

**9A ANNOUNCEMENT SYSTEM
RECORDED ANNOUNCEMENT FACILITIES
NETWORK TYPE
GENERAL DESCRIPTIVE INFORMATION**

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1. GENERAL DESCRIPTION

A. Purpose

1.01 The No. 9A announcement system provides a calling party with access to a recorded announcement by dialing a directory number. The length of these announcements may be varied from 6 seconds to 4 minutes. The system is capable of handling large volumes of traffic, including that associated with news, weather, or other services characterized by unpredictable heavy traffic peaks. The announcement may be sponsored by an outside customer or by the telephone company and may include an advertisement or similar message with the main body of the announcement.

B. Similarity to Other Announcement Systems

1.02 With respect to announcement machine equipment, the No. 9A announcement system is identical with the second arrangement of the No. 8A announcement system. (See Section 951-118-100.) Both systems use the KS-16534 recorder-reproducer and its associated amplifier and control equipment. With respect to distributing facilities, the No. 9A announcement system is similar to the No. 4A and 6A announcement systems. Its main center distributes to subcenters, as well as to incoming announcement trunks. Subcenters likewise connect to other subcenters, as well as to their own incoming trunks. However, each center in the No. 9A announcement system will accommodate many more incoming and outgoing trunks than will the centers in the other two systems just mentioned. Another difference lies in the number of cable pairs required to connect a subcenter to the main center or to a preceding subcenter. (Although "cable pairs" is used herein, it should be understood that open-wire facilities could also be employed in place of cable pairs.) The other systems always use two cable pairs. The No. 9A announce-

ment system employs one cable pair, although two pairs may be employed to insure greater reliability.

C. System Arrangement (See Fig. 1)

Announcement Machine Equipment

1.03 In the No. 9A announcement system no provision has been made for manual answering by an operator. Announcement machine equipment is provided for recording and reproducing announcements. Except for the remote control features, this equipment is located on relay racks in a central office designated as the main center. The equipment has as its fundamental element the KS-16534 recorder-reproducer which is a magnetic drum-type recording and reproducing device. Amplifiers are also provided together with various switching and control facilities. Keys, lamps, a volume indicator, and jacks are provided for local control and recording at the recorder-reproducer location. However, remote control equipment can also be provided which can be located at a distant location. Control and recording from a distance is the usual practice and consists of two optional methods of control. The first method, called remote control, is used when the control apparatus is located at some distance from the main center. This method is usually employed when the control apparatus is located on an outside sponsor's premises. The second method, called local-remote control, is used when the control apparatus is located in the main center building or in a nearby building. Both models employ a handset for recording and reproducing, a desk top control box and a wall-mounted amplifier and relay box.

1.04 The recorder-reproducer and associated equipment at the central office require central office battery and nominal 115-volt, 60-cycle power. The control apparatus at the sponsor's premises requires commercial power only.

Single and Dual Channel Arrangements

1.05 Two announcement machine arrangements are possible. The first, called the single channel arrangement, provides one recorder-reproducer and amplifier. This arrangement necessitates the recording of the announcement "live." This means that the announcement is made available to the distributing network as

it is being recorded. In the event that the recorder-reproducer or its associated circuits fail to operate properly in response to calls either during or after recording, the callers receive busy tone, and a major alarm is sounded in the main center. The second arrangement, called the dual channel arrangement, provides two recorder-reproducers and two amplifiers. This arrangement permits checking an announcement before it is made available to the distributing network. Also, should the equipment providing announcements (that is, "on line") fail to operate properly in response to calls, the second recorder-reproducer and amplifier channel is automatically switched to the distributing network, and a minor alarm sounds in the main center. If the second recorder-reproducer or its amplifier also goes out of service after it is put "on line," callers receive busy tone and a major alarm is sounded. A third recorder-reproducer and amplifier may be provided as an emergency channel arrangement. The emergency channel can be connected to the system manually if the regular dual channel equipment is out of service.

1.06 For further information on the KS-16534 recorder-reproducer and its associated amplifier and control facilities, see Section 951-530-100.

Distributing Network

1.07 In the main center, the announcement machine equipment connects to a distributing circuit. The distributing circuit, in turn, distributes the announcement and various control signals to local incoming announcement trunks, and to outgoing trunks which connect to subcenters in other offices. Subcenters are connected to the main center by either one or two cable pairs. Each subcenter has an amplifier and distributing arrangements. Subcenters distribute to their own local incoming announcement trunks and to other subcenters. Alarm arrangements are provided for the distributing network in both main centers and subcenters.

2. DISTRIBUTING NETWORK EQUIPMENT ELEMENTS

A. Main Center

Distributing and Alarm Circuits

2.01 There are two types of distributing circuits employed in the No. 9A announcement system. One is used with the single channel

announcement machine arrangement and the other with the dual channel. Either type is connected directly to the announcement machine equipment described above. Each is capable of connecting to a maximum of 1100 incoming announcement trunks from local or distant central offices. Each distributing circuit may also connect to outgoing trunks to subcenters in distant central offices. One or two cable pairs may be used to connect the main center with a subcenter. However, the maximum trunk capacity (1100 trunks) of the distributing circuit is reduced by seven for each single cable-pair trunk outgoing to a subcenter and by fourteen for each dual cable-pair trunk.

2.02 An alarm circuit is provided along with the distributing circuit to (1) check for the proper operation of the relays that distribute to the trunks the cut-through pulses that are sent out by the announcement machine at the start of every announcement cycle and (2) check for voice failure. If the cut-through pulse distributing relays do not operate and release at regular periodic intervals during the time that one or more calls are holding the incoming or outgoing trunks, the associated alarm circuit may do one of two things. First, if the system has the single channel machine arrangement, the alarm circuit initiates a major alarm and signals the trunks to return busy tone on subsequent calls. Second, if the system has the dual channel machine arrangement, the alarm circuit initiates a minor alarm and signals the announcement machine to put its other channel "on line." If the cut-through pulse distributing relays still do not function properly, a major alarm is initiated and the trunks are signaled to return busy tone on subsequent calls.

2.03 If a voice failure occurs on a system equipped with a single channel announcement machine, the alarm circuit initiates a major alarm and signals the trunks to return busy tone on subsequent calls. On systems equipped with a dual channel announcement machine, voice failure will first be detected by voice alarm circuits within the machine itself if the failure was caused by troubles generally internal to the announcement machine. In this case, a minor alarm will be actuated and the other channel in the announcement machine will automatically be put "on line." The system then functions essentially as a single channel system.

However, if the voice failure was caused by a trouble generally external to the machine, it will be detected by the alarm circuit. A major alarm will be initiated by the alarm circuit and the trunks will be signaled to return busy on all subsequent calls.

Incoming Announcement Trunks

2.04 Trunking to central office units in the same building and to distant offices which do not have subcenters is provided by incoming announcement trunk circuits. These circuits vary somewhat, depending upon the type of office from which they are incoming. An individual trunk circuit may be set to cut-through to the announcement immediately ("barge-in" operation) or to wait until the start of the announcement cycle, meanwhile giving ringing tone to the caller (synchronized operation). The trunk circuit counts the number of complete announcements received by the caller and opens the transmission path to the calling party after one or two announcements depending on the option used. On-hook supervision is also returned toward the calling end. If the caller hangs up at any time during the announcement, the trunk circuit restores to its normal (idle) condition. In the event that a major alarm condition exists, the announcement trunk circuit returns busy tone.

2.05 The trunk circuit also provides talk-through suppression (prevention of talking between subscribers simultaneously connected to the announcement system).

Outgoing Trunks

2.06 Trunking to subcenters is provided by two arrangements. The first uses one cable pair to carry announcements and control signals from the announcement machine to the subcenter. The second uses two cable pairs for the same purpose. Each cable pair of the 2-cable-pair arrangement performs identical functions.

B. Subcenter

Distributing and Alarm Circuits

2.07 The No. 9A announcement system has two types of subcenter distributing circuits. The first type is connected to the main center (or a preceding subcenter) by one cable pair and has an amplifier and distribution arrangement

for connecting it to incoming announcement trunks and to outgoing trunks to succeeding subcenters. This type of distributing circuit is also provided with a volume level meter and a jack for checking announcements. Associated with this distributing circuit is an alarm circuit that has facilities and functions similar to those found in the main center alarm circuit used with the single channel machine arrangement.

2.08 The second type of distributing circuit is connected to the main center of a preceding subcenter over two cable pairs. It is a combined distributing and alarm unit, and is used to insure greater reliability than can be had with one cable pair. It provides broadly the same checking, amplifier, alarm, and trunk connecting functions as the single cable-pair distributing circuit, but in a dual, rather than in a single, arrangement. For example, each cable pair feeds its own amplifier. One of these amplifiers is connected across a pair of diagonally opposite corners of a resistance bridge; the other is connected across the remaining pair of corners. The parallel combination of all the incoming and outgoing trunks constitutes one of the arms of the bridge. A volume level meter can measure either the separate output of each amplifier or the combined output on the output arm of the bridge. If either cable pair, or its associated amplifier, should fail to supply cut-through pulses or announcement voice to the bridge in response to incoming calls, a minor alarm is registered. If both fail, a major alarm is registered. Should only one cable pair fail to supply voice, the incoming announcement trunks will continue to receive the announcement at a level 6 db below normal. A major alarm condition causes all incoming trunks to return busy tone on incoming calls.

Trunking

2.09 Incoming announcement trunks and outgoing subcenter trunks at all subcenters are similar to those described above for the main center.

3. OPERATION

A. Recording and Checking

Single Channel Arrangement

3.01 In the single channel announcement machine arrangement, as the attendant at the control location dictates the announcement

into the recorder-reproducer, the announcement also goes out "live" on the network if calls are received during the recording interval. The announcement can be any length up to 4 minutes, but 6 seconds is considered the minimum for proper operation of the voice alarm circuits in the announcement machine equipment. (If the telephone company wishes, it can preset a shorter maximum time than 4 minutes.) A volume level meter on the control panel assists in adjusting the speaking level to the proper volume. If the announcement approaches the end of the maximum preset recording time, a signal denotes that the end of the permissible recording period is near. If the recording is technically unacceptable because of volume level or excessive length, another signal advises that the announcement must be redictated. After a technically acceptable announcement has been recorded, it can be checked at any time. While checking (that is, listening to the announcement) is taking place, the announcement machine remains in continuous operation. At the end of the checking interval, the machine normally becomes idle and remains so until calls reach it, at which time it starts. It continues to operate until the calling end sends disconnect forward to the incoming trunk circuit, provided there are no other subscribers calling for the announcement. (The machine can also be set to operate continuously at all times, if desired.) This method of operation provides a continuous check for the presence of voice. With start-stop type of operation, a check for the presence of voice is only made upon receipt of an incoming call.

Dual Channel Arrangement

3.02 In the dual channel announcement machine arrangement, the attendant at the control location dictates a new announcement into the "off-line" channel of the machine. In general, the conditions and checks for volume and length of announcement for this arrangement are similar to those for the single-channel arrangement. The new announcement can be checked and, if necessary, redictated before it is made available to the distributing network. When the new announcement is satisfactory, the "off-line" channel is switched "on line" by the attendant. The new announcement is then automatically recorded from the "on-line" channel onto what is now the stand-by (or "off-line")

channel. The attendant can listen to the announcement on either channel at any time. Conditions for starting and stopping the "on-line" channel of the machine are the same in the dual channel arrangement as in the single channel arrangement. The "off-line" channel normally operates only when the attendant wishes to check (or listen) to the announcement. If one of the channels is taken out of service, any future dictation must follow the "live" dictate procedure, described above for the single channel arrangement. The same holds true in the event that both regular channels are out of service, and the emergency single channel (when provided) has been manually connected to the system.

B. Typical Call

3.03 To receive an announcement, a caller dials a directory number and is connected to an incoming announcement trunk in a distributing center. Upon receipt of one or more such calls to any of the trunks, a start signal is delivered to the main center distributing circuit which causes the announcement machine to begin an announcement cycle. If the announcement is already in progress when the call reaches the incoming trunk, one of two things may happen, depending upon the option provided in the trunk circuit. When the trunk circuit is set for "barge in," it connects the caller to the distributing circuit immediately, allowing him to hear part of the announcement. When the trunk circuit is set for synchronization, it waits until it receives the cut-through pulse before connecting the caller to the distributing circuit. During the period that the call is waiting, the trunk returns ringing. Whether the trunk circuit is set for "barge in" or synchronization, the caller can hear at least one or two (optional) *complete* announcements, after which the trunk circuit opens the transmission path and returns disconnect to the originating end. If the caller then hangs up, the trunk restores itself to normal. The trunk also restores to normal if the caller disconnects before the trunk opens the transmission path. If a major alarm condition exists in the system the trunk circuits return busy tone to the calling party.

4. ADDITIONAL ENGINEERING CONSIDERATIONS

A. Conductor Requirements for Control

4.01 To connect the control location to the main center for the local-remote control method of operation, the single channel machine arrangement requires nine conductors (max 200 ohms each) while the dual channel arrangement requires 16 conductors (max 100 ohms each except for three of these leads which are 50 ohms max each). For the remote control method of operation, the single channel machine arrangement requires two cable pairs while the dual channel arrangement requires three cable pairs. Each cable pair should have a loop resistance no greater than 1640 ohms.

B. Subcenter Limitations

4.02 With a one cable-pair trunk between each center, it is possible to link a maximum of four subcenters in tandem, following the main center. With a 2-cable-pair trunk between each center, a maximum of two subcenters can be linked in tandem following the main center.

C. Types of Offices

4.03 The following table shows the types of offices in which No. 9A main centers and subcenters may be located, and in each case the offices having direct access to this center.

NO. 9A MAIN CENTER OR SUBCENTER LOCATED IN	DIRECT ACCESS FROM					
	MAN.	NO. 5 CBR.	CBR. TAN-DEM	NO. 1 CBR.	PANEL	SxS
No. 5 CBR.	X	X	X	X	X	
No. 1 CBR.	X	X	X	X	X	
CBR. Tandem	X	X	X	X	X	
Panel	X	X	X	X	X	
SxS	X	X	X			X

5. MAINTENANCE

5.01 No special maintenance facilities will be required for the trunk, distributing, and alarm circuit facilities of this system.

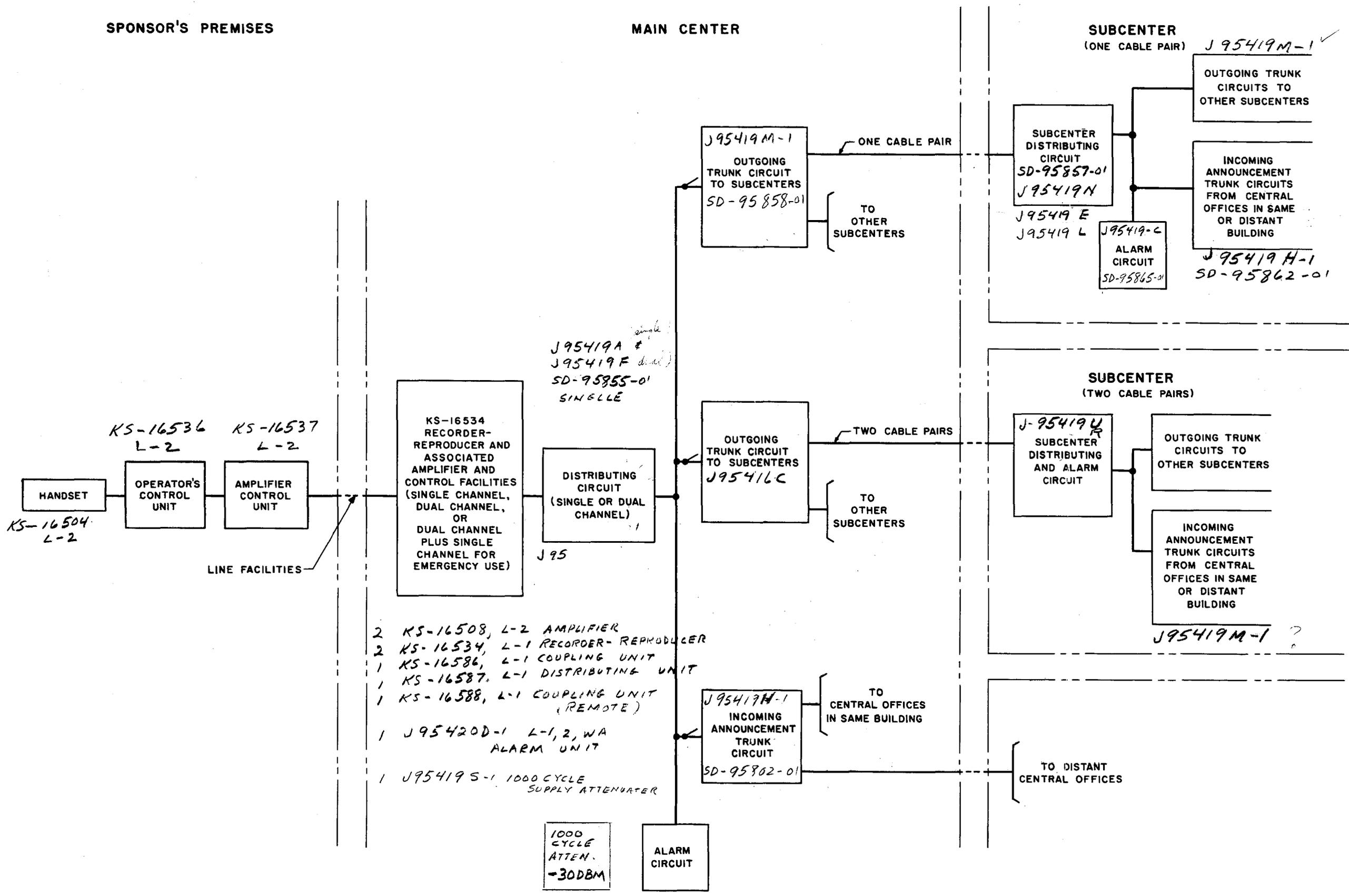


Fig. 1 - No. 9A Announcement System

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