ORDER NO. KM49910781C2

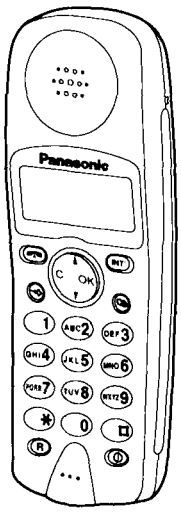
Service Manual

Telephone Equipment

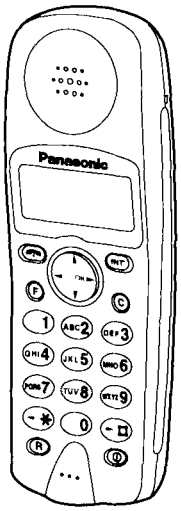
Digital Cordless Phone

KX-TCD951GB
KX-TCD955GC

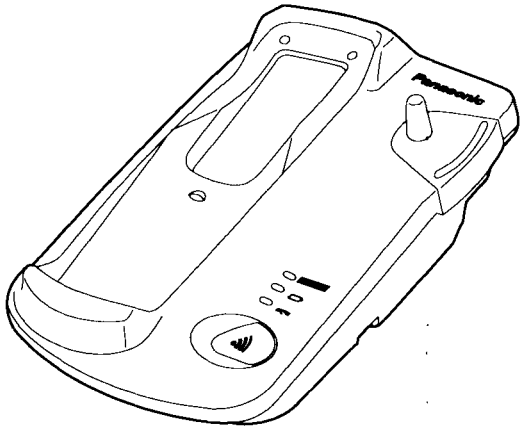
(for Germany)



(Handset)
(KX-TCD951GB)



(Handset)
(KX-TCD955GC)



(Base Unit)
(KX-TCD955GC)

■ SPECIFICATION

Standard:	DECT=Digital Enhanced Cordless Telecommunications GAP=Generic Access Profile (hersteller¸bergreifendes DECT-Funk¸bertragungsverfahren)
Number of channels:	120 Duplex Channels
Frequency range:	1.88 GHz to 1.9 GHz
Duplex procedure:	Time Multiplex, 10 ms frame length
Channel spacing:	1728 kHz
Bit rate:	1152 kbit/s
Modulation:	GFSK
Voice coding:	32 kbit/s
Operation range:	Up to 300 m outdoors, up to 50 m indoors
Analog telephone connection:	Telephone Line / PBX
Power source:	AC Adaptor 230 V ~ /50 Hz
Power consumption, Base unit:	5 VA

Battery life, Handset (if batteries are fully charged):	Stand-by: Up to 65 hours (Ni-Cd) Talk: Up to 6 hours (Ni-Cd)
Operating conditions:	5° - 40°C, 20 - 80% relative air humidity (not condensing)
Dialing modes:	Pulse/Tone
Recall button (set default):	Flash (200 ms)
for PBX:	Flash (80 ms)
Recall button (option):	Earth (400 ms/1300 ms)
Dimensions, Base unit:	about 193 mm x 130 mm x 68 mm (L x W x D)
Dimensions, Handset:	about 160 mm x 56 mm x 31 mm (L x W x D)
Weight, Base unit:	about 270 g
Weight, Handset:	about 150 g
Telephone line cord length:	about 2.1 m
AC adaptor cord length:	about 2 m
Connection jacks:	
Telephone line cord:	TAE 6F and modular jack 6/4
AC adaptor cord:	Modular jack 6/4
AC adaptor plug:	EURO jack

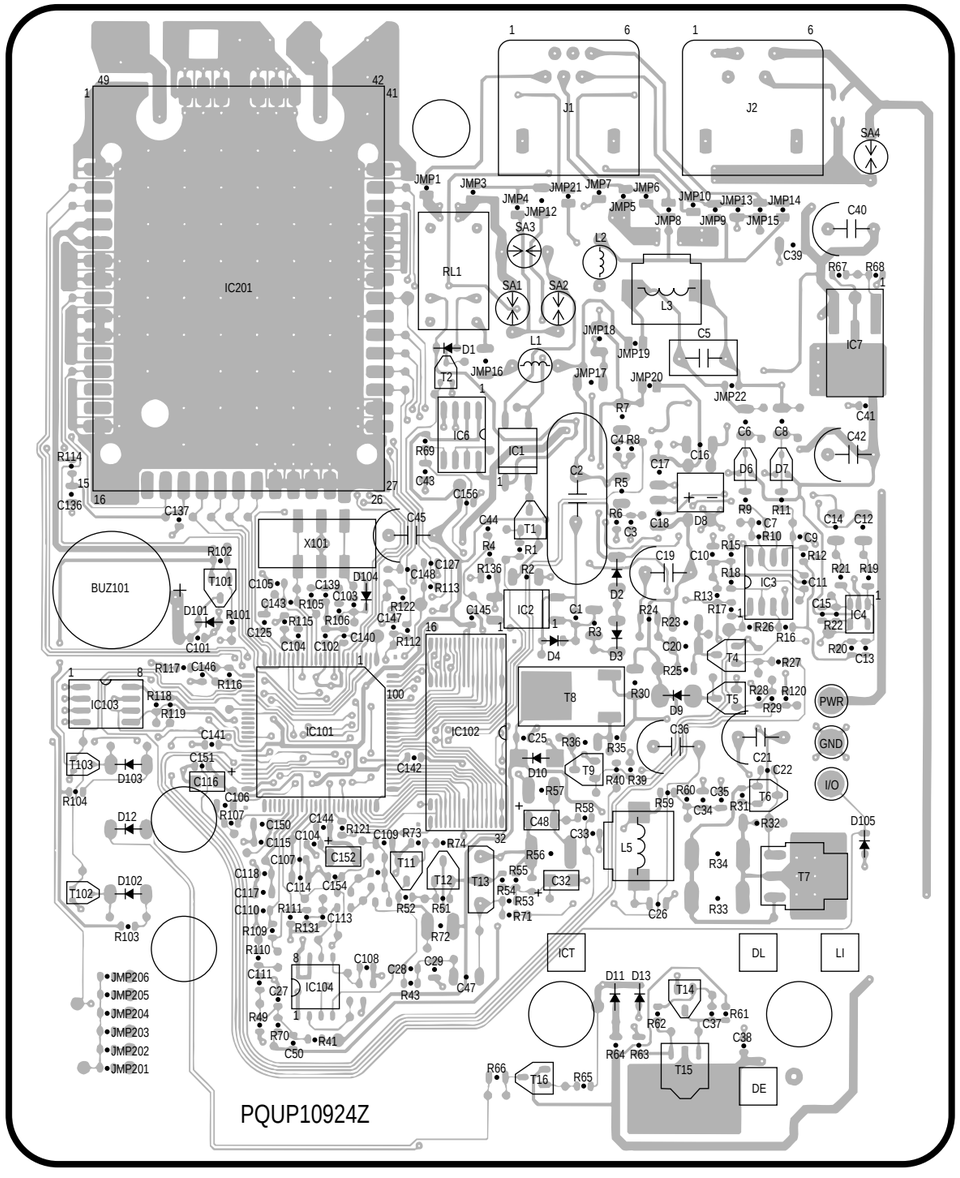
Design and specification are subject to change without notice.

Panasonic

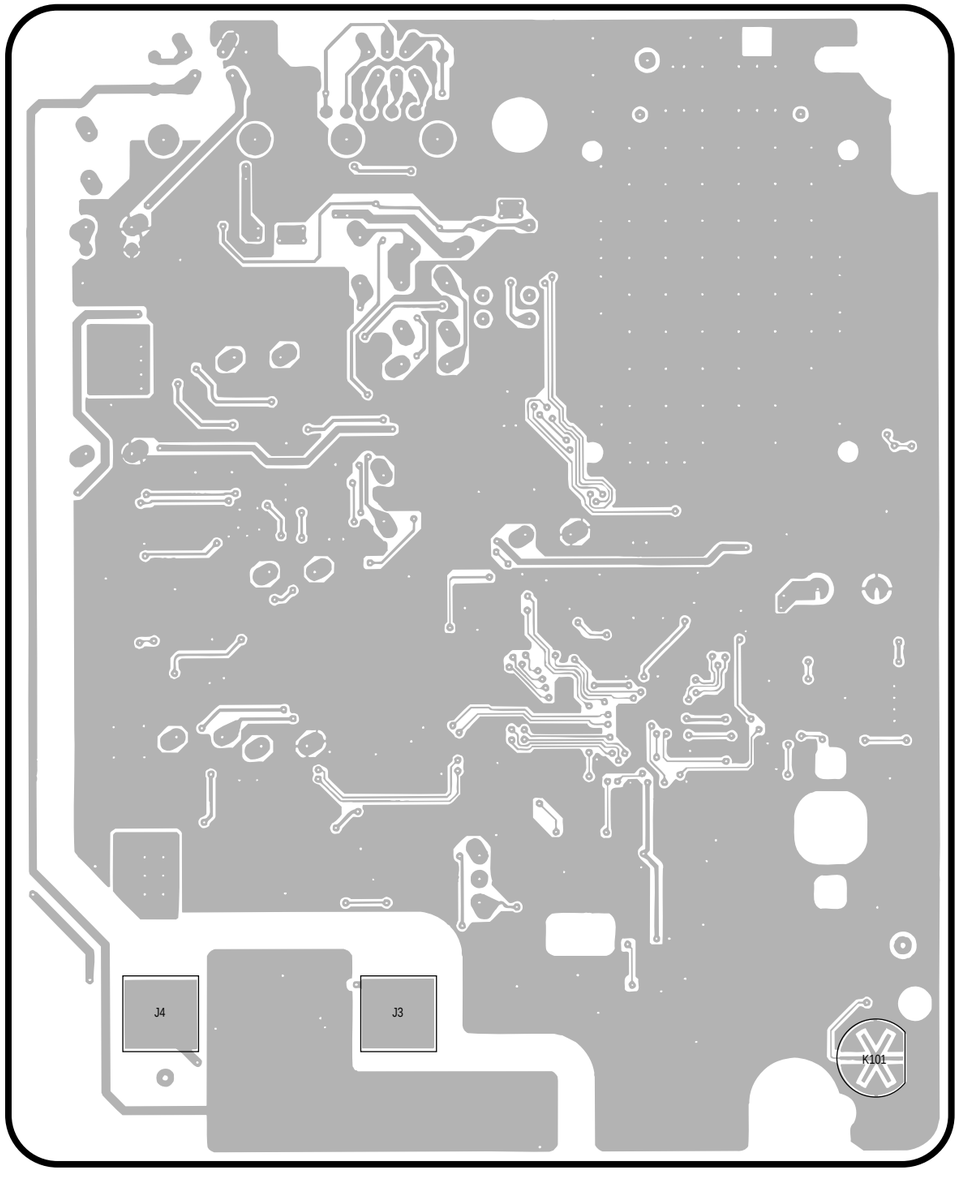
KX-TCD951GB/KX-TCD955GC

CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM (BASE UNIT)

(Component View)

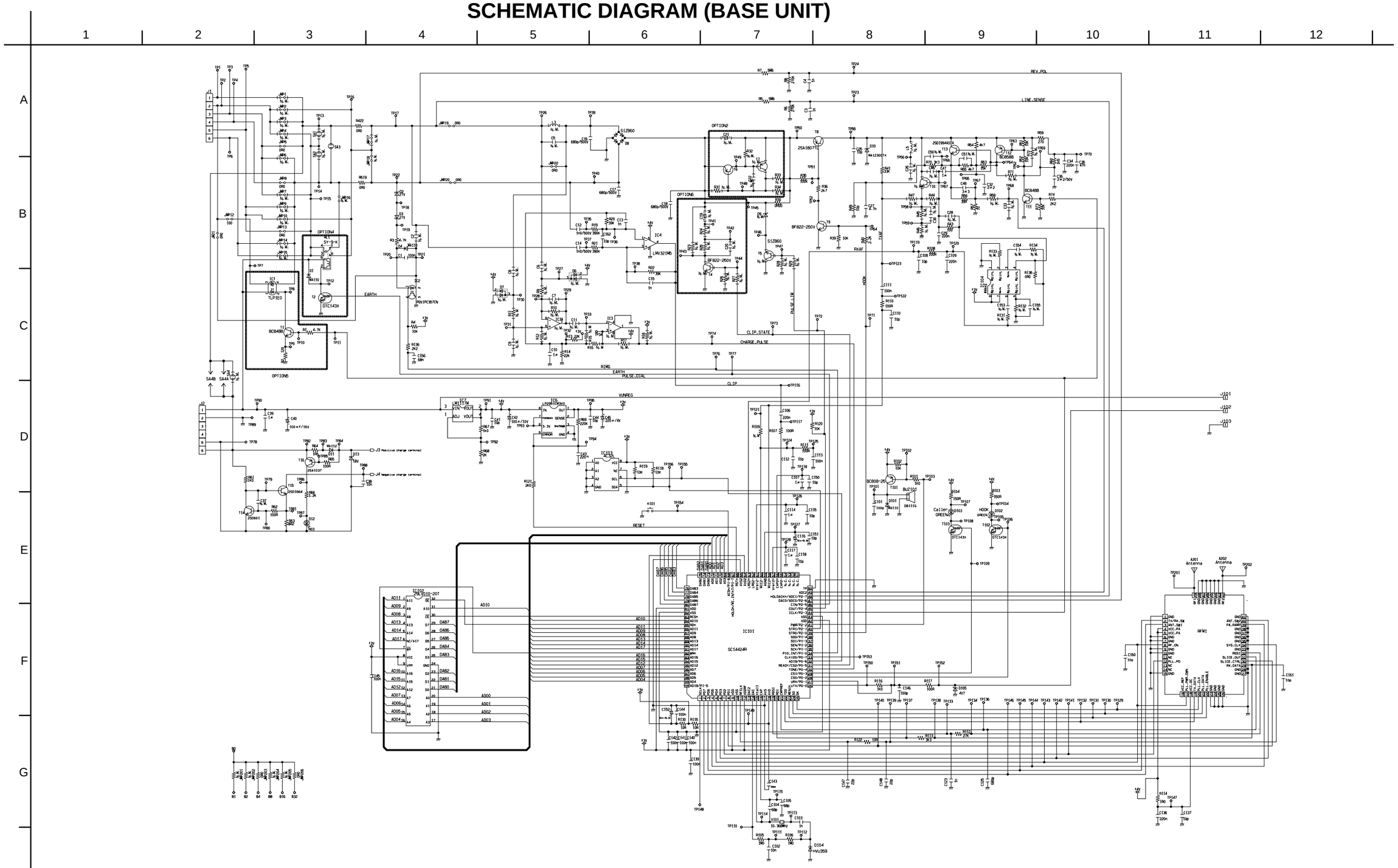


(Flow slder Side View)



KX-TCD951GB/KX-TCD955GC

SCHEMATIC DIAGRAM (BASE UNIT)



Note:

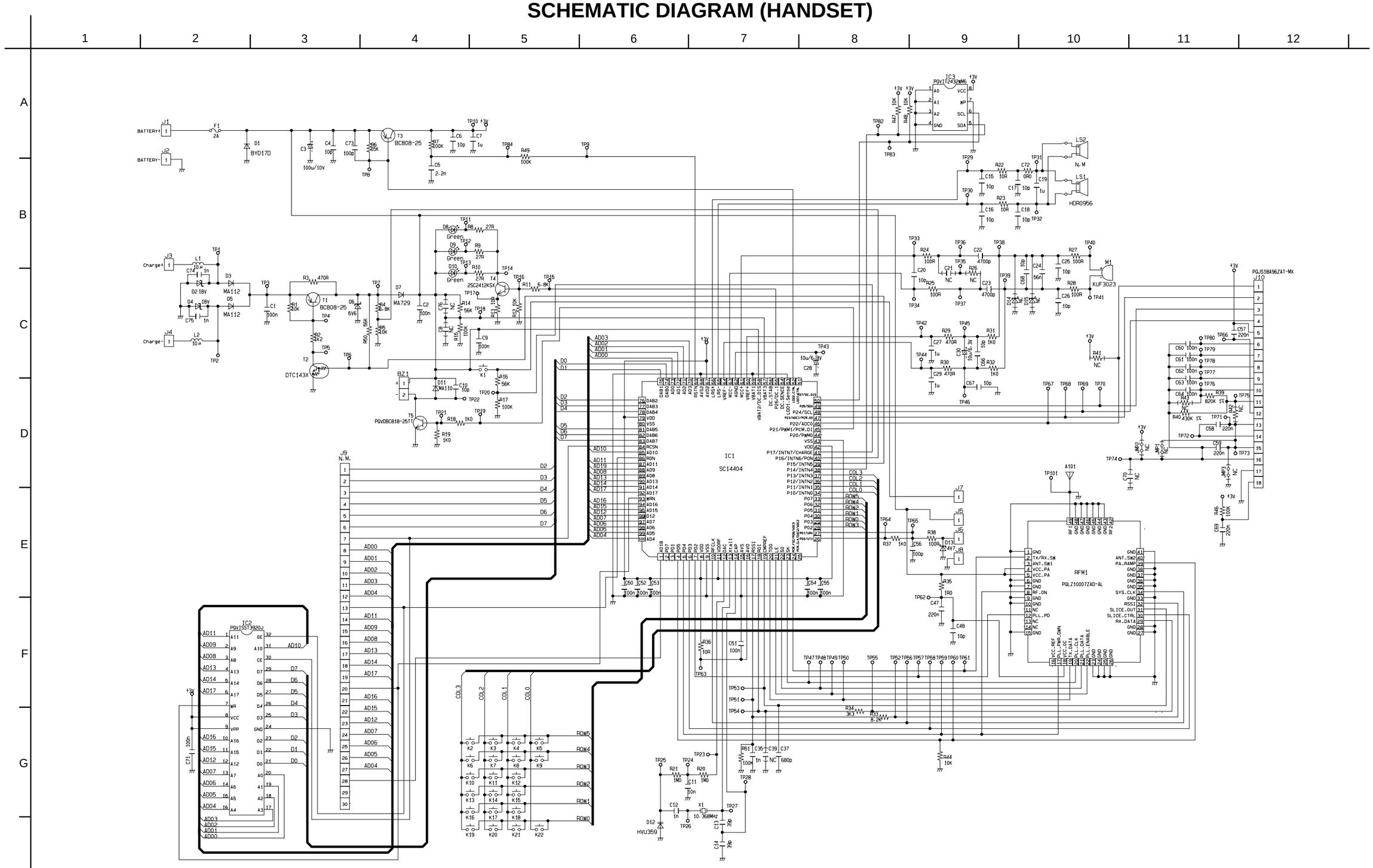
1. DC voltage measurements are taken with electronic voltmeter from negative voltage line.

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

This schematic diagram may be modified at any time with development of new technology.

KX-TCD951GB/KX-TCD955GC

SCHEMATIC DIAGRAM (HANDSET)



Note:

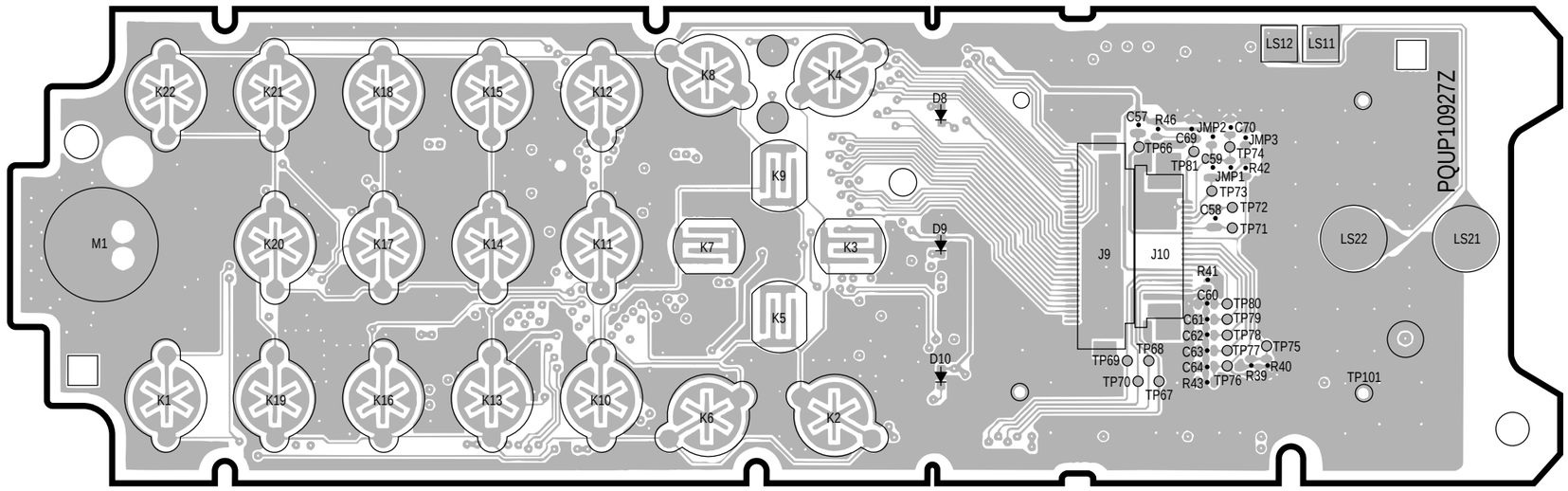
1. DC voltage measurements are taken with electronic voltmeter from negative voltage line.

This schematic diagram may be modified at any time with development of new technology.

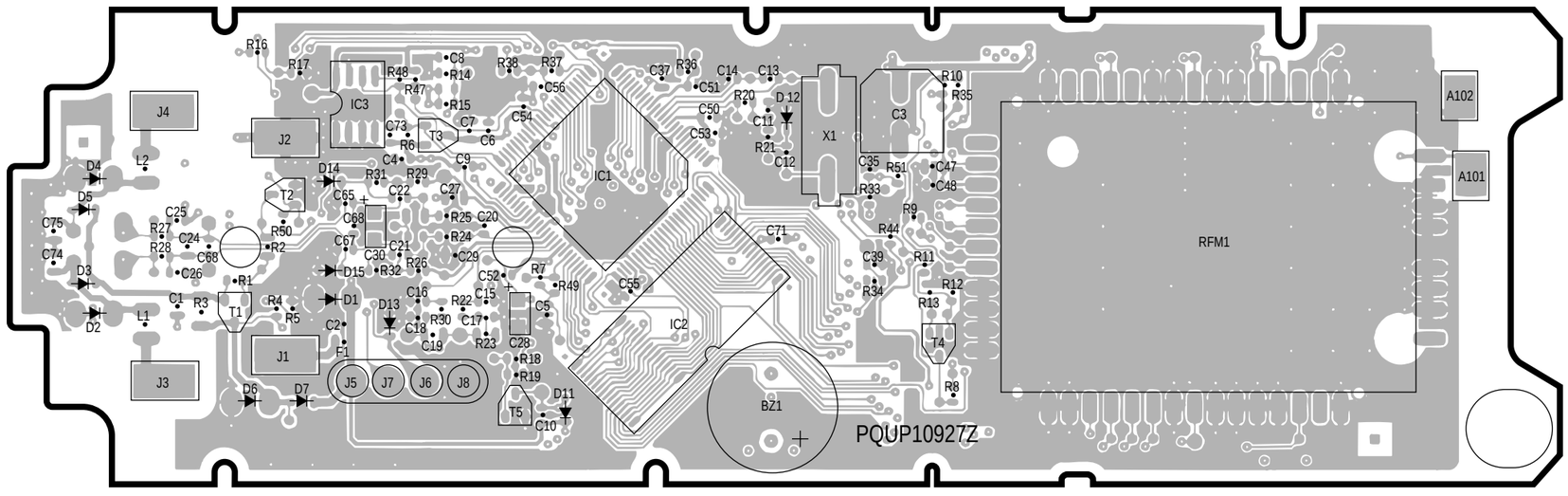
KX-TCD951GB/KX-TCD955GC

CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM (HANDSET)

(Component View)



(Flow slder Side View)



BLOCK DIAGRAM RF UNIT (BASE UNIT)

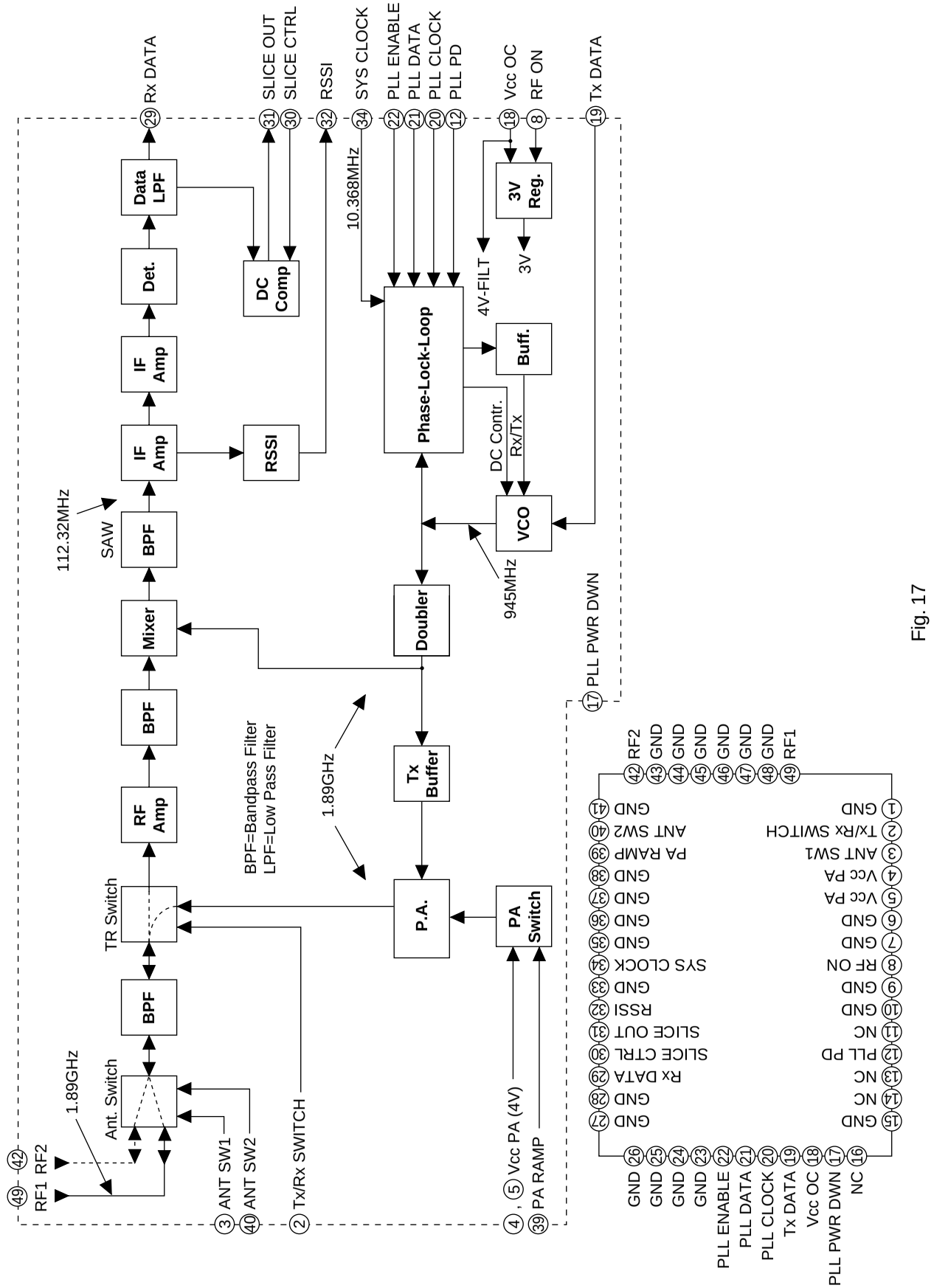


Fig. 17

KX-TCD951GB/KX-TCD955GC

CIRCUIT OPERATION (BASE UNIT)

1. R.F. SECTION (SEE BLOCK DIAGRAM Fig. 17)

BLOCK DIAGRAM BASEBAND SECTION AND LINE INTERFACE (BASE UNIT)

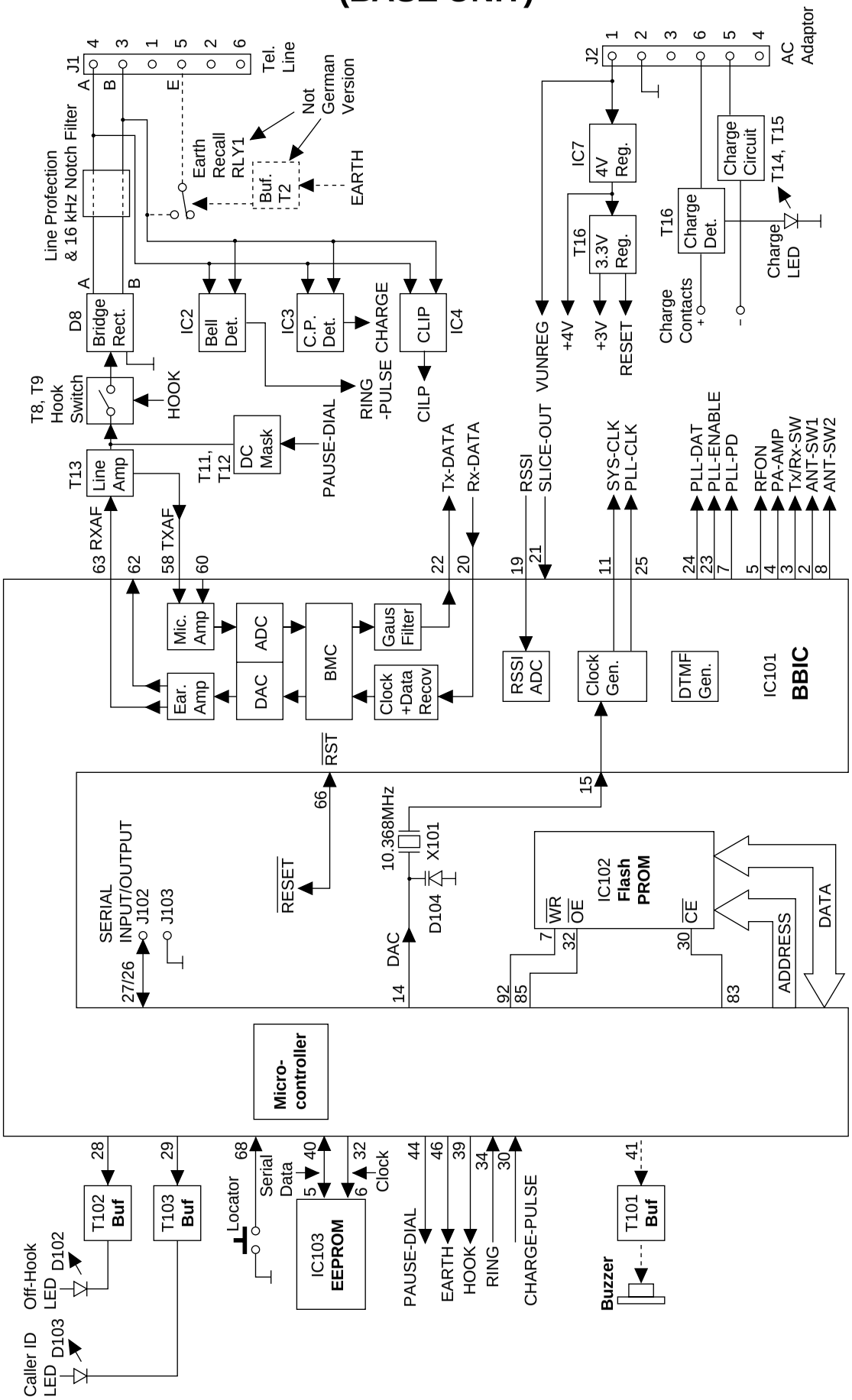


Fig. 18

Circuit Diagram

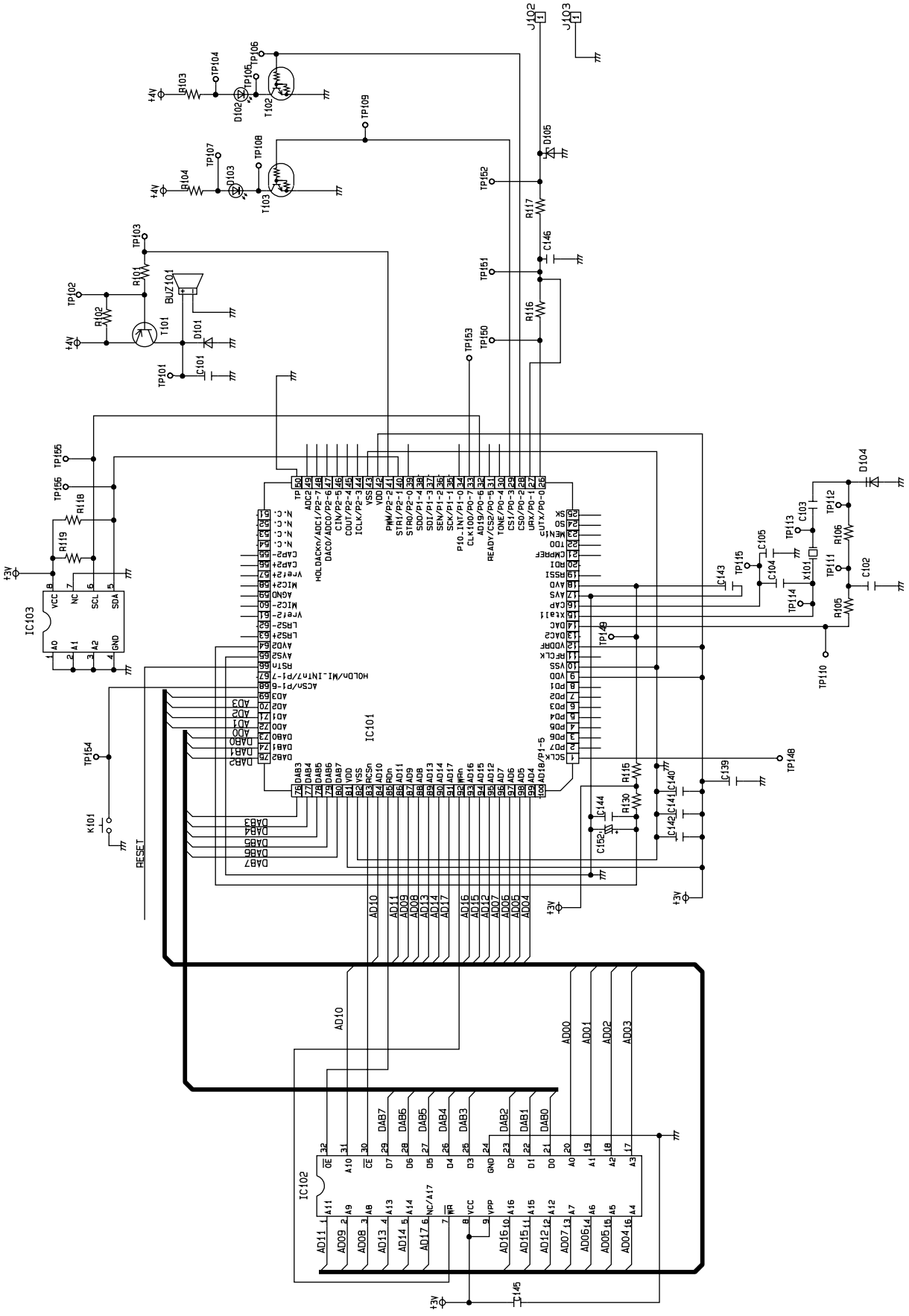


Fig. 19

Circuit Diagram

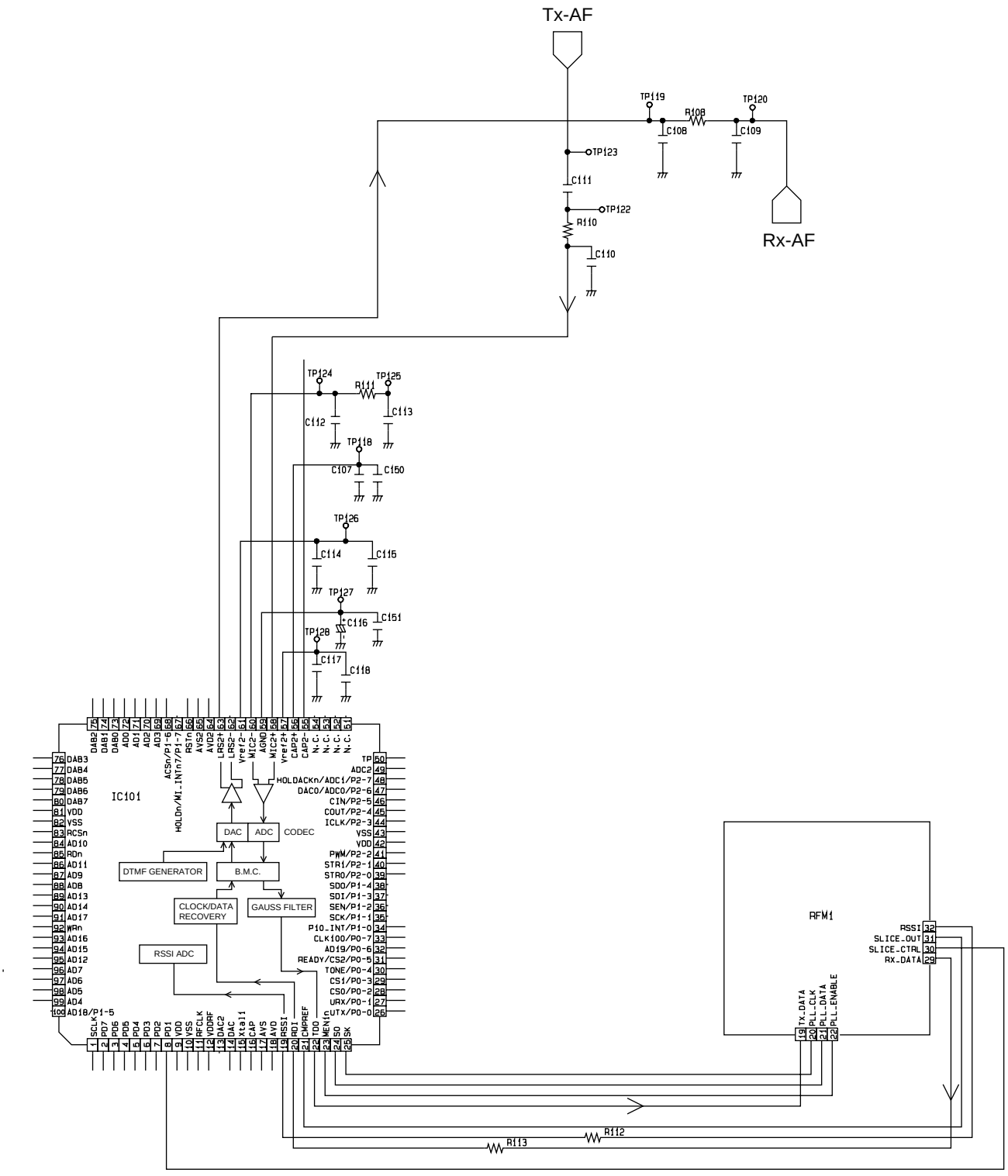


Fig. 20

2. THE LINE INTERFACE SECTION (SEE BLOCK DIAGRAM Fig. 18)

2.1 INTRODUCTION

This section consists of the telephone line interface, bell detector, charge-pulse detector, hook switch, pulse dialing circuits, audio circuits, DC mask & line impedance circuits, power supplies, and battery charger circuits.

2.2 TELEPHONE LINE INTERFACE (SEE Fig. 21)

The telephone line is connected (via 2 or 3 jumpers selected for country of destination) to a JMP19 and JMP20. Surge suppressor SA3 protects against excessive line voltages. Test points are TP14 (A), TP13 (B), TP21 (S) and TP15 (E). A 16 kHz notch filter L3, L5, C5 and C26 blocks the 16 kHz “charge pulse” signal from the rest of the line input circuitry.

Bridge rectifier D8 provides for lines of either polarity. The output of D8 is “Line +” (TP39) and “Line –” which is ground.

2.3 EARTH RECALL (SEE Fig. 21)

For countries that require Earth Recall facilities, relay RLY1 is provided to short the E line to the A or B lines. The relay is energized when transistor T2 is switched on by a high level on the **EARTH** control line from the BB-IC IC101. D1 will quench the large back-emf voltage that would otherwise occur across the relay coil when T2 turns off.

2.4 BELL DETECTOR (SEE Fig. 21)

The AC ringing signal is detected by optocoupler IC2, using its internal diode in conjunction with D4. DC from the line is blocked by C2. The other components D2, D3, and R3 reduce current and increase the circuit impedance in line with national requirements. When ringing is detected IC2 will turn on, and the RING line will be dragged to a low voltage.

Circuit Diagram

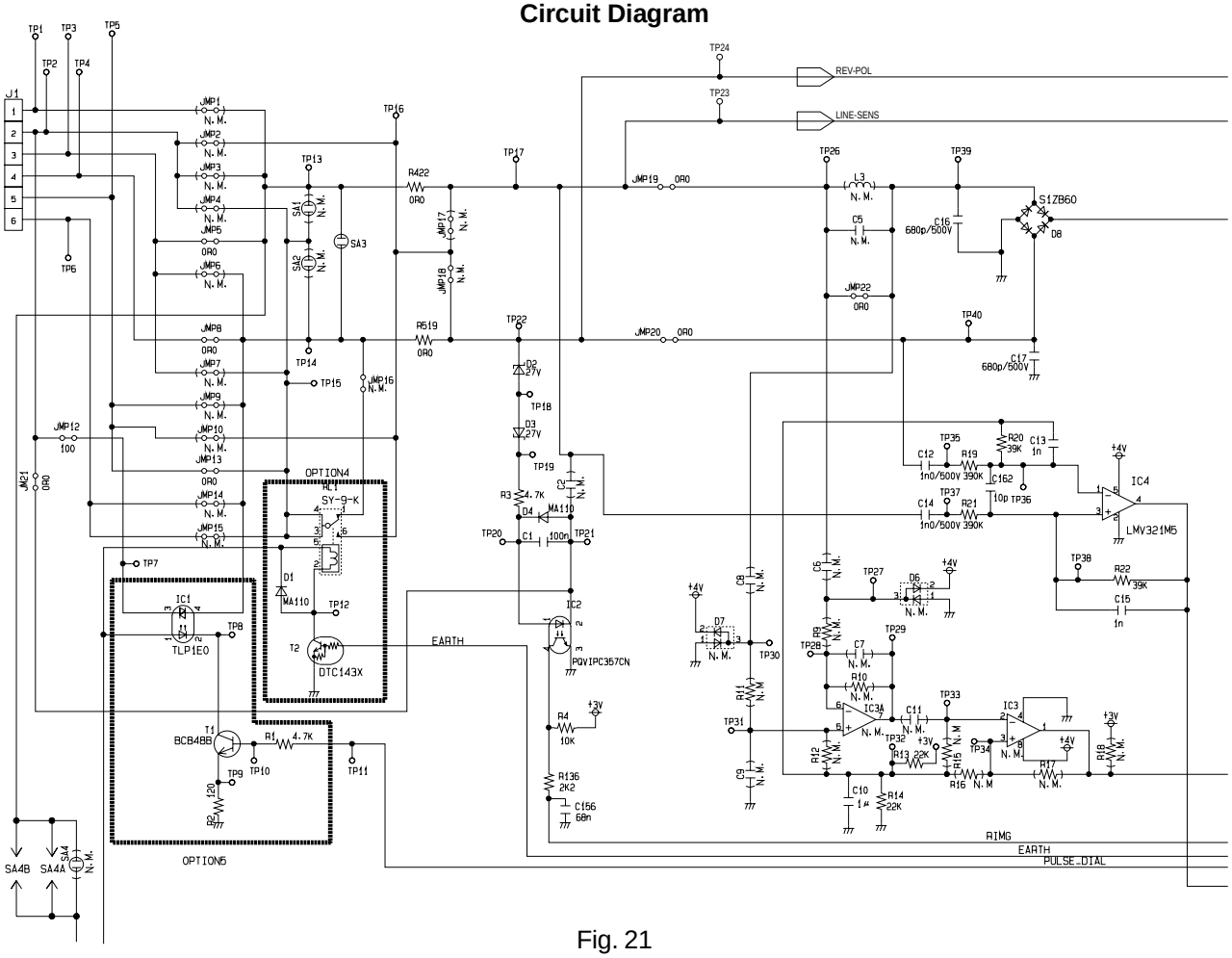


Fig. 21

CIRCUIT OPERATION (HANDSET)

1. THE BASE-BAND SECTION (SEE BLOCK DIAGRAM Fig. 25)

1.1 INTRODUCTION

The base-band section consists of a base-band integrated circuit (BBIC), a Flash PROM, an EEPROM, an LCD Display, a Microphone, an Earpiece, and power supply/battery management circuits.

1.2 THE BASE-BAND INTEGRATED CIRCUIT (BBIC)

The National SC14404 BBIC (IC1) is a CMOS device designed to handle all the audio, signal and data processing needed in a DECT handset. It contains two microprocessors - one general purpose - while the other "burst mode controller" takes care of DECT specific physical layer and radio section control.

The BBIC also contains the ADPCM transcoders, a low power 14 bit codec (ADC/DAC), various other ADC's, DAC's and timers, a UART for data communication with RF unit, a gaussian filter for the DECT GFSK modulation method, clock and data recovery circuits, a clock oscillator circuit, a battery management circuit, and a pair of gain controllable amplifiers for the microphone and earpiece. On some handset models, the Flash ROM will also be contained within the BBIC.

Circuit Diagram

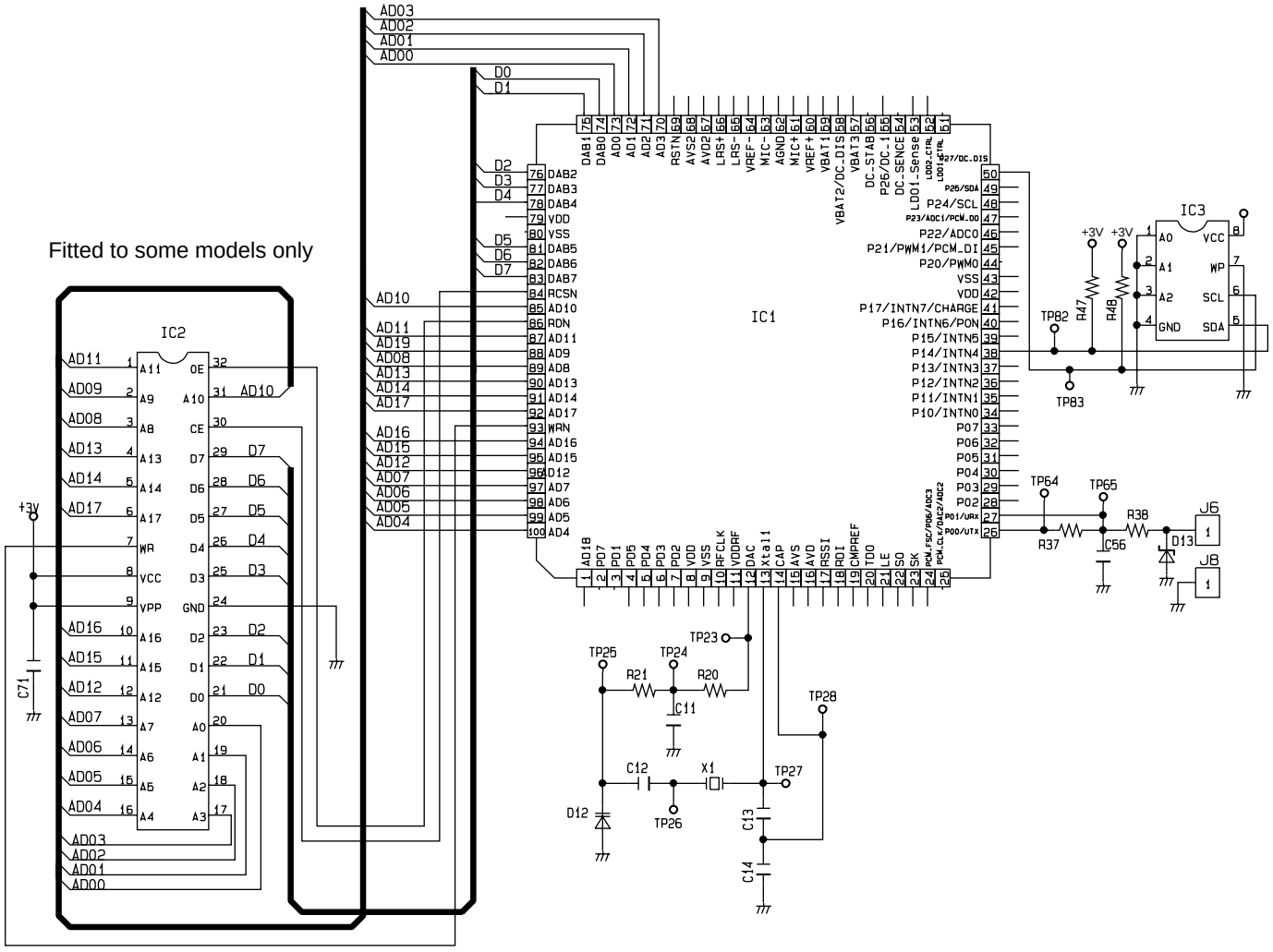


Fig.26

1.6 AUDIO PATH - TX AUDIO (SEE Fig. 28)

Balanced audio from the microphone (TP40 and TP41) enters the BBIC at pins 61 and 63. A balanced bias voltage for the ("electret" type) microphone is supplied by the BBIC from pins 60 and 64 via R31 and R32. This supply is de-coupled by R22, R27, C21, C28, and C22. RF de-coupling of the microphone signal is provided by R27, C25, R28, C26, R24, R25, and C20.

The microphone audio signals are coupled to the BBIC via C22 and C23, which provide some high pass filtering.

In the BBIC audio passes through the gain-controlled microphone amplifier, into the ADC part of the codec, where it is sampled and turned into digital data. The burst mode controller then processes this raw data (called the B-field) performing encryption and scrambling, adding the various other fields that go together to produce the GAP standard DECT frame, assigning to a time slot and channel etc. The data then passes through the gaussian filter to emerge on pin 20 as **TRADAT**.

1.7 AUDIO PATH - RX AUDIO (SEE Fig. 28)

Audio from the receiver **RECDAT** (TP54) enters the BBIC on pin 18 and passes through the clock recovery circuit. The burst mode controller separates out the B-field data, and performs de-encryption and de-scrambling as required. It then goes to the DAC part of the codec where data is turned back into analogue audio. The audio signal is amplified by the gain-controlled earpiece amplifier, and balanced audio is output on pins 65 and 66, and fed to the earpiece (TP31 and TP32). The leads feeding the earpiece are RF de-coupled by C15 to R22, C17, C16, R23, and C18. C19 provides low pass filtering.

Circuit Diagram

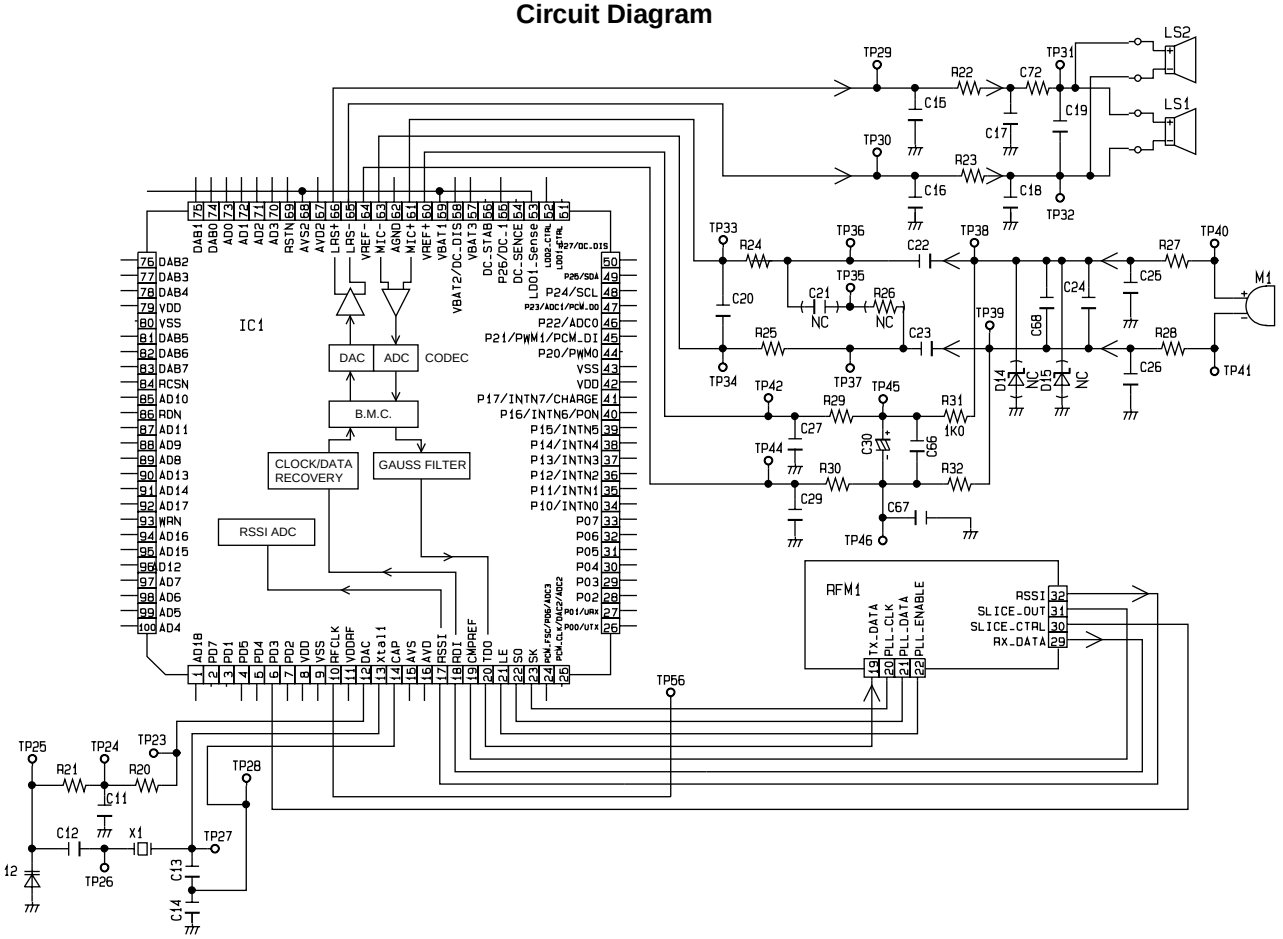


Fig. 28

Circuit Diagram

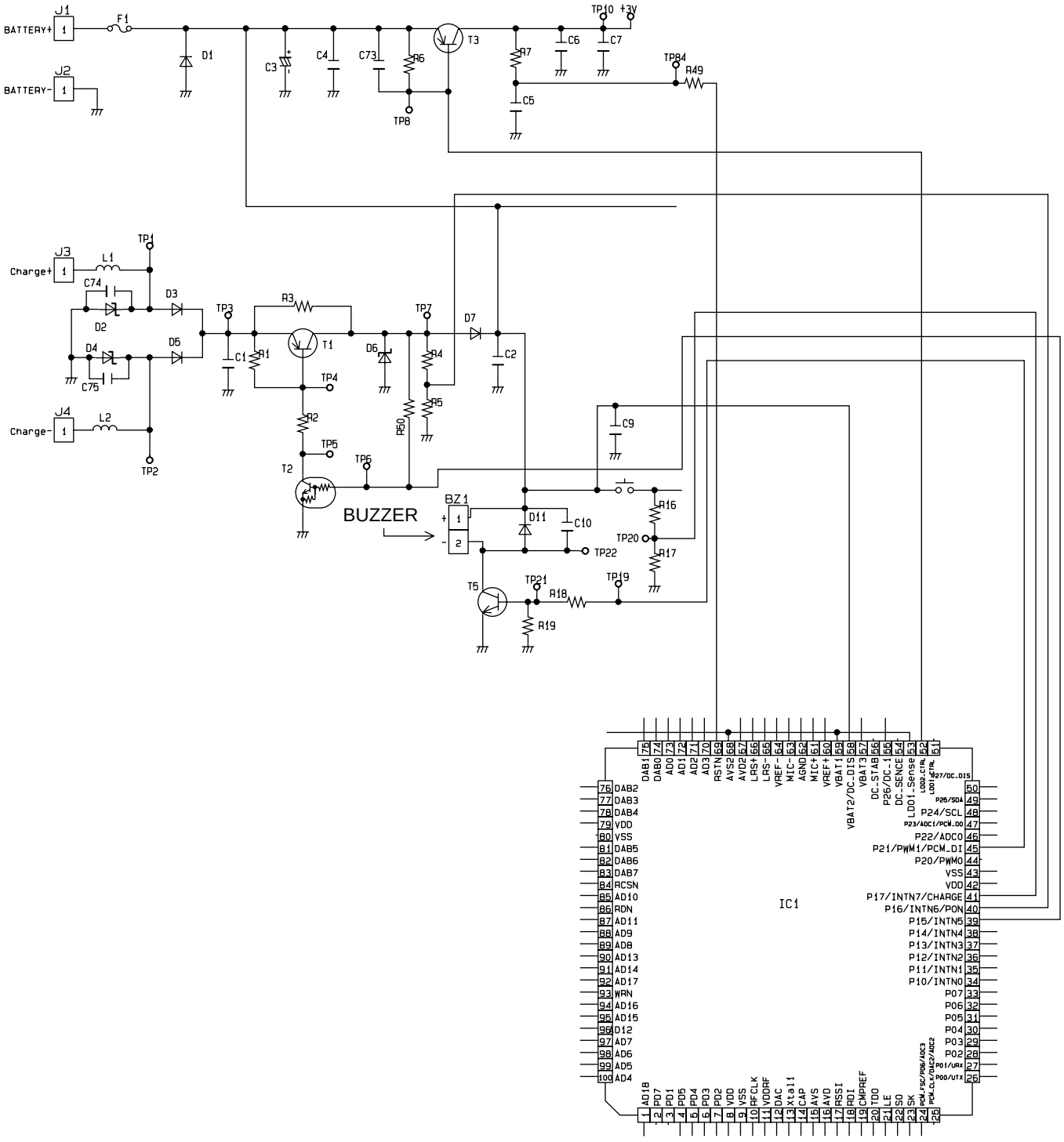


Fig. 30

OPERATION
MAKING CALLS

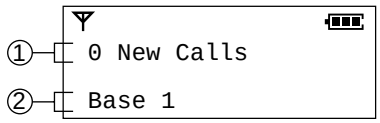
TURNING THE POWER ON

Press ⏻.

• After all possible configurations briefly appear, the display will change to the following. Then the handset is in the stand-by mode.
The current connected base unit number is displayed. (KX-TCD951GB only)

(KX-TCD951GB)

(KX-TCD955GC)



① The number of new Caller ID calls received.
② The current connected base unit number.

• You can choose whether to display the base unit number, handset number or no display in the stand-by mode by programming.

To turn the power OFF, press and hold ⏻ until a beep sounds.
• The display will go blank.
• The handset will not ring.

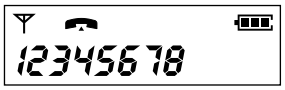
• Depending on the programming mode, you may not be able to turn the power off. First make sure the handset is set to the stand-by mode.

Make sure that the power is ON.

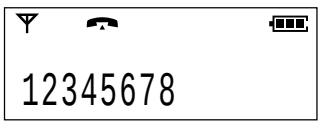
1 **Press 📞.**
• " 📞 " is displayed. (KX-TCD955GC only)

2 **Dial a phone number.**
• The dialed number is displayed.

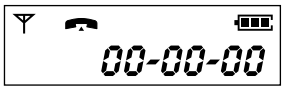
(KX-TCD951GB)

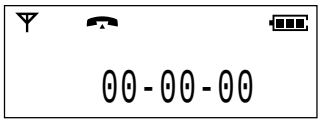


(KX-TCD955GC)



• After a few seconds, the display will start showing the length of the call.





3 **To hang up, press 📞 or place the handset on the base unit.**
• The handset will return to the stand-by mode.

TO DIAL AFTER CONFIRMING THE ENTERED NUMBER

With this feature you are able to confirm the entered number, before you start dialing.

1 **Enter a phone number.**
- The entered number is displayed.
- If you misdial, press [C] (◀). Digits are erased from the right.
- To cancel, press [C] (◀) firmly.

2 **Press [FLASH/RECALL].**
- " " is displayed. (KX-TCD955GC only)
- After a few seconds, the display will start showing the length of the call.

3 **To hang up, press [FLASH/RECALL] or place the handset on the base unit.**
- The handset will return to the stand-by mode.
- If " " flashes and an alarm tone sounds after pressing [FLASH/RECALL], move closer to the base unit. Then try again.
- You can choose whether to display the length of the call, call charge or phone number in the talk mode by programming.

TO REDIAL THE LAST NUMBER DIALLED

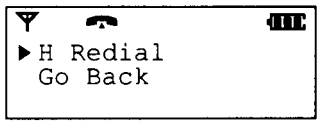
(KX-TCD951GB)

Press [FLASH/RECALL] ➡ [REDIAL].
- The last number dialed is automatically redialed.

(KX-TCD955GC)

1 **Press [FLASH/RECALL].**

2 **Press [F].**



3 **While "Redial" is at the arrow, press OK▶.**
- The last number dialed is automatically redialed.

TO REDIAL AFTER CONFIRMING THE NUMBERS IN REDIAL MEMORY

The unit automatically stores the last 10 numbers dialed into redial memory.

(KX-TCD951GB)

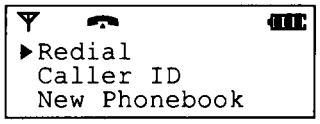
1 **Press [REDIAL].**
- The last number dialed is displayed.

2 **Select the desired number by pressing [REDIAL].**
- You can also search from the most recent to oldest number by pressing ▼. To search from the oldest to most recent number, press ▲.
- "▬▬▬▬▬▬▬▬▬▬" denotes the end of redial memory.
- To exit the list, press [C] firmly.

3 **Press [FLASH/RECALL].**
- The number is dialed automatically.

(KX-TCD955GC)

1 **Press [F].**



2 **While "Redial" is at the arrow, press OK▶.**
- The last number dialed is displayed.

3 **Press ▼ or ▲ until the desired number is displayed.**
- To search from the most recent to oldest number, press ▼. To search from the oldest to most recent number, press ▲.
- When the number at the top of the redial memory is displayed, two beeps will sound.
- To exit the list, press [C].

4 **Press [FLASH/RECALL].**
- The number is dialed automatically.

- If "No Stored Memory" is displayed in step 2, the redial memory is empty.
- If the same phone number is stored in the phonebook, the name will be displayed.

ANSWERING CALLS

Make sure that the power is ON, otherwise the handset will not ring.

(KX-TCD951GB)

1 If the handset is off the base unit, press [SP-PHONE].

- You can also answer a call by pressing any dialing button [0] to [9], [*] or [#].

OR

If on the base unit, just lift up.

- The handset and base unit will not ring if both ringer volumes are set to OFF.

(KX-TCD955GC)

If you subscribe to a Caller ID service, the calling party information will be displayed after the first ring. Please wait until the second ring to answer a call in order to view the Caller ID information.

1 Press [SP-PHONE].

- You can also answer a call by pressing any dialing button [0] to [9], [◄*] or [►#] **(—Any Key Talk).**

2 To hang up, press [SP-PHONE] or place the handset on the base unit.

- The handset and base unit will not ring if both ringer volumes are set to OFF.

SETTING THE RECEIVER VOLUME

TO SELECT THE RECEIVER VOLUME

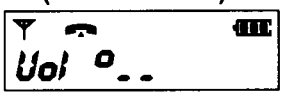
3 levels (HIGH, MEDIUM, LOW) are available. The factory preset is MEDIUM.

While talking, press ▼ or ▲ to select the desired level.

- The display shows the volume level.

Ex. LOW is selected.

(KX-TCD951GB)



(KX-TCD955GC)

- After a few seconds, the display will return to the length of the call.

OR

In the stand-by mode, proceed as follows.

1 Press [→].

2 Press ▼ or ▲ until " F6 " is displayed, then press [OK].

- The current level is displayed.

Ex. LOW is selected.

3 Press ▲ or ▼ to select the desired level.

4 Press [→].

1 Press [F].

2 Press ▼ or ▲ until the arrow points to "Program", then press OK►.

3 Press ▼ or ▲ until the arrow points to "Receiver Volume", then press OK►.

4 Press ▲ or ▼ to select the desired level.

5 Press OK►.

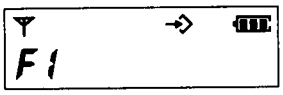
- The display will return to "Receiver Volume". To return to the stand-by mode, press [C] or wait for 60 seconds.

RINGER VOLUME

6 levels are available. The lowest level is 1. The highest level is 6. The factory preset is 3. When set to OFF, the handset will not ring.

(KX-TCD951GB)

1 Press [→].

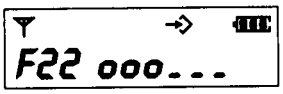


2 Press ▼ or ▲ until " F22 "is displayed.

3 Press [OK].

- The current volume is displayed and rings.

Ex. Level 3 is selected.



4 Press ▼ or ▲ to select the desired level.

- Each time you press a button, the selected volume is displayed and rings.
- To set to OFF, erase " o " by pressing ▼ until " bELL OFF " is displayed.

5 Press [→].

- A confirmation tone sounds and the display will return to the stand-by mode.
- When set to OFF, " bELL OFF " will be displayed.

(KX-TCD955GC)

1 Press [F].

2 Press ▼ or ▲ until the arrow points to "Program", then press OK▶.

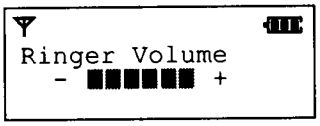
3 Press ▼ or ▲ until the arrow points to "Setting Handset", then press OK▶.

4 Press ▼ or ▲ until the arrow points to "Ringer Volume", then press OK▶.

- The current volume is displayed and rings.

5 Press ▼ or ▲ to select the desired level.

- Each time you press a button, the selected volume is displayed and rings.



- To set to OFF, erase "■ " by pressing ▼ until "OFF" is displayed.

6 Press OK▶.

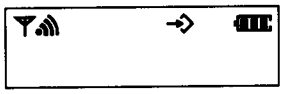
- A confirmation tone sounds.
- The display will return to "Ringer Volume". To return to the stand-by mode, press [C] or wait for 60 seconds.
- When set to OFF, "Ringer Off" will be displayed.

SELECTING THE BASE UNIT RINGER VOLUME

3 levels (HIGH, MEDIUM, LOW) are available. The factory preset is MEDIUM. When set to OFF, the base unit will not ring.
Make sure that the power is ON and the unit is in the stand-by mode.

(KX-TCD951GB)

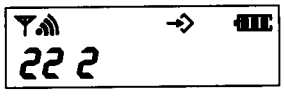
1 Press [→] then [INT'].



2 Press [2] TWICE.

- The current volume is displayed.
  1: LOW **2:** MEDIUM **3:** HIGH **0:** OFF

Ex. MEDIUM is selected.



4 Press the desired volume level [1], [2], [3] or [0].

- Each time you press a button, the selected volume is displayed and rings.

5 Press [→].

- A confirmation tone sounds and the display will return to the stand-by mode.

(KX-TCD955GC)

1 Press [F].

2 Press ▼ or ▲ until the arrow points to "Program", then press OK▶.

3 Press ▼ or ▲ until the arrow points to "Setting Base", then press OK▶.

- "Input Command" is displayed.

4 Press [2] TWICE.

- The current volume is displayed.
  1: LOW **2:** MEDIUM **3:** HIGH **0:** OFF

5 Press the desired volume level [1], [2], [3] or [0].

- Each time you press a button, the selected volume is displayed and rings.

6 Press OK▶.

- A confirmation tone sounds.
- The display will return to "Setting Base". To return to the stand-by mode, press [C] or wait for 60 seconds.

- You can exit the programming mode any time by pressing [C].