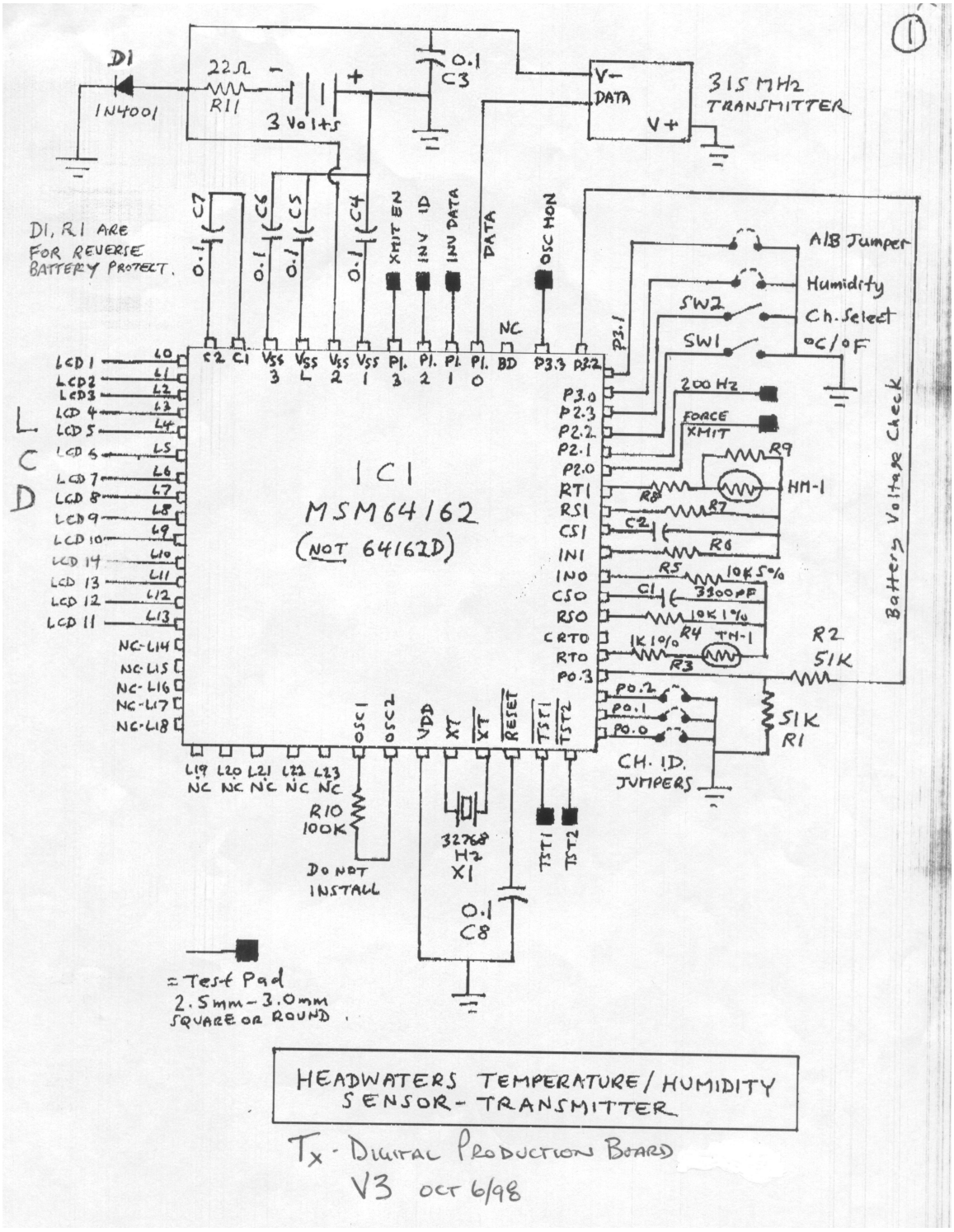
RF99 Wireless Thermometer
March 12, 1999

HEADWATERS
NEW PRODUCTS FOR WORLD MARKETS

Revision: 05

Common TRANSMITTER Component List

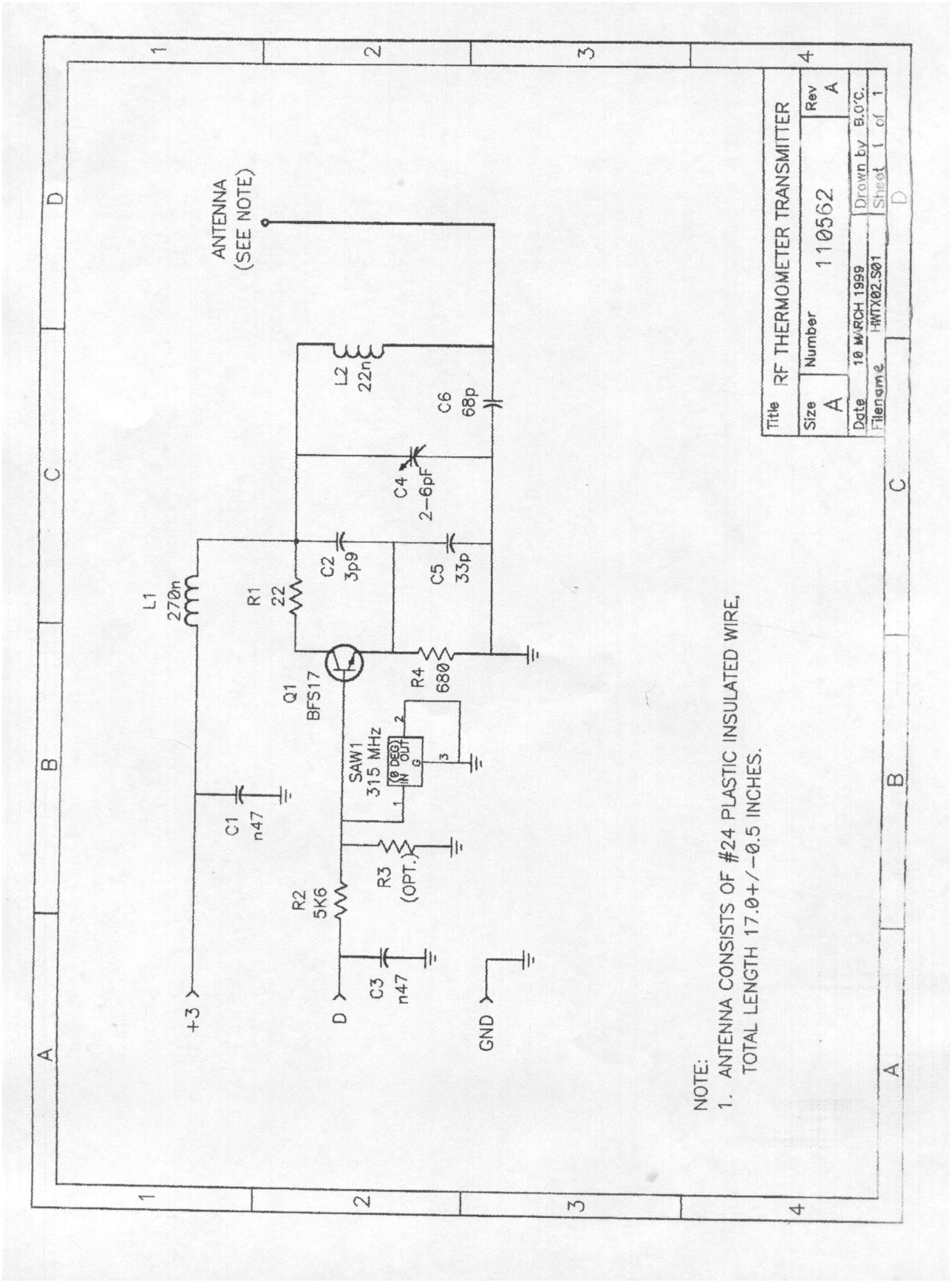
Quantity	Part Description
Tx - Mechanical:	
	See Mechanical Transmitter Components List
Tx - Circuit Boards:	
1	Digital board, double sided FR4, 1.0 mm thick, 0.5 -1.0 ounce copper (36 x 35 mm estimate)
1	RF board, double sided FR4, 1.0 mm thick, 1.0 ounce copper (20.2 x 24.6mm)
Tx - Electro-Mechanical:	
1	LCD glass panel (20 x 33 mm glass size, 14 x 29 mm view area)
1	LCD elastomeric connector (32 mm long)
1+1+1	Battery contacts for 2 AA cells (+ve, -ve, jumper)
1	3 wire ribbon cable connecting RF board to digital board
1	2 wires to connect to battery clips
1	2 wire connect Humidity sensor (humidity version only)
8+	screws for assembly
1	Push button momentary switch NormOpen, for C/F change (SW1)
1	Push button momentary switch NormOpen, for Channel select (SW2)
Tx - Digital Board (Production Version) Electrical:	
1	MSM64162, 3V, CMOS micro (capable of humidity circuit installation, not 64162D) (1C1)
1	32768 Hz quartz watch crystal (X1)
1	1 K-ohm 1% resistor, SMT or thru hole (R3)
1	10 K-ohm 1% resistor, SMT or thru hole (R4)
1	10 K-ohm 5% resistor, SMT (R5)
2	51 K-ohm 5% resistor, SMT (R1,R2)
6	0.1 microfarad, minimum 10 volt, ceramic capacitor, SMT (C3, C4, C5, C6, C7, C8)
1	3300 picofarad NPO or COG ceramic capacitor, SMT (C1)
1	HUMIDITY sensor C5-M3 (HM-1)
1	Temp. probe, 1.2 meter x 2wire cable(white & cap, Korean thermistor, Saitek custom potted cap) (TH-1) (figure RF-Tx-32)
1	IN4001 Diode (D1)
1	22 ohm 1watt resistor (R11)
5	values tbd HUMIDITY ONLY COMPONENTS (R6, R7, R8, R9, C2)


D1
IN4001
22Ω
R11
3 Volts
0.1
C3
V-
DATA
V+
315 MHz
TRANSMITTER
D1, R1 ARE
FOR REVERSE
BATTERY PROTECT.
C7
C6
C5
C4
XMIT EN
INV ID
INV DATA
DATA
OSC MON
NC
A/B Jumper
Humidity
Ch. Select
°C/°F
SW2
SW1
200 Hz
FORCE
XMIT
R9
HM-1
R8
R7
C2
R6
R5
10K 5%
C1
3300pF
10K 1%
R4
TH-1
1K 1%
R3
R2
51K
Battery Voltage Check
51K
R1
CH. ID.
JUMPERS
LCD
IC1
MSM64162
(NOT 64162D)
LCD 1
LCD 2
LCD 3
LCD 4
LCD 5
LCD 6
LCD 7
LCD 8
LCD 9
LCD 10
LCD 14
LCD 13
LCD 12
LCD 11
NC-L14
NC-L15
NC-L16
NC-L17
NC-L18
L19 L20 L21 L22 L23
NC NC NC NC NC
C2 C1 Vss3 Vss2 Vss1 PI.3 PI.2 PI.1 PI.0 BD P3.3 P3.2
P3.1
P3.0
P2.3
P2.2
P2.1
P2.0
RT1
RS1
CS1
IN1
IN0
CS0
RS0
CRT0
RT0
P0.3
P0.2
P0.1
P0.0
OSC1
OSC2
VDD
XT
XT
RESET
TST1
TST2
R10
100K
DO NOT
INSTALL
32768
Hz
X1
0.1
C8
= Test Pad
2.5mm-3.0mm
SQUARE OR ROUND
HEADWATERS TEMPERATURE/HUMIDITY
SENSOR-TRANSMITTER
Tx - Digital Production Board
V3 Oct 6/98

TRANSMITTER Component List (cont'd)

Quantity	Part Description
Tx - RF Board:	
1	SAW resonator 315MHz, RFM RO-2073 RF Monolithics Inc. SAW1
1	2 to 6 picofarads ceramic trim cap, Voltronics JZ060 SMT C4
1	BFS17 NPN RF transistor Q1
1	3.9 picofarad, 0805, +/-0.25p NPO ceramic capacitor C2
1	33 picofarad, 0805, 5%, 50V, NPO ceramic capacitor C5
1	68 picofarad, 0805, 5% 50V NPO, capacitor C6
3	470 picofarad, 0805, 10% 50V NPO, capacitor C1, C3
1	22 nanohenry, 1008, 10% Inductor (Matsuta 1008-22NK) L2
1	270 nanohenry, 1008, 10% Inductor (Matsuta 1008-R27K) L1
1	22 ohm 5% resistor, 0805, 1/10th watt R1
0	optional part, resistor, 0805, 1/10th watt R3 (NOT REQUIRED)
1	680 ohm 5% resistor, 0805, 1/10th watt R4
1	5.6 K-ohm 5% resistor, 0805, 1/10th watt R2
1	Antenna wire, overmolded jacket, with end cap, white matte finish, approx 1.6mm diam (Fig. RF-Tx-31) (length of wire 430 +/- 10mm from solder hole to end of conductor)

FCC APPROVAL BILL OF MATERIALS


ANTENNA
(SEE NOTE)
L1
270n
R1
22
C2
3p9
L2
22n
C6
68p
C4
2-6pF
C5
33p
Q1
BFS17
R4
680
SAW1
315 MHz
0 DEG
IN
OUT
G
C1
n47
R2
5K6
R3
(OPT.)
C3
n47
+3
D
GND
Title RF THERMOMETER TRANSMITTER
Size A
Number 110562
Rev A
Date 10 MARCH 1999
Drawn by B.O'C.
Filename HWTX02.S01
Sheet 1 of 1
NOTE:
1. ANTENNA CONSISTS OF #24 PLASTIC INSULATED WIRE, TOTAL LENGTH 17.0+/-0.5 INCHES.