PC Programmable and Controllable Large Scale Music Fireworks Control System

Brochure

I. Introduction

Welcome!

GB Firing System dedicated to the world of Pyrotechnics.
This document shows how to use the PC programmable and controllable Large Scale Music Fireworks Control System.

PC programmable and controllable Large Scale Music Fireworks Control System is one of the professional Fireworks ignition Control System, which is provided by GB Special Effects Equipments Co., ltd. It consists of a PC, a Host-Controller, some sub-controllers and cables. Every sub-controller can ignite 32 cues fireworks, and the whole

System can ignite 3200 groups in total. The standard configuration is a PC, a Host-Controller, 30 sub-controllers, one terminal device, 26 cables, a serial cable, a USB-RS232, cable which can ignite 800 cues fireworks. The number of sub-controllers in the system can extend to 100 pcs, so the system has good expansibility. The user can create the ignition strategy flexibly according to the specific song, fuse the effect of music and fireworks furthest, thereby can make the best ignition effect artistically.

PC is the center controller of the system, it communicate the host-controller with the serial cable or USB-RS232 cable, sends command to host-controller and receive the data returned from the host-controller. On the host-controller's panel, there are:

(1) Four switches, can manage host-controller power supply, sub-controller power supply, Fire/Detection switch in sub-controller and host-controller operating mode;
(2) One serial port;
(3) One or two 7 cores cable ports;
(4) Voltage indicator can be used to indicate the voltage of the host-controller's cell inside.
(5) Charge interface.

The host-Controller is the main device of the system, which link up the PC and the sub-controllers. The shell of sub-controllers is made of stainless steel, On the top, there are 32 thread clips, which can ignite 32 cues fireworks. On the front and rear there are cable interface, an address identifier (ADDR_ID) and power indicator. The ADDR_ID can be set between 0 and 99.

II. Components

1. PC

fig 1 PC

2. Host-controller

The host-controller's appearance shows in fig 2.

The dimension of the host controller is 420 MM(long)×320 MM(width)×250 MM(height).

The host-controller has two versions, VER1.0 and VER2.0, VER1.0 has one 7 cores cable port and VER2.0 has two 7cores cable ports.

fig 2 Host-controller

3. Sub-controller

The sub-controller's appearance shows in fig 3.

The dimension of the sub-controller is 340 MM(long)×160 MM(width)×100 MM(height).

fig 3 Sub-controller

4. Cable

Cable is 7 cores，show in fig 4. The standard configuration of cable is 26 cables, a 100m long, 24 25m long, a 50 cm long.

fig 4 Cables

5. Serial cable and USB-RS232 cable

In the case of PC has the RS232 port, we can use the serial cable connect with the PC and host-controller, and in the case of PC has not the RS232 port, we can use the USB port of PC to connect PC and host-controller use the USB-RS232 cable plus serial cable. Show in fig 5.

fig 5 USB-RS232 Cable and Serial Cable

6. Terminal Device

Terminal Device connect to the rear of the system which ensure the stability of the system. Show in fig 6.

fig 6 Terminal Device

7. Remote Host Controller

Remote Host Controller is used optionally. The remote control manner is realized with the remote Host Controller and remote Sub Controllers be participated.

The dimension of the remote host-controller is 240 MM (long) ×210 MM (width) ×115 MM (high).

8. Remote Sub Controller

Remote Sub Controller is used optionally. The remote control manner is realized with the remote Host Controller and remote Sub Controllers be participated.

The dimension of the remote sub-controller is 315 MM(long)×255 MM(width)×180 MM(high)

III. Connect Method (CM)

1. The terminal control Method：Show in fig 9.This is the general connect method.

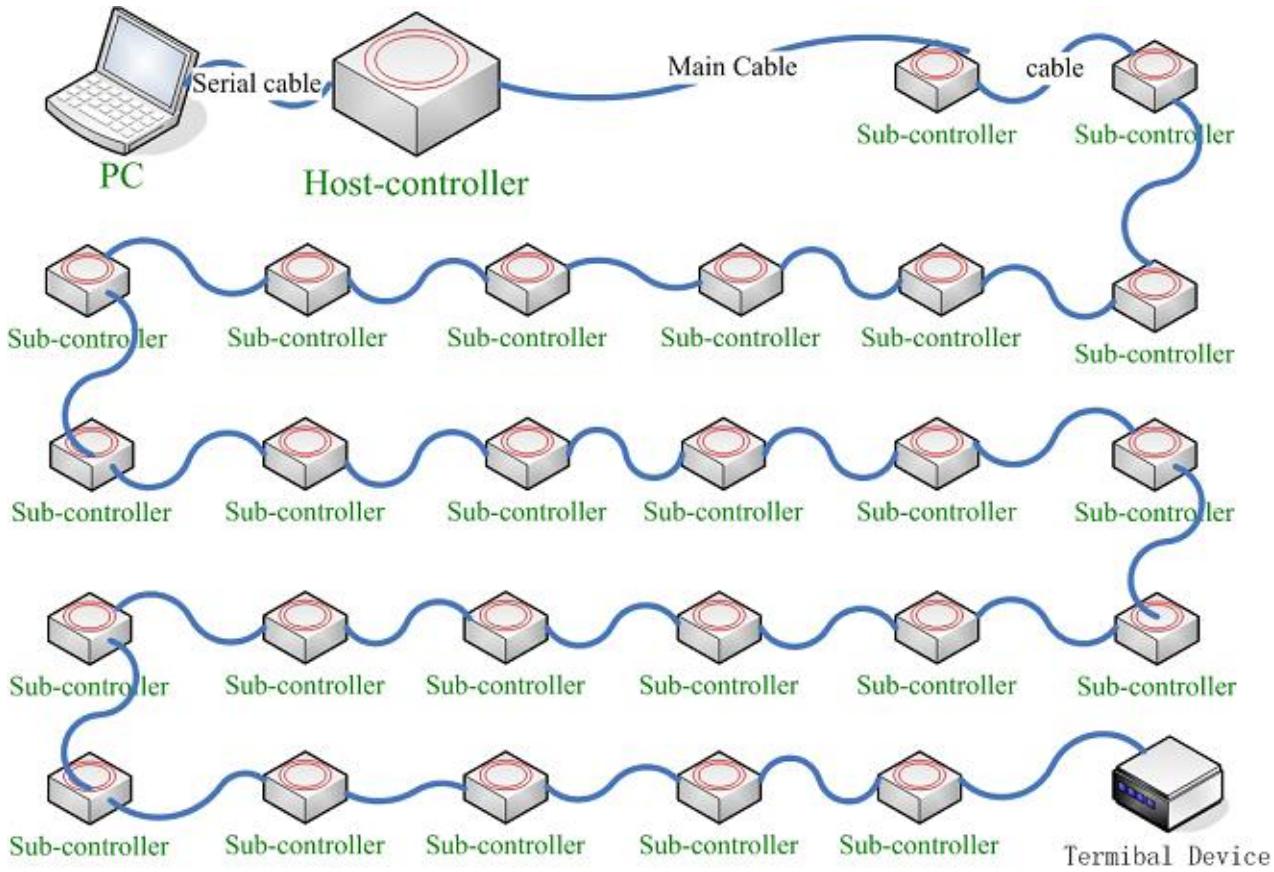


fig 9 The terminal control Method

2. The intermediate control Method：show in fig 10This is special connect method.

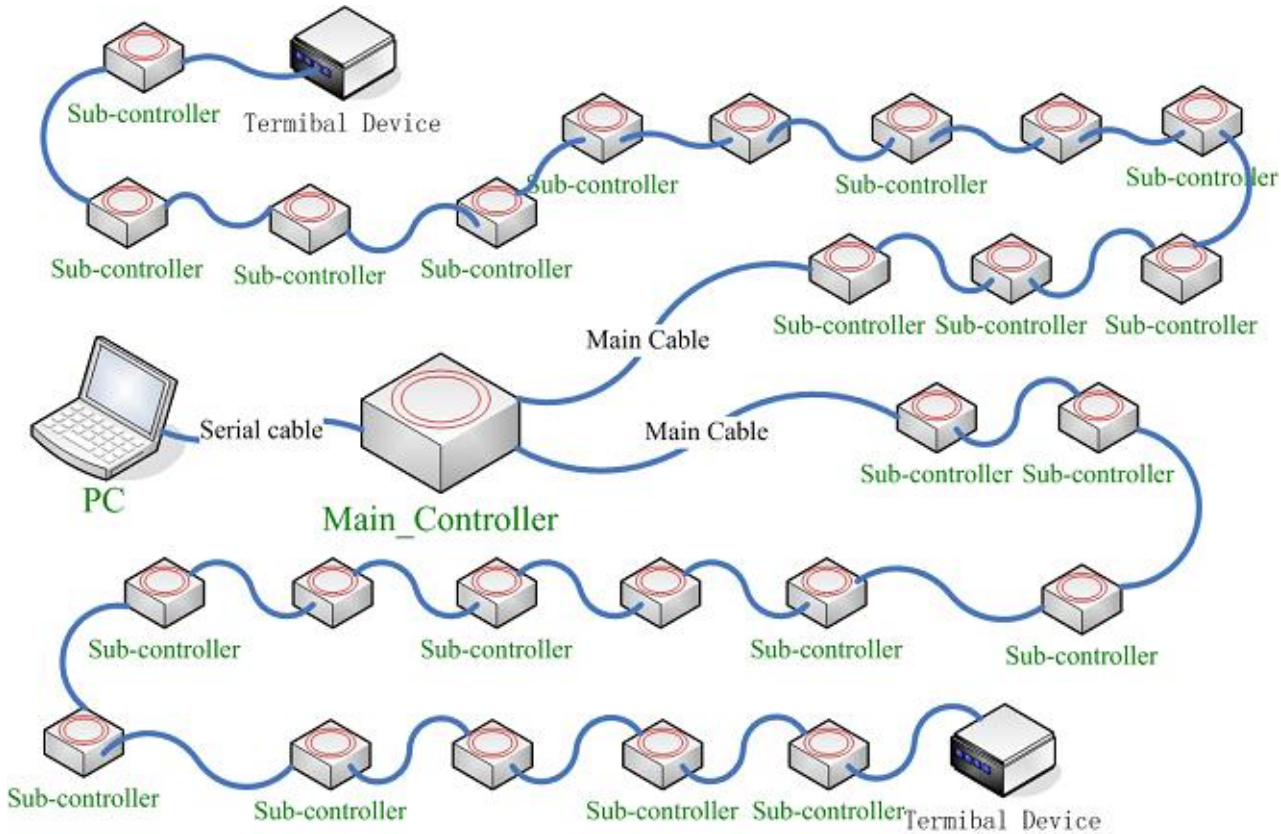


fig 10 The intermediate control Method

3. The remote Control Method: Based on the terminal control Method and the intermediate control

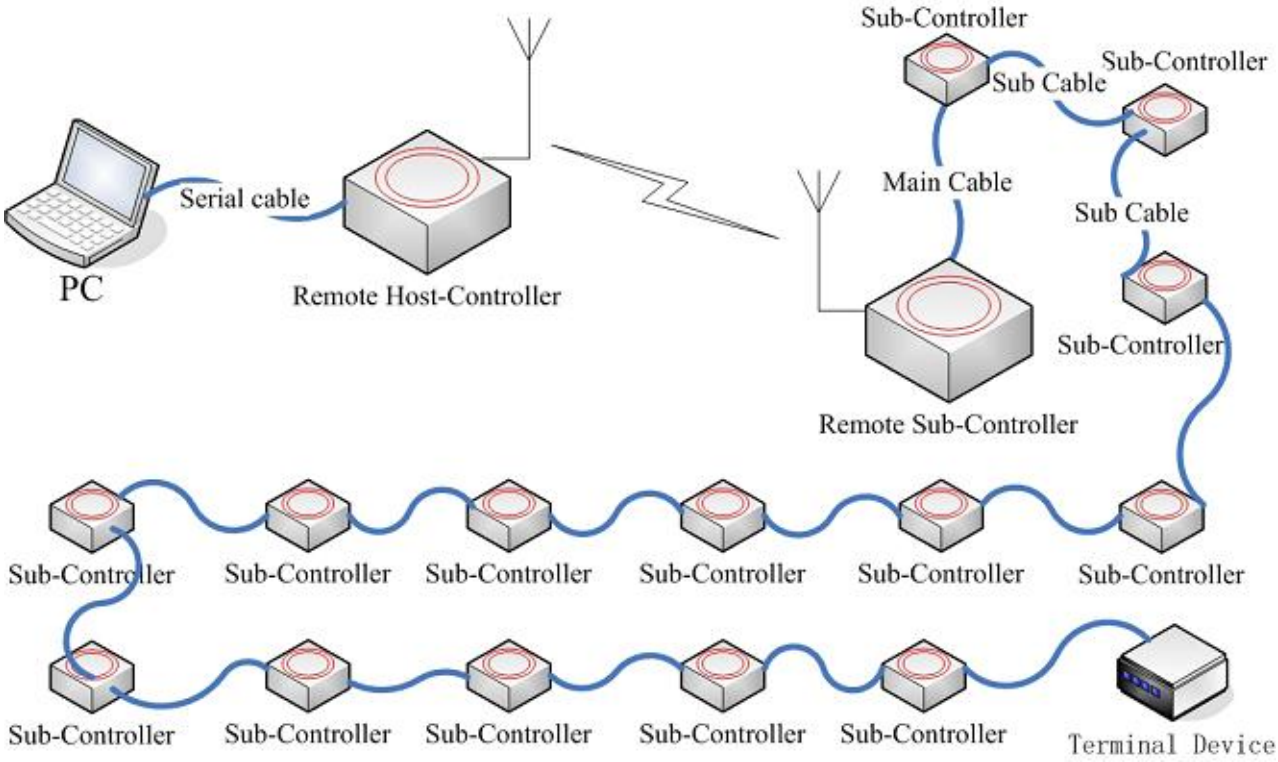


fig 11 Remote Control Method

Method, with the participating of the remote host-controller and the remote sub-controllers, the remote control manner can realize. The sketch map based on the terminal control method is show in fig 11.

IV. How to Use

4.1 Hardware

1. Please carefully check the components of firing system in advance. Whole equipment of firing system consist of：

(1) a PC; (2) a host-controller；(3) some sub-controllers；(4) one or two terminal Device;

(5) 26 7-cores cables; (6) A Serial cable and a USB-RS232 cable.

2. Aspect check before the mission of SET-OFF

(1) Switches, indicators, cable port, connection poles on the host-controller must be fixed reliably in good status, and with no damage;

(2) Confirm the host power, the sub power, fire/Detection switches are in “OFF”(upright).

(3) Confirm the cables are in good status with no damage, and the heads of cables have no become less crowded and distortion.

(4) Confirm the sub-controllers in good status, and with no damage.

3. The Connection of cables

After step 2, we can locate the host-controller, sub-controllers according to the SET-OFF mission, then connect the cables.

(1) The connection of electronically amorce head：

According to the SET-OFF strategy of the mission, connect the electronically amorce head on the specific sub-controllers' thread clip(the number of electronically amorce recommended is unique), And adjust the ADDR_ID in range of 0 to 99.

(2) The connection of cables：

Refer to fig 9 or fig 10 to connect the system.

(3) Serial cable or USB-RS232+serial cable：

Please switch off the power of host-controller, then connect the serial cable or USB-RS232+serial cable to the PC. In the case of PC has the RS232 port, we can use the serial cable connect with the PC and host-controller, and in the case of PC has not the RS232 port, we can use the USB port of PC to connect PC and host-controller use the USB-RS232 cable plus serial cable.

4. The sequence of Power On

(1) Start up PC，Note that not start the software of the control system;
(2) Switch on the host-controller；
(3) Switch on the sub-controller；
(4) Before SET-OFF, switch fire/Detection to the position of "Fire";
(5) Start up the software of the control system；
(6) Perform the Edit/Detection/Fire task.

Above step 2 to step 4 is completed on the host-controller. When in the edit status, step 2 to step 4 is alternative.

5. The detection before SET-OFF

(1) Confirm above operation is OK，clean up field, related persons in place of check of sub-controllers，others withdraw beyond the safe region.
(2) Perform the detection task according to the software part of this manual.
(3) Note down the abnormal groups of the SET-OFF;
(4) After checked entirely, notify the related persons make correspond cue to normal status.(in general the reason of abnormal is connection mistake);
(5) Switch off all the power.

6. SET-OFF

(1) Clean up field again, all persons withdraw beyond the safe region;
(2) In the "**The sequence of Power On"** add step 4- Before SET-OFF, switch fire/Detection to the position of "Fire";
(3) Perform the Fire task according to the software part of this manual.
(4) Switch off the sub-controller and host-controller power;
(5) Reclaim the equipment.

7. Charge

When the voltage is below 10V on the sub-controller and below 20V on the host-controller, please charge before use. The host-controller's charge must cooperate with the operating mode switch, the difference with switch on the "OP_MODE" is switch to the opposite position. Voltage check of the sub-controller will be used with the multimeter. On the host and sub-controller there are two poles for charge, read for anode and black for cathode. The charge voltage is 12 volts.

Recommend duration of charge: is not exceed 8 hours.

4.2 Software

PC Configuration：

The Lowest Configuration：
CPU：Pentium III 1GHz
Memory：256MB
VGA Card：VGA 16bits Color
Hard Disk：20GB
Windows 2000 or Windows XP
DIRECTX9

The Recommended Configuration：
CPU：Pentium VI 2.2G or higher
Memory：512MB
VGA Card： VGA 24 bits Color
Hard Disk：40GB
Windows 2000 or Windows XP
DIRECTX9

1. On the desktop of WINDOWS (fig 12), double click the icon “Fire Expert Application‘, or click the “Fire Expert Application” in the folder of “Program” → “Music Fire Control System”, then the software of the control system will start up.

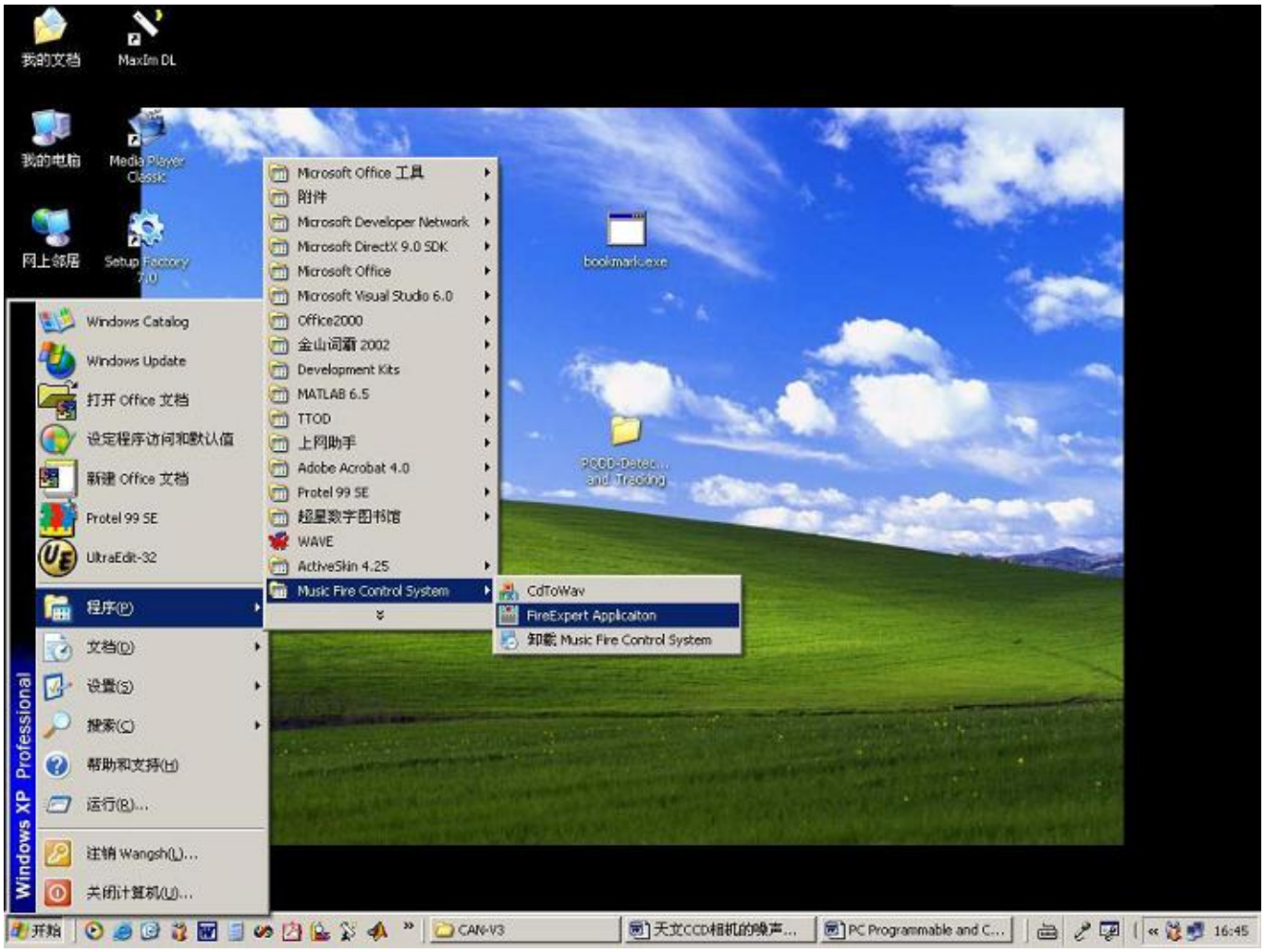


fig 12 Desktop

2. The control Interface show in fig 13. The communication port status and the status of connected to host-controller will display in the status bar below the interface, the status of control software will show in the status bar also(Edit Status). If the communication port initialized failure, please follow the fig 33 to configure the communication.

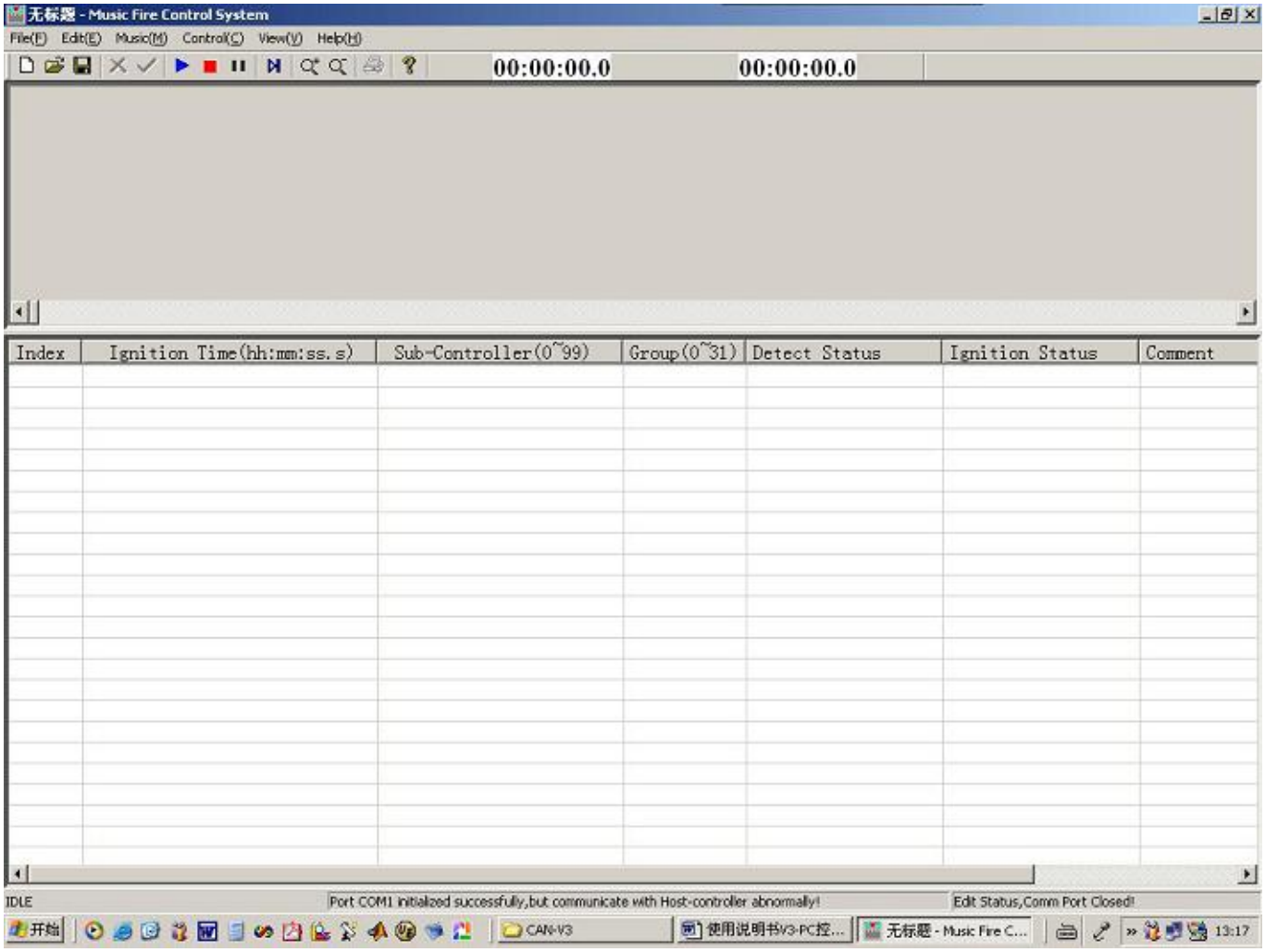


fig 13 Control Interface

3. Menus. Show in fig 14 to fig 19.

(1) File: Show in fig 14.

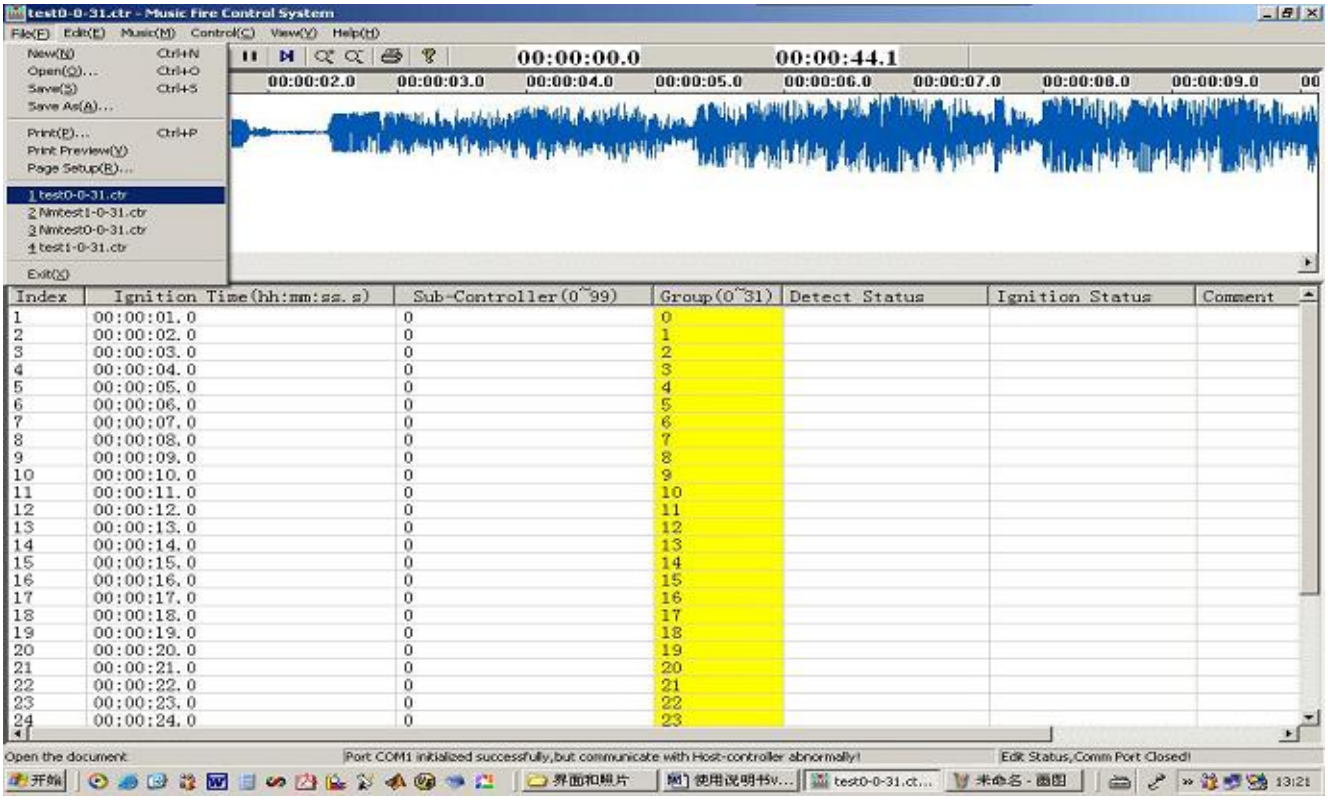


fig 14 “File” Menu

(2) Edit: show in fig 15.

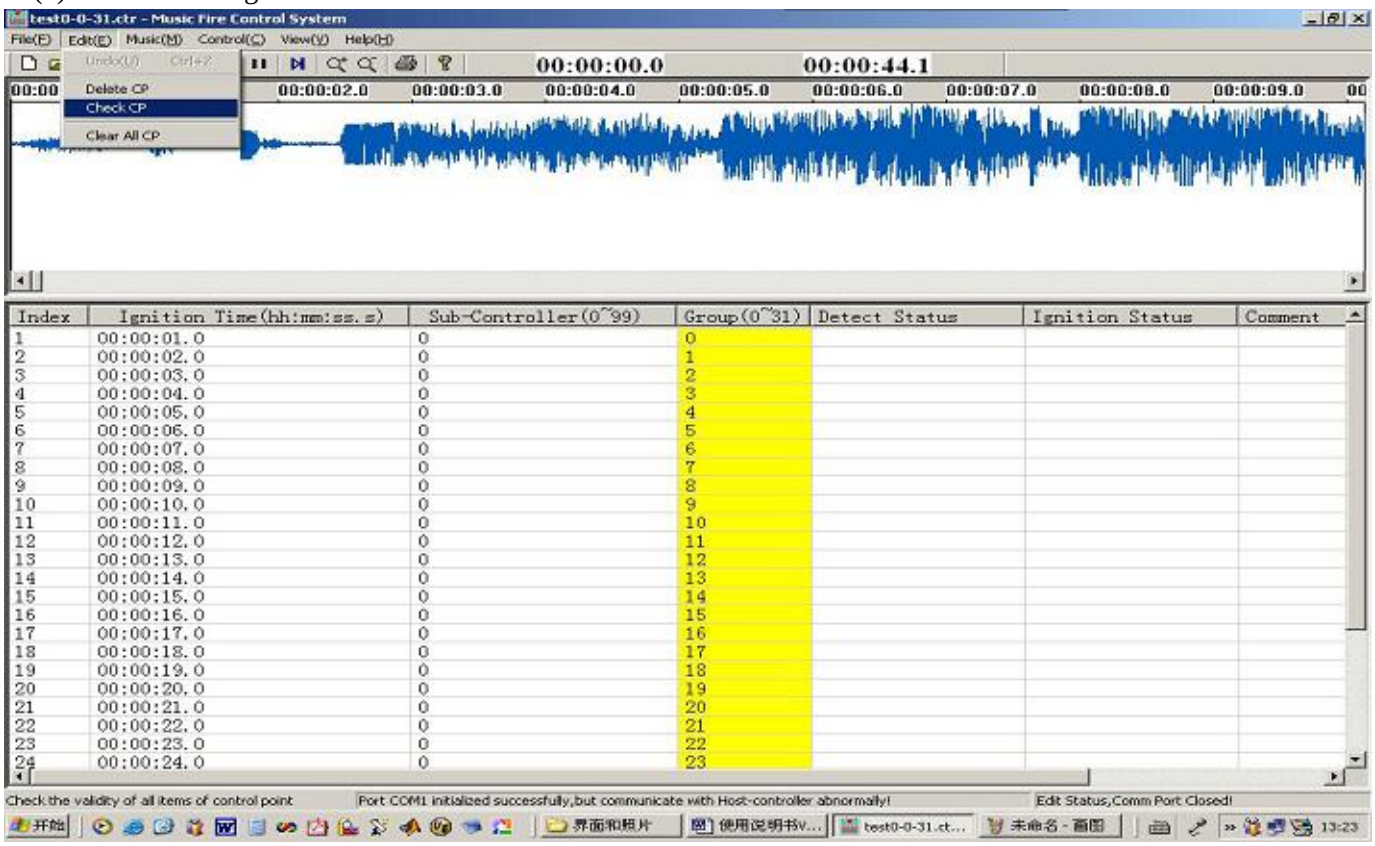


fig 15 “Edit” Menu

(3) Music: show in fig 16.

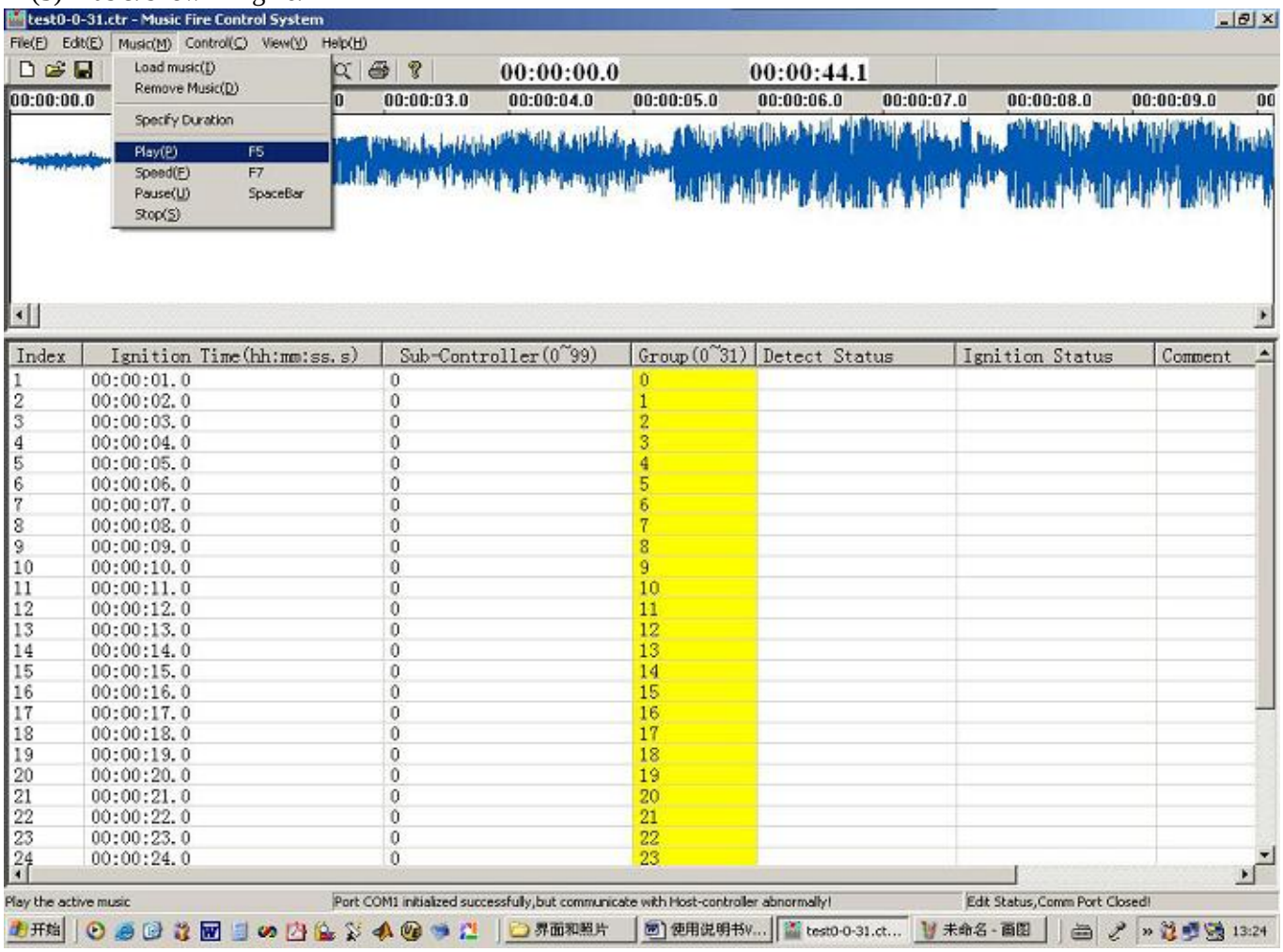


fig 16 “Music” Menu

(4) Control: show in fig 17. The menu has follow items: Cable control manner, Remote control manner, Communication setup, Edit, Detect, Fire, etc.

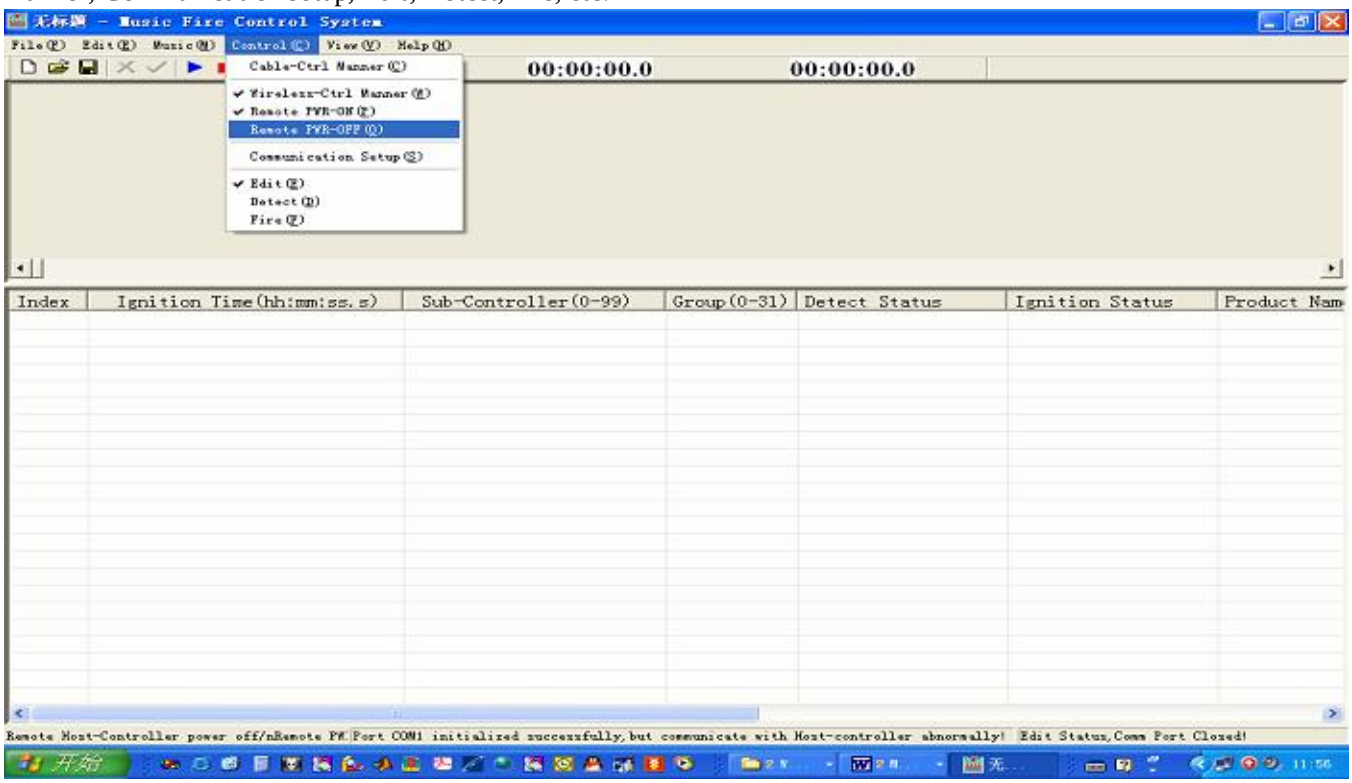


fig 17 “Control” Menu

(5) View: show in fig 18

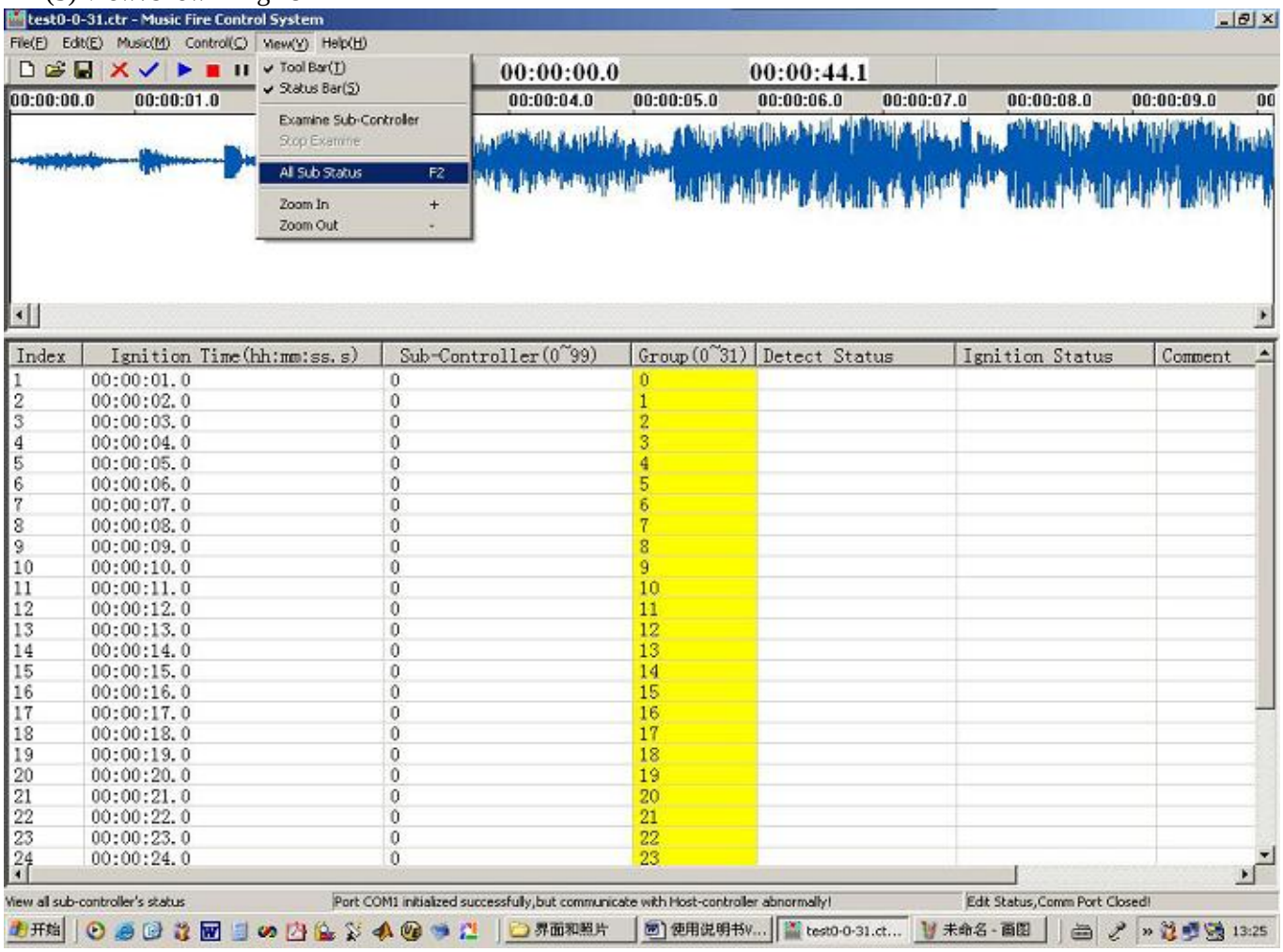


fig 18 “View” Menu

(6) Help: show in fig 19.Click the menu items can display the version of the program and open the User's manual.

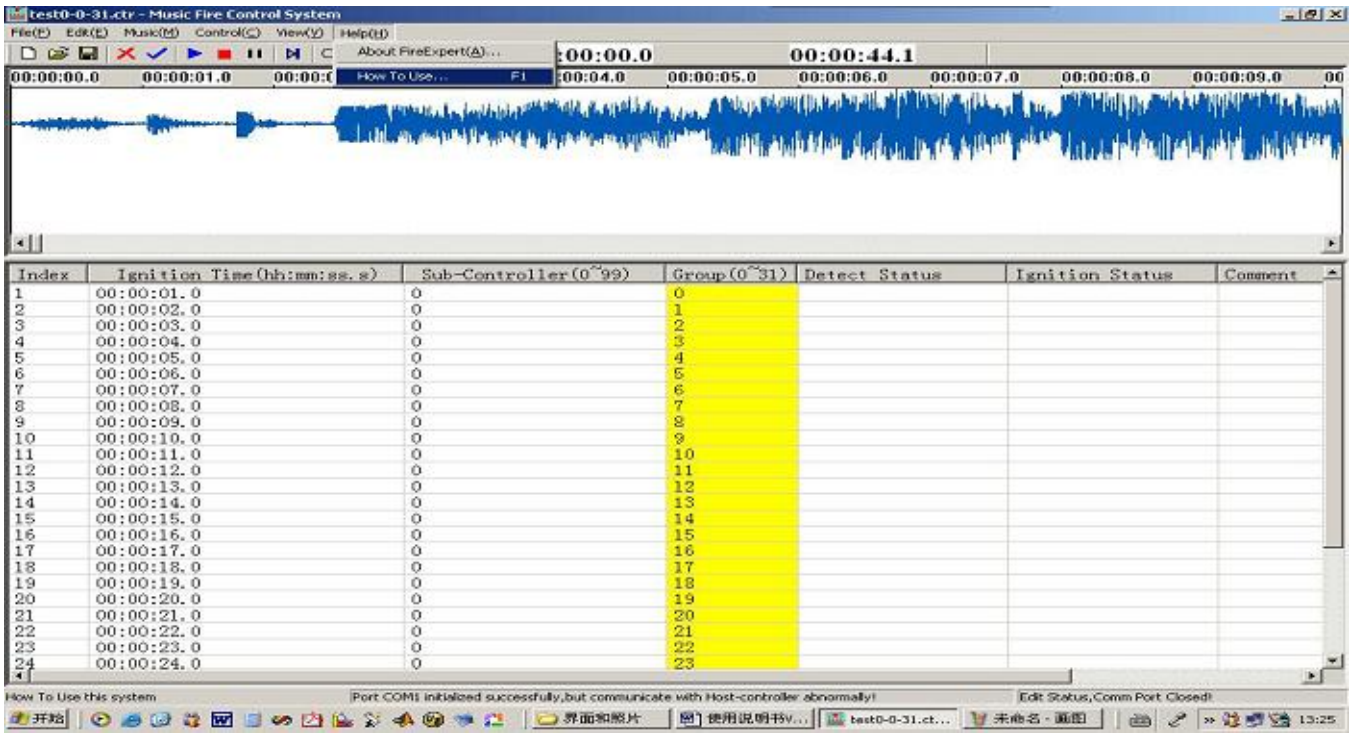


fig 19 "Help" Menu

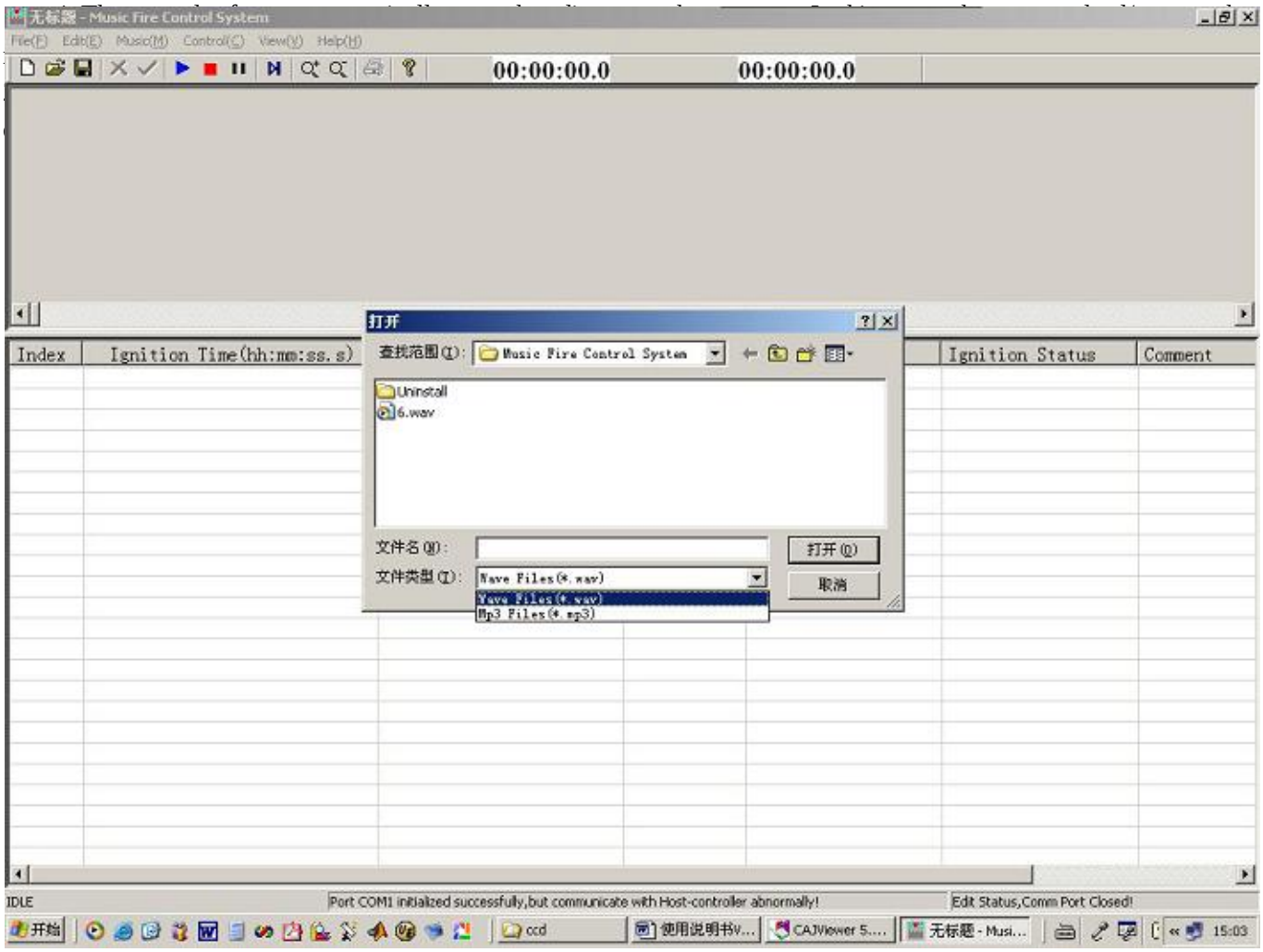


fig 20 Load Music

fig 21 shows the interface after load the music-“6.wav” in the install path.

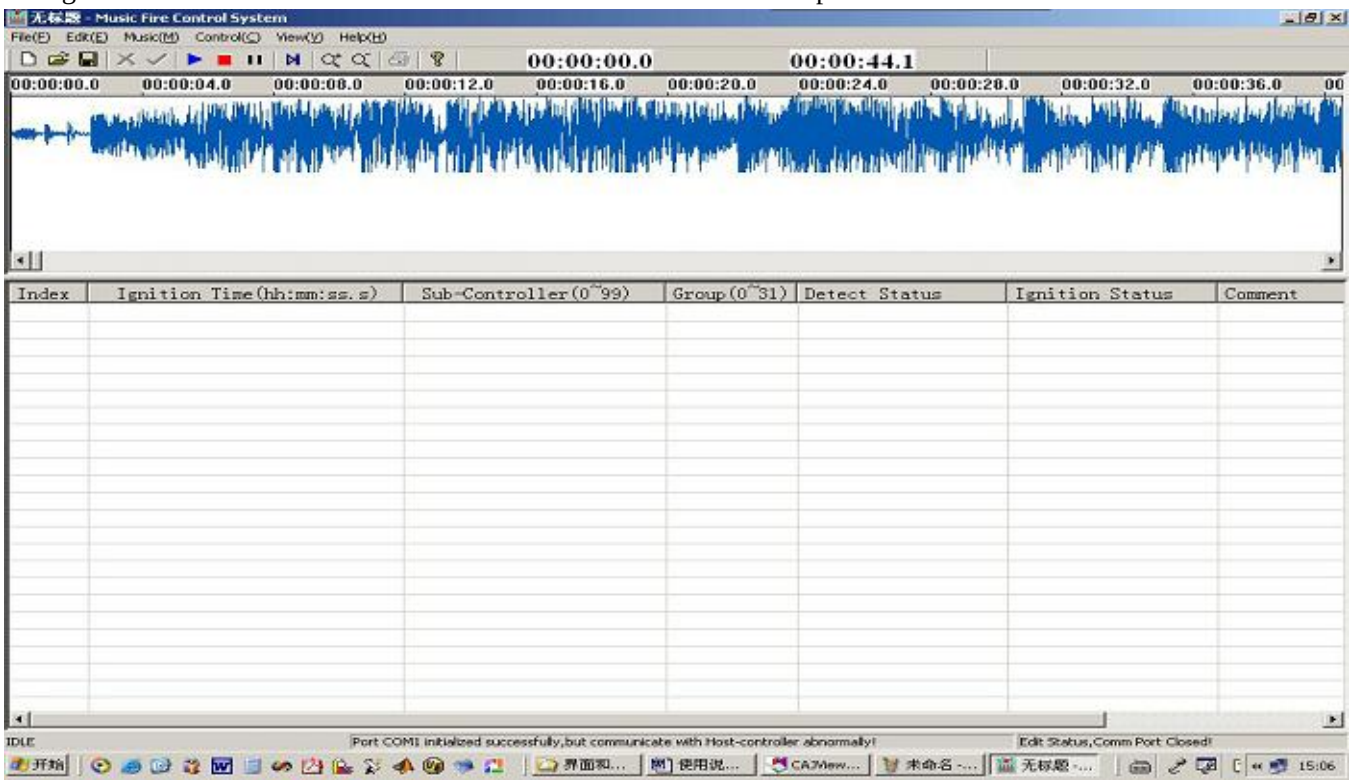
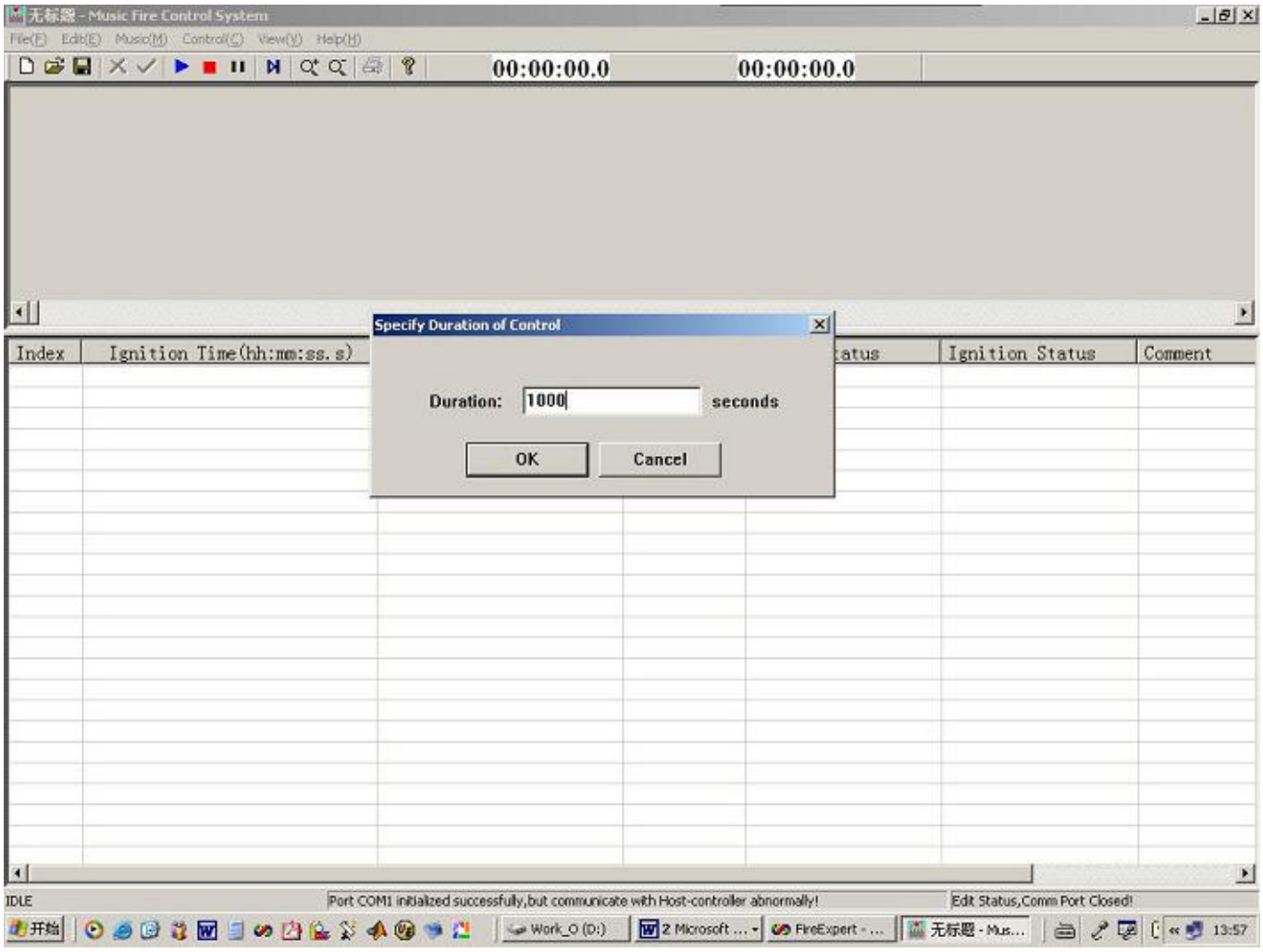


fig 21 After load Music

When no necessary to use the music, you can specify the duration of ignition. Click the menu “Music” → ”Specify Duration”, the specify duration of control dialog as show in will popup. You can specify the duration of control in seconds. The duration of control will display in the Total control window on the toolbar.



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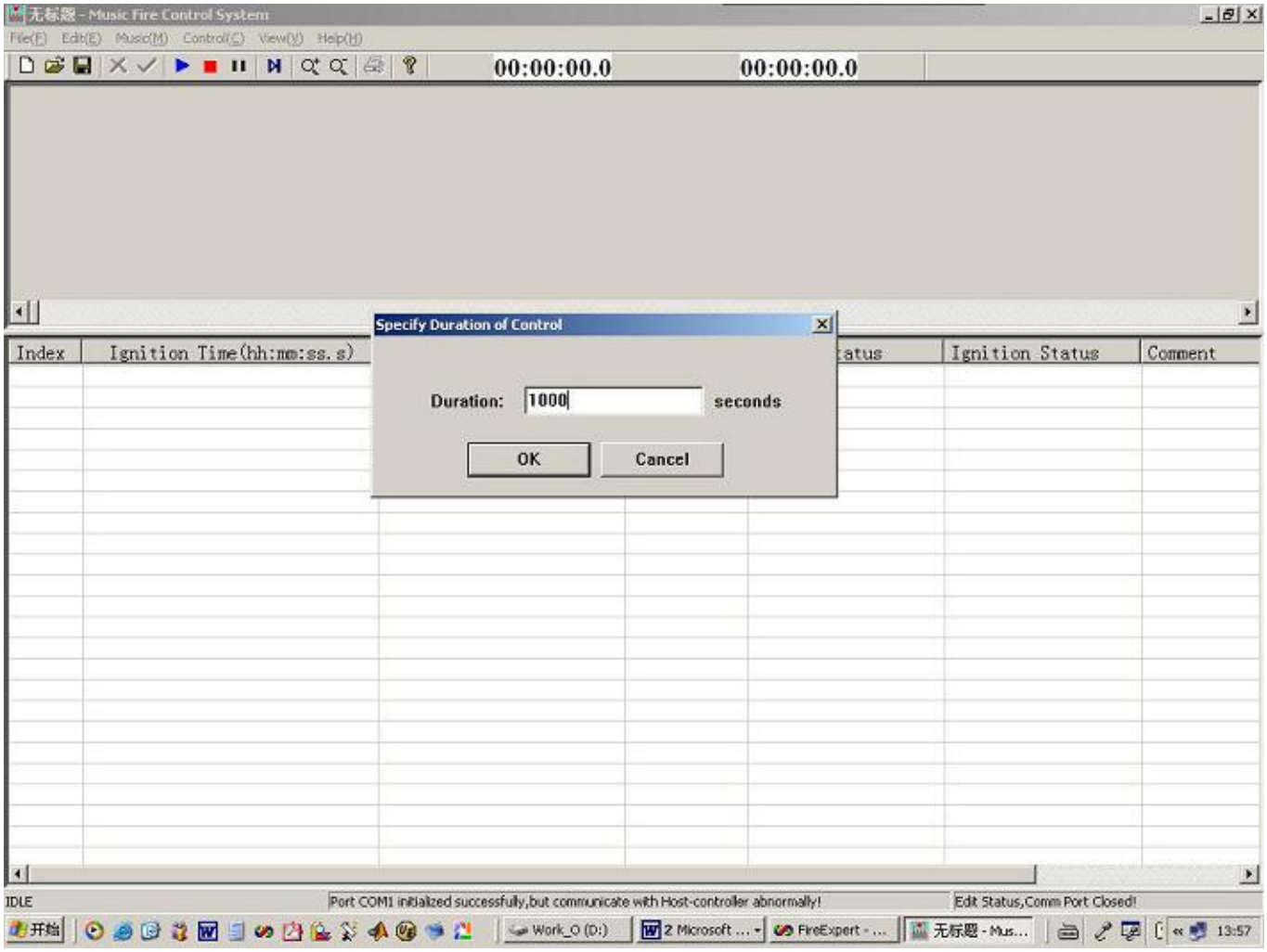


fig22 Specify the duration of control

fig23 shows the interface after specify the duration of 1000 seconds.

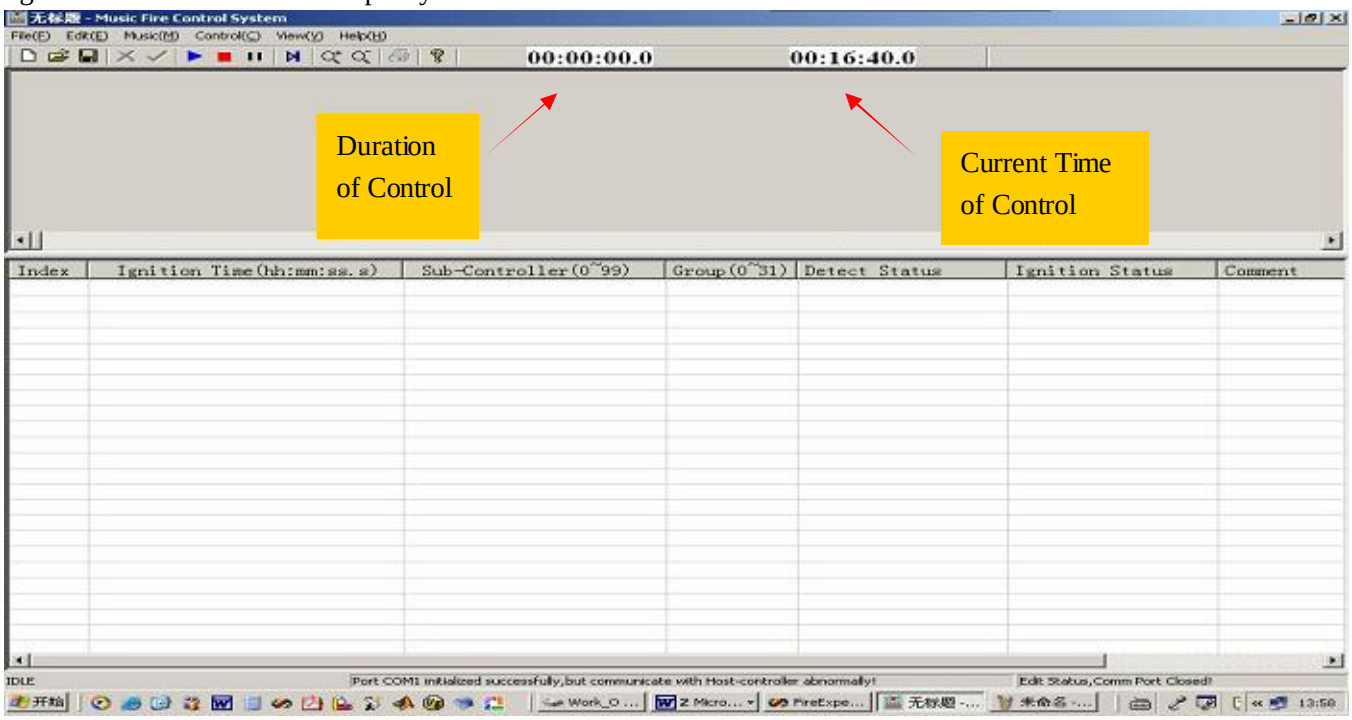


fig23 after specify the duration

5. After load the music, then can add control points. The control point is the fire group of the SET-OFF task. As show in fig 24. Click the “pause” button on the toolbar or push the spacebar in the edit status, then can enter the edit control point dialog. If the user wants to edit the item in the report table, he can double click the item in the edit status.

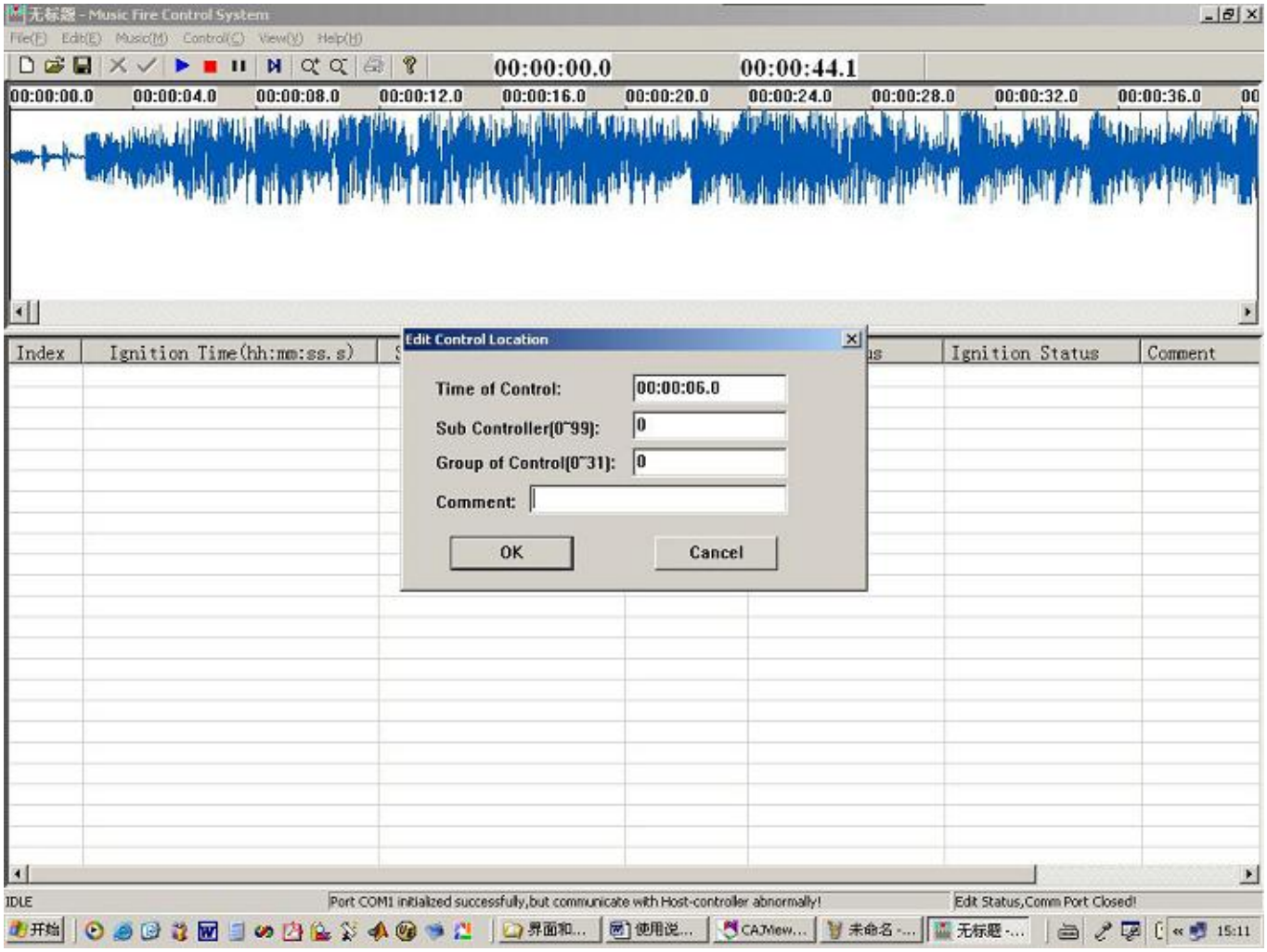


fig 24 Edit control point

The interface after add the control point show in fig 25.

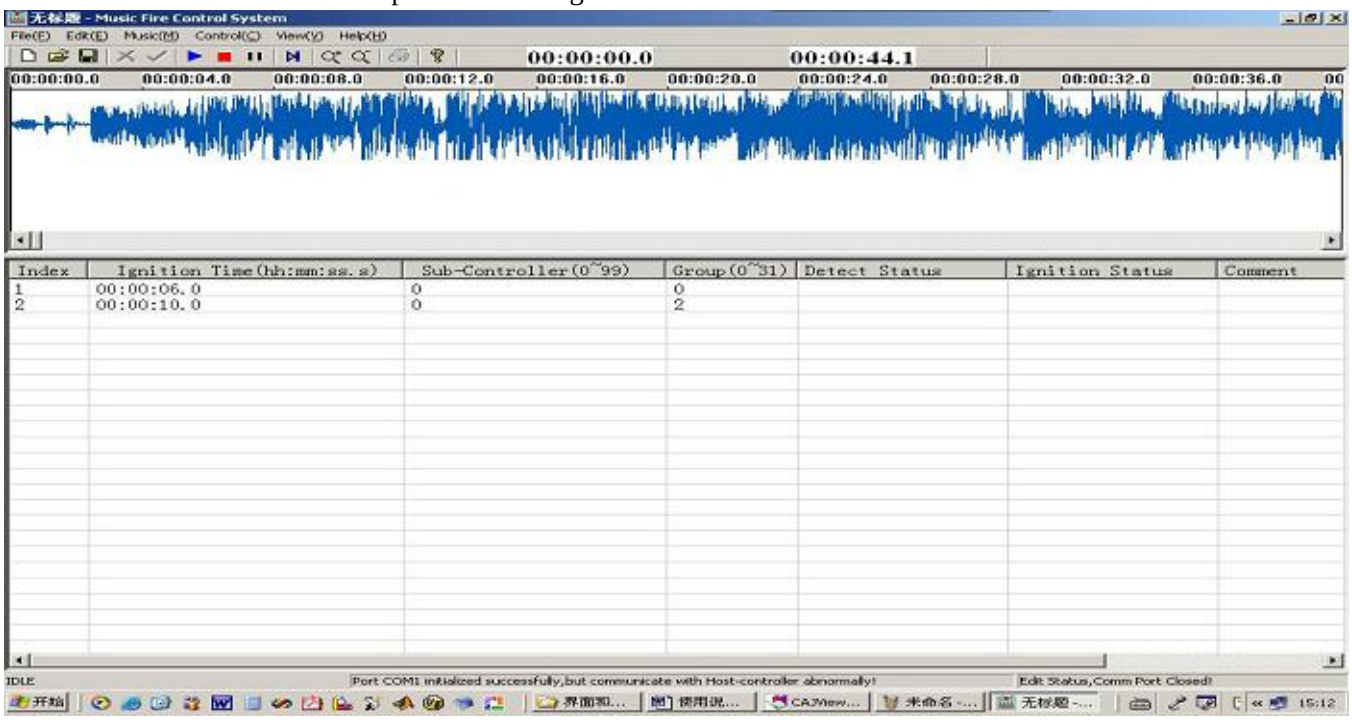


fig 25 After editing control point

6. When all the control point was edited over, the user can save the strategy file. Click “File” →”Save” menu, the dialog as show in fig 26 will popup, input the file name, then click “OK”. The extend name of the file is ctr.

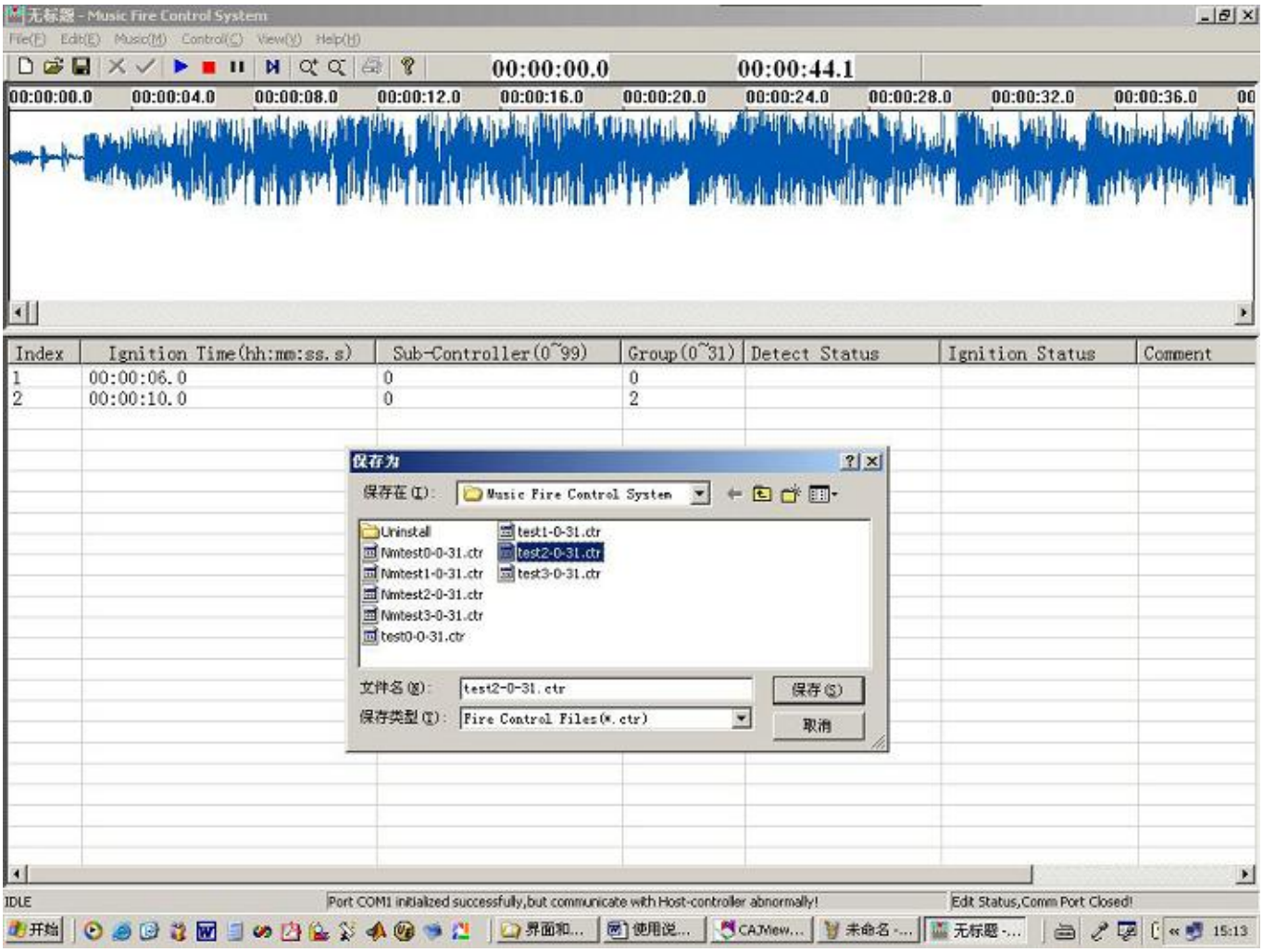


fig 26 Save control file

7. Before SET-OFF, the user can open the saved strategy file directly. As show in the fig 27. The control system automatically enters the edit status after open the strategy file.

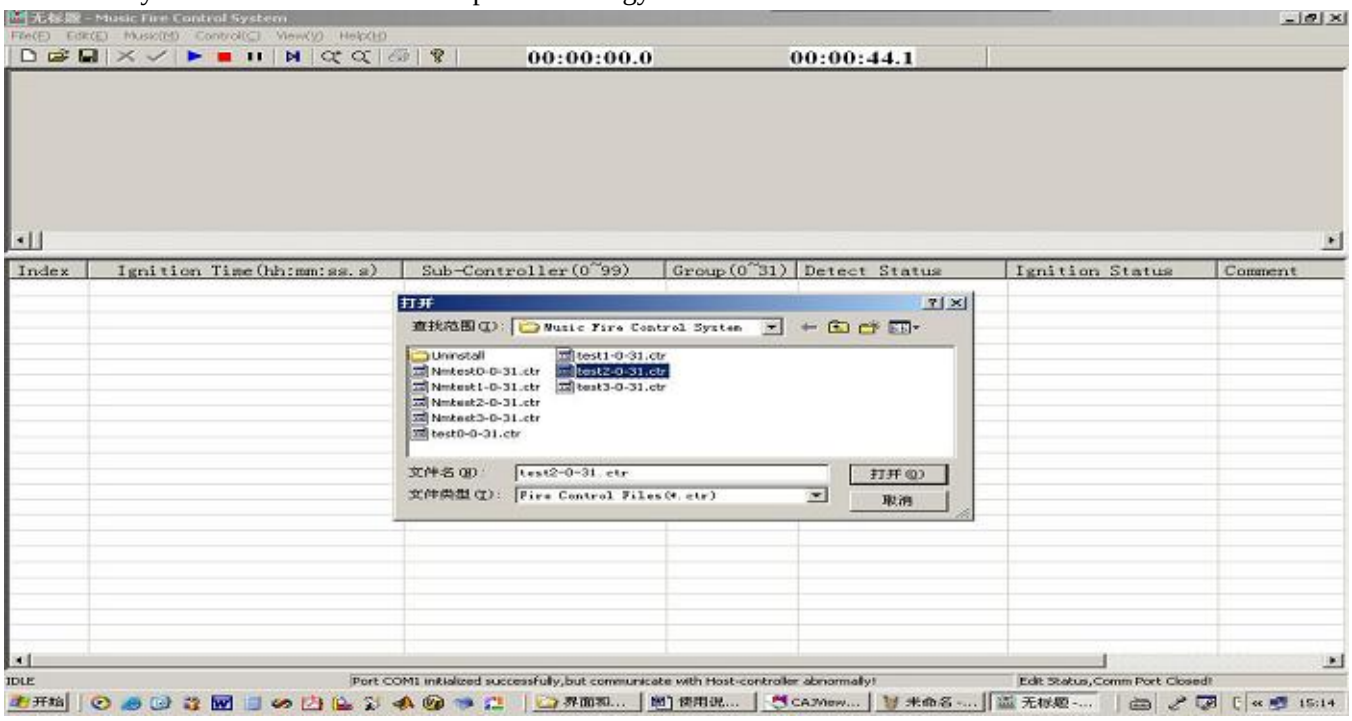


fig 27 Open control file

fig 28 shows the interface after open the control file. The music waveform and control point will show in the control interface.

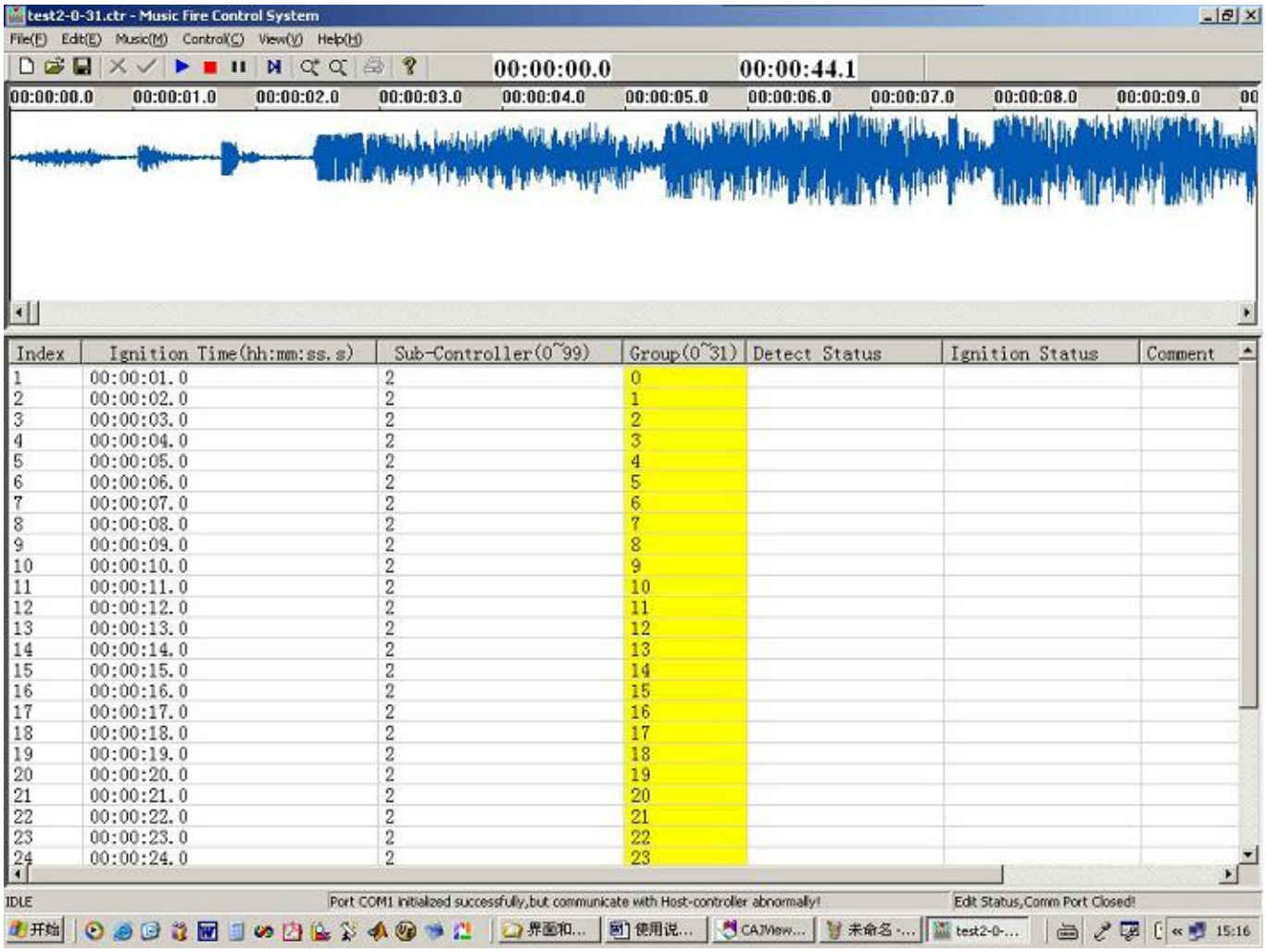


fig 28 After open control file

8. The selection of Control manner. Click “Control” → “Cable-Ctrl Manner” or “Control” → “Wireless-Ctrl Manner” can determine the control manner of mission. When the remote Host-controller and the remote Sub-controllers are used in the mission, the remote control manner should be selected.

9. Detection of Control points. Click the menu “Control” →”Detect”, the control system will enter the detection status. “Detect status, the Comm port is iopened” will show in the status bar in the right-bottom corner. Click the”Play” button in the toolbar, the detection task will be performed so. The status of control points will be returned and show in the report table. As show in fig 29.

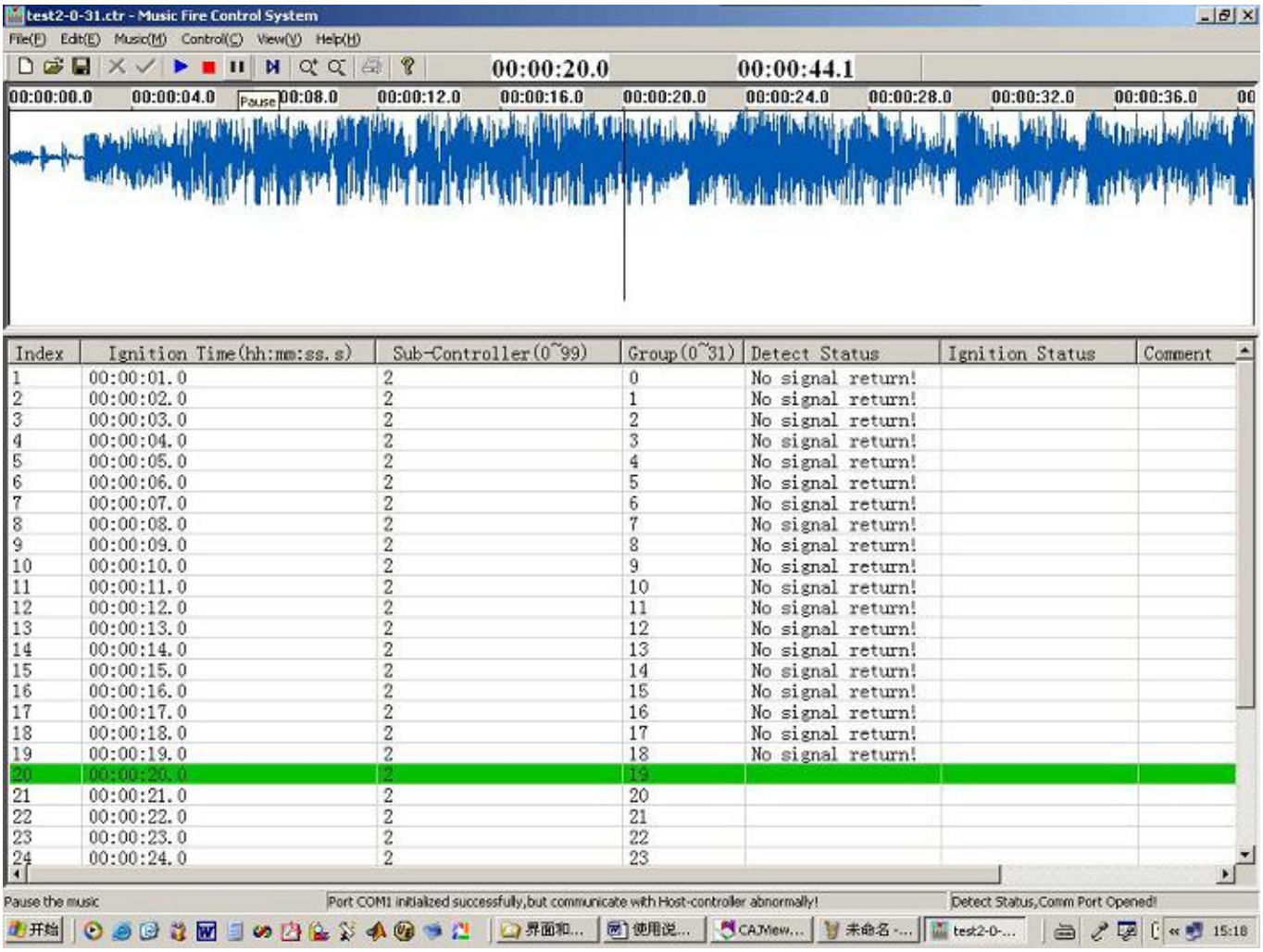


fig 29 Detection

10. Fire. Click the menu “Control” →”Fire”, the control system will enter the fire status. “Fire status, the Comm port is iopened” will show in the status bar in the right-bottom corner Click the ”Play” button in the toolbar, the Fire task will be performed so. The status of control points will be returned and show in the report table. As show in fig 30.

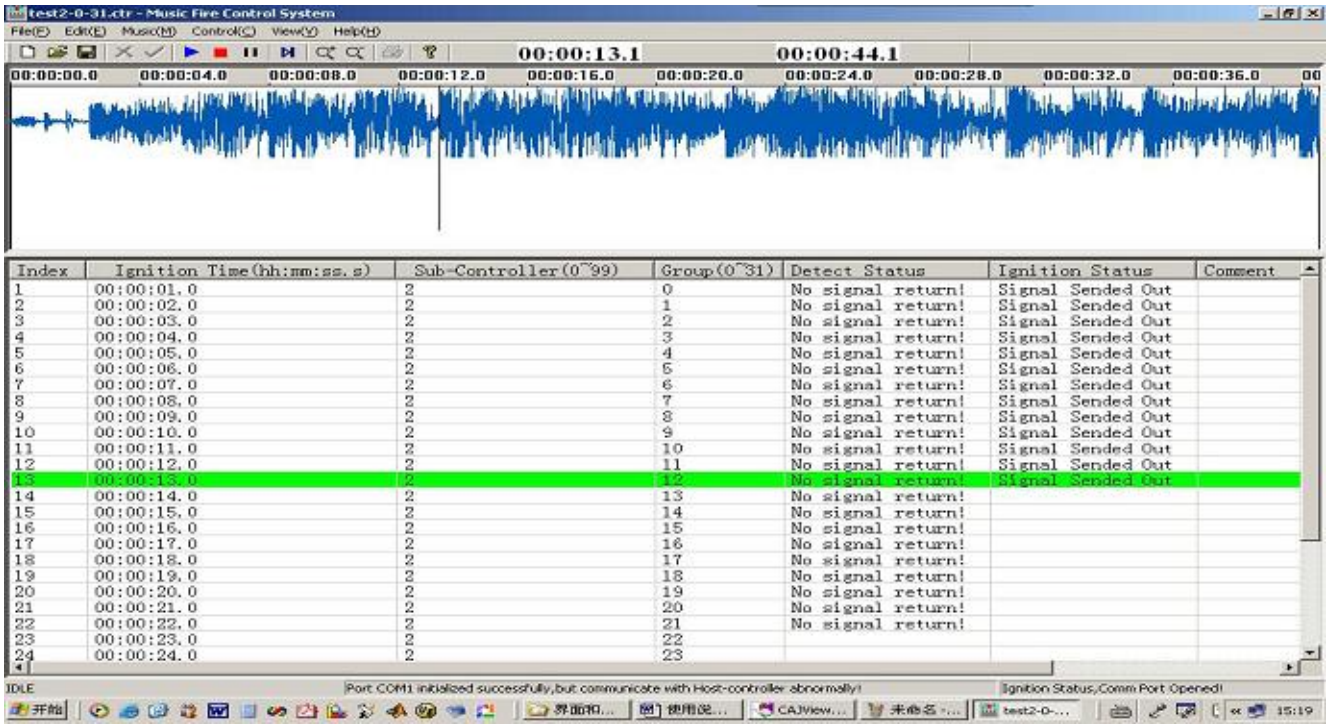
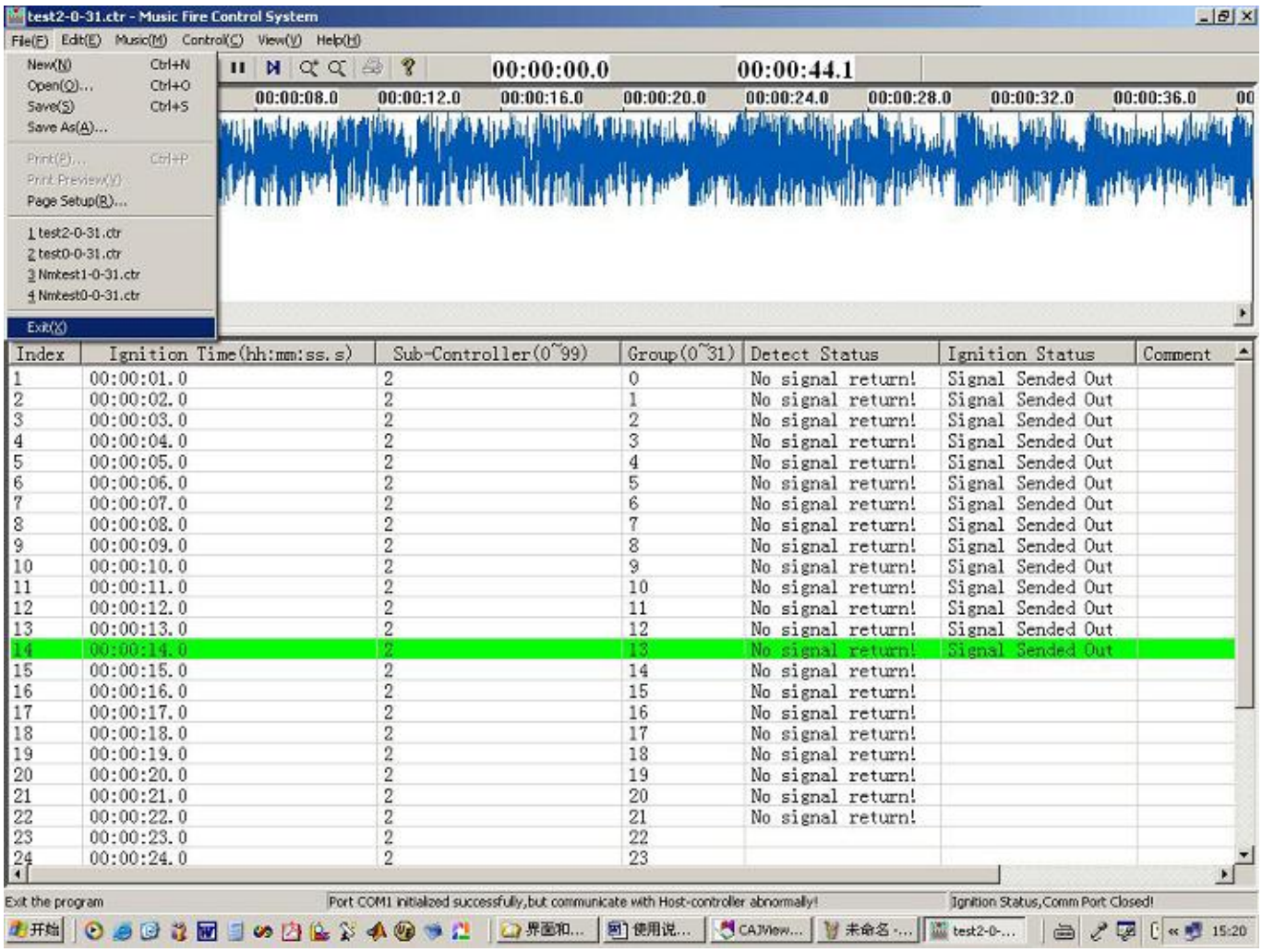


fig 30 Fire

11. Exit Program. If the SET-OFF is over, click the menu “file” → ”Exit” or the right-top close button, to exit the control program. As show in fig 31.



4.3 USB To RS232 Cable

If the PC has not serial port, user can use the USB port to connect the host-controller. In this case, the USB-RS232 cable will be used.

1. Install the driver of USB-RS232 cable, the driver is in the folder “USB-RS232/pcdriver(Z-TEK)” on the install disk;
2. Plug the USB-RS232 cable into the USB port on the PC;
3. The OS will install the driver automatically, after installed, there is a new port will show on the “PORT” node in device manager, eg. ,” USB Serial Ports(COM1)”,as show in fig 32.

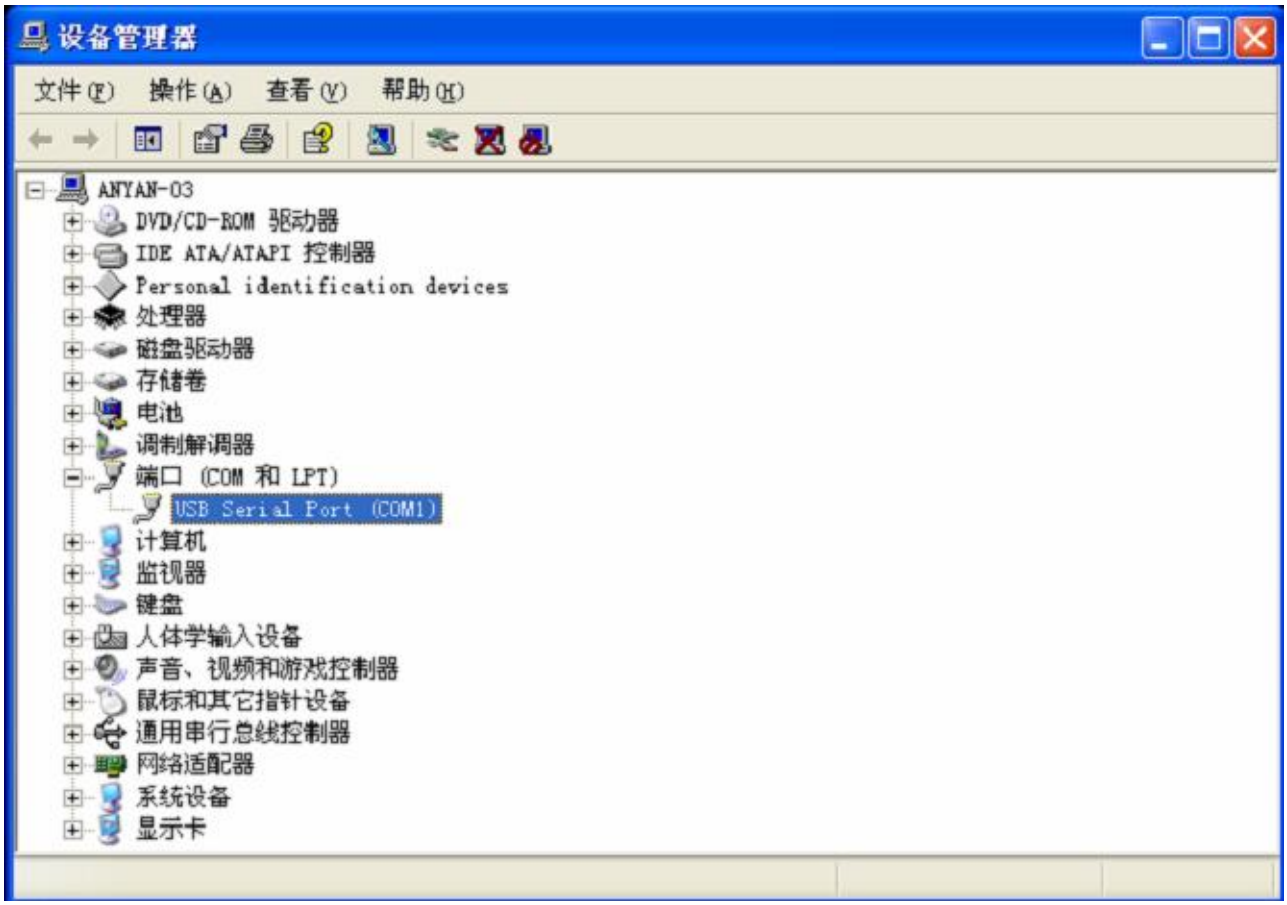


fig 32 USB-to-Serial Port

4. Click the menu “Control” → ”Communication Setup”, a dialog show as fig 33 will popup, in this dialog select the COM port “1”, then, the program will use the COM1 to communicate with the host-controller. In General, only alter the number of COM port is enough, others option not needed alteration.

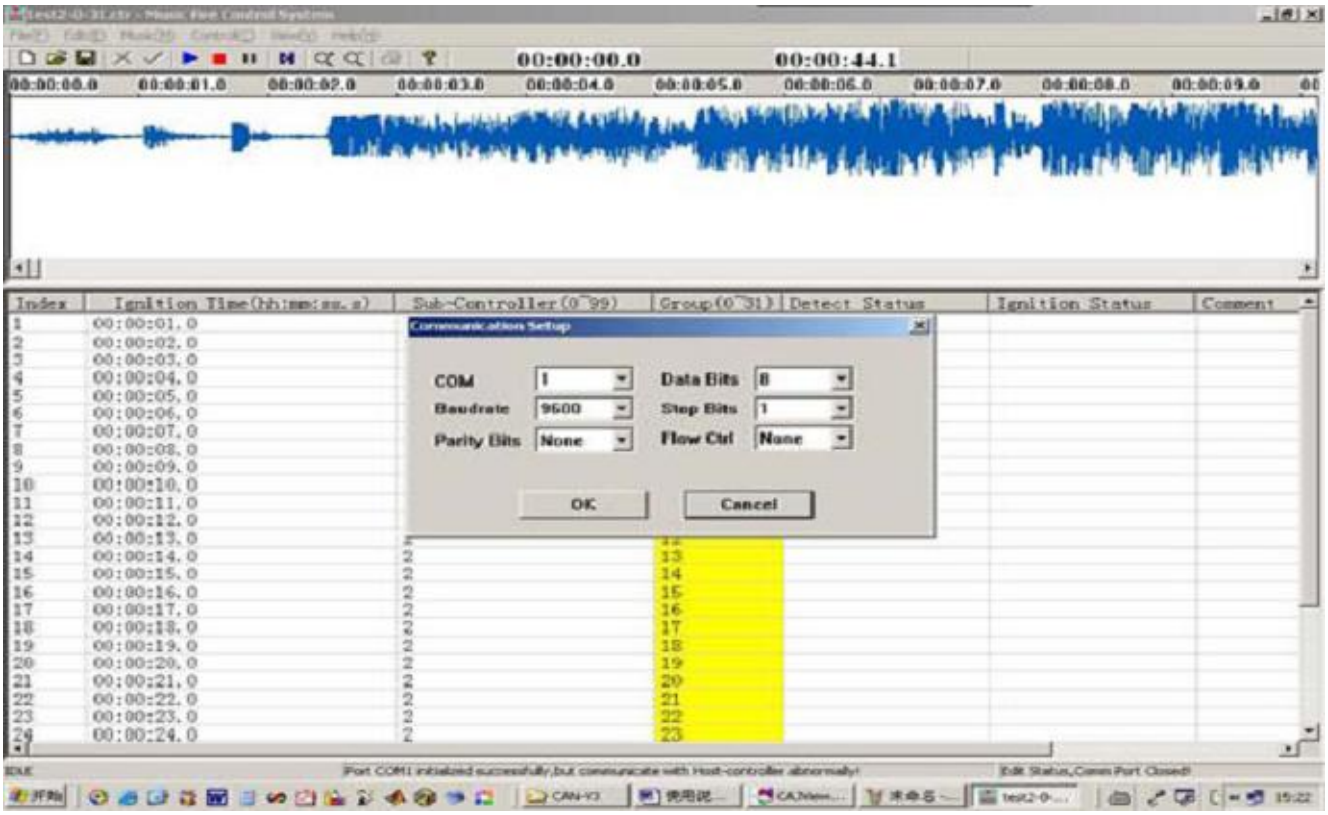


fig 33 Communication Setup

V. Attention

(1) Strictly follow the manual;
(2) Gently get and gently put down;
(3) Protect cable heads well;
(4) During the SET-OFF, not move about the sub-controller once the sub-controller was located. If must move to another place, must switch off the sub controller power;
(5) The equipment is waterproof and windproof to a certain extent;
(6) The voltage of cell must above 11V;
(7) The ADDR_ID rightly configured with the number from 0 to 99;
(8) Before connect the electronically amorce head, must check the resistance of the electronically amorce head, which the resistance beyond 1 to 3 Ω must discard.
(9) The number of electronically amorce head on one thread clip not exceed four, the resistance of electronically amorce head plus the resistance of extend twisted-pair not exceed 10Ω. One electronically amorce head connected to one thread clip is recommended.
(10) Operating temperature not below -20℃, When used below -20℃, Please adopt some heat measure;
(11) Once abnormal situation occur, please ask the professional person to solve;
(12) The total control distance is not exceed 3 kilometers;
(13) Protect the cables when SET-OFF, advise pave underground or protect key part with stannic berth paper;
(14) During transport, storage and working, please keep upturned and protect electronical amorce head clips well;
(15) When the host-controller is version 2, the other terminal device connected to the other unused cable interface optionally due to the situation.
(16) When detecting, please select one or more electronical amorce heads to simulate realtime SET-OFF.

VI. Trouble Shooting

1. If “COM Port * initialized failure” is show in the status bar when the control software start up, then the control system is abnormal. There are two causes:

   (1) The COM port is not exist, please follow the fig 33;

   (2) Program was not exit normally last time, the process was not ended. Please open the task manager, if the “FireExpert.exe’ is exist in the process card(as show in fig 34)，then end the “FireExpert.exe” process, attempt to start the control software again.

fig 34 task manager

2. When perform the detection, communication normal, but detection status is abnormal, there are two causes:

   (**1**)**Reset of Host-controller is not enough;**

   (**2**)**There is having the same ADDR_ID sub-controller.**

   The solution is power on again and check the ADDR_ID of sub-controllers.

3. When exception is presented when switching between the cable-control manner and the remote control manner, Please determine the desirable control manner, exit the application, then start the application again.

4. When use USB-RS232 cable, after installed the driver, the COM port number is exceed 4, eg. COM5、COM6, please alter attribute of port as follow:

   (1) Right click “My computer” → ”Attribute”, then popup “System attribute” dialog;

   (2) Click the “hardware” sheet, then click device manager, then popup the interface of device manager;

   (3) Double click the ” USB Serial Port (COM*)” in the “Ports(COM 和LPT)” node, then popup “USB Serial Port (COM*) attribute” dialog;

   (4) Click the button “Advanced” in sheet “Port Setup”, then popup “COM*’s advanced setup” dialog;

   (5) Select “COM port number” to one of not in using COM1 to COM4, eg. COM1, then click “OK”, return the “USB Serial Port (COM1) attribute” dialog;

   (6) Configure the specific port as show in fig 35, then click “OK”.

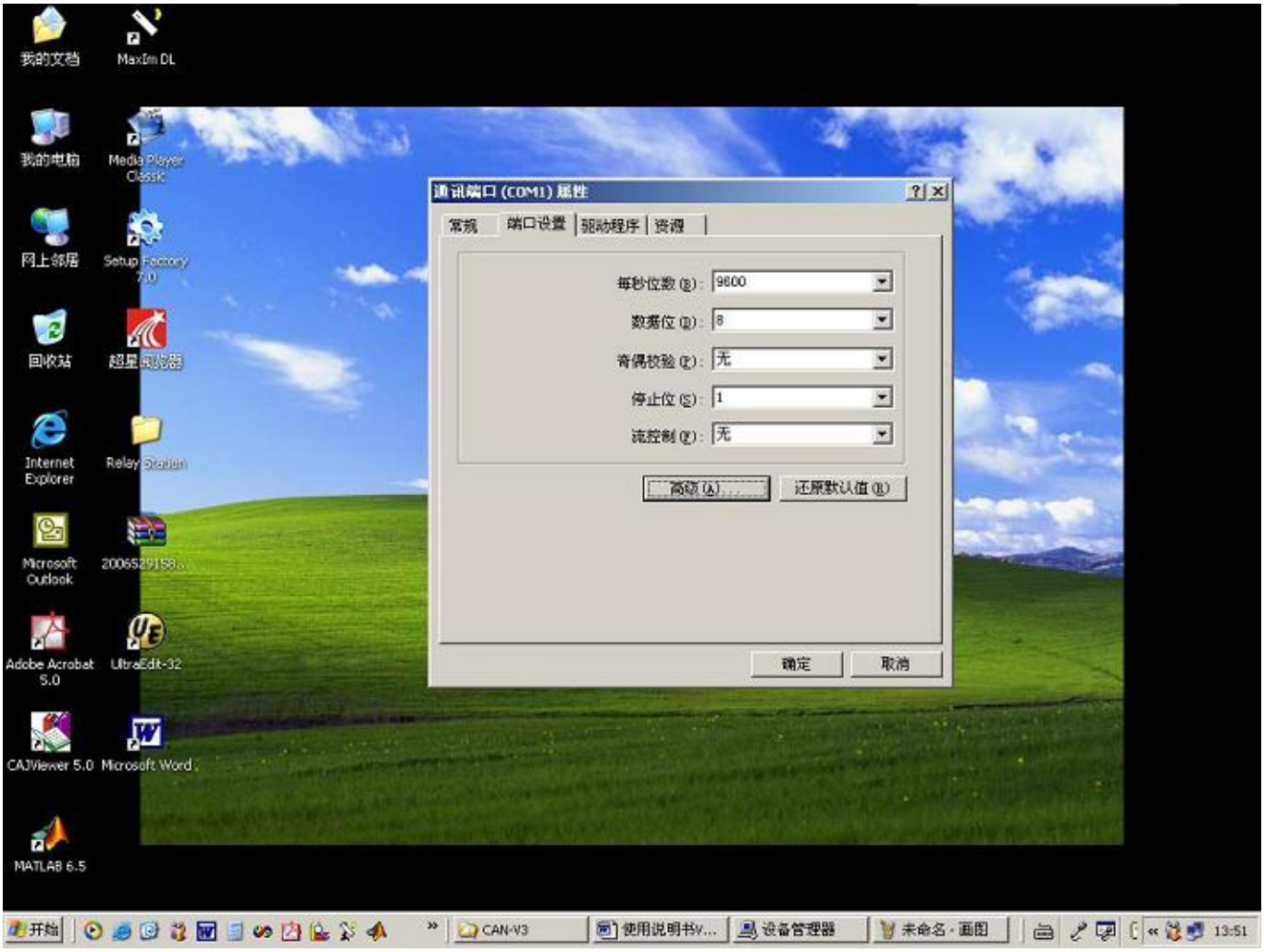


fig 35 Port attribute

Hunan Dream Fireworks Co., Ltd
GB Special Effects Equipment shop
URL: www.dreamfireworks.cn
Email: vicky@myanhua.com
MSN: vicky@myanhua.com
Skype: pyro.vicky
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