Evaluation Board for the ADV7170/71 Digital Video Encoder

Eval-ADV7170/71EB

V1.20 12/97

FEATURES
On-Board Reference
On-Board Clock
8bit/16bit CCIR656/601 Pixel Data Input
4 analog video outputs
Direct Hook-Up to Printer Port of PC
PC Software for Control of the ADV7170/71 modes

INTRODUCTION

This Application Note describes the ADV7170/71EB evaluation board which supports the ADV7170/71 Digital Video Encoder. The device accepts CCIR601/656 compatible video data and converts into analog Composite, Y/C, RGB or YUV video signals in PAL or NTSC format. The ADV7170/71 can be evaluated without the need to provide video pixel data when internal colorbar mode is used.
Full data on the ADV7170/71 is available in the ADV7170/71 data sheet, available from Analog Devices and should be consulted in conjunction with this note when using the Evaluation Board.

REQUIREMENTS

The ADV7170/71 evaluation board requires a DC power supply which is able to deliver a minimum of 5V. Current requirements are approx. 0.3 A**.**
To run the software which is supplied with the ADV7170/71 it is necessary to connect the printer port LPT1 of the PC to the boards 25pin male D-type connector, J1.
In order to run the software on a PC the operating system needs to be Windows 95 or Windows 98. The system requirements ask for any Pentium I, PMMx or Pentium II PC.

GENERAL DESCRIPTION

The ADV7170/71EB provides a 25-pin input port, J2, over which pixel data in CCIR601/656 format can be input. Test pattern generators providing these standards are the Tektronix TSG601 handheld signal generator or the Tektronix TPG20. The input pixel data is converted from ECL level to TTL level via the MC10125TTLs (U1, U2, U3).

If a different clock source as that provided by the pixel data is required, the ADV7170/71EB features a 27Mhz clock (X1) which can be connected over jumper LK1.
The on-board push-button, SW1 provides control over the $\overline{\text{RESET}}$ pin. When this button is pressed, the internal registers of the ADV7170/71 reset to default register settings (see following page).

The ADV7170/71EB also features an external Voltage Reference (D1) which provides 1.235V Output Voltage.

The outputs of DAC A, B, C, D are directly fed to a LPF and then output over the BNC connectors.

The ADV7170/71 pins can be accessed independently over header JP1.

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REGISTER SETTINGS ON POWER-UP AND ON RESET

After pressing the reset button SW1 on the evaluation board, the register settings of the ADV7170/71 will set up as follows:

NTSC Video Standard.
DAC B on
DAC A, C, D off

Disabled:

MR1: Color Bars, CC
MR2: Low Power Mode, Genlock, Square Pixel
MR3: All Zeros invalid, TTX, Chroma Output, VBI_Open
MR4: Sleep Mode, VSYNC_3H, RGB Sync

Enabled:
MR2: Chrominance, Burst
MR4: Active video filter, Pedestal

Output Configuration:

DAC A: CVBS
DAC B: CVBS
DAC C: Chroma
DAC D: Luma

Timing Mode 0, Slave, Blank Input Enabled, Interlaced Mode.

Subcarrier Frequency Register 0:	16hex
Subcarrier Frequency Register 1:	7Chex
Subcarrier Frequency Register 2:	F0hex
Subcarrier Frequency Register 3:	21hex

The following register settings will correspond to the above settings:

00hex	MR0	00hex
01hex	MR1	58hex
02hex	MR2	00hex
03hex	MR3	00hex
04hex	MR4	10hex
09hex	SFR0	16hex
0Ahex	SFR1	7Chex
0Bhex	SFR2	F0hex
0Chex	SFR3	21hex

All other registers : 00hex

After powering up the ADV7170/71EB a hardware reset should be applied (SW1).

EVALUATION SOFTWARE

In order to give the user complete control over the ADV7170/71, a computer program is supplied with the board.

Setting Up:
Insert DISK 1 into the floppy drive and double click on "SETUP.EXE" and you will be prompted for all other necessary information.

Running the Software:
Double clicking the ADV7170/71 icon will run the software for the evaluation board.

Initialisation:

To output NTSC colorbars on DAC B after power up, the following settings should be implemented:

Jumper LK1 set to XTAL SEL
Jumper LK6 set to LO
No jumper on LK3, LK4, LK5

Mode Register 1: Enable Colorbars

Otherwise it is recommended to consult the datasheet for information about each control.

IMPORTANT THINGS TO KNOW:

Validity of Settings:
The evaluation software can automatically check for an acknowledge or, when any register is changed can automatically read-back the new value stored in that register. The "ACKcheck" function is in the "Options" menu. The "Continuous Read" function may be enabled in the "Register Access" menu.

I²C Compatible Programming:
This version of software does not take into account the ability of the ADV7170/71 to accept continuous streams of data. Instead, for every register write or read, it completely re-initiates a start sequence (see the ADV7170/71 Data sheet for information on different ways registers can be written to). This means that more information has to be written to the MPU port extending the time required to program the ADV7170/71.This, while being a valid way of writing to the ADV7170/71 is not the optimum method of writing to the ADV7170/71.

Dynamically Linked Menu System:
All menues in this software are interactive, so when (for example) you change the value of a register all switch settings relevant to that register change will automatically change to the correct state, the inverse is also correct.

ADV7170/71 LINKS

These links are used for operating the ADV7170/71 encoder:

LK1 Connect to XTAL SEL for internal colorbars.
Connect to EXT.CLK for external pixel input.

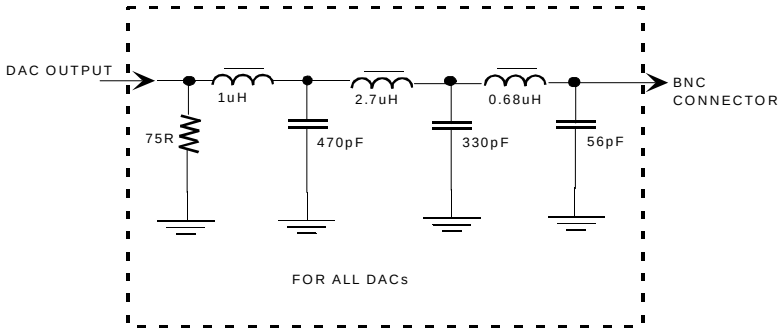
LK3 Connect $\overline{\text{HSYNC}}$ to ground.

LK4 Connect $\overline{\text{VSYNC}}$/FIELD to ground.

LK5 Connect $\overline{\text{BLANK}}$ to ground.

LK6 Tie ALSB pin high (HI) or low (LO).

EXTERNAL LPF FILTER



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