

## TELEPHONE APPARATUS FOR IMPAIRED HEARING SELECTION

### 1. GENERAL

**1.01** This section covers selection of apparatus to amplify incoming speech. It also covers selection of gongs which change the frequencies or tones of the ringing signal for those with impaired hearing.

**1.02** This section is reissued to include the G6AR hand set and eliminate the 52A and 53A gongs.

**1.03** A hearing impairment usually progresses so slowly that the loss is not apparent even to the individual involved until a loss of 20 to 25 per cent (15 to 20 db) has occurred. In greater losses there is reduced possibility for an audiometric measurement of the impairment, even for losses exceeding 50 to 60 per cent (40 to 50 db). This is due to:

- The cost involved.
- Natural reluctance for thorough checkups.
- Lack of ready facilities to obtain a detailed analysis of the hearing loss.

**1.04** Fortunately, regular telephone equipment is adequate until losses have progressed to this range of impairment. Special telephone equipment is usually not requested until the loss has progressed to a point where there is difficulty in understanding conversational levels at a distance of about 3 feet.

**1.05** Since the person with impaired hearing may not be the best judge of the nature or degree of his impairment, it is helpful to supplement a direct interview with observations of individuals closely associated with him. This is particularly true in regard to noticed difficulty in his ability to understand adequately over regular telephone equipment or his ability to hear the ringing signals normally furnished.

**1.06** In cases where special telephone equipment is needed, two general types of problems are involved:

- Inability to hear received speech.
- Inability to hear ringing signal.

**1.07** There are no formalized rules in determining the most appropriate telephone equipment for customers having impaired hearing. However, there are guides that suggest available apparatus that can be utilized. There is no available equipment for certain types of deafness.

**1.08** Experience has shown that people who have difficulty in hearing can be classified into five groups as compared to normal. Table A describes impairment characteristics and telephone apparatus recommended for speech amplification.

**1.09** Recommendations for customers who cannot hear ringing signals are discussed in 3.

**1.10** All installation and equipment changes must be authorized by a service order.

### 2. APPARATUS FOR AMPLIFYING INCOMING SPEECH

#### 532- and 533-Type Telephone Sets

**2.01** These sets are designed for receiver amplification. For further information, see section covering these sets.

#### G6AR Hand Set

**2.02** This handset is designed for receiver amplification. The G6AR hand set can be installed on any 500-type telephone set. For further information, see section covering handsets.

**TABLE A**  
**RECOMMENDED APPARATUS FOR HEARING IMPAIRMENTS**

Group Number	Impairment Characterized by:	Recommended Apparatus
1	No noticeable difficulty in hearing. Considered normal.	Regular apparatus.
2	Some difficulty in understanding speakers in public places such as church or theater. Unable to hear well in group conversations.	
3	Difficulty in understanding speech from a distance of 2 to 3 feet. Needs incoming speech amplifier on telephone. May be using hearing aid.	A 532- or 533-type telephone set or a G6AR hand set. A bone conduction receiver used with these sets may be helpful in some cases. See section on KS-14720, List 2 headset (bone conduction receiver).
4	Extreme difficulty in understanding conversation even with hearing aid.	A 106A loudspeaker set with a modified 500C/D telephone set. A bone conduction receiver may be used with this arrangement.
5	Unable to understand speech under any condition.	None available.

#### 106A Loudspeaker with 500-Type Telephone Set

**2.03** This arrangement is used when customer has extreme difficulty in hearing. The loudspeaker set with speaker disconnected acts as an amplifier for incoming speech.

**2.04** The loudspeaker set is equipped with a volume control which can be set to meet individual needs. Locate the loudspeaker set near its associated telephone set so the volume control is within easy reach of the telephone user.

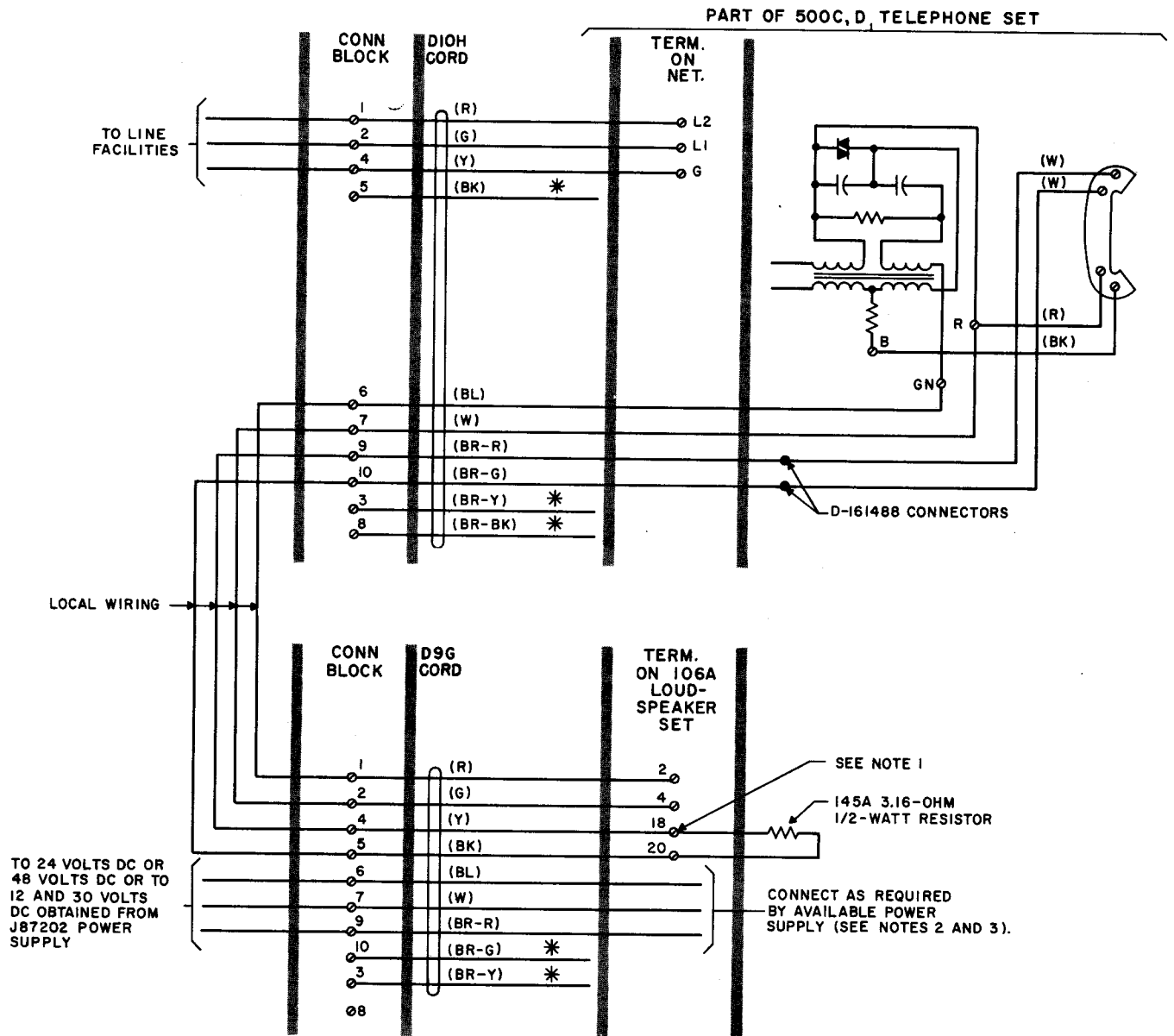
**2.05** The ON-OFF switch must be disabled so the amplifier is on at all times (Fig. 1).

**2.06** Modify the telephone set as follows:

- (1) Remove the varistor from across the receiver in the handset.
- (2) Remove the 3-conductor mounting cord and replace with D10H mounting cord.
- (3) Remove (W) handset lead from GN terminal of network and connect to (BR-R)

mounting cord conductor. Use D-161488 connector.

- (4) Remove (W) handset lead from R terminal of network and connect to (BR-G) mounting cord conductor. Use D-161488 connector. (Tape connectors separately and store out of way of moving parts.)
- (5) Connect (R) mounting cord conductor to L2 of network.
- (6) Connect (G) mounting cord conductor to L1 of network.
- (7) Connect (Y) mounting cord conductor to G of network.
- (8) Connect (BL) mounting cord conductor to GN of network.
- (9) Connect (W) mounting cord conductor to R of network.
- (10) Connect ringer according to type of service required. See section on connections of 500C, D, and 501C, D telephone sets.



- Note 1:** Remove strap between terminals 18 and 19 to disable speaker.
  - Note 2:** Connect negative (-) side of battery to terminal 10 to disable ON-OFF switch.
  - Note 3:** Connect power supply as shown in section covering 106A and 106B loudspeaker sets.
- \* Insulate and store spare conductors.

**Fig. 1 – Connection Diagram**

**2.07** Modify loudspeaker as follows:

- (1) Remove strap between terminals 18 and 19 to disable speaker.
- (2) Connect a 145A 3.16-ohm 1/2-watt resistor between terminals 18 and 20.
- (3) Install D9G cord (Fig. 1).

**2.08** After completing installation, adjust chassis gain control on loudspeaker set as follows:

- (1) Use input signal comparable to normal telephone conversation.
- (2) With cover removed, turn chassis gain control completely counterclockwise to obtain minimum gain. Use KS-6854 screwdriver or equivalent.
- (3) Turn external volume control completely clockwise.
- (4) Turn chassis gain control clockwise for maximum loudness or up to a point just before crosstalk is heard. Press the receiver cap against the cheek. If the receiver has a tendency to howl under these conditions, turn chassis gain control counterclockwise until howling is eliminated. Some howling may be expected when the receiver is not held against the ear or not otherwise sealed.
- (5) Loudness of signal can now be adjusted by external volume control.

**2.09** Additional information can be found in sections on the 106A and B loudspeaker sets.

**3. REMEDIAL MEASURES FOR CUSTOMERS WHO CANNOT HEAR RINGING SIGNAL**

**3.01** On all repair visits, make certain that:

- (a) Ringing apparatus is in proper adjustment.
- (b) Ringing apparatus is centrally or otherwise favorably located.
- (c) Ringing apparatus is not concealed by drapes.

(d) Desk telephone sets are located on a hard surface so that tone is reflected from the gongs of ringer.

(e) Ringer volume control is set to maximum loudness.

**3.02** If telephone apparatus has B-type ringer, and the customer is still unable to hear the ringer, try one of the following:

- (a) Add a 101A gong attachment using 41-type gong. See the section on maintenance of B-type ringers.
- (b) Use a set equipped with a C4A ringer. A variety of gongs producing different frequencies is available. (See Table B.)

**Note:** Gongs should always be used in pairs as follows:

54A-55A	56A-57A
55A-56A	57A-58A
58A-59A	

**3.03** If customer still is unable to hear bell, provide one of the following:

- Extension telephone or ringer.
- BELL CHIME.
- Loud ringing bell.
- Auxiliary signal. (See section on identification of auxiliary signals.)

**Note:** Advise customer there is an additional charge for the above items.

**TABLE B  
GONGS**

Gong	Nominal Frequency Produced
54A	1280 CPS
55A	1610 CPS
56A	2025 CPS
57A	2555 CPS
58A	3220 CPS
59A	4060 CPS

**Note:** Even numbered gongs mount on movable arm of ringer. Odd numbered gongs mount on fixed gong post.