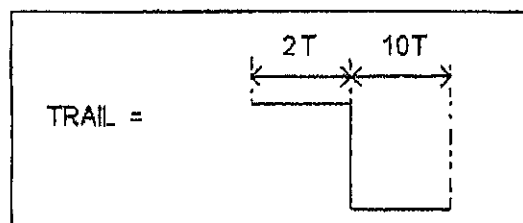
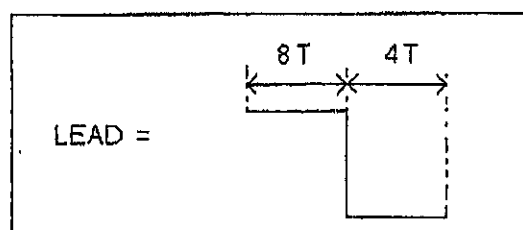
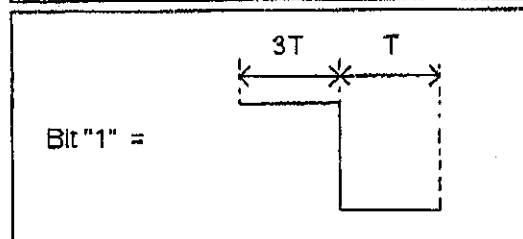
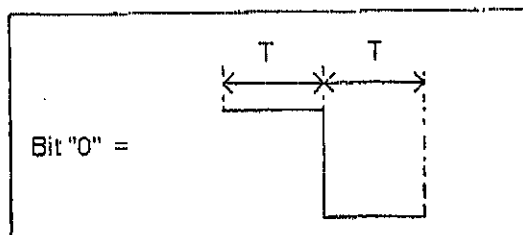


$$T = 1.9 \text{ ms}$$



WIRELESS WEATHER STATION TIMING DIAGRAM

The data is transmitted in a series way as follows

LEAD → CODE → ID → THERMO → CHECKSUM → TRAIL

CODE (4 bits)

The channel number of the remote unit, transmission data will be ignored if the channel number of the transmitter doesn't match with that of the receiver. Its format is 1 nibble (4 bits), i.e. 16 channel can be selected.

For example, if the channel number is 1, 0→0→0→1 should be transmitted.

ID (4 bits)

The ID number of the remote unit, its format is 1 nibble. Only 3 IDs are allowed.

For example, if ID2 is used, 0→0→1→0 should be transmitted.

THERMO 4 nibbles (16 bits)

The outdoor temperature value in degree Celsius; its format is 4 nibbles BCD. The first nibble for its sign indication, 0 for positive value while 2 for negative value.

The second and third nibbles are representing its integer temperature value.

The last nibble is its floating point temperature value.

For example, if the temperature is 24.9°C, 0→0→0→0→0→0→1

→0→0→1→0→0→1→0→0→1 should be transmitted.

CHECKSUM 1 nibble (4 bits)

The exclusive-or value for the above CODE, ID and THERMO data, its format is also in 1 nibble.

In our example, it should be 1→1→0→0

Therefore, in our case, the overall protocol should be

LEAD→0→0→0→1→0→0→1→0→0→0→0→0→0→1→0→0
 →1→0→0→1→0→0→1→1→1→0→0→ **TRAIL**

Data is transmitted or received starting from the most significant bit first.

The longest transmission time is when all the data bit is 1

=

$$(8T+4T)+4*(3T+1T)+4*(3T+1T)+16*(3T+1T)+4*(3T+1T)+(2T+10T)$$

$$= 136T$$

$$= 258.4ms$$

The shortest transmission time is when all the data bit is 0

=

$$(8T+4T)+4*(1T+1T)+4*(1T+1T)+16*(1T+1T)+4*(1T+1T)+(2T+10T)$$

$$= 80T$$

$$= 152ms$$

The transmitter unit will send out the data in the above format for three times.

In between each time of the transmission, there will be a delay for about 70ms.

The worst case (highest percentage on) duty cycle for the longest transmission time is when all the data bit is 1 for 100ms

$$D.C = \frac{(40 \times 1.9)ms}{100ms} = 0.76$$

$$A.T = -2.4dB$$

hp

REF 117.0 dB μ V

AT 20 dB

MKR 562.50 msec

.00 dB

PEAK

LOG

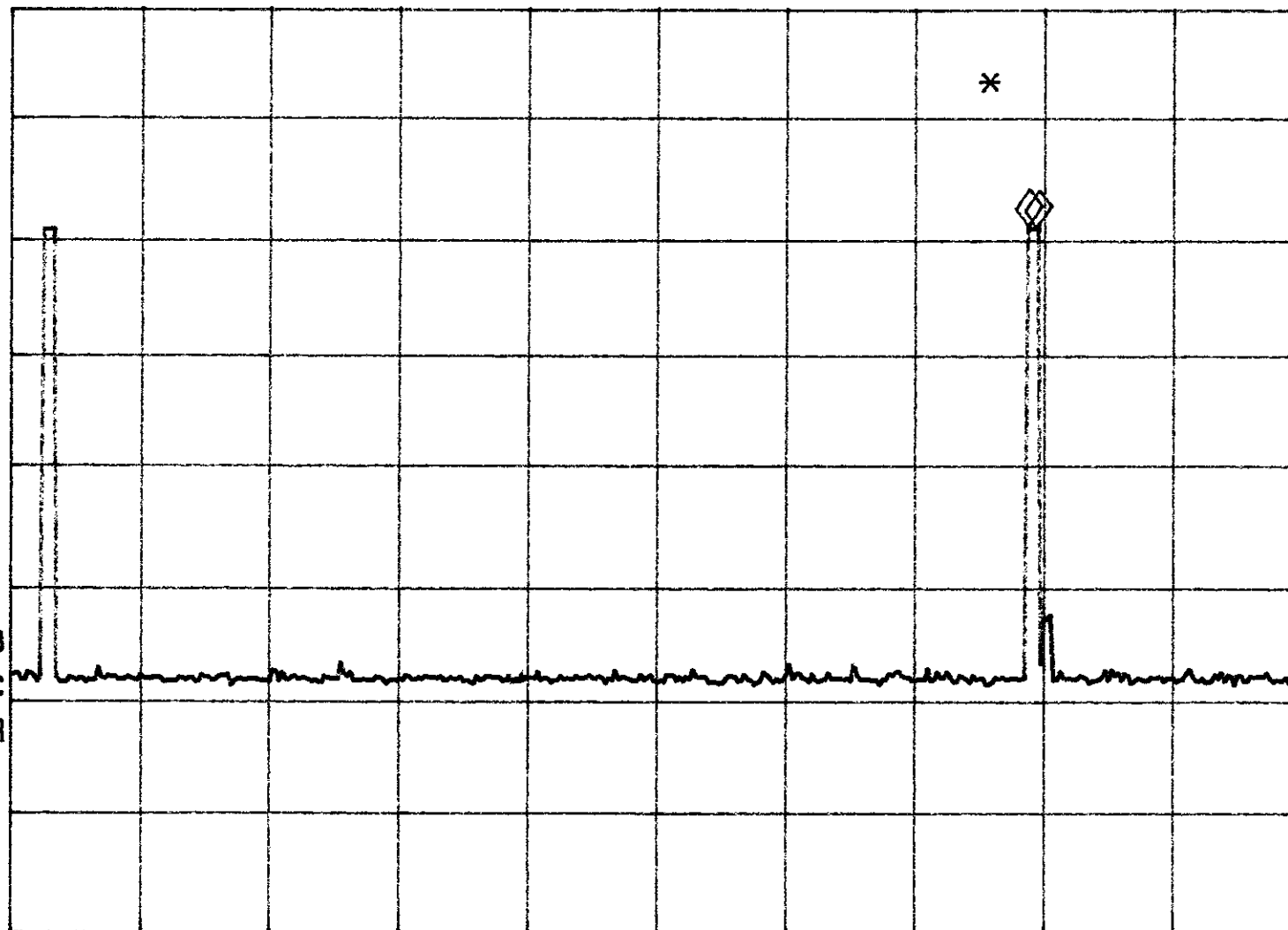
10

dB/

VA SB

SC FC

CORR



CENTER 433.980 MHz

SPAN 0 Hz

#RES BW 3.0 MHz

#VBW 3 MHz

#SWP 75.0 sec

hp

REF 107.0 dBμV

AT 10 dB

PEAK

LOG

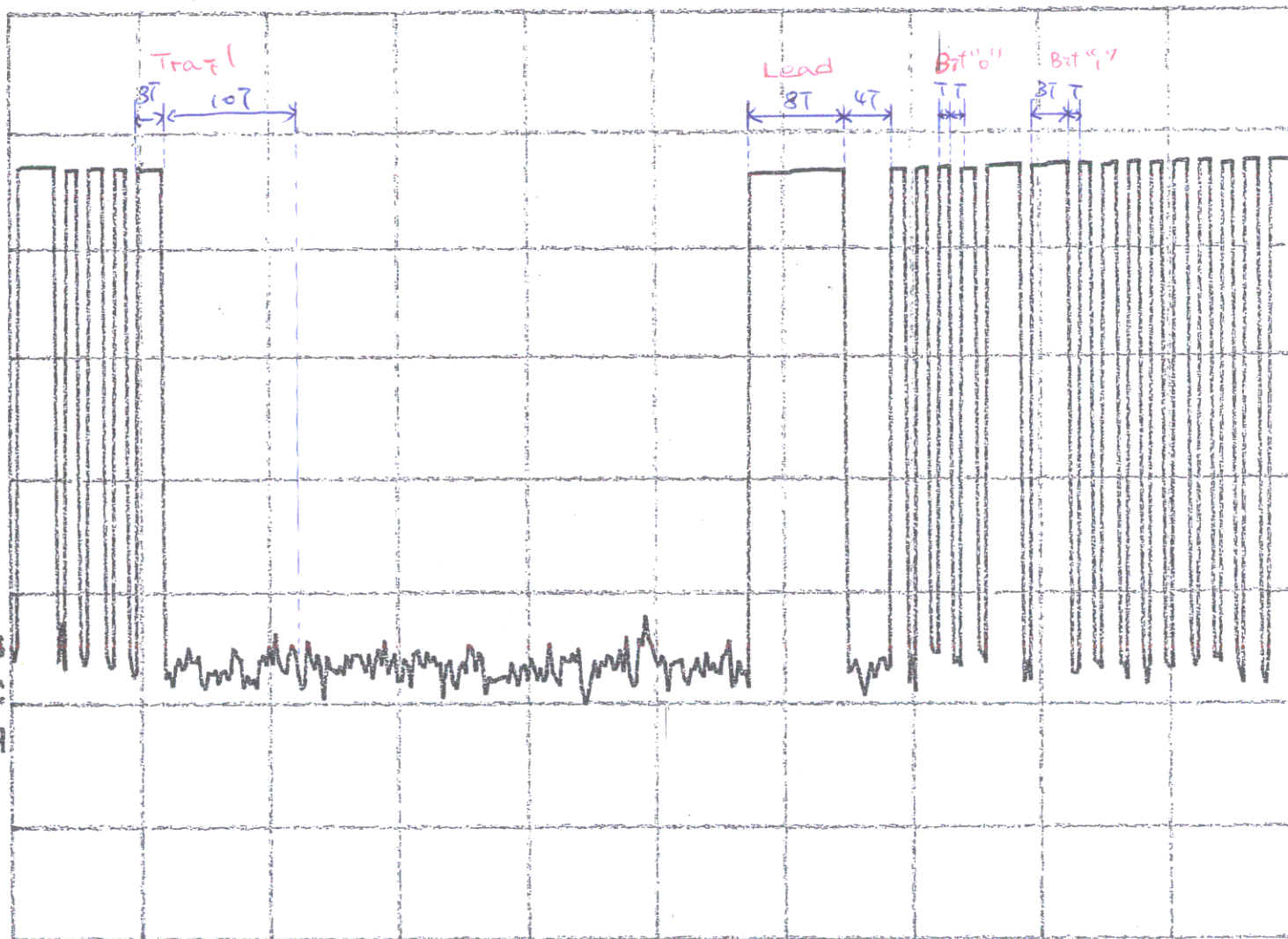
10

dB/

VA SB

SC FC

CORR



T=1.9ms.

CENTER 433.920 MHz

#RES BW 3.0 MHz

#VBW 3 MHz

SPAN 0 Hz

#SWP 200 msec