

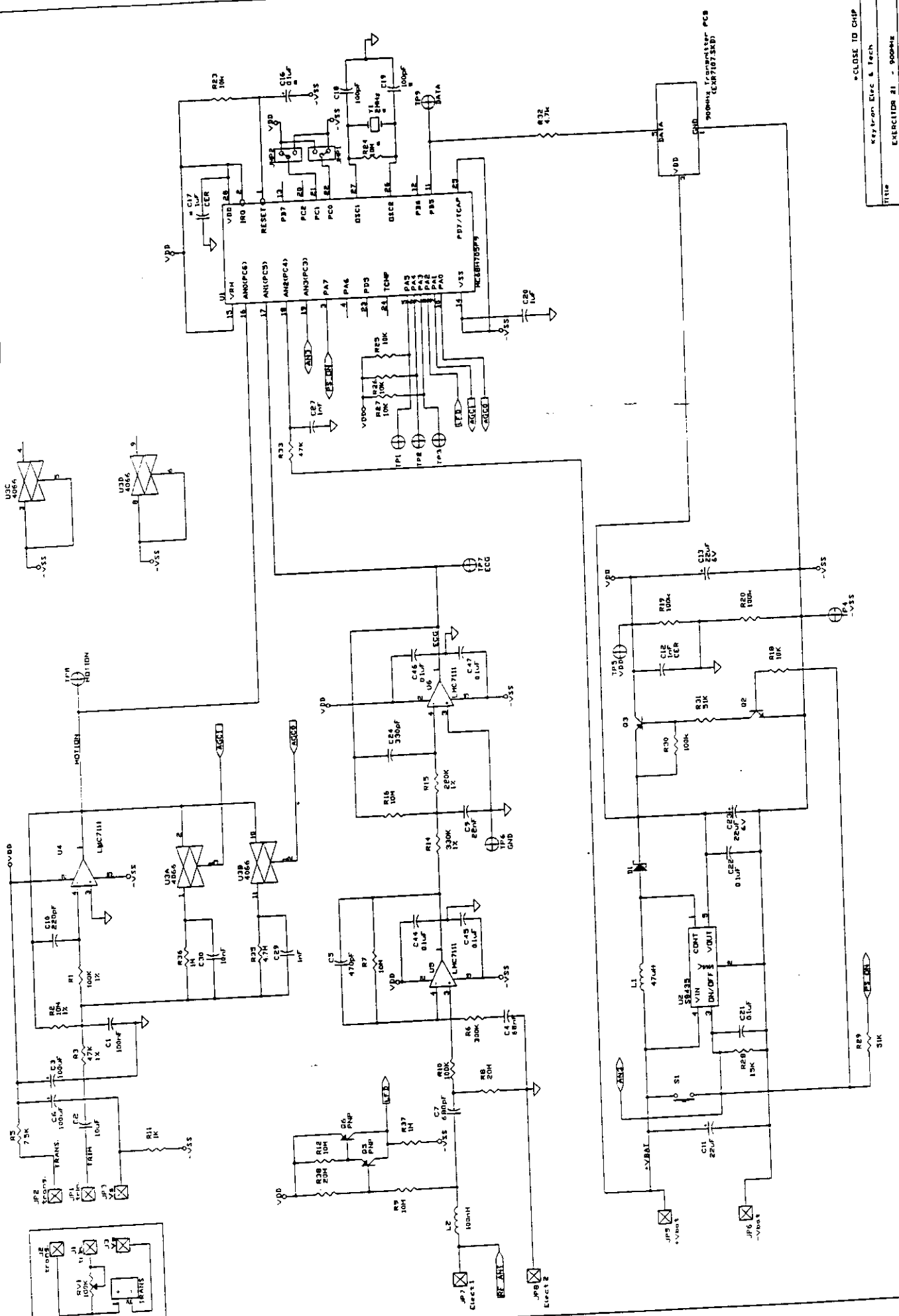
FCC requirements § 2.1033 (b)(4)

**CIRCUIT DESCRIPTION
SCHEMATIC DIAGRAM
PCB DRAWINGS**

The Exercitor™ 21 transmitter board consists of the RFM hybrid, type HX2000, and helix miniature antenna. This board is attached to the Exercitor™ 21 main PCB, comprising analog ECG and acceleration amplifiers, standard Motorola μ C of P9 series and DC-DC converter driven by 1.5 V battery. DC-DC converter provides the stable 3.6 V for the transmitter hybrid. Both boards are enclosed in hermetically sealed plastic belt and the user has no access to this parts. The user has access only to the battery compartment for the battery replacement. From the Exercitor™ 21 schematic diagram it can be seen that the transmitter board DATA input is driven by the microcontroller port via $R32 = 4.7 \text{ k}\Omega$ resistor.

This page is followed by the Exercitor™ 21 transmitter schematic diagram, the HX2000 hybrid transmitter description, transmission timing diagram, antenna and PCB drawings on 4 pages.

JHP1 = VDD - ECG TEST MODE Operation
 -VSS - NORMAL Operation
 JHP2 = VDD - FOM 900MHz Transmitter
 -VSS - FOM 900MHz Transmitter



*CLOSE TO CHIP
 Key: 1000 Eluc & Tech
 Title: EXERCISE 21 - 900MHz
 Date: 10/10/94
 Version: 1.0
 Page: 1/1

RFM**HX2000**

- Ideal for 916.5 MHz Unlicensed Transmitters in the USA and Canada
- Self-Contained RF Functions Shorten Development Time
- Compact, Surface-Mount Case with <90 mm² Footprint

**916.5 MHz
Hybrid
Transmitter**

**SM-4 Case**

The HX2000 is a miniature transmitter module that generates on-off keyed (OOK) modulation from an external digital encoder (not included). The carrier frequency is quartz, surface-acoustic-wave (SAW) stabilized, and output harmonics are suppressed by a SAW filter. The result is excellent performance in a simple-to-use, surface-mount device with a low external component count. The HX2000 is designed for unlicensed remote-control, wireless security, and data-link transmitters operating in the USA under FCC Part 15.249 and in Canada under DOC TRS RSS-210.

Absolute Maximum Ratings

Rating	Value	Units
Power Supply and/or Modulation Input Voltage	10	V
Nonoperating Case Temperature	-40 to +85	°C
Ten-Second Soldering Temperature	230	

Electrical Characteristics

Characteristic	Sym	Notes	Minimum	Typical	Maximum	Units
Operating Frequency	f _o	1, 2, 3, 4	916.300		916.700	MHz
					±200	kHz
RF Output Power into 50 Ω at 25 °C	P _o	2, 4, 5	-3	0		dBm
		2, 3, 4, 5	-5	0		
Within Specified Temperature Range		2, 3, 4, 5		-40	-32	dBc
Harmonic Spurious Emissions						
Modulation Input	V _{IH}	3, 4, 5	2.5		V _{CC}	V
	V _{IL}		0.0		0.3	
	I _{IH}				100	μA
	I _{IL}		0.0			
Dynamic Input Resistance		5	18			kΩ
Data Timing Parameters	t _R	3, 4, 5, 6			60	μs
	t _F				30	
Power Supply	V _{CC}	5, 7	2.7	3	3.3	VDC
	I _{CC}	3, 4, 5, 8		9	11	mA
		5, 9			1.0	μA
Operating Case Temperature Range	T _C	5	-40		+85	°C

Lid Symbolization (In Addition to Lot and/or Date Code)

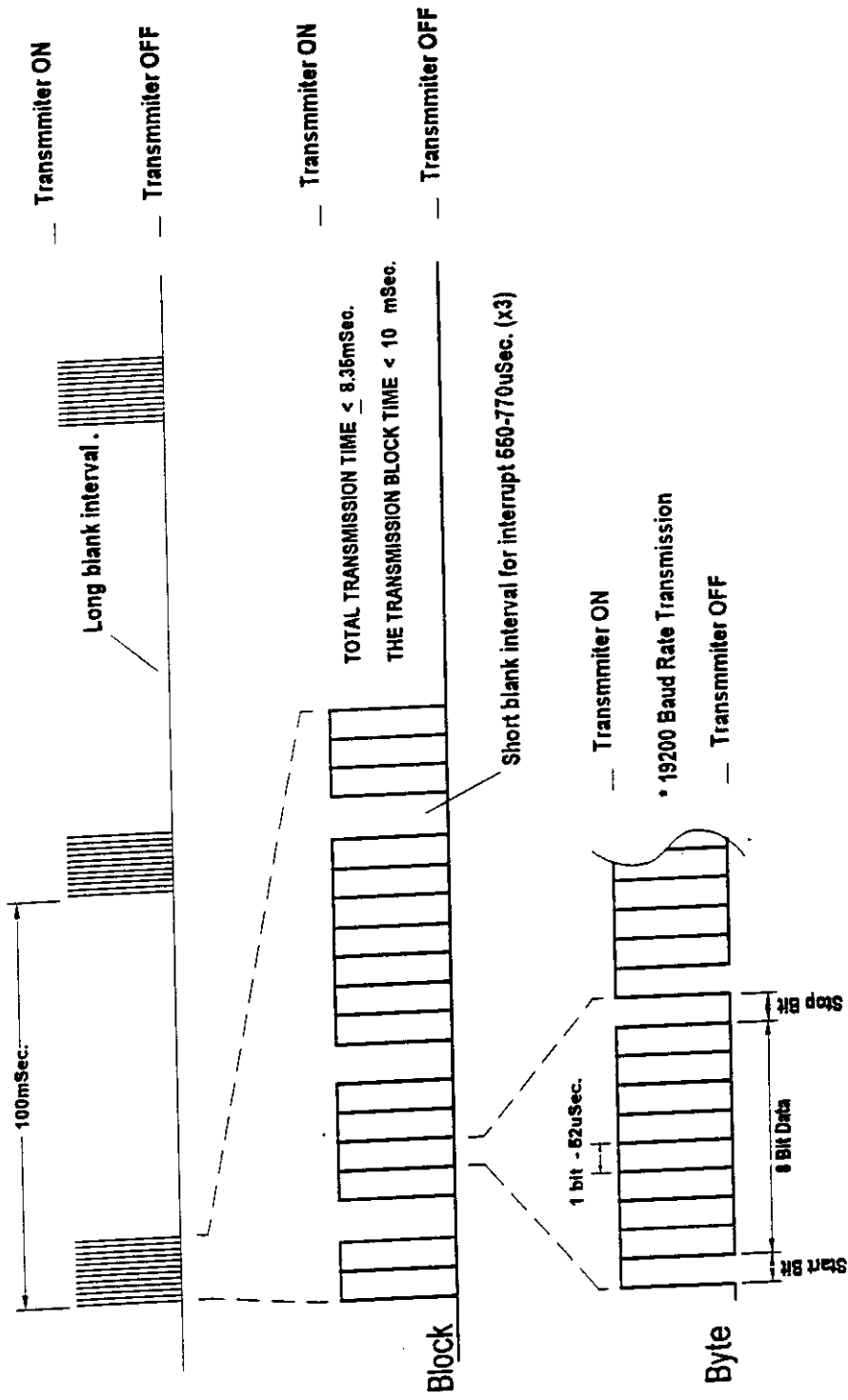
RFM HX2000



CAUTION: Electrostatic Sensitive Device. Observe precautions for handling.

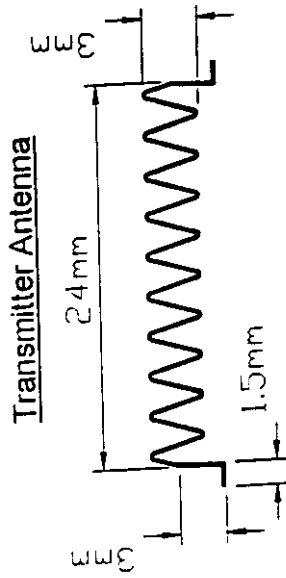
NOTES:

1. One or more of the following United States patents apply: 4,454,488; 4,616,197; 4,670,681; and 4,760,352.
2. Typically, equipment utilizing this device requires emissions testing and government approval, which is the responsibility of the equipment manufacturer.
3. Applies over the specified range of operating temperature.
4. Applies over the specified range of operating power supply voltage.
5. The design, manufacturing process, and specifications of this device are subject to change without notice.
6. The maximum data rate is dependent on the characteristics of the external encoding circuitry (not included).
7. Unless noted otherwise, case temperature T_C = +25°C ± 2°C, test load impedance = 50 Ω, and modulation input is at logic HIGH.
8. The maximum operating current occurs at the maximum specified power supply voltage and maximum specified operating temperature.
9. Standby current is defined as the supply current consumed with the modulation input at logic LOW.

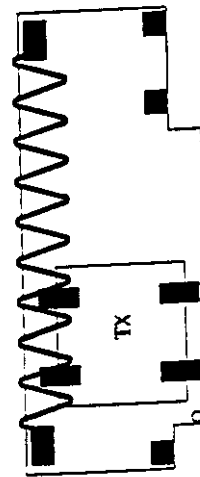


EXERCITOR 21 - 900MHz Transmission Timing Diagram.

Project / Customer		Exercitor 21	
SPECIFICATIONS		TITLE	Exercitor 21
		900MHz Transmission Timing Diagram.	
		SIZE	A4
		FSCH NO.	exr7151.skd
		DWG NO. / FILE NAME	8-Dec-97
		DATE	1 of 1
		SCALE	1mm = 1mm
		SHEET	1 of 1
		Keytron Electronics & Technologies Ltd.	
		DRAWN BY	Eli Z.
		DESIGNED BY	E. K.
		DESIGN ACTIVITY	
		CUSTOMER	



Enameled copper wire 0.5mm in Diameter
Coil - 11 Turns



Materials : PCB - Glass Epoxy FR-4 ; 0.8mm Thickness

Project / Customer		Exercitor 21	
Keytron Electronics & Technologies Ltd.		Transmitter PCB (900MHz)	
SPECIFICATIONS		TITLE	
DRAWN BY	DATE	SIZE	DWG NO. / FILE NAME
DESIGNED BY		A1	EXR7107.skd
DESIGN ACTIVITY		SCALE	DATE
CUSTOMER		1mm - 10mm	30-Sep-21
			SHEET 1 of 1