

CIRCUIT DESCRIPTIONS OF TRANSMITTER CTX4412N

Transmitter has two parts. One is RF module and the other is power and LED board.
Followings are descriptions on circuits.

1. RF TRANSMITTING MODULE

This module generates RF carrier signal for video and two sub-carrier signals for audios and transmits the RF signal to the receiver through the antenna.

Followings are descriptions of each block.

A. SUB-CARRIER GENERATORS

U2(LA7058R) is a generator of sub-carrier 1, The frequency of which is 6.0MHz. The frequency of sub-carriers is adjusted by tuning coil named TC1. TC1 is a custom-made component which can be tuned to 6.0MHz. C19 is a DC block of audio and R25, R26, R27, R28 is an attenuator of audio level. Usually the level of audio is IV P-P. But U2 needs small of them mV for 25kHz deviation.

U3(LA7058R) is a generator of sub-carrier 2, The frequency of which is 6.5MHz. The frequency of sub-carriers is adjusted by tuning coil named TC2. R34 through R37 is an attenuator for audio (R). U2 and U3 operates at 8.7V DC from power board. The capacitors connected to the PIN 7 of U2 & U3 is by pass capacitors.

The output signal from U2 is supplied to CF1 through R30. CF1 is a filter which only passes 6.0 MHz signal.

The output signal from U3 is supplied to CF2 through R39, CF2 is a filter which only passes 6.5 MHz signal.

The sub-carrier 1 and sub-carrier 2 are supplied to U1(video amp) through R8.

B. PRE-EMPHASIS AND VIDEO AMP

The video signal (usually composite signal from yellow RCA jack) is pre-emphasized and attenuated, and then, supplied the U1(VIDEO AMP).

The parts located between CON2 and U1 is for pre-emphasis.

NE592 is a video amp and has a variable resistor (VR1). VR1 controls the level of video, which is supplied to the VCO. The adjust of VR1 means the adjust of deviation of carrier.

C. CPU

This module has a CPU named U5(PIC16F84) to control the operation of module.

U5 has a R-C oscillator which is composed of R51 and C39.

U5 needs 5V DC to operate and 5V DC is made by D2 and supplied to U5.

U5 has 6 outputs and 1 input. Channel select switch is connected to the input.

Whenever the switch is pushed, the channel is changed sequentially.
6 outputs are used to turn on 4 LED'S and to give channel data to the U4.

D. PLL IC

U4(SP5055S) is a PLL IC which compares two signals and makes a error signal.
U4 compares reference frequency from X1 and RF frequency from PIN 13
and then, makes a error signal which is supplied to VCO via R21, C17, C18
and Q1.

E. VCO

Q2(BFG540/X) and peripheral components is a voltage controlled
oscillator. The frequency of this VCO is controlled by error signal
from U4.

When the error signal is increased, the capacitance of D1 is decreased
because D1 is a varactor diode which increases the frequency of VCO,
and vice versa.

The output from VCO is supplied to the antenna via attenuator and filter.
These attenuator and filter are used to limit level of RF signal under the FCC
regulation.

2 POWER AND LED BOARD

This set has a power switch, channel selector switch and 4 LED's on the
front pannel.

The power switch turns on and off the power supplied from DC adaptor.

Channel selector switch is used to change the channel of RF carrier and 4
LED's indicate current channel.

When the power switch is turned on, the 12V DC is supplied to the U1
(KIA7808). U1 is makes a 8.7V DC and supplies it to the RF transmitting
module. The capacitors near the U1 is used to bypass the ripple on
the power.

This set has 4 inputs on the rear pannel. One is a DC in jack for power
supply and the others are inputs for audio and video.

Yellow RCA jack is for video.

White and red jacks are for stereo audio.