# 112A KEY EQUIPMENT

## GENERAL INFORMATION AND LIST OF SECTIONS

## FOR SAGE SYSTEMS

CONTENTS PAGE



### 1.00 INTRODUCTION

**1.01** This section contains general information pertaining to 112A key equipment.

**1.02** This section is reissued to delete references to sections which have been cancelled.

**1.03** Due to extensive changes marginal arrows have been omitted.

### 2.00 DESCRIPTION

**2.01** The 112A key equipment provides means for a key station attendant to establish talking connections over internal lines to other personnel in the same building, over external lines to stations at distant locations, or over external lines to remote radio sites for communicating with aircraft. Some of the specific applications for which this key equipment was designed are at direction centers, combat centers, radar sites, and other control points which make up the SAGE system of air defense. The relay equipment is mounted on frames in a separate equipment room.

**2.02** Each SAGE installation is equipped with various non-Bell System consoles in which telephone apparatus is mounted. Some of the varieties are:

- Situation Display
- Auxiliary A, B, C, and D
- Maintenance
- Gap Filler Radar Data Mapping
- Gap Filler Input Monitor
- Long-range Input Monitor
- Command Desk
- Staff Desk
- Projection
- Range Height and Azimuth Range Indicators at Long-range Radar Sites and Texas Towers

The telephone keys which control all the telephone equipment are located in the face of most of these consoles. The number of keys varies, depending on the type of console and the line requirements of that console. Also included in the console are preformed cable assemblies, dial, buzzer, telephone jacks, maintenance line jacks, and foot switch jack, when required. The line pickup keys appear in varying quantities in multiples of six keys. In

the situation display and the B- and C-type auxiliary consoles, the telephone lines terminate in a maximum of three key assemblies. In the wing on the situation display console, the radio circuits terminate in a maximum of three key assemblies. In the D-type auxiliary console, the telephone lines terminate in one key assembly, and the radio circuits terminate in a maximum of three key assemblies. The bottom key assembly associated with radio circuits is used to control connection to channels. The supplementary key assemblies are used to control connection to the radio sites. The command post consists of five desks: one command desk and four staff desks, each with two positions with space available for four keys assemblies. The maintenance console has space for two telephone panels. Each panel consists of three key assemblies, dial, buzzer, handset mounting, and miscellaneous apparatus. At long-range radar sites or Texas towers, the consoles are equipped with an auxiliary mounting arranged for one key assembly along with the associated telephone and maintenance line jacks and connectors. At long-range radar sites, a blank key space is provided. At Texas towers, an apparatus unit with a dial is used. All other consoles are equipped with maintenance line jacks and keys only.

**2.03** Each key or apparatus unit in the console is equipped with a miniature multipoint male connector. This arrangement permits easy removal, thus minimizing maintenance at the console during operational periods. Miniature multipoint connectors provide a fast connect and disconnect feature for leads to the telephone equipment in the console. This permits quick replacement of the entire console when major troubles occur.

**2.04** Some of the computer frames at the direction center are equipped with a master telephone station where a PBX line is terminated. These stations are located at the end of the computer module. The associated jack stations are located on the front and rear of the line-up of modules. The computer frames at the long-range radar sites and Texas towers are equipped with jack stations only.

**2.05** Provision is also made to locate key assemblies on desks or tables. In these cases, the key assemblies are mounted in modular housings.

**2.06** A number of equipment assemblies are provided at the site for customer operation. These include the Radio Patch and Test Cabinet, Radio Supervisory and Radio Team and Jack Cabinet, Tactical Channel Assignment Panel, Recorder Patch and Monitor Cabinet, Training Activating Key Cabinet, and the Radio Monitor Turret.

## 3.00 PRECAUTION

**3.01** Access to telephone equipment in consoles should be obtained by having the customer remove the necessary panels or covers, as required.

**3.02** On operating consoles, interlock switches are installed for the front and rear panels. When the panels are opened, the switches automatically cut off the high voltage within the console and remove it from service. The side covers can be removed only when either the front or rear panels are open.

**WARNING: Commercial power to convenience outlets and trouble lamps remains on within the console. A "cheater" switch has been provided in the high-voltage interlock circuit. Avoid accidental operation of this switch.**

## 4.00 GENERAL

**4.01** Block diagrams have been provided in this section to show the general layout of 112A key equipment. Included in one block diagram are auxiliary and connecting circuits which are not a part of 112A key equipment, but are shown as aids in developing a more thorough understanding of the way in which this key equipment fits into the SAGE air defense system. SD numbers have been shown as reference information. (See Fig. 1, 2, 3, and 4.)

**4.02** Wire-spring relays have been used extensively in the 112A key equipment. For the description and general maintenance information on wire-spring relays, refer to the appropriate section.

**4.03** General maintenance of head telephone sets, hand telephone sets, dials, subscriber sets, keys, relays, jacks, etc, used with the 112A key equipment are not covered in the maintenance sections. Reference should be made to the section pertaining to the specific item.

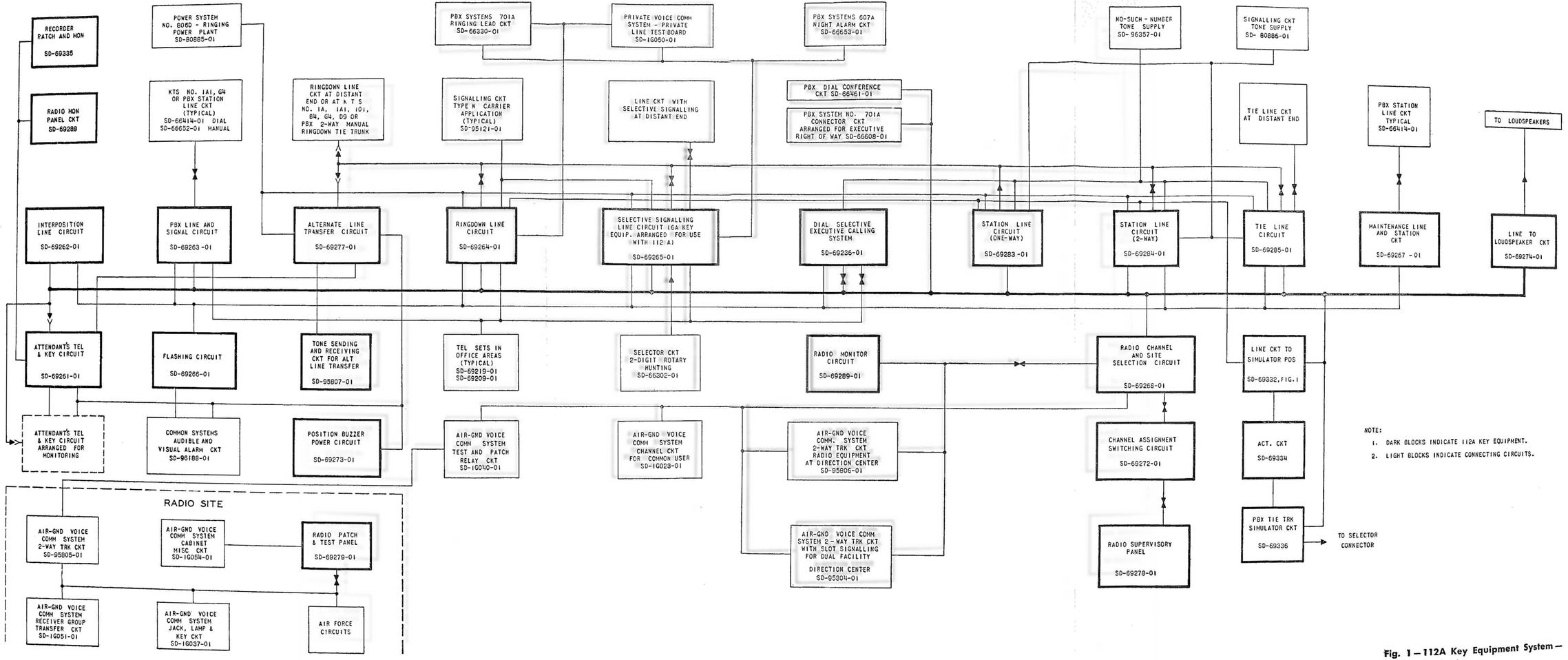


**Fig. 1 — 112A Key Equipment System — Block Diagram**

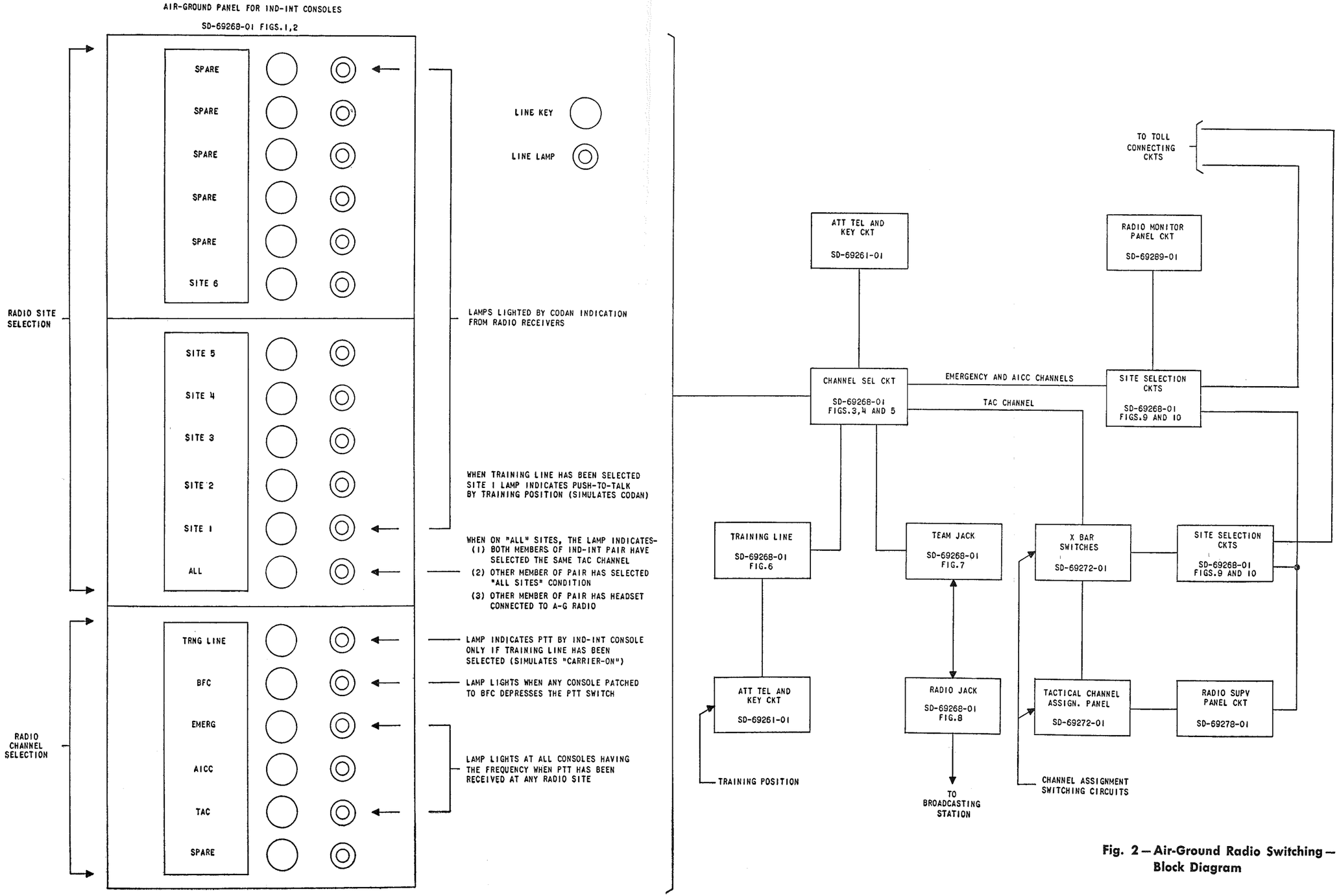


**Fig. 2 — Air-Ground Radio Switching — Block Diagram**

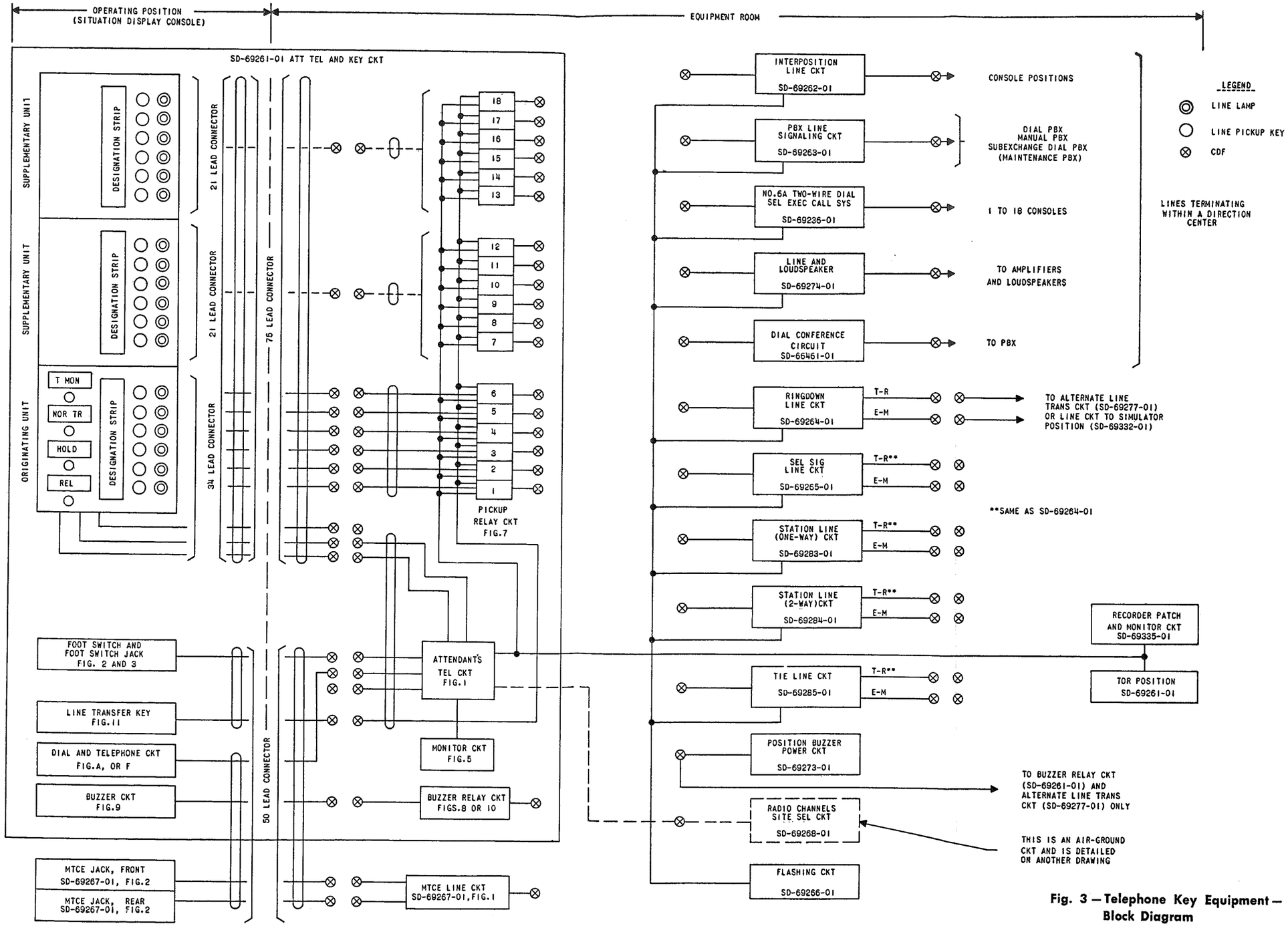


**Fig. 3 — Telephone Key Equipment — Block Diagram**

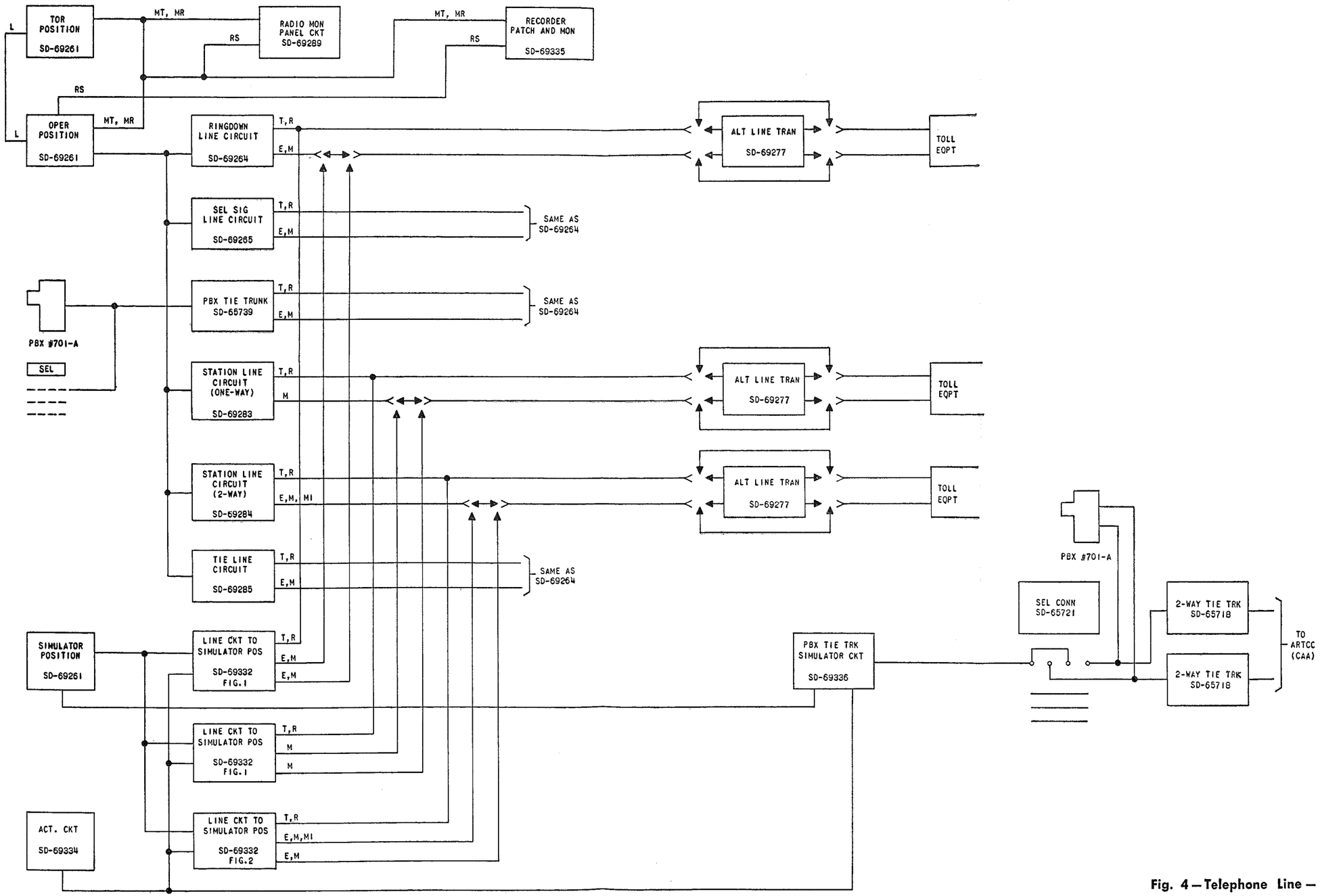


**Fig. 4 — Telephone Line — Block Diagram**