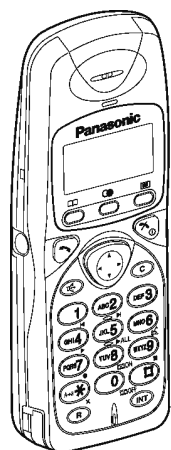
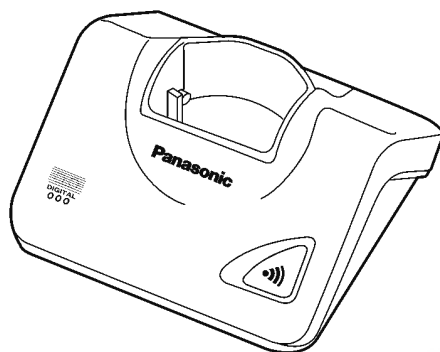


Service Manual

Telephone Equipment



(HANDSET)



(BASE UNIT)

KX-TCD725AXM

Digital Cordless Phone

Metallic Grey Version

(for Eastern Asia)

SPECIFICATION

Standard:	DECT=Digital Enhanced Cordless Telecommunications GAP=Generic Access Profile	Battery life, Handset (if batteries are fully charged):	Stand-by: Up to 100 hours (Ni-Cd) Talk: Up to 10 hours (Ni-Cd)
Number of channels:	120 Duplex Channels	Operating conditions:	5° - 40°C, 20 - 80% relative air humidity (not condensing)
Frequency range:	1.88 GHz to 1.9 GHz	Dialing modes:	Pulse/Tone
Duplex procedure:	Time Multiplex, 10 ms frame length	Recall button (set default):	Flash (80 ms)
Channel Spacing:	1728 kHz	for PBX:	Flash (700 ms)
Bit rate spacing:	1152 kbit/s	Recall button (option):	Earth (400 ms/1300 ms)
Modulation:	GFSK	Dimensions, Base unit:	about 104.5 mm x 123.2 mm x 58 mm (L x W x D)
Voice coding:	32 kbit/s	Dimensions, Handset:	about 136 mm x 47 mm x 31.5 mm (L x W x D)
Operation range:	Up to 300 m outdoors, up to 50 m indoors	Weight, Base unit:	about 140 g
Analog telephone connection:	Telephone Line / PBX	Weight, Handset:	about 70 g
Power source:	AC Adaptor 230 V ~ /50 Hz	Telephone line cord length:	about 2.2 m
Power consumption, Base unit:	5 VA	AC adaptor cord length:	about 1.9 m
		Connection jack:	
		Telephoneline cord:	RJ11 to RJ11. 2-wire cable.
		AC adaptor cord:	Low voltage d.c. jack
		AC adaptor plug:	Euro jack

Design and specification are subject to change without notice.

WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

When you note the serial number, write down all 11 digits. The serial number may be found on the bottom of the unit.

FOR SERVICE TECHNICIANS

ICs and LSIs are vulnerable to static electricity.

When repairing, the following precautions will help prevent recurring malfunctions.

1. Cover plastic parts boxes with aluminum foil.
2. Ground the soldering irons.
3. Use a conductive mat on worktable.
4. Do not grasp IC or LSI pins with bare fingers.

CAUTION

Danger of explosion if battery is incorrectly replaced.

Replace only with the same or equivalent type recommended by the manufacturer.

Dispose of used batteries according to the manufacturer's Instructions.

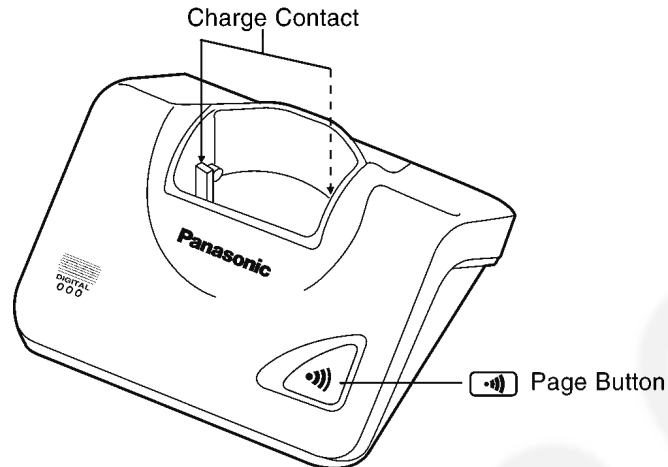
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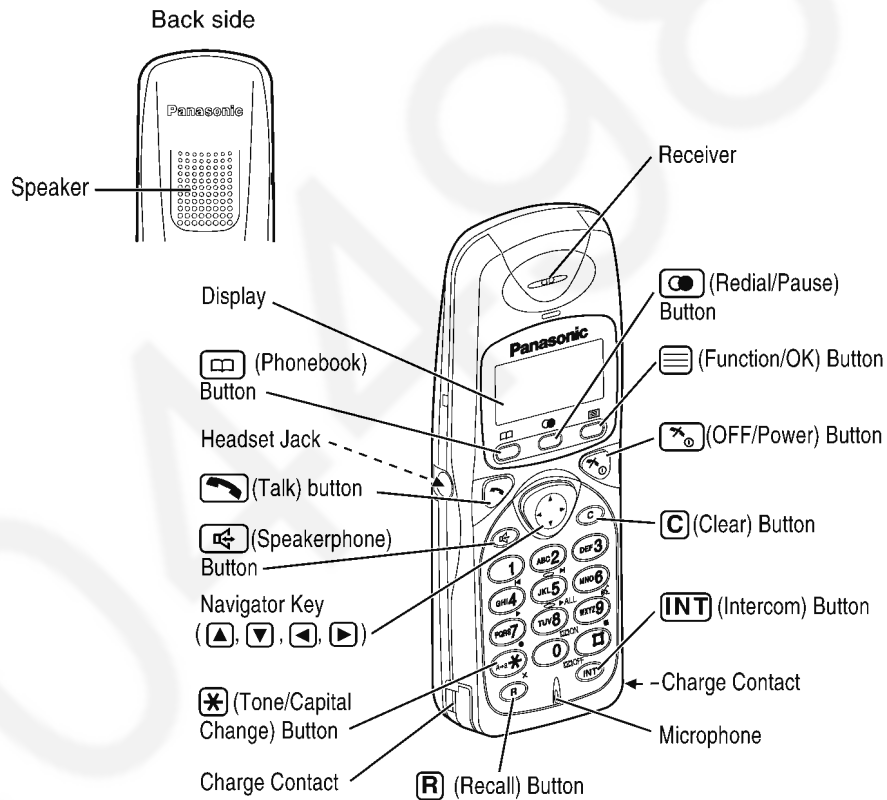
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1 LOCATION OF CONTROLS

1.1. Base Unit



1.2. Handset



2 Displays

2.1. Handset Display



2.2. Icons

 The in-range icon indicates that the handset is in range of the base unit. It flashes when the handset is out of range.

 The page/intercom icon is displayed when paging or using the intercom. It flashes when another unit pages the handset.

 The talk icon is displayed when making or answering calls. It flashes when an outside call is being received.

 The call prohibition icon is displayed when call prohibition mode is set to on.

 The phonebook icon is displayed when storing or viewing caller information into the phonebook.

 The battery icon indicates the battery strength.

2.3. Characters/Symbols

P Pause is selected while dialling

↳ Direct call mode is ON.

[A] Answering system is ON

F **[R]** is pressed while dialling.

[X] Key lock is ON.

3 DISASSEMBLY INSTRUCTIONS

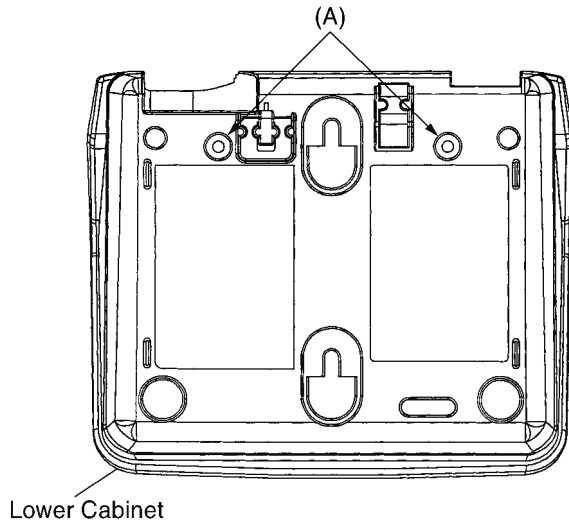


Fig. 1

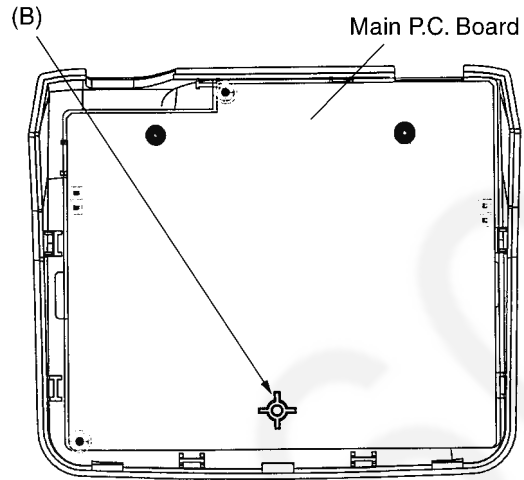


Fig. 2

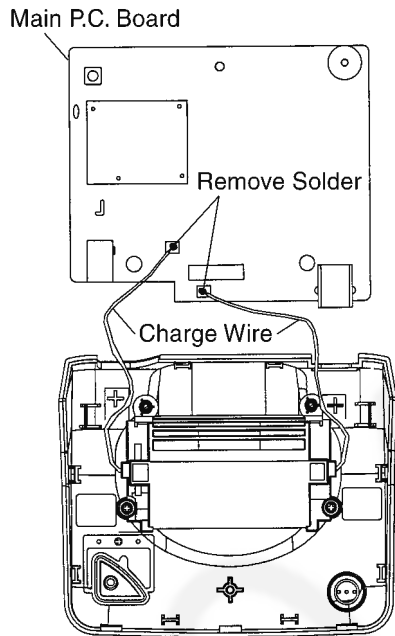


Fig. 3

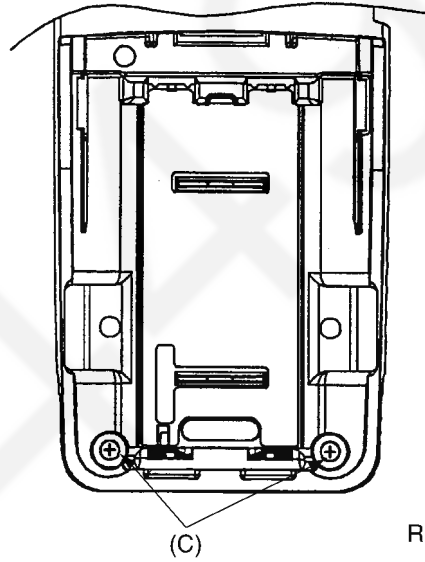


Fig. 4

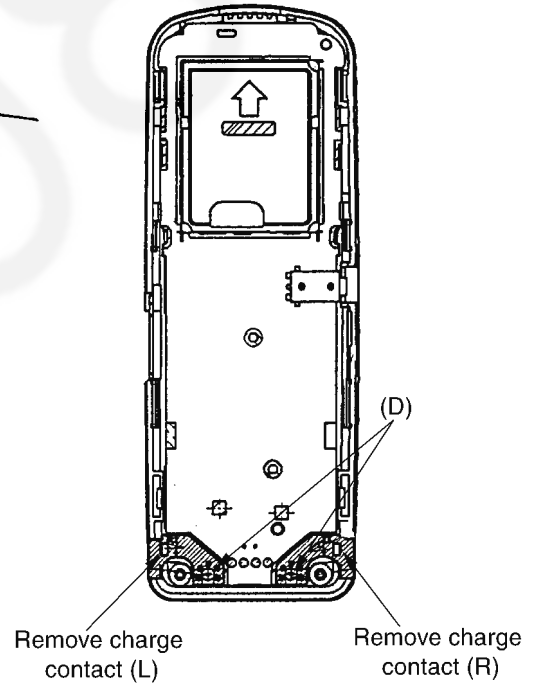
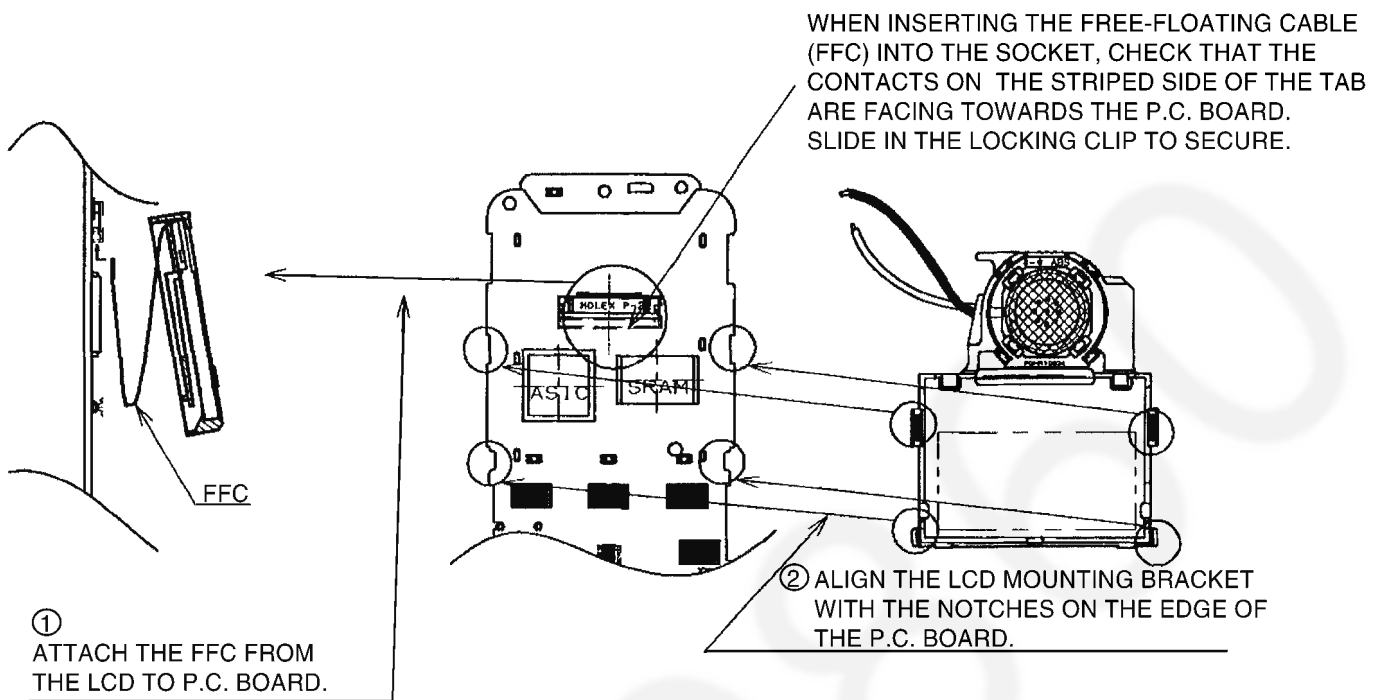


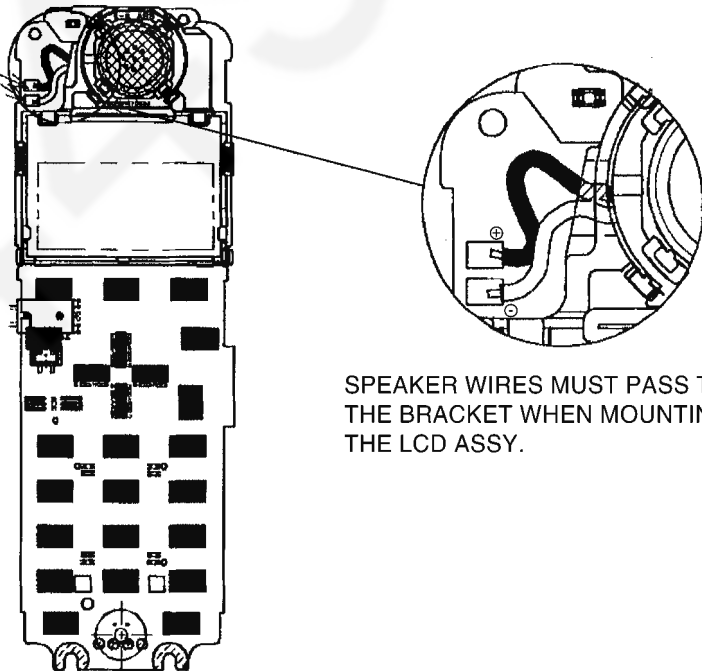
Fig. 5

Shown in Fig.-	To Remove	Remove
1	Lower Cabinet	Screws (2.6 × 10).....(A) × 2
2	Main P.C.B of base	Screw (2.6 × 10).....(B) × 1
3	Main P.C.B of base	Charge wire solder
4	Rear Cabinet of handset	Screws (2 × 8).....(C) × 2
5	Main P.C.B of handset	Screws (2 × 6).....(D) × 2

3.1. Assembly the LCD to P.C. Board (Handset)



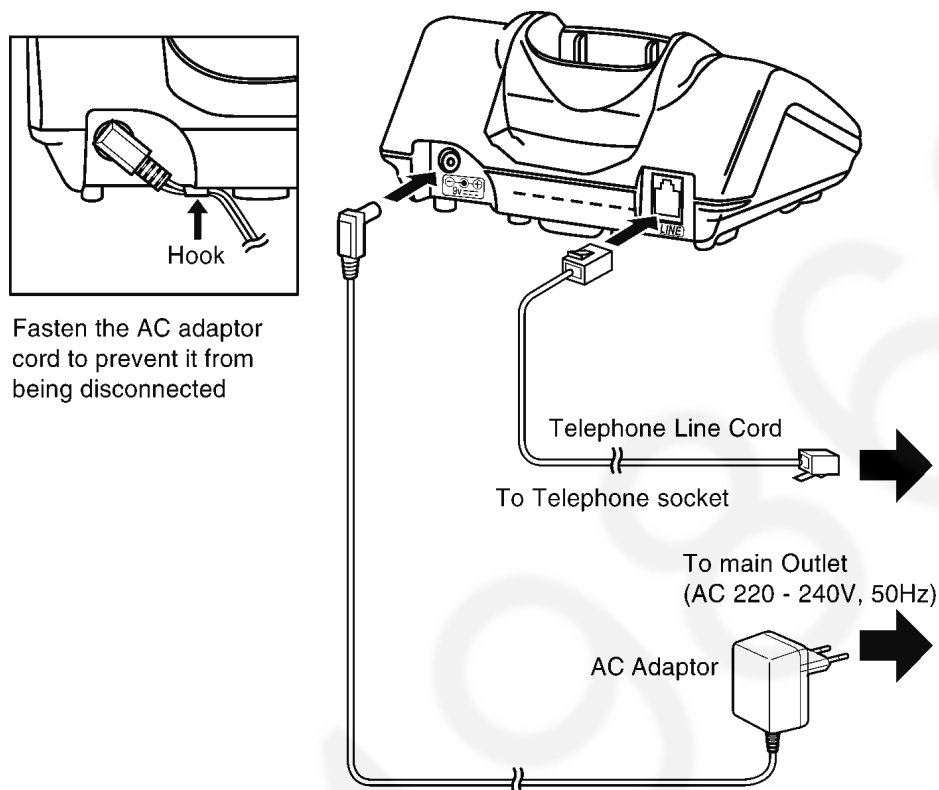
③ SOLDER THE SPEAKER WIRES TO THE PADS



4 SETTINGS

4.1. Connections

Plug in the AC Adaptor and the telephone line cord to the rear of the unit. Then connect the cord as shown.



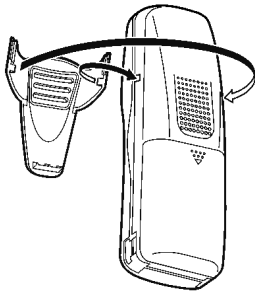
USE ONLY WITH Panasonic AC ADAPTOR PQLV1CEZ.

- The AC Adaptor must remain connected at all times. (It is normal for the adaptor to feel warm during use.)
- This telephone has a single terminal which must be connected to an analog line with a RJ11 connector.
- If your unit is connected to a Telephone line or PBX which does not support Caller ID services, you cannot access those services.
- The telephone will not work during a power failure. We therefore recommend you use a standard telephone and automatic change-over switch to connect this Digital Cordless Phone to the line. Your Panasonic Sales Shop can offer you more information about connection possibilities.

4.2. Using the Belt Clip

You can hang the handset on your belt or pocket using the belt clip.

To attach the belt clip



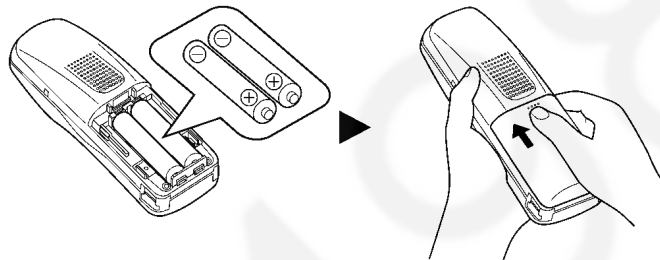
To remove the belt clip



4.3. Batteries

4.3.1. Installing the Batteries in the Handset

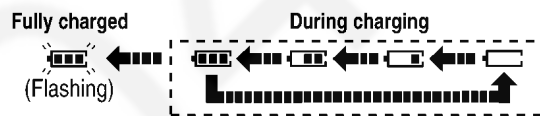
Install the batteries as shown, then install the handset cover.



- If the rechargeable batteries are not inserted correctly, the handset will not work.

4.3.2. Battery Charge

At the time of shipment, the batteries are not charged. To charge, place the handset on the base unit. Please charge the batteries for about **15 hours** before initial use. During charging the battery icon is as shown below

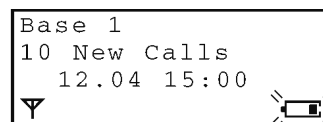


You can check the present battery strength on the display

Battery strength	Fully charged	High	Medium	Low	Need to be charged
Battery icon	 (Flashing)				 (Flashing)

4.3.3. Recharge

When “” flashes or the unit beeps every 15 seconds, recharge the batteries.



4.3.4. Battery Information

After your batteries are fully charged, battery life depends on its type and usage condition.

	Approx. Ni-MH battery life (Included)	Approx. Ni-Cd battery life (Optional) *
While in use (Talk)	Up to about 20 hours	Up to about 10 hours
While not in use (Standby)	Up to about 200 hours	Up to about 100 hours

- Battery life may be shortened depending on usage conditions, such as:
 - when viewing the Caller ID Caller List or phonebook
 - when talking in speakerphone mode
 - ambient temperature.
- **Clean the handset and the base unit charge contacts with a soft, dry cloth. Clean if the unit is subject to grease, dust or high humidity, otherwise the batteries may not be charged properly.**
- If the batteries are fully charged, you do not have to place the handset on the base unit until "■" flashes. This will maximise the battery life.
- The batteries cannot be overcharged.

* Nickel Cadmium (Ni-Cd) rechargeable batteries (AA size) are available.

If you replace the batteries with Ni-Cd batteries, battery type selection on the handset programming must be changed to Ni-Cd.

5 OPERATIONS

This section is intended to provide a basic overview for KX-TCD725AXM.

For a full explanation, refer to the Operating Instructions.

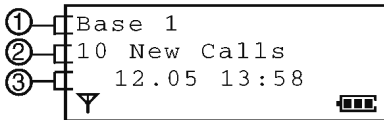
5.1. Turning the Power ON/OFF

To turn the power ON

Press and hold .

- After all possible configurations briefly appear, the display will change to the standby mode. A beep sounds.

Standby mode

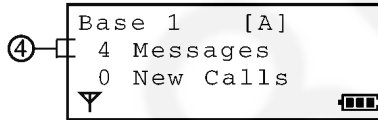


To turn the power OFF

Press and hold  until a beep sounds.

- The display will go blank.
- The handset will not ring.
- A beep sounds.

- If incoming/memo message(s) is/are recorded, the standby mode will be shown as below



- ① The current connected base unit number: You can select whether to display the base unit number, handset number or no display in the standby mode by programming.
- ② The number of new Caller ID calls received.
- ③ The current date and time.
- ④ The number of recorded incoming/memo message: If new incoming/memo message(s) is/are recorded, ④ will flash. When memory is full, ④ will flash faster.

5.2. Making a Call

Make sure that the power is ON, and the unit is in the standby mode.

Press  then dial a phone number.

- After a few seconds, the display will start showing the length of the call.
- If you misdialed, press  and start over again.
- The dialed number is automatically stored into the redial list.

5.3. Answering Call

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

Press  or any dialing button,  to , ,  or  —Any Key Answer.

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

5.4. Terminating a Call

Press  or place the handset on the base unit.

- The handset will returned to the standby mode.

5.5. Summary of Programmable Function

5.5.1. Handset

You can program the following function items **using the handset near the base unit**.

Make sure that the power is ON, and the unit is in the standby mode.

<Standby mode>

Base 1
2 New Calls
03.08 21:06

Press .

<Function menu>

New Phonebook
▶ Setting Handset
Setting Base

- If new incoming/memo message(s) is/are recorded, the function menu will show as follows.

Play New Msg
New Phonebook
Setting Handset
Setting Base

Press .

<Function menu>

Time Alarm

Press .

▶ Set Alarm Time To set the alarm time
Alarm ON/OFF To set the alarm ON/OFF

Ringer Option

Press .

▶ Ringer Volume To select the handset ringer volume
Ext Ring Type To select the ringer type for external call
Int Ring Type To select the ringer type for internal call
Paging Type To select the ringer type for paging
Alarm Type To select the ringer type for time alarm
Private Ring To select the ringer type for private category

Tone Option

Press .

▶ Key Tone ON/OFF To set the key tone ON/OFF
Call Waiting To set the call waiting tone ON/OFF
Range Alarm To set the range warning alarm ON/OFF
Battery Alarm To set the battery low alarm ON/OFF

Display Option

Press .

▶ Standby Display To select the standby mode display
Talk Display To select the talk mode display
Select Language To select the display language
Backlight Color To select the display backlight color
Private Color To select display backlight color for private category

Call Option

Press .

▶ Call Bar To set the call prohibition mode ON/OFF
Direct Call No. To set the direct call number
Direct ON/OFF To set the direct call mode ON/OFF

Other Option

Press .

▶ Change Hset PIN To change the 4-digit handset PIN^{*1}
Auto Talk To set the auto talk feature ON/OFF
Battery type To select the battery type

Registration

Press .

▶ Register H/set To register a handset in the base unit
Cancel Base To cancel the base unit

Select Base To select the base unit access

Reset Handset To clear the handset settings

*1 See **Setting a 4-digit Handset PIN** (P.13) for more details.

5.5.1.1. Setting a 4-digit Handset PIN

You can program a 4-digit handset PIN (Personal Identification Number). The factory preset is 0000. Changing the PIN may prevent the unauthorised use of your unit by another person. You need to enter the 4-digit handset PIN for the following functions.

- Set the call prohibition mode ON/OFF.
- Reset Handset Settings.
- Cancel the base unit.

Make sure that the power is ON, and the unit is in the standby mode.

- 1 Press .
- 2 Press  or  until the arrow points to “Setting Handset”, then press .
- 3 Press  or  until the arrow points to “Other Option”, then press .
- 4 While the arrow is at “Change Hset PIN”, press .

Enter Old PIN	:----
	

- 5 Enter the current 4-digit handset PIN.*¹
The factory preset is 0000.

- 6 Enter the new 4-digit handset PIN TWICE.

If you misdial, press . Digits are erased from the right. To erase all digits, press and hold .

1st	Enter New PIN	:----
		
2nd	Verify New PIN	:----
		

A beep sounds.

To return to the standby mode, press  or wait for 60 seconds.

If 5 beeps sound in step 5, the entered 4-digit handset PIN is incorrect. Enter the correct PIN.

*1 If the current PIN is forgotten, press      and you will be able to enter new PIN.

5.5.2. Base Unit

You can select and execute the following functions by pressing direct command as follows without programming.

Make sure that the power is ON, and the unit is in the standby mode.

Press . Press  or  until the arrow points to "Setting Base", then press .

"Input Command" is displayed.*¹

<Direct command>



Press  , 4-digit base unit PIN, then 	To select the all handsets ringer mode
Press  , 4-digit base unit PIN, then 	To select the selected handset(s) ringer mode
Press  , 4-digit base unit PIN, then 	To select the selected then all handsets ringer mode
Press  then 	To select the base unit ringer volume
Press  , 4-digit base unit PIN, then 	To select the tone/pulse dialing mode
Press  , 4-digit base unit PIN, then 	To select the flash/earth mode
Press  , 4-digit base unit PIN, then 	To select the pause timing
Press  , 4-digit base unit PIN, then 	To store the exchange code (AKZ)
Press  , 4-digit base unit PIN, then 	To store the main exchange code (HAKZ)
Press  then 4-digit base unit PIN* ²	To change the 4-digit base unit PIN* ²
Press  then 4-digit base unit PIN	To set the call restriction
Press  then 4-digit base unit PIN	To cancel the handset registration in the base unit
Press  then 	To clear the total charge
Press  then 	To check the total charge
Press  then 	To store the charge rate
Press  , 4-digit base unit PIN, then 	To store the carrier code
Press  , 4-digit base unit PIN, then 	To store the area code
Press  , 4-digit base unit PIN, then 	To set the relating area code(s) to a carrier code
Press  then 4-digit base unit PIN	To reset the base unit settings
Press 	To set the date/time
Press  then 	To set the remote code
Press  then 	To select the number of rings
Press  then 	To select the caller's recording time
Press  then 	To set the greeting monitor function ON/OFF

*1 If any key is not pressed over 60 seconds, the display will return to "Setting Base".

*2 See **Setting a 4-digit Base Unit PIN** (P.15) for more details.

5.5.2.1. Setting a 4-digit Base Unit PIN

You can program a 4-digit base unit PIN (Personal Identification Number). The factory preset is 0000. Changing the PIN may prevent the unauthorised use of your unit by another person.

You need to enter the 4-digit base unit PIN when using the following functions.

- Ringer Mode Selection
- Selecting the Tone/Pulse Dialling Mode
- Selecting Flash/Earth Mode
- Selecting the Pause Timing
- Call Restriction
- Cancelling a Handset Registration in the Base Unit
- Reset the Base Unit Settings

Make sure that the power is ON, and the unit is in the standby mode.

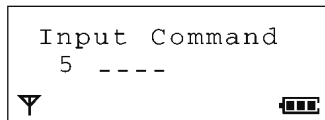
1 Press .

2 Press  or  until the arrow points to "Setting Base", then press .

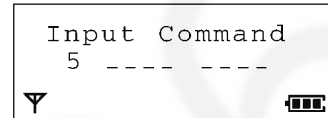
"Input Command" is displayed.

3 Press , then enter the current 4-digit base unit PIN.*¹

The factory preset is 0000.



4 Enter the new 4-digit base unit PIN TWICE.



A beep sounds.

The display will return to "Setting Base". To return to the standby mode, press  or wait for 60 seconds.

If 5 beeps sound in step 3, the entered 4-digit base unit PIN is incorrect. Enter the correct 4-digit base unit PIN.

You can exit the programming mode any time by pressing .

*1 If the current PIN is forgotten, press      and you will be able to enter new PIN.

5.6. Registration

5.6.1. Registering a Handset in the Base Unit

You must register the handset in the base unit before use.

Charge the optional handset batteries for approximately 15 hours before initial use.
 Make sure that the power is ON and the unit is in the standby mode.
 Register the handset number within 1 minute. If not registered within 1 minute, press  on the handset to cancel the programming mode. Then start over again from step 1.

1 Handset:

Press .

2 Press or until the arrow points to "Setting Handset", then press .

3 Base unit where handset is to be registered :

Press and hold  on the base unit for more than 10 seconds until a confirmation tone sounds.

4 Handset:

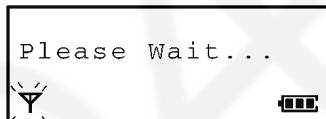
Press  or  until the arrow points to "Registration", then press .

5 While the arrow is at "Register H/set", press .

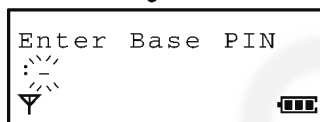
The available base unit numbers are displayed.

6 Press or to select the desired base unit number, then press .

The number is assigned as the base unit number for the handset.

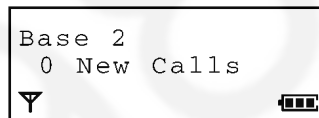


7 Enter the 4-digit base unit PIN.



8 Press .

"Please Wait..." is displayed, then a confirmation tone sounds.
 The handset will return to the standby mode. The current connected base unit number will be displayed.



To register the handset in more than one base unit, repeat from step 1 with the other base unit(s).

You can exit the programming mode any time by pressing .

The base unit number which the handset is currently in contact with can be displayed in the standby mode. Calls (both incoming and outgoing) can be conducted only via the displayed base unit (even if the radio areas overlap with neighbouring base units).

5.6.2. Cancelling a Handset Registration in the Base Unit

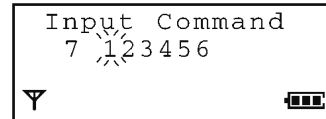
Each handset can cancel itself or another handset.

Make sure that the power is ON, and the unit is in the standby mode.

- 1 Press .
- 2 Press  or  until the arrow points to "Setting Base", then press .
"Input Command" is displayed.
- 3 Press .
- 4 Enter the 4-digit base unit PIN.
The current registered handset number(s) is/are displayed.

- 5 Enter the handset number(s) you desire to cancel.

The selected handset number(s) flash(es).



If you misdial, press the number(s) again.

- 6 Press .

A beep sounds.

The display will return to "Setting Base". To return to the standby mode, press .

You can exit the programming mode any time by pressing .

5.6.3. Cancelling a Base Unit

If another handset is out of range and/or its power is OFF when cancelling a handset registration in the base unit, the previous base unit number will still remain in the cancelled handset. Therefore, you need to cancel the base unit registered in the cancelled handset.

Make sure that the power is ON, and the unit is in the standby mode.

- 1 Press .
- 2 Press  or  until the arrow points to "Setting Handset", then press .
- 3 Press  or  until the arrow points to "Registration", then press .
- 4 Press  or  until the arrow points to "Cancel Base", then press .
- 5 Enter the 4-digit handset PIN.
Registered base unit(s) is(are) displayed.

- 6 Press  or  until the arrow points to the base unit(s) you desire to cancel, then press .

"✓" marks the selected base unit.

- 7 Press .

"Clear ?" is displayed.

- 8 Press  or  to select "YES", then press .

A beep sounds and "CLEARED" is displayed.

To return to the standby mode, press



6 CIRCUIT OPERATION (BASE UNIT)

BLOCK DIAGRAM BASEBAND SECTION AND LINE INTERFACE (BASE UNIT)

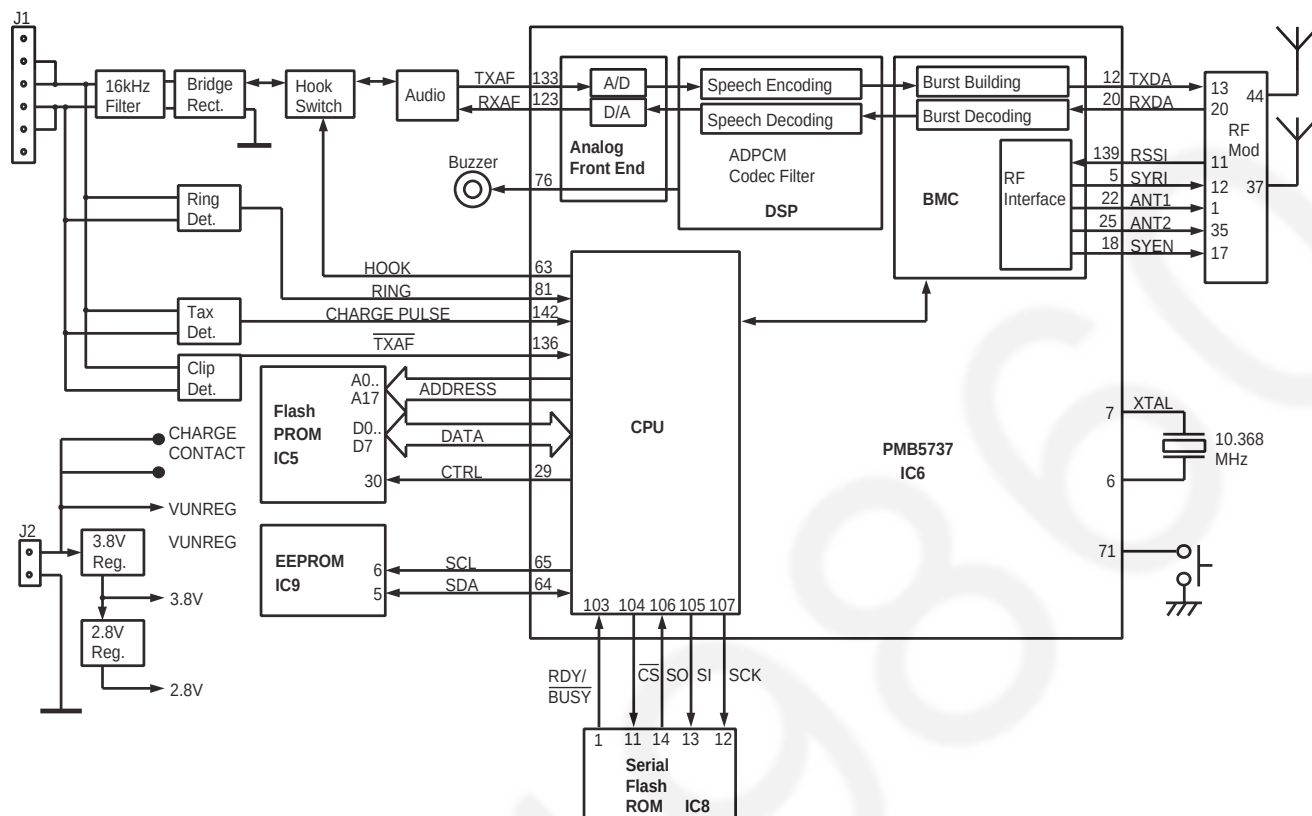


Fig. 17

6.1. THE BASE-BAND SECTION

6.1.1. INTRODUCTION (SEE Fig. 17)

The base-band section consists of a base-band integrated circuit (BBIC), a Flash PROM, an EEPROM and Flash SERIAL DAA ROM.

6.1.2. THE BASE-BAND INTEGRATED CIRCUIT (BBIC)

The PMB5737 (IC6) is a CMOS device designed to handle all the audio, signal and data processing needed in a DECT base unit. It contains a "burst mode controller" which takes care of DECT specific physical layer and radio section control. It also contains an ADPCM codec filter used for speech encoding and decoding in the DSP section, a general purpose microcontroller, various other ADC's, DAC's, timers and power control circuitry.

The BBIC interfaces to its external PROM (IC5) via a data/address/control bus. It connects to the EEPROM via a serial interface, and a second serial interface is used during manufacture and service to connect to an external computer.

It connects to Serial Flash ROM via serial interface.

6.1.3. FLASH PROM (SEE Fig. 18)

The 2 Mbit (IC5) Flash PROM contains the operational firmware for the microcontroller. It is interfaced to the data/address/control bus using address lines A0 to A17, data lines D0 to D7, and chip select (pin 30), output enable (pin 32), and write (pin 7).

6.1.4. EEPROM (SEE Fig. 18)

The electrically erasable PROM PQVIT2464WM6 (IC9) is used to store all the temporary operating parameters for the base (see **EEPROM LAYOUT (BASE UNIT)**). It uses a two-line serial data interface with the BBIC, with bi-directional data on pin 5 (TP104), and clock on pin 6 (TP103).

6.1.5. SERIAL FLASH ROM

The 4Mbit (IC8) Serial Flash ROM contains the audio data for TAM operation. It is interfaced to the clock/input/output using serial interface CS, SI and SO.

6.1.6. CLOCK GENERATION (SEE Fig. 18)

A single clock generator in the BBIC uses an external crystal X1 to derive all clock frequencies used in the base. The crystal is tuned to the exact frequency of 10.368 MHz during manufacture.

The BBIC provides a reference clock signal **SYRI** (IC6 pin 5, or TP101) which is used to drive the PLL circuitry in the RF module. The basic data rate for **TXDA** (pin 12) and **RXDA** (pin 20) is 1.152 Mb/s, which is 10.368MHz divided by 9.

6.1.7. LOCATOR KEY (SEE Fig. 18)

The "Locator (Page)" button is connected to pin 71 (TP109) of the IC6. When pressed the base transmits a message to the handset, which then beeps.

6.1.8. FACTORY SERIAL PORT (SEE Fig. 18)

In order to communicate with the base band section during manufacture and servicing (using a PC) a serial data link has been provided.

Serial data input/output is provided through the SDA terminal (J102). The data is clocked through using the SCL terminal (J103). A ground terminal is provided by J104.

To invoke the external communication mode the MODE_SEL terminal (J101) must be connected to the 2.8V terminal (J100). The serial port terminals J100 to J104 are connected to by means of test probe pads on the ground plane side of the pcb.

6.1.9. BUZZER CIRCUIT (SEE Fig. 18)

A square-wave signal from IC6 pin 76 is used to sound the buzzer via switching transistor T1 (TP98). Various tones and cadences are used dependent on function. Buzzer volume is varied by changing the duty cycle of the drive waveform. D16 provides quenching of back-emf generated when T6 turns off.

6.1.10. AUDIO PATH-RX AUDIO-LINE INPUT (SEE Fig. 18)

Audio from the line interface TXAF (TP97) enters the BBIC on pin 133. The audio signal passes through the analogue part of the BBIC where it is amplified and converted to a digital audio stream signal. The burst mode controller processes this stream performing encryption and scrambling, adding the various other fields to produce the GAP standard DECT frame, assigning to a time slot and channel etc. to emerge on pin 12 as TXDA.

6.1.11. AUDIO PATH - TX AUDIO - LINE OUTPUT (SEE Fig. 18)

Audio from the receiver RXDA enters the BBIC on pin 20 as GAP standard DECT frames. It passes through the decoding section burst mode controller where it separates out the frame information and performs de-encryption and de-scrambling as required. It then goes to the DSP where it is turned back into analogue audio. This is amplified by the analogue front end and emerges at pin 123 - i.e. the RXAF signal of the line interface.

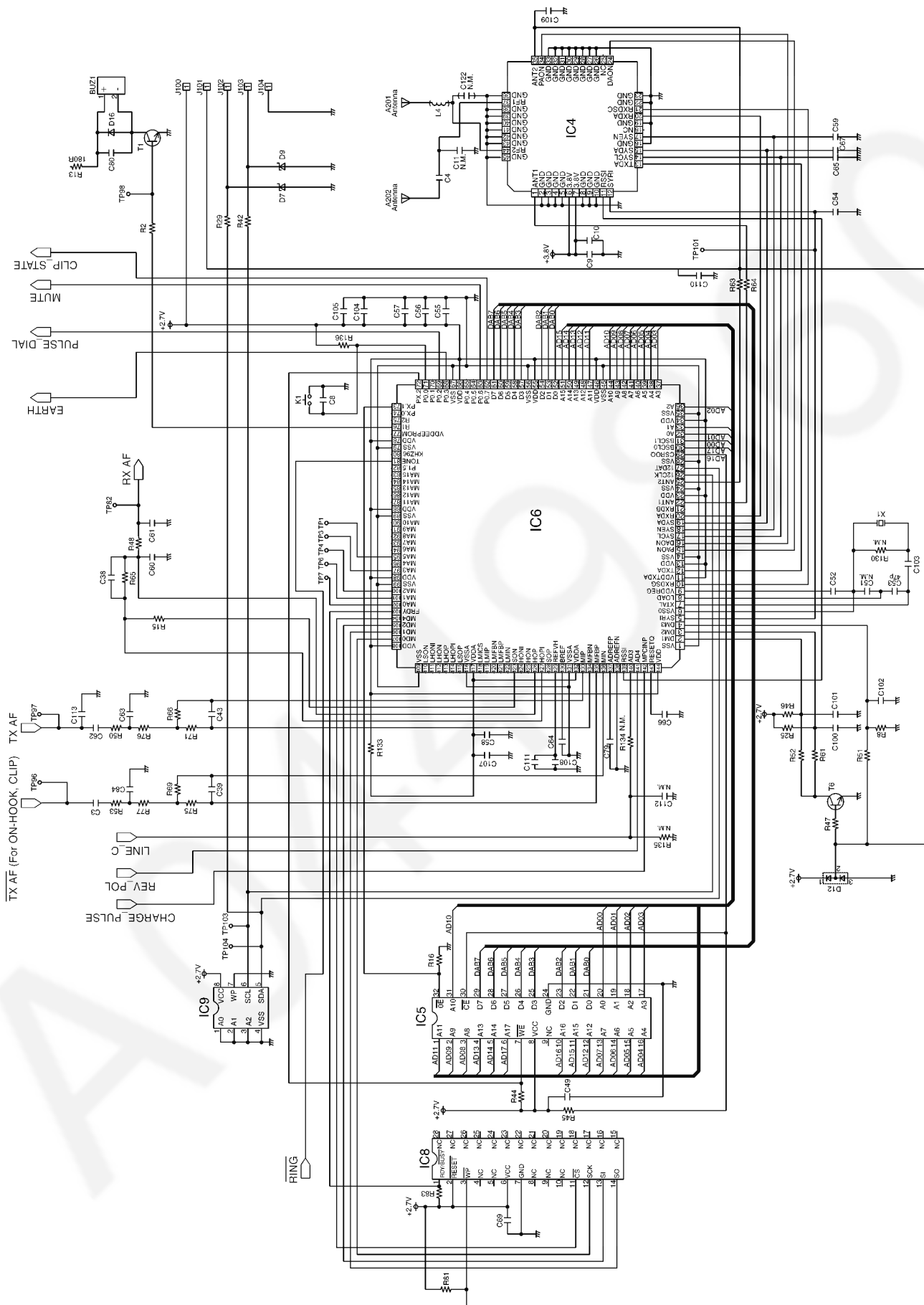


Fig. 18

Circuit Diagram

6.2. THE LINE INTERFACE SECTION (SEE BLOCK DIAGRAM Fig. 17)

6.2.1. INTRODUCTION

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

6.2.2. TELEPHONE LINE INTERFACE (SEE Fig. 19)

The telephone line is connected to a bridge rectifier D8. Surge suppressor SA3 protects against excessive line voltages. Test points are TP40 (A), TP26 (B). Bridge rectifier D8 provides for lines of either polarity. The output of D8 is "Line +" (TP50) and "Line -" which is ground.

6.2.3. BELL DETECTOR (SEE Fig. 19)

The AC ringing signal is detected by photocoupler 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.

6.2.4. CLIP CIRCUITS (SEE Fig. 19)

The CLIP signal is detected by IC3 and sent to the BBIC through the **/TXAF** line as a FSK waveform. The CLIP_STATE signal from the BBIC is used to provide a CLIP impedance through a combination of components selected from R85, R86, C93, C37, and R1. The combination depends upon the CLIP requirements of the specific country - often there is no requirements for the CLIP_STATE impedance.

T10 disables the CLIP signal during the off-hook condition.

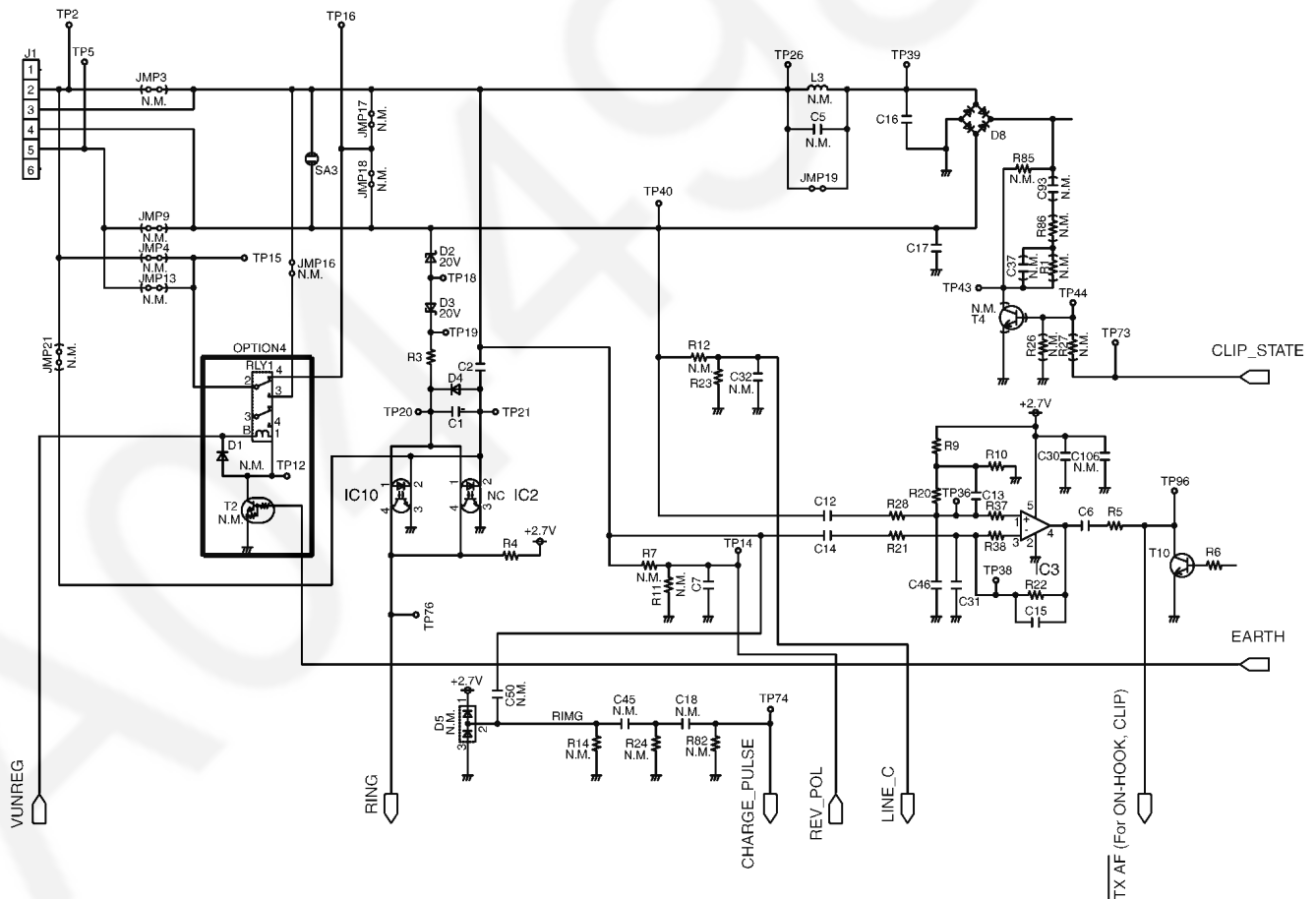


Fig.19
Circuit Diagram

6.2.5. HOOKSWITCH (SEE Fig. 20)

T8 is the hookswitch, driven by T9. When the phone is “off-hook”, the **HOOK** control signal from the BBIC will be a high logic level (+2.8V), and both transistors will be on, thus T8 will “loop” the line. The zenner diode D10 protects transistors T11 to T13 against transient line voltages.

6.2.6. PULSE DIALING (SEE Fig. 20)

During pulse dialing the hookswitch (T8, T9) 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 T11.

6.2.7. AUDIO CIRCUITS (SEE Fig. 20)

The loop current (typically 40mA) passes through T13, R57 and R56. R54 and R55 provide dc biasing for the base of T13.

The line output signal from the BBIC **RXAF** is DC decoupled by C47 and amplified by T13. The emitter load (R57, R58 and C46) is complex in order to achieve the right frequency response with the complex line impedance.

The line input signal **TXAF** is taken from the junction of R41 and R49. Phase cancellation is provided at this point by R70 so that only the incoming line audio should be passed to the BBIC on TXAF.

6.2.8. DISCONNECT (SEE Fig. 20)

The disconnect (DSC) circuit detects whether a second telephone receiver has been picked up while the TAM is operating on the same loop.

The second telephone will cause the current through the unit to drop. This is manifests as a reduced voltage across R56 which is detected at the AD3 input port (pin 140) of the BBIC.

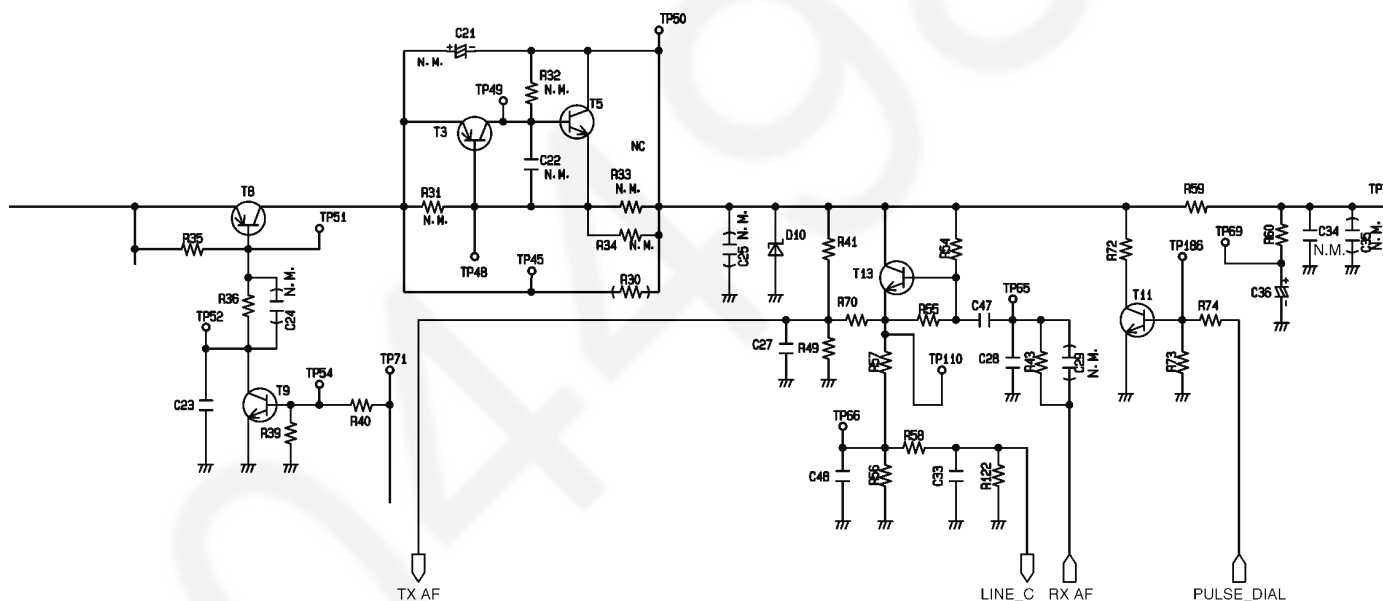


Fig. 20

Circuit Diagram

6.2.9. POWER SUPPLIES (SEE Fig. 21)

The AC adaptor for the KX-TC725 provides unregulated DC through J2 for the handset charge terminal, the 3.8V regulator (IC7) and the Relay coil (RL1) where fitted.

The 3.8V supply from IC7 is used for the RF module, and is further reduced by IC1 to 2.80V for the BBIC supply.

R17, 18 and 19 provide short circuit/over current protection at the handset charge terminal.

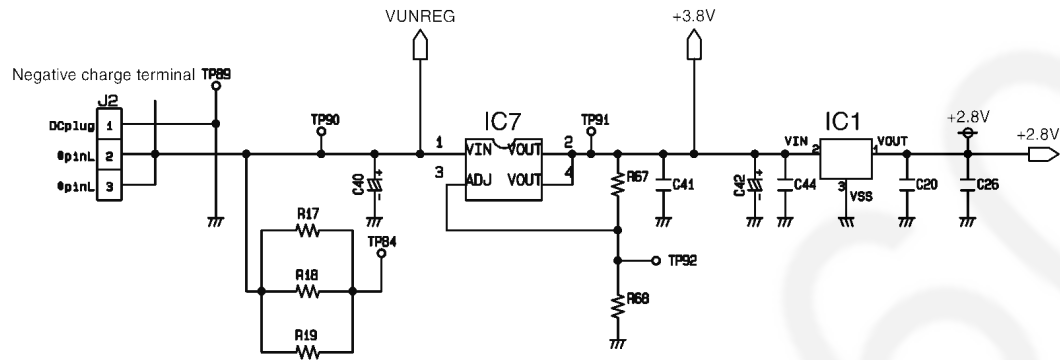


Fig. 21

Circuit Diagram

6.3. RF MODULE

BLOCK DIAGRAM RF MODULE

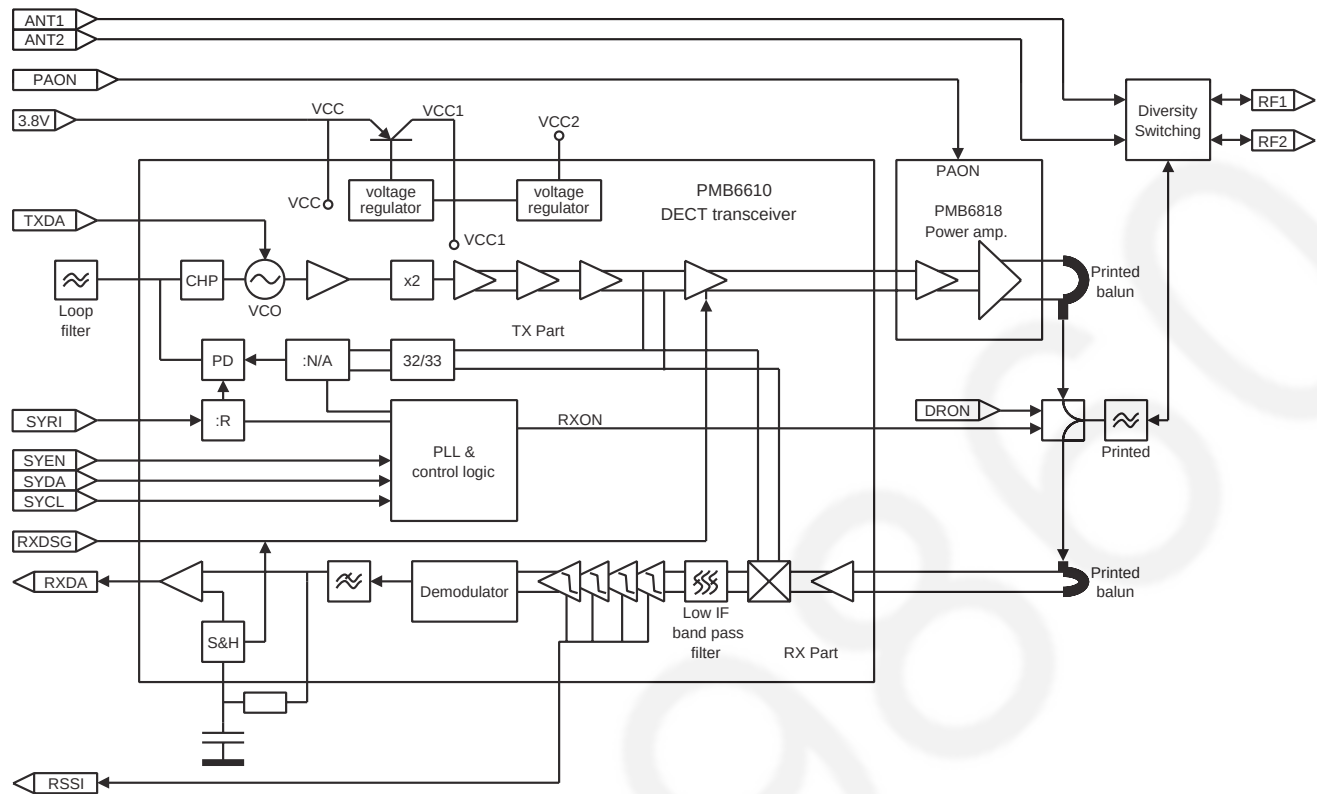


Fig. 22

6.3.1. RF MODULE (SEE BLOCK DIAGRAM Fig.22)

The RF Module consists of two main components: the PMB6610 transceiver and the PMB6818 power amp.

In the transceiver the 10.368MHz clock signal SYCL is multiplied to around 1.9GHz using PLL (Phase Locked Loop) control.

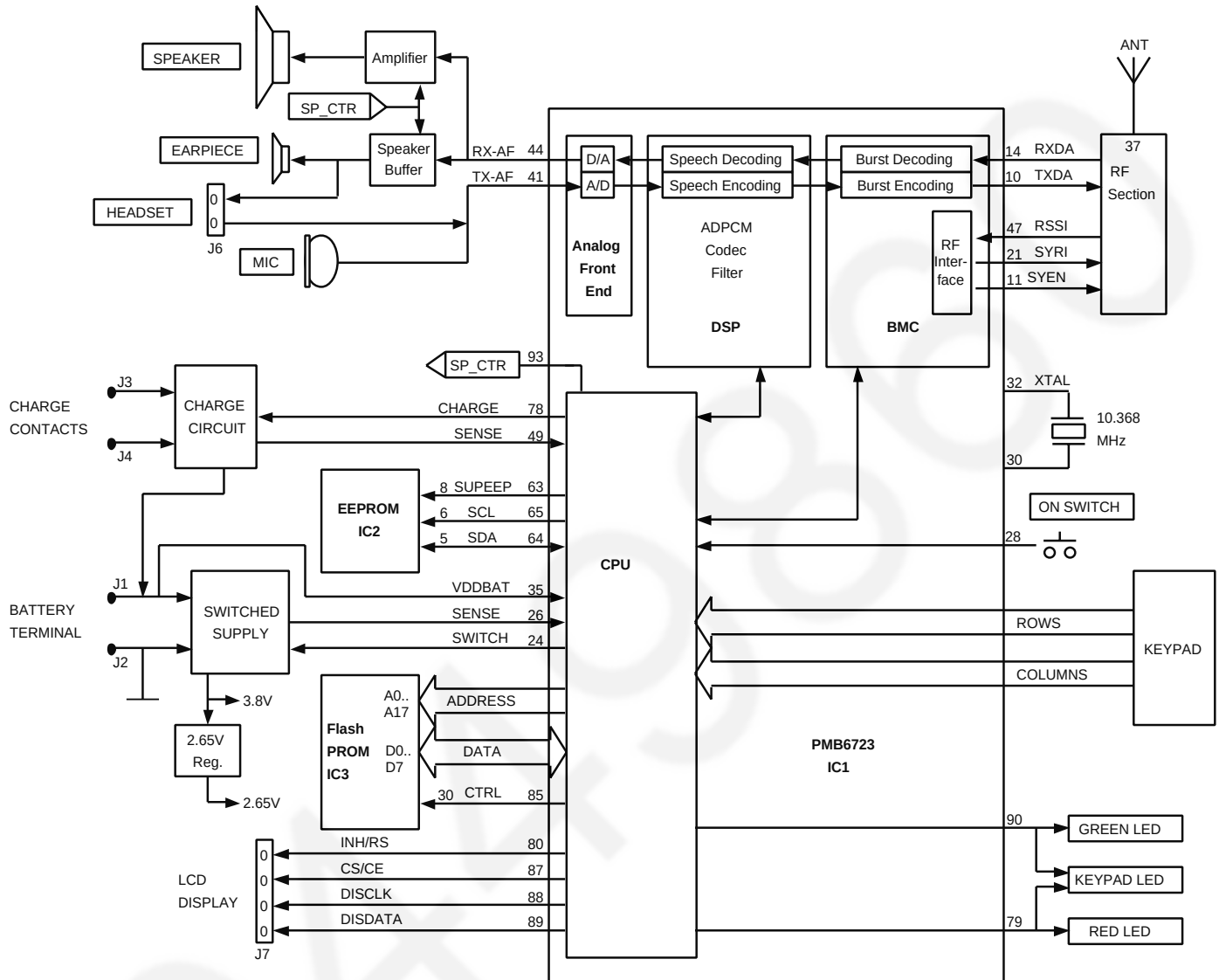
The TXDA signal is used to control the modulation of this frequency to 1.87GHz to 1.93GHz.

Received signals are demodulated, filtered and sent to the BBIC via the RXDA line.

The RSSI (Radio Signal Strength Indicator) signal enables the implementation of diversity switching whereby two antennae can be mounted in different orientations and their signals compared. The one with better reception can be selected by the BBIC using the ANT1 and ANT2 lines.

7 CIRCUIT OPERATION (HANDSET)

BLOCK DIAGRAM BASEBAND SECTION (HANDSET)



7.1. THE BASE BAND SECTION

7.1.1. 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.

7.1.2. THE BASE-BAND INTEGRATED CIRCUIT (BBIC)

The PMB6723 (IC1) is a CMOS device designed to handle all the audio, signal and data processing needed in a DECT handset. It contains a "burst mode controller" which takes care of DECT specific physical layer and radio section control. It also contains an ADPCM codec filter used for speech encoding and decoding in the DSP section, a general purpose microcontroller, various other ADC's, DAC's, timers and power control circuitry.

The BBIC interfaces to its external PROM (IC3) via a data/address/control bus. It connects to the EEPROM (IC2) via a serial interface (SDA and SDC). This serial interface is also used during manufacture and service to connect to an external computer.

7.1.3. FLASH ROM (SEE Fig. 24)

The 1Mbit Flash PROM IC3 contains the operational firmware for the BBIC's general purpose microprocessor. It is interfaced to the BBIC using address lines A0 to A17, data lines D0 to D7, and control lines CE (Chip Enable), WE (Write Enable) and OE (Output Enable).

7.1.4. EEPROM (SEE Fig. 24)

The electrically erasable PROM IC2 is used to store all the temporary operating parameters for the handset (see **EEPROM LAYOUT**). It uses a two-line serial data interface with the BBIC, with bi-directional data on IC2 pin5 (TP52), and a 45 kHz clock on pin6 (TP53).

7.1.5. FACTORY SERIAL PORT (SEE Fig. 24)

In order to communicate with the handset during manufacture and servicing (using a PC) a serial data link has been provided. Serial data input/output is provided through the I2DAT input (pin 64). The data is clocked through using the I2CLK pin (65). Test probe pads SDA and SDC are provided for Flash PROM download with I2DAT and I2CLK respectively.

To invoke the flash PROM download mode the MODE_SEL test pad must be connected to the 2.65V pad.

A Ground reference Test pad is also provided.

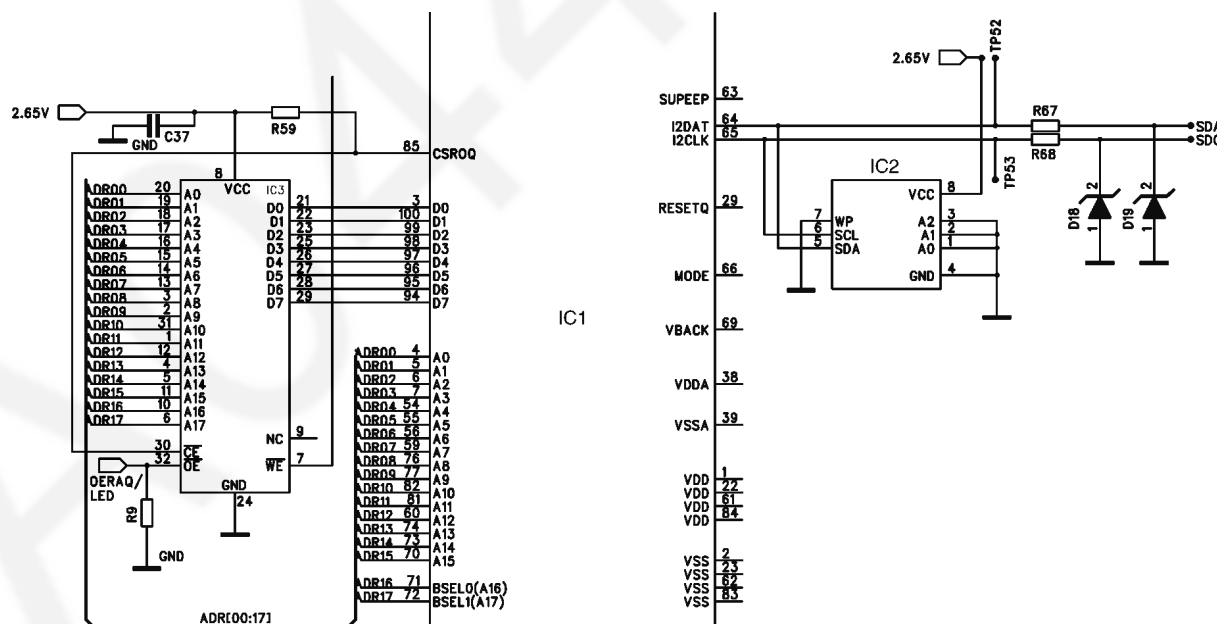


Fig. 24

Circuit Diagram

7.1.6. AUDIO PATH - TX AUDIO (SEE Fig. 25)

The audio signal from the microphone (TP23) enters the BBIC at pin 44. RF decoupling and signal conditioning are provided by C17, R21, C14 and C25.

In the BBIC the signal passes through the analogue section where it is amplified and converted to a digital audio stream signal. The burst mode controller processes this stream performing encryption and scrambling, adding the various other fields to produce the GAP standard DECT frame, assigning to a time slot and channel etc. to emerge on pin 14 as TXDA.

7.1.7. AUDIO PATH - RX AUDIO (SEE Fig. 25)

Audio from the receiver RXDA enters the BBIC on pin 10 as GAP standard DECT frames. It passes through the decoding section burst mode controller where it separates out the frame information and performs de-encryption and de-scrambling as required. It then goes to the DSP where it is turned back into analogue audio. This is amplified by the analogue front end and emerges at pin 40 and 41. The telephone speaker is driven directly from the BBIC output ports.

The hands-free loudspeaker at SP+ and SP- is used to generate the ring alarm. When the handset is not in hands-free mode the HF_AM1 amplifier is deactivated by the SP_CTR control signal at pin 93 from the BBIC.

The earpiece speaker LS1 is driven directly from the HON and HOP output lines, pins 40 and 41, without any amplification.

A 2.5mm jack J6 is provided for connecting a headset.

7.1.8. CLOCK GENERATION (SEE Fig. 25)

A single clock generator in the BBIC uses an external crystal X1 to derive all clock frequencies used in the handset. The crystal is tuned to the exact frequency of 10.368 MHz during manufacture.

The BBIC provides a reference clock signal **SYRI** (IC1 pin21, or TP101) which is used to drive the PLL circuitry in the RF module. The basic data rate for **TXDA** (pin 14) and **RXDA** (pin 10) is 1.152 Mbits/s, which is 10.368MHz divided by 9.

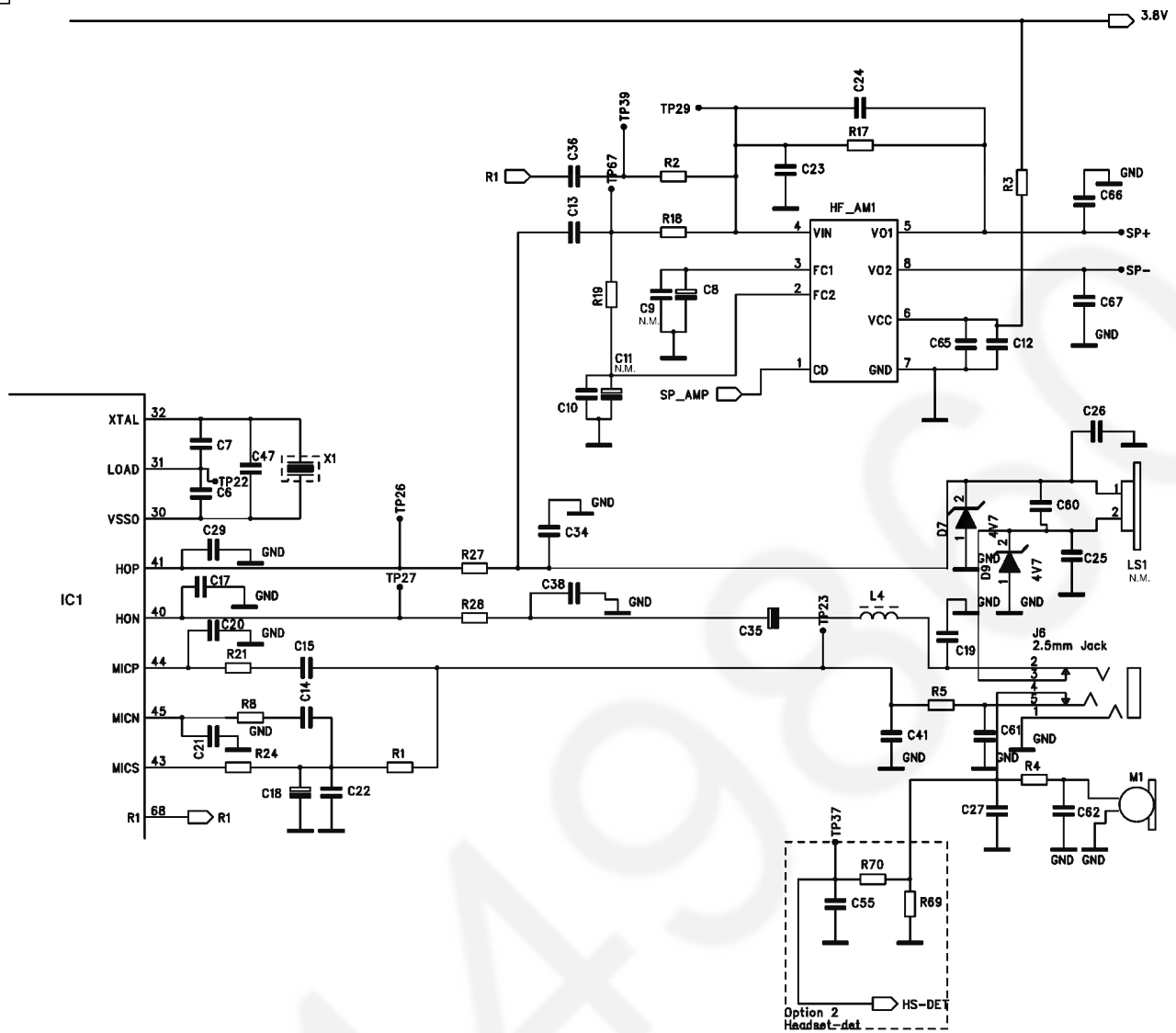


Fig. 25
Circuit Diagram

7.1.9. KEYBOARD (SEE Fig. 26)

The keyboard “On” button is connected directly to pin 33 and 28 of the BBIC. When pressed it turns the handset on and off. All other keys are connected in a row/column matrix. They are scanned in five rows using scan pulses (only active when keys are pressed) from IC1 pins 15 to 19. The five key matrix columns are input to the BBIC on pins 51, 52, 53, 57 and 58.

7.1.10. LCD DISPLAY, AND DISPLAY DRIVER (SEE Fig. 26)

The LCD display receives data via a serial interface. Serial data is sent to the display on pin 6 of the J5 socket, with control lines at pin3 thru 6.

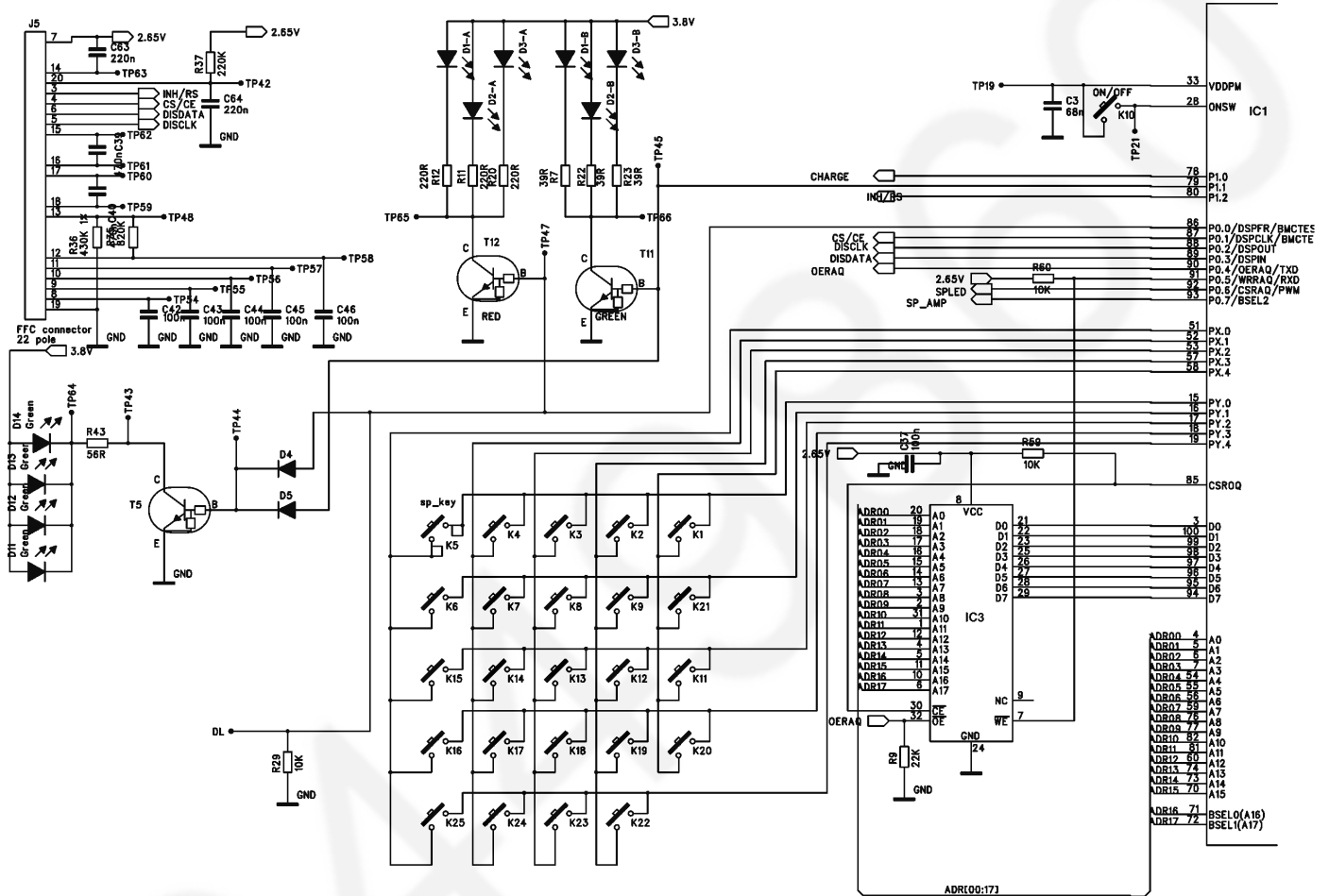


Fig. 26
Circuit Diagram

7.1.11. BATTERY SUPPLY (SEE Fig. 27)

A switch mode boost converter is used to provide a 3.8V supply from the battery. This supply is sensed by the BBIC through pin 26 (TP14) so that the switching rate can be controlled by a FET (T3) driven from pin 24 (TP13). A resistor on the Source of the FET provides a current sense at pin 25 (TP12).

T3 switches the current through L1. When T3 switches off the back emf conducts through D16 and charges the reservoir cap C4.

7.1.12. 2.65V REGULATOR (SEE Fig. 27)

A 2.65V supply is provided for the BBIC and is regulated by the BBIC's on board control signal LRB (pin 37).

This reference is fed to the base of T6 to keep the "VREG+" line at 2.65V.

7.1.13. BATTERY CHARGING CIRCUIT (SEE Fig. 27)

The supply for the battery comes from the charge terminals at J3 and J4. Battery charge rate is controlled by switching the current through T7 such that the average charging current is 170mA. The current flow is monitored at pin 49 of the BBIC by measuring the voltage across R56.

D21 protects against the high voltage present on the charge contacts (J3 and J4) when there is no battery in the handset. R42 and C50 provide a signal to the BBIC (pin 27) to detect that the handset has been placed on the base charger.

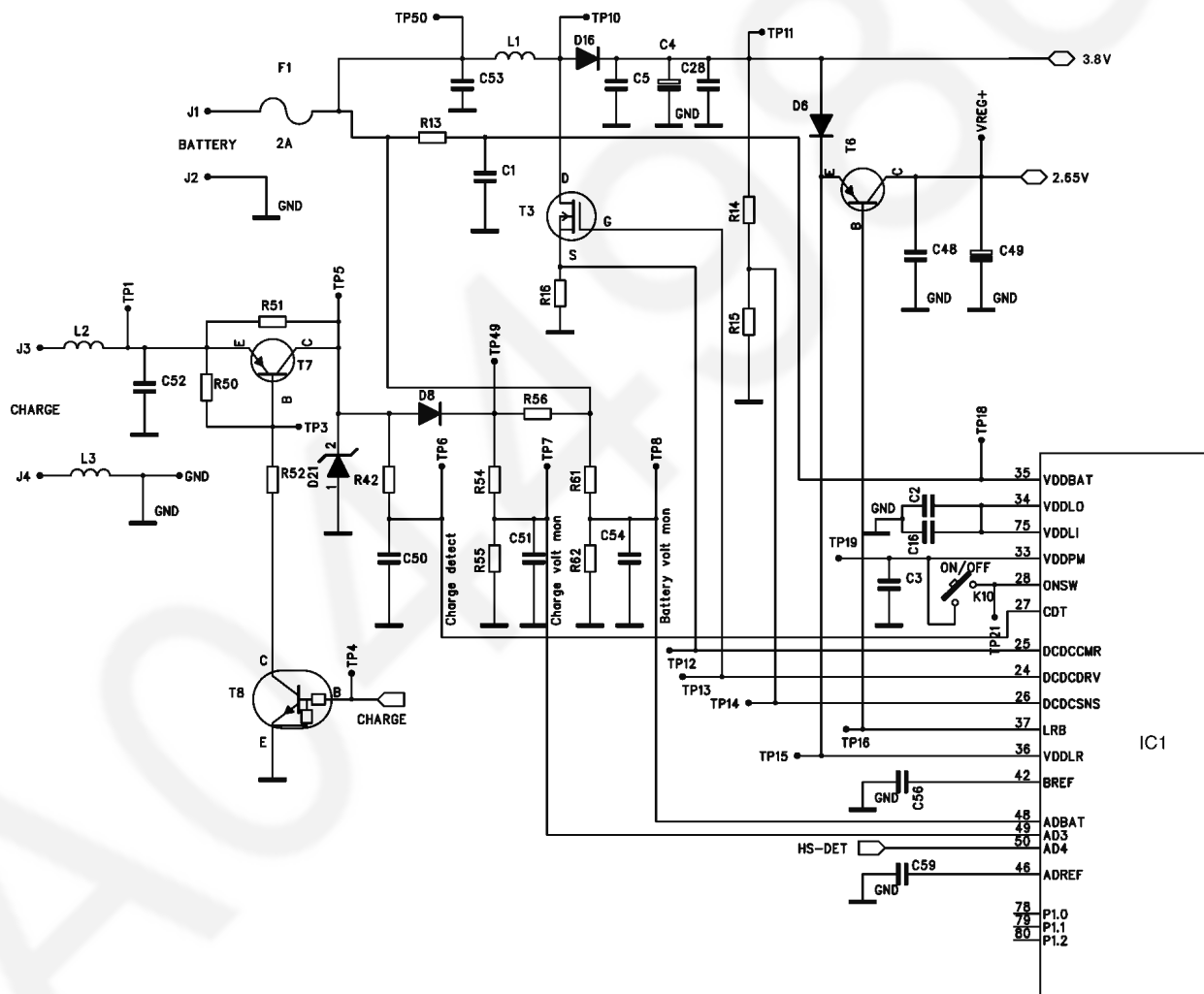


Fig. 27
Circuit Diagram

7.2. RF SECTION

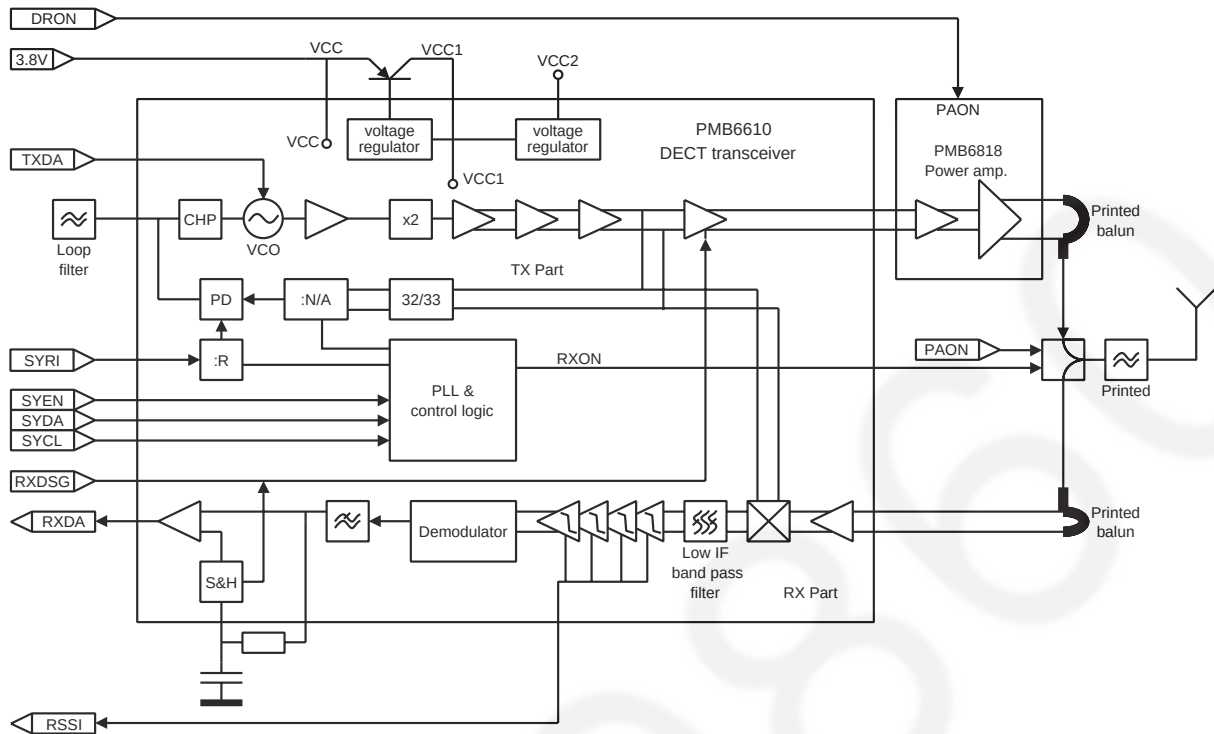


Fig. 28

7.2.1. BLOCK DIAGRAM RF SECTION (HANDSET)

The RF section consists of two main components: The PMB6610 transceiver and the PMB6818 power amp.

In the transceiver the 10.368MHz clock signal SYCL is multiplied to around 1.9GHz using PLL (Phase Locked Loop) control. The TXDA signal is used to control the modulation of this frequency to 1.87GHz to 1.93GHz.

Received signals are demodulated, filtered and sent to the BBIC via the RXDA line.

8 CHECK PROCEDURE (BASE UNIT)

8.1. PREPARATION

8.1.1. EQUIPMENT REQUIRED

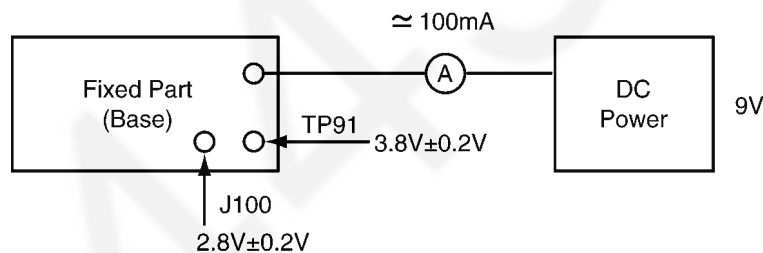
- DECT tester: Romde & Schwarz, CMD 60 is recommended.
- Frequency counter: it must be precise to be able to measure 1Hz (precision; $\pm 4\text{ppm}$).
Hewlett Packard, 53131A is recommended.
- DC power: it must be able to output at least 1A current under 9V.
- Digital multi-meter (DMM): it must be able to measure voltage and current.
- Oscilloscope

8.1.2. JIGs AND PC

- EEPROM serial JIGs
 1. I2C PCB: PQZZTCD705BX
 2. RS232C cable: PQZZ1CD705BX
 3. Clip cable: PQZZ2CD705BX
 4. DC cable: PQZZ3CD705BX
- PC which runs in DOS mode
- **Batch file** for setting

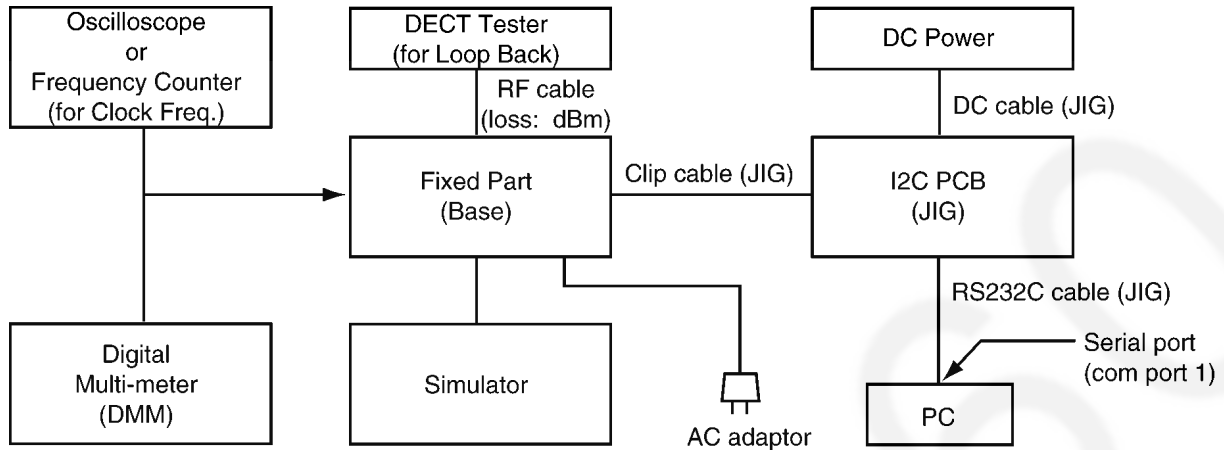
8.2. INITIAL POWER TESTS

1. Turn on the 9V supply.
2. Check for approx. 100mA current on the 9V supply line.
3. Check the 3.8V supply rail at TP91. It must be $3.8\text{V} \pm 0.2\text{V}$.
4. Check the 2.8V supply rail at J100. It must be $2.8\text{V} \pm 0.2\text{V}$.



8.3. PC SETTING

8.3.1. CONNECTIONS



Note:

See **TELEPHONE LINE TESTS** (P.35) for more details.

8.3.2. PC SETTING

1. Open a window of MS-DOS mode from the start-up menu.
2. Change a directory to the one with "RTX_COM" contained.
3. Type "**SET RTX_COM=1**" from the keyboard (when COM port 1 is used for the connection).
4. Type "doskey".

Note:

See the table below for frequently used commands.

Command name	Function	Example
rdeeprom	Read the data of EEPROM	Type "rdeeprom 00 00 FF", and the data from address "00 00" to "FF" is read out.
readid	Read ID (RFPI)	Type "readid", and the registered ID is read out.
writeid	Write ID (RFPI)	Type "writeid 00 18 E0 0E 98", and the ID "0018 E0 0E 98" is written.
setfreq	adjust Frequency of RFIC	Type "setfreq nn nn".
hookoff	off-hook mode on Base	Type "hookoff".
hookon	on-hook mode on Base	Type "hookon".

8.4. SET THE CLOCK FREQUENCY

1. Turn on the 9V supply (AC adaptor).
2. Enter "DEACTMAC" from the PC to switch off the RF unit.
3. Enter "CONTTX 0" to start continuous RF transmission.
4. Enter "RDEEPROM 00 00 0F" to display the first 15 hexadecimal bytes of the EEPROM.
The frequency adjustment value is displayed in the first two locations with the most significant byte (MSB) first. *1
5. Connect the frequency counter probe to TP101 (or pin 12 of the RF module) to measure the SYRI signal from the BBIC.
6. The clock frequency should be within $10,368,000\text{Hz} \pm 10\text{Hz}$. If not then enter "SETFREQ nn nn" where nn nn are the clock frequency adjustment values. An increase in the value will lower the clock frequency and vice versa. The maximum value is 03 FF.
7. Switch off the 9V supply.

Note:

*1 See **EEPROM LAYOUT (BASE UNIT)** (P.56) for more details.

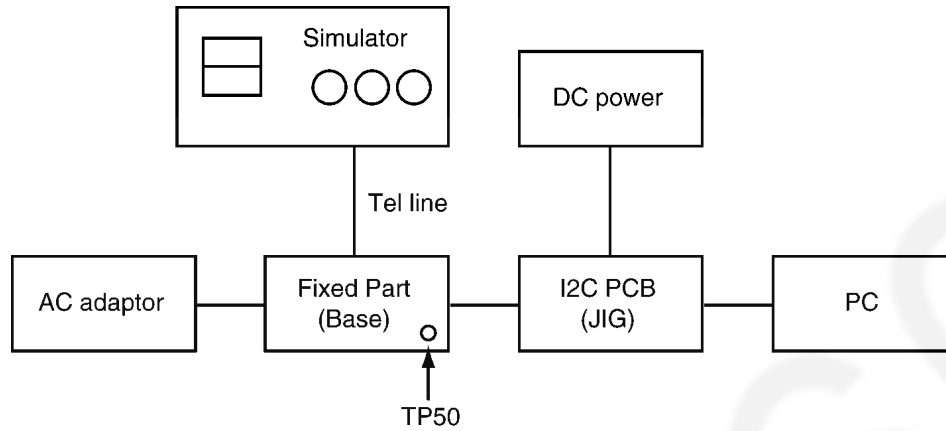
8.5. POWER AND LOOPBACK TESTS

1. Connect the RF Cable from the CMD60 (DECT tester) to RF (IC4 pin44) and Ground plane of the base P.C.B. Use the minimum amount of stripped/exposed cable to solder to the contacts.
2. Switch on the 9V supply.
3. Set the CMD60 as shown below.
TEST MODE: FP
CONFIG MENU: SIGN, SCRAMBLE: OFF
MANUAL TEST: Loop Back mode (TRAFFIC SLOT: 4, TRAFFIC CARRIER: 5)
CONNECT/EXT.ATT: _dBm (RF cable loss)
4. Invoke the "TESTMODE" batch file from the PC.
5. Press ACCEPT RFPI and SETUP CONNECT on the CMD60.
6. Enter "ANT2".
7. Check the power (NTP): it must be between 20 and 25dBm.
8. Press MODULATION.
9. Set DATA TYPE to FIG 31.
10. Check frequency drift: must be 0 ± 35 kHz/ms.
11. Check frequency offset: must be 0 ± 40 kHz.
12. Check deviation or modulation (max $\pm$ B field) with data type "FIG 31": must be 320kHz to 400kHz.
13. Press POWER RAMP on the CMD60.
14. Check that the burst fits the mask.
15. Press Menu Up " $\uparrow$ " on the CMD60.
16. Press BER (Bit Error Rate).
17. Obtain the sensitivity by slowly reducing RF LEVEL until the BER falls below 1000ppm. The sensitivity is the RF LEVEL reading at this point. It must be $< -88\text{dBm}$.
18. Press Menu Up " $\uparrow$ " on the CMD60.
19. Press BEARER RELEASE and switch off the 9V supply.
20. Disconnect the RF cable from the PCB.

Note:

These tests can also be repeated on TRAFFIC CARRIERS 0 and 9.

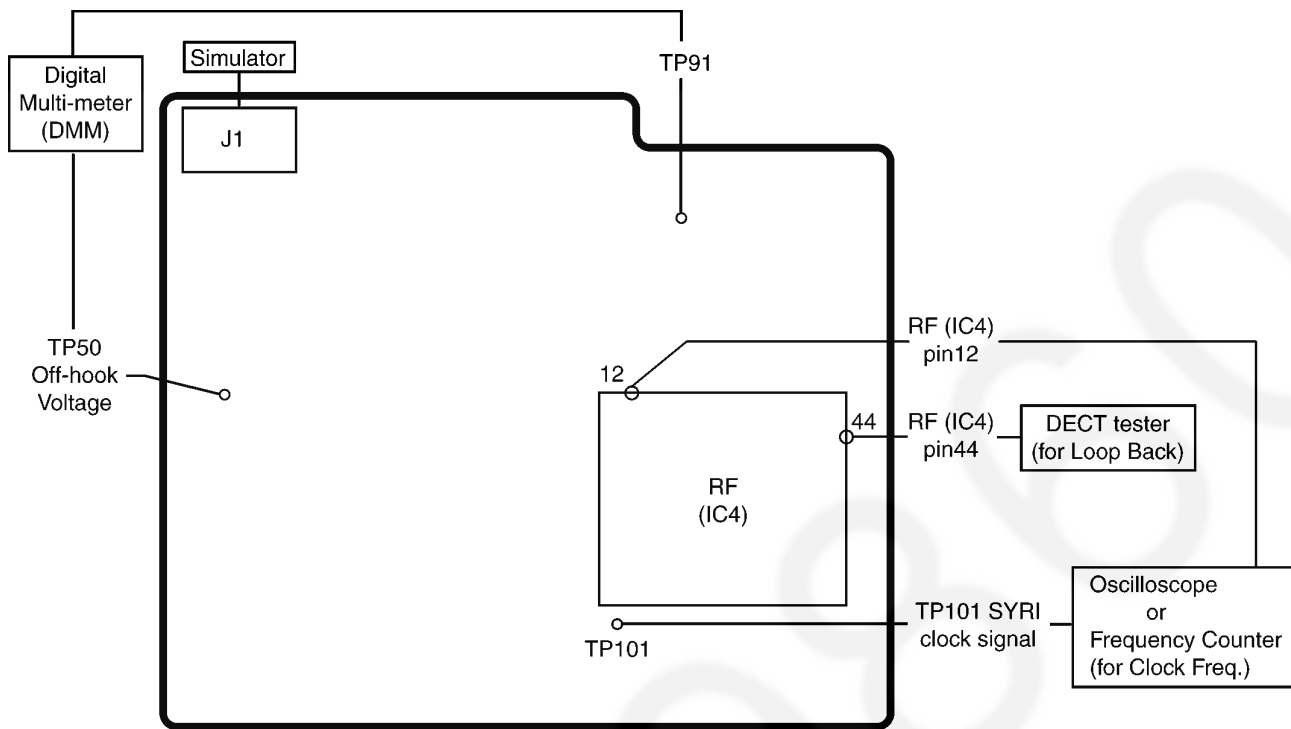
8.6. TELEPHONE LINE TESTS



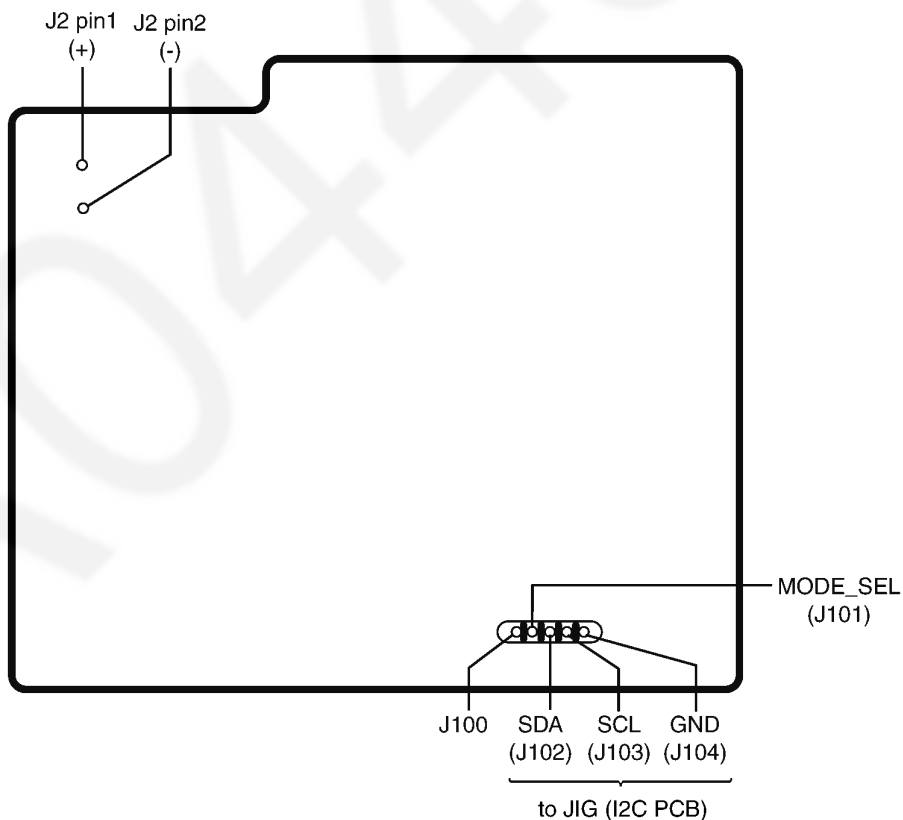
1. Switch on the 9V power supply.
2. Connect a telephone cord from the base unit to the line/DTMF test set.
3. Enter "HOOKOFF" from the PC to invoke an off-hook condition.
4. Set the current limit to 40mA on the line simulator.
5. Enter "HOOKON" from the PC to invoke the on-hook condition.
6. Check that the line current has dropped to $0 \pm 0.5\text{mA}$.
7. Enter "HOOKOFF".
8. Use a DMM to test the off-hook voltage at TP50. It must be $6.5\text{V} \pm 1.0\text{V}$.
9. Enter "LINEIMP 1" at the PC to switch on the pulse-dialing impedance.
10. Check the DC voltage at TP50. It must be $< 3.5\text{V}$.
11. Enter "LINEIMP 0" at the PC to switch off the pulse-dialing impedance.
12. Enter "DTMF_UP" to make the base generate the upper DTMF frequency.
13. Check that the upper frequency is detected by the line/DTMF test set. Must be $1477\text{Hz} \pm 1.5\%$.
14. Enter "DTMF_LO" to make the base generate the lower DTMF frequency.
15. Check that the lower frequency is detected by the line/DTMF test set. Must be $852\text{Hz} \pm 1.5\%$.
16. Switch off the 9V power supply.
17. Disconnect the telephone line and reconnect the base to the Bell oscillator.
18. Switch on the 9V supply.
19. Enter "RINGDET" to check the ring detection status. The command returns a number to the PC display. "0" = no ring.
20. Switch the bell oscillator on to 23Hz, 30V RMS (Sin Wave).
21. Send the batch file "RINGDET".
22. Check that the Number on the PC display has changed to "1".
23. Switch off the 9V power supply.

8.7. BASE UNIT REFERENCE DRAWING

When connecting the Simulator and the Equipments to the P.C.B. for checking, refer to the illustrations below.



Component Side



Flow Solder Side

9 CHECK PROCEDURE (HANDSET)

9.1. PREPARATION

9.1.1. EQUIPMENT REQUIRED

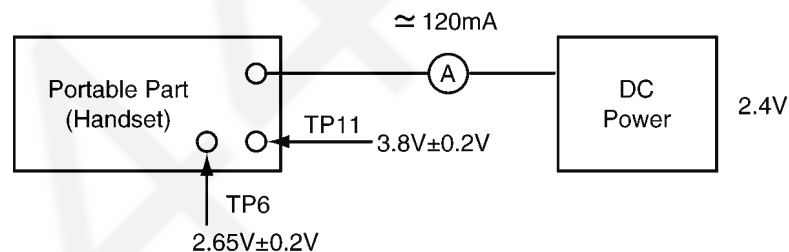
- DECT tester: Romde & Schwarz, CMD 60 is recommended.
- Frequency counter: it must be precise to be able to measure 1Hz (precision; $\pm 4\text{ppm}$).
Hewlett Packard, 53131A is recommended.
- DC power: it must be able to output at least 1A current under 2.4V.
- Digital multi-meter (DMM): it must be able to measure voltage and current.
- Oscilloscope

9.1.2. JIGs AND PC

- EEPROM serial JIGs
 1. I2C PCB: PQZZTCD705BX
 2. RS232C cable: PQZZ1CD705BX
 3. Clip cable: PQZZ2CD705BX
 4. DC cable: PQZZ3CD705BX
- PC which runs in DOS mode.
- **Batch file** for PC setting

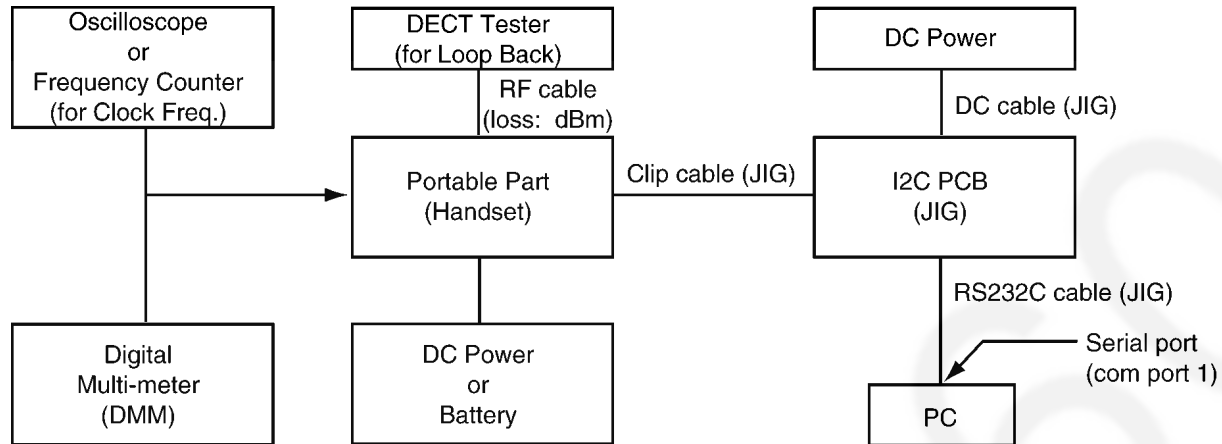
9.2. INITIAL POWER TESTS

1. Switch on the 2.4V supply.
2. Switch the handset on at the keypad.
3. Check for approx. 120mA current on the supply line for around 10s.
4. Check the 3.8V supply rail at TP11. It must be $3.8\text{V} \pm 0.2\text{V}$.
5. Check the 2.65V supply rail at the collector of transistor T6. It must be $2.65\text{V} \pm 0.2\text{V}$.
6. Switch off the 2.4V supply.



9.3. PC SETTING

9.3.1. CONNECTIONS



9.3.2. PC SETTING

1. Open a window of MS-DOS mode from the start-up menu.
2. Change a directory to the one with "RTX_COM" contained.
3. Type "**SET RTX_COM=1**" from the keyboard (when COM port 1 is used for the connection).
4. Type "doskey".

Note:

See the table below for frequently used commands.

Command name	Function	Example
rdeeprom	Read the data of EEPROM	Type "rdeeprom 00 00 FF", and the data from address "00 00" to "FF" is read out.
readid	Read ID (RFPI)	Type "readid", and the registered ID is read out.
writeid	Write ID (RFPI)	Type "writeid 00 18 E0 0E 98", and the ID "0018 E0 0E 98" is written.
setfreq	adjust Frequency of RFIC	Type "setfreq nn nn".
hookoff	off-hook mode on Base	Type "hookoff".
hookon	on-hook mode on Base	Type "hookon".

9.4. SET CLOCK FREQUENCY

1. Turn on the 2.4V supply.
2. Switch the handset on at the keypad.
3. Enter "DEACTMAC" from the PC to switch off the RF unit.
4. Enter "CONTTX 0" to start continuous RF transmission.
5. Check that the current consumption is approx. 220mA.
6. Enter "RDEEPROM 00 00 02" to display the two-byte frequency adjustment value, MSB first. *1
7. Connect the frequency counter probe to TP24 to measure the SYRI signal from the BBIC.
8. The clock frequency should be within 10,368,000Hz $\pm$ 10Hz. If not then enter "SETFREQ nn nn" where nn nn are the clock frequency adjustment values. An increase in the value will lower the clock frequency and vice versa. The maximum value is 01 FF.
9. Switch off the 2.4V supply.

Note:

*1 See **EEPROM LAYOUT (HANDSET)** (P.68) for more details.

9.5. POWER AND LOOPBACK TESTS

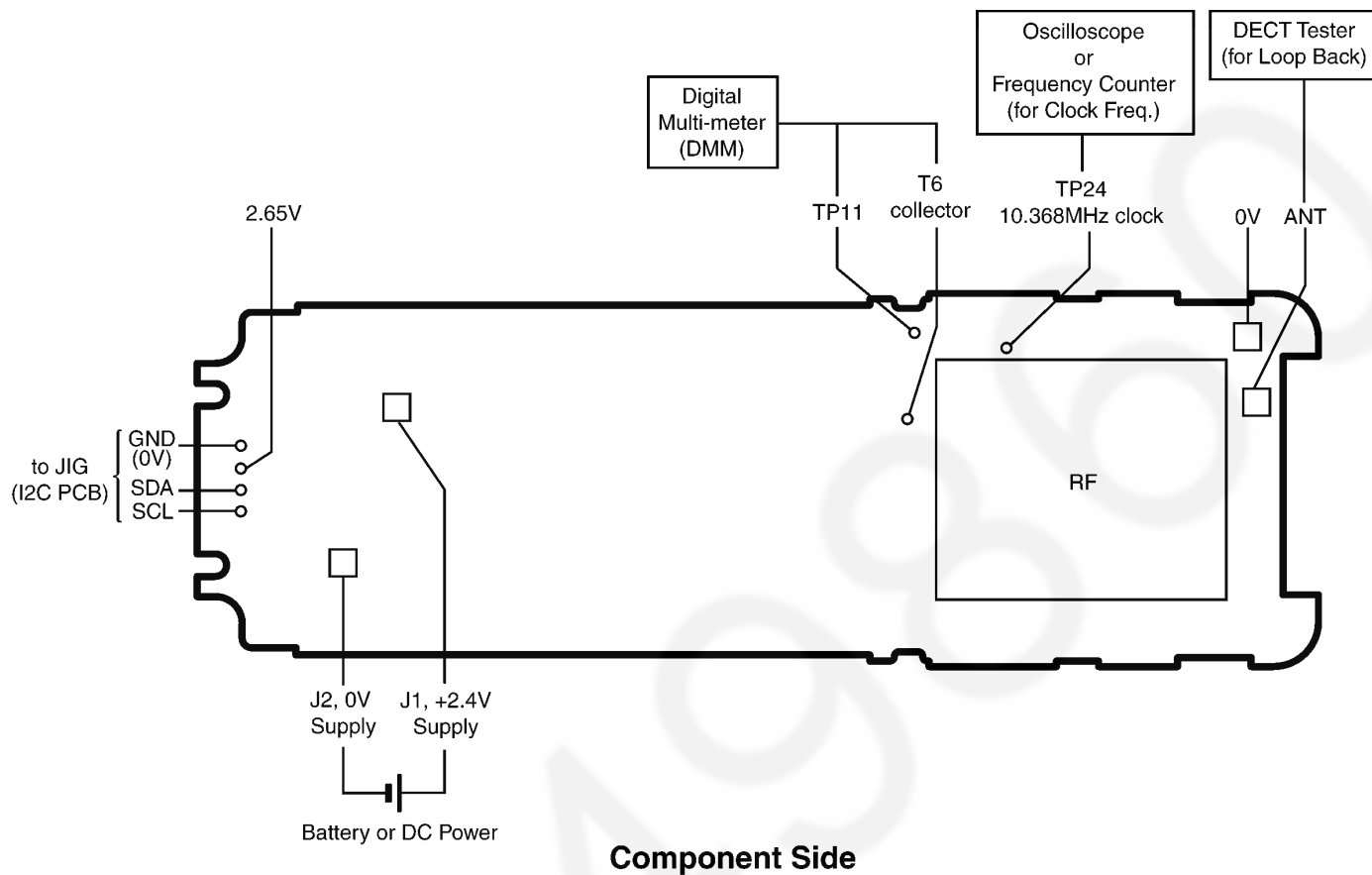
1. Connect the RF input cable from the CMD60 (DECT tester) to the "0V" and "ANT" antenna pads.
2. Switch on the 2.4V supply.
3. Switch the handset on at the keypad.
4. Enter "RDEEPROM 00 4A 01". This will return the value "25" if a base has been registered to the handset, or "FF" if there is no base registered.
5. If a base is not registered to the unit (i.e. "FF" returned in step 4) then enter "SETBASE" to induce registration.
6. Set the CMD60 as shown below.
TEST MODE: PP
CONFIG MENU: SIGN, SCRAMBLE: OFF
MANUAL TEST: Loop Back mode (TRAFFIC SLOT: 4, TRAFFIC CARRIER: 5)
CONNECT/EXT.ATT: _dBm (RF cable loss)
7. Enter "TESTMODE" on the PC.
8. Enter "RDEEPROM 00 36 05" to obtain the base RFPI identifier.
9. Set the RFPI in the CMD60 to the value obtained in the previous step.
10. Press SETUP CONNECT on the CMD60.
11. Check the power (NTP): it must be between 20 and 25dBm.
12. Press MODULATION.
13. Set DATA TYPE to FIG 31.
14. Check frequency drift: must be 0 $\pm$ 35 kHz/ms.
15. Check frequency offset: must be 0 $\pm$ 40 kHz.
16. Check deviation or modulation (max $\pm$ B field) with data type "FIG 31": must be 320kHz to 400kHz.
17. Press POWER RAMP on the CMD60.
18. Check that the burst fits the mask.
19. Press Menu Up " $\uparrow$ " on the CMD60.
20. Press BER (Bit Error Rate).
21. Obtain the sensitivity by slowly reducing RF LEVEL until the BER falls below 1000ppm. The sensitivity is the RF LEVEL reading at this point. It must be < -88dBm.
22. Press Menu Up " $\uparrow$ " on the CMD60.
23. Press BEARER RELEASE and switch off the 2.4V supply.
24. If the "SETBASE" operation above was carried out then enter "RESBASE" to de-register.
25. Disconnect the RF cable.

Note:

Step 2 to 24 can be repeated on TRAFFIC CARRIERS 0 and 9.

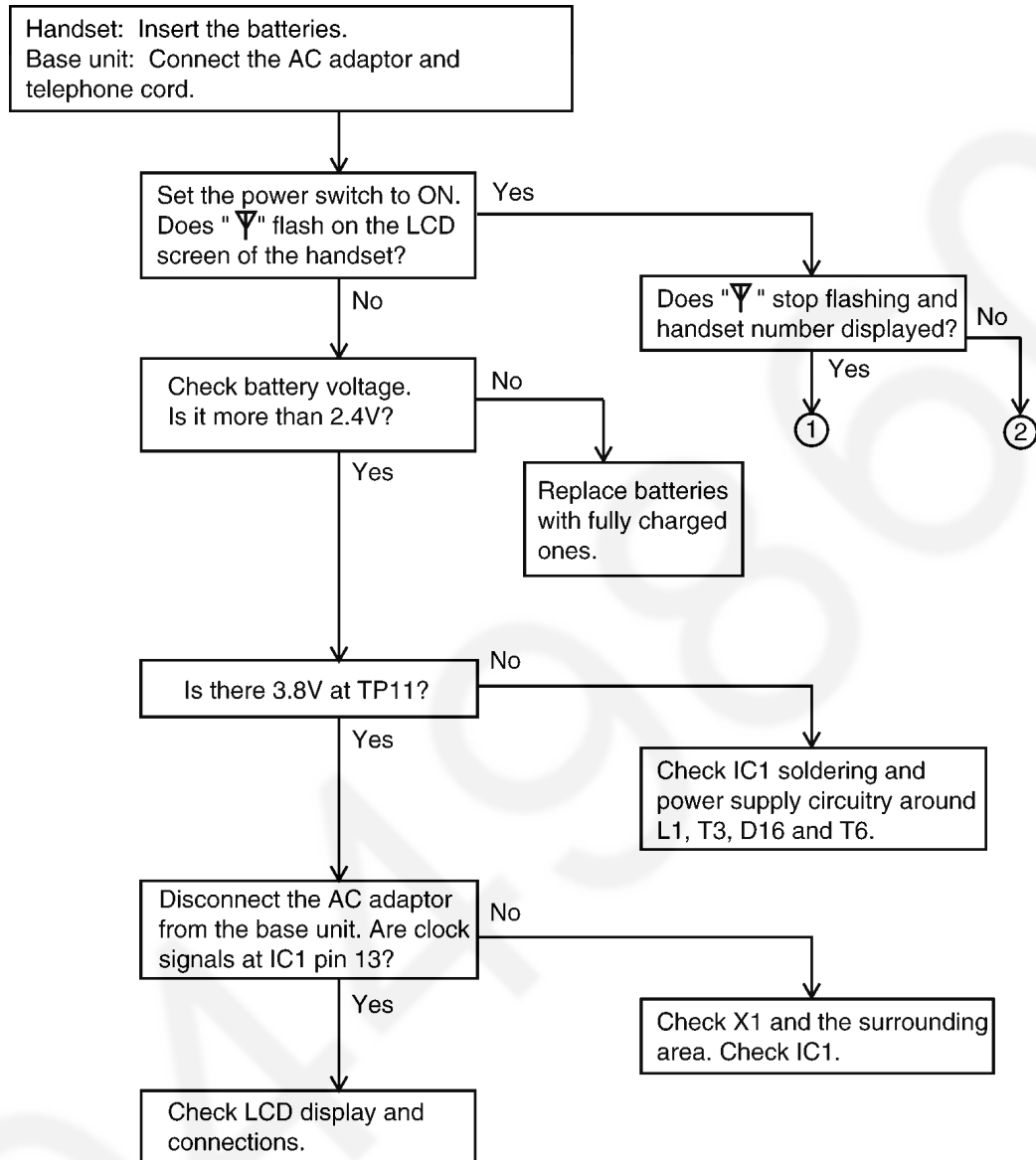
9.6. HANDSET REFERENCE DRAWING

When connecting the Simulator and the Equipments to the P.C.B. for checking, refer to the illustration below.

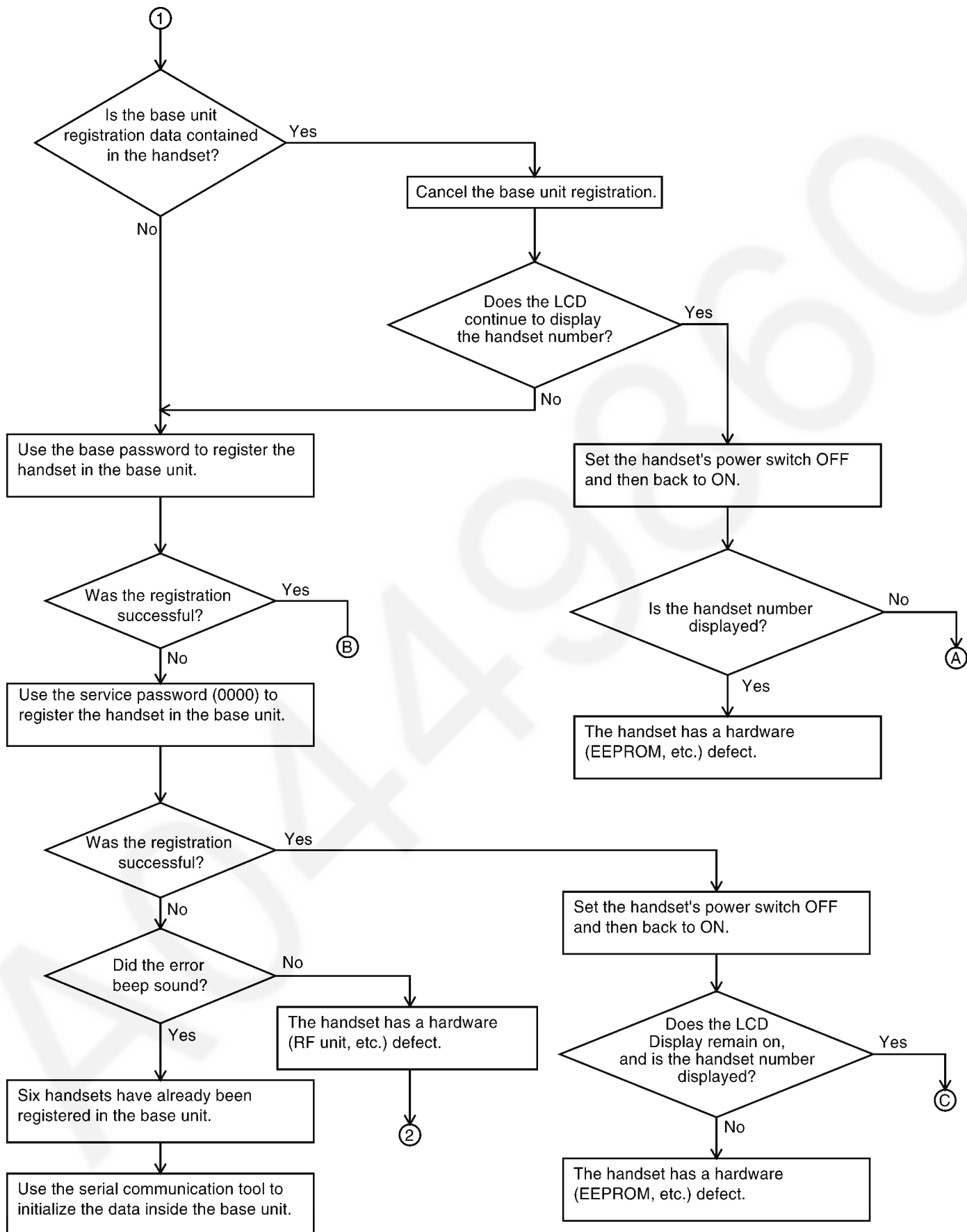


10 TROUBLESHOOTING GUIDE

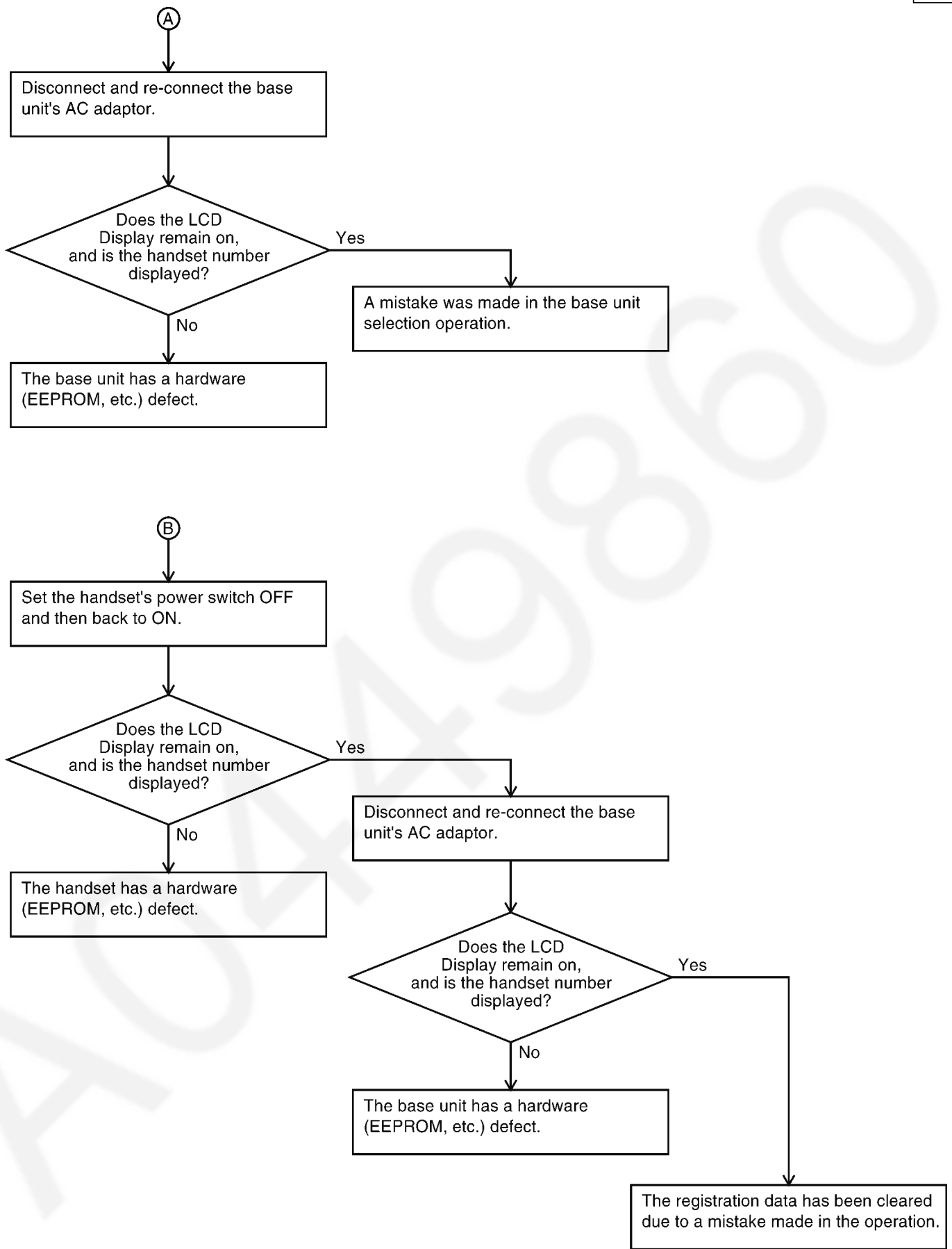
10.1. HANDSET: DOES NOT OPERATE

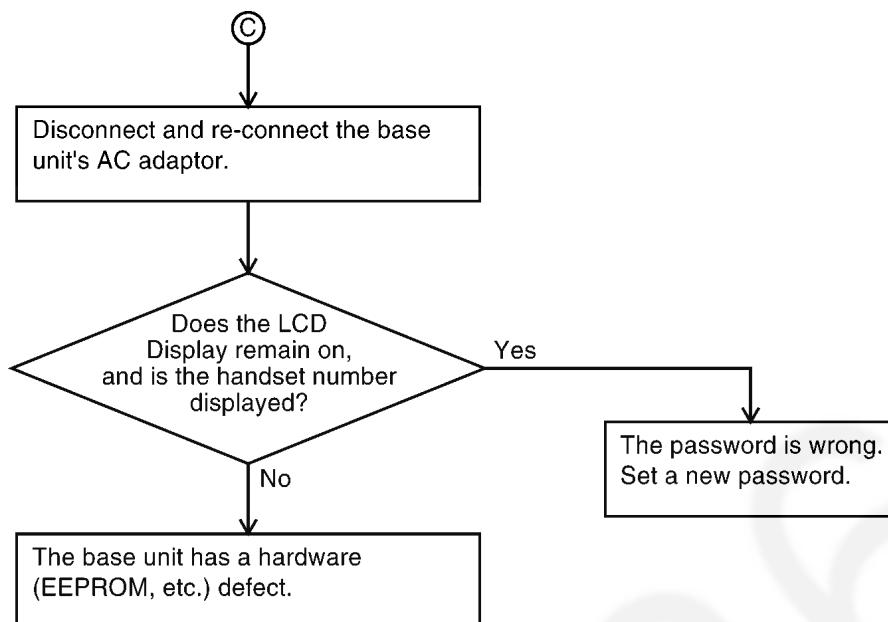


10.2. HANDSET: LINK

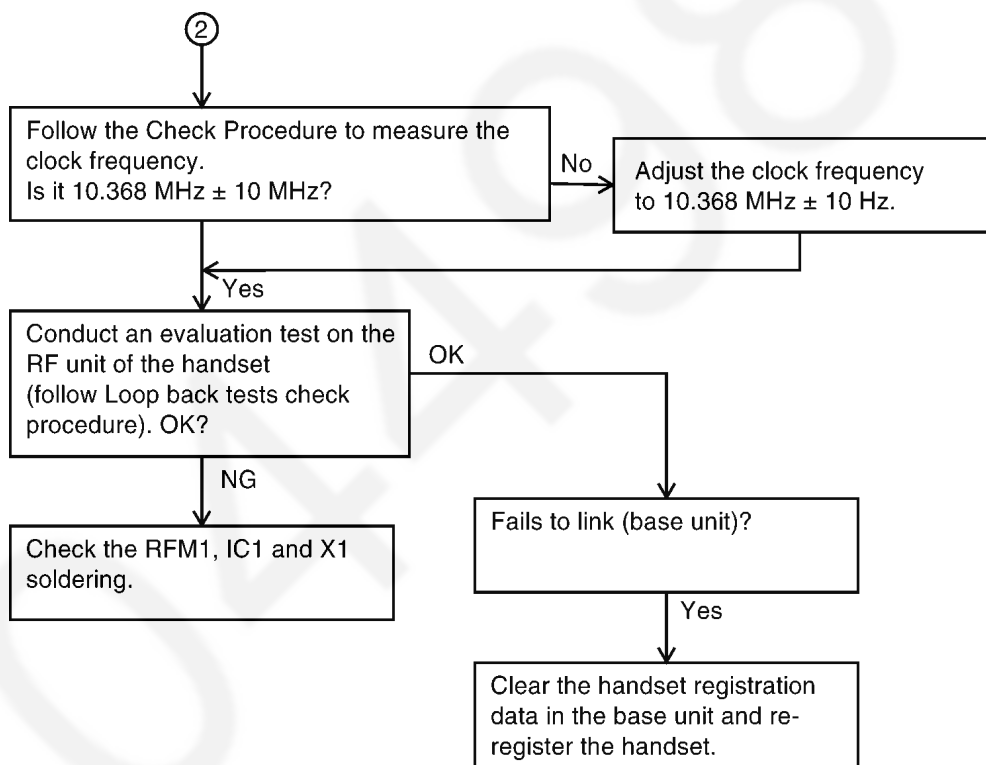


(Use the method for clearing the registered handset data in the base unit.)

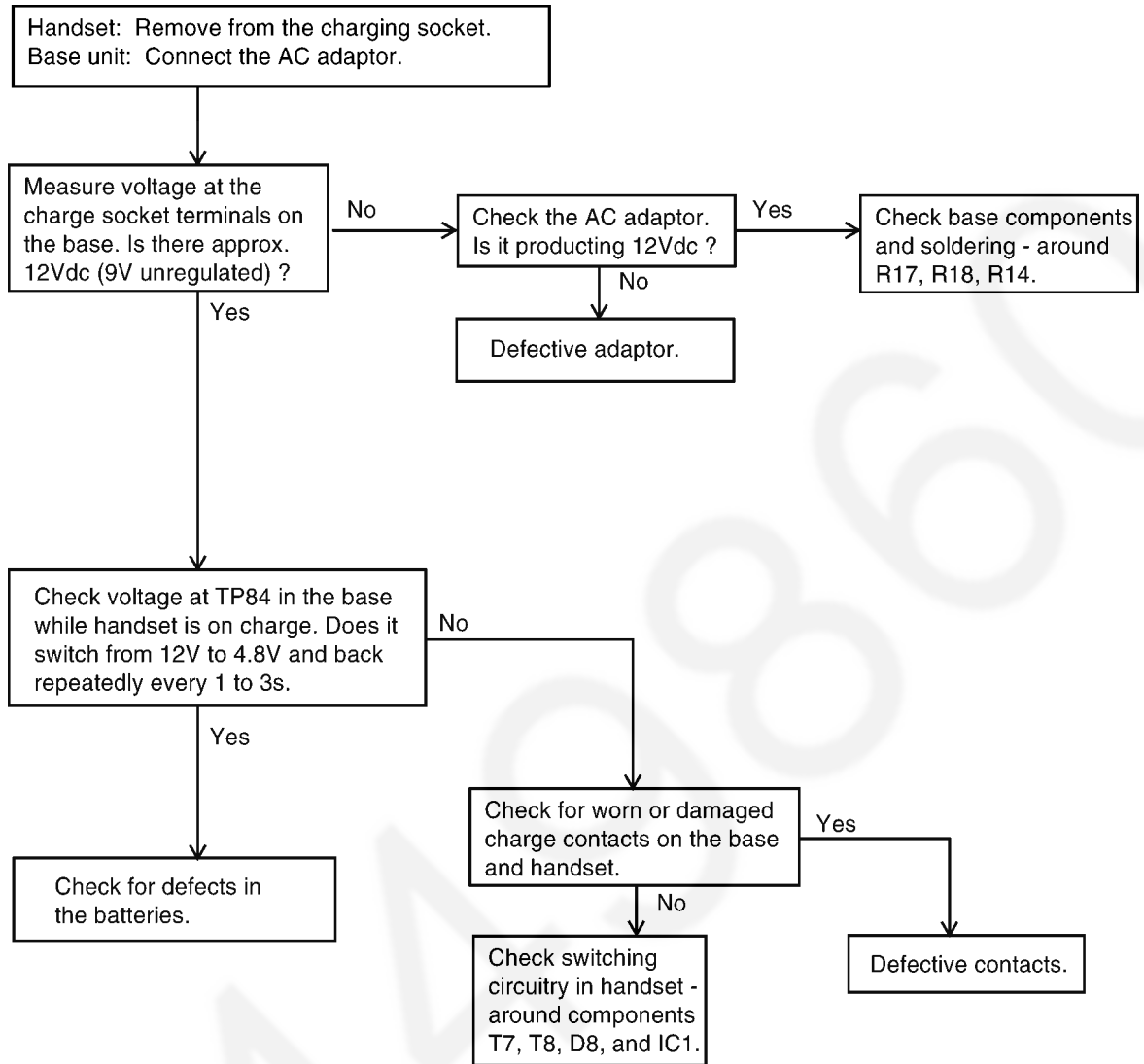




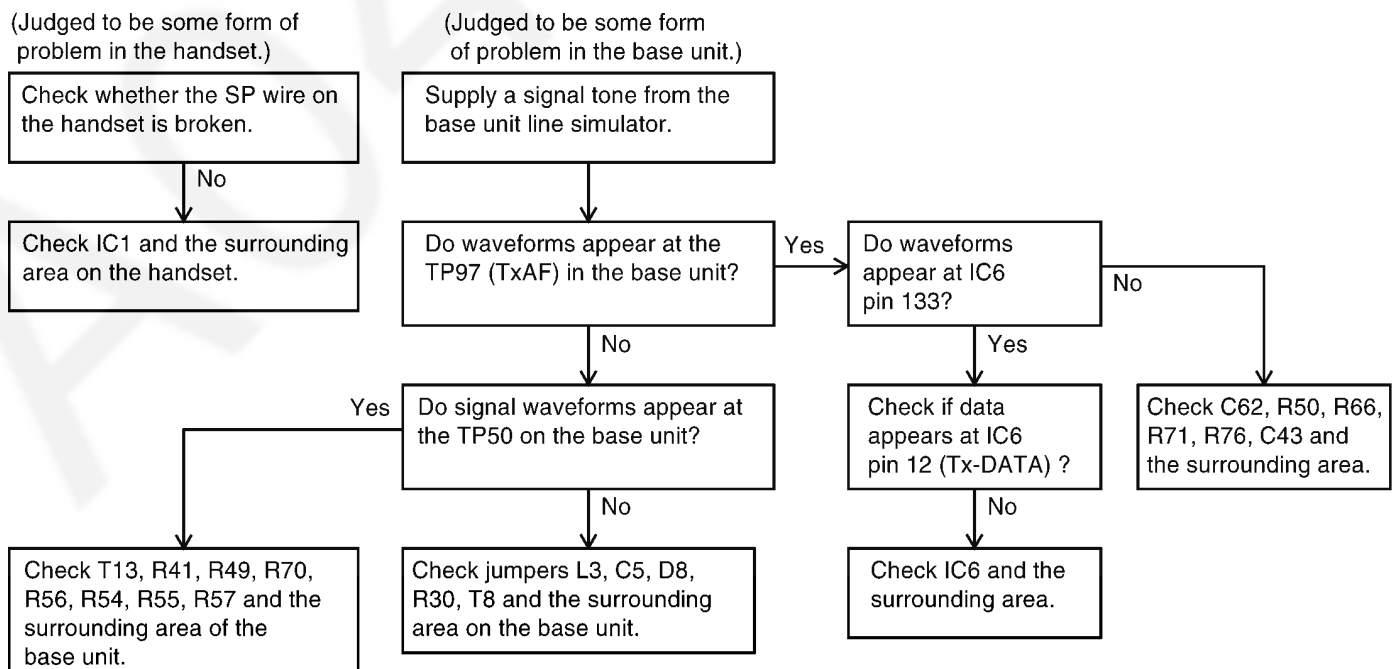
10.3. HANDSET: DOES NOT LINK



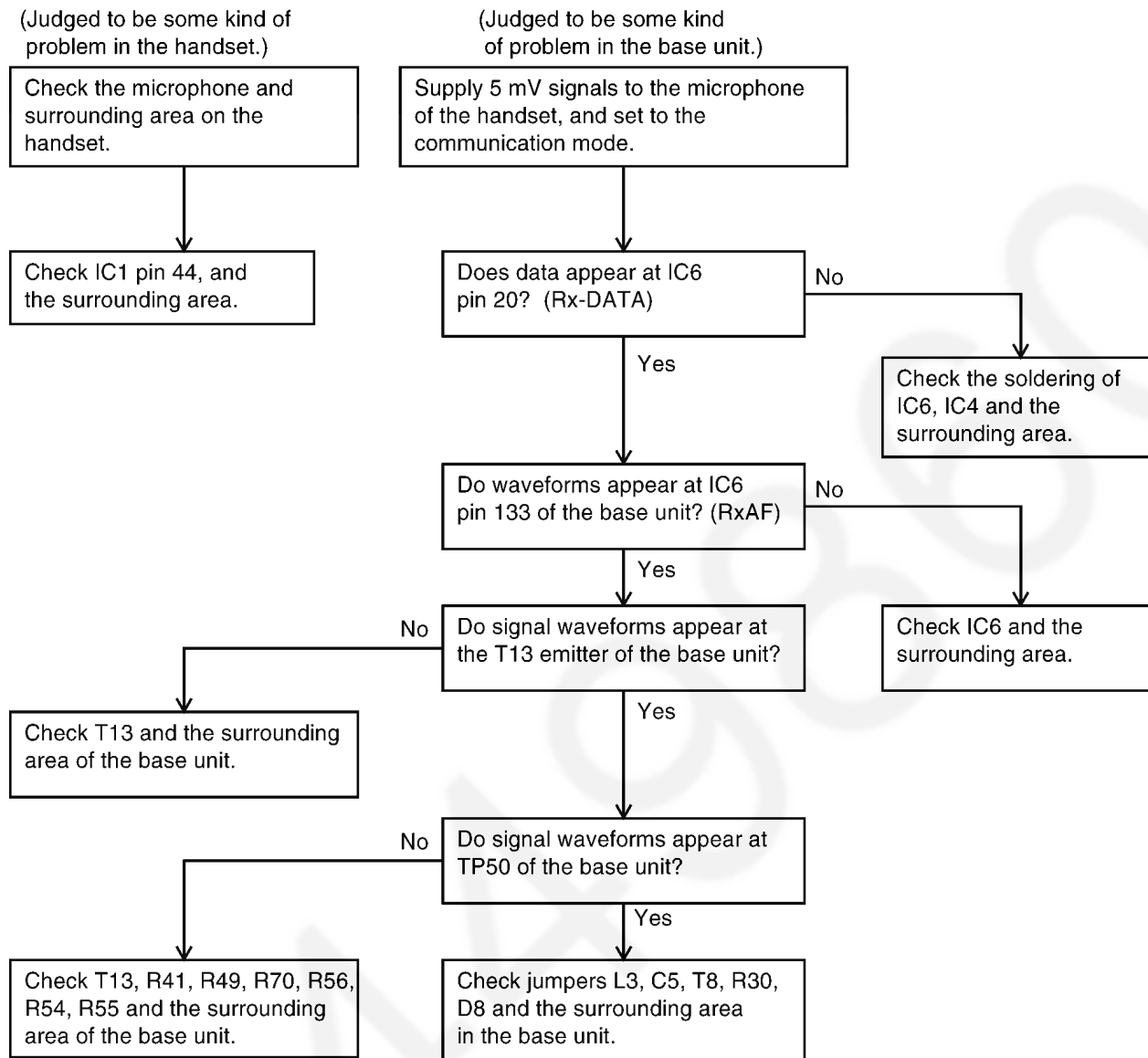
10.4. BATTERY DOES NOT CHARGE



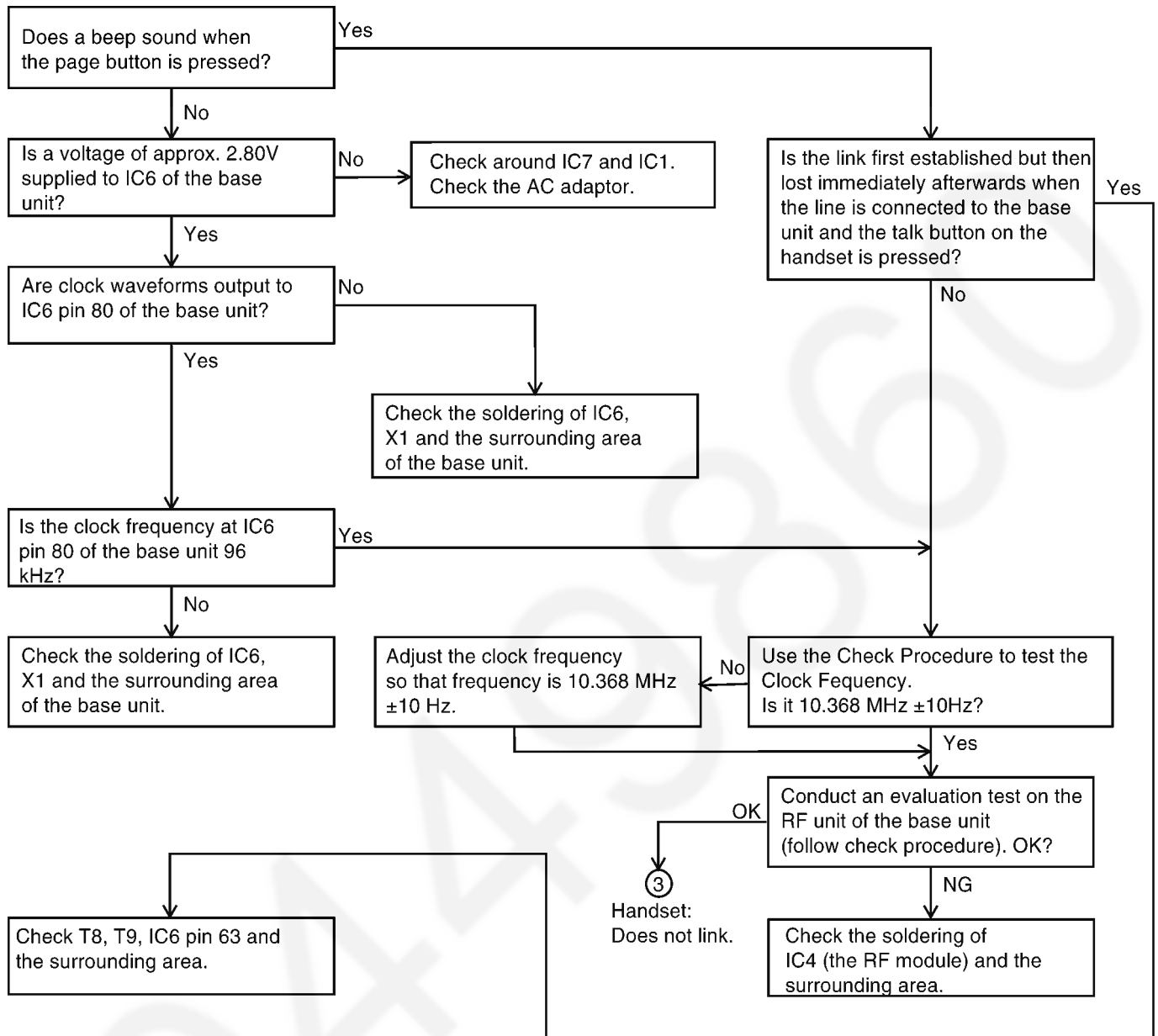
10.5. NO VOICE RECEPTION



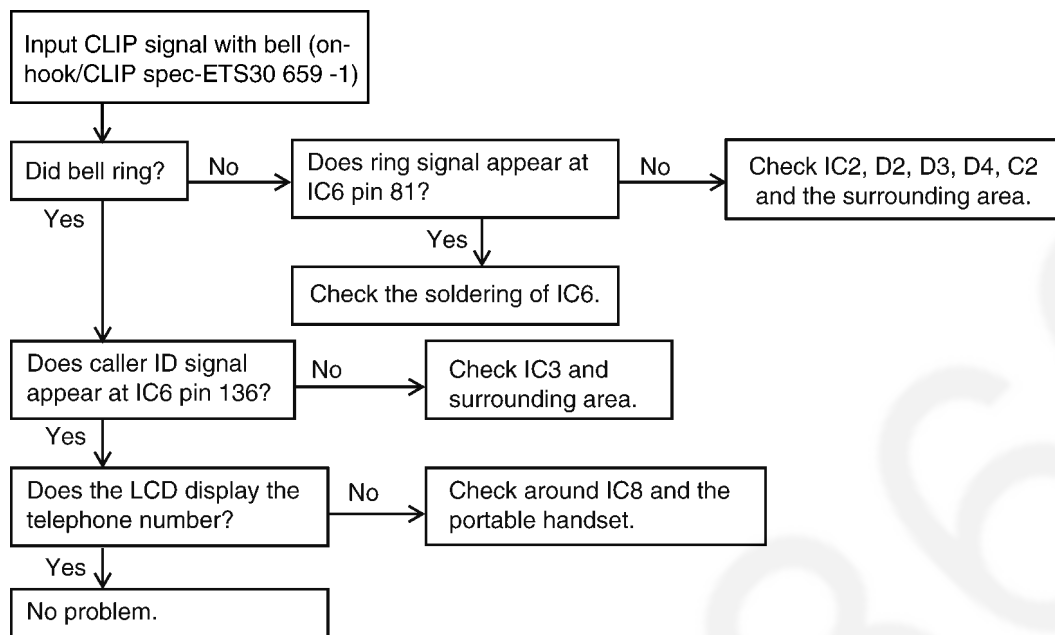
10.6. NO VOICE TRANSMISSION



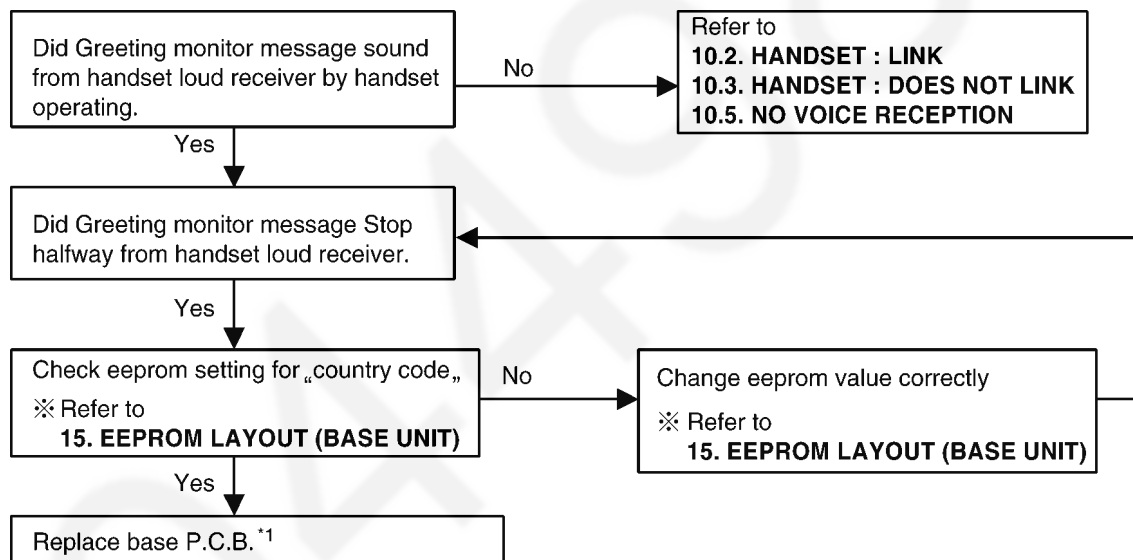
10.7. BASE UNIT: DOES NOT LINK



10.8. BASE UNIT : CALLER ID PROBLEMS



10.9. BASE UNIT: TAM VOICE PROMPT PROBLEMS



Cross Reference

HANDSET: LINK (P.42)

HANDSET: DOES NOT LINK (P.44)

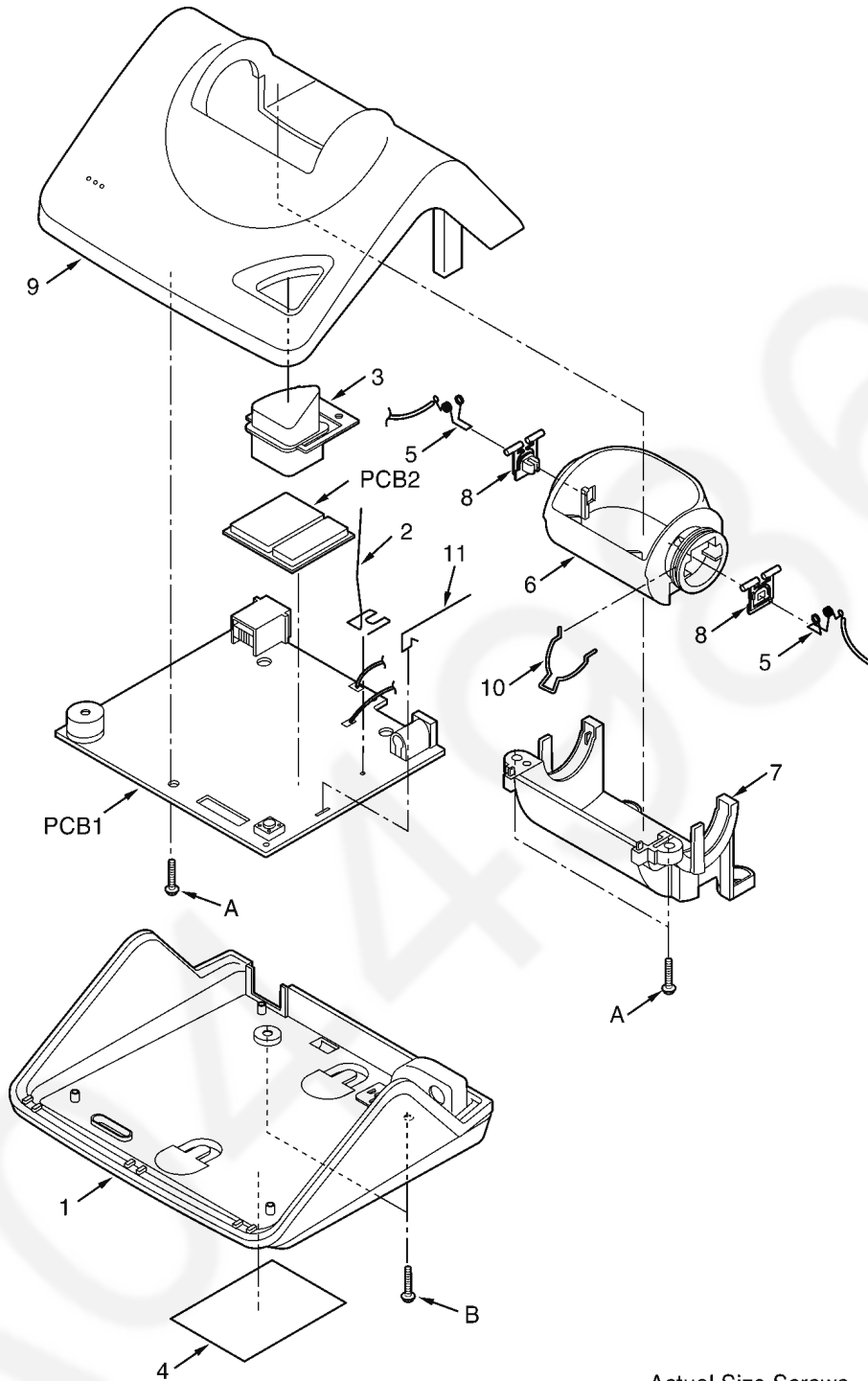
NO VOICE RECEPTION (P.45)

EEPROM LAYOUT (BASE UNIT) (P.56)

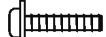
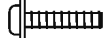
Note:

*1 After replacing the base P.C.B., you need to cancel the registration of handset(s) in the base unit and re-register it. See **Registration** (P.16) for these procedures.

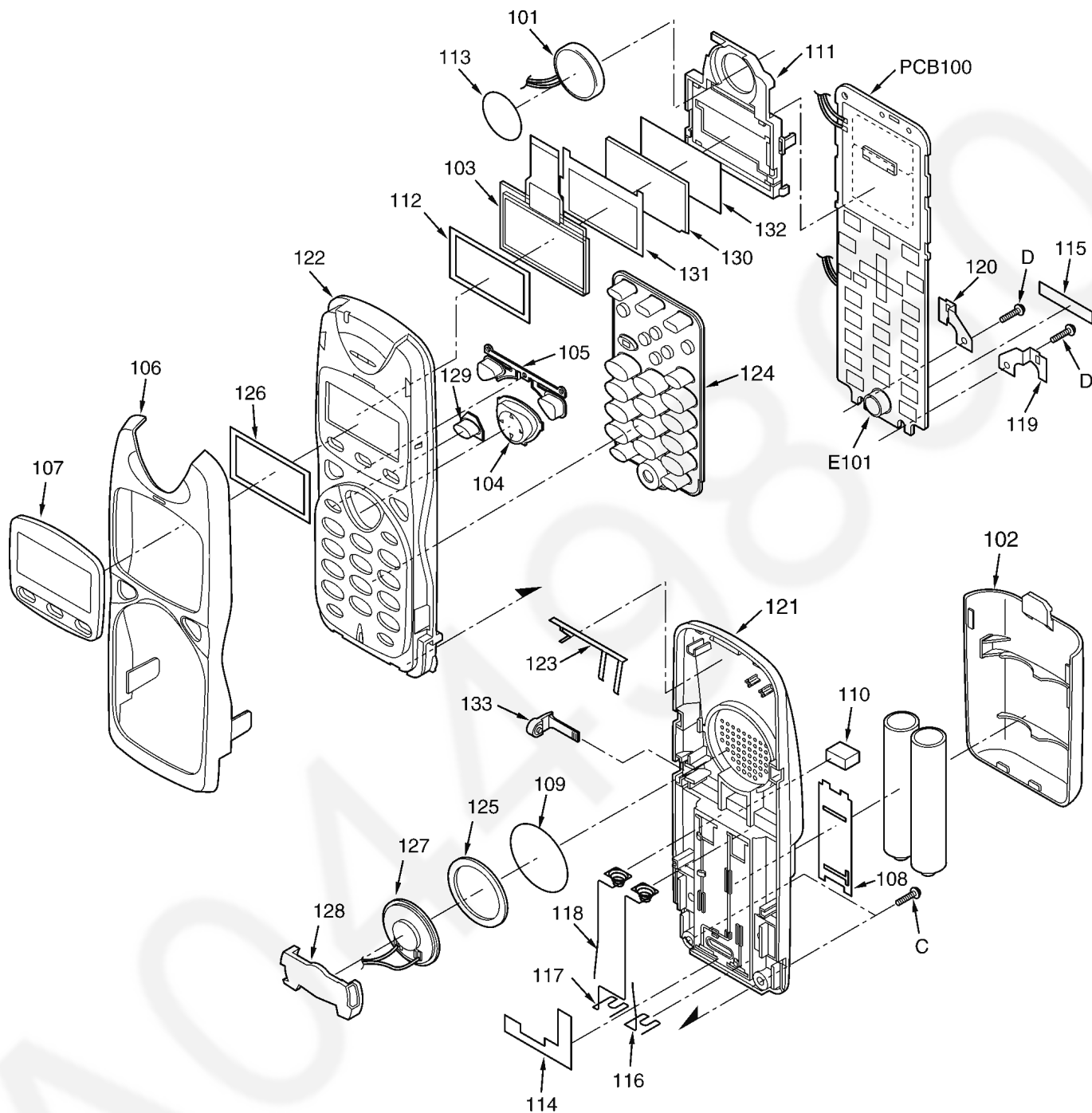
11 CABINET AND ELECTRICAL PARTS LOCATION (BASE UNIT)



Actual Size Screws

Ref.No.	Part No.	Figure
A	XTW26+10P	
B	XTW26+10P	

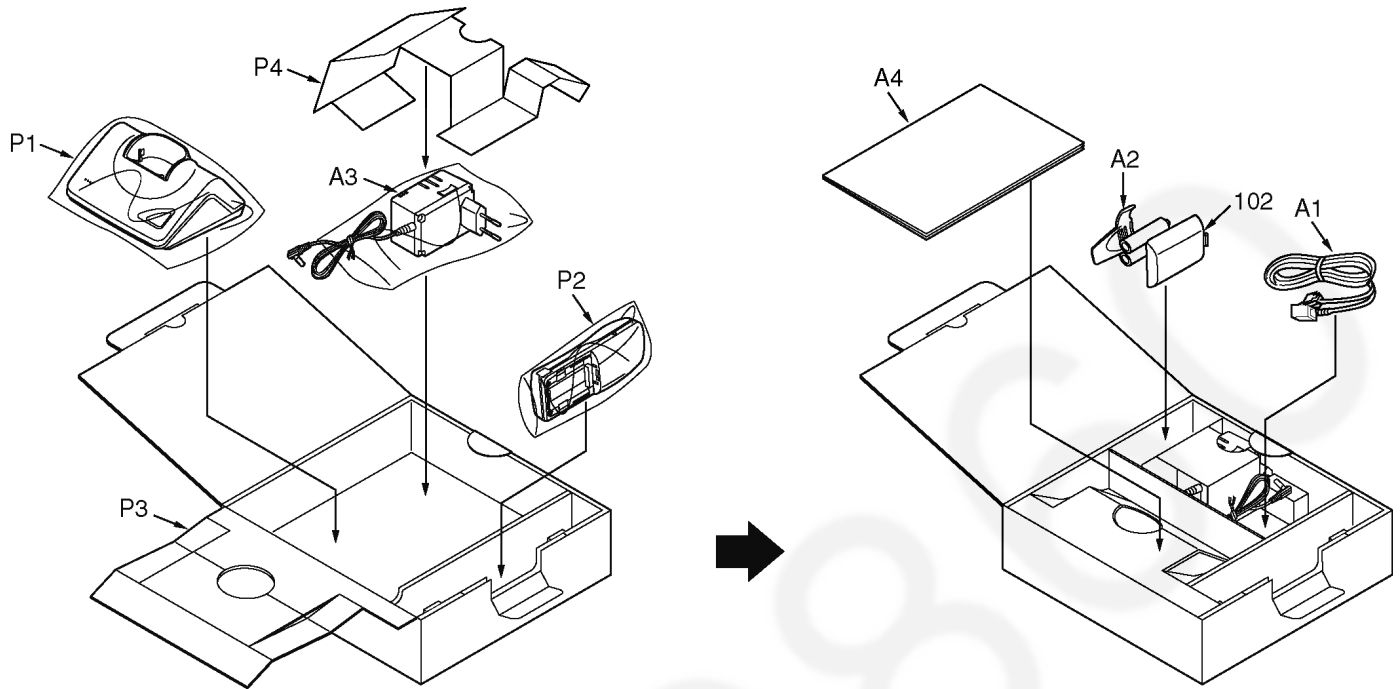
12 CABINET AND ELECTRICAL PARTS LOCATION (HANDSET)



ACTUAL SIZE OF SCREWS

Ref. No.	Part No.	Screw
C	XTW2+Q8P	
D	XTB2+6G	

13 ACCESSORIES AND PACKING MATERIALS



14 REPLACEMENT PARTS LIST

Notes:

1. RTL (Retention Time Limited)

The marking (RTL) indicates that the Retention Time is limited for this item.

After the discontinuation of this assembly in production, the item will continue to be available for a specific period of time. The retention period of availability is dependant on the type of assembly, and in accordance with the laws governing part and product retention. After the end of this period, the assembly 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. 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

Resistor Type:

ERC:Solid	ERJ:Thick Film	PQRD:Carbon
ERD: Carbon	ERO:Metal Film	PQRQ:Fuse
ERF:Wire Wound	ERX:Metal	
ERG:Metal Oxide	PQ4R:Chip	

Wattage:

3: 1/16W	10,16,18: 1/8W	15,20,S1: 1/2W
1: 1W	2: 2W	5: 5W

Capacitor Type:

ECFD:Semi Conductor	ECCD,ECKD,ECU,PQCBC,PQVP: Ceramic
ECQS: Styrol	ECQM,ECQV,ECQE,ECQU,ECQB: Polyester
PQCBX,ECUV: Chip	ECEA,ECSZ,ECOS,PSCE: Electrolytic
ECMS: 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	0J: 6.3V	1A: 10V	50,1H: 50V
2E: 250V	2: 200V	1A: 10V	1C: 16V	1J: 63V
2H: 500V		1V: 35V	1E,25: 25V	2A: 100V

14.1. Base Unit

14.1.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
1	PQYF10191Z4	LOWER CABINET	S
2	PQSA10124Z	ANTENNA, MAIN	
3	PQBC10324Z1	PAGE BUTTON	S
4	QUGT00088Z	NAME LABEL	
5	PQJT10173Z	CHARGE TERMINAL	
6	PQKE10121Z5	CHARGE CASE	S
7	PQKE10122Z5	CHARGE CASE HOLDER	S
8	PQKE10123Z1	CHARGE TERMINAL CASE	S
9	PQKM10473W5	UPPER CABINET	S
10	PQUS10266Z	CRICK SPRING	
11	QUSA00001Z	ANTENNA, SUB	

14.1.2. MAIN P.C.BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB1	PQWP1D725BXH	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICS)	
IC1	PSVIXC62FP27	IC	
IC3	PQVILMV321M5	IC	
IC5	PQWICD725-7H	IC	
IC6	PQVI5737L	IC	
IC7	PQVILM1117MP	IC	
IC8	C3FBKZ000001	IC	
IC9	PQVIT2464WM6	IC	
IC10	PQVIP357CN	IC	
		(TRANSISTORS)	
T1	PQVTBC81725T	TRANSISTOR (SI)	S
T6	PQVTBC81725T	TRANSISTOR (SI)	S
T7	B1ABCE000010	TRANSISTOR (SI)	
T8	2SA1807	TRANSISTOR (SI)	
T9	PQVTBF822T7	TRANSISTOR (SI)	
T10	PQVTBC847BT1	TRANSISTOR (SI)	
T11	PQVTBC847BT1	TRANSISTOR (SI)	
T12	B1ABCE000010	TRANSISTOR (SI)	
T13	2SD874A	TRANSISTOR (SI)	
		(DIODES)	
D2	PQVDBZV55C02	DIODE (SI)	
D3	PQVDBZV55C02	DIODE (SI)	
D4	MA111	DIODE (SI)	
D7	PQVDBZV55C47	DIODE (SI)	S
D8	PQVDS1ZB60F1	DIODE (SI)	
D9	PQVDBZV55C47	DIODE (SI)	S
D10	MA1Z300	DIODE (SI)	
D12	PQVDDAN217	DIODE (SI)	
D16	MA111	DIODE (SI)	
		(CONNECTORS)	
J1	PQJJ1T028Z	TEL JACK	
J2	PQJJ1B007Z	CONNECTOR DC JACK	
		(OTHERS)	
E1	PQEFBKSS1201	BUZZER	
K1	PQSH1A116Z	TACT SWITCH	
SA3	PQVDDSS301L	SURGE ABSORBER	
X1	PQVCF1036N4Z	CRYSTAL OSCILLATOR	
		(RESISTORS)	
R2	ERJ3GEYJ102	1k	
R3	PQ4R18XJ472	4.7k	
R4	ERJ3GEYJ103	10k	
R5	ERJ3GEYJ224	220k	
R6	ERJ3GEYJ102	1k	
R8	ERJ3GEYJ102	1k	
R9	ERJ3GEYJ473	47k	
R10	ERJ3GEYJ473	47k	
R13	PQ4R18XJ181	180	
R15	ERJ3GEYJ683	68k	
R16	ERJ3GEYJ222	2.2k	
R17	ERJ1WYJ111	110	
R18	ERJ1WYJ111	110	
R19	ERJ1WYJ111	110	
R20	ERJ3GEYJ224	220k	
R21	ERJ3GEYJ474	470k	
R22	ERJ3GEYJ274	270k	
R23	ERJ3GEY0R00	0	
R25	ERJ3GEYJ103	10k	
R28	ERJ3GEYJ474	470k	
R29	ERJ3GEYJ101	100	
R30	PQ4R18XJ000	0	
R35	ERJ3GEYJ104	100k	
R36	ERJ3GEYJ272	2.7k	
R37	ERJ3GEYJ101	100	
R38	ERJ3GEYJ101	100	
R39	ERJ3GEYJ103	10k	
R40	ERJ3GEYJ222	2.2k	
R41	ERJ3GEYJ333	33k	

Ref. No.	Part No.	Part Name & Description	Remarks
R42	ERJ3GEYJ101	100	
R43	ERJ3GEYJ560	56	
R44	ERJ3GEYJ103	10k	
R45	ERJ3GEYJ103	10k	
R46	ERJ3GEYJ103	10k	
R47	ERJ3GEYJ102	1k	
R48	ERJ3GEYJ560	56	
R50	ERJ3GEYJ101	100	
R51	ERJ3GEYJ101	100	
R52	ERJ3GEYJ102	1k	
R53	ERJ3GEYJ101	100	
R54	ERJ3GEYJ183	18k	
R55	ERJ3GEYJ104	100k	
R56	ERJ12YJ560	56	
R57	ERJ12YJ220	22	
R58	ERJ3GEYJ224	220k	
R59	ERJ3GEYJ391	390	
R60	ERJ3GEYJ391	390	
R61	ERJ3GEYJ102	1k	
R63	ERJ3GEYJ391	390	
R64	ERJ3GEYJ391	390	
R65	ERJ3GEYJ104	100k	
R66	ERJ3GEYJ101	100	
R67	ERJ3GEYJ331	330	
R68	ERJ3GEYJ681	680	
R69	ERJ3GEYJ101	100	
R70	ERJ3GEYJ562	5.6k	
R71	ERJ3GEYJ154	150k	
R72	PQ4R18XJ100	10	
R73	ERJ3GEYJ103	10k	
R74	ERJ3GEYJ222	2.2k	
R75	ERJ3GEYJ154	150k	
R76	ERJ3GEYJ183	18k	
R77	ERJ3GEYJ183	18k	
R81	ERJ3GEYJ103	10k	
R83	ERJ3GEYJ103	10k	
R84	ERJ3GEYJ103	10k	
R87	ERJ3GEYJ102	1k	
R88	ERJ3GEYJ102	1k	
R122	PQ4R10XJ474	470k	
R130	ERJ3GEYJ104	100k	
R133	ERJ3GEY0R00	0	
R136	ERJ3GEYJ103	10k	
JMP19	PQ4R10XJ000	0	
JMP51	PQ4R10XJ000	0	
JMP52	PQ4R10XJ000	0	
C7	ERJ3GEY0R00	0	
C113	ERJ3GEYJ822	8.2k	
L4	ERJ3GEY0R00	0	
		(CAPACITORS)	
C1	ECUV1C104KBV	0.1	
C2	ECQE2E474KZ	0.47	S
C3	ECUV1C104KBV	0.1	
C4	ECUV1H040CCV	4P	
C6	ECUV1C104KBV	0.1	
C8	ECUV1H100DCV	10P	
C9	ECUV1H100DCV	10P	
C10	ECUV1H100DCV	10P	
C12	ECUV2H102KB	0.001	
C13	ECUV1H151JCV	150P	
C14	ECUV2H102KB	0.001	
C15	ECUV1H151JCV	150P	
C16	ECUV2H681KB	680P	
C17	ECUV2H681KB	680P	
C20	ECUV1H103KBV	0.01	
C23	ECUV2H332KB	0.0033	
C26	ECUV1A225KB	2.2	
C27	ECUV1H100DCV	10P	
C28	PQCUV1C224KB	0.22	
C30	ECUV1H100DCV	10P	
C31	ECUV1H100DCV	10P	
C36	ECEV1HA2R2S	2.2	
C38	ECUV1H121JCV	120P	

Ref. No.	Part No.	Part Name & Description	Remarks
C39	ECUV1H151JCV	150P	
C40	PSCEV1CA101S	100P	
C41	ECUV1H100DCV	10P	
C42	PSCEV1CA101S	100P	
C43	ECUV1H151JCV	150P	
C44	ECUV1C104KBV	0.1	
C46	ECUV1H100DCV	10P	
C47	ECUV1A225KB	2.2	
C48	PQCUV1C105KB	1	
C49	ECUV1C104KBV	0.1	
C52	ECUV1C823KBV	0.082	
C53	ECUV1H470JCV	47P	
C54	ECUV1H100DCV	10P	
C55	ECUV1C104KBV	0.1	
C56	ECUV1C104KBV	0.1	
C57	ECUV1C104KBV	0.1	
C58	ECUV1C104KBV	0.1	
C59	ECUV1H100DCV	10P	
C60	ECUV1H100DCV	10P	
C61	PQCUV1C224KB	0.22	
C62	ECUV1C104KBV	0.1	
C63	ECUV1H472KBV	0.0047	
C64	ECUV1C823KBV	0.082	
C65	ECUV1H100DCV	10P	
C66	ECUV1E333KBV	0.033	
C67	ECUV1H100DCV	10P	
C69	ECUV1C104KBV	0.1	
C79	ECUV1C104KBV	0.1	
C80	ECUV1H101JCV	100P	
C84	ECUV1H100DCV	10P	
C100	ECUV1C105ZFB	1	
C101	ECUV1C105ZFB	1	
C102	ECUV1C105ZFB	1	
C103	ECUV1H270JCV	27P	
C104	ECUV1C104KBV	0.1	
C105	ECUV1C104KBV	0.1	
C107	ECUV1C104KBV	0.1	
C108	ECUV1C105ZFB	1	
C109	ECUV1H100DCV	10P	
C110	ECUV1H100DCV	10P	
C111	ECUV1H100DCV	10P	

14.1.3. RF MODULE

Ref. No.	Part No.	Part Name & Description	Remarks
PCB2	PQLZ10015Z	RF MODULE (IC4)	

14.2. Handset

14.2.1. CABINET AND ELECTRICAL PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
101	L0AD02A00006	RECEIVER	
102	PQKK10109Z5	BATTERY COVER	S
103	L5CBDC00003	LCD DOT MATRIX	
104	PQBC10323Y1	NAVIGATOR KEY	S
105	PQBX10345Y1	FUNCTION BUTTON	S
106	PQGG10116Z5	FRONT CABINET GRILL	S
107	PQGP10176Y2	LCD PANEL	S
108	QUGT00100Z	NAME LABEL	
109	PQHS10457Z	SPEAKER NET	
110	PQHG10634X	RUBBER	
111	PQHR10779Y	LCD HOLDER	
112	PQHS10430Y	LCD SPONGE	
113	PQHS10467Z	RECEIVER NET	
114	PQHX11113Z	SHEET PET	
115	PQHX11030Z	INSULATION TAPE	
116	PQJC10046Z	BATTERY TERMINALS (A)	
117	PQJC10047Y	BATTERY TERMINALS (B)	

Ref. No.	Part No.	Part Name & Description	Remarks
118	PQJC10048Y	BATTERY TERMINALS (C)	
119	PQJT10168Z	CHARGE TERMINAL (L)	
120	PQJT10169Z	CHARGE TERMINAL (R)	
121	PQKF10497Z5	REAR CABINET	S
122	PQKM10464W5	FRONT CABINET	S
123	PQSA10117Y	ANTENNA	
124	PQSX10155Y	RUBBER KEYPAD	
125	PQHG10589Y	SPEAKER SPONGE	
126	PQHS10429X	DOUBLE SIDED TAPE	
127	PQAS3P07Y	SPEAKER	
128	PQHR10778Z	SPEAKER HOLDER	
129	PQBC10314Z1	SP BUTTON	S
130	PQHR10781Z	LCD PLATE	
131	PQHX10962Z	LCD COVER SHEET	
132	PQHX10963Z	LCD REFLECTOR SHEET	
133	PQKE10108Z2	EAR PIECE CAP	S

14.2.2. MAIN P.C.BOARD PARTS

Ref. No.	Part No.	Part Name & Description	Remarks
PCB100	PQWPCD735CER	MAIN P.C.BOARD ASS'Y (RTL)	
		(ICS)	
IC1	PQVI6723L22	IC	
IC2	PQVIT2464WMB	IC	S
IC3	PQWICD735CER	IC	
IC400	PMB6818	IC	
IC402	PMB6610V12	IC	S
HF_AM1	PQVINJM2135M	IC	
		(TRANSISTORS)	
T1	BlGBCFGC0001	TRANSISTOR (SI)	S
T3	PQVTSI2302DS	TRANSISTOR (SI)	
T5	BlGBCFGC0001	TRANSISTOR (SI)	S
T6	PQVTBC80725T	TRANSISTOR (SI)	S
T7	PQVTBC80740T	TRANSISTOR (SI)	S
T8	BlGBCFGC0001	TRANSISTOR (SI)	S
T11	DTC143XKA106	TRANSISTOR (SI)	
T12	DTC143XKA106	TRANSISTOR (SI)	
T400	BC858BW	TRANSISTOR (SI)	
		(DIODES)	
D1	LNJ115W89RA	DIODE (SI)	
D2	LNJ115W89RA	DIODE (SI)	
D3	LNJ115W89RA	DIODE (SI)	
D4	MA111	DIODE (SI)	
D5	MA111	DIODE (SI)	
D6	MA111	DIODE (SI)	
D7	MA8047	DIODE (SI)	
D8	MA112	DIODE (SI)	
D9	MA8047	DIODE (SI)	
D11	B3ABB0000001	DIODE (SI)	S
D12	B3ABB0000001	DIODE (SI)	S
D13	B3ABB0000001	DIODE (SI)	S
D14	B3ABB0000001	DIODE (SI)	S
D16	MA2H73600L	DIODE (SI)	
D17	PQVDBR1111C	DIODE (SI)	S
D18	PQVDBZV55C47	DIODE (SI)	S
D19	PQVDBZV55C47	DIODE (SI)	S
D21	PQVDBZV55C47	DIODE (SI)	S
D400	PQVDBAR6405	DIODE (SI)	
		(COILS)	
L1	GLA220F00005	COIL	
L2	ELJPA100KF	COIL	
L3	ELJPA100KF	COIL	
L4	PQLQR2K1A102	COIL	
L400	GLC4N7Z00005	COIL	
L401	GLC4N7Z00005	COIL	
L402	GLC22NKA0025	COIL	
L405	PSLQR2B2N7S	COIL	
L406	PSLQR2B2N7S	COIL	
F1	PQLQR2M6N8KT	COIL	
		(CONNECTORS)	
J5	PSJS22A62Z	LCD CONNECTOR	
J6	PQJJ1C002Z	HEADSET JACK	

Ref. No.	Part No.	Part Name & Description	Remarks
		(OTHERS)	
A1a	PQJT10152Y	CHARGE PAD	
A1b	PQJT10152Y	CHARGE PAD	
J1	PQJT10152Y	CHARGE PAD	
J2	PQJT10152Y	CHARGE PAD	
E101	PQJM146Z	MICROPHONE	
RFCAN 1	PQMC10417Z	RFCAN 1	
RFCAN 2	PQMC10418Z	RFCAN 2	
X1	PQVCF1036N3Z	CRYSTAL OSCILLATOR	
		(RESISTORS)	
R1	ERJ3GEYJ222	2.2k	
R2	ERJ3GEYJ184	180k	
R3	ERJ3GEYJ000	0	
R4	ERJ3GEYJ330	33	
R5	ERJ3GEYJ330	33	
R6	ERJ3GEYJ471	470	
R7	ERJ3GEYJ120	12	
R8	ERJ3GEYJ471	470	
R9	ERJ3GEYJ223	22k	
R10	ERJ3GEYJ393	39k	
R11	ERJ3GEYJ181	180	
R12	ERJ3GEYJ181	180	
R13	ERJ3GEYJ100	10	
R14	ERJ3GEYJ124	120k	
R15	ERJ3GEYJ473	47k	
R16	PQ4R18XJR10	0.1	
R17	ERJ3GEYJ683	68k	
R18	ERJ3GEYJ563	56k	
R20	ERJ3GEYJ181	180	
R21	ERJ3GEYJ471	470	
R22	ERJ3GEYJ120	12	
R23	ERJ3GEYJ120	12	
R24	ERJ3GEYJ471	470	
R27	ERJ3GEYJ220	22	
R28	ERJ3GEYJ220	22	
R29	ERJ3GEYJ103	10k	
R35	ERJ3GEYJ824	820k	
R36	ERJ3EKF4303	430k	
R37	ERJ3GEYJ224	220k	
R42	ERJ3GEYJ153	15k	
R43	ERJ3GEYJ560	56	
R50	ERJ3GEYJ103	10k	
R51	PQ4R18XJ471	470	
R52	PQ4R10XJ122	1.2k	
R54	ERJ3GEYJ224	220k	
R55	ERJ3GEYJ104	100k	
R56	PQ4R10XJ2R7	2.7	
R59	ERJ3GEYJ103	10k	
R60	ERJ3GEYJ103	10k	
R61	ERJ3GEYJ224	220k	
R62	ERJ3GEYJ104	100k	
R67	ERJ3GEYJ101	100	
R68	ERJ3GEYJ101	100	
R69	ERJ3GEYJ104	100k	
R70	ERJ3GEYJ104	100k	
R404	ERJ3GEYJ1R0	1	
R406	ERJ3GEYJ100	10	
R408	ERJ3GEYJ561	560	
R409	ERJ3GEYJ331	330	
R410	ERJ3GEYJ273	27k	
R411	ERJ3GEYJ472	4.7k	
R412	ERJ3GEYJ272	2.7k	
R413	ERJ3GEYJ332	3.3k	
R414	ERJ3GEYJ183	18k	
R415	ERJ3GEYJ152	1.5k	
R416	ERJ3GEYJ331	330	
R417	ERJ3GEYJ272	2.7k	
R418	ERJ3GEYJ1R0	1	
C47	ERJ3GEYJ473	47k	
		(CAPACITORS)	
C1	ECUV1C683KBV	0.068	
C2	ECUV1C683KBV	0.068	
C3	ECUV1C683KBV	0.068	

Ref. No.	Part No.	Part Name & Description	Remarks
C4	ECST1AD227	220	
C5	ECUV1C683KBV	0.068	
C6	ECUV1H030CCV	3P	
C7	ECUV1H220JCV	22P	
C8	PQCUV1H333JC	0.033	
C10	ECUV1H220JCV	22P	
C12	ECUV1C104KBV	0.1	
C13	ECUV1C104KBV	0.1	
C14	ECUV1C104KBV	0.1	
C15	ECUV1C104KBV	0.1	
C16	ECUV1C683KBV	0.068	
C17	ECUV1H100DCV	10P	
C18	ECST1AY475	4.7	
C19	ECUV1H100DCV	10P	
C20	ECUV1H100DCV	10P	
C21	ECUV1H100DCV	10P	
C22	ECUV1H100DCV	10P	
C23	ECUV1H100DCV	10P	
C24	ECUV1H182KBV	0.0018	
C25	ECUV1H100DCV	10P	
C26	ECUV1H100DCV	10P	
C27	ECUV1H100DCV	10P	
C28	ECUV1A225KB	2.2	
C29	ECUV1H100DCV	10P	
C30	ECUV1C104KBV	0.1	
C31	ECUV1C104KBV	0.1	
C32	ECUV1C104KBV	0.1	
C33	ECUV1C104KBV	0.1	
C34	ECUV1H100DCV	10P	
C35	ECST1AY106	10	
C36	ECUV1C104KBV	0.1	
C37	ECUV1C104KBV	0.1	
C38	ECUV1H100DCV	10P	
C39	PQCUV1C474KB	0.47	
C40	PQCUV1C474KB	0.47	
C41	ECUV1H100DCV	10P	
C42	ECUV1C104KBV	0.1	
C43	ECUV1C104KBV	0.1	
C44	ECUV1C104KBV	0.1	
C45	ECUV1C104KBV	0.1	
C46	ECUV1C104KBV	0.1	
C48	ECUV1C104KBV	0.1	
C49	ECST1AY106	10	
C50	ECUV1C104KBV	0.1	
C51	ECUV1C104KBV	0.1	
C52	PQCUV1E104MD	0.1	S
C53	ECUV1C104KBV	0.1	
C54	ECUV1C104KBV	0.1	
C55	ECUV1H103KBV	0.01	
C56	ECUV1C683KBV	0.068	
C57	ECUV1C104KBV	0.1	
C58	ECUV1C104KBV	0.1	
C59	ECUV1C104KBV	0.1	
C60	ECUV1H100DCV	10P	
C61	ECUV1H100DCV	10P	
C62	ECUV1H100DCV	10P	
C63	ECUV1C224KBV	0.22	
C64	ECUV1C224KBV	0.22	
C65	ECUV1H100DCV	10P	
C66	ECUV1H100DCV	10P	
C67	ECUV1H100DCV	10P	
C400	ECUV1H1R8CCV	1.8	
C402	ECUV1H100DCV	10P	
C404	ECUV1H100DCV	10P	
C405	ECUV1H100DCV	10P	
C406	ECUV1H331JCV	330P	
C407	ECUV1H100DCV	10P	
C408	ECUV1H330JCV	33P	
C409	PQCUV1H102J	0.001	
C410	0805N472J500	0.0047	
C411	ECUV1H102KBV	0.001	
C412	ECUV1H100DCV	10P	
C413	ECUV1H103KBV	0.01	

Ref. No.	Part No.	Part Name & Description	Remarks
C414	PQCUV1H222JC	0.0022	
C415	ECUV1H100DCV	10P	
C416	0805N472J500	0.0047	
C417	ECUV1H103KBV	0.01	
C418	ECUV1H1R5CCV	1.5	
C419	ECUV1H100DCV	10P	
C420	ECUV1H100DCV	10P	
C421	ECUV1H100DCV	10P	
C422	ECUV1H100DCV	10P	
C423	ECUV1H330JCV	33P	
C424	0603N1R8B500	1.8	
C426	ECUV1C104KBV	0.1	
C427	ECUV1H100DCV	10P	
C428	ECUV1H100DCV	10P	
C429	ECUV1H103KBV	0.01	
C431	ECUV1H100DCV	10P	
C432	ECUV1H100DCV	10P	
C433	ECUV1H100DCV	10P	
C434	ECUV1H180JCV	18P	
C435	ECUV1H2R2CCV	2.2	
C436	ECUV1H100DCV	10P	
C437	ECUV1H221JCV	220P	
C438	ECUV1H1R5CCV	1.5	
C439	ECUV1H1R2CCV	1.2	
C440	ECUV1H100DCV	10P	
C441	ECUV1H100DCV	10P	
C442	ECUV1H1R2CCV	1.2	
C443	ECUV1H1R8CCV	1.8	
C444	0603N1R8B500	1.8	
C445	ECUV1H100DCV	10P	
C446	ECUV1C104KBV	0.1	
C447	ECUV1H100DCV	10P	
C448	ECUV1H100DCV	10P	
C449	ECUV1H180JCV	18P	
C450	ECUV1H1R5CCV	1.5	
C451	ECUV1H1R8CCV	1.8	
C452	ECUV1H1R2CCV	1.2	
C455	PQCUV1A105KB	1	
C456	ECUV1H1R8CCV	1.8	
C457	ECUV1H1R8CCV	1.8	
C458	ECUV1H1R8CCV	1.8	
R19	ECUV1H100DCV	10P	

14.3. ACCESSORIES AND PACKING MATERIALS

Ref. No.	Part No.	Part Name & Description	Remarks
A1	PQJA10075Z	TEL CORD	
A2	PQKE10120Z2	BELT CLIP	S
A3	PQLV1CEZ	AC ADAPTOR	△
A4	QUQX00075Z	INSTRUCTION BOOK	
P1	XZB18X22A02	POLY BAG (for Base Unit)	
P2	PQFP10084Z	POLY BAG (for Handset)	
P3	QUPK00032Z	CARTON BOX	
P4	PQPN11679Z	ADAPTOR PAD	

14.4. FIXTURES AND TOOLS

Part No.	Part Name & Description	Remarks
PQZZTCD705BX	I2C PCB	
PQZZ1CD705BX	RS232C CABLE	
PQZZ2CD705BX	CLIP CABLE	
PQZZ3CD705BX	DC CABLE	

Note:

See CHECK PROCEDURE (BASE UNIT) (P.32), and CHECK PROCEDURE (HANDSET) (P.37).

15 EEPROM LAYOUT (BASE UNIT)

15.1. Scope

The purpose of this section is to describe the layout of the EEPROM (IC9) for the TCD725 Base Unit.

The EEPROM contains hardware, software, and user specific parameters. Some parameters are set during production of the base e.g. crystal frequency adjustment at address 0000 and 0001, some are set by the user configuration e.g. ringer volume at address 0210, and some are set during normal use of the phone e.g. meter pulse billing at address 1040..015F.

15.2. Introduction

The base unit uses a 32k bit (4096 x 8) serial EEPROM (IC9) for storing volatile parameters. All parameters are set up before the base leaves the factory. Some of these are vital for the operation of the hardware so a set of default parameters is programmed before the actual hardware fine-tuning can be initiated. This document lists all default settings with a short description.

In the tables below values in a range that are similar are not repeated; i.e. Address 00 to 01 contains the value 00 simply means that the value 00 is repeated in all addresses in the range. All values in this document are in hexadecimal notation.

Type	Name	Description
D	default	The EEPROM location is preset to the Default value by the eeprom default loader.
A	adjust	The EEPROM location is set during the production test and should not be overwritten. The value is set by the eeprom default loader only if the location contains all 1's (byte: 0xFF, word FFFFh), i. e. it has never been set.
-		EEPROM location which is not set at all.
d	default	Same as D but best-guess value and/or not verified.

15.3. EEPROM Layout

15.3.1. General Setup

Address	Default	Name	Type	Description
0000-01	00 4B	EepromOscillator	A	Frequency adjustment
0002	2A	ModulationDeviation	A	Mudulation adjustment
0003	00	InitialTestmode	D	Used when entering testmode
0030-0034	FF .. FF	IPUI_1	D	Ipui for handset 1. If set to FF .. FF the handset is not enrolled.
0035-0039	FF .. FF	IPUI_2	D	Ipui for handset 2. If set to FF .. FF the handset is not enrolled.
003A-003E	FF .. FF	IPUI_3	D	Ipui for handset 3. If set to FF .. FF the handset is not enrolled.
003F-0043	FF .. FF	IPUI_4	D	Ipui for handset 4. If set to FF .. FF the handset is not enrolled.
0044-0048	FF .. FF	IPUI_5	D	Ipui for handset 5. If set to FF .. FF the handset is not enrolled.
0049-004D	FF .. FF	IPUI_6	D	Ipui for handset 6. If set to FF .. FF the handset is not enrolled.

15.3.2. MeterPulse Billing

Address	Default	Name	Type	Description
0140 - 0141	00 01MSB LSB	MpBill.Unit	D	Meter-pulse billing unit
0142-0145	00..00	MpBill.PstnLineTotal	D	Meter-pulse billing total for PSTN line. MSB in 0160h.
0146-0149	00..00	MpBill.Hs1	D	Meter-pulse billing total for HS1
014A-014D	00..00	MpBill.Hs2	D	Meter-pulse billing total for HS2
0140E-0152	00..00	MpBill.Hs3	D	Meter-pulse billing total for HS3
0153-0156	00..00	MpBill.Hs4	D	Meter-pulse billing total for HS4
0157-0159	00..00	MpBill.Hs5	D	Meter-pulse billing total for HS5
015A-015D	00..00	MpBill.Hs6	D	Meter-pulse billing total for HS6
015E-015F	FF..FF	Freeblock0	-	Free block 0

15.3.3. Free Block 1

Address	Default	Name	Type	Description
160	0	RunTimeErrorLogConfig	-	Reserved Not used yet
161-162	00..00	RunTimeErrorLogAddress	-	Last RunTime error (unit16)
163-164	00..00	RunTimeErrorCounter		Number of runtime errors since last default programming (unit16)
0165 - 01FF	FF..FF	FreeBlock1	-	Free Block 1

15.3.4. Audio Setup

Address	Default	Name	Type	Description
0200	0x15	SpeakerGain	D	Gain for speaker output (GX2), see Gain index values
0201	0x11	MicGain	D	Gain for microphone input (GR1), see Gain index values
0202 - 0203 MSB - LSB	0x3BCA	GX1Gain	D	Gain for GX1 gaincell, see appendix Gain for transmit and receive
0204 - 0205 MSB - LSB	0x00B2	GR2Gain	D	Gain for GR2 gaincell, see appendix Gain for transmit and receive.
0206	0x00	Unused	D	
0207	0x00	Unused	D	
0208	0x11	OnhookMicGain	D	Gain for microphone input (GR1) during onhook, see Gain index values
0209	0x00	Unused	D	
020A	0x42	ToneToLineGain	D	Gain for tones emitted to the line, see appendix Amplification by Shift&Add coefficients
020B	0x31	ToneToHandsetGain	D	Gain for tones emitted to the handset see appendix Amplification by Shift&Add coefficients
020C	0xBB	GD1Gain	D	Gain for GD1 gaincell (high DTMF tone), see appendix Gain for tonegenerator
020D	0x24	GD2Gain	D	Gain for GD2 gaincell (low DTMF tone), see appendix Gain for tonegenerator
020E	0x40	GDRGain	D	Gain for GDR gaincell (DTMF tone to handset), see appendix Amplification by Shift&Add coefficients
020F	0x22	GDXGain	D	Gain for GDX gaincell (DTMF tone to line), see appendix Amplification by Shift&Add coefficients
0210	2	RingerVolumeStep	D	Current ringer volume selected by the user
0211	00	RingerVolumeData 0	D	Volume data for ringer volume step 0. Range 0-50. Buzzer models only. This location is overwritten by the RingerVolumeDataSpkr 0 during power up in non-buzzer models!
0212	07	RingerVolumeData 1	D	Volume data for ringer volume step 1. Range 0-50. Buzzer models only. This location is overwritten by the RingerVolumeDataSpkr 1 during power up in non-buzzer models!
0213	15	RingerVolumeData 2	D	Volume data for ringer volume step 2. Range 0-50. Buzzer models only. This location is overwritten by the RingerVolumeDataSpkr 2 during power up in non-buzzer models!
0214	30	RingerVolumeData 3	D	Volume data for ringer volume step 3. Range 0-50. Buzzer models only. This location is overwritten by the RingerVolumeDataSpkr 3 during power up in non-buzzer models!
0215	10	ToneVolumeData	D	Volume data for tone volume. Range 0-50. . Buzzer models only. This location is overwritten by the ToneVolumeDataSpkr during power up in non-buzzer models!
0229	0x69	GCR	D	GCR register
022A	0x00	ACR	D	ACR register
022B	0xE3	ToneFilter 1	D	A2 register
022C	0Xac	ToneFilter 1	D	A1 register
022D	0xF4	ToneFilter 2	D	K register
022E	0x09	ToneFilter 2	D	GE register
022F	0x21	SoftLimiter1	D	LIM_HIGH
0230	0x18	SoftLimiter1	D	LIM_LOW
0231	0x40	SoftLimiter2	D	LPOR + TIM_OVR
0232	0x21	SoftLimiter2	D	GOR

15.3.5. BsNalTask

Address	Default	Name	Type	Description
0240	0x01	ARSCountryCorrespondance	D	ARS Country Correspondance 0 = Negative matching: No area code match -> Carrier is inserted. 1 = Positive matching: Match on area code -> Carrier is inserted. 2 = French matching: First digit of matched area code is replaced by carrier code
0241	0x00	ARSInternationalPrefix	D	ARS international prefix code in BCD on the form: International prefix = 00 Adr 0241 = 0x00
024D - 0250 0251 - 0254 0255 - 0258 0259 - 025C	0x11, 0x2F, 0xFF, 0xFF 0x11, 0x0F, 0xFF, 0xFF 0xFF, 0xFF 0xFF, 0xFF 0xFF, 0xFF	BsNalExemptedNumber 1 BsNalExemptedNumber 2 BsNalExemptedNumber 3 BsNalExemptedNumber 4	D	Exempted numbers in BCD on the form: ExemptedNumber1 = 112 Addr 024D = 0x11 , Addr 024E = 0x2F Addr 024F = 0xFF , Addr 0250 = 0xFF
025D	0x00	ARSCheckEnable	D	ARS check configuration 1 = enable, 0 = disable
025E	0x00	ARS DeleteInternational Number	D	ARS delete international number configuration 1 = enable, 0 = disable Also used for enabling/disabling French ARS matching.
0261	0x00	BarredHandsets	D	Barred handsets configuration Bit 0: SpeakerPhone (TCD715/TCD735) 1: Handset 1, 2: Handset 2, 3: Handset 3, 4: Handset 4, 5: Handset 5, 6: Handset 6
0262 - 0265 0266 - 0269 026A - 026D 026E - 0271 0272 - 0275 0276 - 0279	FF .. FF FF .. FF FF .. FF FF .. FF FF .. FF FF .. FF	BsNalBarredNumber 1 BsNalBarredNumber 2 BsNalBarredNumber 3 BsNalBarredNumber 4 BsNalBarredNumber 5 BsNalBarredNumber 6	D	Barred numbers in BCD on the form: Barred number 1 = 1234 Addr 0262 = 0x12 , Addr 0263 = 0x34 Addr 0264 = 0xFF , Addr 0265 = 0xFF
027A - 027B 027C - 027D 027E - 027F 0280 - 0281 0282 - 0283 0284 - 0285 0286 - 0287 0288 - 0289	0xFF, 0xFF 0xFF, 0xFF 0xFF, 0xFF 0xFF, 0xFF 0xFF, 0xFF 0xFF, 0xFF 0xFF, 0xFF 0xFF, 0xFF	AKZ AccessCode 1 AKZ AccessCode 2 AKZ AccessCode 3 AKZ AccessCode 4 HAKZ AccessCode 1 HAKZ AccessCode 2 HAKZ AccessCode 3 HAKZ AccessCode 4	D	AccessCodes in BCD on the form: AKZ Code 1 = 12 Addr 027A = 0x12 , Addr 027B = 0xFF
028A - 028D 028E - 0291 0292 - 0295 0296 - 0299 029A - 029D	FF .. FF FF .. FF FF .. FF FF .. FF FF .. FF	ARSCarrierCode 1 ARSCarrierCode 2 ARSCarrierCode 3 ARSCarrierCode 5 ARSCarrierCode 4	D	ARS Carrier codes in BCD on the form ARS Carrier 1 = 1234 Addr 028A = 0x12 , Addr 028B = 0x34 Addr 028C = 0xFF , Addr 028D = 0xFF
029E - 02A0 02A1 - 02A3 02E6 - 02E8 02E9 - 02ED	FF, FF, F1 FF, FF, F1 FF, FF, F1 -	ARSAreaCode 1 ARSAreaCode 2 ARSAreaCode 25 Reserved for BsNalTask	D -	ARS Area codes in BCD on the form ARS Area 1 = 1234 associated with ARS Carrier 1 Addr 029E = 0x12 , Addr 029F = 0x34 Addr 02A0 = 0xF1

15.3.6. PSTN Line

Address	Default	Name	Type	Description
0F00	03	UserCfg-1.Mode	D	User configuration (MMI) - mode settings 1. Bit 0 : "R" mode, 0=earth break, 1= loop break 2..1: Dial mode, 00:pulse, 01: DTMF 3..7: Reserved
0F01	0D	UserCfg-2.Mode	D	User configuration (MMI) - mode settings 2. Bit 0..1: short "R" key time selection 00= short, 01= long , 10=extra-long 2..3: long "R" key time selection 00= short, 01=long, 10=extra-long, 11= undef (uses same time as specified for short R key) 4..7: Reserved Defaults to 0000 1101

Address	Default	Name	Type	Description
0F02	10	UserCfg.RPauseTime	D	User configuration (MMI) - "R"-pause. If disabled, normal dial pause (DialPauseTime) is used. Bit 7..0 : "R" pause time, zero value allowed Unit : 50 ms, defaults to 800 ms .
0F03	03	UserCfg.DialPauseTime	D	User configuration (MMI) - dial pause. Bit 3-0 : dial pause in 1 sec units , zero not allowed. Bit 7-4 : unused Defaults to 3 seconds
0F04	0F	Cfg-1	D	PSTN line configuration 1 (factory settings) Bit 0: EarthBreakEnable , Earth break 1= enable , 0=disable 1: LoopBreakEnable, Loop break 1= enable , 0=disable 2: PulseDialEnable, Pulse dial 1= enable , 0=disable 3: RPauseEnable, usage of "R" pause 1= enable , 0=disable 4: PulseType, 0= normal puls-type 1= ('0'=1 puls,..'9'=10 puls's). 5: InterDigitLowImp. controls interdigit impedance. 1: keep low-impedance during interdigit pause 0: normal impedance during interdigit pause 6: LowImpLineSeizure. Special low-imp line seizure (Australian) , 1=enable, 0= disable 7: TwoLines. line config 0= one line , 1=two lines Defaults to 0000 0111B.
0F05	15	Cfg-2		PSTN line configuration 2 (factory settings) Bit 0: Meter-pulse, 1= enable , 0=disable 1: DialToneMode, dial tone detection 1=enable, 0= disable 2: BusyToneMode. busy tone detection 1= enable , 0=disable 3: CurrentLimiterMode, 1=enable, 0= disable 4: RingToneMode. Ring tone detection 1= enable , 0=disable 5: HookRelayEnable, 1=enable, 0= disable (if same port is used for earth-control EarthBreakEnable and HookRelayEnable cannot both be set to 1). 6..7: not used Defaults to 0001 0101B.
0F06	28	MakeTime	D	Pulse make time. Unit : 1 ms. defaults to 40 ms .
0F07	3C	BreakTime	D	Pulse break time Unit : 1 ms. defaults to 60 ms .
0F08	64	DtmfTime	D	DTMF tone pulse time. Unit : 1 ms, defaults to 100 ms .
0F09	0A	InterDigitDtmfTime	D	Inter-digit time in DTMF mode. Unit : 10 ms , defaults to 100ms .
0F0A	4A	InterDigitPulseTime	D	Inter-digit time in Pulse mode. Unit : 10 ms, defaults to 740 ms .
0F0B	08	CalibBreakTime[0]	D	Calibrated loop-break time for short break Unit : 10 ms, defaults to 80 ms .
0F0C	14	CalibBreakTime[1]	D	Calibrated loop-break time for long break Unit : 10 ms, defaults to 200 ms .
0F0D	46	CalibBreakTime[2]	D	Calibrated loop-break time for extra-long break Unit : 10 ms, defaults to 700 ms .
0F0E	28	CalibBreakTime[3]	D	Calibrated earth-break time for short break Unit : 10 ms, defaults to 400 ms .
0F0F	82	CalibBreakTime[4]	D	Calibrated earth-break time for long break Unit : 10 ms, defaults to 1300 ms .
0F10	82	CalibBreakTime[5]	D	Calibrated earth-break time for extra-long break Unit : 10 ms, defaults to 1300 ms.
0F11	FF	LineSeizureEndTime	D	Line seizure end-time - time after hook-on. Meter-pulse detection continues during this period of time. 00h or FFh means 10 ms. Unit : 10 ms, defaults to 10 ms .
0F12	64	RingTermToU100	D	Ring terminate time-out period. This is the max time that must elapse between two ring-voltage bursts before the new ring-voltage is registered as a new incoming call. Unit: 100 ms. defaults to approx 10 sec .
0F13	08	RingPatternToU100	D	Ring pattern timeout. Max. silence period during distinctive ringing. As long as the silence period does not exceed this period of time the ring is still considered and counted as one single ring. Unit : 100 ms. Defaults to 800 ms

Address	Default	Name	Type	Description
0F14	FF	AgcUpdateTime		Line AGC update time. The period of time between each line AGC update. If FFh, line-AGC is disabled. If used recommended value is 64h (1 sec). Unit : 10ms, min/max: 10/FF, Defaults to disabled .
0F15	0A	LineSeizureTime		Line seizure time. The period of time that the PSTN line or the PSTN HW needs after the hook-switch is activated in order to be ready. During this period audio is muted. 700/705: Only used during outgoing calls or if the special-line seizure mode is enabled (Cfg:6). 715/25/35: Always used. Unit : 10 ms,, min/max: 01/FF. Defaults to 100 ms .
0F16	66	InitDialPause	D	Init-dial-pause. Dial pause inserted after hook-off when making an outgoing call. Bit 0..3: init dial pause if PULSE dial-mode. If 0fH then normal dial-pause is used. Bit 4..7: init dial pause if DTMF dial-mode. If 0fH then normal dial-pause is used. Unit : 500 ms, min/max: 00/0F. Defaults to 3 sec and 3 sec .
0F17..1BB	FF..FF	Reserved[5]	D	

15.3.7. Clip configuration

Address	Default	Name	Type	Description
0F37..38	3D 00	Parse.Configuration	D	Clip parse set configuration Bit 0: Etsi: 1= enable 0=disable 1: ForwardNumber: 1= enable 0= disable 2: Danish: 1= enable 0=disable 3: Dutch: 1= enable 0=disable 4: Canadian: 1= enable 0=disable 5: Swedish: 1= enable 0=disable 6: UserDefined: 1= enable 0= disable 7: KPN vmwi: 1= enable 0= disable 8: Reserved8 9: Reserved9 10: Reserved10 11: Reserved11 12: Reserved12 13: Reserved13 14: Reserved14 15: Reserved15

15.3.8. TADTASK

Address	Default	Name	Type	Description
0F40	0x00	CountryCode	D	Country code 0: Germany 1: Greece 2: Turkey 3: England 4: Switzerland 5: Poland 7: France 8: Denmark A: Italy C: Czech E: Hungary F: Spain 14: Russia
0F41-60	0xFF-FF	Tam TagInfo	A	Message TAG information Bit 0-3 Odd number MSG, 4-7 Even number MSG 0: Reserve 1: 2WayInfo 0:Not 2WayRec / 1:2WayRecMsg 2: New Info 0:OLD / 1:NEW 3: OGM Info Not used 4: Reserve 5: 2WayInfo 0:Not 2WayRec / 1:2WayRecMsg 6: New Info 0:OLD / 1:NEW 7: OGM Info Not used
0F61	0x14	Tam PrgInfo	A	TAM Current Setting data Bit 0: Answer ON/OFF 0:OFF / 1:ON 1: Greeting Only Mode ON/OFF 0:OFF / 1:ON 2: VOX Detection ON/OFF 0:OFF / 1:ON 3: CPC time selection 0:time A / 1:time B 4: Greeting Monitor mode ON/OFF 0:OFF / 1:ON 5: Reserve 6: VOX sense selection 0: Normal / 1: Low 7: DSC time selection 0: immediately / 1: 1.6sec
0F62	0x00	Tam PrgRings	A	Current number of rings for answer ON Range:0-7(0=Auto)
0F63-64	0xFFFF	Tam Prg Rmt Code	A	Current Remote code e.g. 123 Address 0x0F63 0xF1 Address 0x0F64 0x23
0F65	0x10	Country Data	D	Each country data Bit 0: Reserve 1: Reserve 2: Max time in Line Remote Not Used 3: Time Data 0:24hour / 1:12hour 4: Vic Menu Data 0: OFF / 1: ON 5: Language Info 0: 1 Language / 1: 2 Languages 6: Reserve 7: Reserve
0F66	0x08	Det Data	D	Detection data Bit 0: Selection CPC A/B 0:OFF (A fixed)/ 1:ON(Select) 1: Reserve 2: Detect 1st Short Bell (300ms) for count 3: Cyclic Detection of VOX 0: OFF / 1: ON (Detect) 4: Detection of DSC 0: OFF / 1: ON (Detect) 5: Reserve 6: Reserve 7: Reserve
0F67	0x06	Option Data	D	Each country data Bit 0: 2 Way Beep ON/OFF 0:OFF / 1:ON 1: 2 Way Beep interval 0:15s per 400ms / 1:20s per 160ms 2: 2 Way Rec ON/OFF 0:OFF / 1:ON 3: Switching of VOX Sense ON/OFF 0:OFF / 1:ON 4: Key Click Tone ON/OFF Not used 5: Reserve 6: Reserve 7: Reserve
0F68	0x00	Tam Prg WordMode	D	Language select data For Switzerland 0:Germany / 1:French For Czech 0:Czech / 1:Slovakian
0F69	0x27	Tam Rings SetNum	D	Number of rings select range for automatic answering 0x25: 2 - 5 Rings 0x27: 2 - 7 Rings
0F6A	0x00	Tam Rings DefNum	D	Number of rings default data 0: Default is Automatically Turn on for Toll saver Other: Default of the number of rings for Turn on.

Address	Default	Name	Type	Description
0F6B-0FF7	-	Free block	-	Free Block

15.3.9. BsUiTask

Address	Default	Name	Type	Description
0FFB - 0FFC	(TCD715 / (TCD700 / TCD705 / TCD725) 0xF7, 0x01	Config	A	BsUiTask configuration Bits 1=enable 0=disable 0: FlashTime1Enabled. 1: FlashTime2Enabled. 2: FlashTime3Enabled. 3: KeyClicksEnabled: TCD700 / TCD705 / TCD725: Default disabled TCD715 / TCD735: Default enabled 4: ARSCarrierMenuEnabled. 5: ARSIntDeletionMenuEnabled. 6: ARSMultipleCarrierMenuEnabled. 7: ARSMultipleAreaCodeMenuEnabled. 8: AmpmClockSettingEnabled. 9-15: Unused.

15.3.10. Bs Model Settings

Address	Default	Name	Type	Description
0FFD	0x00	KammaBaseFeatures	A	Kamma base features Bits 1=enable 0=disable 0: PhoneBookAvailable. 1: TadAvailable. 2-7: Unused.
0FFE	0x04	Kamma4BaseModelId	A	Kamma4 Base Model Identifier: 0x01 = TCD700 0x02 = TCD705 0x03 = TCD715 0x04 = TCD725 0x05 = TCD735 Warning: if this location contains 0xFF the EEPROM is considered un-initialized and the application will be disabled! In this case only bus access is available to allow the EEPROM to be defaulted.

15.4. Appendix

15.4.1. Gain for transmit and receive

	[dB]		[dB]		[dB]		[dB]		[dB]
00 00	16.06	31 15	5.92	BB 22	-2.72	39 20	-11.02	48 D7	-29.51
00 01	16.9	21 41	5.73	AB 92	-2.92	A9 24	-11.2	98 C6	-29.97
00 02	16.26	0B 93	5.53	3A 15	-3.11	98 C2	-11.39	C6 D6	-30.4
00 03	15.92	12 C3	5.34	BA C0	-3.3	39 14	-11.58	C6 DE	-30.8
00 0D	15.47	21 BB	5.14	AB B5	-3.5	A9 22	-11.77	B8 E0	-31.26
00 0B	15.19	0A 94	4.94	19 35	-3.7	9A 0D	-11.91	38 E1	-31.58
00 11	14.81	0B 41	4.74	AB 31	-3.89	99 52	-12.39	48 E1	-32.08
00 12	14.4	32 10	4.54	2A 10	-4.08	C9 15	-12.88	A8 D7	-32.53
00 1D	13.92	22 23	4.35	AA A5	-4.28	99 33	-13.36	A8 DD	-32.88
00 21	13.53	31 B5	4.16	AA B1	-4.47	99 31	-13.84	C8 E1	-33.16
00 2D	13.03	22 4B	3.97	AA BC	-4.66	A8 A5	-14.27	48 E2	-33.66
00 3C	12.54	22 CC	3.77	AA CA	-4.66	99 24	-14.72	28 E7	-34.12
01 10	12.04	32 21	3.59	B9 A3	-5.03	C8 B1	-15.1	48 E3	-34.57
00 BB	11.55	32 25	3.4	AA 42	-5.23	48 B2	-15.6	48 E4	-35.07
00 B3	11.41	23 30	3.2	AA 33	-5.41	28 B7	-16.06	48 E7	-35.53
00 B2	11.33	23 4A	3.01	39 44	-5.59	48 B3	-16.51	98 D6	-35.99
00 B1	11.19	23 B2	2.81	AA 25	-5.78	48 B4	-17.01	C8 E5	-36.42
01 13	11.04	32 B1	2.63	AA 22	-5.96	48 B7	-17.47	C8 EE	-36.82
00 A5	10.84	1B CB	2.43	B9 B5	-6.13	96 A6	-17.93	B8 D9	-37.28
00 A3	10.72	1B 41	2.24	39 33	-6.31	C8 B5	-18.36	A8 E3	-37.6
01 21	10.57	1B 30	2.05	98 93	-6.51	C8 BE	-18.76	A8 E4	-38.1
01 22	10.4	33 B1	1.86	AA 14	-6.69	B8 C0	-19.22	A8 E7	-38.55
01 2D	10.22	33 A1	1.68	9B AD	-6.89	38 C1	-19.54	A8 ED	-38.9
01 31	10.07	33 93	1.49	9B C2	-7.06	48 C1	-20.03	C8 EA	-39.18
01 3C	9.88	1A C1	1.29	9B 42	-7.28	A8 B7	-20.49	B8 EA	-39.78
01 4A	9.68	2B A5	1.09	9B 2C	-7.48	A8 B0	-20.84	98 E2	-40.21
02 0D	9.5	2B C1	0.89	B9 4B	-7.67	C8 C1	-21.12	98 E3	-41.12
10 CB	9.3	2B 44	0.7	A9 C2	-7.87	48 C2	-21.62	98 E4	-41.62
10 C1	9.13	3B 94	0.5	A9 C8	-8.06	28 C7	-22.06	98 E7	-42.06
10 B4	8.95	2B 21	0.3	9A C1	-8.25	48 C3	-22.53	98 ED	-42.42
01 A5	8.76	2B 15	0.11	99 95	-8.43	48 C4	-23.03	C8 E9	-42.7
02 21	8.59	3B CA	-0.08	9A 49	-8.61	48 C7	-23.49	B8 E9	-43.3
02 25	8.4	09 49	-0.28	9A 41	-8.8	98 B6	-23.95	A8 E9	-44.64
02 33	8.2	3B 24	-0.47	B9 31	-8.98	C8 C5	-24.38	29 0F	-46.23
02 49	8.01	1A 14	-0.67	9A 2B	-9.18	C8 CE	-24.78	39 0F	-47.14
02 C2	7.82	3B 13	-0.86	A9 41	-9.37	B8 D0	-25.24	49 0F	-47.64
02 B1	7.63	3A B2	-1.03	A9 38	-9.53	38 D1	-25.56	98 E9	-48.16
20 BC	7.43	2A 2B	-1.22	A9 35	-9.72	48 D1	-26.05	C9 0F	-48.73
11 43	7.24	2A 23	-1.42	99 A3	-9.89	AB C7	-26.51	B9 0F	-49.32
03 49	7.07	3A 4A	-1.61	B9 23	-10.05	AB CD	-26.86	A9 0F	-50.66
21 14	6.88	09 31	-1.8	9A 14	-10.21	CB D1	-27.14	B9 0F	-54.19
11 BD	6.69	BB A4	-2	29 15	-10.38	48 D2	-27.64	B8 00	-1"10^10
30 BD	6.5	BB BB	-2.19	99 B1	-10.55	28 D7	-28.1		
12 15	6.31	BB 4A	-2.38	29 14	-10.66	48 D3	-28.55		
21 2C	6.11	BB 31	-2.56	A9 2C	10.84	48 D4	-29.05		

15.4.2. Gain for tonegenerator

	[dB]		[dB]		[dB]		[dB]		[dB]
00	6.02	1F	-6.09	35	-17.79	51	-26.58	6E	-36.26
01	3.52	1E	-6.16	36	-17.93	52	-28.16	6D	-36.40
02	1.94	1D	-6.30	37	-17.99	53	-29.08	6C	-36.68
03	1.02	1C	-6.58	40	-18.06	54	-29.58	6B	-37.28
04	0.53	1B	-7.18	3F	-18.13	55	-29.84	71	-38.62
05	0.27	21	-8.52	3E	-18.20	56	-29.97	72	-40.21
06	0.13	22	-10.10	3D	-18.34	57	-30.04	73	-41.12
07	0.07	23	-11.02	3C	-18.62	60	-30.10	74	-41.62
10	0.00	24	-11.51	3B	-19.22	5F	-30.17	75	-41.88
0F	-0.07	25	-11.77	41	-20.56	5E	-30.24	76	-42.01
0E	-0.14	26	-11.91	42	-22.14	5D	-30.38	77	-42.08
0D	-0.28	27	-11.97	43	-23.06	5C	-30.66	69	-42.14
0C	-0.56	30	-12.04	44	-23.56	5B	-31.26	7F	-42.21
0B	-1.16	2F	-12.11	45	-23.82	61	-32.60	7E	-42.28
11	-2.50	2E	-12.18	46	-23.95	62	-34.19	7D	-42.42
12	-4.08	2D	-12.32	47	-24.01	63	-35.10	7C	-42.70
13	-5.00	2C	-12.60	50	-24.08	64	-35.60	7B	-43.30
14	-5.49	2B	-13.20	4F	-24.15	65	-35.86	7A	-44.64
15	-5.75	31	-14.54	4E	-24.22	66	-35.99	79	-48.16
16	-5.89	32	-16.12	4D	-24.36	67	-36.06	08	-1*10 ¹⁰
17	-5.95	33	-17.04	4C	-24.64	70	-36.12		
20	-6.02	34	-17.54	4B	-25.24	6F	-36.19		

15.4.3. Amplification by Shift & Add coefficients

	[dB]		[dB]		[dB]		[dB]		[dB]
00	6.02	1F	-6.09	35	-17.79	51	-26.58	6E	-36.26
01	3.52	1E	-6.16	36	-17.93	52	-28.16	6D	-36.40
02	1.94	1D	-6.30	37	-17.99	53	-29.08	6C	-36.68
03	1.02	1C	-6.58	40	-18.06	54	-29.58	6B	-37.28
04	0.53	1B	-7.18	3F	-18.13	55	-29.84	71	-38.62
05	0.27	21	-8.52	3E	-18.20	56	-29.97	72	-40.21
06	0.13	22	-10.10	3D	-18.34	57	-30.04	73	-41.12
07	0.07	23	-11.02	3C	-18.62	60	-30.10	74	-41.62
10	0.00	24	-11.51	3B	-19.22	5F	-30.17	75	-41.88
0F	-0.07	25	-11.77	41	-20.56	5E	-30.24	76	-42.01
0E	-0.14	26	-11.91	42	-22.14	5D	-30.38	77	-42.08
0D	-0.28	27	-11.97	43	-23.06	5C	-30.66	69	-42.14
0C	-0.56	30	-12.04	44	-23.56	5B	-31.26	7F	-42.21
0B	-1.16	2F	-12.11	45	-23.82	61	-32.60	7E	-42.28
11	-2.50	2E	-12.18	46	-23.95	62	-34.19	7D	-42.42
12	-4.08	2D	-12.32	47	-24.01	63	-35.10	7C	-42.70
13	-5.00	2C	-12.60	50	-24.08	64	-35.60	7B	-43.30
14	-5.49	2B	-13.20	4F	-24.15	65	-35.86	7A	-44.64
15	-5.75	31	-14.54	4E	-24.22	66	-35.99	79	-48.16
16	-5.89	32	-16.12	4D	-24.36	67	-36.06	08	-1*10*10
17	-5.95	33	-17.04	4C	-24.64	70	-36.12		
20	-6.02	34	-17.54	4B	-25.24	6F	-36.19		

15.4.4. Gain index values

Index (dec)	Index (hex)	Gain (dB)	DspRam
0	0x00	-21	0xC8C1
1	0x01	-20	0x48C1
2	0x02	-19	0xB8C0
3	0x03	-18	0x98A6
4	0x04	-17	0x48B4
5	0x05	-16	0x28B7
6	0x06	-15	0xC8B1
7	0x07	-14	0x9931
8	0x08	-13	0xC915
9	0x09	-12	0x9A0D
10	0x0a	-11	0x3920
11	0x0b	-10	0xB923
12	0x0c	-9	0xB931
13	0x0d	-8	0xA9CB
14	0x0e	-7	0x9BC2
15	0x0f	-6	0xAA22
16	0x10	-5	0xB9A3
17	0x11	-4	0x2A10
18	0x12	-3	0xAB92
19	0x13	-2	0xBBA4
20	0x14	-1	0x3AB2
21	0x15	0	0x3BCA
22	0x16	+1	0x2BA5
23	0x17	+2	0x1B30
24	0x18	+3	0x234A
25	0x19	+4	0x224B
26	0x1A	+5	0x0A94
27	0x1B	+6	0x3115
28	0x1C	+7	0x0349
29	0x1D	+8	0x0249
30	0x1E	+9	0x10B4
31	0x1F	+10	0x0131
32	0x20	+11	0x0113
33	0x21	+12	0x0110
34	0x22	+13	0x002D
35	0x23	+14	0x001D
36	0x24	+15	0x0011
37	0x25	+16	0x0003
38	0x26	+17	0x0001
39	0x27	+18	0x0000

15.4.5. Speakerphone gain

DspRam	Index	Attenuation
0x02DA	0/0x00	-21 dB
0x0333	1/0x01	-20 dB
0x0397	2/0x02	-19 dB
0x0407	3/0x03	-18 dB
0x0485	4/0x04	-17 dB
0x0512	5/0x05	-16 dB
0x05B0	6/0x06	-15 dB
0x0662	7/0x07	-14 dB
0x072A	8/0x08	-13 dB
0x080A	9/0x09	-12 dB
0x0905	10/0x0a	-11 dB
0x0A1E	11/0x0b	-10 dB
0x0B5B	12/0x0c	-9 dB
0x0CBD	13/0x0d	-8 dB
0x0E4B	14/0x0e	-7 dB
0x100A	15/0x0f	-6 dB
0x11FF	16/0x10	-5 dB
0x1431	17/0x11	-4 dB
0x16A8	18/0x12	-3 dB
0x196C	19/0x13	-2 dB
0x1C86	20/0x14	-1 dB
0x2001	21/0x15	0 dB
0x23E8	22/0x16	+1 dB
0x284A	23/0x17	+2 dB
0x2D35	24/0x18	+3 dB
0x32B9	25/0x19	+4 dB
0x38E9	26/0x1A	+5 dB
0x3FDB	27/0x1B	+6 dB
0x47A6	28/0x1C	+7 dB
0x5064	29/0x1D	+8 dB
0x5A33	30/0x1E	+9 dB
0x6534	31/0x1F	+10 dB
0x718E	32/0x20	+11 dB
0x7F69	33/0x21	+12 dB

16 EEPROM LAYOUT (HANDSET)

16.1. Scope

The purpose of this section is to describe the layout of the EEPROM (IC2) TCD725 handset.

The EEPROM contains hardware, software, and user specific parameters. Some parameters are set during production of the handset e.g. crystal oscillator adjustment at 0000..01, some are set by the user when configuring the handset e.g. ringer volume at 0F38, and some during normal use of the phone e.g. redial memory at 0311..0392.

16.2. Introduction

The handset uses a 32k bit (4096 x 8) serial EEPROM (IC9) for storing volatile parameters. All parameters are set up before the handset the factory. Some of these are vital for the operation of the hardware so a set of default parameters is programmed before the actual hardware fine-tuning can be initiated. This document lists all default settings with a short description.

This document lists all default parameters with a short description.

In the tables below values in a range that are similar are not repeated; i.e. Address 00 to 01 contains the value 00 simply means that the value 00 is repeated in all addressee in the range.

Type	Name	Description
D	default	The EEPROM location is preset to the Default value by the eeprom default loader.
A	adjust	The EEPROM location is set during the production test and should not be overwritten. The value is set by the eeprom default loader only if the location contains 0xFF, i. e. it has never been set.
-		EEPROM location which is not set at all.

16.3. EEPROM contents

16.3.1. General Setup

Address	Default	Name	Type	Description
00-01	?? ??	EepromOscillator	D	Frequency adjustment.....
0002	20	ModulationDeviation	A	Mudulation adjustment
0030-0034	00 .. 00	IPEI	A	IPEI
0036-003A	?? .. ??	PARK_1	-	PARK for registration 1
003B-003F	?? .. ??	PARK_2	-	PARK for registration 2
0040-0044	?? .. ??	PARK_3	-	PARK for registration 3
0045-0049	?? .. ??	PARK_4	-	PARK for registration 4
004A	FF	PLI_1	D	Pli for registration 1. If set to FF the registration is deleted.
004B	FF	PLI_2	D	Pli for registration 2. If set to FF the registration is deleted.
004C	FF	PLI_3	D	Pli for registration 3. If set to FF the registration is deleted.
004D	FF	PLI_4	D	Pli for registration 4. If set to FF the registration is deleted.
0100-0104	?? .. ??	RFPI_1	-	RFPI for registration 1
0105	??	SerClass_1	-	Service class for registration 1
0106	??	LAL_1	-	Location area level for registration 1
0107	??	IPUI_LEN_1	-	IPUI length for registration 1
0108-0114	?? .. ??	IPUI_1	-	IPUI for registration 1
0115	??	ZAP_1	-	ZAP for registration 1
0116	??	STATUS_1	-	Status for registration 1
0117-0126	?? .. ??	UAK_1	-	UAK for registration 1
0127-012F	?? .. ??	Reserved	-	Protocol data
0130-0134	?? .. ??	RFPI_2	-	RFPI for registration 2
0135	??	SerClass_2	-	Service class for registration 2
0136	??	LAL_2	-	Location area level for registration 2
0137	??	IPUI_LEN_2	-	IPUI length for registration 2
0138-0144	?? .. ??	IPUI_2	-	IPUI for registration 2
0145	??	ZAP_2	-	ZAP for registration 2
0146	??	STATUS_2	-	Status for registration 2
0147-0156	?? .. ??	UAK_2	-	UAK for registration 2
0157-015F	?? .. ??	Reserved	-	Protocol data
0160-0164	?? .. ??	RFPI_3	-	RFPI for registration 3
0165	??	SerClass_3	-	Service class for registration 3
0166	??	LAL_3	-	Location area level for registration 3
0167	??	IPUI_LEN_3	-	IPUI length for registration 3
0168-0174	?? .. ??	IPUI_3	-	IPUI for registration 3

Address	Default	Name	Type	Description
0175	??	ZAP_3	-	ZAP for registration 3
0176	??	STATUS_3	-	Status for registration 3
0177-0186	?? .. ??	UAK_3	-	UAK for registration 3
0187-018F	?? .. ??	Reserved	-	Protocol data
0190-0194	?? .. ??	RFPI_4	-	RFPI for registration 4
0195	??	SerClass_4	-	Service class for registration 4
0196	??	LAL_4	-	Location area level for registration 4
0197	??	IPUI_LEN_4	-	IPUI length for registration 4
0198-01A4	?? .. ??	IPUI_4	-	IPUI for registration 4
01A5	??	ZAP_4	-	ZAP for registration 4
01A6	??	STATUS_4	-	Status for registration 4
01A7-01B6	?? .. ??	UAK_4	-	UAK for registration 4
01B7-01FF	?? .. ??	Reserved	-	Protocol data

16.3.2. MMI parameters

Address	Default	Name	Type	Description
200-20C	204 = 00	DirectCallEntry	D	The first byte is the length of the speeddialnumber. The next 12 bytes is the 24 digits. every digit is 4 bytes and stored in BCD + some special characters.
20D-28E	--	Redial	D	
28F	00	LastRedialEntry	D	
290 - 299	FF	HotKey	D	index 0 - speeddialentry for key 0 index 1 - speeddialentry for key 1 - index 9 - speeddialentry for key 9
29A - 29B	00 00	HSPinCode	-	4 BCD Digits
29C	00	EESubscriptionNumber	D	Selected subscription
29D-2A4	00	EESubscriptionInfo	D	HandsetNumber And BaseType for all subscriptions.
2A5-2A6	FF FF	AlarmTime	D	4 BCD Digits Hours Tens,Units : Minutes Tens,Units
2A7	00	AlarmConfig	D	bit1 + bit2 - Configuration settings for alarm. 1 Byte 00 - OFF 01 - ONCE 10 - DAILY.
2A8-2AB	00	TotalHandsetCharge	D	Holds the chargecostcount since last handset-reset or callcost-reset(32bit).
2AC	11	FactoryLanguageSetting	D	Factory setting for language: 00 = Spanish 01 = Norwegian 02 = French 03 = Italian 04 = Danish 05 = Dutch 06 = Swedish 07 = Finnish 08 = Greek 09 = Turkish 0A = Hungarian 0B = Portugese 0C = Russian 0D = Polish 0E = Slovakian 0F = Czech 10 = German 11 = English
2AD	11	Language	D	Language code (see table above)

Address	Default	Name	Type	Description
2AE - 2B0	FF FF FF	AvailableLanguages	D	Bit 0: 0:Disable, 1:Enable Spanish Bit 1: 0:Disable, 1:Enable Norwegian Bit 2: 0:Disable, 1:Enable French Bit 3: 0:Disable, 1:Enable Italian Bit 4: 0:Disable, 1:Enable Danish Bit 5: 0:Disable, 1:Enable Dutch Bit 6: 0:Disable, 1:Enable Swedish Bit 7: 0:Disable, 1:Enable Finnish Bit 0: 0:Disable, 1:Enable Greek Bit 1: 0:Disable, 1:Enable Turkish Bit 2: 0:Disable, 1:Enable Hungarian Bit 3: 0:Disable, 1:Enable Portuguese Bit 4: 0:Disable, 1:Enable Russian Bit 5: 0:Disable, 1:Enable Polish Bit 6: 0:Disable, 1:Enable Slovakian Bit 7: 0:Disable, 1:Enable Czech Bit 0: 0:Disable, 1:Enable German Bit 1: 0:Disable, 1:Enable English Bit 2-7: Reserved
2B1-2BA	0x41	Category	D	
2BB	00	RunTimeErrorLogConfig	D	00 = Show RunTimeErrorLog disabled.
2BC-2BD	0000	RunTimeErrorLogAddress	D	0000 = No error.

16.3.3. Audiosettings

Address	Default	Name	Type	Description
345	01	ExtMelodyIndex	D	Melody played when incoming external call
346	01	IntMelodyIndex	D	Melody played when incoming internal call
347	01	PageMelodyIndex	D	Melody played when paging
348	01	AlarmMelodyIndex	D	Melody played when alarm is sounded
349	03	EERingerVolume	D	Volume of the ringer
34A	02	EEVoiceVolume	D	Volume of the earpiece
34B	03	EESpVolume	D	Volume of the speakerphone
34C	02	EETAMVoiceVolume	D	Volume of the earpiece when in TAM
34D	03	EETAMSpPhVolume	D	Volume of the speakerphone when in TAM

16.3.4. MMI

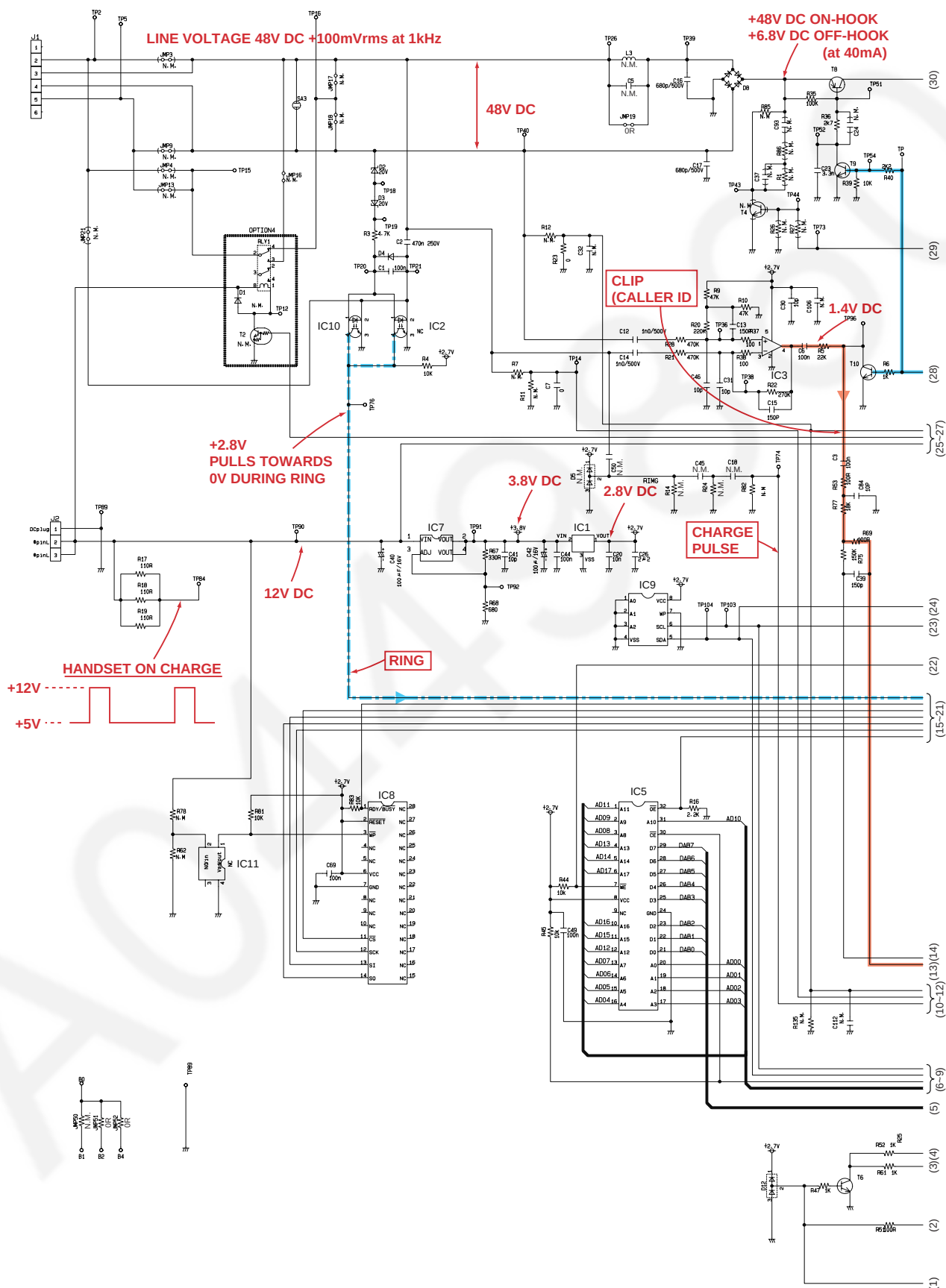
Address	Default	Name	Type	Description
778-1EE7	Number Length = 00	PhoneBook	-	200 Phonebook entries, with each location defined by 30 bytes: Name[MAX_NAME_LENGTH] = 16 bytes NumberLength = 1 byte Number[MAX_NUMBER_LENGTH/2] = 12 bytes Category = 1 bytes
1EE8	01	AutoRedial Configuration	D	Bit 0: 0:Disable, 1:Enable Bit1-7: Reserved
1EE9	28	AutoRedial RetryTimeout	D	Timeout between auto redial attempts. Unit: 1 second. Defaults to 40 seconds.
1EEA	0C	AutoRedial RetryCount	D	Maximum number of auto redial attempts Defaults to 12.
1EEB	00	AudibleRinger	D	
1EEC	08	DisplayContrast	D	Display contrast value[00..1F] with 00 as the highest contrast setting
1EED	02	BacklightColour	D	00 = Off 01 = Red 02 = Green 03 = Orange
1EEE	00	PhbNoOfUsedLocEeprom	D	Number of used locations in Phonebook
1EEF	00	PhbSortListChecksumHigh	D	High byte of sorted list checksum for Phonebook
1EF0	00	PhbSortListChecksumLow	D	Low byte of sorted list checksum for Phonebook
1EF1	00	PhbSortListFlag	D	Byte used as a flag in the Phonebook
1EF2	01	AlphabetKeyMode	D	Stored keyboard alphabet mode Default to Alphabet ("ABC")

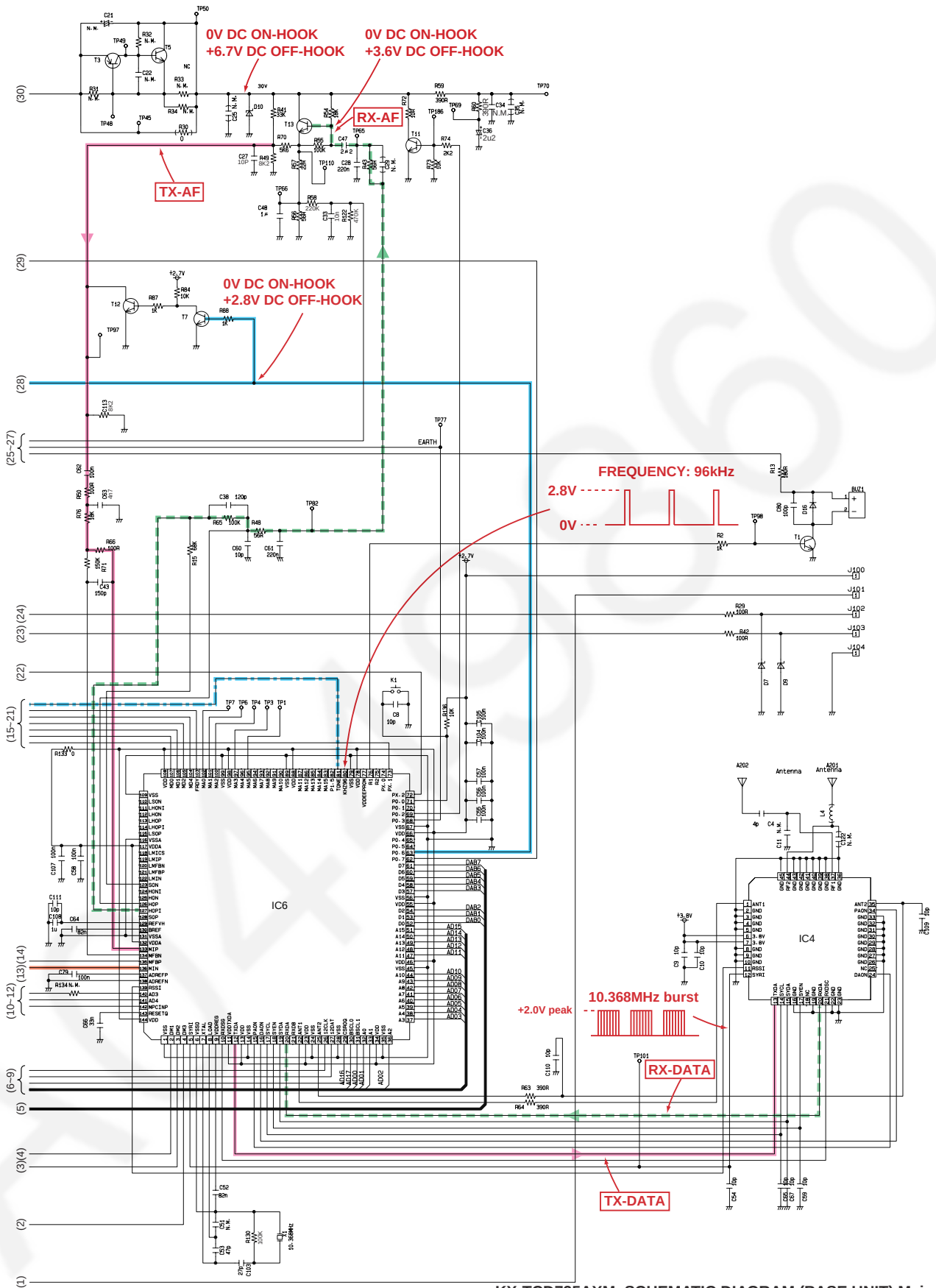
16.3.5. MMI Bits

Address	Default	Name	Type	Description
1F00	0B	EEToneConfig	D	bit 0 - Keytone on/off - 1/0 bit 1 - Call waiting on/off - 1/0 bit 2 - Range alarm on/off - 1/0 bit 3 - Battery low alarm on/off - 1/0
1F01	C6	UIConfig00	D	bit 0 - Direct call 1 = on / 0 = off bit 1 - StandbyDisplay00 00 = Off / 01 = Clock bit 2 - StandbyDisplay01 10 = PpNo / 11 = FpNo bit 3 - BatteryType 1 = Ni-Cd/0 = Ni-Mh bit 4 - Call barring bit 5 - Autio talk bit 6 - TalkmodeDisplay00 11 = Talk time bit 7 - TalkmodeDisplay01 01 = Talk cost 10 = Phone number

17 SCHEMATIC DIAGRAM (BASE UNIT)

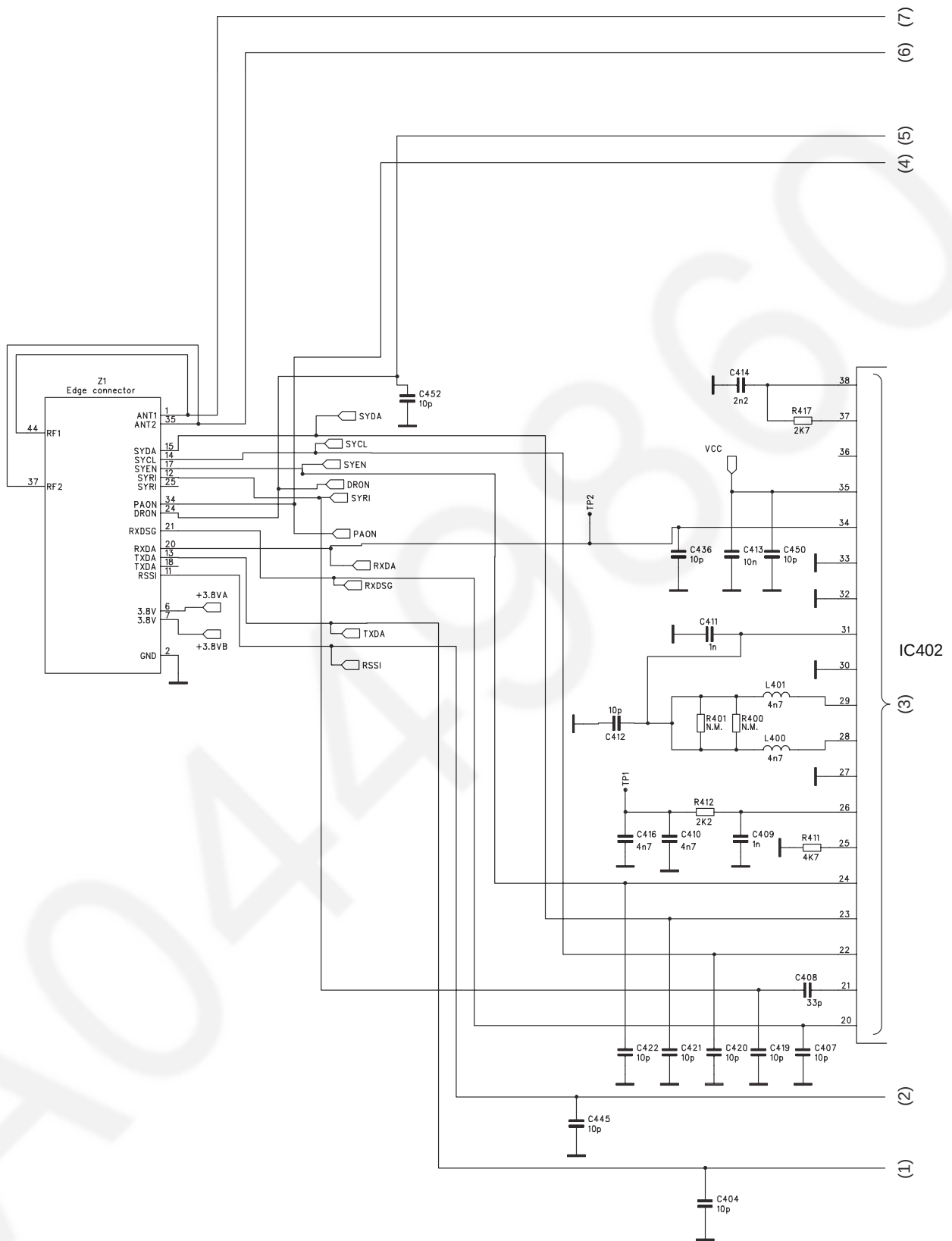
17.1. Main

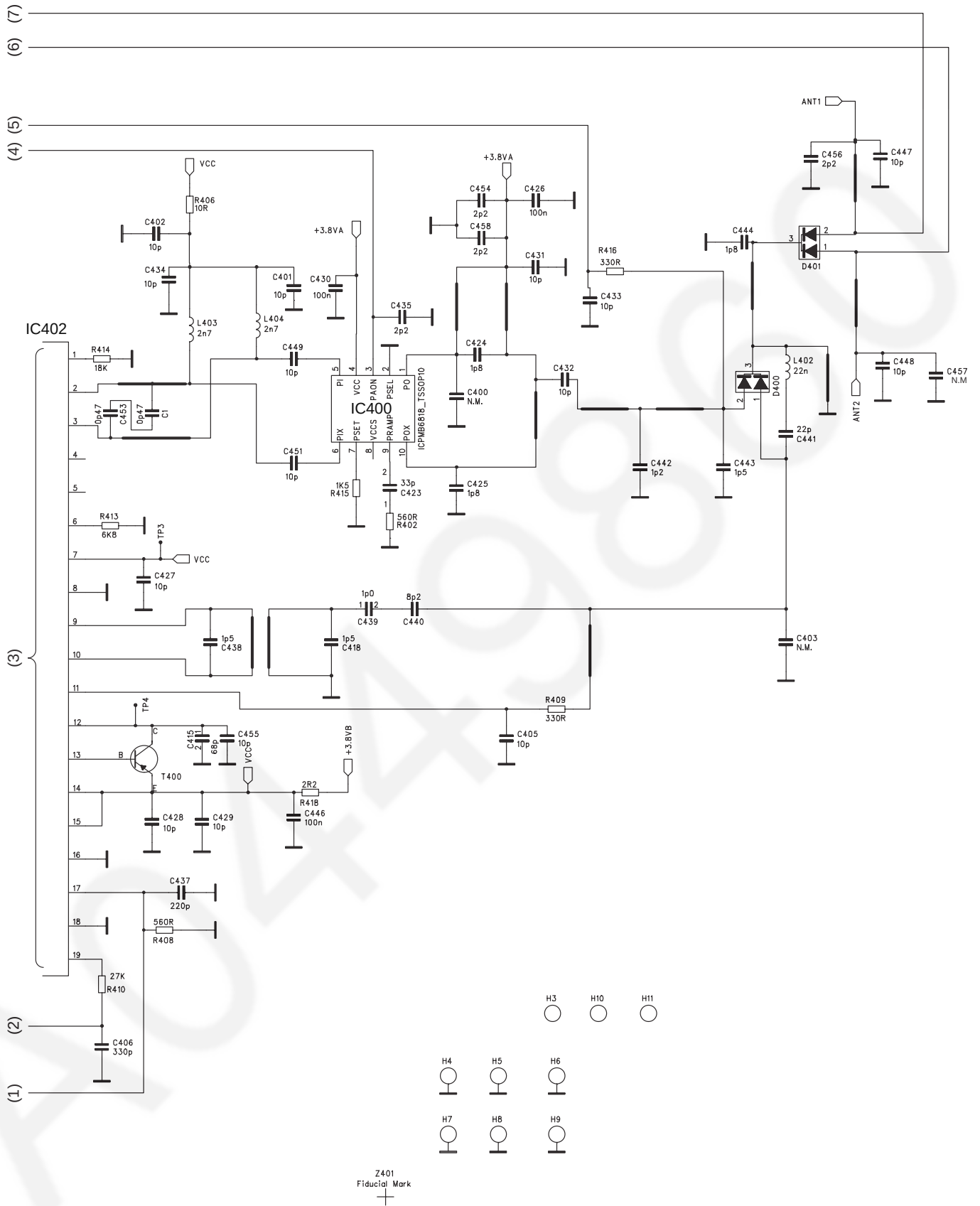




KX-TCD725AXM: SCHEMATIC DIAGRAM (BASE UNIT) Main

17.2. RF Module

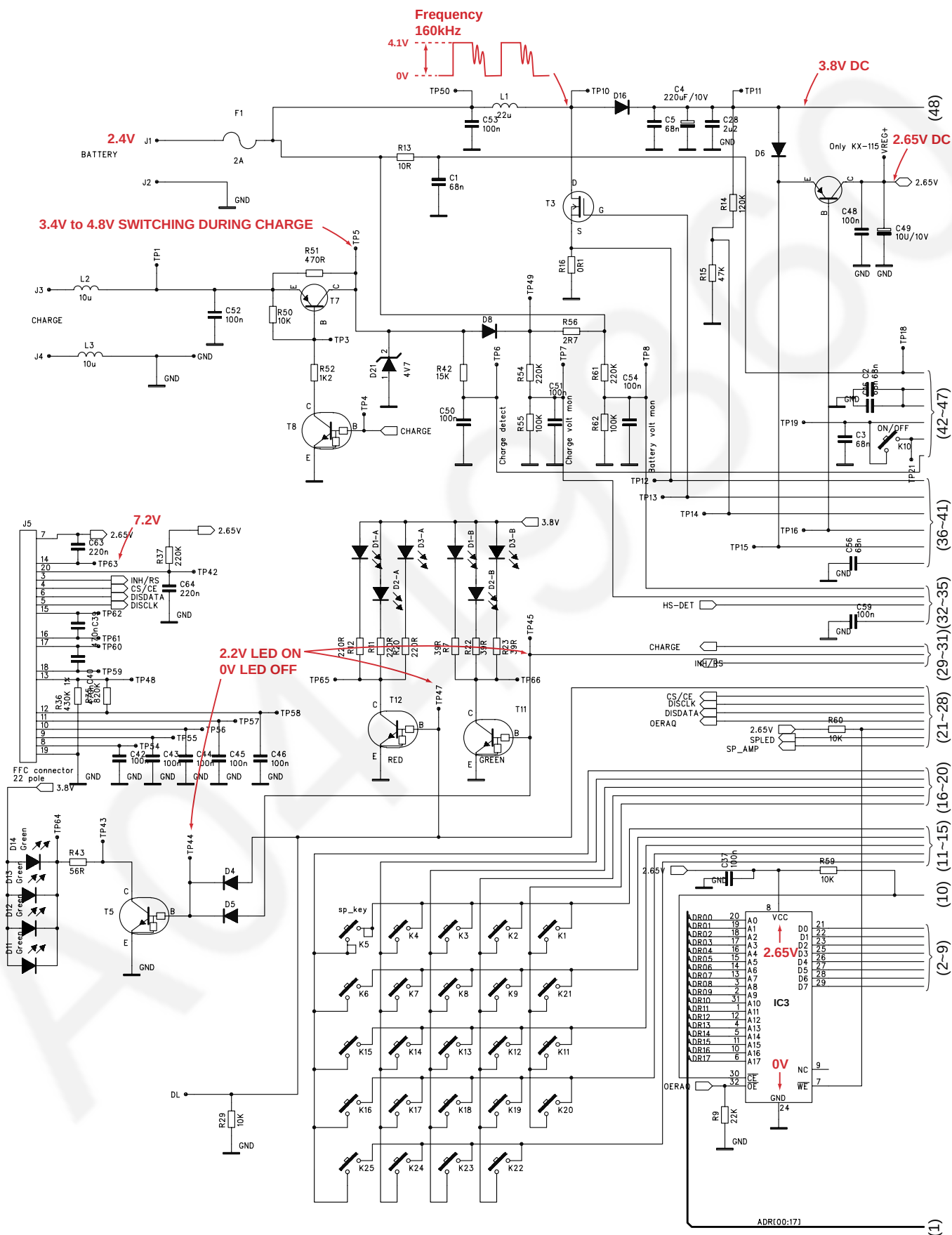


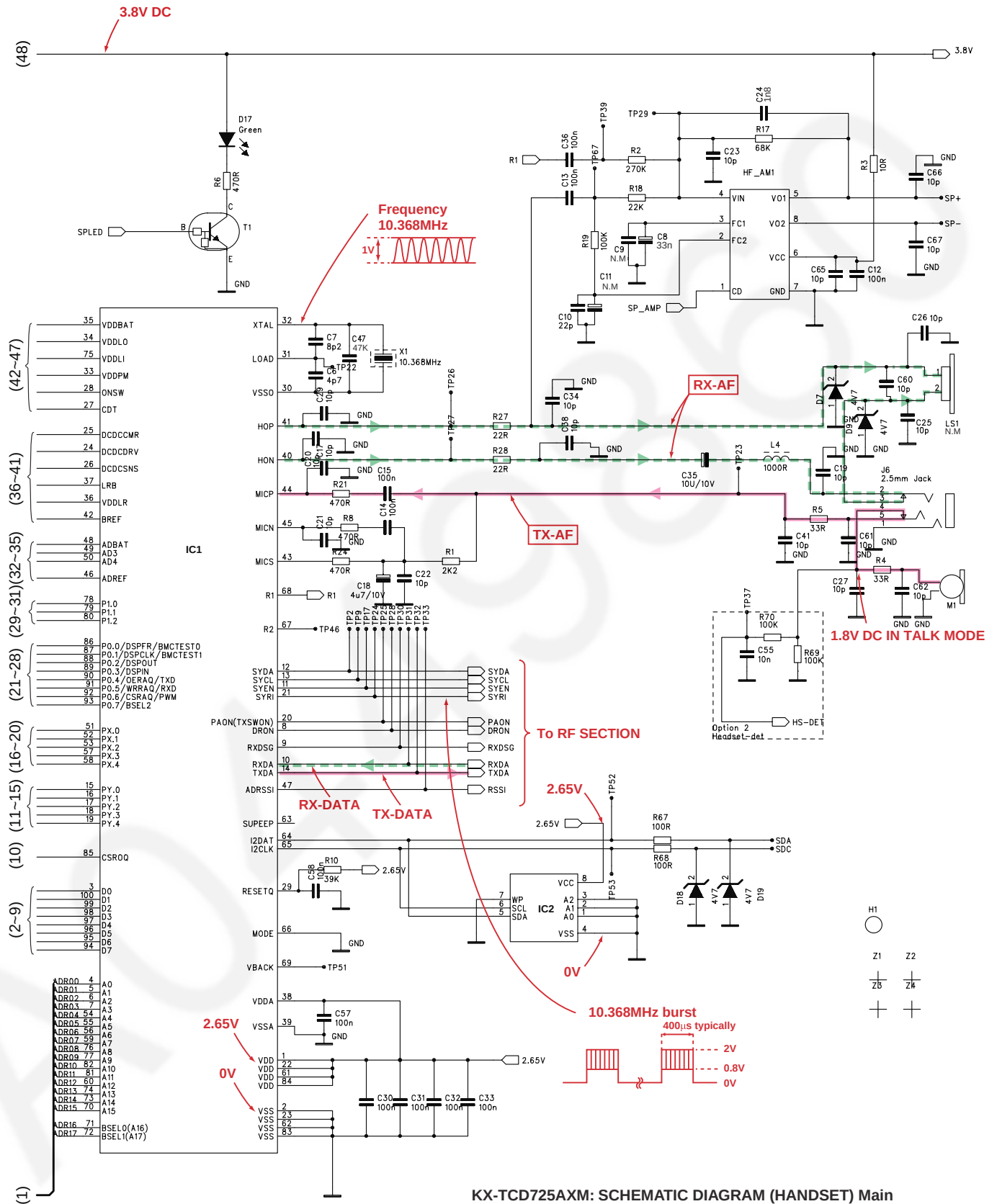


KX-TC725AXM: SCHEMATIC DIAGRAM (BASE UNIT) RF Module

18 SCHEMATIC DIAGRAM (HANDSET)

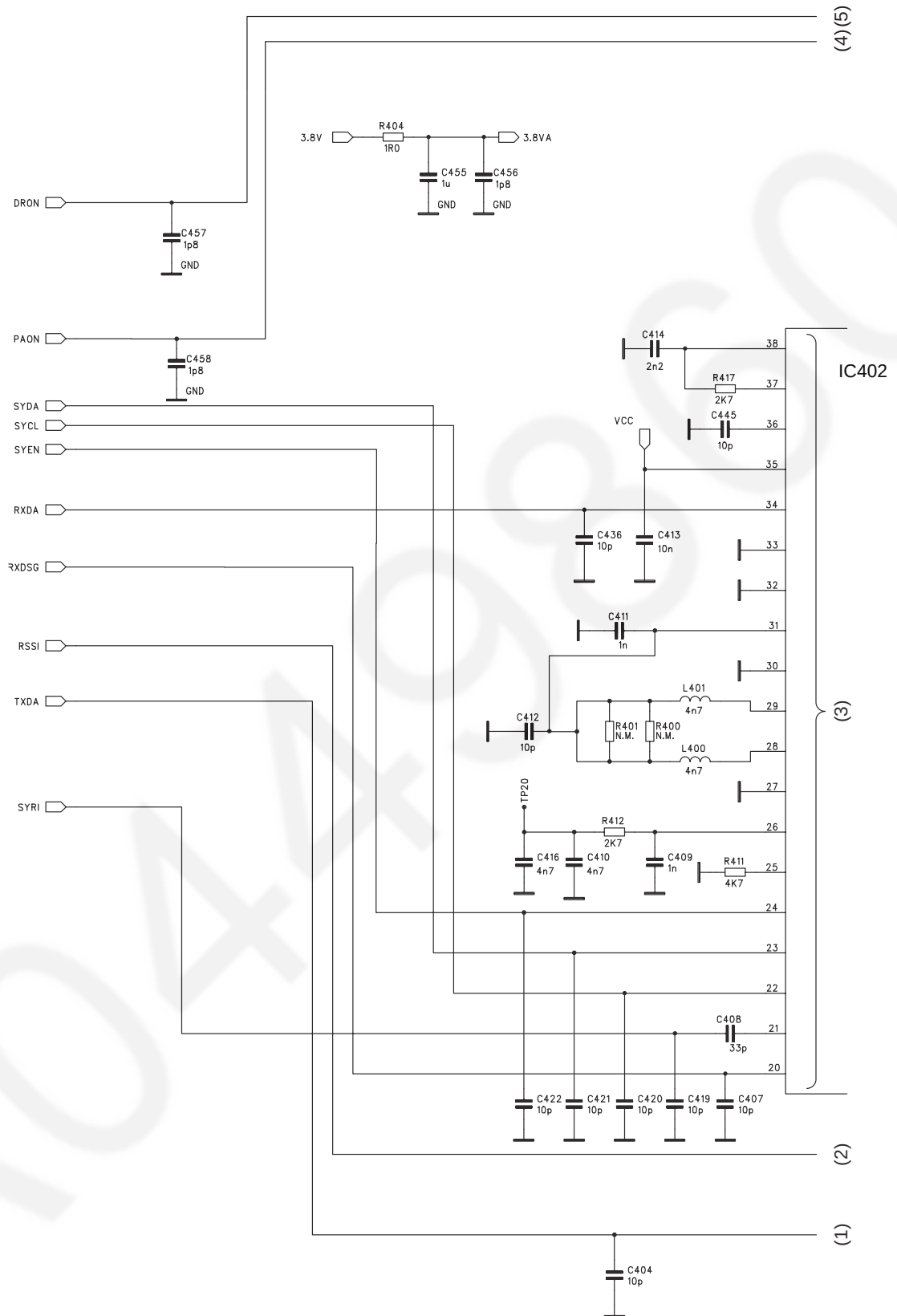
18.1. Main

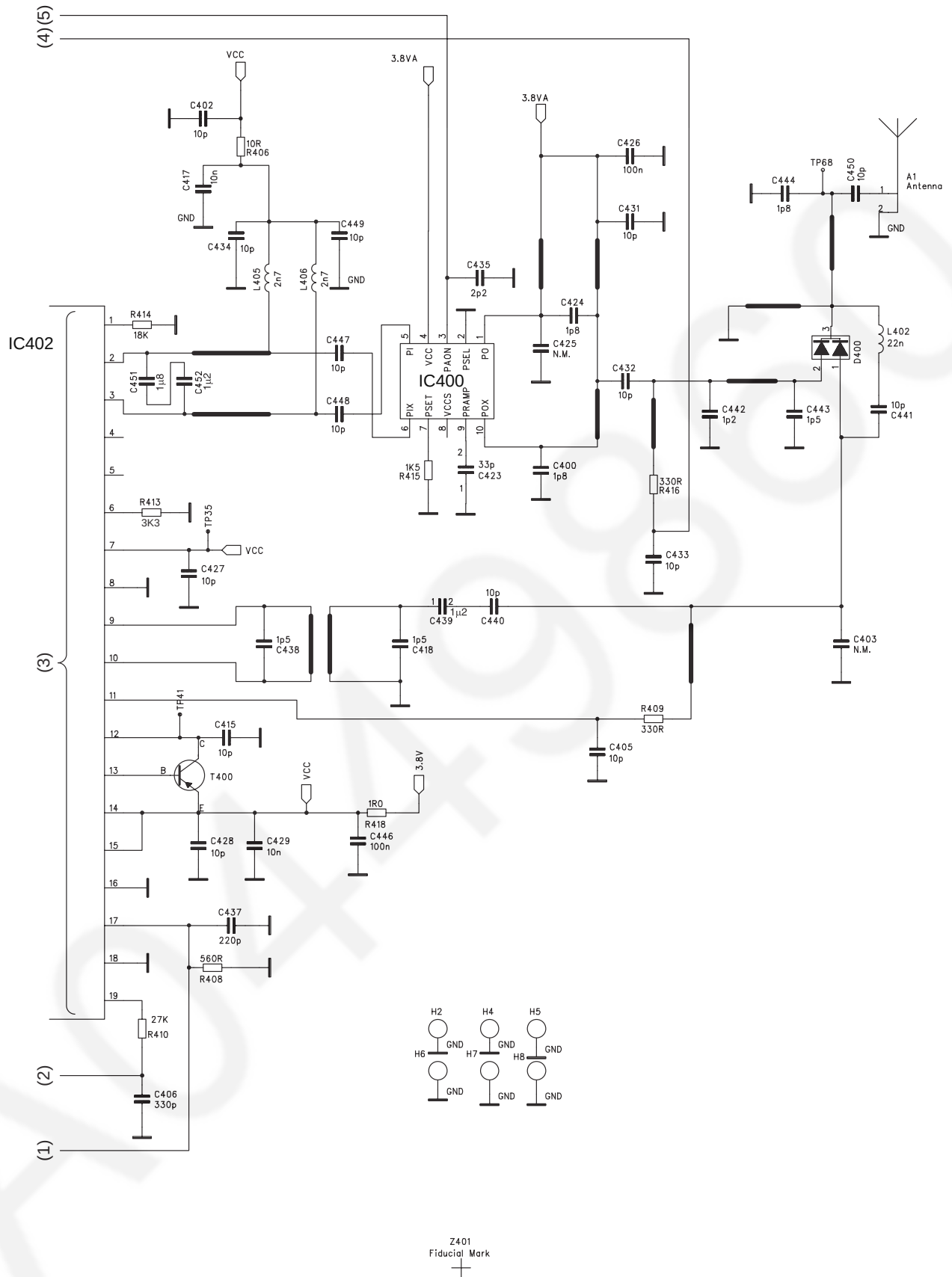




KX-TC725AXM: SCHEMATIC DIAGRAM (HANDSET) Main

18.2. RF Section





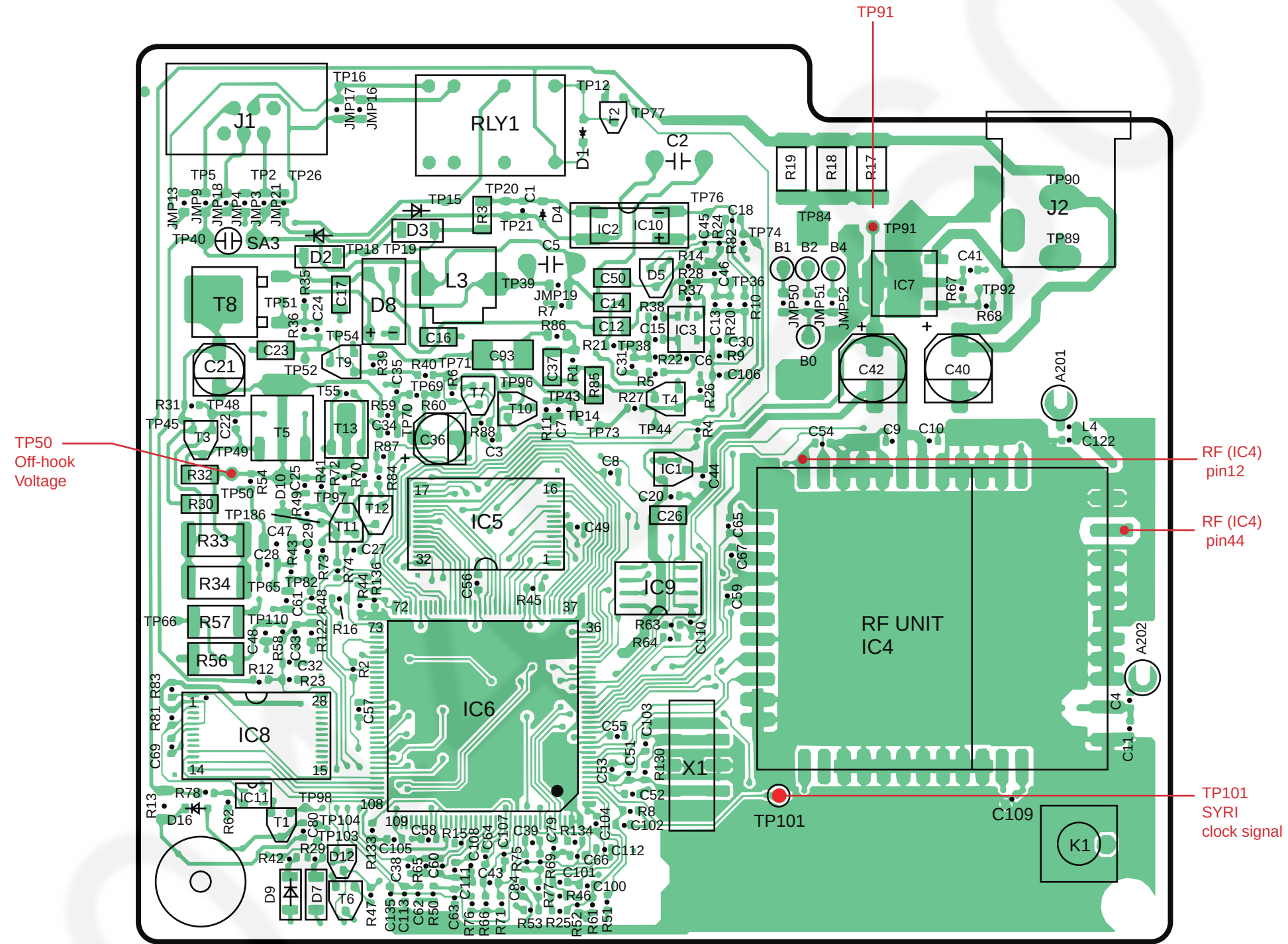
KX-TCD725AXM: SCHEMATIC DIAGRAM (HANDSET) RF Section

18.3. Memo

A0449860

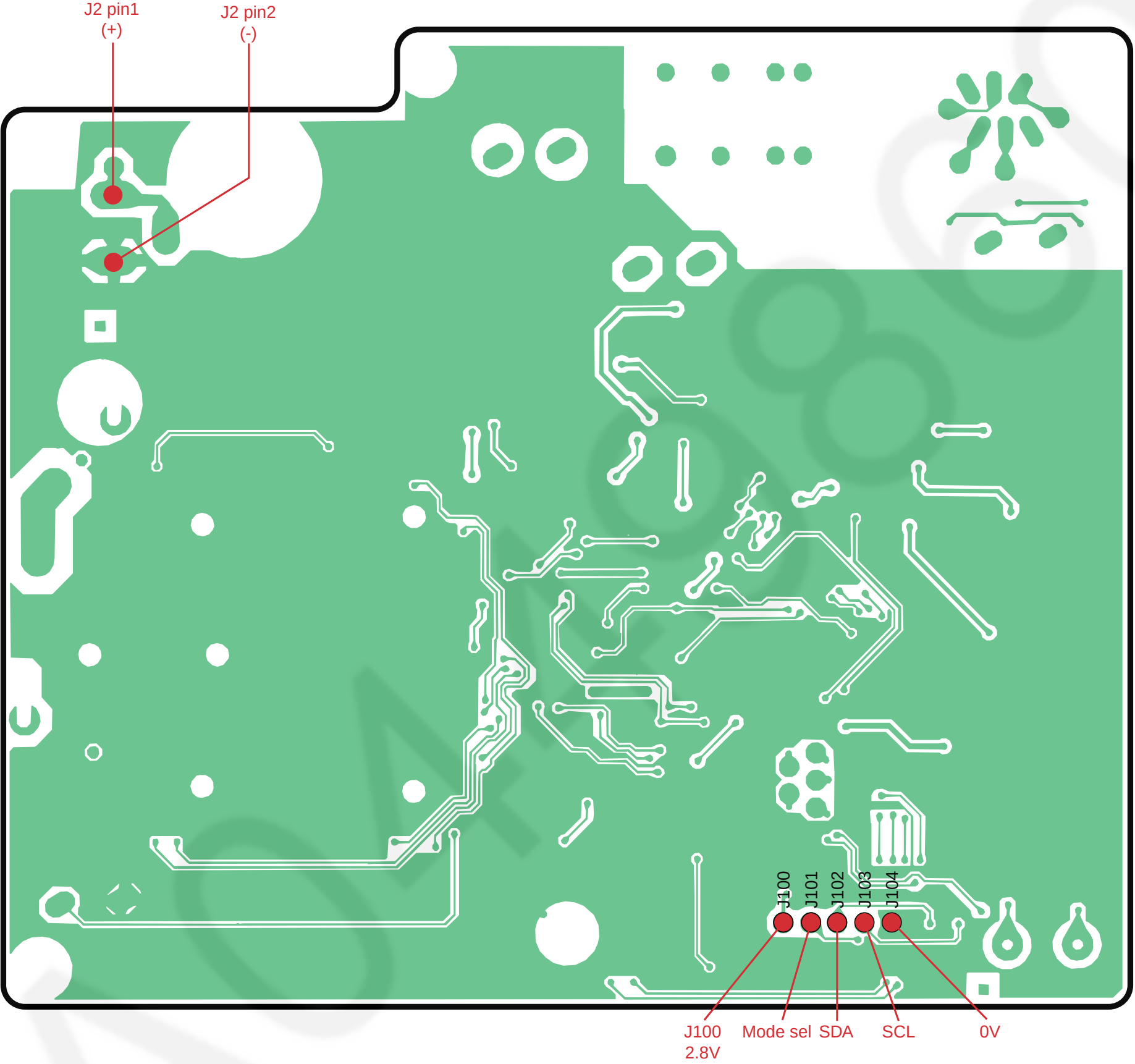
19 CIRCUIT BOARD (BASE UNIT)

19.1. Component View



KX-TCD725AXM : BASE UNIT Main (Component View)

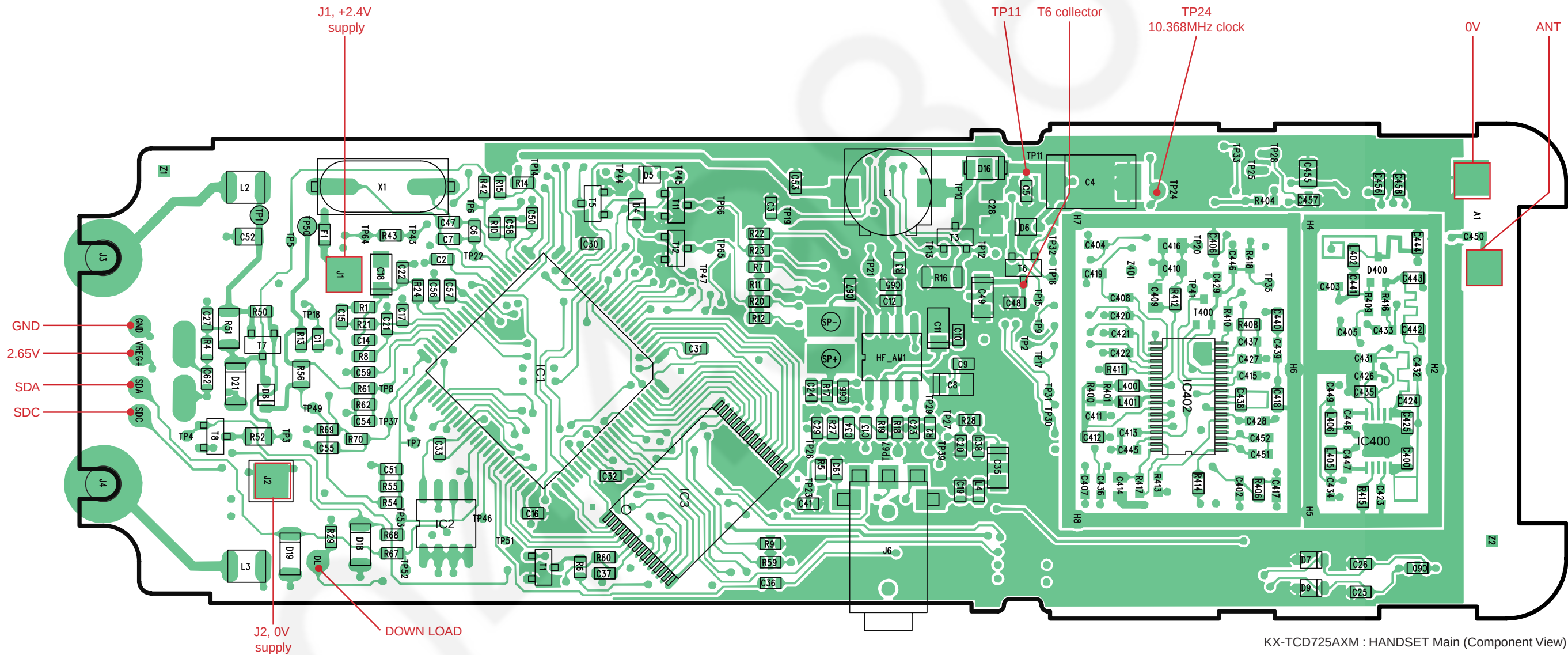
19.2. Flow Solder Side View



KX-TCD725AXM : BASE UNIT Main (Flow Solder Side View)

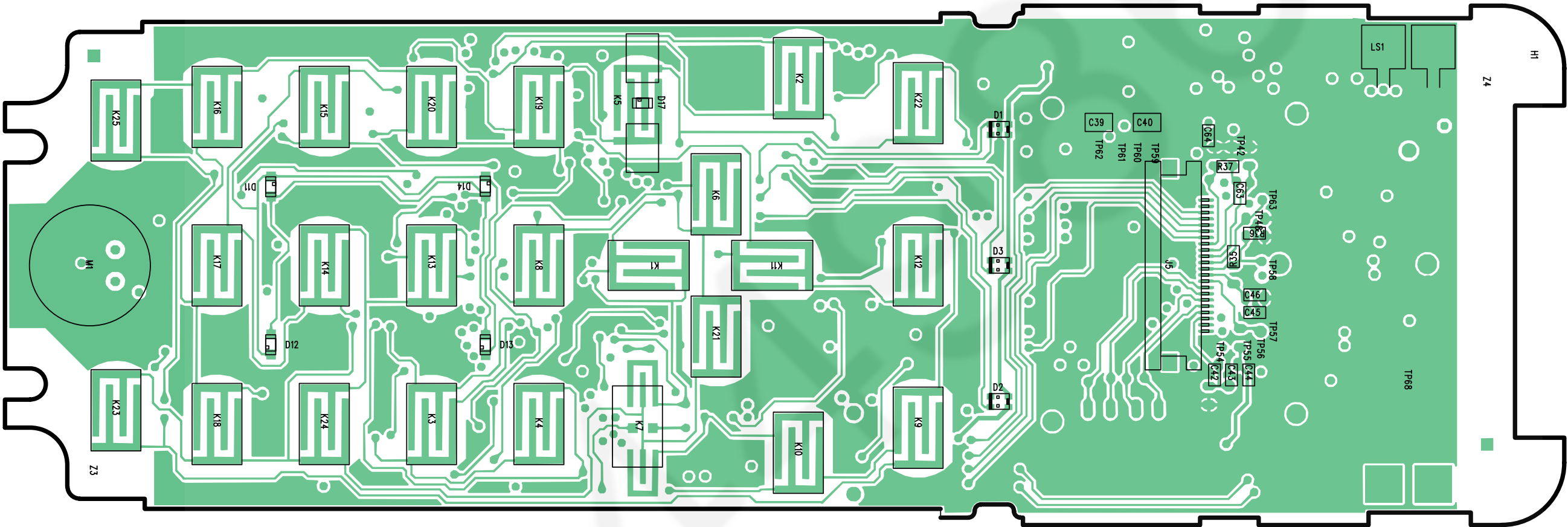
20 CIRCUIT BOARD (HANDSET)

20.1. Component View



KX-TCD725AXM : HANDSET Main (Component View)

20.2. Flow Solder Side View



KX-TCD725AXM : HANDSET Main (Flow Solder Side View)