

# TV PRODUCER

Computer Friends  
14250 NW Science Park Drive  
Portland, OR 97229  
(503) 626-2291

VERSION 1.1

# IMPORTANT

The serial number of your TV Producer card is your warranty registration number. Keep track of this number, so that if you need to contact Computer Friends concerning your TV Producer, we can quickly locate your records. All calls to us will be shortened if you know this number. Be sure to write the serial number of the TV Producer on the warranty registration card.

Enclosed is your warranty registration postcard:  
**PLEASE MAIL IT IMMEDIATELY.**

## WARRANTY

Computer Friends, Inc. warrants to the original consumer purchaser that each of its hardware products, and all components thereof, will be free from defects in materials and/or workmanship for 90 days from the date of purchase. Any warranty hereunder is extended only to the original consumer purchaser and is not assignable.

In the event of malfunction or other indication of failure attributable directly to faulty workmanship and/or materials, CFI will, at its option, repair or replace the defective product, to whatever extent it shall deem necessary to restore the product to proper operating condition, provided the consumer purchaser send with the defective product proof of the date of purchase of the product.

Before returning a product for repair, the customer must call customer service at (503) 626-2291 for a return authorization number (RMA). This number must be included with the customer's mailing address and telephone number when the product is returned.

Products should be returned to:

Computer Friends, Inc.  
14250 NW Science Park Drive  
Portland, Oregon 97229

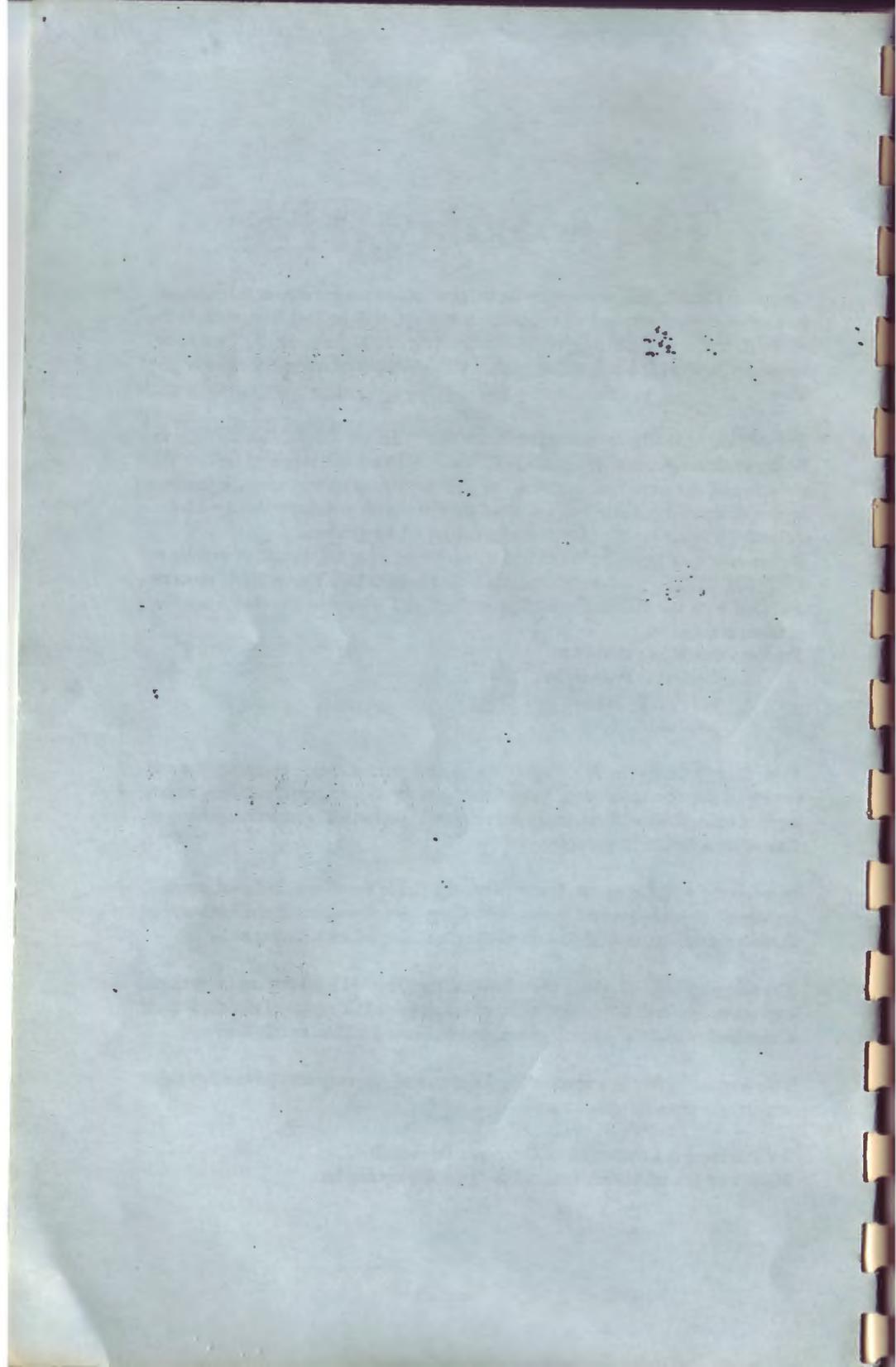
Even though Computer Friends Inc. has tested this hardware and software and reviewed the documentation, they make no warranty or representation, either express or implied, with respect to this product's performance, merchantability or fitness for a particular purpose.

In no event will Computer Friends Inc. be liable for direct, indirect, special, incidental, or consequential damages resulting from any defect in the hardware or its documentation, even if advised of the possibility of such damages.

The warranty set forth above is exclusive and in lieu of all others, oral or written, express or implied. No dealer, agent or employee of Computer Friends, Inc. is authorized to make any modification, extension or addition to this warranty.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

TV Producer is a trademark of Computer Friends, Inc.  
Macintosh is a trademark licensed to Apple Computer, Inc.



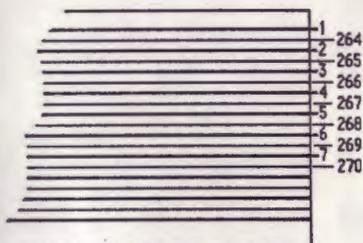
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## A NOTE ABOUT NTSC

The standard, worldwide TV picture is 'interlaced', that is, each TV frame is electronically constructed as follows:



PART OF TV SCREEN (NOT TO SCALE)

The TV frame frequency (i.e. the number of times/sec that a complete set of 485 lines is traced) is 30. To alleviate (but not to eliminate) the flicker arising from a 30 times/sec scan rate, the TV scanning process is interlaced. In the first 1/30 sec (first field) lines 1 through 263 are scanned, in the next 1/30 sec (second field) lines 264 through 525 are scanned. The scan lines corresponding to the second field are interleaved between the lines of the first field.

The Macintosh screen uses a non-interlaced format, thus eliminating 'flicker'. If you transfer the eye from a non-interlaced to an interlaced display, the effect is more noticeable than it would be if you were looking at a TV picture for some time. Besides, the effect of interlacing shows at its worst when displaying single horizontal lines. For these reasons, TV programs seldom display single horizontal lines. You can achieve professional results by adapting your image(s) to fit a television broadcast.

Techniques to do this vary as widely as the applications vary. However, to convey the idea graphically (i.e. a picture is worth a thousand words), we have included a disk containing samples of pictures to transfer to a TV display using TV Producer. Please view the disk.

# A NOTE ABOUT NTSC

The TV Producer software is designed to work with the Apple Macintosh II video card (not included) to 'gen-lock' the video card to an external composite video signal...

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## DESCRIPTION

TV Producer works with the Apple Macintosh II video card (not included) to 'gen-lock' the video card to an external composite video signal permitting Macintosh graphics to be superimposed over live video and to produce a NTSC (National Television Standards Committee) composite video output signal. TV Producer's composite video output signal complies with RS-170A and is compatible with standard video equipment; including color video cameras, monitors, projectors and video tape recorders.

The Apple Macintosh video card usually operates at scan frequencies much higher than standard video equipment. TV Producer allows you to select between NTSC and the higher (normal) video card scan frequencies. In NTSC mode, you may enable or disable the external video signal. The external video signal, if enabled, can be selected to show through none, some or all of the Macintosh graphics.

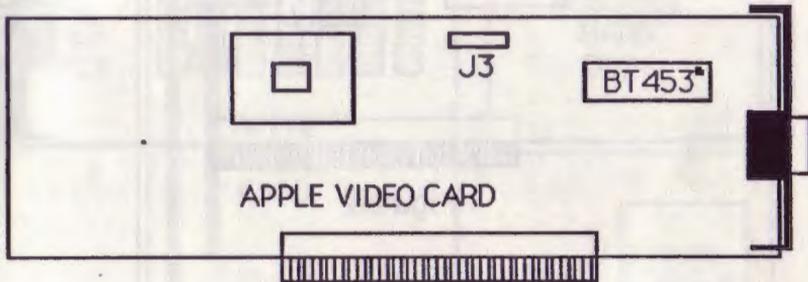


Figure 1

## INSTALLATION

Please read **all** instructions first.

TV Producer requires two sets of connections to the Macintosh video card, one to the connector marked J3 and the other to the BT453 (color look-up table) chip (figure 1). Neither connection is permanent nor will the operation of the video card be effected. Currently, the Macintosh video card does not include the connector marked J3, so it must be added. This operation is simple but requires a knowledge of soldering. Please refer this step to a competent technician.

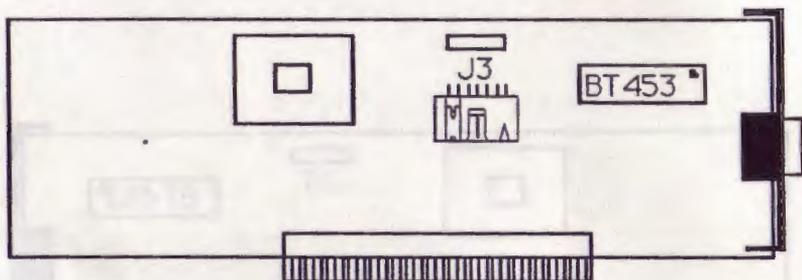


Figure 2

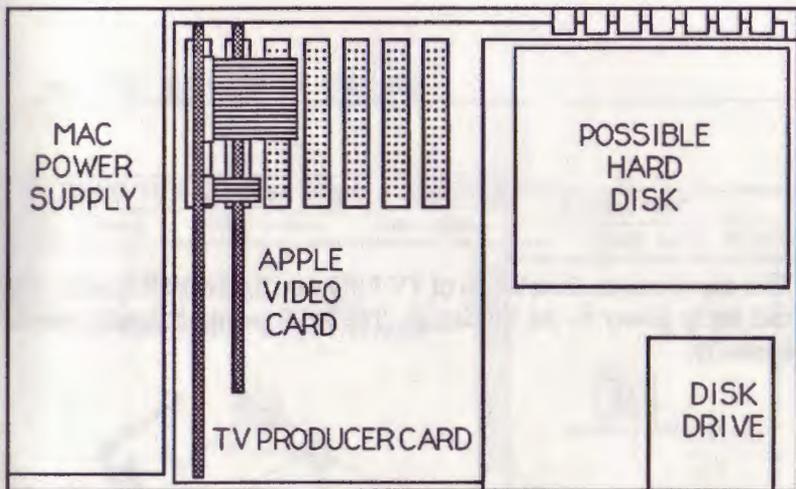
### INSTALLING J3

This operation should be performed in a static controlled environment. At a minimum, this should be a sheet of aluminium foil over the work area and one hand should be kept in contact with the foil as much as possible.

Unplug the Macintosh and remove the top cover, as explained in the owner's manual. Remove the video card from the Macintosh and lay it flat on the aluminium foil.

J3 is located at the top of the video card and consists of two rows of 7 holes (it is some times covered by a yellow control sticker). Any solder in the holes should be removed with a solder sucker or solder wick. Be careful the traces can be easily damaged. Insert the 14 pin male header (included) with the notch towards the top of the board (figure 2). After any soldering always check your work for solder bridges.

**NOTICE:** an early version of the Apple video card has a 26 pin connector rather than a 14 pin connector. If you have this style of video card, please contact Computer Friends for different J3 installation instructions.



## INSTALL IN MACINTOSH II

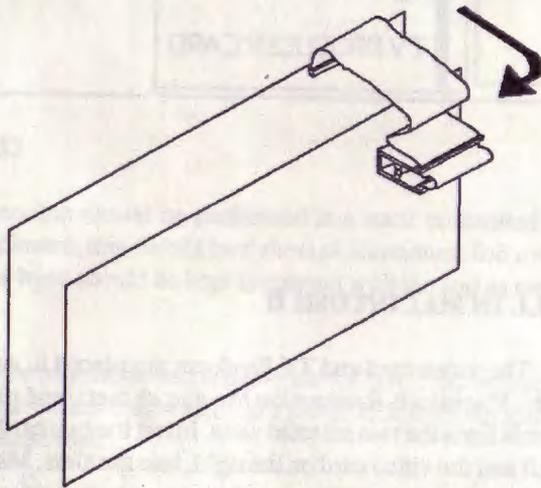
The video card and TV Producer are placed in any two adjacent slots in the Macintosh. Remove the Macintosh metal end plates and plastic back panels from the two selected slots. Insert the two cards, TV Producer on the left and the video card on the right, into the slots. Make sure that the card metal end plates and the slot connectors mate correctly.

Install the 14 pin jumper cable to J3 from the corresponding connector on TV Producer. Connect the RGB monitor to the video card.

## INSTALLING BT453 CONNECTION

To install the IC clip, locate the BT453 chip (figure 1). With the IC clip ribbon cable orientated towards the top of the Macintosh video card, expand the jaws of the IC clip and clip on to the BT453. Make sure that the IC clip is well seated over the BT453. And that none of the BT453 pins are uncovered.

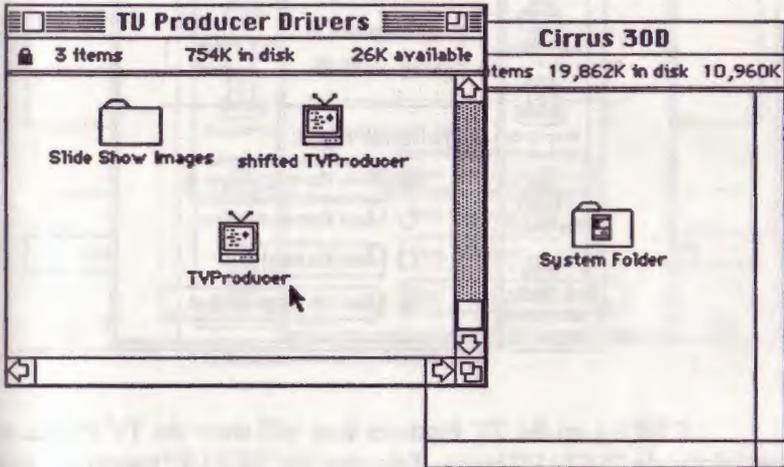
This completes the installation of TV Producer. Recheck all connections and apply power to the Macintosh. The RGB monitor should operate normally.



Bend ribbon cable as shown before replacing Macintosh cover.

#### In case of problems

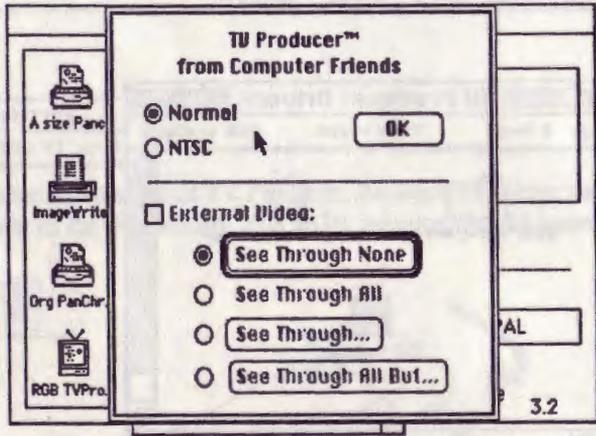
Turn the Macintosh off. Recheck all connections. If there are no visible problems, then remove the TV Producer card and contact your dealer or Computer Friends customer service.



## INSTALLING TV PRODUCER CHOOSER PROGRAM

The TV Producer card is currently controlled from the system DA "CHOOSER". To install the control program, insert the TV Producer disk and drag the TV Producer program into your system folder. Now, when you select CHOOSER you will find the TV Producer icon.

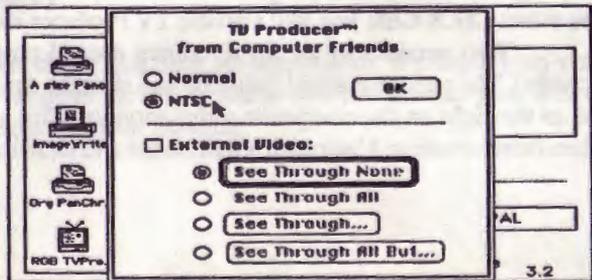
Two versions of the TV Producer control program have been provided. The version marked "shifted" will shift the Apple display down and to the right on the composite video monitor. This version is useful when demonstrating Macintosh applications and showing the menu bar.

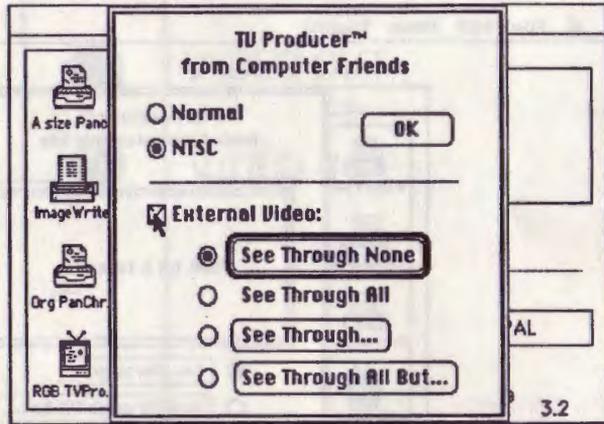


Clicking on the TV Producer icon will show the TV Producer card slot and a "SET UP" button. Selecting the "SET UP" button lets you make the following selections.

- Normal the default video card scan frequency
- NTSC standard video scan frequency
- OK Finished setting up TV Producer

External Video is enabled only when NTSC is selected. If External Video is selected, then the following buttons are enabled.





**See Through None**

All Macintosh graphics are visible so external video images cannot be seen. This is the default setting.

**See Through All**

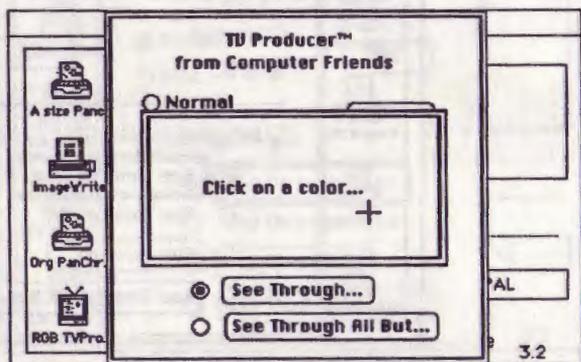
All Macintosh graphics are invisible so all that you can see is the video input.

**See Through...**

Waits for a mouse click and makes all pixels of that color transparent to the external video signal

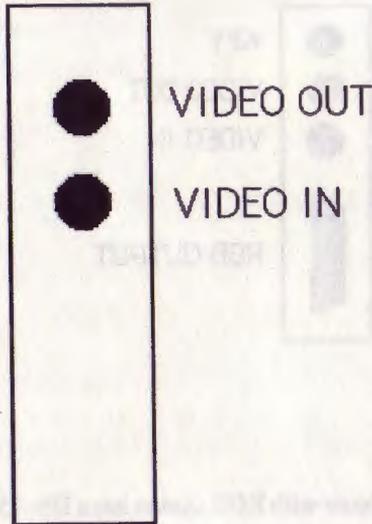
**See Through All But...**

Waits for a mouse click and makes all pixels but that color transparent to the external video signal



The "See Through..." and "See Through All But..." buttons allow you to select any color from the screen to be transparent to the external video signal. For example, selecting the "See Through..." button then clicking the mouse on a red area of the display will cause all occurrences of the red to be replaced with the external video signal. Also, selecting the "See Through All But..." button then clicking on the red area will cause the red area(s) to remain but all other colors on the display will be replaced with the external video signal. In both cases, the Macintosh display remains unchanged, the transparent effect appears only on the composite video output signal.

**NOTE:** Selecting the 'See through all' button may place you in a situation where you are no longer able to see the TV Producer control program. Pressing the RETURN key will put TV Producer into the 'See through none' mode so that the control program is once again visible.



### CONNECTING VIDEO EQUIPMENT

The rear panel on TV Producer has two 'pin plug' connectors. A video source (color camera, VCR video out, ect.) may be connected to the 'VIDEO IN' connector. 'VIDEO OUT' is connected to a video monitor or VCR video input connection. Video cables are available from most Radio Shack stores.

Professional video equipment with 'HI-Z' loop through connections may also be used, as long as the final piece of equipment in the chain is terminated at 75 ohms.



## RGB OPTION

The TV Producer with RGB option has a DB-15 connector on the rear panel. This connector is an alternate RGB video output connector, exactly like the Apple graphics card DB-15 connector. The difference is that the TV Producer RGB connector can display the 'EXTERNAL' video input as well as the Macintosh graphics. The composite video output is still available. The composite output and the RGB output display exactly as before. But the RGB image, having a higher bandwidth, is much sharper than the composite video image.

The TV Producer RGB connector can be connected to the desired equipment, following the pinout listed in Appendix I. The red and blue analog video signals are 0.7v p-p with no sync. The green analog video signal is 1.0v p-p with sync. The composite sync signal is 0 - 5v negative true. Composite sync should not be connected if the output equipment can accept the sync-on-green signal. A multi-sync RGB monitor connected to the Apple graphics card could also be moved the TV Producer RGB connector.

**NOTICE:** If the RGB monitor is disconnected from the Apple graphics card, you **MUST** click on the 'Mac video is not terminated' box on the TV Producer control program. When the RGB monitor is connected to the Apple graphics card, the 'Mac video is not terminated' box should be clicked OFF.

**SPECIAL NOTE:** The 'KEY' connector is currently unused.

## **PAL OPTION**

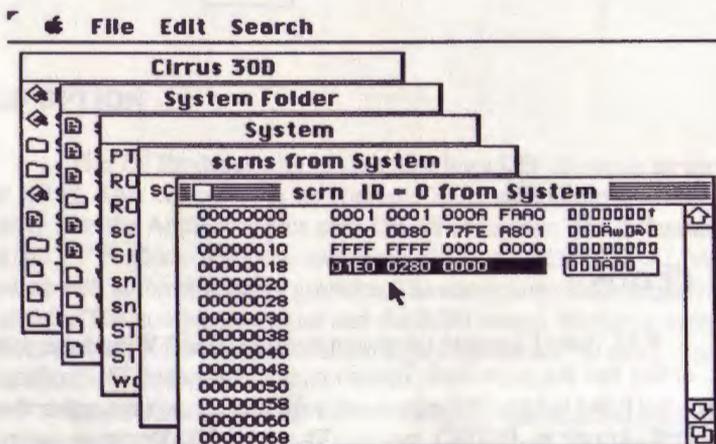
**PAL** is the European television standard. The TV Producer with **PAL** option has the same basic operation as the standard TV Producer, except that it has been modified to work with the **PAL** system rather than the North American (**NTSC**) system. The **PAL** TV Producer control program sets a different screen resolution. The Macintosh video card resolution is normally 640 X 480 pixels. For **PAL**, the Macintosh video card is reset to a resolution of 640 X 512 pixels. This allows more of the active video screen to be used by programs, but there is still an area at the top and bottom of the screen which cannot be covered (this is a limitation of the Apple video card). Also, the 'shifted' version of the TV Producer control program is not needed for **PAL** - only one control program has been provided. The TV Producer disk contains a modified version of the Macintosh **SYSTEM** program. This new **SYSTEM** program will expand the screen to 512 lines. Please place the **SYSTEM** program in your system folder and restart your Macintosh.\*

\*You can modify your current **SYSTEM** program by following the procedure on the following pages.

## CHANGING THE SYSTEM TO 512 LINES

After double clicking on 'ResEdit', find and open the following:  
the current system folder  
the SYSTEM program  
the resource 'scrn'  
the resource 'scrn ID=0'

You should now see something similar to the following

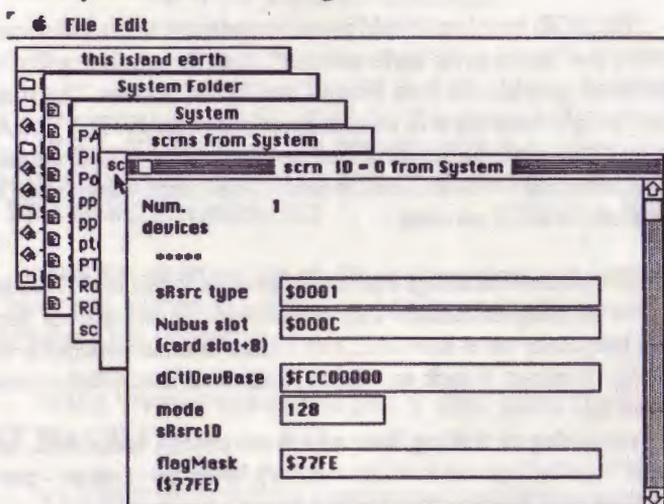


You should now see a block of numbers, ending with the following three numbers (these numbers are highlighted above):

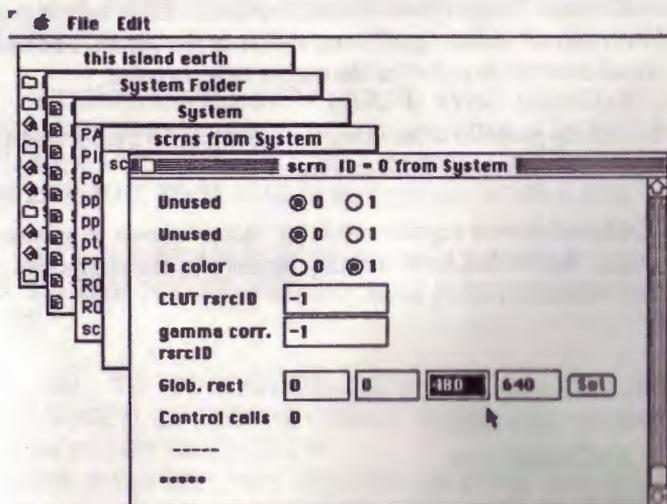
01E0 0280 0000

These are the dimensions of the screen window. Change the '01E0' to '01FF'. Now close each of the open windows and when asked if you want to 'SAVE CHANGES TO DISK' click on 'YES'. In order for these changes to take effect you must restart the Macintosh.

In the most recent version of ResEdit, editing the screen resource (scrn) is handled in a more user friendly way. Thus when you open the resource 'scrn ID=0' you'll see the following.



Now, by using the thumb box in the scroll bar, go to the bottom of the window. Where you'll see 'Glob. rect' this is the Macintosh screen coordinates.



The number that is highlighted is the vertical size of the screen. To change the system to 512 lines, just change the highlighted number to 511.

NOTE: In order for the changes to take affect you must restart the Macintosh

## NOTES

The RGB monitor should remain connected to the video card. If the monitor is a 'multi-sync' style monitor\*, then the monitor will display the Macintosh graphics in both Normal and NTSC modes. The monitor width and height controls will need to be adjusted for NTSC. The Apple monitor, which is not multi-sync, cannot display the NTSC signal and should be turned off while in NTSC mode. The external video signal is not displayed on the RGB monitor.

One of the first things that you will notice is that the NTSC image will appear to jump or flicker. This is unavoidable because of the low scanning frequency used in NTSC. The flicker is most noticeable with a single, high contrast (black on white) horizontal line. Flicker may be minimized by:

removing or shifting lines which are exactly horizontal, having horizontal lines be 2 pixels thick (or thicker), lower the contrast - use dark gray on light gray or select compatible colors.

TV Producer uses the external video signal as a reference when external video is enabled, this results in a much better output signal. Thus, if possible, External Video should be enabled (and a video source present) even if the external video signal is not visible in the output. The external video signal must be in color for the output to be in color.

There is a timing problem when using the video card in 2 color and 4 color modes, please avoid using these modes.

Some Macintosh power supplies made by 'Astec' appear to generate too much noise. This noise, unfortunately, appears in the composite video output as horizontal rolling bars.

\*types of multi-sync monitors include:

Sony CPD-1302

NEC multi-sync

## **MOST ASKED QUESTIONS ABOUT TV PRODUCER**

**Q WILL TV PRODUCER WORK WITH MODERN-ART-IST, VIDEOWORKS, CRICKET DRAW AND OTHER PAINTING AND DRAWING PROGRAMS?**

**A YES, TV PRODUCER IS TRANSPARENT TO AND WILL RUN IN CONJUNCTION WITH ALL MAJOR PAINT & DRAW PROGRAMS ON THE MARKET.**

**Q WILL TVPD RUN WITH ONLY ONE MEG INSTALLED IN MY MAC II ?**

**A YES, BUT BE SURE THAT YOU HAVE ENOUGH MEMORY TO RUN MEMORY INTENSIVE PAINT PROGRAMS, SUCH AS MODERN ARTIST, OR PIXEL PAINT.**

**Q IS A MULTISYNC MONITOR REQUIRED TO USE TV PRODUCER?**

**A NO, HOWEVER, A NON MULTI- SYNC MONITOR SUCH AS THE STANDARD APPLE MONITOR WILL LOSE SYNC IN NTSC. USE A MONITOR THAT WILL AUTOMATICALLY SWITCH FROM 15.75 KHZ TO 35 KHZ HORIZONTAL SCAN RATE.**

**Q IF I ORDER AN RGB TV PRODUCER WILL I THEN BE ABLE TO USE MY STANDARD APPLE MONITOR IN NTSC MODE?**

**A NO, TV PRODUCER OUTPUTS AN NTSC RGB SIGNAL, WHICH IS INCOMPATIBLE WITH THE STANDARD APPLE MONITOR FREQUENCY. HOWEVER, WITH THE RGB VERSION OF TVPD YOU CAN DISPLAY A HIGHER QUALITY VIDEO SIGNAL ON AN NTSC RGB MONITOR OR PROJECTION SYSTEM.**

**Q DOES TVPD WORK ONLY WITH THE APPLE VIDEO CARD?**

**A CURRENTLY, TV PRODUCER WORKS ONLY WITH THE APPLE VIDEO CARD.**

**Q IS TVPD COMPATIBLE WITH MOST OF THE COMMONLY AVAILIABLE RECORDING DEVICES?**

**A YES, TVPD OUTPUTS A VIDEO SIGNAL WHICH CAN BE RECORDED BY 1" & 3/4" VTR'S AS WELL AS 1/2" VHS MACHINES.**

**Q WILL TVPD WORK WITH TIME BASE CORRECTORS, SWITCHERS, AND OTHER PROFESSIONAL STUDIO EQUIPMENT?**

**A. TVPD WILL WORK WITH MOST PROFESSIONAL STUDIO EQUIPMENT. HOWEVER, SWITCHERS REQUIRE THE ABILITY TO ADJUST SCH PHASE, TVPD HAS NO USER ADJUSTMENTS ,BUT FUTURE REVISIONS WILL ADDRESS THIS SITUATION.**

**Q WHAT SHOULD I DO IF MY MONITORS BECOME UNREADABLE WHEN I SWITCH TO NTSC.**

**A DO NOT TURN YOUR COMPUTER OFF FROM THE HARD SHUT DOWN SWITCH ON THE REAR PANEL .INSTEAD USE THE PROGRAMMER SWITCH ON THE SIDE PANEL AND RESTART.**

**Q THE COLOR ON MY NTSC MONITOR IS ALL WRONG, ALSO ,THE VIDEO IS ROLLING VERTICALLY & HORIZONTALLY. WHAT IS WRONG?**

**A APPROXIMATELY 80% OF ALL FIELD SERVICE PROBLEMS WITH TVPD HAVE BEEN TRACED TO THE IMPROPER SOLDERING OF THE J3 CONNECTOR, OR TO LOOSE CONNECTORS .CONTACT COMPUTER FRIENDS SERVICE DEPARTMENT IF RESOLDERING & RECONNECTING DOES NOT SOLVE YOUR PROBLEM.**

## SPECIFICATIONS

TV Producer operates internally in RGB. The external video signal is demodulated to RGB, then mixed with the Macintosh graphics and finally re-modulated to composite video.

### INPUTS

**Video In:** 1v p-p, internally terminated at 75 ohms, negative sync.

**Key:** 0 - 5v analog key, internally terminated at 75 ohms

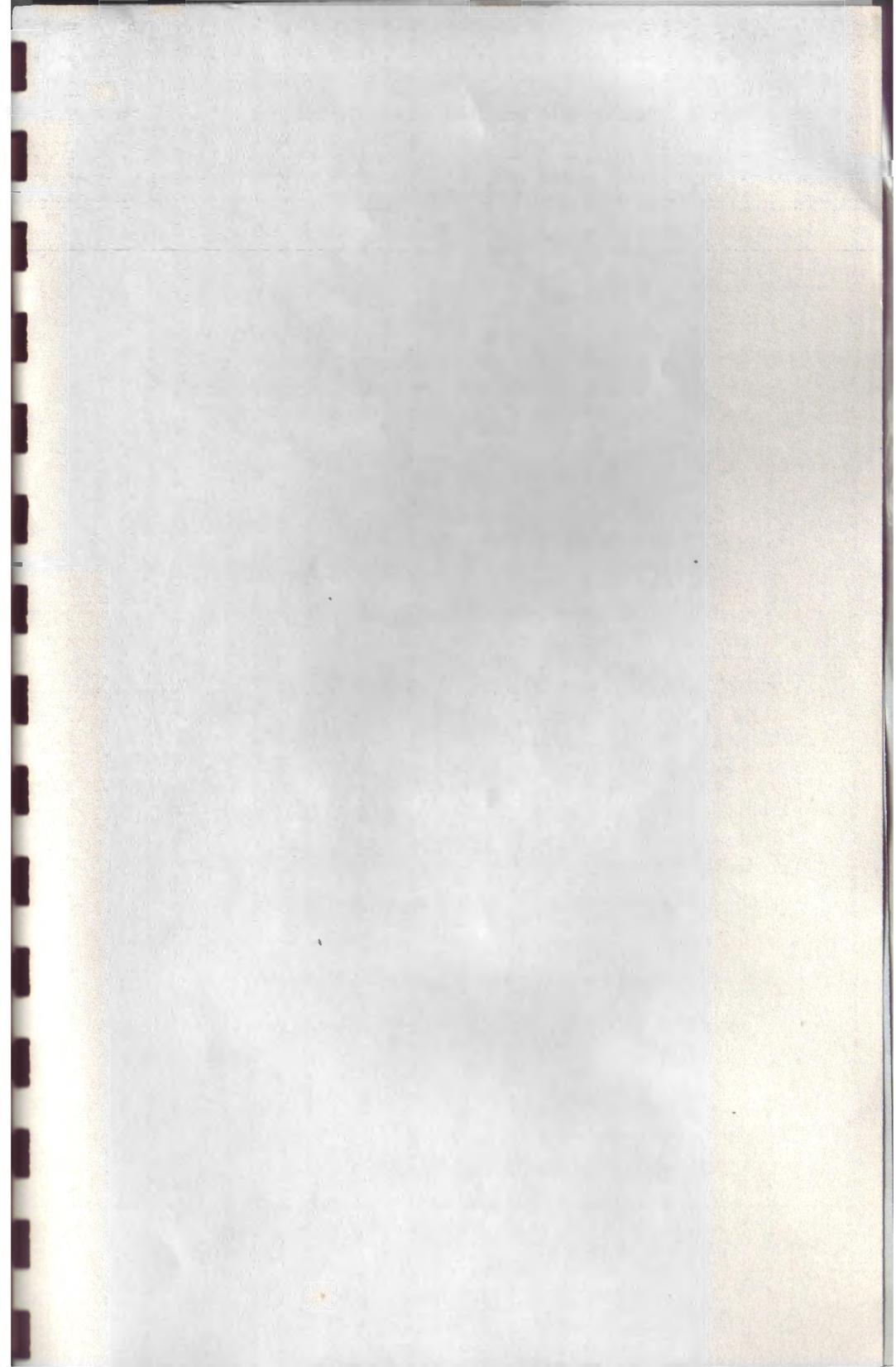
### OUTPUT

**Video Out:** 1v p-p when terminated at 75 ohms

## Appendix 1

### Apple Video Card Pinout

Pin	Function
1	Red Video Ground
2	Red Composite video
3	Composite Sync
4	(not used)
5	Green Composite Video
6	Green Video Ground
7	(not used)
8	(not used)
9	Blue Composite Video
10	(not used)
11	(not used)
12	(not used)
13	Blue Video Ground
14	(not used)
15	(not used)
Shell	Shield Ground



Appendix I

Apple Video Card Pins

No.	Description
1	Red Video Channel
2	Black Video Channel
3	Composite Sync
4	(not used)
5	Green Composite Video
6	Blue Video Channel
7	(not used)
8	(not used)
9	Blue Composite Video
10	(not used)
11	(not used)
12	(not used)
13	Blue Video Channel
14	(not used)
15	(not used)
16-18	(not used)

