EE990f0ff
4702-Q18710-42

# Software Specification for Multi Colour TV System

MN1871681 SB.

**Panasonic**

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Revision 1.1

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# 1. Outline

This is a TV station selection system through the voltage synthesizer in which 8-bit microcontroller MN1871681, AN5195K for TV 1 chip and EEPROM 24C04 are used.

It can be used for both single and multi-system CTV, B/W TV.

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# 2. Main Features

**Tuning**

- Auto program tuning function
- Auto search tuning function
- Manual fine tuning function
- Direct position selection function
- Position UP/DOWN function
- Previous position / Channel call function
- Position recall function
- Auto colour detection of PAL, SECAM and NTSC(3.58MHz) at TV mode, PAL PAL60, NTSC(3.58MHz & 4.43MHz) and SECAM at AV mode
- All colour system can be set by manual setting function
- Total of 40 program memory or 100 program memory

**AV and Sound**

- TV/AV function (TV-AV or TV-AV1-AV2 or TV-AV1-AV2-AV3) option
- SIF can be set by manual setting function(BG / DK / I / M)
- Sound Mute function
- Bass/Treble/Balance/Woofer sound control function

**PWM**

- 7-bit PWM for volume control

**Timer**

- Sleep timer (120 minutes, 10 minutes per step)

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**Others**

- 8 colour OSD(including black)
- Auto detection of 50/60 Hz for proper OSD
- Automatic power off 10 minutes after no channel broadcasting in TV mode
- Audio and Video mute during channel position change
- 32-key remote control
- 8 local key control
- Last power status memory (channel, picture and sound level setting etc.)
- Last position and volume memory
- Auto audio mute after no channel broadcasting in TV mode
- Selective English/Chinese OSD menu function
- Preset direct picture control function (Standard, Mild, P.P and Dynamic)
- Preset direct sound control function (Standard, News and Music)
- Presonal preference function and operation (P.P store and recall)
- Blue back screen function when no signal receiving

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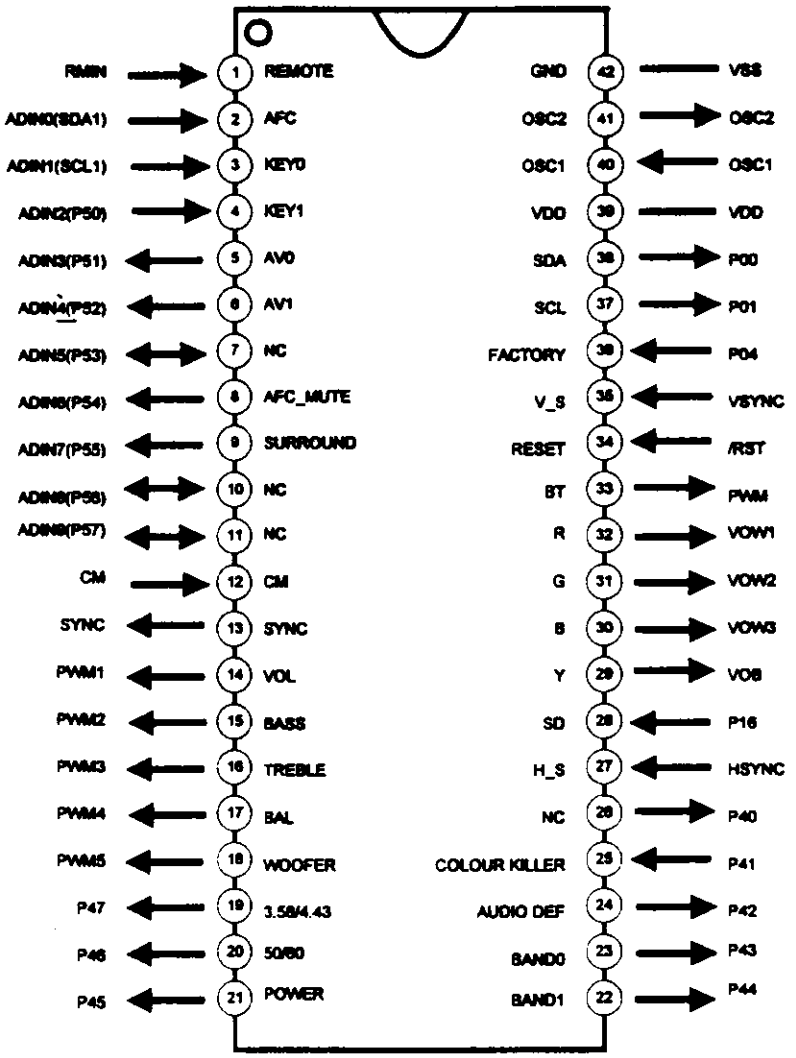
# 3. Pin Configuration




**MN1871681 SDIL 42**

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# 4. Terminal Description

| Pin No. | Name | Symbol | I/O | Description |
|---|---|---|---|---|
| 1 | RMIN | REMOTE | I | Remote control signal input terminal |
| 2 | ADIN0(SDA1) | AFC | I | AFC input terminal |
| 3 | ADIN1(SCL1) | KEY0 | I | Key scan input |
| 4 | ADIN2(P50) | KEY1 | I | Key scan input |
| 5 | ADIN3(P51) | AV0 | O | AV1, AV2, AV3 selection |
| 6 | ADIN4(P52) | AV1 | O | (P51,P52=00=AV1, 10=AV2, 01=AV3) |
| 7 | ADIN5(P53) | NC | I/O | No connection |
| 8 | ADIN6(P54) | AFC_MUTE | O | No connection |
| 9 | ADIN7(P55) | SURROUND | O | Surround sound enable bit (0=off, 1=on) |
| 10 | ADIN8(P56) | NC | I/O | No connection |
| 11 | ADIN9(P57) | NC | I/O | No connection |
| 12 | CM | CM | I | No connection |
| 13 | SYNC | SYNC | O | No connection |
| 14 | PWM1 | VOL | O | Volume control output |
| 15 | PWM2 | BASS | O | Bass control output |
| 16 | PWM3 | TREBLE | O | Treble control output |
| 17 | PWM4 | BAL | O | Balance control output |
| 18 | PWM5 | WOOFER | O | Woofer control output |
| 19 | P47 | 3.58/4.43 | O | 3.58/4.43 filter control bit (L=4.43, H=3.58) |
| 20 | P46 | 50/60 | O | 50/60 Hz selection bit (L=60, H=50) |
| 21 | P45 | POWER | O | Power control output (H=on, L=off) |
| 22 | P44 | BAND1 | O | Band selection bits |
| 23 | P43 | BAND0 | O | (P43,P44=00=UHF, 10=VHF-L, 01=VHF-H) |
| 24 | P42 | AUDIO DEF | O | Audio Mute control output (L=off, H=on) |
| 25 | P41 | COLOUR KILLER | I | Colour killer detection (L=off,H=on) |
| 26 | P40 | NC | O | No connection |
| 27 | HSYNC | H_S | I | Horizontal synchronizing for built in input character generator |
| 28 | P16 | SD | I | This is a station detection terminal used for audio program and auto search |
| 29 | VOB | Y | O | OSD Blank output (L=disable, H=enable) |
| 30 | VOW3 | B | O | OSD Blue output terminal |
| 31 | VOW2 | G | O | OSD Green output terminal |
| 32 | VOW1 | R | O | OSD Red output terminal |
| 33 | PWM | BT | O | 14 bit PWM output for tuning voltage |
| 34 | /RST | RESET | I | Reset terminal (normal=H, active=L) |
| 35 | VSYNC | V_S | I | Vertical synchronizing input terminal for built in character generator |
| 36 | P04 | FACTORY | I | Factory mode selection input |
| 37 | P01 | SCL | OD | Serial Clock pin for I2C |
| 38 | P00 | SDA | OD | Data pin for I2C |
| 39 | VDD | VDD | - | Power supply pin (+5V) |
| 40 | OSC1 | OSC1 | I | MCU oscillator clock input (12MHz) |
| 41 | OSC2 | OSC2 | O | MCU oscillator clock input (12MHz) |
| 42 | VSS | GND | - | Ground |

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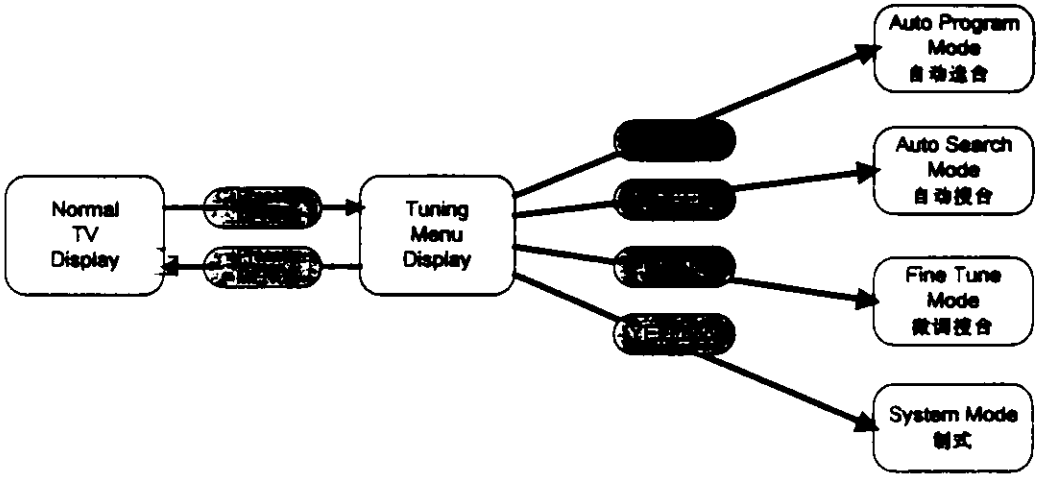
# 5. TV Function

## 5.1 Tuning

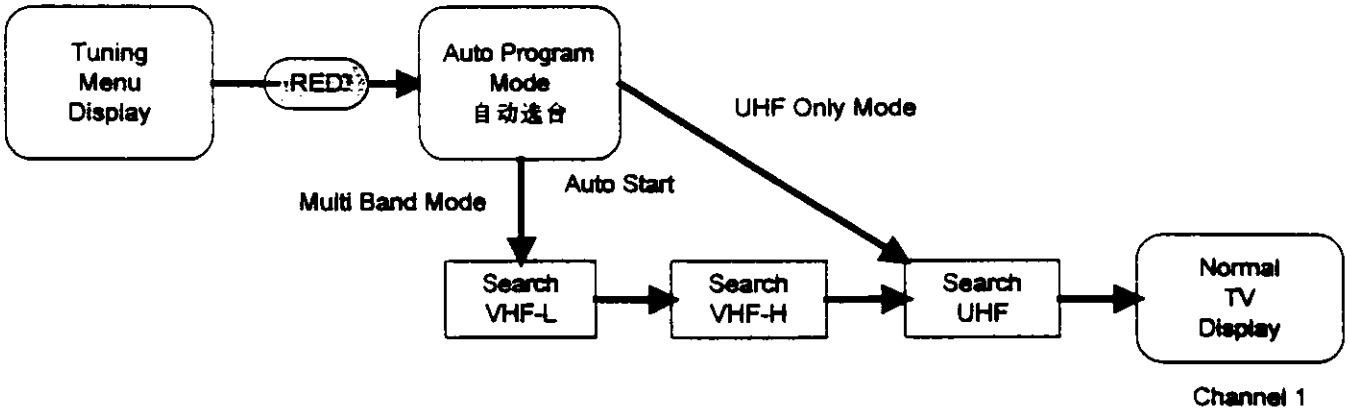
TV Tuning function is basically done in tuning menu. The maximum numbers of memorized channel are 40 (0-39) and 100 (0-99) depending on the option bit setup.




The following tuning functions are provided:

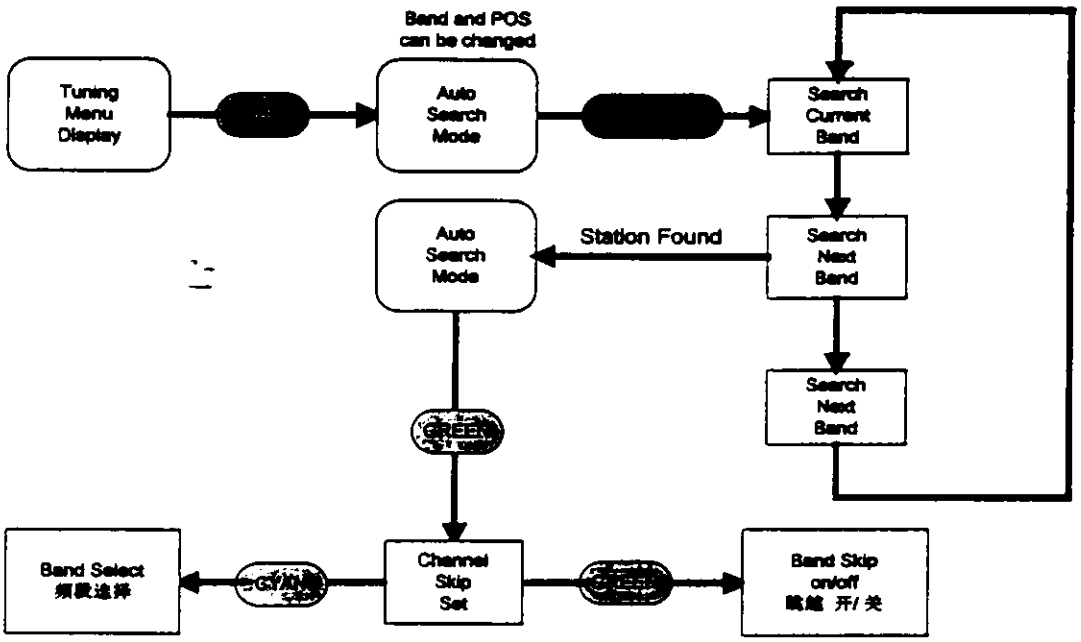
### 5.1.1 Auto Program

When auto program is actived, all the broadcasting channel in VHF-L, VHF-H and UHF (or UHF only) will be tuned to the best picture and memorized in EEPROM. The searching is in the sequence of VHF-L, VHF-H and UHF and from the minimum BT data to maximum. Upon completion, it will exit tuning menu and enter TV mode at position 1, the broadcasting channel is stored on EEPROM from position 1. Auto program function can only be actived by pressing the related key in tuning menu. If user want to exit during searching, simply press the menu key to exit.



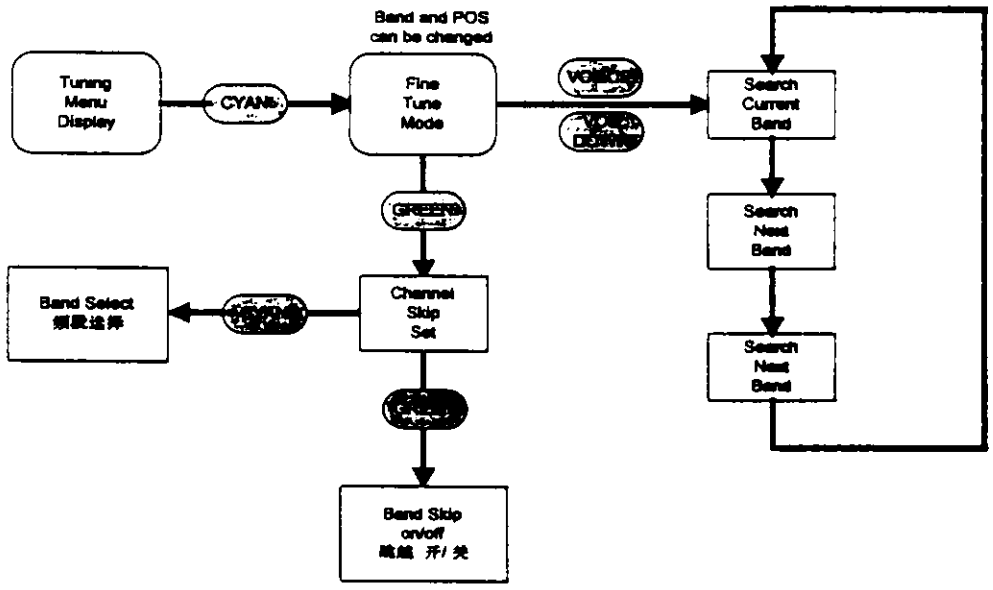
### 5.1.2 Auto search up

When this function is activated, it will search for the next upper broadcasting channel. When the best picture is found, it will be memorized in EEPROM and return to auto search in preset mode. The searching will go round robin in the sequence of VHF-L, VHF-H and UHF. Auto search UP function can only be activated by pressing the related key in tuning menu.




### 5.1.3 Manual fine tune

Manual fine tuning up and down can be done by pressing volume up or volume down key in tuning menu continuously until the best picture of a broadcasting channel found. The tuning data and band information will be memorized once up or down key was released.

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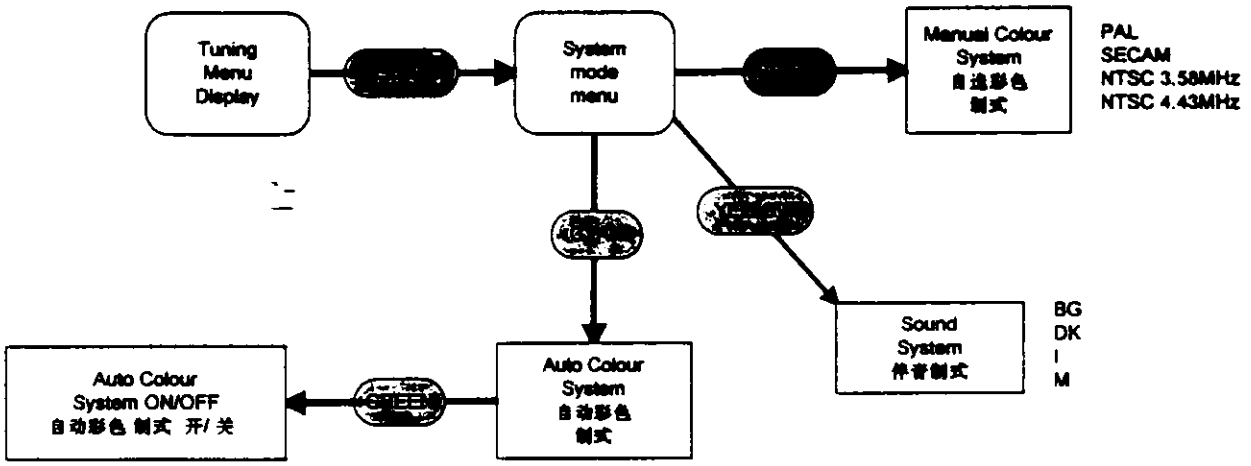
### 5.1.4 System mode

A Colour and sound system setting can be adjusted manually by the user. The number selection choice of colour and sound system setting would different depending on the option set up. When the system mode menu is selected, pressing the green key will go into the manual colour system setup, pressing the cyan key will go into the auto colour system setup, and pressing the yellow key will go to the sound system setup.




## *5.2 Position UP/DOWN*

This function is carried out among the prestored position in the EEPROM. The sequence is

1. Select the next position number by reading skip position information.
2. Read the BT, Band data, colour and sound system from EEPROM.
3. Output the BT data to tuner through PWM, band data to output port, colour and sound system to AN5195K

In case there is only one station is stored, that mean all the others are skipped, therefore, this station will always be displayed.

In case there is no station is stored (all are skipped), every position will be selected.

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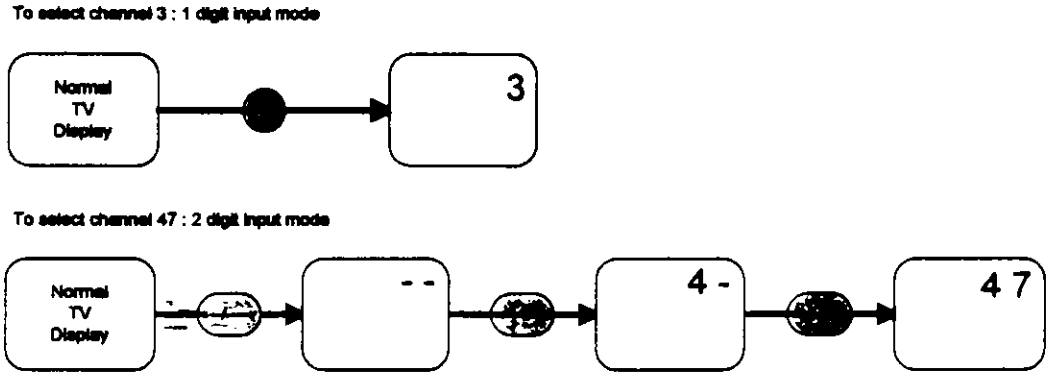
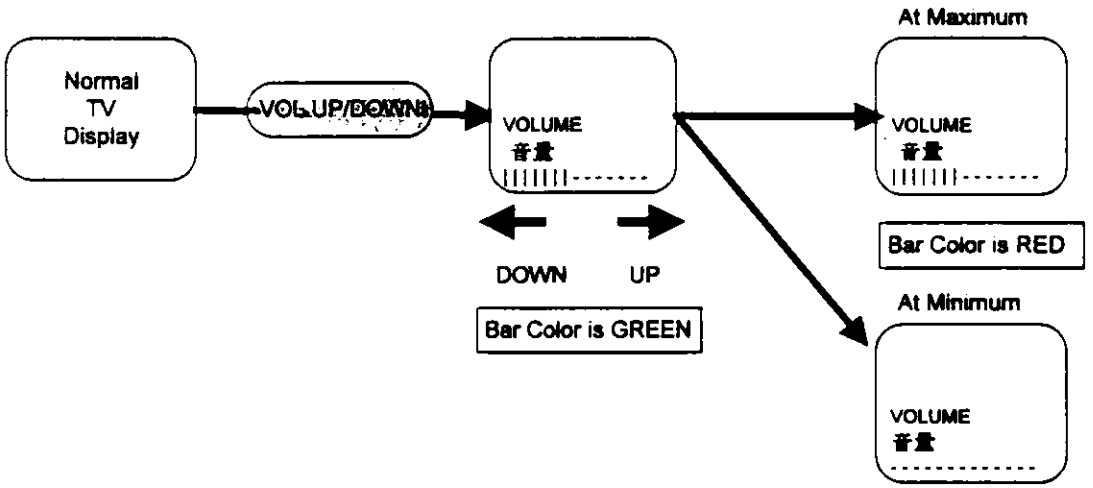
## 5.3 Direct Position Selection

This function is possible by the use of remote control only. As the number of position from 0 up to 39 or 99, position selection is made easy by the use of ten-key. This function is performed by pressing "-/--" key followed by 2 Digits indicating the selecting position.




## 5.4 Volume Control

The desired sound volume can be selected by the used of volume UP/DOWN key. Pressing volume key will recall volume OSD and adjustment can be done. At the maximum and minimum, the bar turns red.

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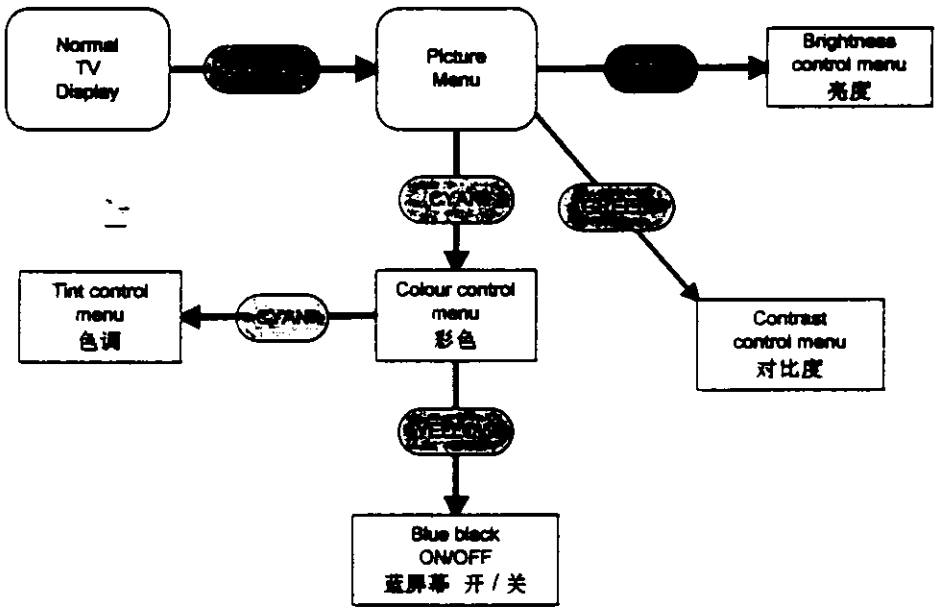
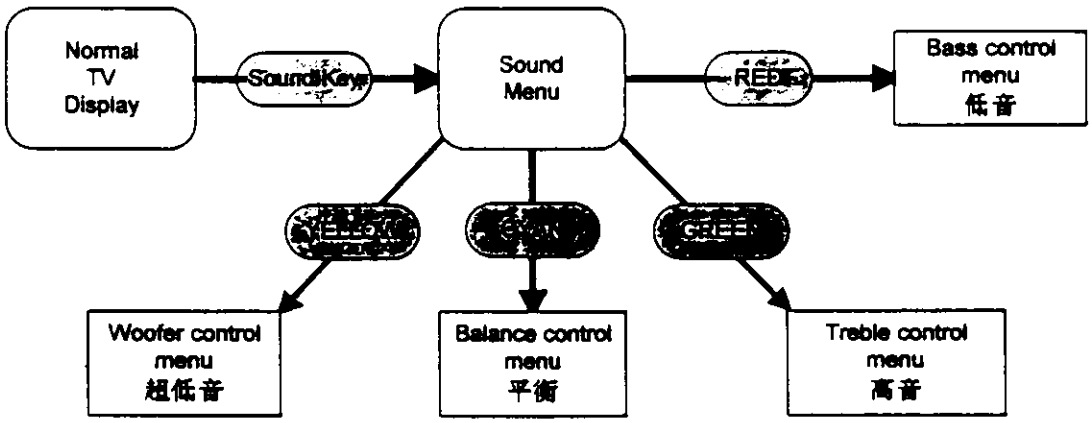
## 5.5 Picture Control

The Brightness, Contrast, Colour and Tint of the TV picture can be controlled in picture control menu. Pressing picture key will display the picture OSD menu, Brightness, Contrast and Colour setting level can be selected the keys RED, GREEN and CYAN respectively. Adjustment up and down for picture control can be done by volume up and volume down keys.




## 5.6 Sound Control

The Treble, Bass, Balance and Woofer of the TV sound can be controlled in sound control menu. Adjustment up and down for sound level control can be done by pressing volume up/down keys.

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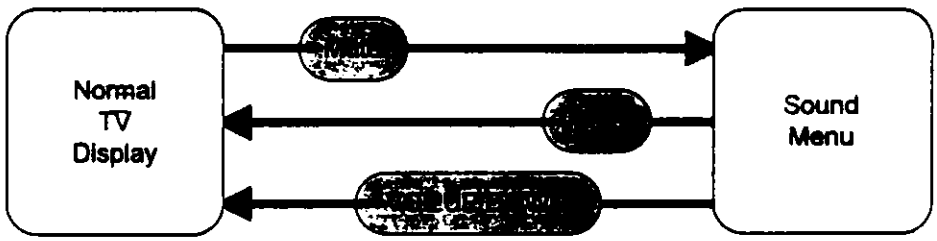
## 5.7 Sound Mute

The mute mode is controlled by the mute key in remote controller. Mute mode is a state in which the audio sound is completely erased. Pressing the mute key will release the TV from the sound mute state (minimum the output of volume PWM port[pin 14] and disable audio def pin[pin 24]).

Releasing mute mode can be done by pressing mute key itself, volume up/down keys and power off.

Mute function acts not only with this condition but during changing position and detecting no SD signal[pin 28].




## 5.8 AV Control

The AV mode is controlled by the TV/AV key. Note that during in AV mode, tens keys, position up/down and tuning menu are not allowed. TV/AV1, TV/AV1/AV2 or TV/AV1/AV2/AV3 depend on the option bit of EEPROM.

Colour system is determined by reading EEPROM of each mode, and send its information to AN5195K.

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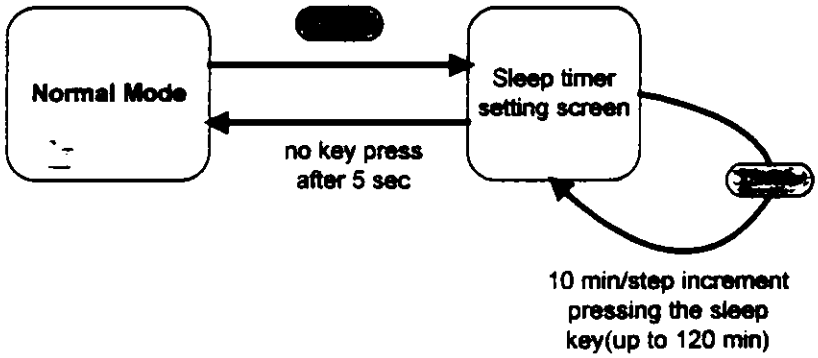
## 5.9 Sleep Timer

Sleep key is used to set the sleep timer. At each time pressing the key, setting is made every 10 minutes up until 120 minutes; thereafter, it will be reset to sleep 00. At this state, the sleep timer is off. However, an embedded 10 minutes timer will turn off the TV set if SD pin(pin 28) is in inactive for 10 minutes. Otherwise, the TV set will be turned off according to the time set by the sleep timer.

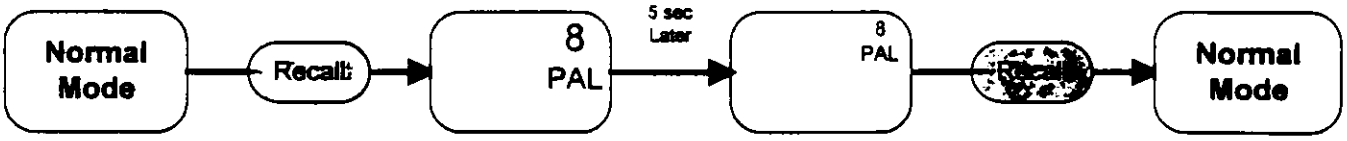
Sleep timer will be released when main power off, power key off, auto power off on no SD signal status.




## 5.10 Recall

Pressing recall key will bring the position number on screen with big size and colour system except AV mode. All information for picture and sound control is displayed. If system is in sleep timer mode, sleep timer information is also displayed. There is no key input within 5 seconds, the big character display will be reduced to small one and it will display permanently. Pressing the key thereafter will cancel the position call.

Status of recall is stored to EEPROM when power on, OSD display determined depend on the EEPROM status.

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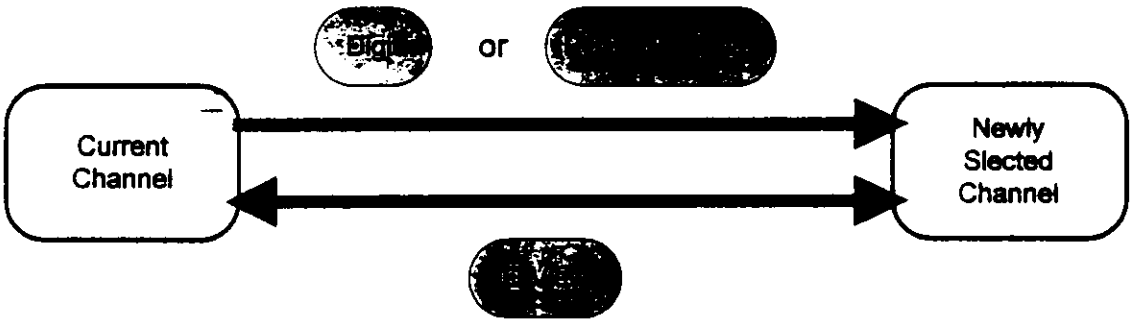
## 5.11 Previous position channel call

Whenever Q view in the remote control is pressed, the position will be returned to the previous position will be returned to the previous position except in the case that no position channel was changed after the TV power on.

In the case of main power on or power on, last position which stored in EEPROM(means current selected position) become the previous position channel. Therefore, no position channel was changed after the TV power on.




## 5.12 Power on/off

At each time pressing the power key in the remote control, power on/off control output is reversed. At time of power off, it will accept the local key position up/down key.

## 5.13 AFC mute control

All auto program and auto search position are initialized to have AFT mute operation off.

## 5.14 Skip

Skip all position will not be used in after auto program. The position number will change to red. All skip program number change to red colour.

When auto program in process, all BT and band data of tuned station is stored to EEPROM from position 1, the rest of all position will be the skip position. (e.g. when 12 stations tuned, then position 13 to 99 and 0 become skip position.)

During auto search and fine tune, pressing RED key makes that position to skip position. Skip information of each channel is stored in EEPROM.

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## 5.15 Normal

Pressing normal key will bring the Brightness, Contrast, Colour and Tint to defined position stored in EEPROM.

| | Min. | Center | Max. | Step |
|---|---|---|---|---|
| **Brightness** | 0 | 32 | 63 | 64 |
| **Contrast** | 0 | 32 | 63 | 64 |
| **Colour** | 0 | 32 | 63 | 64 |
| **Tint** | 0 | 32 | 63 | 64 |
| **Treble** | 0 | 32 | 63 | 64 |
| **Bass** | 0 | 32 | 63 | 64 |
| **Balance** | 0 | 32 | 63 | 64 |

Note:

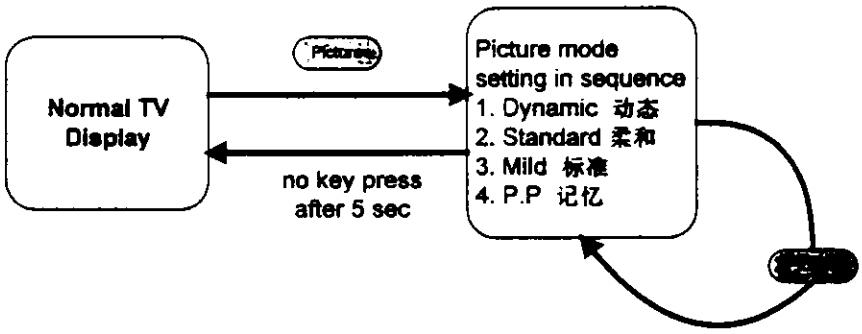
Brightness data is calculated by user adjusted data and factory data. Factory brightness data(sub-brightness) can be adjusted in 64 steps (i.e. 00-3F).

When pressed normal key, no special OSD display appears.

When pressed normal key, all data are stored to EEPROM and send to AN5195K.

## 5.16 Preset picture control

The Dynamic, Standard, Mild and P.P picture mode can be selected by the user, Dynamic, Standard and Mild are predefined by the factory, Presonal Preference(P.P) is preseted by the user. Pressing the picture mode key will display the picture mode menu, at each time of pressing key, setting will be made and switch to another mode. The following illustrated the procedure of setting picture mode.




| | Dynamic | Standard | Mild | P.P. |
|---|---|---|---|---|
| **Brightness** | 32 | 32 | 32 | user defined |
| **Contrast** | 63(max) | 32 | 20 | user defined |

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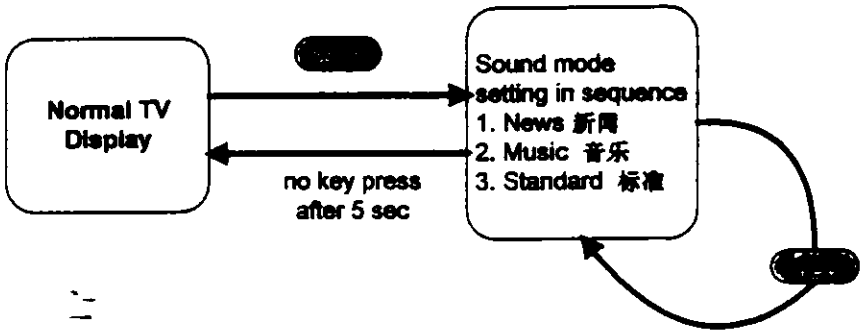
## 5.17 Preset sound control

The News, Music and standard sound mode can be selected by the user, pressing the sound mode key will display the sound mode menu, at each time of pressing key, setting will be made and switch to another mode. The following illustrated the procedure of setting sound mode.




| | News | Music | Standard |
|---|---|---|---|
| **Bass** | 22 | 63(max) | 32 |
| **Treble** | 22 | 63(max) | 32 |

## 5.18 Languages Selection

Chinese and English OSD menu can be selected by pressing the language key. Once the key has been pressed, a Language selection menu will be shown on TV screen, pressing the same key can be selected between Chinese and English menu display.

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# 6. Remote control key assign table

The Remote Controller is using NEC protocode and customer code is 2 byte format which is x'0a' and x'00'. The following table show the remote control key assign.

| | Assigned name | Function |
|---|---|---|
| 00 | 0 | Direct Function |
| 01 | 1 | Direct Function |
| 02 | 2 | Direct Function |
| 03 | 3 | Direct Function |
| 04 | 4 | Direct Function |
| 05 | 5 | Direct Function |
| 06 | 6 | Direct Function |
| 07 | 7 | Direct Function |
| 08 | 8 | Direct Function |
| 09 | 9 | Direct Function |
| 0A | - / -- | Direct position selection, up to 99 positions |
| 0B | Mute | Audio mute control |
| 0C | Picture | TV: Brightness, Contrast, Colour, Tint, Sharpness control |
| 0D | VOL UP | Volume, Tuning & Picture adjustment up |
| 0E | VOL DOWN | Volume, Tuning & Picture adjustment up |
| 0F | POS UP | Position up |
| 10 | POS DOWN | Position down |
| 11 | Preset | Preset Key |
| 12 | Power | Power on/off |
| 13 | Sleep | Sleep timer |
| 14 | TV/AV | TV/AV changeover |
| 15 | Reserved | Reserved |
| 16 | recall | Recall the position number |
| 17 | Q. View | Quick View |
| 18 | ~~Normal~~ | Normal key |
| 19 | RED | Item selection key RED |
| 1A | GREEN | Item selection key GREEN |
| 1B | YELLOW | Item selection key YELLOW |
| 1C | [illegible] | Item selection key CYAN |
| 1D | Surround | Surround sound key |
| 1E | Sound | Sound control menu |
| 1F | Lang. | English/Chinese selection |

40 PreAuD Preset audio

— PicPiC Preset Picture

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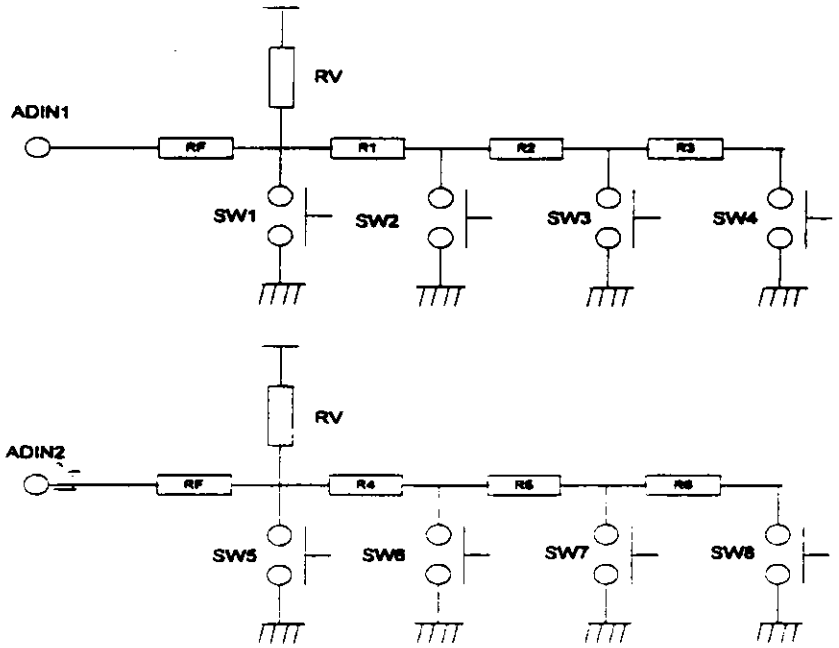
# 7. Local control key




## 7.1 Keys assignment

| Switch | Key function |
|---|---|
| SW1 | TV/AV |
| SW2 | VOL UP |
| SW3 | POS UP |
| SW4 | Preset menu |
| SW5 | Standby |
| SW6 | VOL DOWN |
| SW7 | POS DOWN |
| SW8 | Picture menu |

## 7.2 Key input detection voltage

| Input Voltage V | | A/D conversion data range | ADIN1 | ADIN2 |
|---|---|---|---|---|
| 0 - 2.9 | 0 | < 06H | TV/AV | Standby |
| 1.1 - 1.7 | 1.56 | < 0CH | VOL UP | VOL DOWN |
| 2.1 - 2.7 | 2.50 | < 12H | POS UP | POS DOWN |
| 3.0 - 3.6 | 3.53 | < 18H | Preset menu | Picture menu |

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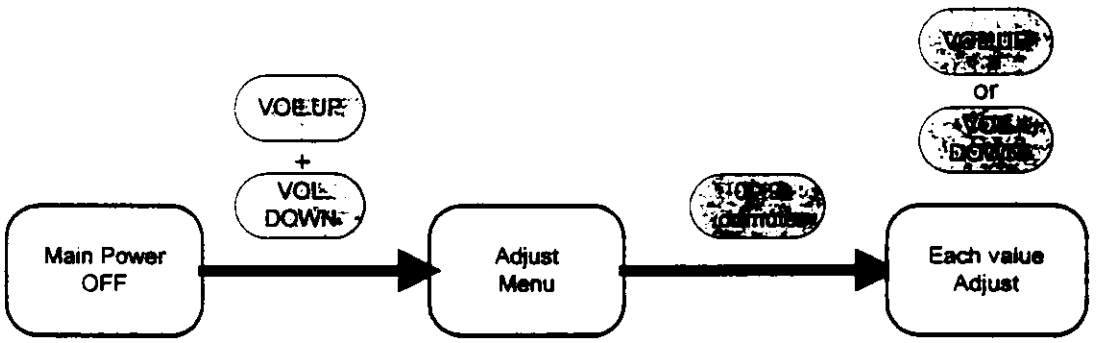
# 8. Manual Adjustment

To go into the adjustment menu, press the local volume up and down keys simultaneously in switching on the TV set. A picture with adjust menu will be displayed on the screen. All items can be selected in sequence by position up and down keys. Selecting the item then the volume bar is green in colour will be displayed indicating the current value in the EEPROM of adjust item. Change the item value by volume up/down keys, the new adjustment value will be stored in the EEPROM. The screen will stay until power off.

**Manual Adjustment function**

| Key | Item | Display | Ranges | Step |
|---|---|---|---|---|
| 0 | Video Adjust | VAD | 0-7 | 8 |
| 1 | AFT | AFT | 0-1FF | 512 |
| 2 | RFAGC | RFAGC | 0-3F | 64 |
| 3 | VCO | VCO | 0-7F | 128 |
| 4 | Cutoff-R | C-R | 0-FF | 256 |
| 5 | Cutoff-G | C-G | 0-FF | 256 |
| 6 | Cutoff-B | C-B | 0-FF | 256 |
| 7 | Drive-R | D-R | 0-7F | 128 |
| 8 | Drive-B | D-B | 0-7F | 128 |
| 9 | Sub-Brightness | S-B | 0-3F | 64 |
| Mute | H Center | H-C | 0-7 | 8 |

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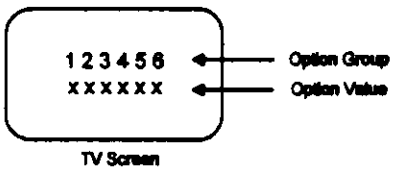
# 9. Option setting

To go into the option menu, press the local position up and down keys simultaneously in switching on the TV set. A picture with option number will be shown on the screen. The upper line represent the group of setting accrording to the following table, lower line represent the option value in the range of 0-7.




The number is in GREEN colour indicating the current options in the EEPROM. With 0-7 keys, change the digits position from left to right by volume up/down key and change the digit value by direct digit keys. Changed digit will become RED. Every Time the option setting is changed, the new option number will be stored in the EEPROM.

| EEPROM Data Address | Data bit | Option Group | | Bit | Item | Option value | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 00H | 0 | 1 | Stereo | 0 | Bass/Treble/Balance | × | ✓ | × | ✓ | - | - | - | - |
| | 1 | | | 1 | Woofer | × | × | ✓ | ✓ | - | - | - | - |
| | 2 | | | 2 | Reserved | - | - | - | - | - | - | - | - |
| 00H | 4 | 2 | Colour Sys | 0 | SECAM | × | ✓ | × | ✓ | - | - | - | - |
| | 5 | | | 1 | RF NTSC | × | × | ✓ | ✓ | - | - | - | - |
| | 6 | | | 2 | Reserved | - | - | - | - | - | - | - | - |
| 01H | 0 | 3 | AV Mode | 0 | 0 = AV1 only<br>1 = AV1 & AV2 | × | ✓ | × | ✓ | - | - | - | - |
| | 1 | | | 1 | 2 = AV1 only<br>3 = AV1, AV2 & AV3 | × | × | ✓ | ✓ | - | - | - | - |
| | 2 | | | 2 | Reserved | - | - | - | - | - | - | - | - |
| 01H | 4 | 4 | Sound Sys 1 | 0 | B/G (5.5MHz) | × | ✓ | × | ✓ | × | ✓ | × | ✓ |
| | 5 | | | 1 | D/K (6.5MHz) | × | × | ✓ | ✓ | × | × | ✓ | ✓ |
| | 6 | | | 2 | I (6.0MHz) | × | × | × | × | ✓ | ✓ | ✓ | ✓ |
| 02H | 0 | 5 | Sound Sys 2 | 0 | M (4.5MHz) | × | ✓ | × | ✓ | - | - | - | - |
| | 1 | | | 1 | Start up LOGO | × | × | ✓ | ✓ | - | - | - | - |
| | 2 | | | 2 | Reserved | - | - | - | - | - | - | - | - |
| 02H | 4 | 6 | Auto Tuning | 0 | Search Down | × | ✓ | × | ✓ | × | ✓ | × | ✓ |
| | 5 | | | 1 | UHF Only<br>(✓=UHF,<br>×=UHF/VHF-L/H) | × | × | ✓ | ✓ | × | × | ✓ | ✓ |
| | 6 | | | 2 | Channel<br>(✓=100, ×=40) | × | × | × | × | ✓ | ✓ | ✓ | ✓ |

× = Disable ✓ = Enable

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# 10. Auto Adjustment

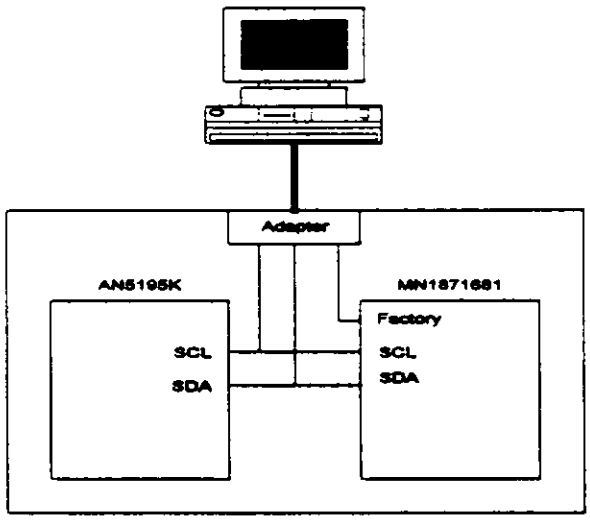
When the factory pin of MCU (pin 36) goes LOW, it will go into factory mode. The factory mode will disable the TV operation and the I2C bus transmission. When main power is off, then exit the auto adjustment mode.

## *10.1 MCU process*

1. When MCU detect the factory pin (pin36) is "L" level, then it make I2C bus terminal in hi-impedance status whiten 100ms and release these bus.
2. In this mode, all local key, remote key disable and all action become prohibited.
3. All the terminal status except I2C bus and OSD port remain the latest status just before the factory pin detected "L".
4. OSD display are prohibited.
5. After this mode when factory pin detect "H", then read EEPROM data to on-chip RAM and restart from the "RESET START" status (branch to reset start address).
6. After this process all data stored in EEPROM and send to AN5195K is based on on-chip RAM.

## *10.2 Adapted computer process*

1. Make factory pin "L" and wait 100ms.
2. Initial setting of AN5195K is operated by operator.
3. The same data set on AN5195K must be sent to EEPROM.
4. Make factory pin "H"




TV SET

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# 11. Service Mode

To go into the service mode, press local keys TV/AV and stand-by simultaneously in switching on the TV set. The TV set will power on such as normal power on. This service mode is for disabling the automatic power off 10 minutes after no channel broadcasting in production line.

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# 12. Matching Chart of Pin Assigning

| Pin No. | Pin Name MN1876476 | I/O | Pin No. | Pin Name MN1871681 | I/O |
|---|---|---|---|---|---|
| 1 | P06/RMIN | I | 1 | RMIN | I |
| 2 | ADIN0(SDA1) | I/O | 2 | ADIN0(SDA1) | I |
| 3 | ADIN1(SCL1) | I/O | 3 | ADIN1(SCL1) | I |
| 4 | ADIN2(P50) | I/O | 4 | ADIN2(P50) | I |
| 5 | ADIN3(P51) | I/O | 5 | ADIN3(P51) | O |
| 6 | ADIN4(P52) | I/O | 6 | ADIN4(P52) | O |
| 7 | ADIN5(P53) | I/O | 7 | ADIN5(P53) | I/O |
| 8 | ADIN6(P54) | I/O | 8 | ADIN6(P54) | O |
| 9 | ADIN7(P55/IRQ2) | I/O | 9 | ADIN7(P55) | O |
| 10 | ADIN8(P56/IRQ3) | I/O | 10 | ADIN8(P56) | I/O |
| 11 | ADIN9(P57/ACIN) | I/O | 11 | ADIN9(P57) | I/O |
| 12 | CM | I | 12 | CM | I |
| 13 | SYNC | O | 13 | SYNC | O |
| 14 | PWM1(P30) | I/O | 14 | PWM1 | O |
| 15 | PWM2(P31) | I/O | 15 | PWM2 | O |
| 16 | PWM3(P32) | I/O | 16 | PWM3 | O |
| 17 | PWM4(P33) | I/O | 17 | PWM4 | O |
| 18 | PWM5(P34) | I/O | 18 | PWM5 | O |
| 19 | PWM6(P35) | I/O | | | |
| 20 | PWM7(P36) | I/O | | | |
| 21 | PWM8(P37) | I/O | | | |
| 22 | AVDD | - | | | |
| 23 | CREF | O | | | |
| 24 | VPH | O | | | |
| 25 | VCP | O | | | |
| 26 | CVBS | I | | | |
| 27 | AVSS | - | | | |
| 28 | P47 | I/O | 19 | P47 | O |
| 29 | P46 | I/O | 20 | P46 | O |
| 30 | P45 | I/O | 21 | P45 | O |
| 31 | P44 | I/O | 22 | P44 | O |
| 32 | P43 | I/O | 23 | P43 | O |
| 33 | P42 | I/O | 24 | P42 | O |
| 34 | P41 | I/O | 25 | P41 | I |
| 35 | P40 | I/O | 26 | P40 | O |
| 36 | P21/XO | I/O | | | |
| 37 | P20/XI | I/O | | | |
| 38 | VSS | - | | | |
| 39 | HSYNC | I | 27 | HSYNC | I |
| 40 | P16/SD | I | 28 | P16 | I |
| 41 | P15/(VOB) | I/O | 29 | VOB | O |
| 42 | P14(VOW3) | I/O | 30 | VOW3 | O |
| 43 | P13(VOW2) | I/O | 31 | VOW2 | O |
| 44 | P12(VOW1) | I/O | 32 | VOW1 | O |

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| Pin No. | Pin Name MN1876476 | I/O | Pin No. | Pin Name MN1871681 | I/O |
|---|---|---|---|---|---|
| 46 | P10(PWM/VOI) | I/O | 33 | PWM | O |
| 47 | P66 | O | | | |
| 48 | P65 | O | | | |
| 49 | P64 | O | | | |
| 50 | P63 | O | | | |
| 51 | P62 | O | | | |
| 52 | P61 | O | | | |
| 53 | P60 | O | | | |
| 54 | P07/ /RST | I/O | 34 | /RST | I |
| 55 | P05/IRQ1/VSYNC | I | 35 | VSYNC | I |
| 56 | P04/IRQ0 | I/O | 36 | P04 | I |
| 57 | P03(/SBD) | I/O | | | |
| 58 | P02(/SBT0) | I/O | | | |
| 59 | P01(SDA0) | I/O | 37 | P01 | OD |
| 60 | P00(SCL0) | I/O | 38 | P00 | OD |
| 61 | VDD | - | 39 | VDD | - |
| 62 | OSC1 | I | 40 | OSC1 | I |
| 63 | OSC2 | O | 41 | OSC2 | O |
| 64 | VSS | - | 42 | VSS | - |

# 13. "Fu Lam Moon" Logo

When the TV is turned into the operation mode, in no signal mode (Blue Back option is "ON") and by pressing RECALL KEY, the "Fu Lam Moon" logo will appear on the screen. It will last for 5 seconds. Seven different color of the graphic logo can be selected by pressing the "RECALL KEY". The default color of the logo is red in color. The default color will be resumed by the TV "ON/OFF POWER KEY". "STAND BY KEY" will keep the current graphic color.

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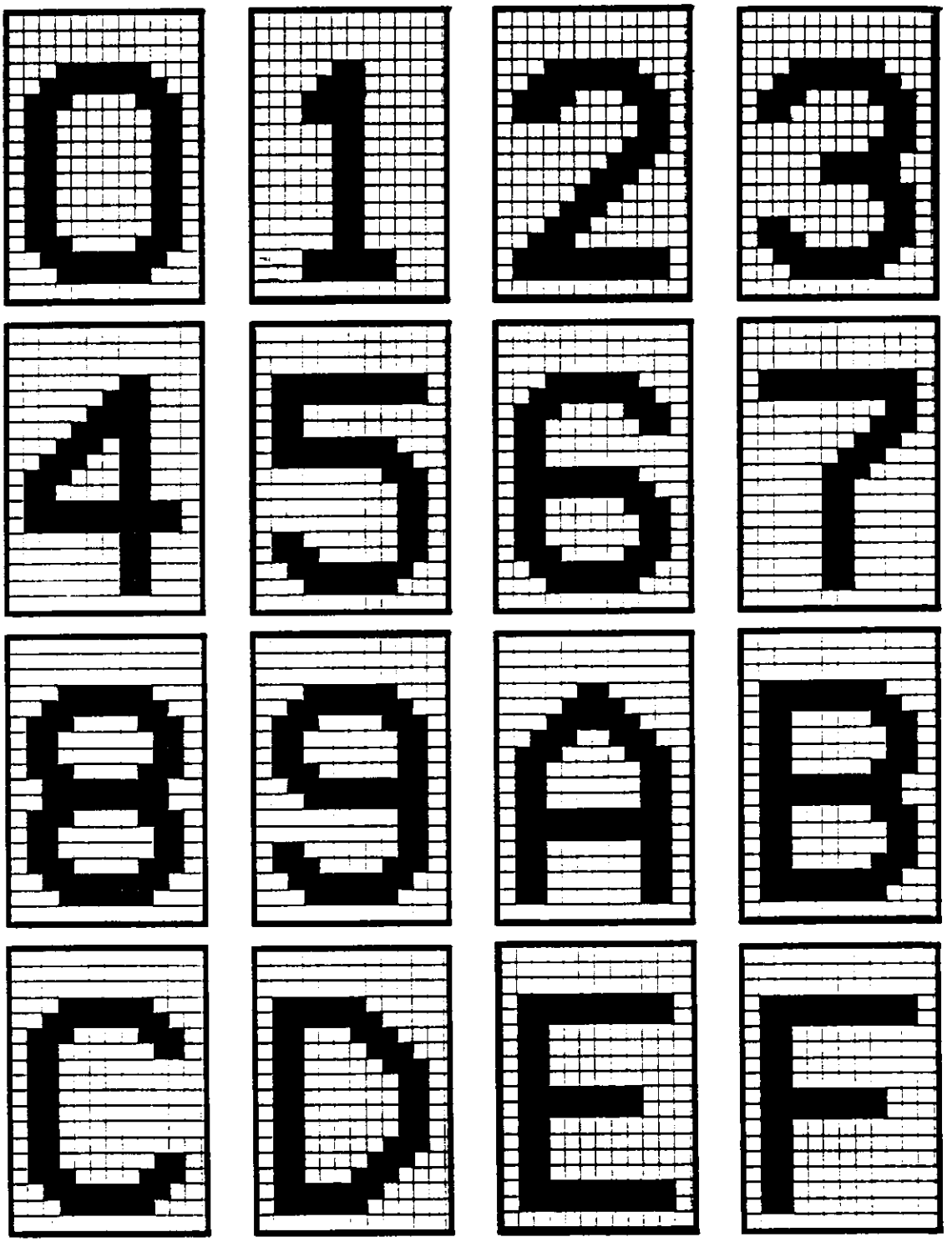
# 13. Appendix

## *13.1 Characters Set*



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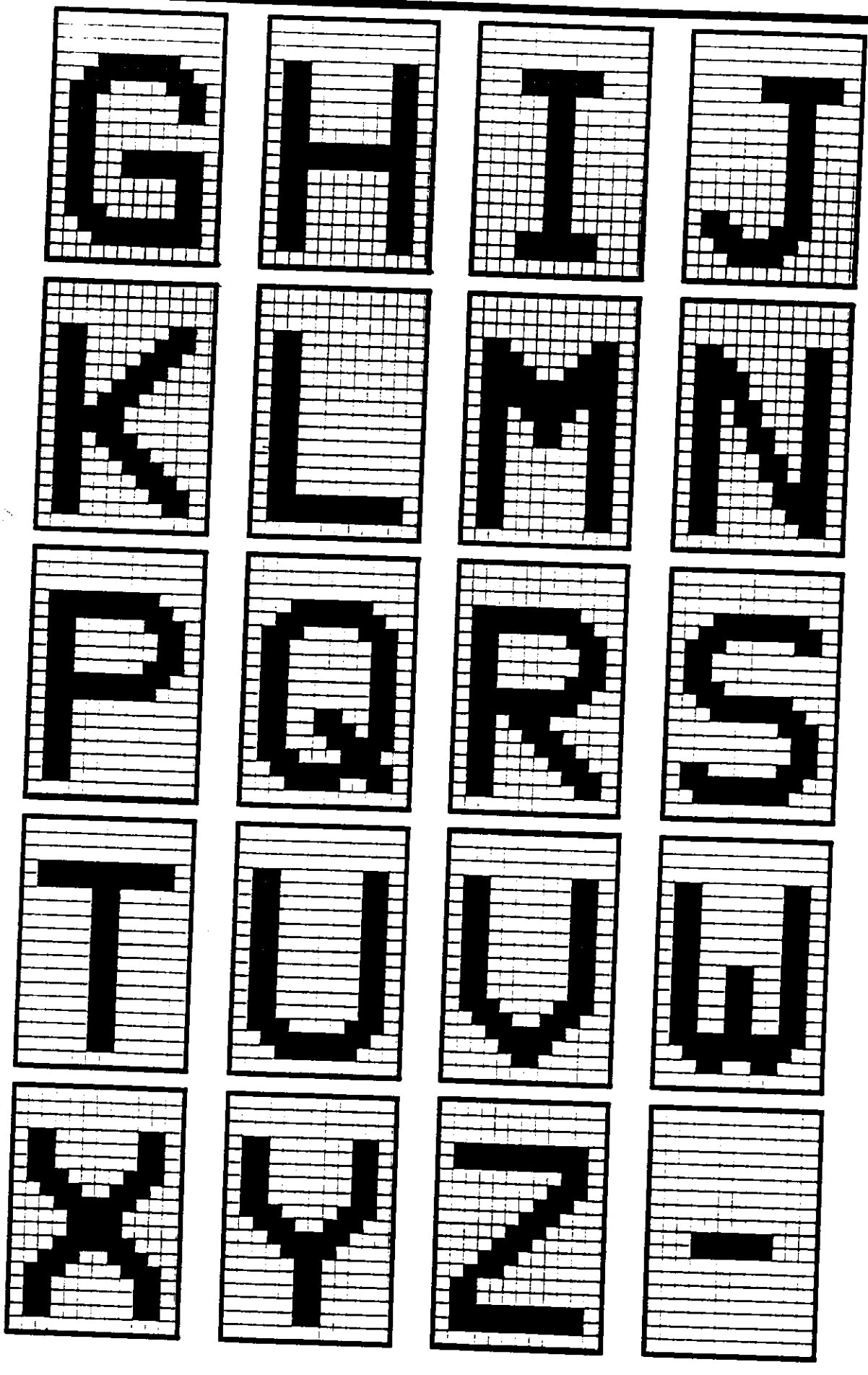

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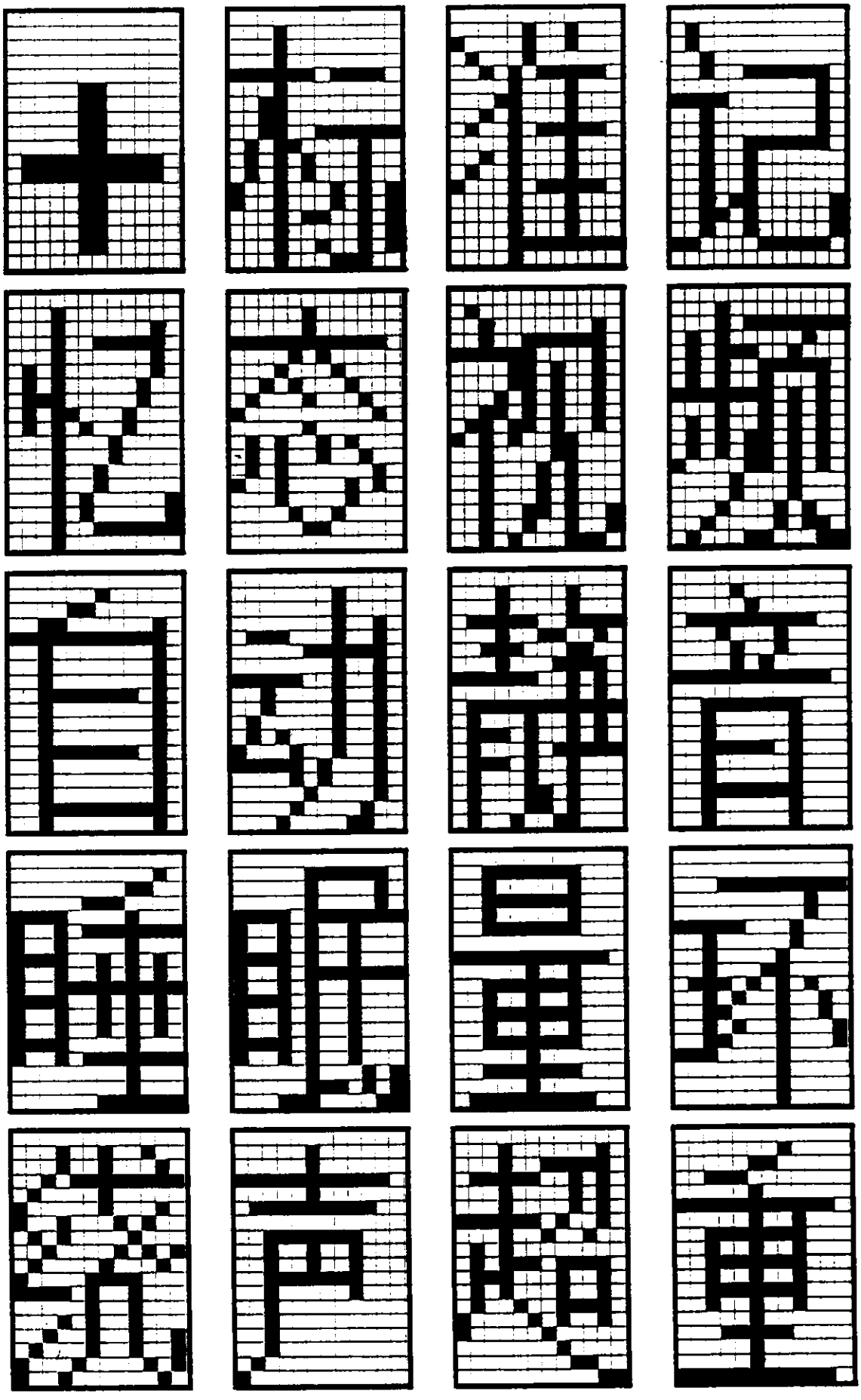

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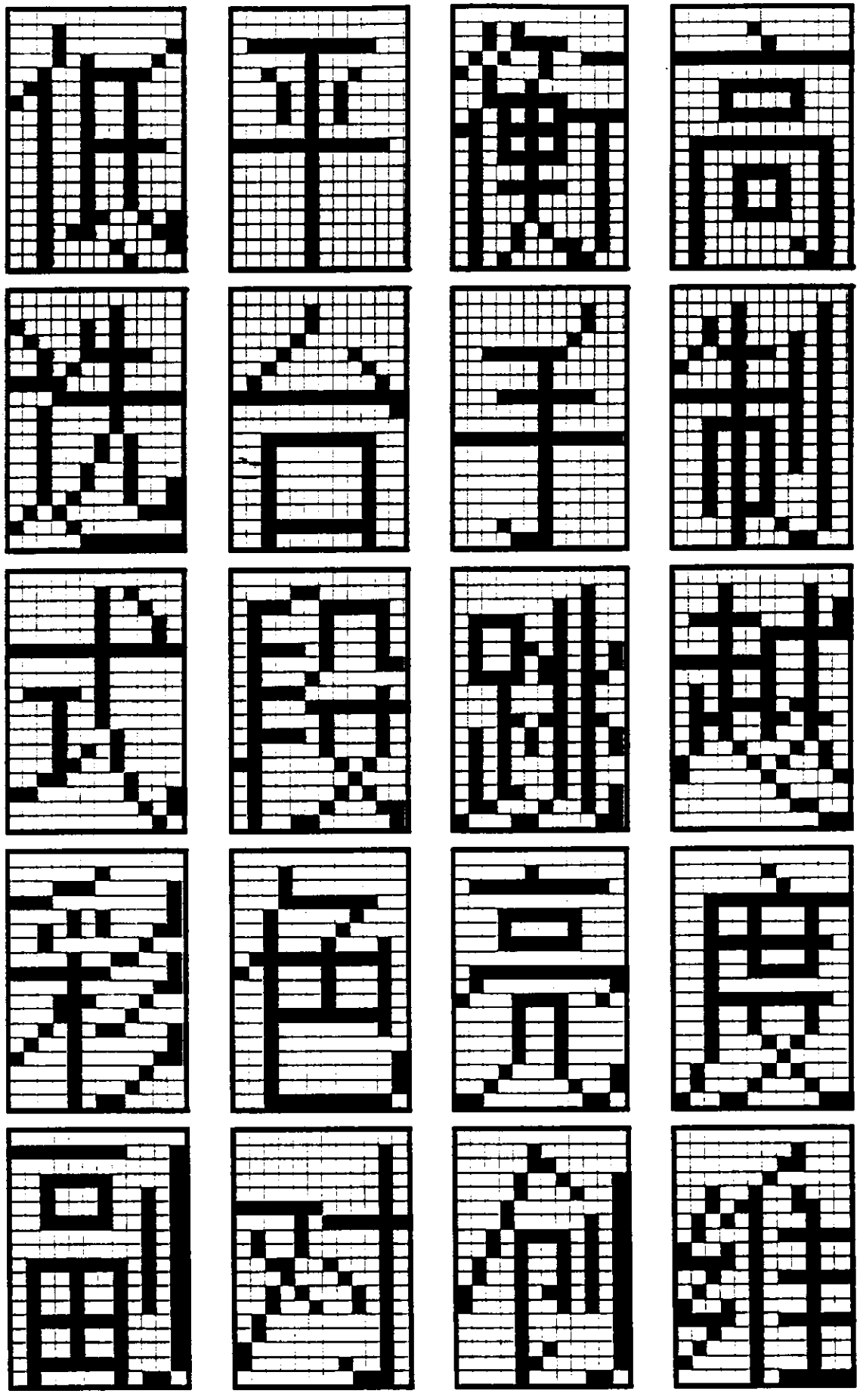

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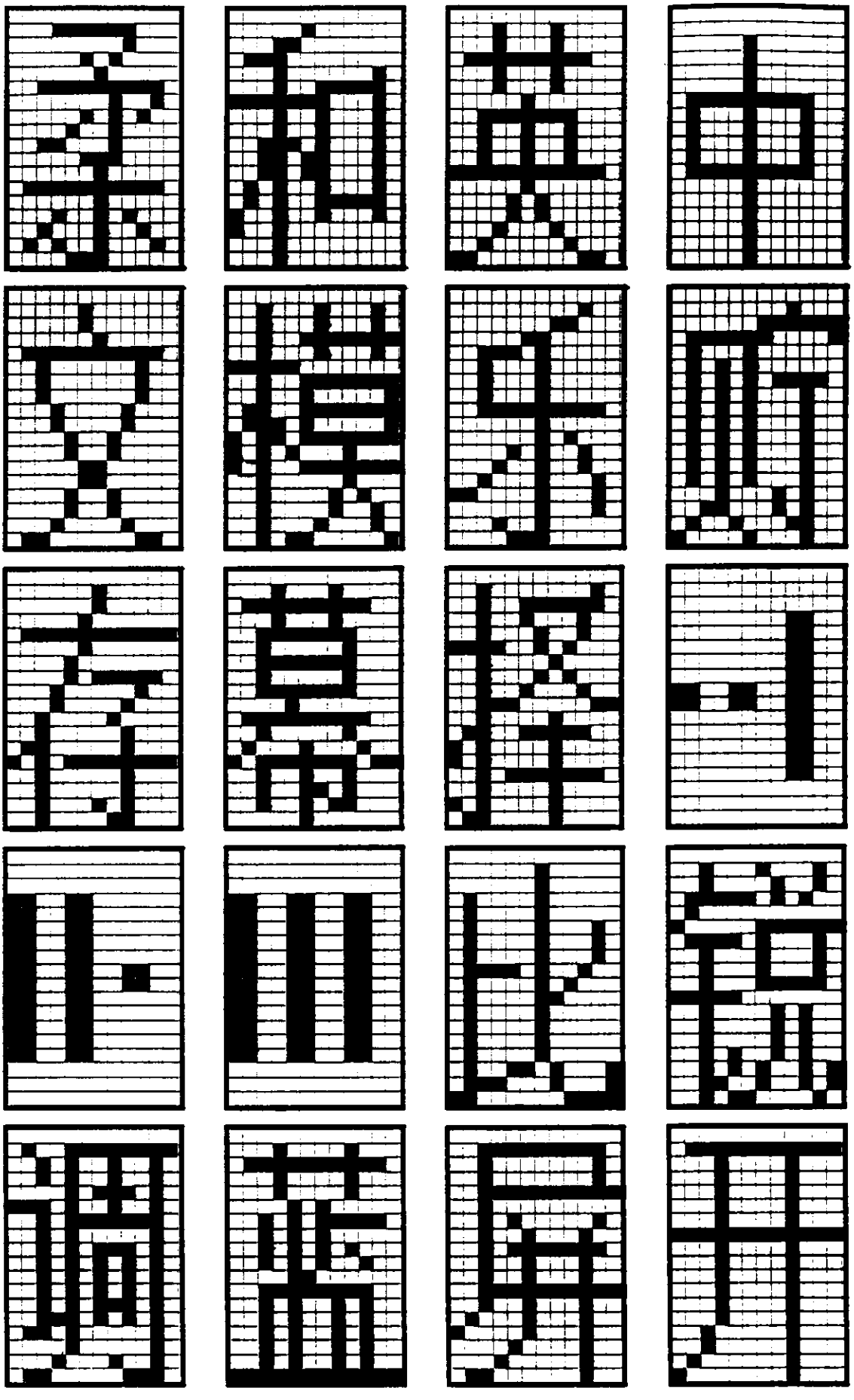

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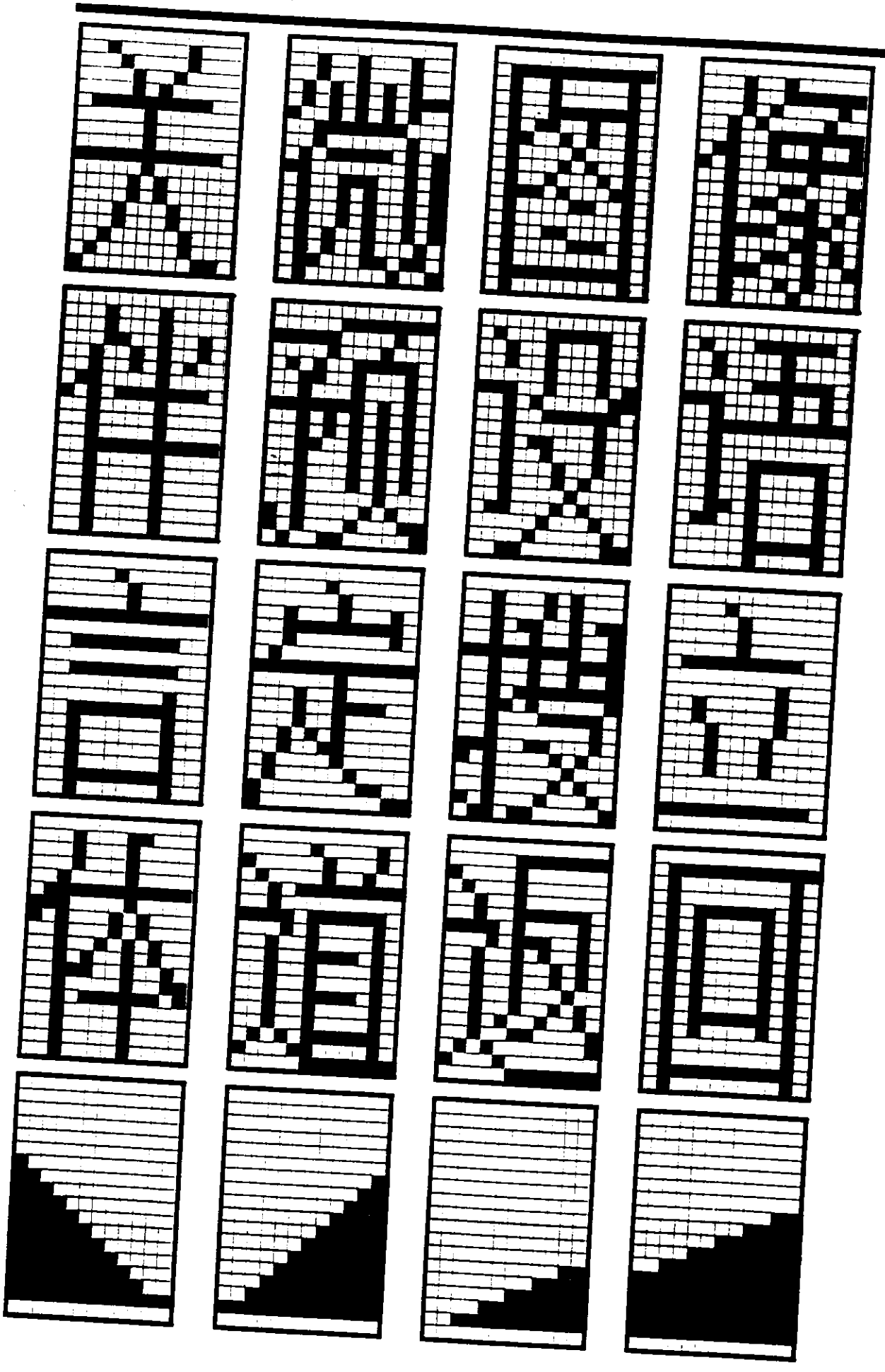

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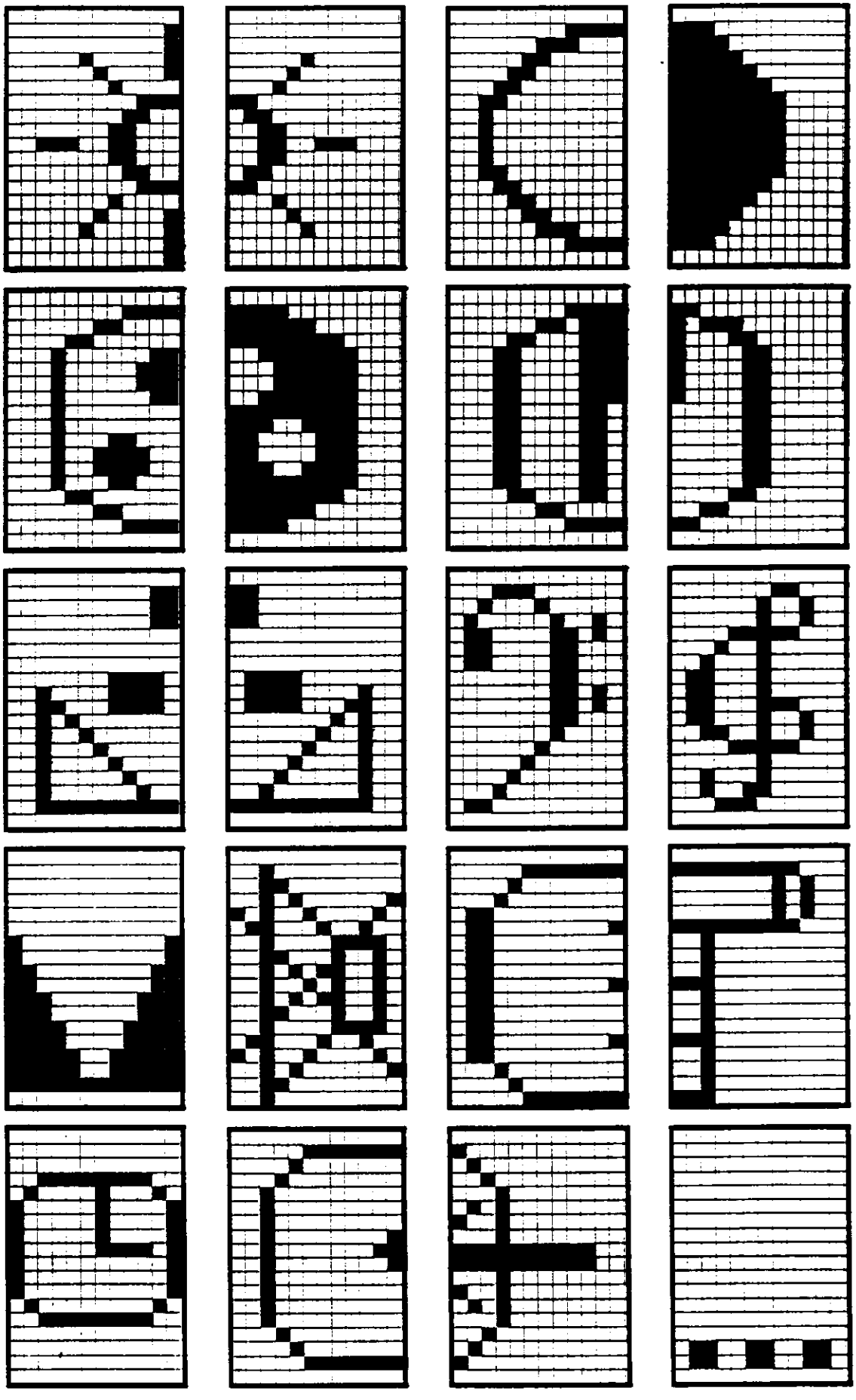

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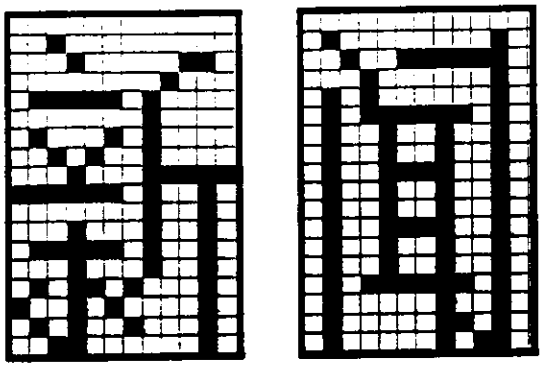

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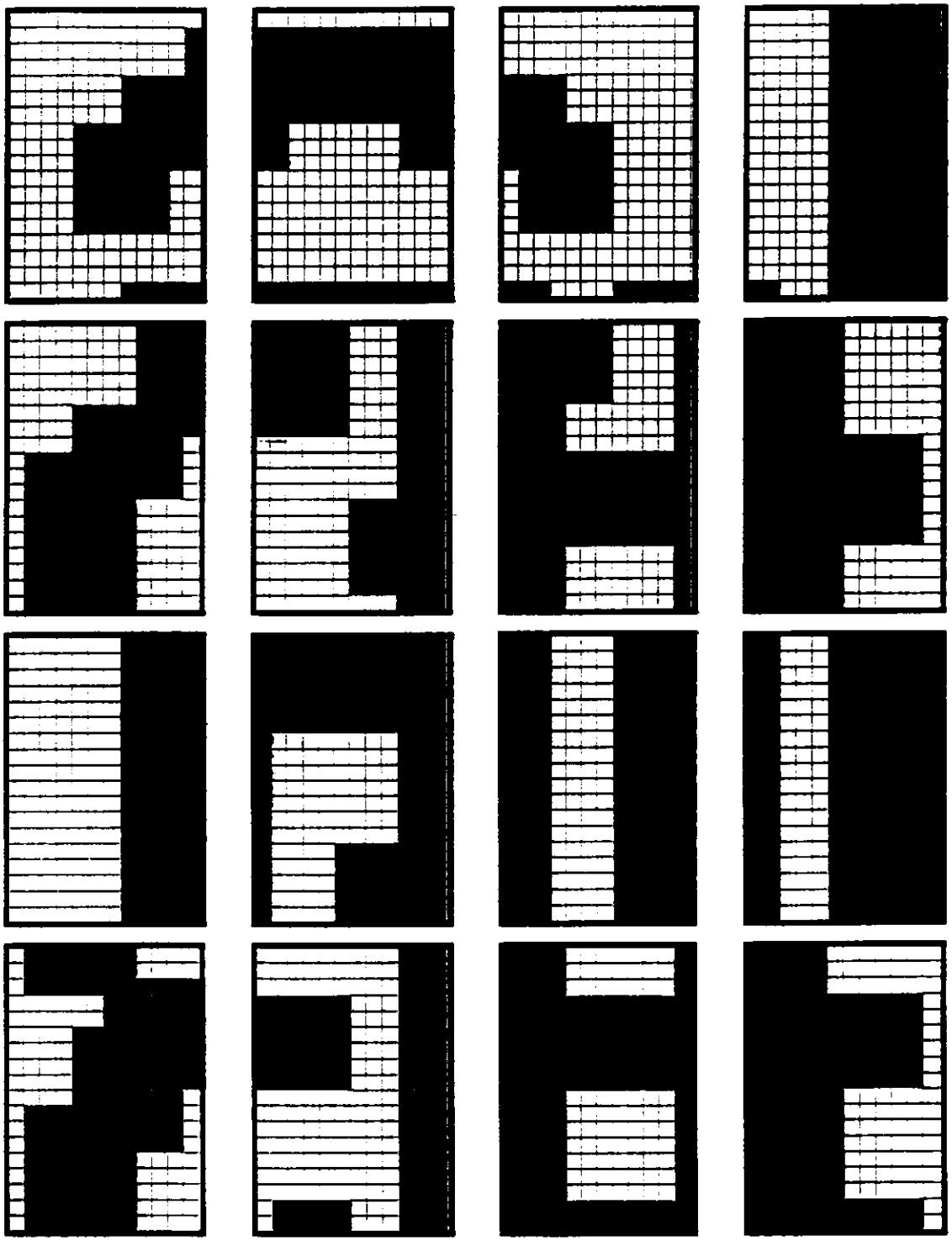
## 13.2 Logo Fonts set



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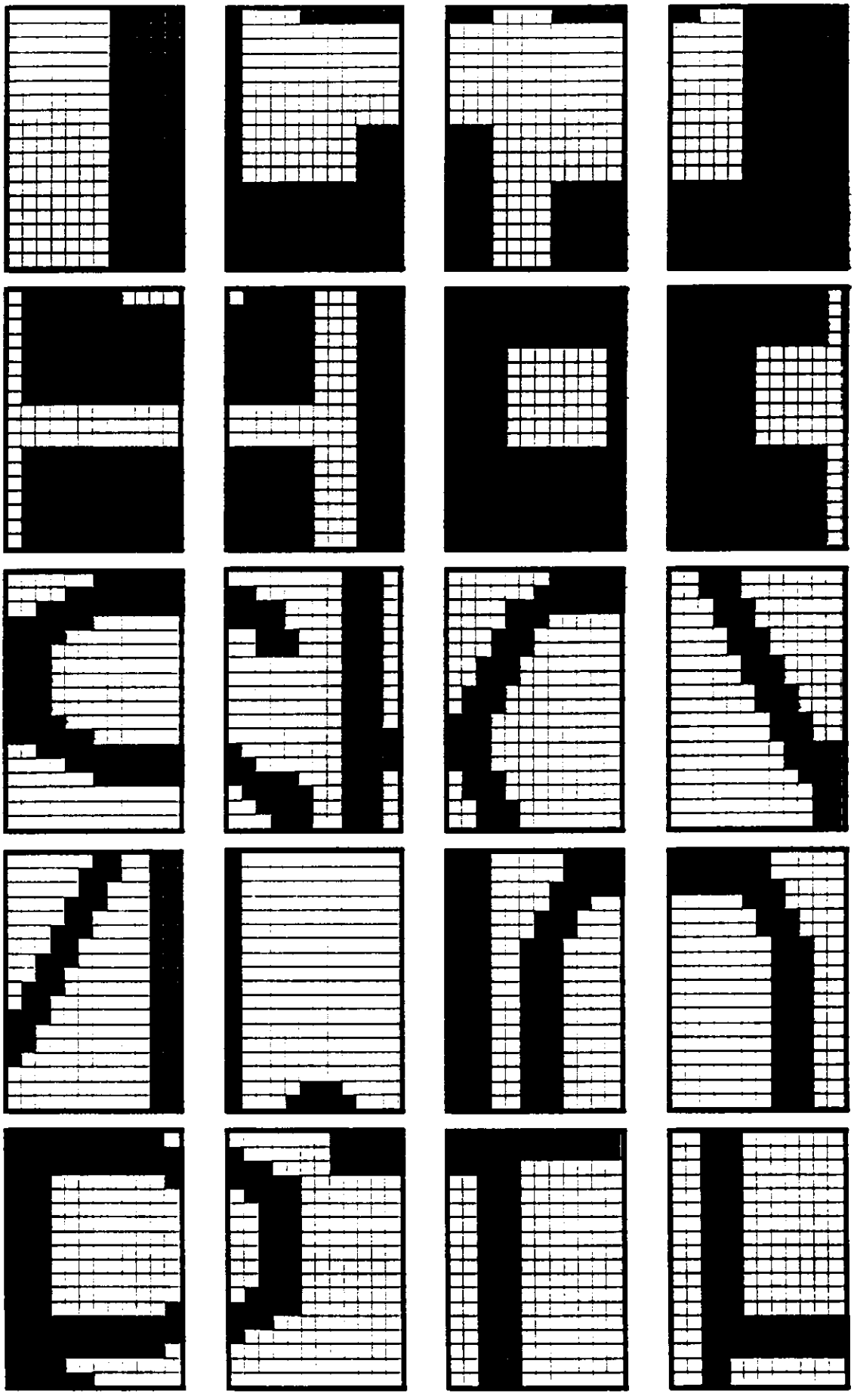

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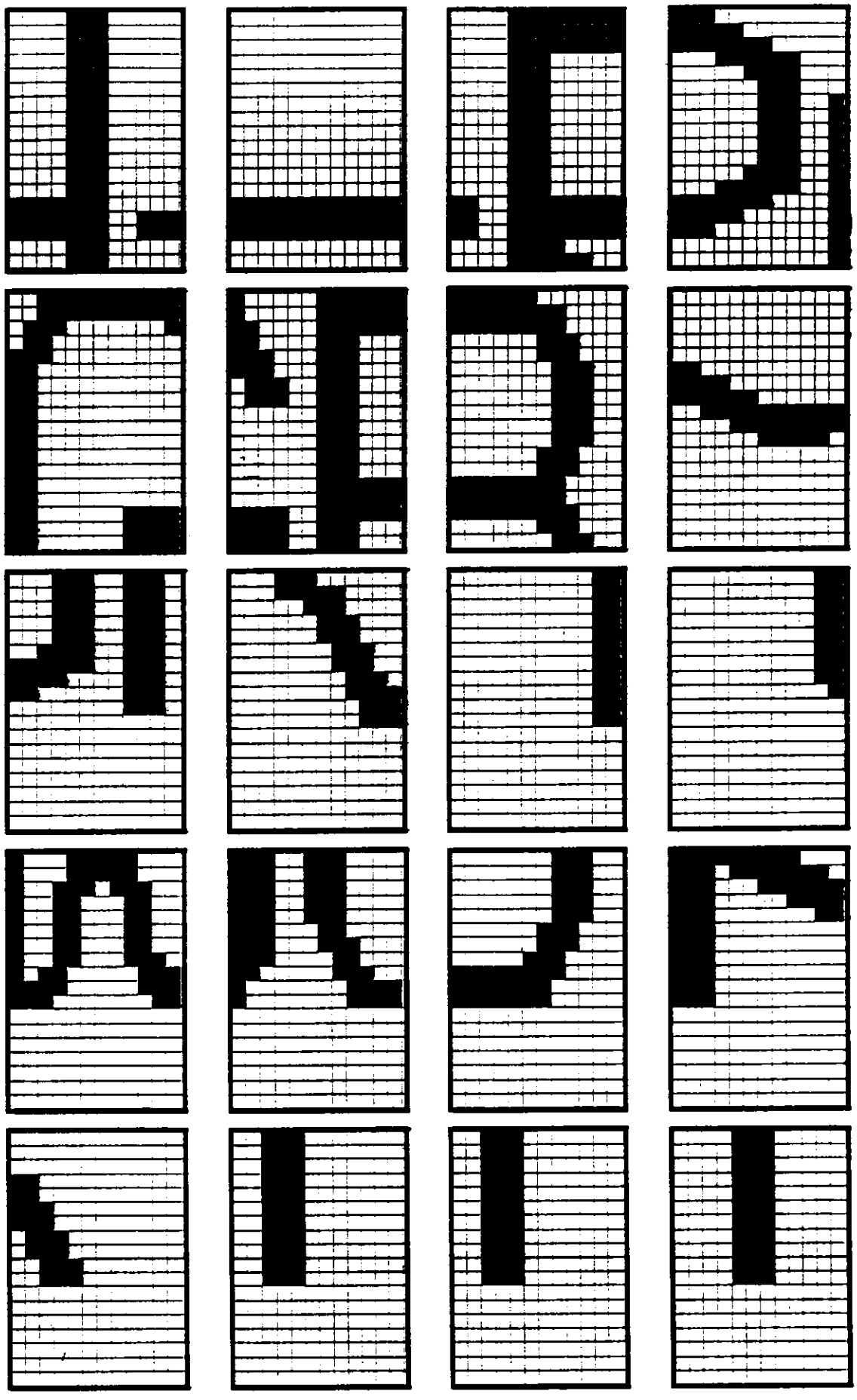

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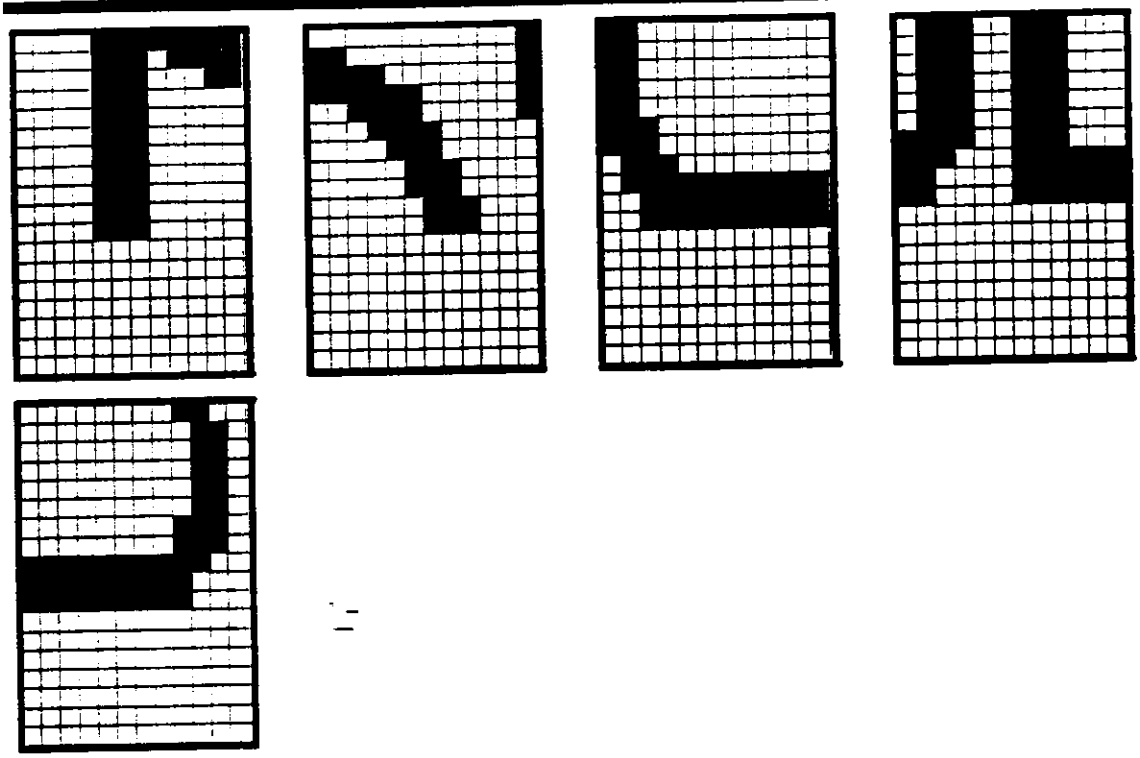

---- End of Specification ----

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