VCM-Series Digital Voice Module

USER'S   MANUAL

HMT TECH.CO.,LTD.

VCM-Series Digital Voice Module Instructions

Catalogue

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Function Introduction

VCM series-Digital Voice Module store voice data by EPROM / Flash ROM instead of SRAM or DRAM as a storage of voice board; The reason why we use non-volatility memory (EPROM/ Flash ROM) to store is it's easy to store and the data won't be missing because of power failures or human negligence.   Editing, controlling voice quality and preventing noise production via PC are the advantages.

With ample manpower, capital, and time, we've developed the most user-friendly digital voice software for editing, arrangement support —**TrueWave** & **Rom_Linker**.   From the window platform, users can edit and see the voice waves clearly, making all the noises disappear! Such a professional function troubleshoots all the problems!   Most of all, it doesn't need certain record interface cards but a Sound Card installed in PC to record, edit and arrange at any time.. For **Rom_Linker** software, it arranges and edits the voice segments according to users' requirements like his / her own.   Meanwhile, connecting to **TrueWave** via OLE enables the users hear the voice date right away.   It avoids mistakes made by saving wrong arrangements onto EPROM and wasting time!

We adapt a so-called "Step Schedule Play" technique to store voice data.   All sentences from the data are saved only once.   It can be rearranged and used.   And won't take up more memory because of repeating, composing usages.   Meanwhile, by suitable package, there's no need to recall where the sentence is from.   All you have to remember is to know which trigger number stands for!

Even for electronics dummies, just know how to record onto EPROM or Flash ROM and you can use VCM-Series products with ease!

Apply the most easily accessible hardware source---PC & Sound Card.   Along with the best voice editing, composing, arranging software---**TrueWave and ROM_Linker**, VCM series Digital Voice Module is your best choice!

- HMT **TrueWave** and **ROM_Linker** are edited and authorized by *__HMT__* for customers for **FREE**!
- VCM series products are developed and made by *Hwan Maw Technology Co., Ltd.*

Features Introduction
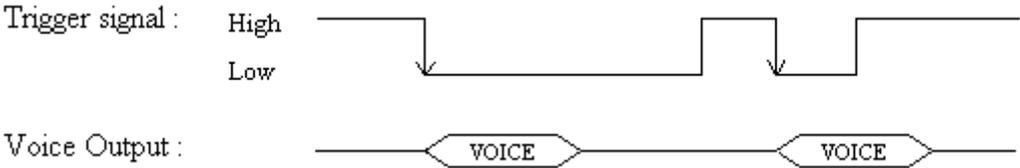
Input Trigger Attribute

VCM series Digital voice module input pins are called <u>Input Trigger.</u>
The number of input trigger pins is varied with different styles in VCM-Series See VCM series Hardware function Comparison]. <u>Input trigger</u> number is based on one direct correspondence or coding. [Please refer to Trigger Mode Section].   From each input trigger number, we set the attribute individually.   According to varied needs, there are individual input trigger settings. The attributes are classified as follows and they can be put together:

(1)Edge/Level

This attribute is to set the way of signal when the input is triggered by the external output.
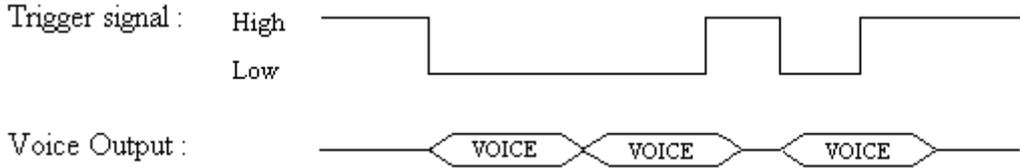
1.) To set Edge Trigger

Ex. Use Low Trigger

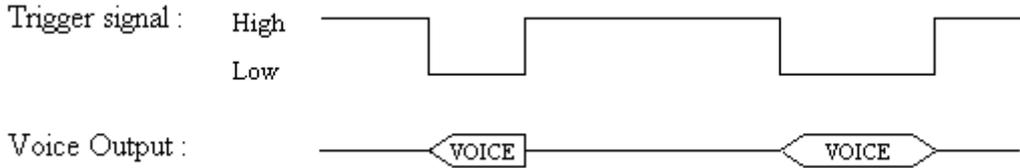

2.) To set Level Trigger

Ex. Use Low Trigger

(2)Hold/Unhold

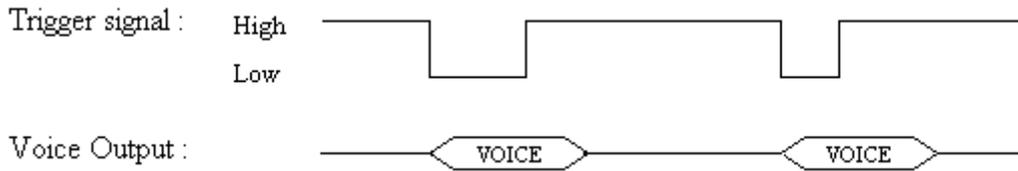This attribute is to set the relationship between the voice output and the external trigger signal.

1.) To set in a Hold condition (External trigger signal keeps held)

Ex Use Low Trigger

2.) To set in an Unhold condition (External trigger signal is no need to hold)

Ex Use Low Trigger

Trigger signal : High / Low

Voice Output : VOICE   VOICE

(3) Retrigger/Irretrigger

This attribute is to set whether the selected voice file can be played out right after the interruption of other voice sentences.

1.) To set under the Interruptible situation (interruptible)

Ex.Use Low Trigger.   X1 is to set as an Interruptible attribute.

Trigger signal : X1   High / Low

Trigger signal : X2   High / Low

Voice Output : V1 V2   V1   V2
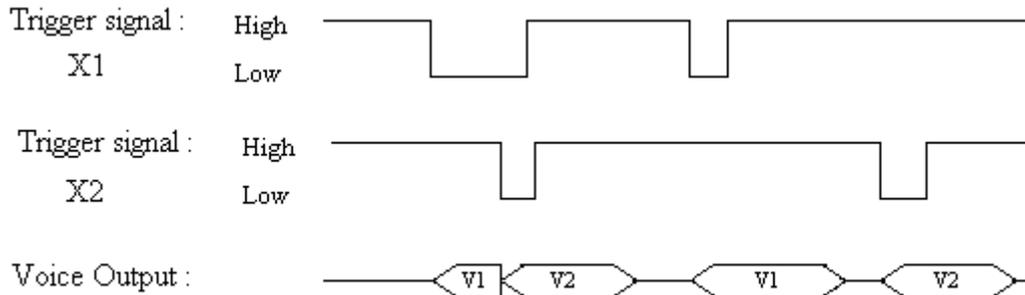
2.) To set under the Non-interruptible situation (non-interruptible)

Ex.Use Low trigger.   X1 is to set as a Non-interruptible attribute.

Trigger signal : X1   High / Low

Trigger signal : X2   High / Low

Voice Output : V1   V1   V2
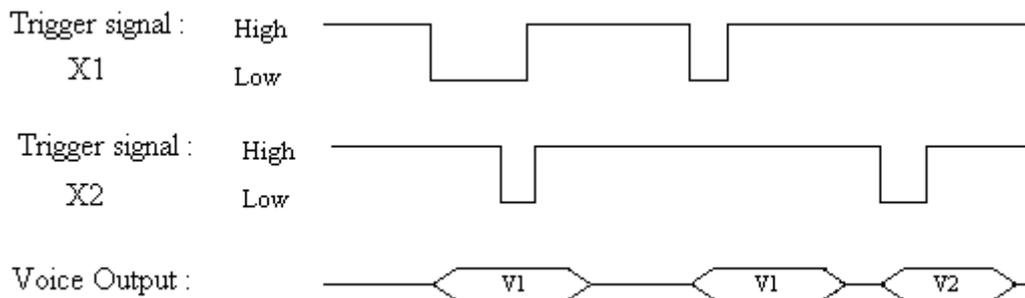
Status Response Signal

When connect to outer control system, VCM series provides <u>Busy signal</u> and <u>Stop signal</u> as the action response signal.   When outer control system connects to VCM series, it uses Busy signal under the Polling way.   It uses Stop signal under the Interrupt way.
Stop signal is 40ms (pulse).
Three output status options in Busy signal & Stop signal respectively.

Busy signal:

(1) Always High: Busy signal keeps in High level output (TTL: +5V).

When not using Busy signal , the users can set the system under this status.

(2) Active Low: Busy signal keeps High level (TTL: +5V) when not performing.

Vice versa, it becomes Low level (TTL: 0V).　When the program is finished, it'll go back to High level (TTL: +5V).

(3) Active High: Busy signal keeps Low level (TTL: 0V) when no performing.

Vice versa, it becomes High level (TTL: +5V).　When the program is finished, it'll go back to Low level (TTL: 0V).

Stop signal:

(1) Always High: Stop signal keeps in High level input (TTL: +5V).

When not using Stop signal, the users can set the system under this status.

(2) Low Pulse: When the performing is finished, Stop signal produces a 40ms-wide Low pulse to inform the outer control system the performing is over.

(3) High Pulse: When the performing is finished, Stop signal produces a 40ms-wide High pulse to inform the outer control system the performing is over.

● **When outer pin signal triggers VCM series, it works at <u>40ms</u> at least!**

VCM-series Sentence Setting

By applying "Step Schedule Play", we call every unit as "**WORD**" which means a voice file edited and saved under **<u>TrueWave</u>**.　"**Sentence**" is composed of one or more "**WORD**" arrangements (up to 4096 arrangements).　By saving one copy of "**WORD**" data, it presents the most economical method.　What's more, there's no limitation of length for each "**WORD**" as long as the memory space is enough!

Each trigger number can be pointed as a "**Sentence**"**.**　When outer trigger condition is set, it'll play the content of the selected "**Sentence**"!

Sampling Rate Selection

Sampling Rate Setting

Storing voice data via 8Bits way makes the better quality for voice.　The quality is much better than the same types of voice modules.　Just select a lower sampling rate to present a nice performance.　We provide six selections 8KHz / 11KHz / 16KHz / 22KHz / 24KHz/32KHz for Sampling Rate.　Strongly recommend to select 16KHz Sampling Rate for it can present an excellent voice quality.

Input Trigger Mode Selection

Description

　　　VCM-Series is the only voice module to support couples of trigger modes under a sole hardware structure.　　This brand-new product satisfies not only various needs from customers but lower the cost of stock.

Trigger Mode provided are as follows:

(1)　Single Mode

(2)　Cycle Mode

(3)　Binary Mode

(4)　BCD Mode

(5)　Parallel Mode

(6)　Serial Mode, 2400 bps, N, 8,1

(7)　Serial Mode, 4800 bps, N, 8,1

(8)　Serial Mode, 9600 bps, N, 8,1

(9)　Serial frame Mode, One start byte and one stop byte. 2400 bps, N, 8,1

(10)　Serial frame Mode, Two start bytes and one stop byte. 2400 bps, N, 8,1

(11)　Serial frame Mode, One start byte and two stop bytes. 2400 bps, N, 8,1

(12)　Serial frame Mode, Two start bytes and two stop bytes. 2400 bps, N, 8,1

(13)　Serial frame Mode, One start byte and one stop byte. 4800 bps, N, 8,1

(14)　Serial frame Mode, Two start bytes and one stop bytes. 4800 bps, N, 8,1

(15)　Serial frame Mode, One start bytes and two stop bytes. 4800 bps, N, 8,1

(16)　Serial frame Mode, Two start bytes and two stop bytes. 4800 bps, N, 8,1

(17)　Serial frame Mode, One start byte and one stop byte. 9600 bps, N, 8,1

(18)　Serial frame Mode, Two start bytes and one stop bytes. 9600 bps, N, 8,1

(19)　Serial frame Mode, One start byte and two stop bytes. 9600 bps, N, 8,1

(20)　Serial frame Mode, Two start bytes and two stop bytes. 9600 bps, N, 8,1

(21)　Binary + Single Mode (without strobe)

(22)　Binary + Single Mode (with strobe)

(23)　BCD + Single Mode (without strobe)

(24)　BCD + Single Mode (with strobe)

Input Trigger Mode Descriptions

Descriptions for each mode help the user to select the best mode.

(1) **Single Mode**:

Adapt one to one trigger method to have each pin correspond to one trigger number.

(2) **Circle Mode**:

This mode is an extension of Single Mode.　When more than one input pins are triggered, it'll play the sentences in sequence.

Ex. X0 Trigger Set as Sentence 5

　　X1 Trigger Set as Sentence 12

　　X2 Trigger Set as Sentence 1

　　X3 Trigger Set as Sentence 7

When X0 and X2 are triggered at the same time, it'll play "Sentence 5" and then "Sentence 1".

(3) **Binary Mode**:

Adapt X0 (LSB) – X7 (MSB) as an eight-digit trigger code.　X8 is Strobe Signal. This mode can be up to 255 sentences. (It depends on the product type.　Please refer to VCM–Series voice module comparison sheet.)

<Note> Trigger code is FF (Hex).　It means stop performing.

(4) **BCD Mode**:

Adapt X4 (LSB) – X7 (MSB) and X0 (LSB) – X3(MSB) as two BCD trigger code. X8 is Strobe Signal.　This mode can be up to 100 sentences.

(5) **Parallel Mode**:

Adapt X0 (LSB) – X7 (MSB) as an eight-digit trigger code without Strobe Signal. This mode can be up to 254 sentences. (It depends on the product type.　Please refer to VCM-Series voice module comparison sheet.)

(6) **Serial Mode**:

Adapt serial signal to transmit the trigger code.　Built-in 19 stand-by trigger codes and they can be performed in sequence.　On communication electronic level, it provides RS-232 and TTL level to choose.　It supports 2400 bps,N,8,1 / 4800 bps,N,8,1 / 9600 bps,N,8,1(three communication protocol). This mode can be up to 255 sentences.

<Note> Trigger code is FF (Hex).　It means stop performing.

(7) **Serial Frame Mode**:

This mode is an extension of Serial Mode. Besides the serial mode functions, it provides four frames including starting and ending unit bytes for users to arrange.

Format:

1 Byte	1 Byte	19 Bytes	1 Byte	1 Byte
Starting Byte 1	Starting Byte 2	Up to 19 Trigger Numbers	Ending Byte 1	Ending Byte 2

Starting Byte 1 and Ending Byte2 columns are necessary inputs. As for Starting Byte 2 and Ending Byte 1 depend on the users. The most different between this and serial mode is the frame mode needs to receive the whole package without any mistakes firstly. Then according to the sequence of 19 trigger codes to perform. If transmit one whole package （means the starting bytes and ending bytes are correct and no data stored in 19 trigger codes）, it'll finish the status of performing.

<Note> Trigger code is FF (Hex). It means stop performing.

(8) **Binary + Single Mode: (without strobe)**   [For VCM-100 ONLY]

Apply X0 (LSB) – X7 (MSB) as a unit for an 8-bit trigger code. Triggers from X8 to X23 are set for Single Trigger. This mode can be up to 254 sentences to play out.

CTG means Code Trigger; STG means Single Trigger. In order to meet users' demands, we set certain usages from CTG and STG. Users can decide to use it or not.

1.) STG - priority

If use this setting, Retrigger / Irretrigger attributes from the original STG will be invalid. The attribute with the priority can interrupt other non-priority attributes (Priorities: X8 > X9 > X10 > X11 > ….. > X22 > X23).

2.) STG (Priority) > CTG

If set this attribute, the priority is: STG > CTG. It means CTG will be interrupted by STG Trigger. Meanwhile, attributes for each trigger code won't change as well. If CTG Trigger code is set as Irretrigger, one attribute is valid to the ones in the same group. It means CTG is only workable to its own trigger code but they are interrupted by STG still!

3.) STG Trigger happens—to interrupt CTG or not

This attribute is the extension of the second attribute. If set this attribute, the CTG will be interrupted immediately when the STG Trigger is on. Vice versa, after the CTG is finished, it starts STG..

(9) **Binary + Single Mode: (with strobe)**   [For VCM-100 ONLY]

This mode uses X0 (LSB) – X7 (MSB) as an 8-bit Trigger Code. X8 is set for Strobe Signal use; Triggers from X9 to X23 are set for Single Trigger use. This mode can be up to 254 sentences.   CTG means Code Trigger; STG means Single Trigger. About the relationship between CTG and STG, please refer to (8) description.

(10) **BCD + Single Mode: (without strobe)**   [For VCM-100 ONLY]

This mode uses X0 (LSB) – X3 (MSB) and X4 (LSB) – X7 (MSB) as two BCD Trigger Code. Triggers from X8 to X23 are set for Single Trigger.   This mode can be up to 115 sentences to perform. CTG means Code Trigger; STG means Single Trigger. About the relationship between CTG and STG, please refer to (8) description.

(11) **BCD + Single Mode: (with strobe)**   [For VCM-100 ONLY]

This mode uses X0 (LSB) – X3 (MSB) and X4 (LSB) – X7 (MSB) as two BCD Trigger Codes.   X8 is set for Strobe Signal use; Triggers from X9 to X23 are set for Single Trigger. This mode can be up to 115 sentences to perform.   CTG means Code Trigger; STG means Single Trigger.   About the relationship between CTG and STG, please refer to (8) description.

● Sampling Rate Selection and Memory Storage Length

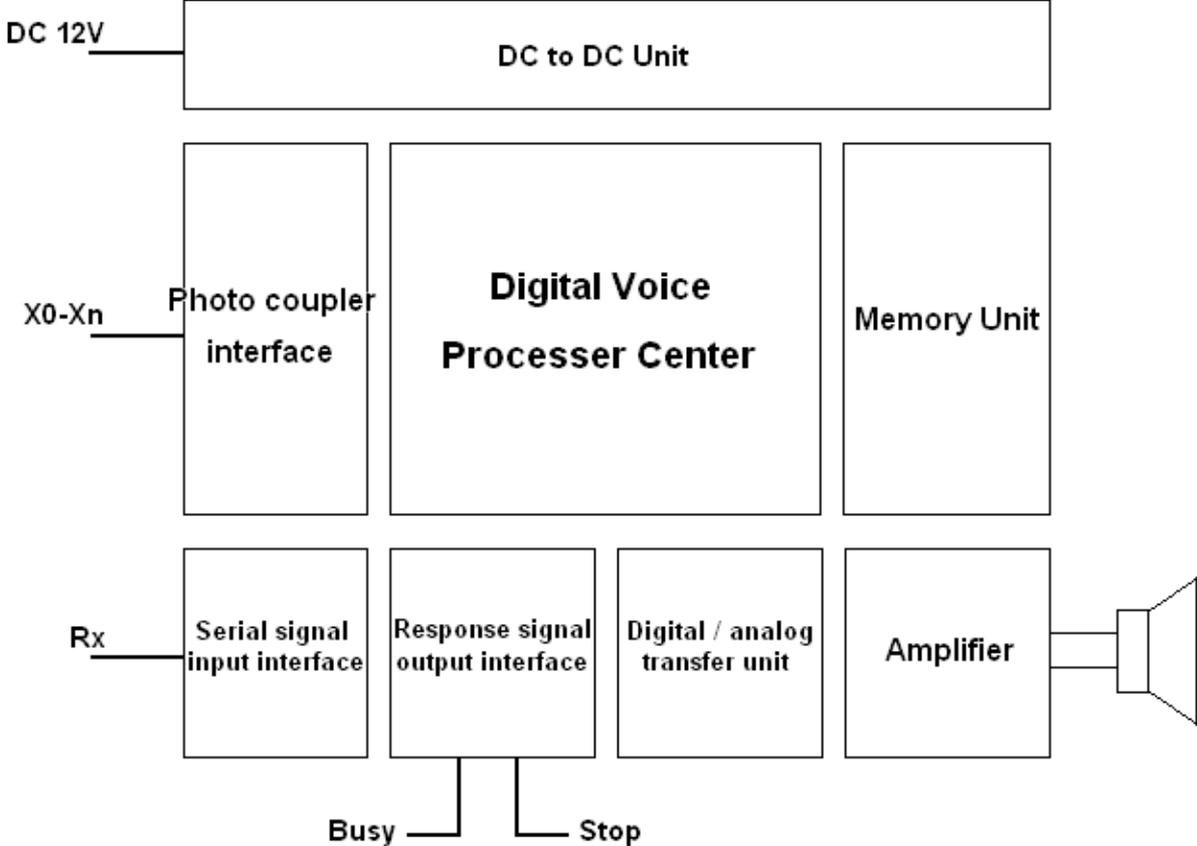| 8k Hz	1MB	4MB	8MB
One pc of EPROM	15 sec	63 sec	127 sec
Two pcs of EPROM	31 sec	127 sec	255 sec
Three pcs of EPROM	47 sec	191 sec	383 sec
Four pcs of EPROM	63 sec	255 sec	511 sec
11k Hz	**27C010**	**27C040**	**27C080**
One pc of EPROM	10.9 sec	46.6 sec	94.3 sec
Two pcs of EPROM	22.8 sec	94.3 sec	189.6 sec
Three pcs of EPROM	34.7 sec	142 sec	285.0 sec
Four pcs of EPROM	46.6 sec	189 sec	380.3 sec
16k Hz	**27C010**	**27C040**	**27C080**
One pc of EPROM	7.5 sec	31.5 sec	63.5 sec
Two pcs of EPROM	15.5 sec	63.5 sec	127.5 sec
Three pcs of EPROM	23.5 sec	95.5 sec	191.5 sec
Four pcs of EPROM	31.5 sec	127.5 sec	255.5 sec
22k Hz	**27C010**	**27C040**	**27C080**
One pc of EPROM	5.04 sec	23.30 sec	47.18 sec
Two pcs of EPROM	11.43 sec	47.18 sec	94.80 sec
Three pcs of EPROM	17.39 sec	71.01 sec	142.5 sec
Four pcs of EPROM	23.30 sec	94.80 sec	190.1 sec
24k Hz	**27C010**	**27C040**	**27C080**
One pc of EPROM	5.0 sec	21.0 sec	42.33 sec
Two pcs of EPROM	10.33 sec	42.33 sec	85.00 sec
Three pcs of EPROM	15.66 sec	63.66 sec	127.66 sec
Four pcs of EPROM	21.00 sec	85.00 sec	170.33 sec
32k Hz	**27C010**	**27C040**	**27C080**
One pc of EPROM	3.75 sec	15.75 sec	31.75 sec
Two pcs of EPROM	7.75 sec	31.75 sec	63.75 sec
Three pcs of EPROM	11.75 sec	47.75 sec	95.75 sec
Four pcs of EPROM	15.75 sec	63.75 sec	127.75 sec

EPROM Type 27C010 means 1Mbit.   27C040 means 4Mbit while 27C080 means 8Mbit.

EPROM Type number can be varied along with the factories!

About Function-Mute Description

VCM series provides initial mute function code. It's used to place among sentence arrangements without taking up any more memory space! The current initial mute "WORD" is from 0.33sec to 21.33sec for selections. Regarding this function, please refer to "ROM_LINKER Tool Software and Example Manual".
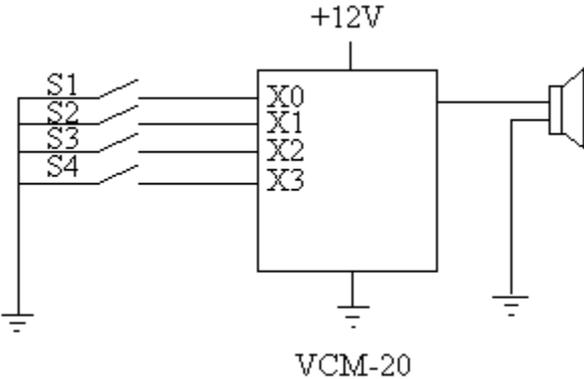
## VCM-Series Basic System Diagram

Power Supply
DC 12
or DC 12-36V

DC 12V — DC to DC Unit

X0-Xn — Photo coupler interface

Digital Voice Processer Center

Memory Unit

Rx — Serial signal input interface

Response signal output interface

Digital / analog transfer unit

Amplifier

Busy — Stop

VCM Series Voice Module Control Examples.

Take VCM-20 as an example:

(1) Single Mode

VCM-20

(2) 3 bit Code + Strobe Signal Mode

uP   VCM-20
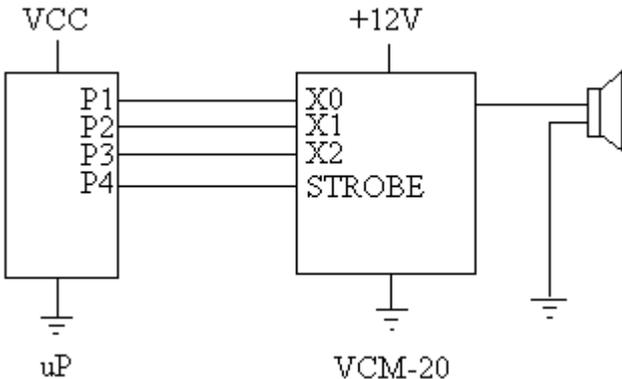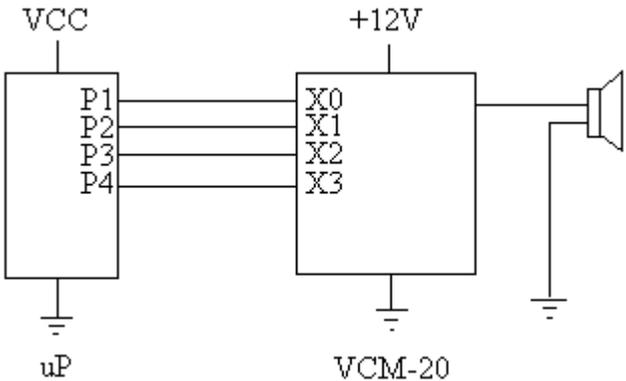
(3) 3 bit Code + Strobe Signal Mode [use Busy Signal]

uP   VCM-20
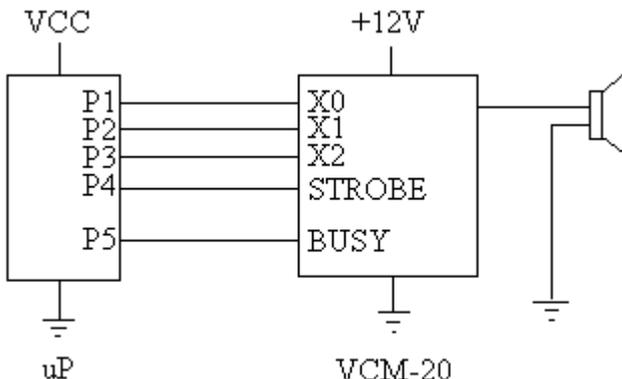
(4) 3 bit Code + Strobe Signal Mode [use Stop Signal]

VCC   +12V

P1 — X0
P2 — X1
P3 — X2
P4 — STROBE
P5 — STOP

uP   VCM-20

(5) 4 bit Code Mode

VCC   +12V

P1 — X0
P2 — X1
P3 — X2
P4 — X3

uP   VCM-20

(6) 4 bit Code Mode [use Busy Signal]

VCC   +12V

P1 — X0
P2 — X1
P3 — X2
P4 — X3
P5 — BUSY

uP   VCM-20
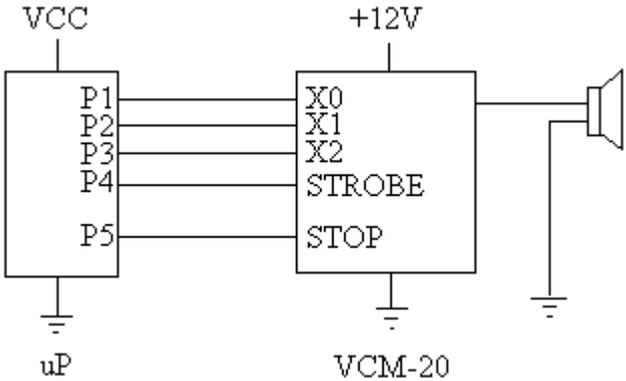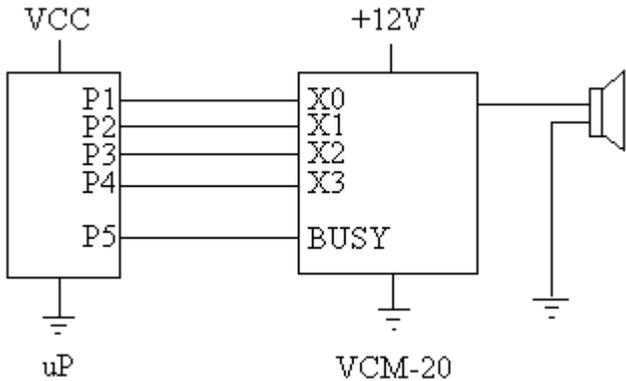
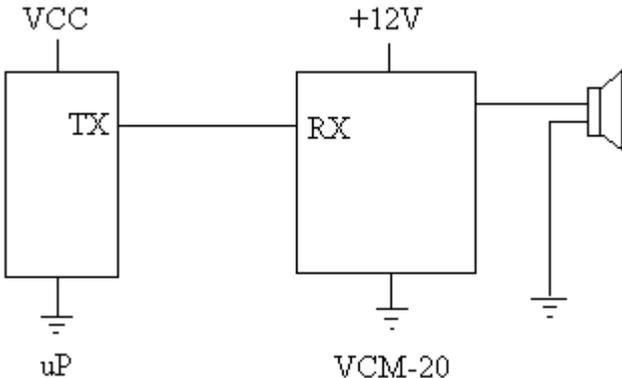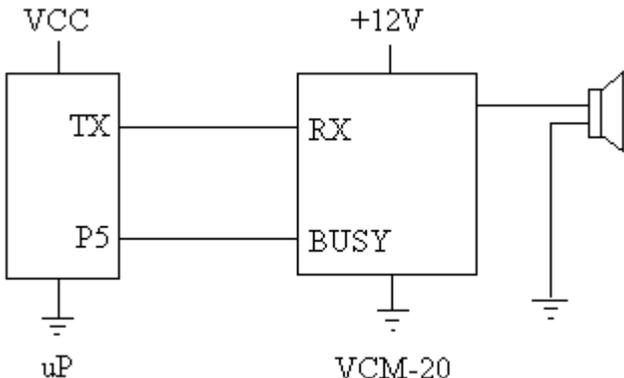## (7) 4 bit Code Mode [use Stop Signal]
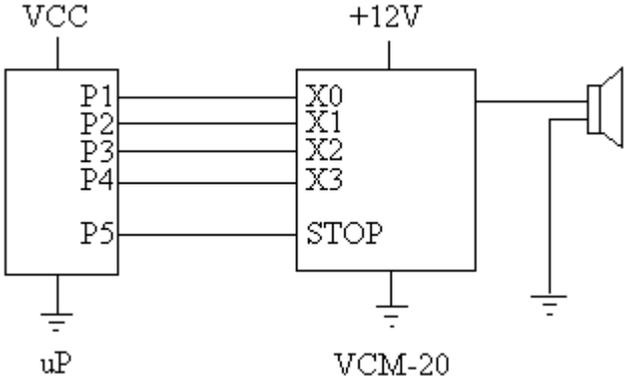
(8) Serial Code Mode

(9) Serial Code Mode [use Busy Signal]

(10) Serial Code Mode [use Stop Signal]