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ENGINEERING DEPARTMENT

ITEM NO: XXX  
MODEL NAME:- ARCTIC CAT  
FREQUENCY :- 49.860MHZ  
DATE :- 24-7-2006  
BY: B.LEE  
REV 0

### (CIRCUIT DESCRIPTION )

#### IN TRANSMIT MODE.

WHEN THE CONTROL KNOB IS PRESSED, A CW SIGNAL IS TRANSMITTED. THE CRYSTAL CONTROLLED OSCILLATOR Q1 OUTPUT IS COUPLED THROUGH C8 TO THE BASE OF Q2. FROM Q2 THE SIGNAL IS FED THROUGH T-1 . THE LOW PASS FILTER MADE UP OF C13 & T-1 & C14 L-3 WHICH IS CONNECTED TO THE ANTENNA. THE 'MODULATION IS PROVIDED BY IC-1 . WHEN SWITCH IS PUSHED, THE MODULATION SIGNAL WILL BE SENT TO THE BASE OF Q2 THAT WILL MODULATE THE RF WAVE DIRECTLY. ENERGY IS SUPPLIED BY A 9.V ALKALINE BATTERY.

#### IN RECEIVE MODE

Q2 IS THE SUPERREGENERATOR & DETECTOR.  
IC-1 IS THE SIGNAL PRE-AMPLIFIER & DECODER.  
Q3,Q4, AND Q9,Q10 ARE THE MOTOR DRIVERS.  
QA1,QA2, AND QA3 QRE THE MUTI-OSCILLATOR THAT CREATES 70% POWER TO THE BACKWARD FUNCTION  
Q11,Q12,Q13,Q14 AND Q5,Q6,Q7,Q8 ARE THE MOTOR CURRENT DRIVERS.  
ENERGY IS SUPPLIED BY 9.6VDC -- EIGHT 1.2V AA TYPE NICAB BATTERY.

#### \*\* ANTENNA AND GROUND CIRCUITRY.

THIS UNIT MAKES USE OF AN EXTENAL 20 -INCH ANTENNA. THE ANTENNA IS INDUCTIVELY COUPLED.  
THE UNIT RELIES ON THE GROUND TRACE OF THE PRINTED CIRCUIT BOARD. NO EXTERNAL GROUND IS PROVIDED.  
ENERGY IS SUPPLIED BY A 9.V ALKALINE BATTERY.

#### \*\* BACKGROUND

THE DEVICE DESCRIBED HEREIN IS A WIRELESS (RF) TOY GAME CAR CONTROLLER TRANSMITTER FOR USE WITH THE TOY GAME CAR CONTROLLED RECEIVER. IT HAS ONLY ONE CHANNEL OF OPERATION WHICH THE USER MAY CHOOSE ONLY , AND IS USED TO SEND BUTTON-STATE DATA FROM THE CONTROLLER TO A WIRELESS RECEIVER CONNECTED WITH MOTORS

#### \*\* TYPICAL OPERATION

TYPICAL OPERATION WOULD INVOLVE THE USER TURNING ON THE UNIT TO THE TOY GAME.  
WHEN TURNED ON, THE UNIT COMES UP ON THE DEFAULT CHANNEL AND TRANSMITS A CONTINUOUSLY STEAM DATA. THE USER CAN NOT, AT WILL, CHANGE TO ANY OTHER OF THE PREDEFINED CHANNEL.

#### CONFIGURATION

THE TRANSMITTED RF CIRCUITRY CONSISTS OF A CRYSTAL CONTROLLED OSCILLATOR, FOLLOWED BY ONE POWER AMPLIFIER, & FINALLY, AN ANTENNA. THE MAIN CHARACTERISTICS OF THIS CONFIGURATION ARE SHOWN BELOW :-

FREQUENCY RANGES	49.860MHZ	
OCCUPIED BANDWIDTH (3DB)	./- 2KHZ	MAX
FREQUENCY STABILITY	./- 20 PPM	MAX
MODULATION METHOD	A M	100% .
OUTPUT POWER	80DBUV / M	MAX

#### REFERENCE OSCILLATOR

A 49.860MHZ CRYSTAL OSCILLATOR IS USED TO GENERATE THE REFERENCE FREQUENCY.  
IT HAS A STABILITY OF +/- 20 PPM.

#### AMPLIFIER

THE OSCILLATOR IS FOLLOWED BY ONE AMPLIFIER. THIS ACTS MORE AS BUFFER FOR THE OSCILLATOR THAN AS GAIN STAGE. AND ADD VERY LITTLE POWER TO THE SIGNAL.  
THE FINAL OUTPUT IS 80DBUV PER METER MAX

#### ANTENNA

THE SYSTEM ANTENNA IS A ROD ANTENNA LINKED TO PCB .  
ANTENNA CAN BE TURNED OUT OR IN PENDING USER'S WISH.

#### MICROCONTROLLER

- \* THE TX SYSTEM IS CONTROLLED BY A SMALL MICROCONTROLLER RUNNING WITH A 120KHZ +/- 20% OSCILLATOR
- \* THE RX SYSTEM IS CONTROLLED BY A SMALL MICROCONTROLLER RUNNING WITH A 120KHZ +/- 20% OSCILLATOR