

## 2991A/B-, 2992A-, AND 2993A-TYPE MULTIBUTTON ELECTRONIC TELEPHONE (MET) SETS GENERAL DESCRIPTION

### 1. GENERAL

**1.01** This section provides identification, and describes the physical and functional characteristics of the 2991A/B-, 2992A-, and 2993A-type Multibutton Electronic Telephone (MET) Sets (Fig. 1 through 5) initially designed to be used with DIMENSION® Custom Telephone Service (DCTS) and the HORIZON® Communication System.

\*Trademark American Telephone and Telegraph Company.

**1.02** Whenever this section is reissued, the reason for reissue will be listed in this paragraph.

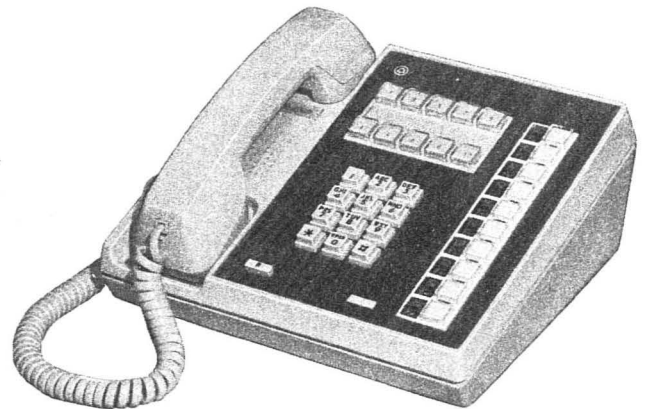


Fig. 2—2991A04 Telephone Set



Fig. 1—2991A01 Telephone Set

### 2. IDENTIFICATION

**2.01** For set ordering information refer to Table A and for replaceable component information refer to Table B.

**2.02** The following built-in optional features and adjuncts can be used with these sets as specified in Table C.

#### BUILT-IN

- 10-Button Direct Station Selection (DSS) Key

#### ADJUNCTS

- 4A Speakerphone
- TOUCH-A-MATIC® Adjunct Repertory Dial (2870A1 Dial)
- SPOKESMAN® (107B Loudspeaker Set)

### 3. PHYSICAL DESCRIPTION

**3.01** MET sets feature contemporary styled ivory colored housings, K-type handsets, modular handset and mounting cords, and decorator options provided by snap-in faceplates available in seven colors and two woodgrain finishes. All sets provide a TOUCH-TONE® dial, tone ringer, ringer volume control knob on the left side of the set to allow manual adjustment of the ringer level, and a recall button located below and to the left of the dial.

#### NOTICE

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Bell System except under written agreement



Fig. 3—2991B02 Telephone Set

Each set contains one or more vertically oriented line/feature keys positioned to the right of the dial. These keys, available in 5- and 10-button arrays, are arranged to provide 5-, 10-, 20-, and 30-button sets. One 10-button set code is also equipped with a 10-button direct station selection key.

**3.02** The exterior upper and lower housings enclose a chassis assembly which consists of a plastic chassis with all components and circuits attached. The upper housing and chassis assembly are common to both the desk and wall mounted sets. A lower housing is used for desk sets which position the faceplate at an angle of approximately 15 degrees from the desk top. Desk sets are also supplied with a seven foot long 8-conductor plug-ended mounting cord.

**3.03** Wall sets use a wall housing in place of the lower housing on the desk set. This housing interfaces with a wall bracket that is attached to the wall and supports the chassis so the faceplate slopes outward from the wall at an angle of approximately 8 degrees. The wall sets

contain all hardware required for installation including the wall bracket and a connecting block for terminating a 4-pair cable. All desk sets may be converted to wall sets by using the appropriate D-kit of parts as specified in Table C.

**3.04** Component interconnections are made in a screw terminal field located under the TOUCH-TONE dial. The dial is equipped with snap-in brackets for easy access to the interconnect field. Where possible, components are equipped with spade terminals to simplify identification and assembly.

**3.05** The nonlocking buttons on the line/feature key provide silent, low-travel movement for ease of operation. A removable cap on each button will accept designation tabs from the preprinted E-6980-1 and E-6980-2 form supplied with the sets. Two light emitting diode (LED) indicators, one green and one red, are positioned adjacent to each button. The green LED has a round lens and indicates the status of the line or feature associated with the button. The red LED has a square lens with a diamond pattern. This LED, called the "I-use" LED, is used for line buttons to indicate which line is in use when off-hook or which line is to be used when going off-hook.

**3.06** Station sets equipped with a 10-button 665A Direct Station Selection (DSS) key have the capability of calling other stations in the system by merely depressing the appropriate button. This key uses low-travel nonlocking buttons with removable button caps the same as the line/feature key. The buttons are arranged in a 2 by 5 array above the dial (Fig. 2).

#### 4. FUNCTIONAL DESCRIPTION

**4.01** The MET set differs from the conventional key-type telephone set primarily by the manner in which station indications (lamp and ringer) are controlled and key features are activated. Two 2-wire data links are required, one for receiving indicator control signals and one for transmitting feature activating signals. DC power is supplied continuously to the set over these two data links.

**4.02** All electronic circuits in the MET set are contained on four printed wiring boards. The indicator driving circuit is mounted on a flexible board which is part of the line or feature keys;



the data receive, data transit, and logic circuits are on the logic circuit board; the power supply circuit and tone ringer circuits are contained on individual circuit boards. The single MET set code which offers the DSS feature contains another printed wiring board assembly with additional circuitry. A functional block diagram of a MET set is shown in Fig. 6.

**4.03** Connections to the MET set are made via a four pair cord. The purpose of each conductor pair in the cord is:

- (a) **Talk Tip and Talk Ring (TT and TR):** This pair is the primary speech pair. The line circuit of the serving system connects via these conductors to the speech network in the telephone set. Voice and TOUCH-TONE dial signals are carried on this pair.
- (b) **Auxiliary Tip and Auxiliary Ring (AT and AR):** This pair is reserved for use with other MET set codes, as identified in Section 503-100-130.
- (c) **Lamp Tip and Lamp Ring (LT and LR):** Indicator control signals are received over this pair. In this way control of the ringer and LED indicators are maintained.
- (d) **Button Tip and Button Ring (BT and BR):** The condition of telephone feature controls is transmitted from the set over this pair. The control equipment in the system serving the MET set is thus able to monitor its status.



Fig. 4—2992A01 Telephone Set

The lamp and button data pairs are used to carry power to the set. The lamp pair is at a positive potential with reference to the button pair, as indicated in Fig. 7.

**4.04** The two data pairs connecting to a MET set terminate on the logic printed wiring board in the data receiver and transmitter circuits. The data receiver provides input to logic circuitry on the board. It includes a transformer for connection to the lamp data pair. The data transmitter receives input from the logic circuitry. It functions in synchronism with received data and includes a transformer for connecting to the button data pair. A switching regulator is contained on a power supply printed wiring board. It is connected to the center-taps of each transformer on the logic board and provides dc output voltage to power the set circuitry. It receives power phantom on the data pairs. The logic circuitry responds to received data and inputs from the telephone user. Received information is processed to activate set features, e.g., turning the ringer on and off, and activating LED indicators. User inputs from recall, DSS or line/feature key button depression and switchhook transitions are translated by the logic circuitry into data signals transmitted from the set.

**4.05** The line/feature keys in a MET set provide input to the logic printed wiring board. A button depression causes a message to be sent to the controlling system. The controlling system sends messages to the MET set to light or extinguish LEDs. The LEDs provide visual indication to a user regarding feature status and/or line usage.

**4.06** Depressing a button on a DSS key, when provided in a MET set, furnishes an input to the logic printed wiring board via the first line key in the set. The resulting message sent to the controlling system causes the station associated with the depressed button to be signaled.

**4.07** The ringer in the set is a tone ringer. Its tone generating components are contained on a tone ringer printed wiring board. The frequency, level, and duty cycle are controlled by data signals and the appropriate drive is provided from the logic board to the tone ringer board in order to achieve audible output. The ringer volume control allows manual adjustment of ringer level, including an off position.



Fig. 5—2993A01 Telephone Set

## 5. DESK TO WALL CONVERSION

**5.01** All desk sets can be converted to wall sets by using either a D-180663, D-180664, or D-180665 Kit of Parts (refer to Table C). These kits contain a wall bracket, housing, one-foot long D8W-50 cord, plug retainer, handset hook, and strain relief strap.

## 6. ADJUNCTS

**6.01** Available adjuncts necessary for additional features are as follows:

- TOUCH-A-MATIC Adjunct Reperatory Dial (Refer to Table C)

Order one for each installation:

- (a) 2870A1 dial

- 4A Speakerphone Adjunct (Refer to Table C)

Order one each for each installation:

- (a) 108-type loudspeaker (any color)
- (b) 680-type transmitter (any color)
- (c) 85B1-49 power unit
- (d) 223D adapter

- (e) D-180508 Kit of Parts—which provides Ivory housing for loudspeaker and Ivory trim for transmitter

- SPOKESMAM Adjunct (Refer to Table C)

Order one each for each installation:

- (a) 107B-50 loudspeaker set
- (b) 2012D transformer
- (c) 42A or 44A connecting block.

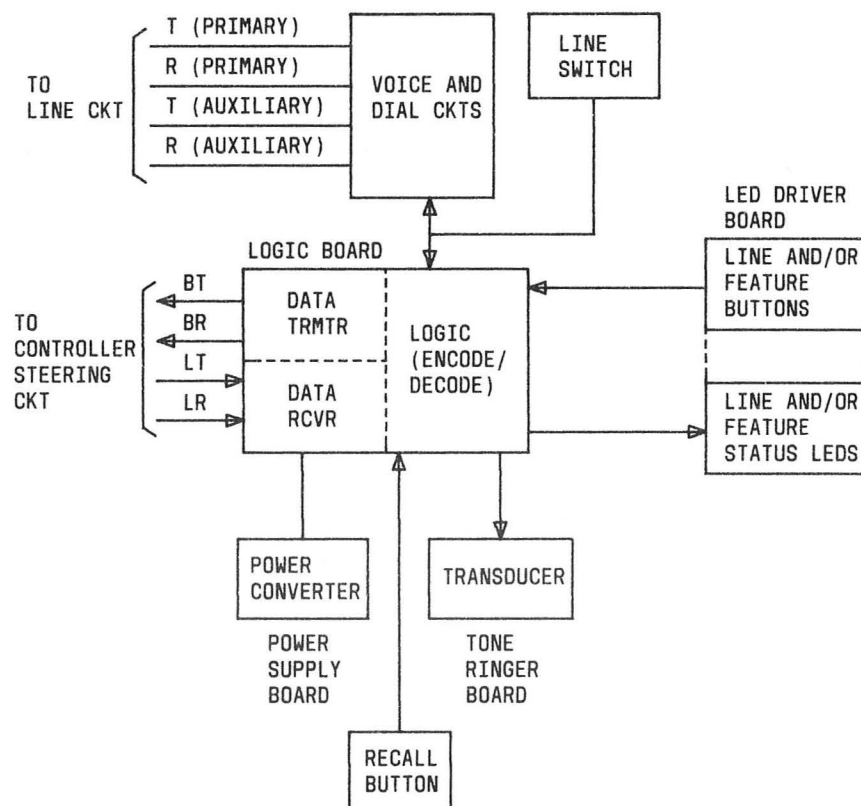


Fig. 6—MET Set Function Block Diagram

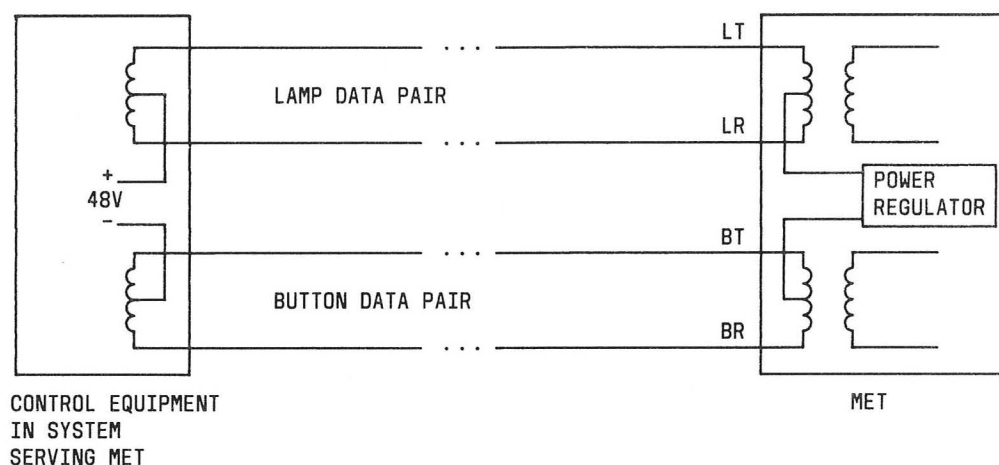


Fig. 7—Arrangement for Providing Power to Met

TABLE A

MULTIBUTTON ELECTRONIC TELEPHONE SET  
(FACTORY ARRANGEMENTS)

SET CODE	DESK SET	WALL SET	5-BUTTON LINE/ FEATURE KEY	10-BUTTON LINE/ FEATURE KEY	20-BUTTON LINE/ FEATURE KEY	30-BUTTON LINE/ FEATURE KEY	10-BUTTON DIRECT STATION SELECTION KEY	FACEPLATE*
2991A01	X		X					261B—
2991A02	X			X				261A—
2991A04	X			X			X	261C—
2991B01		X	X					261B—
2991B02		X		X				261A—
2992A01	X				X			262A—
2993A01	X					X		263A—

\* Sets are shipped with a disposable protective faceplate. Faceplates must be ordered separately, complete faceplate code by adding color suffix from following:

Avocado	(-100)	Orange	(-112)
Teak	(-108)	Red	(-114)
Walnut	(-109)	Blue	(-115)
Gold	(-111)	Black	(-118)



TABLE B

## REPLACEABLE COMPONENTS

SET CODE§	LINE/ FEATURE KEY	10-BUTTON DSS KEY	TT DIAL ASSEMBLY	HANDSET	HANDSET CORD *	MTG CORD†	HOUSING		KEY DESIG TAB	BUTTON CAP‡	
							UPPER	LOWER			
2991A01	680A		35AR3A	K1C-50	H4DU-50	D8W-50	61AU-50	61AL-50	E-6980-1	840693725	
2991A02	681A										665A
2991A04											
2991B01	680A							681A			62AU-50
2991B02											
2992A01							63AU-50		63AL-50		
2993A01											

\* Available in 6- and 12-foot lengths.

† Available in 1-, 7-, 14-, and 25-foot lengths.

‡ Package of 11.

§ See Table A for information on faceplates.

**TABLE C**  
**DESK TO WALL CONVERSION AND ADJUNCT COMPATIBILITY\***

SET CODE	DESK TO WALL CONVERSION	TOUCH -A- MATIC®†	4A SPKPH†	SPOKES-MAN ® †
2991A01	Kit D-180663	ADJ	ADJ	ADJ
2991A02		ADJ	ADJ	ADJ
2991A04		ADJ	ADJ	ADJ
2991B01		†	†	†
2991B02		†	†	†
2992A01	Kit D-180664	ADJ	ADJ	ADJ
2993A01	Kit D-180665	ADJ	ADJ	ADJ

\* Refer to Parts 5 and 6 for information on kits and Adjuncts, respectively.

† These Adjuncts are not compatible with wall sets or with a desk set converted to a wall set.



TABLE D  
MULTIBUTTON ELECTRONIC TELEPHONE SET  
CONNECTING APPARATUS

APPARATUS	FUNCTION
85A Connecting Block	Provides an 8-position modular jack and screw terminals for termination of 4-pair station cable. Used with MET wall sets. (Supplied with each MET wall set and wall conversion kit.)
86A Connecting Block	Provides an 8-position modular jack and screw terminals for termination of 4-pair station cable. Used for surface mounted installation. Can be mounted to a standard wall outlet box by using a 275A adapter.
96A Connecting Block	Provides three 8-position modular jacks and 66-type terminals for termination of 25-pair station cable. Installation and mounting is the same as the 66E3-25 connecting block.
258A Adapter	Provides six 8-position modular jacks wired to a 50-contact miniature ribbon plug. Used to adapt a 25-pair connector cable or a 66E-type connecting block.
259A Adapter	Provides an 8-position modular jack wired to the first four contact pairs (1-26, 2-27, 3-28, 4-29) of a 50-position miniature ribbon plug. Used to adapt a 25-pair connector cable or a 66E-type connecting block.
259B Adapter	Provides an 8-position modular jack wired to the second four contact pairs (5-30, 6-31, 7-32, 8-33) of a 50-position miniature ribbon plug. Used to adapt a 25-pair connector cable or a 66E-type connecting block.
275A Adapter	Provides for mounting an 86A connecting block to a standard wall outlet box.
KS-20458L12,L13,L14, L19,L20, and L21 Cover	Encloses a 259-type (L12, L13, L14) or 258A (L19, L20, L21) adapter, telephone set mounting cord plug, and connector end of a 25-pair station cable. Mounts with screws (L12, L19) magnets (L13, L20) or adhesive strips (L14, L21).
D8W-50 Cord	Plug-ended 8-conductor modular mounting cord used on MET sets. Available in the following lengths: 1-foot (short), 7-foot (standard), 14-foot (long), and 25-foot (extra long) used to connect with 8-position modular jacks.