
TAGO
ELECTRONICS

CONTENTS

TAGO™ ELECTRONICS

Dear Customer:

The manufacturer of our p.c.b.'s has informed us that games employing flourescent light fixtures may cause enough line noise to inhibit the sound generator.

To alleviate this problem, it is necessary to install a line filter between the light fixture and the power source.

Tago Electronics

1909 South Great Southwest Parkway, Grand Prairie, Texas 75051 (214) 641-5822 (800) 527-3639

TAGO™ ELECTRONICS

The Turn-A-Profit™ game change kit utilizes one of a number of games that are either copyrighted by Tago Electronics or are purchased under license from the orginal manufacturer.

By this affidavit, Tago certifies that the boards generating the games Conquest, Anteater, and Calipso have been purchased under license. Anteater and Calipso have furthermore been copyrighted which copyright has been assigned to Tago Electronics.

Tago Electronics holds the purchaser of the kit harmless on any action that challenges the license and/or copyright of the game.

As emphasized in the manual of instructions of the kit, Tago urges that, before installation of the kit commences, all original manufacturer names, logos, and art work be removed or painted over. This is the purchaser's responsibility entirely and it is Tago's good advice.

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F.C.C. USER INFORMATION

WARNING:

THIS EQUIPMENT GENERATES, USES AND CAN RADIATE RADIO FREQUENCY ENERGY AND IF NOT INSTALLED AND USED IN ACCORDANCE WITH THE INSTRUCTIONS MANUAL, MAY CAUSE INTERFERENCE TO RADIO COMMUNICATIONS. AS TEMPORARILY PERMITTED BY REGULATION, IT HAS NOT BEEN TESTED FOR COMPLIANCE PURSUANT TO SUBPART J OF PART 15 OF F.C.C. RULES, WHICH ARE DESIGNED TO PROVIDE REASONABLE PROTECTION AGAINST SUCH INTERFERENCE. OPERATION OF THIS EQUIPMENT IN A RESIDENTIAL AREA IS LIKELY TO CAUSE INTERFERENCE IN WHICH CASE THE USER AT HIS OWN EXPENSE WILL BE REQUIRED TO TAKE WHATEVER MEASURES MAY BE REQUIRED TO CORRECT THE INTERFERENCE.

COSMETIC CONVERSION INSTRUCTIONS

1. It is most important that all visible original manufactures' name, logo, and art work are removed prior to conversion and replaced by the graphics supplied by Tago.

2. The original serial number placque must remain on game for purposes of licensing with government as well as record keeping on UCC-1 filing where debt or leases are involved.

3. Remove header, view plex, and side decals. Decals may easily be removed by use of a heat gun or razor scraper. Be certain that all original art work names and logos are removed.

4. Some games will require that you cover original painted surfaces. Please use black glass enamel water base paint using a roller (you may substitute other colors). In some cases the monitor card board bezel will need to be painted as well.

5. Install new header & view plex with original hardware.

6. Control panel wrap is designed for use with every game. Apply it carefully over old art work after removing buttons & stick. Be sure no bubbles are left under wrap. Apply instructions. Control panel plexy covers have been stocked separately by distributor; find the one marked by the name of the game and install. If hole cutting is required use 1 1/8 inch hole saw drill bit using plexy as your guide.

7. Apply side decals horizontally on lower half of cabinet.

8. Stand back and admire your new game. This was the hard part. Refer to Electronic Conversion sheet.

"How to Play" instructions and donuts for buttons are to be installed on the control panel under the control plexy. The Tago logo may be placed under control plexy or on front face of cabinet on coin door.

STERN CONVERSION INSTRUCTIONS

Conversion of this game is fairly easy. The entire harness (with the exception of the control panel) is compatible with the new game you are installing. To convert the control panel, remove control pane , disconnect harness at the white plug. Make necessary changes (drilling, wrap and plexy installation.)

Now, using the harness you removed from the control panel, cut about 6 inches from white plug. Butt splice this portion of the harness to the control harness provided with the kit.

Refer to pinout sheet for color code information to match existing wiring to the new game you are now installing.

Stern Game

WHT/ORG - Pin 7 / Pin H - WHT/BLU

New Game

IP UP YELLOW - Pin 7 / Pin H - BROWN IP DN

You would connect the Stern WHT/ORG to the New Game YELLOW
You would connect the Stern WHT/BLU to the New Game BROWN

The New Game tells you what function that wire goes to, so connect it to appropriate button on Control panel.

NOTE: If there are jumpers on the existing card edge of your Stern Game, cut the jumper about 1/4 inch from where the jumper and harness wire meet at card edge. Tie wrap these jumpers to the harness so they won't short out anything.

UNIVERSAL HARNESS CONVERSION INSTRUCTIONS

The TAGO Universal Harness can be installed into any video game that uses a color, vertical, raster scan monitor with a power supply that provides +12V, +5V & -5V. (If your game does not meet the P.S. requirements TAGO can provide an isolation transformer and switching power supply at a very reasonable cost.)

Most games are engineered to have 2 separate harnesses, 1) the game harness and 2) the AC distribution harness. Installation of the Universal Harness entails removal of the existing game harness only. (This must be done due to the functional differences between the existing game and the game you are converting to.)

I. 1. To remove the game harness disconnect and note polarity on video monitor connector.
   2. Disconnect or cut wires to speaker about 6 inches from speaker.
   3. Next, disconnect harness from Control Panel.
   4. Now, disconnect harness from Coin Box (coin switch, lights and control panel and test switches, if there)

   Now, the important stuff,
   5. Ensure that +5, -5, +12 and ground connections at power supply are properly labeled for future connection
   6. Remove the existing PC board and remove game harness from cabinet

II. Universal Harness Installation

   A. Monitor--WELLS GARDNER - Connect 10 pin inline connector with red wire to TOP interface card (if connector is on mother PCB connect with RED toward you.

   --ELECTROHOME - see enclosed diagram of mother board for connections (reference sheets)

   B. Control Panel--See Universal Harness sheet for wire color codes (reference sheets)

   C. Coin Box--See Universal Harness sheet for wire color codes for lights (if present) coin switch(s) and coin counter (reference sheets)

   D. Speaker--The two long gray wires with butt splices connect to the two wires on your speaker.

   E. PC Board--Place PC board so as to take up any excess slack on the universal harness and position it on side wall (to prevent dust buildup)

F. Next, connect the wires on your power supply +5 to white/red, -5 to white/green, +12 to violet, and ground to black. DO NOT CONNECT COIN COUNTER AT THIS TIME. After verifying that all connections are secure and proper turn game on and actuate coin switch. Listen for game sounds when pressing IP start button. If picture is upside-down, do the following:

WELLS GARDNER - See Wells Gardner reference sheet.

ELECTROHOME - See Electrohome reference sheet.

NOTE - Horizontal sync, horizontal and vertical size will probably need adjusting. If game operates OK at this point, connect the coin counter wire to: 1 to the white/red (+5V)
1 to the white/yellow (coin counter)
(If coin counter does not advance when coin switch is actuated, reverse the order of these two wires)

MONITOR SECTION

A. ELECTROHOME

B. WELLS GARDNER

ELECTROHOME MONITOR ADJUSTMENTS:

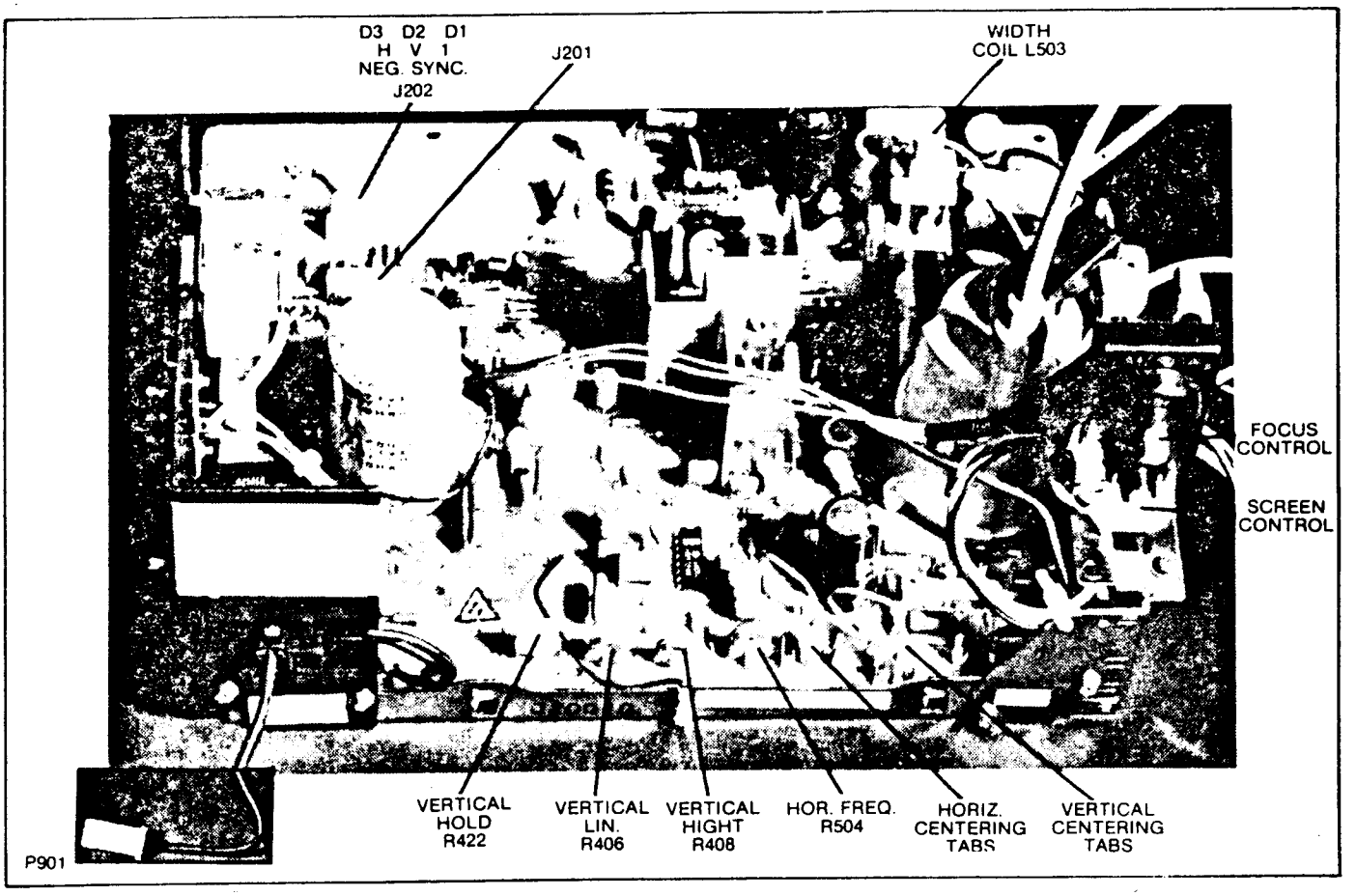
Two problems may surface after completing the electronic conversion. One, the picture may roll uncontrollably and two, the picture may be upside-down.

A. If picture rolls uncontrollably;
First adjust the vertical hold and horizontal frequency. If this does not correct problem set these two controls to their center.

The game you are now installing outputs the following signals: Red Info, Green Info, Blue Info and Neg. Comp. Sync Info. It is the Negative Composite Syncronization Signal that is more likely to cause the picture rolling symptom.

To correct this the sync input wire should be plugged into J2 & J3. (see main PCB component layout sheet.) It plugs into E5 & E6 for a positive sync signal.

B. If video picture is upside-down;
Remove Q1 through Q5 connector on mother board (see main component layout sheet). Break each connector apart so that four wires with their plug remain. (notice each connector is labeled 1, 3, 4 and 5.) Plug Q3 connector onto Q5 on mother board, plug Q5 connector onto Q3 on mother board, plug Q1 connector onto Q4 on mother board, and plug Q4 connector onto Q1 on mother board. Discard Q2 plug.

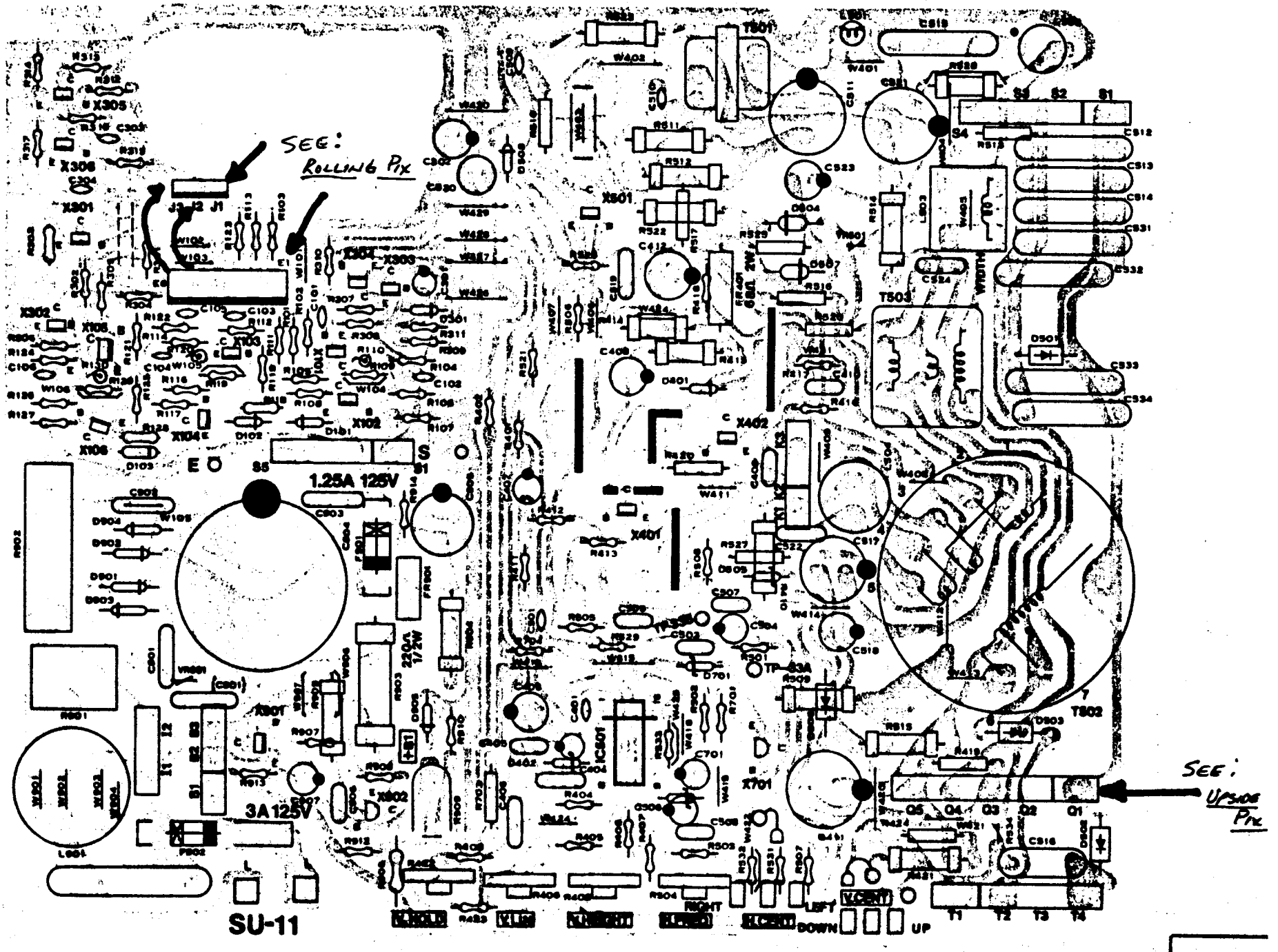


Operating Instructions

1. Apply a suitable power source to the monitor through an isolation transformer by means of P901.
2. Apply a suitable signal source to the monitor PCB by mean of J201.
3. For negative input pulses use J202 D21 for vertical ⊓ . D3 for Horizontal ⊓ .
4. Set up Controls
   All controls are preset at the factory, but may be adjusted to suit program material. Refer to pages 6 and 8 (WHITE BALANCE AND GRAY SCALE TRACKING).

ELECTRONIC MONITOR

MAIN P.C.B. COMPONENT LAYOUT



WELLS GARDNER MONITOR ADJUSTMENTS:

Two problems may surface after completing the electronic conversion. One, the picture may roll uncontrollably and two, the picture may be upside-down.

A. If picture rolls uncontrollably;
First adjust the vertical hold and horizontal frequency. If this does not correct problem set these two controls to their center.

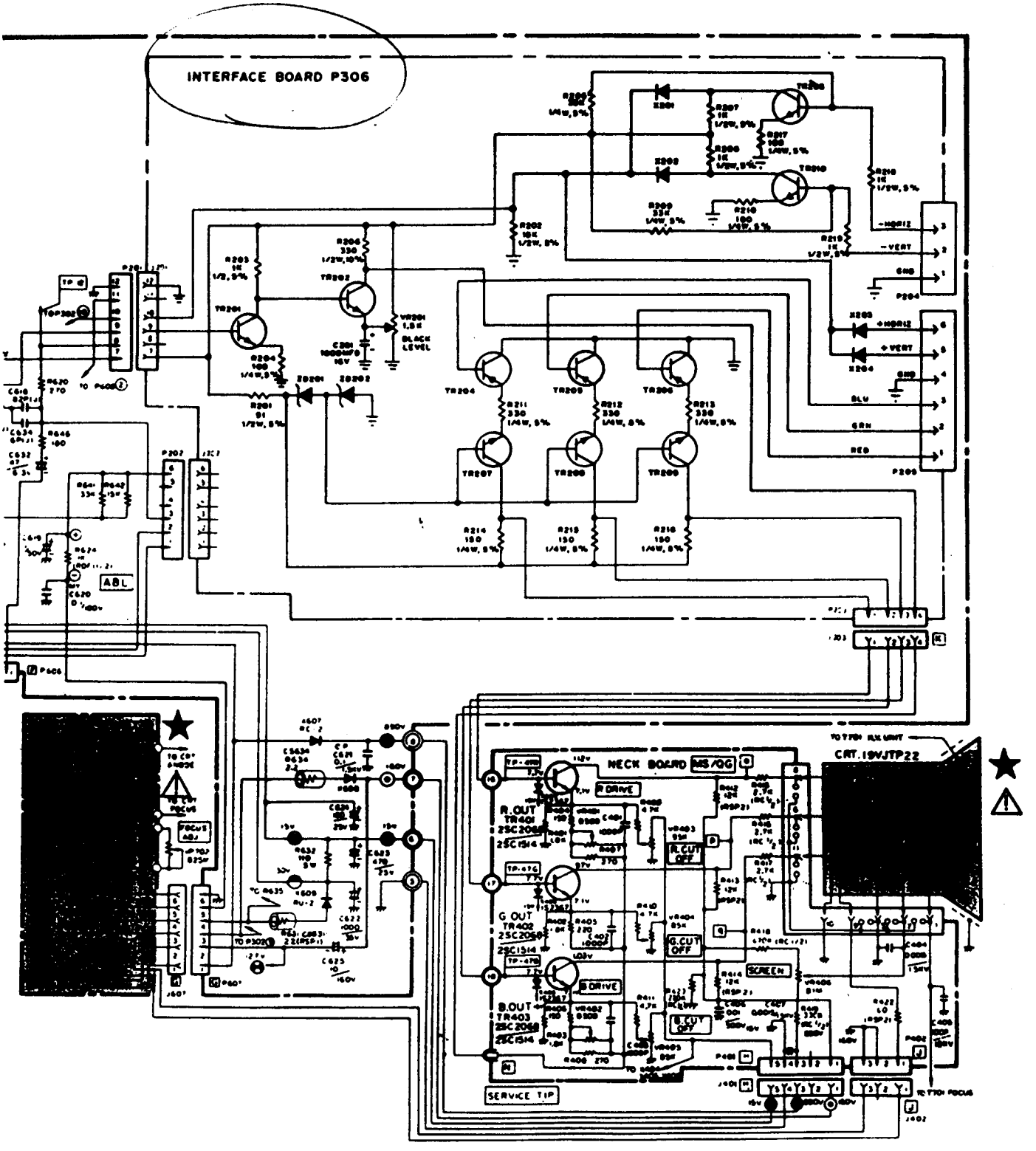
The game you are now installing outputs the following signals: Red Info, Green Info, Blue Info and Neg. Comp. Sync Info. It is the Negative Composite Syncronization Signal that is more likely to cause the picture rolling symptom.

Connect the sync wire to the -horizontal, -vertical or both. (It may be connected to the +horizontal, +vertical inputs.)

B. If video picture is upside-down;
To invert the picture locate the four wires on the deflection yoke (picture tube neck.) Switch the two outer wires, then switch the two inner wires. (Switch yellow & green and blue & red) If these wires are soldered on, trace them down to a 4 plug connector. Break the connector in half. Turn both halves 180 degrees and plug back in. That's all there is to it.

LOR MONITOR SCHEMATIC DIAGRAM

MODEL 19 K4605 & 19 K4655



K4605 - 5805 A

UNIVERSAL HARNESS

ASSIGNED PIN #	COLOR CODE	FUNCTION	SIDE 2 PIN #
15 PIN CAP			**12 PIN PLUG**
1	BLK	GROUND	1
2	ORG	1P START	2
3	WHT/YEL	2P START	3
4	WHT/VIO	LEFT	4
5	WHT/BLU	RIGHT	5
6	YEL	UP	6
7	BRN	DOWN	7
8	WHT/BRN	FIRE	8
9	WHT/BLK	BOMB	9
10	WHT/BLK/BRN	FUNCTION 1	10
11	WHT/BLK/BRN	FUNCTION 2	11
			OPEN SPADES
12	(2)WHT/RED	+5 VOLTS	
13	(2)WHT/GRN	-5 VOLTS	+5, -5 & GND
14	VIO	+12 VOLTS	TO 9 PIN CAP
15	(2)BLK	GROUND	
15 PIN PLUG			**10 PIN INLINE**
1	RED	RED MON	1
2	GRN	GRN MON	2
3	BLU	BLU MON	3
4	BLK	GROUND	4
5			
6	WHT/GRY	COMP SYNC	10
			9 PIN CAP
7	BLK	GROUND	1
8	BLK	GROUND	2
9	WHT/ORG	COIN SW	3
10	WHT/RED	+5 to COIN CTR	5
11	WHT/GRN	-5 to COIN LITES	6
12	WHT	TEST SW	
13	WHT/YEL	COIN CTR	8
			BUTT SPLICED
14	GRY	AUDIO	1
15	GRY	AUDIO	2

PART SIDE				SOLDER SIDE	
FUNCTION	COLOR	PIN	PIN	COLOR	FUNCTION
+12V	VIOLET	1	A	WHT/GRN	-5V
AUDIO	GRAY	2	B	GRAY	AUDIO
FIRE UP	WHITE	3	C	WHT/BLK/BRN	FIRE DOWN
FIRE RT	WHT/BLK	4	D	WHT/BRN	FIRE LT
		5	E		
TEST SW	WHT	6	F		
UP	YEL	7	H	BRN	DOWN
LEFT	WHT/VIO	8	J	WHT/BLU	RIGHT
1P START	ORG	9	K		
		10	L		
COIN CTR	WHT/YEL	11	M	WHT/YEL	2P START
		12	N		
MON BLUE	BLU	13	P	GRN	MON GREEN
MON SYNC	WHT/GRY	14	R	RED	MON RED
		15	S		
GND	BLK	16	T	BLK	GND
GND	BLK	17	U	BLK	GND
+5V	WHT/RED	18	V		

DIP SWITCH SETTING:

	ON	OFF
DIP 1	SOUND IN DEMO	NO SOUND IN DEMO
DIP 2	5 LIVES	3 LIVES
DIP 3	NOT USED	

	DIP 4	DIP 5	COINS	CREDITS
COIN 1 INPUT	OFF	OFF	1	4
	OFF	OFF	1	3
	ON	OFF	1	1
	ON	ON	1	2

	DIP 4	DIP 5	COINS	CREDITS
COIN 2 INPUT	OFF	OFF	4	1
	OFF	ON	3	1
	ON	OFF	2	1
	ON	ON	2	1

PART SIDE "B" SIDE ON PCB				PART SIDE "A" SIDE ON PCB	
FUNCTION	COLOR	PIN	PIN	COLOR	FUNCTION
+12V	VIOLET	1	A	WHT/GRN	-5V
AUDIO	GRAY	2	B	GRAY	AUDIO-P10
		3	C		
		4	D		
		5	E		
RETRACT/TEST	WHT/BRN	6	F		
1P UP	YELLOW	7	H	BROWN	1P DOWN
1P LEFT	WHT/VIO	8	J	WHT/BLUE	1P RIGHT
1P START	ORANGE	9	K		
		10	L	WHT/ORG	ON COIN CTR
COIN CTR	WHT/YEL	11	M	WHT/YEL	2P START
		12	N		
MON BLUE	BLUE	13	P	GREEN	MON GREEN
MON SYNC	WHT/GRY	14	R	RED	MON RED
		15	S		
GND	BLK	16	T	BLK	GND
GND	BLK	17	U	BLK	GND
+5V	WHT/RED	18	V	WHITE	+ FOR COIN CTR

DIP SWITCH SETTING:

	ON	OFF
DIP 1	SOUND IN DEMO	NO SOUND IN DEMO
DIP 2	5 LIVES	3 LIVES
DIP 3	NOT USED	

	DIP 4	DIP 5	COINS	CREDITS
COIN 1 INPUT	OFF	OFF	1	4
	OFF	OFF	1	3
	ON	OFF	1	1
	ON	ON	1	2

	DIP 4	DIP 5	COINS	CREDITS
COIN 2 INPUT	OFF	OFF	4	1
	OFF	ON	3	1
	ON	OFF	1	1
	ON	ON	2	1

CONQUEST

FUNCTION	COLOR	B SIDE PIN	A SIDE PIN	COLOR	FUNCTION
+12	VIO	1	A	WHT/GRN	-5V
AUDIO	GRY	2	B	GRY	AUDIO
		3	C		
		4	D		
2P START	WHT/YEL	5	E	ORG	1P START
TEST SW	WHT	6	F	WHT/BRN	FIRE
		7	H	WHT/BLK	FWD
LEFT	WHT/VIO	8	J	WHT/BLU	RIGHT
		9	K		
		10	L	WHT/ORG	COIN SW
COIN CTR	WHT/YEL	11	M		
		12	N		
MON BLUE	BLU	13	P	GRN	GRN MON
MON SYNC	WHT/GRY	14	R	RED	RED MON
		15	S		
GND	BLK	16	T	BLK	GND
GND	BLK	17	U	BLK	GND

DIP SWITCH SETTING:

SW 1 TABLE/UP

ON	TABLE
OFF	UP

SW 2 ROCKET NUMBER

ON	4
OFF	3

SW 3 POSSIBLE ADDITIONAL GAME NUMBER

ON	FREE PLAY
OFF	ONCE

SW 4 5 PLAY NUMBER

4	5	EUROPA 1 way	EUROPA 2 way	U.S.A. 1 way	U.S.A. 2 way
ON	ON	1 c - 99 p	1 c - 3 p	2 c - 1 p	1 c - 1 p
ON	OFF	1 c - 1 p	1 c - 3 p	1 c - 1 p	1 c - 2 p
OFF	ON	2 c - 1 p	1 c - 3 p	3 c - 1 p	1 c - 3 p
OFF	OFF	4 c - 1 p	1 c - 3 p	4 c - 1 p	1 c - 4 p

SW 6

ON	U.S.A.
OFF	EUROPA

GAME DIAGNOSTICS

Most failures that occur in the field are due to loose connections or defective switches. A diagnostic test has been included in the program to help test, and therefore correct, any problem related to CONTROL, COIN, CR ROM/RAM failures.

To enter the DIAGNOSTIC TEST press the TEST switch while turning game on. If your game has no test switch, ground pin B6 on the card edge connector while turning game on. MONITOR WILL DISPLAY THE FOLLOWING DATA:

PORT A

X	X	X	X	X	X	X	X
* CS2	CS1	LF1	RT1	DN1	UP1	N/U	RETRACT & TS

PORT B

X	X	X	X	X	X	X	X
* N/U	N/U	LF2	RT2	DN2	UP2	DS1	DS2

PORT C

X	X	X	X	X	X	X	X
* N/U	2PS	N/U	N/U	DS3	DS4	DS5	1PS

*Lines preceeded by * are not displayed. This data corresponds to switch being act ated. 1= off condition, 0= on condition.

MENOMICS LISTING

CS = coin switch	LF = left	RT = right
DN = down	TS = test switch	DS = dip sw on PCB
2PS = 2 player start	1PS = 1 player start	UP = up

IF THERE IS A ROM/RAM FAILURE MONITOR WILL DISPLAY:

ROM XX	XX denotes location of defective chip
RAM GHJK	denoting 2114 RAM failure (replace 1 chip at a time)