

# CIRCUIT DESCRIPTION

## 1. Receiver

The receiver is double conversion super heterodyne, designed to operate in the frequency range of 400 to 480MHz.

### 1) Front - end rf amplifier

An incoming signal from the transmit/receive switch circuit (D8 D9 D14 D15). After passing through a band pass filter BPF the signal is amplified (Q23) passing through a band pass filter BPF. Unwanted signals before it is passed to the first mixer. (see Fig1.)

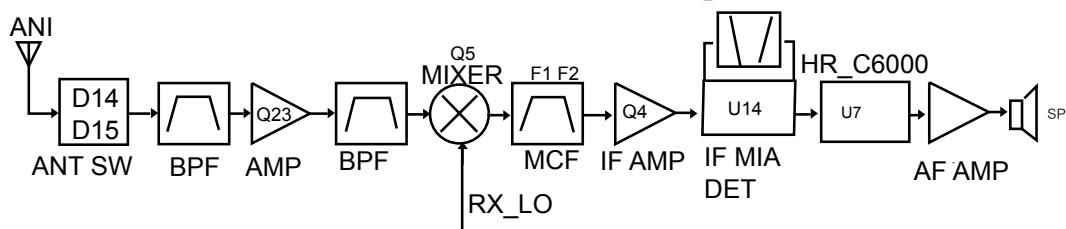


Fig .1

### 3) AMP

The programmable frequency-control synthesizer in RDA1846S generate PLL and sent it into Q5(3SK318) to mix frequency.(see fig1.)

### 4) First Mixer

local oscillator signal from the PLL frequency synthesizer circuit at the first mixer (Q5) to create a 51.55MHz first intermediate frequency (1st IF) signal. The first IF signal is then fed through two monolithic crystal filters (F1.F2) to further remove spurious signals.

### 5) IF amplifier

The first IF signal is amplified by Q4, and then enters U14 (FM processing IC). The signal is heterodyned again with a second local oscillator signal within U102to create a 450kHz second IF signal. The second IF signal is then fed through a 450F ceramic filter (G1) to further eliminate unwanted signals before it is amplified and FM detected in U7.

## 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 RDA1846S 22 pins. Modulation is performed at RDA1846S 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 to the sufficient level to drive the power module.

### 2-4 ) Final module

The MOS FET-type power module Q20 is used tp amplify the tranmission 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,D15 are consist of TR switch . (Seefig.4)

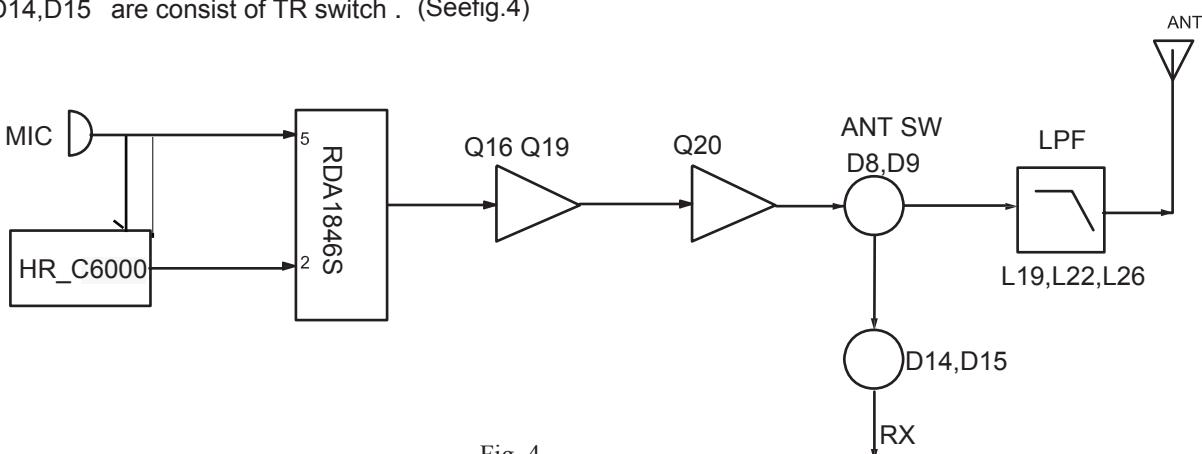


Fig .4

### 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 pote- ntial difference between R25,R85 ,R86 by U16. Comaring with APC voltage from the microp- rocessor, the signal in U16 aways controls the voltage to have the same value with APC vol- tage . The output becomes the Q20 power control voltage and the current the is 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 sperker. (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 (seefig3)

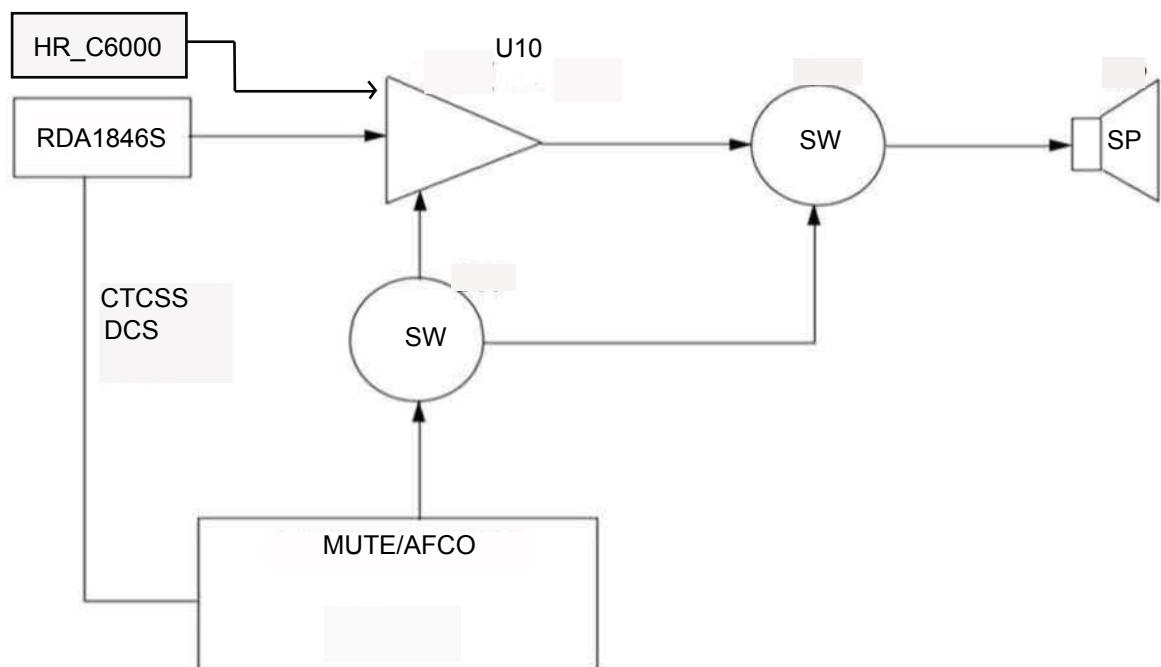


Fig.3

### 5.PLL

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

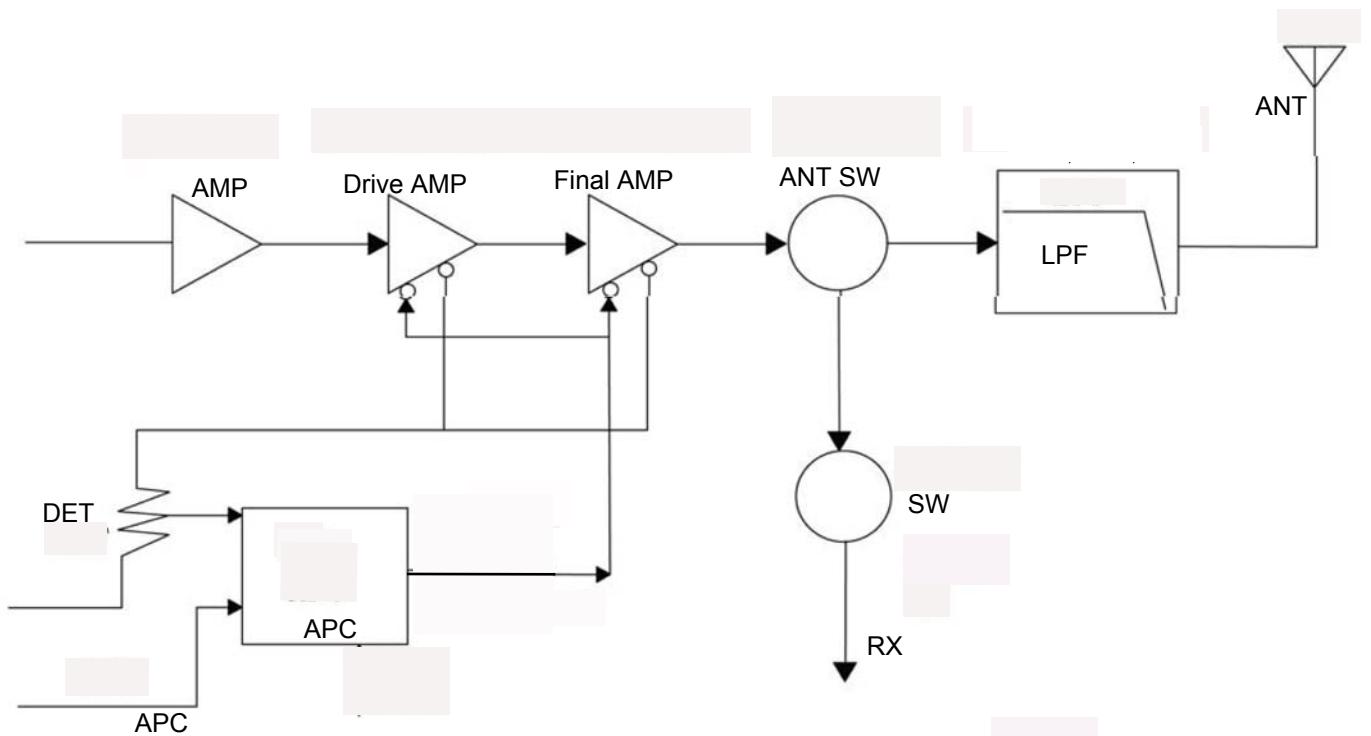


Fig .5

## 6. POWER SUPPLY

There are power supplies for the microcomputer 3.3V 5V RX5V0 and TX5V0 .  
3.3V for the microcomputer is always out while the power is on RX5V0 is 5V for reception and is output during transmission.TX5V0 is 5V for transmission and is output during transmission.

## 7. CONTROL SYSTEM

The U1 microprocessor operates at 12MHz