

# **X-10® POWERHOUSE™**



Commodore 64/128  
Software Owner's Manual

# 1 TABLE OF CONTENTS

Introduction	3
Required equipment	4
Set-up instructions	5
System diagram	6
System operation	7
Demo mode	8
Joystick operation	13
Install mode	13
Operate mode	23
Now	27
Today	27
Tomorrow	28
Everyday	28
Specific Days	29

Review	30
Exiting the program	33
Saving schedules	34
Keyboard operation	36
Manual operation	37
Appendix - A, Utility program	38
Glossary of terms	49
Software license and warranty	55

### 3 INTRODUCTION

It is assumed that you have already read the owners manual supplied with the POWERHOUSE™ Computer Interface, have set up the X-10 modules and checked that you can turn them on and off manually from the rocker keys on the Interface. If this is the case you may skip the rest of this section and proceed to page 5 of this manual ( SET-UP).

If you already own other X-10 components and are adding the Computer Interface to your system, you may have decided to skip the hardware manual, in which case please read on.

#### **First check that the Interface works manually:**

Plug the Interface into a 120 volt outlet where you intend to leave it. When you first plug it in, the housecode will be set to "A". Therefore set all of your existing modules to housecode "A" and a unit code between 1 and 8 (you can change these settings later when programming your schedules). Check that you can turn on and off all of your modules from the Interface by pressing the ON and OFF sides of the rocker switch corresponding to the unit code you set on the module. If this doesn't happen, refer to APPENDIX D (TROUBLESHOOTING) in the manual supplied with the POWERHOUSE™ Computer Interface.

## REQUIRED EQUIPMENT

4

The software and cable supplied with this manual are designed to work with the POWERHOUSE™ Computer Interface, Model No. CP290. You will also need the following:

- Commodore 64 or Commodore 128 (operating in C-64 mode).
- 5 1/4" Disk Drive
- Television set or monitor (color for best results).
- One Joystick.
- 9 volt alkaline battery.
- X-10 modules (quantity and type are dependent upon which lights and appliances you wish to control. See Appendix - B in POWERHOUSE Computer Interface owner's manual for types of modules available).

## 5 SET-UP INSTRUCTIONS

1. Connect your computer to your color TV (or monitor). If you are using a TV, set the antenna switch box to COMPUTER (or GAME).
2. Install a 9 volt alkaline battery in the battery compartment located at the back of the Interface.
3. Plug the Interface into a 120 volt outlet.
4. Connect the Interface to the User Port on the Commodore 64 or Commodore 128, using the cable supplied with the software.
5. Plug a joystick into control port 2.
6. Turn on your TV (or Monitor) and tune it to channel 3 or 4. Set your modulator switch to the same number.
7. Turn on your Commodore 64 and disk drive (if you have a Commodore 128 hold down the Commodore key while you turn on the computer to enter the C-64 mode).
8. Insert the program disk into the disk drive and load the program by typing **LOAD "X10",8** and then press RETURN. When you get the blinking cursor, type **RUN** and then press RETURN.

Note: If you completed step 2 above, then you have a battery back-up system. If a power failure should occur, the Interface will run on battery back-up. This will be indicated by the flashing of the red transmit light approximately every 5 seconds. If the Interface is without power for approximately 100 hours you will lose all programmed information you have entered. It is good practice to remove the battery if the Interface is unplugged and not used for a long period of time. Replace the battery at least once a year.

## METR 6

The diagram illustrates a home automation system centered around a Commodore 64 (or 128) computer. The computer is connected to several modules via a central power line:

- MONITOR (or TV):** Connected to the computer's video output.
- APPLIANCE MODULE:** A module that controls various appliances, connected to the computer's I/O port.
- POWER SUPPLY:** A module that provides power to the system, connected to the computer's power input.
- LAMP MODULE:** A module that controls a lamp, connected to the computer's I/O port.
- WALL SWITCH MODULE:** A module that controls a wall switch, connected to the computer's I/O port.
- MINI CONTROLLER:** A module that controls a mini controller, connected to the computer's I/O port.
- POWERHOUSE INTERFACE:** A module that interfaces with the computer's keyboard, connected to the computer's keyboard port.
- COMMODORE 64 (or 128):** The central computer unit.
- DISK DRIVE:** A disk drive connected to the computer's disk drive port.
- JOYSTICK:** A joystick connected to the computer's joystick port.
- THERMOSTAT CONTROLLER:** A thermostat controller connected to the computer's I/O port.

Figure 1.

## 7 SYSTEM OPERATION

The first screen you see after loading the program asks you to choose either **J** for Joystick or **K** for Keyboard mode. Operation of the program is expected to be mainly with the joystick but the computer keyboard may also be used (see **KEYBOARD OPERATION** page 36). The joystick will be used during this tutorial.

The program is divided into three main modes:

- Install Mode:** Deals with setting up the relevant graphics of your home. The time of day and base Housecode are set here as well.
- Operate Mode:** Allows you to choose a light or appliance located anywhere inside or outside your home and then turn it on or off immediately (**NOW**), or program it to turn on or off later.
- Demo Mode:** Lets you step through several screens showing typical rooms with lights and appliances already installed. You can stop at any screen and practice controlling lights and appliances without actually sending any signals to X-10 modules.

**If you have a joystick, it is recommended that you choose this DEMO mode first to familiarize yourself with the operation of the program.**



The first screen you see after powering up the computer (with the Interface connected) is the introductory screen shown in Figure 2. This screen lets you choose the method of operating the program - Joystick or Keyboard. At this screen you can also choose **D** for a (**D**)emonstration (Demo mode will automatically be selected if you load the program without the Interface connected). It is recommended that you try this Demo mode first to familiarize yourself with the operation of the program.

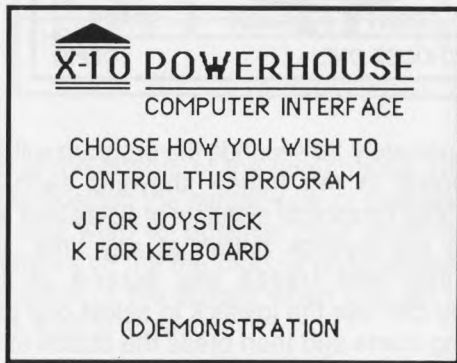


Figure 2.

After choosing **D** you will be shown a screen which tells you that this is a demonstration and does not affect the interface (the interface doesn't even need to be connected at this point). You are asked to connect a joystick (the Demo only works with a joystick) and then press the joystick button. The multiroom screen shown in Figure 3 will appear and the bottom right hand corner will indicate that you are in the Demo mode.

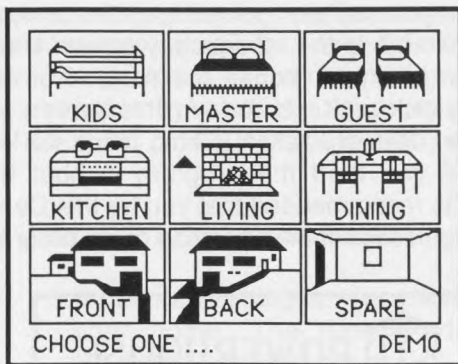


Figure 3.

If you wait approximately 20 seconds the program will start cycling through the rooms in the house showing each room with pre-installed ICONS (graphical symbols of lights and appliances). You may press the joystick button at any time, to stop the automatic cycling and freeze the screen at that room. Alternatively, you can use the joystick to select one of the rooms before the cycling starts and then press the button to go into that room.

Let's suppose for example that you are in the Living Room. The screen will look like that shown in Figure 4. This is a typical Living Room with lights and appliances installed for the purpose of the demo. Later you will be able to install your own ICONS to represent what you want to control. (More will be said about this once we have finished with the Demo mode).

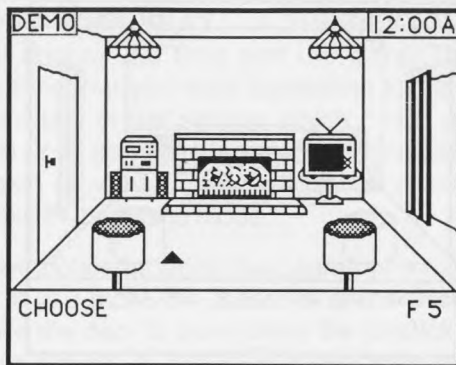


Figure 4.

The prompt at the bottom of the screen says **CHOOSE**, so use the joystick to position the cursor near or over one of the lights or appliances you wish to operate. You don't have to be very accurate; notice that the module code appears in the bottom right hand corner of the screen when you get close enough to "capture" the light or appliance.

Let's say you choose the left hand lamp (F5) and press the joystick button. The prompt says choose **ON OFF SKIP GROUP**. See Figure 5.

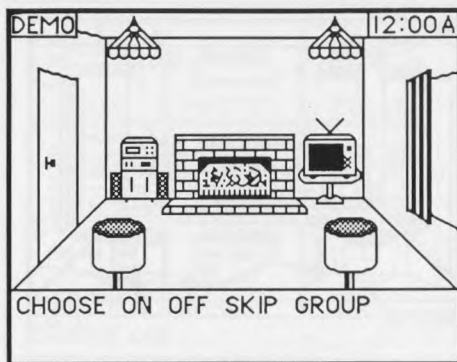


Figure 5.

**GROUP** allows you to select each light or appliance in turn and group them together, you can then turn them **ON** or **OFF** now or later as a group. **SKIP** allows you to choose a different light or appliance if you chose the wrong one by mistake. Let's choose **ON** (by moving the joystick until the word **ON** changes from red to white) and then press the joystick button. You are then asked if you want the light on **FULL** or **DIMMED** (if you had chosen an appliance you would not have been asked this). Choose **FULL** and press the joystick button.

Choose **NOW** and press the joystick button. Notice that the lamp changes color on the screen to signify that it has gone **ON**. Practice turning on and off other lamps and appliances in the room in this way. (Remember you're not actually turning anything on or off while you're in the Demo mode).

If you choose something other than **NOW**, e.g. **TODAY**, **TOMORROW**, **EVERYDAY**, or **SPECIFIC DAYS**, you will be asked to choose the time and the days. This is how you program the time that you want something to happen. More will be said about this in the section which deals specifically with **OPERATION**. You may practice programming other items in this room but again remember that you are not actually storing any programs while in the Demo mode.

You may have noticed, during the course of moving the joystick around, that if you move the cursor over the door, it opens. Try this, and while the door is open press the joystick button. This is how you leave a room. At this point in the Demo you are shown a page of text which explains that the room you have just left was pre-installed for the demo. You are asked to press the joystick button and when you do this you are shown a page of lights. If you wait a few seconds the program will show you a page of appliances (if you get impatient you can press the joystick button at each page to go on to the next page). These **ICONS** are the ones you will be able to install in the rooms when in the **INSTALL** mode. After the pages of lights and appliances you are shown an empty room with 11 "tabs" representing the positions in which you can install the **ICONS** when you are in the **INSTALL** mode. The next screen takes you back to the beginning of the Demo.

You can go through the Demo as many times as you like and when you have seen enough, press (**Q**)uit. This will take you back to the screen which allows you to choose the method of operating the program - Joystick or Keyboard.

## 13 JOYSTICK OPERATION

When you have seen enough of the demonstration, press the **Q** key on the computer keyboard. This will take you back to the screen giving you the choice of Joystick or Keyboard operation.

### INSTALL MODE.

At the introductory screen press the **J** key on the keyboard to choose joystick operation. The screen briefly flashes up the message: **LOADING DATA FROM INTERFACE PLEASE WAIT.**

After a brief pause the screen shown in Figure 6 asks you to choose **OPERATE** or **INSTALL**. Move the joystick to select **INSTALL** and press the joystick button.

The screen in Figure 7 shows you the time set in the Interface and asks you if it is correct. Let's assume it isn't and choose **NO**.

The computer responds with a series of timeset prompts. At each screen make a choice with the joystick and enter with the joystick button. Finally confirm that the time is correct by choosing **YES**.



Figure 6.

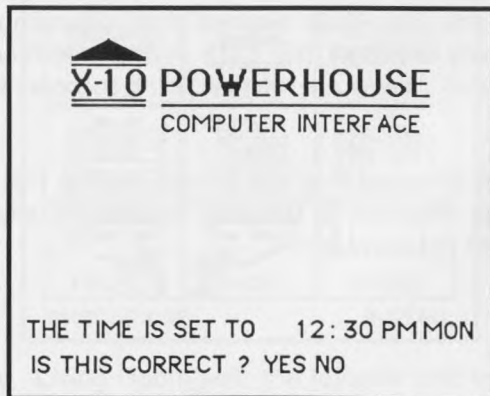


Figure 7.

NOTE that the screen update of the clock occurs approximately every 50 seconds. Therefore although the Interface clock is accurate, the time on the screen can appear to be off by 50 seconds. Timed events occur at real time not screen time therefore if you are "testing" the interface by programming something to happen and waiting to see if it happens, you should program the event to happen at least 2 minutes from the screen time. If you choose 1 minute from the screen time, the time you program may have already elapsed.

After correctly setting the time, the screen shown in Figure 8 shows you the base housecode and asks you if it is correct. You may decide to leave it on "A" if you previously checked the system manually on A. However if you wish to change it select **NO** and press the joystick button. If you select a different housecode you are then warned that changing the base housecode will clear all the data in the interface (but you presumably don't have any at this point so continue with the change).

You are then informed that you should change the housecode on all of your modules to the new housecode and press the joystick button to continue.



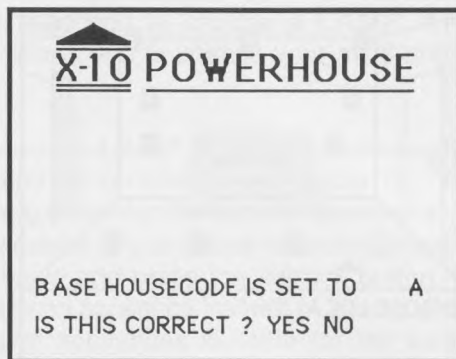


Figure 8.

After the time and base housecode have been set the multiroom screen shown in Figure 9 appears.

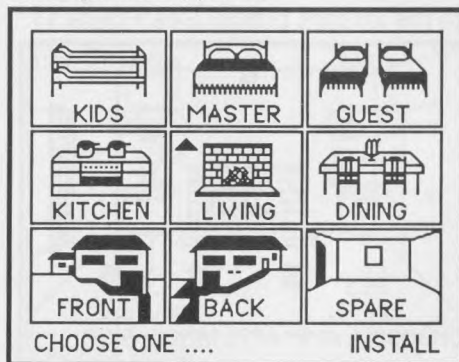


Figure 9.

Choose the Living Room with the joystick and enter with the button. (See Figure 10). There are 11 tabs (same in other rooms) indicating positions where lamps or appliances can be installed.

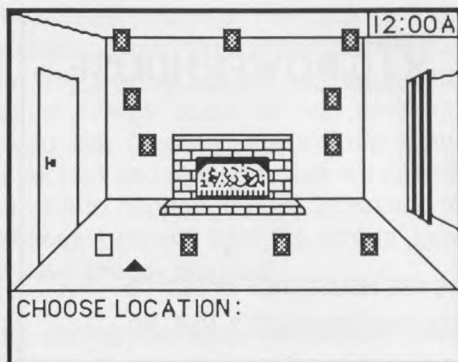


Figure 10.

Use the joystick to choose the left hand tab on the bottom row (notice the tab changes color when the cursor gets near it). Enter this choice with the joystick button. See Figure 11.

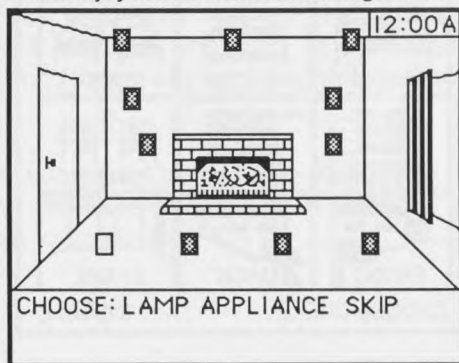


Figure 11.

The prompt asks you to choose a **LAMP**, **APPLIANCE** or **SKIP**. **SKIP** allows you to change your mind and choose a new location.

In this case choose **LAMP**. A screen of differently colored table and floor lamps will be shown (see Figure 12). You will only be shown lamps suitable for the location chosen i.e. you will not be shown a chandelier if you chose a floor position. Select one of the lamps shown and press the joystick button. Later you may wish to choose an appliance instead of a lamp and again you will only be shown appliances suitable for the location you have chosen, i.e. you will not be shown a coffee pot if you chose a location outside the house and you will not be shown a sprinkler if you chose the living room.

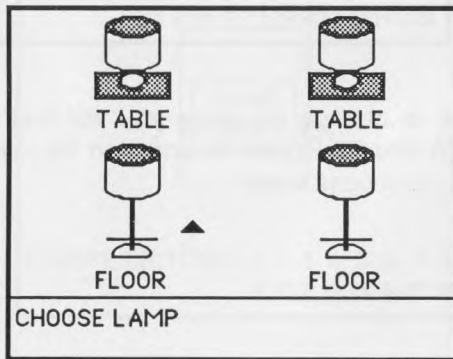


Figure 12.

## 19

After the choice of lamp (or appliance) has been made the screen shows an X-10 module (lamp, appliance or wall switch module depending on the ICON chosen) and offers the next combination of housecode and unit code available. See Figure 13.

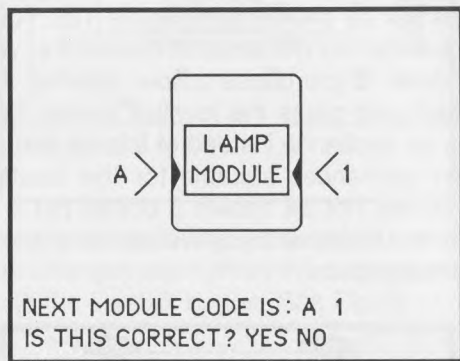


Figure 13.

If you choose to change the code you will first be shown 16 housecodes (A thru P), Figure 14, and then 16 unit codes (1 thru 16), Figure 15, to choose from.

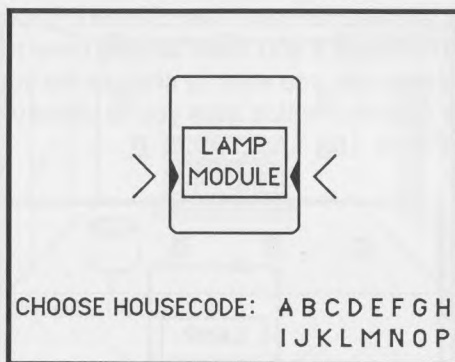


Figure 14.

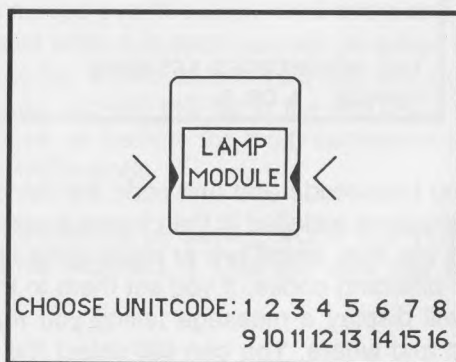


Figure 15.

## 21

You are only allowed to have **two** different housecodes in the same room. Therefore, if you have already used two housecodes in a room and then say you want to change the code offered, you will be shown a screen which asks you to choose which one you require. See Figure 16.

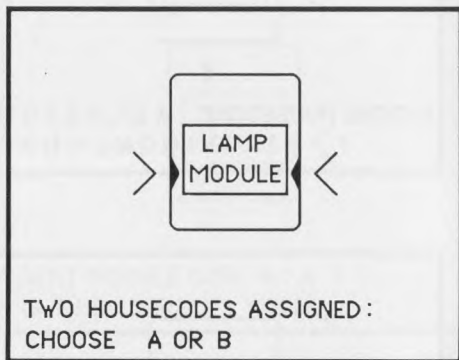


Figure 16.

After selecting housecode and unit code the living room screen returns with the lamp installed in the chosen location. See Figure 17. Note that you may install two or more lights and set them to the same (or different) codes. If you set them to the same code, the screen will display a message telling you that the code is already used and where. You can still select the same code in which case any on or off operation of the program for one unit code will affect both units.

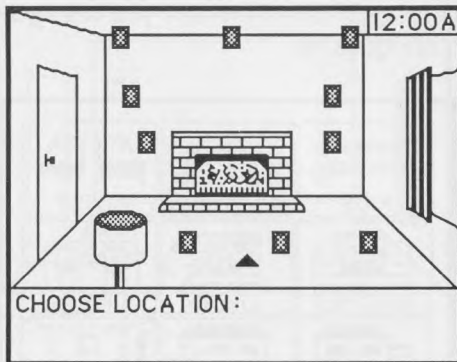


Figure 17.

If the cursor is moved over the door, it will open; and if the joystick button is pressed while it is open you will be asked if you want to install more rooms. If you select **YES** you will go back to the multiroom screen and will still be in the **INSTALL** mode. If you select **NO** you will go back to the multiroom screen and will now be in the **OPERATE** mode.

Let's choose **OPERATE** by saying **NO** to **DO YOU WANT TO INSTALL MORE ROOMS ?** This will take you to the screen shown in Figure 18.

## 23 OPERATE MODE

When you enter the OPERATE mode you will see the multiroom screen shown in Figure 18.

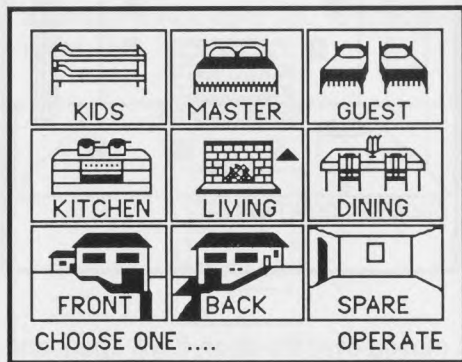


Figure 18.

You choose an area in which you have previously installed ICONS using the joystick and the joystick button. Say you choose the Living Room, the room may look like that shown in Figure 19.



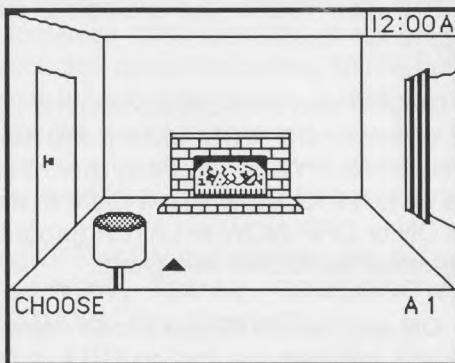


Figure 19.

Figure 19 shows the ICON(S) which you previously installed and asks you to choose one to operate. You choose one with the joystick and the joystick button. Figure 20 then asks you to choose **ON**, **OFF**, **SKIP** or **GROUP**.

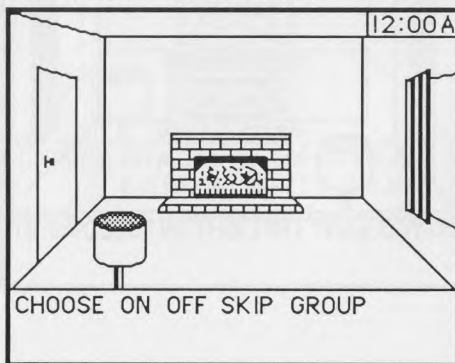


Figure 20.

Choose **SKIP** if the **ICON** you selected was selected unintentionally.

If you choose **GROUP** and then choose another **ICON**, you will be asked the question **DO YOU WANT MORE IN GROUP YES NO**. If you choose **YES**, you can then choose another **ICON** and add up to 11 **ICONS** within a room to the group, then you can select **ON** or **OFF**, **NOW** or **LATER** (programmable) and operate or program all the **ICONS** as a group.

If you choose **ON** and the **ICON** you chose represents a light, you will be asked if you want the light on **FULL** or **DIMMED**. See Figure 21.

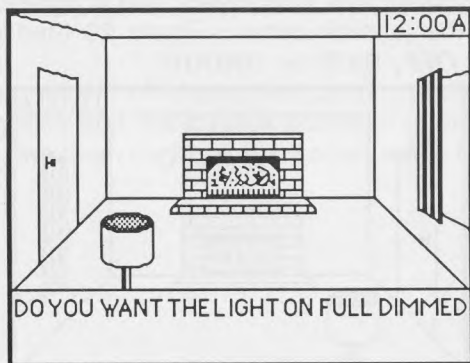


Figure 21.

If you choose dimmed you will be asked to select the intensity you require (between 10% and 90% of full brightness). Select with the joystick and press the button. **NOTE** lamps are always restored to **FULL** brightness before a **DIM** command is sent. This is because the interface does not know how bright the lamp is at the moment (it may have been previously dimmed by someone else; even from another X-10 controller).

After choosing OFF or ON and the intensity, the prompt line asks you to choose **NOW**, **TODAY**, **TOMORROW**, **EVERYDAY** or **SPECIFIC DAYS**. See Figure 22.

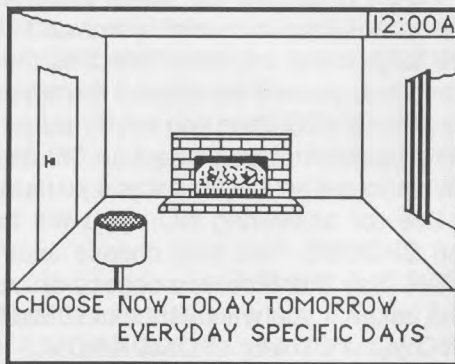


Figure 22.

You may choose any one of these, and the descriptions below are what will happen in each case.

## **NOW:**

If you select **NOW** the light or appliance will go **ON** or **OFF** immediately, and the **ICON** on the screen will change to indicate this.

## **TODAY:**

If you select **TODAY**, you will be asked to select AM/PM and then the time later today at which you want that particular light/appliance to go on or off. After selecting the hour, tens of minutes and minutes, you will be asked if the time you entered is correct. If you choose YES, then you will be asked if you want to set an OFF time (assuming you just set an ON time). You will be asked if you want to set an ON time if you just set an OFF time. After setting this (or answering NO), you will be back to the prompt saying **CHOOSE**. You may choose another **ICON** and again select **ON**. Say this time you choose an appliance; then you will **not** be asked if you want **FULL** or **DIMMED** but will go straight to **NOW**, **TODAY**, **TOMORROW**, **EVERYDAY**, **SPECIFIC DAYS**.

## **TOMORROW:**

If you select **TOMORROW**, you can select an **ON** or **OFF** time which will occur at a specific time tomorrow instead of today. Both today and tomorrow are "once only" events and will be cleared from memory at approximately 4 minutes past midnight of that day.

## **EVERYDAY:**

If you select **EVERYDAY**, any event programmed will occur *every day of every week* continuously. In the **EVERYDAY** mode, you will be asked after setting the times, the question, **REGULAR** or **SECURITY**. If you select **REGULAR** then the events will happen at exactly the times you program them *every day of every week*. If you choose **SECURITY** these events will occur within the hour of your programmed time but will be at a slightly different time each day (to give your home a lived in appearance).

For example: If the programmed time is 8:17 in the **SECURITY** mode, the actual time of the event is at 8:17 the first day and any time between 8:00 and 9:00 the rest of the days. Security is only available in **EVERYDAY** and **SPECIFIC DAYS** modes.

## SPECIFIC DAYS:

If you choose this mode you will first be asked to **CHOOSE DAY**. You choose from one of the 7 days with the joystick and then press the joystick button. The prompt says **DO YOU WANT ANY MORE DAYS YES NO**. If you choose **YES**, select the next day you want with the joystick and then press the joystick button. Finally, answer **NO** to **DO YOU WANT MORE DAYS**.

The display will then show you which days you have selected and ask you to choose AM or PM. You may choose either and then set the hour, tens of minutes and minutes as in previous modes. You then choose **REGULAR** or **SECURITY**. That particular light/appliance will then go ON or OFF at the specified time on each of the chosen days, *every week* (slightly different time each day if you choose **SECURITY**).

You are then shown the event you have entered and asked if this is correct. If it is, select **YES** with the joystick and enter with the joystick button. You are then asked if you want to enter an OFF time and you can set this to happen in any mode. For example, the porch light could go on **TODAY** at 6:00 PM and off **TOMORROW** at 5:00 AM; or the HI-FI could go on Monday, Tuesday, Wednesday, Thursday and Friday at 7:00 AM and off **EVERYDAY** at 11:00 PM. You may also program multiple ON and/or OFF times. e.g. ON at 7:00 PM, OFF at 8:00 PM, OFF again at 9:00 PM and OFF again at 10:00 PM (useful if you have kids who keep leaving lights on).

If you choose a lamp or appliance for which you have already set a timed event, as well as showing the code for that lamp or appliance, the prompt line will also show you that it is **TIMED**. See Figure 23.

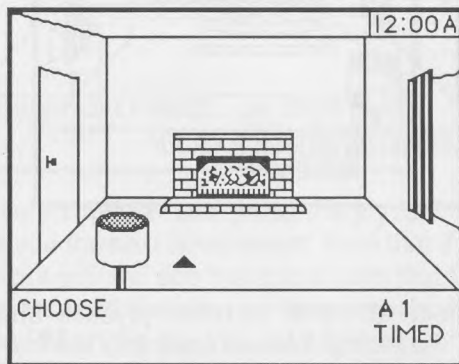


Figure 23.

Now when you press the joystick button, in addition to offering you the choice of **ON, OFF, SKIP** and **GROUP** the prompt line will also offer you **REVIEW**. The word **REVIEW** does not appear if you select an untimed **ICON**. See Figure 24.



Figure 24.

If you now select **REVIEW** with the joystick and press the joystick button, the prompt line will show you the first timed event for that light or appliance and will give you the option of choosing **MORE**, **CANCEL** or **QUIT**. See Figure 25.





Figure 25.

Each time you select **MORE** and press the joystick button, the screen will show you the next timed event. Note that if you review a **SECURITY** event you will see the actual time that the lamp or appliance will go on or off that day, i.e the event shown in Figure 25 will show 2:30 PM on the day you set it and any time between 2:00 PM and 3:00 PM any other day that you review it. Likewise, if you review a **TOMORROW** event tomorrow, it will be displayed as a **TODAY** event. The update from today to tomorrow and to a new security time occurs at approximately 4 minutes past midnight each day. At this time the clock in the upper right hand corner of the screen will be momentarily replaced by the word **UPDATE**.

You can cancel any timed event by selecting **CANCEL** with the joystick and then pressing the joystick button. When you have finished reviewing, select **QUIT** with the joystick and press the joystick button. This will take you back to the screen allowing you to choose another unit to operate.

### 33 EXITING THE PROGRAM

When you have installed all modules, set all desired times and are ready to leave the program, press the **Q** key on the keyboard. This will take you back to the screen allowing you to choose **OPERATE** or **INSTALL**. Remove the disk from the drive and turn off the drive and the computer. You may disconnect the interface from the computer if you wish (you must of course leave the interface plugged into a 120 volt AC outlet to control your home). If you installed a 9 volt alkaline battery in your interface, you may unplug it to move it to another room in your house. All timed events and graphics information will be stored in the interface which will control your home automatically and will only need to be re-connected to the computer to make changes to timed events or to install more **ICONS** or to save the complete contents of the interface onto the **POWERHOUSE** disk using the **SCHEDULES** program. See **SAVING SCHEDULES** page 34.

**NOTE.** You can press **Q** at any time to go back to the screen which allows you to choose **OPERATE** or **INSTALL** but if you are in the middle of an operation such as setting a time or installing an **ICON**, pressing **Q** will take you back to this screen without completing the operation and without storing it in the interface.

To save the contents of the POWERHOUSE interface onto the POWERHOUSE disk you must first load the SCHEDULES program. To do this type **LOAD "SCHEDULES"**,<sup>8</sup> and then press RETURN. Then type **RUN** and press RETURN. This will allow you to save your schedules onto the POWERHOUSE disk and retrieve them later. You might for example wish to have a Summer schedule and a Winter schedule. Three different schedules can be saved on the disk, in areas A, B and C. You can also make back-up copies of your POWERHOUSE program and save more schedules onto different disks. Figure 26 gives you the choice of saving schedules **to** disk, loading schedules **from** disk or returning to BASIC (to re-load the POWERHOUSE program).

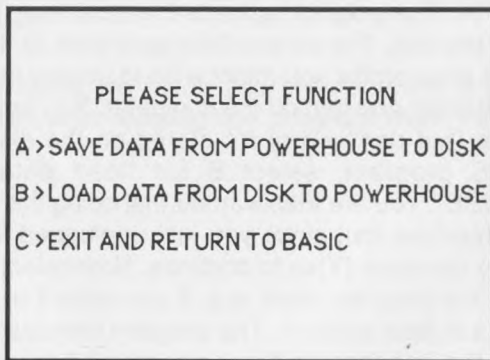


Figure 26.

Let's assume you want to save a schedule so choose A. Then choose **where** you want to save the schedule - area A, B or C. See Figure 27.

SUMMER, WINTER and HOLIDAY are examples, you can enter your own names (up to 8 letters).

```
POWERHOUSE -> DISK  
  
DISK AREA  A  > SUMMER  
DISK AREA  B  > WINTER  
DISK AREA  C  > HOLIDAY  
CHOOSE DISK AREA (A,B,C, OR [Q]UIT)
```

Figure 27.

Each schedule can be given a name of up to 8 letters so type in the name you wish to give the schedule, for example **Winter**. Then press RETURN. The program uploads the data from the interface and saves it onto the disk. The screen then goes back to the one shown in Figure 26. As an exercise you might wish to unplug the interface (with no battery installed) and turn off the computer. You have now lost all of your program (but don't worry it's stored on the disk). Re-load the SCHEDULES program, select B for "load data from disk to POWERHOUSE". You are then warned that doing this will erase all the data in the interface (but since you just unplugged it there isn't any data to loose) so select (Y)es to continue. Now select which area you want to load the program from, e.g. if you stored a schedule called Winter in area A then select A. The program then loads the data from the disk into the interface and you are advised to wait as this could take up to 4 minutes depending on the size of the schedule you saved. You may now choose C to return to BASIC and then load the POWERHOUSE program. Now select OPERATE mode and check that all of your data has been re-loaded into the interface.

The introductory screen allows you to choose between Joystick or Keyboard operation. The Joystick has been used in this manual but if you do not own a joystick you may use the keyboard cursor keys to make selections.

In this mode the sequence of screens and operation is the same as in the joystick mode but the cursor is moved around the screen with the cursor keys and selections are entered with the RETURN key.

Use the **cursor keys** to move the cursor **down** or to the **right**.

Use the **cursor keys with the shift key** to move the cursor **up** or to the **left**.

To select the Keyboard mode you should select **K** at the first screen you see after loading the program (with the Interface connected).

## 37 MANUAL OPERATION

The interface has the capability of transmitting all 256 **X-10** codes (A thru P x 1 thru 16). The software available for the Commodore 64/128 (Cat No. SC64) can address 95 of these codes either automatically (programmable) or manually with the Joystick or Keyboard while the interface is connected to the computer (7 rooms X 11 ICONS per room plus 9 ICONS each in the front and the back of the house = 95 ICONS). Manual control of the first 8 unit codes on the Base Housecode is provided from the 8 rocker keys on the interface whether or not the interface is connected to the computer. Further manual control from other locations in your home is possible by purchasing additional MINI CONTROLLERS each of which can control up to 8 modules manually, and can DIM and BRIGHTEN lights from their keyboards. There is even a controller which allows you to control up to 8 modules over the telephone, from anywhere in the world! See Appendix - B in the manual supplied with the POWERHOUSE computer interface for types of X-10 controllers available.

## APPENDIX A - UTILITY PROGRAM 38

On the same side of the disk as the POWERHOUSE program you will find a UTILITY program. This utility program is an extension of BASIC and once loaded, can be used as BASIC commands. This enables you to write programs in BASIC and lets you use BASIC commands to perform functions such as setting the clock, uploading or downloading timer events etc. As with the main POWERHOUSE program, the utility program is written to address the User Port. For details of the data format sent to the interface you should refer to the Programming Guide supplied with the POWERHOUSE Computer Interface. Before executing the utility commands you must first load the utility program. To do this, enter:

```
LOAD "X10UTILITY",8  
RUN
```

If an error occurs, for example if the interface is not connected to the User Port, the error message "X10 connection error" is displayed. Memory locations \$C000 - \$CFFF should be left clear for the operation of the utility program.

The BASIC commands available and the function of each of them are explained below. Note that in some cases the values entered for the parameters specified in the syntax are not the same as mentioned in the programming guide. This is because the values assigned here are chosen to make BASIC manipulation easier whereas the values used in the programming guide, which are often bit mapped Hex numbers, are more appropriate for machine code programming and are not easy to use in a BASIC program.

**Basic commands.**

**SETIME** - Used to set the master clock in the interface.

**Syntax - SETIME DAY,HOUR,MIN**

Where: **DAY** is a value between 1 and 7 (Sunday = 1, Monday = 2, Saturday = 7)

**HOURL** is in 24 hour format (0-23)

**MIN** is minutes (0-59)

Example: To set the clock to 7:45 PM on Friday, you would enter:

SETIME 6,19,45

**RDTIME** - Used to read the time from the interface.

**Syntax - RDTIME**

Once **RDTIME** has been executed, the utility program places the uploaded information in the following memory locations:

The day can be found in location 52492 (Hex CD0C)

The hour can be found in location 52493 (Hex CD0D)

The minutes can be found in location 52494 (Hex CD0E)

These commands are used in the example program "TIME" which can be found on the same side of the disk as the utility program.



**BASE** - Used to set the Base Housecode in the interface (set to "A" when you first power up the interface). Note, using this command to change the base housecode will also clear all timer events and graphics information stored in the interface, therefore any program which uses this command should first display a message to the user advising him of such and giving him the opportunity to continue or not.

### Syntax - BASE CODE

Where **CODE** represents the base housecode as shown in the table below.

A=1	B=2	C=3	D=4
E=5	F=6	G=7	H=8
I=9	J=10	K=11	L=12
M=13	N=14	O=15	P=16

NOTE that these values are NOT the same as used in the programming guide (for ease of use by the BASIC programmer).

Program example using **BASE**:

```

10 INPUT "ENTER BASE HOUSECODE (A-P) "; A$
20 BHC = ASC (A$) - 64
30 BASE BHC
40 PRINT "DONE"
50 END

```

## Reading the base housecode.

To read the base housecode, you need to read the time using **RDTIME**, this command also loads the base housecode into memory location 52495 (Hex CD0F). The base housecode in this location is in the form as sent to the interface i.e. A=1, P=16.

Program example using **RDTIME**:

```
10 RDTIME
20 BHC = PEEK (52495)
30 PRINT "BASE HOUSECODE IS "; CHR$ (BHC + 64)
40 END
```

**X10NOW** - Used to instruct the interface to send an X-10 command onto the house wiring to instantly control an X-10 module.

**Syntax - X10NOW FUNCTION, LEVEL, HOUSECODE, HIUNIT, LOUNIT**

Where: **FUNCTION** is a number between 1 and 3 and  
1=ON 2=OFF 3=DIM

**LEVEL** is a number which sets the intensity of the DIM command ( if **FUNCTION** is set to 1 or 2, **LEVEL** is ignored but a "dummy" value must be entered).

**HOUSECODE** is a value between 1 and 16 (A=1 to P=16).

**HIUNIT** is a bit mapped value corresponding to Unit Codes 9 thru 16. Where:

9=128 10=64 11=32 12=16 13=8 14=4 15=2 16=1

For example, to address unit codes 9, 10 and 16 you simply add the appropriate values as shown below.

$128 + 64 + 1 = 193$  therefore **HIUNIT** = 193

## 43

**LOUNIT** is a bit mapped value corresponding to Unit Codes 1 thru 8. Where:

1=128 2=64 3=32 4=16 5=8 6=4 7=2 8=1

For example, to address unit codes 1, 7 and 8 you simply add

$128 + 2 + 1 = 131$  therefore **LOUNIT** = 131

Program example using **X1ØNOW**:

```
10 LEVEL = Ø
20 INPUT "ENTER FUNCTION (1=OFF 2=ON 3=DIM) "; FUNC
30 IF FUNC = 3 THEN PRINT : INPUT "LEVEL (Ø-15) "; LEVEL
40 PRINT : INPUT "HOUSECODE (A-P) "; A$: HCODE = ACS
  (A$) - 64
50 PRINT : INPUT "HIUNIT "; HIUNIT
60 PRINT : INPUT "LOUNIT "; LOUNIT
70 X1ØNOW FUNC,LEVEL,HCODE,HIUNIT,LOUNIT
80 PRINT : PRINT "DONE"
90 END
```

**DNGRAPH** - Used to download to the interface, graphics Data representing the type (lamp or appliance), location (in the house) and state (on ICON or off ICON) of a unit to be controlled.

**Syntax - DNGRAPH ADDRESS,DATA1,DATA2**

Where: **ADDRESS** is a number between 0 and 255, representing any of 256 lamps or appliances to be controlled.

**DATA1** and **DATA2** are numbers between 0 and 254 which are stored in the interface to represent graphical information. The use of these locations depends on the graphics approach used by the programmer. The contents of these locations are merely numbers stored to represent graphical information (see programming guide, page 26 for suggested allocation of these numbers) and are uploaded to the computer by an **UPGRAPH** command (see page 47).

Program example using **DNGRAPH**:

```
10 INPUT "ADDRESS (0-255) "; ADDR
20 PRINT : INPUT "DATA1 "; D1
30 PRINT : INPUT "DATA2 "; D2
40 DNGRAPH ADDR,D1,D2
50 PRINT : PRINT "DONE"
60 END
```

**UPGRAPH** - Used to request the interface to upload all 256 pairs of Graphics information (**DATA1**, **DATA2**) which were stored in the interface using a **DNGRAPH** command. Should be used as an initial upload when the utility program is first loaded.

### Syntax - UPGRAPH

**DATA1** can be found in memory location (Hex CE00) 52736 + Address

**DATA2** can be found in memory location (Hex CF00) 52992 + Address

Program example using **UPGRAPH**:

```
10 HOME
20 PRINT "UPLOADING GRAPHICS DATA"
30 UPGRAPH
40 PRINT : PRINT "DONE"
50 END
```

**DNTIMER** - Used to download a Timer event to the interface.

**Syntax** - **DNTIMER ADDRESS, BYTE 20, 21, 22, 23, 24, 25, 26, 27**

Where: **ADDRESS** is a number between 0 and 127 representing any of the 128 timed events which can be stored in the interface.

**BYTE 20** thru **BYTE 27** are as per the timer event download table on page 21 of the programming guide.

Note, the programming guide shows these bytes in Binary and Hex but in a BASIC program these bytes should be specified in decimal form. It is assumed that the programmer is familiar with Binary to Decimal conversion.

Program example using **DNTIMER**:

```
10 INPUT "ADDRESS FOR TIMED EVENT (0-127) "; ADDR
20 FOR X = 0 TO 7: PRINT : PRINT "ENTER DATA FOR BYTE ";
X + 20
30 INPUT BYT(X): NEXT X
40 DNTIMER ADDR, BYT(0), BYT(1), BYT(2), BYT(3), BYT(4),
BYT(5), BYT(6), BYT(7)
50 PRINT : PRINT "DONE"
60 END
```

**UPTIMER** - Used to upload all 128 timer events stored in the interface. Should be used as an initial upload when the utility program is first loaded.

### Syntax - UPTIMER

The data can be found in the following memory locations.

Byte 20	(HEX C900)	51456 + Address
Byte 21	(HEX C980)	51584 + Address
Byte 22	(HEX CA00)	51712 + Address
Byte 23	(HEX CA80)	51840 + Address
Byte 24	(HEX CB00)	51968 + Address
Byte 25	(HEX CB80)	52096 + Address
Byte 26	(HEX CC00)	52224 + Address
Byte 27	(HEX CC80)	52352 + Address

Program example using **UPTIMER**:

```
10 HOME
20 PRINT "UPLOADING TIMED EVENTS"
30 UPTIMER
40 PRINT : PRINT "DONE"
50 END
```



**X1ØQUIT** - Used to disable all the new commands that were added by the **X1ØUTILITY** and restores the original BASIC. The new commands can be restored with "SYS 49152".

**Syntax - X1ØQUIT**

### **IMPORTANT**

The POWERHOUSE disk contains the program **STARTX1Ø** which should be loaded at the start of any BASIC program which uses **X1ØUTILITY** commands.

Programs which use the **X1ØUTILITY** program require that **X1ØUTILITY** is loaded each time the program is run or listed. If this is not done the **X1ØUTILITY** commands will generate errors.

When **X1ØUTILITY** commands are used in **IF/THEN** statements, a colon (:) must appear between the **THEN** and the **X1ØUTILITY** command.

Example for reading the time in an IF/THEN loop:

```
10 IF X=1 THEN : RDTIME
```

## 49 GLOSSARY OF TERMS

- BASE HOUSECODE:** The rocker switches on the Interface operate on the base housecode. The base housecode is set to "A" when you first power up the Interface but it can be changed in the INSTALL mode.
- CANCEL:** Removes a timed event for a particular light or appliance.
- CURSOR:** Triangular tab which is moved by the joystick or cursor keys on the keyboard (depending on which mode you are in) to make a selection.
- DATA:** Timed events and graphical information stored in the Interface.
- DOWN-LOAD:** The transfer of data from the computer to the Interface. This occurs when you complete an operation by pressing the joystick button or return key (depending on which mode you are in).
- ENTER:** This means press the return key on the keyboard if in the keyboard mode, or press the joystick button if in the joystick mode.

**EVENT:** Any number of lights or appliances (up to 8), on the *same* Housecode, in the *same* room, can be programmed to go on *or* off, at *one* particular time, on *any* number of days. This constitutes ONE event. For example, unit codes 1,4,9 and 14 programmed to go ON at 7:30 PM on Monday, Wednesday and Friday is just one event and 128 timed events can be programmed.

**EVERYDAY:** Selected after choosing to turn on or off a light or appliance in the OPERATE mode. Allows you to program an event to happen every day at the same time (slightly different each day if SECURITY is chosen).

**GROUP:** Selected after choosing to turn on or off a light or appliance in the OPERATE mode. Allows you to choose other lights and appliances and GROUP them to go on or off together.

**HOUSECODE:** All X-10 modules and manual controllers are normally set so that their housecode dials are the same letter. The Interface is normally set to housecode "A" but it can be changed at the start of the INSTALL mode.

- ICON:** Graphical symbol representing a light or appliance to be controlled.
- INSTALL MODE:** In this mode you can set present time and day, set base housecode and place up to 11 graphical symbols representing lights and appliances in each room and up to 9 graphical symbols in both the front and the back of the house.
- NOW:** Selected after choosing a light or appliance in OPERATE mode, will turn it on or off immediately.
- OPERATE:** In this mode you can choose a graphical symbol representing a particular light or appliance and turn it on or off now, or program it to go on or off later.
- PROGRAM DISK:** This is the disk containing the graphical software which allows you to tell the Interface where the lights and appliances are located and when you want them to go on and off.

- QUIT: Accessed by pressing the "Q" key on the computer keyboard. This can be pressed at any time and takes the program back to the screen which allows you to choose OPERATE or INSTALL. Lets you start again if you get lost. You will not lose any programmed information by pressing "Q".
- REMOVE: Removes the graphic symbol representing a light or appliance, when in the INSTALL mode. Also removes any timed events for that light or appliance.
- REVIEW: Selected after choosing a TIMED ICON in the OPERATE mode. Allows you to look at each event programmed for that particular light or appliance.
- RS-232 : Data transfer between the Interface and the Computer is RS-232 compatible. However, for the Commodore 64/128, the USER port is used.

- SECURITY:** If a light or appliance is programmed to go on at 7:42 p.m. in the Security mode, it will go on at 7:42 p.m. the first day and any time between 7:00 p.m. and 8:00 p.m. the rest of the days (different each day). Security is only available in EVERYDAY and SPECIFIC DAYS modes.
- SPECIFIC DAYS:** Selected after choosing to turn on or off a light or appliance in the OPERATE mode. Allows you to specify the days that you want an event to happen, e.g. on Tuesdays and Thursdays only (every Tuesday and Thursday).
- TODAY:** Selected after choosing to turn on or off a light or appliance in the OPERATE mode. Allows you to program a time at which that light or appliance will go on or off later TODAY. Will happen only once today and then the event will be cleared from memory at approximately 4 minutes past midnight today.

- TOMORROW:** Selected after choosing to turn on or off a light or appliance in the OPERATE mode. Allows you to program a time at which that light or appliance will go on or off TOMORROW. Will happen only once tomorrow and then the event will be cleared from memory at approximately 4 minutes past midnight tomorrow.
- UNIT CODE:** Each X-10 module is set to a different UNIT CODE (between 1 and 16). When the Interface sends a particular unit code, only modules set to that code will respond.
- UP-LOAD:** Transfer of data from the Interface to the computer. Occurs when the Interface is re-connected to the computer and the program is loaded.
- USER PORT:** Edge connector on the back of the Commodore 64/128 computer to which the Interface is connected for manual control or programming.

## 55 SOFTWARE LICENSE & WARRANTY

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If service is required under this warranty:

1. Return the defective disk or cable postage prepaid to:  
X-10 (USA) Inc.  
185A LeGrand Ave.  
Northvale, NJ 07647
2. Enclose a check for \$2.00 to cover postage and handling.
3. Enclose a dated proof of purchase.





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