7A COMMUNICATION SYSTEM"—COM KEY*"718 KEY TELEPHONE SYSTEM

DESCRIPTION, ORDERING INFORMATION, AND OPERATION

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1. GENERAL

1.01 This section contains descriptive, ordering, and operation information for the 7A Communication System. Installation, connection, and maintenance information is now contained in Task Oriented Practice (TOP) 518-450-101.

1.02 This section is reissued to remove the information relating to installation, connections, and maintenance. Since this reissue is a general revision, no revision arrows have been used to denote significant changes.

1.03 After January 1, 1980, connection of customer or telephone company (telco) provided equipment to the 7A Communication System requires the use of a 33B voice coupler when providing music-on-hold. Also after January 1, 1980, the 415B, 460C, 471C, and 479C key telephone units (KTUs) must be used when providing their related services. Previously connected or Class C system components may be used for additions and maintenance at grandfathered installations for the life of the equipment, provided they are not modified. Class C stock may also be used in new installations after January 1, 1980.

1.04 Incoming central office (CO) lines to be installed in compliance with the Federal Communications Commission (FCC) Registration Program must be routed through a standard network interface. Information on approved interfaces is contained in Sections 463-400-100 through 463-400-150.

1.05 This issue is based on the following:

- Section 463-341-102—Music-on-Hold 33A-Type Voice Coupler
- Section 503-603-120—575AM- and 2575AM-Type Telephone Sets; Identification, Installation, Connections, and Maintenance
- Section 503-603-130—853AM- and 2853AM-Type Telephone Sets; Identification, Installation, Connections, and Maintenance
- Section 503-701-110—832- and 2832-Type Telephone Sets; Identification, Installation, Connections, and Maintenance
- Section 512-620-487—Speakerphone System—3-Type; 832-, 833-, 2832-, and 2833-Type Telephone Sets, Connections
- Section 512-740-471—Speakerphone System 4A, 832-, 833-, 2832-, and 2833-Type Telephone sets
- CD- and SD-69652-01, Issue 4—7A Communication System Circuit
- CD- and SD-69654-01, Issue 3—832A, B, or C and 2832A Telephone Circuit for Use With 7A Communication System
- CD- and SD-69656-01, Issue 2—6A1 and 6B1 Selector Console Circuit to Use With 7A Communication System.

If this section is to be used with equipment or apparatus reflecting a later issue of the drawing(s), reference should be made to the CDs and SDs to determine the extent of the changes and the manner in which the section may be affected.

2. DESCRIPTION OF APPARATUS

2.01 The 7A Communication System will accommodate a maximum of 7 CO/PBX lines and 18 stations. It is equipped with a 2-path intercom. A 570-type KSU houses a power supply and KTU mountings. Telephone sets (832-, 2832-, 575-, and 2575-type) are special 10-button, 11-button, and 13-button sets providing basic services such as pickup, hold and illumination, voice and tone signaling, multiline conferencing, and automatic button restoration (ABR) and intercom only. Optional features are privacy (lockout), privacy release, station restriction, paging [with or without customer-provided (CP) background music], power failure transfer, ring transfer, music-on-hold (utilizing CP music source), intercom preset conference, station busy console with direct station selection (DSS), station busy console with message waiting (MW), intercom-only telephone sets, TOUCH-TONE dialing, speakerphone, external signaling circuit, and connection to customer paging and do-not-disturb.

2.02 In the 7A Communication System, each station has access to all CO/PBX lines and both intercom paths except the intercom only station which has access only to the intercom paths. One station, designated as the attendant station (station

code 0), is the only station factory-wired in the KSU for CO/PBX ringing. Incoming calls are answered at the attendant station. The attendant ascertains the station or party being called and places the incoming call on hold. The attendant may then page the called party or dial the called station or party over an intercom path and inform them of the incoming call. The attendant may reenter the call by depressing the associated line button. The attendant station (station code 0) is the only station that can divert its common audible ringing via the optional ring transfer feature. Any station may be optionally wired for CO/PBX ringing on a single line or for common audible ringing. Stations cannot be wired for both common audible and CO/PBX ringing. In the 7A Communication System, as many as ten stations may be wired for common audible ringing. Intercom station codes are 0 (attendant station code) and 3 through 19. Code 1 is the transfer digit for 2-digit codes and code 2 is for paging.

570-TYPE KSU

2.03 The 570A KSU (MD) has the following mechanical design features:

- Contains an internally mounted 19C2A power unit (19C2 in some earlier models) and a KS-19175L1 interrupter
- Contains five internally mounted 66-type connecting blocks for option, console, and station connections
- Has fuse panel which provides power distribution to connectors and station blocks for lamp and fusing functions
- Has status lamps to indicate status of CO/PBX and intercom lines
- Has designation strip holder and tab assembly serving as a retainer to lock KTUs in the connectors
- Mounts twelve 4-inch and three 8-inch KTUs
- Has 424C, 455A, 456B, and 460-type KTUs shipped with KSU
- Is 25-1/2 inches wide, 17 inches high, 11 inches deep, and requires 9-1/2 inches of wall space on either side of the backboard to permit full opening of the carrier assemblies
- Is arranged for wall mounting or may be floor-mounted (using the 77-type apparatus mounting)
- Has a removable fiberglass cover.

2.04 The 570B KSU (Fig. 1) is the same as the 570A except:

- No KTUs are shipped with the KSU—the 424C, 455A, 456B, and 460-type KTUs must be ordered separately
- Wired for use of a 498A KTU equipped with a 116A1 circuit module when music-on-hold is furnished—***the 451-type KTU is not compatible with the 570B KSU***
- Redesigned fuse panel using fuse clips instead of fuse holders (Fig. 1)
- J2 through J8 wired to A battery and A ground to permit use of 415-type KTU (Automatic Private Line Circuit) when music-on-hold is not provided.

2.05 All wiring connections are made on connecting blocks located in the KSU (Fig. 2). Since all stations pick up all lines on the same button at each telephone set, all equipment connections are factory-wired to the connecting blocks.

All station connections are made on the station connection field blocks using standard color-code cutdown. This eliminates the need for an external cross-connection field except when using satellite wiring plan.

2.06 The block and column on which a station is cut down determines the intercom code assigned to that station. Intercom codes available are codes 0 and 3 through 19.

(a) Connecting block 1 (Fig. 2) contains the diode arrangement for preset conference and common audible signaling. Terminals are provided for strapping the power failure transfer, CO ringing, preset conference, paging, and ring transfer.

(b) Connecting block 2 (Fig. 2) contains the polarity guard diodes for the CO/PBX lines.

(c) Connecting block 3 (Fig. 2) provides terminals for connecting station code 0 (attendant sta-

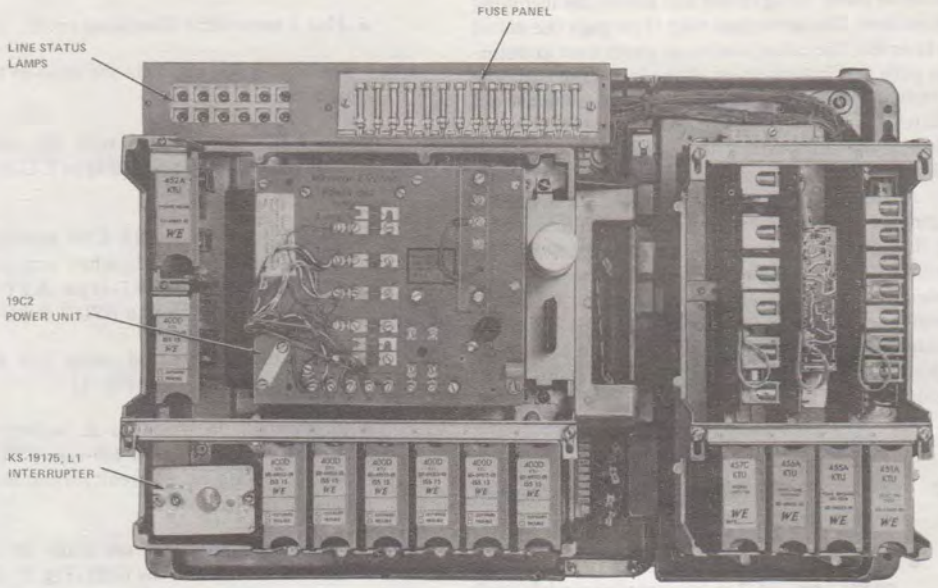


Fig. 1—570-Type KSU (Cover Removed)

tion), station code 3, the incoming CO/PBX lines, the optional message waiting or DSS consoles, and the 33-type voice coupler.

(d) Connecting blocks 4 and 5 (Fig. 2) provide terminals for connecting station codes 4 through 19.

2.07 The fuse panel in the 570-type KSU utilizes 70-type indicator fuses to give a visual indication of fuse status. The 19-type power units are equipped with 24-type fuses which do not provide a fuse status indication.

2.08 The lamp panel in the 570-type KSU provides a status lamp for each CO/PBX line and intercom path. The lamps give the same indication of line status (flash, steady, wink) as the line lamps in the telephone sets.

CONSOLES

A. 6A1 Selector Console (Station Busy Console With DSS)

2.09 The 6A1 selector console (Fig. 3) is a 20-button console providing a 17-button DSS field with station busy lamps. Of the three remaining buttons, one is used as a paging button, one is used as an intercom recall button, and one button is spare. Ivory (-50) is the standard console color, and a 6A2—(refer to Table A) faceplate must be ordered with each console. Current 6A1 consoles are shipped with an ivory (-50) mounting cord rather than satin-silver (-87). The 6A1 selector console is normally used in addition to the attendant's telephone set to provide DSS on the intercom.

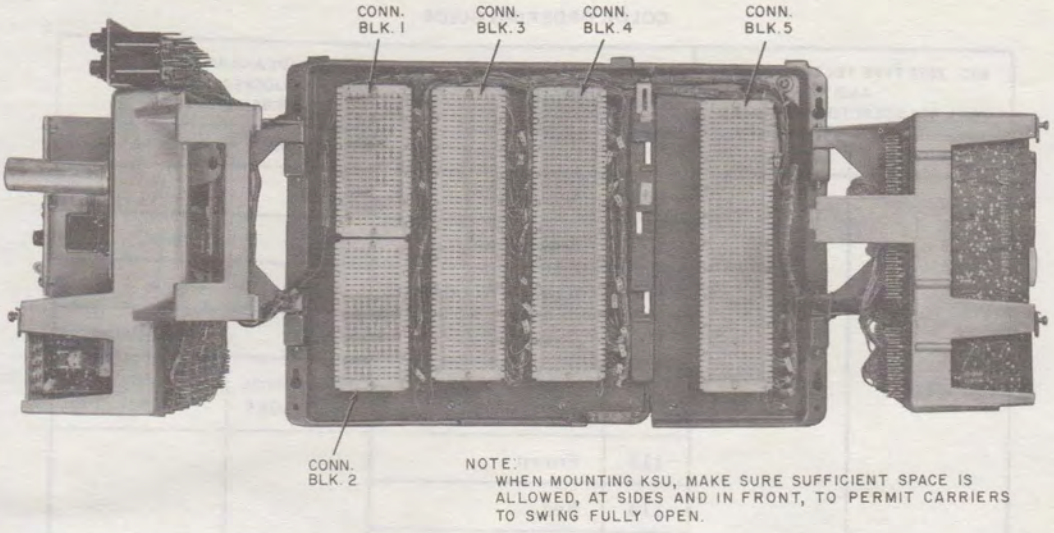


Fig. 2—570- Type KSU (Carriers Open)

Fig. 3—6A1 Selector Console (DSS)

TABLE A

COLOR ORDERING GUIDE

832-, 2832-TYPE TELEPHONE SETS AND 6A1, 6B1 SELECTOR CONSOLES		FACEPLATES		SPEAKERPHONE, LOUDSPEAKER, AND TRANSMITTER	
SUFFIX	COLOR	SUFFIX	COLOR	SUFFIX	COLOR
−50	Ivory	−100	Avocado	−03	Black
		−108	Teak (Woodgrain)	−51	Green
		−109	Walnut (Woodgrain)	−58	White
		−111	Gold	−60	Light Beige
		−112	Orange	Kit of Parts D-180508*	Ivory
		−113	Brown		
		−114	Red		
		−115	Blue		
		−118	Black		

* Order separately.

B. 6B1 Selector Console (Station Busy Console With MW)

2.10 The 6B1 selector console (Fig. 4) is a 20-button console providing a 17-button message waiting field. Three buttons are not used. Ivory (-50) is the standard console color, and a 6A2—(refer to Table A) faceplate must be ordered with each console. Current 6B1 consoles are shipped with an ivory (-50) mounting cord rather than satin-silver (-87). The 6B1 selector console is normally used in addition to the attendant telephone set to provide the message waiting feature.

> ***Note:*** Up to three selector consoles in any combination can be used in a 7A Communication System.

2.11 ***Console Power Requirements:*** If more than one console is to be used, lamp power (± 18V, 2A) must be provided by a 215C1 power unit installed in the KSU or an equivalent external unit. The 215C1 has three ±18V outputs. When it is installed in an earlier model KSU which has a 19C2 for the principal power unit, the ±18V output of the 19C2 is disabled.

EXTERNALLY MOUNTED APPARATUS

A. 33-Type Voice Coupler

2.12 The 33-type voice coupler is an interconnecting unit which provides a point of connection for a customer-provided music source used with music-on-hold and background music. It is wall-mounted externally from the KSU. A potentiometer (with screwdriver adjustment slot) controls the level of the background music. The unit contains fuses for protection against hazardous voltages from the CP music source. Refer to paragraph 1.03 for restrictions on use of 33-type voice coupler.

B. 20A-49 Apparatus Unit

2.13 The 20A-49 apparatus unit provides a point of connection or interface to an external paging system. Also, the 20A-49 apparatus unit is used with a large high-power paging system provided by the

Fig. 4—6B1 Selector Console (MW)

telephone company. The unit is 1-13/16 inches deep by 2-3/4 inches high by 4-3/8 inches long and is wall-mounted externally to the 570-type KSU. It presents a load to the 457C KTU equivalent to one loudspeaker and provides an output impedance to the COAM equipment of approximately 300 ohms. The output is transmitted to the COAM paging equipment through a transformer which is both electrostatically and electromagnetically shielded to minimize the possibility of introducing noise. A potentiometer (with screwdriver adjustment slot) is provided to adjust the signal level. Connections are made on five screw terminals.

C. 22A-49 Apparatus Unit

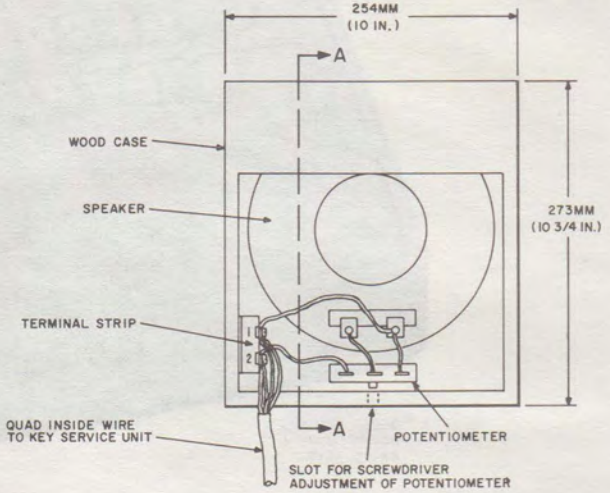
2.14 The 22A-49 apparatus unit is an external signaling circuit that activates a signaling device which is external to the telephone sets. The 22A-49 apparatus unit offers a contact closure or opens a contact, as required, to operate KS-16301 type signaling devices (Section 463-110-100) or other external alerting devices. The unit is 1-13/16 inches deep by 2-3/4 inches high by 4-3/8 inches long and is wall-mounted externally to the 570-type KSU. Connections are made on six screw terminals. The 22A-49 apparatus unit may be used to activate an external signaling device for:

- Common audible
- Station codes
- CO/PBX ringing
- Ring transfer.

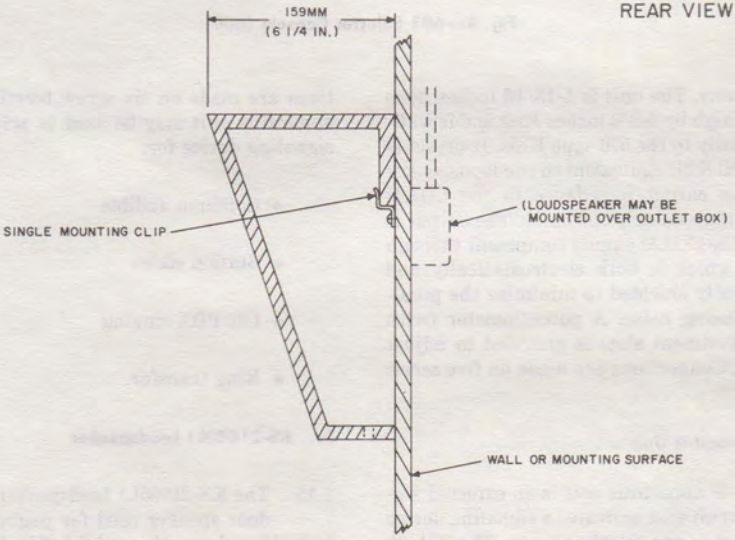
D. KS-21880L1 Loudspeaker

2.15 The KS-21880L1 loudspeaker (Fig. 5) is an indoor speaker used for paging. It is 11 inches high, 10 inches wide, and 6-1/2 inches deep. It has a potentiometer (with screwdriver adjustment slot) for volume control. The KS-21880L1 loudspeaker is furnished with a walnut (woodgrain) finish. It was formerly known as the K8 loudspeaker. The speaker and the speaker enclosure are available as a List 2 and List 3, respectively, as repair or replacement parts.

FRONT VIEW



REAR VIEW



VIEW A-A

Fig. 5—KS-21880L1 Loudspeaker, Connections, and Mounting

E. KS-21939L2 Loudspeaker

2.16 The KS-21939L2 loudspeaker (Fig. 6) is a horn-type speaker used for paging at indoor or outdoor locations. It is 7-1/2 inches in diameter, 7 inches deep, and weighs 3-1/4 pounds. The loudspeaker is equipped with a swivel mounting bracket having three holes in the outer rim for mounting on a flat surface. The loudspeaker will also fasten to a 1/2-inch pipe. Pigtail leads are provided for connections. Nominal frequency response of the loudspeaker is 400 to 13,000 Hz. The KS-21939L2 loudspeaker has a screwdriver adjusted volume control. It was formerly known as the KS-16846L2 loudspeaker which did not have a volume control. The KS-21939 loudspeaker is also available as a List 1 which is the same as the List 2 except it has no volume control, and as a List 3 which is the same as a List 2 except it is equipped with a rigid conduit mounting adapter.

2.17 The KS-21880 and the KS-21939 loudspeakers are 45-ohm speakers. In the 7A Communication System, do not substitute speakers with other impedances for the two loudspeakers. Existing stocks of K8 or KS-16846L2 loudspeakers may be used.

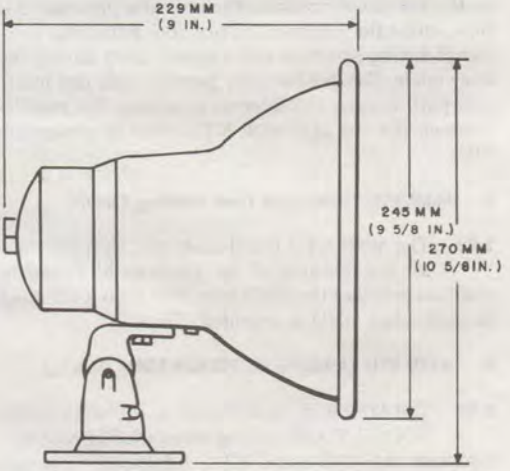


Fig. 6—KS-21939L2 Loudspeaker

KEY TELEPHONE UNITS

A. 400-Type KTU (CO or PBX Line Circuit)

2.18 The 400G KTU (MD) is a 4-inch unit which provides a key telephone set with CO or PBX line service. Additional information on the 400-type KTUs may be found in Section 518-215-400 (Line Services) and CD- and SD-69513-01 or CD- and SD-69942-01.

2.19 The latest version of the line circuit KTU is the 400H (MD); all earlier 400-type KTUs are rated MD but can be used when available. The 400H (MD) can be mounted in any 570-type KSU with the following limitations.

(a) Do not install a 400H (MD) KTU in a 570A KSU (MD) when music-on-hold is required. Only the 451-type music-on-hold KTU can be used with the 570A KSU, and it is ***not*** compatible with the 400H.

(b) When a 400H (MD) (or any other 400-type line circuit) is installed in a 570B KSU, only the 498A KTU can be used to provide music-on-hold. The 451-type music-on-hold KTU is ***not*** compatible with the 570B KSU.

B. 424B and 424C KTU (Dial Intercom, 19-Code Selector Circuit)

2.20 The 424B or C KTU is an 8-inch dial selective intercom unit. Additional information may be found in CD- and SD-69567-01. The 424C is the preferred KTU for replacements and new installations. In the 7A Communication System, the 424B/C KTUs provides rotary dial selection and nineteen dial codes (nine single-digit and ten 2-digit codes).

> ***Note:*** In the 7A Communication System, the first digit of the 2-digit code is 1; therefore, 1 is not available as a station code. Code 2 is dedicated to paging which leaves codes 0 (attendant station) and 3 through 19 available for station codes.

Do not use a 424A KTU in the 7A Communication System.

C. 440A KTU (MD) (TOUCH-TONE‡ Telephone Adapter Circuit)

2.21 The 440A KTU isan8-inch unit that provides TOUCH-TONE dialing when used in conjunction with the 424B or C KTU. Additional information on the 440A KTU may be found in CD- and SD-69906-01.

> ***Note:*** The 440A KTU is superseded by an improved adapter used for TOUCH-TONE dialing, the 478B KTU, which should be used for replacement and for new installations (see paragraph 2.29).

D. 451A or 451B KTU (Music-On-Hold Circuit)

2.22 The 451-type KTU is a 4-inch unit that is used with an externally mounted 33A voice coupler to connect a customer-provided source of music to a maximum of seven CO/PBX lines placed on hold. The 451A KTU was formerly identified as a 123A IU.

Install the 451-type KTU only in a 570A KSU containing 400G or earlier line circuits. If the KSU is a 570B, the 498A music-on-hold KTU equipped with a 116A1 CM must be used (see paragraph 2.30).

E. 452A KTU (Power Failure Transfer Circuit)

2.23 The 452A KTU is a 4-inch unit that automatically "cuts through" up to seven CO/PBX lines to external line ringers in the event of power failure.

F. 455A KTU (Tone Ringing Signal Generator Circuit)

2.24 The 455A KTU is a 4-inch unit that contains the tone ringing generator for CO/PBX signaling.

G. 456A or 456B KTU (Voice and Tone Alerting Circuit)

2.25 The 456-type KTU is a 4-inch unit that provides the following features on intercom calls:

- Ringing tone to calling party
- Tone alerting signal to called party
- Voice signaling to called party
- Input signal to paging amplifier.

The 456A will be rated MD but can be used in all installations where paging feedback or radio frequency interference are not problems. Paging feedback is, in general, an installation problem, and changeout to the 456B will help only in marginal cases. The 456-type KTU must be replaced by a 468B KTU when do-not-disturb (DND) is provided.

H. 457C KTU (Paging Amplifier Circuit)

2.26 The 457C KTU is a 4-inch unit that contains the amplifier circuitry for paging and customer-provided background music. The customer-provided music source can be connected to the paging speakers when the paging circuit is not in use. The 457C KTU has a peak power output of 3 watts.

> ***Caution: The 457B KTU should not be used in lieu of the 457C KTU due to the likelihood of circuit failures.***

I. 460C KTU (2-Path Intercom Access Circuit)

2.27 The 460C KTU is an 8-inch unit that contains two separate intercom paths. Path selection is based on operation of the associated intercom button on the key telephone sets. The unit also provides dial tone, seizes the selector, and provides a flashing lamp signal during selection and a steady lamp during the busy mode. Control circuitry permits only one intercom path to seize the selector at a time. For restrictions on the use of a 460B KTU refer to paragraph 1.03.

J. 468B KTU (Voice and Tone Alerting Circuit)

2.28 The 468B KTU is a 4-inch unit that provides all the features of the 456-type KTU and in addition provides the DND tone. The 468B KTU must be used when DND is provided.

K. 478B KTU (Adapter for TOUCH-TONE Dialing)

2.29 The 478B KTU is an 8-inch unit that provides TOUCH-TONE dialing when used in conjunction with the 424B and C KTU. Additional information on the 478B KTU may be found in CD- and SD-69931-01.

L. 498A KTU (Music-On-Hold Circuit)

2.30 The 498A KTU is a 4-inch unit which provides music-on-hold for up to four CO/PBX lines

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when used in a 570B KSU. ***This KTU should always be equipped with a 116A1 CM when used in COM KEY key telephone system in order to provide music-on-hold for up to seven lines.*** The 498A equipped with a 116A1 CM plugs into J18 on the KSU.

Do not install a 498A KTU in a 570A KSU. It is not electrically compatible.

KITS OF PARTS

2.31 Privacy (D-180486), Ring Transfer (D-180487), Privacy Release (D-180488), and Recall (D-180591) Kit of Parts can be added to certain type 832 and 2832 telephone sets in the field. Refer to Table C for a summary of the features provided by these kits. Later model telephone sets have these features built in at the factory.

A. D-180486 Kit of Parts (Privacy)

2.32 The D-180486 Kit of Parts provides a privacy or lockout feature. A station equipped with a privacy circuit is prevented from picking up a busy CO/PBX line. Intercom lines have no privacy.

B. D-180487 Kit of Parts (Ring Transfer)

2.33 The D-180487 Kit of Parts provides the feature for transferring incoming CO/PBX ringing from an attendant station to a designated secondary station. The D-180487 Kit of Parts adds an eleventh button (651C key) to the manufacture discontinued 832A or 2832A telephone sets.

C. D-180488 Kit of Parts (Privacy Release)

2.34 The D-180488 Kit of Parts provides the feature of permitting an excluded or locked-out station to enter a conversation on a busy CO/PBX line. The D-180488 Kit of Parts adds an eleventh button (651D key) to the 832A (MD) or 2832A (MD) telephone set.

D. D-180591 Kit of Parts (Recall)

2.35 The D-180591 Kit of Parts provides a station the feature of simulating a switchhook flash or recall. The D-180591 Kit of Parts adds an eleventh button to the 832A or 2832A telephone set. An 832A or 2832A telephone set equipped with the D-180591 Kit of Parts (recall) is electrically equivalent to the 832BM or 2832BM telephone set.

E. D-180656 Kit of Parts (Shelf for Wall Mounting Telephone Sets)

2.36 The D-180656 Kit of Parts provides a method for wall mounting COM KEY key telephone system telephone sets. This kit of parts consists of a shelf assembly (ivory colored) and a retaining clamp. The shelf will incline the telephone set 15 degrees from the horizontal to facilitate its use. This kit can be used with any of the 832- or 2832-type telephone sets not already designed for wall mounting.

> ***Note:*** When possible, sets designed for wall mounting should be used in preference to the D-180656 Kit of Parts.

TELEPHONE SETS

A. Full Service Telephone Sets (Table B)

> ***Caution: The system may be disabled if multiple buttons are depressed at an idle station.***

2.37 The 832- and 2832-type telephone sets are 10-, 11-, or 13-button key telephone sets designed for use with the 7A Communication System. The sets are equipped with a loudspeaker for tone and voice signaling. A volume control is provided to control the level of the signal. Conferencing of two or more CO/PBX lines is accomplished by simultaneously depressing the buttons associated with the lines to be conferenced. The CO/PBX lines cannot be conferenced with intercom lines. Automatic button restoration (ABR) restores all depressed buttons when the handset is replaced. The lamp under the HOLD button is provided for use as a message waiting indicator.

2.38 Full service telephone sets for the 7A Communication System are available in ivory (-50) only and are shipped from the factory with throwaway, protective faceplates. For each set, it is necessary to order a colored faceplate from the complement of nine vinyl-clad metal decorator faceplates that are available (see Table A). Current 832- and 2832-type telephone sets are shipped with an ivory (-50) mounting cord rather than satin-silver (-87).

TABLE B

7A COMMUNICATION SYSTEM TELEPHONE SET FEATURES

FEATURE	STATUS	10-BUTTON SETS	11-BUTTON SETS	13-BUTTON SETS
		832A (MD) 2832A(MD)	832B(MD) 832BM 832DM 2832B(MD) 2832BM 2832DM	832C(MD) 832CM 832EM 2832C(MD) 2832CM 2832EM
RECALL	Factory Provided		•	•
	Factory Connected		•	•
	Field Provided *	•†		
	Field Connected	•		
PRIVACY CIRCUIT	Factory Provided			•
	Factory Connected			•
	Field Provided ‡	•	•	
	Field Connected	•	•	
PRIVACY RELEASE	Factory Provided			•
	Factory Connected			•
	Field Provided §	•†		
	Field Connected	•		
RING TRANSFER	Factory Provided			•
	Factory Connected			
	Field Provided ¶	•†		
	Field Connected	•		•

* Kit of Parts D-180591

† Only one of these features can be added to one 832A or 2832A set.

‡ Kit of Parts D-180486.

§ Kit of Parts D-180488.

¶ Kit of Parts D-180487.

832A/2832A (MD) Telephone Sets

2.39 The 832A telephone set is a rotary dial 10-button key set. The set has seven CO/PBX line pickup buttons, two intercom pickup buttons, and a HOLD button. The 832A telephone set may be modified in the field to provide a privacy circuit and either a PRIV RLS, RING TR, or RECALL button.

Note: Only one button (for privacy release, ring transfer, or recall) can be added to the 832A telephone set.

2.40 The 2832A set is the same as the 832A except it has TOUCH-TONE dialing.

832B/2832B (MD) Telephone Sets

2.41 The 832B telephone set is a rotary dial 11-button key set. The set has seven CO/PBX line pickup buttons, two intercom buttons, a HOLD button, and a RECALL button. The eleventh button, to the right and below the key assembly, is factory-wired for recall and is designated with an amber cap. A momentary operation of the RECALL button opens the line simulating a switchhook flash. The set may be modified in the field for privacy.

2.42 The 2832B set is the same as the 832B except it has TOUCH-TONE dialing.

832BM/2832BM Telephone Sets (Fig. 7)

2.43 The 832BM/2832BM 11-button telephone sets are the same as the 832B/2832B (MD) sets except that modular handset components are added.

832C/2832C (MD) Telephone Sets

2.44 The 832C telephone set is a rotary dial 13-button key telephone set. The set has a lower row of ten buttons for seven CO/PBX line pickups, two intercom line pickups, and for hold. The upper row contains three buttons on the left providing recall, privacy release, and (optional) ring transfer. A brushed aluminum finished collar assembly, with the words COM KEY key telephone system in black letters, is positioned to the right of these buttons. The 832C telephone set is factory-wired with a privacy circuit and with the PRIV RLS button operational. The RING TR button is not factory-connected. An amber button cap is provided for the RECALL button, and an E-6406 designation strip is provided for labeling the RECALL, PRIV RLS, and RING TR buttons.

2.45 The 2832C set is the same as the 832C except it has TOUCH-TONE dialing.

832CM/2832CM Telephone Sets (Fig. 8)

2.46 The 832CM/2832CM 13-button telephone sets are the same as the 832C/2832C (MD) sets except that modular handset components are added.

832DM/2832DM Telephone Sets

2.47 The 832DM/2832DM 11-button telephone sets are the same as the 832BM/2832BM except that they are arranged for wall mounting. The switchhook allows the handset to hang vertically to the left of the housing.

832EM/2832EM Telephone Sets (Fig. 9)

2.48 The 832EM/2832EM 13-button telephone sets are the same as the 832CM/2832CM except that they are arranged for wall mounting.

B. Intercom Only Telephone Sets

575AM Telephone Set

2.49 The 575AM desk-type telephone set is a rotary dial, ivory color, 6-button key set ***arranged for intercom service only.*** It is similar to the 565-type set in physical appearance. The set is equipped with a loudspeaker for tone and voice signaling. A volume control is provided to control the level of the signal. The first button (hold button position) is a red nonfunctional button (blocked nonoperative) which may be illuminated for use as a message waiting indicator. The second, third, and fourth (not used with 7A Communication System) buttons are illuminated pickup buttons. The fifth and sixth are not illuminated and are blocked nonoperative.

2.50 As shipped from the factory, only two intercom buttons (buttons two and three) are wired operational as required for use with the 7A Communication System.

2.51 The intercom pickup buttons on the 575AM telephone set do not automatically restore to the nonoperated position when the handset is placed on-hook.

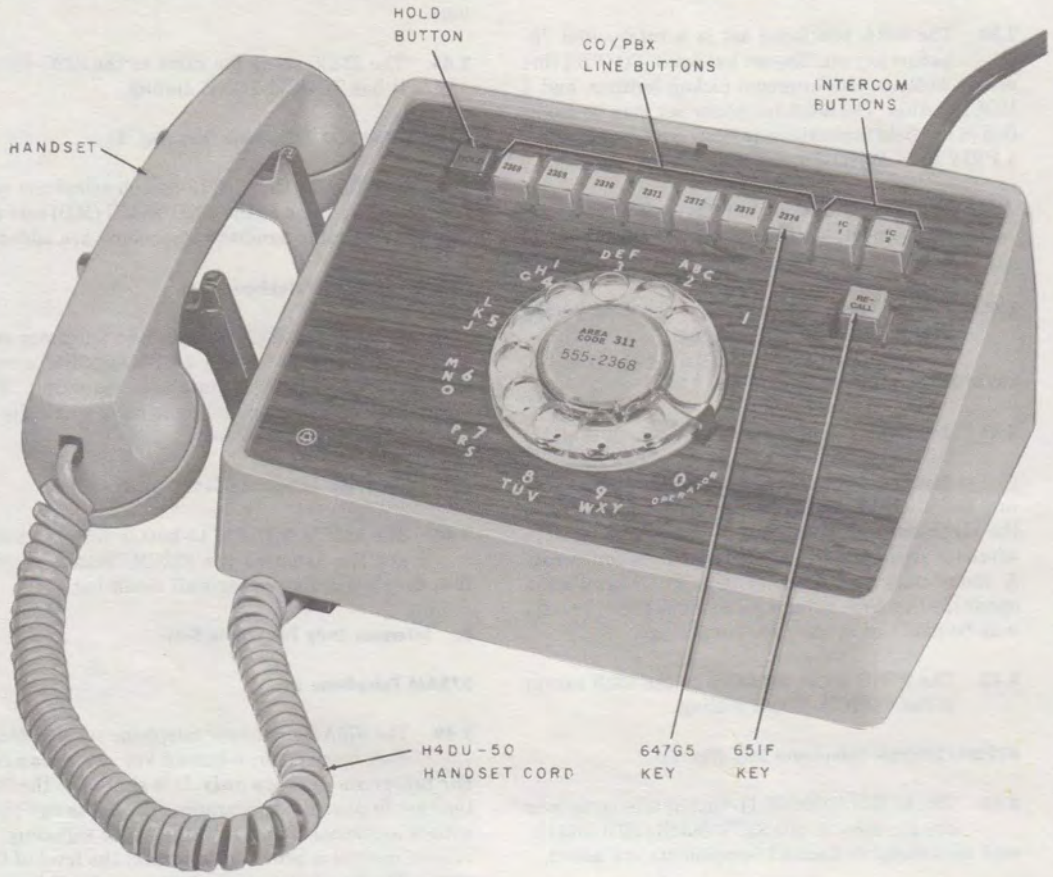


Fig. 7—832BM-50 Telephone Set

2575AM Telephone Set

2.52 The 2575AM telephone set is the same as the 575AM telephone set except it is equipped with TOUCH-TONE dialing.

853AM/2853AM Telephone Set

2.53 The 853AM/2853AM telephone sets perform the same functions as the 575AM/2575AM telephone sets except they are arranged for wall mounting.

3. INSTALLATION

Caution: The paging feature of the 7A Communication System can be inadequate for paging in noisy locations. A preinstallation survey should be made of noisy areas where paging is to be provided. The results of the survey may indicate:

3.01 Select appropriate apparatus according to job requirements.

Fig. 8—2832CM-50 Telephone Set

- ***Additional speakers will be required.***

- Speakers will have to be located closer together.

- ***An auxiliary paging system (telephone company or customer provided) will be required.***

- An auxiliary paging system requires the use of a 20A-49 apparatus unit.

A. Ordering Guide

(a) Apparatus for basic service are as follows:

- Unit, Service Key, 570B (No KTUs are furnished with the KSU; order required KTUs separately.)

Cord, Power (order required length)

824013288 (P-40J328) (4 feet)
824013296 (P-40J329) (6 feet)

Fig. 9—832EM-50 Telephone Set

824010995 (P-40J099) (12 feet)

- Mounting, Apparatus, 77C (floor stand for 570-type KSU; order one per installation when KSU is to be floor-mounted)
- Unit, Telephone Key, 400G (MD) (CO/PBX line circuit) (order one per line for use in 570A or B KSU)
- Unit, Telephone Key, 400H (MD) (CO/PBX line circuit) (order one per line for use in 570B KSU or in 570A KSU when music-on-hold is not required)
- Unit, Telephone Key, 424C (Dial Intercom, 19-Code Selector Circuit)
- Unit, Telephone Key, 455A (Tone Ringing Signal Generator Circuit)
- Unit, Telephone Key, 456A or 456B (Voice and Tone Alerting Circuit)
- Unit, Telephone Key, 460C (2-Path Intercom Access Circuit).

11-Button Sets:

- Set, Telephone (desk), 832BM-50 (rotary dial) or 2832BM-50 (TOUCH-TONE telephone)
- Set, Telephone (wall), 832DM-50 (rotary dial) or 2832DM-50 (TOUCH-TONE telephone)
- Plate, Face, 832B—(refer to Table A) (order one for each 832BM or 832DM telephone set)
- Plate, Face, 2832B—(refer to Table A) (order one for each 2832BM or 2832DM telephone set).

13-Button Sets:

- Set, Telephone (desk), 832CM-50 (rotary dial) or 2832CM-50 (TOUCH-TONE telephone)
- Set, Telephone (wall), 832EM-50 (rotary dial) or 2832EM-50 (TOUCH-TONE telephone)
- Plate, Face, 833A—(refer to Table A) (order one for each 832CM or 832EM telephone set)
- Plate, Face, 2833A—(refer to Table A) (order one for each 2832CM or 2832EM telephone set).

Intercom-Only Sets:

- Set, Telephone, 575AM-50 desk type (rotary dial)
- Set, Telephone, 2575AM-50 desk type (TOUCH-TONE telephone)
- Set, Telephone, 853AM-50 (wall-type rotary dial)
- Set, Telephone, 2853AM-50 (wall-type TOUCH-TONE telephone)
- Cable, Connector, A25B (order one single-ended cable per telephone set and console used; length must be specified).

(b) Optional apparatus (order as required) are as follows:

- Console, Selector, 6A1-50 (Station Busy Console with DSS)

- Console, Selector, 6B1-50 (Station Busy Console with MW)
- Coupler, Voice, 33-type (order when background music or music-on-hold is provided)
- Diode, 446F, or equivalent (order one for each rotary dial station to be restricted)
- Kit of Parts, D-180486 (Privacy Circuit order one for each 832/2832A, B, BM, or DM type telephone set to be locked out)
- Kit of Parts, D-180487 (Ring Transfer order one for each 832A or 2832A telephone set used as attendant station)
- Kit of Parts, D-180488 (Privacy Release order one for each 832A or 2832A telephone set used for a station equipped with the privacy release feature)
- Kit of Parts, D-180591 (Recall order one for each 832A or 2832A telephone set used as a station equipped with the recall feature)
- Kit of Parts, D-180656 (Shelf Assembly order one for each 832/2832A, B, C, BM, or CM type telephone set to be wall-mounted)
- Loudspeaker, Horn, KS-21939L2 (order as required for outside paging)
- Loudspeaker, Indoor, KS-21880L1 (order as required for indoor paging)

Note: A maximum of seven paging loudspeakers can be connected to the 7A Communication System.

- Ringer, E1C (MD) and E1CM (order one for each line to be wired for power failure ringing)
- Speakerphone, 3B (MD) (order one each for each station to be equipped)

  Cord, D10R—(refer to Table A) (specify length: 1 foot 4 inches, 9, 12, or 25 feet)

  Loudspeaker, 760A—(refer to Table A)

  Transformer, 2012D

  Transmitter, 666B—(refer to Table A)

  Unit, Control, 55B

- Speakerphone, 4A (order one each for each station to be equipped)

  Adapter, 223-A-49 (includes M16C and M2FG cords)

  Loudspeaker, 108—(refer to Table A)

  Transmitter, 680A—(refer to Table A)

  Unit, Power, 85B1-49

- Unit, Apparatus, 20A-49 (order when 7A Communication System is connected to an external paging system)
- Unit, Apparatus, 22A-49 (order when signaling devices, external to telephone sets, are required) (Signaling devices, bells, buzzers, gongs, etc, and an external power supply must be ordered as required.)
- Unit, Telephone Key, 440A or 478B (TOUCH-TONE Telephone Adapter Circuit)

Note: J13/J14 connector on KSU must have A and B ground connected when 478B KTU is used. Do not use 478B KTU in conjunction with any dial intercom selector circuit except 424C.

- Unit, Telephone Key, 451A or 451B (Music-On-Hold Circuit) (order one per system in which 400G or earlier line circuits are used with 570A KSU)
- Unit, Telephone Key, 452A (Power Failure Transfer Circuit)
- Unit, Telephone Key, 457C (Paging Amplifier Circuit)
- Unit, Telephone, Key, 468B (Voice and Tone Alerting Circuit. Order one when DND feature is required)
- Unit, Telephone Key, 498A (Music-On-Hold Circuit order one per system in which 400H line circuits are used with 570B KSU; provides music for up to four CO/PBX lines)
- Module, Circuit, 116A1 (Music-On-Hold Circuit daughter board order one per 498A KTU)

- Key, 688A DND key.

(c) Replaceable components are as follows:

570-Type KSU:

- Fuse, 24B (3A)
- Fuse, 24C (2A)
- Fuse, 24F (5A)
- Fuse, 70A (1-1/3A)
- Fuse, 70G (1/2A)
- Fuse, 70H (3/4A)
- Interrupter, KS-19175L1
- Lamp, 51A
- Unit, Power, 19C2A
- Unit, Power, 19C2 (on earlier models of 570A KSU).

33A Voice Coupler:

Fuse, 35P (3/4A).

33B Voice Coupler:

Fuse, 24D (3/4A).

Telephone Sets:

Refer to Table C.

6A1 and 6B1 Selector Consoles:

- Base, 6A1 (for 6A1 Selector Console)
- Base, 6B1 (for 6B1 Selector Console)
- Cord, Mounting, D50AD-50

TABLE C

TELEPHONE SETS AND REPLACEABLE COMPONENTS—ORDERING GUIDE

TEL SET	BASE	HOUSING	DIAL	KEY	FACEPLATE (NOTE)	HANDSET	HANDESET CORD	LAMP
832BM	832BM	832A-50	8CA	647G5 651F	832B-			
832CM	832CM	832A-50	8CA	647G5 647S5	833A-			
832DM	840998710	6C1-50	8CA	647G5 651F	832B-			
832EM	840998736	6C1-50	8CA	647G5 647S5	833A-			
2832BM	2832BM	832A-50	35AF3A	647G5 651F	2832B-			
2832CM	2832CM	832A-50	35AF3A	647G5 647S5	2833A-	G15A-50	H4DU-50	51A
2832DM	840998728	6C1-50	35AF3A	647G5 651F	2832B-			
2832EM	840998744	6C1-50	35AF3A	647G5 647S5	2833A-			
575AM		840996268	9CA	636A				
2575AM		840997258	35Y3A	636A	840845502			
853AM		853A-50	8RA	635A5	853A-			
2853AM		853A-50	35Y3A	635A5	2853A-			

Note: See Table A for color suffix.

- Housing, 6A1-50
- Key, 647J5 (for 6A1 Selector Console)
- Key, 647AG5 or 647J5C (for 6A1 Selector Console)
- Key, 647AF5 or 647C5 (for 6B1 Selector Console)
- Lamp, 51A
- Plate, Face, 6A2—(refer to Table A)
- Floor Mounting-Mounting Apparatus (77C).

B. Satellite Wiring Plan

3.02 The 7A Communication System is designed for Home-Run cabling (direct cabling) from each telephone set to the KSU. Where it is more practical to serve a group of stations from a secondary location, a satellite wiring plan can be used. The satellite wiring plan is a connecting block arrangement for station terminations. It is served by a connecting cable or cables from the KSU.

3.03 Cabling is required between the KSU and the satellite location to provide the following leads:

- Those leads common to all stations, such as T, R, and A of the CO/PBX lines, T and R of the intercoms, etc. Only one appearance of these leads is required at the satellite.
- Six leads for ***each*** station code working from the satellite location. These are the VS, CO, SB, ±10V, ET, and ER leads.
- Additional leads required to cover A1, lamp, and lamp ground restrictions. These restrictions limit the voltage drop in the lamp loop to less than 2 volts and require a low resistance A to A1 lead.

3.04 Two methods are covered for providing the proper amounts of terminations and leads at a satellite location. One method employs a prewired 14A1-100 terminal block. The second uses standard 66-type connecting blocks and a nomograph which help to determine the number of extra lamp and lamp ground leads required.

3.05 All satellite wiring arrangements should limit the total distance from the KSU to the satellite ***plus*** from the satellite to the station to 667 feet.

3.06 The 14A1-100 terminal block consists of a 66-type connecting block factory-wired to four microribbon connectors. One 14A1-100 terminal block will accommodate eight 25-pair station cables. Station cables are terminated on the 66-type connecting block columns following the even-count color code.

3.07 Connections between the terminal block and the KSU are made using connector cables plugged into the connectors on the block. The other end of the cables are terminated in the KSU, on the rows and columns of the KSU that would normally contain the station cables.

3.08 The same basic rules used with the 14A1-100 terminal block apply for satellites using standard 66-type connecting blocks. Sufficient conductors must be run from the KSU to the satellite to provide a one-time appearance of all common station leads, individual code leads, and enough L and LG multiples (see paragraph 3.03).

3.09 The number of additional conductors required per L and LG lead is determined using the nomograph. To use the nomograph, it is necessary to know three items:

(a) The distance from the KSU to the satellite location

(b) Number of stations to work from the satellite

(c) Distance from satellite location to farthest station working from satellite.

By plotting the values on the proper scales and connecting them, the required number of additional conductors required per L and LG lead can be determined.

4. FEATURES (IDENTIFICATION AND OPERATION)

BASIC FEATURES

A. Automatic Button Restoration (ABR)

4.01 Automatic button restoration is a feature of the 832- and 2832-type telephone sets used with the 7A Communication System. When the handset is replaced, all depressed buttons return to the unoperated position. This prevents inadvertent intrusion on calls in progress and ensures that multiple

buttons will not be left depressed on a set causing an undesired conference from the idle set.

4.02 The intercom-only telephone sets, 575AM, 2575AM, 853AM, and 2853AM do not have ABR.

4.03 On 832- and 2832-type telephone sets equipped with a RECALL button, this feature should be used for flashing, instead of the switchhook. Otherwise, the ABR will release the line button when the switchhook is operated. On 832/2832A sets without recall, hold down the line button while flashing with the switchhook.

4.04 Automatic button restoration is a mechanical function of the telephone set; no wiring is required and field adjustment of the mechanism is not recommended.

B. Common Audible

4.05 The 7A Communication System is factory-wired for the attendant station (intercom code 0) to receive ***tone ringing*** whenever there is an incoming call on any of the CO/PBX lines. (The lamp under the associated CO/PBX line button flashes for visual identification of the calling line.)

4.06 The attendant answers all incoming calls and either takes a message or forwards the call to the desired party using the intercom. To forward a call, the attendant puts the incoming call on hold (CO/PBX line lamp goes from steady to wink), then picks up an idle intercom path, dials the desired station, and voice signals that there is a call on a particular CO/PBX line. By observing the CO/PBX line lamp (going from wink to steady), the attendant is able to determine when the call is picked up. If after a suitable period of time the call is not picked up, the attendant may again pick up the line and proceed per local instructions.

4.07 Common audible is derived through diodes located on connecting block 1. As factory-wired, there is one diode per CO/PBX line connected to a common audible terminal. A factory-provided strap (on the installer's side of block 1) connects the common audible terminal to station code 0.

C. Multiline Conferencing

4.08 Multiline conferencing is a feature of the telephone sets used in the system. Since there is no amplification involved, this type of conferencing is limited.

Note: Transmission levels will be reduced and transmission is not guaranteed.

4.09 Conferencing is accomplished by simultaneously depressing the CO/PBX line buttons of the CO/PBX lines to be conferenced.

Intercom and CO/PBX lines cannot be conferenced together. In addition, the radio paging, telephone dictation, and 4-wire line features are not intended to be bridged or conferenced to a CO line.

4.10 All lines that are conferenced together may be put on hold simultaneously by depressing the HOLD button.

4.11 To make a call during a conference:

(1) Depress HOLD button—all buttons restore.

(2) Select an idle line.

(3) Dial call.

(4) If it is desired to add this call to the conference while holding this CO/PBX line button down, depress the conferenced CO/PBX line buttons.

(5) To reenter conference again after call is completed, simultaneously depress conferenced buttons again.

4.12 If it is desired to add another call to the conference, while holding the conferenced CO/PBX line buttons down, depress button of CO/PBX line to be added.

4.13 To prevent dropping one of the participants when setting up a conference, ensure that the conferenced CO/PBX line buttons are held down when adding another station.

Caution: The system may be disabled if multiple buttons are left depressed at an idle station after a conference.

4.14 Conferencing is a mechanical function of the telephone set and requires no wiring.

D. Pickup, Hold, and Illumination

4.15 The system provides pickup on CO/PBX and intercom lines and hold on CO/PBX lines. Lamps provide the following information: steady lamps are for line busy, flashing lamps for incoming calls, and winking lamps for hold.

4.16 The CO/PBX and intercom lines appear on the same buttons at all stations. By observing the lamps associated with the CO/PBX and intercom line buttons, the station user can readily determine the status of each line. Any station user can pick up any idle line or place any CO/PBX line on hold.

E. Tone and Voice Signaling

4.17 All stations are alerted to an incoming call by a distinctive tone signal. The CO/PBX ringing is a frequency-shifting tone. Intercom ringing is a single tone followed by voice signaling. Voice signaling is used in conjunction with tone signaling when calling a station on the intercom. When a station receives incoming CO/PBX tone signals and is simultaneously signaled on the intercom, the intercom signal is given preference.

F. 2-Path Intercom

4.18 The intercom has two separate talking paths. A path is selected by depressing one of the two intercom buttons on the telephone set. There is no privacy on either path and any station may break into an existing conversation.

4.19 When it is desirable for a station to pick up only the two intercom lines and not have access to the CO/PBX lines, a 575AM or a 2575AM telephone set can be used if a desk-type telephone set is required or an 853AM or 2853AM can be used for wall installations.

4.20 The selector, used to select and alert the called stations, is shared between the two paths. The alerting signal at the called station is a tone burst followed by a voice signal from the calling station. The lamp signals on the intercom are as follows: When the selector has seized a path, the lamp associated with that path will flash on all telephone sets. This shows the called party which path to answer. When the called party answers, the flashing intercom lamp lights steadily. When an intercom path is idle, the associated lamp is off.

4.21 To place an intercom call perform the following:

(1) Select idle intercom path and depress associated button.

(2) Lift telephone handset.

Note: If lamp is flashing on other intercom path, dialing cannot take place until the selector is released. While the selector is seized by another station, no dial tone or other indication is available.

(3) Dial selected station—tone burst signals called station.

(4) Calling station makes announcement or waits for called party to answer. When called party picks up, intercom lamp will go steady.

4.22 Intercom is factory-wired, requiring the 424C, 456B, and 460C KTUs. The intercom code of a station is determined by the column on connecting blocks 3, 4, or 5 on which the station cable is terminated.

OPTIONAL FEATURES

A. Central Office (CO) Ringing

4.23 The CO ringing feature permits a station not wired for common audible to receive the ringing signal on a selected CO/PBX line. Any combination of stations may be connected for CO ringing on a one-line per-station basis. A terminal representing each CO/PBX line is brought out on connecting block 1, row 21.

B. External Signaling Circuit

Caution: The 22A-49 apparatus unit contains a nonadjustable, mercury-wetted, sealed contact relay and must be mounted in a vertical upright position.

4.24 Where external signaling devices (such as bells, gongs, chimes, lights or buzzers) are to be connected to the 7A Communication System, a 22A-49 apparatus unit must be provided. The 22A-49 apparatus unit is externally mounted and connections are made to the KSU with inside wire. Also, an external power supply must be provided to operate the signaling devices. The 22A-49 apparatus unit may be used to activate external signaling devices that are operated by an open circuit (through a relay break

contact) or that are operated by a circuit closure (through a relay make contact).

4.25 The 22A-49 apparatus unit is used to activate external signaling devices that are connected for the following:

- Station codes
- Common audible
- CO/PBX ringing
- Ring transfer.

4.26 One 22A-49 apparatus unit is required for each station code or each CO/PBX line equipped with an external signaling device. The KS-16301 type auxiliary signals or ringers are recommended as external signaling devices for use with the 7A Communication System. Refer to Section 463-110-100 for identification, installation, operation, maintenance, and ordering information on the KS-16301 type signals.

4.27 The external power supply used to operate the signaling devices must be properly fused and have the capacity to adequately power the signaling devices. Information found in Section 167-416-201, 167-440-201, or 167-446-101 may be used as a guide toward selecting an appropriate power supply. Do not use a power supply that exceeds the contact rating of the 22A-49 apparatus unit.

C. Intercom Preset Conference

4.28 Intercom preset conference allows up to five preselected stations to be alerted simultaneously by dialing code 19.

4.29 When preset conference is used, station code 19 is forfeited. Signaling via preset conference takes precedence over CO/PBX ringing at a preset conference station.

4.30 To use preset conference proceed as follows:

(1) Lift handset

(2) Select idle intercom path and depress associated button

(3) Dial 19—tone burst signals all stations wired for preset conference

Note: Attendant may use DSS code 19 if equipped with DSS console.

(4) Announcement is made to all preset conference stations simultaneously.

D. Music-On-Hold

4.31 The music-on-hold feature transmits music to calling or called parties on CO/PBX lines that are placed on hold.

Caution: The output of the CP music source must furnish ac coupling only—thus blocking all direct current to the input terminals of the 33-type voice coupler.

4.32 Music-on-hold is provided on CO/PBX lines by a 451A or B KTU (with 400G (MD) or earlier KTUs in a 570A KSU), a 498A KTU equipped with a 116A1 CM (with any 400-type KTUs in a 570B KSU), a 33-type voice coupler, and a customer-provided music source. The customer-provided music source must have an output impedance low enough to drive an 8-ohm load without distortion. The music source must also be adjustable so the listening level of the music-on-hold may be adjusted.

The CP music source should be able to deliver up to one watt into an 8-ohm load. The 33-type voice coupler will accept input from any customer-provided apparatus that does not blow the fuses in the voice coupler. If the customer wants a copy of the technical reference covering the 33-type voice coupler, contact the local Telephone Company Business Office or the Marketing Representative. If a service call is caused by a malfunction of the customer-provided equipment, billing should be made in accordance with Section 660-101-312.

E. Ring Transfer

4.33 Ring transfer switches the incoming CO/PBX ringing from the attendant station (code 0) to an alternate telephone or telephones in the 7A Communication System. Ring transfer can be wired for fixed station or as a flexible station arrangement.

With fixed station ring transfer, incoming CO/PBX calls are transferred to a specific station or group of stations as fixed by an option strap in the KSU. The flexible station ring transfer arrangement utilizes a 6041G key to permit any one of up to five stations or groups of stations to be selected for ring transfer of incoming CO/PBX calls.

4.34 To operate ring transfer wired for fixed station transfer, depress RING TR button on attendant telephone set (locking it down). To transfer ringing back to the attendant station, depress RING TR button again (which releases it). While the button is depressed, the lamp under it lights (steady).

4.35 To operate ring transfer arrangement for flexible station transfer, depress button on the 6041G key associated with the station or stations to receive incoming CO/PBX calls. Then depress RING TR button on the attendant telephone set (locking it down). While the button on the attendant set is depressed, the lamp under it lights (steady). To transfer ringing back to the attendant station, depress the RING TR button again (which releases it). Afterward, operate the release button on the 6041G key.

4.36 The attendant telephone set must be equipped with a ring transfer button to control ring transfer. Where the 832/2832C, CM or EM telephone set is installed as an attendant station, the factory-provided RING TR button must be wired in.

F. Paging and Background Music

4.37 In the 7A Communication System, paging may be as follows:

(a) Provided for up to seven speakers, using indoor or outdoor speakers

(b) Connected to a COAM paging system

(c) Connected to a separate paging system provided by the telephone company.

4.38 For background music, a 33-type voice coupler must be installed and connected to the KSU and customer-provided music source. When the paging system is not being used, the customer-provided music source may be used to provide background music over the paging speakers.

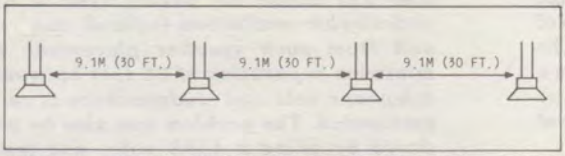
Caution: Avoid placing loudspeakers directly in front of or close to stations that will utilize the paging system. An undesirable oscillation (squeal) can result from such speaker placement. A minimum separation of 60 feet between telephone sets and loudspeakers is recommended. The problem can also be reduced by using a 456B voice and tone alerting circuit KTU instead of a 456A.

4.39 A paging system should be loud enough to be heard but not loud enough to annoy those who work near the speakers. The number and location of speakers are influenced mainly by the environment in which they will be located. Figure 10 shows several examples of speaker placement. It may be necessary to experiment with speaker placement on site to achieve the desired results. Noisy locations may require additional speakers or an auxiliary paging system. Refer to Section 981-251-100 for general information on loudspeaker paging system. The system is factory wired so paging may be activated by dialing code 2.

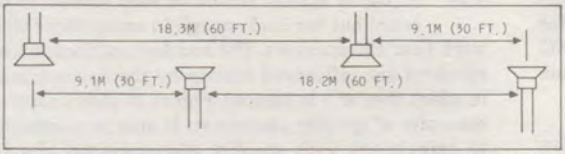
4.40 The KS-21880L1 loudspeaker (Fig. 5) is an indoor speaker. It is wall-mounted or may be mounted over an outlet box. A mounting clip is furnished with the speaker. Speaker volume is controlled by a potentiometer (with screw driver adjustment slot) located in the bottom of the speaker.

Speaker volume level will be affected by changes in room content. The addition of furniture, fixtures, draperies, carpeting or wall covering may necessitate increasing speaker volume, which, however, may increase the tendency of the system to "squeal" because of feedback between loudspeakers and telephones. If this occurs, try to change the relative positions of loudspeakers and telephones, if possible. If a 456A voice and tone alerting circuit is used, replace it with a 456B.

4.41 The KS-21939L2 loudspeaker (Fig. 6) is applicable to locations with adverse weather conditions. The loudspeaker is equipped with a swivel mounting bracket for mounting on a flat surface. Also the speaker can be fastened to a 1/2-inch pipe or conduit. The loudspeaker is equipped with a screwdriver adjusted volume control. Screw terminals are provided for connections to the speaker.

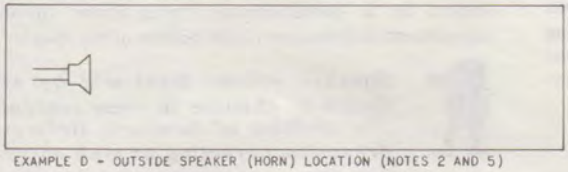


EXAMPLE A - SPEAKERS LOCATED ON ONE WALL OF ROOM (NOTES 1, 2 AND 3)



EXAMPLE B - SPEAKERS LOCATED ON OPPOSITE WALLS OF ROOM (NOTES 1 AND 2)

EXAMPLE C - SPEAKERS LOCATED IN INDIVIDUAL ROOMS (NOTES 1, 2 AND 4)



EXAMPLE D - OUTSIDE SPEAKER (HORN) LOCATION (NOTES 2 AND 5)

NOTES:
1. EXAMPLES A, B AND C ARE FOR QUIET OR OFFICE TYPE ENVIRONMENTS, LESS THAN 65DB SOUND PRESSURE LEVEL (SPL). ALL SPEAKERS SHOULD BE LOCATED AT LEAST 18.3 METERS (60 FEET) FROM ANY STATION USED FOR PAGING.
2. SPEAKER WIRING SHOULD BE RUN SEPARATELY, NOT PART OF A VOICE CABLE. QUAD CABLE SHOULD BE USED WITH BOTH PAIRS CONNECTED. SPEAKERS SHOULD BE HUNG AS CLOSE TO THE CEILING AS POSSIBLE. MAXIMUM SPEAKER DISTANCE FROM THE KSU IS 97.6M (320 FT.) USING QUAD WIRE.
3. SPEAKERS REACH A DEPTH OF 9.1M (30 FT.). IF ROOM IS OVER 9.1M (30 FT.) WIDE, FACING SPEAKERS SHOULD BE USED.
4. ONE SPEAKER WILL SERVE A ROOM UP TO 7.6M BY 7.6M (25 BY 25 FT.)
5. ONE SPEAKER (HORN) MOUNTED 6.1M (20 FT.) ABOVE GROUND LEVEL WILL COVER AN AREA APPROXIMATELY 24.4 BY 30.5M (80 BY 100 FT.). IF THE HORN IS MOUNTED LESS THAN 6.1M (20 FT.) ABOVE GROUND LEVEL, TWO HORNS MUST BE USED. HORNS SHOULD NOT BE MOUNTED LESS THAN 4.6M (15 FT.) ABOVE GROUND LEVEL. IF MORE THAN ONE HORN IS USED, THEY SHOULD BE MOUNTED VERTICALLY, RATHER THAN SIDE-BY-SIDE.

Fig. 10—Example of Paging Speaker Location

When using outdoor speakers, the speaker leads must be protected in accordance with local instructions or Section 460-100-400.

4.42 A COAM paging system or a separate telephone company-provided paging system is connected to the 7A Communication System through a 20A-49 apparatus unit. The 20A-49 apparatus unit is mounted externally to the KSU.

The 20A-49 apparatus unit provides a nominal 300-ohm output to a customer-owned paging system. It does not provide a means to activate the customer's equipment; therefore, the customer's equipment must be in the ON mode at all times.

G. Power Failure Ringer

4.43 For each location to be equipped with power failure transfer, a power failure ringer [E1C (MD) and E1CM] must be installed. Install the E1C (MD) and E1CM ringer near telephone set location.

H. Power Failure Transfer

4.44 Utilizing a 452A KTU and externally mounted E1C (MD) and E1CM ringers, this feature pro-

vides an audible indication of incoming CO/PBX calls during a power failure condition.

4.45 The tip and ring of all CO/PBX lines are wired to line ringers through normally made contacts of relays in the 452A KTU. The relays are held operated while local power is available. When power is lost to the KSU, the relays release and the tip and ring of the CO/PBX lines are cut through to the line ringers.

I. Privacy

4.46 Privacy prevents a station from bridging into a CO/PBX call in progress. Privacy is a station feature, and each station that is to be excluded (locked out) must be equipped with a privacy circuit board.

4.47 A privacy circuit, D-180486 Kit of Parts, must be added to an 832/2832A (MD), B (MD), BM, or DM telephone set used as a privacy station (Fig. 11). The 832/2832C (MD), CM, and EM telephone sets are wired at the factory with the privacy circuit operational.

4.48 The privacy circuit operates only when the telephone set is off-hook. The circuit monitors the A lead to determine the status of the line. A ground (or positive potential) on the A lead indicates the line is busy, operates the privacy circuit, and the station attempting to bridge is excluded. A negative potential on the A lead does not cause the privacy circuit to operate and the set is not excluded. There is no privacy on the intercom paths.

J. Privacy Release

4.49 Privacy release permits a second privacy-equipped (locked out) telephone to be bridged into a call on a CO/PBX line.

4.50 A privacy release button, D-180488 Kit of Parts, must be added to an 832A or 2832A telephone set for privacy release. Refer to Table B for a summary of sets which are factory-equipped with the privacy release feature.

4.51 When a station is off-hook with a CO/PBX line button depressed, any station equipped with a privacy circuit will be locked out from that CO/PBX line.

(a) To permit a privacy-equipped station to bridge into a call perform the following:

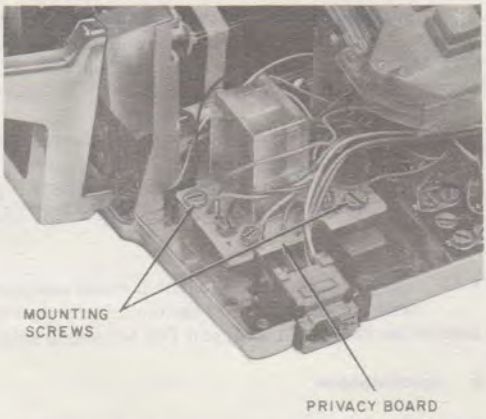


Fig. 11—Privacy Circuit Mounted in Telephone Set

(1) Depress (and hold down) the PRIV RLS button at the station where the CO/PBX line is picked up

(2) Observe that line lamp changes from steady to wink (the line goes on hold)

(b) The privacy-equipped station may now bridge into the call as follows:

(1) Observe that line lamp changes from wink to steady (indicating station has entered the call)

(2) Release the PRIV RLS button.

4.52 To allow an additional privacy-equipped station to bridge into the call, both stations must depress their PRIV RLS buttons simultaneously. The line lamp will change from steady to wink. As the third station bridges into the call, the line lamp will become steady. The PRIV RLS buttons are then released.

K. Recall

Caution: If CO/PBX lines are conferenced and the RECALL button is depressed, the conferenced lines may be disconnected.

4.53 Recall provides the same functions as switchhook flash without restoring the line buttons. Recall is accomplished by depressing the RECALL button on the telephone set. The RECALL button is designated with an amber cap.

4.54 A recall button, D-180591 Kit of Parts, must be added to an 832A or 2832A telephone set if this feature is required. All other 832- and 2832-type telephone sets are factory-equipped with a RECALL button.

4.55 The 832A and 2832A telephone sets equipped with RECALL buttons are electrically equivalent to the 832/2832B, BM, and DM telephone sets.

L. Speakerphone

4.56 Speakerphone service may be provided at all stations in the system.

4.57 To originate a call using speakerphone proceed as follows:

(1) Depress CO/PBX or intercom button associated with an idle line.

(2) Momentarily depress transmitter ON button. ON lamp lights and dial tone is heard through the loudspeaker.

(3) Dial number in normal manner.

(4) When called party answers, transmitter and loudspeaker are used to carry on the conversation. Adjust volume level as desired.

4.58 To answer an incoming call using speakerphone proceed as follows:

(1) When audible tone signals an incoming call, depress CO/PBX or intercom button associated with flashing lamp.

(2) Momentarily depress transmitter ON button. Audible signal is silenced and the speakerphone is connected to the line.

(3) Answer call using transmitter and loudspeaker to carry on conversation.

4.59 To disable transmitter when it is desired not to transmit conversation from the surrounding area to the distant station proceed as follows:

(1) Depress transmitter ON button during entire period transmitter is to be disabled.

Note: With transmitter disabled, conversation will not be transmitted to the distant station; however, the distant party may be heard over the loudspeaker.

(2) Release transmitter ON button and system is restored to hands-free operation.

4.60 To transfer from handset to speakerphone operation proceed as follows:

(1) Put line on hold

(2) Hang up handset

(3) Turn speakerphone on

(4) Depress line button.

4.61 To transfer from speakerphone to handset operation, lift handset during speakerphone operation to automatically transfer to handset operation. When it is necessary to transfer back to speakerphone, refer to paragraph 4.60 to prevent disconnect.

4.62 To terminate a call on speakerphone, momentarily depress transmitter OFF button.

Note: Restore depressed line buttons after a conference call.

M. Station Busy Consoles

4.63 The 570-type KSU has the capacity for one station busy console—either DSS or MW. However, a maximum of three consoles can be connected to a COM KEY 718 key telephone system (refer to N. Multiple Consoles).

If any DDS consoles are to be installed, be sure that the D0-D1 and CG0-CG1 straps on connecting block 3 are removed. If no DSS consoles are installed, be sure that straps are in place.

Station Busy Console (6A1) With DSS

4.64 By first selecting an idle intercom path, then depressing the appropriate button on the 6A1

console, an attendant may signal any station over the intercom or make announcements over the paging system. The console also provides the attendant with a visual indication of a busy station. Seventeen buttons on the console correspond to the station codes (codes 3 through 19); one button is associated with paging, one button is arranged for recall, and one button is spare.

4.65 Any station having the handset off-hook lights a lamp under the associated button on the 6A1/DSS console as a visual indication of a busy station. The operated switchhook contacts of a telephone set extend ground over an SB( ) lead, through the KSU to the 6A1 console, thus lighting the lamp under the associated button in the DSS field.

4.66 To DSS from the 6A1 console proceed as follows:

(1) Lift handset on the associated telephone set.

(2) Select idle intercom path and depress intercom button.

(3) On the 6A1 console, momentarily depress button on DSS field corresponding to desired station—tone burst signals called station.

(4) Announcement may now be made to called party.

4.67 If called party may be reached at another station, proceed as follows:

(1) Momentarily depress RECALL button on DSS console—dial tone will be returned.

(2) Momentarily depress button on DSS field corresponding to desired station—tone burst signals called party.

(3) Announcement may now be made to called party.

Note: The selector may be repeatedly recalled (without losing the seized intercom path) by repeatedly depressing the RECALL button and the DSS button. If intercom call is answered at any point, user must hang up and start over.

4.68 To page from the 6A1/DSS console proceed as follows:

(1) Lift handset on the associated telephone set.

(2) Select idle intercom path and depress intercom button.

(3) Momentarily depress PAGE button on DSS console—tone burst will be heard over paging system loudspeakers.

(4) Speak into handset transmitter to make announcement.

(5) Replace handset.

Station Busy Console (6B1) With MW

4.69 By depressing the appropriate button on the 6B1 console, an attendant may signal any station that there is a message waiting by lighting the lamp under the station HOLD button. The console also provides the attendant with a visual indication of a busy station. Seventeen buttons on the console correspond to the station codes (3 through 19); three buttons are not used.

4.70 To signal an intercom station that there is a message waiting at the attendant, the attendant depresses the MW button associated with the desired station. The button will lock down in a partially depressed state causing the lamp under the HOLD button of the called station to light (steady). This steady lamp alerts the station user that he has a message waiting and to call the attendant. When the station calls the attendant, the attendant then depresses the associated MW button to release it.

Note: When more than one MW console is installed, the MW signal can only be retired at the console originating the signal since the key must be physically released.

Caution: Although all CO/PBX and intercom line buttons may be unoperated, a busy station indication is displayed at the 6A1/DSS or 6B1/MW console when a station handset is left off-hook.

4.71 The station busy feature of the 6B1/MW console is similar to that of the 6A1/DSS console described in paragraph 4.65.

N. Multiple Consoles

4.72 Although the 570-type KSU was originally designed for one station busy console, up to

three consoles in any combination can be supplied. Extra power and, in some cases, additional terminations are required. Extra power is required because the ±18-volt supply in the KSU is capable of powering only one console. Each additional console requires one ampere at ±18 volts. The additional power can be supplied by a separately ordered and installed 215C1 power unit. Use a separate 18-gauge wire for each ±18-volt lead required. In addition, the ground terminals of the 215C1 power unit should be strapped to the ±18-volt ground terminal of the KSU power unit. A 215C1 power unit fused for ±18 volts can be used for three leads.

4.73 Since there are terminations for only one DSS and one MW console within the KSU, additional blocks which must be mounted external to the KSU are required when more than one console of either type is required. When 66M1-50 blocks are used, B or C bridging clips are used as straps for common leads. Where a second wire must be connected to a terminal, 183B2 adapters are used.

4.74 At multiple console installations, the station busy and message waiting features for the attendant station (station 0) can be activated if desired. The DSS feature is ***not*** activated, and intercom calls from the second and/or third multiple console station must be made by dialing.

O. Station Restriction

4.75 This feature prevents any outgoing CO/PBX calls from being made at a restricted station.

> ***Caution: Make sure bare leads of the diode do not come into contact with the case of the network, other network terminals, or other parts of the telephone set. Use insulating sleeving where required.***

4.76 The restricted station may receive calls, but cannot call out on CO/PBX lines. This is accomplished by adding a diode (rotary dial sets only) and reversing two leads in the TOUCH-TONE telephone set.

P. TOUCH-TONE Dialing

4.77 Where TOUCH-TONE telephone sets are used with the 7A Communication System; a 440A (MD) or 478B KTU (TOUCH-TONE telephone adapter) is required. These are the only adapters usable in this system.

> ***Note:*** Do not use a 494A KTU (selector) with COM KEY 718 key telephone system due to an incompatibility with the DSS console circuitry.

The adapter converts the multifrequency tones from the telephone set dial to contact closures which supply ground to the proper leads in the code selector circuit, 424B or 424C KTU.

4.78 When the adapter used is a 478B, ensure that A and B grounds are available at the J13/14 connector. If these grounds are not connected, install the D-180720 Kit of Parts supplied with the 478B KTU. Instruction sheets are supplied with the kit of parts.

> ***Note:*** All 570B KSUs are equipped with these grounds.

4.79 Remove the RS1 to CG strap in column A of connecting block 1 when any TOUCH-TONE telephone adapter KTU is installed.

Q. Automatic, DC Signaling, Private Line Circuit

4.80 ***Private line service can be supplied in the 570B KSU only if music-on-hold is not also being furnished.*** A circuit incompatibility exists between the private line circuit and the music-on-hold circuit. A 415-type KTU is required for each private line circuit desired and is plugged into the KSU in place of one of the CO/PBX line circuits. Each private line installed will reduce the number of CO/PBX lines by one. In addition, a 415-type KTU or equivalent is required at the distant end.

R. Do-Not-Disturb (DND)

4.81 Two versions of DND are available with COM KEY 718 key telephone system, automatic (ADND) and manual (MDND). A 570B KSU is required, the feature cannot be installed with a 570A. The ADND is activated only when the station is off-hook, MDND can be activated with the station on-hook or off-hook. When activated, all intercom and DSS calls are blocked and the calling station receives a continuous 500 Hz tone indicating the called party does not want to be disturbed. The CO calls are not blocked.

4.82 To provide DND, the 570B KSU must be equipped with a 468A KTU (voice and tone

alerting circuit) in place of the 456B KTU. For ADND the telephone sets involved must be modified so that the voice signaling lead is opened when the station goes off-hook. For MDND the sets must be equipped and wired with a 688A key.

4.83 To activate ADND it is only necessary for the station to go off-hook. For MDND the push-to-operate, push-to-release button on the 688A key is operated. In both cases calling stations on intercom or DSS will hear the steady tone. The feature remains in effect until the station goes back on-hook (ADND) or the key is reoperated (MDND).