

29930GE1/2-C CIRCUIT DESCRIPTION

A. BASE UNIT

1. TEL-LINE INTERFACE
2. RING DETECT
3. POWER SUPPLY
4. AUDIO AMPLIFIER AND COMPANDOR
5. DTMF GENERATOR
6. RSSI CONTROL
7. DATA COMMUNICATION INTERFACE
8. INTERCOM FUNCTION
9. BASE RF MODULE

B. PORTABLE UNIT

1. LOW BATTERY DETECTION CIRCUIT
2. BUZZER
3. INDICATOR CATEGORY
4. AUDIO AMPLIFIER AND COMPANDOR
5. PORTABLE RF MODULE

TELIA CORPORATION

FCC ID: NPQBA909

EXHIBIT #: 16A-16L

A. BASE SET

1. TEL-LINE INTERFACE

TEL-LINE INTERFACE CIRCUIT CONSISTS OF A RELAY, DIODE BRIDGE (D1 ~ D4), TRANSFORMER (T1) AND SPEECH NETWORK CIRCUIT AS FOLLOWS FIG.1

A DC LOOP IS CONFIGURED WHEN CPU PIN 43 ARE SET HI.

THE LOOP CURRENT FLOWS AS FOLLOWS : TIP -> FUSE1 -> LS-RELAY1 -> R1 -> T1 -> D2,D1/D3,D4 -> RING

THE PULSE SIGNAL FROM CPU PIN 43 ARE TRANSMITTED THROUGH LSI TO TURN ON AND OFF THE TEL-LINE.

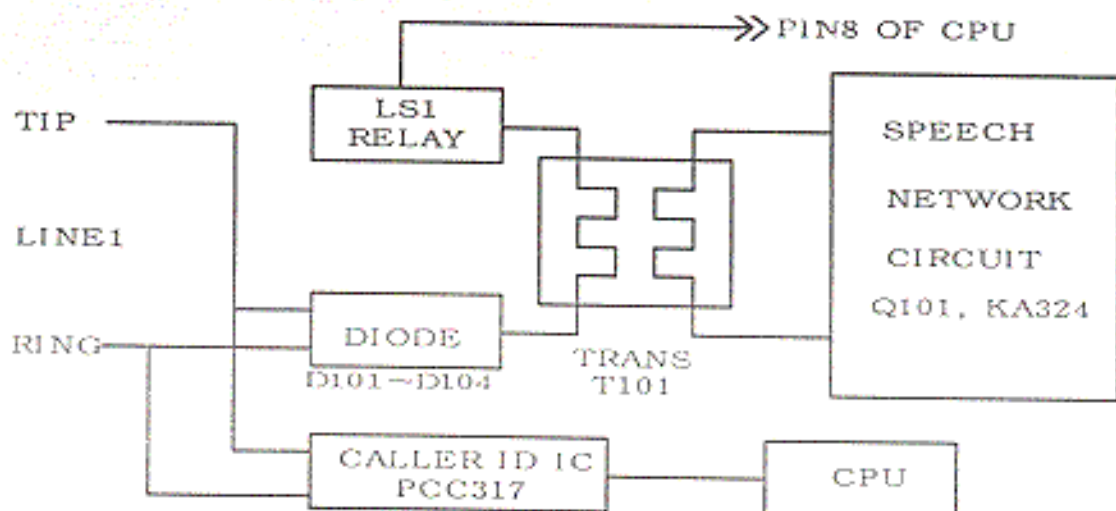


FIG.1

2. RING DETECT

THE RING SIGNAL SUPPLIED BETWEEN T101 AND RING PASSES THROUGH THE FOLLOWING PROCEDURES AND IS DETECTED BY THE CPU.

TIP/RING → FU101 → C176 → OPTOCOUPLER (IC108) → RING

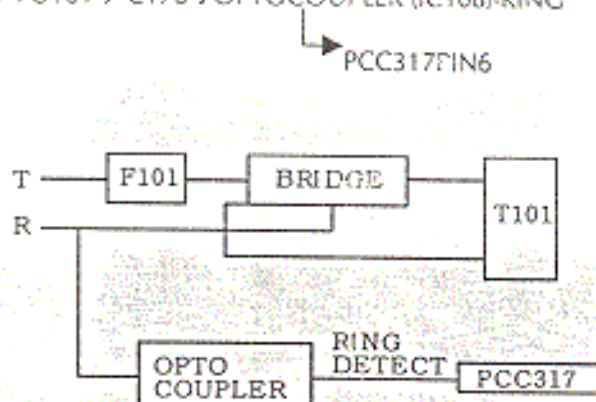


FIG.2

3. POWER SUPPLY

3-1 THE OUTPUT VOLTAGE OF IC106 IS REGULATED 5V AND THIS VOLTAGE IS USED BY MAIN SUPPLYING VOLTAGE OF CPU AND TX,RX POWER.



FIG.3

4. AUDIO AMPLIFIER AND COMPANDOR

4-1 TX PART:

THE TRANSMITTED SIGNALS FROM TELEPHONE LINE ARE FEED TO COMPANDOR IC(IC103) THROUGH THE AUDIO AMPLIFIER AND THE RECEIVED SIGNALS FROM TELEPHONE LINE ARE ALSO FEED TO AUDIO AMPLIFIER THROUGH THE SPEECH NETWORK CIRCUIT.

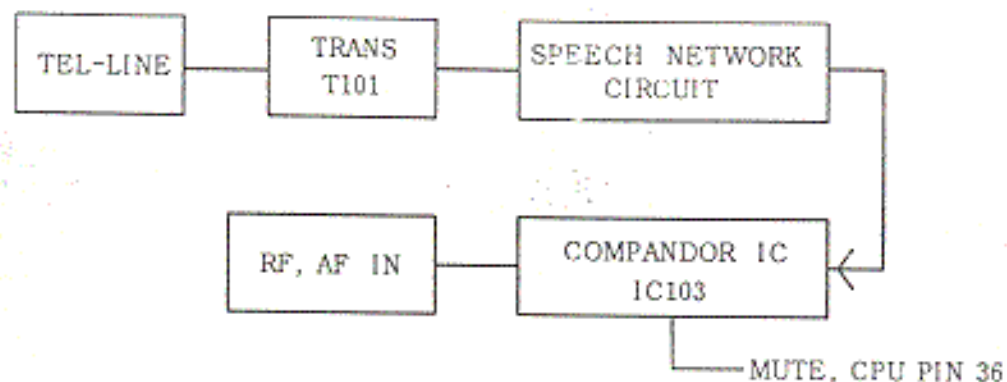


FIG.4

4-2 RX PART:

THE RECEIVED SIGNALS FROM AF OUT OF RF MODULE, FEED TO COMPANDOR FOR NOISE ELIMINATION. THIS SIGNAL THROUGH MATCHING TRANS TR101, ALSO FEED TO TELEPHONE LINE THROUGH THE SPEECH NETWORK CIRCUIT TO. TRANSFER TO OTHER PARTY.

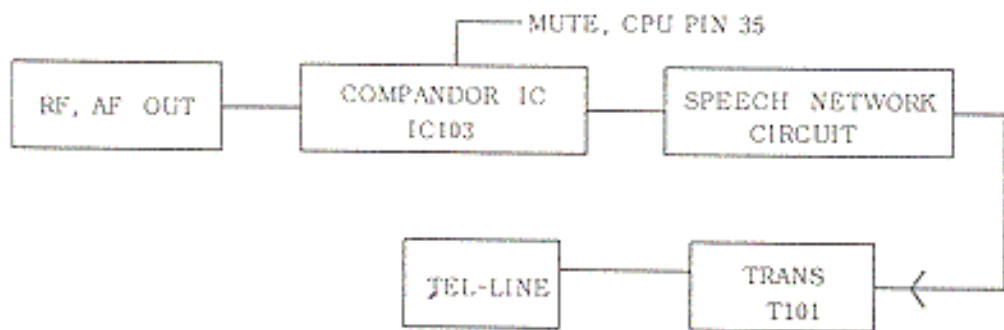


FIG.5

5. DTMF GENERATOR

THE IC107 DTMF GENERATOR IS INTENDED TO PROVIDE DUAL-TONE MULTI-FREQUENCY (DTMF) FOR TONE DIALLING SYSTEM.

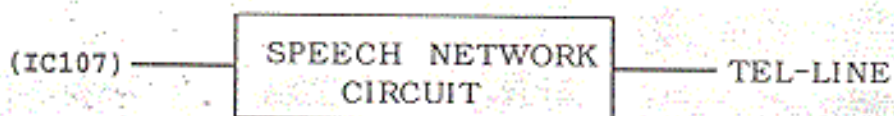


FIG.6

6. RSSI CONTROL

RSSI LEVEL OUTPUT FROM THE IF IC THROUGH IC104D OP AMP OUT OF IS DETECTING BY PIN 28 OF CPU.



FIG.7

7. DATA COMMUNICATION INTERFACE.

DATA COMMUNICATION IS OPERATED SERIAL OUTPUT

7-1 PIN 26(RX DATA) OF CPU :

DATA SIGNAL WILL RECEIVE FROM THE PORTABLE UNIT AS THROUGH FILTER CIRCUIT IC104 AND DATA SIGNAL INPUT PIN 26 (RX DATA) OF CPU

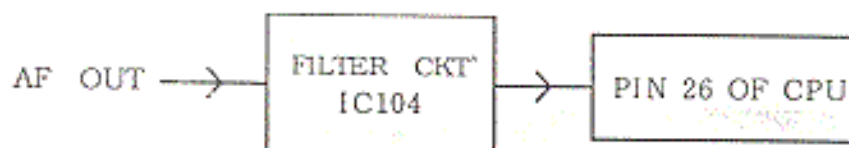


FIG.8

7-2 PIN 27 (TX DATA) OF CPU :

DATA SIGNAL WILL SEND TO THE PORTABLE UNIT AS THROUGH PIN 27(TX DATA) OF CPU



FIG.9

8. PAGING FUNCTION

PAGING FUNCTION CAN BE SELECTED EITHER FROM BASE TO PORTABLE UNIT. THE INTERCOM FUNCTION CAN BE ENABLED BY PRESSING THE PAGING KEY IN THE BASE SET.

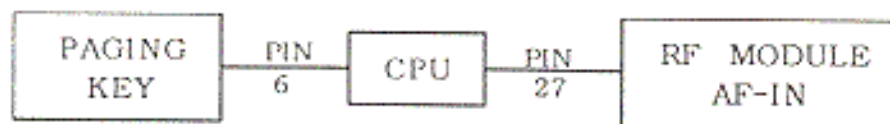


FIG.10

9. BASE RF MODULE

9-1. RX PART

THE RECEIVER FRONT-END CONTAINS A SAW FILTER, AN RF LOW NOISE AMPLIFIER, A ACTIVE TRANSISTOR MIXER, A MONOLITHIC CRYSTAL FILTER AND 10.7MHz IF AMPLIFIER. ALSO IT INCLUDES BUFFER AMPLIFIERS FOR THE GENERATION OF LOCAL OSCILLATOR POWER.

THIS FRONT-END RECEIVER RECEIVES AN RF SIGNAL FROM THE ANTENNA. AND RF SIGNALS WITHIN THIS FREQUENCY RANGE IS 926.125MHz ~ 927.675MHz PASS THROUGH RF AMP (Q1) AND SAW FILTER.

AFTER PASSING THROUGH THE SAW FILTER, THE SIGNAL IS MIXED WITH 1ST LOCAL FREQUENCY FROM VOLTAGE CONTROLLED OSCILLATOR.

THE SIGNAL IS AMPLIFIED ON THE IF AMP TRANSISTOR (Q2) AND THE SIGNAL PASS THROUGH THE CERAMIC FILTER (10.7MHz).

AFTER THE IF SIGNAL PASS THE CERAMIC FILTER, THE SIGNAL ENTER BY THE FM IF (INTERMEDIATE FREQUENCY) IC.

AND THE SIGNAL IS MIXED IN THE FM IF IC (KA3361).

THE SIGNAL PASS THROUGH THE CERAMIC FILTER (450KHz).

THE OUTPUT SIGNAL IN THE FM IF IC STREAMS FROM THE AF-OUT TERMINAL OF THE CONNECTOR 1 TO THE BASE.

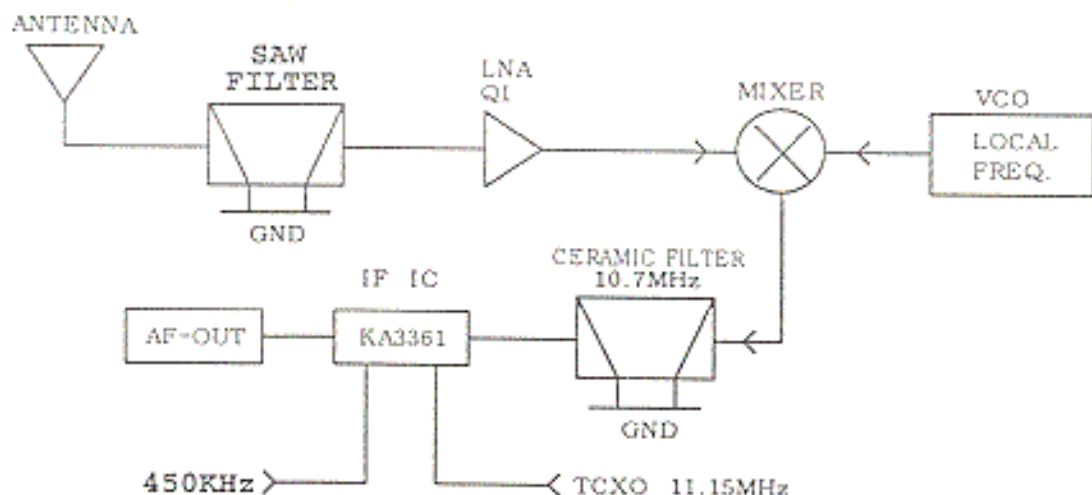


FIG.11

9-2. TX PART

THE SIGNAL IS MADE TO THE BASE, ENTER BY THE AF-IN TERMINAL OF THE CONNECTOR 3.
THE SIGNAL SEND THE MOD TERMINAL OF THE TX VCO.
THE SIGNAL IS MIXED IN THE TX VCO MIXING THE RF SIGNAL, THE RF SIGNAL ADJUST THE TRIMMER CAPACITOR (VC1).
THE RF SIGNAL ENTER BY THE TRANSMISSION POWER AMP TRANSISTOR (Q1) ENTER BY THE SAW FILTER.
THE RF SIGNAL PASS THROUGH THE SAW FILTER, TOWARDS THE ANT.
THE LAST TRANSMISSION RF SIGNAL IS 902.12MHz - 903.98MHz

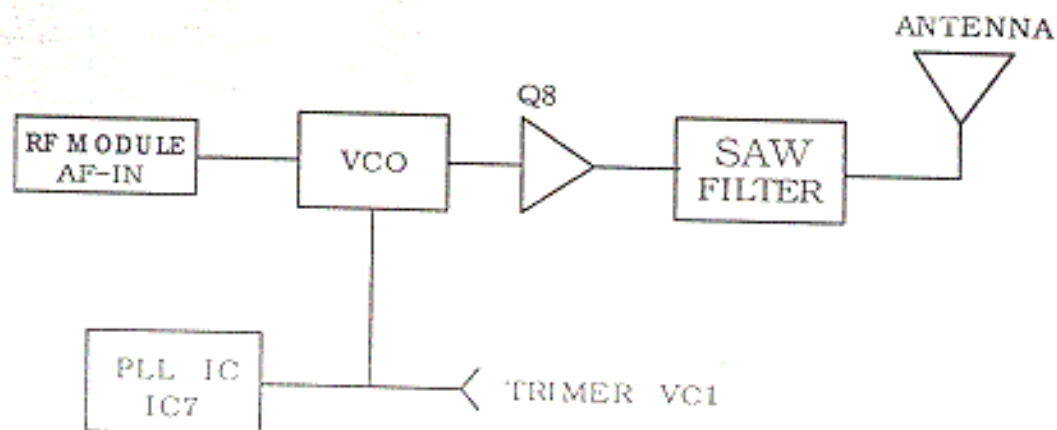


FIG. 12

16H

B. PORTABLE UNIT

1. LOW BATTERY DETECTION CIRCUIT

TRANSISTOR Q5, Q6 IS CONTROLLED BY BATTERY VOLTAGE.
IF THE VOLTAGE OF BATTERY PACK IS BELOW 3.3V, CHANGED FROM HIGH TO LOW AT
PIN 33 OF CPU THEN CPU BECOMES TO RECOGNIZE TO LOW VOLTAGE OF BATTERY PACK



FIG.13

2. BUZZER

BUZZER IS CONTROLLED BY PIN 22 OF CPU DURING RECEIVED RING SIGNAL AND KEY
INPUT



FIG.14

3. INDICATOR CATEGORY

ALL INDICATOR IS DISPLAYED AT LCD WINDOW BY THE CPU CONTROL

4. AUDIO AMPLIFIER AND COMPANDOR

4-1 TX PART

THE TRANSMITTED SIGNALS FROM MIC ARE FEED TO COMPANDOR IC4 THROUGH AUDIO AMPLIFIER IC1A AND SIGNALS INPUT RF MODULE AF-IN

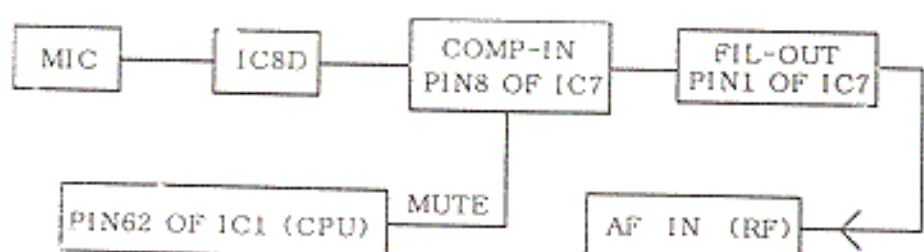


FIG.15

4-2 RX PART

THE RECEIVED SIGNALS FROM AF OUT CONTAIN SIGNALS AND PASS ONLY THROUGH COMPANDOR FOR NOISE ELIMINATION AND SIGNAL INPUT AUDIO AMPLIFIER.

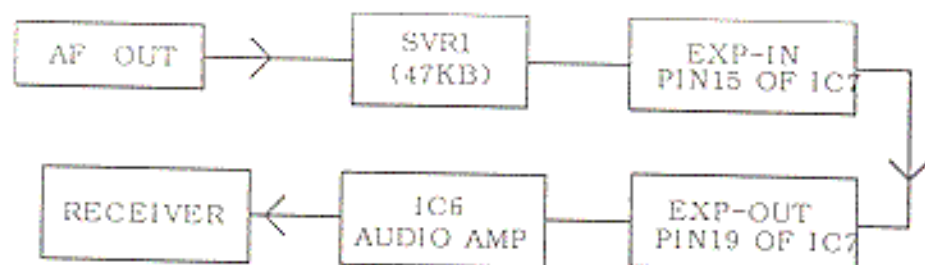


FIG.16

5. PORTABLE RF MODULE

5-1. RX PART

THE RECEIVER FRONT-END CONTAINS A SAW DUPLEX FILTER, AND RF LOW NOISE AMPLIFIER, A ACTIVE TRANSISTOR MIXER, A CERAMIC FILTER AND 10.7MHz "IF" AMPLIFIER. ALSO IT INCLUDES BUFFER AMPLIFIERS OR THE GENERATION OF LOCAL OSCILATOR POWER.

THIS FRONT-END RECEIVES AN RF SIGNAL FROM THE ANTENNA. AND RF SIGNALS WITHIN THIS FREQUENCY RANGE IS 902.125MHz - 903.98MHz PASS THROUGH BAND PASS FILTER AND RF AMP (Q1).

AFTER PASSING THROUGH THE SAW FILTER, THE SIGNAL IS MIXED WITHIN 1ST LOCAL FREQUENCY FROM VOLTAGE CONTROLLED OSCILLATOR.

THE SIGNAL IS AMPLIFIED ON THE IF AMP TRANSISTOR (Q2). AND THE SIGNAL PASS THROUGH THE MONOLITHIC CRYSTAL FILTER (10.7MHz) AFTER THE IF SIGNAL PASS THE CERAMIC FILTER, THE SIGNAL ENTER BY THE FM IF (INTERMEDIATE FREQUENCY) IC.

AND THE SIGNAL IS MIXED IN THE FM IF IC (KA3361). THE SIGNAL PASS THROUGH THE CERAMIC FILTER (450KHz). THE OUTPUT SIGNAL IN THE FM IF IC STREAMS FROM THE AF-OUT TO AUDIO AMP (IC2).

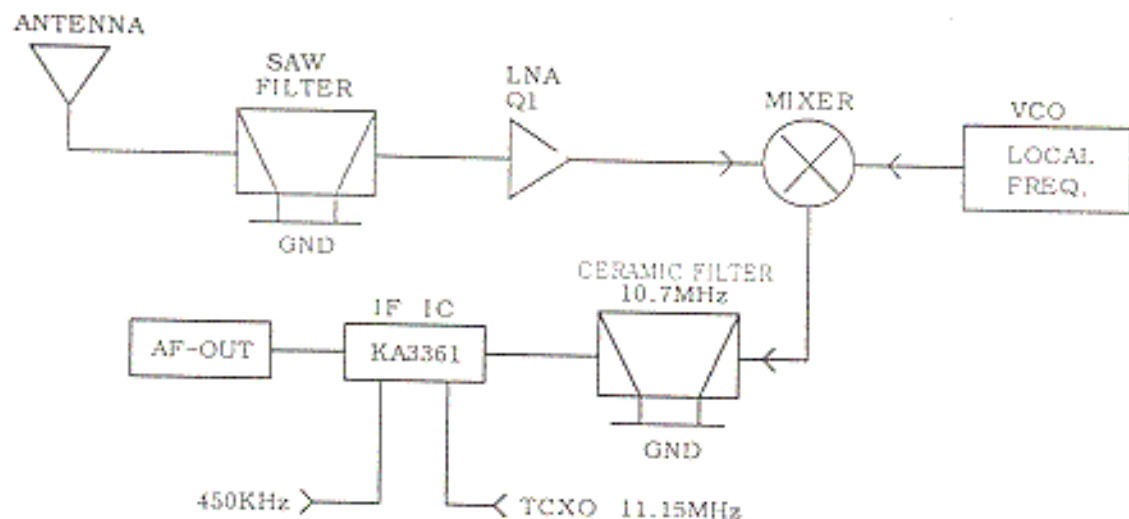


FIG.17

16K

5-2. TX PART

THE SIGNAL IS MADE TO THE PORTABLE, ENTER BY THE AF-IN TERMINAL.
THE SIGNAL SEND THE MOD TERMINAL OF THE TX VCO.
THE SIGNAL IS MIXED IN THE TX VCO MIXING THE RF SIGNAL, THE RF SIGNAL ADJUST
THE TRIMMER CAPACITOR (VC1).
THE RF SIGNAL ENTER BY THE TRANSMISSION POWER AMP TRANSISTOR (Q8)
THE SIGNAL IS AMPLITUDE IN THE Q8.
ENTER BY THE SAW FILTER.
THE RF SIGNAL PASS THROUGH THE SAW FILTER, TOWARDS THE ANT.
THE LAST TRANSMISSION RF SIGNAL, IS 926.125MHz ~ 927.675MHz.

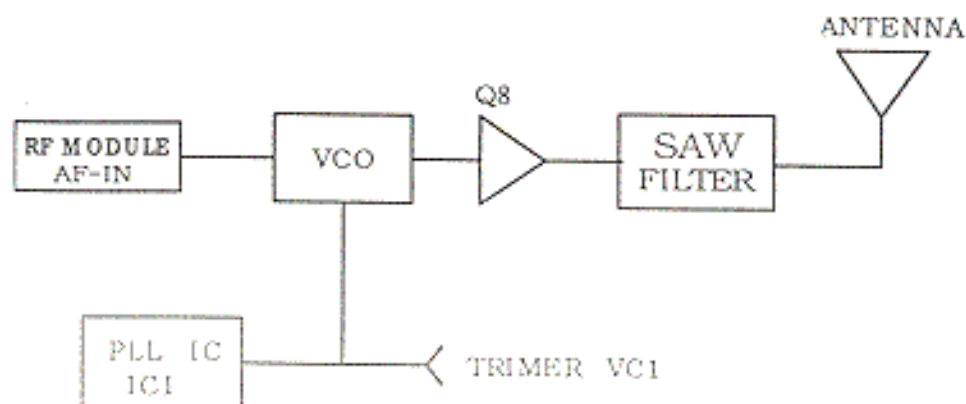


FIG. 18