

TYPE 102A KEY TELEPHONE SET

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1. GENERAL

1.01 This section describes the GTE Automatic Electric (GTE AE) Type 102A Key Telephone Set and provides installation instructions. Also included are operating and field maintenance instructions. For shop repair and conversion procedures, refer to Section 997-514-800.

1.02 This telephone set is intended for use as customer station equipment with GTE AE Type 10A1, 10A2, and 17A Key Telephone Systems (KTS's) and comparable equipment of other manufacturers.

1.03 This section is reissued to incorporate a number of changes and added features to the Type 102A set. Marginal arrows are used to identify the new material. Remove the

previous issue of this section from the binder or microfiche file and replace it with this issue.

2. DESCRIPTION

2.01 The telephone set (Figure 1) is 11-1/2 inches long, 8 inches deep, and 4-1/2 inches high. It is provided as either a 10- or 20-pushbutton instrument for multiline key system use. The telephone set is available in the following colors: basic black, espresso brown, beige, and basic white. The telephone set used with a 10A2 KTS is equipped with a nonconferencing keypad while the one used with a Type 17A KTS is equipped with a conferencing keypad.



→ Figure 1. Telephone Set .

Housing

2.02 The housing is molded of plastic and is identical for the desk and wall versions except that the wall housing does not contain openings for the hookswitch cradle as required in the desk housing.

Baseplate

2.03 The baseplate on the wall version provides an opening that allows surface-mounted cable to be attached to the internal telephone connector without removing the connector cover. The running cable that plugs into the internal telephone connector must be terminated with an AMP, Incorporated or equivalent-type plastic connector with strain relief.

2.04 The baseplate also provides four holes near the connector opening for mounting directly to a handy box or a plaster ring.

Faceplate and Facemat

2.05 A clear, nonglare faceplate is furnished with each telephone set. It is inserted over the facemat by inserting two tabs into slots in the front of the housing and deflecting the housing at the upper edge to engage a third tab into a slot. Facemats are available in 13 colors: black, beige, apple green, gold, yellow, blue, white, antique white, tan, brown, avocado, red, and burnt orange. Only one color-coordinated facemat is furnished with each telephone set. The other colors can be ordered separately if desired. The rotary dial facemats have the dial numerals and letters printed around the periphery of the dial cutout. The Touch Calling facemats have a position indicated for an adhesive-backed number card.

Component Arrangement

2.06 The Type 46A ringer is located on the left rear of the baseplate. When a ringing and paging or hands-free answer-back amplifier is used, (as in a Type 17A KTS), it replaces the ringer on the baseplate and volume control is mounted on the left front of the baseplate. When hands-free answer-back is provided, the associated microphone is also mounted on the left front of the baseplate. The transmission network is located on the baseplate in front of the ringer. The terminal board, equipped with push-on terminals, is located on the right-front of the baseplate. The area above the terminal board and transmission network is covered by a top plate that is held in place by the same screws that secure the housing. This top plate is hinged in front so it can swing away to allow access to the components below. A recall switch, a buzzer, either a rotary dial or Touch Calling Unit (TCU) are mounted on the top plate (The buzzer is not included on a Type 17A KTS telephone set.) When hands-free answer-back is provided, a privacy pushbutton is also mounted on the top plate.

CAUTION: The ringing and paging amplifier will be damaged if exposed to standard ringing current.

2.07 The desk version of the telephone set has a plastic handset cradle on the left side that operates the internally mounted hookswitch and restores pushbuttons. Pushbutton restoral on hangup and recall switch for initiating new calls or signaling an operator are standard features of the telephone set. If pushbutton restoral is not desired, it can be disengaged by moving the plastic pushbutton-restoral actuator to its inner detent position. The plastic actuator is located near the lower rear of the left-side bracket. On added versions of the telephone set, bend the small tab on the bottom of the interlock lever away from the hookswitch lever. The interlock lever is located on the upper-rear of the left-side bracket. The recall switch is mounted on the top plate and appears to the lower left of the dial when viewed from the front of the telephone set. The privacy pushbutton, used when hands-free answer-back is provided, is also mounted on the top

plate and appears to the upper right of the dial or TCU when viewed from the front of the telephone set.

2.08 The wall version of the telephone set has an externally mounted hookswitch and cradle assembly mounted on the upper-left-hand side of the telephone set. Push-button restoral is not available on the wall telephone set.

2.09 A wiring harness, from the key strip to a 50-pin connector, is provided with the wall version. This connector is located on brackets on the rear center of the base. An opening is in the base beneath the connector to provide access for the running cable connector.

Keyset

2.10 A 10-pushbutton telephone set is equipped with 1 keyset, and the 20-pushbutton telephone set is equipped with 2 keysets. Two types of keysets are available: 1 has a hold key and 9 line-pickup keys, and the other has 10 line-pickup keys. If only 1 keyset is used (10-pushbutton telephone set), there are 1 hold and 9 line-pickup keys. If 2 keysets are used (20-pushbutton telephone set), there are 1 hold and 19 line-pickup keys. On the 20-pushbutton telephone set, a maximum of 15 keys can be converted to signalling. In either telephone set, only 1 line-pickup key can be operated at a time. (On telephone sets used with the Type 17A KTS, more than one line pickup key can be operated at a time). Operation of the nonlocking hold key replaces the telephone circuit with a holding bridge provided by associated relay equipment. This frees the telephone set for use on other lines. The held line remains on hold until released by any telephone set where that line appears. The hold feature does not apply to tie or intercom lines.

2.11 Each key contains a lamp and a removable plastic cap that is provided to allow insertion of a key-designation tab. The lamp grounds for each line key (the second keystrip of a 20-pushbutton telephone set does not have this feature) are commoned to free line cord leads for various options. The common can be connected to five through nine line cord (or harness) leads as required. (Nine is recommended for long cable loops on Type 10A1 and 10A2 KTS's).

Cables and Connections

2.12 On the desk set, a 6-foot silver-satin line cord of a 10-pushbutton telephone set terminates on module plugs that plug into keystrip keys. The module plugs provide for line position assignments for each station. The desk-set line cord also has 18 spade-ended leads. The desk set is equipped with either a 50- or 100-conductor line cord terminated with 1 or 2 AMP CHAMP® connectors, respectively.

2.13 The wall telephone set has the same connecting arrangement as the desk telephone set except for the line cord, which is replaced by an internal, 50-point receptacle

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and wiring harness that terminates in 8 module plugs and 18 conductors. This arrangement provides for use of AMP, Incorporated or equivalent plastic connector-ended, running cables. Schematic and connecting diagrams for the telephone set are shown in Figures 2 through 6.

Recall Pushbutton

2.14 All versions of this telephone set are factory equipped with a recall pushbutton that can be used to flash the operator. The pushbutton is mounted to the top plate with two nuts and protrudes through the lower-left portion of the faceplate on desk versions and through the upper-right portion on wall versions.

Pushbutton Restoral

2.15 The automatic pushbutton restoral disabling device is an improved design to disable the pushbutton restoral mechanism. The plastic pushbutton restoral actuator makes the automatic pushbutton restoral disabling and reactivating process much easier and more accurate.

2.16 Moving the actuator to the inner detent position disables the pushbutton restoral mechanism, and moving it to the outer detent position reenables the pushbutton restoral mechanism. A small handle is provided to facilitate moving the actuator in or out.

Handset

2.17 The handset is a Type 811 equipped with a 6-foot retractile cord that enters at the left side of the housing. On the wall version, the 12-foot retractile handset cord attaches to the combined, external, handset cradle and hookswitch assembly that is mounted to the baseplate.

3. OPTIONS

3.01 The following options are, or will be, available with the telephone set:

- (a) Two- to four-wire conversion, using kit H-999578-1.
- (b) Less-dial version with blank faceplate and facemat.

3.02 Provisions are incorporated into the telephone set for the use of the following associated equipment:

- (a) Speakerphone. All components are external to the instrument. A short line cord is required to interconnect the telephone set to the speakerphone.
- (b) Headset. A headset jack kit (Pacific Plantronics Company Kit JS-0136-1), consisting of a jack, push-turn key and amplifier, that permits the use of a headset with the telephone set.
- (c) Hands-free answer-back. This unit consists of a receiver microphone assembly, potentiometer assembly, and electronic components mounted on a printed wiring card. This card is mounted in the

position normally occupied by the Type 46 ringer assembly or the signaling and paging amplifier. The purpose of this unit is to permit a recipient of an intercom call to acknowledge the call without using the handset.

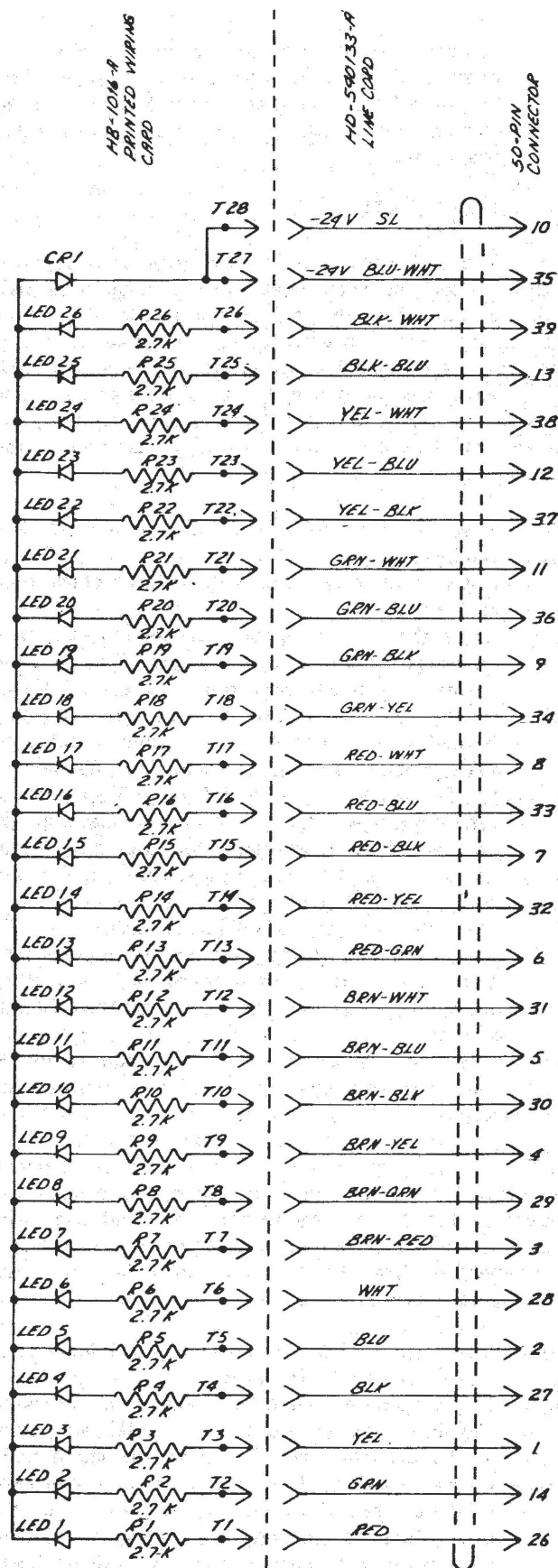
4. INSTALLATION

4.01 The desk version of the telephone set is supplied with a line cord that is terminated with a connector plug(s). Refer to Figure 3 for the schematic and wiring diagram of the telephone set used with KTS's other than Type 17A and Figure 4 for telephone sets used with the Type 17A KTS. Figure 5 is the wiring diagram for the conferencing keyset, and Figure 6 is the wiring diagram for the non-conferencing keyset. Use the following procedure to install the telephone set:

- (a) Place the telephone set on the desk or table where it will be used.
- (b) Insert the line-cord plug into the receptacle of a bridging adapter.
- (c) Insert the plug of a running cable to the other receptacle of the bridging adapter (The bridging adapter may not be needed in a Type 10A2 KTS.)
- (d) On a Type 17A KTS installation, insert the plug located at the other end of the running cable into the receptacle that is located in the KTS cabinet.
- (e) On Type 10A1, 10A2, and 16A KTS's, a running cable with one end having loose conductors should be used. These loose conductors should be terminated in the KTS cabinet described in the 484 division of GTE Practices.
- (f) Place the designation tabs in the pushbuttons. To install a designation tab, squeeze the top and bottom sides of the pushbutton cap and remove it. Insert the designation tab and replace the pushbutton cap.
- (g) Meet the line position assignment requirement by placing the modules in the proper locations on the keystrip.

4.02 The baseplate on the wall version of the telephone set provides four holes near the connector opening for mounting directly to a handy box or a plastic ring. The adapter plate kit, HH-880050 can be used if desired and is recommended. Use the following procedure to install the telephone set:

- (a) Insert two 8-32 by 7/16-inch (D761056-E) screws in the top mounting holes.
- (b) Remove the hood from the running cable connector and attach the connector to the inside connector in the telephone set. The cover and strain relief bracket (part No. HD-490039-A) (quantity of two) must be installed on plastic connectors when the plastic hood is removed. On running cables with metal-encased connectors, the strain relief bracket must be bent downward 90 degrees to permit entry



→ Figure 2. Line Cord Lead Connections to Card.

into the baseplate. On single-line telephone sets, connect the station wire to the proper terminal board terminals inside the telephone set.

NOTE: The head of the screws in the keyhole slots should be either insulated or run down sufficiently to prevent shorting with the bottom of the wiring card or terminal board.

- (c) Hang the telephone on the two top mounting screws and install the third 8-32 by 7/16-inch screw in the mounting hole in the lower left of the baseplate.

CAUTION: After the lower screw head(s) contact the baseplate, tighten no more than one-half to one turn to prevent distortion of the baseplate.

5. MODIFICATIONS

5.01 The telephone set can be modified to fulfill various services such as two- to four-wire conversion, headset operation, etc. The procedures for making the various modifications are given in the following paragraphs. It is recommended that the modifications be done before the telephone set is installed.

Housing Removal

5.02 The telephone housing must be removed to perform the modifications. Use the following procedure to remove the telephone set housing:

- (a) Spread the housing to free the tab at the top of the baseplate from the housing. Carefully insert a screwdriver or other flat-edged tool (so as not to scratch the plastic) under the faceplate and lift it out. Be careful not to damage the facemat.
- (b) Lift out the facemat.
- (c) Under the facemat are two housing screws. Loosen these screws and lift the housing off.
- (d) A hinged top plate is located under the housing. Swing this top plate toward the front of the telephone set. This exposes the terminal board onto which many of the electrical connections are made.

Converting Line Pickup Key to Signaling Key

5.03 Line-pickup keys that are not used for line pickup can be converted to signaling keys. Use the following procedure to make this conversion:

- (a) Remove the telephone set housing as described in paragraph 5.02.
- (b) Remove the plunger screw from the line-pickup key(s) to be converted.
- (c) Make wiring changes as shown in Table 1.
- (d) Replace the top plate, housing, facemat, and faceplate.

Table 1. Terminal Board Connections for Pickup-to-Signal-Key Conversion.

LINE	LEAD	MOVE FROM TERMINAL	CONNECT TO TERMINAL
1	ORN-WHT	1	ANY OF THE FOLLOWING: 21, 22, 30, 31, 32, 33, 34, 35.
2	SLT-WHT	2	
3	GRN-RED	2	
4	BLU-BLK	12	
5	BRN-BLK	12	
6	BLK-BRN	13	
7	BLK-BLU	13	
8	RED-GRN	23	
9	WHT-SLT	23	
10	ORN-WHT	3	
11	SLT-WHT	3	
12	GRN-RED	4	
13	BLU-BLK	4	
14	BRN-BLK	14	
15	BLK-BRN	14	
16	BLK-BLU	15	
17	RED-GRN	15	
18	WHT-SLT	25	
19	VIO-BRN	25	

- (1) Faceplate, 10-pushbutton — HD-780094
- (2) Faceplate, 20-pushbutton — HD-780095
- (3) Facemat, 10-pushbutton — HD-530035
- (4) Facemat, 20-pushbutton — HD-530036

NOTE: The facemat color code suffixes are listed in Table 4.

Station-Busy, Message-Waiting, and Signaling Modifications for Use with Type 17A Key Telephone System

5.07 The telephone set for the Type 17A KTS is factory wired as an A telephone set. When two telephone sets are connected to the same running cable and direct station-busy, message-waiting, and intercom signaling is required, make the following changes to convert one telephone set to a B version:

- (a) To provide the message-waiting feature in the HOLD lamp position, move the GRN-YEL lead from terminal 63 on the terminal board and connect it to terminal 18.
- (b) To provide the signaling-paging capability, move the GRN lead from terminal 36 on the terminal board and connect it to terminal 19.
- (c) To provide the station-busy-lamp feature at a monitoring station (direct-station-selection attendant position) move the ORN-YEL lead from terminal 47 and connect it to terminal 43; then move the SLT-YEL lead from terminal 43 and connect the lead to terminal 47 on the terminal board.

Station-Restriction Conversion

5.08 To provide a station restriction in the telephone set, the following modifications are required:

- (a) Telephone set with rotary dial:
 - (1) Connect the cathode (banded end) of an FD-1029-DG diode to translation network terminal 1.
 - (2) Connect the anode of the same diode to transmission network terminal 11.
- (b) Telephone set with TCU:
 - (1) Remove, tape, and store the brown TCU wire from terminal board terminal 40.
 - (2) Move the white TCU wire from transmission network terminal to terminal board terminal 54.
 - (3) Connect two wire straps as follows: strap transmission network terminal 1 and terminal board terminal 40 together and strap transmission network terminal 2 and terminal board terminal 6 together.

Headset Adapter Conversion

5.04 The telephone set can be used with a headset instead of a handset. When the headset plug is inserted into the headset adapter, the handset is muted. Use the following procedure to install the headset adapter:

- (a) Obtain a Pacific Plantronics, Incorporated JS-0136-1 external jack headset kit (SMC 424635).
- (b) Install the adapter to the telephone set following the procedures given in Section 028-735-100.
- (c) Make the wire connections as given in Table 2.

Conversion from Two to Four Wire

5.05 To convert the telephone set from two- to four-wire service, install relay H-888578-1 in the mounting hole provided in the sideplate, then make the wiring changes indicated in Table 2.

Less-Dial Conversion

5.06 To provide the less-dial configuration, proceed as follows:

- (a) Remove the existing faceplate and facemat.
- (b) Remove the TCU or rotary dial assembly.
- (c) Make the necessary wiring change, while referring to Table 3.
- (d) Add the new faceplate and facemat.

Table 2. Modifications.

	WIRE	HEADSET ROT. DESK		HEADSET T/C DESK		24 WIRE ROT. DESK		24 WIRE T/C DESK		24 WIRE ROT. WALL		24 WIRE T/C WALL		24 WIRE & HEADSET-ROT.		24 WIRE & HEADSET-T/C		MONITORED STA BUSY		MONITORING STA BUSY		DIAL-LESS T/C	
		MOVE FROM	CONN TO	MOVE FROM	CONN TO	MOVE FROM	CONN TO	MOVE FROM	CONN TO	MOVE FROM	CONN TO	MOVE FROM	CONN TO	MOVE FROM	CONN TO	MOVE FROM	CONN TO	MOVE FROM	CONN TO	MOVE FROM	CONN TO	MOVE FROM	CONN TO
JACKSET & HEADSET ADAPTER LEADS	RED	INSULATE & STORE		INSULATE & STORE										INSULATE & STORE		INSULATE & STORE							
	BRN	INSULATE & STORE		INSULATE & STORE										INSULATE & STORE		INSULATE & STORE							
	BLK		NET 23		NET 23										TB 17		TB 17						
	WHT		TB 49		TB 49										TB 49		TB 49						
	SLT		TB 47		TB 47										TB 47		TB 47						
	VIO		NET 2		TB 39										NET 2		TB 39						
	BLU		NET 5		NET 5										NET 5		NET 5						
	GRN		TB 41		TB 41										TB 41		TB 41						
	YEL		NET 13		TB 29										TB 42		TB 42						
	ORN		TB 44		TB 44										TB 44		TB 44						
HANDSET LEADS	RED		NET 5		TB 41					TB 17	TB 38			NET 5	TB 41	NET 5	TB 41					TB 29	NET 4
	YEL	NET 4	TB 37	TB 29	TB 37	NET 4	TB 42	TB 29	TB 42			TB 29	TB 42	NET 4	TB 37	TB 29	TB 37						
	BLK					NET 23	TB 16	NET 23	TB 16					NET 23	TB 16	NET 23	TB 16						
HOOKSWITCH LEADS	GRN	NET 13	TB 37	NET 13	TB 37									NET 13	TB 37	NET 13	TB 37						
	YEL													NET 23	TB 17	NET 23	TB 17						
	SLT																						
	BRN																						
	BLK																						
	RED																						
LINE 9 PLUG LEADS	SLT																						
	VIO																						
	WHT																						
	SLT																						
	WHT																						
	GRN																						
LAMP GROUND LEAD FROM CONNECTOR	WHT					TB 56	TB 53	TB 56	TB 53	TB 56	TB 53	TB 56	TB 53	TB 56	TB 53	TB 56	TB 53			TB 56	TB 62		
	RED					TB 57	TB 54	TB 57	TB 54	TB 57	TB 54	TB 57	TB 54	TB 57	TB 54	TB 57	TB 54			TB 57	TB 61		
	RED					TB 57	TB 55	TB 57	TB 55	TB 57	TB 55	TB 57	TB 55	TB 57	TB 55	TB 57	TB 55						
	BLK																						
HOLD PUSHBUTTON LEADS	GRN																						
	WHT																						
	GRN																						
	YEL																						
FW RELAY 24 WIRE LEADS	AI	WHT				TB 49		TB 49		TB 49		TB 49		TB 49		TB 49							
	FW	WHT				TB 20		TB 20		TB 20		TB 20		TB 20		TB 20							
	RT	RED				TB 11		TB 11		TB 8 or 54		TB 8 or 54		TB 11		TB 11							
	RR	RED				TB 10		TB 10		TB 10 or 55		TB 10 or 55		TB 10		TB 10							
	BLU					NET 4		TB 29		NET 4		TB 29		NET 4		TB 29							
	BLU					NET 23		NET 23		NET 23		NET 23		NET 23		NET 23							
	YEL					TB 16		TB 16		TB 16		TB 16		TB 16		TB 16							
	YEL					TB 42		TB 42		TB 42		TB 42		TB 42		TB 42							
STRAP	WHT									TB 16	TB 38	TB 16	INSUL & STORE										
	WHT									TB 42	INSUL & STORE												

Table 3. Less-Dial Conversion.

	WIRE	LESS-DIAL ROTARY		LESS-DIAL T/C	
		MOVE FROM	CONN TO	MOVE FROM	CONN TO
RECALL SWITCH LEADS	WHT	40	STORE	40	STORE
	WHT	28		28	
HOOK-SWITCH LEADS		TB 28	NET 2		
KEYSET	GRN	NET 11	NET 1	NET 5	NET 1
DIAL LEADS	BLU	NET 1			
	YEL	NET 11			
	WHT	NET 2			
	RED	NET 4			
TOUCH-CALL LEADS	BLU			NET 4	
	SLT			TB 29	
	PINK			NET 11	
	BRN			TB 6	
	WHT			NET 1	
	GRN			NET 2	
	RED			TB 40	
HANDSET LEADS	GRN			NET 11	NET 2

→ Table 4. Color Suffixes.

SUFFIX	COLOR
AR	Basic black
BR	Espresso Brown
CR	Antique white
DR	Apple green
ER	Tan
FR	Burnt orange
GR	Gold
HR	Red
JR	Yellow
KR	Blue
MR	White
NR	Avacado
QR	Beige

- (4) Connect the cathode (banded end) of an FD-1029-DG diode to terminal board terminal 54.
- (5) Connect the anode of the same diode to transmission network terminal 1.

NOTE: The added diode may require the addition of an extra length of wire so as to reach the terminal listed. The modification prevents dialing whenever the polarity of the tip wire is positive with respect to the ring wire. When tip is negative with respect to ring, dialing is not restricted. By properly polarizing the tip and ring wire pairs coming into the keyset of the telephone set, dialing on a line can be restricted or as desired. In a Type 10A2 KTS, line polarity can be determined at the common equipment cross-connect field blocks. In a Type 17A KTS, line polarity for all lines (intercom lines included) is factory wired with tip being positive with respect to ring. Line polarity for the intercom path labeled "ICM2" can be reversed by interchanging the SL-VIO and VIO-SL line cord conductors found at terminals 10 and 11. Reversing the tip and ring wires for the other ICM pushbuttons can only be accomplished by cutting and resplicing the line cord conductors or pulling out and reinserting the pins at the keyset plugs.

Busy Station Display

5.09 The busy station display strip can light two digit numbers to indicate the particular station which is busy. This strip can handle up to a maximum of 26 stations in the system.

5.10 The busy station display kit (HH-880048-1) is used on standard 10-pushbutton desk-type 102A key telephone

sets equipped with ringer and buzzer a signaling and paging or a hands-free answer-back amplifier. The wiring information for connecting line cord leads to the card is shown in Figure 2 (no wiring changes are required within the telephone set). Table 5 provides installation procedures for the busy station display.

5.11 The kit consists of the following:

- (a) Card and LED frame assembly.
- (b) Two screws to mount the LED frame assembly.
- (c) Line cord assembly.
- (d) Station display window.
- (e) Three designations strips.
- (f) Customer Instruction (CI) sheet.

Exclusion Unit

5.12 The exclusion unit is a single circuit common to all lines which the key telephone can access. The circuit must not function on the 24-volt intercom lines but must always function on -24 and -48 volt PABX and CO lines. The circuit is compatible with dial 1 PABX systems.

5.13 The unit is totally self-contained and encapsulated in a nonconductive enclosure that is designed to mount into the key telephone. The mounting must accommodate either a self-adhesive or screw type arrangement.

5.14 The exclusion circuit allows conferencing by holding the line pushbutton down and partially depressing the hold pushbutton, and not by using a dial 1 or hookswitch flash.

5.15 Additional capabilities of the exclusion feature are as follows:

- (a) The exclusion circuit does not affect telephone set operation when only one party at a time handles a CO call.
- (b) The first party off-hook on any CO line cannot be interrupted by any other station that is equipped with the privacy circuit.
- (c) Telephone sets that are not equipped with the exclusion circuit have complete access to any line at any time.
- (d) After a multistation conference is established, privacy is restored to the line.
- (e) Intercom usage is totally independent of the exclusion feature.
- (f) During a power failure, the exclusion circuits do not function, but all CO lines are operational.

Adapter Plate

5.16 The adapter plate kit (HH-880050-1) is used for mounting Type 102A, 881A, and 882A telephone sets to the following electrical boxes:

- (a) 4 by 4 (Square).
- (b) 2 by 4 (Duplex; see note).
- (c) 63A (SE Series).
- (d) 4-11/16 by 4-11/16.
- (e) Plaster ring and 4 by 4 octagon.

NOTE: Recent changes made to the baseplate of the telephone set itself will allow direct mounting on 2 by 4 Duplex boxes. Until this version reaches the field in sufficient quantities, the HH-880050-1 adapter should be ordered.

5.17 The adapter plate kit consists of the following:

- (a) Adapter plate (HD-780123).
- (b) Two 6-32 by 1/4 (D-762047-C) screws for mounting the adapter plate.
- (c) Two 8-32 by 1/4 (D-761056-B) screws for mounting the adapter plate to the following boxes:

- (1) 4 by 4
- (2) 4-11/16 by 4-11/16
- (3) 4 by 4 octagon

- (d) Three 8-32 by 0.437 (D-761056-E) screws for mounting the telephone set.

6. OPERATION

Placing Call

6.01 To place a call on the telephone set, perform the following steps:

- (a) Lift the handset.
- (b) Depress an idle-pickup pushbutton (designated by an unlit lamp); the associated lamp lights.
- (c) Wait for dial tone and dial the desired number.
- (d) When the called party answers, begin conversation.

Answering Call

6.02 Incoming calls on the telephone set are announced by a ringer, buzzer, signaling and paging or hands-free answer-back amplifier that transmits an electronic tone. The signaling and paging or hands-free answer-back amplifier is used only with the Type 17A KTS. A flashing lamp under one of the line pickup pushbuttons indicates the line that call is on. To answer the call, perform the following steps:

- (a) Lift the handset.
- (b) Depress the pickup pushbutton associated with the flashing lamp; the lamp lights steadily.
- (c) Begin conversation.

Using Hold Function

6.03 To place a line on hold, depress the hold pushbutton momentarily. The operated pickup pushbutton restores, and its lamp starts to wink.

→ Table 5. Busy Station Display Installation.

STEP	PROCEDURE
1	Remove faceplate and facemat (refer to paragraph 5.02), remove two housing screws, and set housing aside.
2	Move keyset from middle position to bottom position by removing two keyset mounting screws.
3	Remove one keyset mounting bracket screw (on right side of telephone set) and bracket. Reassemble the bracket in top position and keyset in lower position; use existing screws.
4	Connect the line cord leads to the card (Figure 6).
5	Assemble Light-Emitting Diode (LED) frame (with line cord leads connected to the card) to top position of keyset brackets with two thread-forming screws.
6	Attach line cord clip to top slot in baseplate and dress line cord leads.
	NOTE: On telephone sets with rotary dial, it is necessary to remove dial bracket mounting screws and remount dial bracket assembly using top holes in bracket.
7	Reassemble housing using existing screws.
8	Select one of the three designation strips and place strip on the LED frame.
9	If desired, type station assignee's initials on paper designation strip and attach to top of the LED frame with adhesive areas of strip.
10	Assemble display window over LED frame and designation strip.
	NOTE: A 50-pin connector must be connected to 102A or 17A or equivalent key telephone system.

6.04 To take the line off of hold, lift the handset and depress the associated line pickup pushbutton; the associated lamp stops winking and lights steadily. When a call is on hold, another call can be placed or answered through other lines, or the handset can be returned to its cradle.

Terminating Call

6.05 To terminate a call on the telephone set, return the handset to its cradle; the lamp associated with the depressed line pickup pushbutton extinguishes and the pushbutton restores (except on the Type 10A2 KTS wall telephone set). A call placed on hold can only be terminated by taking the call off hold and then returning the handset to its cradle.

Multistation Conferencing Using Exclusion Unit

6.06 A station operator who wishes to allow one or more parties into the conversation, must perform the following procedure:

- (a) Inform the party or parties to be conferenced-in to depress the appropriate line pushbutton.

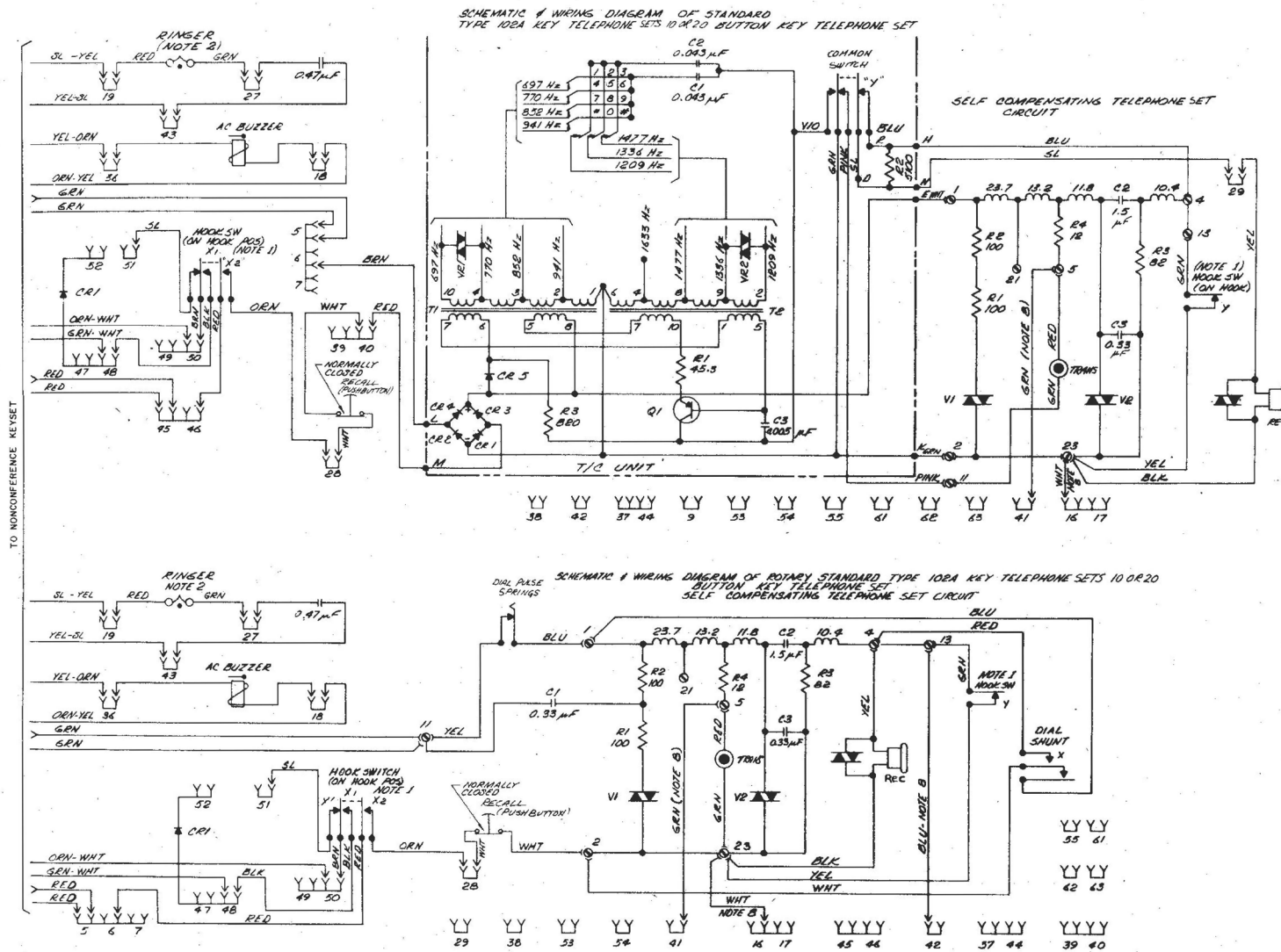
NOTE: If the intercom is to be used to notify the other parties, the C.O. line should be placed on HOLD

and the parties instructed to depress the appropriate line pushbutton after the first party reseizes the call and the line pushbutton lamp lights steadily.

- (b) Allow these stations into the call by holding down the busy line pushbutton to prevent pushbutton restoration and by momentarily depressing the HOLD pushbutton.
- (c) These stations have now joined the conversation and privacy is restored to that line.

6.07 On telephone sets equipped with conferencing key-strips, an alternate means of achieving a multistation conference exists. To achieve this alternative, perform the following:

- (a) Place the C.O. line on HOLD.
- (b) Call the station(s) to be conferenced-in on the intercom.
- (c) Conference the appropriate line pushbutton with the intercom pushbutton.
- (d) Since the exclusion circuit does not affect intercom operation, any party desiring access to the conversation may freely do so by using this intercom path.



1. WHEN GOING OFF HOOK, X₁ CONTACTS MAKE BEFORE X₂ CONTACTS MAKE, Y₁ CONTACTS BREAK AFTER X₂ CONTACTS MAKE. WHEN GOING ON HOOK, X₁ CONTACTS BREAK AFTER X₂ CONTACTS BREAK. X CONTACT ON DIAL SHUNT MAKE FIRST. Y CONTACTS ON HOOKSWITCH BREAK LAST. X₁ CONTACTS ON HOOKSWITCH MAKE BEFORE Y₁ CONTACTS BREAK. Y CONTACTS ON COMMON SWITCH BREAK FIRST.
2. ON STANDARD TELEPHONE SET EQUIPPED WITH RINGER, INSULATE AND STORE BLUE AND BLACK RINGER LEADS.
3. ALL SCREW TERMINALS ARE ON TRANSMISSION NETWORK.
4. ON STANDARD 10-PUSHBUTTON TELEPHONE SET, A KEYSWITCH WITH HOLD PUSHBUTTON IS USED. ON 20-PUSHBUTTON TELEPHONE SET, A KEYSWITCH WITH HOLD PUSHBUTTON AND 10-PUSHBUTTON KEYSWITCH WITHOUT HOLD PUSHBUTTON ARE USED.
5. TELEPHONE SET CAN BE FURNISHED FACTORY WIRED FOR EITHER 104T OR 17A KEY TELEPHONE SYSTEMS.
6. HOLD PLUNGER RELEASE: THE X AND Y CONTACTS OF ANY LOCKED LINE PLUNGER BREAK BEFORE THE Z CONTACTS BREAK AND THE X₁ CONTACTS MAKE ON THE HOLD PLUNGER.
7. WHEN ANY LINE PLUNGER IS RELEASED THE X CONTACTS BREAK BEFORE THE Y CONTACTS BREAK.
8. STRAP WIRE ASSEMBLIES ARE USED ON WALL VERSIONS ONLY.
9. ON THE CHAINING SWITCH, THE X₁ AND Y₁ CONTACTS BREAK BEFORE THE Z₁ CONTACTS BREAK. THE X₁ CONTACTS MAKE BEFORE X₂ AND Y₁ CONTACTS MAKE.
10. WHEN DEPRESSING LINE PUSHBUTTON, ALL CHAINING SWITCH CONTACTS MUST OPERATE BEFORE ANY LINE PLUNGER CONTACTS OPERATE. WHEN A LOCKED LINE PUSHBUTTON IS RELEASED BY DEPRESSING LINE LINE PUSHBUTTON, THE CONTACTS OF THE RELEASED PUSHBUTTON BREAK BEFORE THE CONTACTS OF THE DE-PRESSED PUSHBUTTON MAKE.
11. IF BUZZER WITH SCREW TERMINALS IS USED, CONNECT ORANGE YELLOW AND YELLOW-ORANGE LEADS DIRECTLY TO BUZZER.
12. WHEN TWO TELEPHONE SETS ARE CONNECTED TO THE SAME CABLE, ONE TELEPHONE SET SHOULD BE DESIGNATED AS A AND THE OTHER AS B. ALL TELEPHONE SETS ARE FACTORY WIRING AS TELEPHONE SET A. FOR TELEPHONE SET B WIRING SEE NOTE 13.
13. TELEPHONE SET B:
 - A. TO PROVIDE MESSAGE WAITING FEATURE IN HOLD LAMP POSITION, MOVE GREEN-YELLOW LEAD FROM TERMINAL 63 ON TERMINAL BOARD AND CONNECT TO TERMINAL 18 ON TERMINAL BOARD.
 - B. TO PROVIDE SIGNALING TERMINAL AND CONNECT TO TERMINAL 47 ON TERMINAL BOARD, MOVE GREEN LEAD FROM TERMINAL 36 AND CONNECT TO TERMINAL 47 ON TERMINAL BOARD.
 - C. TO PROVIDE STATION BUSY LAMP FEATURE AT MONITORED STATION ON TELEPHONE SET B, MOVE SLATE YELLOW LEAD FROM TERMINAL 36 ON TERMINAL BOARD AND CONNECT TO TERMINAL 47 ON TERMINAL BOARD. REMOVE ORANGE YELLOW FROM TERMINAL 47 AND CONNECT TO TERMINAL 43 ON TERMINAL BOARD.
14. NOTES 1, 3, 6, AND 7 APPLY TO ALL TELEPHONE SETS EQUIPPED WITH SIGNALING AND PAGING AMPLIFIER AND CONVERGENCE KEYSWITCH.
15. TO PROVIDE COMPLETE CUTOFF OF SIGNALING AND PAGING VOLUME, REMOVE BLUE WIRE FROM TERMINAL 2 AND CONNECT TO TERMINAL 10.
16. LINE 9 PLUG LEADS AND ANY FOUR LAMP GROUP LEADS AND THE LEADS TO EITHER RINGER OR BUZZER ARE AVAILABLE FOR OPTIONS. ANY COMBINATION OF THESE AVAILABLE LEADS MAY BE USED. HOWEVER, IF ANY OF THE RINGER OR BUZZER LEADS WILL RESULT IN THE LOSS OF THESE ITEMS.
17. FOR COMMON AUDIBLE CUTOFF DURING SPEAKERPHONE MODE, CONNECT RED AND BLACK LEADS; OTHERWISE, INSULATE AND STORE THEM. CONNECT 35-8 CONTROL UNIT R₁ AND R₂ 8-8 LEADS AND EITHER RINGER OR BUZZER LEADS TO TR81 AND TR82.
18. FOR 20-PUSHBUTTON TELEPHONE SETS, THERE ARE TWO GREEN LEADS. CONNECT BOTH AS SHOWN.
19. ANY TERMINAL SHOULD BE CONNECTED TO TR89 IF ON HOOK SIGNALING IS REQUIRED OR CONNECTED TO TR47 IF OFF-HOOK SIGNALING IS REQUIRED.
20. CONNECT TERMINAL 3 TO EXTERNAL BUSY LAMP IF REQUIRED.
21. CONNECT TERMINALS 31 AND 32 TO KTS FOR COMMON SIGNAL CONTROL.
22. CONNECT TERMINALS 27 AND 36 TO 1010 TRANSFORMER FLUG. TRANSFORMER FLUG MAY BE MOUNTED UP TO 20 FEET FROM 558 CONTROL UNIT.
23. STRAP TERMINAL 21 TO TERMINAL 15 TO PROVIDE FOR STATION-BUSY LAMP CONTROL.
24. CONNECT TERMINAL 20 (52 LEAD) TO TERMINAL 30 IF REDUCED SPEAKER VOLUME IS DESIRED.

Figure 3. Telephone Set Schematic and Wiring Diagram for KTS's Other Than Type 17A KTS.

TYPE 102A KEY TELEPHONE SET EQUIPPED WITH SIGNAL PAGING OR HANDS-FREE ANSWER-BACK AMPLIFIER AND
CONFERENCE KEYSET -- DESK (10 BUTTON)

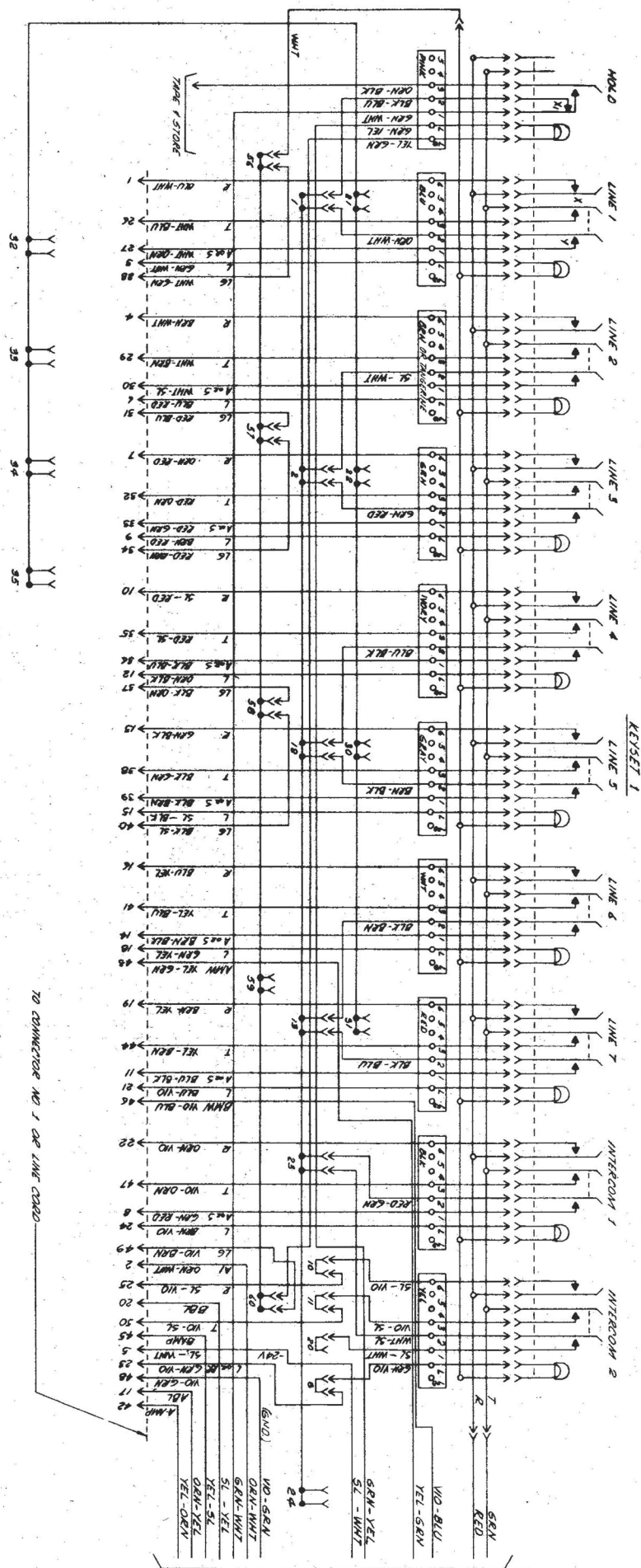


Figure 5. Conferencing Keyset Wiring Diagram.

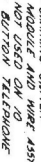


Figure 6. Nonconferencing Keyset Wiring Diagram