

# CIRCUIT DESCRIPTION

## 1.RECEIVER

### 1-1 Front end ( RF AMP)

The signal coming from the antenna passes through the transmit/receive switching diode circuit, is amplified by the RF amplifier Q23. The winding, L4, L5, L6 making up of select band pass, enter into RDA1846S 15 pins, and then pass through low noise amplification (LNA). ( See fig.1 )

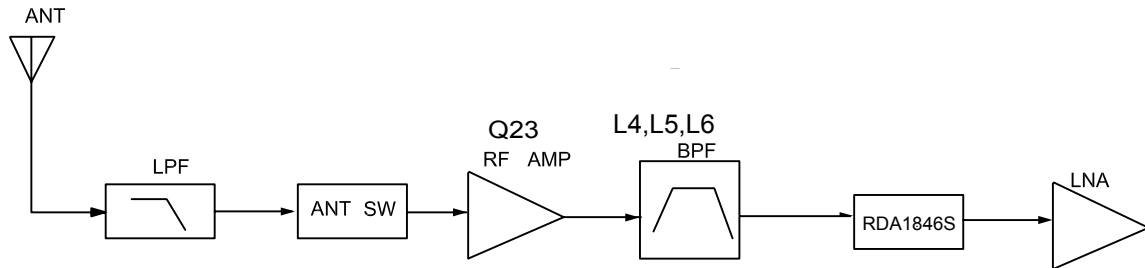


Fig .1

### 1-2 Mixing

(Completed in RDA1846S) IC in RDA1846S can program to control frequency synthesizer to generate local oscillation and receiving signal, and then mix frequency in image frequency interference suppression mixers to generate IF (intermediate frequency). (See fig.2)

### 1-3 IF, Squelch, AF

(Completed in RDA1846S) IF signal passes through analog signal band-pass for processing, in order to suppress out of band noise, then entry programmable gain control, after high-precision analog-digital conversion and digital signal processing, to complete the processing of squelch and acceptance of intensity etc. The audio signal is sent out after high-precision digital-analog conversion.

1. Analog Channle: after high-precision digital-analog conversion, analog audio signal is sent to the afamplifier through RDA1846S.
2. DIGITAL channel: signal is sent to band-pass processor (U7) from RDA1846S to be decoded and decompressed to convert to digital signal, and then is sent to the AF amplifier. (See fig.2).

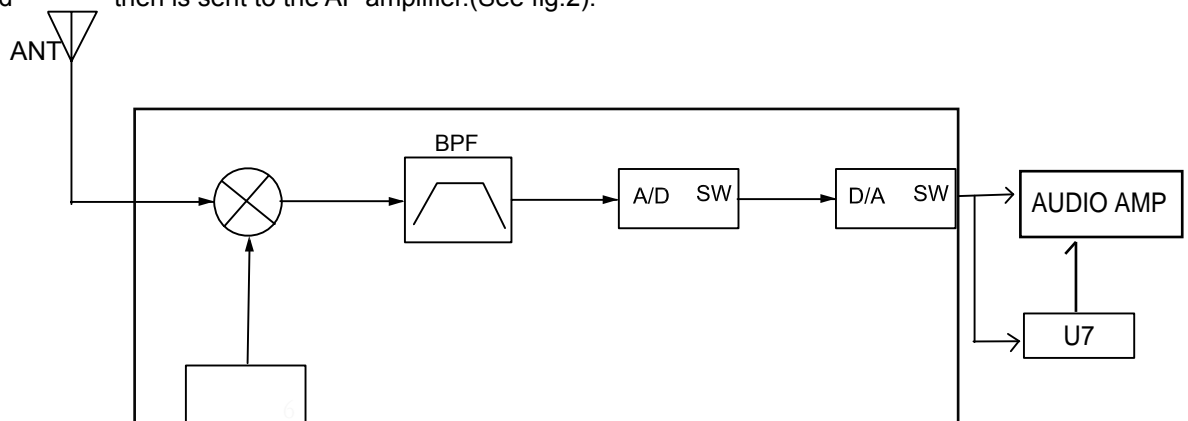


Fig .2

## 2.TRANSMITTER

### 2-1) Transmit audio

- 1.Analog channel:sent to RDA1846S for frequency modulation and then sent out.
- 2.Digital channel:sent into band-pass processor HR\_C6000 for sampling,decompressing and I/Q modulation,then is sent into RDA1846S for frequency modulation berfer sending out.

### 2-2)CTCSS DCS

CTCSS ,DCS encoding can be generated by the microprocessor and sent into RDA1-U1 MCU . Modulation is performed at RD-MCU VCO side .

### 2-3) VCO and RF amplifie

By programming to control RDA1846S to complete the autocontrol of frequency.The RF signal from the RDA1846S is amplified , by Q16,Q19,Q15 to the sufficient level to drive the power module.

### 2-4) Final module

The MOS FET-type power module Q20 is used to amplify the transmission power .

### 2-5) ANT switch and LPF

The signal from the module passes through, D8 D9 diode and composed of LPF with , L19,L22, L26, then is transmitted from the ANT terminal . D8,D9,D14, and D15 are consist of TR switch . (See fig.4)

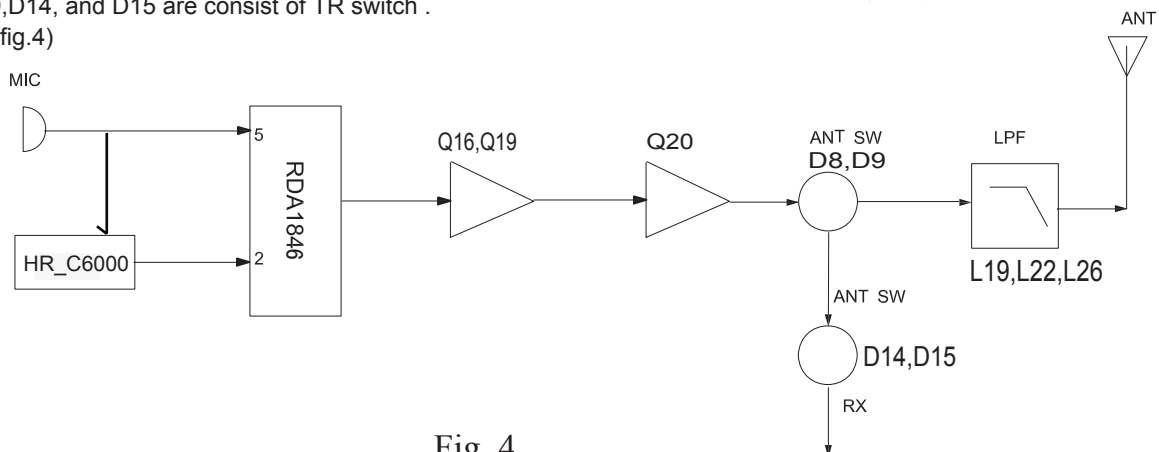


Fig .4

### 2-6) APC

The APC keep the current constant to the final module. The current to the final module is output as a voltage by detecting the potential difference between R25,R86,R86 by U16. Comparing with APC voltage from the microprocessor, the signal in U16 always controls the voltage to have the same value with APC voltage . The output becomes the Q20 power control voltage and the current the us kept constant in this loop.

### 3. AF amplifier

Analog signal passes from 9 pins of RDA1846S while digital signal passes from HR\_C6000, Then will be amplified by the U10(LM4951) audio power amplifier to drive the loud speaker. (See fig.3)

### 4.Receive signalina

The CTSS,DCS from (U8)RDA1846S the microprocessor determines,and controls the MUTE,and AFCO and the speaker output sounds in line with the squelch results of that content (see fig3)

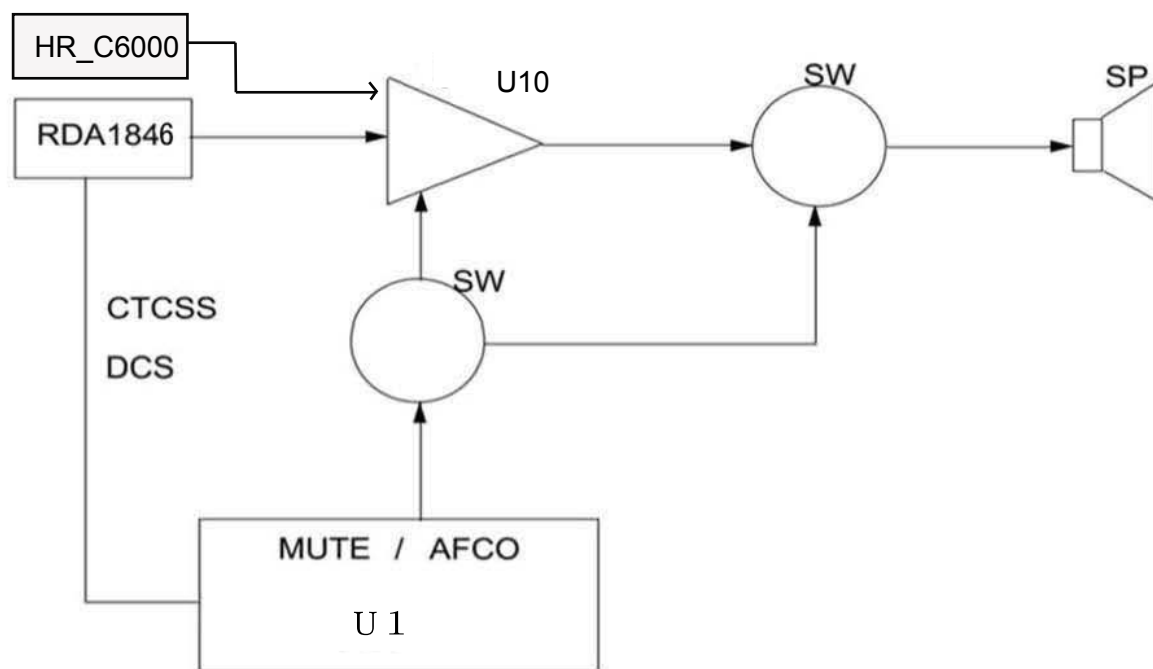


Fig .3

### 5.PLL

The VCO of receive and transmitter are integrated within RDA1846S,PLL control is controlled program Reference Oscillator through external TCXO 26M oscillation signals.Using the adjustable side of ystal oscillation to calibrate the VCO frequency.

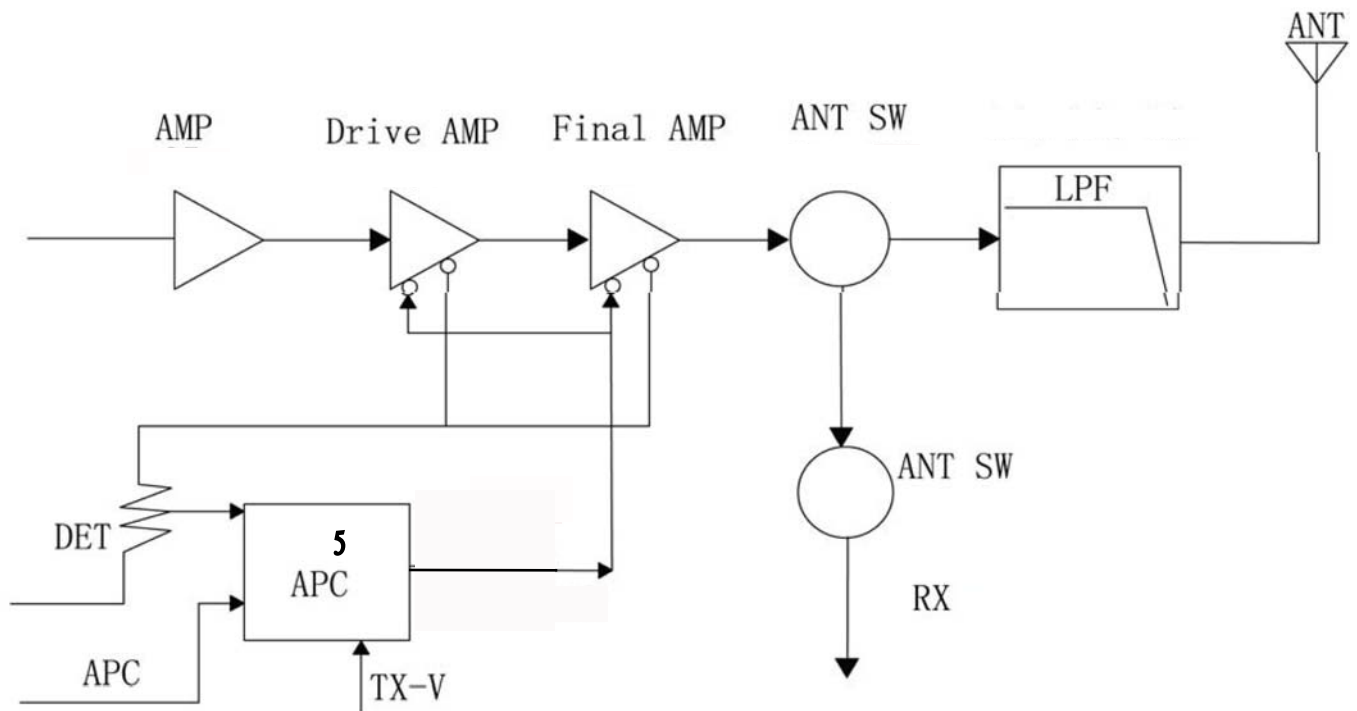


Fig .5

## 6. POWER SUPPLY

There are power supplies for the microcomputer 3.3V 5V RV and TV . 3.3V for the microcomputer is always out while the power is on RV is 5V for reception and is output during reception. TV is 5V for transmission and is output during transmission.

## 7. CONTROL SYSTEM

The U1 microprocessor operates at 12MHz