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ITEM NO:  
MODEL NAME: SKY SCREAMER  
FREQUENCY = 27.145MHz  
DATE: 12TH FEB 2000  
BY: S.A.D  
REV: 0000  
PAGE 1 OF 2

## ENGINEERING DEPARTMENT (CIRCUIT DESCRIPTION)

### CIRCUIT DESCRIPTION:

#### IN TRANSMIT MODE:

WHEN THE UNIT IS TURNED ON, A CW SIGNAL IS TRANSMITTED. THE CRYSTAL CONTROLLED OSCILLATOR Q1 OUTPUT IS COUPLED THROUGH C4 TO THE BASE OF Q3. FROM Q3 THE SIGNAL IS FED THROUGH T1, THE LOW PASS FILTER MADE UP OF C3, T1, & C2 WHICH IS CONNECTED TO THE ANTENNA. THE MODULATION IS PROVIDED BY BC1. FORWARD TONE SIGNAL IS TO BE SENT FIRST WHEN POWER IS ON. WHEN ONE OF THE CONTROL SWITCH IS PUSHED, THE MODULATION CONTROL SIGNAL WILL BE SENT TO THE BASE OF Q2 THAT WILL MODULATE Q3 RF WAVE DIRECTLY. ENERGY IS SUPPLIED BY A 9V ALKALINE BATTERY.

#### IN RECEIVE MODE:

Q1 IS THE SUPPRESSOR & DETECTOR. Q2, Q3 & Q4 ARE THE SIGNAL STAGE AMPLIFIERS. IC-1 IS THE SIGNAL DECODER. Q5 & Q6 & L1 ARE THE MOTOR-1 DRIVERS. Q7, Q8, Q9, Q10, Q11 ARE THE MOTOR-2 DRIVERS. Q12, Q13, Q14, Q15, Q16, Q17 ARE THE MOTOR-3 DRIVERS. ENERGY IS SUPPLIED BY A 9V (300mAh) RECHARGEABLE NiCAD BATTERY.

### ANTENNA AND GROUND CIRCUITRY:

THIS UNIT MAKES USE OF AN EXTERNAL 40-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 9V ALKALINE BATTERY.

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ENGINEERING DEPARTMENT

**ITEM NO:****MODEL NAME:** RC AIR SERVO**FREQUENCY :** 27.145MHZ**DATE :** 12TH FEB 2000**BY:** B LEE**REV:** 0001**PAGE 2** OF 2**(CIRCUIT DESCRIPTION )****BACKGROUND**

THE DEVICE DESCRIBED HEREIN IS A WIRELESS (RF) TOY GAME "SKY SCREAMER" TRANSMITTER FOR USE WITH THE TOY GAME "SKY SCREAMER" 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 AND WITH PROPPELLERS)

**TYPICAL OPERATION**

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

**CONFIGURATION**

THE TRANSMITTER 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	27.145MHZ	
OCCUPIED BANDWIDTH (100)	+/- 20KHZ	
FREQUENCY STABILITY	+/- 20 PPM	
MODULATION METHOD	AM	
OUTPUT POWER	800MW /M	APPROX.

**REFERENCE OSCILLATOR**

A 27.145MHZ 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 800MW PER METER MAX.

**ANTENNA**

THE SYSTEM ANTENNA IS A ROD ANTENNA, LINKED TO PCB METAL BRACKET. ROD ANTENNA CAN BE TURNED-OUT OR IN DEPENDING USER'S WISH.

**MICROCONTROLLER**

THE SYSTEM IS CONTROLLED BY A SMALL MICROCONTROLLER RUNNING

A) WITH A 32KHZ LOCAL OSCILLATOR FOR TX (SET BY INTERNAL)

B) WITH A 32KHZ LOCAL OSCILLATOR FOR RX (SET BY EXTERNAL RESISTOR)