

INSTALLATION AND FIELD MAINTENANCE
TYPE 88AT SPEAKERPHONE ADAPTER

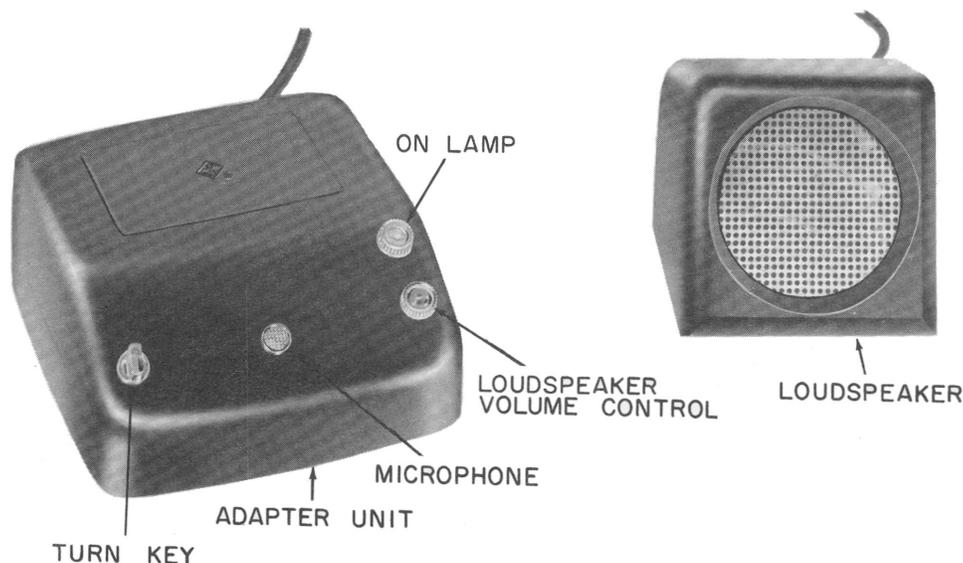


Figure 1. Type 88AT Speakerphone Adapter

1. GENERAL

1.01 The Type 88AT Speakerphone Adapter (See Fig. 1) can be adapted to a standard type telephone to provide loudspeaking service. When coupled with a standard telephone, by operating a key on the adapter unit, the telephone can be used as a speakerphone. This means the handset is left in the cradle during dialing and conversation. The telephone user speaks into the microphone in the adapter unit and listens to the called party through the speaker.

1.02 The Type 88AT Speakerphone Adapter can be adapted to Automatic Electric Company telephones.

2. DESCRIPTION

2.01 The Type 88AT Speakerphone Adapter consists of an adapter unit, loudspeaker, terminal block, and three interconnecting cords.

2.02 The adapter unit houses the controls, ON lamp, microphone, and electrical components. When flashing, the ON lamp indicates that the line has been seized. The position of the turn key determines whether the telephone will be used as a standard telephone or speakerphone. The volume control adjusts the output of the speaker. The

plastic adapter unit housing measures approximately 5-5/8 inches long, 5-3/8 inches wide, and 2 inches high.

2.03 The plastic loudspeaker cabinet houses a 3-inch speaker and its associated printed card assembly. The cabinet measures 3-7/10 inches wide and 3-7/10 inches high.

2.04 The terminal block contains 10 screw-type terminals for interconnecting the conversion set to the telephone.

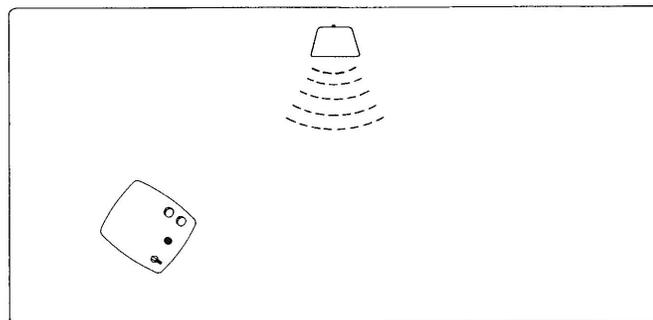


Figure 2. Suggested Arrangement

Table 1. Connecting the Speakerphone Adapter to Various Types of Telephones

Type of Telephone	Connections to Transmission Unit						Connections to Terminal Strip					
	Black Lead to Terminal	Red Lead to Terminal	Green Lead to Terminal	Yellow Lead to Terminal	White Lead to Terminal	Blue Lead to Terminal	Black Lead to Terminal	Red Lead to Terminal	Green Lead to Terminal	Yellow Lead to Terminal	White Lead to Terminal	Blue Lead to Terminal
Type 80, 85 (A, B, or C) Manually Adjusted	10	11	1	7								
Type 80, 85 (A, B, or C) & 182 Self Comp.	10	11	1	8								
Type 86 Manually Adjusted*		8	2				R			A	1B	N
Type 86 Self Compensating*		11	1				R			A	1B	N
Type 87 Manually Adjusted		11	2				L1			L2		
Type 87 Self Compensating		11	1				L1			L2		
Type 860A Self Compensating*	10	11	1	8	7	20						
Type 90M		11	1				L1			L2		
Type 183	15	8	2	16								

* For use with A. E. Co. 10A1 Key Telephone System.

3. INSTALLATION

3.01 Place the adapter unit on the desk adjacent to the telephone. To minimize feedback, place the speaker two (or more) feet away from the adapter unit. It is important that the adapter unit and the loudspeaker are not facing each other. (See Fig. 2). Keep the side of the adapter unit at an angle of not over 90° to the nearest sound path from the loudspeaker. Fasten the terminal block to any convenient surface, such as the back or underneath of the desk, or to a wall.

3.02 A line voltage of 17 volts minimum measured at the conversion set adapter unit is required for operation. Under certain operating conditions, normal telephone line power may not be sufficient for efficient operation of the speakerphone adapter. If this condition exists, it may be necessary to use a separate Type 88 power supply. Power deficiency may exist when the telephone is connected to either a W. E. Co. 555 PBX, or Leich L55 PBX when battery is taken over cable pairs from the central office. As a result, local supervision may not function properly, and the loudspeaker volume may be reduced. Supervision difficulty may also occur when the telephone is connected to a PABX. When used with a 10A1 key system, an auxiliary relay (L-7039-AO) is used in conjunction with the Type 88 power supply.

CAUTION: It may be necessary to restrict the maximum loop resistance to 500 ohms for satisfactory dialing and ring cut-off operation. If this restriction is not possible, the separate Type 88 power supply should be employed.

4. CONNECTIONS

4.01 The adapter unit and loudspeaker unit are furnished interconnected with a 3-conductor cord. No other connections are required between these two units.

4.02 The adapter unit and the terminal block are interconnected with an 8-conductor cord. One end of this cord is factory wired to the adapter unit. The other end of the cord is connected to the terminal block as shown in Fig. 3.

4.03 The terminal block and the telephone are interconnected with a 6-conductor cord. This cord is connected to the telephone at the transmission unit or the terminal strip. See Table 1 for connections between telephones and the terminal block.

4.04 If an auxiliary power supply is to be provided, it should be connected per instructions provided in GSP 490-100-200.

5. INSTRUCTIONS TO USER

5.01 For handset operation (or normal telephone operation) the turn key (Fig. 1) must be in the vertical position. Use the desk set as if it were a standard telephone.

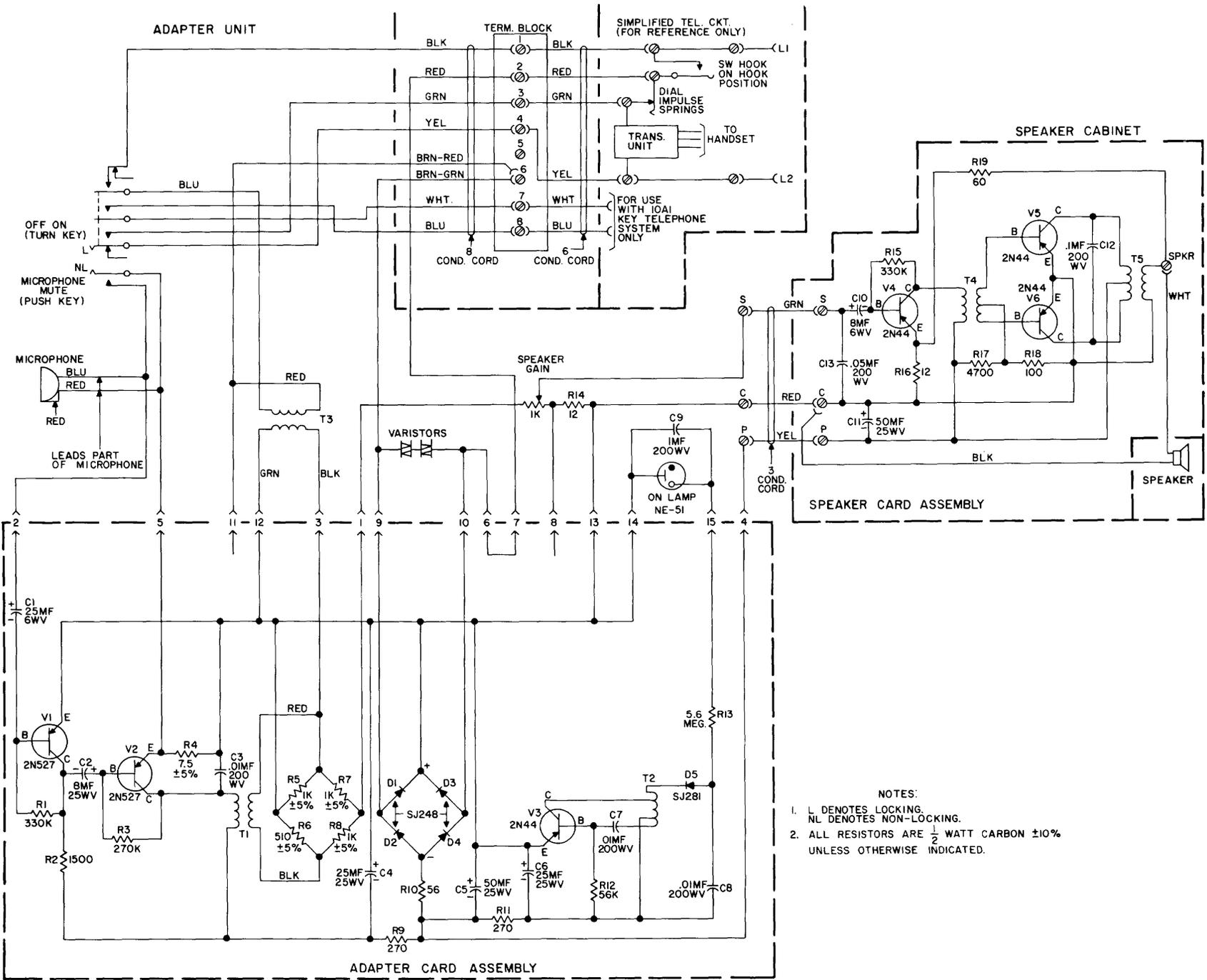
Speakerphone Operation

5.02-a To answer a call using loudspeaker operation:

- (1) Rotate the turn key to the horizontal position. The ON lamp will flash.
- (2) Upon reaching the distant party, adjust the volume of the speaker to the desired level.
- (3) The turn key is rotated to the vertical position, after the call has been concluded, to release the line.

5.02-b To initiate a call using loudspeaker operation:

- (1) Rotate the turn key to the horizontal position to seize the line. The ON lamp will flash indicating the line has been seized.
- (2) When dial tone is heard, dial the desired number and listen for ring-back tone.
- (3) When the distant party answers the call, adjust the volume control so you can hear the distant speaker's voice distinctly. Do not set the volume control higher than necessary; to do so may let enough sound from the loudspeaker enter the microphone and cause a howl which will be heard at both stations. Increasing speaker volume higher than necessary will also cause an undesirable sidetone (echo) in the distant party's receiver.
- (4) As the person speaking moves away from the microphone, the sound in the distant receiver decreases. When the adapter unit is in a quiet room in which sound carries well, the microphone



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Figure 3. Adapter Unit and Speaker Cabinet Circuit

- NOTES:
1. L DENOTES LOCKING.
NL DENOTES NON-LOCKING.
 2. ALL RESISTORS ARE $\frac{1}{2}$ WATT CARBON $\pm 10\%$
UNLESS OTHERWISE INDICATED.

will satisfactorily pick up words spoken several feet away. Under adverse conditions, such as a noisy room, or a poor connection, or on long distance calls, speak within 2 feet of the microphone.

- (5) Rotate the turn key to the vertical position when the call has been concluded to release the line. The ON lamp is extinguished.

5.03 To exclude the distant party from the conversation, depress the turn key. This short-circuits the microphone. This operation is possible only when the instrument is being used as a speakerphone. In this position the key is nonlocking and must be held down.

5.04 To recall (flash), the operator, alternately rotate the turn key on the adapter unit until the operator answers. To converse privately with the operator, transfer to handset operation, paragraph 5.06. The operator can then be recalled by depressing the switchhook plunger several times.

5.05 The 88AT can be useful during a conference as the microphone will pick up all the voices in a room, unless the room is large and noisy. Leave the adapter unit and telephone in one position, it is not necessary to face the microphone toward each person that speaks.

5.06 If at any time during a conversation it is desired to change from loudspeaking operation to handset operation, lift the handset and rotate the key to the vertical position. The ON lamp will be extinguished, conversation can continue through the handset. If during conversation it is desired to change from handset operation to loudspeaking operation rotate the key to the horizontal position and replace the handset.

6. TROUBLE SHOOTING

6.01 Verify the report of trouble by making test calls using (1) the handset, and (2) the loudspeaking section. If the loudspeaking section operates properly, but the handset does not operate correctly, use standard telephone repair procedure.

6.02 If the trouble is in the 88AT, use the following procedure:

- (1) Visually check the wiring of adapter unit and loudspeaker cabinet.
- (2) Check the adjustment of the turn key springs.

- (3) If the microphone section is functioning properly, but the loudspeaker section is not; the trouble is probably in the loudspeaker card assembly, (WA-1038-A). See Fig. 3. Disconnect the five wires leading to the card assembly and try a replacement card. If the microphone section or both the microphone and loudspeaker sections do not operate; the trouble is probably in the adapter unit card assembly (WA-1037-A). See Fig. 3. The installer shall inform the customer at the time of installation of the proper method for operating the Type 88AT Speakerphone Adapter.

NOTE: The customer's telephone will operate as a regular telephone with either the adapter unit or loudspeaker card removed.

7. CIRCUIT PRINCIPLE

7.01 When the handset is being used, the telephone circuit is similar to that of a standard telephone.

7.02 A block diagram of the loudspeaking operation is shown in Fig. 4. When speaking into the microphone of the adapter unit, the calling party's voice is picked up by the microphone amplifier, fed through the balance network out on the telephone line to the distant party. When the dis-

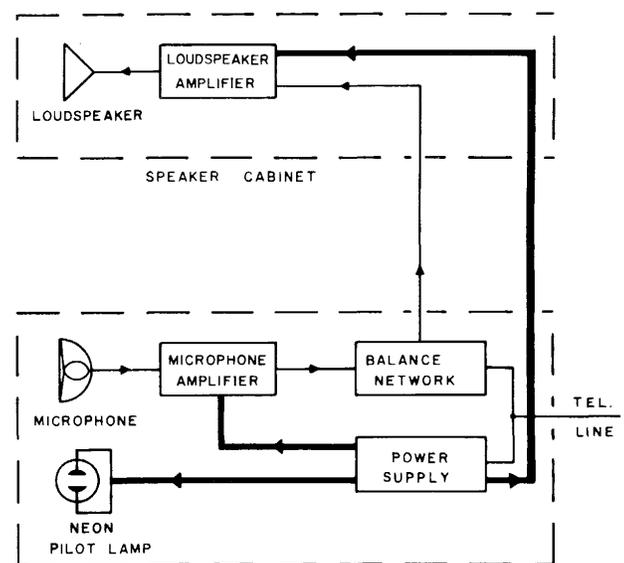


Figure 4. Block Diagram of Speakerphone Adapter

tant party speaks, his voice travels through the telephone line and balancing network, into the loudspeaker amplifier, and is amplified and reproduced by the loudspeaker.

7.03 The amplifiers are entirely powered by the d-c voltage from the central office via the telephone line. Some of the d-c voltage from the telephone line is fed into the adapter unit power supply which distributes the power to the amplifiers and ON lamp. If a Type 88 power supply is

used the amplifiers are powered with the d-c voltage from the power supply.

7.04 The purpose of the balance network is to couple the microphone amplifier and loudspeaker amplifier to the telephone line, and to keep the coupling between the two amplifiers at a minimum. Since there is acoustical coupling between loudspeaker and microphone, any electrical coupling between the amplifiers will increase the tendency for acoustical feedback (howl). The balance obtainable is dependent upon line impedance and will vary with different line conditions.