

5A ANNOUNCEMENT SYSTEM

GENERAL DESCRIPTION

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1. INTRODUCTION

GENERAL

1.01 The 5A announcement system is used in No. 4-type toll crossbar and crossbar tandem offices for providing recorded announcements to operators and customers. Some typical announcements are circuit-busy (CBA), vacant code

(VCA), and sender overload (SOA). A maximum of 6 different announcements may be recorded in a single 5A system. Dual system arrangements provide for 12 recording channels. All announcements are recorded from a telephone set or from a toll switchboard position.

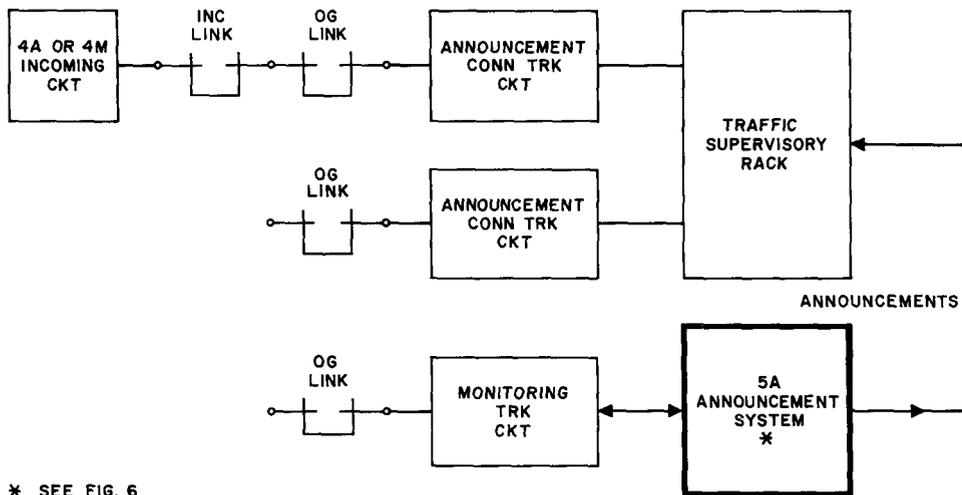
1.02 This section is reissued for the following reasons:

- (a) To remove operating procedures which are now covered in Section 201-511-301.
- (b) To describe revised system operation.
- (c) To add figures of revised equipment groupings.
- (d) To include the use of transistorized amplifiers.
- (e) To include the addition of a volume limiting amplifier.

Since this reissue is a general revision, arrows ordinarily used to indicate changes are omitted.

1.03 Announcements are recorded on a recorder-reproducer, called an announcement machine, that has a 6-channel capacity. All six channels playback simultaneously with each channel connected separately to the toll equipment through a channel amplifier and the announcing trunk circuit. A 5A announcement system may be single, or it may be dual for reducing traffic interruptions during maintenance or for increasing the announcement capacity of the office. For simplicity, a single system is described in this section.

1.04 A call-director type telephone set is used to operate and control the 5A system. The 619A, 619B, and modified 601A telephone sets are currently in use (Fig. 3). A remote or extension telephone set may be connected to each 5A system; however, only one telephone set is used at a time.



* SEE FIG. 6

Fig. 1 — Announcement System Use In No. 4 Toll Office

1.05 Earlier 5A announcement systems use a No. 1, 3, 3C, 3CL or 5 switchboard position instead of a call-director type telephone set.

CAPACITY

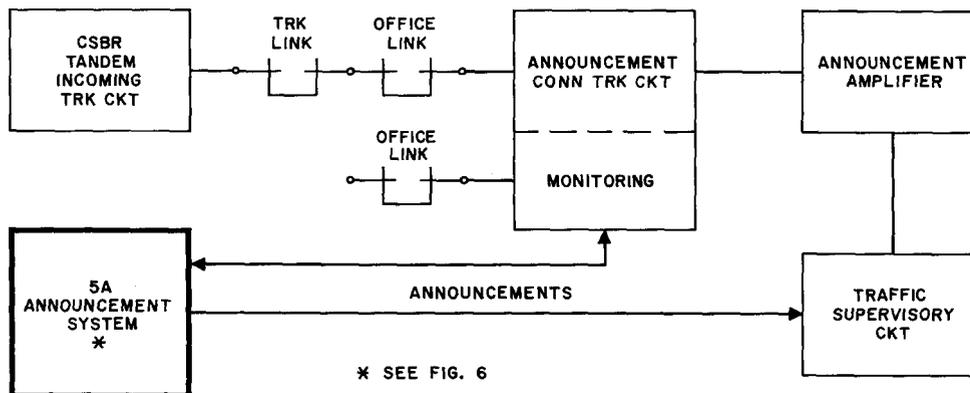
1.06 A single 5A system contains six separate channels for automatic announcements to toll offices. A dual system has 12 channels, 6 in each system.

1.07 In a No. 4 toll office, each channel of the 5A system may be connected to 20 trunk groups. This flexibility is obtained by patching each 4-wire channel to five jacks at the traffic supervisory rack.

1.08 In crossbar tandem offices, the 5A system may be connected to 8 announcement trunk groups for each channel, with 80 connecting trunks per group. Therefore, offices equipped with a traffic supervisory cabinet can select up to 640 announcement connecting trunk circuits with the rotary selector switches.

TOLL OFFICE CONNECTIONS

1.09 Figure 1 is a diagram of the 5A announcement system use in a No. 4 toll office. The six announcement channels are connected to the traffic supervisory rack where each channel is patched to a group of announcement connecting trunk circuits. Also, a monitoring trunk circuit



* SEE FIG. 6

Fig. 2 — 5A Announcement System Use In Crossbar Tandem Office

connects the 5A system to an outgoing link frame, enabling an operator to answer calls directed to an announcement.

1.10 Figure 2 is a diagram of the 5A system use in a crossbar tandem office. The six announcement channels are connected to the traffic supervisory circuit where each is connected to an announcement amplifier for distribution to a group of announcement connecting trunk circuits. A part of the announcement connecting trunk circuit connects the 5A system to an office link frame, enabling an operator to answer calls directed to the announcement connecting trunk circuit.

2. EQUIPMENT ELEMENTS

DESCRIPTION OF ELEMENTS

A. Dual System

2.01 A dual system is mounted on an 11-foot 6-inch high by 2-foot 5/8-inch wide single bay frame arranged to mount 2- by 23-inch mounting plates. The two systems are physically separated as shown in Figure 4. Two frame local cables are provided, each interconnecting the units of one announcement system.

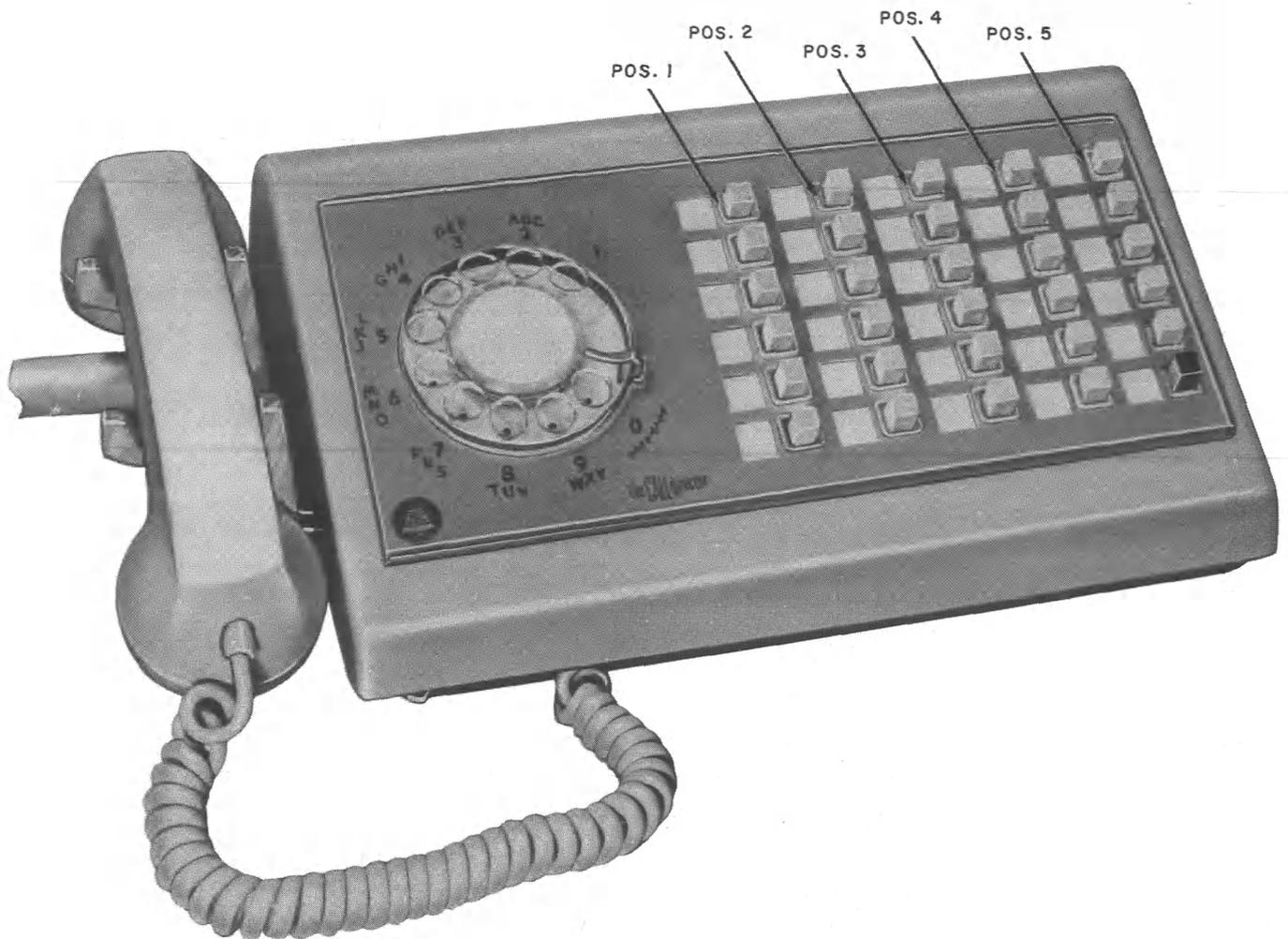


Fig. 3 — 619A Telephone Set

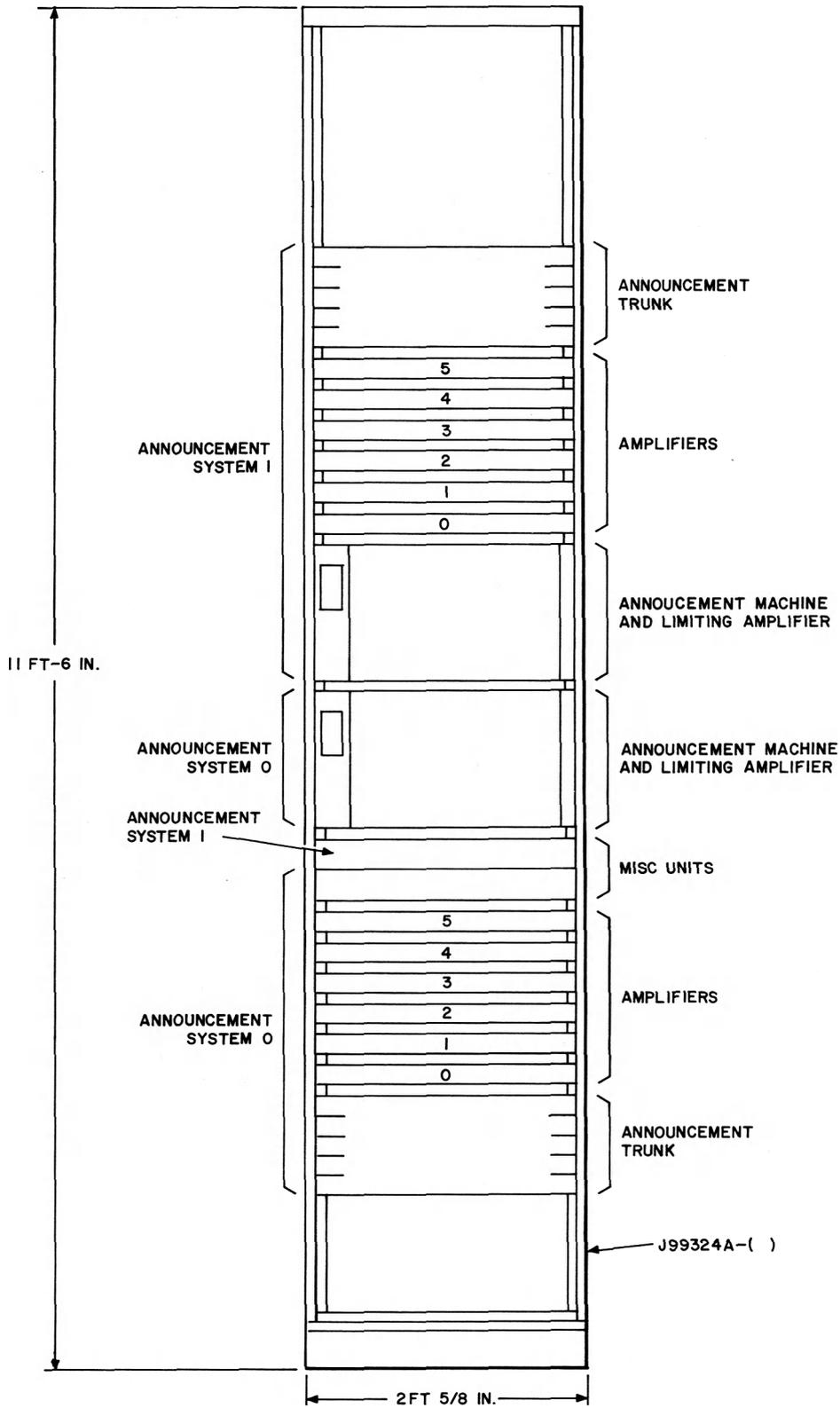


Fig. 4 — Announcement Frame — Dual 5A Announcement System Using Transistor Components

2.02 An announcement machine is mounted to the center of the frame for each system. The distribution of parts in the machine is shown in Figures 7 and 8 and discussed in Part 3.

2.03 The limiting amplifier is transistorized and mounted on an adapter with the announcement machine for each system. Therefore, no additional frame height is used by the amplifier.

2.04 The announcement trunk circuit unit is surface wired on five 2- by 23-inch mounting plates.

2.05 Six channel amplifiers are mounted for each system. Each amplifier is transistorized and mounted on a 2- by 23-inch plate. A dust cover is provided to protect the unit and must be removed for circuit adjustments.

2.06 A 619A or 619B telephone set, located in a quiet area away from the equipment frame, is required for each system. One extension or remote telephone may be installed for each system. External lead resistance for a remote set should not exceed 450 ohms.

2.07 Figure 3 illustrates a 619A telephone set. On the face plate are six horizontal rows of five buttons. Each row corresponds to an announcement channel. The button positions shown in Figure 4 are: (1) alarm, (2) announce (channel selector), (3) emergency announcing, (4) ring, and (5) monitor, release, and record. The dial is reserved for future use and is not used within the 5A announcement system.

2.08 A miscellaneous unit is located on the frame below the announcement machine and contains signal and channel testing facilities. A 1000-cycle tone at -10 dbm is present at a 1000, -10, 600 jack.

B. Single System

2.09 A single announcement system mounts on the same frame as a dual system, but has only one announcement trunk, announcement machine, limiting amplifier, and six amplifiers (Fig. 4). Less than half a frame is utilized for the transistorized system.

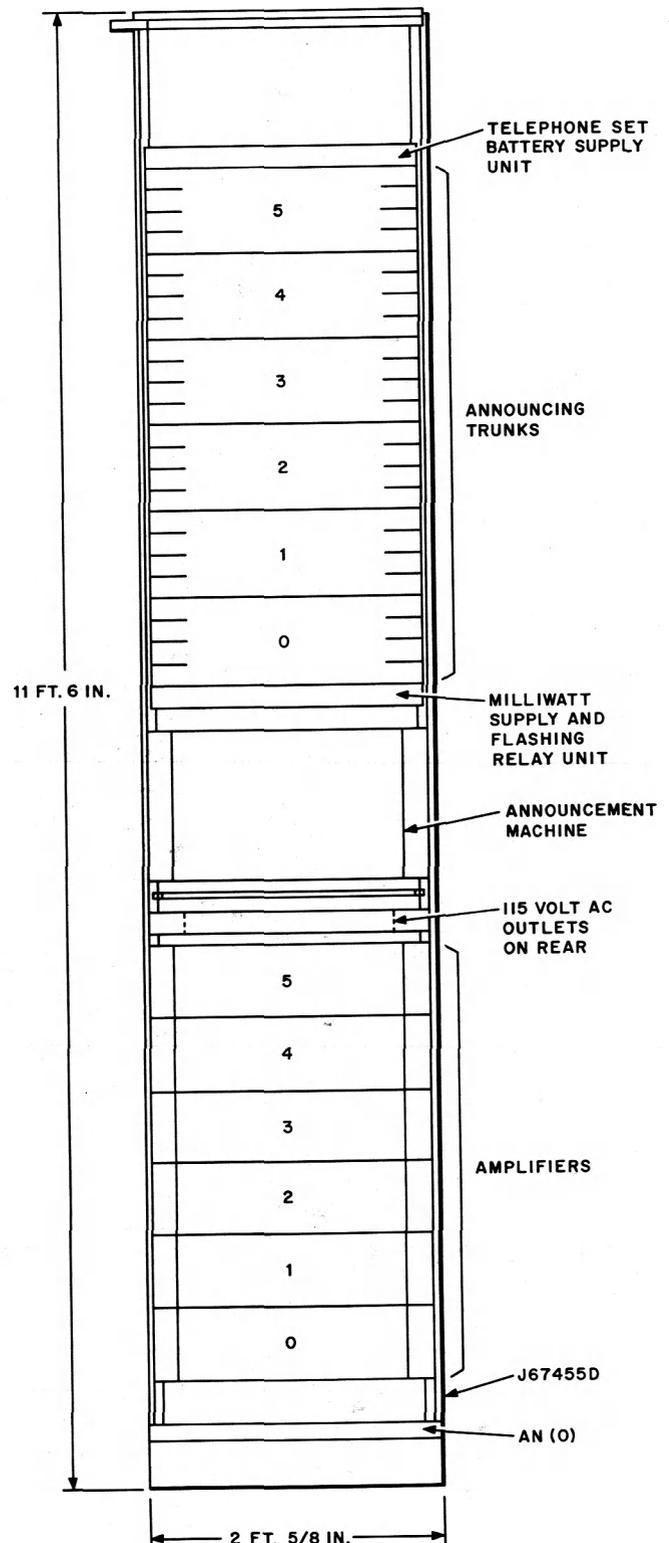


Fig. 5 — Announcement Frame — 5A Announcement System Using Vacuum Tube Amplifier

2.10 Earlier systems, now manufacture discontinued, use vacuum tube amplifiers which require more space. Figure 5 shows the equipment arrangement.

2.11 A telephone set or switchboard position is required to operate the system. The 619A or 619B telephone set described in 2.06 is used with a single system arranged according to Figure 4. A system arranged according to Figure 5 utilizes a 619A, 619B, or modified 601A telephone set; or a No. 1, 3, 3C, 3CL, or 5 switchboard position. The modified 601A telephone set and the switchboard positions for recording are rated manufacture discontinued.

2.12 A milliwatt supply and flashing relay unit is provided on the frame (Fig. 5) to enable testing of the system.

2.13 When a telephone set is used with a system as arranged in Figure 5, a battery supply unit is provided at the top of the frame.

3. OPERATION

A. General

3.01 A block diagram of a complete 5A announcement system is shown in Figure 6. Announcements are made through the telephone

set, the announcing trunk circuit, limiting amplifier, and amplifier and recorded on the selected channel in the announcement machine. Channels are selected at the telephone set and connections are arranged by the announcing trunk circuit.

3.02 Recorded announcements from the machine are played back through an associated channel amplifier to the toll system. Connections between the amplifier and toll system are made by the announcing trunk circuit.

3.03 Emergency announcements by an operator are made from the telephone set through the announcing trunk circuit, limiting amplifier, and the record path of the amplifier.

3.04 The telephone set may also be used to answer calls directed to the 5A announcement system.

B. Announcement Machine — Recorder Reproducer

3.05 The core of the 5A system is the announcement machine. Figures 7 and 8 illustrate the front and rear views. Announcements are recorded on a rubberized, magnetic recording band which forms a continuous "tape" around a revolving wheel called a recording drum. The band

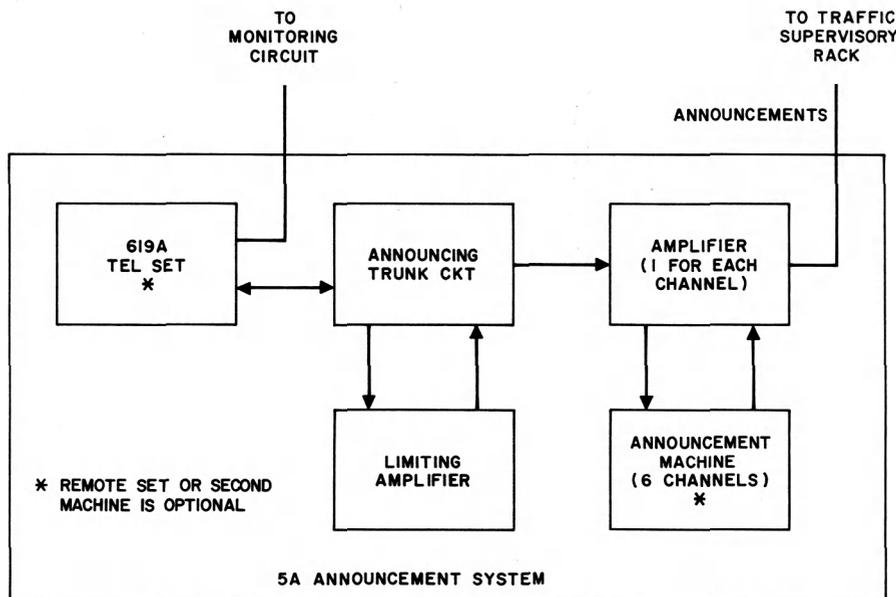


Fig. 6 — 5A Announcement System

is about 1-1/2 inches wide to provide a recording medium for six channels. The drum revolves continuously when the machine is on.

3.06 The recording drum on the front of the machine is connected through a gear case to a belt driven pulley on the rear of the machine. An air-cooled motor drives the belt, causing the drum to rotate at about 4-3/4 rpm. This results in an announcement cycle of 12.6 seconds.

3.07 Micro Switches operated by cams fixed to the recording drum make closures to indicate the start of each recording time interval. The closures operate relays in the trunk circuit

and flash lamps at the telephone set or switch-board position. Actual recording or announcing time is 11.2 seconds with the remaining 1.4 seconds of the cycle used for Micro Switch operation.

3.08 For each channel, there is an erase head to remove previously recorded announcements and a record-reproduce head to transcribe new announcements onto the recording band and to playback recorded announcements. The erase head is mounted in front of the record-reproduce head and, therefore, erases immediately before the new recording is transcribed. The channel is erased and recorded simultaneously during one revolution. Playback from the record-reproduce

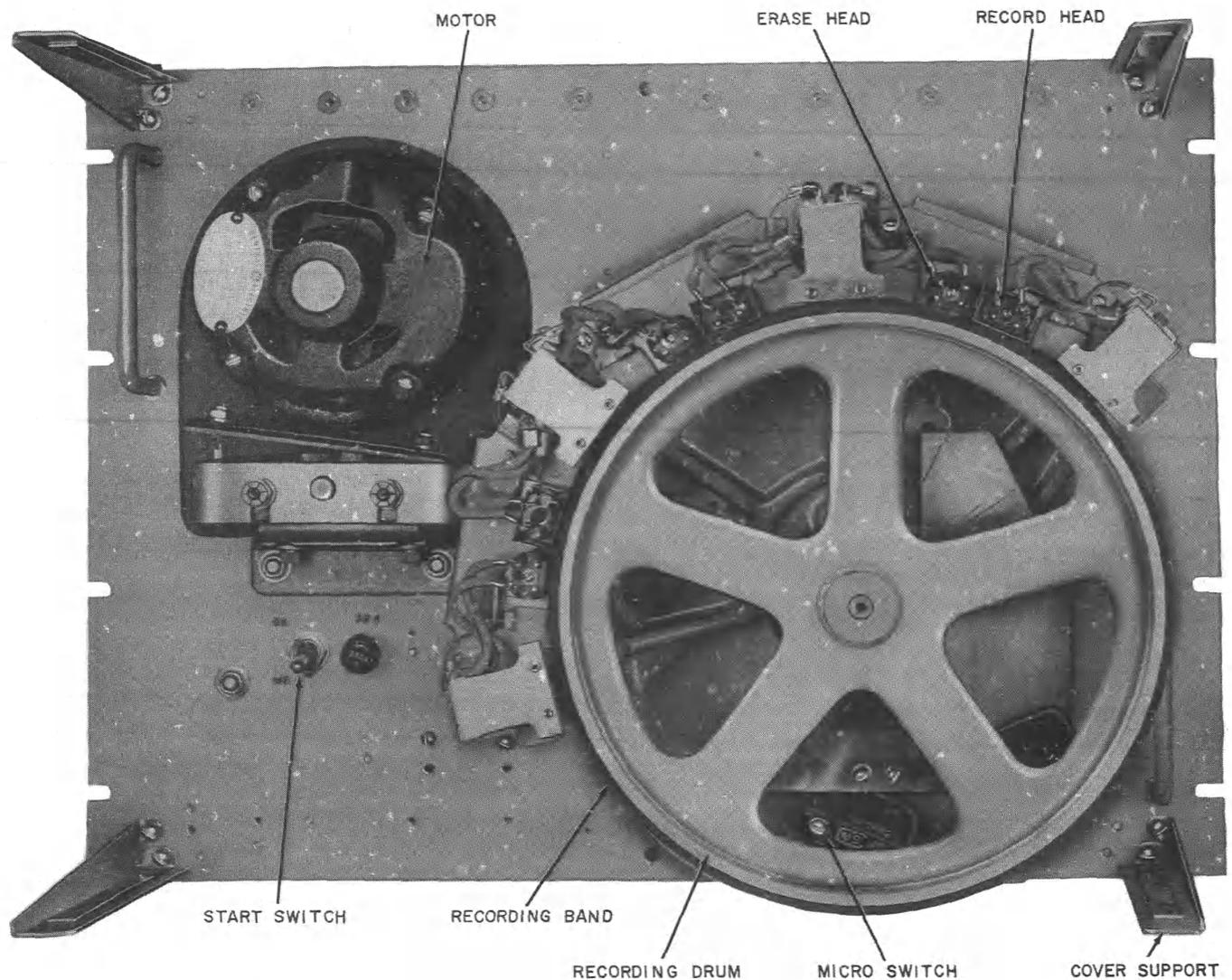


Fig. 7 — Announcement Machine — Front View

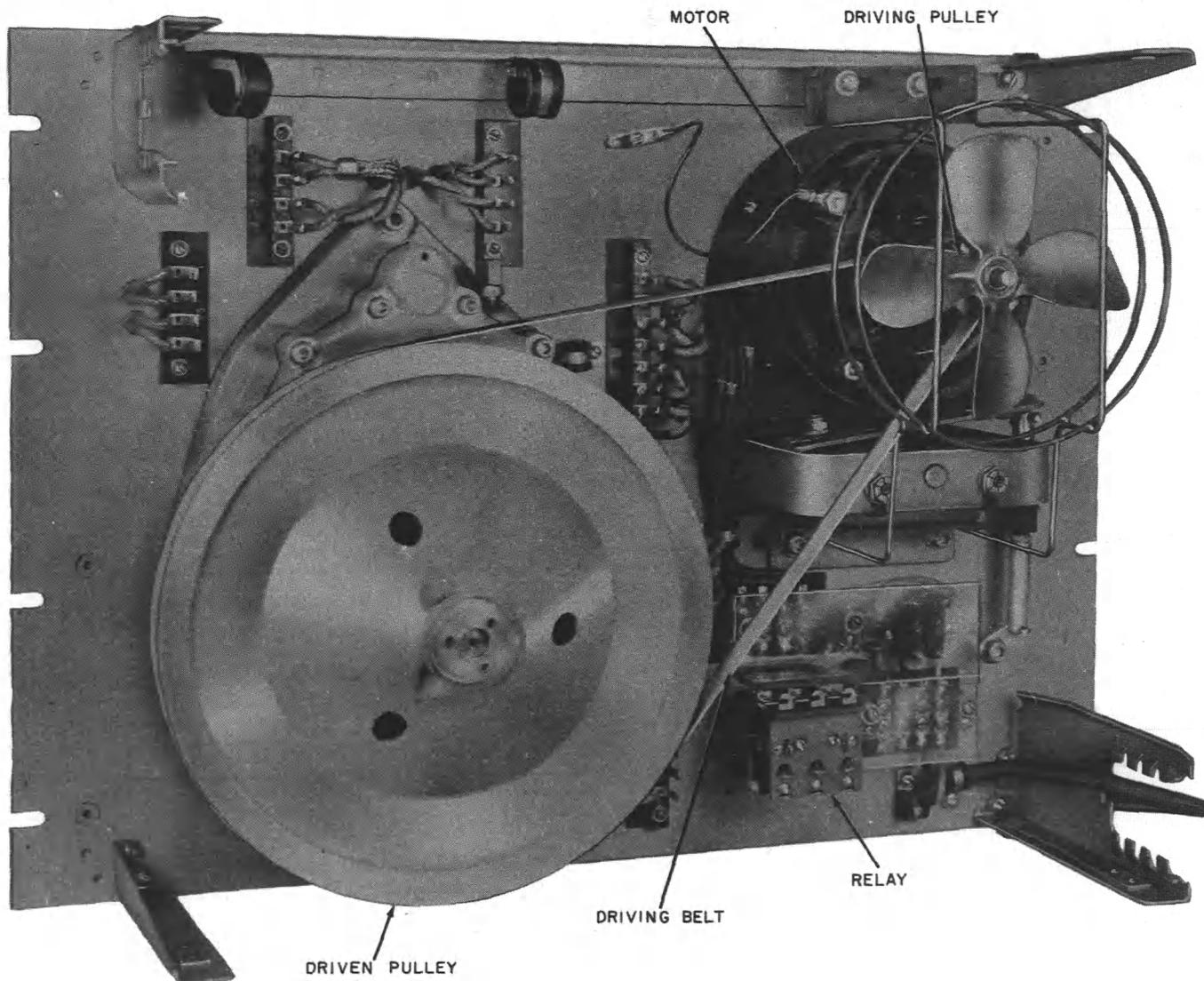


Fig. 8 — Announcement Machine — Rear View

head follows immediately after the recording cycle. All 12 heads are arranged on a casting as shown in Figure 9.

3.09 Provisions have been made for adjusting the pressure of the heads on the recording band, for adjusting the belt tension, and for adjusting the Micro Switch operating times.

C. Amplifiers

3.10 During recording or operator announcing, a volume limiting amplifier is connected between the telephone set and the channel ampli-

fiers by the announcing trunk circuit, Figure 6. The limiting amplifier reduces large variations in speech volume to a uniform voice level. Consequently, all announcements are transmitted at a suitable level to the toll equipment. The limiting amplifier is not connected during playback or machine announcing.

3.11 A separate amplifier is used for each of the six channels in the announcement machine. Each channel amplifier is used during record and playback to amplify the voice signal to a preset level. Individual gain controls for record and playback are provided.

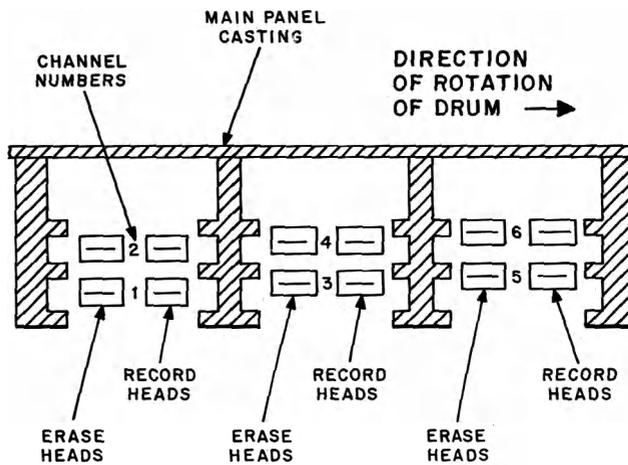


Fig. 9 — Arrangement Of Erase and Record Heads On Casting — Top View

3.12 Each channel amplifier consists of a pre-amplifier, power amplifier, bias oscillator, voice alarm circuit, and switching relay. The relay is controlled by the announcing trunk circuit and sets up a recording or playback path in the amplifier.

3.13 When recording, the voice input from the limiting amplifier is connected through the preamplifier and power amplifier, combined with a high frequency bias current from the oscillator, and applied to the record head of the announcement machine for transcription on the recording band. Simultaneously, the bias oscillator provides a high current to the erase head.

3.14 During playback, the recorded voice announcement is picked up by the reproduce head in the announcement machine, progressively amplified by the preamplifier and power amplifier, and provided to the toll equipment through the announcing trunk circuit. The high frequency oscillator is disabled and the voice alarm circuit monitors the announcement output of the amplifier.

3.15 Emergency operator announcements are made from the telephone set through the limiting amplifier and the record path of the channel amplifier with the bias oscillator disabled. Switching connections are made by the trunk circuit. In earlier configurations, operator announcements are made from a switchboard position.

3.16 A voice alarm circuit monitors the announcement level in each channel amplifier and operates alarms when the announcement level falls below a preset value for more than 7 seconds. Minimum voice level is adjustable and the time delay is adjustable from 8 to 25 seconds at the amplifier.

D. Announcing Trunk

3.17 The announcing trunk is a switching circuit for controlling the various functions of the 5A system. Although most operations are initiated at the telephone set or a switchboard, the trunk circuit establishes paths and makes connections among the system elements and between the system and the toll equipment.

3.18 The normal condition of the trunk circuit is to arrange the announcement system for automatic announcing on six channels to the toll equipment and to establish the alarm control circuits.

3.19 The trunk circuit arranges the connections for erasing announcements, recording, playback, and emergency operator announcing on any channel selected from the telephone set or switchboard. When making a recording from a 619 type telephone set, the trunk automatically provides 120-ipm tone to the toll equipment on the channel being recorded. Earlier trunks used in the 5A system do not have this feature.

E. Telephone Sets

3.20 The 619A or 619B telephone set is used for supervision and control of the 5A system. (See Figure 6.) The set is connected to the announcing trunk circuit for announcing, recording, and playback and is connected to a monitor trunk circuit of the toll equipment for answering calls directed to an announcement. The telephone is normally installed in a quiet area and connected by an A100D cord to suitable connecting blocks in the switchroom. One telephone set is required and one remote set may be installed for each single announcing system. Lamps associated with each button indicate operations selected. During automatic announcing on all six channels, no buttons are depressed and no lamps are lighted.

3.21 The modified 601A telephone set is an earlier type similar to the 619A set and is used for supervision and control of the 5A system. However, the button arrangement, lamp indications, and method of operation are different depending on the associated announcing trunk.

F. Switchboard Positions

3.22 Twelve jack appearances and six associated lamps are located in a recording position, which is an end position of the switchboard. For No. 1- and No. 3-type switchboards, cords and associated keys and lamps from the last equipped position next to the recording position are used for recording and manual announcing. But each end position of the No. 5 switchboard is equipped with cord, lamp, and ringing key for the same purpose. No. 3-type switchboards must be equipped with a pad control simplex to operate relays in the announcing trunk circuit.

3.23 Two jack appearances and an answering lamp for each channel are multiplied throughout the No. 1- and No. 3-type toll switchboards. One jack appearance and an answering lamp for each channel are multiplied throughout the No. 5 toll switchboard for emergency manual operation in the event of machine failure.

G. Recording Procedures

3.24 With 5A announcement systems arranged to return 120-ipm tone to the toll equipment when a channel is being recorded, there is no need to remove patches at the No. 4 toll traffic supervisory rack or to make busy the connecting trunks of the crossbar tandem equipment.

3.25 In 5A announcement systems that are not arranged to return 120-ipm tone during recording, it is necessary to remove patches at the traffic supervisory rack of a No. 4 office before recording. In crossbar tandem offices, since the announcing trunks are cabled directly to the connecting trunks, the announcement connecting trunks of the toll equipment must be made busy at the outgoing trunk test frame before recording.

3.26 The operational procedures for recording announcements include the flashing sequences for the various equipment arrangements.

The nominal recording time is 11.4 seconds and flashes are approximately 1.4 seconds.

H. Machine Announcements

3.27 For the No. 4 systems, after the desired recording has been made and when conditions warrant, the channel is released or an announcing trunk is patched at the traffic supervisory rack to a group of announcement connecting trunks. When an announcement connecting trunk is seized, the announcement is sent out. Prior to each announcement, a flash originating at the announcement machine is sent to each trunk.

3.28 For crossbar tandem, after the desired recording has been made, the channel is released or the busy condition is removed from the connecting trunks. When a connecting trunk is seized, the announcement is sent out.

I. Emergency Operator Announcing

3.29 In the event of a failure in the announcement machine, an operator can make announcements in place of recorded announcements. But when the 5A system is arranged to return 120-ipm tone during recording, emergency operator announcements may also be made in place of a recorded announcement when it is not advisable to erase a recording.

J. Monitoring

3.30 Calls directed to an announcement trunk group may be answered from the telephone set or switchboard position. The No. 4A and 4M toll switching systems use a monitoring trunk circuit for this purpose. (See Figure 1.) The monitoring trunk connects the telephone set of the announcement system to incoming calls directed to the announcement trunks. An operator may select and answer a call directed to any announcement channel. When a call is selected for answering, the recorded announcement is temporarily blocked. When the monitor feature is not in use, the monitor trunk is automatically made busy and incoming calls receive the recorded announcement.

3.31 Crossbar tandem systems use a part of the announcement connecting trunk circuit for answering instead of a separate monitor trunk.

(See Figure 2.) As in the No. 4-type office, the circuit operates to connect an operator with an incoming call.

K. Voice Alarm

3.32 A voice signal failure on any channel during automatic announcing causes the alarms to operate. Therefore, when no announcement is present on a channel, a 1000-cycle tone should be recorded to prevent an alarm. The tone is available at the announcement frame. (Refer to 2.08.)

3.33 When a voice signal fails for longer than 8 to 25 seconds, the ALM lamp at the telephone set or switchboard lights, a minor audible alarm sounds in the switchroom, an aisle pilot lamp lights, and the ALM lamp associated with the announcing trunk lights at the announcement frame.

3.34 Operation of the ALM CO key silences the audible alarm, extinguishes the aisle pilot lamp, and lights a guard lamp. The ALM lamp at the announcement frame or at the telephone set or switchboard remains lighted.

3.35 The ALM CO key will not retire an alarm lamp at a switchboard except during intervals when an operator is announcing and then, only if transmission of operator announcement is effective.

3.36 When the trouble is cleared, the ALM-lamps at the telephone set or switchboard and at the announcement frame are extinguished. Releasing the ALM CO key extinguishes the guard lamp.

4. MAINTENANCE

4.01 The recording machine requires periodic inspections for cleaning and lubricating. Also, occasional checks of head pressure on the recording band will prevent undue wearing of the band. General maintenance is infrequent; adjustments and replacements are normally performed on service order.

4.02 The amplifiers and trunk circuits may be tested with the facilities at the announcement frame, a transmission measuring set, and a voltmeter. Occasional gain adjustments may be required.