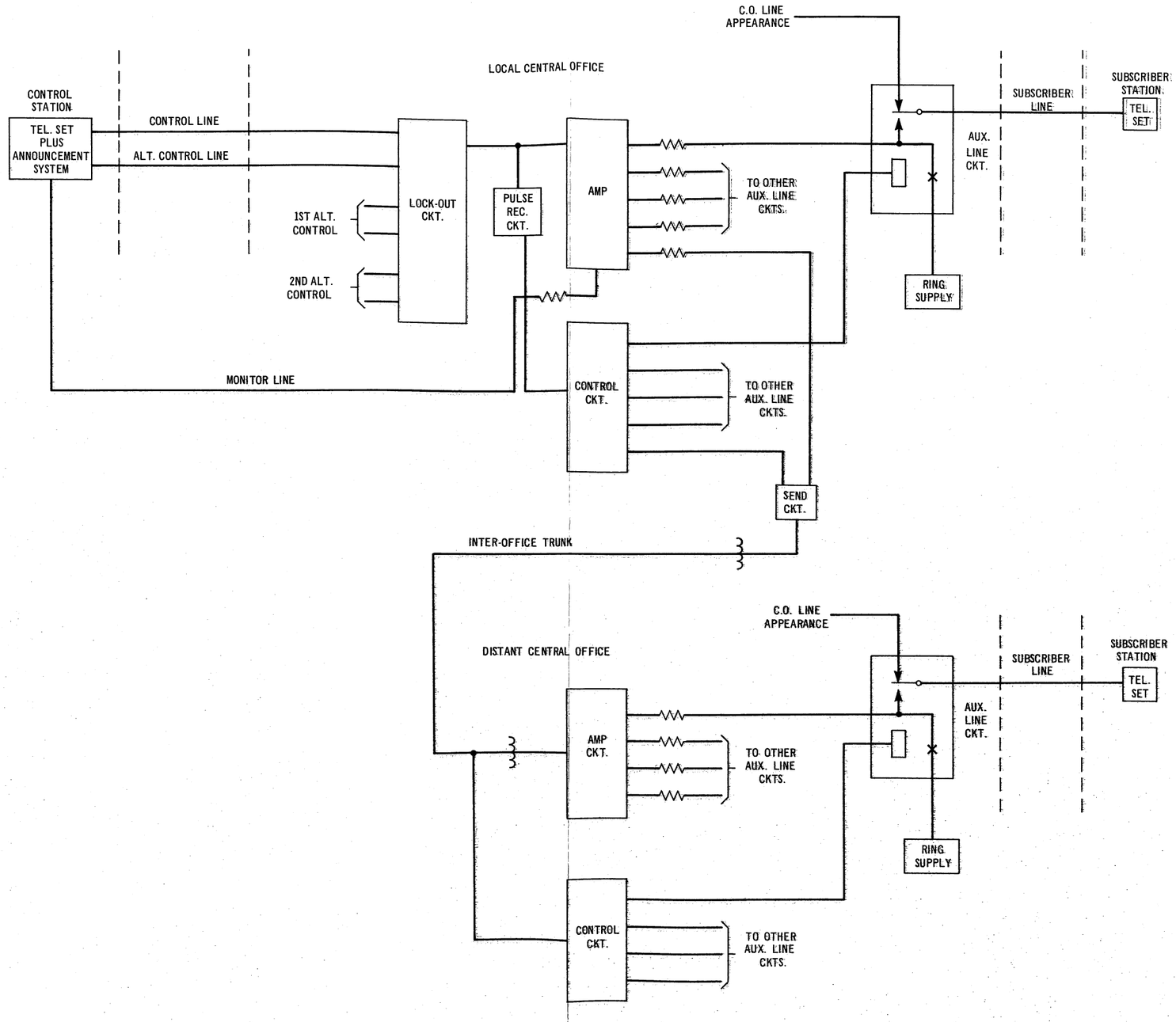
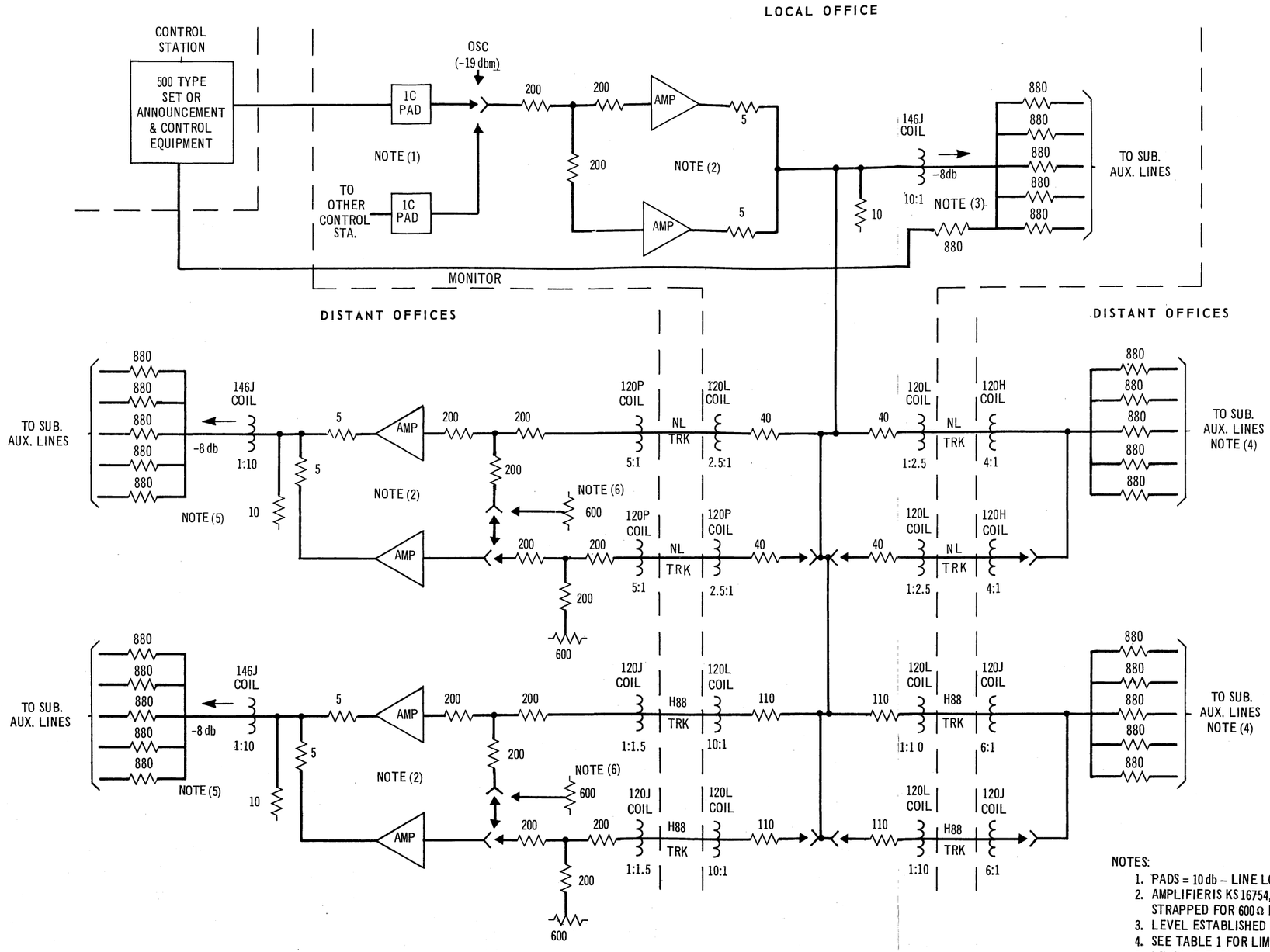


Fig. 2 – Group Alert System Block Diagram Showing Optional Features and Inter-Office Arrangements



NOTES:

1. PADS = 10 db – LINE LOSS.
2. AMPLIFIER IS KS 16754, L3 STRAPPED FOR 600Ω IN, 12Ω OUT.
3. LEVEL ESTABLISHED WITH NO LOAD.
4. SEE TABLE 1 FOR LIMITATIONS.
5. LEVEL ESTABLISHED WITH NO LOAD AFTER LOCAL OFFICE IS ALIGNED.
6. TERM. PROVIDED WHEN DUAL CHANNEL IS NOT PROVIDED.

Fig. 3 – Group Alert System Simplified Level Diagram