

Service Manual

EASA-PHONE®

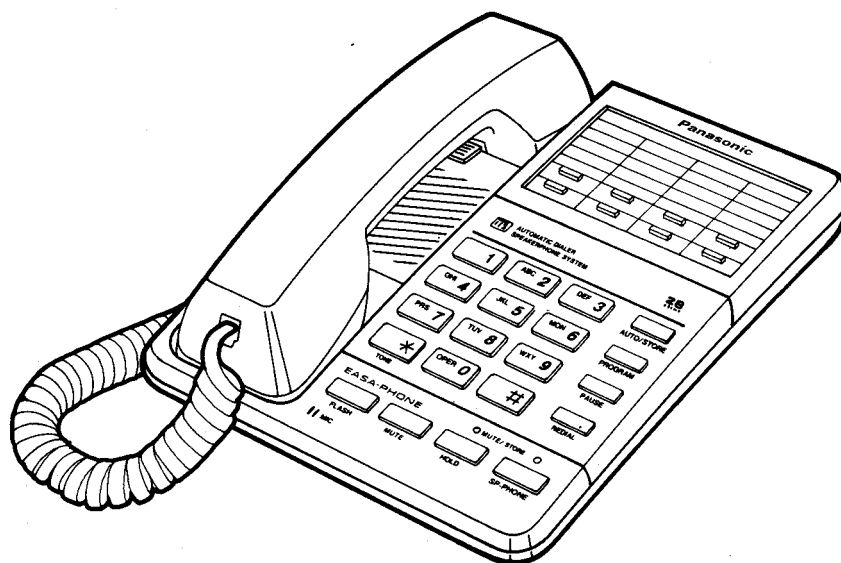


Integrated
Telephone System

and Technical Guide

Telephone Equipment

KX-T2315



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REPLACEMENT PARTS LIST\СПИСОК ЗАПАСНЫХ ЧАСТЕЙ

Panasonic

Matsushita Services Company
Division of Matsushita Electric
Corporation of America
50 Meadowland Parkway,
Secaucus, New Jersey 07094

Matsushita Electric
of Canada Limited
5770 Ambler Drive, Mississauga,
Ontario, L4W 2T3

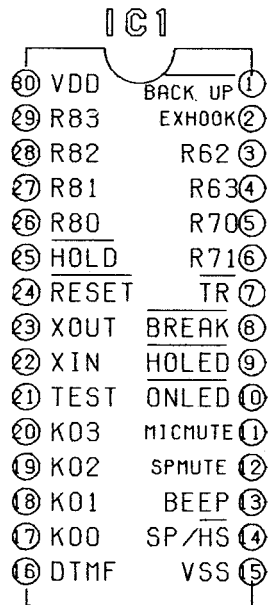
Panasonic Sales Company,
Division of Matsushita Electric
of Puerto Rico, Inc.
San Gabriel Industrial Park
65th Infantry Ave. Km.9.5
Carolina, Puerto Rico 00630

■ SPECIFICATIONS

| | |
|------------------|---|
| Power Source: | Telephone line voltage |
| Memory Capacity: | 28 telephone numbers, up to 16 digits for each station |
| Dial Speed: | Tone (DTMF)/Pulse (10 pps) |
| Redial: | Last dialed telephone number |
| Pause: | 3.5sec |
| Speaker: | Handset; 3 cm (1 ³ / ₁₆ ") PM dynamic type receiver unit, 150Ω |
| Microphone: | Electret condenser microphone |
| Dimensions: | 167 (W) × 70 (H) × 220 (D) mm (6 ⁹ / ₁₆ "×2 ³ / ₄ "×8 ² / ₃₂ ") |
| Weight: | 910 g (2 lb 0.1 oz) |

Design and specifications are subject to change without notice.

CPU DATA



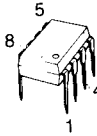
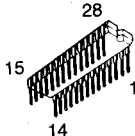
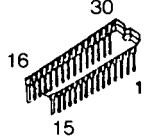
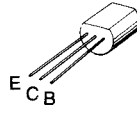
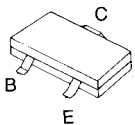
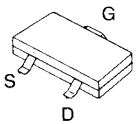
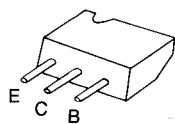
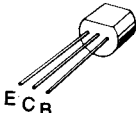
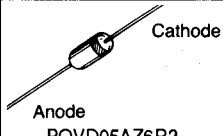
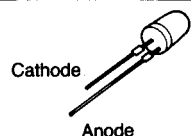
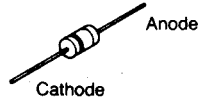
IC1: PQV1451N9965
 Memory: 16 digit 28 station
 Clock Frequency: 480 kHz
 Power Supply Voltage: 2.2~6 V

| Pin No. | Mark | Function | High | Low | |
|---------|-----------------|---------------------------|-------------|---------|--|
| 1 | Back Up | Back Up Output | Set Standby | Active | |
| 2 | Ex-Hook | Extention TEL Hook Inputt | Active | Normal | |
| 3 | R62 | Key Scan Input | Disable | Enable | |
| 4 | R63 | Key Scan Input | | | |
| 5 | R70 | Key Scan Output | | | |
| 6 | R71 | Key Scan Output | Normal | Active | |
| 7 | TR | Line Catch Output | | | |
| 8 | DP | Dial Pulse Output | | | |
| 9 | LED1 | Hold/Memory LED | Make | Break | |
| 10 | LED2 | SP-Phone LED Output | OFF | ON | |
| 11 | Mic-Mute | Mic-Mute Output | Active | Normal | |
| 12 | SP-Mute | SP-Mute Output | | | |
| 13 | Key Tone | Key Tone Signal | | | |
| 14 | SP/HS | SP-Phone/Handset Output | SP-Phone | Handset | |
| 15 | Vss | GND | | | |
| 16 | DTMF | DTMF Signal | Active | Normal | |
| 17 | K00 | Key Scan Input | Disable | Enable | |
| 18 | K01 | Key Scan Input | | | |
| 19 | K02 | Key Scan Input | | | |
| 20 | K03 | Key Scan Input | | Normal | |
| 21 | TEST | ----- | | | |
| 22 | X in | System Clock | | | |
| 23 | X out | System Clock | | | |
| 24 | Reset | Reset Input | Normal | Active | |
| 25 | HOLD | LINE POWER INPUT | Active | | |
| 26 | R80 | Key Scan Output | Disable | Enable | |
| 27 | R81 | Key Scan Output | | | |
| 28 | R82 | Key Scan Output | | | |
| 29 | R83 | Key Scan Output | | | |
| 30 | V _{DD} | + Power Source Terminal | | | |

Circuit Operation:

- Pin ① outputs a low level while the set is working and a High level while the set is not working.
- Pin ② inputs the hold cancellation signal. When the hold switch is cancelled, it inputs a high level.
- Pin ③~⑥, ①⑦~②①, ②⑤~②⑨ input/output port the scanning signal to the Key-#, Auto/Store, Program, Pause, Redial, ON/OFF, Mute, Hold, Flash, Tone/Pulse SW, M1~8 HOOK SW.
- Pin ⑦ outputs the SP phone on and hold control signal.
During SP phone on and hold its outputs is a low level.
- Pin ⑧ is an output to control the Make/Break of the pulse. During Break its output is a low level.
- Pin ⑨ is multi indicator control signal. While the LED lights, the outputs are at the low level.
- Pin ⑩ is ON/OFF LED control signal. The ON/OFF LED lights up while a low level is outputted.
- Pin ⑪ is Mic. Mute control signal. It outputs a high level and the MUTE LED lights up during muting.
- Pin ⑫ is the SP Mute control signal. During muting, its output is a high level.
- Pin ⑬ outputs a square wave to Key Tone signal.
- Pin ⑭ outputs SP/HS Switching signal. (SP-Phone: at high level, HS: at low level)
- Pin ⑯ is the terminal for the D/A change and the DTMF signal outputs.
- Pin ⑳ inputs the reset signal to IC. When reset, inputs low level.
- Pin ㉑ inputs the standby signal to IC. When standby, inputs low level.
- When the signal is sent from pin ④ to pin ㉑ via the diode, the single DTMF tone will be outputted.

TERMINAL GUIDE OF IC'S, TRANSISTORS AND DIODES

| | | | | |
|--|--|--|---|--|
|  <p>PQVIBA8205</p> |  <p>PQVISC79054A</p> |  <p>PQVI451N9965</p> |  <p>2SA1625</p> |  <p>2SD1819A 2SB1218A</p> |
|  <p>2SK1228</p> |  <p>2SD662B DTC144A</p> |  <p>2SC2120</p> |  <p>Anode Cathode PQVD05AZ6R2 PQVD05AZ3.0 PQVDS5688G 1SS131 MA161</p> |  <p>Cathode Anode LN28RPL</p> |
|  <p>Anode Cathode MA4150 MA4300</p> | | | | |

IC BLOCK DIAGRAM

IC2 PQVISC79054A

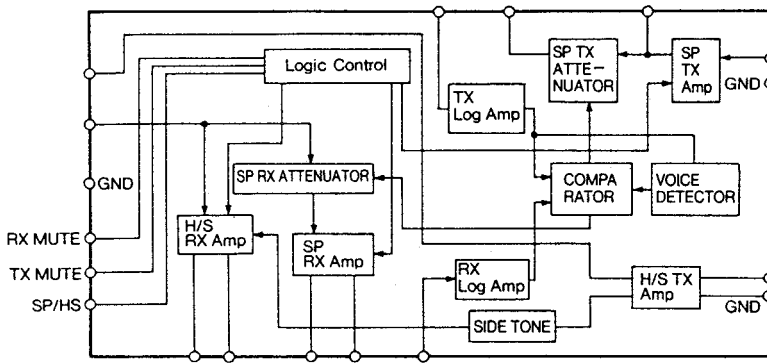


Fig. 5

IC3 PQVIBA8205

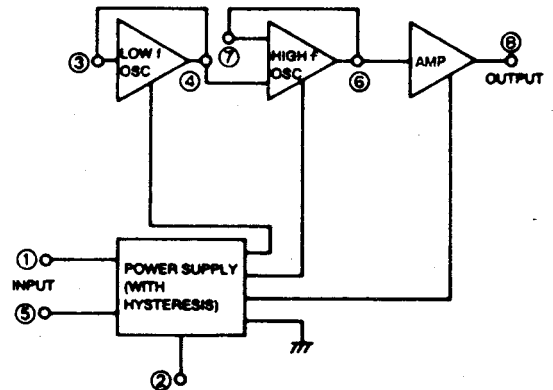


Fig. 6

ADJUSTMENT

Perform the following adjustment after replacing IC2 and VR2.

| |
|---|
| Test Equipment: |
| Loop Simulator RC Oscillator VTVM |
| Preparation: |
| <ol style="list-style-type: none"> Set the unit's controls as follows: <ol style="list-style-type: none"> SP-PHONE SWITCH—"ON" VOLUME CONTROL—"MAX" MUTE SWITCH—"ON" Disconnect microphone. Set the variable resistor of the loop simulator to maximum resistance (fully counterclockwise). Connect the unit to the loop simulator. Make adjustment in a quiet room. After adjustment are made, connect microphone. |
| Reception Level: |
| <ol style="list-style-type: none"> Set the loop simulator selector switch to "RX" Set RC Oscillator to 1 kHz, -40 dBm with a VTVM. Connect the VTVM to Test Points ▼ (-) - ▼ (+). Adjust VR2 for a reading of -13 dBm ± 0.5 dBm on the VTVM. |

Please refer to the Circuit Board and wiring Connection Diagram which is located at the test points (▼).

Schematic Diagram of Loop Simulator

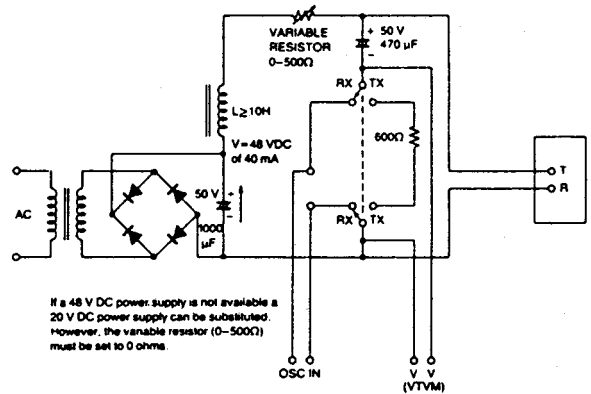
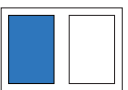
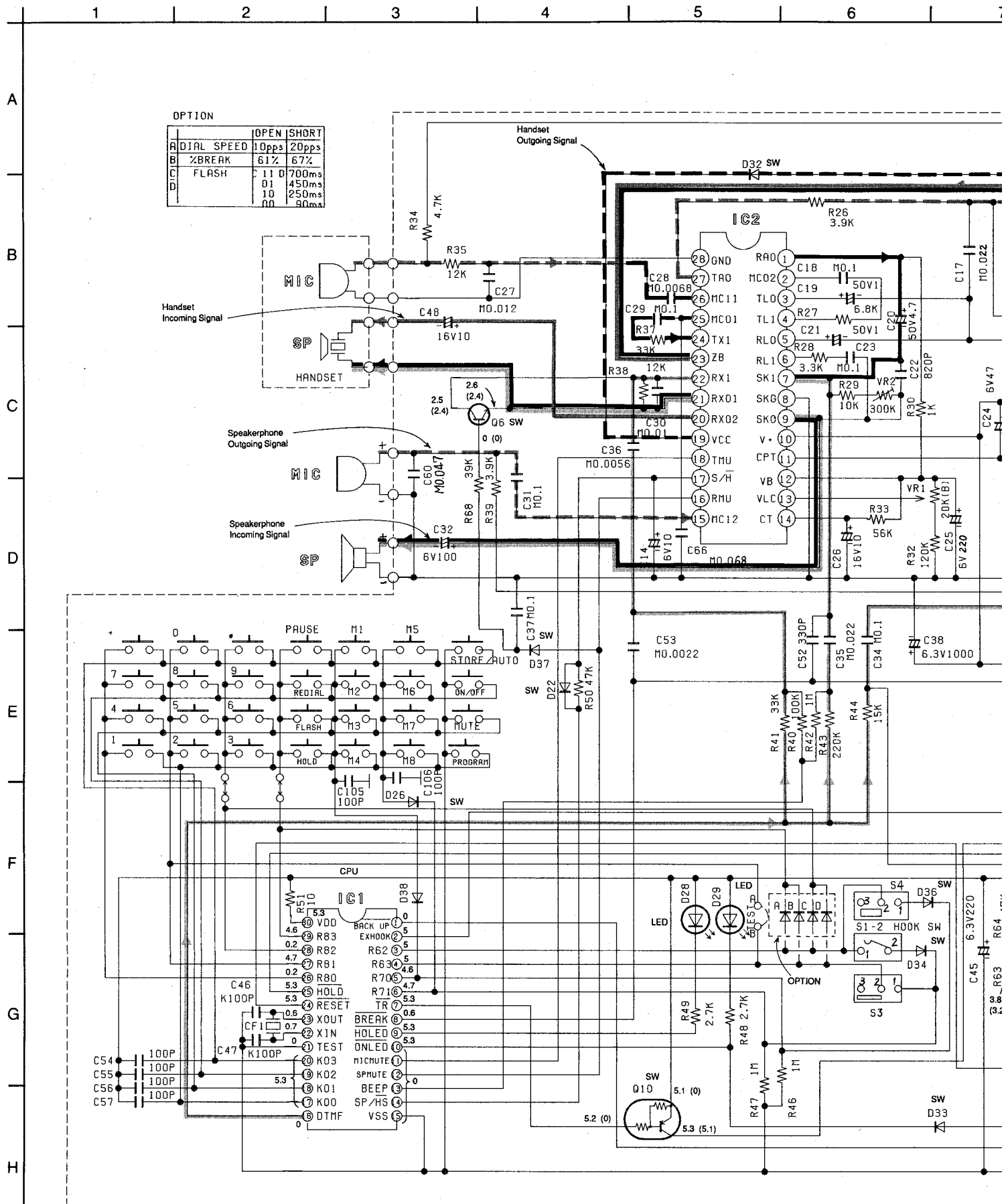
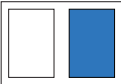
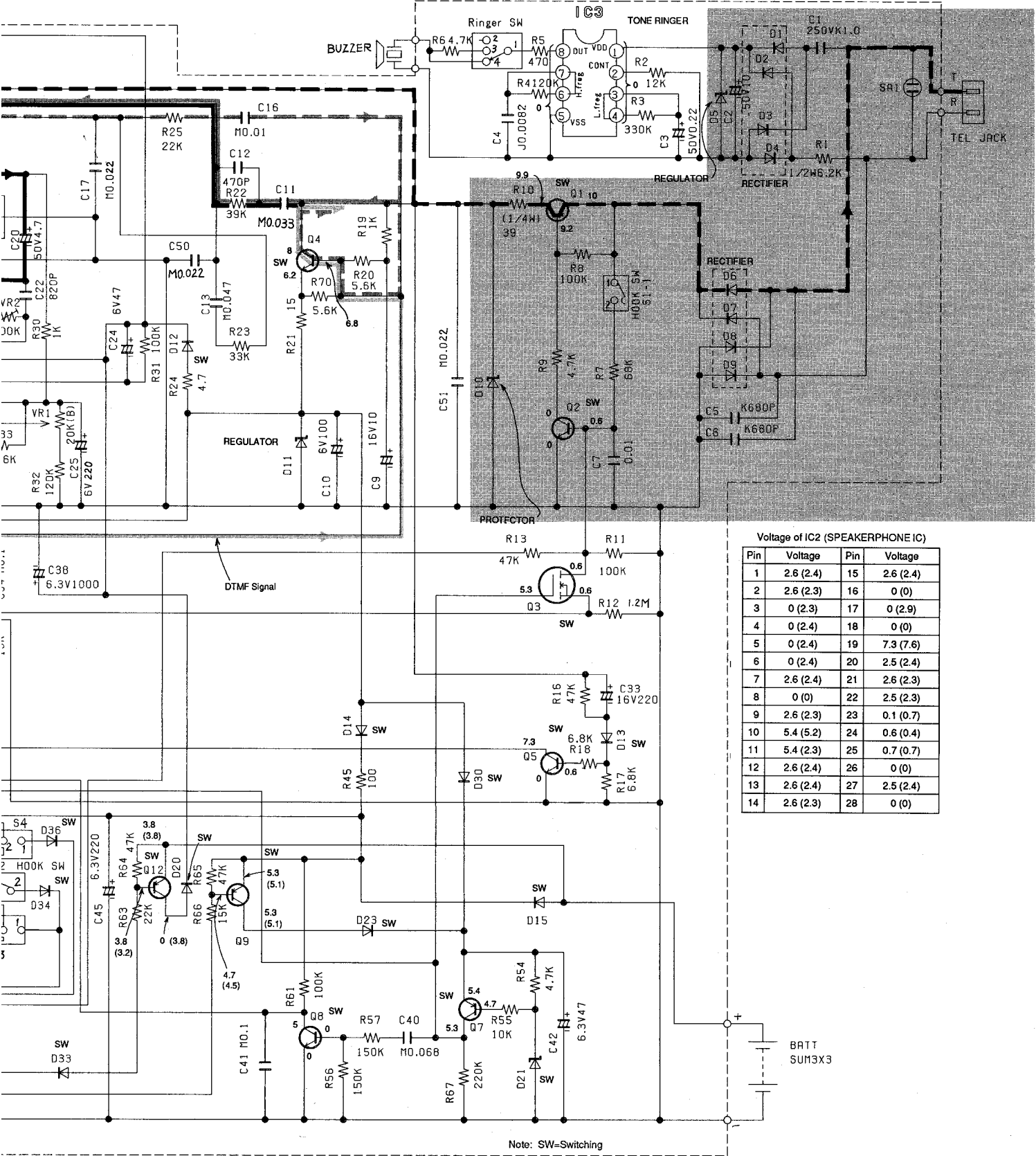


Fig. 7

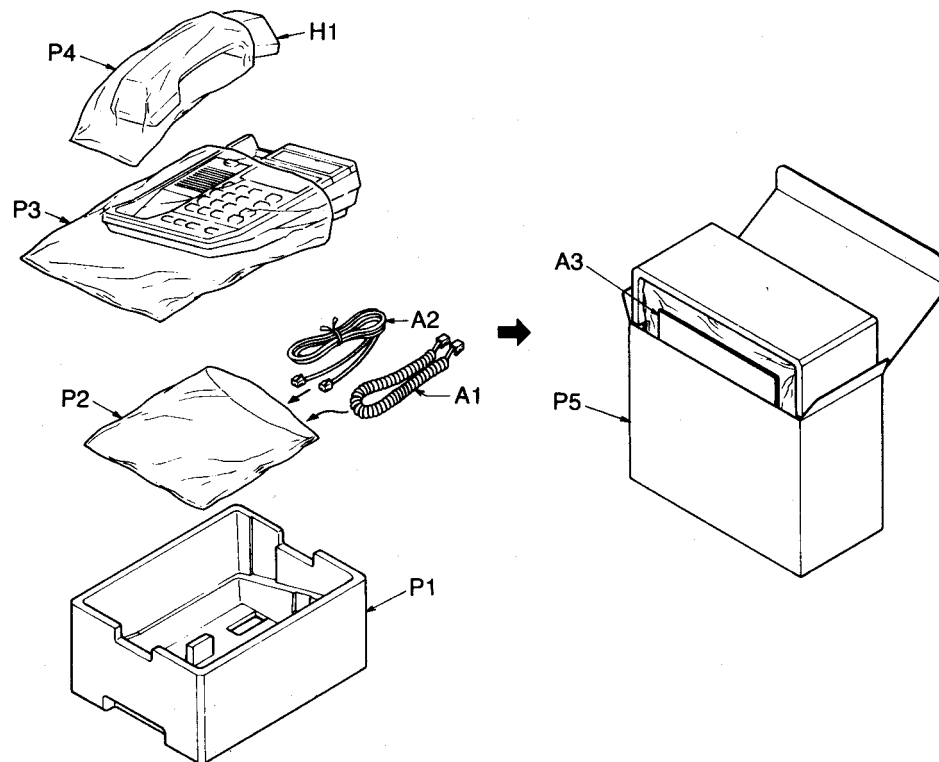
SCHEMATIC DIAGRAM



TIC DIAGRAM





ACCESSORIES & PACKING MATERIALS



CABINET AND ELECTRICAL PARTS LOCATION

ACTUAL SIZE OF SCREWS

| | |
|-----------|---|
| Part No. | |
| XTW3+S12P |  |
| XTW3+S8P |  |

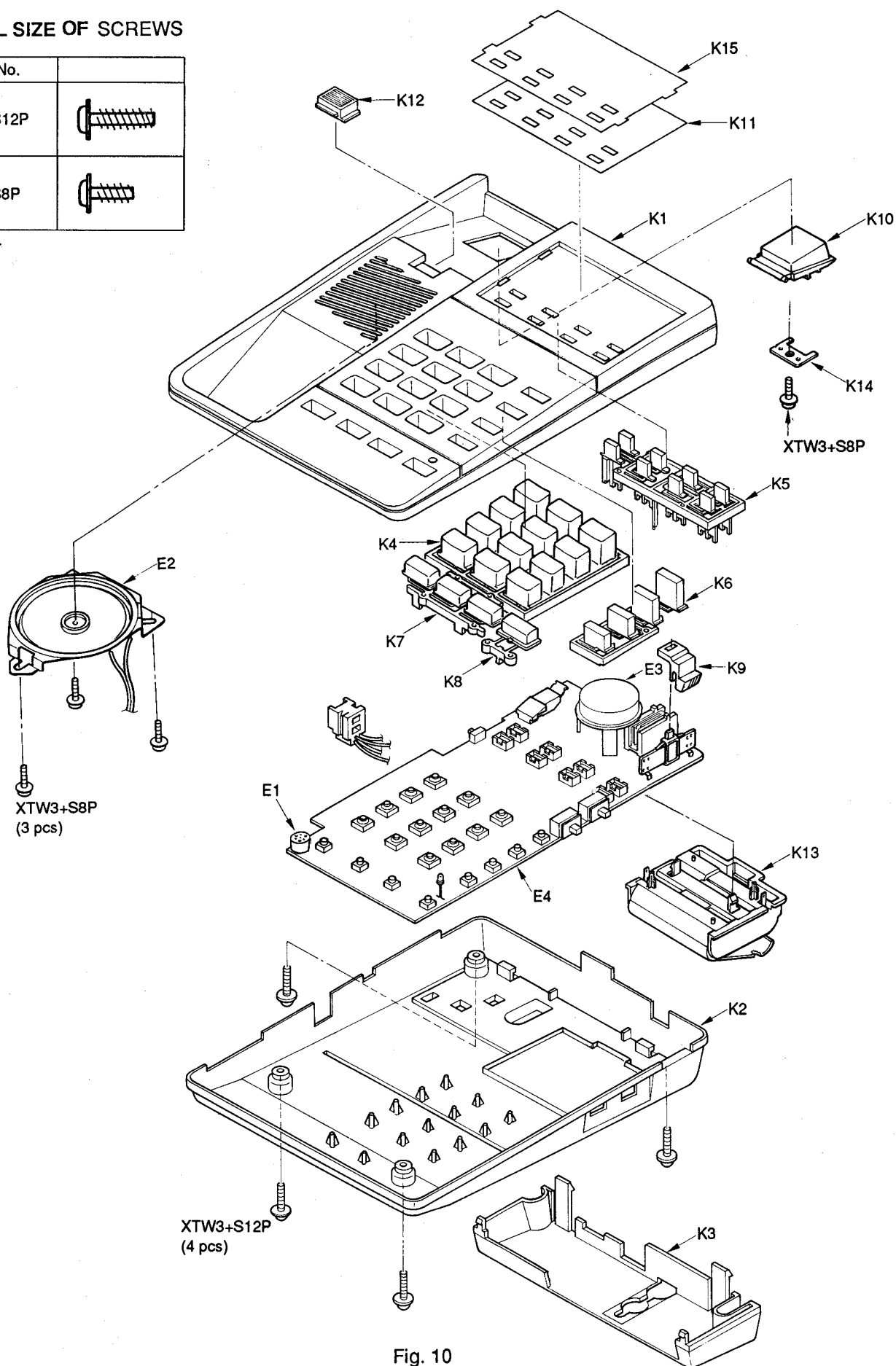


Fig. 10

REPLACEMENT PARTS LIST

Model KX-T2315

Notes:

- Printed circuit board assembly with mark (NLA) is no longer available after production discontinuation of the complete set.
- Important safety notice.
Components identified by the Δ mark special characteristics important for safety. When replacing any of these components, use only manufacture's specified parts.
- The S mark indicates service standard parts and may differ from production parts.

4. RESISTORS & CAPACITORS

Unless otherwise specified.

All resistors are in ohms(Ω) k=1000 Ω , M=1000k Ω

All capacitors are in MICRO FARADS(μ F) P= μ F

*Type & Wattage of Resistor

Type

| | | |
|-------------|-----------------|----------------------|
| ERC:Solid | ERX:Metal Film | PQ4R:Carbon |
| ERD:Carbon | ERG:Metal Oxide | ERS:Fusible Resistor |
| PORD:Carbon | ER0:Metal Film | ERF:Cement Resistor |

Wattage

| | | | | | |
|------------|------------|-----------------|------|------|------|
| 10,16:1/8W | 14,25:1/4W | 12, S1, 50:1/2W | 1:1W | 2:2W | 3:3W |
|------------|------------|-----------------|------|------|------|

*Type & Voltage of Capacitor

Type

| | |
|---------------------|--------------------------------|
| ECFD:Semi-Conductor | ECCD,ECKD,ECBT,PQCBC : Ceramic |
| ECQS:Styrol | ECQE,ECQV,ECQG : Polyester |
| PQCUV:Chip | ECEA,ECSZ : Electrolytic |
| ECQMS:Mica | ECQP : Polypropylene |

Voltage

| ECQ Type | ECQG ECQV Type | ECSZ Type | Others | |
|----------|-------------------|-----------|-----------|-----------|
| 1H:50V | 05:50V | 0F:3.15V | 0J :6.3V | 1V :35V |
| 2A:100V | 1:100V | 1A:10V | 1A :10V | 50,1H:50V |
| 2E:250V | 2:200V | 1V:35V | 1C :16V | 1J :63V |
| 2H:500V | | 0J:6.3V | 1E,25:25V | 2A :100V |

| Ref. No. | Part No. | Part Name & Description | Pcs |
|-------------------|--------------|---|------------|
| SWITCHES | | | |
| S1 | ESE14A211A | SWITCH, HOOK | 1 Δ |
| S2 | POSS2A27Y | SWITCH, RINGER | 1 |
| S3 | POSS3A17Y | SWITCH, DIALING | 1 |
| S4 | PQSS2A16Y | SWITCH, LOCAL CALL ONLY | 1 |
| S5~12 | POSH1A36Z | SWITCH, DIRECT CALL | 8 |
| S13~23, 32 | PQSH1A33Z | SWITCH, DIALING | 12 |
| S24~31 | EVQ12405K | SWITCH, FLASH, HOLD etc. | 8 |
| CABINET PARTS | | | |
| K1 | PQKM186Z | UPPER CABINET | 1 |
| K2 | POYFT2315M | LOWER CABINET ASSEMBLY | 1 |
| K3 | PQYL2315M | STAND ASSEMBLY | 1 |
| K4 | PQBCX155Y | BUTTON, DIALING | 1 |
| K5 | PQBCX156Z | BUTTON, DIRECT CALL | 1 |
| K6 | PQBCX157Z | BUTTON, AUTO, PROG., PAUSE, REDIAL | 1 |
| K7 | PQBCX158Z | BUTTON, FLASH, MUTE, HOLD | 1 |
| K8 | PQBC249Z | BUTTON, SPEAKERPHONE | 1 |
| K9 | PQBD146Z | KNOB, VOLUME | 1 |
| K10 | PQBE33Z | BUTTON, HOOK | 1 |
| K11 | PQHP5080Z | TELEPHONE CARD | 1 |
| K12 | PQKE46Y2 | HANDSET HUNGER | 1 |
| K13 | PQWBT2315M | BATTERY CASE ASSEMBLY | 1 |
| K14 | PQUL142Z | METAL PARTS, HOOK BOTTON | 1 |
| K15 | PQHR5269Z | TRANSPARENT PLATE | 1 |
| ELECTRICAL PARTS | | | |
| E1 | PQJM122Z | MICROPHONE | 1 |
| E2 | PQAS65P06V | SPEAKER | 1 |
| E3 | PQWH2T3110M | BUZZER ASSEMBLY | 1 |
| E4 | PQWPT2315M | PRINTED CIRCUIT BOARD (NLA) | 1 |
| HANDSET PART | | | |
| H1 | PQJX2PS409Z | HANDSET ASSEMBLY (CAN'T BE ASSEMBLED.) | 1 |
| OTHERS | | | |
| CF1 | PQVBB480E2 | CERAMIC FILTER | 1 |
| SA1 | PQVDSAE310F1 | VARISTOR | 1 Δ |
| VR1 | PQVAL204B24A | VARIABLE RESISTOR, 20K Ω | 1 |
| VR2 | EVNDXAA03B35 | VARIABLE RESISTOR, 300K Ω | 1 |
| ACCESSORIES | | | |
| A1 | PQJA59Y | TELEPHONE CORD | S 1 |
| A2 | PQJA193M | HANDSET CORD | 1 |
| A3 | PQOX6122Z | INSTRUCTION BOOK | 1 |
| PACKING MATERIALS | | | |
| P1 | PQPK995Z | GIFT BOX | 1 |
| P2 | PQPN1080Z | CUSHION | 1 |
| P3 | PQPP34Z | PROTECTION COVER (for HANDSET) | 1 |
| P4 | XZB26X40A01 | PROTECTION COVER (for SET) | 1 |

| Ref. No. | Part No. | Part Name & Description | Pcs |
|--|--------------|-------------------------|---------------|
| INTEGRATED CIRCUITS, TRANSISTORS & DIODES | | | |
| IC1 | PQVI451N9962 | IC | 1 |
| IC2 | PQVISC79054A | IC | 1 |
| IC3 | PQVIBA8205 | IC | 1 |
| Q1 | 2SA1625 | TRANSISTOR(SI) | S 1 Δ |
| Q2 | 2SD662B | TRANSISTOR(SI) | S 1 Δ |
| Q3 | 2SK1228 | TRANSISTOR(SI) | 1 |
| Q4 | 2SC2120 | TRANSISTOR(SI) | S 1 |
| Q5, 6, 8 | 2SD1819A | TRANSISTOR(SI) | S 3 |
| Q7, 9, 12 | 2SB1218A | TRANSISTOR(SI) | S 3 |
| Q10 | DTC144A | TRANSISTOR(SI) | S 1 |
| D1~4, 12~15, 20, 22, 23, 26, 30, 33, 34, 36~38 | 1SS131 | DIODE(SI) | S 18 Δ |
| D5 | MA4300 | DIODE(SI) | S 1 Δ |
| D6~9 | PQVDS5688G | DIODE(SI) | S 4 Δ |
| D10 | MA4150 | DIODE(SI) | 1 Δ |
| D11 | PQVD05AZ6R2 | DIODE(SI) | 1 |
| D21 | PQVD05AZ3.0 | DIODE(SI) | 1 |
| D28, 29 | LN28RPL | LED | 2 |
| D32 | MA161 | DIODE(SI) | S 1 |
| JACKS | | | |
| J1 | PQJ1TA11Z | JACK, TELEPHONE | Δ 1 |
| J2 | PQJ1TB2Y | JACK, HANDSET | 1 |

| Ref. No. | Part No. | Value | Ref. No. | Part No. | Value |
|------------|--------------|---------------|----------|--------------|--------|
| RESISTORS | | | | | |
| R1 | ERDS1TJ622 | 6.2K Δ | R36 | Not Used | |
| R2 | ERDS2TJ123 | 12K | R37 | PQ4R10XJ333 | 33K |
| R3 | ERDS2TJ334 | 330K | R38 | PQ4R10XJ123 | 12K |
| R4 | PQ4R10XJ124 | 120K | R39 | PQ4R10XJ392 | 3.9K |
| R5 | PQ4R10XJ471 | 470 | R40 | PQ4R10XJ104 | 100K |
| R6 | PQ4R10XJ472 | 4.7K | R41 | PQ4R10XJ333 | 33K |
| R7 | PQ4R10XJ683 | 68K Δ | R42 | PQ4R10XJ105 | 1M |
| R8 | PQ4R10XJ104 | 100K Δ | R43 | PQ4R10XJ224 | 220K |
| R9 | ERDS2TJ472 | 4.7K Δ | R44 | PQ4R10XJ153 | 15K |
| R10 | ERDS2TJ390 | 39 Δ | R45 | PQ4R10XJ101 | 100 |
| R11 | PQ4R10XJ104 | 100K | R46 | PQ4R10XJ105 | 1M |
| R12 | ERDS2TJ125 | 1.2M | R47 | PQ4R10XJ105 | 1M |
| R13 | PQ4R10XJ473 | 47K | R48 | ERD25TJ272 | 2.7K |
| R14 | Not Used | | R49 | ERDS2TJ272 | 2.7K |
| R15 | Not Used | | R50 | PQ4R10XJ473 | 47K |
| R16 | PQ4R10XJ473 | 47K | R51 | ERDS2TJ100 | 10 |
| R17 | PQ4R10XJ682 | 6.8K | R52 | Not Used | |
| R18 | PQ4R10XJ682 | 6.8K | R53 | Not Used | |
| R19 | PQ4R10XJ102 | 1K | R54 | PQ4R10XJ472 | 4.7K |
| R20 | PQ4R10XJ562 | 5.6K | R55 | PQ4R10XJ103 | 10K |
| R21 | ERDS2TJ150 | 15 | R56 | PQ4R10XJ154 | 150K |
| R22 | PQ4R10XJ393 | 39K | R57 | PQ4R10XJ154 | 150K |
| R23 | PQ4R10XJ333 | 33K | R58 | Not Used | |
| R24 | PQ4R10XJ477 | 4.7 | R59 | Not Used | |
| R25 | PQ4R10XJ223 | 22K | R60 | Not Used | |
| R26 | ERDS2TJ392 | 3.9K | R61 | PQ4R10XJ104 | 100K |
| R27 | PQ4R10XJ682 | 6.8K | R62 | Not Used | |
| R28 | PQ4R10XJ332 | 3.3K | R63 | PQ4R10XJ223 | 22K |
| R29 | PQ4R10XJ103 | 10K | R64 | PQ4R10XJ473 | 47K |
| R30 | PQ4R10XJ102 | 1K | R65 | PQ4R10XJ473 | 47K |
| R31 | PQ4R10XJ104 | 100K | R66 | ERDS2TJ153 | 15K |
| R32 | PQ4R10XJ124 | 120K | R67 | PQ4R10XJ224 | 220K |
| R33 | PQ4R10XJ563 | 56K | R68 | ERD25TJ393 | 39K |
| R34 | PQ4R10XJ472 | 4.7K | R69 | Not Used | |
| R35 | PQ4R10XJ123 | 12K | R70 | PQ4R10XJ562 | 5.6K |
| CAPACITORS | | | | | |
| C1 | ECQE2E105KZ | 1 Δ | C36 | PQCUV1H562KB | 0.0056 |
| C2 | ECEA1HU100 | 10 Δ | C37 | PQCUV1E104ZF | 0.1 |
| C3 | ECEA1HUR22 | 0.22 | C38 | ECEA0JU102 | 1000 |
| C4 | ECQG1H822JZ | 0.0082 | C39 | Not Used | |
| C5 | ECKD2H681KB | 680P Δ | C40 | PQCUV1C683MD | 0.068 |
| C6 | ECKD2H681KB | 680P Δ | C41 | PQCUV1E104ZF | 0.1 |
| C7 | PQCUV1H103KB | 0.01 Δ | C42 | ECEA0JKS470 | 47 |
| C8 | Not Used | | C43 | Not Used | |
| C9 | ECEA1HU100 | 10 | C44 | Not Used | |
| C10 | ECEA0JKS101 | 100 | C45 | ECEA1AU221 | 220 |
| C11 | ECUV1H333JC | 0.033 | C46 | PQCUV1H101JC | 100P |
| C12 | PQCUV1H471JC | 470P | C47 | PQCUV1H101JC | 100P |
| C13 | ECUV1H473MD | 0.047 | C48 | ECEA1HU100 | 10 |
| C14 | ECEA1HU100 | 10 | C49 | Not Used | |
| C15 | Not Used | | C50 | PQCUV1H223KB | 0.022 |
| C16 | PQCUV1H103KB | 0.01 | C51 | PQCUV1H223KB | 0.022 |
| C17 | PQCUV1H223KB | 0.022 | C52 | PQCUV1H331JC | 330P |
| C18 | PQCUV1E104ZF | 0.1 | C53 | PQCUV1H222KB | 0.0022 |
| C19 | ECEA1HU010 | 1 | C54 | PQCUV1H101JC | 100P |
| C20 | ECEA1HU477 | 4.7 | C55 | PQCUV1H101JC | 100P |
| C21 | ECEA1HU010 | 1 | C56 | ECUV1H101JC | 100P |
| C22 | PQCUV1H821JC | 820P | C57 | PQCUV1H101JC | 100P |
| C23 | PQCUV1E104ZF | 0.1 | C58 | Not Used | |
| C24 | ECEA1EU470 | 47 | C59 | Not Used | |
| C25 | ECEA1HU221 | 220 | C60 | PQCUV1E473MD | 0.047 |
| C26 | ECEA1HU100 | 10 | C61 | Not Used | |
| C27 | PQCUV1H123MD | 0.012 | C62 | Not Used | |
| C28 | PQCUV1H682KB | 0.0068 | C63 | Not Used | |
| C29 | PQCUV1E104ZF | 0.1 | C64 | Not Used | |
| C30 | PQCUV1H103KB | 0.01 | C65 | Not Used | |
| C31 | PQCUV1E104ZF | 0.1 | C66 | PQCUV1C683MD | 0.068 |
| C32 | ECEA1AU101 | 100 | | | |
| C33 | ECEA1CU221 | 220 | C105 | PQCUV1H101JC | 100P |
| C34 | ECUV1H104MD | 0.1 | C106 | PQCUV1H101JC | 100P |
| C35 | PQCUV1H223KB | 0.022 | | | |