

247A KEY TELEPHONE UNIT

IDENTIFICATION, INSTALLATION, AND MAINTENANCE

1. GENERAL

1.01 Information in this section was formerly contained in Section 518-410-410 which is hereby cancelled.

1.02 This section is issued to:

- Rate the 247A KTU, MD, replaced by the 247B KTU
- Rate the printed wiring circuit boards PC1, PC2, and PC3 (A&M only)
- Delete connection drawings which are now contained in the 6A Key Telephone System connection sections

2. IDENTIFICATION

(a) Purpose

To permit TOUCH-TONE® dialing on 2A Communication System (Business Interphone) and all arrangements of the 6A Key Telephone System.

(b) Ordering Guide

- Replaceable Components
 - P48F439 Printed Wiring Board Assembly (PC1)
 - P49F442 Printed Wiring Board Assembly (PC2)
 - P48F445 Printed Wiring Board Assembly (PC3)

(c) Design Features

- Unit activated only by TOUCH-TONE dial stations
- Does not interfere with rotary dial pulses, therefore both TOUCH-TONE and rotary dial telephone sets may be used on the same system.
- Will work with only minor strapping changes on the KTUs of the system involved.

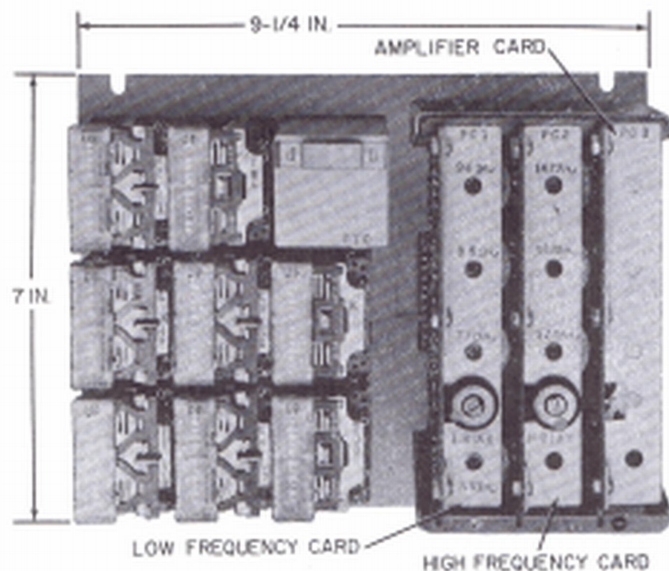


Fig. 1 — 247A KTU TOUCH-TONE Adapter, Front View

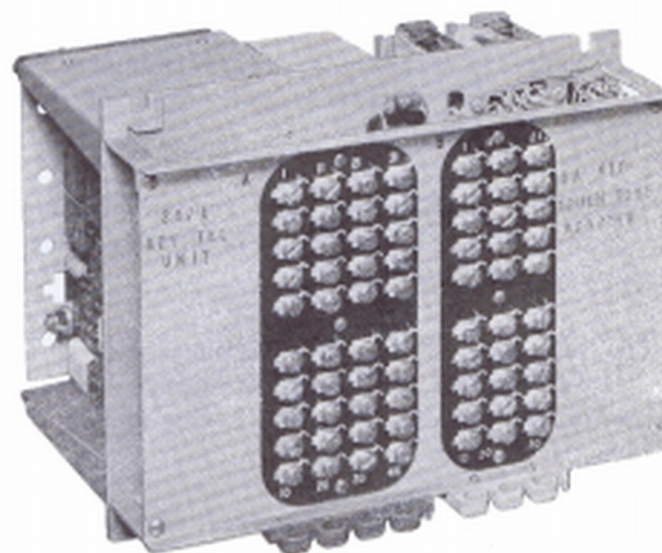


Fig. 2 — 247A KTU TOUCH-TONE Adapter, Rear View

(d) Operating Features

- Converts multifrequency tones, generated by a TOUCH-TONE dial, into relay operations. This function is comparable to the 204E selector switch in causing a selected station to be signaled.
- Connects to the 1st terminal of the 2nd bank of the selector switch to utilize the normal audible signaling path of the 207-type KTU.
- Internal circuitry is provided to disconnect the unit from the line after dialing is completed or time out has occurred (usually in 5 to 10 seconds). This guards against false relay operation by speech or noise since frequencies generated by TOUCH-TONE dials fall within the voice range.
- An interrupted warning tone is provided approximately 7 seconds after seizure, to indicate time out has occurred. Call must then be abandoned and the circuit seized again.

3. INSTALLATION

- (a) Where possible, install adjacent to 207-type KTU.
- (b) Mount in standard apparatus cabinets, relay racks or panels used for 200-type KTUs.
- (c) Requires 20-26 volts dc for satisfactory operation. Power should be provided from the associated system.
- (d) Handling of KTUs sometimes results in damage to wire spring relays. After mounting, visually inspect all wire spring relays for:
 - Improper position of contact springs
 - Broken cards
 - Improper position of cards

(e) For connections see:

- 2A Communication System (Business Interphone), Section 512-534-400
- 6A Key Telephone System
 - (1) Selector-Only Arrangement, Section 518-410-400
 - (2) Single-Talking Link Arrangement, Section 518-410-401
 - (3) Two-Talking Link Arrangements, Section 518-410-402
- CD- and SD-69447 (TOUCH-TONE Adapter Circuit)

(f) Before placing unit in service adjust *H* and *L* relay as explained in Part 4.**4. MAINTENANCE****4.01 Maintenance should be limited to the following:****(a) Checking relay portion of unit.**

Note: When checking relay portion of unit, all three printed board assemblies must be removed from unit to prevent possible damage to transistors.

- (b) Replacing of defective printed board assemblies.
- (c) Adjusting *H* and *L Bias* potentiometers for proper operation of *H* and *L* relays.

4.02 General information for adjusting *H* and *L Bias* potentiometers is as follows:

- (a) Rotating the *H* or *L Bias* potentiometer in the *counterclockwise* direction will decrease sensitivity of the circuit to a point where the relays will operate slowly or not at all. Rotating the potentiometers in the *clockwise* direction will increase sensitivity of the circuit to a point where more than one relay in the *H* or *L* group will operate from the same frequency.

(b) Depressing two adjacent horizontal dial buttons at the same time will only produce the low frequency tone for that horizontal row. Rows from top to bottom operate relays *L1*, *L2*, *L3*, and *L4*, respectively.

(c) Depressing two adjacent vertical dial buttons at the same time will only produce the high frequency tone for that row. Rows from left to right operate relays *H1*, *H2*, and *H3*, respectively.

4.03 Procedure for adjusting H and L relay operation

(a) Connect a telephone set equipped with a 12-button TOUCH-TONE dial to any convenient T and R terminals associated with TOUCH-TONE dial stations, so that the 247A KTU can be observed while operating dial buttons.

Note: On two-talking link arrangements of the 6A Key Telephone System, the second link must be made busy.

(b) Block *TOA* relay operated to prevent time-out.

(c) Adjust *L* relay as follows:

- (1) Remove handset.
- (2) Depress any two adjacent horizontal dial buttons in the top row.
- (3) Adjust *L Bias* potentiometer *counterclockwise* until the *L1* relay fails to operate.
- (4) Readjust potentiometer *clockwise* until only *L1* relay operates properly.
- (5) Now successively depress two adjacent horizontal dial buttons in the other rows to observe the operation of *L2*, *L3*, and *L4* relays. Readjust *L Bias* potentiometer if necessary according to (3) and (4).

Note: If a readjustment is necessary, repeat tests for all *L* relays.

(d) Adjust *H* relay as follows:

(1) Follow same procedure as with *L* relay except that two adjacent vertical dial buttons are depressed and the *H Bias* potentiometer is adjusted.

(e) Operate each dial key individually, observing that the proper *H* and *L* relay combination is operating according to Table A. If necessary readjust the bias potentiometers.

(f) Remove blocking tool from *TOA* relay.

(g) Initiate several test calls to make sure that signaling occurs at the selected station.

(h) Remove telephone set used for tests from the line.

4.04 To check the time-out feature, remove the handset of a TOUCH-TONE dial station and observe the time that it takes to receive the interrupted warning tone. This should occur between 5 to 10 seconds.

4.05 Sequence charts are furnished in Fig. 3, 4, 5, and 6. For more detailed information, refer to CD- and SD-69447.

**TABLE A
DIGIT SEQUENCE**

DIGIT	FREQUENCIES TRANSMITTED	RELAYS OPERATED
1	1209 & 697	H1, L1
2	1336 & 697	H2, L1
3	1477 & 697	H3, L1
4	1209 & 770	H1, L2
5	1336 & 770	H2, L2
6	1477 & 770	H3, L2
7	1209 & 852	H1, L3
8	1336 & 852	H2, H3
9	1477 & 852	H3, L3
0	1336 & 941	H2, L4

Note: All high frequencies ± 2 cps; all low frequencies ± 1 cps.

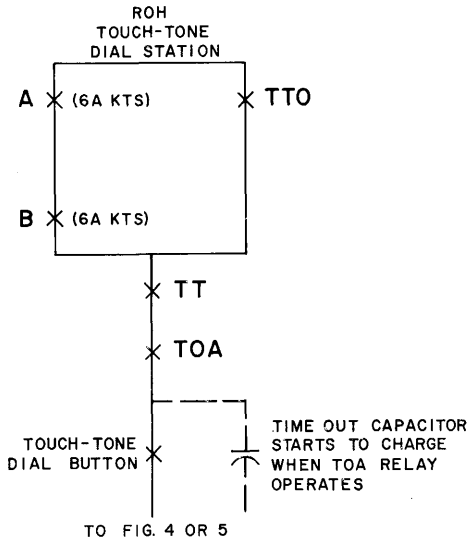


Fig. 3 — 6A KTS, Line Seizure

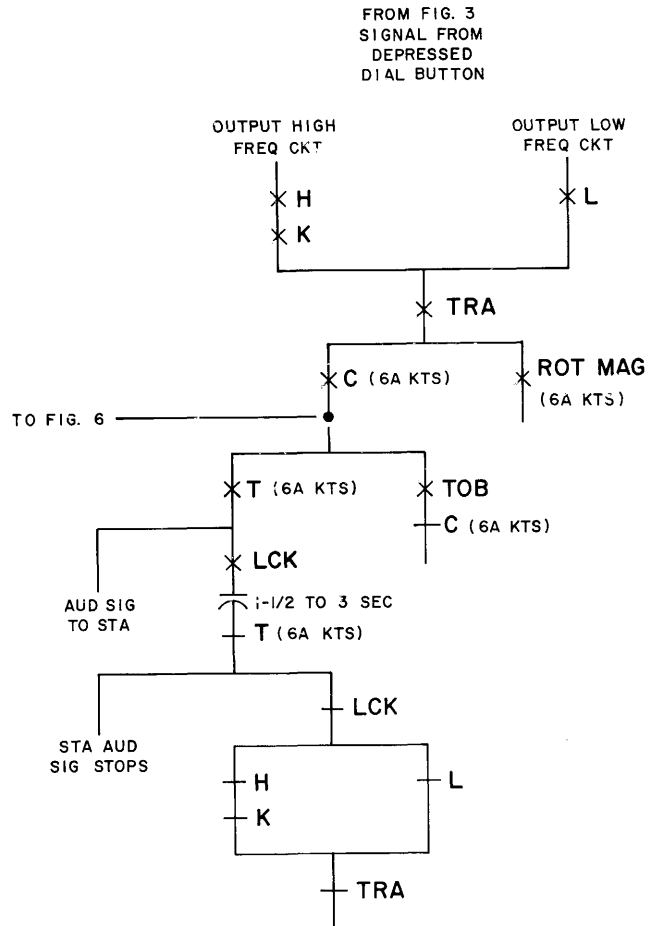


Fig. 4 — 6A KTS, Dialing Single-Digit Code

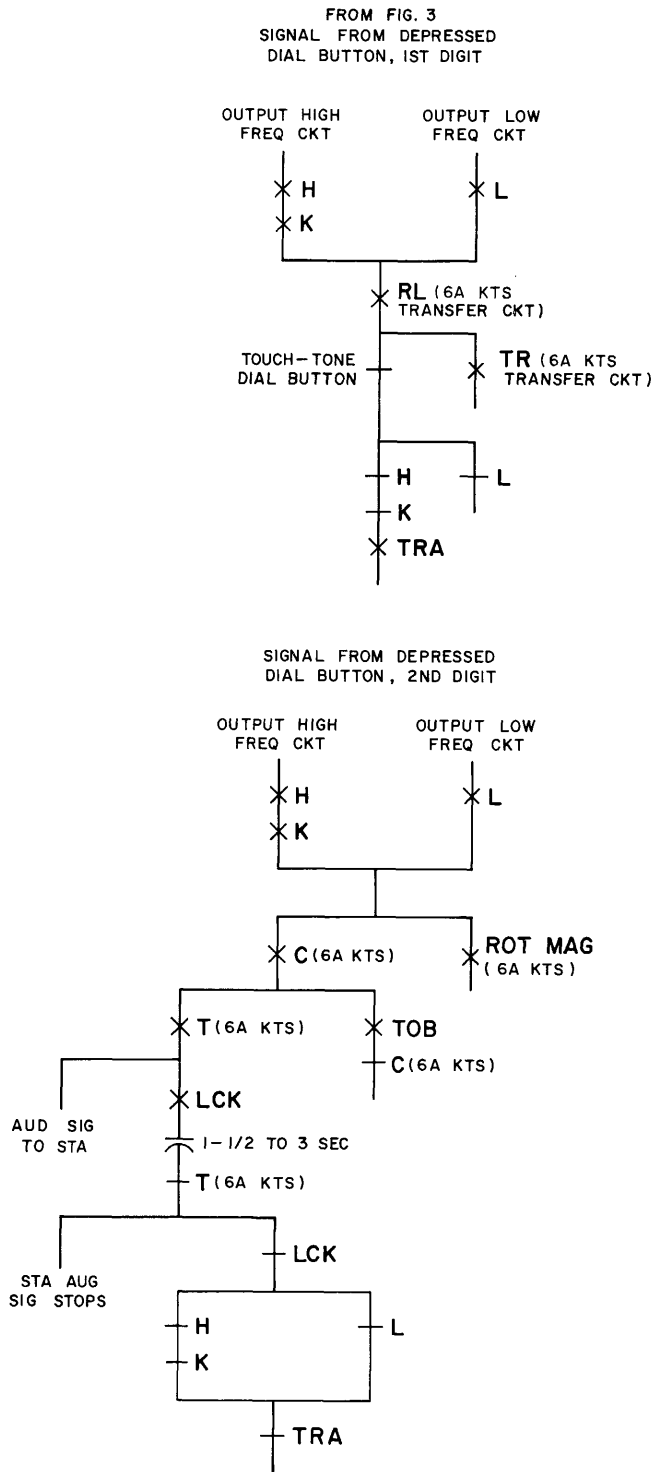


Fig. 5 — 6A KTS, Dialing 2-Digit Code

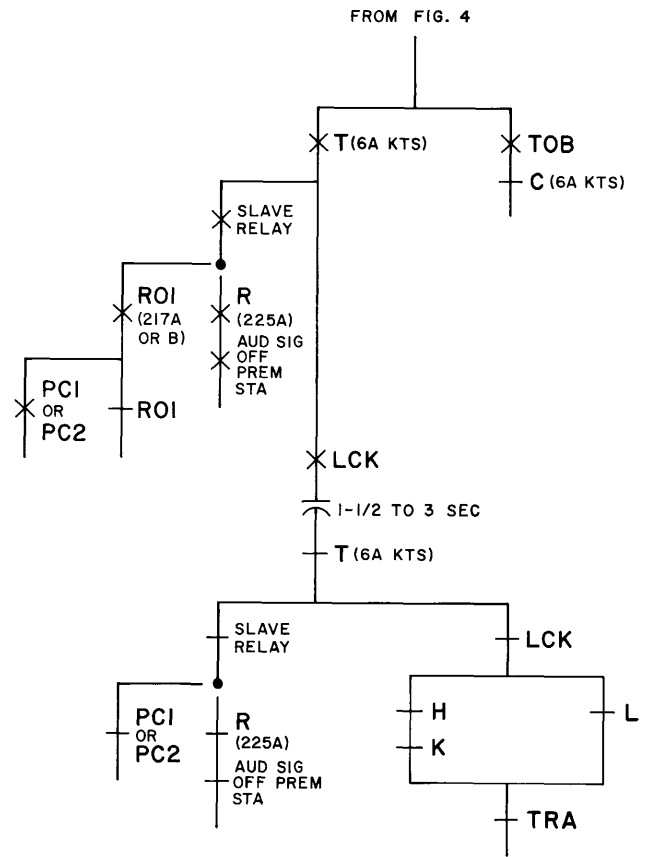


Fig. 6 — Selector-Only Arrangement, Off-Premise Station or Preset Conference Selection