UNIVERSAL COMPOSITE AND RGB2HDMI OUTPUT

EXTERNAL VIDEO FOR RETRO\VINTAGE COMPUTERS

UNIVERSAL COMPOSITE AND RGB2HDMI OUTPUT

EXTERNAL VIDEO FOR RETRO\VINTAGE COMPUTERS

Created by Rudy's Retro Intel

I created these boards so that I could get external composite video in my Kaypro II computer. Then the project expanded to include RGB2HDMI connection. Finally, it was changed so that the board could work on many retro\vintage computers.

The first board produces composite output *and* RGB2HDMI connections. Both can be used at the same time. For the HDMI video to work you will need to purchase the RGBtoHDMI adapter. It is available in several places, so just search for the name on the internet.

The second board used to get RGB2HDMI output. Again, you will need the adapter board to use it.

You only need one of the two boards so make only what you need.

Hopefully, you find this board is good to have and let me know in which computer you are using it in

Rudy's Retro Intel

https://www.youtube.com/c/RudysRetroIntel

***** I have created this document based on my own work with my Kaypro II computer. It is offered without any warranty or guarantee. I\we are not liable for any mistakes, harms, or losses that may arise from using this board. This board is a hobbyist project. By using these boards, you agree to waive all\any right(s) to take legal action against me\us.***

Current Version

The latest version is 2.5 has the following features:

1. External composite video connection.
2. Video select which allows for inverted or normal displays. Some computers invert the signal and this jump must be set.
3. External RGB2HDMI connection.

Manual can be found on GitHub: **https://github.com/RudyRetroIntel/Video-Adapter**
YouTube channel: **https://www.youtube.com/@RudysRetroIntel**

Different Boards and Usage

There are two different board.

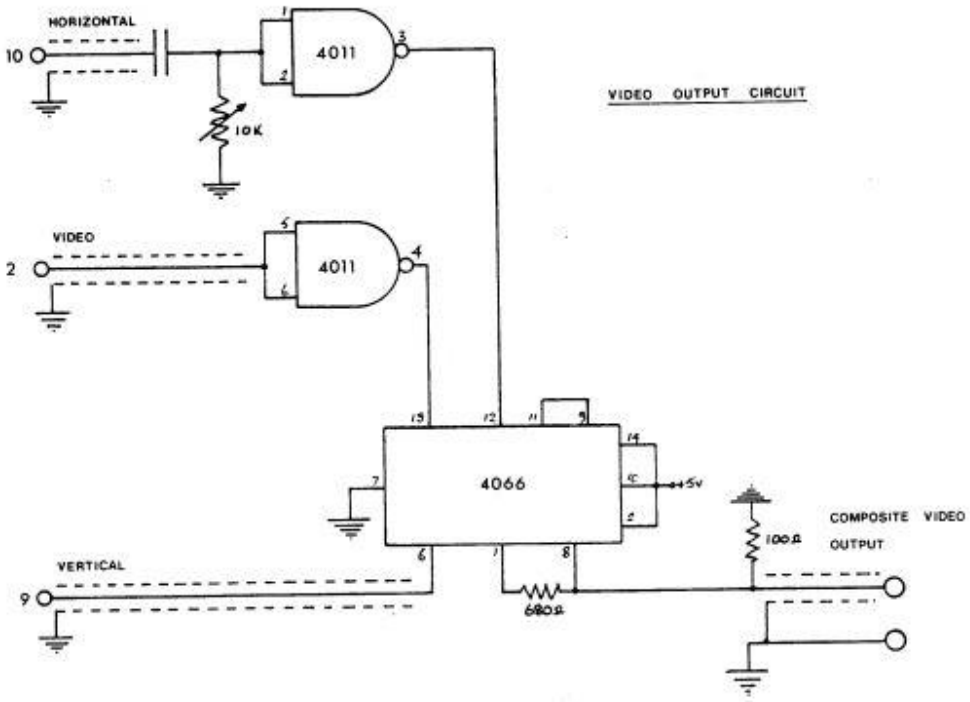
First board is used to provide both composite output and RGB2HDMI port for HDMI output via the RGB2HDMI adapter board which is not included. You will have to purchase or build this board separately.

Second board is only use for RGB2HDMI. This much smaller board does not provide composite output.

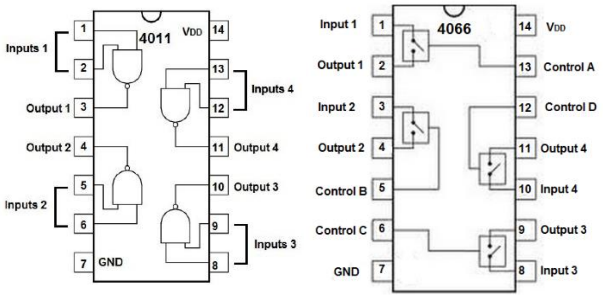
Technical Information and Schematics

Schematic that was used for this board are shown. I have not created a new schematic that shows the completed board as a whole.

Original schematic created by Nick Hampshire and can be found in the book called “The PET Revealed” from 1979. Below is a screen shot. **https://petlibrary.tripod.com/COMPVID.HTM**



Below are the pinouts for the CD4011BE and CD4066BE ICs



RGB2HDMI Connector and Cable Information

Used a network LAN cable which has the wires that are twisted in pairs inside the cable. Below is the cabling for the connector DB9 connector.

DB9 Connector which: *Connects to the Universal board*

Video = Pin 4 - Colour I used Green
Vertical Sync = Pin 9 - Colour I used Blue
Horizontal Sync = Pin 8 - Colour I used Orange
Ground = Pin 1- 3, 5 - 7 - Colour I used: All white wires with a stripe on them and Brown

DB9 Male Connector which: *Connects to the RGB2HDMI adapter board*

Video = Pin 4 - Colour I used Green
Vertical Sync = Pin 9 - Colour I used Blue
Horizontal Sync = Pin 8 - Colour I used Orange
Ground = Pin 1 - Colour I used: All white wires with a stripe on them
GND - Colour I used: Brown

More details will be found with the documentation provided by your RGB2HDMI adapter board.

Assembly Guide

Have the board(s) created by your own PCB manufacture, here are the parts list. This list many not cover all the parts needed.

MANUFACTURER PART NUMBER	DESCRIPTION	Parts Vendor	Quantity
CD4011BE	IC GATE NAND 4CH 2-INP 14DIP	DigiKey	1
CD4066BE	IC QUAD BILATERAL SWITCH 14DIP	DigiKey	1
245-14-1-03	CONN IC DIP SOCKET 14POS TIN	DigiKey	2
3306K-1-103	TRIMMER 10K OHM 0.2W PC PIN SIDE	DigiKey	1
CF1/4CT52R332J	RES 3.3K OHM 5% 1/4W AXIAL	DigiKey	1
CF14JT680R	RES 680 OHM 5% 1/4W AXIAL	DigiKey	1
CF1/4CT52R104J	RES 100K OHM 5% 1/4W AXIAL	DigiKey	3
K222K15X7RH5UL2	CAP CER 2200PF 100V X7R RADIAL	DigiKey	1

Board Troubleshooting

Issue: Video is inverted. Seeing black letters on white background

Fix: Power off the computer, disconnect the board and set the jumper setting for the external video to **Normal** or **Inverse. If this jumper is incorrectly set the video will be inverted**. *DO NOT make this change with power on.*

Issue: No video

Fix:

1. Ensure you are getting the following signals: Video, Horizontal Sync, Vertical Sync, +5VDC and Ground. Not that +5VDC is not required for just RGB2HDMI connection.
2. Ensure you have the following signals connected to the correct locations on the board.
3. Ensure monitor is powered on.
4. Adjust the brightness and\or contrast of your monitor.
5. Check to ensure your composite cable good. At times they can go bad without doing anything to them. Verify that the cable is working.
6. Test and replace capacitor with 2200pF.
7. Test and replace 10K potentiometer.
8. Test and replace ICs 4011 and\or 4066.

Issue: Picture is not clear, scrambled, or off screen

Fix:

1. Adjust 10K potentiometer to fine tune the picture.
2. Adjust the settings on your monitor. This includes Horizontal and\or Vertical position
3. If using the RGB2HDMI connection, check the settings in the RGB2HDMI board (not included). See their documentation on settings as this is not covered in this manual.