MODEL 185889
10/20 HANDSFREE PCB

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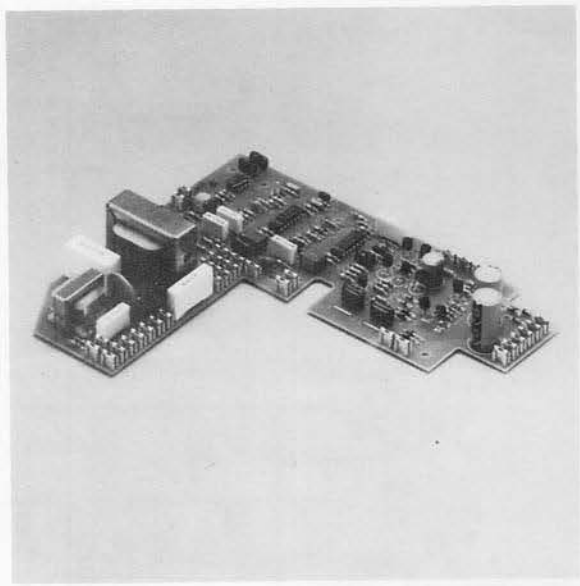

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Figure 1: Model 185889 10/20 Handsfree PCB

1. INTRODUCTION

1.01 This section covers the Model 185889 10/20 handsfree PCB (Printed Circuit Board). (See Figure 1.) A general description as well as information on removal, disassembly, replacement parts, and installation is included.

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

1.03 For information concerning telephones that the 10/20 handsfree PCB is used in, refer to the appropriate section in Volume 1 of the ITT Telephone Apparatus Practices Manual.

2. GENERAL DESCRIPTION

2.01 The Model 185889 PCB is a handsfree circuit designed for use in ITT multibutton handsfree telephones. The handsfree components and network components are consolidated onto the PCB. (See Figure 2.)

2.02 The PCB provides the necessary components for placing or answering calls during handsfree operation. The circuit and associated components form a two-way talk path, with volume control and privacy on transmission.

2.03 The PCB also provides the components necessary to connect and to match the impedance of the telephone transmitter and receiver to the telephone circuit.

2.04 The 10/20 handsfree circuit is a printed circuit assembly. (See Figure 3.) It is designed for field replacement; it is mounted to the telephone base. The two-position terminals on the PCB are used for connection to the telephone.

2.05 The 10/20 handsfree PCB is identified by a code number etched on the PCB. Refer to ordering information in Table A for an explanation of the code number. The available styles of the PCB are described in the following paragraphs.

MODEL 185889-101

2.06 The Model 185889-101 PCB provides the components to operate in handsfree telephones equipped with a rotary dial.

MODEL 185889-102

2.07 The Model 185889-102 PCB provides the components to operate in handsfree telephones equipped with a pushbutton dial.

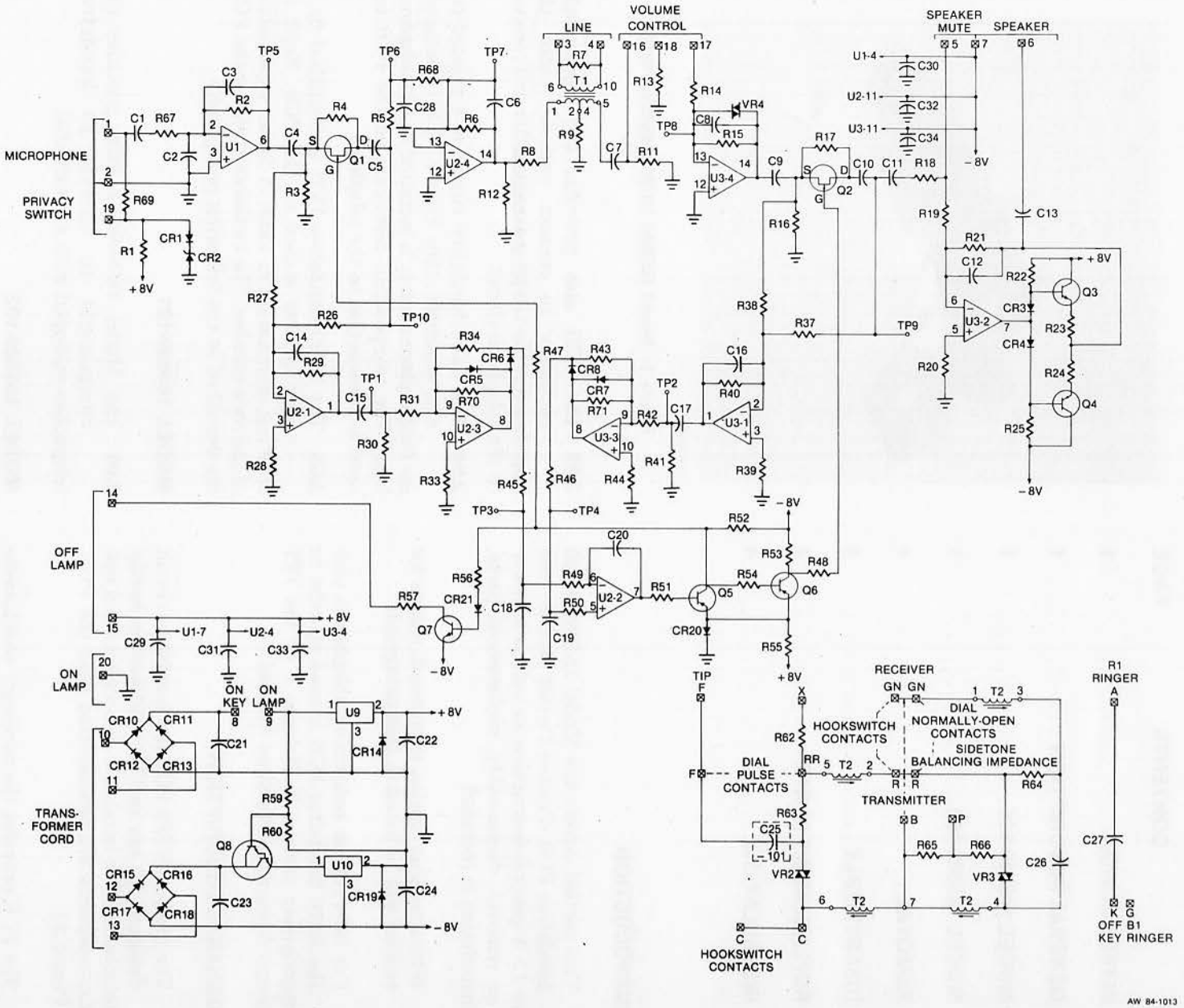

Figure 2: Model 185889 10/20 Handsfree PCB, Schematic

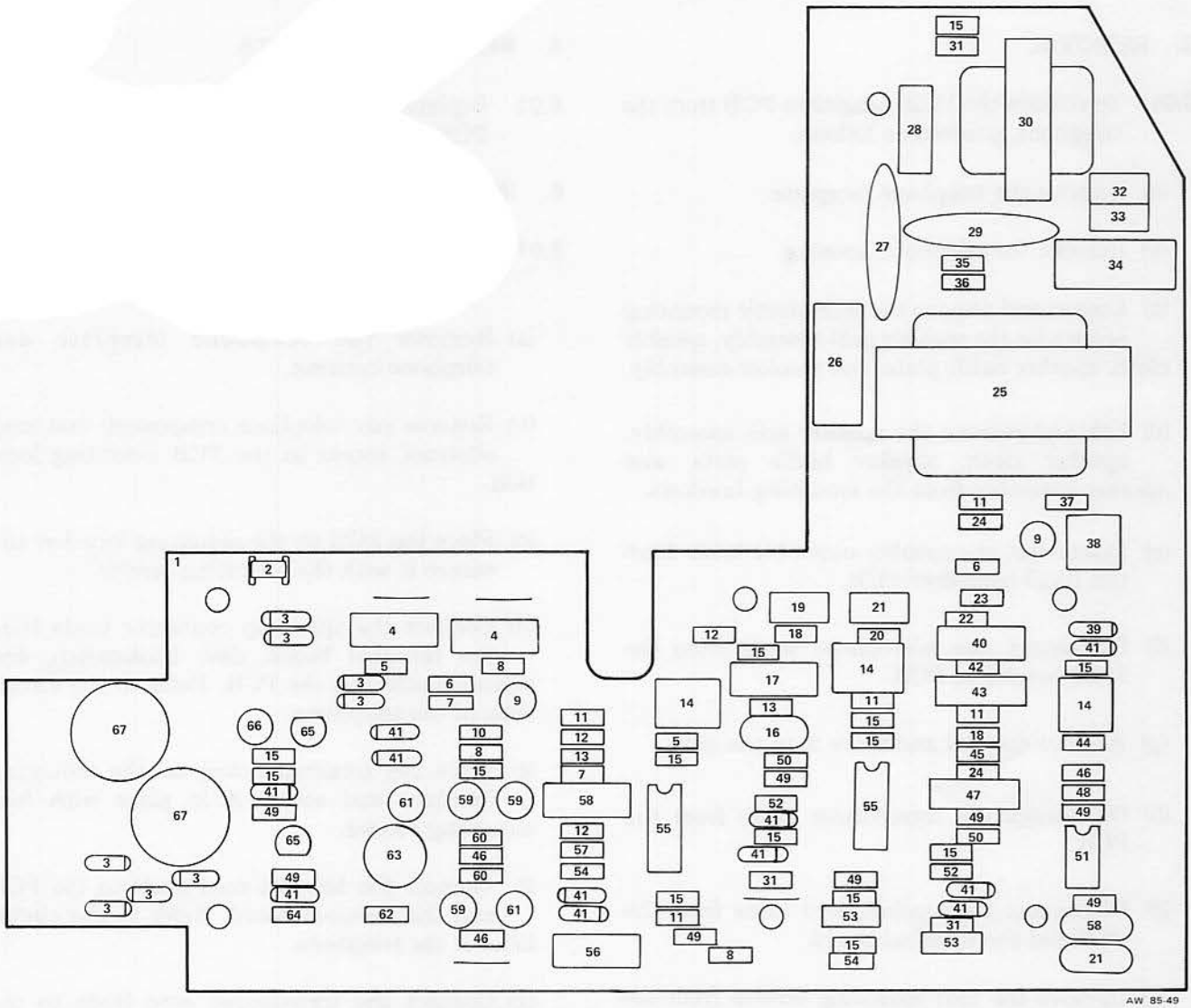

Figure 3: Model 185889 10/20 Handsfree PCB, Component Locations

TABLE A

ORDERING INFORMATION

CODE NUMBERS			
PCB CODE NUMBERS ARE FORMED IN TWO STEPS AS FOLLOWS:			
(1) PCB Model Number (See Part 1) — 185889 (2) PCB Style (See Part 2) — 101			
PART 1 PCB MODEL NUMBER		**PART 2 PCB STYLE**	
CODE	**DESCRIPTION**	**CODE**	**DESCRIPTION**
185889	Model 185889 10/20 Handsfree PCB	101	For Rotary Dial Telephones
		102	For Pushbutton Dial Telephones

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3. REMOVAL

3.01 To remove the 10/20 handsfree PCB from the telephone, proceed as follows:

(a) Remove the telephone faceplate.

(b) Remove the telephone housing.

(c) Loosen and remove the four plastic mounting screws for the speaker grill assembly, speaker cloth, speaker baffle plate, and speaker assembly.

(d) Lift and remove the speaker grill assembly, speaker cloth, speaker baffle plate, and speaker assembly from the mounting brackets.

(e) Disconnect the speaker assembly leads from the 10/20 handsfree PCB.

(f) Disconnect the microphone leads from the 10/20 handsfree PCB.

(g) Remove the dial and move it to one side.

(h) Disconnect the transformer leads from the PCB.

(j) Disconnect the handset cord leads from the PCB and the terminal board.

(k) Remove the four mounting screws from the terminal board.

(m) Move the terminal board to one side to allow access to the PCB.

(n) Disconnect the remaining spade-tip leads that are connected to the PCB.

(p) Remove the PCB mounting screws and lift the PCB from the telephone base.

4. DISASSEMBLY

4.01 Disassembly of the 10/20 handsfree PCB is not recommended since it would require removal of components and terminals. For maintenance purposes, it is suggested that a questionable unit be substituted with a known good unit.

5. REPLACEMENT PARTS

5.01 Replacement parts for the 10/20 handsfree PCB are listed in Table B.

6. INSTALLATION

6.01 To install the 10/20 handsfree PCB inside the telephone, proceed as follows:

(a) Remove the telephone faceplate and telephone housing.

(b) Remove any telephone component that may obstruct access to the PCB mounting location.

(c) Place the PCB on the mounting location and secure it with the mounting screws.

(d) Connect the spade-tip connector leads from the terminal board, dial, hookswitch, and volume control to the PCB. Refer to the circuit label of the telephone.

(e) Place the terminal board on the mounting brackets and secure it in place with four mounting screws.

(f) Connect the handset cord leads to the PCB and the terminal board. Refer to the circuit label of the telephone.

(g) Connect the transformer cord leads to the PCB.

(h) Place the dial in the mounting brackets and secure it in place with the mounting screws.

(j) Connect the microphone leads to the PCB. Refer to the circuit label of the telephone.

(k) Connect the speaker assembly leads to the PCB. Refer to the circuit label of the telephone.

(m) Place the speaker assembly, speaker baffle plate, speaker cloth, and speaker grill assembly on the mounting brackets.

(n) Secure them in place with the four plastic mounting screws.

(p) Replace the telephone housing and telephone faceplate.

TABLE B

REPLACEMENT PARTS LIST

INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED	
		Model 185889 10/20 Handsfree PCB	**101**	**102**
1	185888-101	Printed Card, Drilled	1	1
2	187948-101	Terminal, Two-Position	35	35
3	180658-101	Diode, 1N4004, CR10-13, CR15-18	8	8
4	181164-119	Capacitor, 0.22 MFD, C10, C11	2	2
5	181789-153	Resistor, 39 K, R18, R20	2	2
6	181789-169	Resistor, 1 M, R47, R48	2	2
7	181789-164	Resistor, 330 K, R40, R54	2	2
8	181789-158	Resistor, 100 K, R17, R51, R53	3	3
9	181469-101	Transistor, 2N4302, Q1, Q2	2	2
10	181789-149	Resistor, 18 K, R56	1	1
11	181789-134	Resistor, 1 K, R3, R12, R16, R30, R41	5	5
12	181789-145	Resistor, 8.2 K, R13, R19, R37	3	3
13	181789-152	Resistor, 33 K, R15, R38	2	2
14	183588-348	Capacitor, 1 MFD, C1, C9, C15	3	3
15	181789-146	Resistor, 10 K, R14, R28, R31, R34, R39, R42, R43, R49, R50, R52, R59, R60, R62, R69	14	14
16	095655-101	Varistor, VR4	1	1
17	182075-109	Capacitor, 0.0047 MFD, C8	1	1
18	181789-128	Resistor, 390 Ohm, R8, R11	2	2
19	181668-102	Capacitor, 2.2 MFD, C7	1	1
20	181789-167	Resistor, 560 K, R29	1	1
21	181665-106	Capacitor, 300 PFD, C3, C14	2	2
22	181789-147	Resistor, 12 K, R26	1	1
23	181789-161	Resistor, 180 K, R27	1	1
24	181789-160	Resistor, 150 K, R4, R6	2	2
25	185334-101	Transformer, Hybrid, T1	1	1
26	181164-110	Capacitor, 0.47 MFD, C27	1	1
27	095974-102	Varistor, VR2	1	1
28	181164-112	Capacitor, 0.12 MFD, C25	1	–
29	095974-101	Varistor, VR3	1	1
30	088710-104	Coil, Induction, T2	1	1
31	181789-125	Resistor, 220 Ohm, R45, R46, R63	3	3
32	181789-240	Resistor, 1.6 K, 1/2 W, R66	1	1
33	181789-239	Resistor, 2 K, 1/2 W, R65	1	1
34	181164-115	Capacitor, 1.5 MFD, C26	1	1
35	181789-115	Resistor, 33 Ohm, R64	1	1
36	181789-133	Resistor, 910 Ohm, R7	1	1
37	181789-122	Resistor, 120 Ohm, R9	1	1
38	183588-338	Capacitor, 0.33 MFD, C4	1	1
39	180281-101	Diode, Zener, 1N4734, 5.6 V, CR2	1	1
40	182075-103	Capacitor, 0.047 MFD, C5	1	1
41	180656-102	Diode, 1N4148, CR1, CR3-8, CR14, CR19-21	11	11
42	181789-142	Resistor, 4.7 K, R5	1	1
43	182075-102	Capacitor, 0.022 MFD, C28	1	1
44	181789-132	Resistor, 820 Ohm, R1	1	1
45	181789-141	Resistor, 3.9 K, R68	1	1
46	181789-138	Resistor, 2.2 K, R22, R25, R67	3	3
47	182135-127	Capacitor, 680 PFD, C6	1	1
48	181789-162	Resistor, 220 K, R2	1	1
49	180464-112	Capacitor, 0.1 MFD, C22, C24, C29-34	8	8

TABLE B

REPLACEMENT PARTS LIST (Cont)

INDEX NO	PART NUMBER	DESCRIPTION	QUANTITY USED	
		Model 185889 10/20 Handsfree PCB	**101**	**102**
50	181789-140	Resistor, 3.3 K, R33, R44	2	2
51	183547-102	Op Amp, LF356 (DIP), U1	1	1
52	181789-166	Resistor, 470 K, R70, R71	2	2
53	181664-109	Capacitor, 4.7 MFD, 20 V, C18, C19	2	2
54	181665-104	Capacitor, 100 PFD, C12, C20	2	2
55	185747-101	Quad Op Amp, U2, U3	2	2
56	182075-104	Capacitor, 0.47 MFD, C17	1	1
57	181789-179	Resistor, 820 K, R21	1	1
58	181665-105	Capacitor, 510 PFD, C2, C16	2	2
59	180279-101	Transistor, 2N4143, Q4, Q5, Q6	3	3
60	181789-111	Resistor, 15 Ohm, R23, R24	2	2
61	180147-101	Transistor, 2N4141, Q3, Q7	2	2
62	181789-226	Resistor, 160 Ohm, 1/2 W, R57	1	1
63	181819-103	Capacitor, 47 MFD, 25 V, C13	1	1
64	181789-139	Resistor, 2.7 K, R55	1	1
65	183584-101	Voltage Regulator, U9, U10	2	2
66	181471-101	Transistor, 2N5305, Q8	1	1
67	181819-101	Capacitor, 470 MFD, 25 V, C21, C23	2	2

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NOTES:

1. All resistors are 1/4 W, ±5% unless otherwise specified.
2. All capacitor values are in microfarads (MFD) or picofarads (PFD).