

Service Manual

Telephone Equipment

Model No. **KX-TG8421BX**
KX-TGA840BX

Digital Cordless Answering System

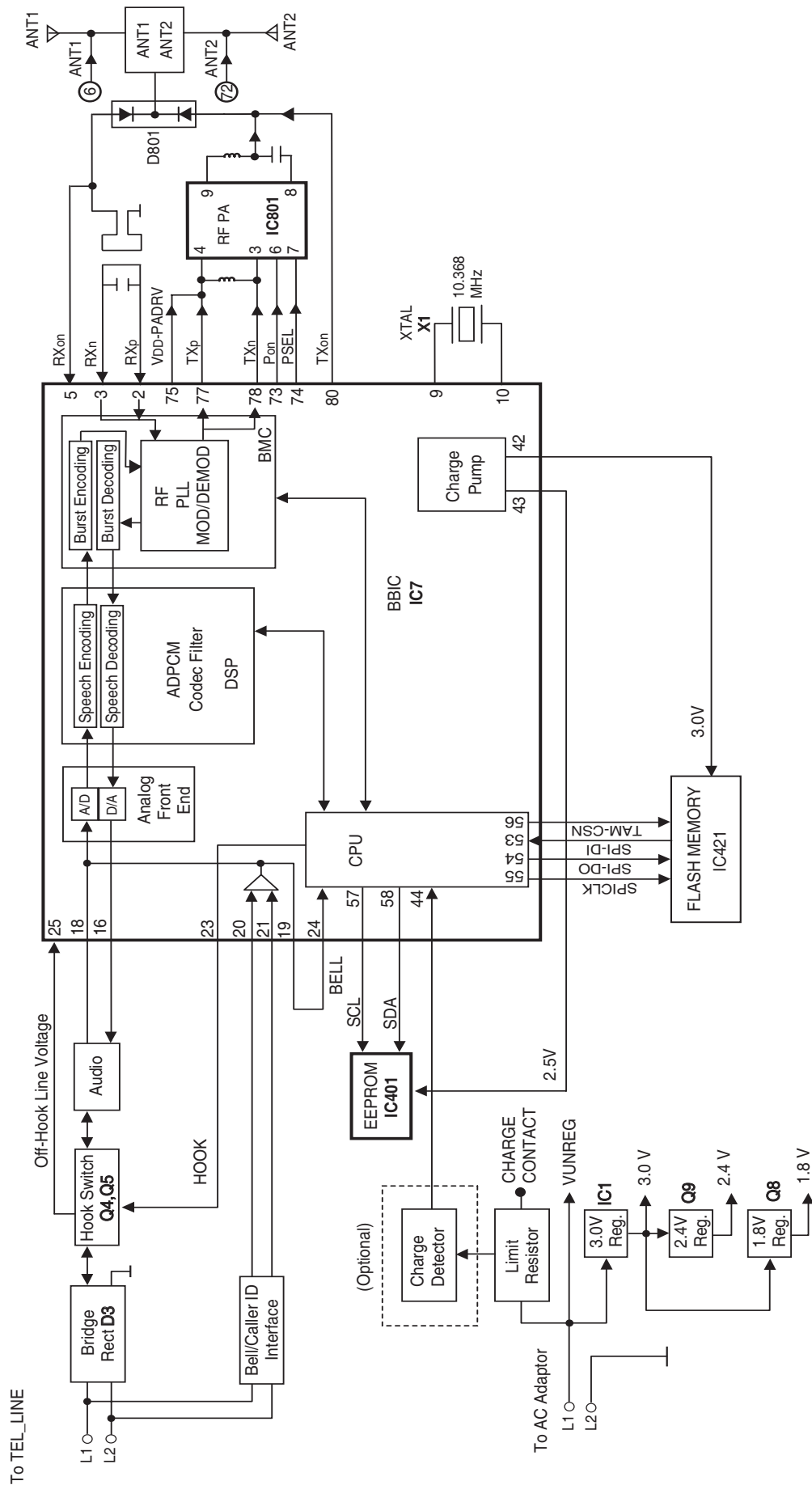
(for Middle Near East and Africa)

Panasonic

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1 Technical Descriptions

1.1. Block Diagram (Base Unit)



1.2. Circuit Operation (Base Unit)

1.2.1. Outline

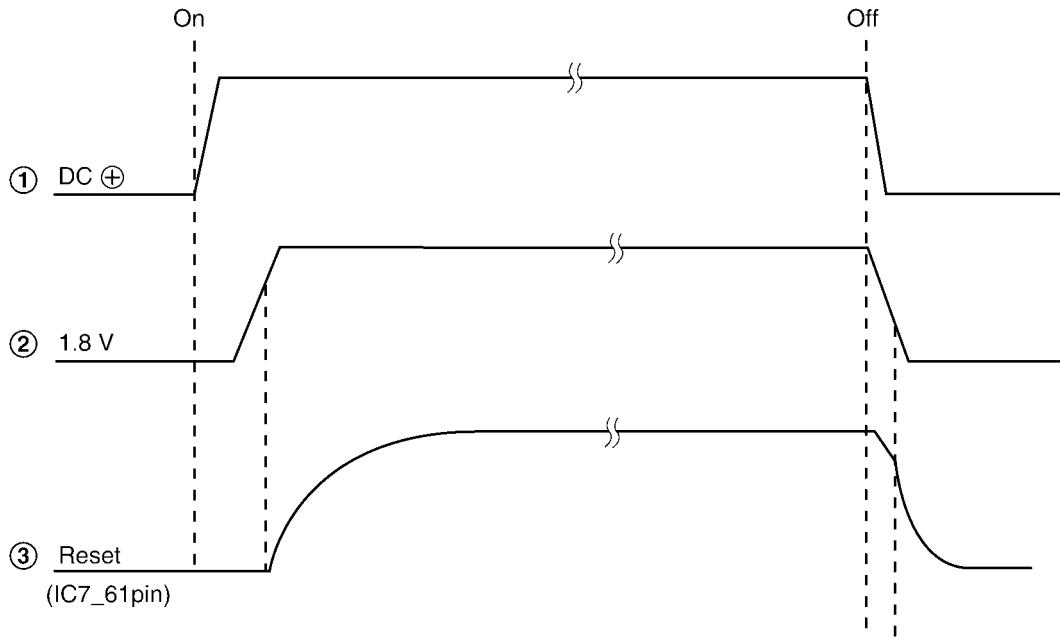
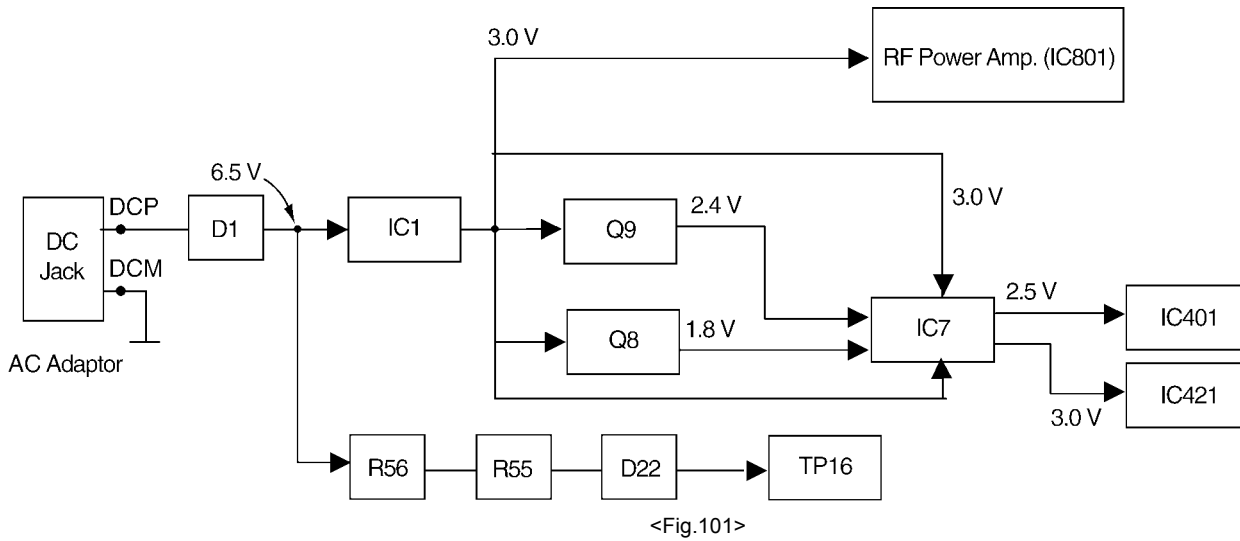
Base Unit consists of the following ICs as shown in **Block Diagram (Base Unit)** (P.2).

- DECT BBIC (**B**ase **B**and IC): IC7
 - Handling all the audio, signal and data processing needed in a DECT base unit
 - Controlling the DECT specific physical layer and radio section (**B**urst **M**odule **C**ontroller section)
 - ADPCM code filter for speech encoding and speech decoding (DSP section)
 - Echo-cancellation and Echo-suppression (DSP section)
 - Any tones (tone, sidetone, ringing tone, etc.) generation (DSP section)
 - DTMF receiver (DSP section)
 - Clock Generation for RF Module
 - ADC, DAC, timer, and power control circuitry
 - PLL Oscillator
 - Detector
 - Compress/Expander
 - First Mixer
 - All interfaces (ex: RF Power Amp, EEPROM, LED, Analog Front End, etc.)
- RF Power Amp.: IC801
 - Amplifier for transmission and reception
- EEPROM: IC401
 - Temporary operating parameters (for RF, etc.)
- FLASH MEMORY: IC421
 - Voice Prompt (TAM) D/L Area
 - ICM/OGM Recording Area
- Additionally,
 - Power Supply Circuit (+3.0 V, +2.4 V, +1.8 V output)
 - Crystal Circuit (10.368 MHz)
 - Charge Circuit
 - Telephone Line Interface Circuit

1.2.2. Power Supply Circuit

The power is supplied to the DECT BBIC, RF Module, EEPROM and Charge Contact from AC Adaptor (+6.5 V) as shown in Fig.101. The power supply is as follows;

- DECT BBIC (IC7):
 DC Jack (+6.5 V) → D1 → IC1 → IC7
 DC Jack (+6.5 V) → D1 → IC1 → Q9 → IC7
 DC Jack (+6.5 V) → D1 → IC1 → Q8 → IC7
- RF Power Amp. (IC801):
 DC Jack (+6.5 V) → D1 → IC1 → IC801 (Power AMP)
- EEPROM (IC401):
 DC Jack (+6.5 V) → D1 → IC1 → IC7 → IC401
- FLASH MEMORY (IC421):
 DC Jack (+6.5 V) → D1 → IC1 → IC7 → IC421
- Charge Contact (TP16):
 DC Jack (+6.5 V) → D1 → R56 → R55 → D22 → TP16



1.2.3. Telephone Line Interface

<Function>

- Bell signal detection
- Clip signal detection
- ON/OFF hook circuit

Bell & Clip (: Calling Line Identification Presentation: Caller ID) signal detection:

In the standby mode, Q3 is open to cut the DC loop current and decrease the ring load.

When ring voltage appears at the L1T (A) and L1R (B) leads (when the telephone rings), the AC ring voltage is transferred as follows;

- B → L2 → C4 → R6 → R33 → IC7 Pin 21 (CID INp)
- A → L1 → C3 → R4 → R35 → IC7 Pin 20 (CID INn)

ON/OFF hook circuit:

In the standby mode, Q3 is open, and connected as to cut the DC loop current and to cut the voice signal. The unit is consequently in an **on-hook condition**.

When IC7 detects a ring signal or press the TALK Key onto the handset, Q4 turns on and then Q3 turns on, thus providing an **off-hook condition** (DC current flows through the circuit) and the following signal flow makes the loop current.

- B → L2 → D3 → Q3 → Q5 → R21 → R22 → D3 → L1 → A [**OFF HOOK**]

1.2.4. Transmitter/Receiver

- Audio Circuits and DTMF tone signal circuits.

Base Unit and Handset mainly consist of RF Module and DECT BBIC.

Base Unit and Handset transmit/receive voice signal and data signal through the antenna on carrier frequency.

1.2.4.1. Transmitter Block

The voice signal input from the TEL LINE interface goes to RF Power Amp. (IC801) through DECT BBIC (IC7) as shown in **Block Diagram (Base Unit) (P.2)**

The voice signal passes through the analog part of IC7 where it is amplified and converted to a digital audio stream signal. The burst switch controller processes this stream performing encryption and scrambling, adding the various other fields to produce the GAP (**Generic Access Profile**) standard DECT frame, assigning to a time slot and channel etc.

In IC7, the carrier frequency is changing, and frequency modulated RF signal is generated. In IC801, RF signal is amplified, and radiated from antenna. Handset detects the voice signal or data signal in the circuit same as the following explanation of Receiver Block.

1.2.4.2. Receiver Block

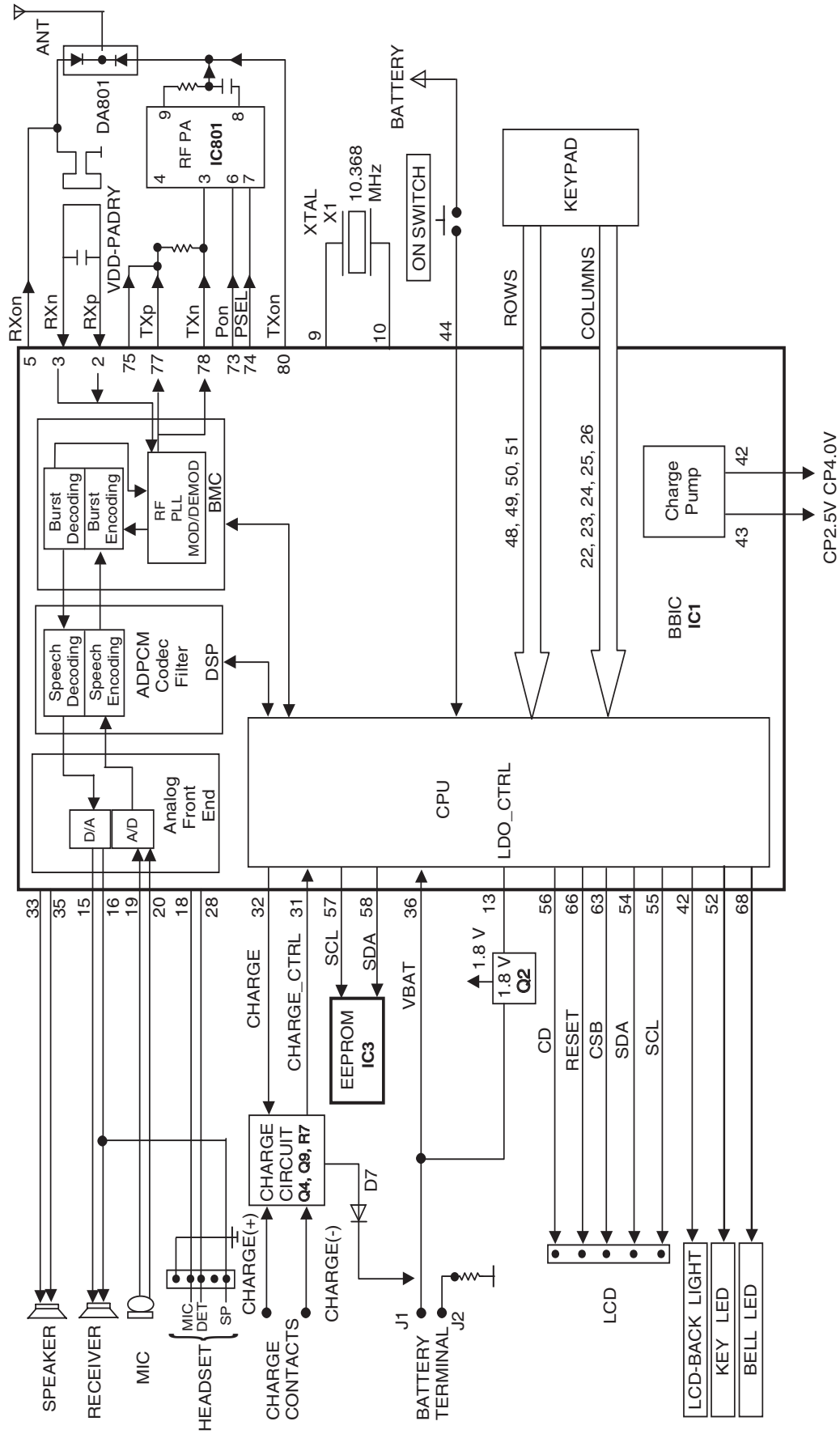
The signal of 1900 MHz band (1881.792 MHz ~ 1897.344 MHz) which is input from antenna is input to IC7 as shown in **Block Diagram (Base Unit) (P.2)**.

In IC7, the signal of 1900 MHz band is downconverted to 864 kHz signal and demodulated, as GAP (**Generic Access Profile**) standard DECT frames. It passes through the decoding section burst switch controller where it separates out the frame information and performs de-encryption and de-scrambling as required. It then goes to the DSP section where it is turned back into analog audio. This is amplified by the analog front end, and goes to the TEL LINE Interface.

1.2.5. Pulse Dialling

During pulse dialling the hookswitch (Q3,Q4) is used to generate the pulses using the HOOK control signal, which is set high during pulses. To force the line impedance low during the "pause" intervals between dial pulses, the PULSE_DIAL signal turns on Q2.

1.3. Block Diagram (Handset)



1.4. Circuit Operation (Handset)

1.4.1. Outline

Handset consists of the following ICs as shown in **Block Diagram (Handset)** (P.6).

- DECT BBIC (**B**ase **B**and IC): IC1
 - All data signals (forming/analyzing ACK or CMD signal)
 - All interfaces (ex: Key, Detector Circuit, Charge, DC/DC Converter, EEPROM, LCD, RF Power Amp.)
 - PLL Oscillator
 - Detector
 - Compress/Expander
 - Reception
- RF Power Amp: IC801
 - Amplifier for transmission
- EEPROM: IC3
 - Temporary operating parameters (for RF, etc.)

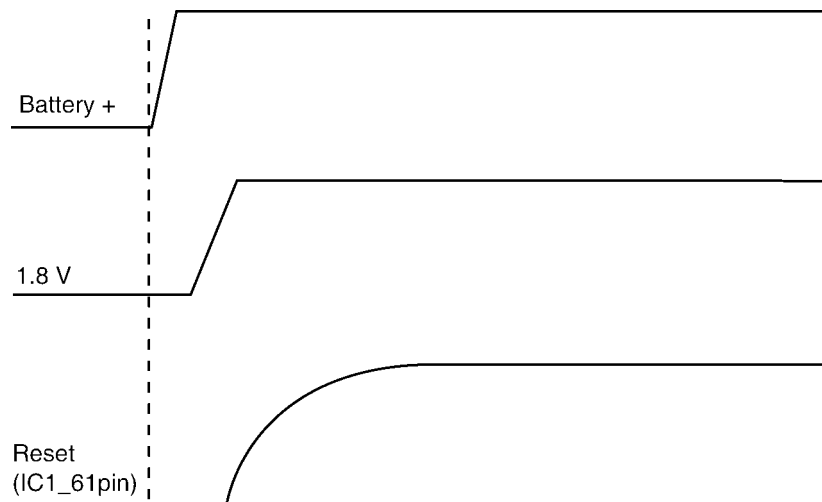
1.4.2. Power Supply Circuit/Reset Circuit

Circuit Operation:

When power on the Handset, the voltage is as follows;

BATTERY(2.2 V ~ 2.6 V: BATT+) → F1 → Q2 (1.8 V), IC1-43pin (2.5V)

The Reset signal generates IC1 (61 pin) and 1.8 V.



1.4.3. Charge Circuit

Circuit Operation:

When charging the handset on the Base Unit, the charge current is as follows;

DC+(6.5 V) → D1 → R56 → R55 → D22 → CHARGE+(Base) → CHARGE+(Handset) → Q4 → D7 → F1 → BATTERY+... Battery...

BATTERY- → R45 → GND → CHARGE-(Handset) → CHARGE-(Base) → GND → DC-(GND)

In this way, the BBIC on Handset detects the fact that the battery is charged.

The charge current is controlled by switching Q9 of Handset.

Refer to Fig.101 in **Power Supply Circuit** (P.4).

1.4.4. Battery Low/Power Down Detector

Circuit Operation:

"Battery Low" and "Power Down" are detected by BBIC which check the voltage from battery.

The detected voltage is as follows;

- Battery Low

Battery voltage: $V(\text{Batt}) \leq 2.25 \text{ V} \pm 50 \text{ mV}$

The BBIC detects this level and "■" starts flashing.

- Power Down

Battery voltage: $V(\text{Batt}) \leq 2.0 \text{ V} \pm 50 \text{ mV}$

The BBIC detects this level and power down.

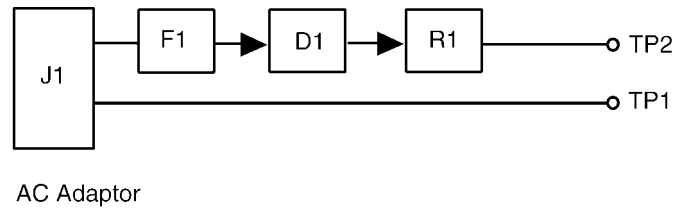
1.4.5. Speakerphone

The hands-free loudspeaker at SP+ and SP- is used to generate the ring alarm.

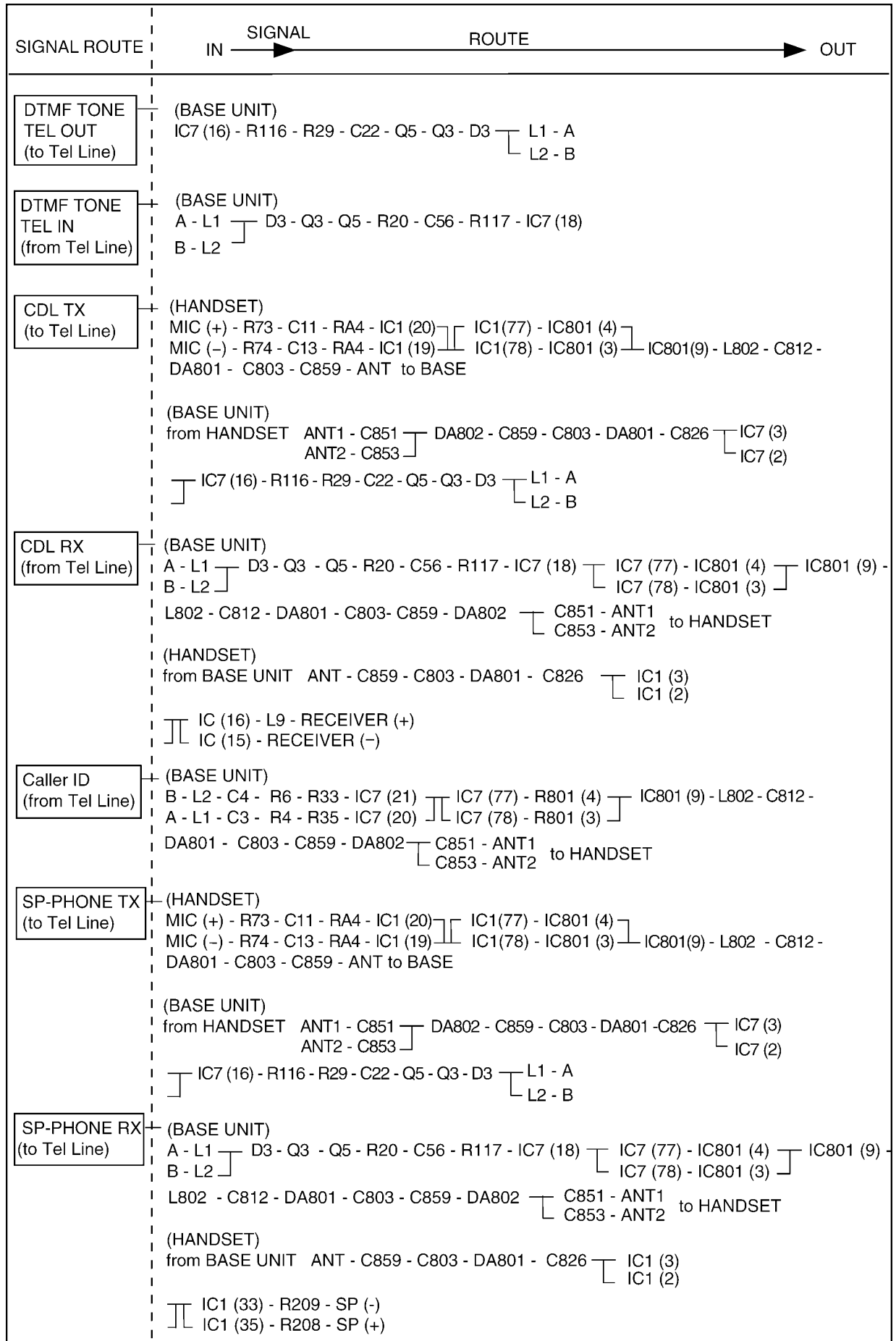
1.5. Circuit Operation (Charger Unit)

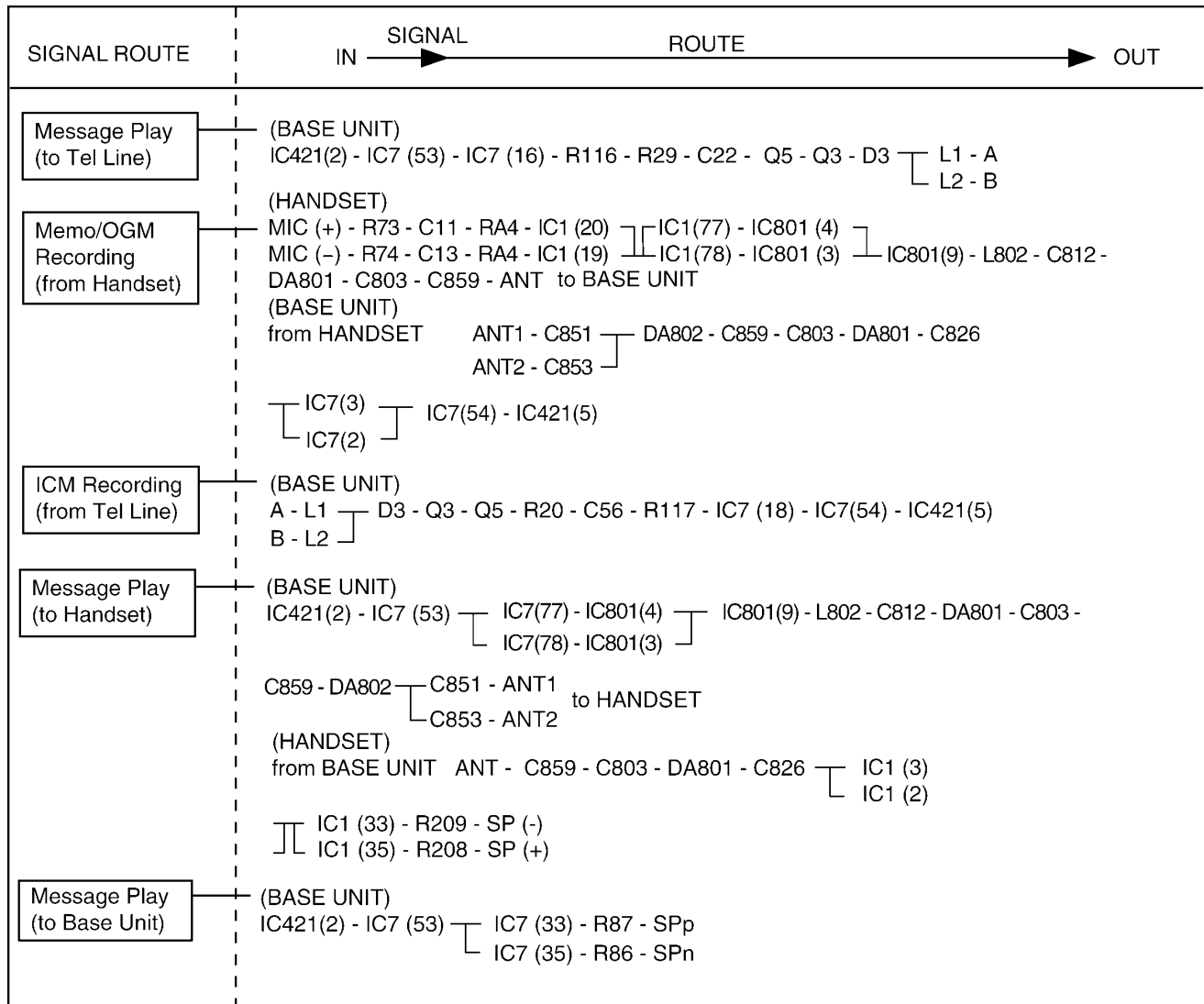
1.5.1. Power Supply Circuit

The power supply is as shown.



1.6. Signal Route





2 Schematic Diagram

2.1. For Schematic Diagram

2.1.1. Base Unit (Schematic Diagram (Base Unit))

Notes:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

Important Safety Notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

2. The schematic diagrams may be modified at any time with the development of new technology.

2.1.2. Handset (Schematic Diagram (Handset))

Notes:

1. DC voltage measurements are taken with an oscilloscope or a tester with a ground.
2. The schematic diagram may be modified at any time with the development of new technology.

2.1.3. Charger Unit (Schematic Diagram (Charger Unit))

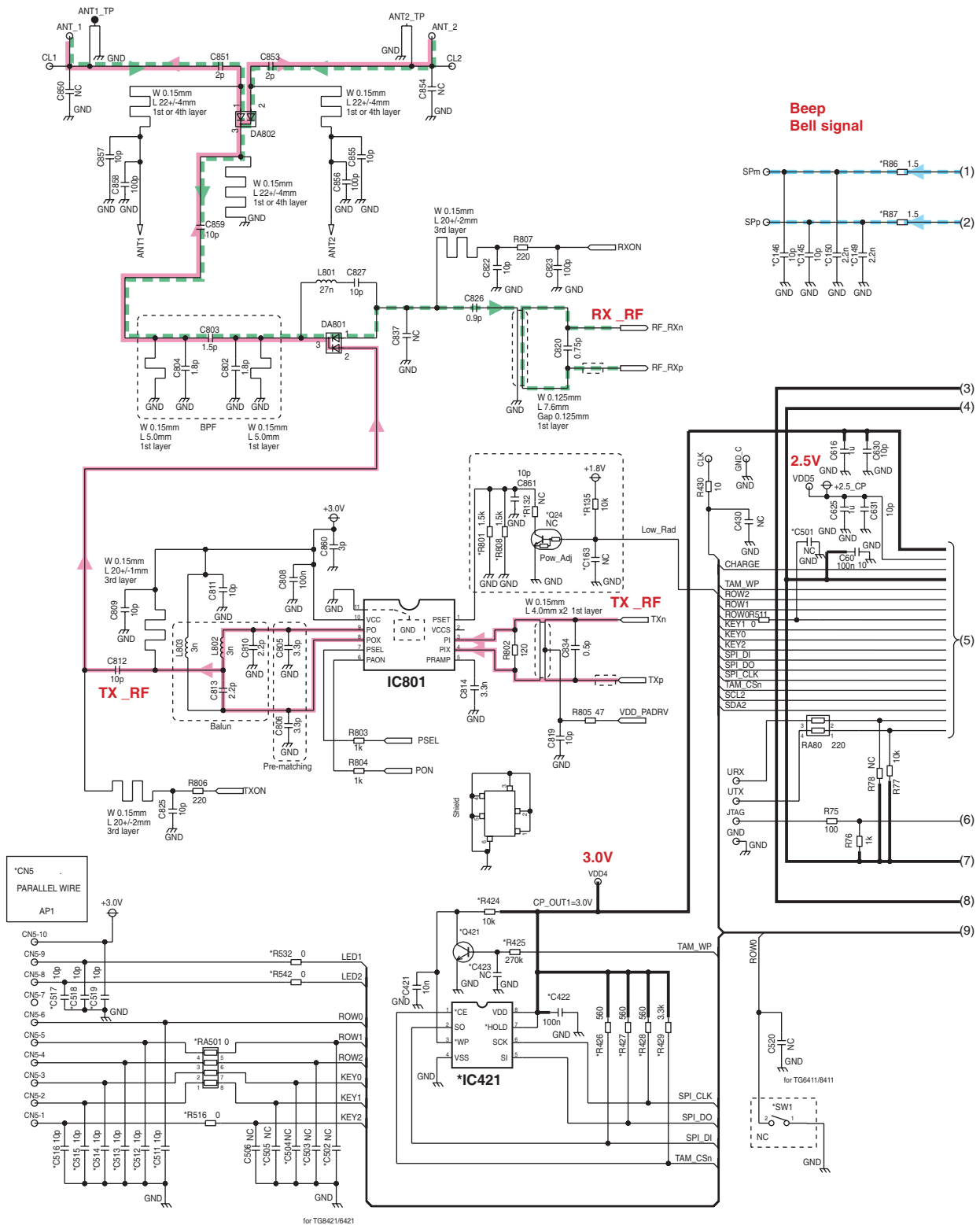
Notes:

1. DC voltage measurements are taken with voltmeter from the negative voltage line.

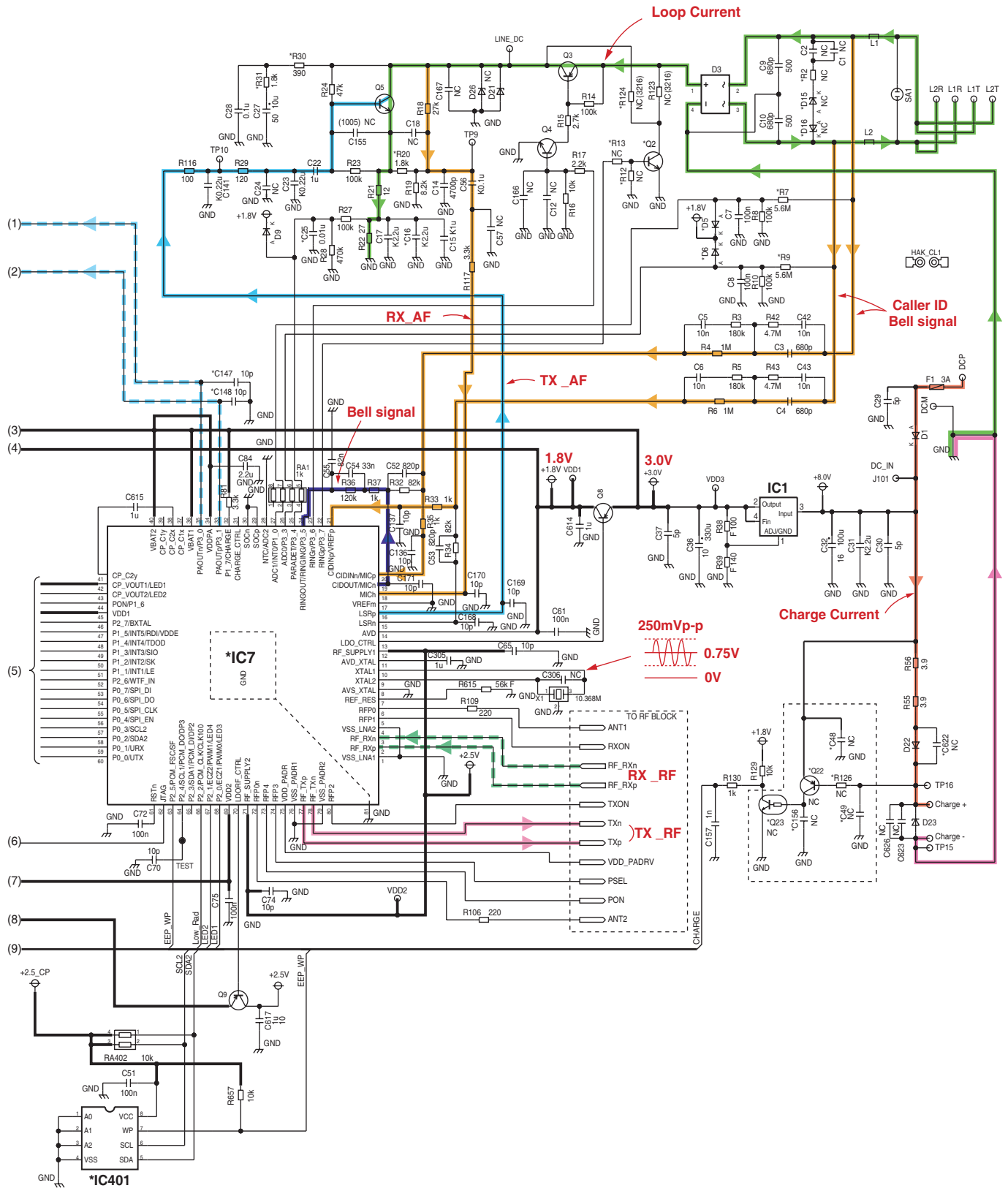
Important Safety Notice:
Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only the manufacturer's specified parts.

2. The schematic diagram may be modified at any time with the development of new technology.

2.2. Schematic Diagram (Base Unit)

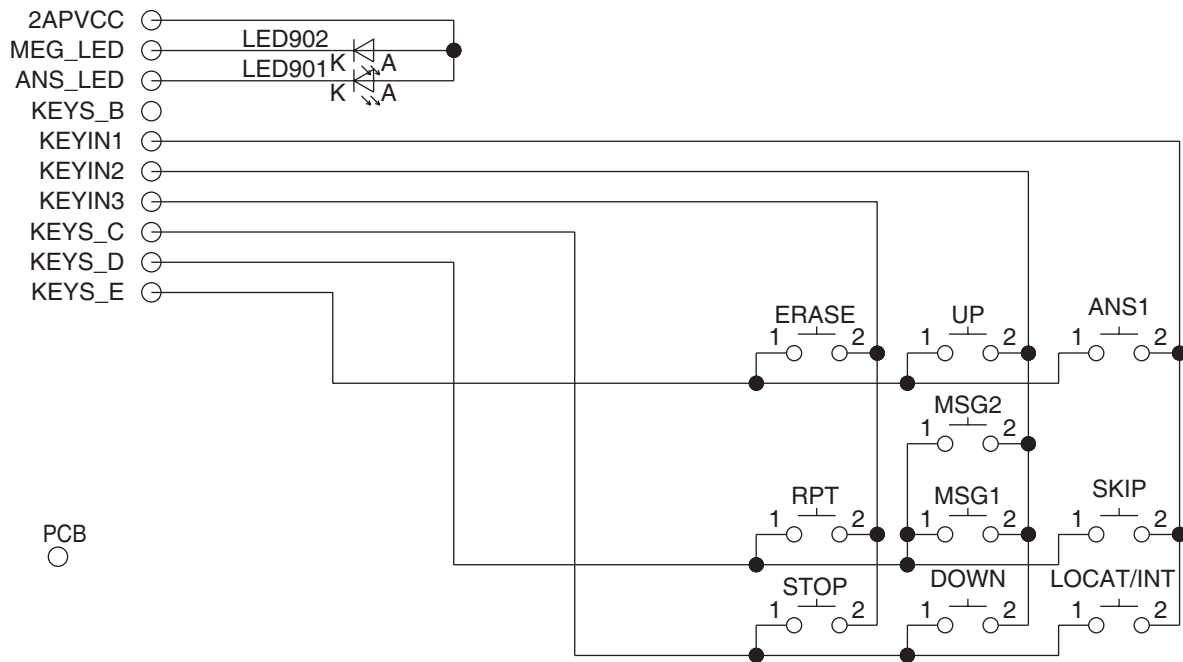


NC: No Components



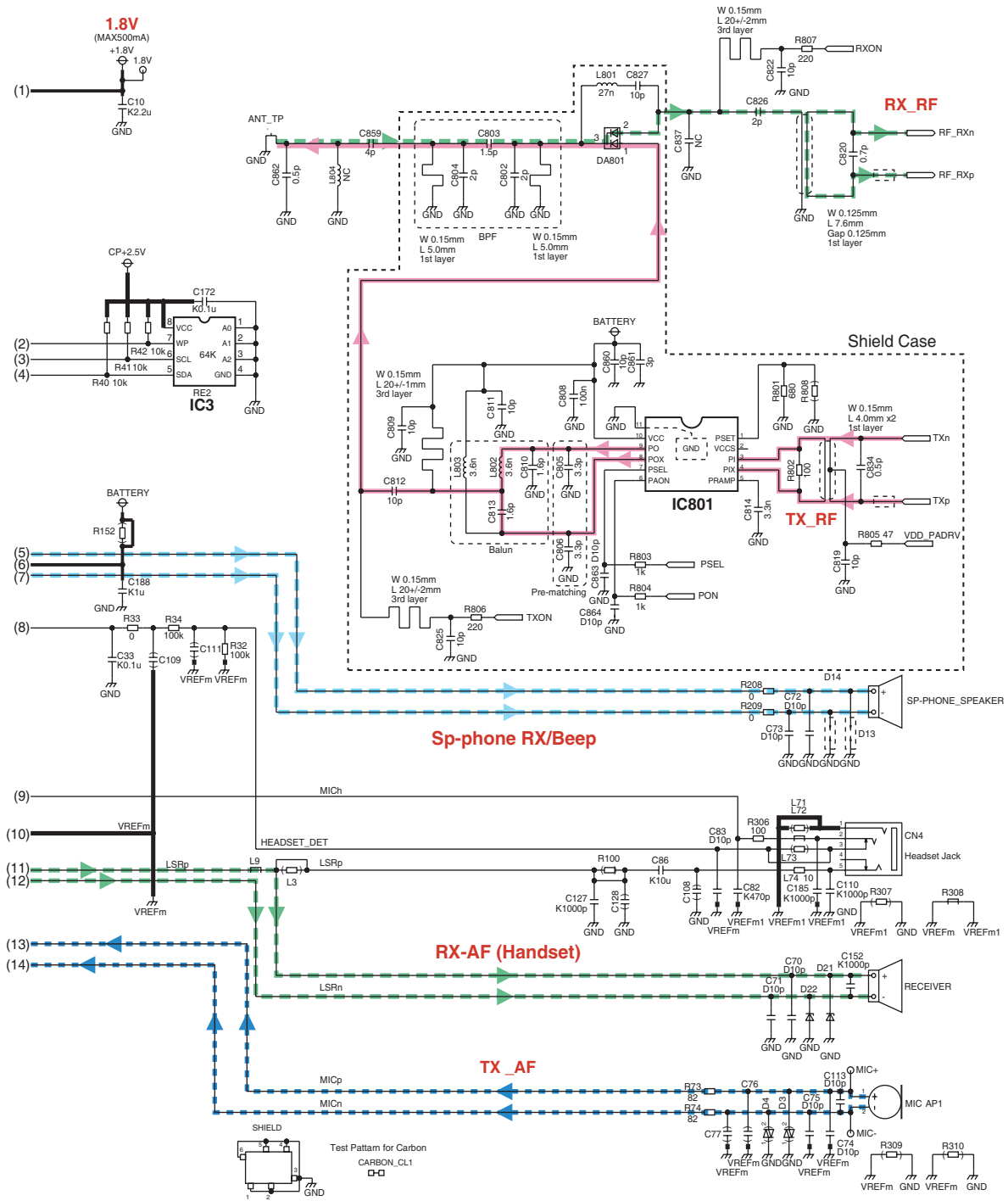
NC: No Components

2.3. Schematic Diagram (Base Unit_Operation)



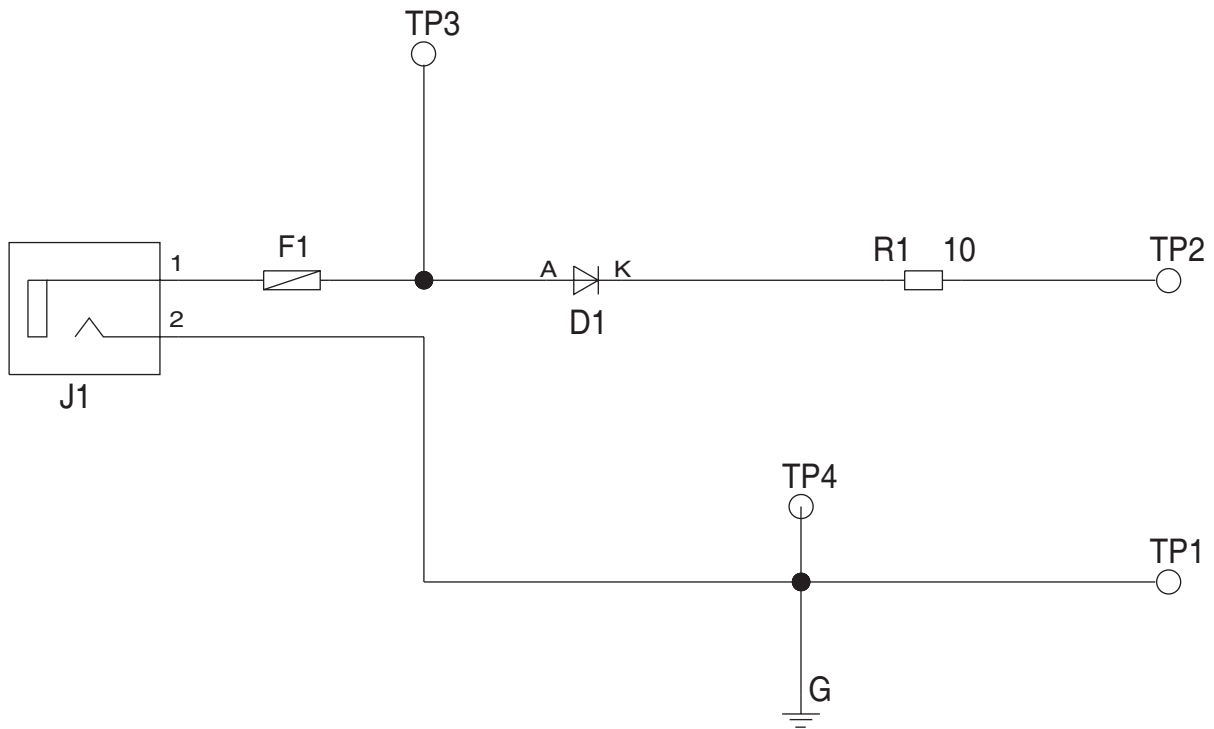
Memo





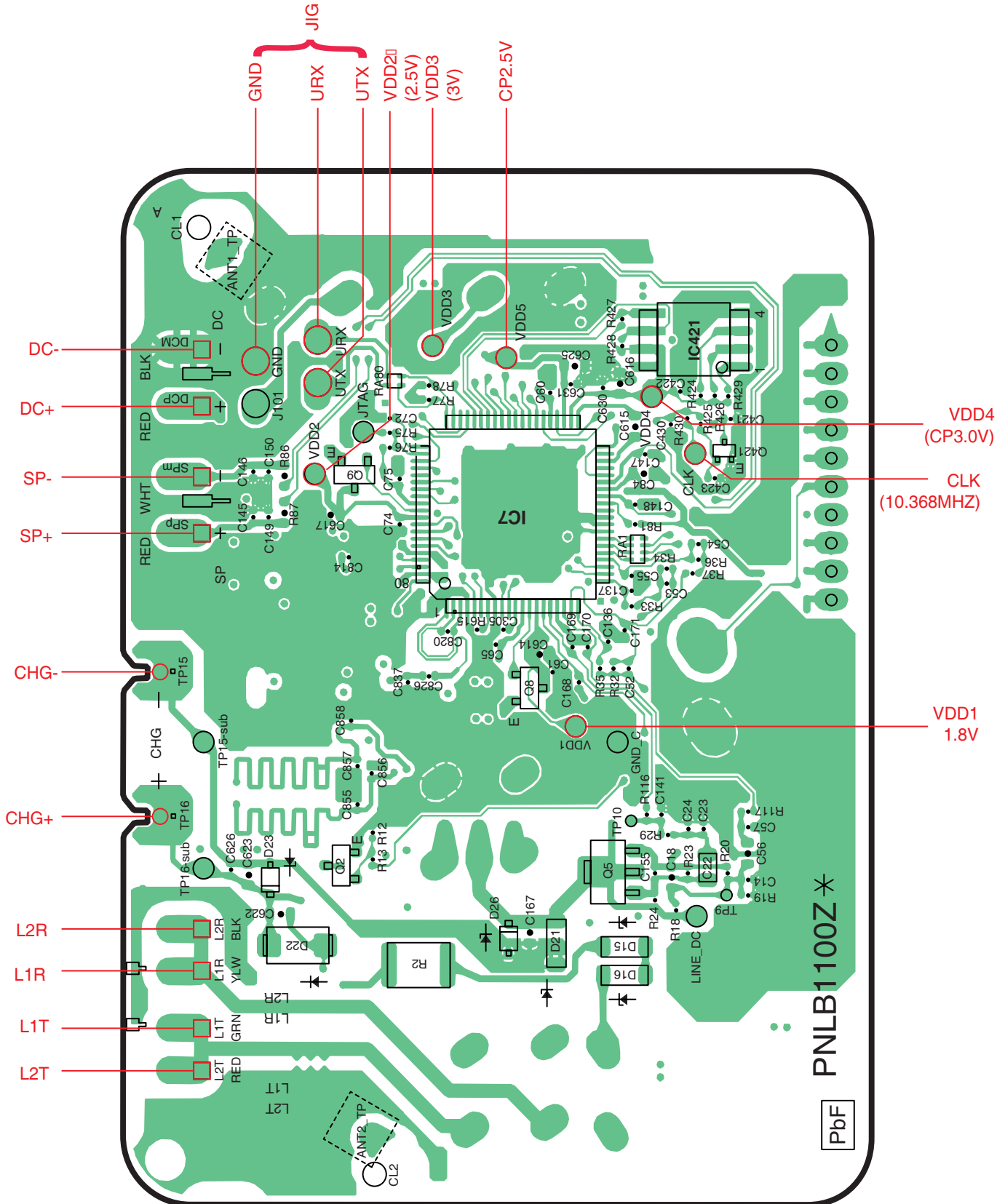
NC: No Components

2.5. Schematic Diagram (Charger Unit)



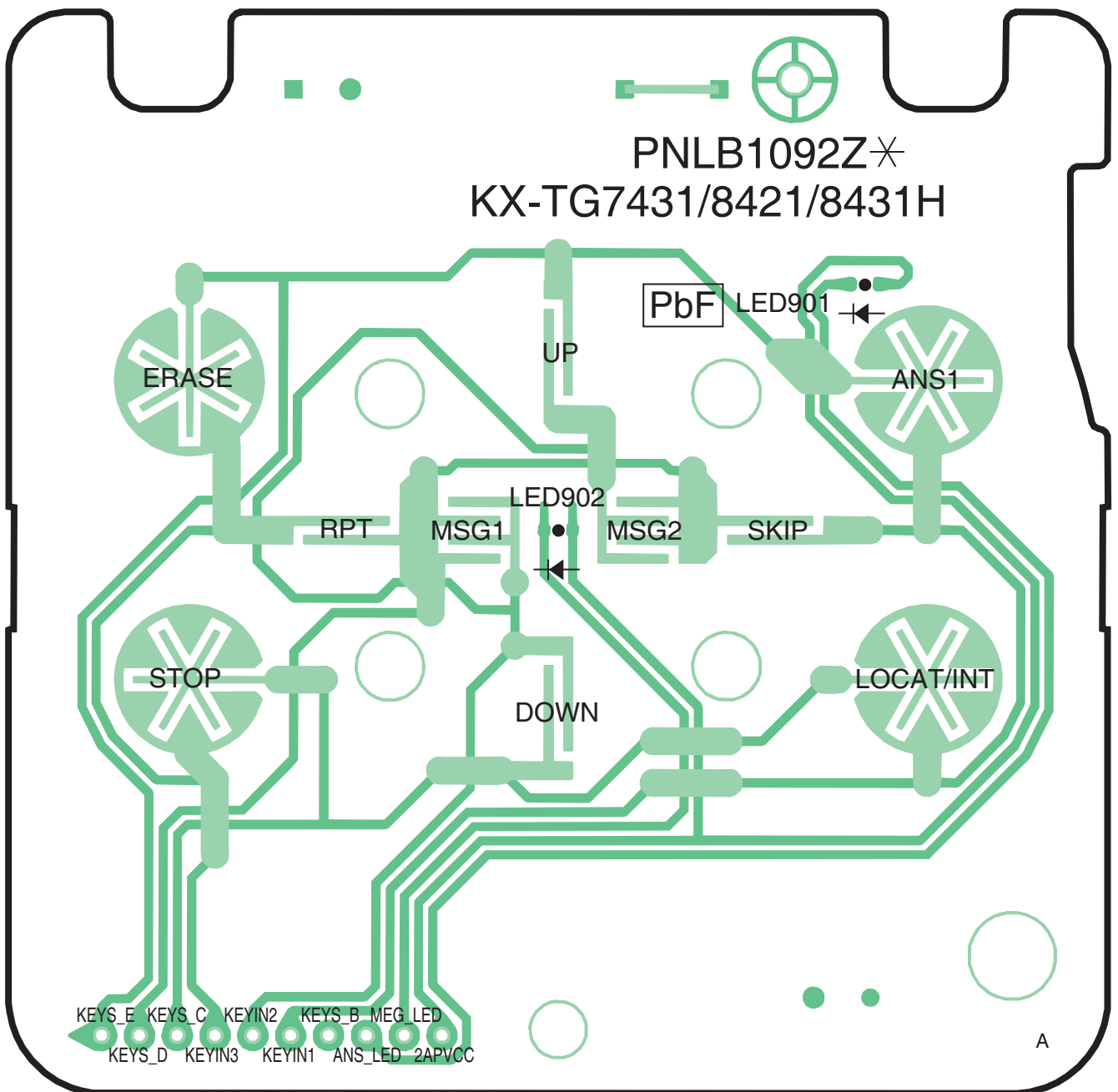
SCHEMATIC DIAGRAM (Charger Unit)

3.1.2. Bottom View



3.2. Circuit Board (Base Unit_Operation)

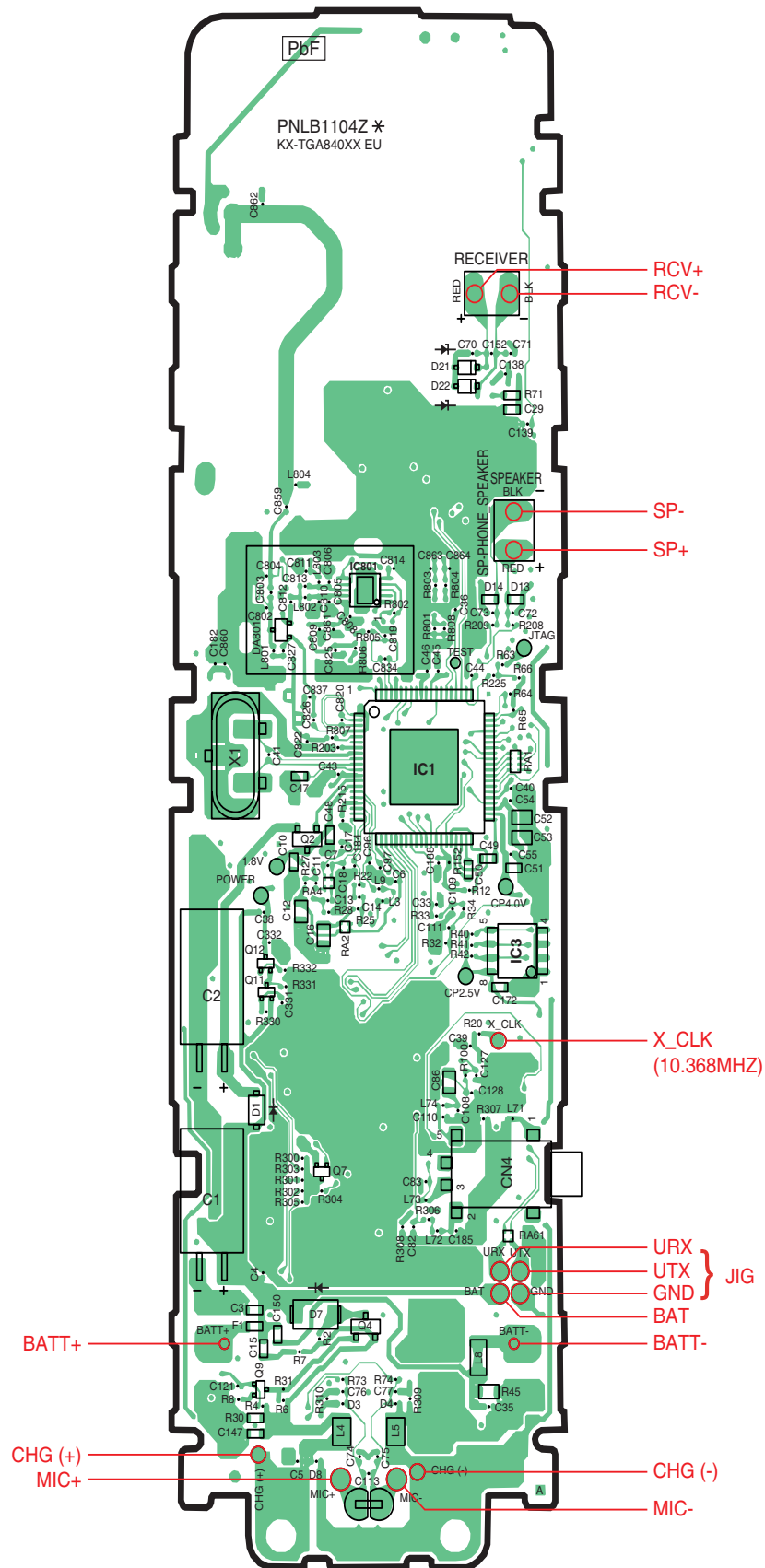
3.2.1. Component View



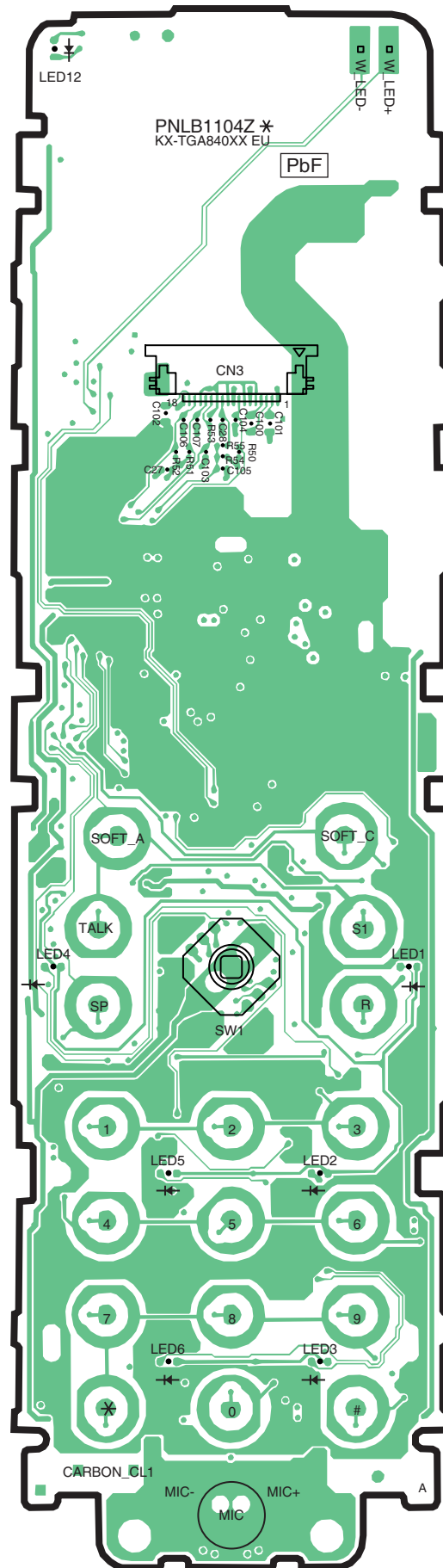
Memo

3.3. Circuit Board (Handset)

3.3.1. Component View

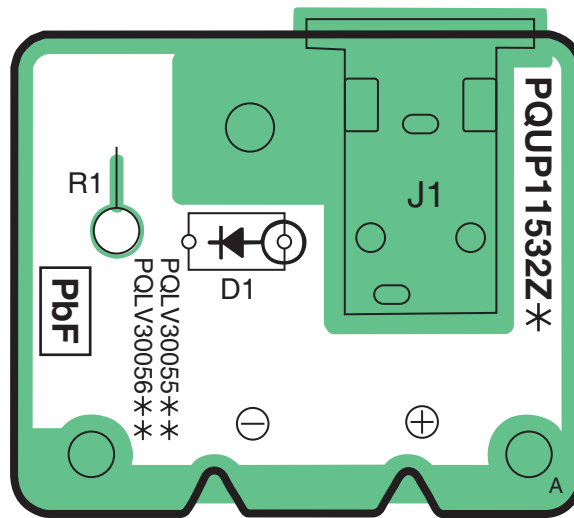


3.3.2. Bottom View



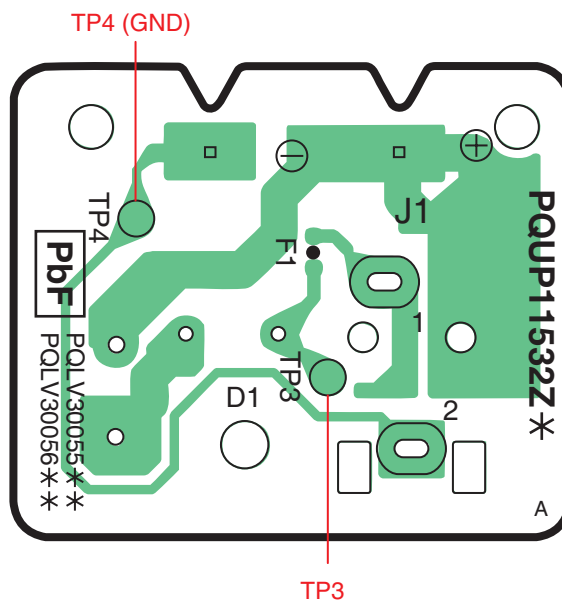
3.4. Circuit Board (Charger Unit)

3.4.1. Component View



CIRCUIT BOARD (Charger unit (Component View))

3.4.2. Bottom View



CIRCUIT BOARD (Charger unit (Bottom View))

4 Exploded View and Replacement Parts List

4.1. Replacement Part List

1. RTL (Retention Time Limited)

Note:

The "RTL" marking indicates that its Retention Time is Limited.

When production is discontinued, this item will continue to be available only for a specific period of time. This period of time depends on the type of item, and the local laws governing parts and product retention.

At the end of this period, the item will no longer be available.

2. Important safety notice

Components identified by the Δ mark indicates special characteristics important for safety. When replacing any of these components, only use specified manufacture's parts.

3. The S mark means the part is one of some identical parts. For that reason, it may be different from the installed part.

4. ISO code (Example: ABS-94HB) of the remarks column shows quality of the material and a flame resisting grade about plastics.

5. RESISTORS & CAPACITORS

Unless otherwise specified;

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

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

*Type & Wattage of Resistor

Type

ERC:Solid	ERX:Metal Film	PQ4R:Chip
ERDS:Carbon	ERG:Metal Oxide	ERS:Fusible Resistor
ERJ:Chip	ER0:Metal Film	ERF:Cement Resistor

Wattage

10,16:1/8W	14,25:1/4W	12:1/2W	1:1W	2:2W	3:3W
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*Type & Voltage Of Capacitor

Type

ECFD:Semi-Conductor	ECCD,ECKD,ECBT,F1K,ECUV: Ceramic
ECQS:Styrol	ECQE,ECQV,ECQG: Polyester
ECUV,PQCUV,ECUE:Chip	ECEA,ECST,EEE: Electytic
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 :16V	
2H:500V		0J:6.3V	1E,25:25V	2A :100V	

4.1.1. Base Unit

4.1.1.1. Main P.C.Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB1	PNWP18421BXH	MAIN P.C.BOARD ASS'Y (RTL)	
	C3	F1K2H681A008	680P	
	C4	F1K2H681A008	680P	
	C5	ECUV1C103KBV	0.01	
	C6	ECUV1C103KBV	0.01	
	C7	ECUV1C104KBV	0.1	
	C8	ECUV1C104KBV	0.1	
	C9	F1K2H681A008	680P	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C10	F1K2H681A008	680P	
	C14	ECUE1E472KBQ	0.0047	
	C17	PQCUV1A225KB	2.2	
	C18	ERJ3GEYJ682	6.8k	
	C22	PQCUV1A105KB	1	
	C23	ECJ0EB0J224K	0.22	s
	C25	ECUE1C103KBQ	0.01	
	C27	F2A1H100B132	10	
	C29	F1G1H5R0A480	5P	
	C30	F1G1H5R0A480	5P	
	C31	PQCUV1A225KB	2.2	
	C32	F2A1C1010119	100	
	C36	F2A1A3310040	330	
	C37	F1G1H5R0A480	5P	
	C42	ECUV1C103KBV	0.01	
	C43	ECUV1C103KBV	0.01	
	C51	ECUE1A104KBQ	0.1	
	C52	ECUE1H821KBQ	820p	
	C53	ECUE1H821KBQ	820p	
	C54	ECUE1A333KBQ	0.033	
	C55	ECUE1A823KBQ	0.082	
	C56	ECUV1C104KBV	0.1	
	C60	ECUE1A104KBQ	0.1	
	C61	ECUE1A104KBQ	0.1	
	C65	ECUE1H100DCQ	10p	
	C70	ECUE1H100DCQ	10p	
	C72	ECUE1A104KBQ	0.1	
	C74	ECUE1H100DCQ	10p	
	C75	ECUE1A104KBQ	0.1	
	C84	ECUV1A225KB	2.2	
	C136	ECUE1H100DCQ	10p	
	C137	ECUE1H100DCQ	10p	
	C141	ECJ0EB0J224K	0.22	s
	C145	ECUE1H100DCQ	10p	
	C146	ECUE1H100DCQ	10p	
	C147	ECUE1H100DCQ	10p	
	C148	ECUE1H100DCQ	10p	
	C149	ECUE1H222KBQ	0.0022	
	C150	ECUE1H222KBQ	0.0022	
	C157	ECUE1H102KBQ	0.001	
	C168	ECUE1H100DCQ	10p	
	C169	ECUE1H100DCQ	10p	
	C170	ECUE1H100DCQ	10p	
	C171	ECUE1H100DCQ	10p	
	C305	ECUE0J105KBQ	1	
	C421	ECUE1C103KBQ	0.01	
	C422	ECUE1A104KBQ	0.1	
	C511	ECUE1H100DCQ	10p	
	C512	ECUE1H100DCQ	10p	
	C513	ECUE1H100DCQ	10p	
	C514	ECUE1H100DCQ	10p	
	C515	ECUE1H100DCQ	10p	
	C516	ECUE1H100DCQ	10p	
	C517	ECUE1H100DCQ	10p	
	C518	ECUE1H100DCQ	10p	
	C519	ECUE1H100DCQ	10p	
	C614	ECUV1A105KBV	1	
	C615	ECUV1A105KBV	1	
	C616	ECUV1A105KBV	1	
	C617	ECUV1A105KBV	1	
	C625	ECUV1A105KBV	1	
	C630	ECUE1H100DCQ	10p	
	C631	ECUE1H100DCQ	10p	
	C802	F1G1H1R8A480	1.8P	
	C803	F1G1H1R5A480	1.5P	
	C804	F1G1H1R8A480	1.8P	
	C805	F1G1H3R3A480	3.3P	
	C806	F1G1H3R3A480	3.3P	
	C808	ECUE1A104KBQ	0.1	
	C809	ECUE1H100DCQ	10p	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C810	F1G1H2R2A480	2.2P	
	C811	ECUE1H100DCQ	10p	
	C812	ECUE1H100DCQ	10p	
	C813	F1G1H2R2A480	2.2P	
	C814	ECUE1H332KBQ	0.0033	
	C819	ECUE1H100DCQ	10p	
	C820	F1G1HR75A480	0.75P	
	C822	ECUE1H100DCQ	10p	
	C823	ECUE1H101JCQ	100p	
	C825	ECUE1H100DCQ	10p	
	C826	F1G1HR90A480	0.9P	
	C827	ECUE1H100DCQ	10p	
	C834	F1G1HR50A480	0.5P	
	C851	F1G1H2R0A480	2P	
	C853	F1G1H2R0A480	2P	
	C855	ECUE1H100DCQ	10p	
	C856	ECUE1H101JCQ	100p	
	C857	ECUE1H100DCQ	10p	
	C858	ECUE1H101JCQ	100p	
	C859	ECUE1H100DCQ	10p	
	C860	F1G1H3R0A480	3P	
	C861	ECUE1H100DCQ	10p	
	E2	WBX10SH-3.5G	LEAD WIRE	
	D1	B0JCME000035	DIODE (SI)	
	D21	PQVDR1220A	DIODE (SI)	S
	D22	B0ECKM000008	DIODE (SI)	
	D23	MA8220	DIODE (SI)	S
	D3	B0EDER000009	DIODE (SI)	
	D5	MA111	DIODE (SI)	S
	D6	MA111	DIODE (SI)	S
	D9	MA111	DIODE (SI)	S
	DA801	B0DDCD000001	DIODE (SI)	
	DA802	B0DDCD000001	DIODE (SI)	
	F1	K5H302Y00003	FUSE	
	IC1	C0CBAYG00016	IC	S
	IC7	C1CB00002906	IC	
	IC401	PQWICD300EHR	IC	
	IC421	C3FBMY000195	IC	
	IC801	C1CB00001842	IC	
	L1	PQLQXF330K	COIL	S
	L2	PQLQXF330K	COIL	S
	L801	G1C27NJ00010	COIL	
	L802	G1C3N0ZA0063	COIL	
	L803	G1C3N0ZA0063	COIL	
	Q2	B1ABCE000009	TRANSISTOR (SI)	
	Q3	B1ACGP000007	TRANSISTOR (SI)	
	Q4	PQVTBF822T7	TRANSISTOR (SI)	
	Q5	2SD0874AS	TRANSISTOR (SI)	
	Q8	B1ADGE000004	TRANSISTOR (SI)	
	Q9	B1ADGE000004	TRANSISTOR (SI)	
	Q421	2SC6054JSL	TRANSISTOR (SI)	
	R3	PQ4R10XJ184	180k	S
	R4	PQ4R10XJ105	1m	S
	R5	PQ4R10XJ184	180k	S
	R6	PQ4R10XJ105	1m	S
	R7	ERJ3GEYJ565	5.6m	
	R8	ERJ3GEYJ104	100k	
	R9	ERJ3GEYJ565	5.6m	
	R10	ERJ3GEYJ104	100k	
	R12	ERJ2GEJ103	10k	
	R13	ERJ2GEJ681	680	
	R14	ERJ3GEYJ104	100k	
	R15	PQ4R10XJ272	2.7k	S
	R16	ERJ2GEJ103	10k	
	R17	ERJ2GEJ222	2.2k	
	R18	ERJ2GEJ273X	27k	
	R19	ERJ2GEJ822	8.2k	
	R20	ERJ2GEJ392	3.9k	
	R21	ERJ12YJ120	12	
	R22	ERJ12YJ270	27	
	R23	ERJ2GEJ104	100k	
	R24	ERJ2GEJ473	47k	
	R27	ERJ2GEJ104	100k	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R28	ERJ2GEYJ474	470k	S
	R29	ERJ2GEJ121	120	
	R30	ERJ3GEYJ820	82	
	R31	ERJ3GEYJ821	820	
	R32	ERJ2GEJ823	82k	
	R33	ERJ2GEJ102	1k	
	R34	ERJ2GEJ823	82k	
	R35	ERJ2GEJ102	1k	
	R36	ERJ2GEJ124	120k	
	R37	ERJ2GEJ102	1k	
	R38	ERJ2RKF1000	100	
	R39	ERJ2RKF1400	140	
	R42	PQ4R10XJ475	4.7m	S
	R43	PQ4R10XJ475	4.7m	S
	R55	ERJ1TYJ3R9U	3.9	
	R56	ERJ1TYJ3R9U	3.9	
	R75	ERJ2GEJ101	100	
	R76	ERJ2GEJ102	1k	
	R77	ERJ2GEJ103	10k	
	R81	ERJ2GEJ332	3.3k	
	R106	ERJ2GEJ221	220	
	R109	ERJ2GEJ221	220	
	R116	ERJ2GEJ101	100	
	R117	ERJ2GEJ332	3.3k	
	R124	PQ4R18XJ100	10	S
	R129	ERJ2GEJ103	10k	
	R130	ERJ2GEJ102	1k	
	R135	ERJ2GEJ103	10k	
	R424	ERJ2GEJ103	10k	
	R425	ERJ2GEJ274	270k	
	R426	ERJ2GEJ561	560	
	R427	ERJ2GEJ561	560	
	R428	ERJ2GEJ561	560	
	R429	ERJ2GEJ332	3.3k	
	R430	ERJ2GEJ100	10	
	R511	ERJ2GE0R00	0	
	R516	ERJ2GE0R00	0	
	R532	ERJ2GE0R00	0	
	R542	ERJ2GE0R00	0	
	R615	D0GA563ZA006	56k	
	R657	ERJ2GEJ103	10k	
	R801	ERJ2GEJ152	1.5k	
	R802	ERJ2GEJ121	120	
	R803	ERJ2GEJ102	1k	
	R804	ERJ2GEJ102	1k	
	R805	ERJ2GEJ470	47	
	R806	ERJ2GEJ221	220	
	R807	ERJ2GEJ221	220	
	R808	ERJ2GEJ152	1.5k	
	RA1	D1H810240004	RESISTOR ARRAY	S
	RA402	D1H410320002	RESISTOR ARRAY	
	RA501	EXB28VR000X	RESISTOR ARRAY	
	RA80	D1H422120001	RESISTOR ARRAY	
	SA1	J0LF00000026	VARISTOR	
	E1	PNMC1013Z	MAGNETIC SHIELD	
	X1	H0J103500027	CRYSTAL OSCILLATOR	

4.1.1.2. Operational P.C.Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB2	PNWP2G7431H	OPERATIONAL P.C.BOARD ASS'Y (RTL)	
			(DIODES)	
	LED901	PQVDBR1111C	LED	S
	LED902	PQVDBR1111C	LED	S

4.1.2. Handset

4.1.2.1. Main P.C.Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB100	PNWPGA840BXR	MAIN P.C.BOARD ASS'Y (RTL)	
	IC1	C1CB00002906	IC (BBIC (FLASH))	
	IC3	PQWIA130EXRR	IC (EEPROM)	
	IC801	C1CB00001842	IC	
			(TRANSISTORS)	
	Q2	B1ADGE000004	TRANSISTOR (SI)	
	Q4	B1ADGE000004	TRANSISTOR (SI)	
	Q7	UN9219J	TRANSISTOR (SI)	S
	Q9	2SC6054JSL	TRANSISTOR (SI)	
	Q11	B1ADCF000161	TRANSISTOR (SI)	
	Q12	B1ADCF000161	TRANSISTOR (SI)	
			(DIODES)	
	D1	MA2YD2120L	DIODE (SI)	
	D7	B0JCM0000035	DIODE (SI)	
	D21	MA8043M	DIODE (SI)	S
	D22	MA8043M	DIODE (SI)	S
	DA801	B0DDCD000001	DIODE (SI)	
	LED1	B3AEB0000124	LED	
	LED2	B3AEB0000124	LED	
	LED3	B3AEB0000124	LED	
	LED4	B3AEB0000124	LED	
	LED5	B3AEB0000124	LED	
	LED6	B3AEB0000124	LED	
	LED12	B3ACB0000216	LED	
	L801	G1C27NJ00010	COIL	
	L802	G1C3N6ZA0063	COIL	
	L803	G1C3N6ZA0063	COIL	
	F1	PQLQR2M5N6K	COIL	S
	RA1	D1H810240004	RESISTOR ARRAY	S
	RA2	D1H410220001	RESISTOR ARRAY	
	RA4	D1H433220001	RESISTOR ARRAY	
	RA61	D1H422120001	RESISTOR ARRAY	
	D13	D4ZZ00000024	VARISTOR	
	D14	D4ZZ00000024	VARISTOR	
	CN3	K1MN18BA0111	CONNECTOR	
	CN4	K2HD103D0001	CONNECTOR	
	L9	J0JCC0000287	IC FILTER	
	L72	J0JCC0000276	IC FILTER	
	R308	J0JCC0000286	IC FILTER	
	R2	ERJ2GEJ392	3.9k	
	R6	ERJ2GEJ102	1k	
	R7	ERJ2GEJ122	1.2k	
	R8	ERJ2GEJ101	100	
	R12	ERJ2GE0R00	0	
	R20	ERJ2GEJ100	10	
	R22	ERJ2GEJ332	3.3k	
	R25	ERJ2GEJ222	2.2k	
	R27	ERJ2GEJ821	820	
	R28	ERJ2GEJ821	820	
	R30	ERJ3GEYJ273	27k	
	R32	ERJ2GEJ104	100k	
	R33	ERJ2GE0R00	0	
	R34	ERJ2GEJ104	100k	
	R40	ERJ2GEJ103	10k	
	R41	ERJ2GEJ103	10k	
	R42	ERJ2GEJ103	10k	
	R45	ERJ6RSJR10V	0.1	
	R50	ERJ2GEJ332	3.3k	
	R51	ERJ2GEJ471	470	
	R52	ERJ2GEJ221	220	
	R53	ERJ2GEJ332	3.3k	
	R54	ERJ2GEJ103	10k	
	R55	ERJ2GEJ102	1k	
	R63	ERJ2GEJ101	100	
	R64	ERJ2GEJ103	10k	
	R66	ERJ2GEJ102	1k	
	R71	ERJ3GEYJ820	82	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	R73	ERJ2GEJ820	82	
	R74	ERJ2GEJ820	82	
	R203	D0GA563ZA006	56k	
	R208	ERJ2GE0R00	0	
	R209	ERJ2GE0R00	0	
	R215	ERJ2GE0R00	0	
	R225	ERJ2GE0R00	0	
	R300	ERJ2GEJ271	270	
	R301	ERJ2GEJ271	270	
	R302	ERJ2GEJ271	270	
	R303	ERJ2GEJ271	270	
	R304	ERJ2GEJ271	270	
	R305	ERJ2GEJ271	270	
	R306	ERJ2GEJ101	100	
	R330	ERJ2GEJ105X	1M	
	R331	ERJ2GEJ273X	27k	
	R332	ERJ2GEJ273X	27k	
	R801	ERJ2GEJ681	680	
	R802	ERJ2GEJ101	100	
	R803	ERJ2GEJ102	1k	
	R804	ERJ2GEJ102	1k	
	R805	ERJ2GEJ470	47	
	R806	ERJ2GEJ221	220	
	R807	ERJ2GEJ221	220	
	L74	ERJ2GEJ100	10	
	C1	F2A0J3310067	330	
	C2	F2A0J3310067	330	
	C5	ECUE1A104KBQ	0.1	
	C10	ECUV1A225KB	2.2	
	C11	ECUE1A104KBQ	0.1	
	C12	PQCUV0J106KB	10	
	C13	ECUE1A104KBQ	0.1	
	C14	ECUE1C103KBQ	0.01	
	C16	PQCUV0J106KB	10	
	C17	ECUE1H100DCQ	10p	
	C18	ECUE1H100DCQ	10p	
	C27	ECUE0J105KBQ	1	
	C29	ECUV1H100DCV	10p	
	C33	ECUE1A104KBQ	0.1	
	C40	ECUE1A104KBQ	0.1	
	C43	ECUE1H100DCQ	10p	
	C44	ECUE1A104KBQ	0.1	
	C45	ECUE1A104KBQ	0.1	
	C46	ECUE1H100DCQ	10p	
	C47	ECUV1A105KBV	1	
	C49	ECUV1A105KBV	1	
	C50	ECUV1A105KBV	1	
	C51	ECUV1A105KBV	1	
	C52	PQCUV0J106KB	10	
	C53	PQCUV0J106KB	10	
	C54	ECUE1H100DCQ	10p	
	C55	ECUE1H100DCQ	10p	
	C70	ECUE1H100DCQ	10p	
	C71	ECUE1H100DCQ	10p	
	C72	ECUE1H100DCQ	10p	
	C73	ECUE1H100DCQ	10p	
	C74	ECUE1H100DCQ	10p	
	C75	ECUE1H100DCQ	10p	
	C82	ECUE1H471KBQ	470p	
	C83	ECUE1H100DCQ	10p	
	C86	PQCUV0J106KB	10	
	C96	ECUE1H100DCQ	10p	
	C97	ECUE1H100DCQ	10p	
	C100	F1H1E1050001	1	
	C101	ECUV1C105KBV	1	
	C102	ECUV1C105KBV	1	
	C110	ECUE1H102KBQ	0.001	
	C113	ECUE1H100DCQ	10p	
	C127	ECUE1H102KBQ	0.001	
	C152	ECUE1H102KBQ	0.001	
	C172	ECUV1C104KBV	0.1	
	C184	ECUE1H100DCQ	10p	
	C185	ECUE1H102KBQ	0.001	

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	C188	ECUE0J105KBQ	1	
	C331	ECUE0J105KBQ	1	
	C332	ECUE0J105KBQ	1	
	C802	F1G1H2R0A480	2.0p	
	C803	F1G1H1R5A480	1.5p	
	C804	F1G1H2R0A480	2.0p	
	C805	F1G1H3R3A480	3.3p	
	C806	F1G1H3R3A480	3.3p	
	C808	ECUE1A104KBQ	0.1	
	C809	ECUE1H100DCQ	10p	
	C810	F1G1H1R6A480	1.6p	
	C811	ECUE1H100DCQ	10p	
	C812	ECUE1H100DCQ	10p	
	C813	F1G1H1R6A480	1.6p	
	C814	ECUE1H332KBQ	0.0033	
	C819	ECUE1H100DCQ	10p	
	C820	F1G1HR70A480	0.7p	
	C822	ECUE1H100DCQ	10p	
	C825	ECUE1H100DCQ	10p	
	C826	F1G1H2R0A480	2.0p	
	C827	ECUE1H100DCQ	10p	
	C834	F1G1HR50A480	0.5p	
	C859	F1G1H4R0A480	4p	
	C860	ECUE1H100DCQ	10p	
	C861	F1G1H3R0A480	3p	
	C862	F1G1HR50A480	0.5p	
	C863	ECUE1H100DCQ	10p	
	C864	ECUE1H100DCQ	10p	
	MIC100	L0CBAY000032	MICROPHONE	
	E101	L5DYDY00003	LIQUID CRYSTAL DISPLAY	
	E102	PQLZ11015Z	BACKLIGHT UNIT	
	E103	PNMC1013Z	CASE,MAGNETIC SHIELD	ABS-HB
	E104	PNLA1020Z	ANTENNA	
	E105	PNVE1002Z	BATTERY TERMINAL	
	E106	PNJE1022Z	SPECIAL SWITCH	
	X1	H0J103500034	CRYSTAL OSCILLATOR	
	SW1	K0C115A00007	SEESAW SWITCH	

4.1.3. Charger Unit

4.1.3.1. Main P.C.Board Parts

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	PCB200	PQWPTGA721CH	MAIN P.C.BOARD ASS'Y (RTL)	
			(DIODE)	
	D1	B0JAME000095	DIODE(SI)	
			(JACK)	
	J1	K2ECYB000001	JACK	
			(RESISTOR)	
	R1	ERG2SJ100E	10	
			(FUSE)	
	F1	K5H302Y00003	FUSE	

4.1.4. Screws

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
	A	XTB26+8GFJ	TAPPING SCREW	
	B	XTB2+8GFJ	TAPPING SCREW	

4.1.5. Fixtures and Tools

Safety	Ref. No.	Part No.	Part Name & Description	Remarks
		PQZZ1CD300E	JIG CABLE	
		PNZZTG8421BX	BATCH FILE CD-ROM	