

5A ANNOUNCEMENT SYSTEM  
RECORDED ANNOUNCEMENT FACILITIES  
FOR USE WITH

NO. 1, NO. 3-TYPE, AND NO. 5 TOLL SWITCHBOARDS  
IN NO. 4-TYPE TOLL CROSSBAR OFFICES  
AND WITH  
NO. 1 AND NO. 3-TYPE SWITCHBOARDS  
IN CROSSBAR TANDEM OFFICES

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1. INTRODUCTION

1.01 The 5A announcement system provides recorded announcements to operators and customers. Various types of announcements may be recorded, such as circuits-busy announcements, announcement that a vacant code has been dialed, etc. The announcement system may be used in No. 4-type toll crossbar and crossbar tandem offices with No. 1, No. 3-type, or No. 5 toll switchboards.

1.02 This section is reissued (1) to add the use of the announcement system in crossbar tandem offices and (2) to show a lengthening of the announcement cycle from 6.3 to 12.6 seconds. The new cycle permits an announcement of 11.2 seconds with a silent period of 1.4 seconds. Most machines in the

field can readily be modified for the longer cycle. Since this section covers a general revision, the arrows ordinarily used to indicate changes have been omitted.

1.03 Six announcements may be made simultaneously with each being connected through an announcing trunk to a maximum of 100 terminations.

1.04 Normally the two end positions of a switchboard are arranged for recording an announcement, erasing a previously used announcement, and playback of a recording. After a recording is made, the announcements are transmitted automatically.

1.05 In the event of machine failure, provision is made to permit an operator to make announcements. Emergency announcements can be made at regular operating positions or at the end positions. When the machine fails, alarm signals are given at the switchboard and at the announcement machine.

2. PRINCIPLES OF OPERATION

2.01 The record-reproduce heads and erase heads of the announcement machine are arranged to provide six circular recording paths, or channels, on the magnetic recording band. There may be a maximum of six announcing trunks, each connected to a separate channel on the announcement machine, so that six different announcements may be made simultaneously.

2.02 Recording is accomplished by passing through a record-reproduce head of the machine the desired voice signal, together with a high-frequency bias current from an oscillator which is a part of the associated amplifier. No high-frequency bias is used during reproduction. Erasure is accomplished by a second head, the erase head, fed with high-frequency erasing current from the oscillator.

2.03 The recording-reproducing machine is arranged for simultaneous erasure and recording. The erasing head for each of the six channels is located a little ahead of the record-reproduce head, so that as the record-

ing drum rotates, a section of the band associated with a single channel is erased immediately before reaching the recording head. The section of the band is completely erased in one revolution of the recording drum. Therefore, to insure complete erasure (particularly necessary if the new announcement does not occupy a full talking period), recording is delayed until the end of the first revolution.

2.04 For the No. 4-type systems, after an announcement has been recorded, an appropriate group of announcement connecting trunks is patched at the traffic supervisory rack to the announcing trunk associated with the channel on which the announcement has been recorded. The machine will continue to announce as long as an announcement connecting trunk is connected to the machine.

2.05 For crossbar tandem, the announcement connecting trunks are cabled directly to an announcing trunk and the machine will operate continuously under control of a switch on the machine. While an announcement is being recorded, the connecting trunks are made busy at the manual outgoing trunk test frame.

### 3. EQUIPMENT ELEMENTS

3.01 Fig. 1 shows the announcement frame consisting of the recorder-reproducer, six amplifiers, and six announcing trunks.

#### A. Recorder-Reproducer

3.02 The recorder-reproducer is used for recording announcements and for reproducing them when announcement connecting trunks are connected to the announcing trunks discussed below. A maximum of six different announcements (one on each channel) may be recorded on the machine. The machine also erases a previous announcement before a new recording is made.

3.03 Three interrelated mechanisms in the recorder-reproducer are a drum drive for the recording medium, a cam and micro switch system for control of recording time and for correlated switching, and an assembly on which are mounted twelve magnetic heads, one for recording and reproducing and one for erasing on each of the six channels.

3.04 The recording medium consists of a molded synthetic rubber band approximately 1-1/2 inches wide containing an iron oxide.

3.05 The drum drive for the recording medium includes a gear case mounting the driven pulley on the rear and the recording drum on the front. A motor and its pulley are coupled to the driven pulley by means of a flat endless woven belt. The driven pulley is on a shaft which is in line with the shaft of the recording drum. The recording drum is located on the front of the panel. The motor is as-

sembled on vibration mountings, and a rod and rubber mounting assembly is provided to maintain constant belt tension. The motor is so pivoted that its weight also acts to maintain tension in the driving belt. Fig. 2, page 8 shows the front view of the machine and Fig. 3, page 9 the rear view.

3.06 A cast aluminum cam is mounted on the rear of the recording drum. This cam operates an associated micro switch which controls flashes to the switchboard and controls cut-through in the connecting trunk when this trunk is arranged for delayed cut-through.

3.07 The assembly on which the magnetic heads are mounted is located on the front side of the panel (see Fig. 2). The magnetic head mounts are pivoted on rigid castings which project over the top of the recording drum and are secured to a large ring casting at the rear of the recording drum. The castings have been so machined that the magnetic heads are spaced apart so as to provide the locations of the six separate recording channels. Thus, a continuous loop of recording medium is presented to the magnetic head provided for each channel. Suitable means have been included in the magnetic head mounting assembly to assure a positive contact pressure between the magnetic head and the recording surface.

#### B. Amplifier

3.08 One amplifier is used for each of the six channels of the announcement machine. The amplifier is used for amplification of the voice in recording and also for amplification in reproducing an announcement. In emergency operation, the announcement by an operator is made through the amplifier.

3.09 Each amplifier consists essentially of an amplifier circuit, a switching relay, an oscillator, a self-contained power supply to provide plate and filament voltages, and a voice-failure alarm unit.

3.10 The switching relay serves to interchange the input and output connections of the amplifier to the recorder-reproducer as required to record and to reproduce. The amplification levels for recording and reproducing conditions can be set independently by individual gain controls. The switching relay is controlled by the operation of relays in the trunk circuit.

3.11 The voice-failure alarm circuit is connected when the amplifier is in the reproducing condition, to indicate when the amplifier output falls below a predetermined level by actuating an alarm. (See 3.19 and 3.20.)

#### C. Announcing Trunk

3.12 The announcing trunk connects an announcement on the machine to a number of announcement connecting trunks.

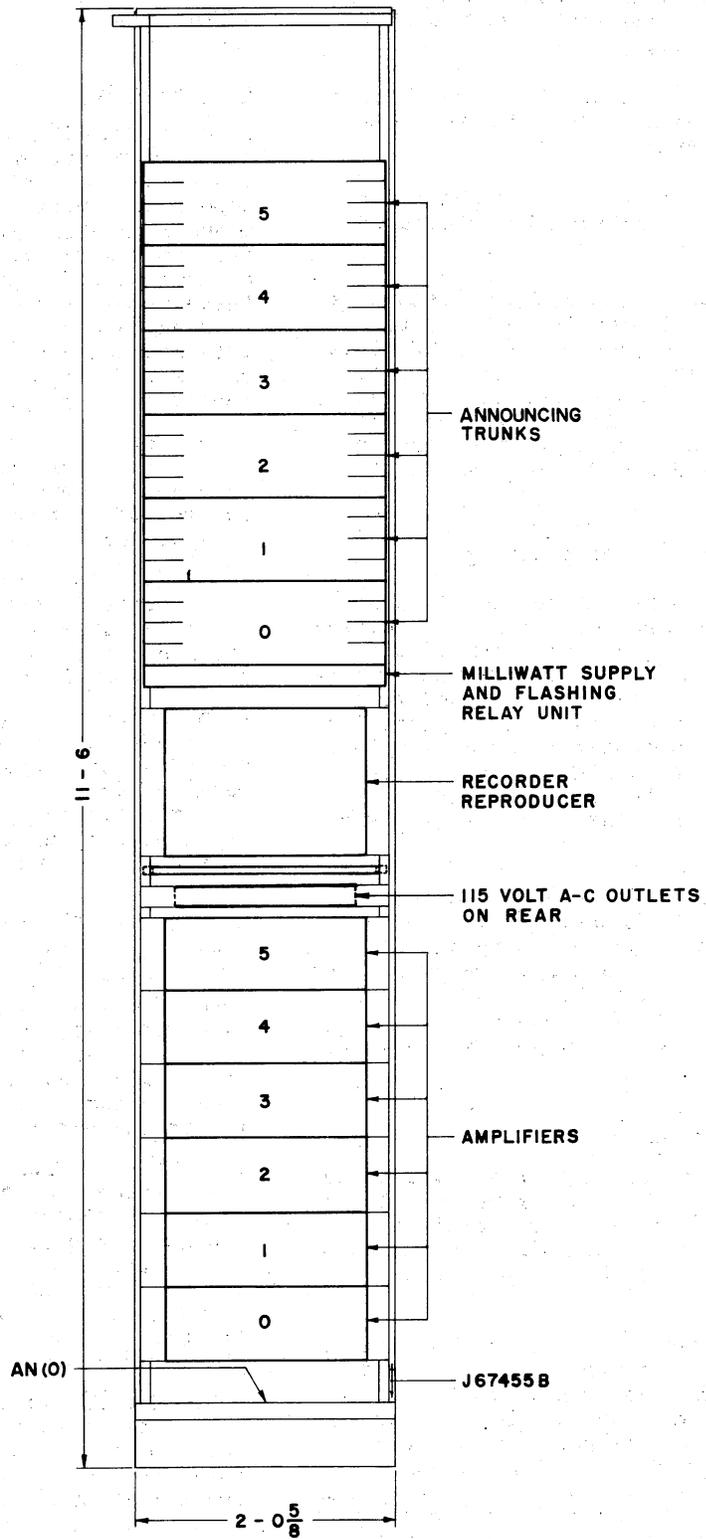


Fig. 1 - Annunciation Frame

3.13 The announcing trunk circuit provides means for starting the motor of the announcement machine circuit so that an operator may erase a previous announcement, record a new announcement, and listen to the playback of her recording.

3.14 The trunk circuit provides means for an operator to make announcements independently of the machine.

3.15 The trunk circuit provides means for controlling alarm signals in case of machine failure.

3.16 In No. 3-type switchboard positions, a pad control simplex is required to operate a relay in the announcing trunk. This pad control simplex is not always provided for switchboards using via net loss operation with fixed pads. If this is the case, the positions with the announcing trunk appearances must be provided with a pad control simplex.

#### D. Face Equipment at Switchboards

3.17 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, adjacent to the end position, are used for recording and announcing at the recording position. Each end position of the No. 5 switchboard is equipped with a cord, lamp, and ringing key for this purpose.

3.18 Two jack appearances and an answering lamp for each channel are multiplied throughout the No. 1 and No. 3-type toll switchboards, and 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.

#### E. Alarm Facilities

3.19 When there is failure of a voice signal on a channel that is serving a call, alarm lamps light and a minor audible alarm sounds to indicate to the maintenance forces that there is trouble in the machine or amplifier.

3.20 The alarm facilities are as follows: minor audible alarms located in the switchroom; alarm lamps, individual to the channel, located with the channel equipment (green lamp) and in the head end position or cable turning section of the switchboard (red lamp); standard aisle, floor and exit pilots used to direct the central office switchman to the channel equipments; and a locking-type alarm cutoff key and associated guard lamp, provided for each channel and located with the channel equipment.

#### 4. METHOD OF OPERATION

4.01 The method of operation is described below for each of the three switchboards with which the announcement machine operates.

##### A. Recording

4.02 For the No. 4-type systems, the announcing trunk is connected to the connecting trunks by means of patches at the traffic supervisory rack. In order to record, the channel used should not be patched up at the traffic supervisory rack to an announcement connecting trunk group. This precaution is taken to allow the operator to check her recording before it is sent out. Either an idle channel can be used or an active channel can be taken out of service until the new recording is completed.

4.03 For crossbar tandem, the announcing trunks are cabled directly to the announcement connecting trunks. In order to record, the connecting trunks must be made busy at the manual outgoing trunk test frame.

4.04 The steps performed by an operator in order to record an announcement are given in Table A. The machine cycle is 12.6 seconds and consists of a 1.4-second flash and 11.4-second announcement time.

4.05 After hearing the playback, if the recording is acceptable, the operator removes the cord from the jack after a flash is received on the cord lamp. If the recording is not satisfactory, she repeats the recording procedure until a satisfactory announcement has been recorded.

##### B. Machine Announcement

4.06 For the No. 4-type systems, after the desired recording has been made and when conditions warrant, an announcing trunk is patched at the traffic supervisory rack to a group of announcement connecting trunks. This causes the machine motor to start. When an announcement connecting trunk is seized, the announcement is sent out.

4.07 For crossbar tandem, after the desired recording has been made, the busy condition is removed from the connecting trunks. The machine motor is started by operating a key on the machine. It then operates continuously because of the permanent cabling between the announcing trunks and the connecting trunks. When a connecting trunk is seized, the announcement is sent out.

4.08 The connecting trunks may be arranged for immediate cut-through of the announcement, or they may be arranged to delay cut-through until the beginning of the next cycle with audible ringing being provided until the start of the cycle.

4.09 Fig. 4 shows block diagrams of the announcement facilities for crossbar tandem and for the No. 4-type systems.

Table A - Operator Procedure for Recording Announcements

Step	OPERATION			RESULT
	No. 1 Switchboard	No. 3-type Switchboard	No. 5 Switchboard	
1	Cord inserted into RECORD-ANNOUNCE jack of desired channel.	Cord inserted into RECORD-ANNOUNCE jack of desired channel.	Cord inserted into RECORD jack of desired channel.	Recording machine started
2	TALK key operated, remains operated	MON key operated	*	Recording input connected to amplifier and record-reproduce head circuit connected to amplifier output
3	Flash received on cord lamp	Flash received on cord lamp	Flash received on cord lamp	(Flash is approximately 1.4 sec)
4	Immediately after flash, ringing key operated momentarily	Immediately after flash, TALK key operated, remains operated	Immediately after flash, cord ringing key operated, held operated	Previous announcement erased
5	Flash received on cord lamp	Flash received on cord lamp	Flash received on cord lamp	-
6	New announcement recorded	New announcement recorded	New announcement recorded	(Talking period is approximately 11.2 sec)
7	TALK key remains operated, cord left in jack	TALK key restored to MON position before next flash, cord left in jack	Ringing key released before next flash, cord left in jack	Amplifier automatically arranged for reproducing
8	Playback of announcement heard	Playback of announcement heard	Playback of announcement heard	-
9	If recording is acceptable, cord removed from jack after next flash on cord lamp	If recording is acceptable, cord removed from jack after next flash on cord lamp	If recording is acceptable, cord removed from jack after next flash on cord lamp	-

\*For No. 5 switchboard, recording input is connected to amplifier and record-reproduce head circuit is connected to amplifier output when the headset plug is inserted into the jack associated with the recording position.

#### C. Emergency Operator Announcement

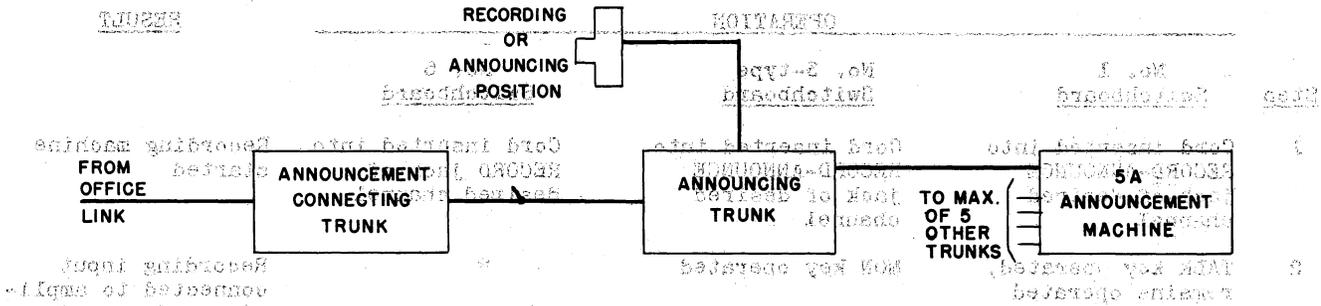
4.10 In the event of failure of the recorder-reproducer, operator announcements may be used instead of machine announcements. These announcements are made through the amplifier associated with each channel. Any position of the switchboard may be used for making emergency announcements. However, only the end positions can be used to make or erase a recording.

4.11 The steps performed by an operator in order to make an announcement are given in Table B.

#### D. Alarm Facilities

4.12 In order to bring in an alarm, there must be a failure of a voice signal on a channel that is serving a call. Under this condition, an ALM lamp at the switchboard lights, a minor audible alarm sounds in the switchroom, an aisle pilot lamp lights, and an ALM lamp associated with the announcing trunk lights at the announcement frame. All these signals are locked in until released by the maintenance forces, except the ALM lamp at the switchboard. (See 4.14.)

**CROSSBAR TANDEM**  
Table A - Operator Procedure for Recording Announcements



**NO. 4 - TYPE TOLL CROSSBAR**

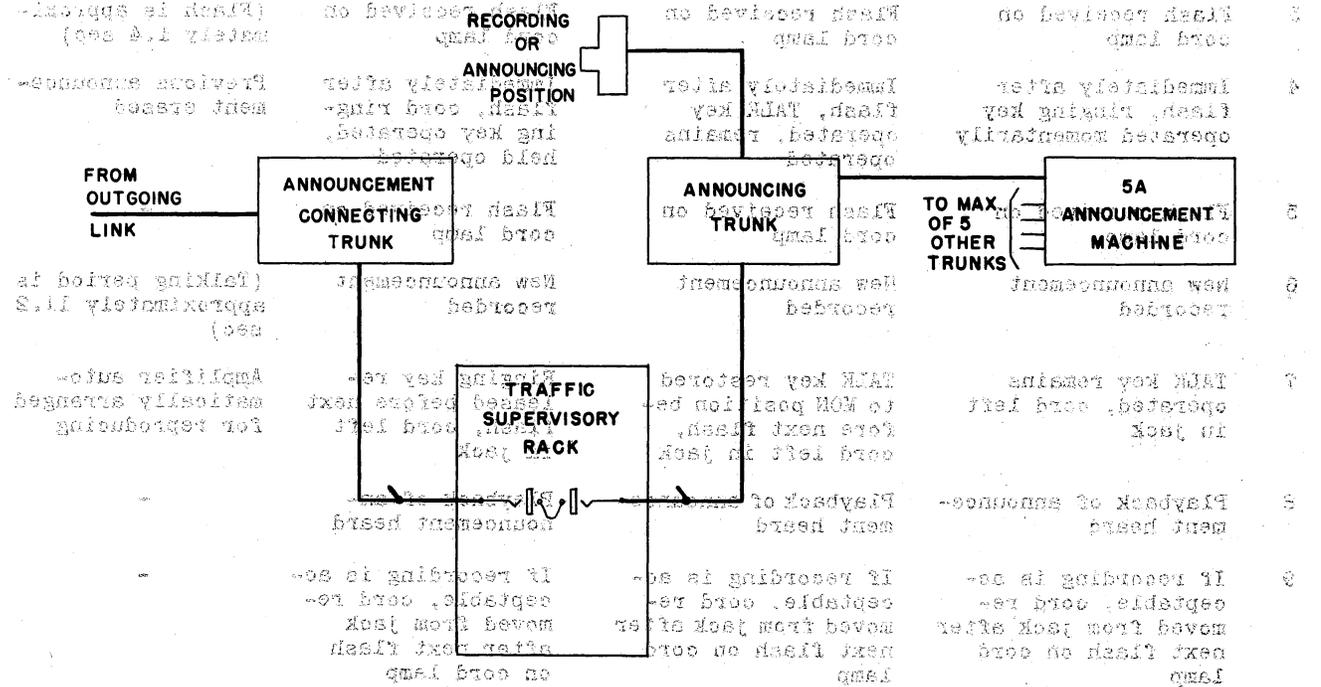


Fig. 4 - Block Diagram of Recorded Announcement Facilities

- 4.13 Operation of the ALM CO key silences the audible alarm, extinguishes the aisle pilot lamp, lights a guard lamp and keeps the lamp at the announcement frame lighted. The ALM lamp at the switchboard remains lighted.
- 4.14 The ALM CO key will not retire an alarm lamp at the switchboard except during intervals when an operator is announcing and then, only if transmission of operator announcement is effective.
- 4.15 When the trouble is cleared, the ALM CO key is released. This extinguishes the guard and ALM lamps at the announcement frame.

- 5. MAINTENANCE FACILITIES
  - A. Machine and Trunks
    - 5.01 No special equipment is necessary for testing and maintaining the recorder-reproducer or trunks.
  - B. Amplifiers
    - 5.02 Potentiometer adjustments for the amplifiers can be made by using the milliwatt supply associated with the machine, and either a transmission measuring set or an ac voltmeter.

Table B - Operator Procedure for Making Emergency Announcements

Step	OPERATION			RESULT
	No. 1 Switchboard	No. 3-type Switchboard	No. 5 Switchboard	
1	Cord inserted into MAN jack	Cord inserted into MAN RING jack	*Dummy plug inserted into lower jack of a pair of RECORD jacks	When announcement connecting trunk is seized, associated line lamp lights
2	**Other end of cord inserted into RECORD-ANNOUNCE (OPR ANNOUNCE) jack	Second cord in- serted into RECORD- ANNOUNCE (OPR AN- NOUNCE) jack	Cord inserted into OPR ANNOUNCE jack	Line lamp extin- guished
3	TALK key operated, remains operated	TALK key operated, remains operated	#TALK key operated, remains operated	-
4	φRinging key of cord in RECORD-ANNOUNCE (OPR ANNOUNCE) jack operated once	φRinging key of cord in MAN RING jack operated once	φCord ringing key operated once	Cuts through to trunks that have been connected since the start of the last cycle
5	Announcement made	Announcement made	Announcement made	-
6	Steps 4 and 5 re- peated until the cord supervisory lamp lights, which indicates that there are no calls	Steps 4 and 5 re- peated until the cord supervisory lamp lights, which indicates that there are no calls	Steps 4 and 5 re- peated until the cord supervisory lamp lights, which indicates that there are no calls	-
7	Announcing stopped, cord removed from RECORD-ANNOUNCE (OPR ANNOUNCE) jack	Announcing stopped, cord removed from RECORD-ANNOUNCE (OPR ANNOUNCE) jack	Announcing stopped, cord removed from OPR ANNOUNCE jack	-
8	Other end of cord left in MAN jack	Original cord left in MAN RING jack	Dummy plug left in lower RECORD jack	Line lamp signal received, if addi- tional calls seize announcement con- necting trunks

\*Dummy plug has tip, ring, and sleeve short-circuited. When announcements are made at a regular operating position of a No. 5 switchboard, the dummy plug must be inserted into the RECORD jack at the recording position, since this jack does not appear at the regular operating positions.

\*\*The names of the jacks at recording positions are given. Where different, the names of the jacks at regular operating positions are given in parentheses.

#This step is not required when announcements are being made from an end position.

φThis step is required only where audible ringing is provided to the start of the announcement cycle.



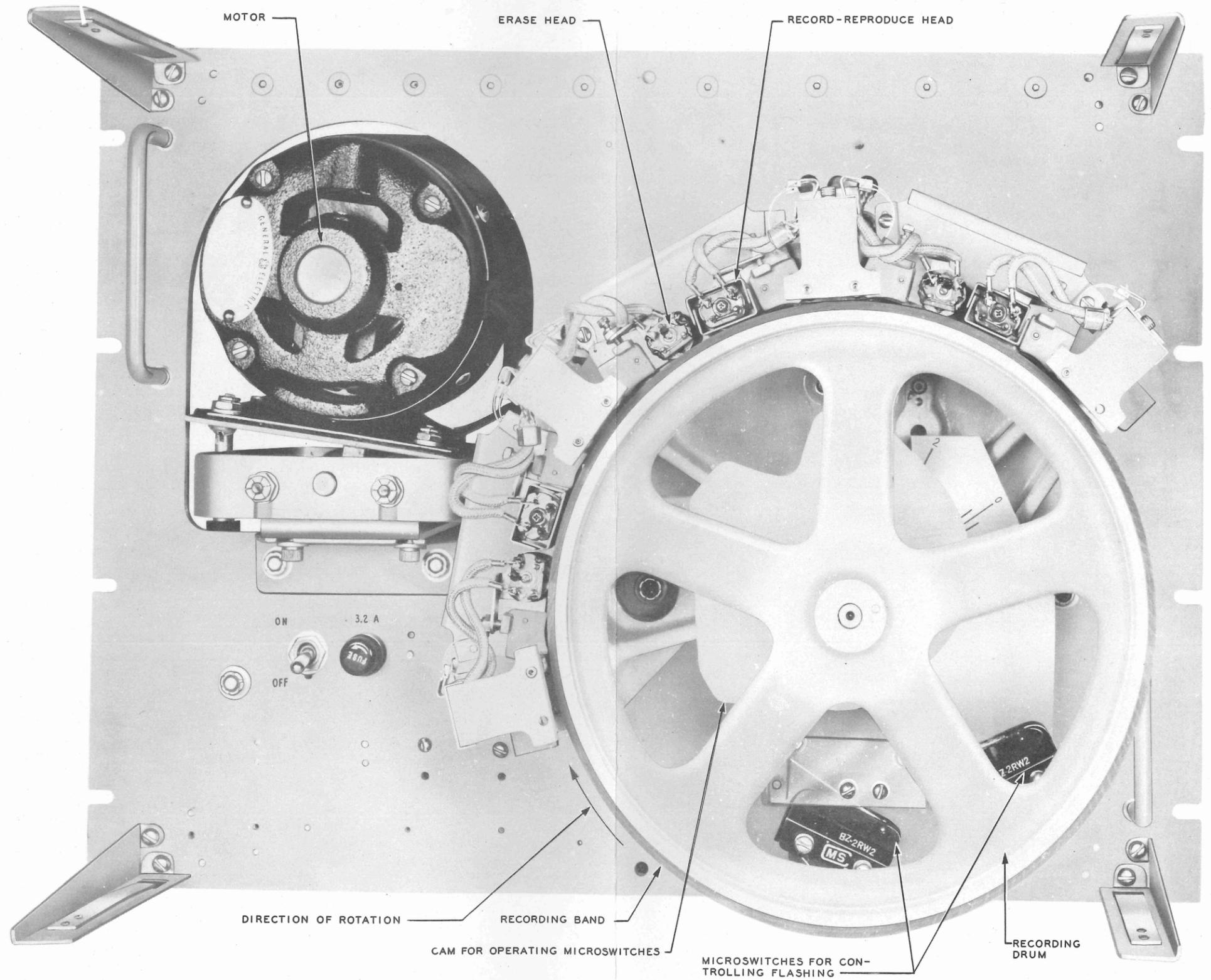


Fig. 2 - Announcement Machine - Front View Without Cover

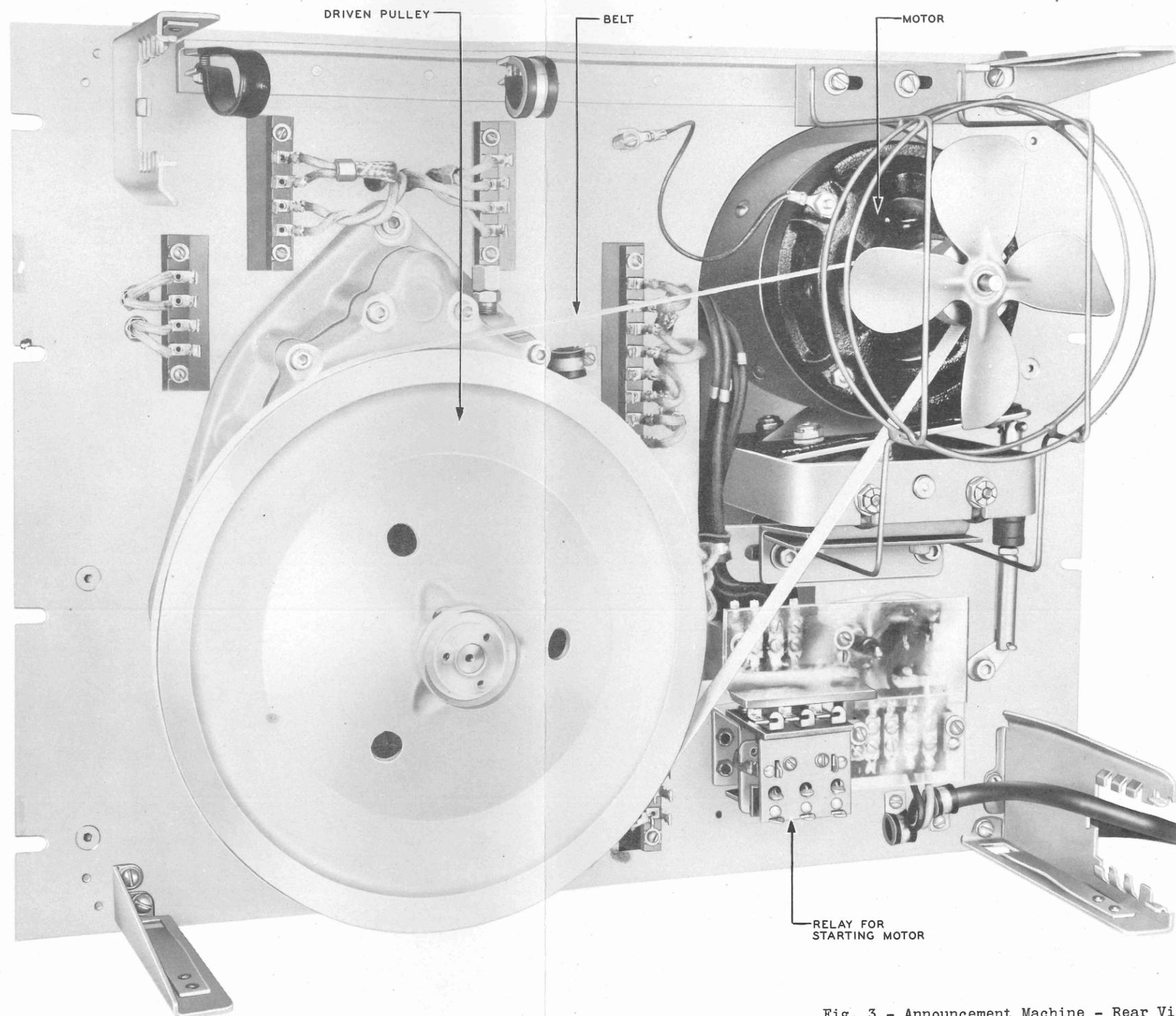


Fig. 3 - Announcement Machine - Rear View Without Cover