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ITEM NO:	PD51
MODEL NAME:-	MUSTANG AEROPLANE
FREQUENCY :-	27.145MHZ
DATE :-	20TH OCT 2005.
BY:	B.LEE
REV	ORIG

ENGINEERING DEPARTMENT (CIRCUIT DESCRIPTION)

CIRCUIT DESCRIPTION :-

IN TRANSMIT MODE.

WHEN TX UNIT IS PRESSED ON, 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 T1 AND ANTENNA ROD. THE LOW PASS FILTER MADE UP OF C11, F1, C12 & L3 WHICH ARE CONNECTED TO THE ANTENNA. THE MODULATION IS PROVIDED BY U1. THE RF SIGNAL IS TO BE SENT FIRST WHEN POWER IS ON. THE MODULATION CONTROL SIGNAL WILL BE SENT TO THE BASE OF Q3 THAT WILL MODULATE Q2 RF WAVE DIRECTLY. ENERGY IS SUPPLIED BY (9V) 6X1.5V AA ALKALINE DC BATTERY.

IN RECEIVE MODE

Q1 IS THE SUPERREGENERATOR & DETECTOR.
IC1 IS THE SIGNAL DECODER.
Q2 & Q5 & U1-A/B ARE THE CURRENT DRIVER OF THE MOTORS
Q3/ Q4 / Q5 Q6 /Q7 /Q8/ Q9 ARE THE CURRENT DRIVER OF THE STEERING MAGNETIC COILS
ENERGY IS SUPPLIED BY A 3.6V (400 MA) RECHARGEABLE NICAD BATTERY.

ANTENNA AND GROUND CIRCUITRY.

THIS UNIT MAKES USE OF AN EXTERNAL 32-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 WIRELES (RF) TOY GAME **AIR PLANE TRANSMITTER** FOR USE WITH THE TOY GAME **AIR PLANE 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 MOTOR AND WITH PROPELLER(S)

TYPICAL OPERATION

TYPICAL OPERATION WOULD INVOLVE THE USER PREESSING ON THE TX UNIT TO THE TOY GAME. WHEN PRESSED 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 **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	<100KHZ AT -26DB
FREQUENCY STABILITY	+/ - 20 PPM
MODULATION METHOD	AM
OUTPUT POWER	80DBM

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 80DBM PER METER MAX

ANTENNA

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

MICROCONTROLLER

THE SYSTEM IS CONTROLLED BY A SMALL MICROCONTROLLER RUNNING

- A) WITH A 128KHZ LOCAL OSCILLATOR FOR TX
- B) WITH A 128KHZ LOCAL OSCILLATOR FOR RX