

**EXHIBIT B**

[FCC Ref. 2.1033(b)(4)]

"Description of Circuit Functions"

## 4-3. DESCRIPTION OF CIRCUIT FUNCTION

### BASE UNIT

1. TEL-LINE INTERFACE (LINE 1, LINE 2)
2. RING DETECTION (LINE 1, LINE 2)
3. POWER SUPPLY
4. AUDIO PATH FOR CORDLESS PHONE (LINE 1, LINE 2)
5. DTMF GENERATOR (LINE 1, LINE2)
6. ANTENNA CONTROL
7. DATA COMMUNICATION INTERFACE
8. INTERCOM FUNCTION
9. SPEAKER PHONE OPERATION
10. CORDED PHONE OPERATION
11. HEADSET PHONE OPERATION
12. CORDLESS PHONE OPEARTION
13. DSP OPERATION
14. BASE RF MODULE

### PORATABLE UNIT

1. LOW BATTERY DETECTION CIRCUIT
2. BUZZER
3. INDICATOR CATEGORY
4. AUDIO PATH FOR CORDLESS PHONE
5. PORTABLE RF MODULE

## BASE UNIT

### 1. TEL-LINE INTERFACE

#### [LINE 1]

TEL-LINE INTERFACE CIRCUIT CONSISTS OF DIODE BRIDGE (BD201), PHOTO COUPLER (PC203), TRANSISTOR (Q202, Q203) AND TRANSFORMER (TR201, TR202) AS FOLLOWS FIG.1  
A DC LOOP IS CONFIGURED WHEN CPU PIN 35 ARE SET LOW.

THE LOOP CURRENT FLOWS AS FOLLOWS:

TEL LINE → BRIDGE (BD201) → PHOTO COUPLER (PC203) → TRANSISTOR (Q202)

THE PULSE SIGNAL FROM CPU PIN 35 TURNS ON OR OFF THE TEL-LINE.

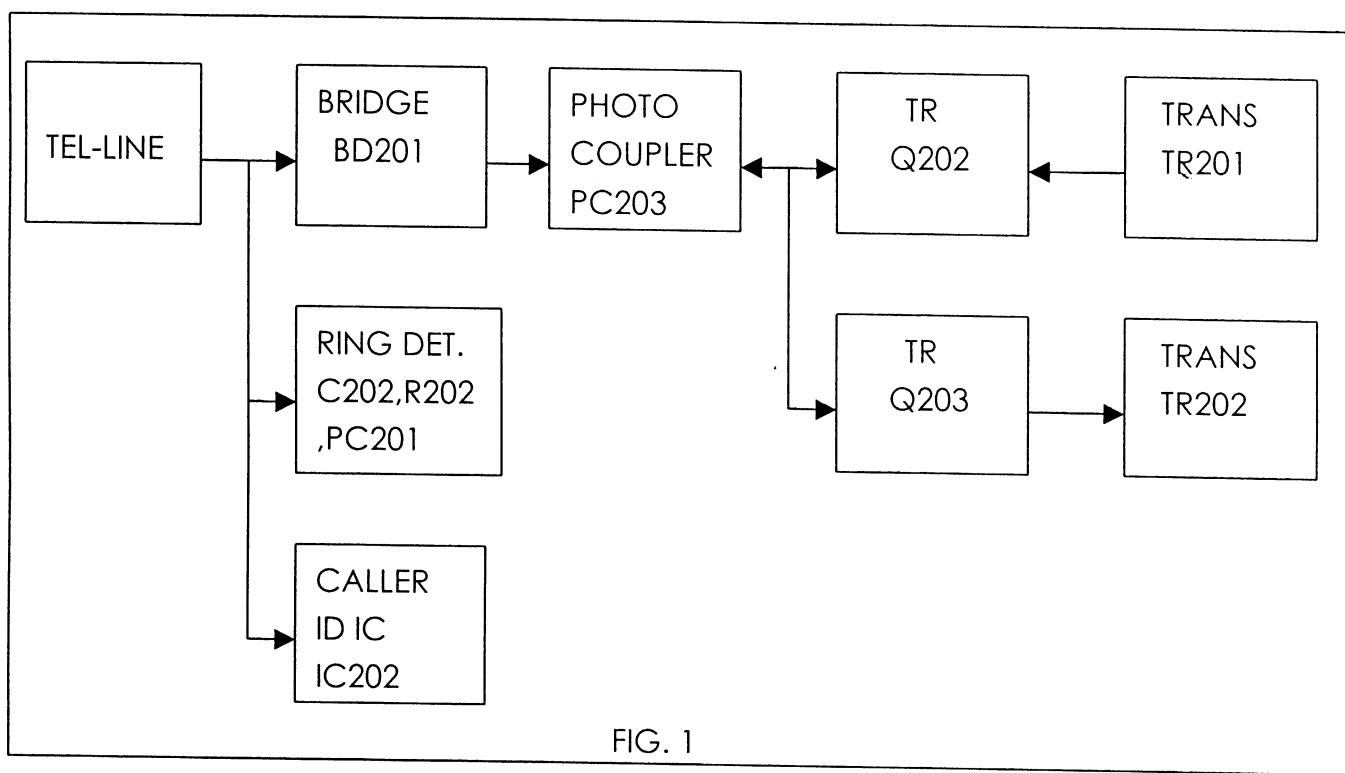


FIG. 1

#### [LINE 2]

TEL-LINE INTERFACE CIRCUIT CONSISTS OF DIODE BRIDGE (BD202), PHOTO COUPLER (PC204), TRANSISTOR (Q209, Q210) AND TRANSFORMER (TR203, TR204) AS FOLLOWS FIG.2  
A DC LOOP IS CONFIGURED WHEN CPU PIN 36 ARE SET LOW.

THE LOOP CURRENT FLOWS AS FOLLOWS:

TEL LINE → BRIDGE (BD202) → PHOTO COUPLER (PC204) → TRANSISTOR (Q209)

THE PULSE SIGNAL FROM CPU PIN 36 TURNS ON OR OFF THE TEL-LINE.

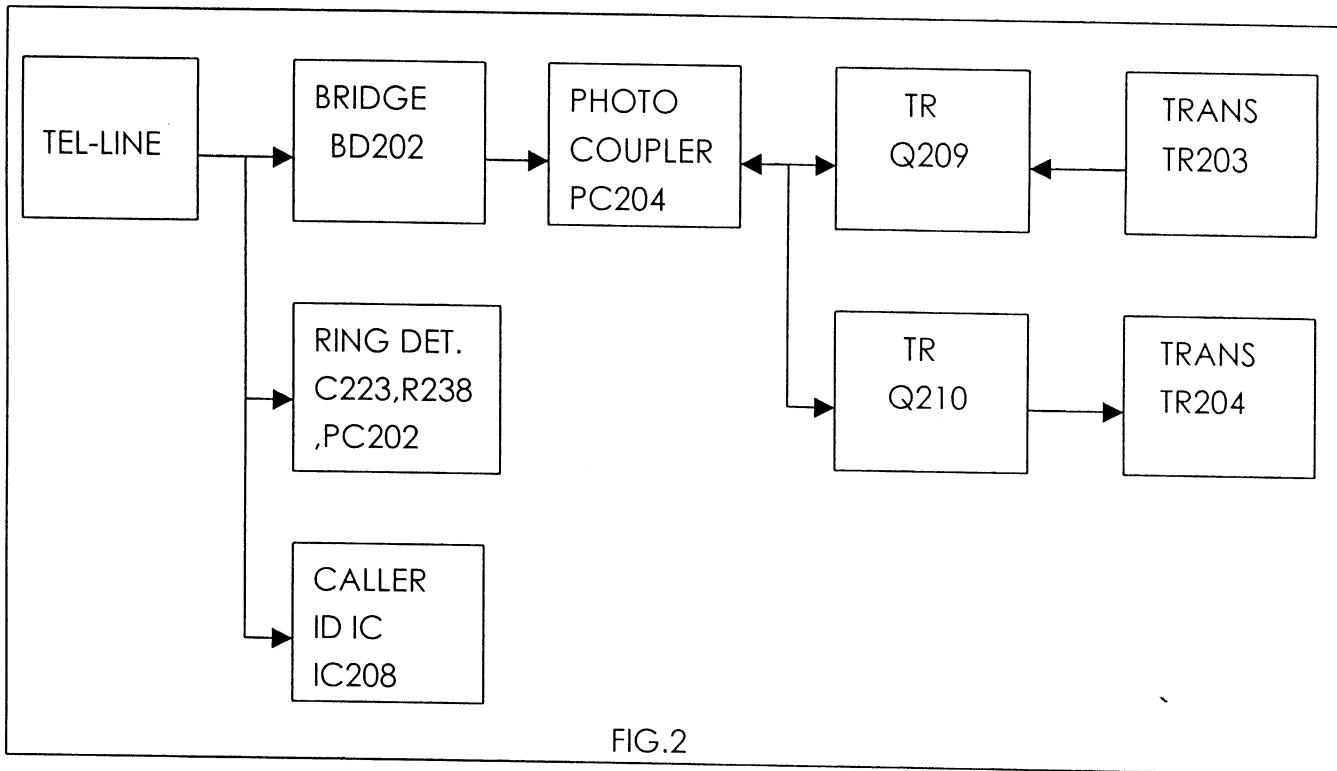


FIG.2

## 2. RING DETECTION

### [LINE 1]

THE RING SIGNAL IS SUPPLIED TO THE PC201 AND DETECTED BY THE CPU.

TIP/RING → F201 → DZ201, C202, R201, C183, R81 → OPTO COUPLER (PC201) →  
→ CPU PIN30

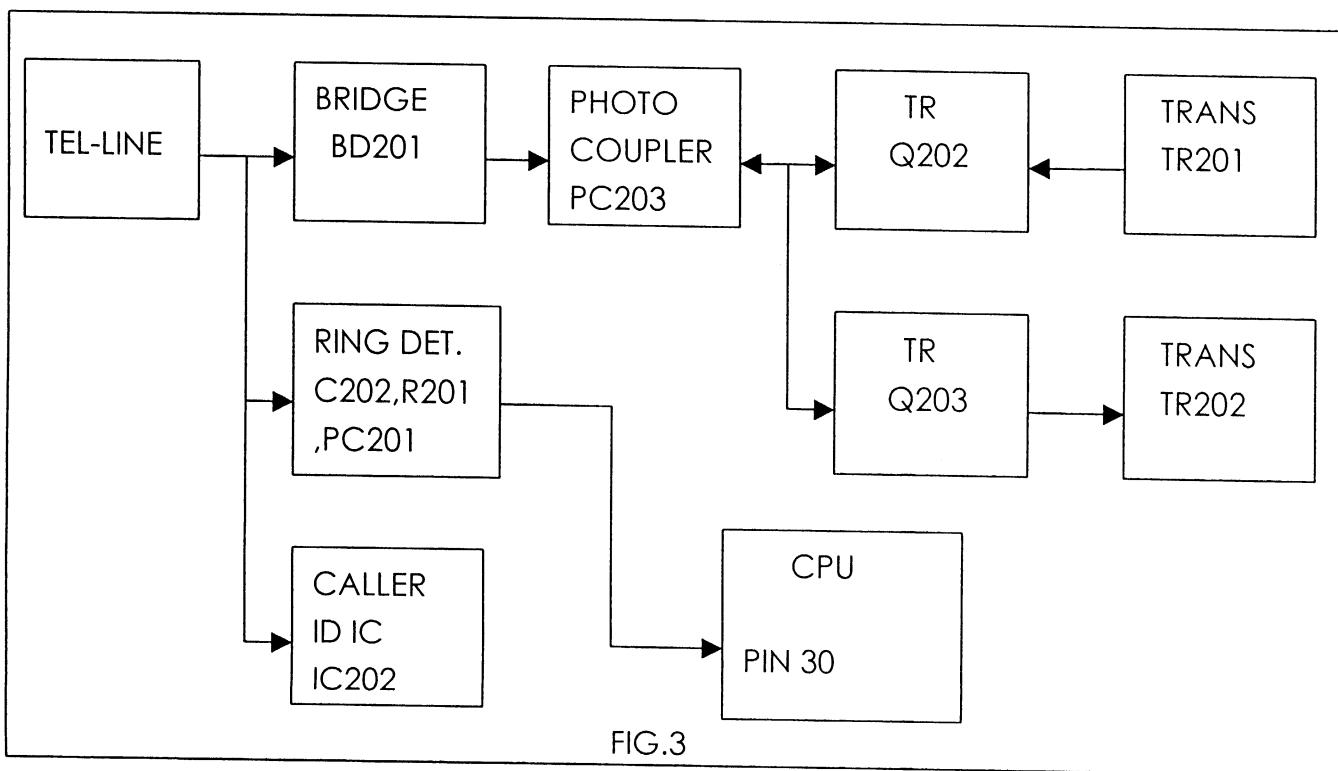


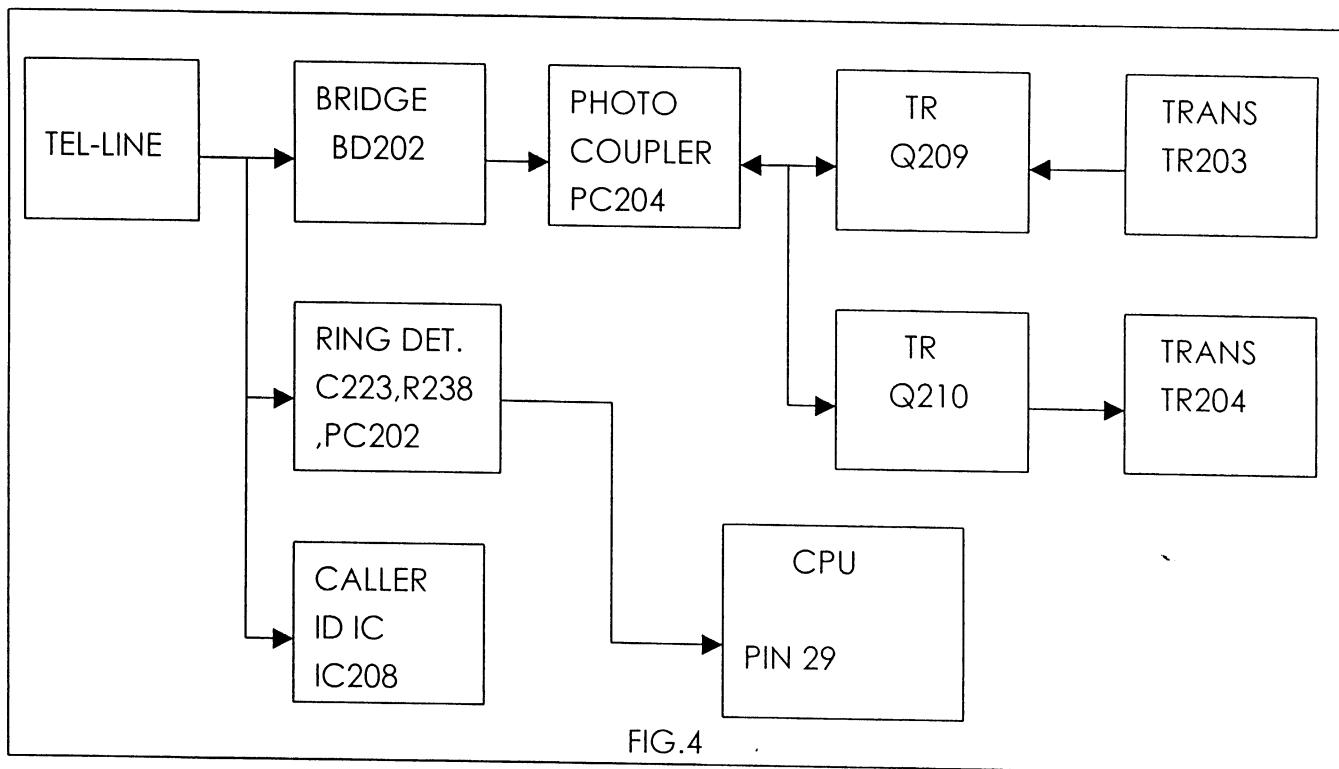
FIG.3

[LINE 2]

THE RING SIGNAL IS SUPPLIED TO THE PC202 AND DETECTED BY THE CPU.

TIP/RING → F202 → DZ203, C223, R238, C184, R82 → OPTO COUPLER (PC202) →

→ CPU PIN29

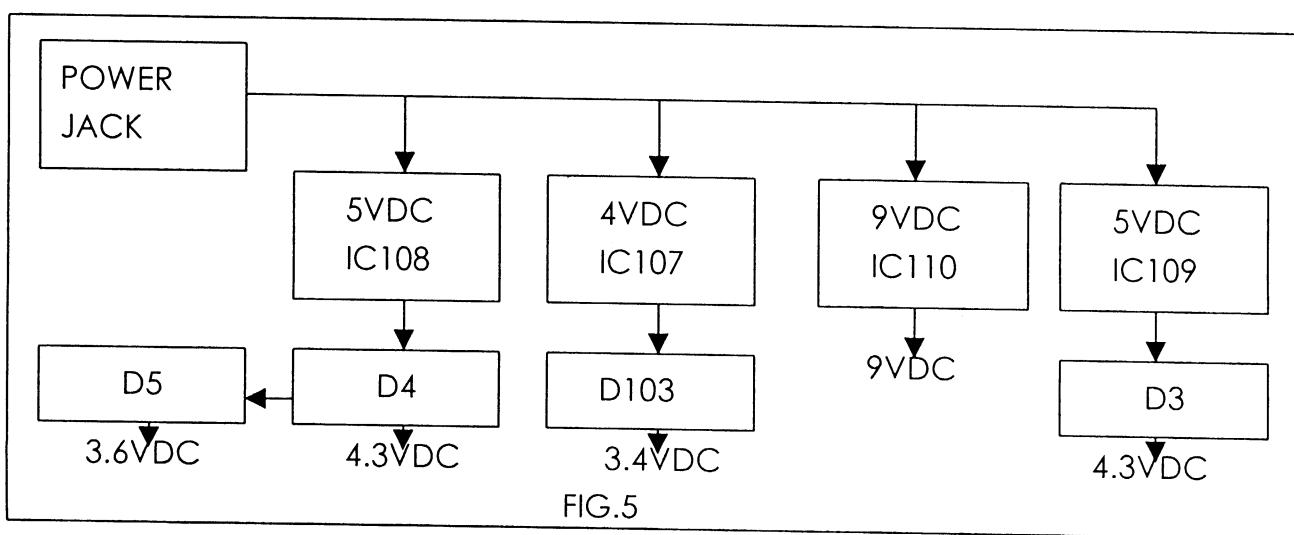


### 3. POWER SUPPLY

THE OUTPUT VOLTAGE OF IC107 IS REGULATED AS 4V AND THIS VOLTAGE IS USED TO THE CPU (IC105), TEL-LINE INTERFACE CIRCUIT AND TX, RX POWER.

THE OUTPUT VOLTAGE OF IC108 IS REGULATED AS 5V AND THIS VOLTAGE IS USED TO THE CPU (IC4) AND FLASH MEMORY (IC2).

THE OUTPUT VOLTAGE OF IC109 IS REGULATED AS 5V AND THIS VOLTAGE IS USED TO THE DSP (IC5, IC6), FLASH MEMORY (IC1) AND S-RAM (IC3).

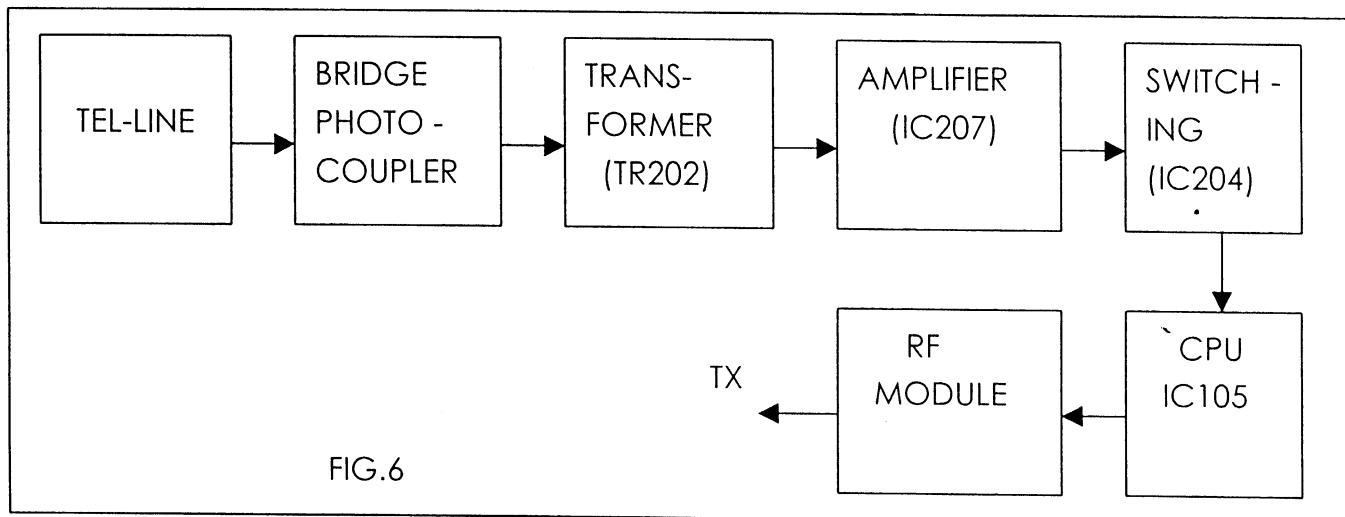


#### 4. AUDIO PATH FOR CORDLESS PHONE

[LINE 1]

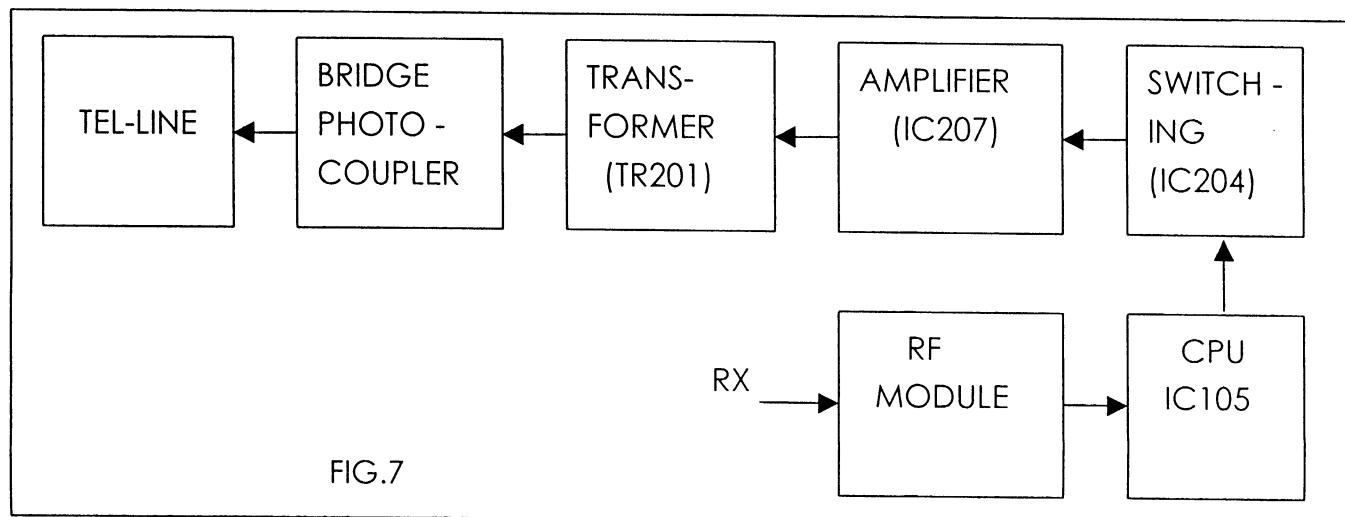
##### 4-1 TX PART:

THE RECEIVED ANALOG SIGNALS FROM TELEPHONE LINE ARE FED TO THE INTERNAL CODEC OF CPU (IC105) AND CONVERTED TO DIGITAL SIGNAL AND THEN TRANSMITTED TO THE HANDSET THROUGH THE RF PART.



##### 4-2 RX PART:

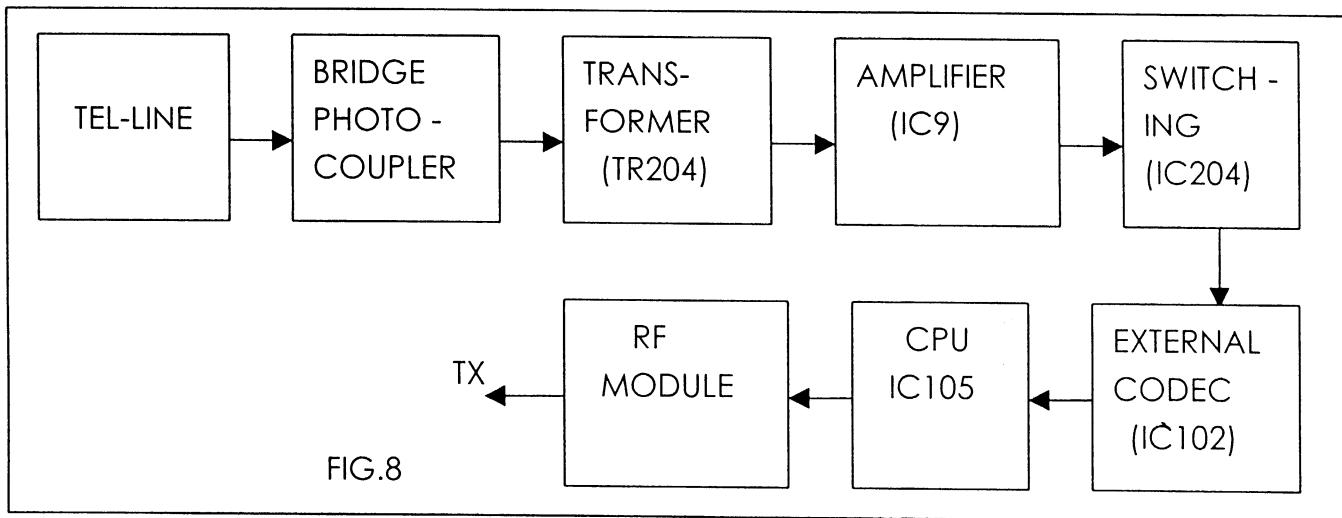
THE RECEIVED DIGITAL SIGNALS FROM THE HANDSET THROUGH THE RF PART ARE FED TO THE CPU (IC105) AND CONVERTED TO ANALOG SIGNAL AND THEN IT IS FED TO THE TELEPHONE LINE THROUGH THE AMPLIFIER AND THE SWITCHING IC.



[LINE 2]

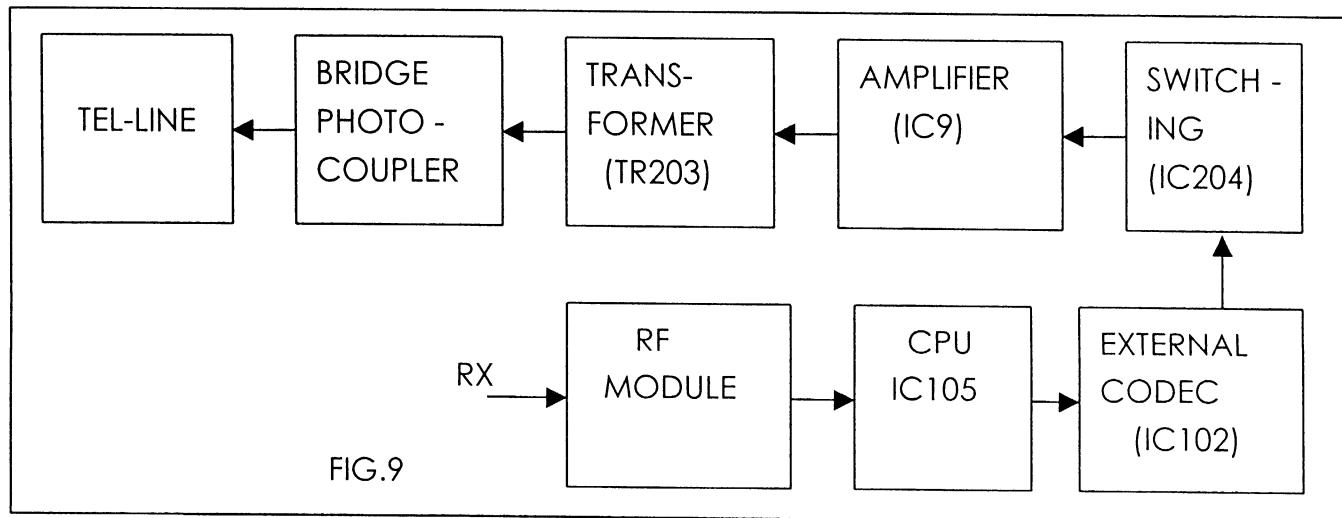
**4-3 TX PART:**

THE RECEIVED ANALOG SIGNALS FROM TELEPHONE LINE ARE FED TO THE CPU (IC105) THROGH THE EXTERNAL CODEC (IC102) AND CONVERTED TO DIGITAL SIGNAL AND THEN TRANSMITTED TO THE HANDSET THROUGH THE RF PART.



**4-4 RX PART:**

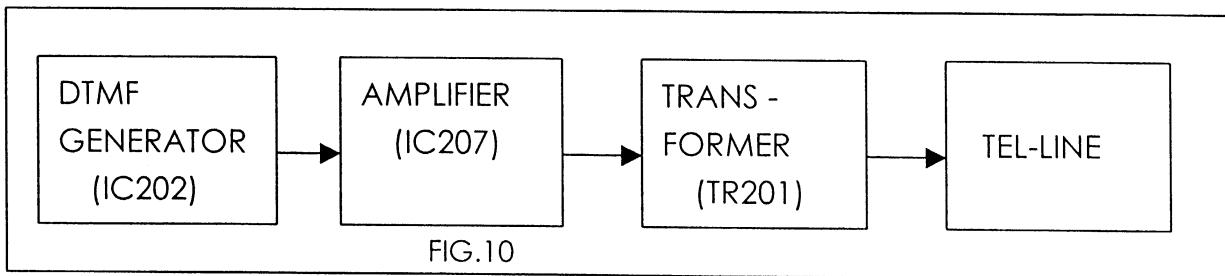
THE RECEIVED DIGITAL SIGNALS FROM THE HANDSET THROUGH THE RF PART ARE FED TO THE CPU (IC105) AND CONVERTED TO ANALOG SIGNAL IN TEE EXTERNAL CODEC (IC102) AND THEN IT IS FED TO THE TELEPHONE LINE THROUGH THE AMPLIFIER AND THE SWITCHING IC.



## 5. DTMF GENERATOR

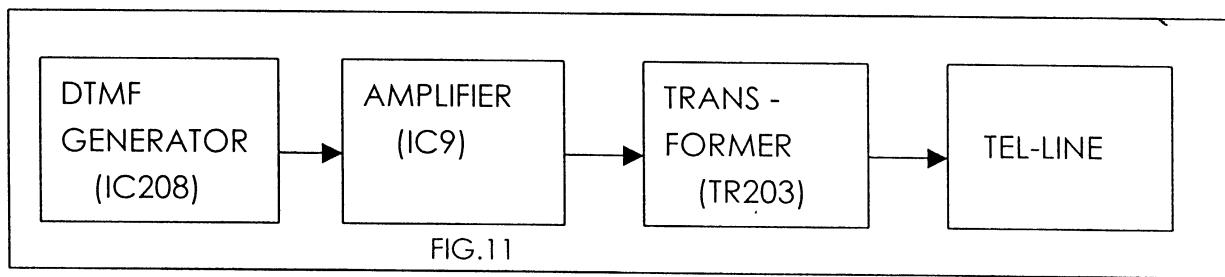
[LINE 1]

THE IC202 DTMF GENERATOR IS INTENDED TO PROVIDE DUAL-TONE MULTI-FREQUENCY (DTMF) FOR TONE DIALLING SYSTEM.



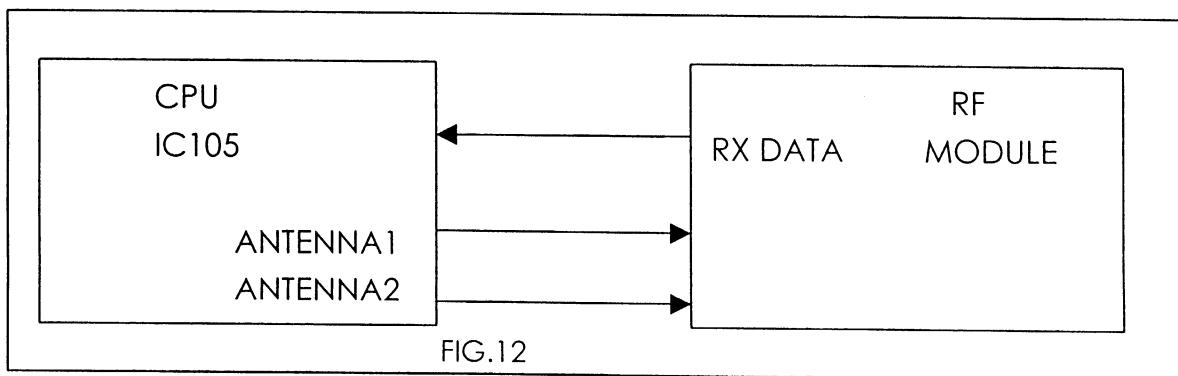
[LINE 2]

THE IC208 DTMF GENERATOR IS INTENDED TO PROVIDE DUAL-TONE MULTI-FREQUENCY (DTMF) FOR TONE DIALLING SYSTEM.



## 6. ANTENNA CONTROL (BASE)

THE CPU (IC105) DECIDES WHICH ANTENNA IS GOOD BY RX DATA AND IT CONTROLS GOOD ANTENNA PER EACH SLOT OF THE FRAME.

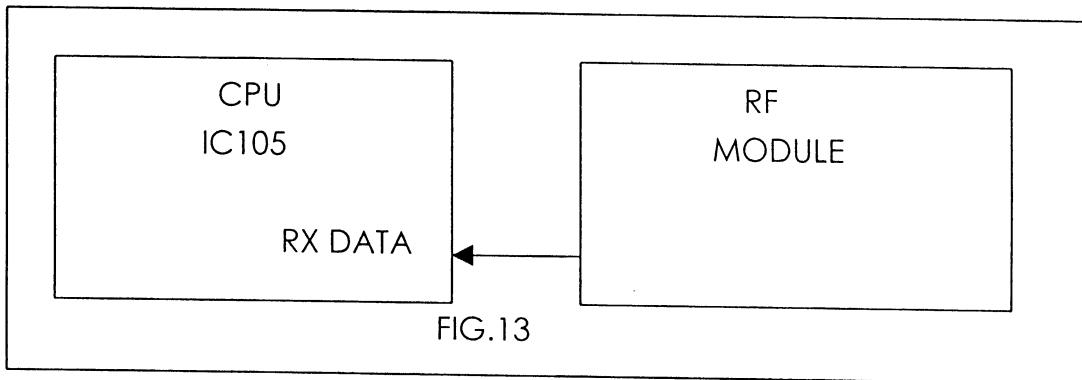


## 7. DATA COMMUNICATION INTERFACE.

\* DATA COMMUNICATION IS OPERATED BY SERIAL OUTPUT

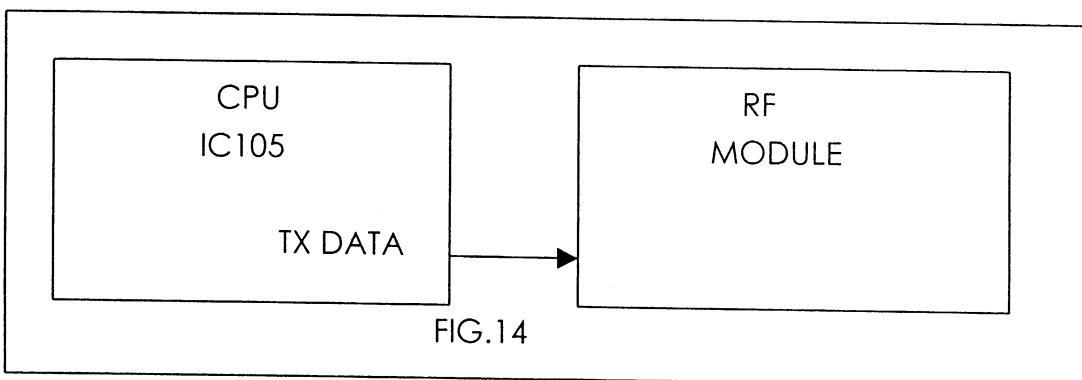
### 7-1 PIN 20 (RX DATA) OF CPU:

CPU PIN 20 RECEIVES RX DATA FROM THE RF MODULE WHICH IS SENT FROM THE PORTABLE UNIT .



### 7-2 PIN 22 (TXDATA) OF CPU :

TX DATA WILL BE SENT TO THE PORTABLE UNIT AS THROUGH PIN 22(TX DATA) OF CPU



## 8. INTERCOM FUNCTION

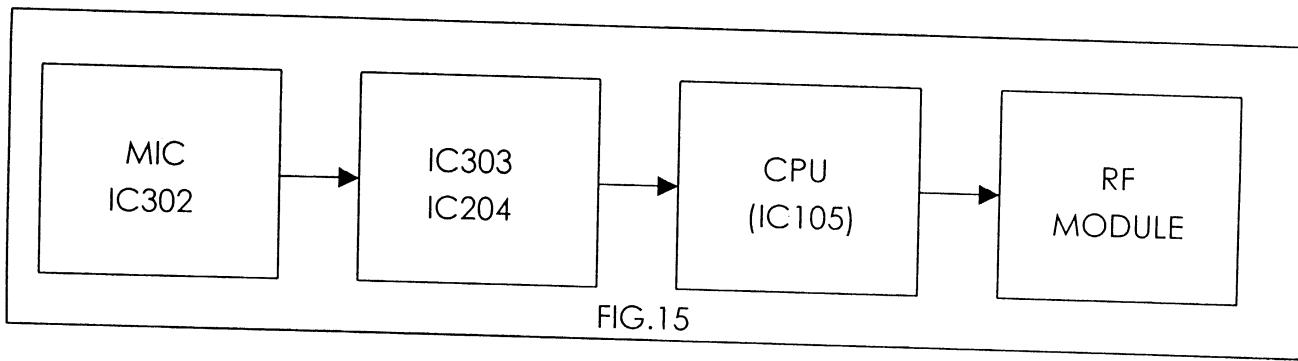
PAGING FUNCTION CAN BE SELECTED FROM BASE TO PORTABLE UNIT. THE INTERCOM FUNCTION CAN BE ENABLED BY PRESSING THE INT/TRSF KEY IN THE BASE AND HANDSET.

### 8-1. BASE TO HANDSET INTERCOM

#### 8-1-1. SPEAKER PHONE TO HANDSET INTERCOM

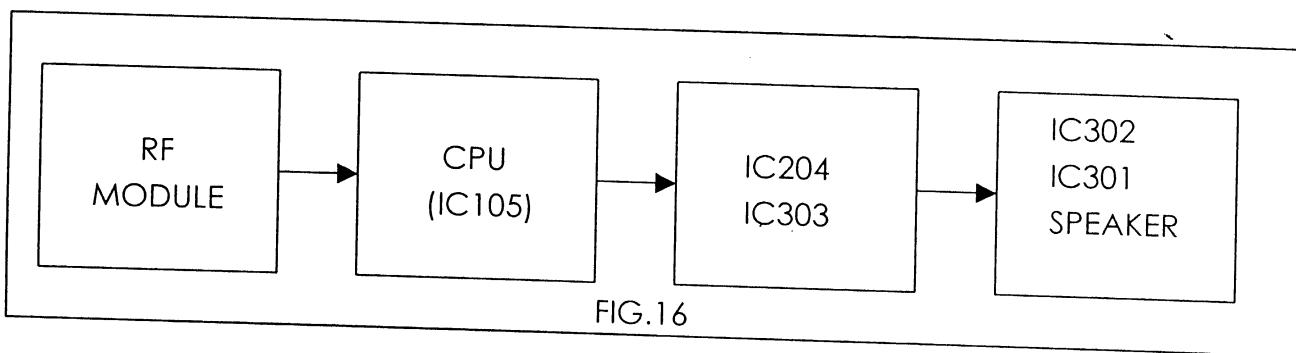
##### 8-1-1-1. TX PART

PICKED UP AUDIO SIGNAL IS AMPLIFIED IN THE IC303 AND IT IS FED TO THE CPU(IC105) THROUGH THE SWITCHING IC(IC204). THE CPU MAKES IT AS DIGITAL SIGNAL AND TRANSMITES TO THE HANDSET THROUGH THE RF MODULE.



#### 8-1-1-2. RX PART

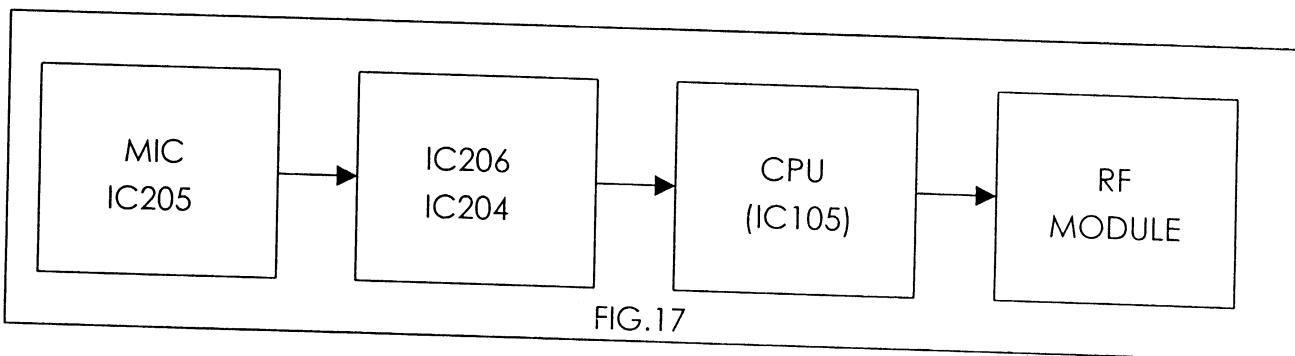
RECEIVED DIGITAL SIGNAL FROM THE HANDSET IS CONVERTED TO THE ANALOG SIGNAL IN THE CPU(IC105) AND THEN THE AUDIO SIGNAL IS AMPLIFIED IN THE IC303 AND SP301 GENERATES AUDIO SOUND BY WAY THE SWITCHING IC(IC302) AND AMPLIFIER(IC301).



#### 8-1-2. CORDED PHONE TO HANDSET INTERCOM

##### 8-1-2-1. TX PART

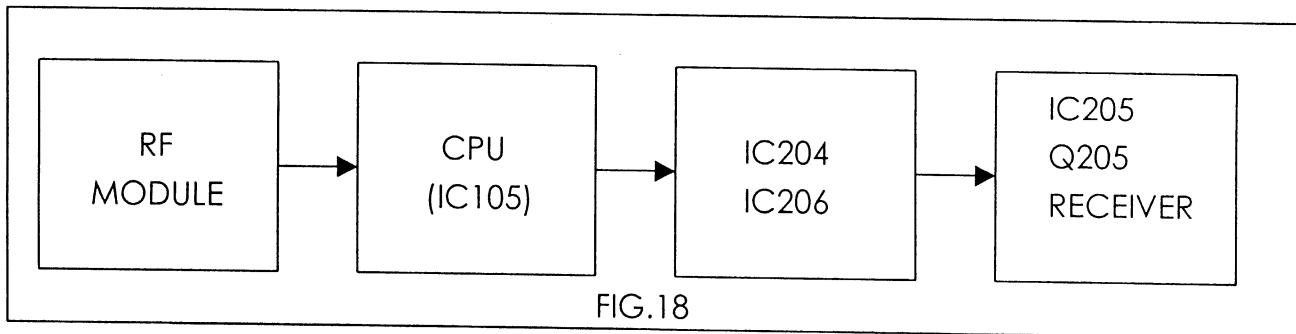
PICKED UP AUDIO SIGNAL IS AMPLIFIED IN THE IC206 AND IT IS FED TO THE CPU(IC105) THROUGH THE SWITCHING IC(IC204). THE CPU MAKES IT AS DIGITAL SIGNAL AND TRANSMITES TO THE HANDSET THROUGH THE RF MODULE.



##### 8-1-2-2. RX PART

RECEIVED DIGITAL SIGNAL FROM THE HANDSET IS CONVERTED TO THE ANALOG SIGNAL IN THE CPU(IC105) AND THEN THE AUDIO SIGNAL IS AMPLIFIED IN THE IC206 AND RECEIVER GENERATES AUDIO SOUND BY WAY

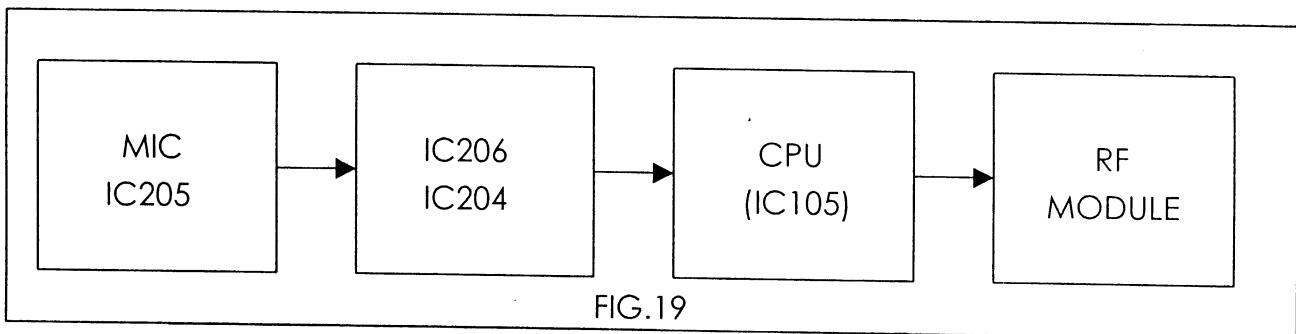
THE SWITCHING IC(IC205) AND BUFFER(Q205).



### 8-1-3. HEADSET PHONE TO HANDSET INTERCOM

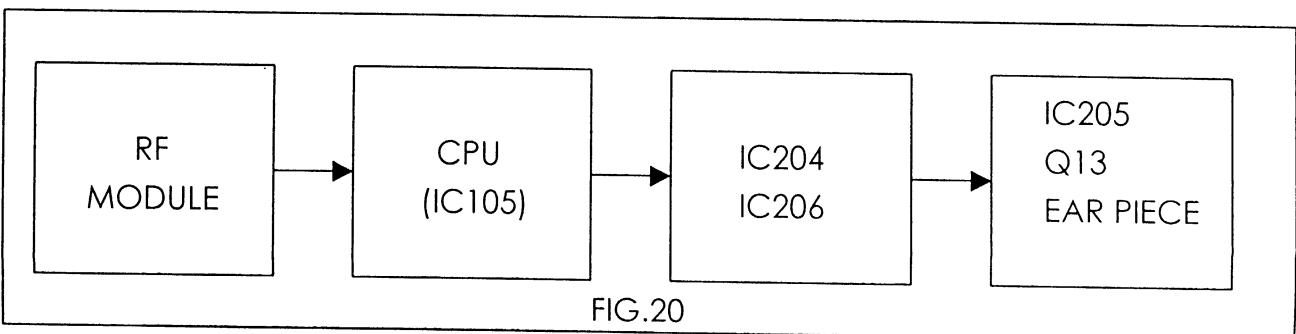
#### 8-1-3-1. TX PART

PICKED UP AUDIO SIGNAL IS AMPLIFIED IN THE IC206 AND IT IS FED TO THE CPU(IC105) THROUGH THE SWITCHING IC(IC204). THE CPU MAKES IT AS DIGITAL SIGNAL AND TRANSMITES TO THE HANDSET THROUGH THE RF MODULE.



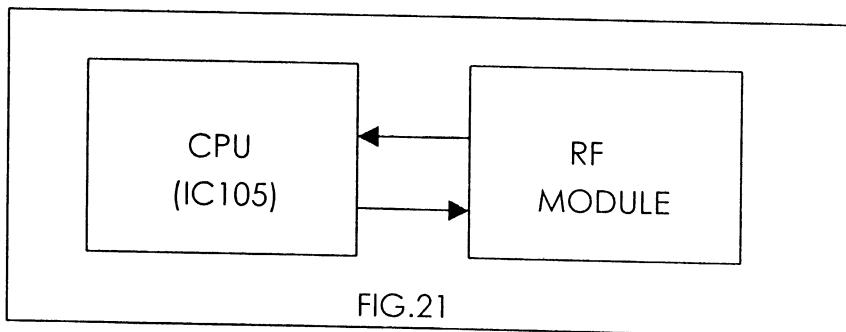
#### 8-1-3-2. RX PART

RECEIVED DIGITAL SIGNAL FROM THE HANDSET IS CONVERTED TO THE ANALOG SIGNAL IN THE CPU(IC105) AND THEN THE AUDIO SIGNAL IS AMPLIFIED IN THE IC206 AND EAR PIECE GENERATES AUDIO SOUND BY WAY THE SWITCHING IC(IC205) AND BUFFER(Q13).



## 8-2. HNADSET TO HANDSET INTERCOM

RECEIVED DIGITAL SIGNAL FROM HANDSET IS SENT TO THE OTHER HANDSET BY WAY THE OTHER SLOT.



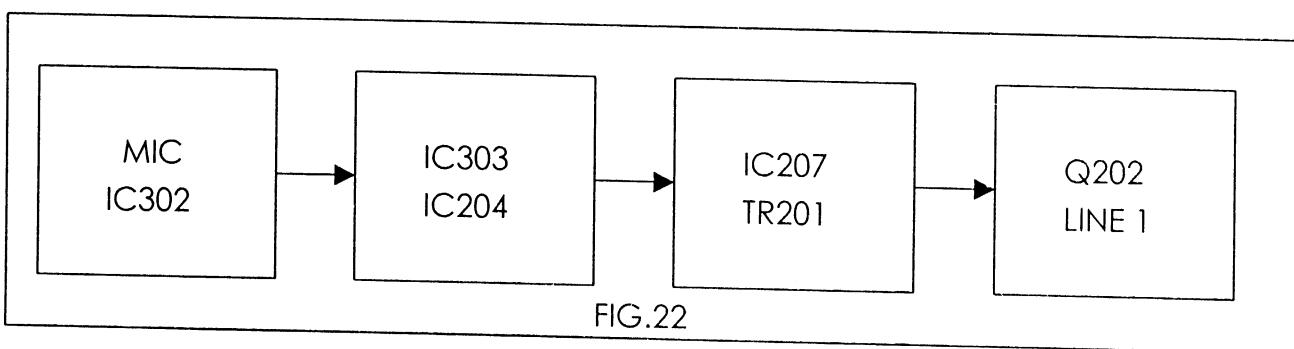
## 9. SPEAKER-PHONE OPERATION

### 9-1. LINE 1

#### 9-1-1. TX PART:

PICKED UP AUDIO SIGNAL FROM MICROPHONE IS AMPLIFIED IN THE IC303 AND IT IS FED TO THE IC207 THROUGH THE SWITCHING IC (IC204).

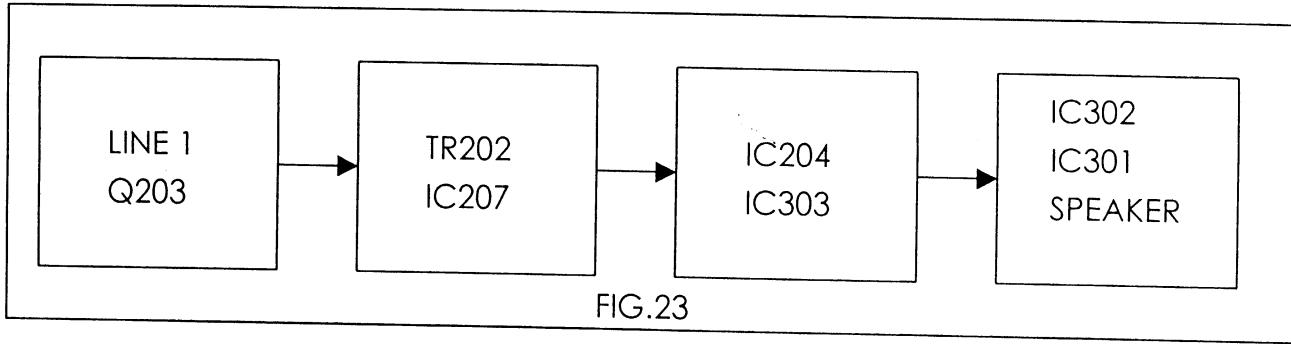
THE AUDIO SIGNAL IS FED TO TR201 AND AMPLIFIED IN Q202 AND THEN TRANSMITTED TO THE LINE 1.



#### 9-1-2. RX PART:

THE RECEIVED AUDIO SIGNALS FROM THE LINE ARE FED TO TR202 AFTER THROUGH Q203 AND IT IS AMPLIFIED IN IC207 AND PASSED BY SWITHCING IC (IC204).

THE AUDIO SIGNAL IS AMPLIFIED IN IC303 AND FED TO IC302 AND THEN IT IS AMPLIFIED IN THE POWER AMP (IC301) AND GENFRATED BY SP301

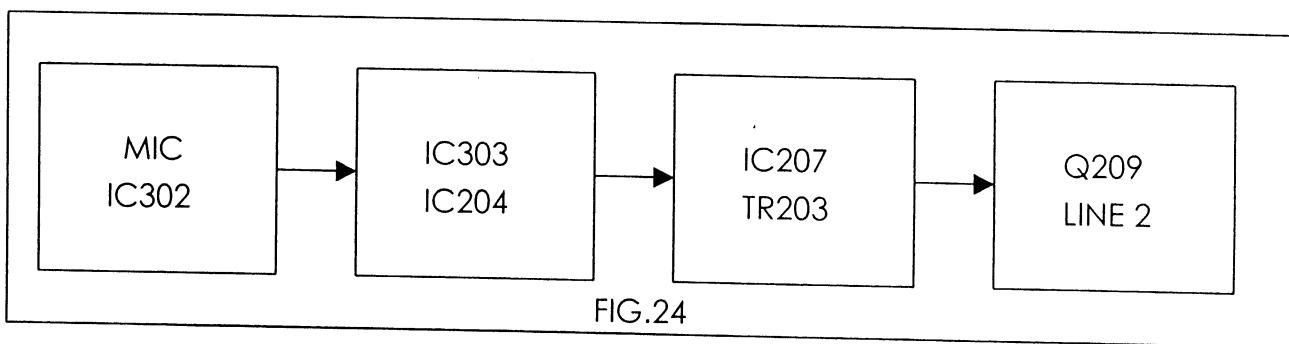


## 9-2. LINE 2

### 9-2-1. TX PART:

PICKED UP AUDIO SIGNAL FROM MICROPHONE IS AMPLIFIED IN THE IC303 AND IT IS FED TO THE IC207 THROUGH THE SWITCHING IC (IC204).

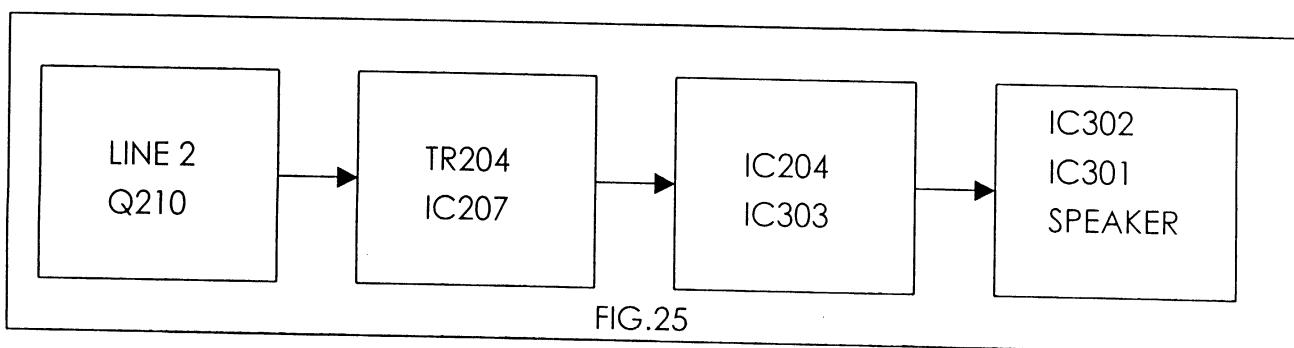
THE AUDIO SIGNAL IS FED TO TR203 AND AMPLIFIED IN Q209 AND THEN TRANSMITTED TO THE LINE 2.



### 9-2-2. RX PART:

THE RECEIVED AUDIO SIGNALS FROM THE LINE ARE FED TO TR204 AFTER THROUGH Q210 AND IT IS AMPLIFIED IN IC207 AND PASSED BY SWITCHING IC (IC204).

THE AUDIO SIGNAL IS AMPLIFIED IN IC303 AND FED TO IC302 AND THEN IT IS AMPLIFIED IN THE POWER AMP (IC301) AND GENERATED BY SP301.



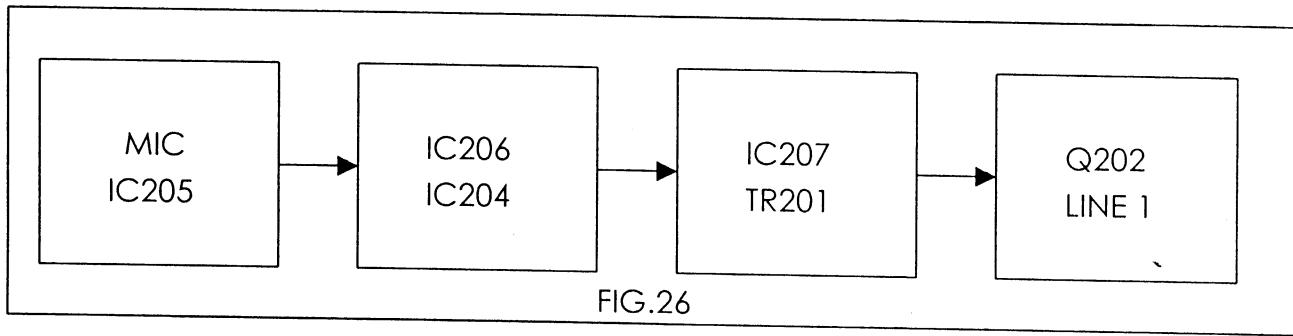
## 10. CORDED PHONE OPERATION

### 10-1. LINE 1

#### 10-1-1. TX PART:

PICKED UP AUDIO SIGNAL FROM MICROPHONE IS AMPLIFIED IN THE IC206 AND IT IS FED TO THE IC207 THROUGH THE SWITCHING IC (IC204).

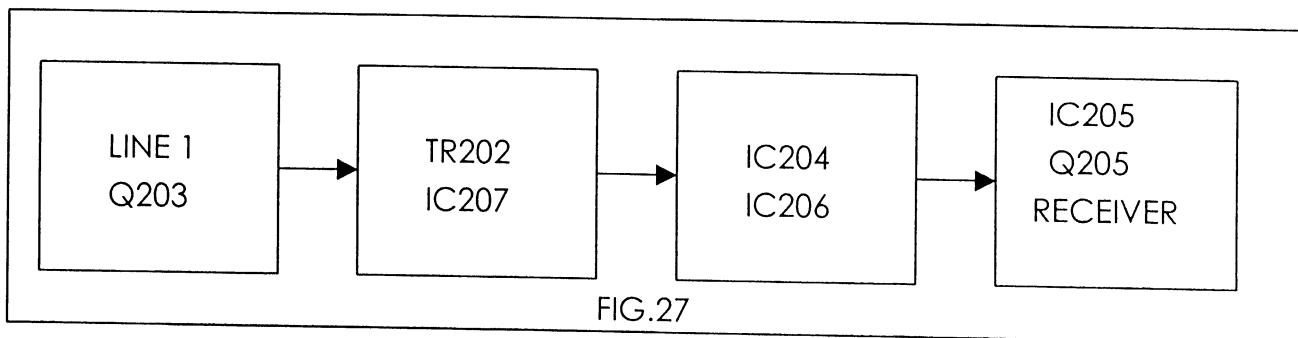
THE AUDIO SIGNAL IS FED TO TR201 AND AMPLIFIED IN Q202 AND THEN TRANSMITTED TO THE LINE 1.



#### 10-1-2. RX PART:

THE RECEIVED AUDIO SIGNALS FROM THE LINE ARE FED TO TR202 AFTER THROUGH Q203 AND IT IS AMPLIFIED IN IC207 AND PASSED BY SWITCHING IC (IC204).

THE AUDIO SIGNAL IS AMPLIFIED IN IC206 AND FED TO IC205 AND THEN IT IS PASSED BY THE BUFFER AMP (Q205) AND GENERATED BY RECEIVER.

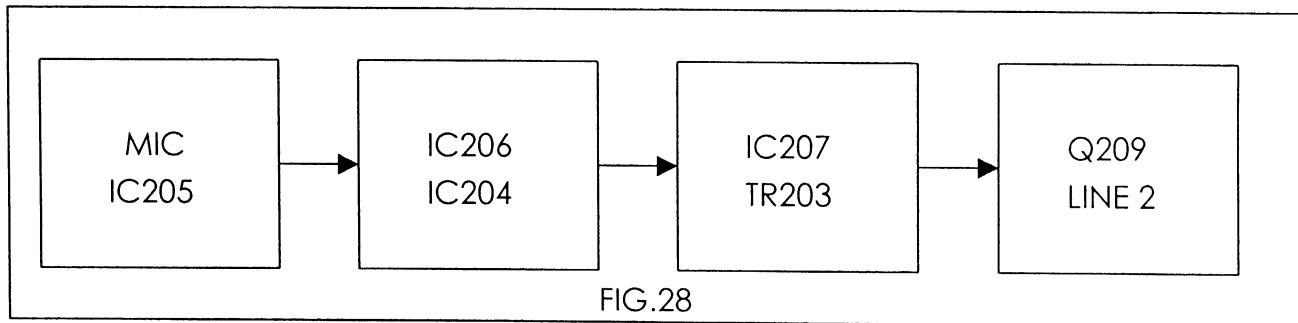


## 10-2. LINE 2

#### 10-2-1. TX PART :

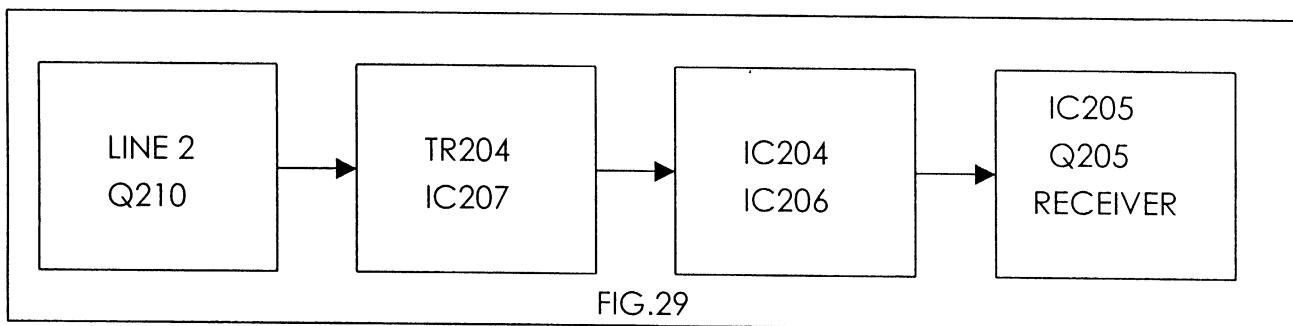
PICKED UP AUDIO SIGNAL FROM MICROPHONE IS AMPLIFIED IN THE IC206 AND IT IS FED TO THE IC207 THROUGH THE SWITCHING IC (IC204).

THE AUDIO SIGNAL IS FED TO TR203 AND AMPLIFIED IN Q209 AND THEN TRANSMITTED TO THE LINE 2.



#### 10-2-2. RX PART:

THE RECEIVED AUDIO SIGNALS FROM THE LINE ARE FED TO TR204 AFTER THROUGH Q210 AND IT IS AMPLIFIED IN IC207 AND PASSED BY SWITCHING IC (IC204). THE AUDIO SIGNAL IS AMPLIFIED IN IC206 AND FED TO IC205 AND THEN IT IS PASSED BY THE BUFFER AMP (Q205) AND GENERATED BY RECEIVER.

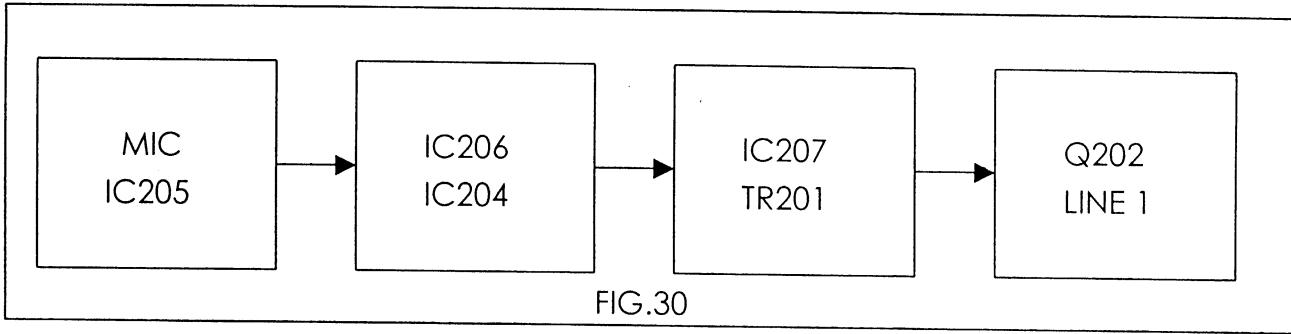


### 11. HEADSET PHONE OPERATION

#### 11-1. LINE 1

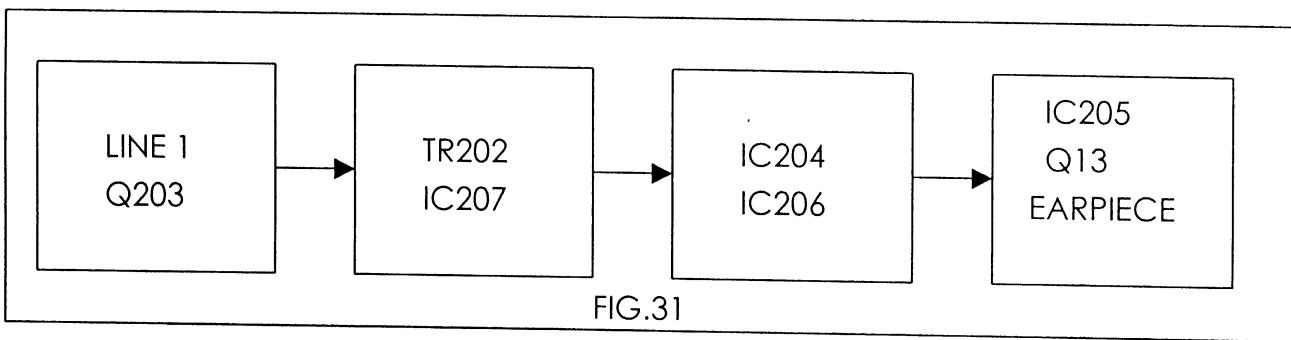
##### 11-1-1. TX PART:

PICKED UP AUDIO SIGNAL FROM MICROPHONE IS AMPLIFIED IN THE IC206 AND IT IS FED TO THE IC207 THROUGH THE SWITCHING IC (IC204). THE AUDIO SIGNAL IS FED TO TR201 AND AMPLIFIED IN Q202 AND THEN TRANSMITTED TO THE LINE 1.



### 11-1-2. RX PART:

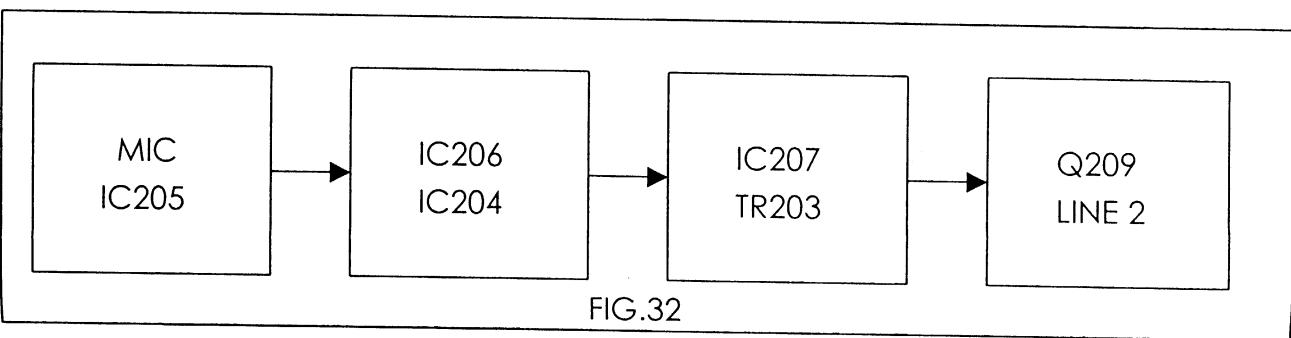
THE RECEIVED AUDIO SIGNALS FROM THE LINE ARE FED TO TR202 AFTER THROUGH Q203 AND IT IS AMPLIFIED IN IC207 AND PASSED BY SWITCHING IC (IC204). THE AUDIO SIGNAL IS AMPLIFIED IN IC206 AND FED TO IC205 AND THEN IT IS PASSED BY THE BUFFER AMP (Q13) AND GENERATED BY EARPIECE.



## 11-2. LINE 2

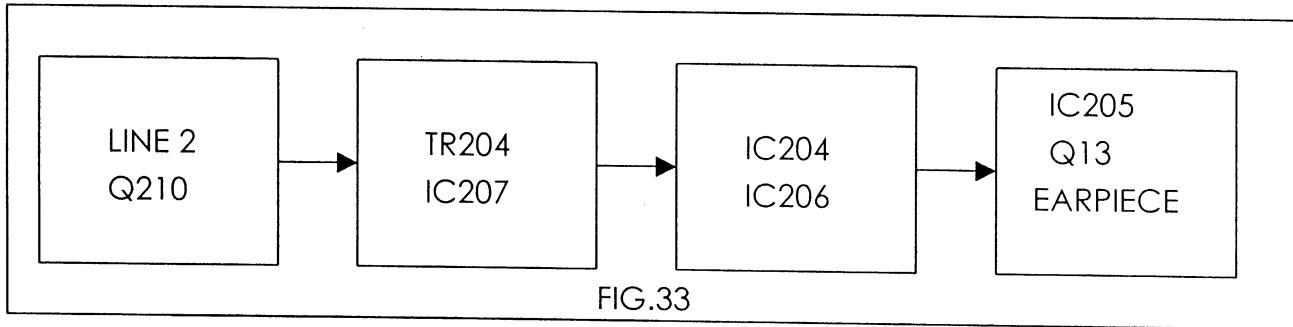
### 11-2-1. TX PART :

PICKED UP AUDIO SIGNAL FROM MICROPHONE IS AMPLIFIED IN THE IC206 AND IT IS FED TO THE IC207 THROUGH THE SWITCHING IC (IC204). THE AUDIO SIGNAL IS FED TO TR203 AND AMPLIFIED IN Q209 AND THEN TRANSMITTED TO THE LINE 2.



## 11-2-2. RX PART:

THE RECEIVED AUDIO SIGNALS FROM THE LINE ARE FED TO TR204 AFTER THROUGH Q210 AND IT IS AMPLIFIED IN IC207 AND PASSED BY SWITHCING IC (IC204). THE AUDIO SIGNAL IS AMPLIFIED IN IC206 AND FED TO IC205 AND THEN IT IS PASSED BY THE BUFFER AMP (Q13) AND GENERATED BY RECEIVER.



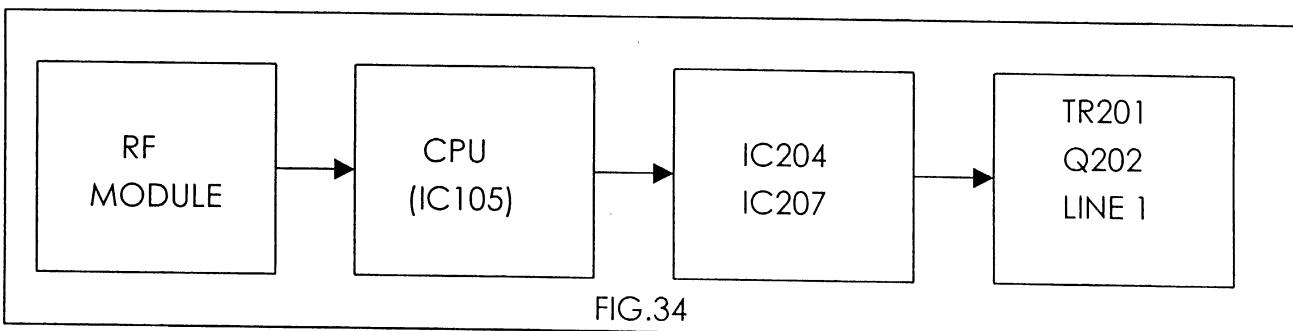
## 12. CORDLESS PHONE OPERATION.

### 12-1. LINE 1

#### 12-1-1. TX PART (AUDIO)

RECEIVED DIGITAL SIGNAL FROM THE HANDSET IS CONVERTED TO THE ANALOG SIGNAL IN THE CPU(IC105) AND THEN THE AUDIO SIGNAL IS AMPLIFIED IN THE IC207 THROUGH THE AWITCHING IC (IC204).

THE AUDIO SIGNAL IS FED TO TR201 AND AMPLIFIED IN Q202 AND THEN TRANSMITTED TO THE LINE 1.

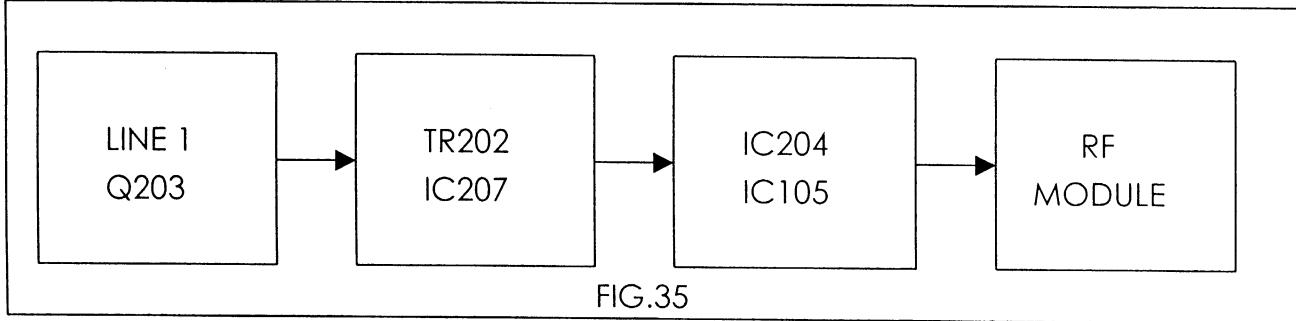


#### 12-1-2. RX PART (AUDIO)

THE RECEIVED AUDIO SIGNALS FROM THE LINE ARE FED TO TR202 AFTER THROUGH Q203 AND IT IS AMPLIFIED IN IC207 AND PASSED BY SWITHCING IC (IC204). THE AUDIO SIGNAL IS FED TO THE CPU (IC105).

THE CPU MAKES IT AS DIGITAL SIGNAL AND TRANSMITES TO THE HANDSET

THROUGH THE RF MODULE.

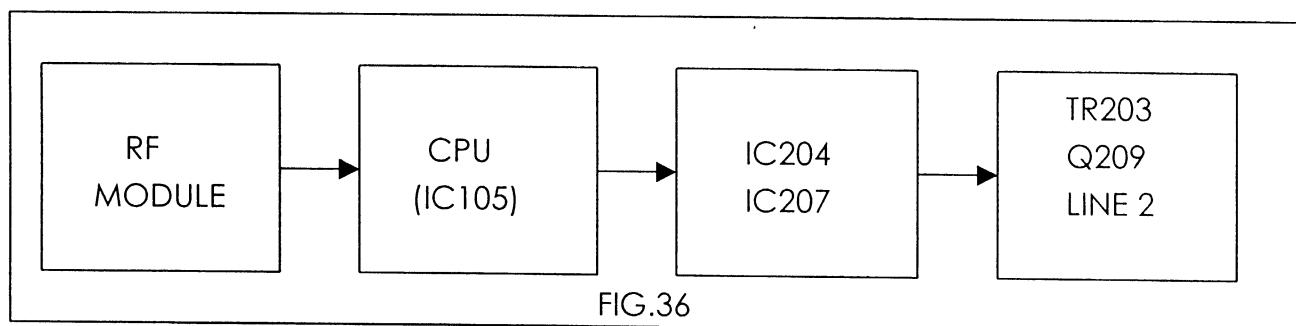


## 12-2. LINE 2

### 12-2-1. TX PART (AUDIO)

RECEIVED DIGITAL SIGNAL FROM THE HANDSET IS CONVERTED TO THE ANALOG SIGNAL IN THE CPU(IC105) AND THEN THE AUDIO SIGNAL IS AMPLIFIED IN THE IC207 THROUGH THE SWITCHING IC (IC204).

THE AUDIO SIGNAL IS FED TO TR203 AND AMPLIFIED IN Q209 AND THEN TRANSMITTED TO THE LINE 2.

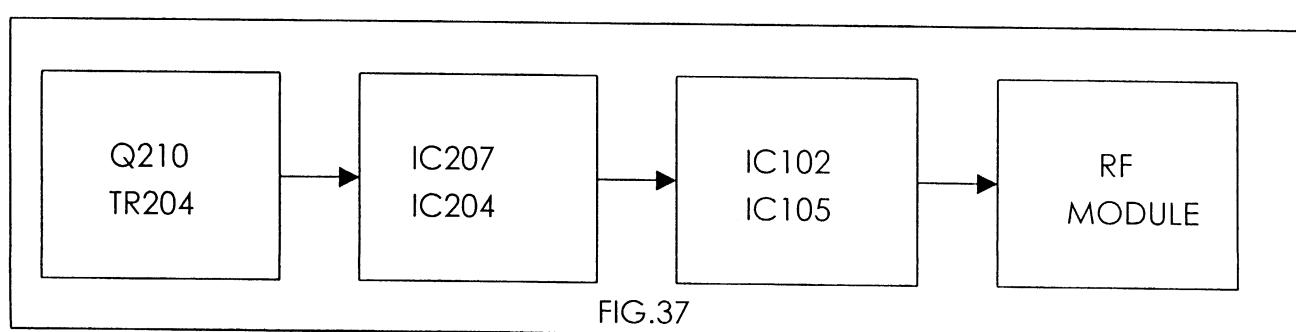


### 12-2-2. RX PART (AUDIO)

THE RECEIVED AUDIO SIGNALS FROM THE LINE ARE FED TO TR204 AFTER THROUGH Q210 AND IT IS AMPLIFIED IN IC207 AND PASSED BY SWITHCING IC (IC204).

THE AUDIO SIGNAL IS FED TO THE CPU (IC105) THROUGH IC102.

THE CPU MAKES IT AS DIGITAL SIGNAL AND TRANSMITES TO THE HANDSET THROUGH THE RF MODULE.

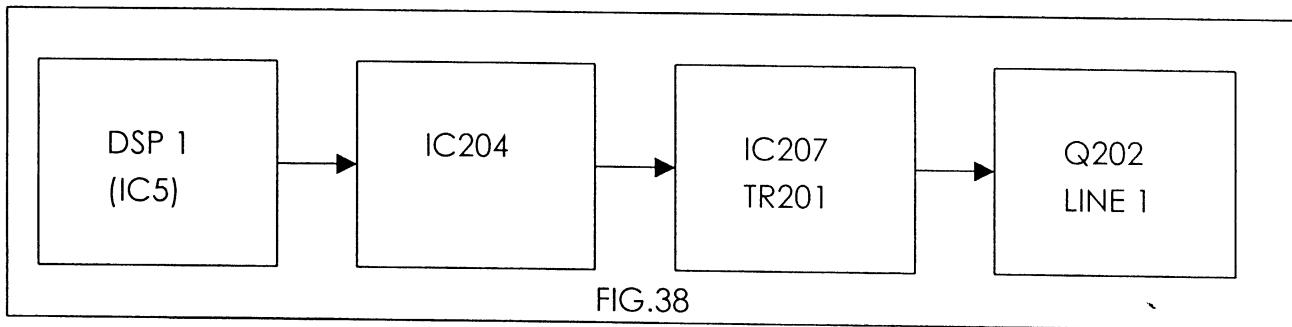


## 13. DSP OPERATION

### 13-1. LINE 1

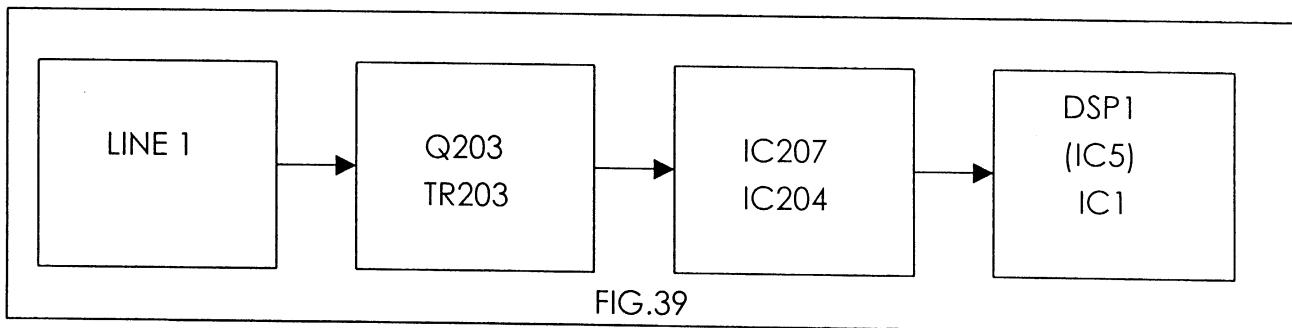
#### 13-1-1. OGM OPERATION

RECEIVED DIGITAL SIGNAL FROM THE DISP1 (IC5) IS FED THE SWITCHING IC (IC204). THE AUDIO SIGNAL IS FED TO TR201 AND AMPLIFIED IN Q202 AND THEN TRANSMITTED TO THE LINE 1.



#### 13-1-2. ICM OPERATION

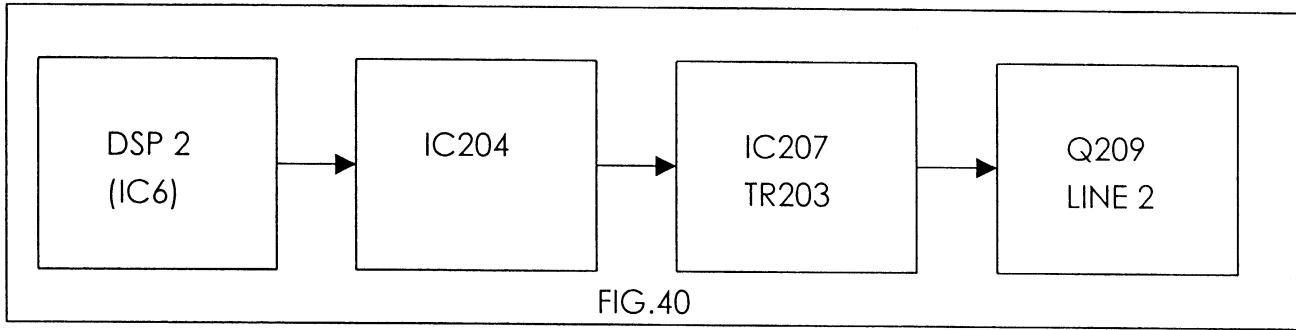
THE RECEIVED AUDIO SIGNALS FROM THE LINE ARE FED TO TR202 AFTER THROUGH Q203 AND IT IS AMPLIFIED IN IC207 AND PASSED BY SWITHCING IC (IC204). THE AUDIO SIGNAL IS FED TO THE DSP 1 (IC5) AND CONVERTED TO THE DIGITAL SIGNAL AND THEN IT IS SAVED TO THE MEMORY (IC1).



### 13-2. LINE2

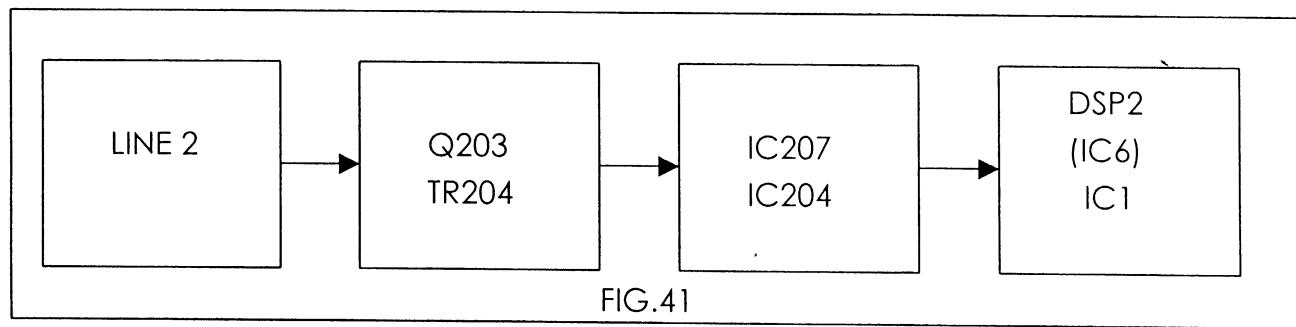
#### 13-2-1. OGM OPERATION

RECEIVED DIGITAL SIGNAL FROM THE DISP2 (IC6) IS FED THE SWITCHING IC (IC204). THE AUDIO SIGNAL IS FED TO TR203 AND AMPLIFIED IN Q209 AND THEN TRANSMITTED TO THE LINE 2.



### 13-2-2. ICM OPERATION

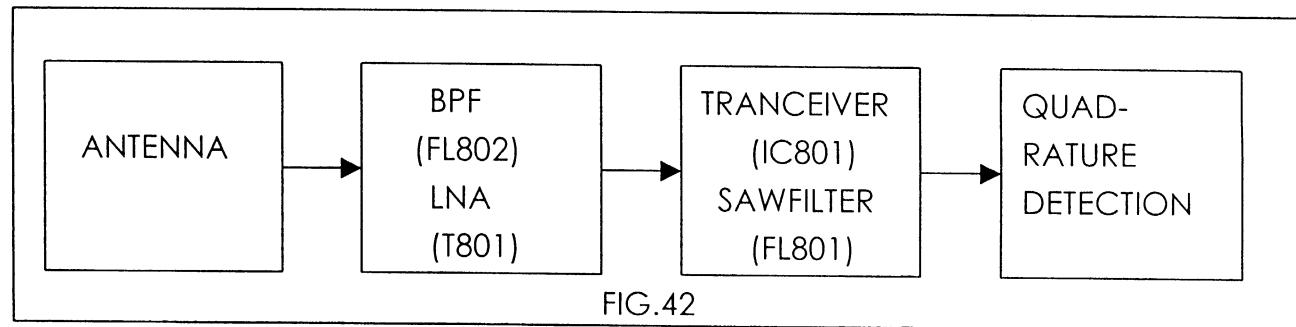
THE RECEIVED AUDIO SIGNALS FROM THE LINE ARE FED TO TR204 AFTER THROUGH Q210 AND IT IS AMPLIFIED IN IC207 AND PASSED BY SWITCHING IC (IC204). THE AUDIO SIGNAL IS FED TO THE DSP 2 (IC6) AND CONVERTED TO THE DIGITAL SIGNAL AND THEN IT IS SAVED TO THE MEMORY (IC1).



## 14. BASE RF MODULE

### 14-1. RX PART

THE RECEIVER FRONT-END CONTAINS A BAND PASS FILTER AND RF LOW NOISE AMPLIFIER, THE RF SIGNAL ENTERS INTO THE MIXER OF TRANCEIVER IC (IC101) RECEIVERD RX SIGNALS(2.4GHz ~ 2.4835GHz) AND LOCAL SIGNALS (2.290GHz ~2.371GHz) ARE PLUSED AND IN THE MIXER. OUT SIGNAL FROM MIXER MAKES 110.592MHz BY WAY FL103 SARFILTER. 110.592MHz MAKES ORIGINAL DIGITAL DATA BY QUADRATURE DETECTION. ORIGINAL DIGITAL DATA PASSES BUFFER AMP (T807) AND GOES TO CPU.

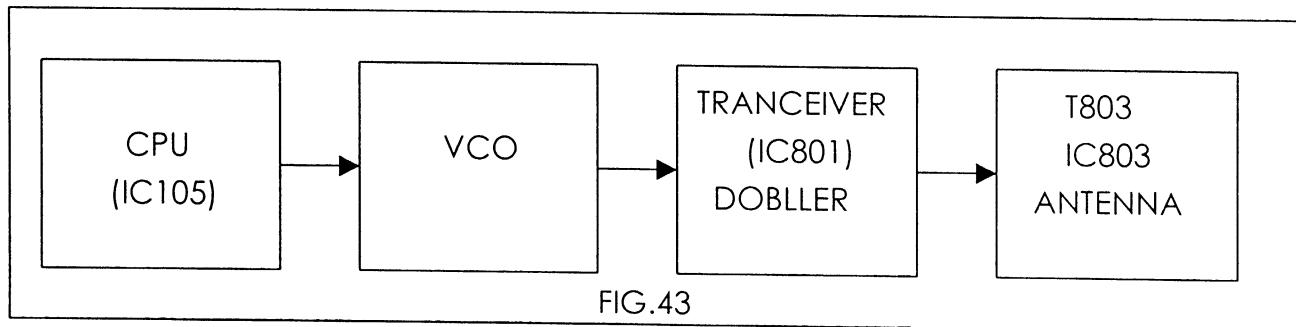


## 14-2. TX PART

THE DIGITAL SIGNAL IS MADE BY CPU IN THE BASE, THE SIGNAL ENTERS TO RF CONNECTOR 18. THE SIGNAL IS MODULATED IN THE VCO TO 1.2GHZ.

THIS 1.2GHZ SIGNAL IS CONVERTED BY TRANCEIVER IC (IC801) TO 2.4GHz.

THIS 2.5GHz IS AMPLIFIED IN T803 AND IC803 AND TRANSMITTED TO ANTENNA.

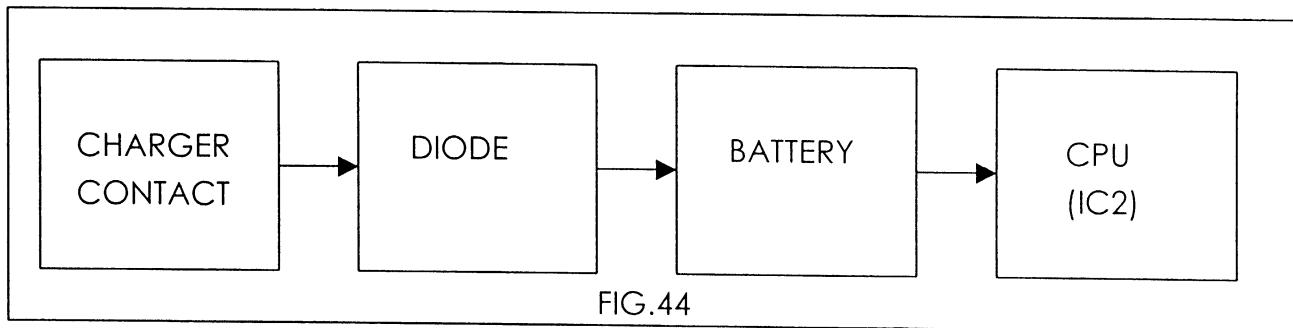


## **PORTABLE UNIT**

### **1. LOW BATTERY DETECTION CIRCUIT**

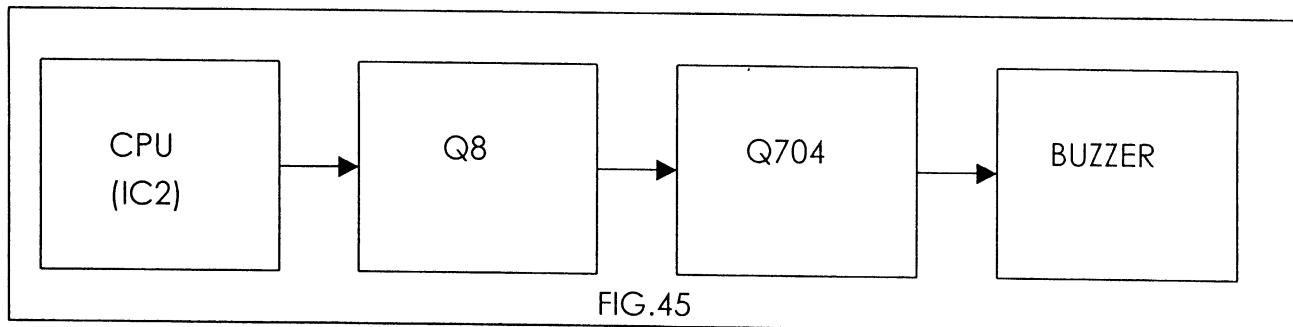
THE CPU READS BATTERY LOW VOLTAGE BY AD CONVERTER FROM PIN 57.

BATTERY LOW DETECTION VOLTAGE IS 3.4V+/-0.1V.



### **2. BUZZER**

BUZZER IS CONTROLLED BY PIN 44 OF CPU DURING RECEIVED RING SIGNAL AND KEY INPUT



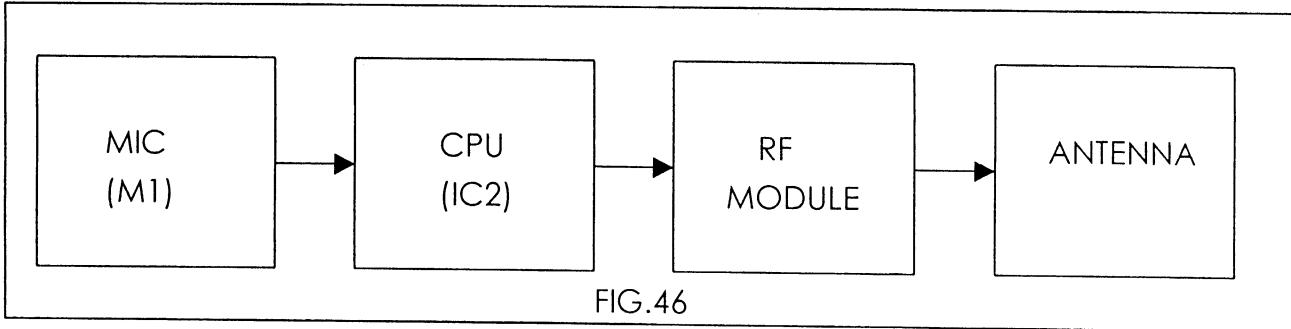
### **3. INDICATOR CATEGORY**

ALL INDICATOR IS DISPLAYED AT LCD WINDOW BY THE CPU CONTROL

### **4. AUDIO PATH FOR CORDLESS PHONE**

#### **4-1 TX PART**

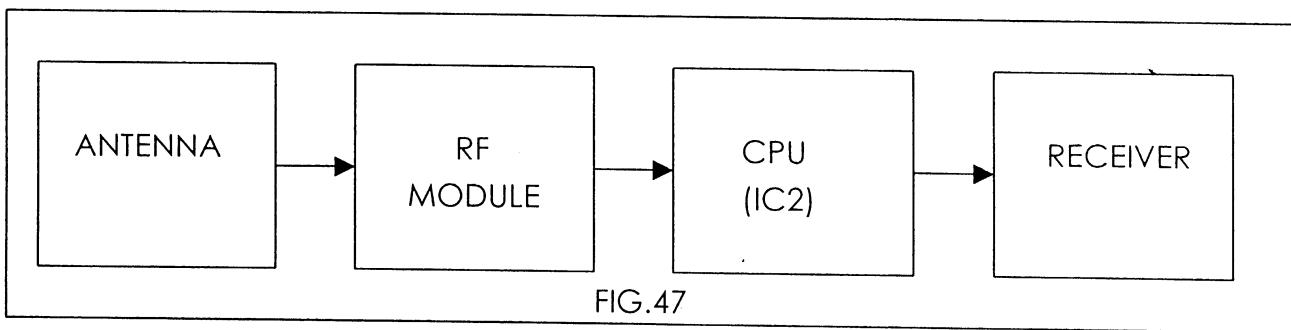
THE PICKED UP SIGNALS FROM MIC ARE FED TO THE CPU (IC2). THE AUDIO SIGNAL IS CONVERTED TO THE DIGITAL SIGNAL IN THE CPU. THE DIGITAL SIGNAL ENTERS TO THE DEVIATION PORT OF RF MODULE.



#### 4-2 RX PART

THE RECEIVED SIGNALS FROM AF OUT ENTERS TO THE CPU (IC2).

THE DIGITAL SIGNAL IS CONVERTED TO THE ANALOG SIGNAL AND GENERATED BY THE RECEIVER.

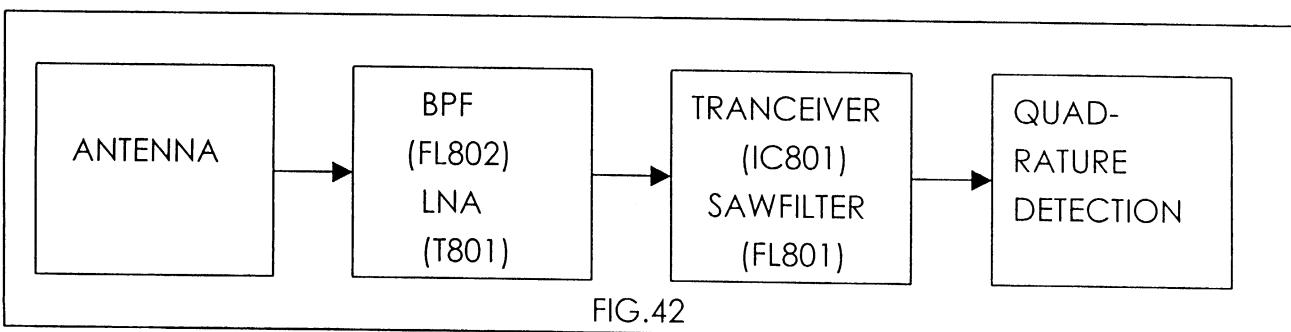


### 5. PORTABLE RF MODULE

#### 5-1. RX PART

THE RECEIVER FRONT-END CONTAINS A BAND PASS FILTER AND RF LOW NOISE AMPLIFIER, THE RF SIGNAL ENTERS INTO THE MIXER OF TRANCEIVER IC (IC101)

RECEIVED RX SIGNALS(2.4GHz ~ 2.4835GHz) AND LOCAL SIGNALS (2.290GHz ~2.371GHz) ARE PLUSED AND IN THE MIXER. OUT SIGNAL FROM MIXER MAKES 110.592MHz BY WAY FL103 SAWFILTER. 110.592MHz MAKES ORIGINAL DIGITAL DATA BY QUADRATURE DETECTION. ORIGINAL DIGITAL DATA PASSES BUFFER AMP (T807) AND GOES TO CPU.



## 5-2. TX PART

THE DIGITAL SIGNAL IS MADE BY CPU IN THE BASE, THE SIGNAL ENTERS TO RF CONNECTOR 18. THE SIGNAL IS MODULATED IN THE VCO TO 1.2GHZ.

THIS 1.2GHZ SIGNAL IS CONVERTED BY TRANCEIVER IC (IC801) TO 2.4GHz.

THIS 2.5GHz IS AMPLIFIED IN T803 AND IC803 AND TRANSMITTED TO ANTENNA.

