

TELEPHONE APPARATUS FOR IMPAIRED HEARING

SELECTION

1.00 GENERAL

1.01 A hearing impairment usually progresses so slowly that the loss is generally 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, the lack of ready facilities for obtaining a detailed analysis of the nature of the loss, the cost involved, and the natural reluctance for thorough checkups reduce the possibility that audiometric measurement of the impairment will be available, even for losses exceeding 50 to 60 per cent (40 to 50 db).

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

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

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

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

1.05 There are no formalized rules that can be followed in determining the most appropriate telephone equipment for customers having impaired hearing. However, there are some guides which will suggest types of available apparatus that can be utilized. It should be recognized that there is no available equipment for certain types of deafness. Experience has shown that people who have difficulty in hearing can be classified into five groups as compared to normal.

1.06 Table A describes hearing characteristics and telephone apparatus recommended for improving ability to hear speech.

1.07 Recommendations for customers who cannot hear ringing signals are discussed in 4.00.

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

2.00 532- AND 533-TYPE TELEPHONE SETS

Identification, installation, maintenance, and connections for the 532- and 533-type telephone sets are covered in other C Sections.

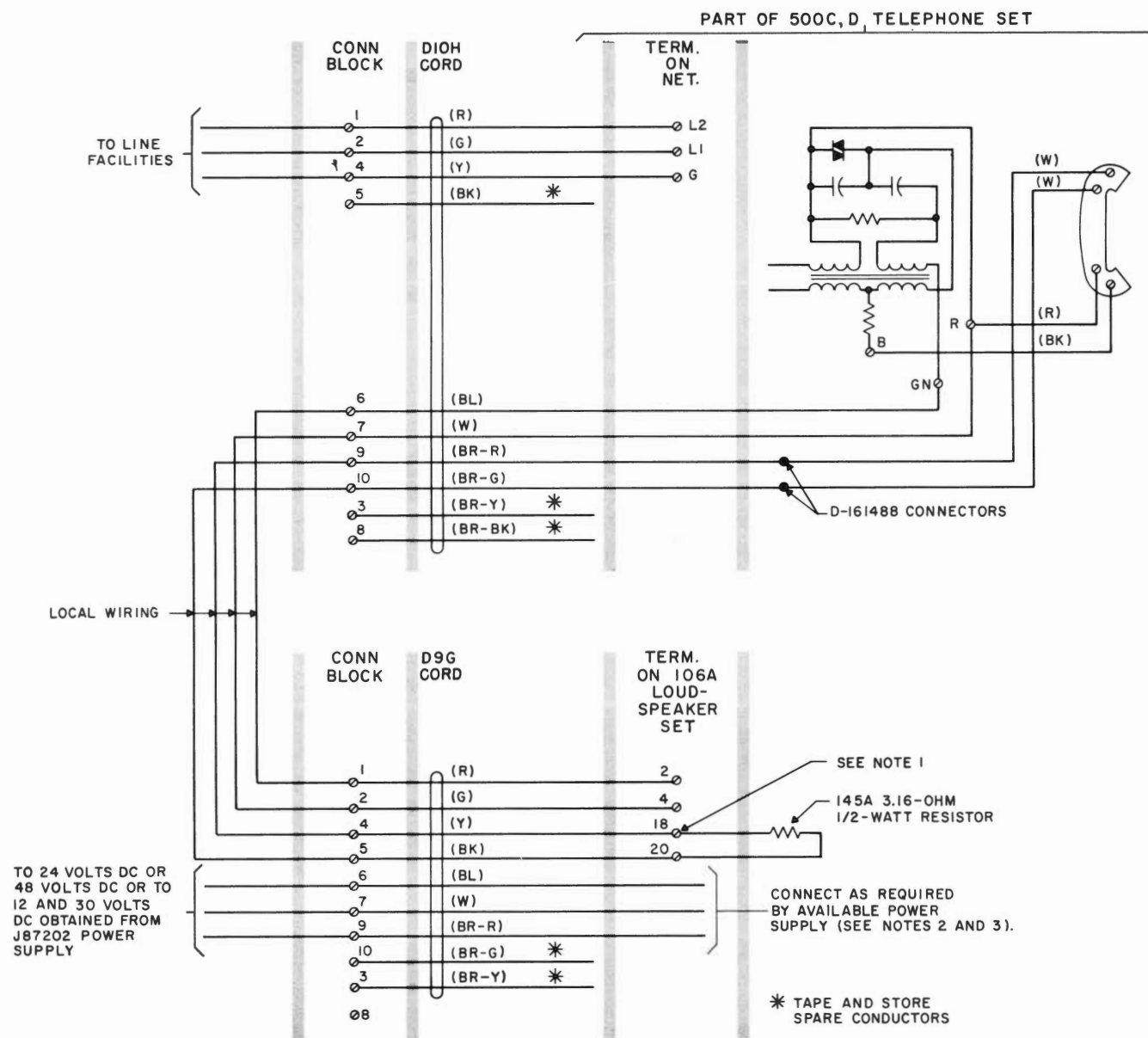


Fig. 1 — Connection Diagram

TABLE A

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. A bone conduction receiver used with these sets may be helpful in some cases. See C Section entitled 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.

3.00 106A LOUDSPEAKER SET WITH 500C/D TELEPHONE SET

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

3.02 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 will be within easy reach of the telephone user.

3.03 The on-off switch must be disabled so the amplifier is on at all times (see Fig. 1).

3.04 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 another 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.

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9. Connect W mounting-cord conductor to R of network.
10. Connect ringer as required by type of service. See C Section entitled Telephone Sets—500C, D and 501C, D, Common Battery—Connections.

3.05 Modify loudspeaker set 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 (see Fig. 1).

3.06 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 sealed otherwise.
5. Loudness of signal can now be adjusted by external volume control as desired.

3.07 Additional information can be found in C Section entitled Loudspeaker Sets, 106A and B, Identification, Installation, Connections, and Maintenance.

4.00 REMEDIAL MEASURES FOR CUSTOMERS WHO CANNOT HEAR RINGING SIGNAL

4.01 On all repair visits, make certain that:

- Ringing apparatus is in proper adjustment.
- Ringing apparatus is centrally or otherwise favorably located.
- Ringing apparatus is not concealed by drapes.
- Desk-type telephone sets are sitting on a hard surface so that tone from the gongs of the ringer is reflected.
- Ringer volume control is set to maximum loudness.

4.02 If telephone apparatus has B-type ringer and the customer is still unable to hear the ringer, then:

- Try adding 101A gong attachment using 41-type gongs. (See the C Section entitled Ringers, B Type, Maintenance.)
- Try using set employing C-type ringer with 55A, 56A, or 57A gong. (See the C Section entitled Ringers, C Type, Maintenance.)

4.03 If customer still is unable to hear bell:

- Provide extension telephone or ringer.
- Provide loud-ringing bell (592-type subscriber set).
- Provide auxiliary signal. (See the C Section entitled Auxiliary Signals, Identification.)