

6A KEY TELEPHONE SYSTEM

IDENTIFICATION

1.00 INTRODUCTION

1.01 This section covers the description and use of the 6A key telephone system.

1.02 The 6A key telephone system, available in three arrangements, is a dial selective intercommunicating system designed to accommodate 36 station codes. In general, the 6A system is designed for on-premise operation, although use of a long line circuit will enable remote stations to have access to the local 6A system facilities.

1.03 The 6A key telephone system, will eventually replace the 9-station dial intercommunicating arrangement covered by SD-69199-01 and C Sections under 1A1 key telephone systems.

1.04 This section is reissued to add information, revise Table A, and change the following KTU codes:

- 226A is replaced by 226B
- 232A is replaced by 232B

1.05 Due to extensive changes, marginal arrows have been omitted.

2.00 GENERAL

2.01 The 6A key telephone system offers a variety of service features to the customer depending on the type of basic arrangement installed. Some optional features can be obtained by strapping changes on key telephone units; other features require the addition of key telephone units.

2.02 The following instruction cards for station systems should be furnished at each station:

- Form E4649 — Key Telephone Sets
- Form E4653 — The Call Director Telephone Sets.

3.00 ARRANGEMENTS

Selector Only (Fig. 1)

3.01 This arrangement provides for:

- Access to a common talking path for a maximum of 36 station codes.
- Dial station selection

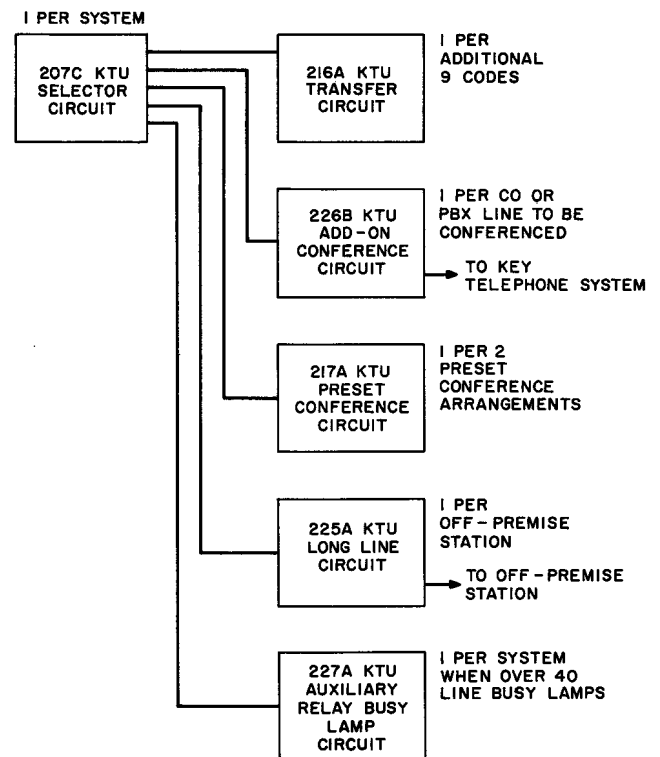


Fig. 1 — Selector-Only Arrangement

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- Station signaling over a separate pair by means of a single-spurt audible signal.
- Line busy lamps indicating the 6A system is busy.
- Preset conferencing.

This optional feature enables a 6A station to select a group of stations (maximum of six) by means of a dialed code or the operation of a signal key. Different preset conference arrangements may be provided at an installation and a particular station can appear in one, all, or none of these. Use of a dial code to originate a conference would reduce the number of 6A stations on the system.

Note: A preset conference arrangement consisting of more than two stations should not be added on a central office or PBX line.

- Off-premise stations can be a part of the intercommunicating network with the use of a long line circuit. This circuit will provide satisfactory transmission providing the following conditions are met:
 - (a) All off-premise stations must be equipped with 500-type telephone sets.
 - (b) The maximum external loops shall not exceed 1000 ohms when a minimum battery potential of 20 volts is supplied. However, longer loops may be used if the battery potential is increased.
 - (c) Off-premise stations that may be connected to the add-on conference feature should not exceed a 1000-cps loss of 8 db from the station to the serving central office.

(d) If any of the above conditions cannot be met, the circuit should be locally engineered.

- Add-on conferencing is a feature that allows a central office or PBX line to be interconnected with any 6A station. Operation is as follows. An incoming call on a central office or PBX line is picked up under control of an associated key telephone system. A hold is placed on the central office or PBX line, the desired intercommunicating station is signaled, and a talking path established. By operation of the add-on conferencing signal key at the 6A control station, the central office or PBX line is connected to the intercommunicating line.

Note: To keep transmission at a satisfactory level, connect no more than a maximum of two 6A stations on any one conference call.

Single-Talking Link (Fig. 2 or 3)

3.02 This arrangement provides for:

- A selector and a primary talking link. The selector is used in the process of station selection and the primary link is used as the talking path between the called and calling stations.
- Dial tone to a station originating a call.
- Selective signaling by means of a signaling key on a one-per-called-station basis.
- Combined line and busy lamps. A steady lamp indicating the 6A system is busy and a flashing lamp indicating an incoming call.

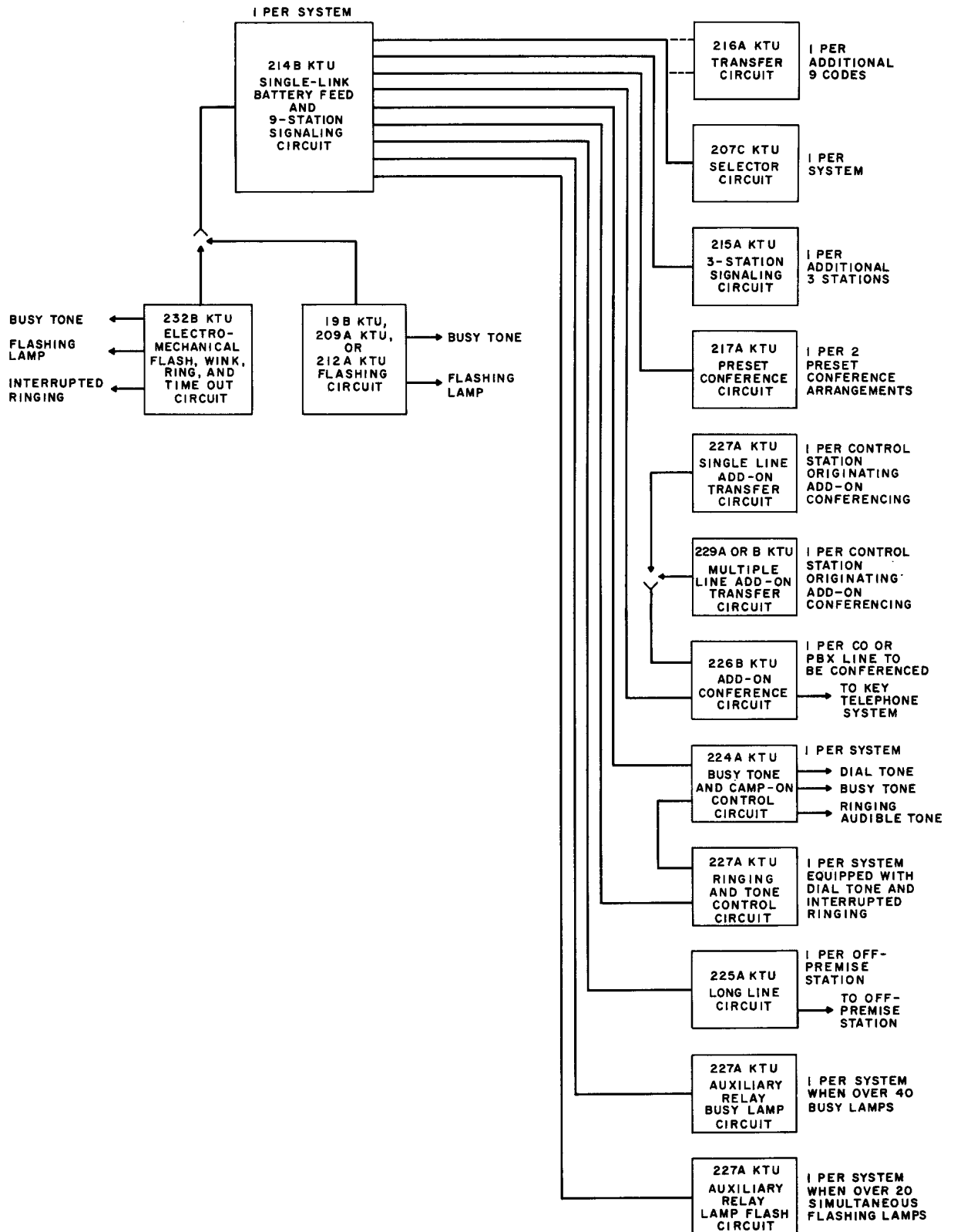


Fig. 2 — Single-Link Arrangement, Using 214B KTU

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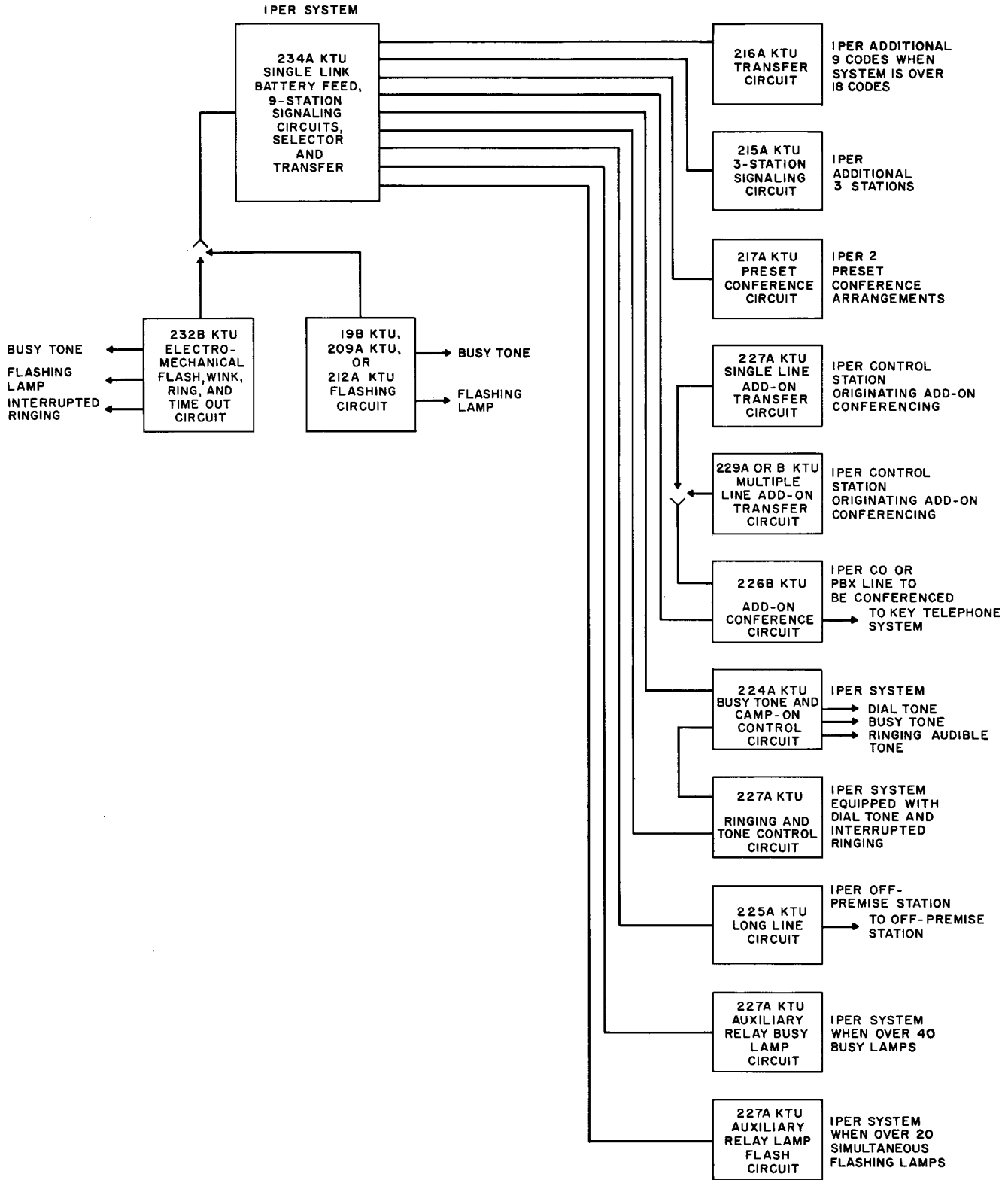


Fig. 3 — Single-Link Arrangement, Using 234A KTU

- Audible signaling at a 6A station which can be provided in one of three ways:
 - (a) Signaling over the *T* and *R* leads to a bridged ringer. This feature permits signaling and talking over a single pair.
 - (b) Signaling over a separate pair. This type can be employed at stations where audible signals are other than bridged ringers (eg, buzzers, bells, etc).
 - (c) Operating a station common audible signal through a control circuit per SD-69294-01 and C Section entitled Audible and Visual Signaling—Using a 227A Key Telephone Unit.
- Audible ringing tone to the calling station when interrupted ringing is provided.
- Off-premise stations as described in 3.01.
- Preset conferencing is an optional feature that enables a 6A station to select a group of stations (maximum of six) by means of a dialed code or the operation of a signal key. Different preset conference arrangements may be provided at an installation, and a particular station can appear in one, all, or none of these. Use of a dial code would reduce the number of 6A stations on the system. The visual signal is used to indicate the progress of a conference call. When a conference call is originated, the calling station has a steady busy lamp, and the called stations have the flashing line lamp. As soon as the first called station answers, the calling station's lamp begins to flash and continues to do so until all stations have answered. All lamps then go steady indicating that the conference is now completed.

All three methods of signaling may be found on a 6A key telephone system.

- Single spurt or interrupted ringing.
 - (a) Single-spurt signaling provides for the audible signal at the called station to be operated once for a nominal 1-1/2 second period.
 - (b) Interrupted ringing provides for the audible signal at the called station to be interrupted at the rate of 1 second on and 3 seconds off, until such time as the called station answers or the call is abandoned.

Note: Tripping of ring can take place only during the silent interval.

- Automatic cutoff of all, some, or none of the associated stations. Stations that are wired for automatic cutoff are prevented, on pickup, from being transferred onto an existing talking connection on the primary link.
- Selective conferencing is available where pushbutton signaling has been provided. The conference is called by operating a number of pushbuttons (maximum of six) simultaneously. The visual signal is used to indicate the progress of a selected conference call, as described in preset conferencing.
- Camp-on is a feature that allows a 6A station, wired for automatic cutoff, to go in over the busy lamp, indicating the system

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is busy, and dial a station code. The dialed code is stored in the selector. The calling station receives a busy tone indicating to him, as well as to any other station which subsequently picks up, that the system is now camped on. When the system becomes free, the previously selected station is automatically signaled without further operation by the calling station. Stations not wired for automatic cutoff cannot originate the camp-on feature, as they would immediately be transferred onto the primary link on pickup.

- Add-on conferencing as described in 3.01.

Two-Talking Link (Fig. 4)

3.03 This arrangement provides for:

- A selector and a primary talking link as described in 3.02, plus the addition of a secondary talking link. This enables one system to carry on two simultaneous and independent conversations. Whenever the secondary link is free, a call on the primary link is automatically transferred to it, thereby freeing the primary link for another call. A slight click is heard during this transfer operation.
- Dial tone to a station originating a call.
- Selective signaling
- Combined line and busy lamps
- Audible signaling
- Single spurt or interrupted ringing
- Automatic cutoff
- Audible ringing tone
- Selective conferencing

} as described in 3.02

- Off-premise stations
 - Add-on conferencing
- } as described in 3.01

- Busy tone to a calling station when the called station is busy on the secondary link.

- Preset conferencing as described in 3.02 with the added feature of the calling station receiving a busy signal when a station that is part of the preset conference arrangement called is busy on the secondary link. Busy tone would be heard until the first called station answers.

- Camp-on, when associated with a two-link system, has two phases of operation.

(a) Camping on a busy system (both links in use) as described in 3.02, with the camp-on control circuit locking operated under control of the secondary link. The release of the secondary link and the transfer operation freeing the primary link would allow the called station to be signaled automatically. Had the primary link released first the camped-on condition would have persisted until the secondary link had released, even though a link is available.

(b) The second phase of operation allows a calling station to camp on when a station that is busy on the secondary link is called. Under this condition the calling station receives the busy tone and then reserves the intercom system until the secondary link releases.

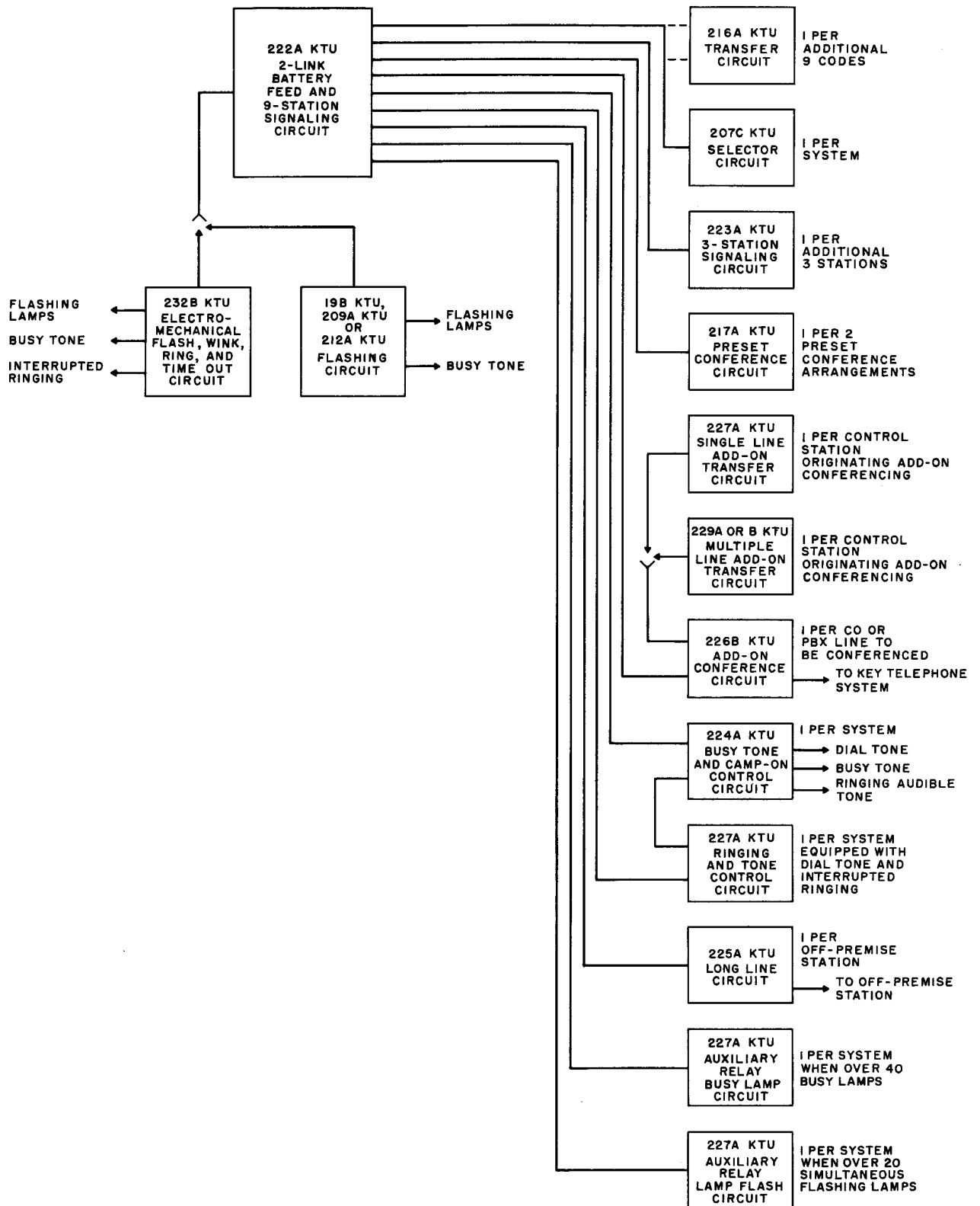


Fig. 4 — Two-Link Arrangement

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3.04 A holding arrangement for 6A system stations, to be used primarily for outward add-on conferencing, has been developed. See C Section entitled 6A Key Telephone System, Holding Arrangement for 6A Stations, Using 1A or 1A1 Line and Signaling Circuits.

4.00 APPARATUS

4.01 Table A lists the key telephone units used with the 6A key telephone systems.

4.02 6A key telephone system arrangements are available in packaged key telephone units such as:

Selector Only Arrangement

200 F*

200 G*

200 K*

* when subcoded D

Two-Talking Link Arrangement

200 H

For additional information refer to the C Sections covering these units.

4.03 For maintenance of the 204-type selector which is a part of the 207C or 234A KTU refer to C Section entitled 1A and 1A1 Key Telephone System, Maintenance.

5.00 REFERENCE

5.01 Information covering the 6A key telephone system arrangements is covered in the following:

Connections

- C71.012 — Selector Only
- C71.013 — Single-Talking Link
- C71.014 — Two-Talking Link
- C71.015.00 — Holding Arrangement for 6A System Stations

Maintenance

- C71.017 — Selector Only Arrangement
- C71.018 — Single-Talking Link Arrangement
- C71.019 — Two-Talking Link Arrangement

Drawings

- CD- and SD-69286-01 — Intercommunicating Line Circuit
- CD- and SD-69288-01 — Panel Mounted Units
- CD- and SD-69294-01 Visual and Audible Signal Circuits

TABLE A

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| KTU Code | Circuits | Quantity Required | Use | | | Panel Width | | Fig. No. |
|------------|--|---|--------------|-----------------|--------------|---------------------------------------|------------------------------|----------|
| | | | Sel-Only Arr | Single-Link Arr | Two-Link Arr | Inches | $\frac{7}{16}$ -inch Modules | |
| 207C | Selector | 1 per system | • | •* | • | 5 $\frac{1}{4}$ | 12 | 5 |
| 214B | Battery feed and 9-station signaling | 1 per system | | •* | | 16 $\frac{5}{32}$ | 37 | 7 |
| 215A | 3-Station signaling | 1 per 3 additional stations | | • | | 3 $\frac{15}{16}$ | 9 | 6 |
| 216A | Transfer | 1 per additional 9 codes | • | •* | • | 3 $\frac{1}{16}$ | 7 | 8 |
| 217A | Preset conference control | 1 per 2 conference arr | • | • | • | 3 $\frac{1}{16}$ | 7 | 9 |
| 222A | Battery feed and 9-station signaling | 1 per system | | | • | 23 | 49 | 10 |
| 223A | 3-Station signaling | 1 per 3 additional stations | | | • | 5 $\frac{1}{16}$ | 13 | 11 |
| 224A | Busy signal and camp-on control | 1 per system | | •† | • | 3 $\frac{1}{2}$ | 8 | 12 |
| 225A | Long line | 1 per off-premise station | • | • | • | 2 $\frac{3}{16}$ | 5 | 13 |
| 226B | Add-on conference control | 1 per CO or PBX line to be conferenced | • | • | • | 3 $\frac{1}{2}$ | 8 | 14 |
| 227A | Ringling and tone control | 1 per system equipped with dial tone and interrupted ringing | | • | • | 3 $\frac{1}{16}$ | 7 | 15 |
| | Single line add-on transfer | 1 per control station originating 1 add-on conference line | | • | • | | | |
| | Auxiliary relay busy lamp | 1 per system when over 40 line busy lamps | • | • | • | | | |
| | Auxiliary relay lamp flash | 1 per system when over 20 simultaneous flashing lamps | | • | • | | | |
| 228A | Blank apparatus panel assembly | As required for bridging purposes | • | • | • | 3 $\frac{15}{32}$ | 8 | |
| 229A or B‡ | Multiple line add-on transfer | 1 per control station originating 2 to 7 add-on conference lines | | • | • | 3 $\frac{1}{16}$ | 7 | 16 |
| 232§ type | Electromechanical flash, wink, ring, and time-out, when equipped with KS 15900, List 1 interrupter | 1 per system for flashing lamps, busy tone, and interrupted ringing | | • | • | 3 $\frac{15}{32}$ | 8 | 17 |
| 234A | Battery feed, 9-Station signaling, selector, and transfer | 1 per system | | • | | 23 | 49 | 18 |
| 19B§ | Flashing | 1 per system for flashing lamps and busy tone | | • | • | Mounting detail per local engineering | | |

* 234A KTU is electrically equivalent to 1 each of these units.

† Supply only when camp-on, dial tone, or audible ringing tone is furnished.

‡ The 229B KTU has three additional contacts wired to the terminal plate.

§ The required interruptions may be furnished by an associated key telephone system.

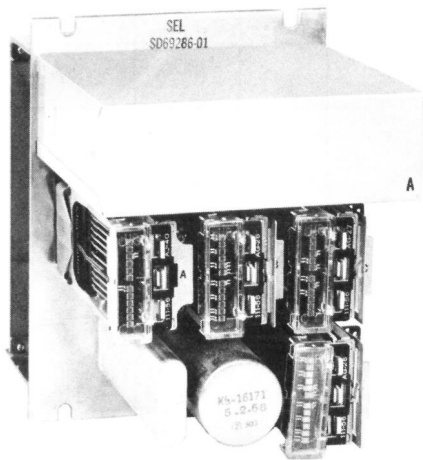


Fig. 5 — 207C KTU, Selector Circuit

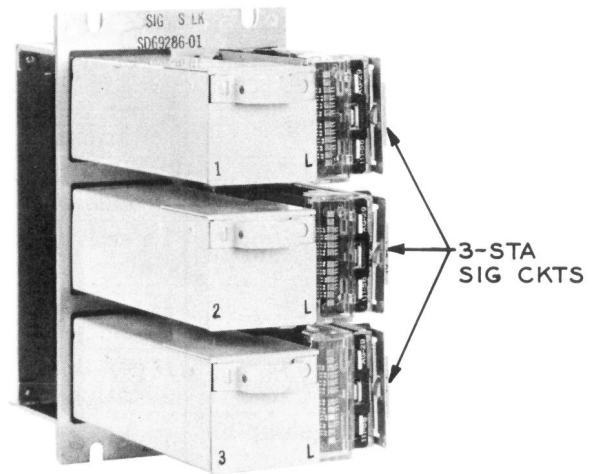


Fig. 6 — 215A KTU, Signaling Circuit, Single-Talking Link

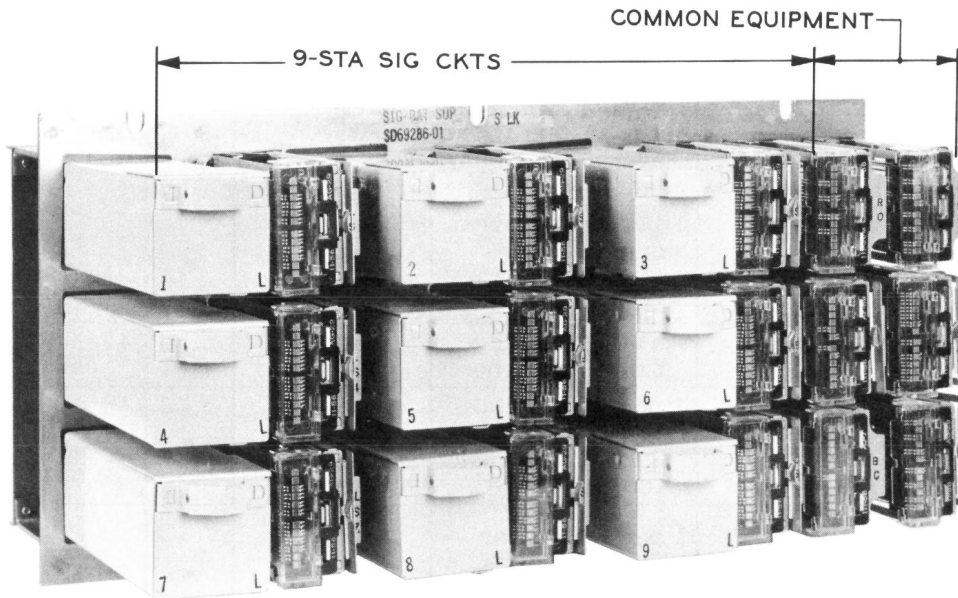


Fig. 7 — 214B KTU, Battery Supply and Signaling Circuit, Single-Talking Link

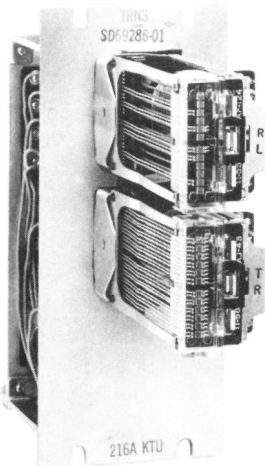


Fig. 8 – 216A KTU, Transfer Circuit

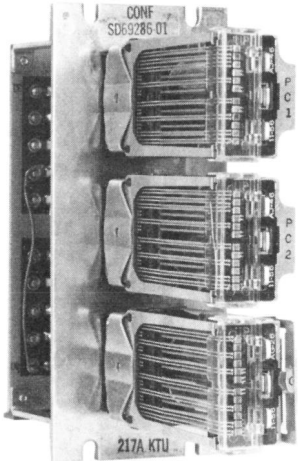


Fig. 9 – 217A KTU, Preset Conference Control Circuit

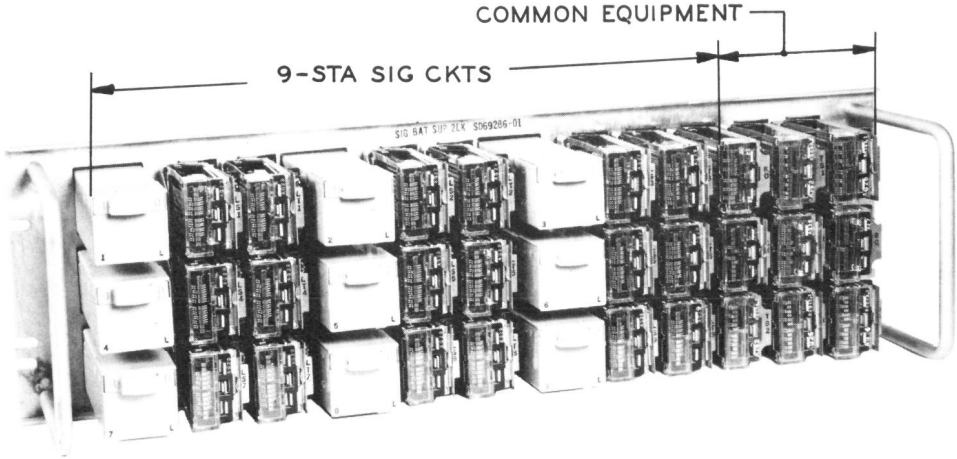


Fig. 10 – 222A KTU, Battery Supply and Signaling Circuit, Two-Talking Link

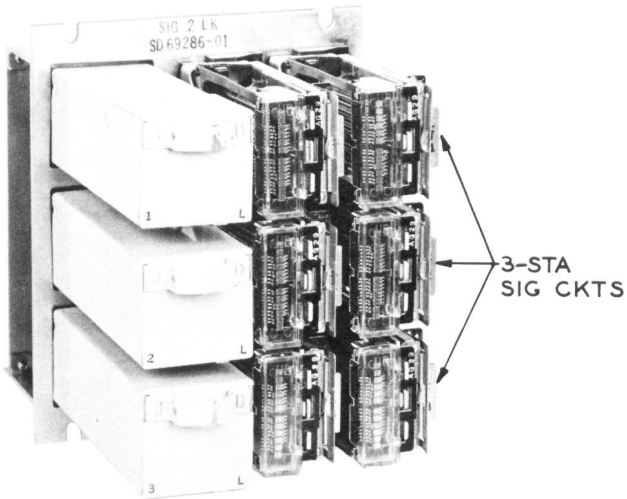


Fig. 11 — 223A KTU, Station Signaling Circuit, Two-Talking Link

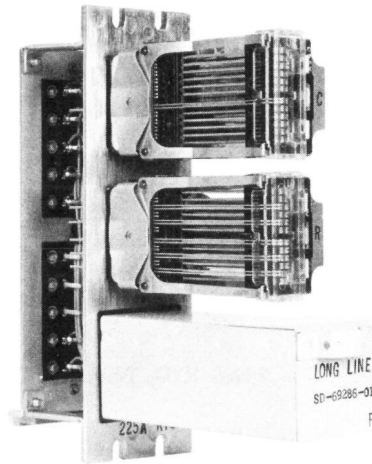


Fig. 13 — 225A KTU, Long Line Circuit

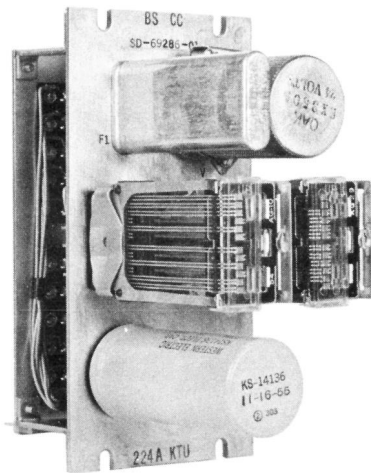


Fig. 12 — 224A KTU, Busy Signal and Camp-On Control Circuit

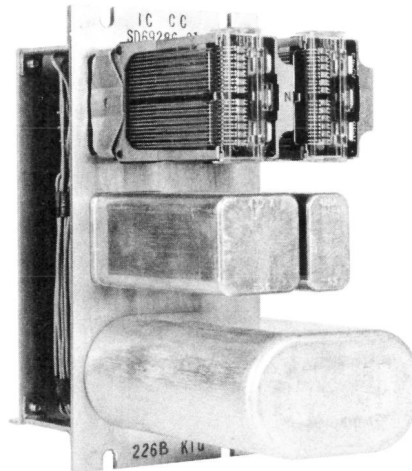
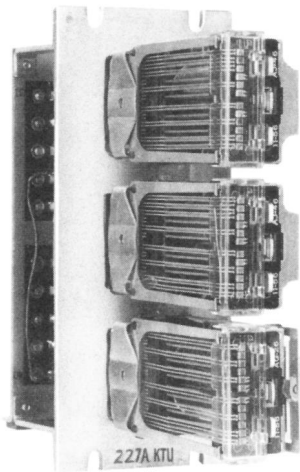
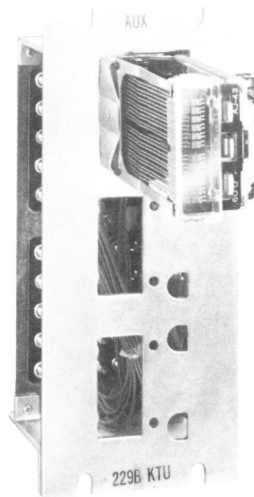


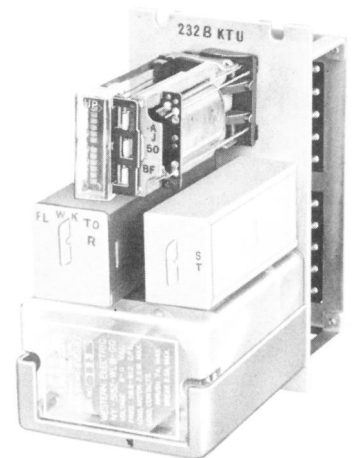
Fig. 14 — 226B KTU, Add-On Conferencing Control Circuit



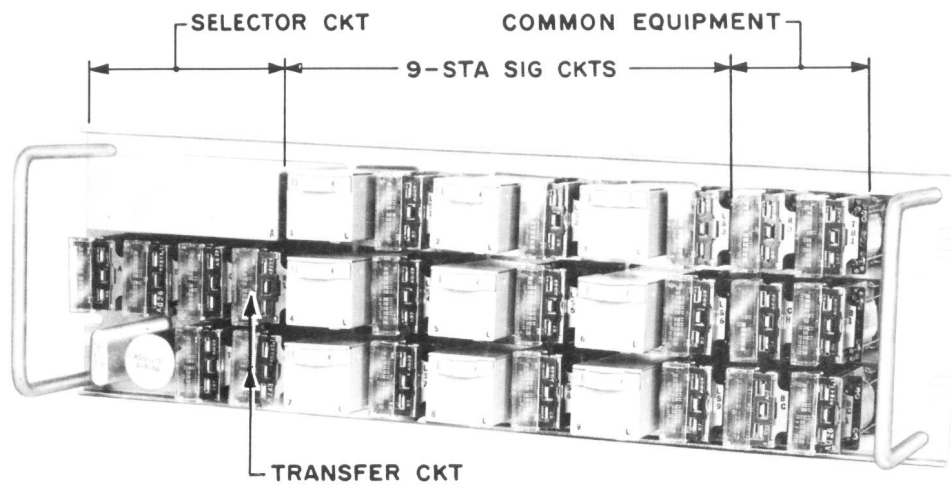
**Fig. 15 — 227A KTU
Auxiliary Relay Circuit**



**Fig. 16 — 229B KTU,
Multiple Line Add-On
Transfer Circuit**



**Fig. 17 — 232B KTU, Electro-
mechanical Flash, Wink, Ring,
and Timeout Circuit**



**Fig. 18 — 234A KTU, Battery Feed and Signaling (Single-Link) Selector and
Transfer Circuit**