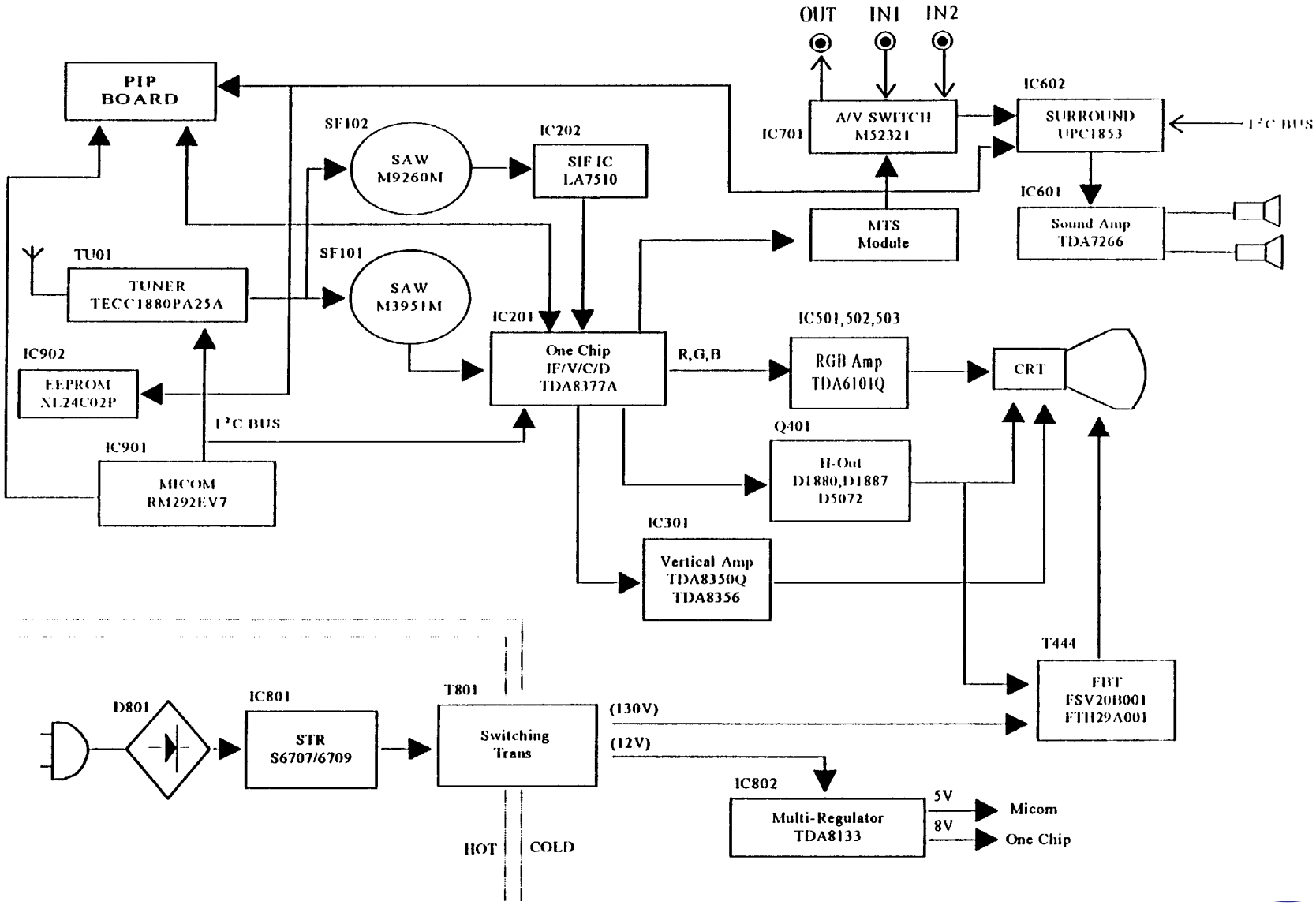
CTV Training Manual
KCT52A Chassis

20 Inch: TXE2045, TXE2046
25 Inch: TXE2545, TXE2546, TXE2549
27 Inch: TXE2745, TXE2746, TXE2749

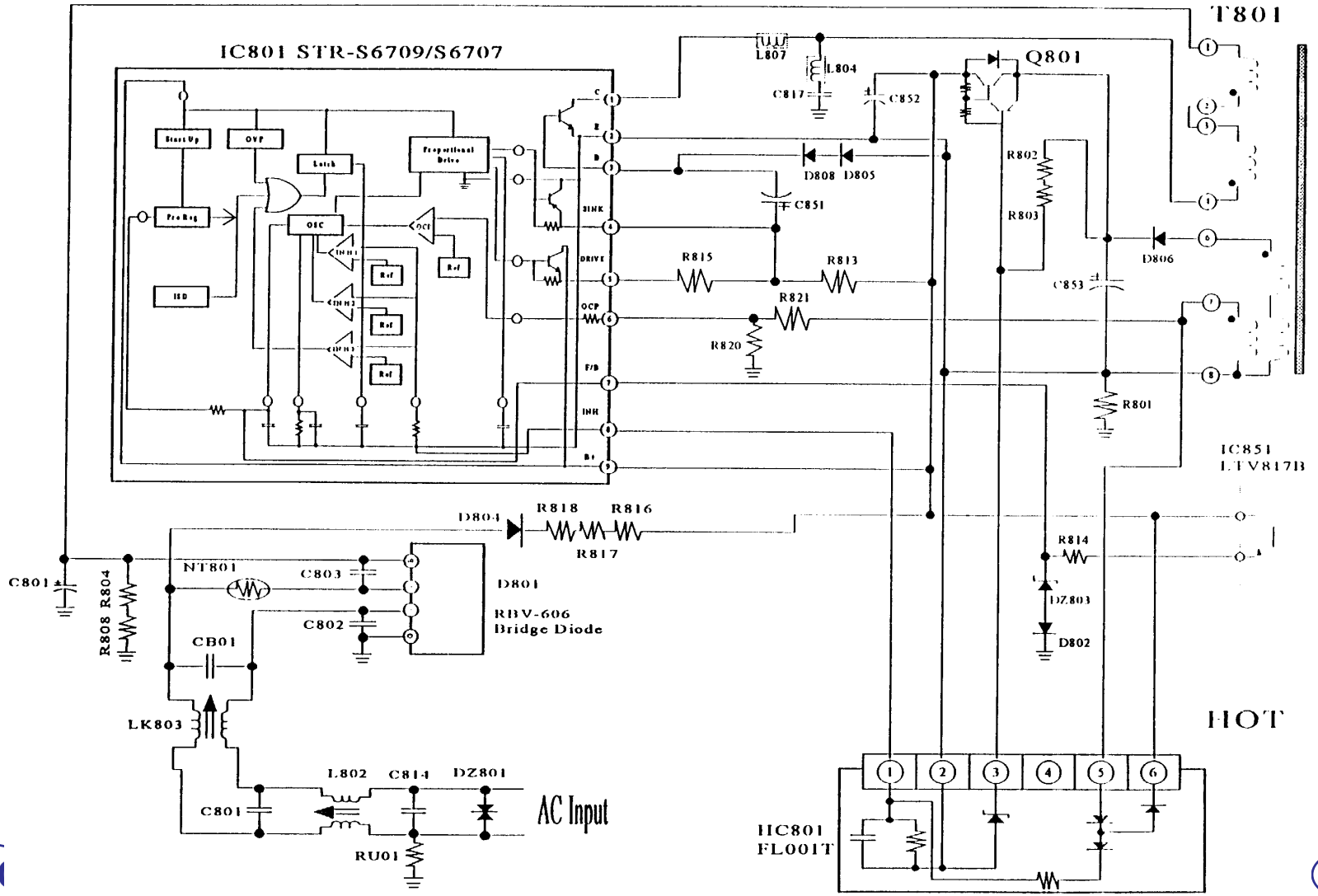
Samsung Electronics America
Product Support Department.

Contents

Block Diagrams



Power Supply Circuit



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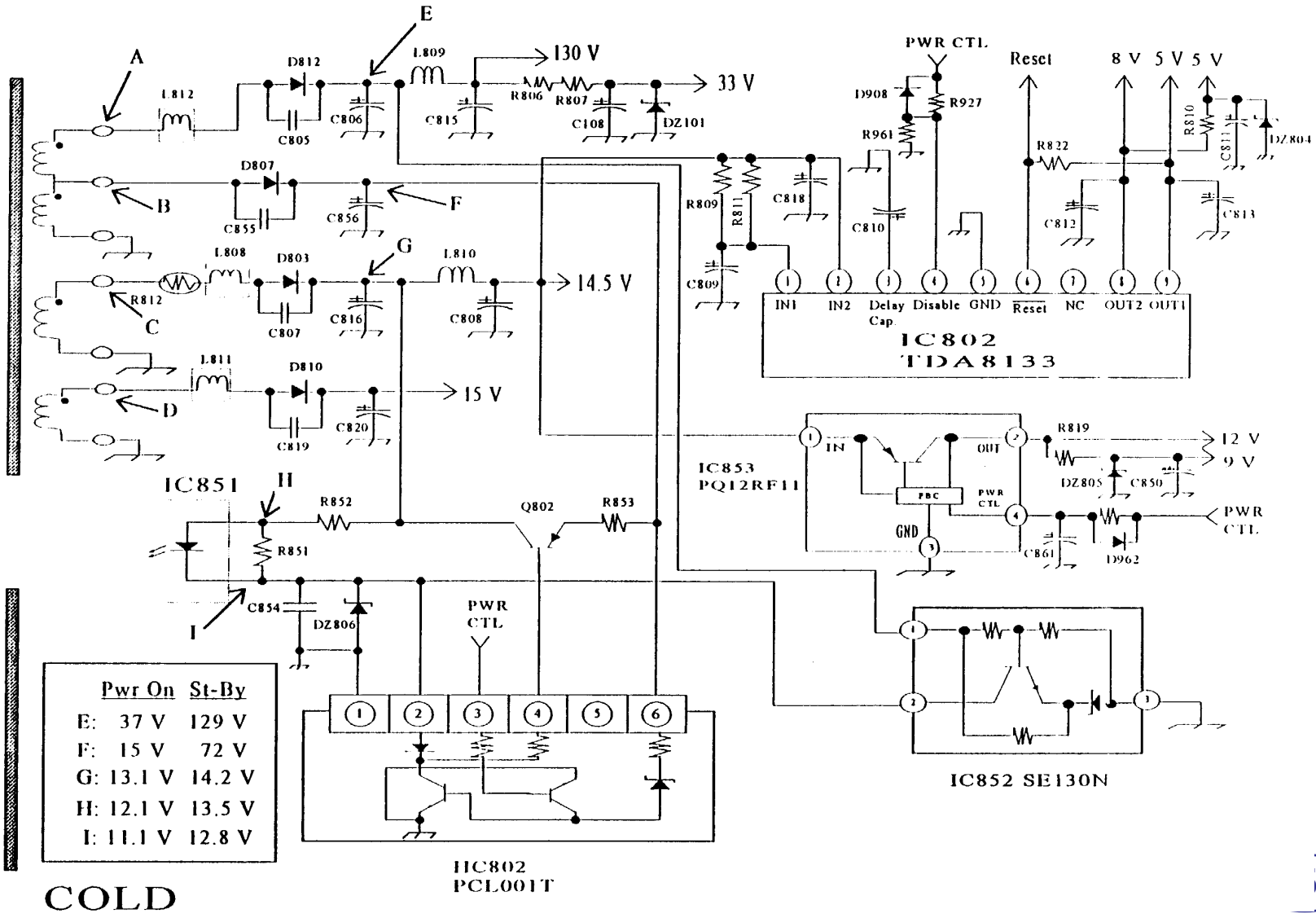
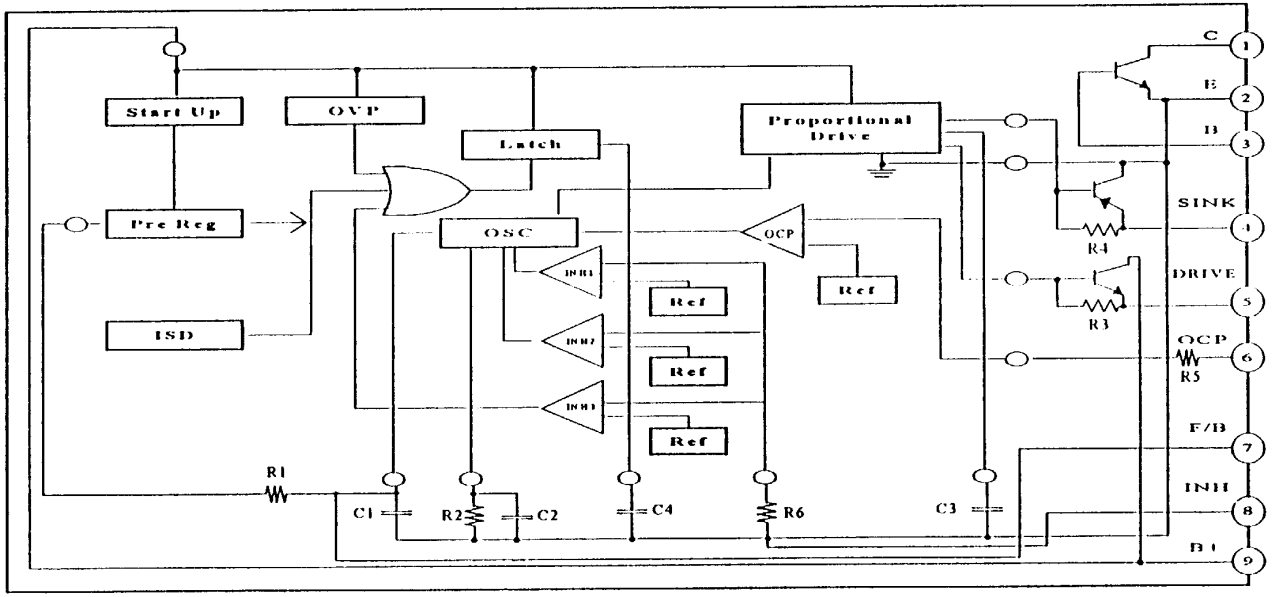


TOC

IC Block Diagram & Pin Description

IC801 (STRS6709)
Block Diagram



IC801 (STRS6709) Pin Description

Pin No	Pin Name	Description
1	Collector	Switching TR Collector
2	GND	Switching TR Emitter
3	Base	Switching TR Base
4	Sink	Control S/TR base current
5	Drive	Supply S/TR base current
6	OCP	Over current Protection
7	Feedback	Output voltage Feedback
8	Inhibit	Off time control, latch up control
9	B+	Main Power Supply

IC801 (STRS6709) Internal Parameter

R1	T-on trimming	C1	3300 pF
R2	T-off trimming	C2	0.01 uF
R3	1 K ohm	C3	820 pF
R4	0.7 ohm	C4	0.01 uF
R5	100 ohm		
R6	85 ohm		

IC Pin Voltage & Waveforms

IC801 Pin Voltage & Waveform

Pin No	Stand-by	Power On
1	See printout	See printout
2	See printout	See printout
3	See printout	See printout
4	See printout	See printout
5	See printout	See printout
6	See printout	See printout
7	See printout	See printout
8	See printout	See printout
9	6V	See printout

HC801 Pin Voltage & Waveform

Pin No	Stand-by	Power On
1	See printout	See printout
2	See printout	See printout
3	See printout	See printout
5	See printout	See printout
6	6V	See printout

HC802 Pin Voltage & Waveform

Pin No	Stand-by	Power On
1	0 V	0 V
2	11.1 V	12.5 V
3	0 V	5 V
4	12.5	71 V
6	15 V	72.2 V

IC Pin Voltage & Waveforms

IC852 Pin Voltage & Waveform

Pin No	Stand-by	Power On
1	37 V	129 V
2	10.8 V	12.5 V

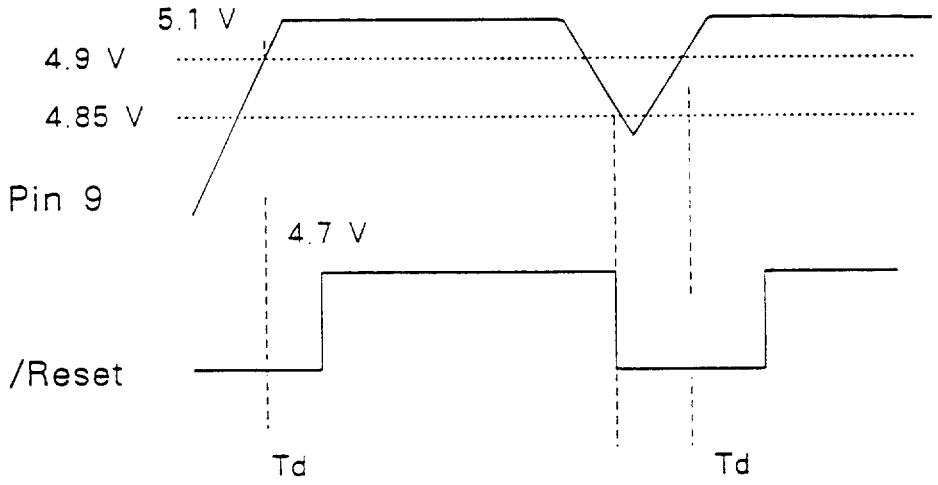
IC802 Pin Voltage & Waveform

Pin No	Stand-by	Power On
1	11.4 V	12.2 V
2	13.1 V	13.7 V
3	2.9 V	3 V
4	0 V	3.8 V
6	4.7 V	4.7 V
8	0 V	8 V
9	5 V	5 V

Output2 (Pin 8) is disabled if Pin 4 is less than 0.8 V. The /Reset (Pin 6) goes low if output1(Pin 9) is less than 4.85 V, and goes high if Pin 9 is higher than 4.9 V. The cap. C810 connected to Pin 3 determines delay time (Td) of /Rest Pin going high or low.

HC853 Pin Voltage & Waveform

Pin No	Stand-by	Power On
1	12.9 V	13.7 V
2	0.6 V	11.8 V
4	0 V	3.8 V



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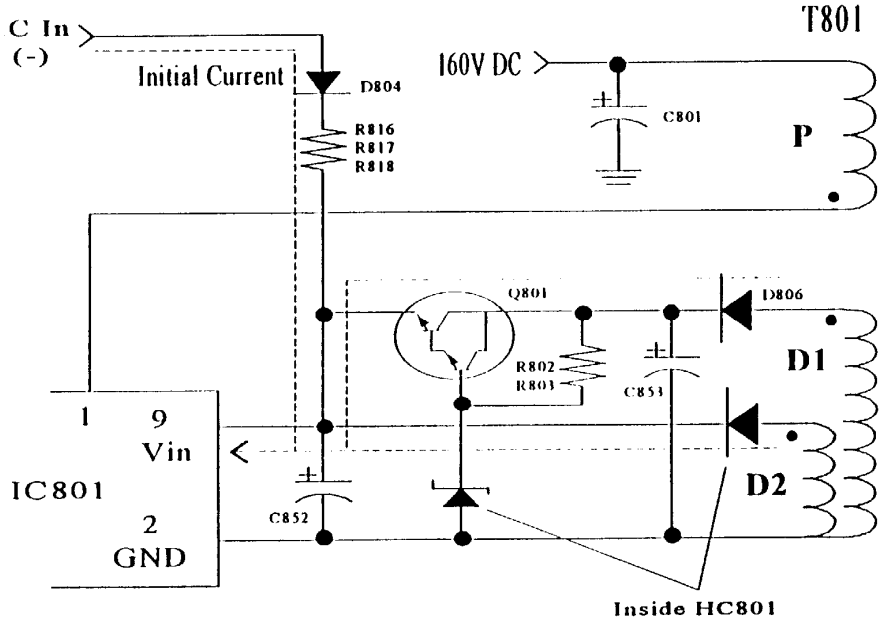
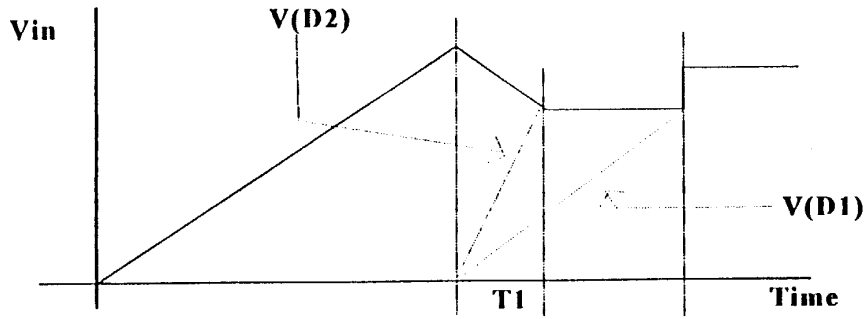




Start up Circuit

When AC cord is plugged in, the initial current starts flowing through the path as shown, and charges C852.

When Vin reaches about 8V, the control circuit is activated, and the oscillation begins.

D1, D2 windings provide the necessary back-up current to Vin after the control circuit is activated as the initial current alone can not sustain the current consumed by the control IC.

The DI winding voltage is set between the threshold of Stop voltage (Vin=5.1 V) and Overvoltage (Vin=10V).

As shown in the graph, D1 and D2 winding voltages are necessary to power up the control IC.

Power Supply Description

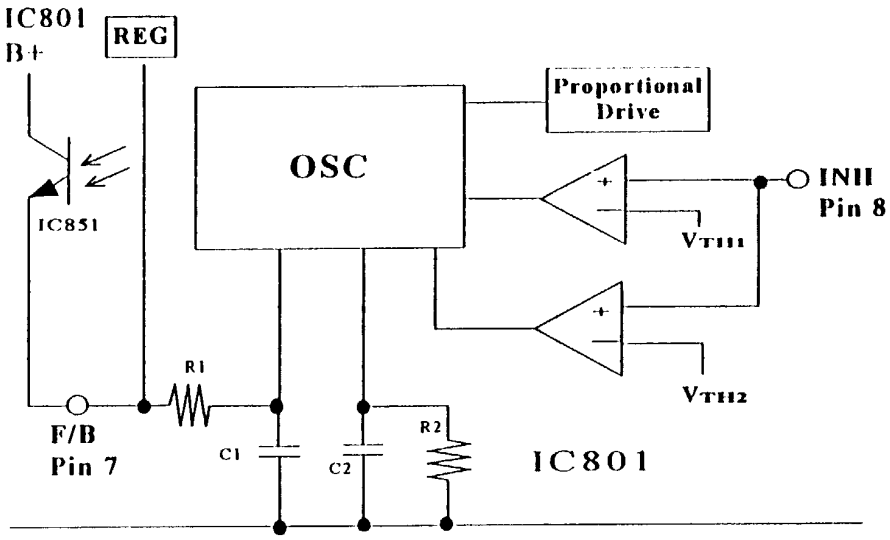


Fig. 1

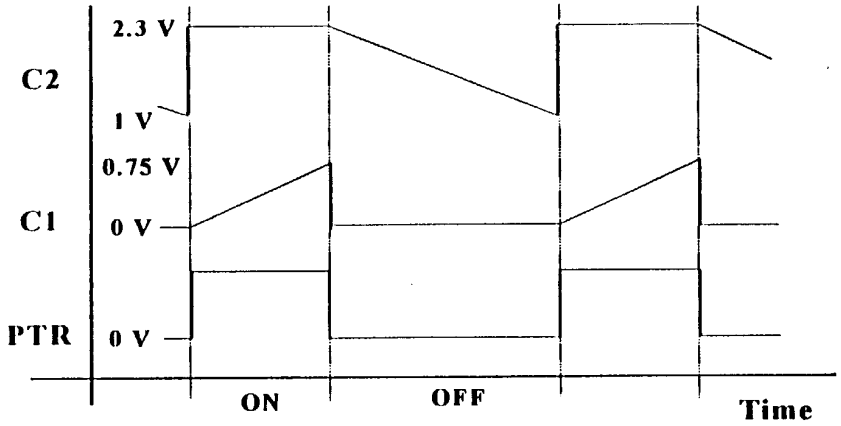


Fig. 2

On-Time Control Circuit Description

The oscillator generates driving pulses to turn PTR on/off by charging and discharging C1 and C2.

Refer to the waveform shown below, left.
When the PTR is on, C2 is charged to the constant voltage. Al the same time, C1 starts charging at almost 0 V through R1. When the voltage of C1 approaches 0.7V, the output of oscillator is reversed and the PTR is turned off.

As the PTR is turned off, C1 is rapidly discharged by the oscillator, and C2 starts to discharge through R2.
When the voltage of C2 decreases to approx. 1V, the output of the oscillator reverses again and the PTR turned on.

On-time control is done by changing C1 charging rate through feedback current developed in the photo coupler, which depends on the input voltage and load current fluctuations.

Power Supply Description

Fig. 1

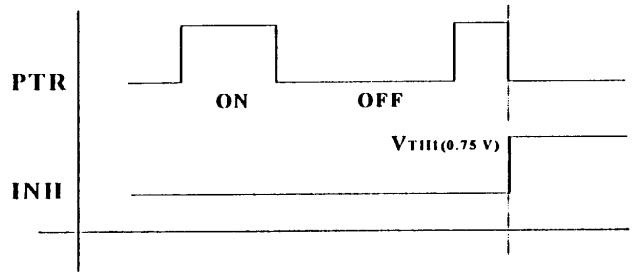
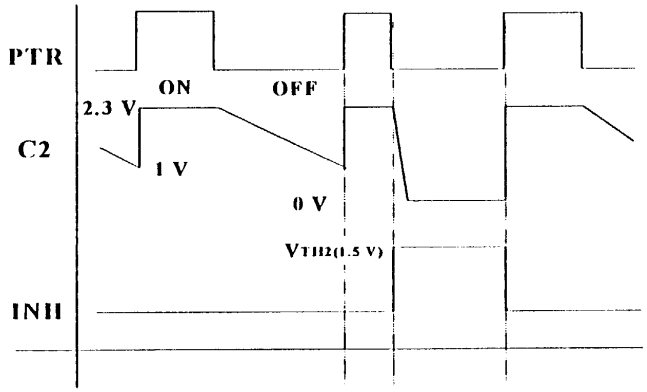
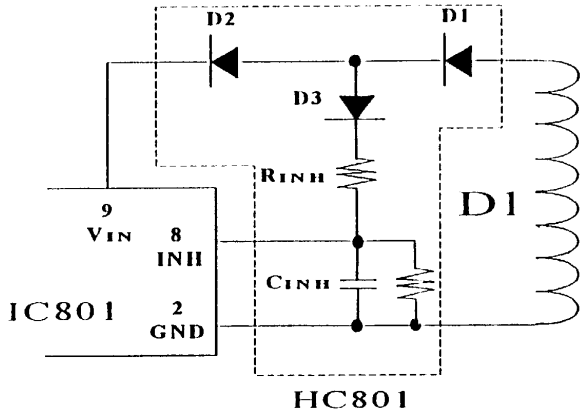


Fig. 1





Off-Time Control Circuit Description

The INH voltage is used as the input signal to the COMP1 and COMP2 within the control IC.

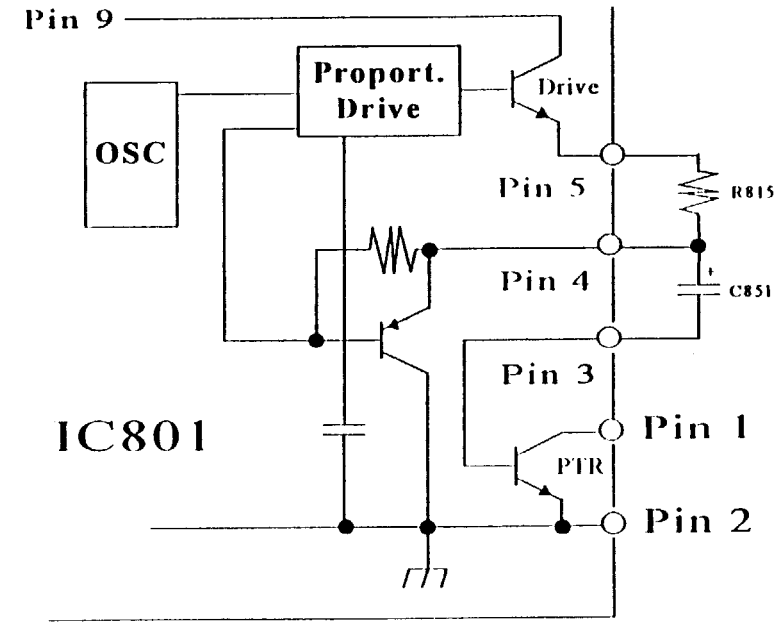
When INH voltage reaches Vth1, the OSC output is kept low, so PTR maintains off mode. (Fig. 1)

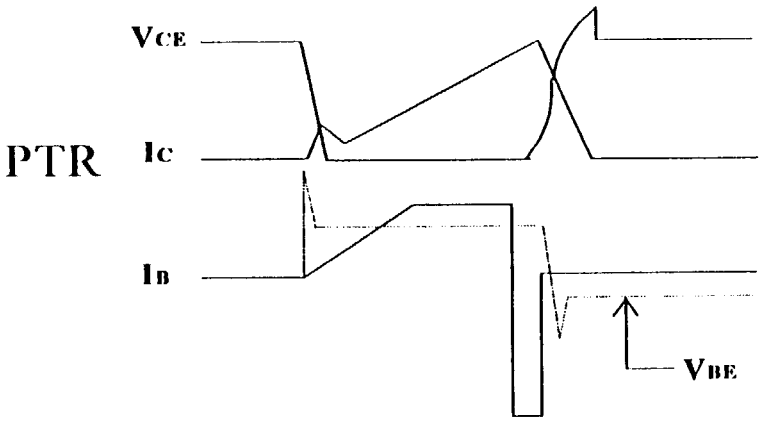
When INII voltage reaches Vth2, the output of the COMP2 reverses and tile voltage of C2 starts to discharge rapidly. If the INH voltage does not fall below Vth2, tile C2 voltage will be kept to almost 0 V, and tile PTR will remain off mode. (Fig.2)

When the PTR is off, the primary energy is transferred to the secondaries including DI winding, which voltage is set to higher volatile than Vth2 in normal operation.
This transferred energy starts charging Cinh through D3 and Rinh. When INH voltage reaches Vth, C2 will discharge quickly, and remain low even after the energy transfer is completed became the INH voltage does not fall instantaneously, bid rather fall in decay fashion. This falling time duration depends on Cinh,IC input impedance, mid INH voltage, which is proportional to output load voltage.

Higher the load voltage (less load current) is, the longer the falling time is because INH voltage is higher.

Power Supply Description





PTR Drive Circuit Description

The control IC uses a proportional drive system to reduce the PTR ON loss, saturation loss, and storage time loss.

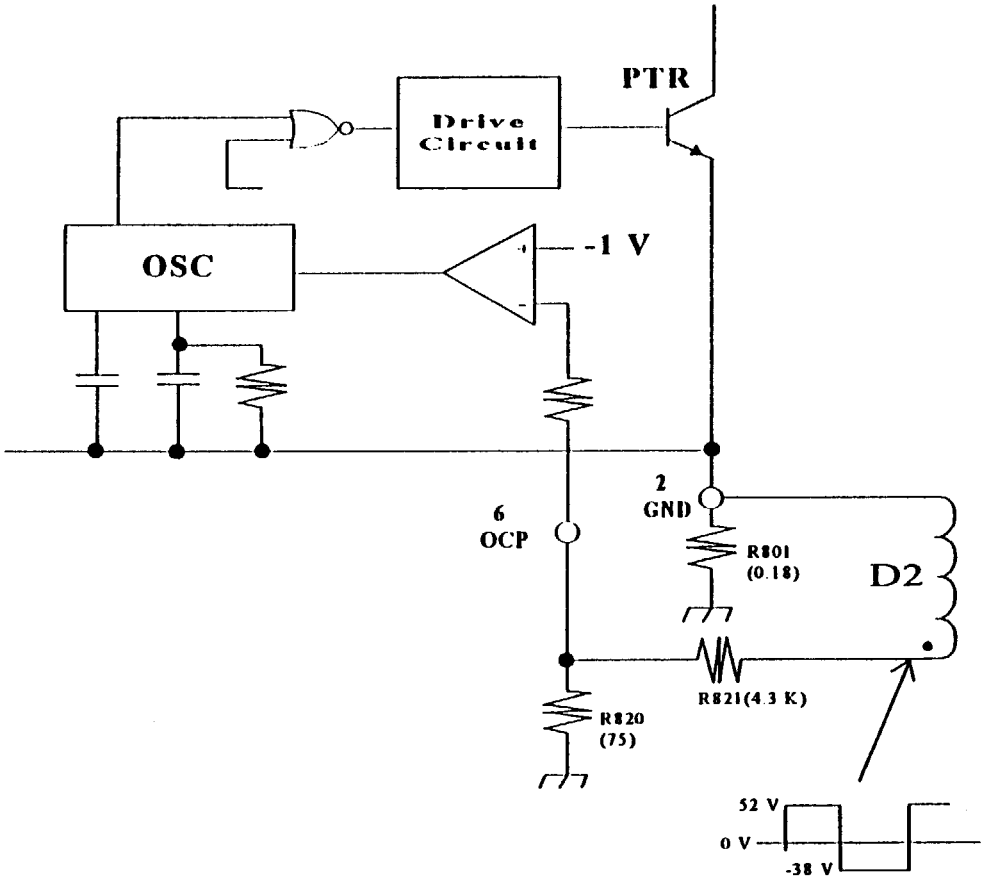
When Proprot. drive circuit generates a positive pulse out of Pin 5, the base current to Pin 3 (base of PTR) develops, and increases linearly because of R813 and C851 combination.

This base current drives PTR to turn on.

When the driving pulse goes low, the R813 and C851 combination reverse biases PTR base completely to make sure the the PTR is off.

The relation between Vbe (IB) and Vce (Ic) of the PTR is shown on the graph.

Power Supply Description



OCP (Over Current Protection) Circuit Description)

he overcurrent protection is performed by the pulse-by-pulse ystem, which directly detects the collector current of the TR.

he detect reference voltage to the comparator is set to -1 V ɔove the control IC ground (Pin 2).

Power Supply Description

Over Voltage Protection Circuit Description

The overvoltage protection circuit activates the latch circuit when the Vin voltage exceeds about 11V.

Since Vin is proportional to the load voltage, the OVP circuit will trigger the latch circuit when an abnormally high voltage appears on the load line due to the open loop in the feedback path.

Overheat Protection Circuit Description

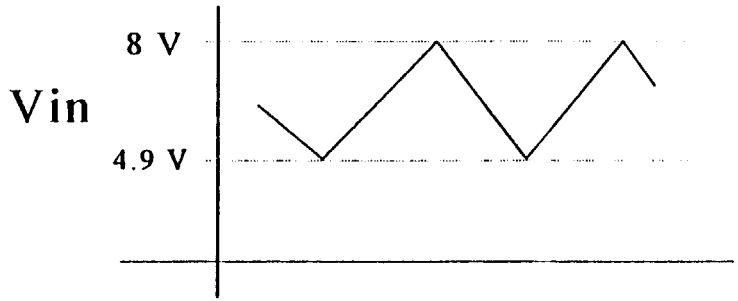
When the control IC's temperature reaches over 150 degree C, the latch circuit is activated.

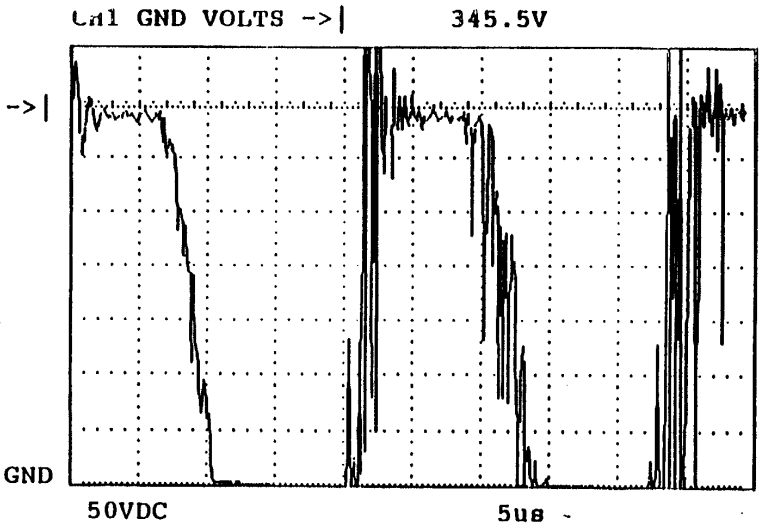
Actual temperature detection is done through the control circuit mounted on the IC frame internally.

Latch Circuit Description

The latch circuit stops oscillation of the control IC when OVP or Overheat condition occurs.

When this happens, the Vin voltage will fluctuate between the Stop voltage and the Operation voltage continuously.





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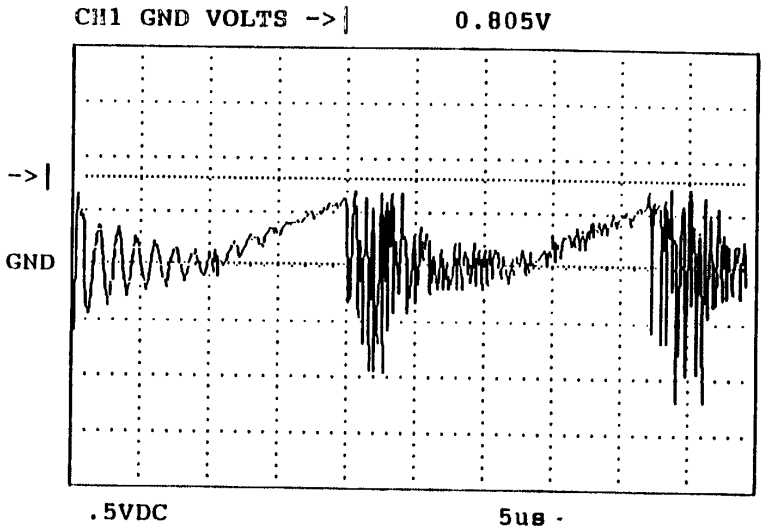

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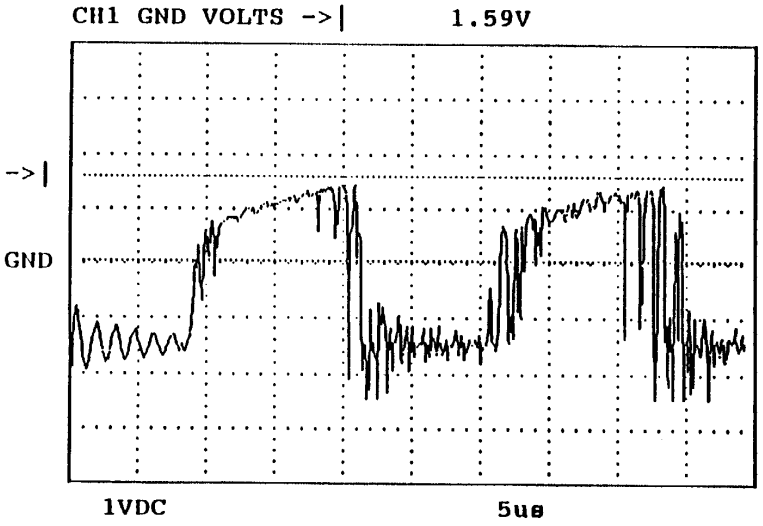

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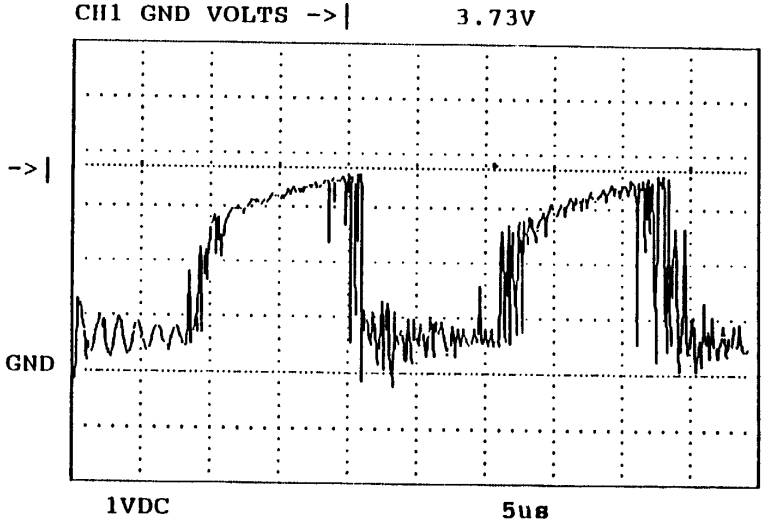

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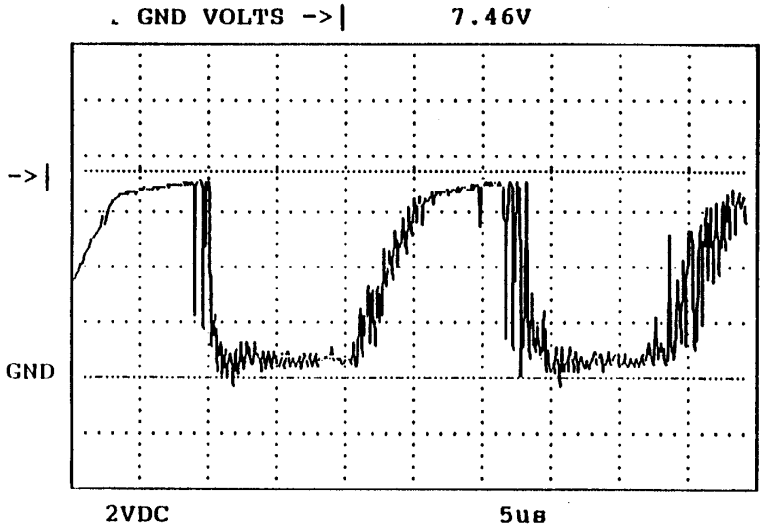

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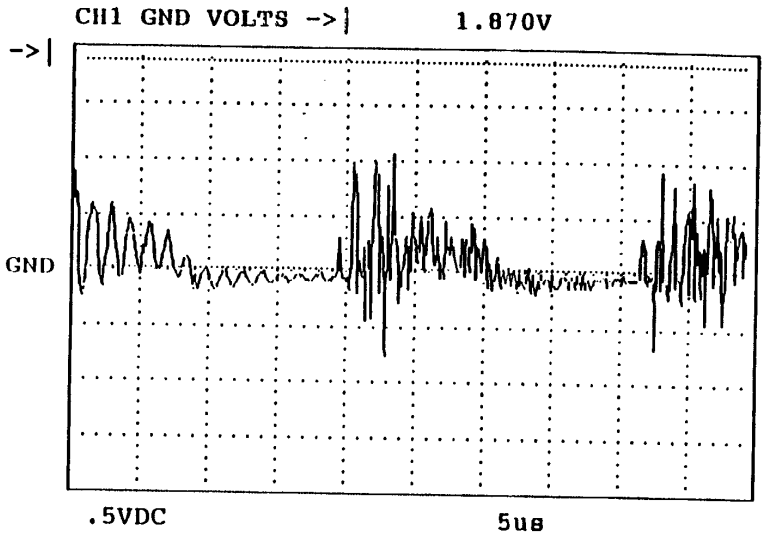

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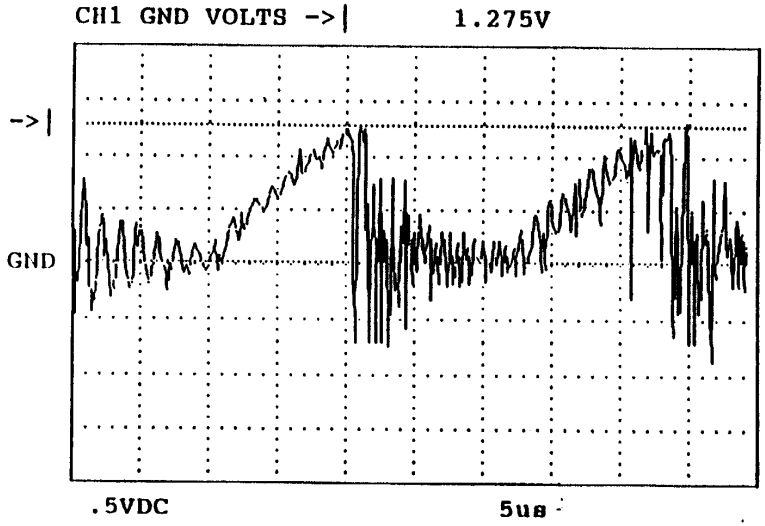

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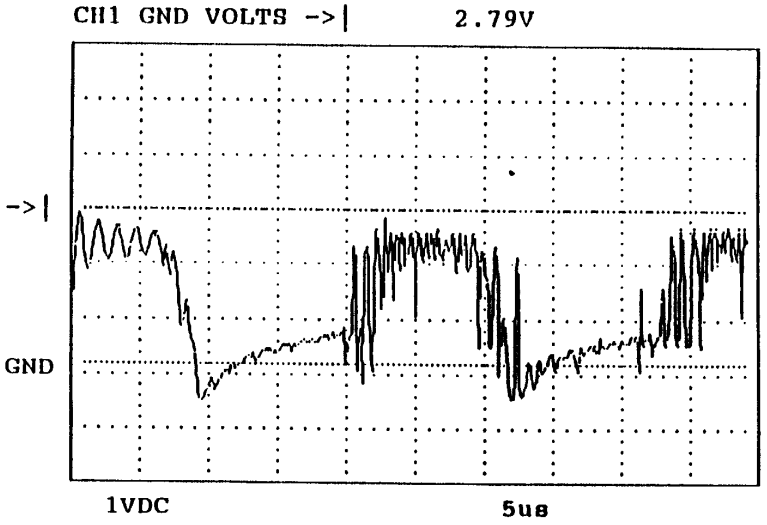

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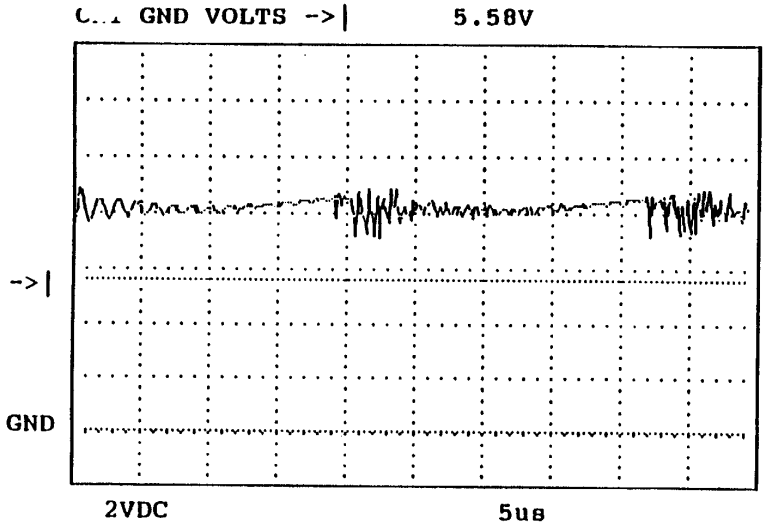

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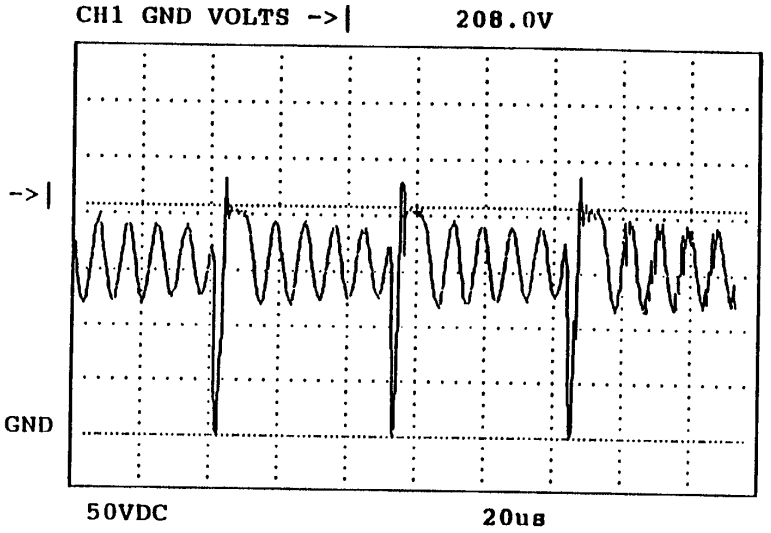

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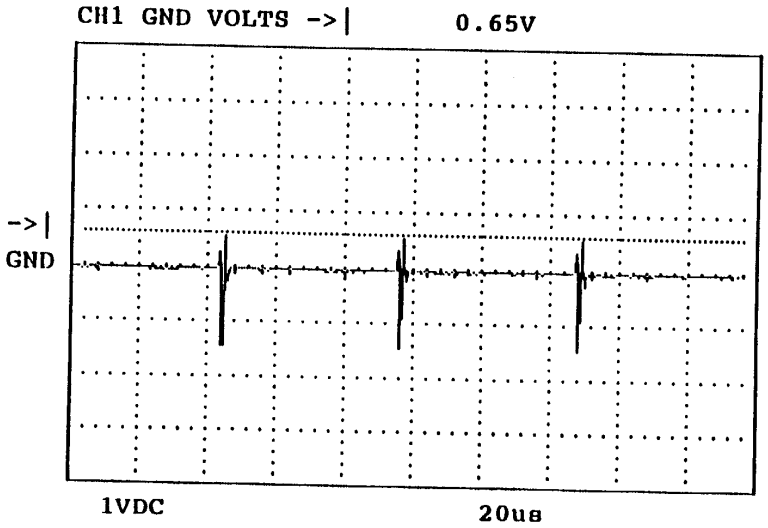

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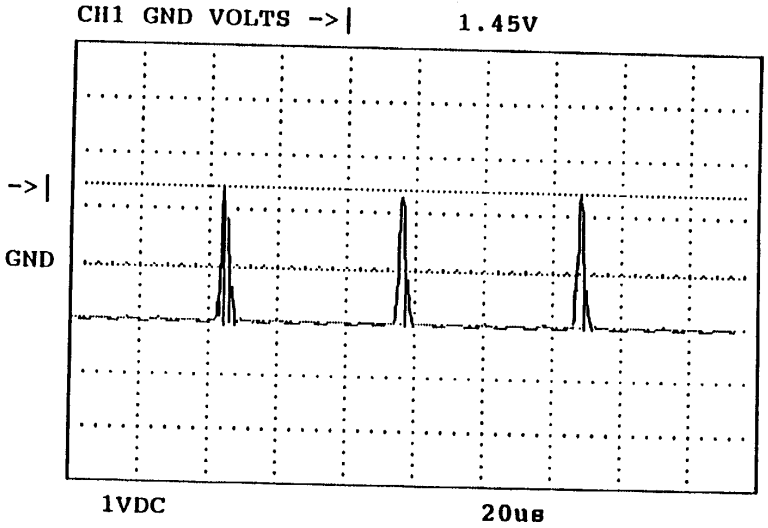

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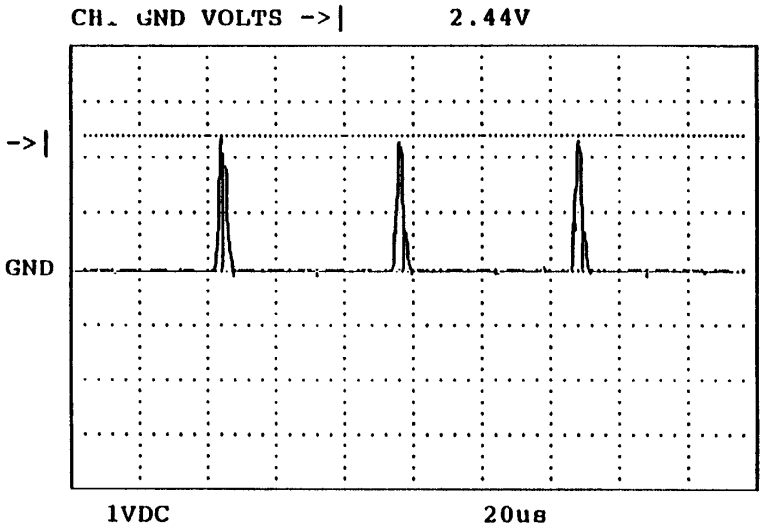

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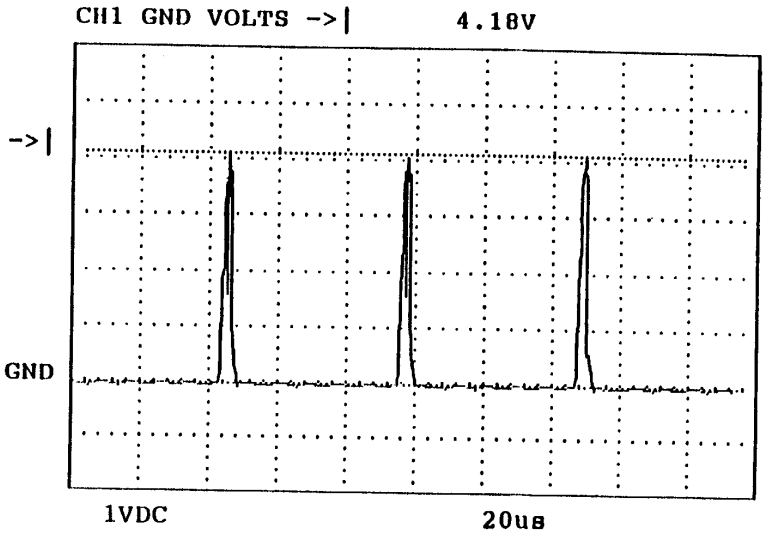

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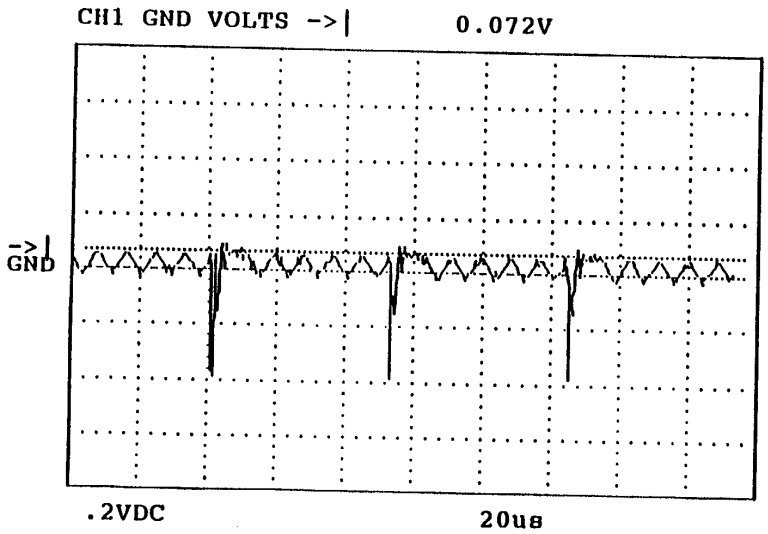

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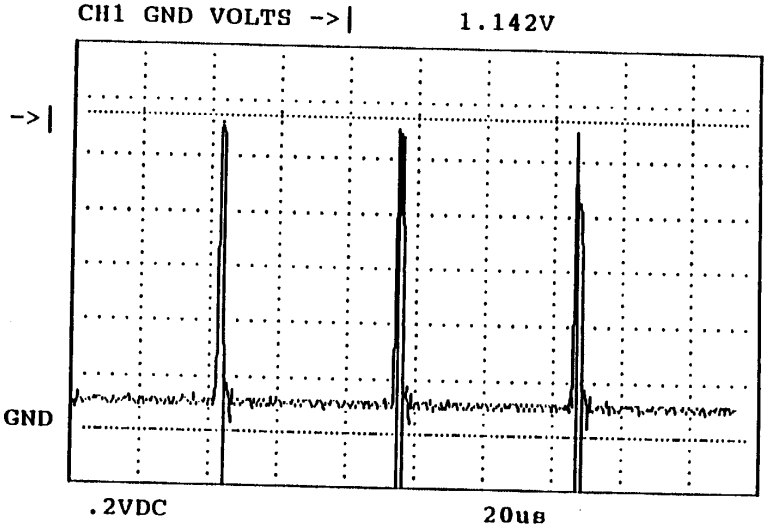

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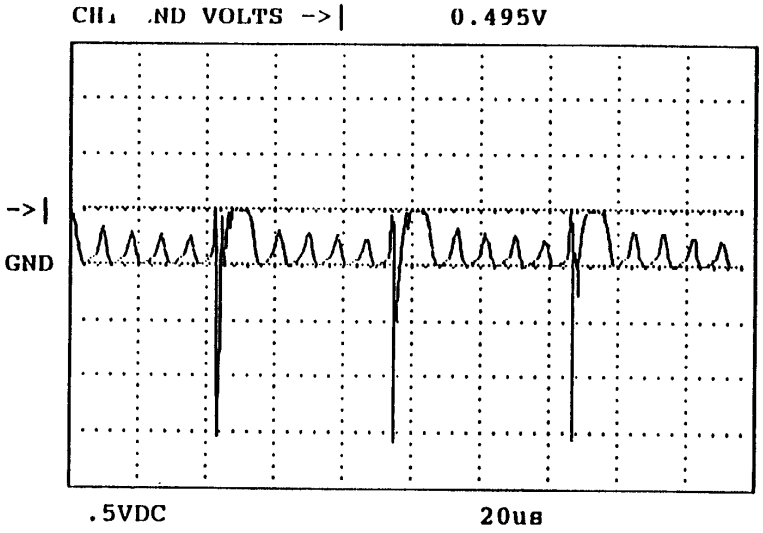

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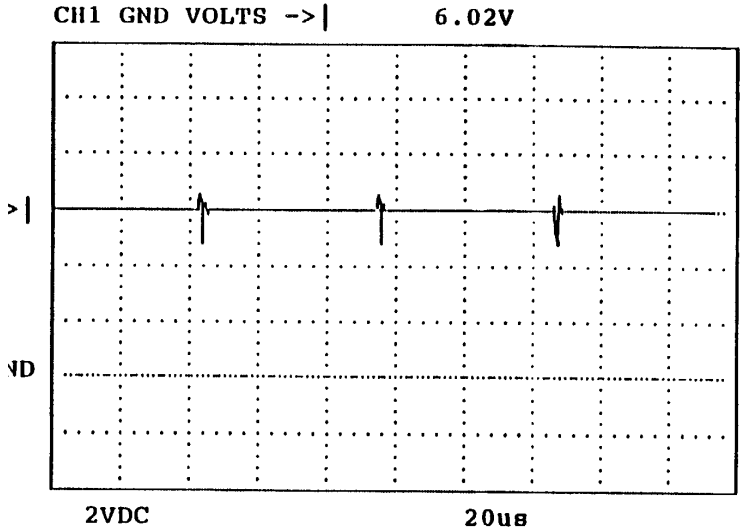

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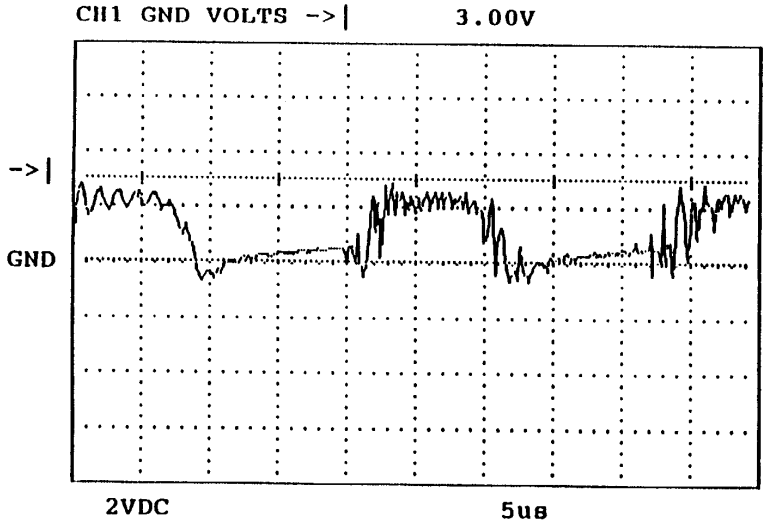

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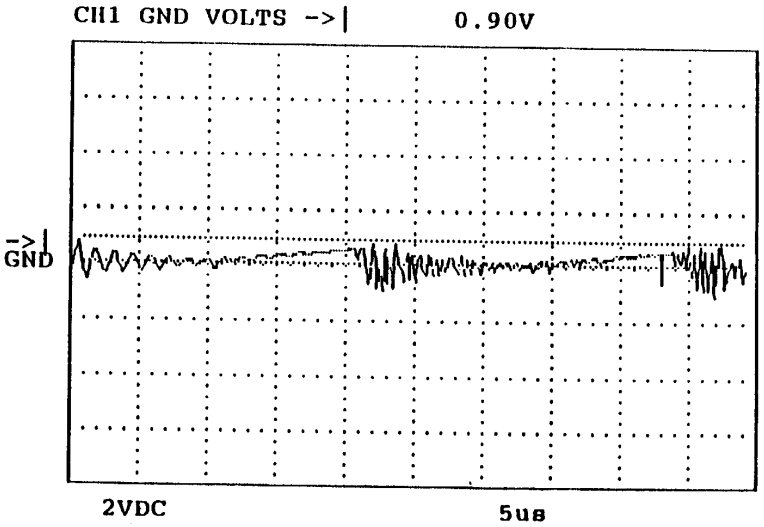

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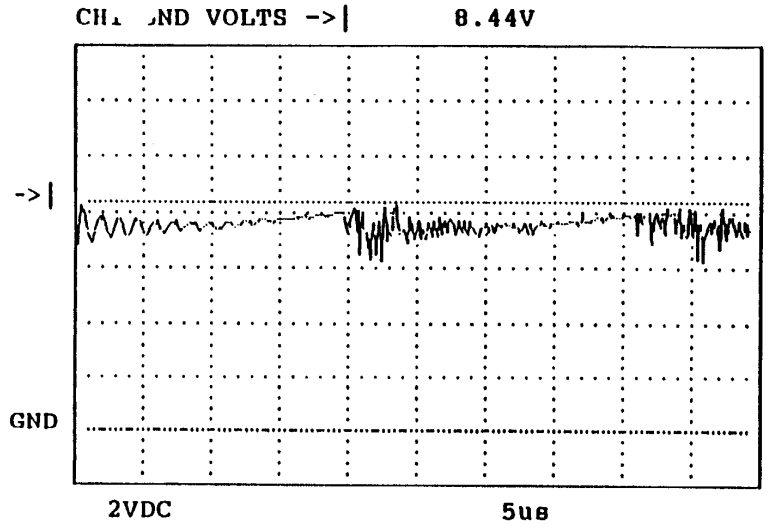

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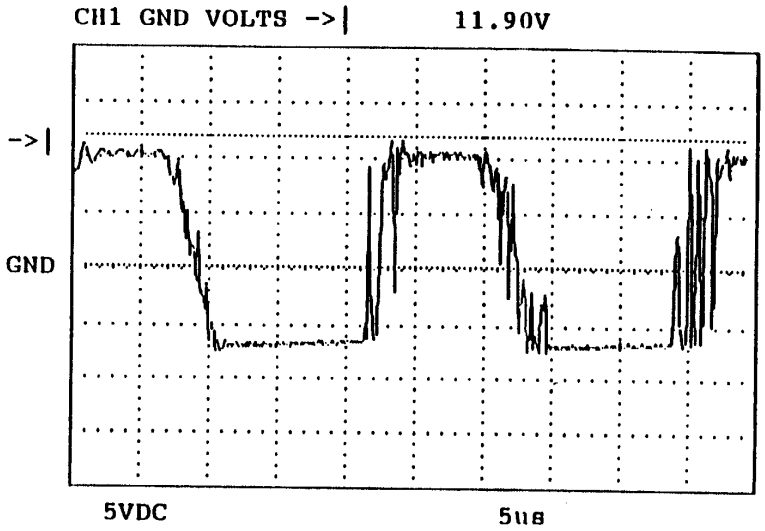

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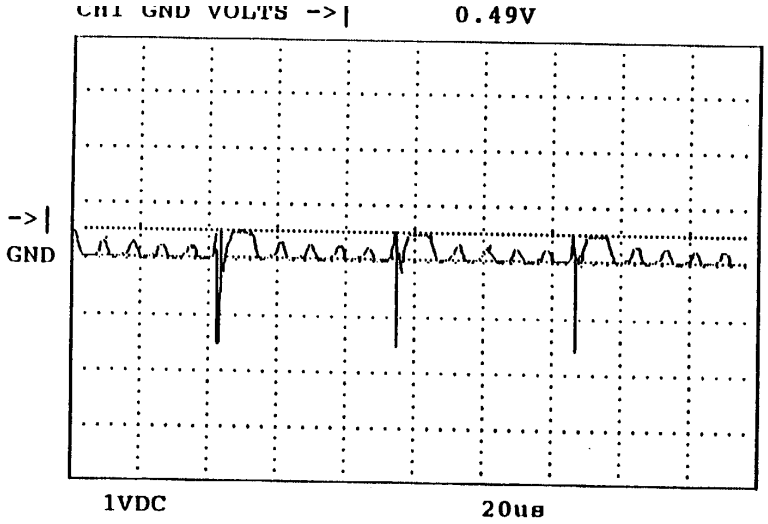

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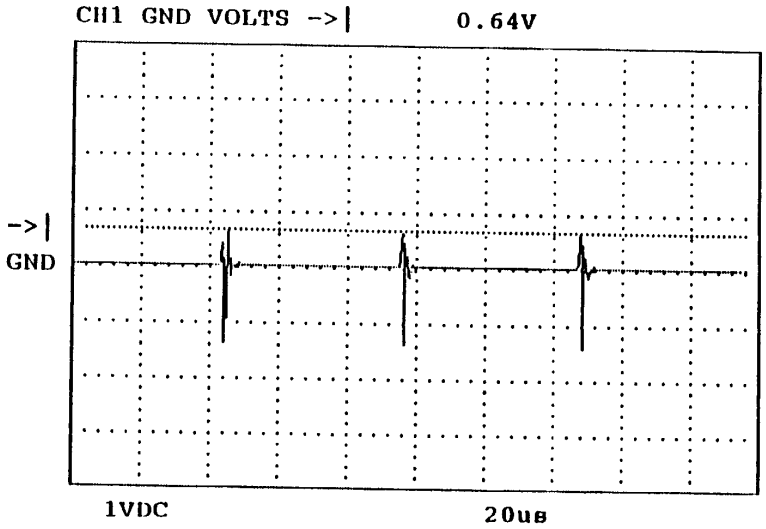

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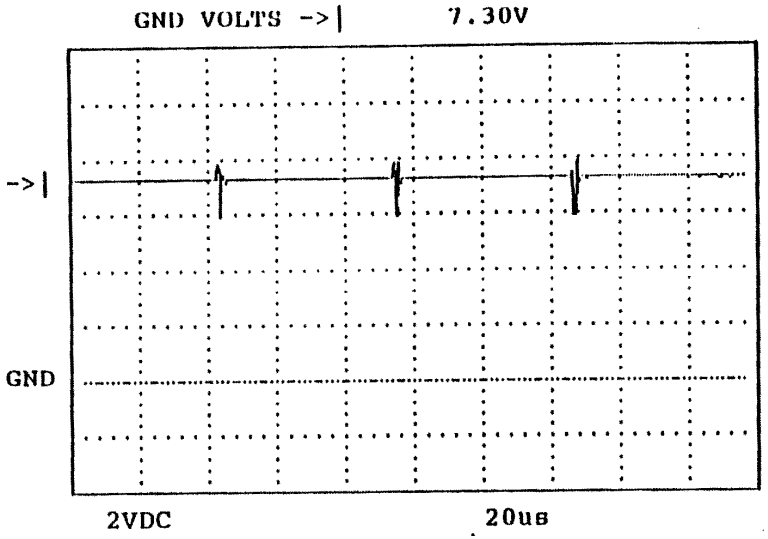

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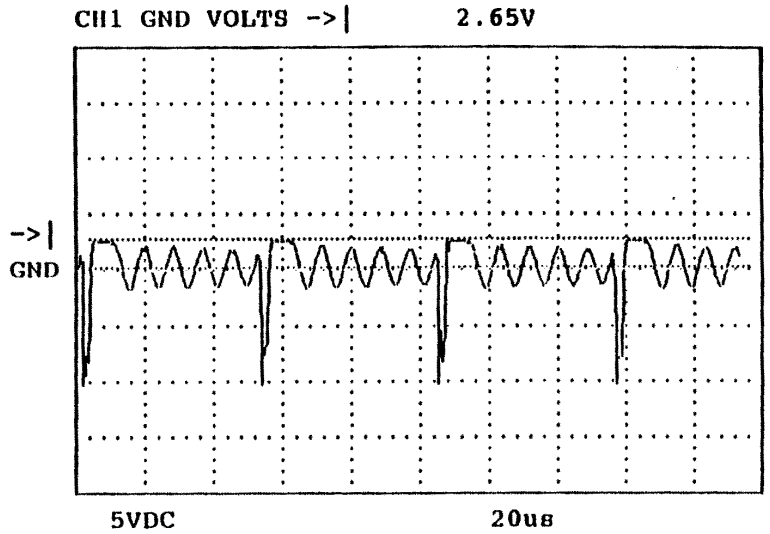

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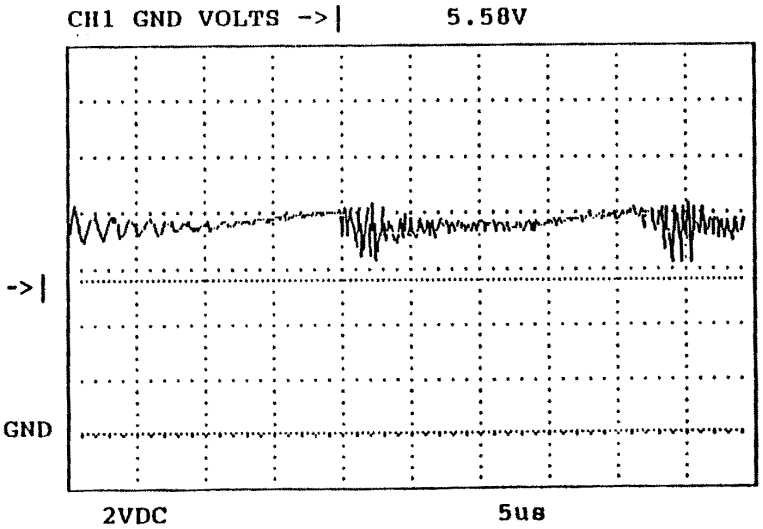

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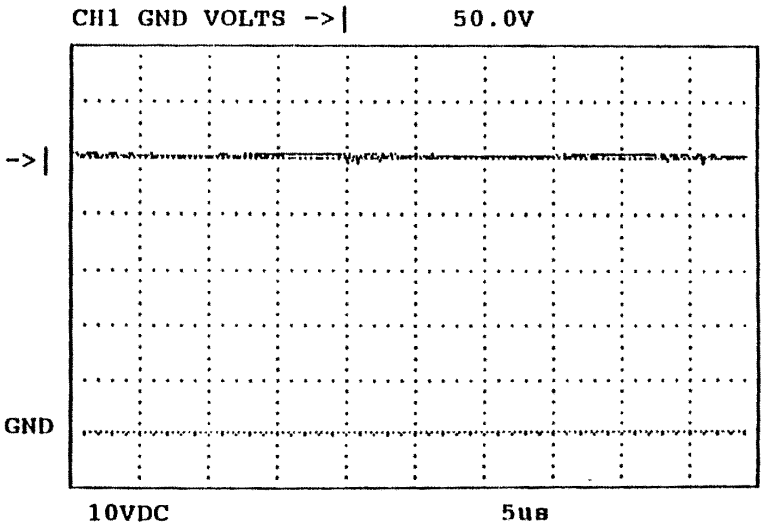

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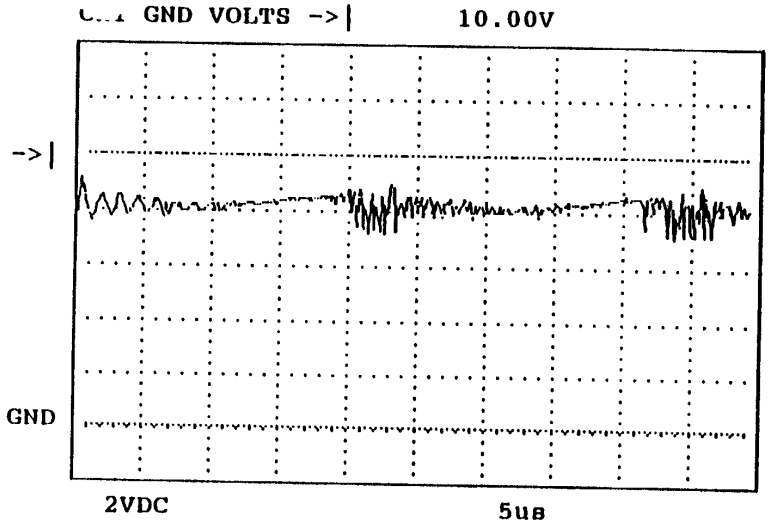
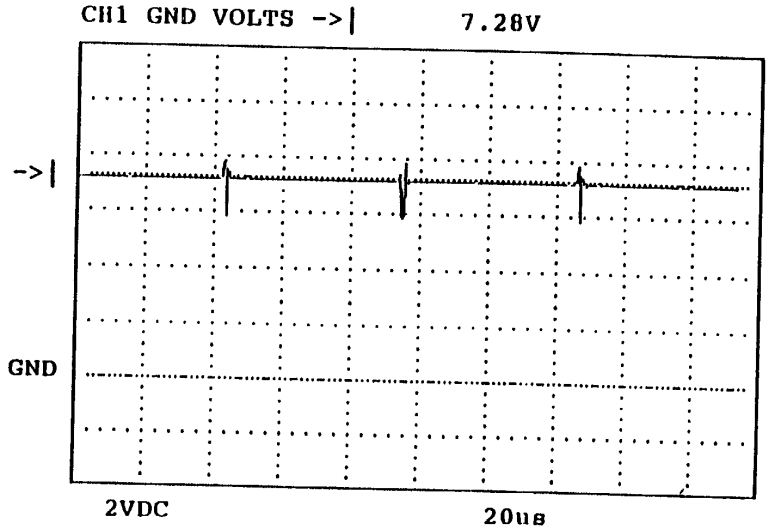
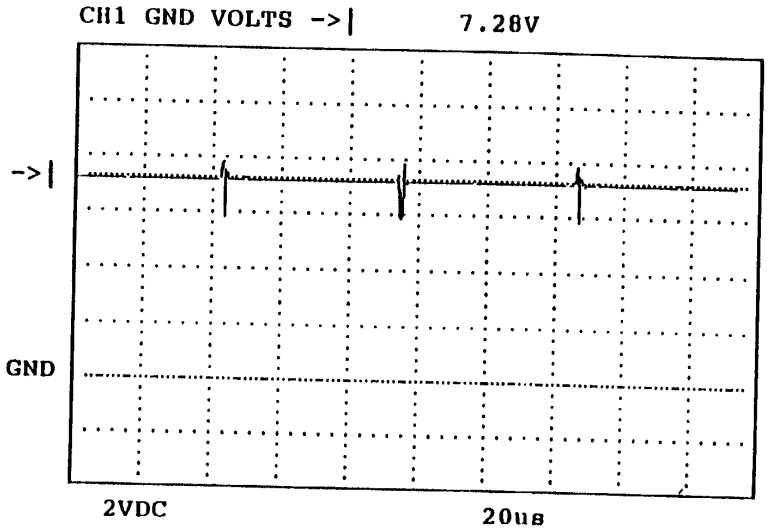


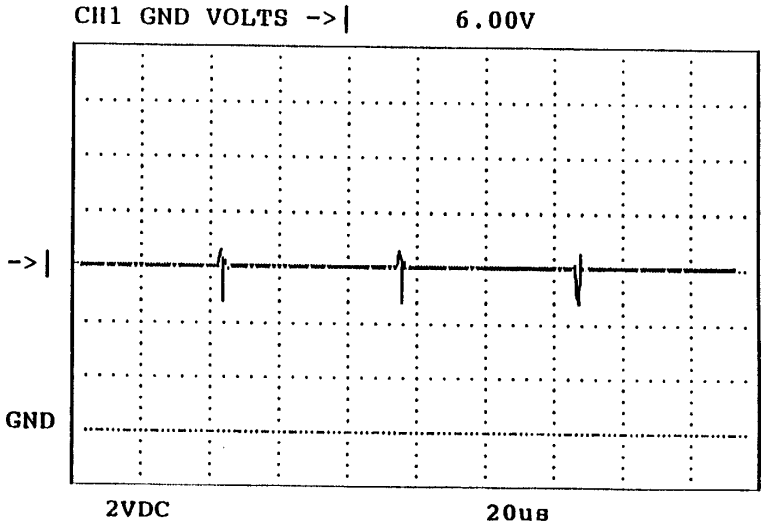
(POWER ON) Q801 E



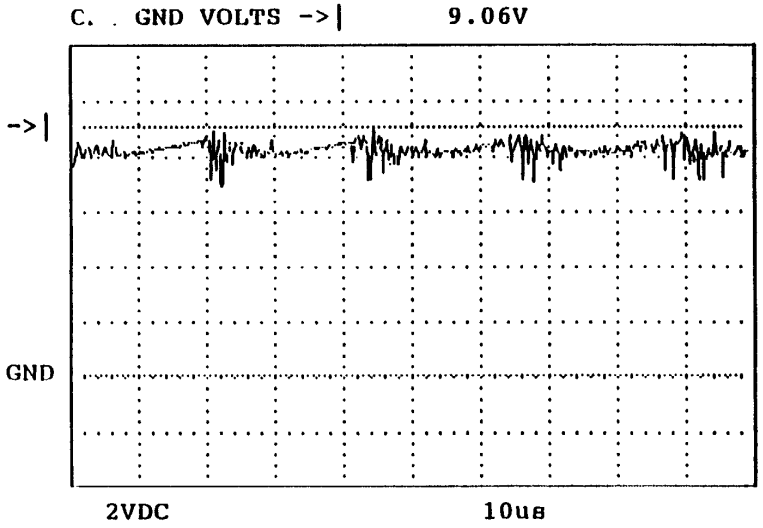
(STAND-BY) Q801 B



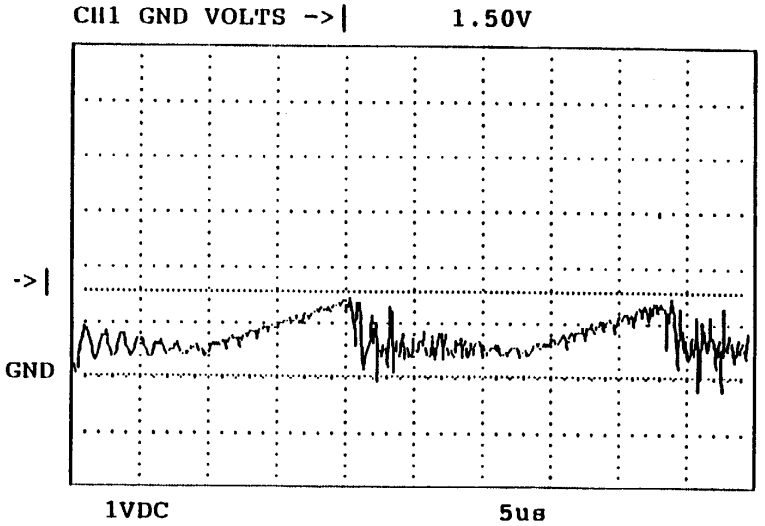
(STAND-BY) Q801 C



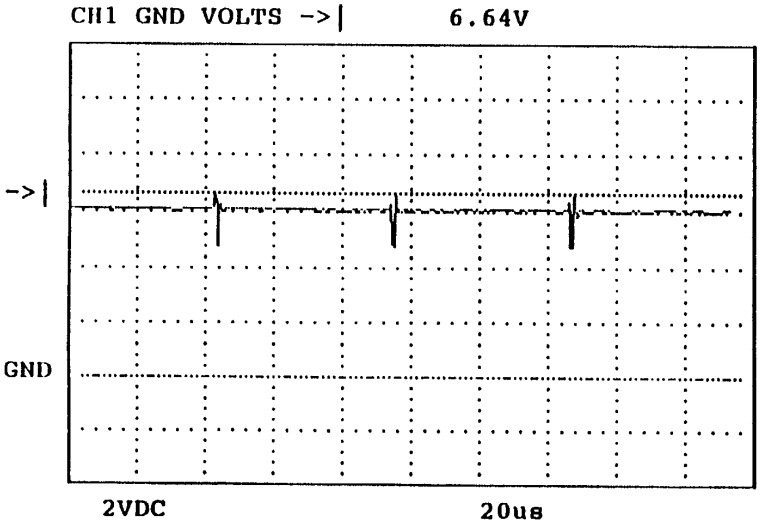
(STAND-BY) Q801 E



(POWER ON) IC851 C



(POWER ON) IC851 E



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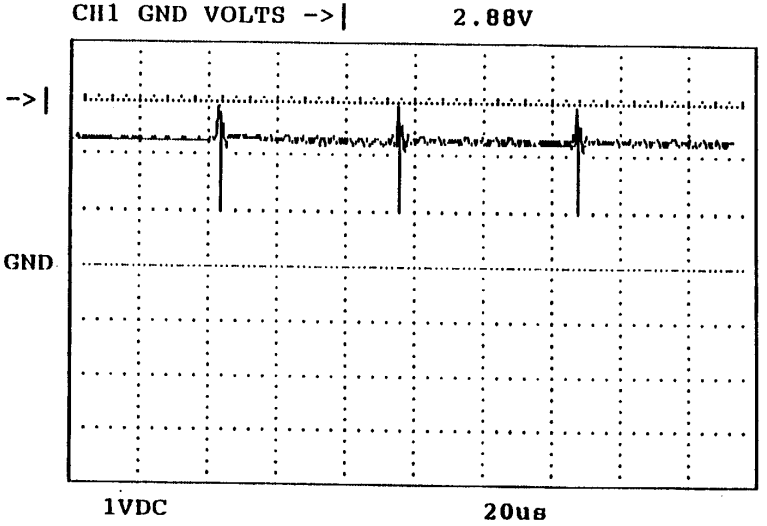

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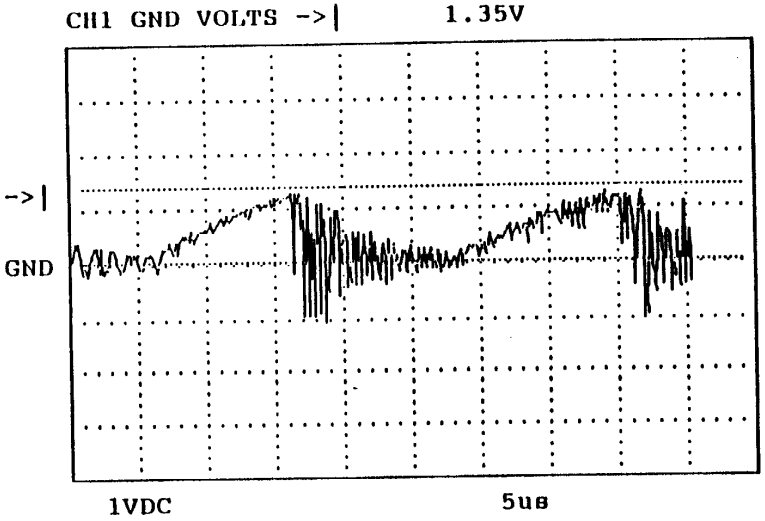
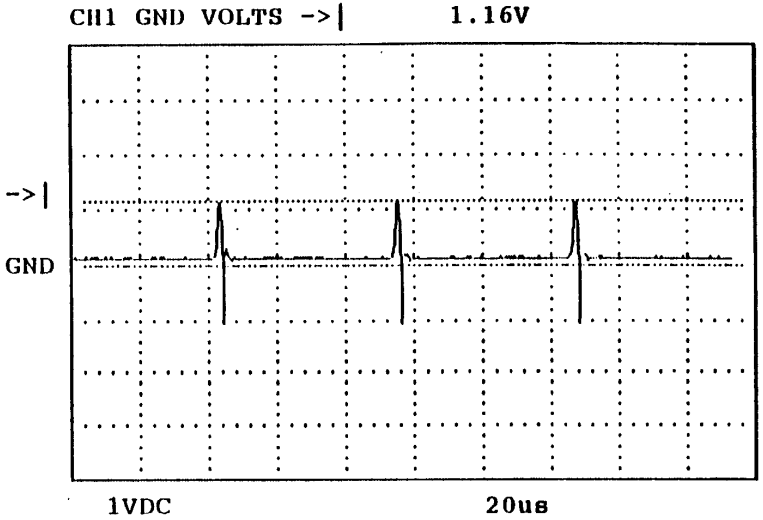
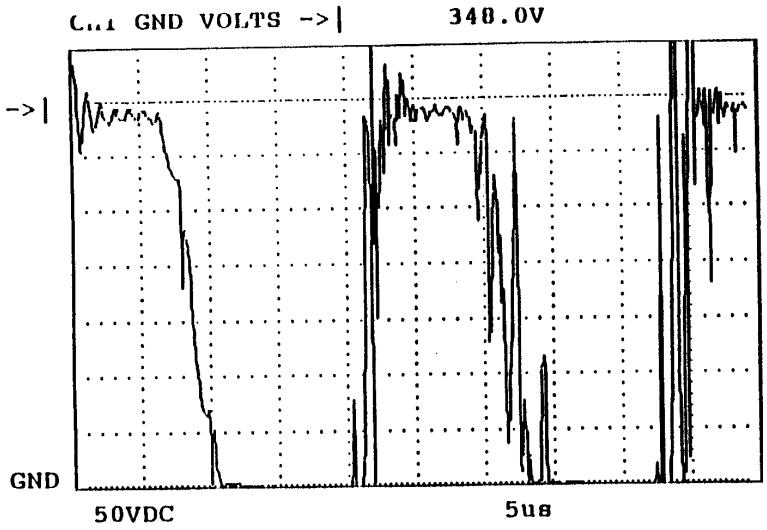


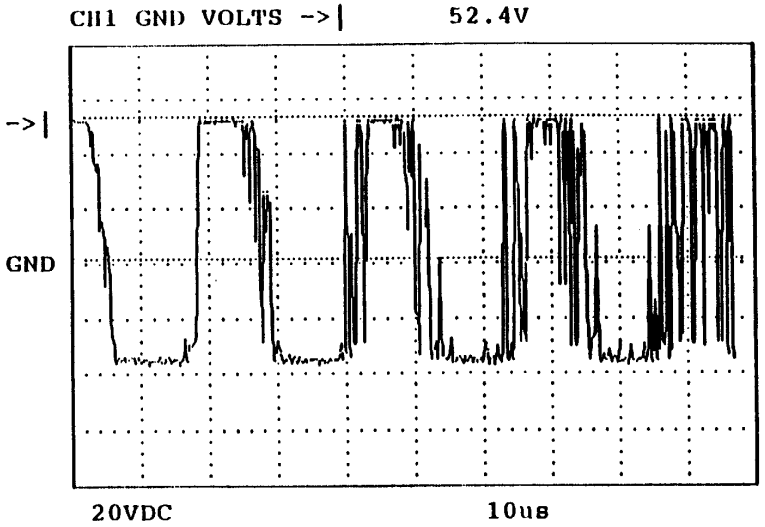
(POWER ON) DZ803



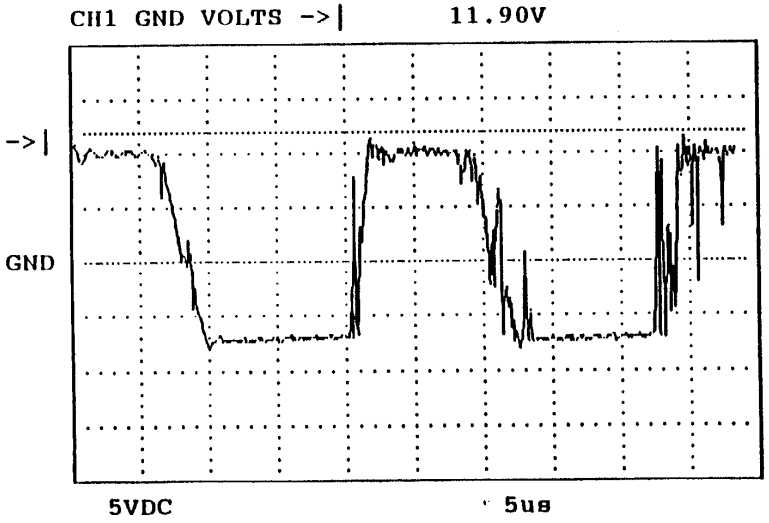
(STNAD-BY) DZ803



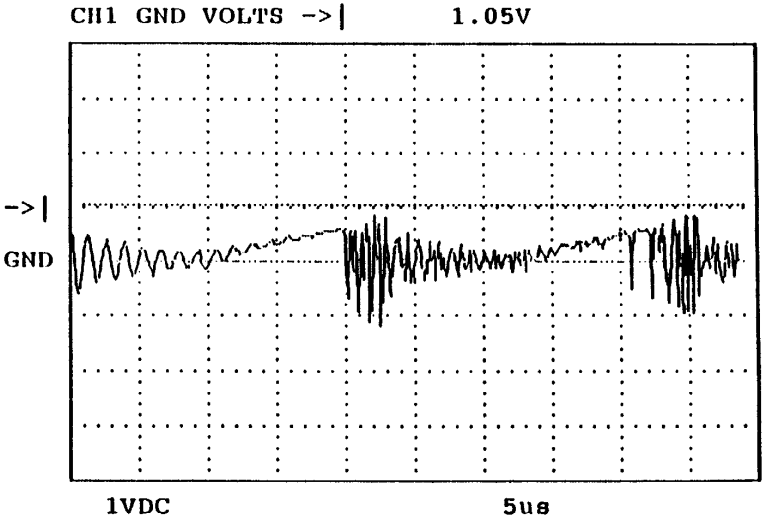
(POWER ON) T801 PIN 4



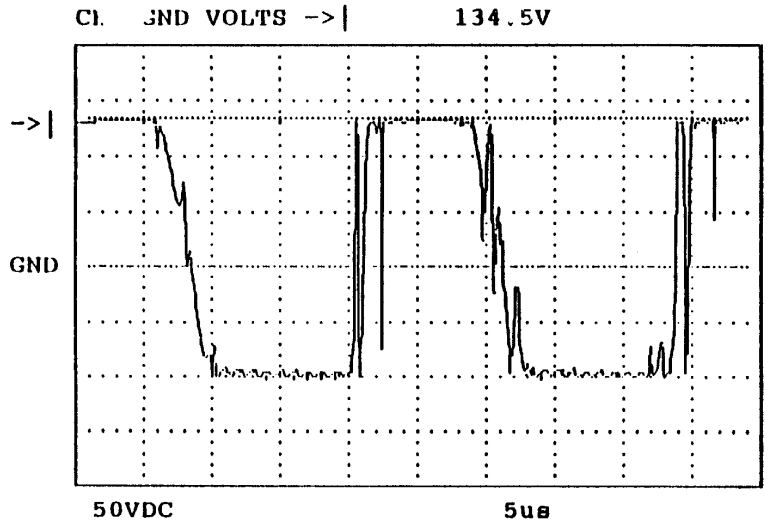
(POWER ON) T801 PIN 6



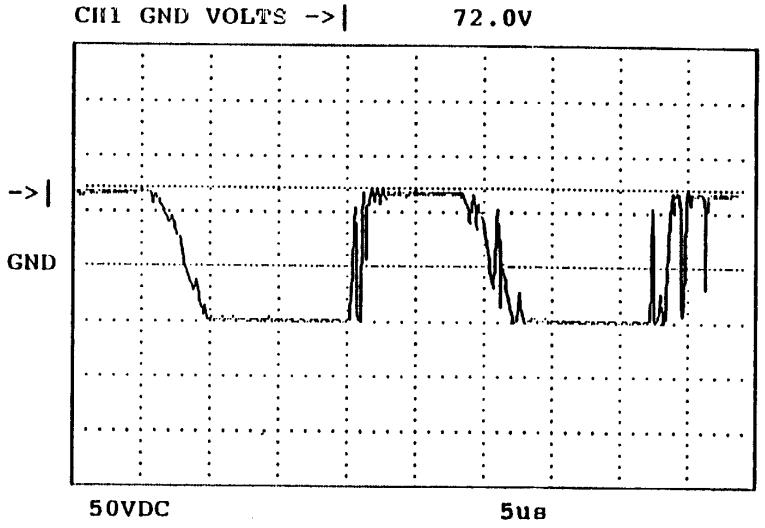
(POWER ON) T801 PIN 7



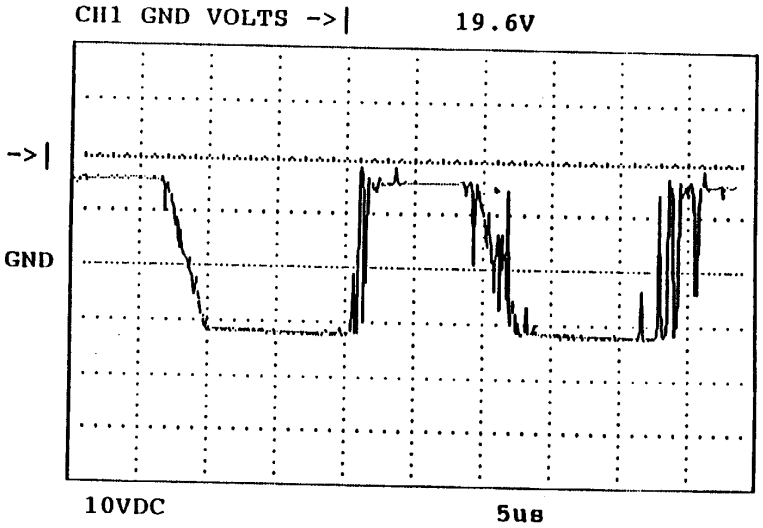
(POWER ON) T801 PIN 8



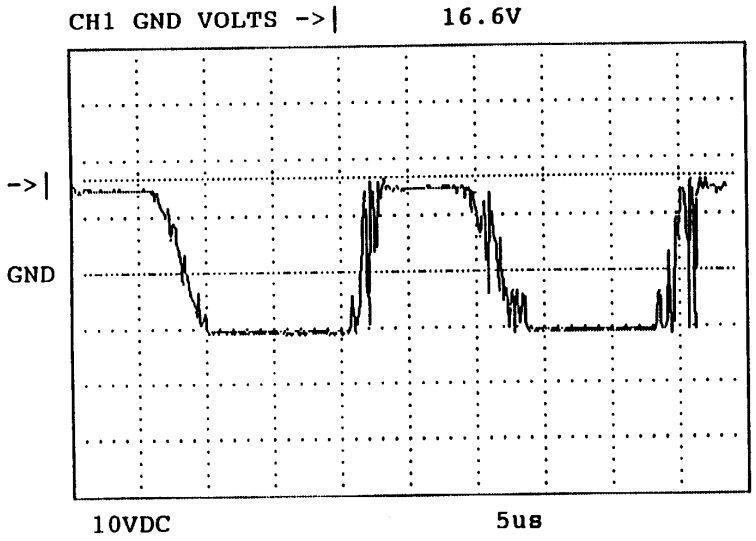
(POWER ON) POINT A



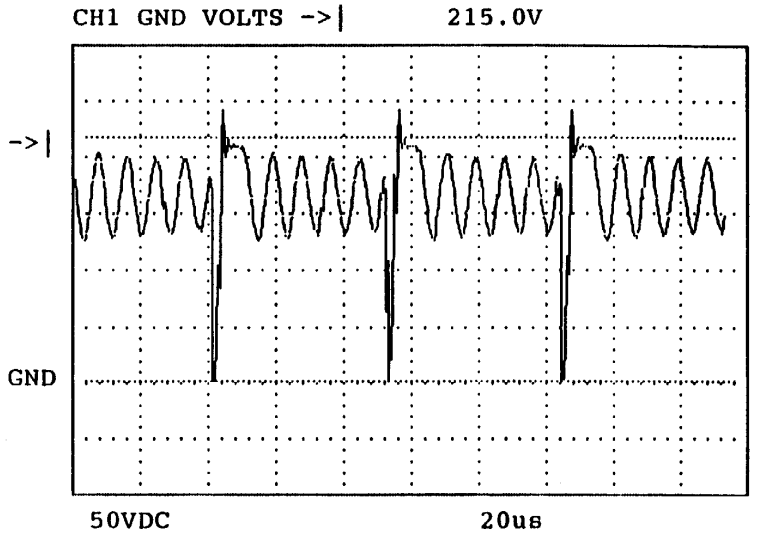
(POWER ON) POINT B



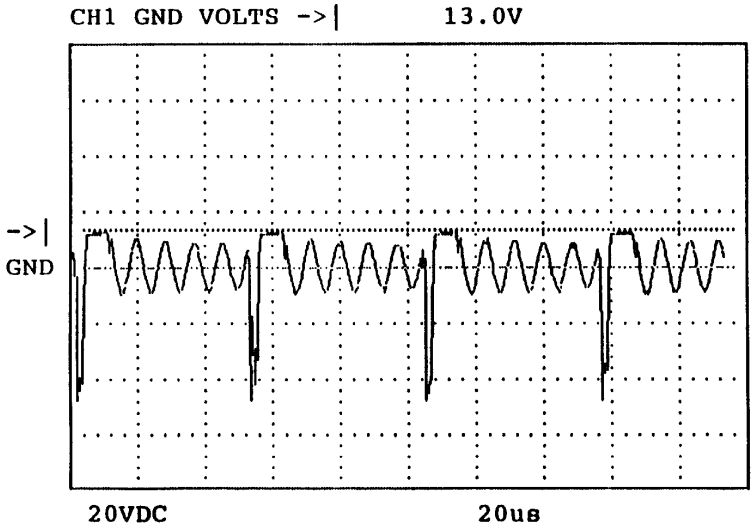
(POWER ON) POINT C



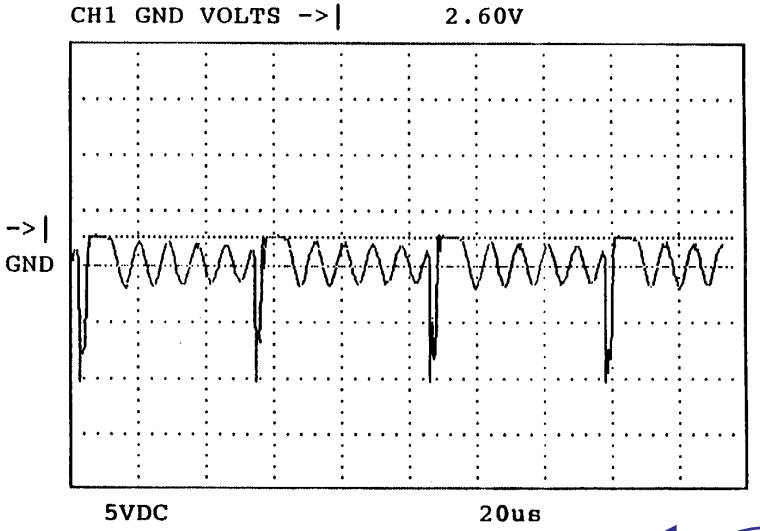
(POWER ON) POINT D



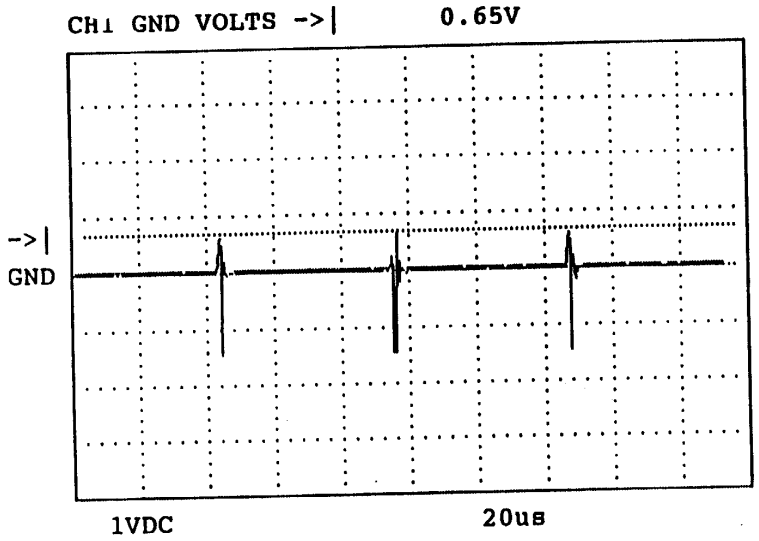
(STAND-BY) T801 PIN4



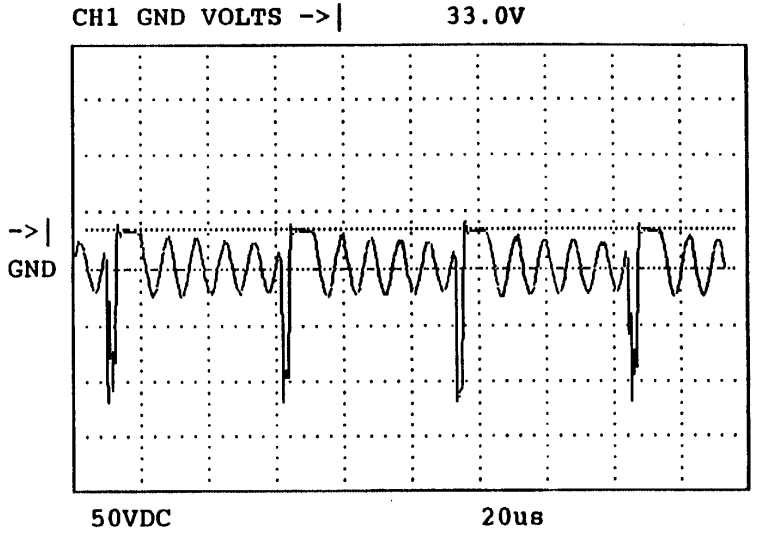
(STAND-BY) T801 PIN 6



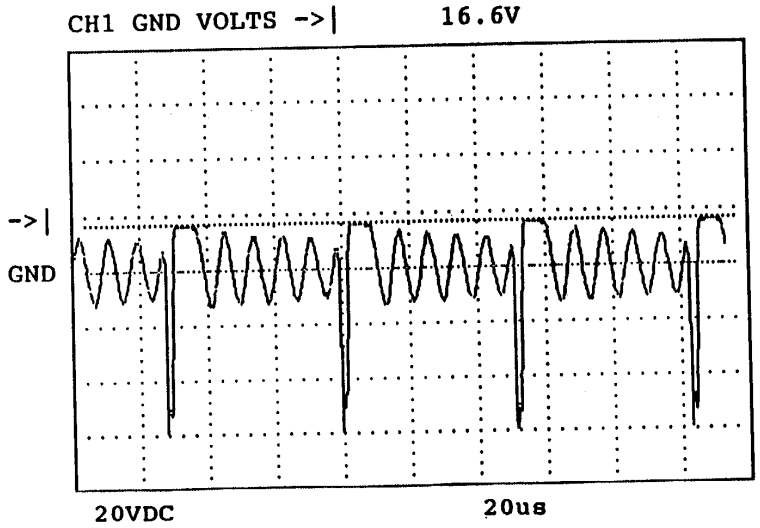
(STAND-BY) T801 PIN7



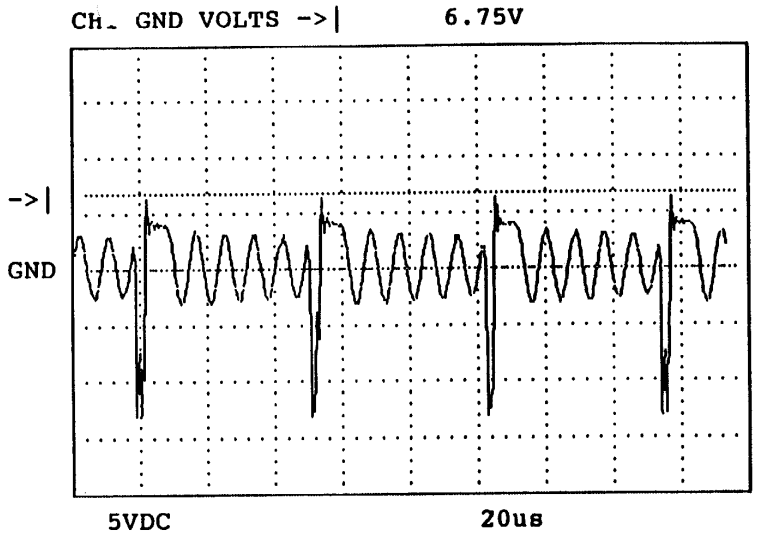
(STAND-BY) T801 PIN 8



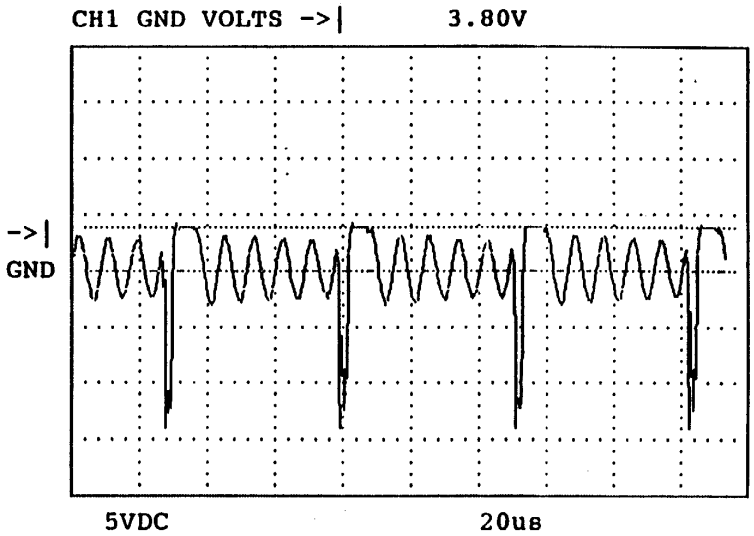
(STAND-BY) POINT A



(STAND-BY) POINT B

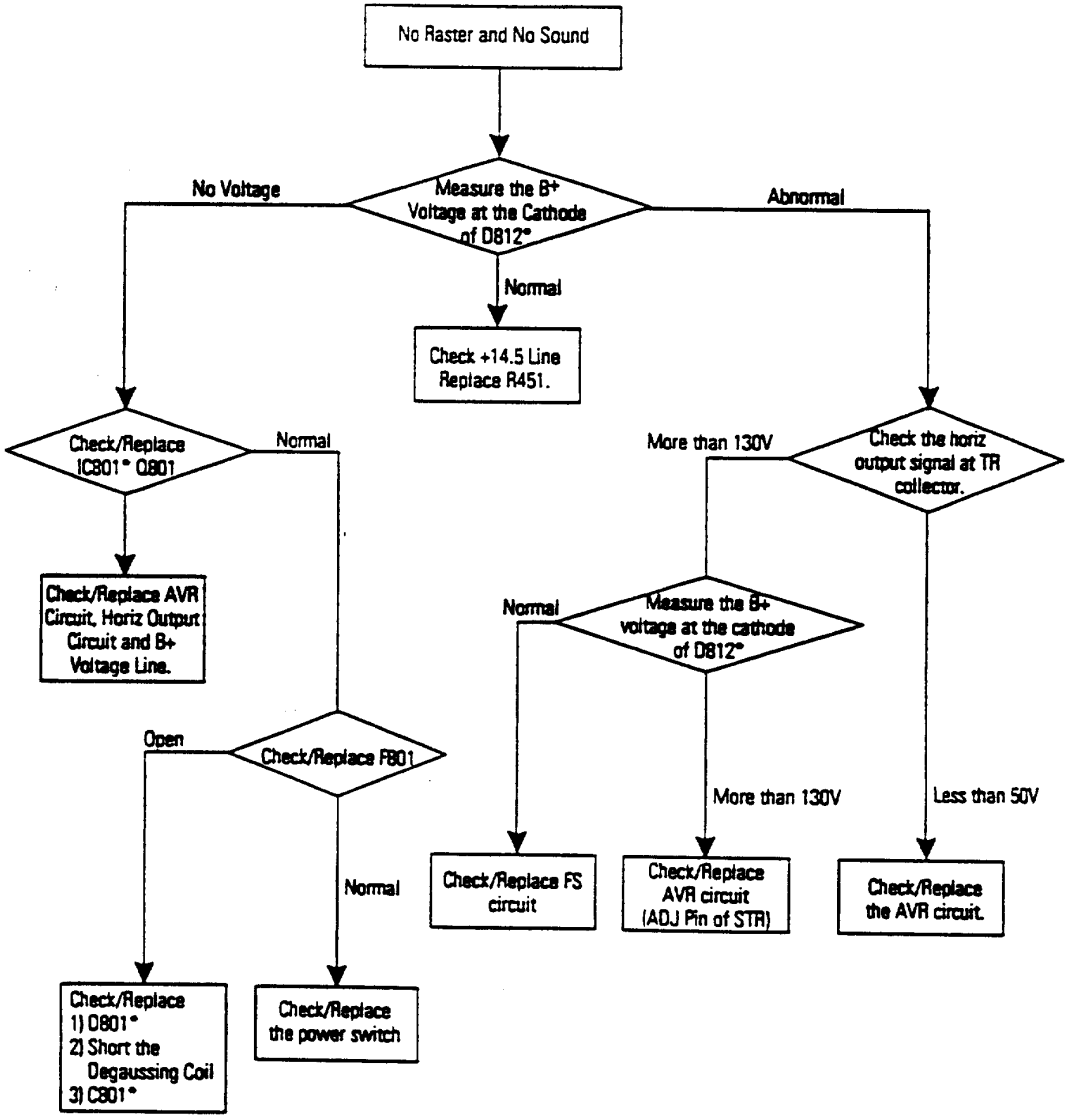


(STAND-BY) POINT C

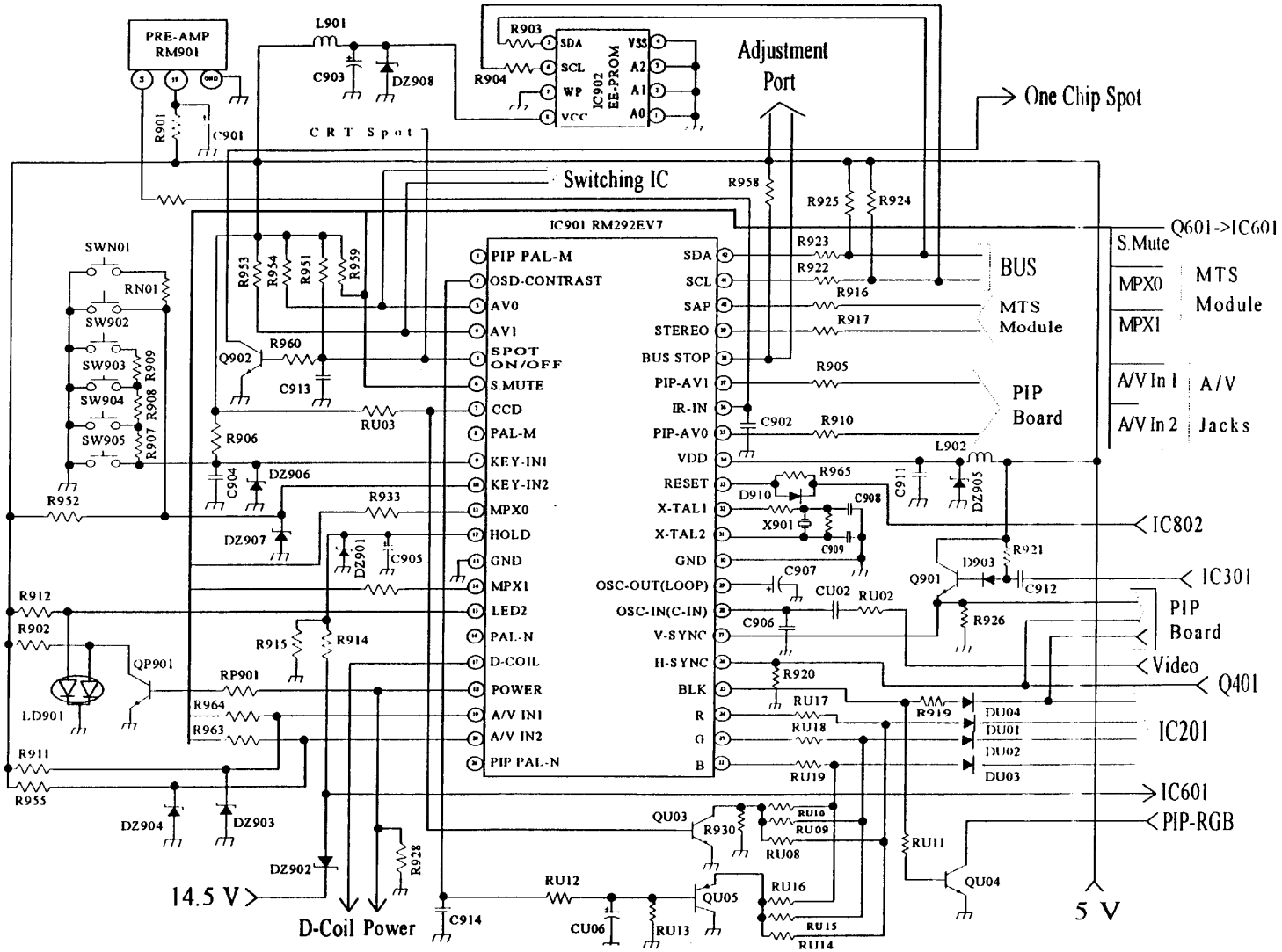


(STAND-BY) POINT D

Troubleshooting: No Raster and No Sound



Micom Circuit



IC Pin Description

Micom (IC901) Pin Description

Pin No	Pin Name	In/Out	Description
2	OSD-CONTRAST	OUTPUT	OSD Contrast level adjustment
3, 4	AV0, AV1	OUTPUT	TV/AV mode selection control
5	SPOT	OUTPUT	CRT spot prevention control
6	S.MUTE	OUTPUT	Sound mute control
7	CCD	OUTPUT	Caption Brightness control
9, 10	KEY-IN1, IN2	INPUT	Key matrix input
11, 14	MPX 0, 1	OUTPUT	MTS mode selection
12	HOLD	INPUT	Power failure detection
15	LED2	OUTPUT	LED drive signal output
17	D-COIL	OUTPUT	Degaussing coil control
18	POWER	OUTPUT	Power on/off
19, 20	A/V-IN1, IN2	INPUT	Detection of AV Jack plugged in
22~24	R, G, B	OUTPUT	OSD RGB output
25	BLK	OUTPUT	OSD blanking signal output
26	H-SYNC	INPUT	H-Sync input
27	V-Sync	INPUT	V-Sync input
28	OSC-IN(C-IN)	INPUT	Composite video input
29	OSC-OUT(LOOP)	IN/OUT	Loop out of Pin 28
31, 32	XTAL 2, 1	IN/OUT	Oscillation for Micom Operation
33	RESET	INPUT	Micom initialization
34	VDD	INPUT	Main B+
35, 37	PIP-AV0, AV1	OUTPUT	PIP TV/AV Selection
36	IR-IN	INPUT	Remote signal input
38	BUS STOP	OUTPUT	Factory use
39	STEREO	INPUT	Stereo indication input
40	SAP	INPUT	SAP indication input
41, 42	SCL, SDA	IN/OUT	Bus control

EEPROM (IC902) Pin Description

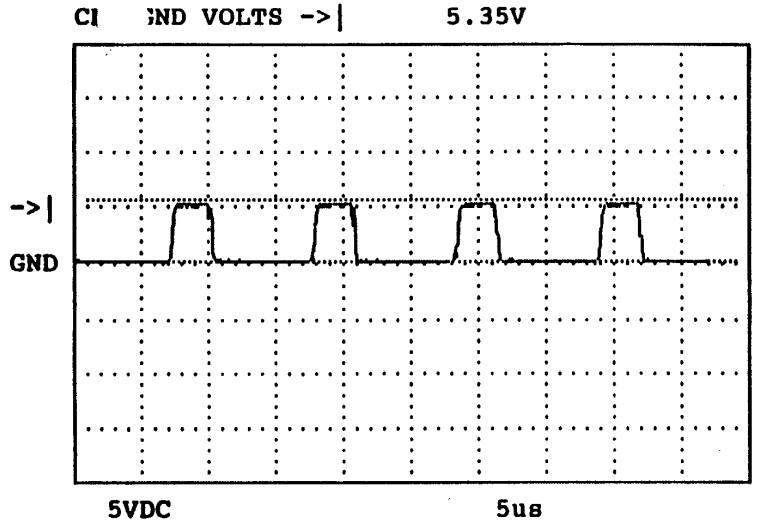
Pin No	Pin Name	In/Out	Description
1~3	A0 ~ A2	Input	Address Inputs
4	Vss	-	Ground
5, 6	SDA, SCL	In/Out	Serial clock/Data
7	WC	Input	Write Control input
8	Vcc	Input	Supply voltage

*Memory capacity: 256 X 8 bits (256 words), Retention: 10 years

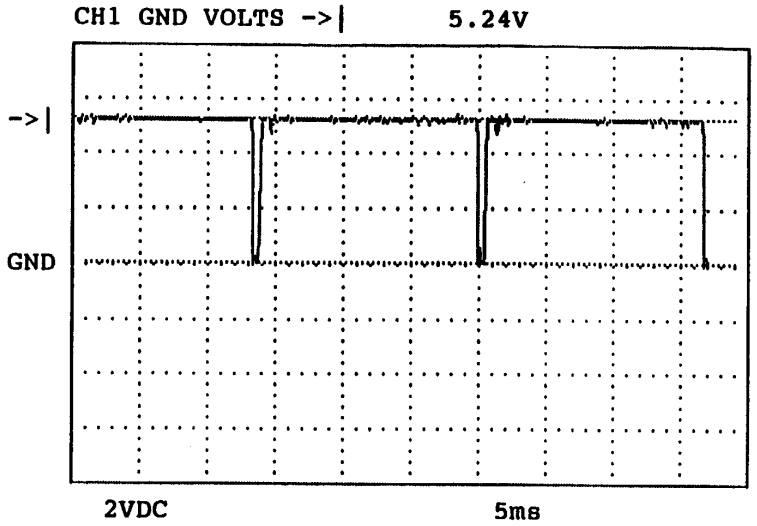
IC Pin Voltage & Waveforms

Micom (IC901) Pin Description

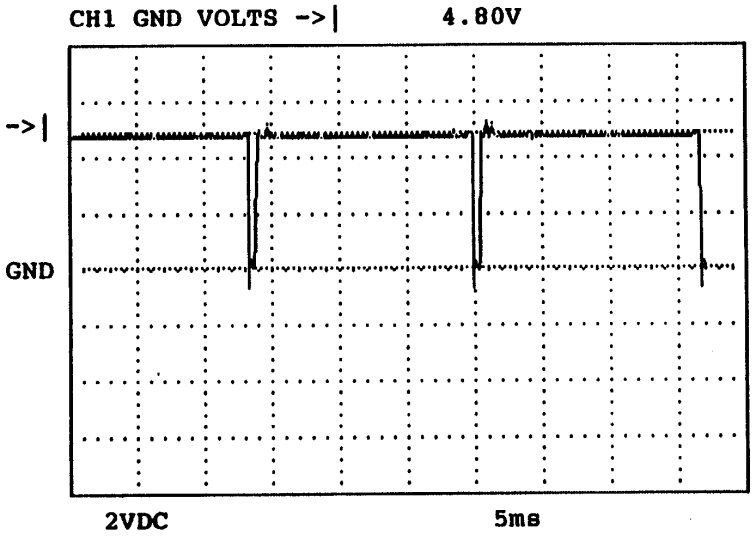
Pin No	Volatges & Waveforms	Pin No	Volatges & Waveforms
2	See print out	26	See print out
3,4	TV AV1 AV2 AVO 5 V 0 V 2.8 V AV1 0 V 2.8 V 2.8 V	27	See print out
5	Power Off: 0.6 V On: 0 V	28	See print out
6	Mute Off: 0 V On: 0.6 V	29	1.7 Vdc + 0.2 Vpp(Video)
7		31,32	See print out
9,10	See print out	33	5V
11,14	ST Mono SAP MPX0 L H L MPX1 L L H	34	5V
12	5 V	35,37	TV AV1 AV2 PIP-AVO 5 V 5 V 0 V PIP-AV1 5 V 0 V 0 V
15		36	See print out
17	5V when Reset goes 0V-> 5V for about 2 sec, then goes low	38	5V
18	Power On: 5V Off: 0 V	39	
19,20	Jack In: 5V Out: 0.5 V	40	
22~24	See print out	41,42	See print out
25	See print out		



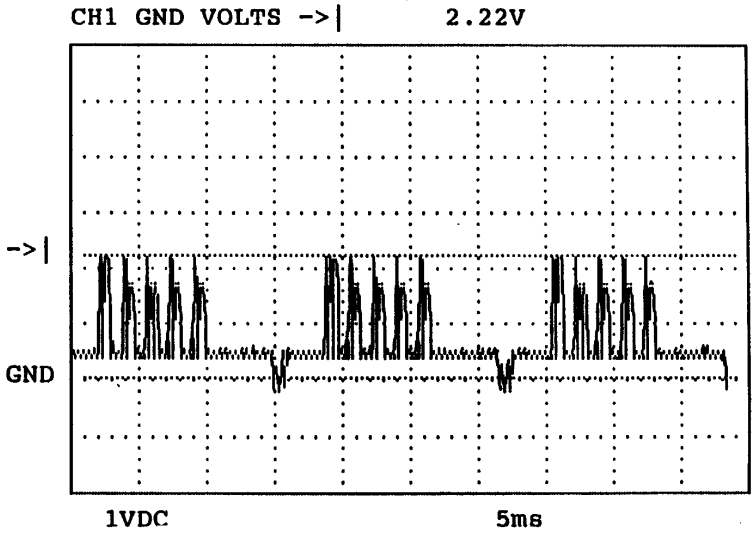
MICOM PIN 2 (P.std:Movies)



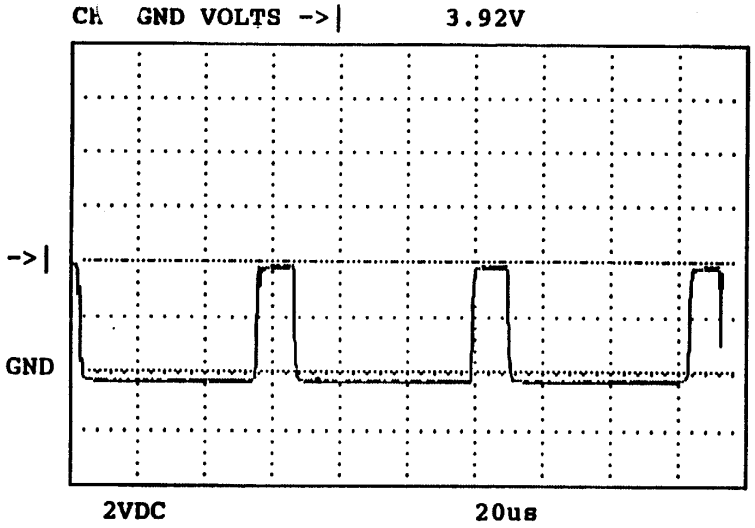
MICOM PIN 9 (No Key Pressed)



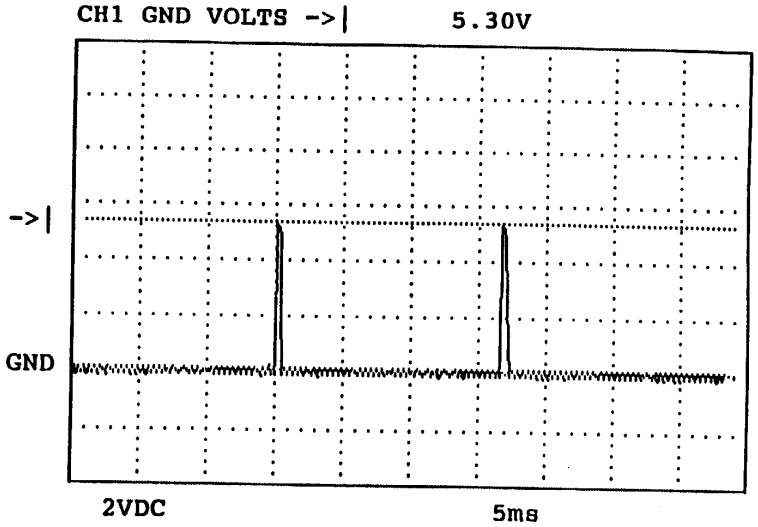
MICOM PIN 10
(No key pressed)



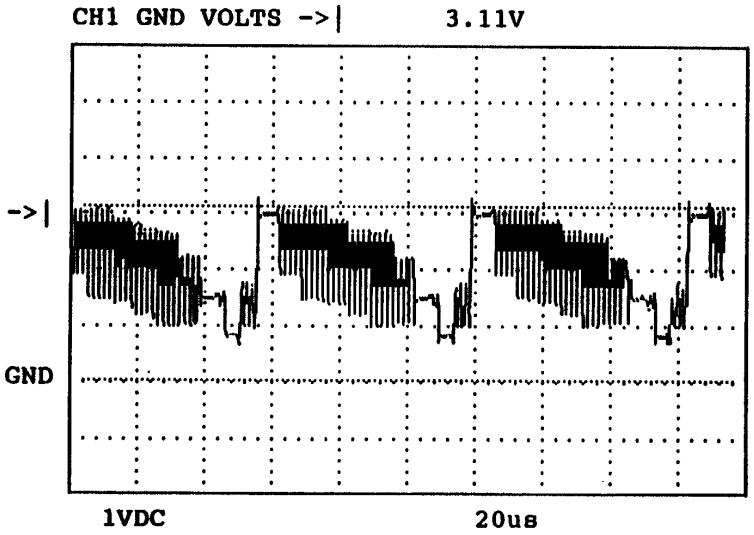
(STAND-BY) T801 PIN 22~24
(Menu key pressed)



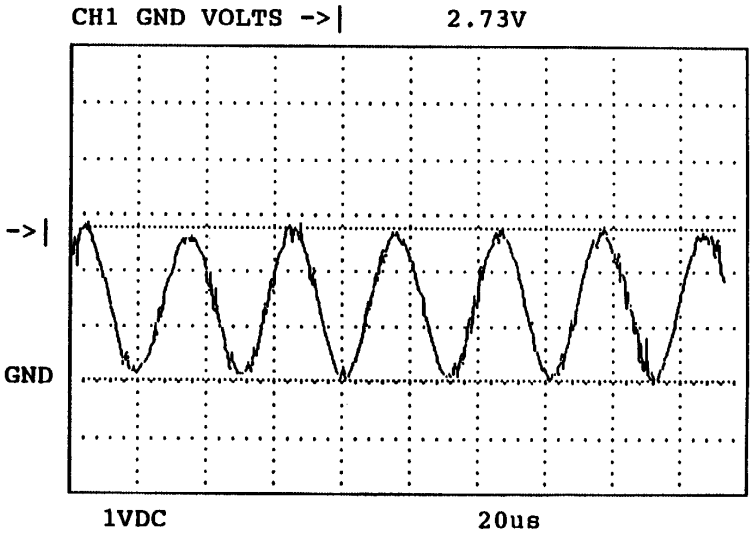
MICOM PIN 26



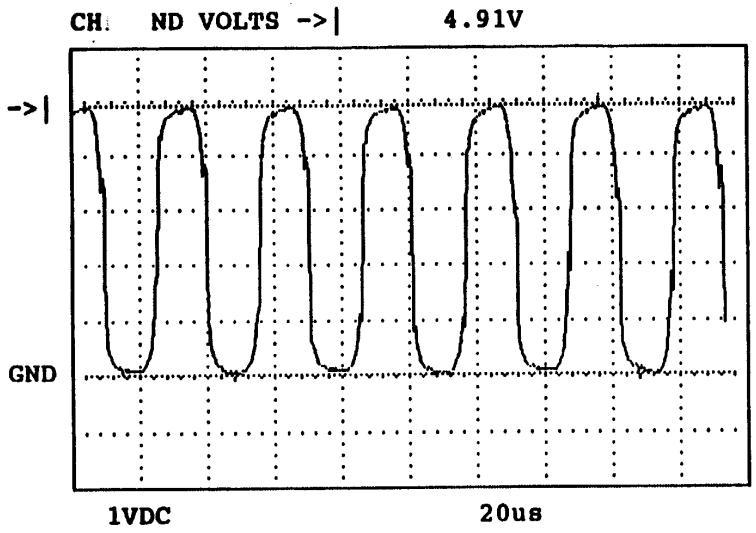
MICOM PIN 27



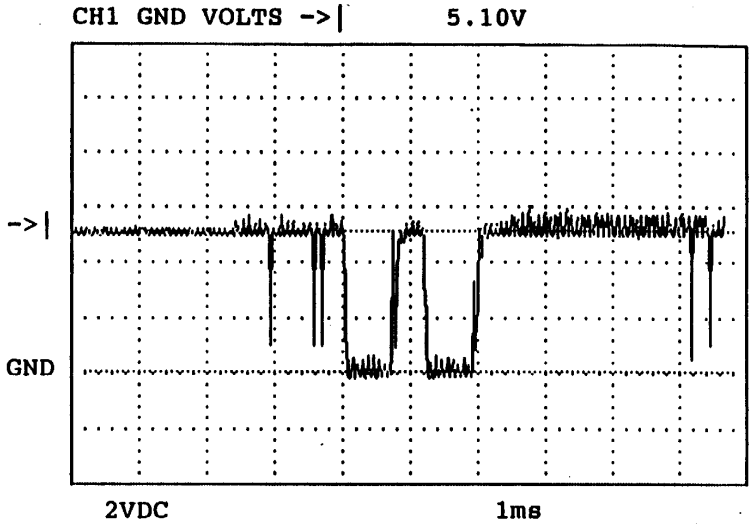
MICOM PIN 28



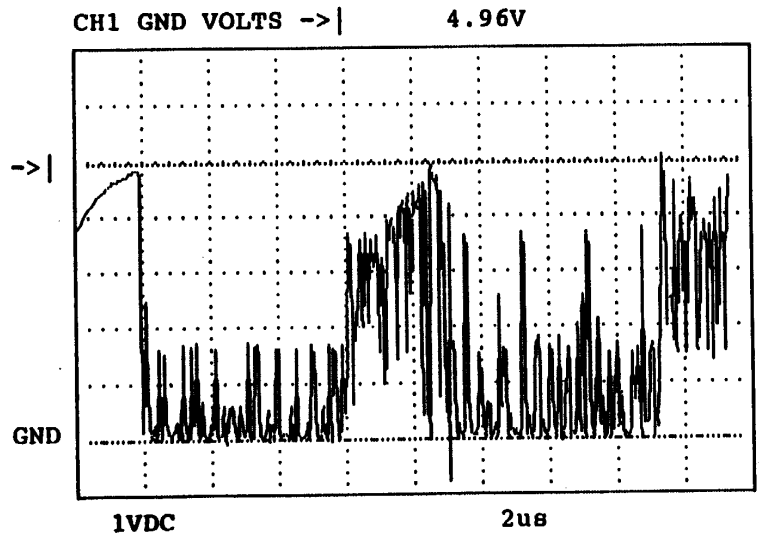
MICOM PIN 31



MICOM PIN 32

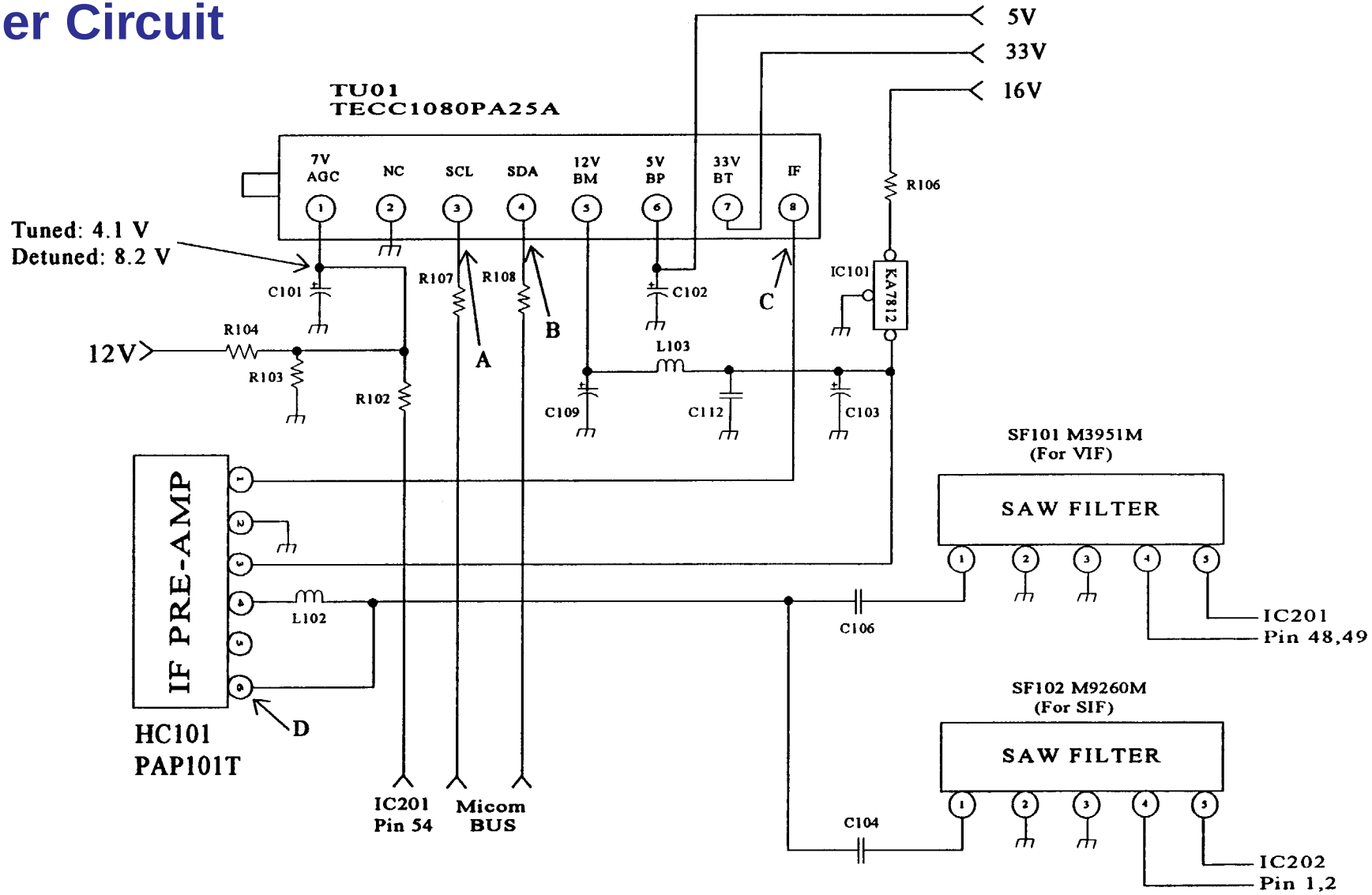


MICOM PIN 36
(Mute key pressed)



MICOM PIN 41, 42

Tuner Circuit



Tuner Description

TU01 TECC1080PA25A Tuner

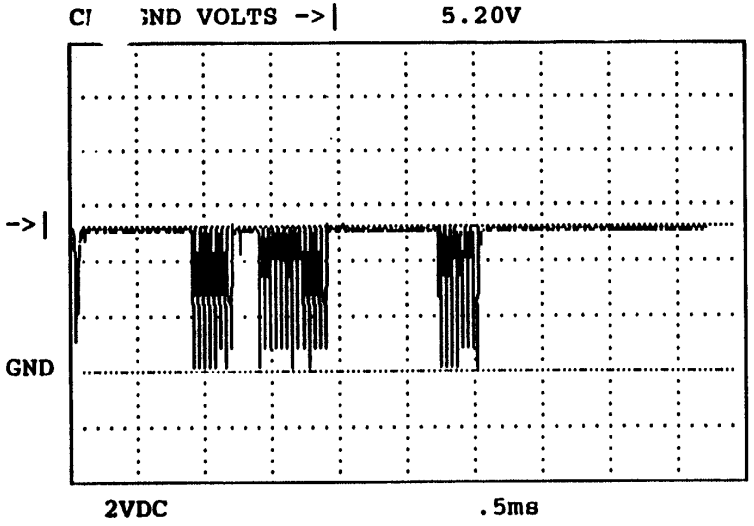
Band change-over system: PLL control system
Tuning system: Electronic tuning system with PLL
Voltage & Current at each terminal

Terminal	Supply Voltage	Operation Guaranteed Voltage	Current
BM	12 +/– 0.1 V	12 +/– 1.2 V	80mA (typ.)
AGC	8 +/– 0.1 V	9V Max	-
BT	33 V +/– 0.1 V	33 +/– 2 V	2mA (typ.)
BP	5 V +/– 0.1 V	5 +/– 0.5 V	50mA (typ.)

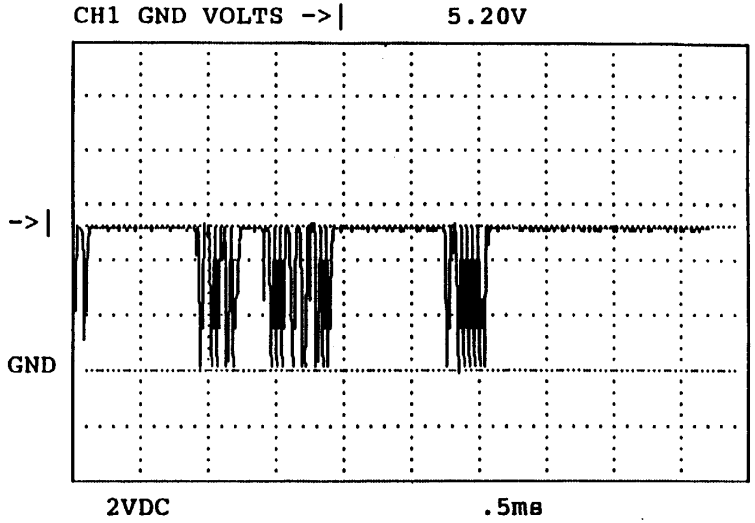
Tuner PLL Data Format

		MSB							LSB
Address Byte	1	1	0	0	0	MA1	MA0	0	A
Divider Byte1	0	N14	N13	N12	N11	N10	N9	N8	A
Divider Byte 2	N7	N6	N5	N4	N3	N2	N1	N0	A
Control Byte	1	CP	T2	T1	T0	RSA	RSB	OS	A
Bandswitch Byte	X	X	X	X	BS4	BS3	BS2	BS1	A

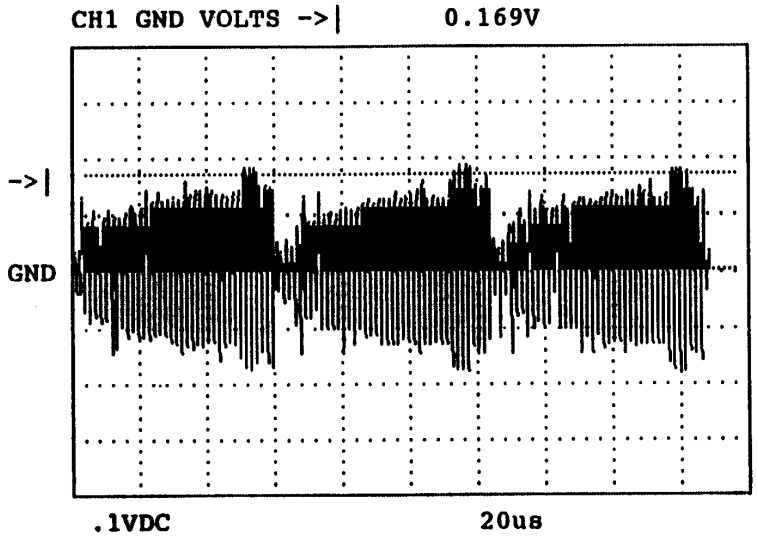
*MA1, MA0: Programmable address bits
CP: Charge pump current (CP=0; 50 uA, CP-1;250uA)
RSA, RSB: Reference divider ratio select bits
OS: Tuning amplifier control bit (OS=0; Tuning voltage is ON, OS=1; Tuning voltage is off)
BS4 .. BS1: PNP bandswitch buffers control bits Bsn=0 Buffer is OFF Bsn=1 Buffer is ON
A: Acknowledge
N14 ... N0: Programmable divider bits
T2, T1, T0: Test bits
A: Acknowledge



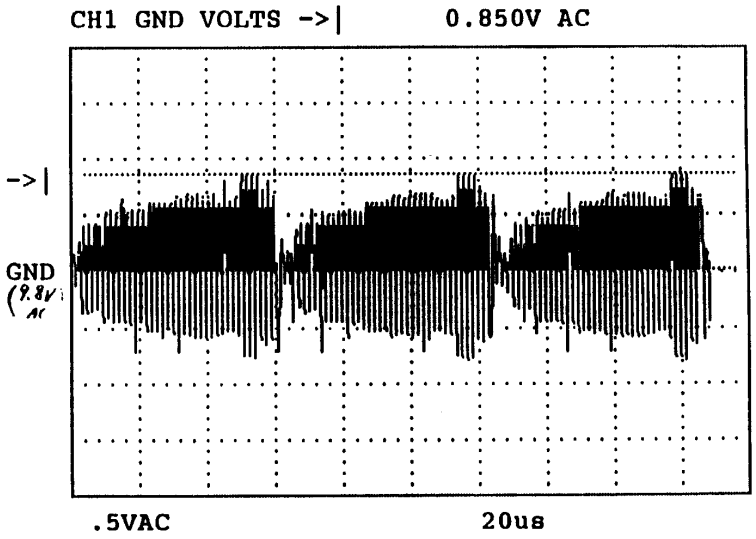
POINT A



POINT B

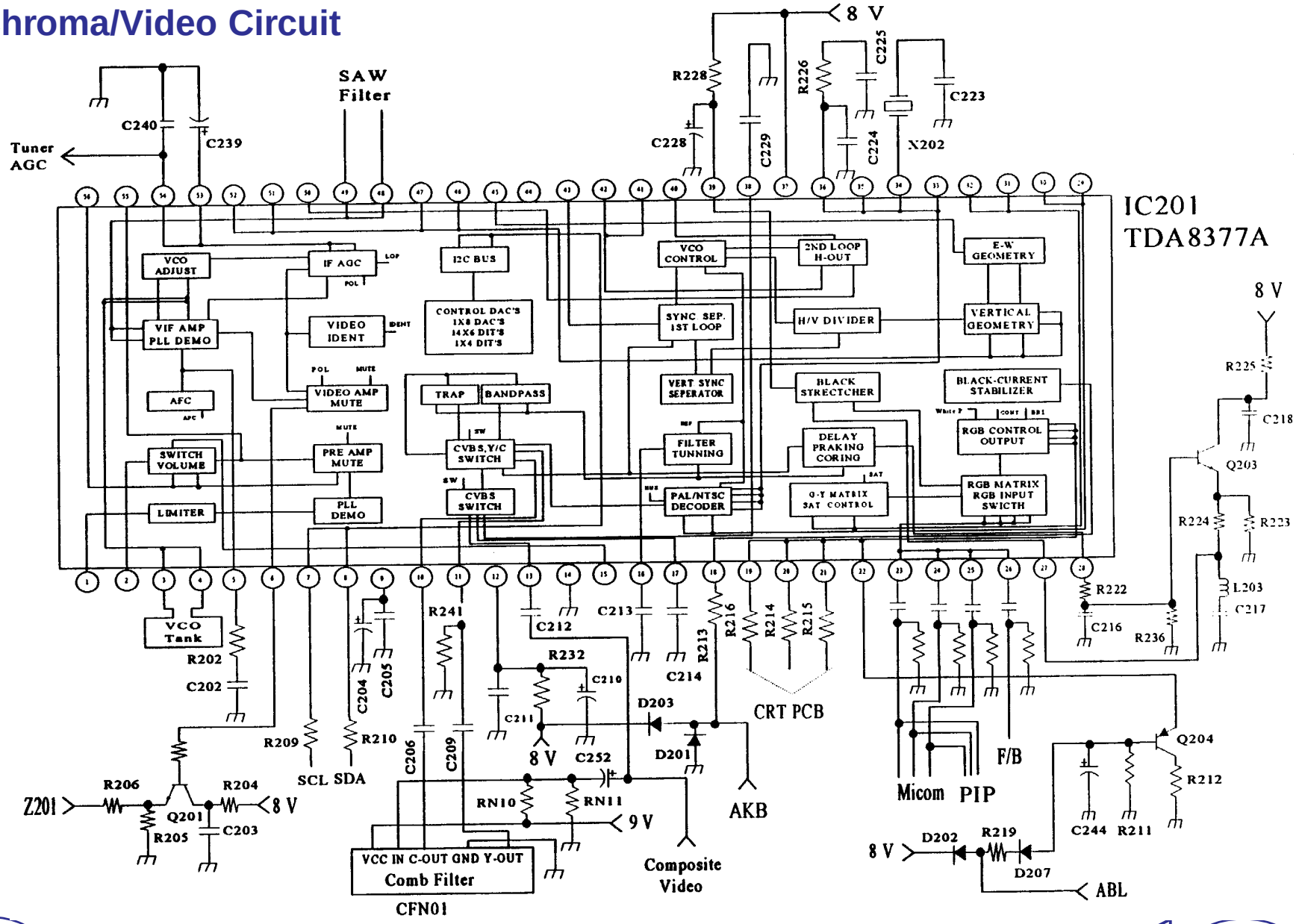


POINT C

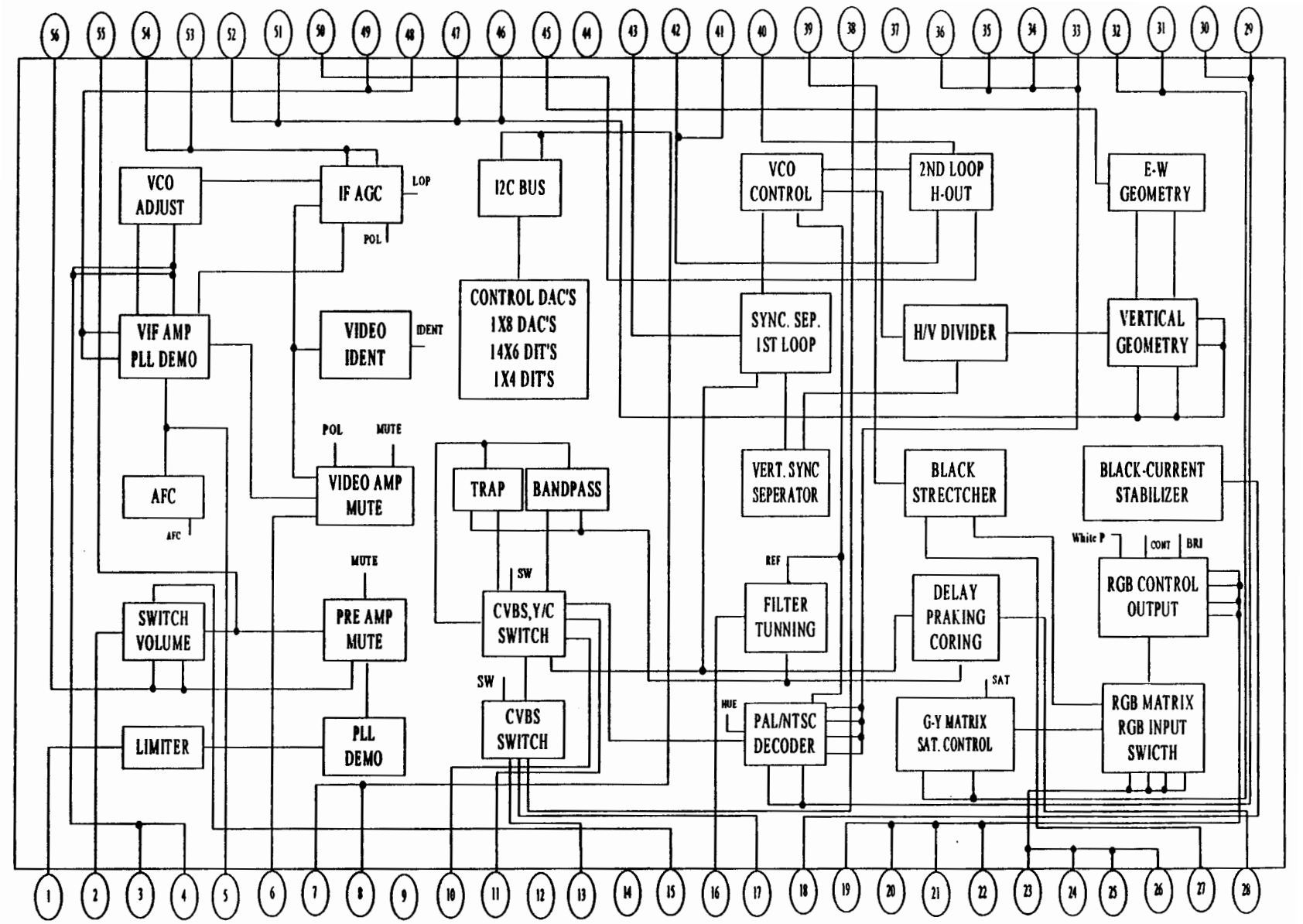


POINT D

IF/Chroma/Video Circuit



IF/Chroma/Video circuit



IC Pin Description

TDA8377 (IC201) Pin Description

Pin No	Pin Name	Description
1	SOUND IF INPUT	4.5 Mhz SIF signal input (1m Vrms max.)
2	EXT AUDIO INPUT	External Audio input
3,4	VCO REF FILTER	IF VCO tuning filter (2 X IF carrier freq.)
5	PLL LOOP filter	PLL loop filter to stabilize PLL loop response
6	VIDEO OUT	Composite video output
7	BUS (SCL) INPUT	Serial clock input
8	BUS (SDA) INPUT	Serial data input
9	BANDGAP DECOUPLING	Reference voltage setting for IC operation
10	CHROMA INPUT	Chroma signal input
11	T/CVBS INPUT	Luminance signal input
12	Main B+	Main Power Supply
13	INT CVBS INPUT	Composite video input
14	GND	Ground
15	AUDIO OUT	NC
16	DECOUPLING FILTER	To remove noise in VCO loop output
17	EXT CVBS INPUT	External composite video input (Terminate by cap.)
18	BLACK CURRENT INPUT	Cathode block beam level input for compensation
19~21	R,G,B OUTPUT	RGB output
22	ABL	Beam current limiting input for compensation
23~25	R,G,B INPUT	OSD & PIP RGB input
26	RGB INSERTION SWITCH	Fast blanking signal input for internal & external RGB selection
27	Y INPUT	Luminance input
28	Y OUTPUT	Luminance output
29, 30	B-Y, R-Y OUTPUT	NC
31, 32	B-Y, R-Y INPUT	NC
33	SECAM REF OUTPUT	NC

IC Pin Description

TDA8377 (IC201) Pin Description (continued)

Pin No	Pin Name	Description
34	X-TAL (3.58)	3.58 Mhz oscillation for chroma processing
35	X-TAL (3.58/4.43)	NC
36	LOOP FILTER BURST PHASE DET	Loop output response stabilization
37	B+	Power supply
38	CVBS OUTPUT	Composite video output
39	BLACK PEAK HOLD	Detection of peak black level
40	H-OUT	Hor. Drive Pulse out
41	SANDCASTLE OUTPUT FLYBACK INPUT	Flyback pulse input for AFC operation
42, 43	PHI1, 2 FILTER	Filters to stabilize loop output response
44	GND	Ground
45	East-West Drive	Pincushion correction wave output
46, 47	Vert. Drive Pos/Neg	Vertical drive pulse out in balance phase
48, 49	IF Input	PIF Input
50	EHT/OVP	Overheat/Overvoltage detection
51	VERT. SAWTOOTH	Vertical drive pulse amplitude control
52	REF CURRENT INPUT	Reference current output for vertical drive circuit
53	AGC DECOUPLING	IF AGC output response stabilization
54	TUNER AGC OUTPUT	RF AGC Output
55	AUDIO DEAMPHASIS	Audio signal deamphasis
56	DECOUPLING SOUND MODULATOR	Decoupling LPF for DC feedback loop

IC Pin Voltage & Waveforms

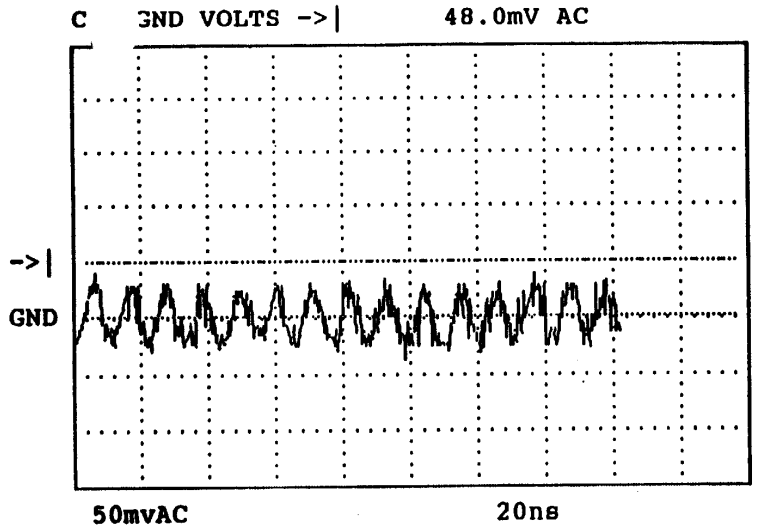
TDA8377 (IC201) Pin Voltage & Waveforms

Pin No	Pin Name	Voltage & Waveforms
1	SOUND IF INPUT	See print out
2	EXT AUDIO INPUT	NC
3, 4	VCO REF FILTER	See print out
5	PLL LOOP FILTER	See print out
6	VIDEO OUT	See print out
7	BUS (SCL) INPUT	See print out
8	BUS(SDA) INPUT	See print out
9	BANDGAP DECOUPLING	6.5 V
10	CHROMA INPUT	See print out
11	Y/CVBS INPUT	See print out
12	MAIN B+	8 V
13	INT CVBS INPUT	See print out
16	DECOUPLING FILTER	3.5 V
17	EXT CVBS INPUT	3.3 V
18	BLACK CURRENT INPUT	See print out
19-21	R,G,B OUTPUT	See print out
22	ABL	Cont,Bright: Max—— 2.8 V Cont:Max,Bright:Center—— 3.25 V; Cont,Bright:Min ——3.7 V
23~25	R,G,B INPUT	
26	RGB INSERTION SWITCH	See print out
27	Y INPUT	See print out
28	Y OUTPUT	See print out
34	X-TAL (3.58)	See print out
36	LOOP FILTER BURST PHASE DET	5 V
37	B+	8 V

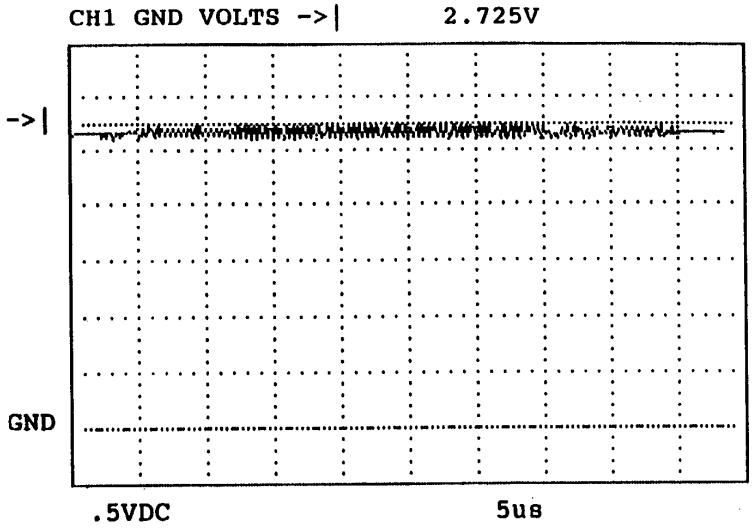
IC Pin Voltage & Waveforms

TDA8377 (IC201) Pin Voltage & Waveforms (continued)

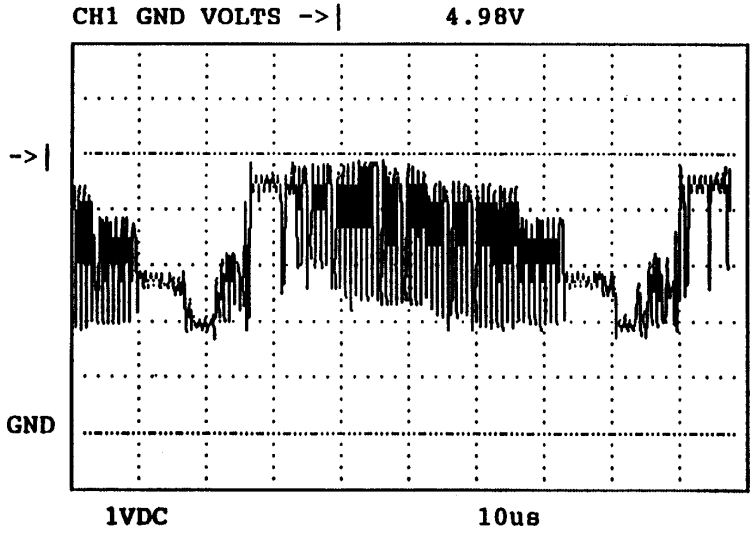
Pin No	Pin Name	Voltage & Waveforms
38	CVBS OUTPUT	See print out
39	BLACK PEAK HOLD	3.9 V
40	H-OUT	See print out
41	SANDCASTLE OUTPUT FLYBACK INPUT	See print out
42, 43	PHI 1,2 FILTER	See print out
45	EAST-WEST DRIVE	See print out
46, 47	VERT. DRIVE POS/NEG	See print out
48, 49	IF INPUT	See print out
50	EHT/OVP	2.6 V
51	VERT. SAWTOOTH	See print out
52	REF CURRENT INPUT	3.9 V
53	AGC DECOUPLING	3.2 V
54	TUNER AGC OUTPUT	3.6 V
55	AUDIO DEAMPHASIS	See print out
56	DECOUPLING SOUND MODULATOR	See print out



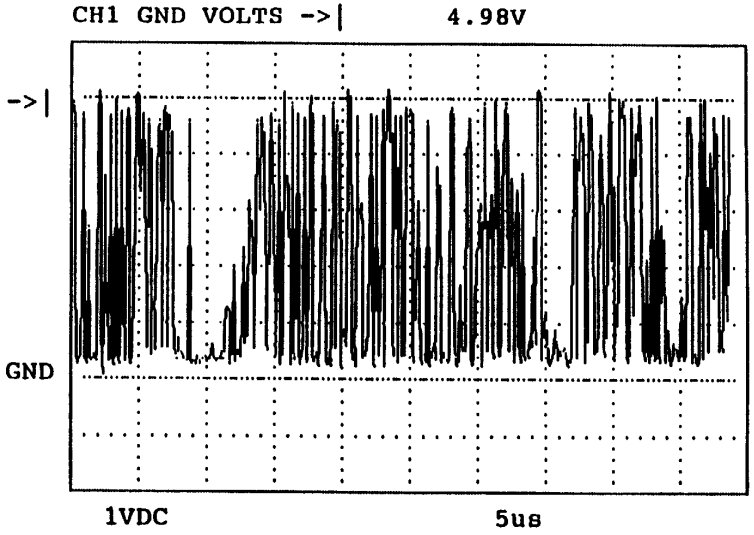
IC201 PIN 3,4



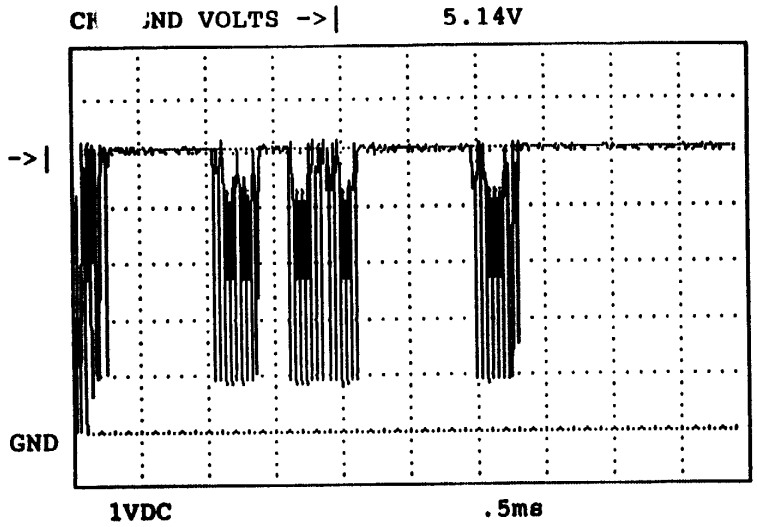
IC201 PIN 5



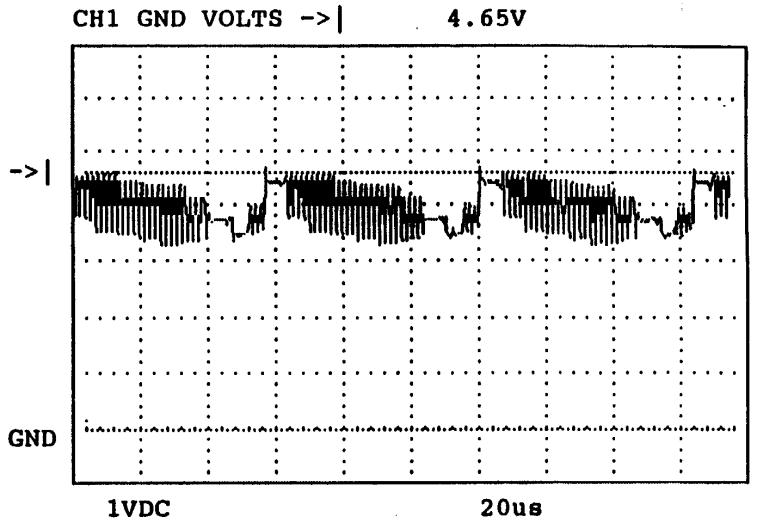
IC201 PIN 6



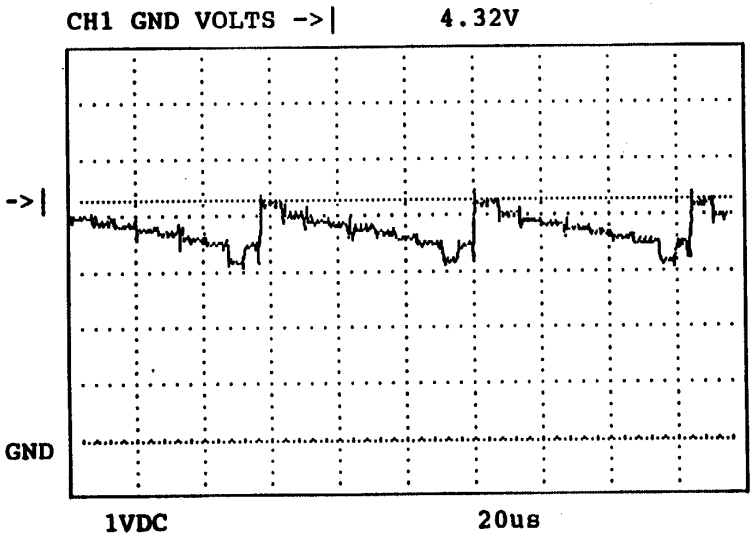
IC201 PIN 7



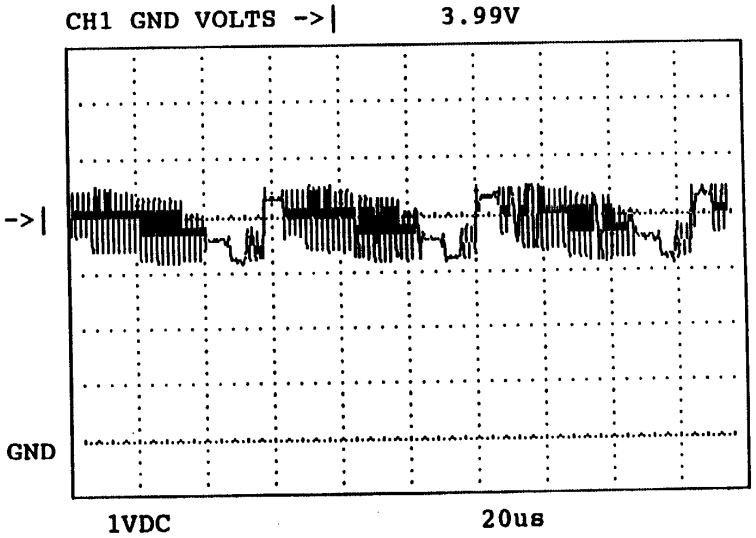
IC201 PIN 8



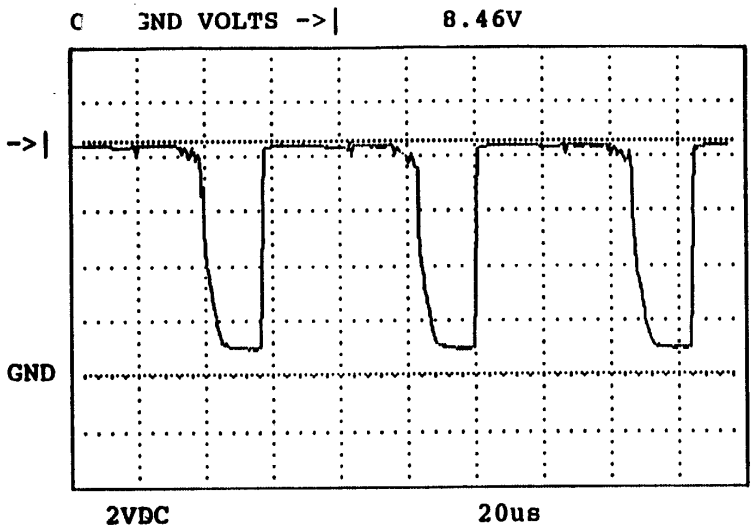
IC201 PIN 10



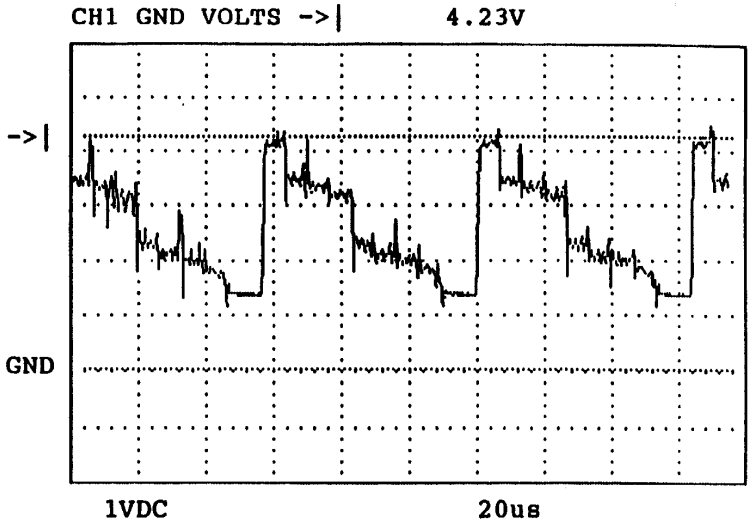
IC201 PIN 11



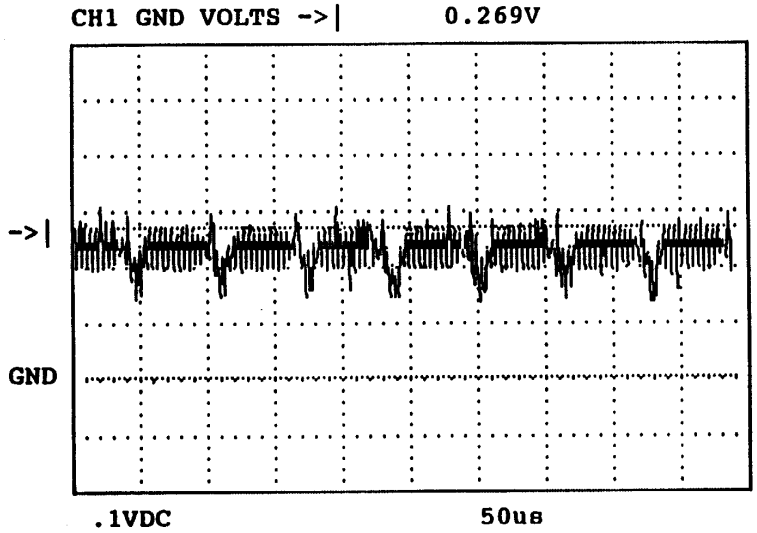
IC201 PIN 13



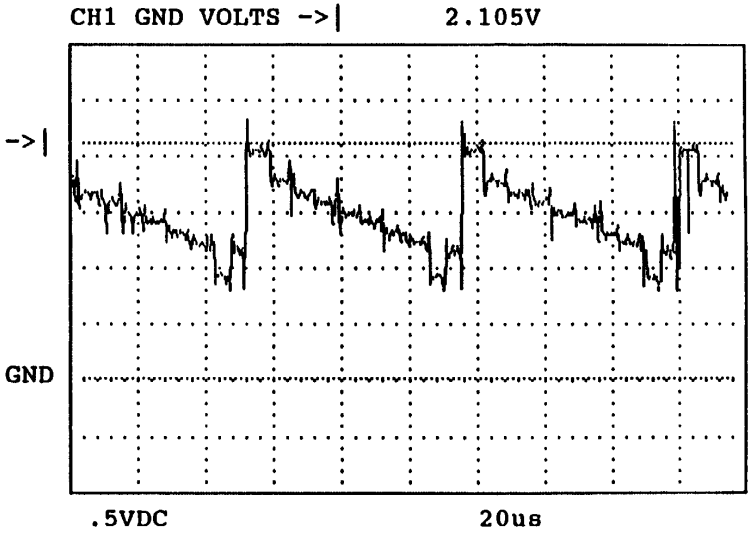
IC201 PIN 18



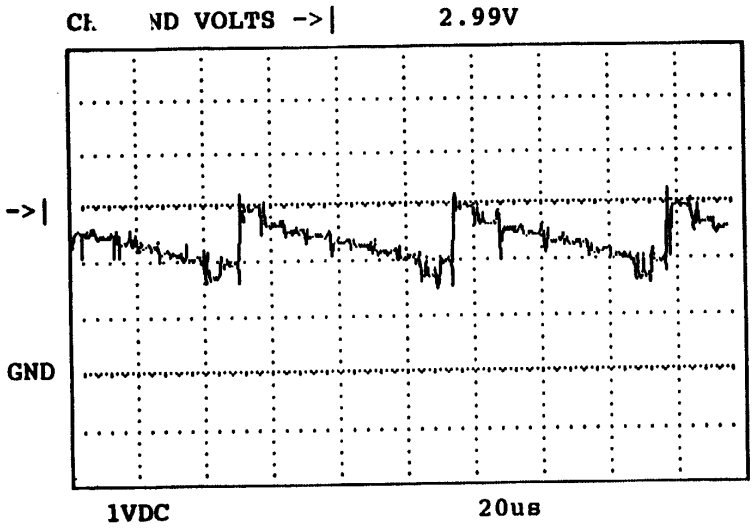
IC201 PIN 20



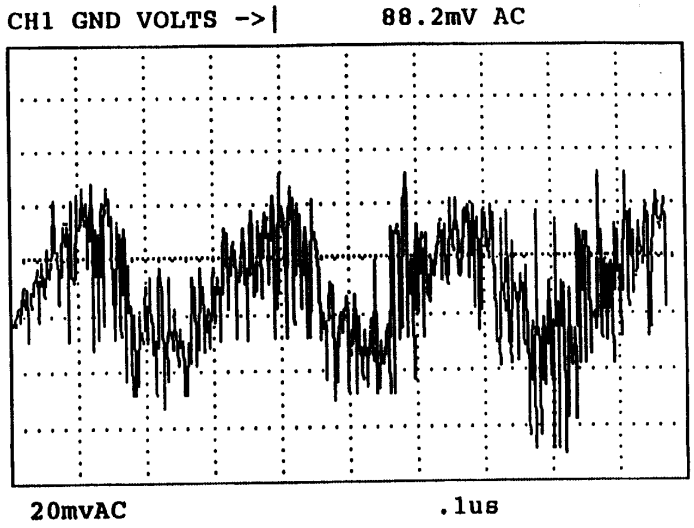
IC201 PIN 26



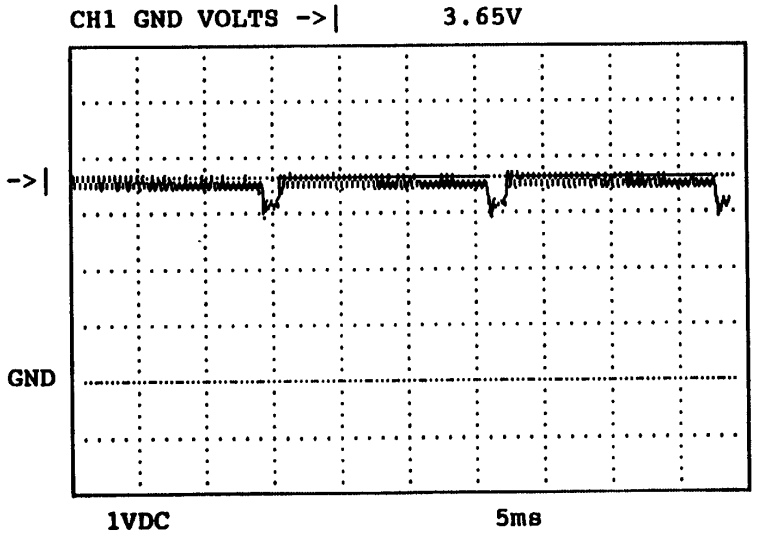
IC201 PIN 27



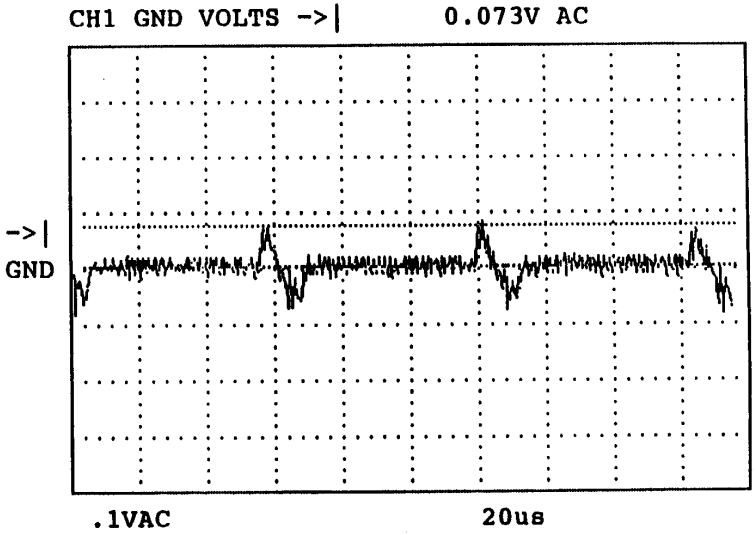
IC201 PIN 28



IC201 PIN 34

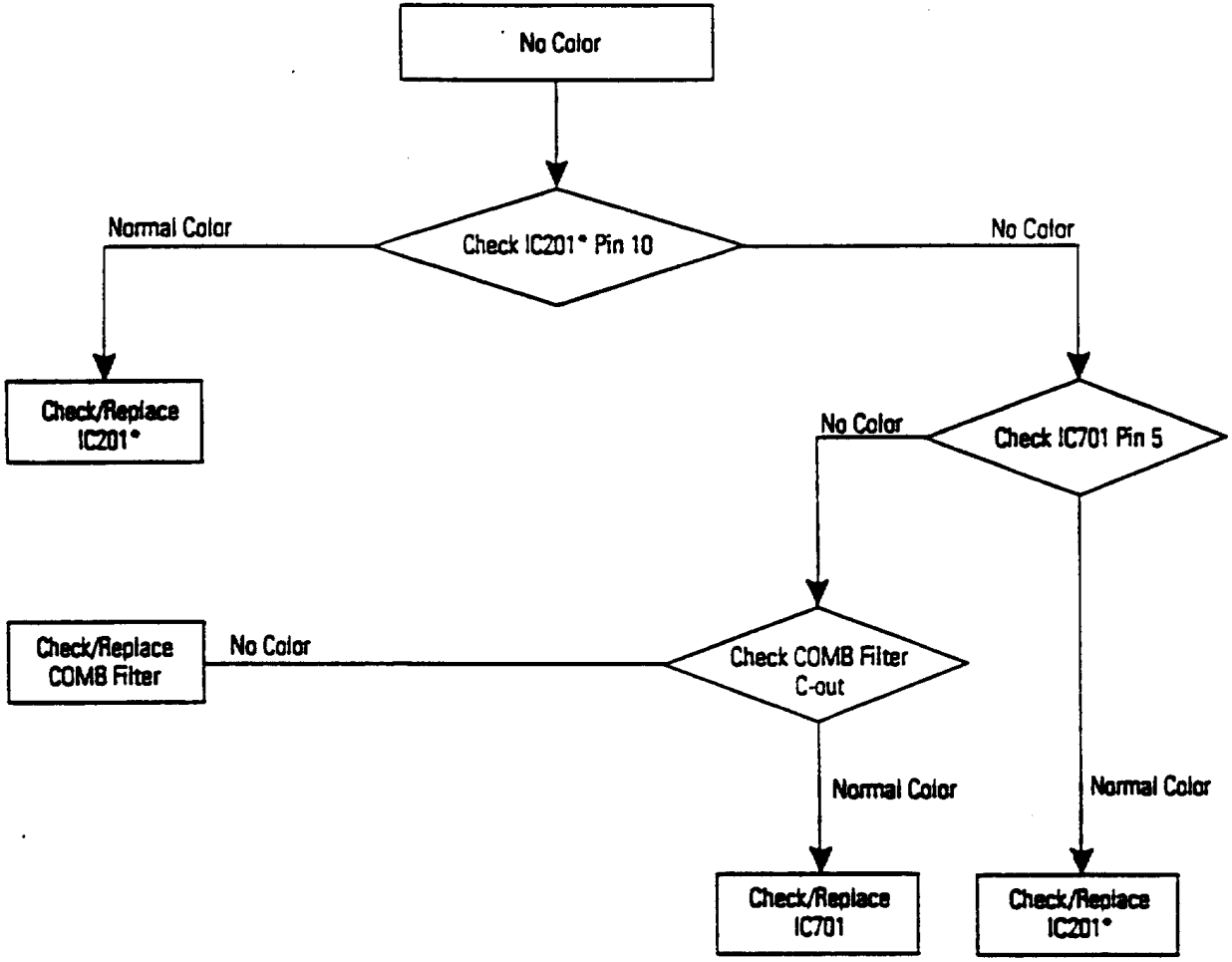


IC201 PIN 38

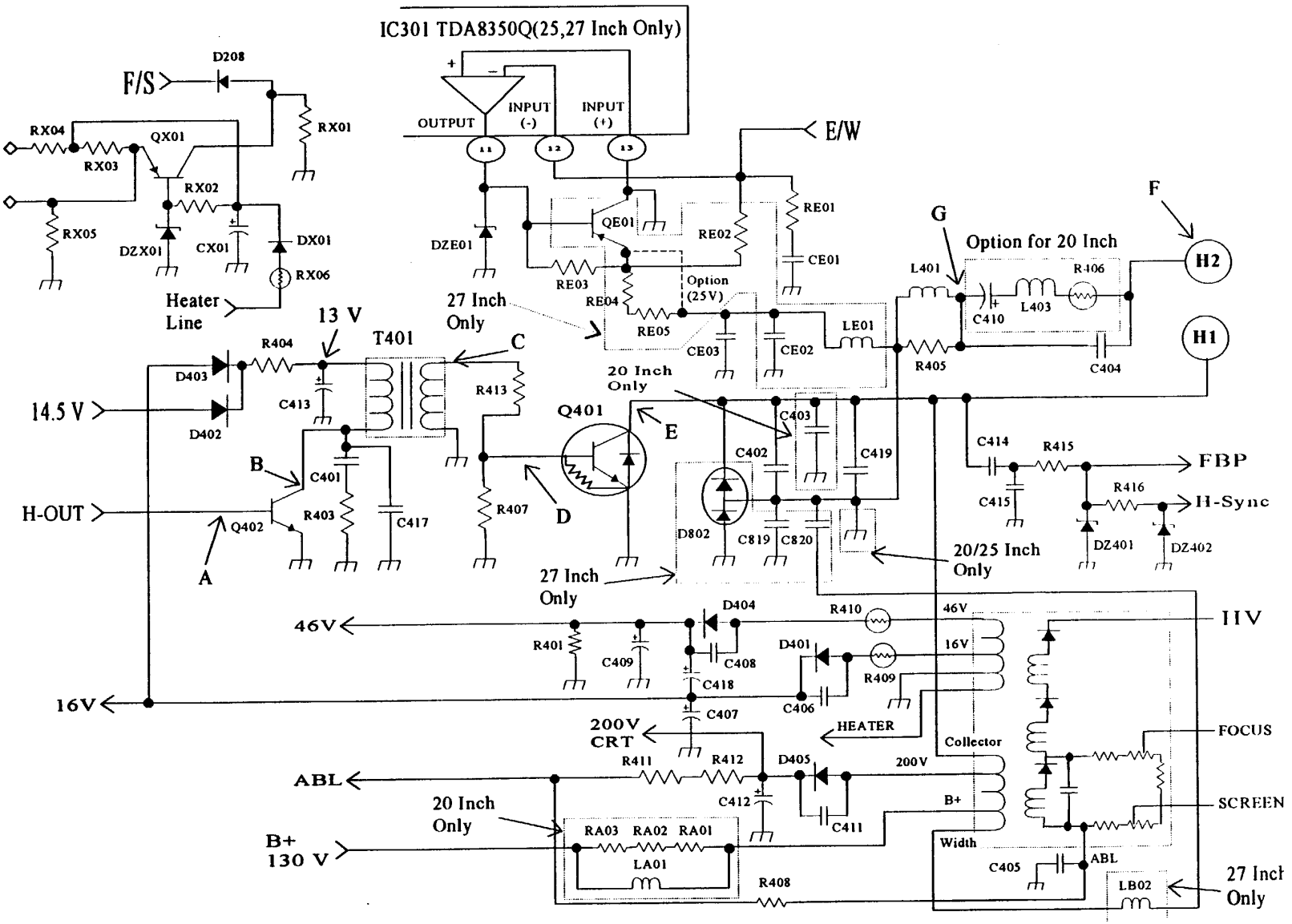


IC201 PIN 48, 49

Troubleshooting – No Color

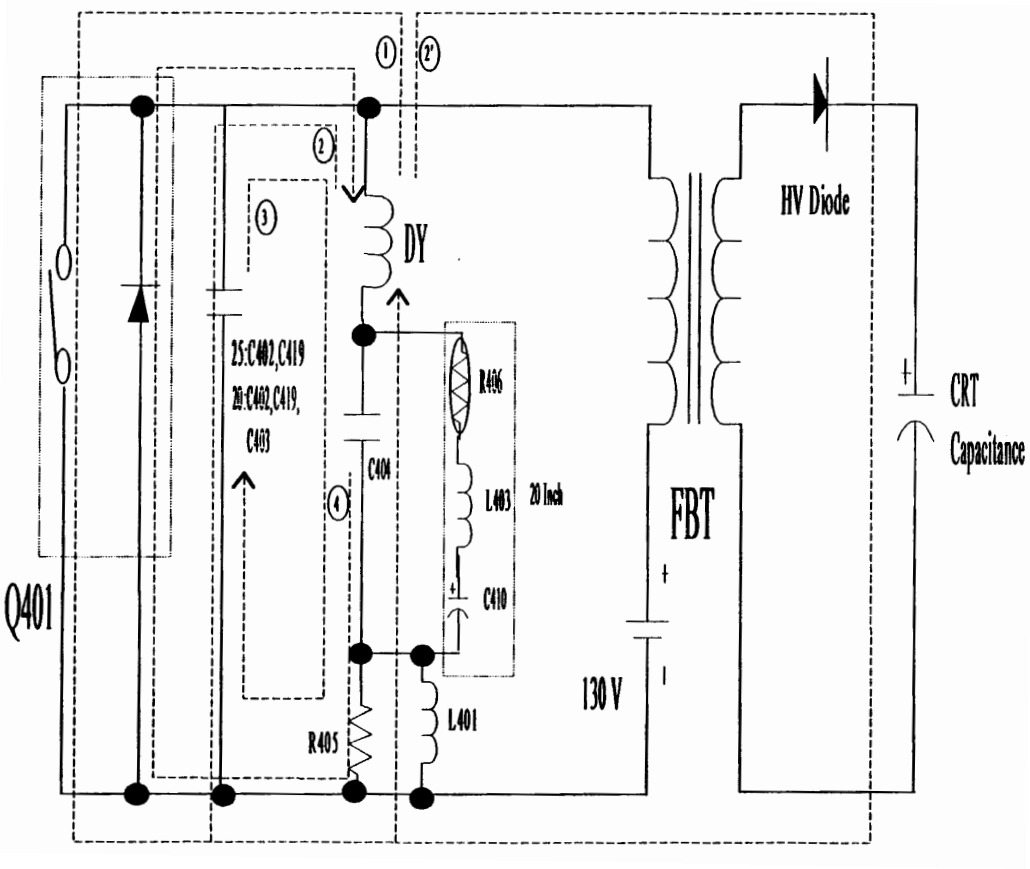


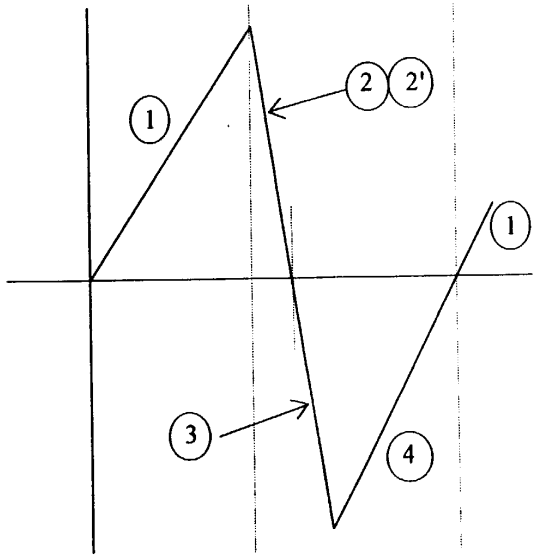
Horizontal Deflection Circuit



Horizontal Deflection Circuit Description

20/25 Horizontal Deflection Circuit

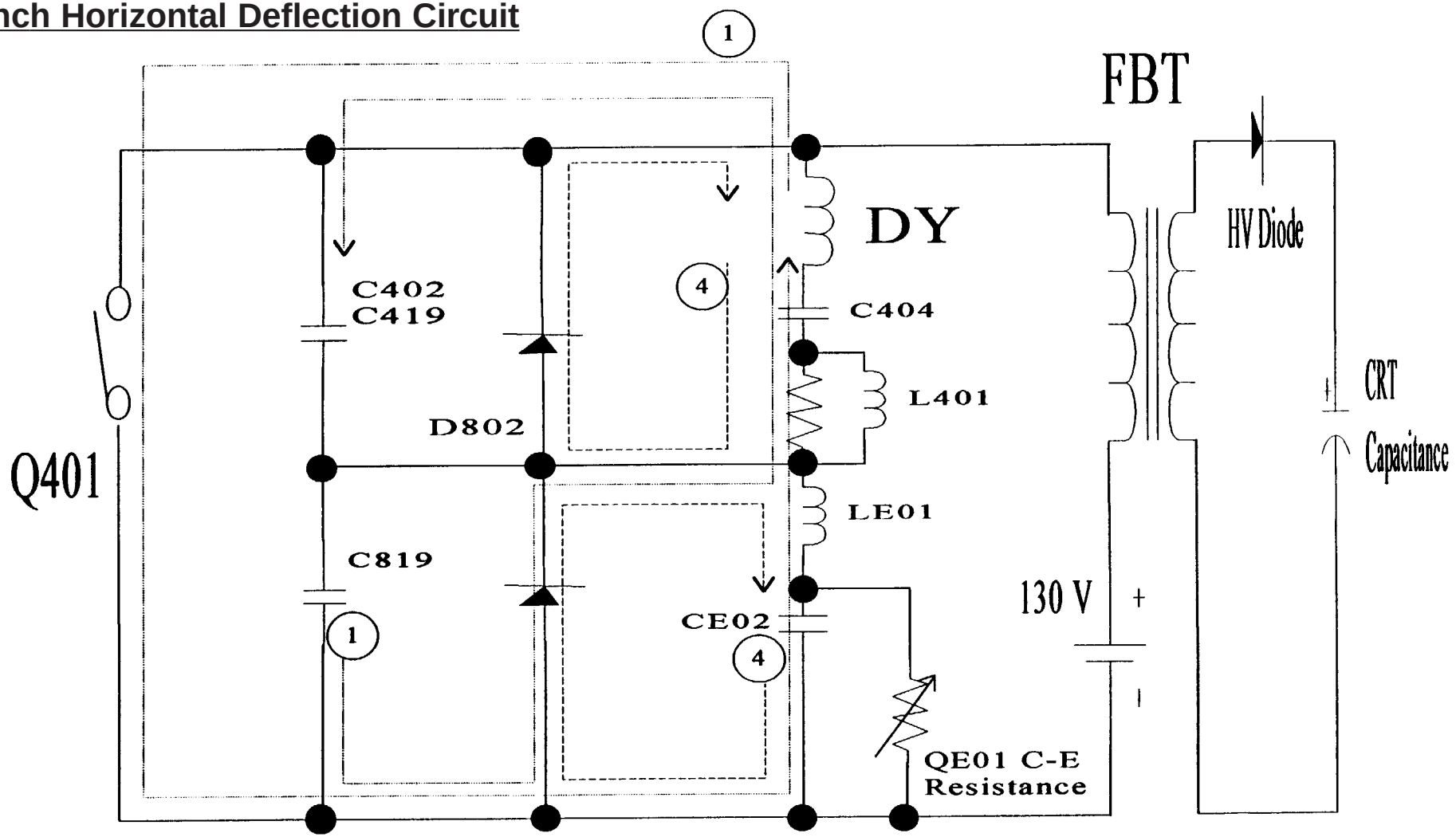




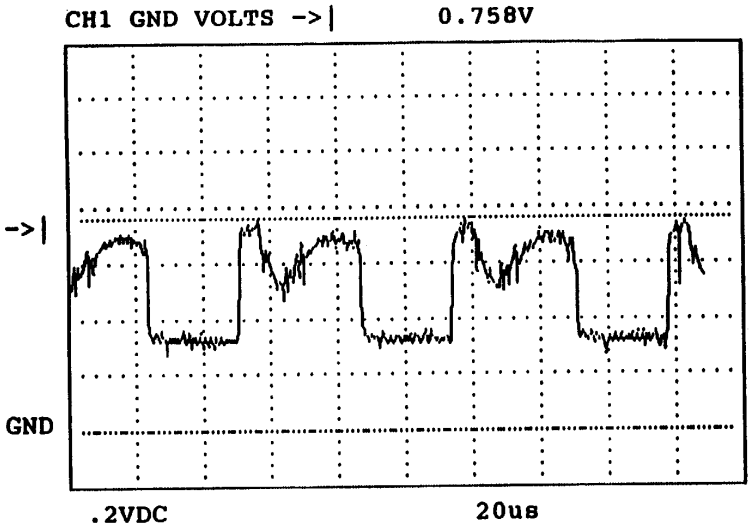
Deflection current waveform

Horizontal Deflection Circuit Description

27 Inch Horizontal Deflection Circuit

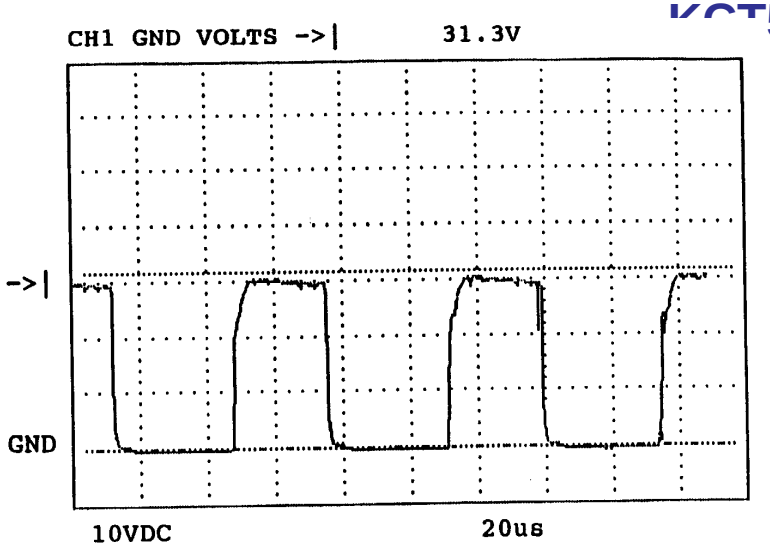


* QE01 C-E Resistance is controlled by DC current & Parabola voltage in vertical deflection time from EastWest Amp output in IC301



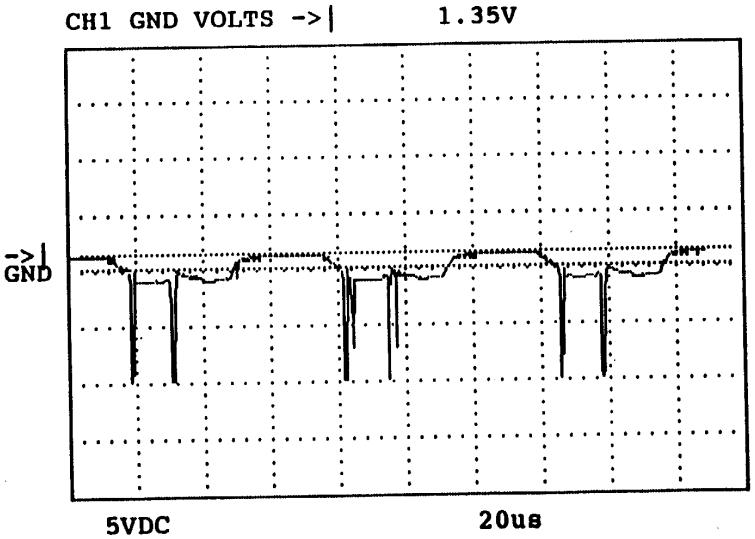
ACQUISITION MODE: PEAK DETECT

POINT A



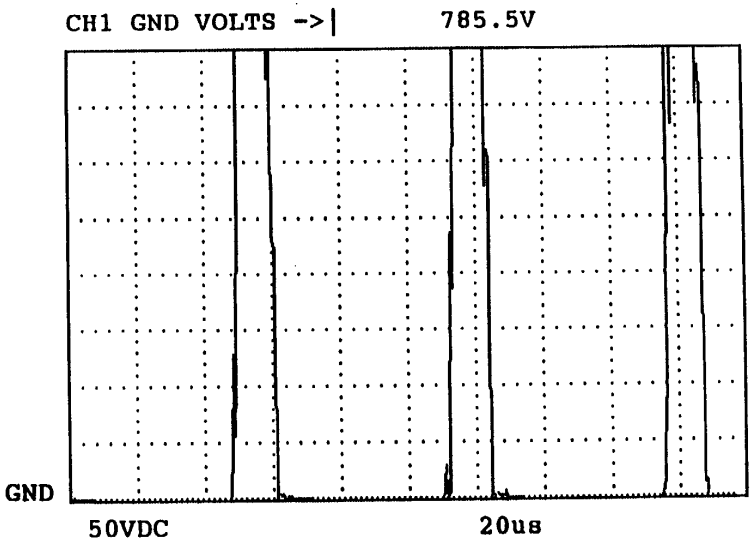
ACQUISITION MODE: PEAK DETECT

POINT B



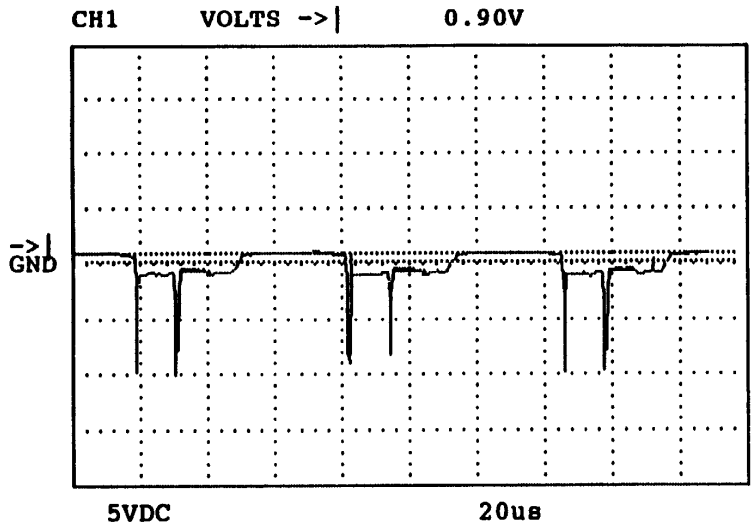
ACQUISITION MODE: PEAK DETECT

POINT C



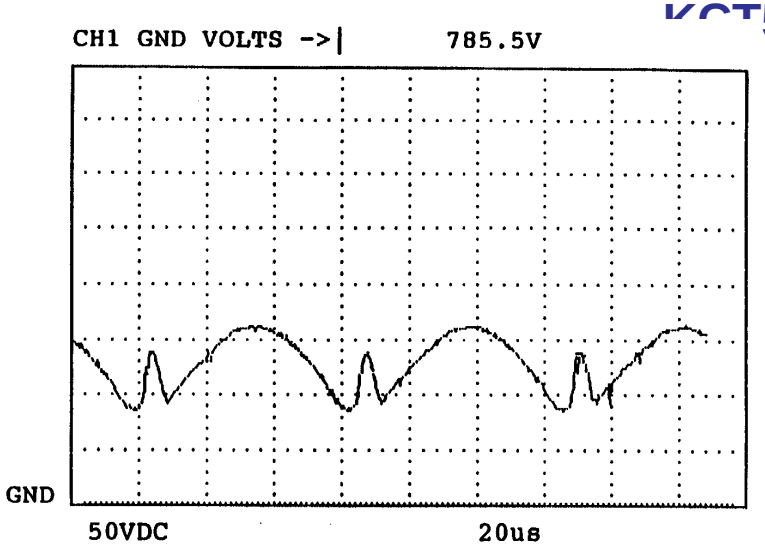
ACQUISITION MODE: PEAK DETECT

POINT E



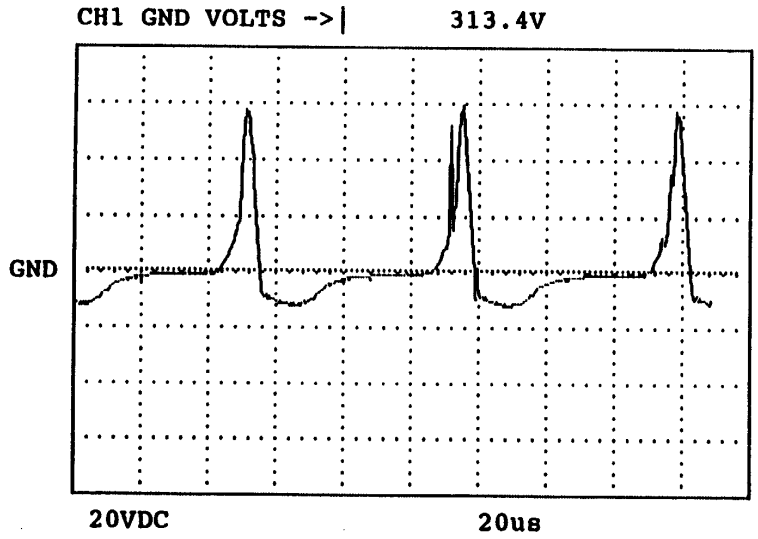
ACQUISITION MODE: PEAK DETECT

POINT D



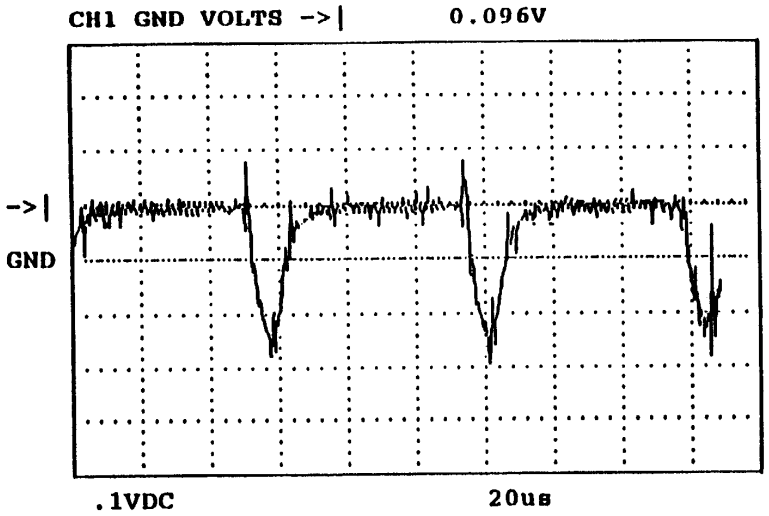
ACQUISITION MODE: PEAK DETECT

POINT F

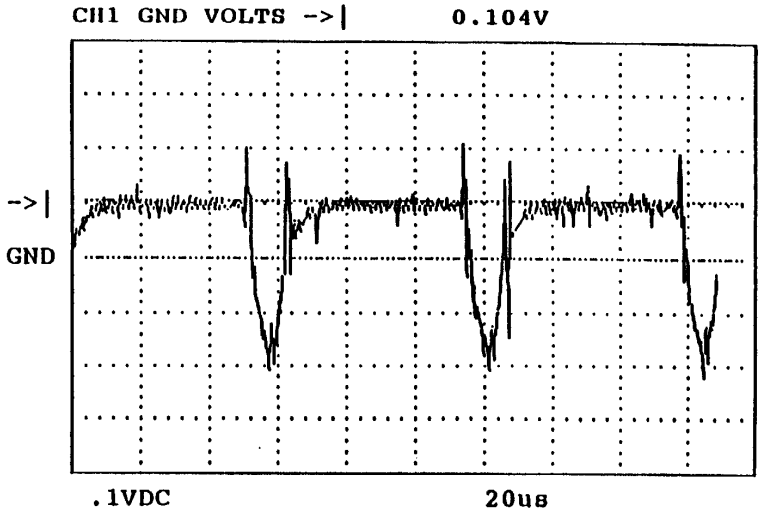


ACQUISITION MODE: PEAK DETECT

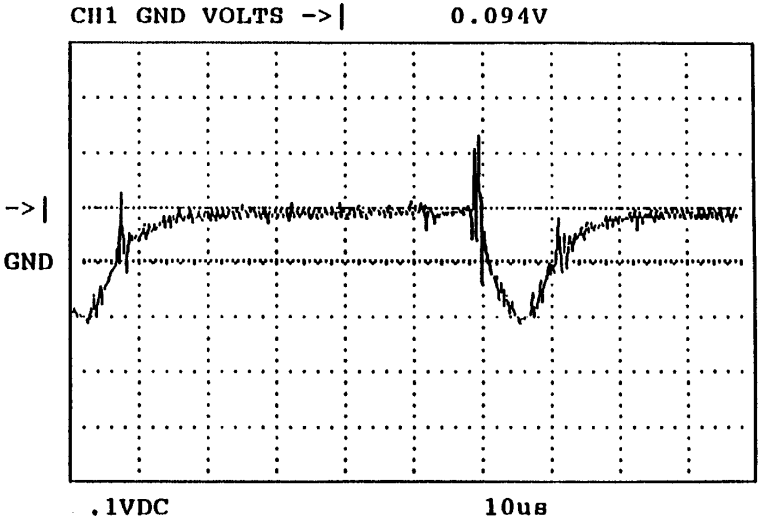
POINT G



IC301 PIN 11

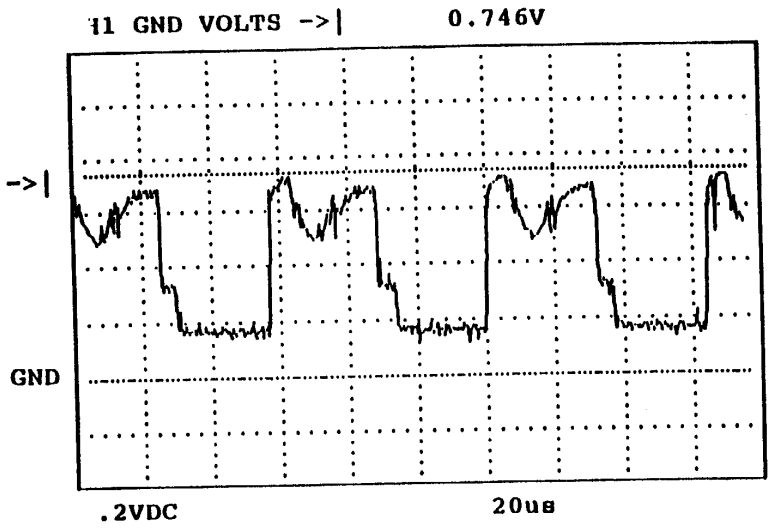


IC301 PIN 12



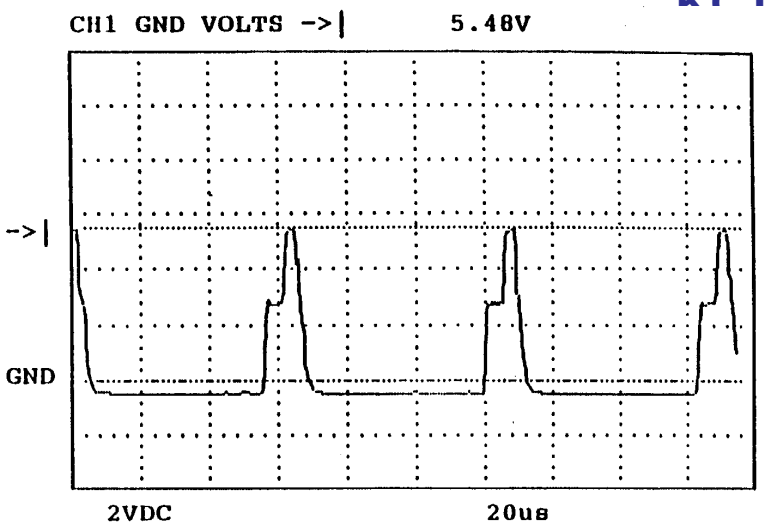
ACQUISITION MODE: PEAK DETECT

IC201 PIN 45



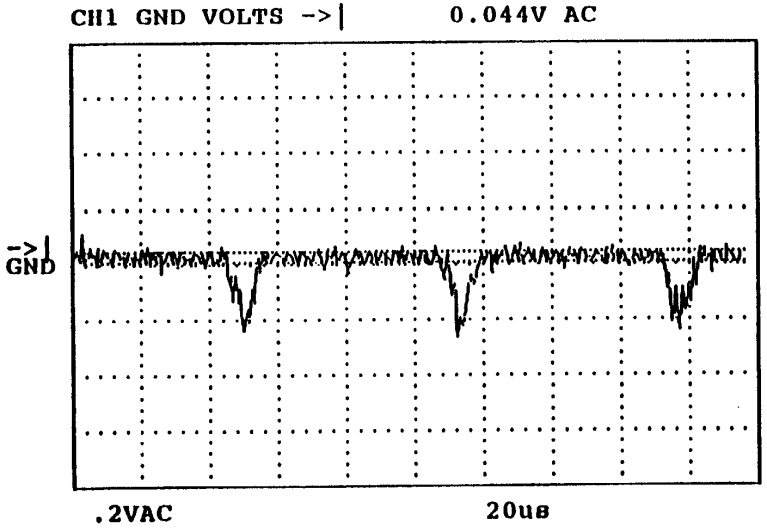
ACQUISITION MODE: PEAK DETECT

IC201 PIN 40



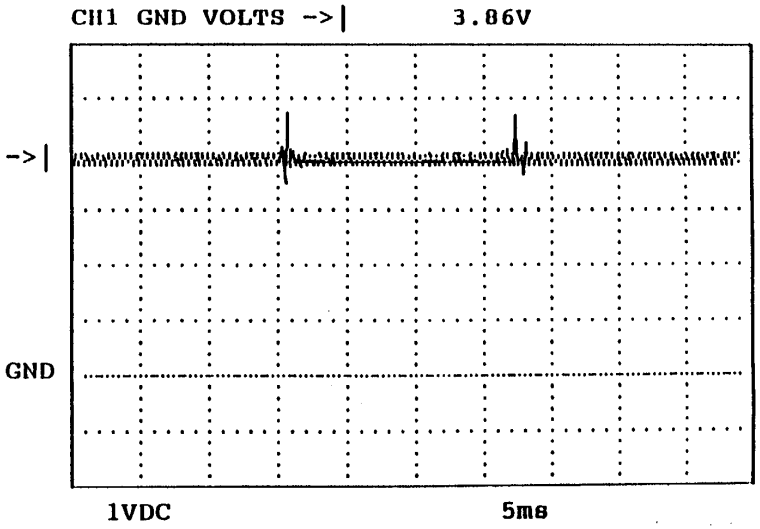
ACQUISITION MODE: PEAK DETECT

IC201 PIN 41



ACQUISITION MODE: PEAK DETECT

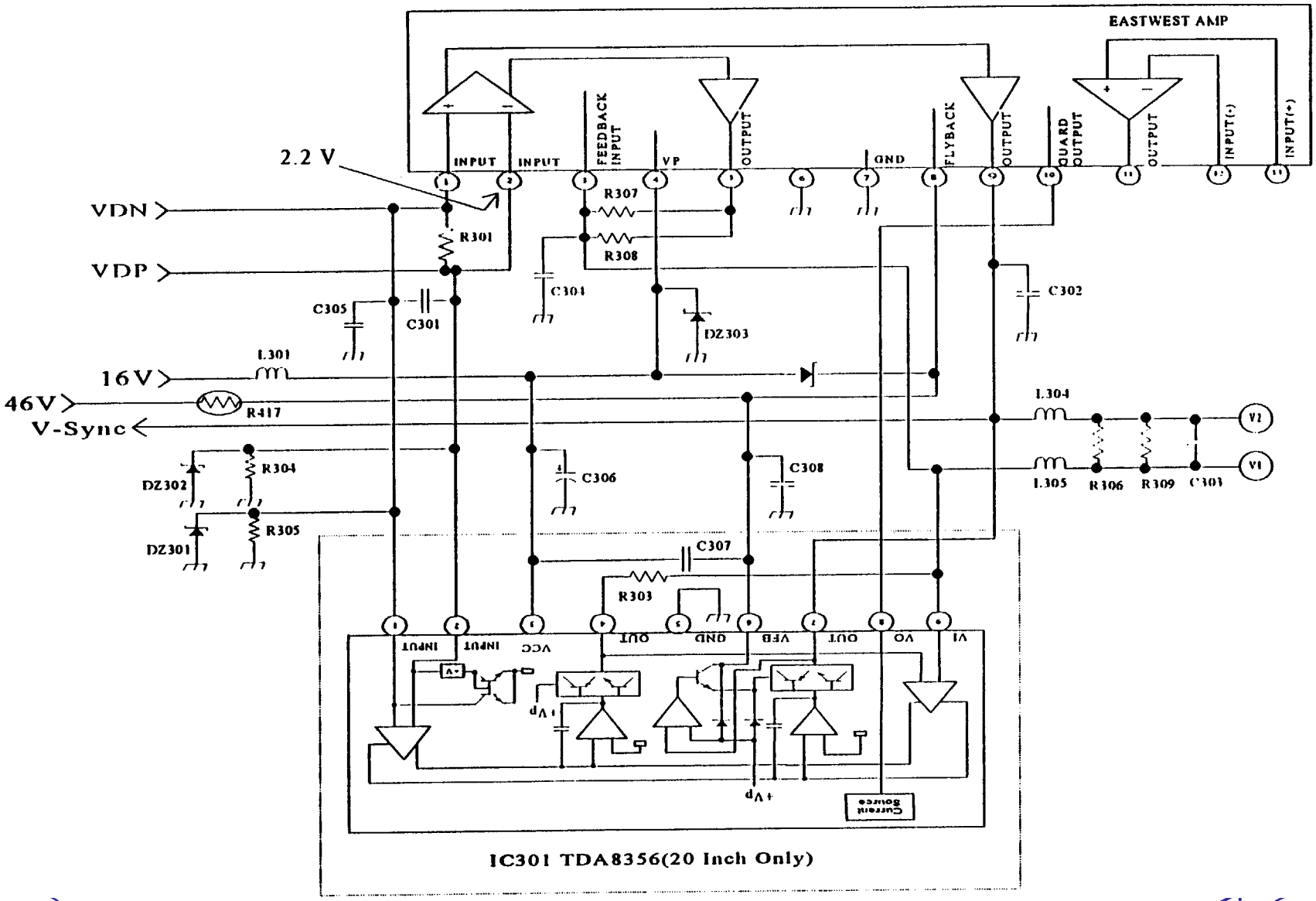
IC201 PIN 42



ACQUISITION MODE: PEAK DETECT

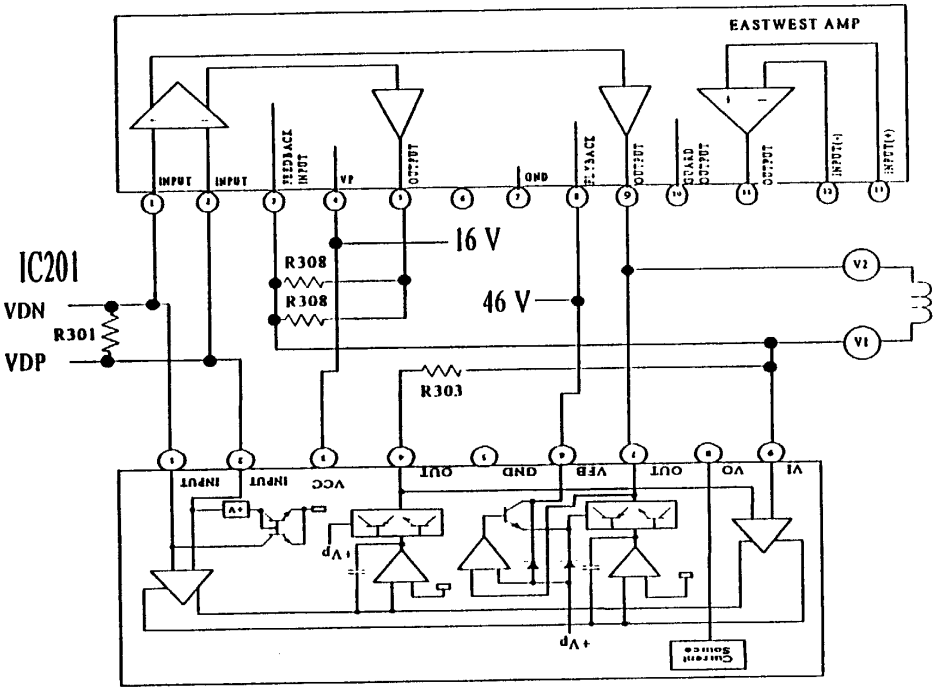
IC201 PIN 43

Vertical Deflection Circuit



Vertical Deflection Circuit Description

IC301 TDA8450Q(25/27Inch Only)



IC301 TDA8356(20 Inch Only)

PIN Description

TDA8350Q	TDA8356	Description
Pin 1, 2	Pin 1, 2	Input Power Stage
Pin 3	Pin 9	Feedback Voltage
Pin 4	Pin 3	Operating Supply Voltage
Pin 5, 9	Pin 4, 7	Def. Current Outputs in Opposite Phase
Pin 8	Pin 6	Flyback Supply Voltage
Pin 10	Pin 8	Guard Output
Pin 11,12,13	EastWest Amp for pincushion correction	

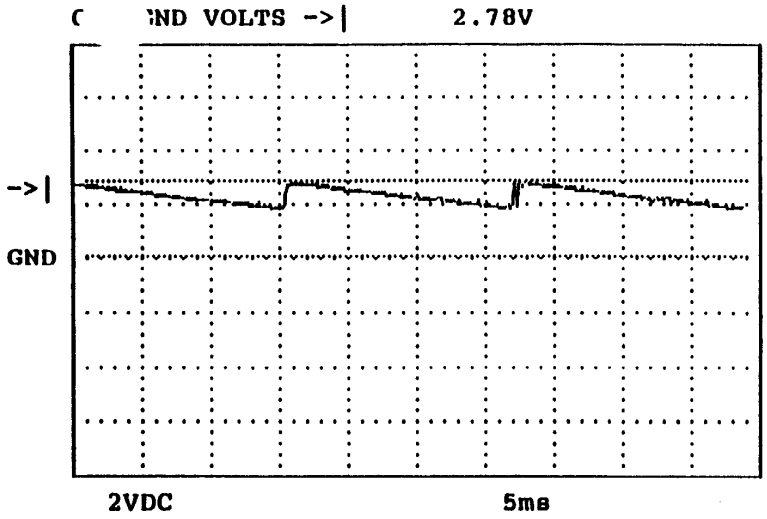
Circuit Descriptions

The vertical driver circuits a bridge configuration. The deflection coil is connected between the outputs of both output amplifiers, which are driven in opposite phase. The resistor (R303 for TDA356; R307, R308 for TDA8350Q) in series with the deflection coil and the voltage across this resistor is internally used for feedback information.

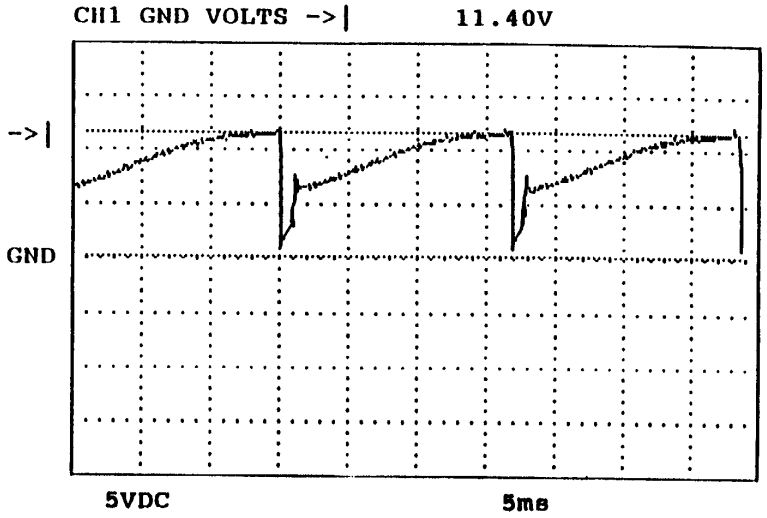
The input circuit is voltage driven, and is adapted for circuits which deliver symmetrical signal currents. The differential current across the external resistor (R301) a voltage which determines the output current through the coil. The relation between the differential current through this resistor and the output current is : Idiff * R301 - Icoil * (R303 or R307/308). The output current can be adjusted by varying the resistor R301.

The flyback voltage is determined by the additional supply voltage from 46V line.

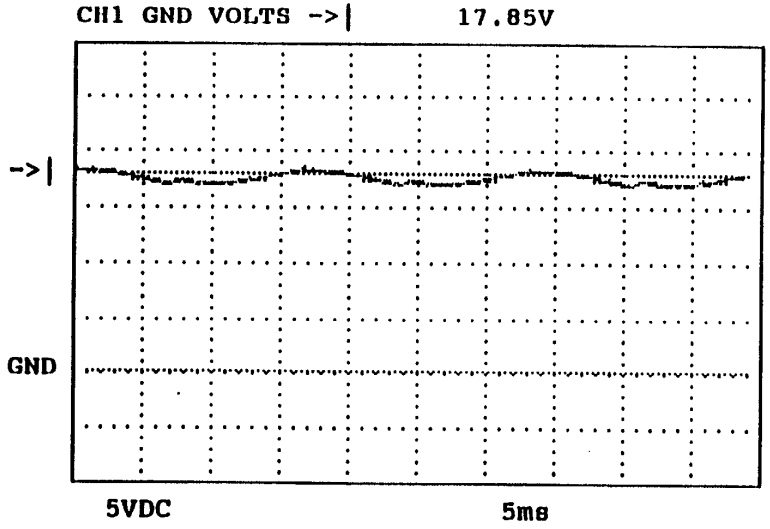
The guard circuit output can be used for blanking the screen during short of the output circuit, or of the supply voltage. However, for this chassis this is not used.



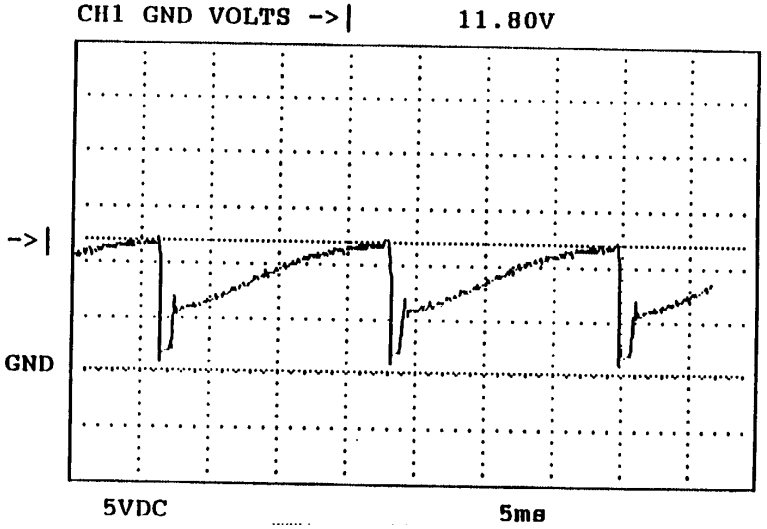
IC301 PIN 1



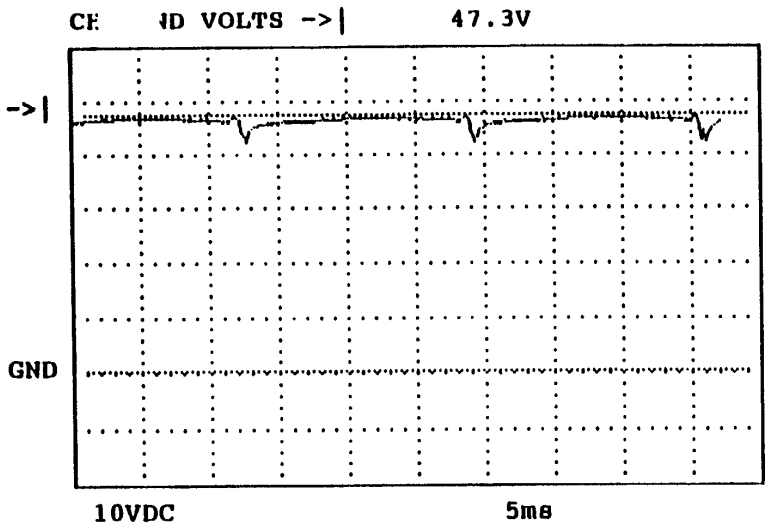
IC301 PIN 3



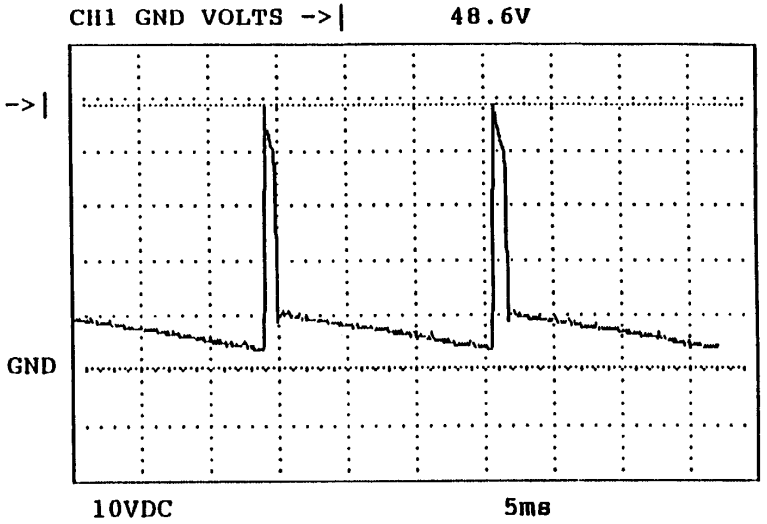
IC301 PIN 4



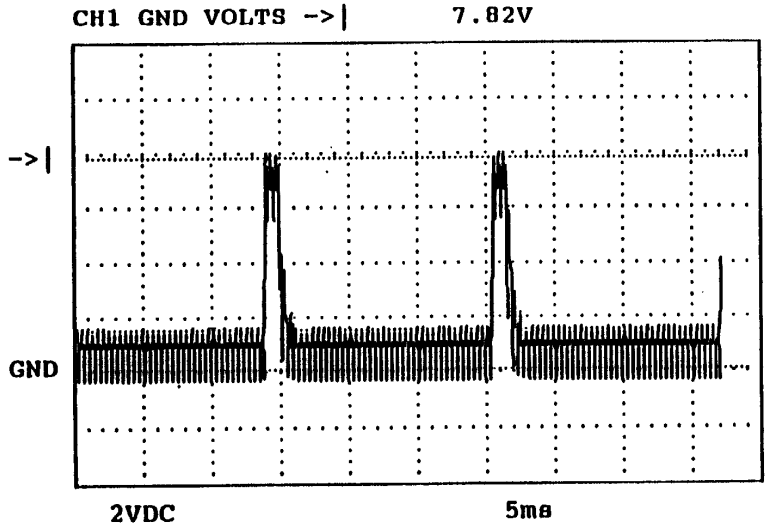
IC301 PIN 5



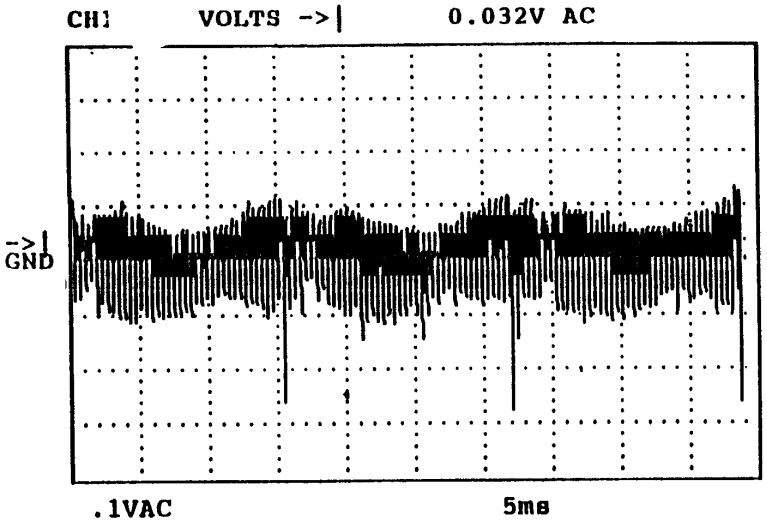
IC301 PIN 8



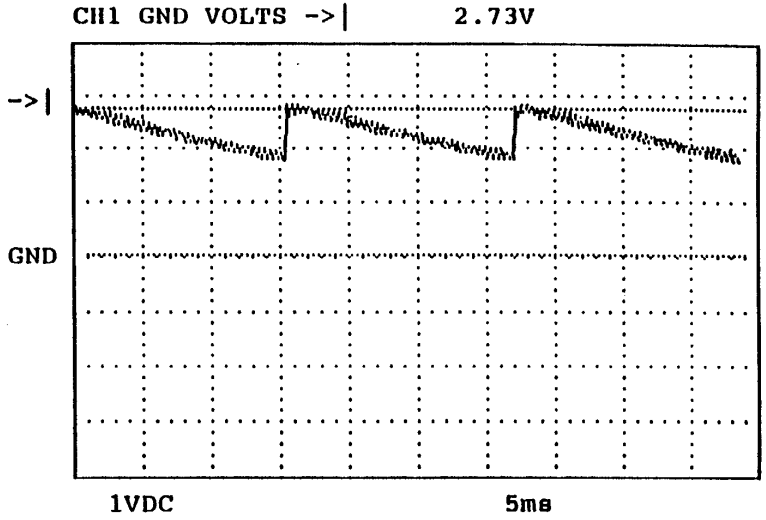
IC301 PIN 9



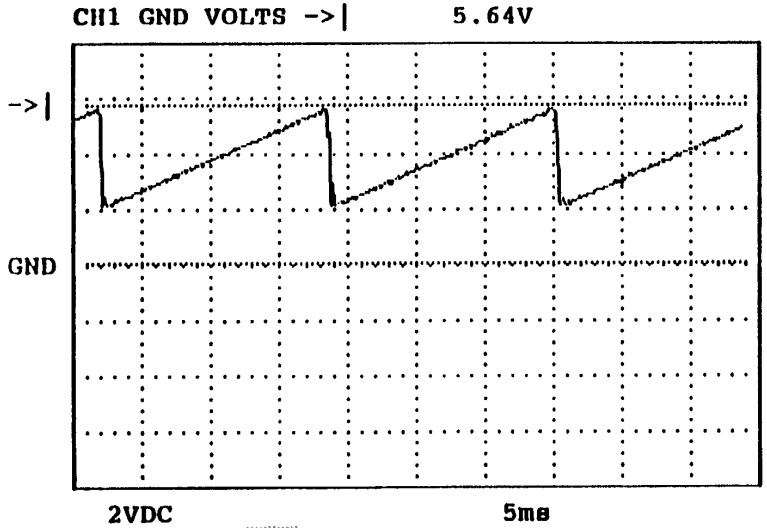
IC301 PIN 10



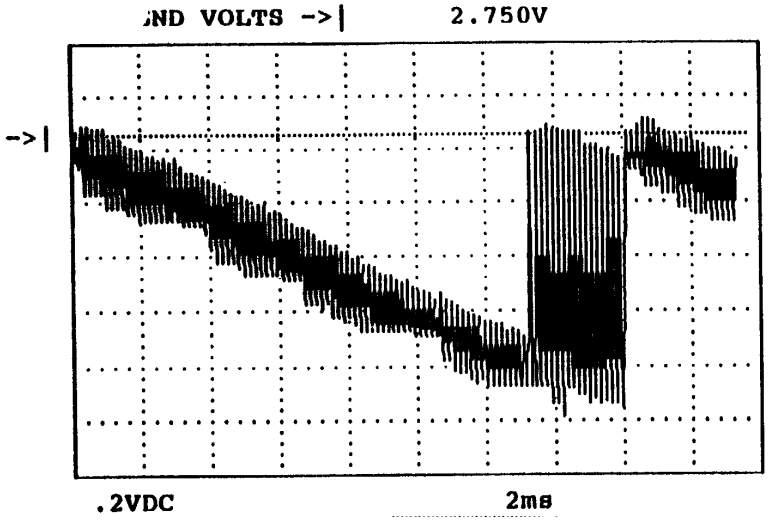
IC201 PIN 46



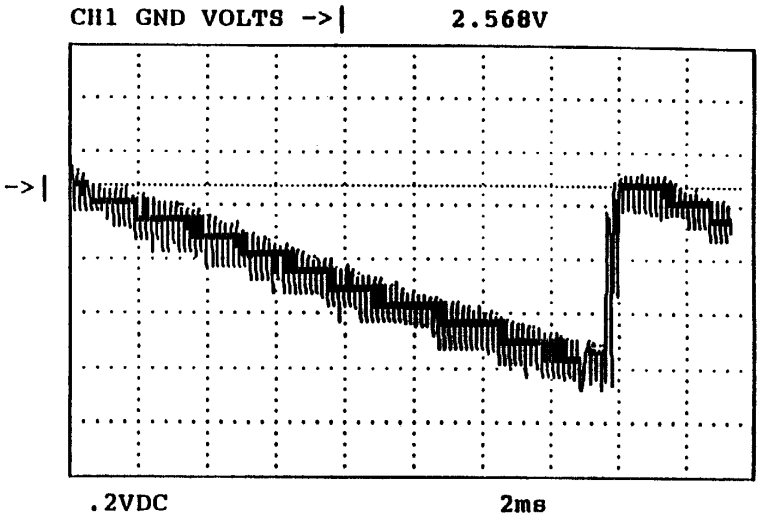
IC201 PIN 47



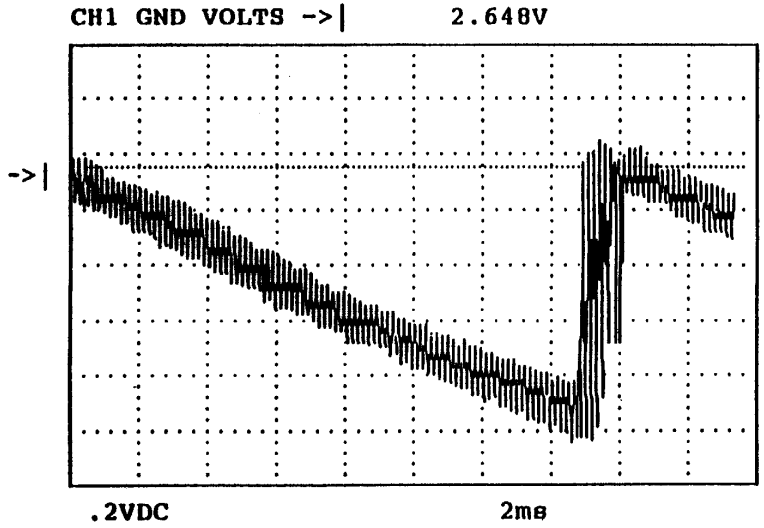
IC201 PIN 51



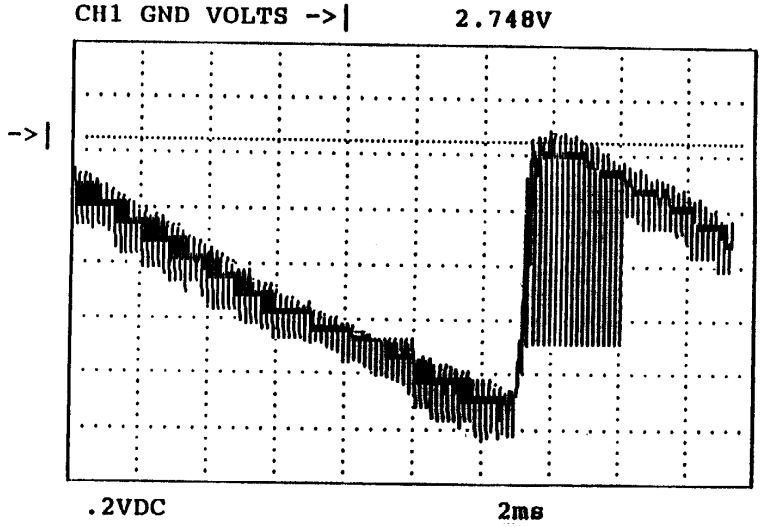
IC201 PIN 47 (VS:0)



IC201 PIN 47 (VA:0)

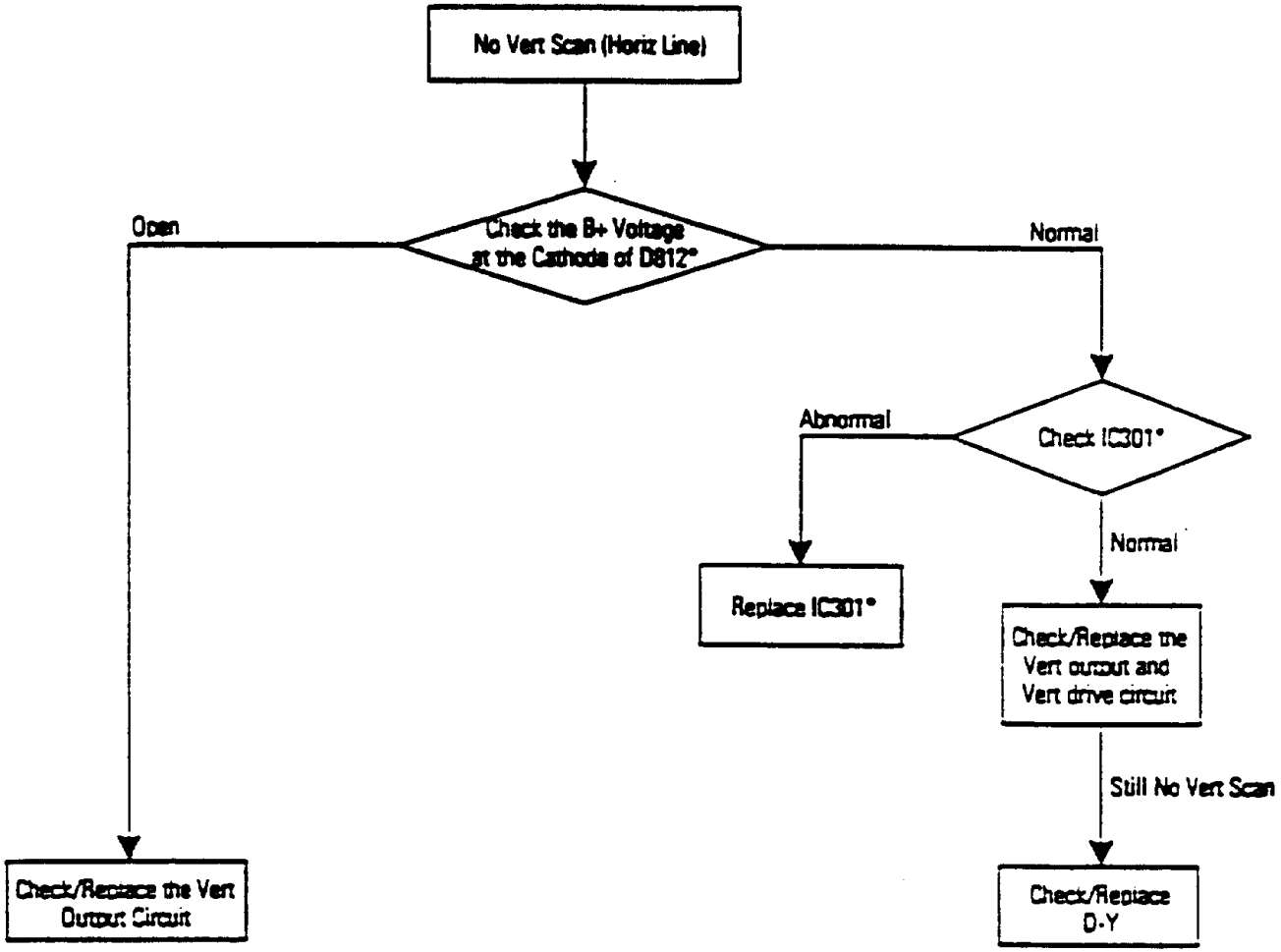


IC201 PIN 47 (VS:63)

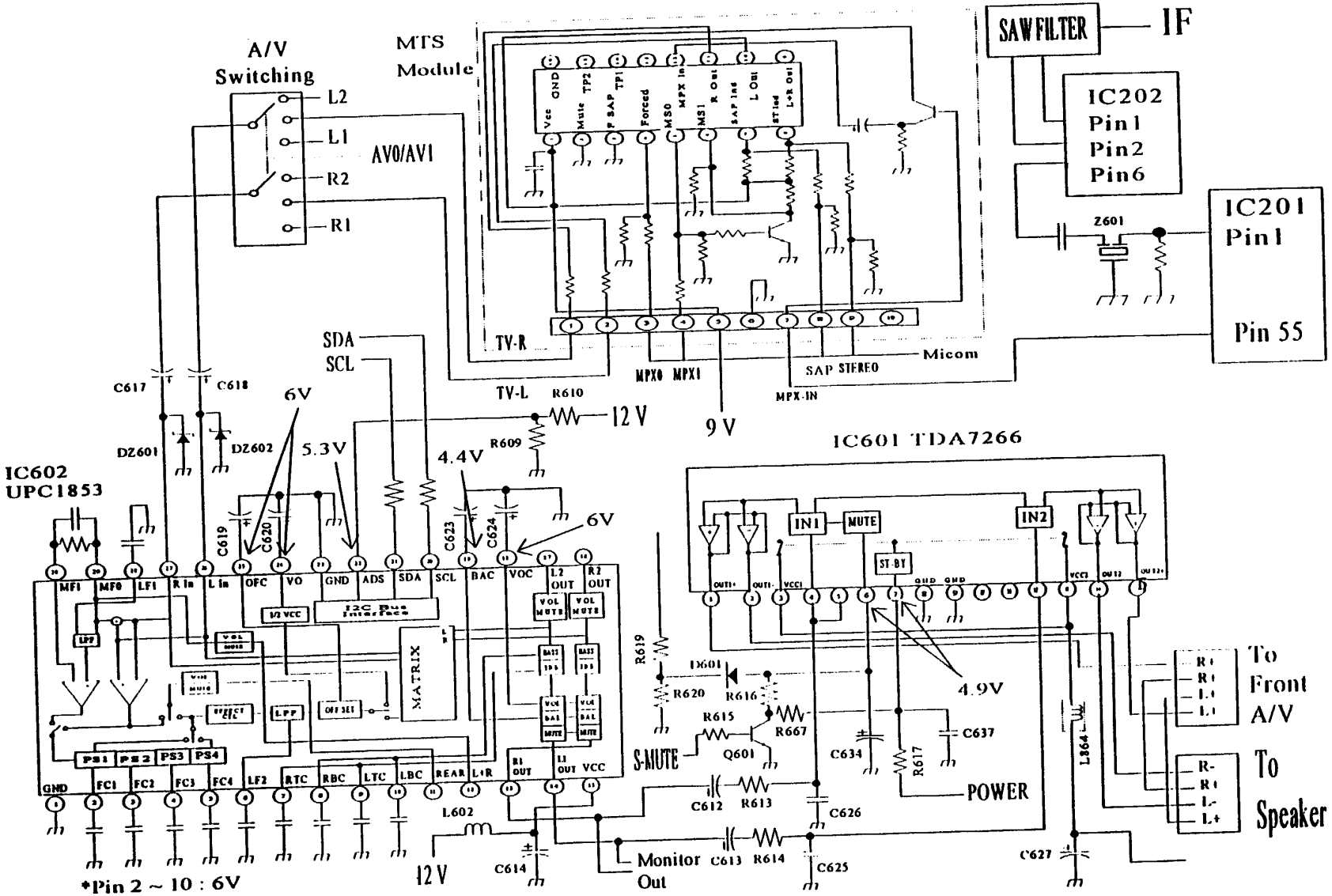


IC201 PIN 47 (VA:63)

Troubleshooting: No Vertical Scan (Horizontal Line)



Sound Circuit

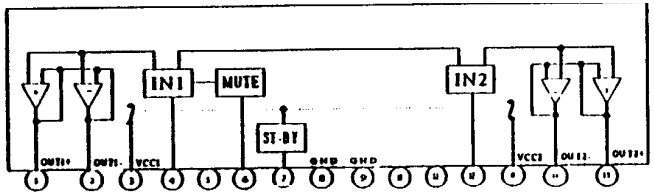


IC Block Diagram & Description

MTS Module Terminal Description

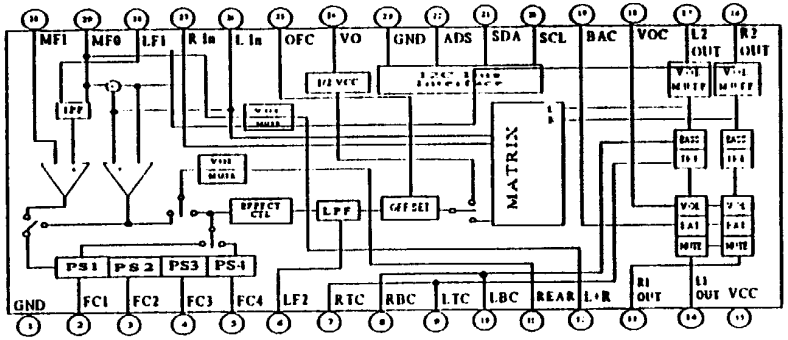
No	Name	Description	No	Name	Description
1	R-Out	Demodulated Right output	6	GND	Ground
2	L-Out	Demodulated Left output	7	MPX In	4.5 MHz SIF Audio signal input
3	M0	ST MONO SAP M0 L H L	8	SAP	SAP indicator drive output(4.7V)
4	M1	M1 L L H	9	STEREO	Stereo indicator drive output(4.7V)
5	Vcc	Power Supply(9V)	10	NC	

IC 601 TDA 7266 Description

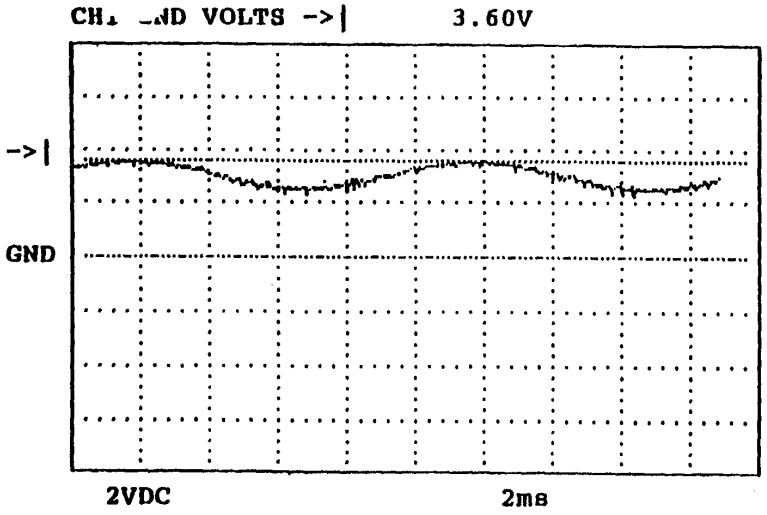


No	Name	Description	No	Name	Description
1	OUT1+	Right Amp Output +	9	S-GND	AMP Ground
2	OUT1-	Right Amp Output-	10	NC	
3	Vcc	Power Supply	11	NC	
4	IN1	Right audio Input	12	IN2	Left audio Input
5	NC		13	Vcc	Power Supply
6	MUTE	Cuts off Amp output when activated	14	OUT2-	Left Amp Output -
7	ST-BY	POWER signal input avoid POP noise during On/Off	15	OUT2+	Left Amp Output+
8	PW-GND	Power Supply Ground			

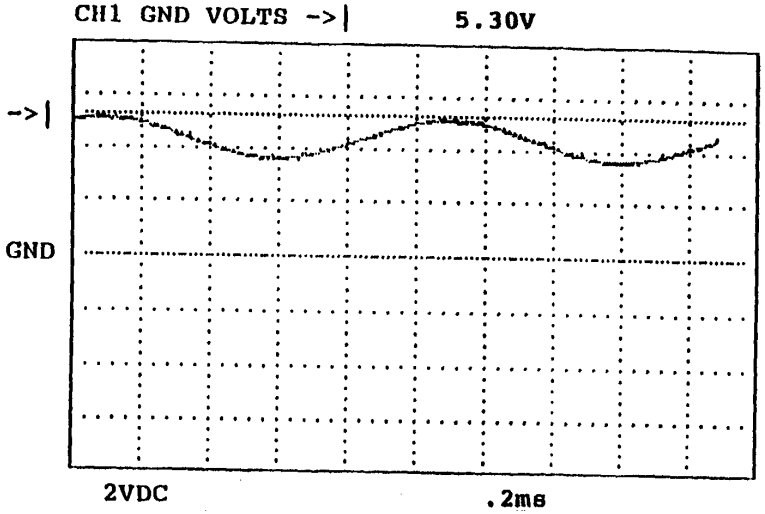
IC602 UPC 1853 Description



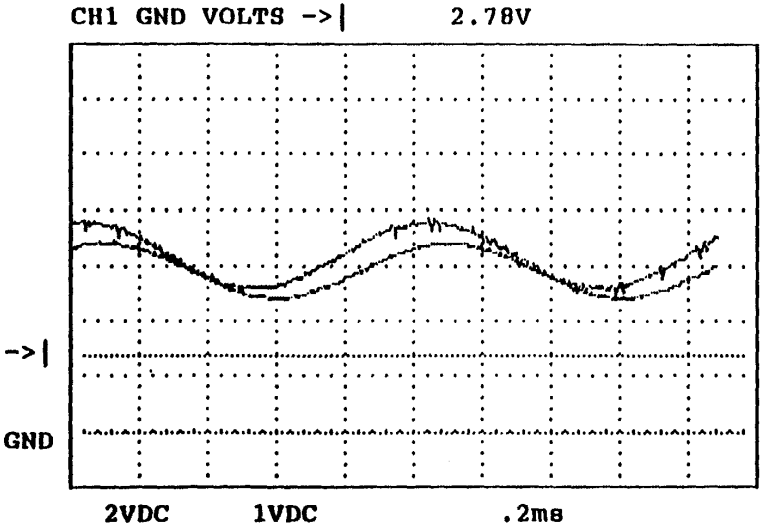
Pin No	Pin Name	Description
2 ~ 5	FC1 ~ FC4	Determine time constant of phase shifter
6,28	LF2,LF1	Low Pass Filter
7,8	RTC,RBC	Treble boost/cut control of R-CH
9,10	LTC,LBC	Treble boost/cut control of L-CH
11	Rear Out	L - R signal output
12	L+R out	L + R signal output
13,14	R1,L1 Out	R-CH,L-CH Main signal output
15	Vcc	Supply voltage
16,17	R2,L2 Out	R-CH,L-CH Out for external processor
18,19	VOL-C,BAL-C	Shock noise filter for D/A convertor
20,21	SCL,SDA	Serial Clock/Data input
22	ADS	Slave address selection
24	1/2 Vcc	Filter for middle point of supply voltage
25	OFC	Filter to absorb noise by phase shifter
26,27	Lin,Rin	L-CH,R-CH signal input
29,30	MF0,MF1	High Pass Filter for surround function



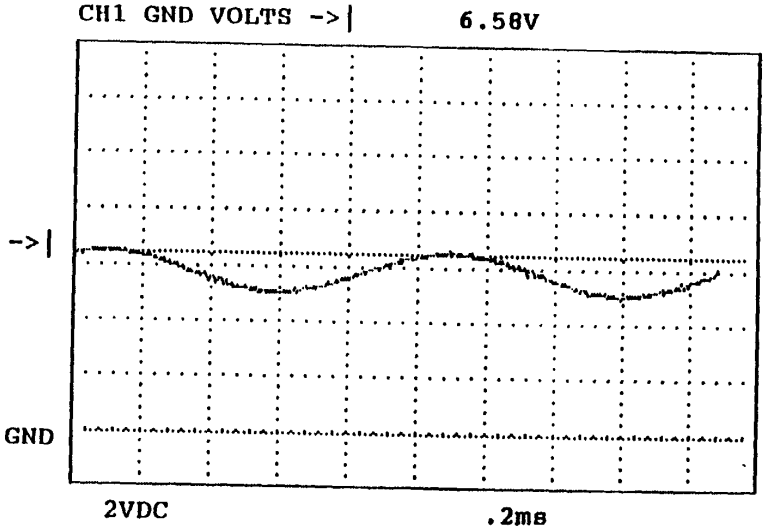
MTS MODULE PIN 7



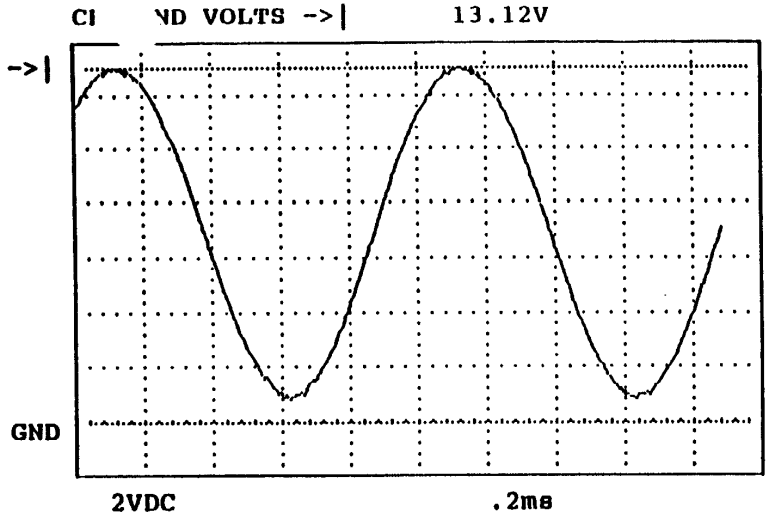
MTS MODULE PIN 1,2



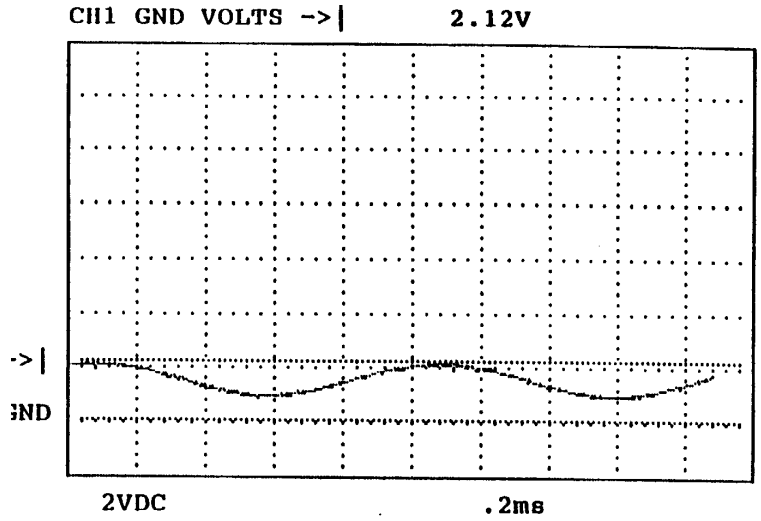
IC602 PIN 13, 14



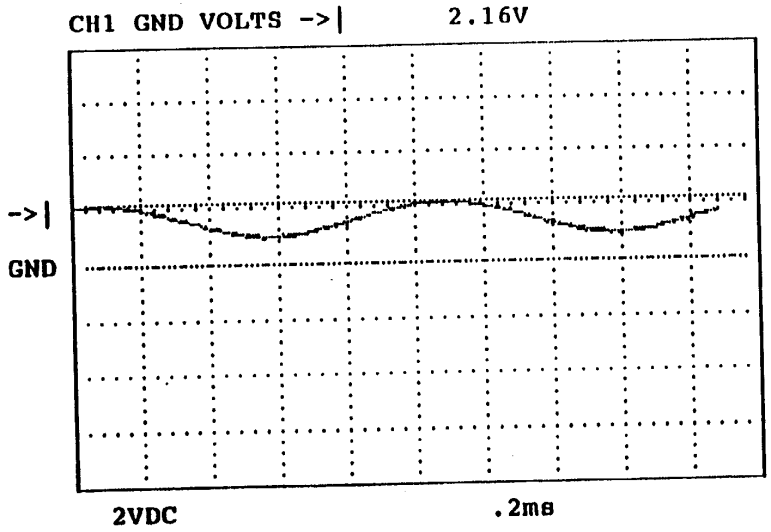
IC602 26,27,29.30



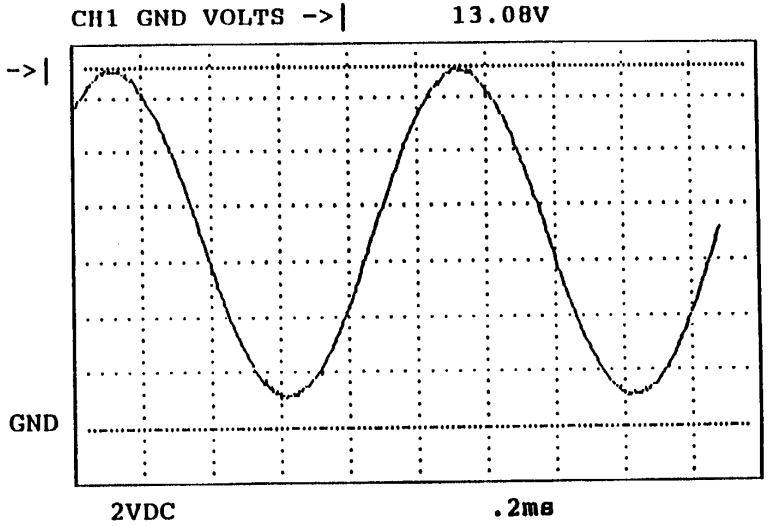
IC601 PIN 1,2



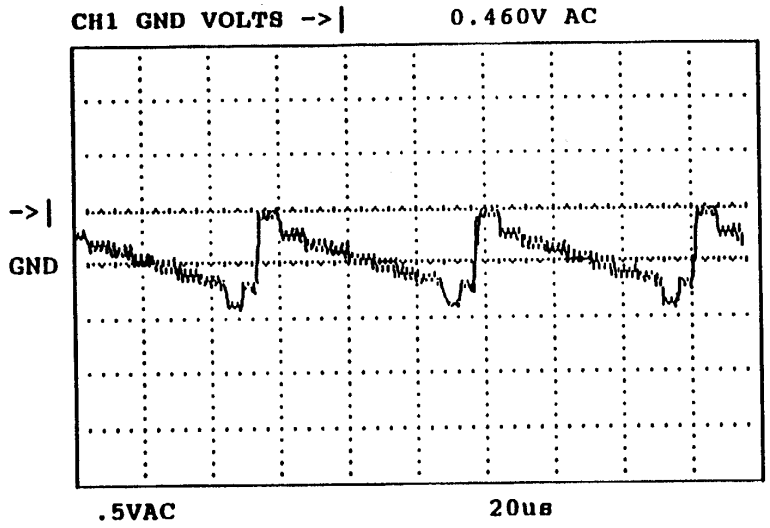
IC601 PIN 4,5



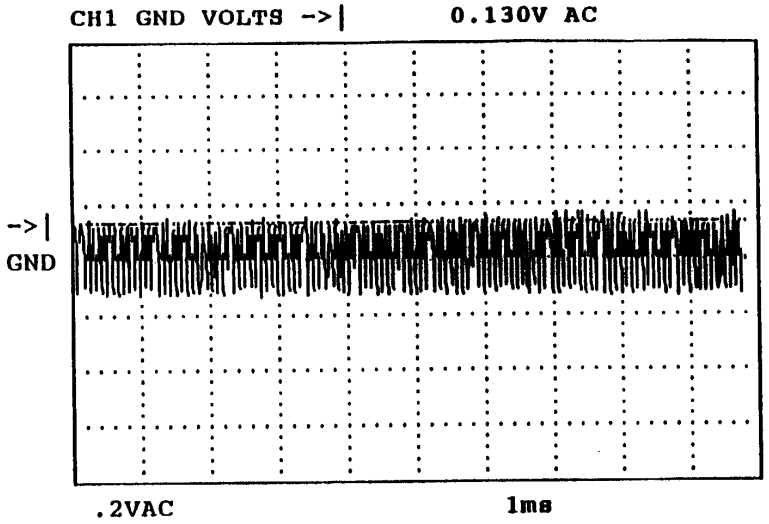
IC601 PIN 12



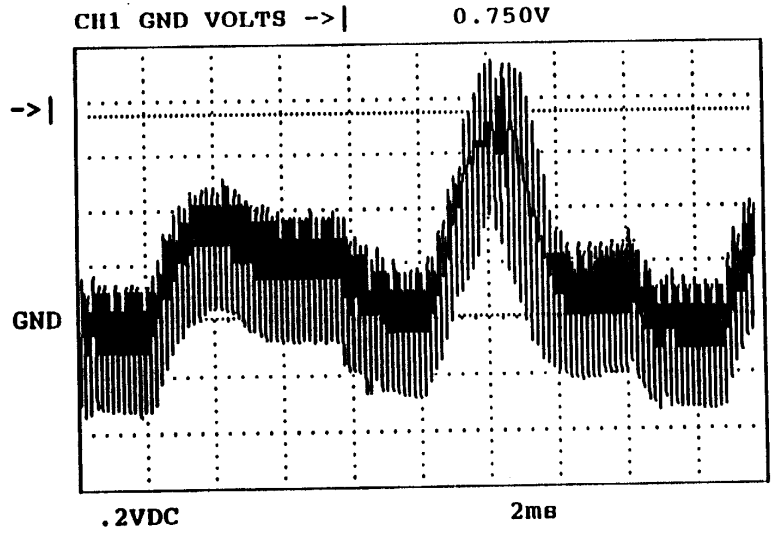
IC601 PIN 14, 15



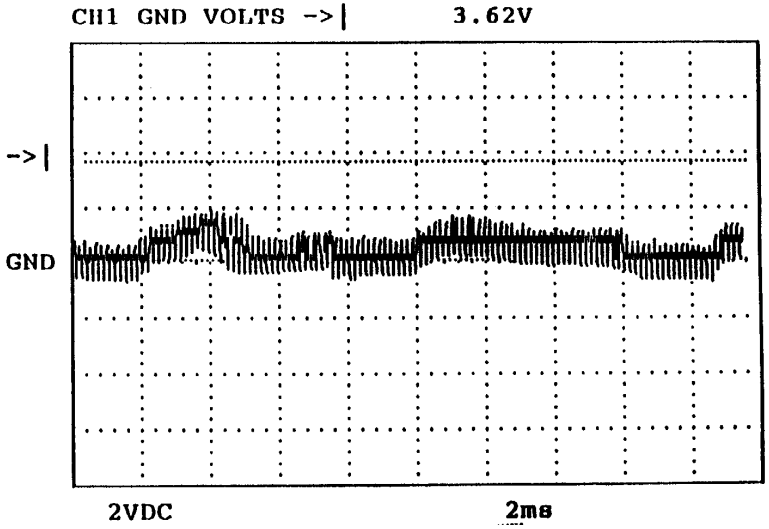
IC202 PIN 6



IC202 PIN 1, 2

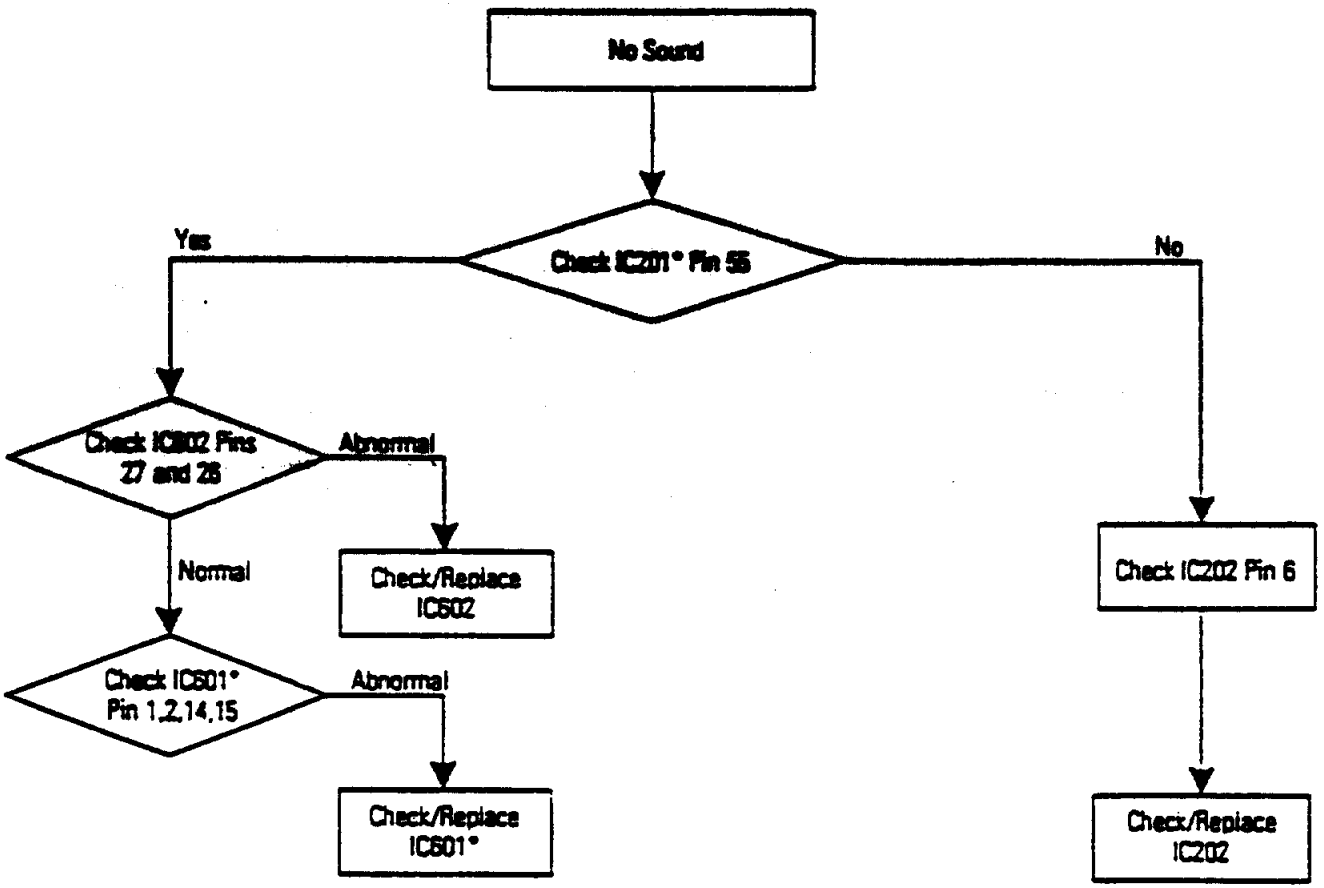


IC201 PIN 1

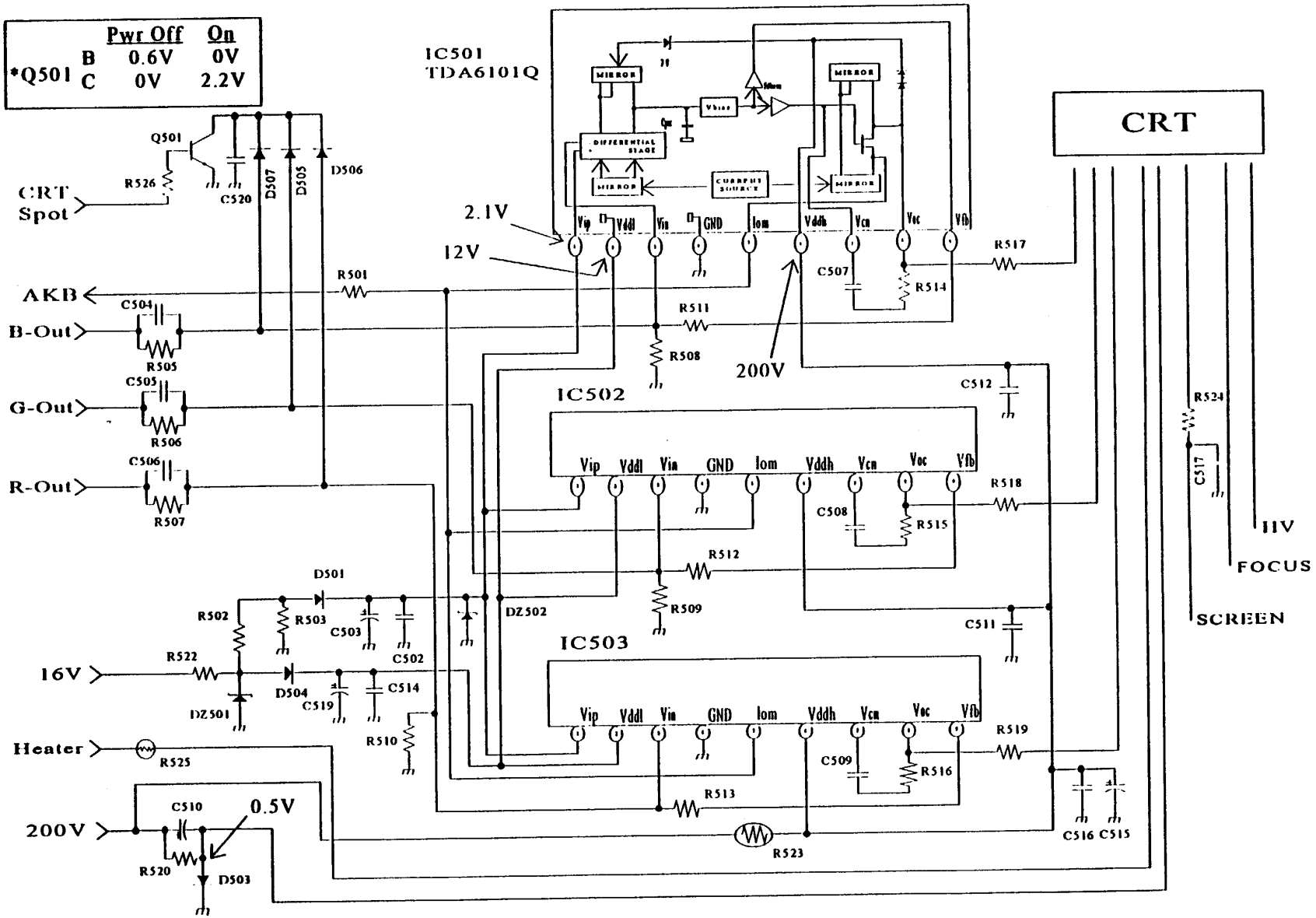


IC201 PIN 55

Troubleshooting: No Sound

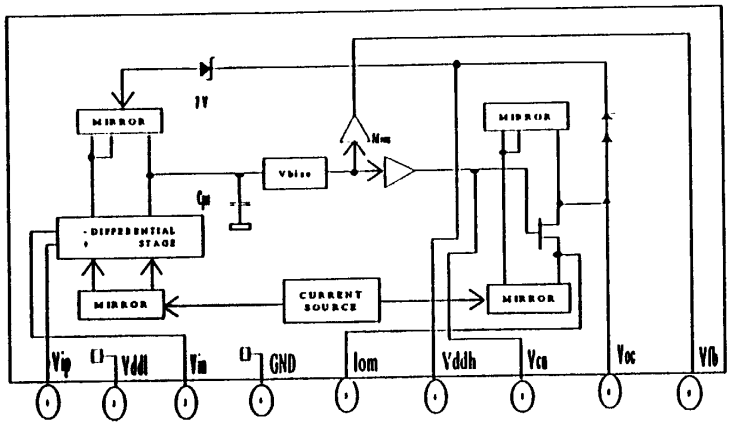


CRT Drive Circuit



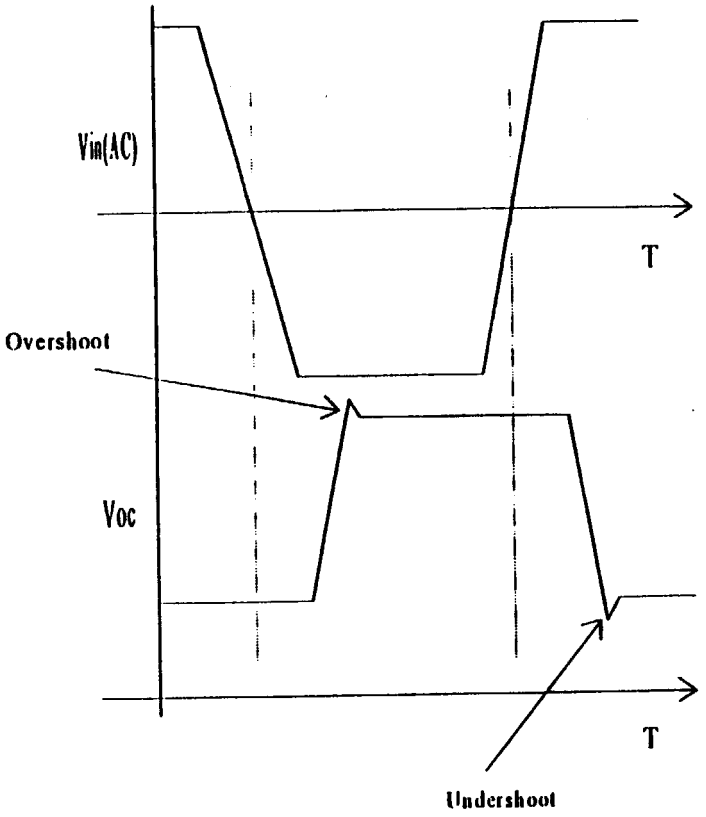
CRT Drive Circuit Description

IC501 TDA61010 Block Diagram

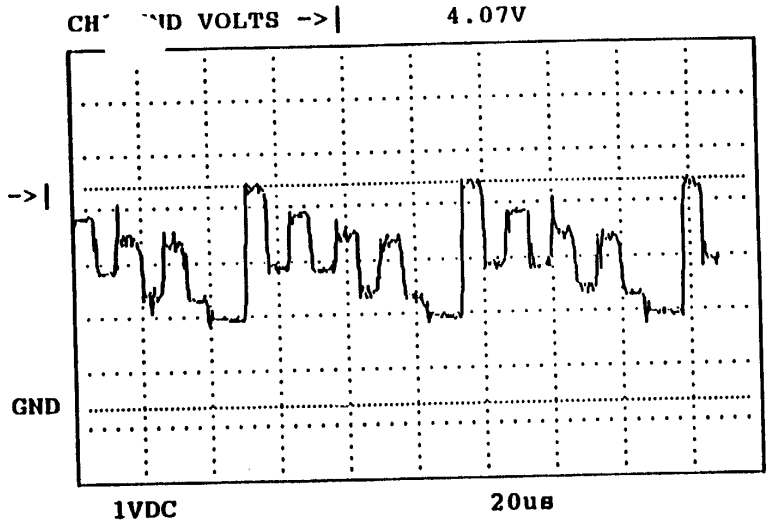


IC501 TDA61010 Pin Description

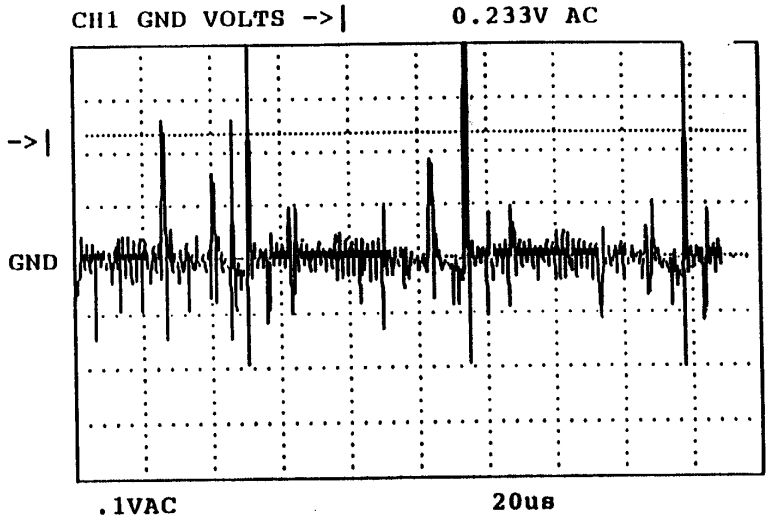
Pin No.	Pin Name	Description
1	Vip	Non-Inverting votage Input (3V)
2	Vddl	Supply voltage low (12V)
3	Vln	Inverting voltage input
4	GND	Ground, substrate’
5	Iom	Black current measurement output
6	Vddh	Supply voltage high (200V)
7	Vcn	Cathode transient voltage output
8	Voc	Cathode DC voltage output
9	Vfb	Feedback voltage output



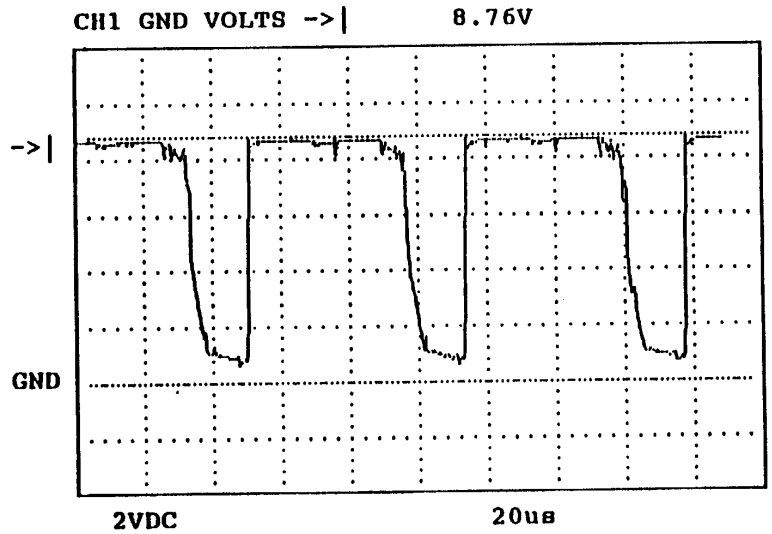
Vin versus Voc



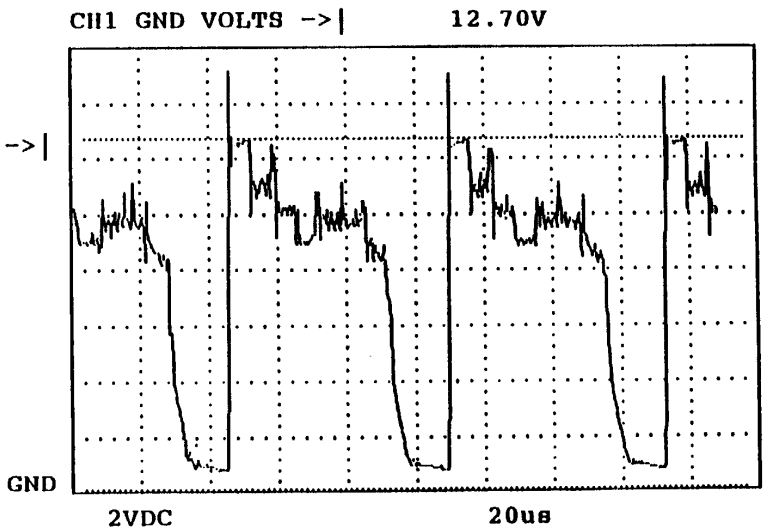
B-OUT



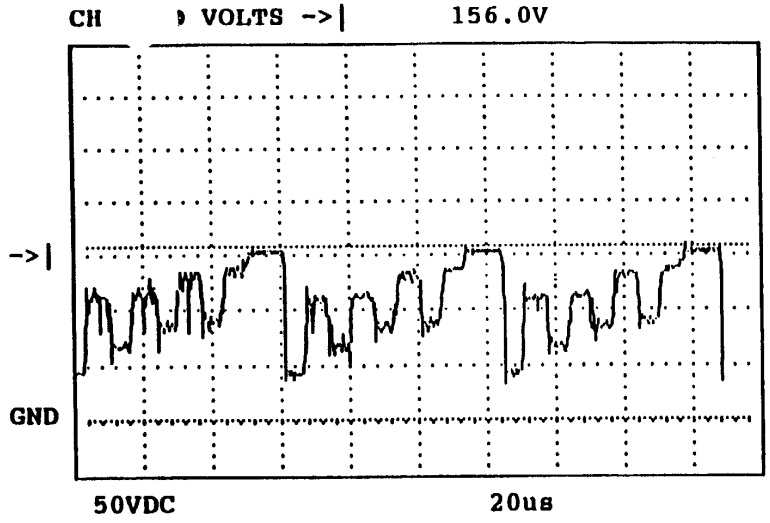
IC501 PIN 3



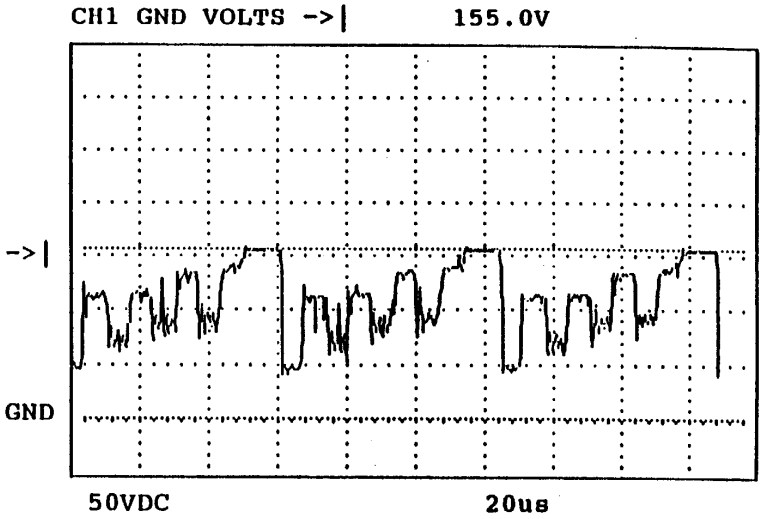
AKB



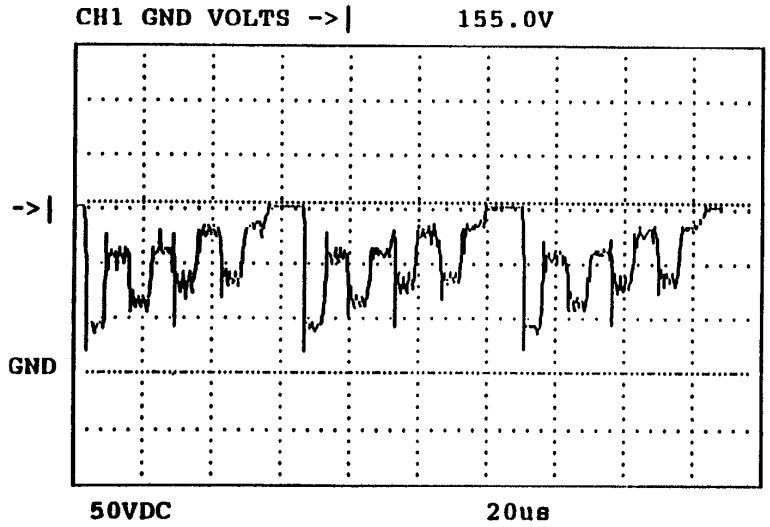
IC501 PIN 5



IC501 PIN 7

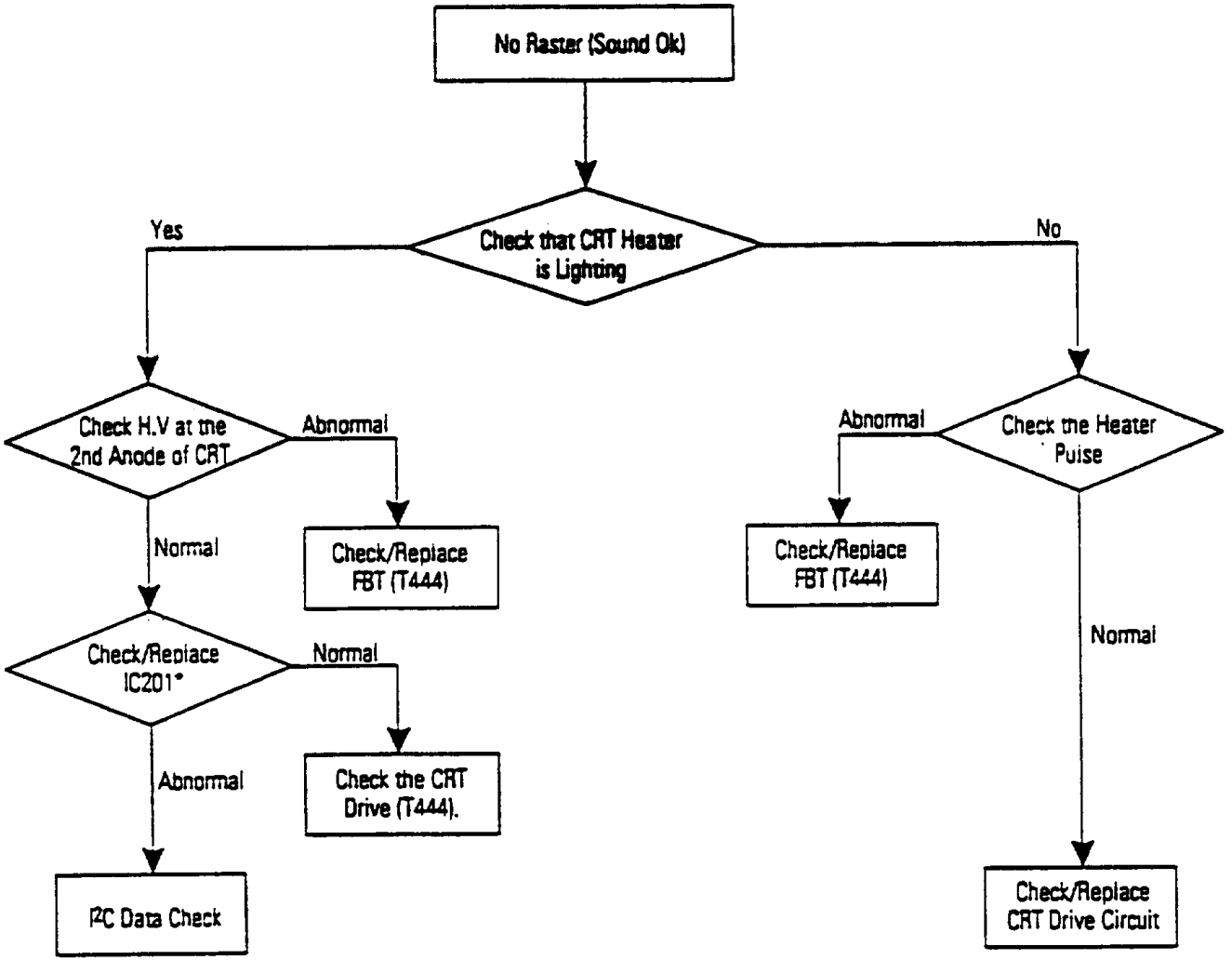


IC501 PIN 8

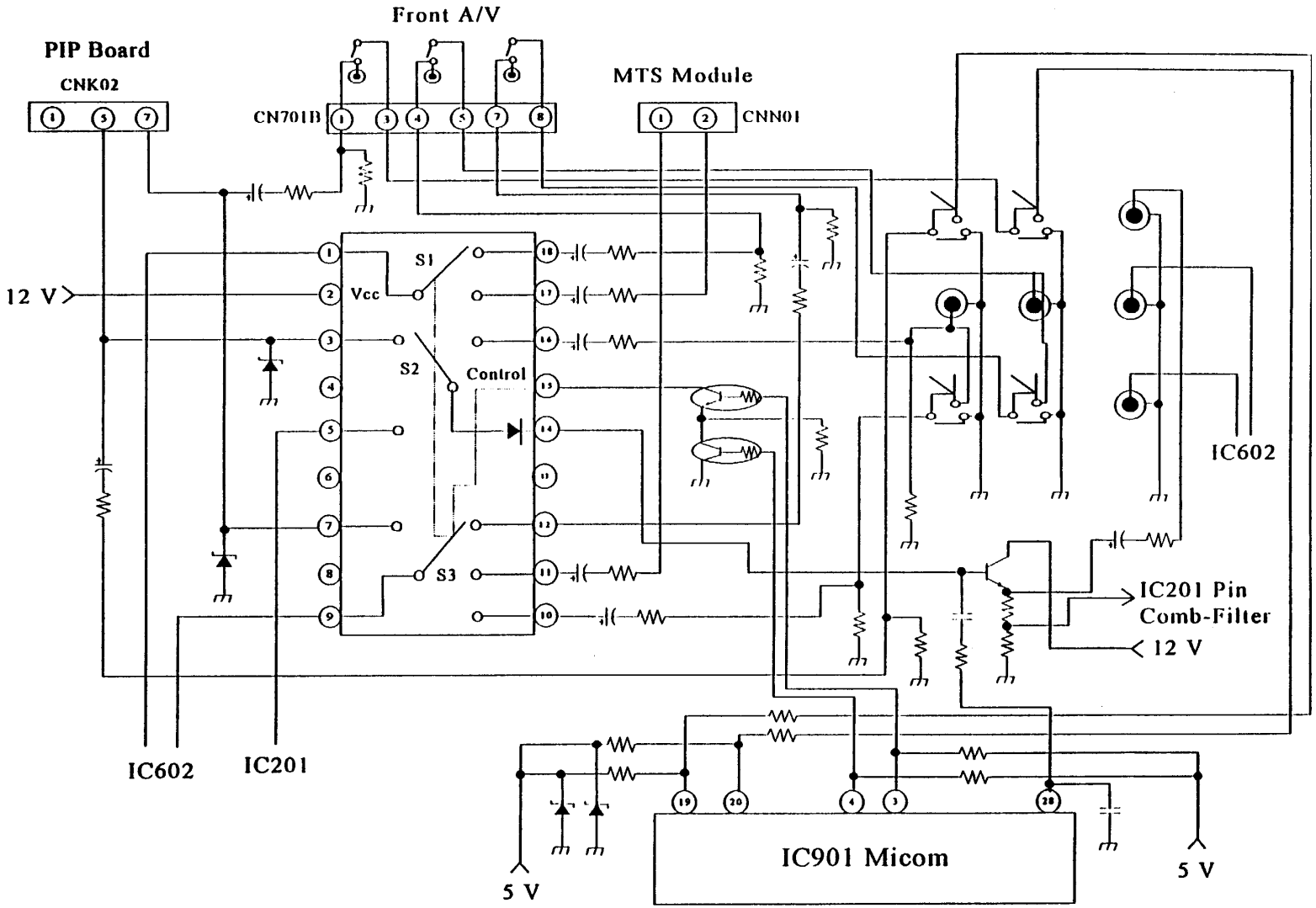


IC501 PIN 9

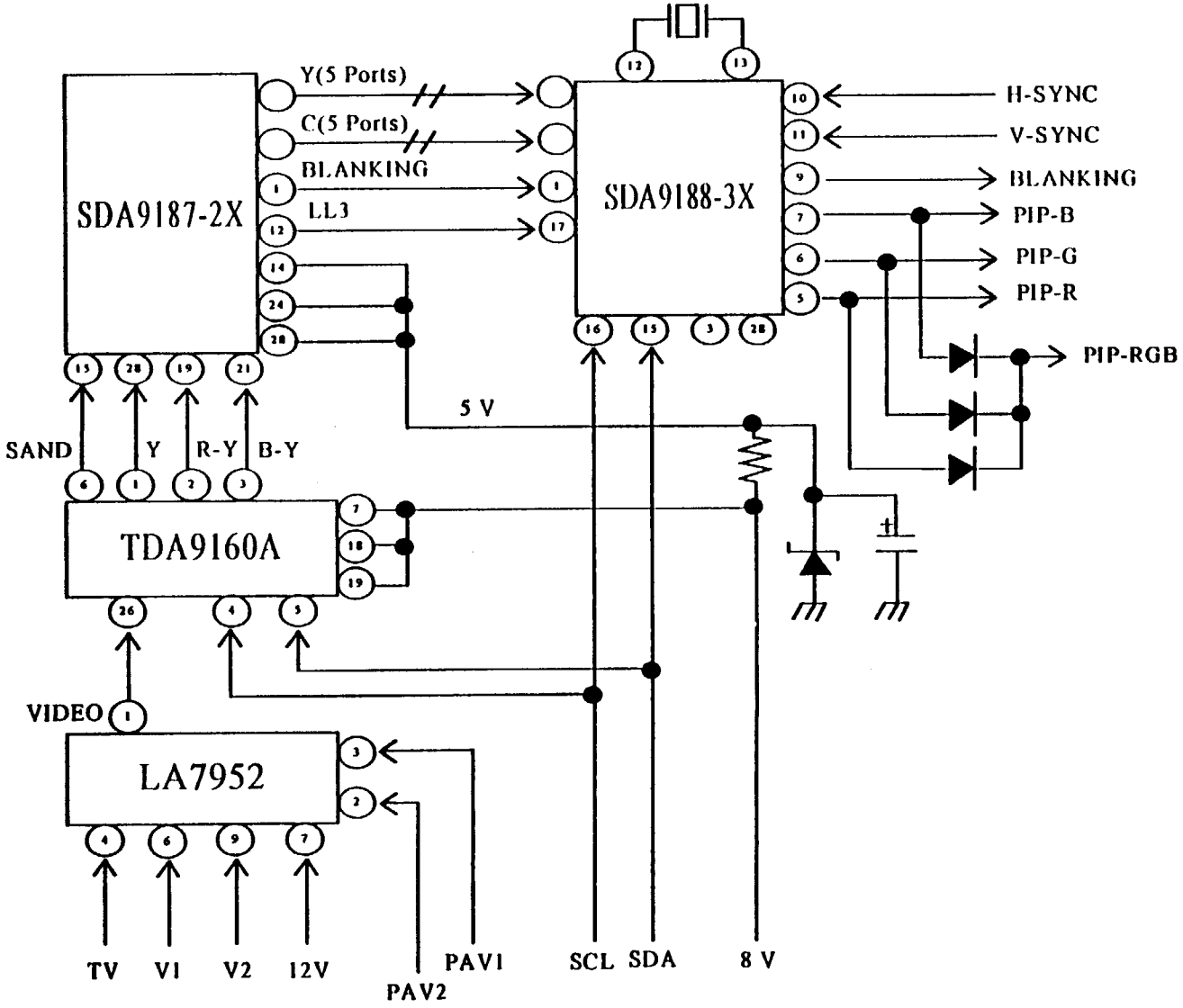
Troubleshooting: No Raster (Sound OK)



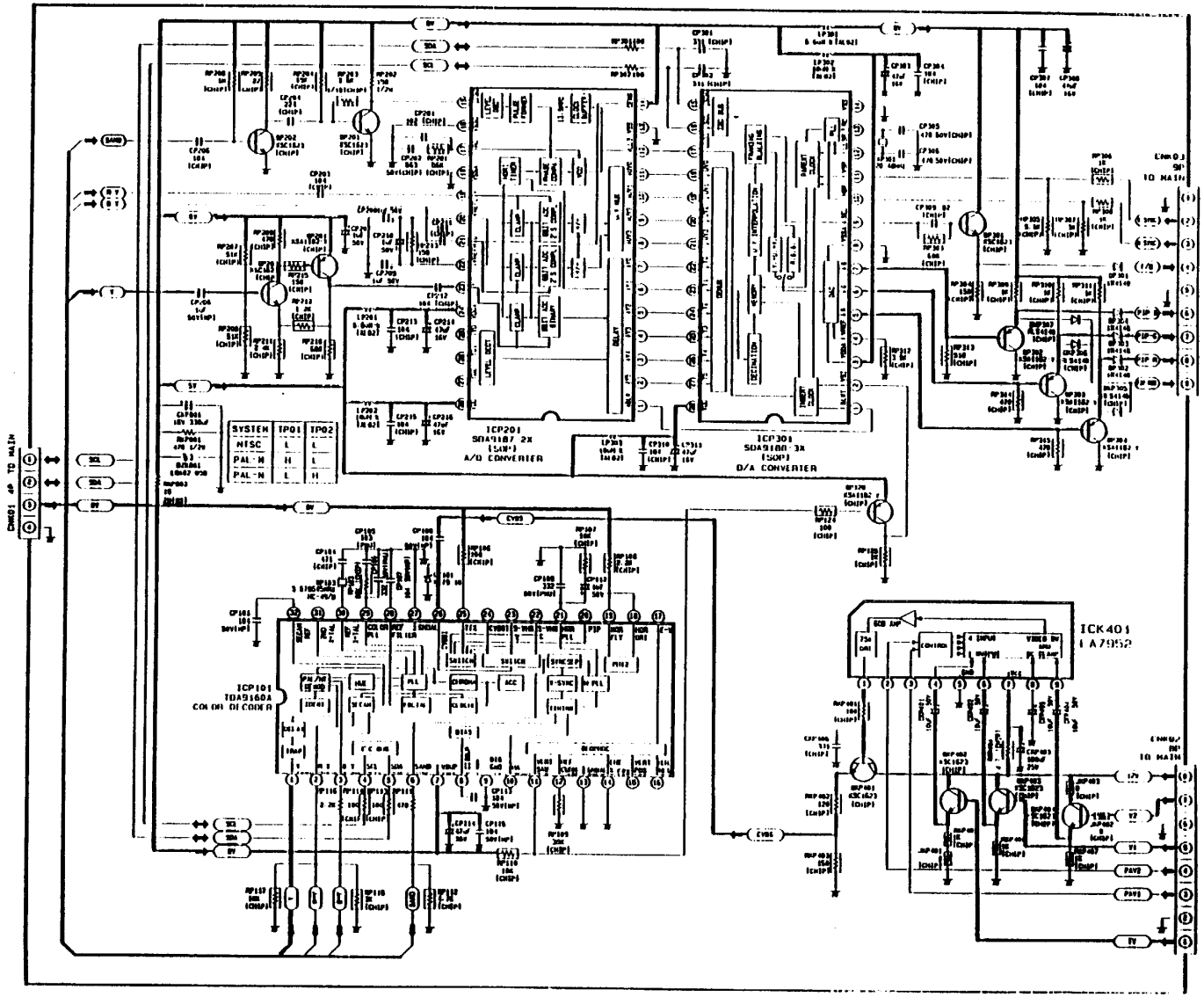
A/V Switching Description



PIP Block Diagram



Schematic Diagram



PIP Principle Sync Timing Diagrams

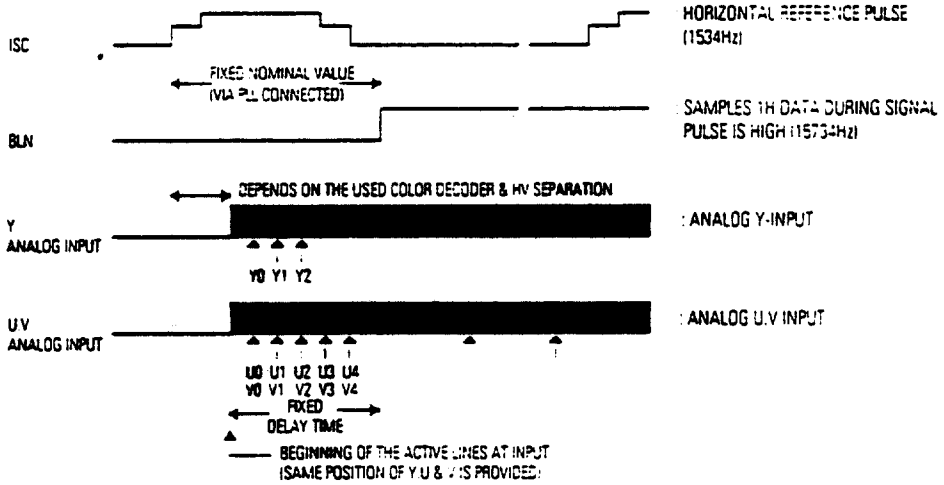


Fig. 7-5 Sampling Format

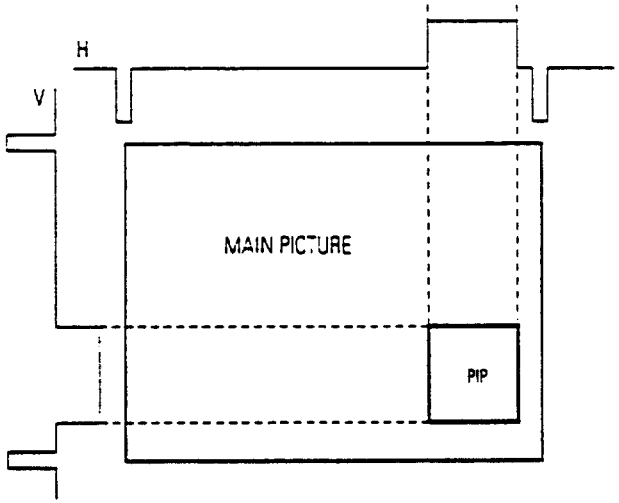


Fig. 7-7 PIP Dipslay in Main Picture

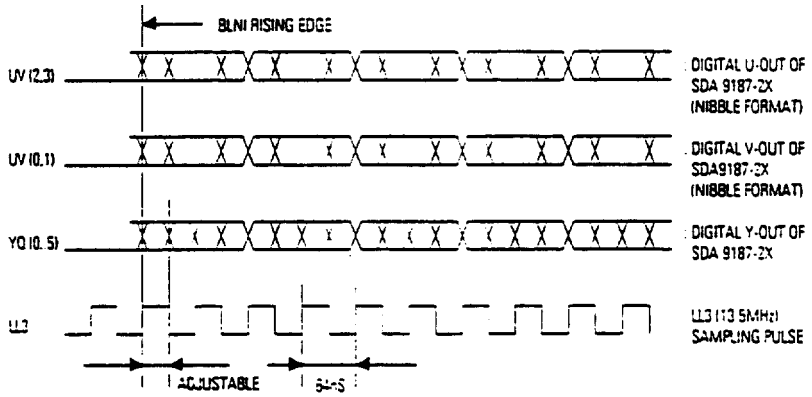


Fig. 7-6 Timing Waveforms

3. Alignment and Adjustment

3-1 Preadjustment

1. Since there are no VRs in the KCT52A chassis,all adjustments after parts replacement must be done VIA the Service Mode.
2. The Factory Mode adjustments are necessary when either the EEPROM (IC902) or the CRT is replaced.
3. Do not tamper with the " Adjustment"screen of the Factory Mode menu. This screen is setting intended only for factory use

3-1-1 When EEPROM (IC902) Is Replaced

1. When IC902 is replaced, all adjustment data revert to their initial values. It is necessary to re-program this data.
2. After IC902 is replaced, warm up the TV for 10seconds.
   Make the following adjustments AFTER setting up purity and convergence:

   White Balance
   Sub-Brightness
   Vertical Center
   Vertical Size
   Horizontal Size (No use in 21" and 25" models)

3-2 Factory ("SERVICE) Mode

1. The set must be in Factory ('Service") Mode. Selection sequence: STAND-BY — MUTE—1—8—2—POWER ON.

2 The "FACTORY MODE" message will be displayed. The Factory Mode has four components: Adjustment, Test Pattern, Set Option Byte, and Factory Reset.

3. Access the Adjustment Mode by pressing the 'VOLUME" keys (>, <). The adjustment parameters are listed in the accompanying table. Select them by pressing the CHANNEL keys (^,v).

4. After completing the Factory Mode adjustments, turn the power switch OFF.

3-2-1 Adjustment

1. Selection sequence: STANDBY — MUTE — 1— 8 —2 — POWER ON
2. Example: Sub-bright Adjustment (see to the right)

"FACTORY MODE"

Adjustment
Test Pattern
Set Option Byte
Factory Reset

↓ Press VOL ▶

AGC	43	VS	32
VCO	64	VA	13
SBT	9	HS	38
SCT	5	EWA	53
SCR	8	EWP	42
STT	10	EWC	31
RG	34	EWT	31
GG	32	VZM	25
BG	34	MAT	off
SCO	9	VOL	46
VSL	25		

↓ Press CH ▼

AGC	43	VS	32
VCO	64	VA	13
SBT	9	HS	38
SCT	5	EWA	53
SCR	8	EWP	42
STT	10	EWC	31
RG	34	EWT	31
GG	32	VZM	25
BG	34	MAT	off
SCO	9	VOL	46
VSL	25		

↓ Press VOL ◀ or ▶

SB	3

Main Adjustment Parameter

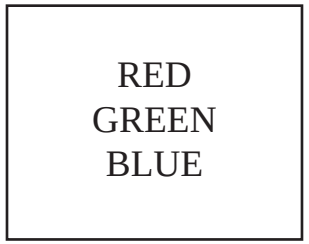
Function	OSD	RANGE	DATA
Auto Gain Control	AGC	0~63	43
Voltage Control Oscillator	VCO	0~127	64
Sub Bright	SBT	0 ~ 13	5
Sub Contrast	SCT	0 ~ 13	10
Sub Color	SCR	0 ~ 13	8
Sub Tint	STT	0 ~ 13	2
Red Gain	RG	0 ~ 63	32
Green Gain	GG	0 ~ 63	32
Blue Gain	BG	0 ~ 63	32
S-Correction	SCO	0 ~ 63	9
Vertical Slope	VSL	0 ~ 63	25
Vertical Shift	VS	0 ~ 63	32
Vertical Amplitude	VA	0 ~ 63	22
Horizontal Shift	HS	0 ~ 63	38
East West Amplitude	EWA	0 ~ 63	53
East West Pin	EWP	0 ~ 63	42
East West Corner	EWC	0 ~ 63	31
East West Tilt	EWT	0 ~ 63	31
Vertical Zoom	VZM	0 ~ 63 (not used)	25
Matrix	MAT	on/off	off
	VOL	0 ~ 63	46

NOTE: The actual data values vary according to model.

3.2.2 Test pattern (Aging Mode)

1. This mode can be used during servicing, or for confirming that the convergence and purity adjustments are correct.

2. Access the Test Pattern parameters by pressing the CHANNEL keys (^, v) while the Service Mode is one. The cursor will move to the test pattern. Press the VOLUME keys. On-screen display:



3-2-3 Set Option Byte

1. In the Service Mode, various options can be selected VIA the Option Bytes;
2. Example:
   BYTE 0 : 00
   BYTE 1 : 00 FOR PIP MODEL

   BYTE 0: 20
   BYTE 1:00 FOR NON-PIP MODEL

Values Expressed in Hexadecimal Numbers

OPTION BYTE 0	0 (HEX)	0	0: AIR/STD/HRC/IRC 1 : AIR/STD/HRC/AFN
		1	0 : NON AUTO POWER OFF 1 : AUTO POWER OFF AFTER 20MIN.
		2	0 : AUTO MUTE IN NO SIGNAL 1 : NONE AUTO MUTE
		3	0 : HELP MESSAGE 1 : NONE HELP MESSAGE
	0 (HEX)	0	0 : NONE AUTO ON 1 : AUTO ON
		1	0 : PIP 1 : NONE PIP
		2	0 : SHARPNESS 4 STEP (STANDARD) 1 : SHARPNESS 8 STEP (STANDARD)
		3	DON'T CARE
OPTION BYTE 1	0 (HEX)	0	00 : TV/VIDEO1/VIDEO2 01 : TV/VIDEO1/VIDEO2 10 : TV/VIDEO 11 : TV/VIDEO
		2	0 : VIDEO IDENT MODE=IF-INT CONTROLS 1 : VIDEO IDENT MODE=NO INFLUENCE
		3	0 : PICTURE LEVEL R/B=10 STEP 1 : PICTURE LEVEL R/B= 5 STEP
	0 (HEX)	0	DON'T CARE
		1	DON'T CARE
		2	DON'T CARE
		3	DON'T CARE

3.2.4 Factory Reset

When "Factory Reset" is selected, the User-Control data reverts to the initial values. : The User-Control data is available at MENU (picture, sound and the other functions etc.)
Note:When "Factory Reset" is selected,the Factory Mode Data does not change.

Selection sequence:
Stand-By -MUTE - 1 - 8 - 2 - POWER ON

FACTORY MODE

Adjustment
Test Pattern
Set Option Byte
Factory Reset

Press CH▼

FACTORY MODE

Adjustment
Test Pattern
Set Option Byte
Factory Reset

Press VOL▶
Execute

3.3 Other Adjustments

3.3.1 General

1. Usually, a color TV needs only slight touch-up adjustment upon installation Check the basic characteristics such as height, horizontal and vertical sync and focus.

2. Observe the picture for good black and white details. There should be no objectionable color shading. If color shading is present, perform the purity and convergence adjustments described below.

3. Use the specified test equipment or its equivalent

4. Correct impedance matching is essential.

5. Avoid overload. Excessive signal from a sweep generator might overload the front-end of the TV. When inserting signal markers, do not allow the marker generator to distort test results.

6. Connect the TV only to an AC power source with voltage and frequency as specified on the backcover nameplate.

7. Do not attempt to connect or disconnect any wires while the TV is turned on. Make sure that the power cord is disconnected before replacing any parts.

8. To protect against shock hazard, use an isolation transformer.

3-3-2 Automatic Degaussing

A degaussing coil is mounted around the picture tube, so external degaussing after moving the TV should be unnecessary. However, the receiver must be properly degaussed upon installation.

The degaussing coil operates for about 1 second after the power is switched ON. If the set has been moved or turned in a different direction, disconnect its AC power for at least 10 Minutes.

If the chassis or parts of the cabinet become magnetized, poor color purity will result If this happens, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube and the sides and front of the receiver. Slowly withdraw the coil to a distance of about 6 feet before removing power.

3-3-3 High Voltage Check

CAUTION: There is no high voltage adjustment on this chassis. The B+ power supply must be set to either +130V or +125V (for "20" screen). Conditions: Full color bar input and normal picture level.

1. Connect a digital voltmeter to the second anode of the picture tube.

2. Turn on the TV. Set the Brightness and Contrast controls to minimum (zero beam current).

3. The high voltage should not exceed 29.5KV.

4. Adjust the Brightness and contrast controls to both extremes. Ensure that the high voltage does not exceed 29.5KV under any conditions.

SIZE	**20"**	**25"**	**27"**
MAX H-VOLTAGE	27.5KV	28.5KV	29.5KV

3.3.4 FOCUS Adjustment

1. Input a black and white signal.

2. Adjust the tuning control for the clearest picture.

3. Adjust the FOCUS control for well defined scanning lines in the center area of the screen.

3.3.5 B+ Line Check

There are 3 power modes:

1. "A": When AC power supply is connected; Stand-By" mode.

2. "B": When " Set Power-ON" button is pressed.

I "C": Operated by FBT.

Each voltage is marked on its lead-in wire.

3-3-6 F/S (Fail Safe) Circuit Check

1. The failsafe circuit check is the final step after servicing.

· Turn the power switch on and adjust the screen for "Normal".

3. Temporarily short Pin R and Pin X an the chassis (RX05, RX04). Sound and picture will disappear.

4. The TV should remain in this state. This shows that the failsafe circuit is working properly.

5. To restore picture and sound, temporarily turn off the AC power supply. After about 30 seconds, switch power 6N.

3.3.7 Color Purity Adjustment

1. Warm up the receiver. Operate it for 20 minutes, with the Brightness control set to maximum.
2. Fully degauss the receiver. Use an external degaussing coil.
3. Roughly adjust convergence by rotating the convergence magnet.
4. Input a black and white signal.
5. Loosen the Deflection Yoke clamp screw, and move the Deflection Yoke as close to the purity magnet as possible.
6. Loosen the Purity Magnet clamp. Adjust the purity magnet so that the vertical green raster is precisely at the center of the screen. Then tighten the clamp.
7. Slowly move the Deflection Yoke forward, and adjust it for the best overall green screen.
8. Tighten the Deflection Yoke clamp screw.

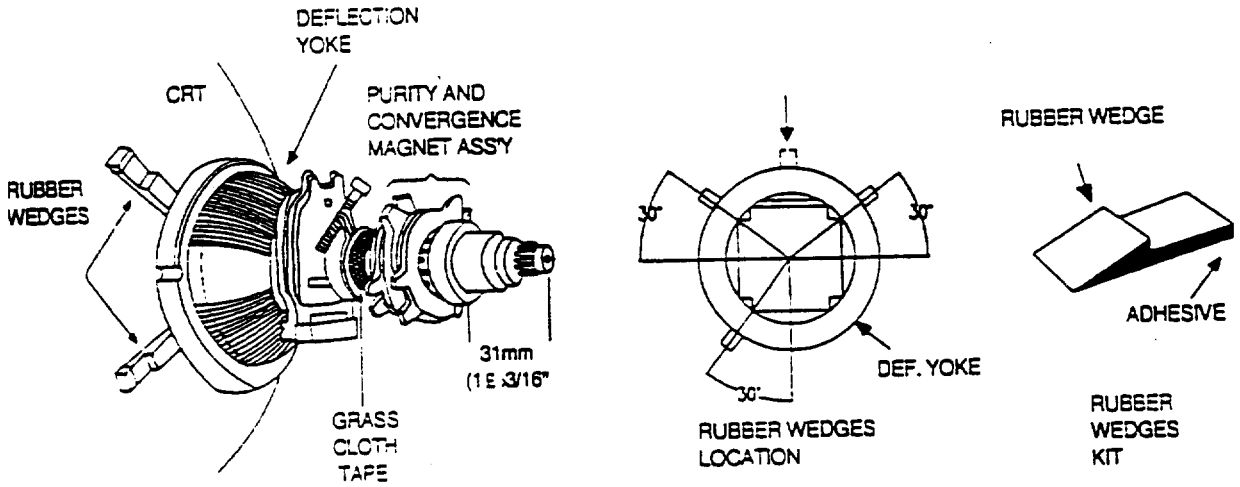


Fig 3.1 Tube Assembly

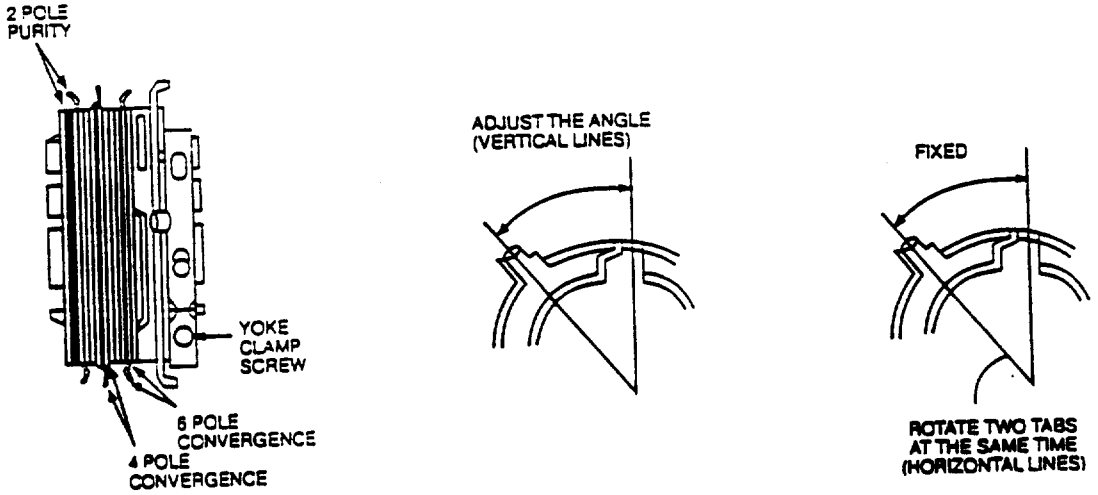


Fig 3.2 Purity and Convergence Magnets

3-3-8 Center Convergence Adjustment

Note: Before attempting any convergence adjustment, make sure that the receiver has been powered ON for at least twenty minutes.

1. Input a crosshatch pattern from a color bar generator.
2 Adjust the Brightness and Contrast controls for a well defined pattern.
3. Adjust the two tabs of the 5-pole magnets. Change the angle between the tabs, and superimpose red and blue vertical lines in the of the picture screen.
4. Next, turn both tabs at the same time. Keep the angle between the tabs constant, and superimpose the red and blue horizontal lines at the center of the screen.
5. Adjust the two tabs of the 6-pole magnets. Superimpose the red/blue lines on the green Adjusting the angle affects the horizontal lines.
6. Repeat adjustments 3, 4 and 5. The dot movement is complex because the 4-pole and 6-pole magnets interact.

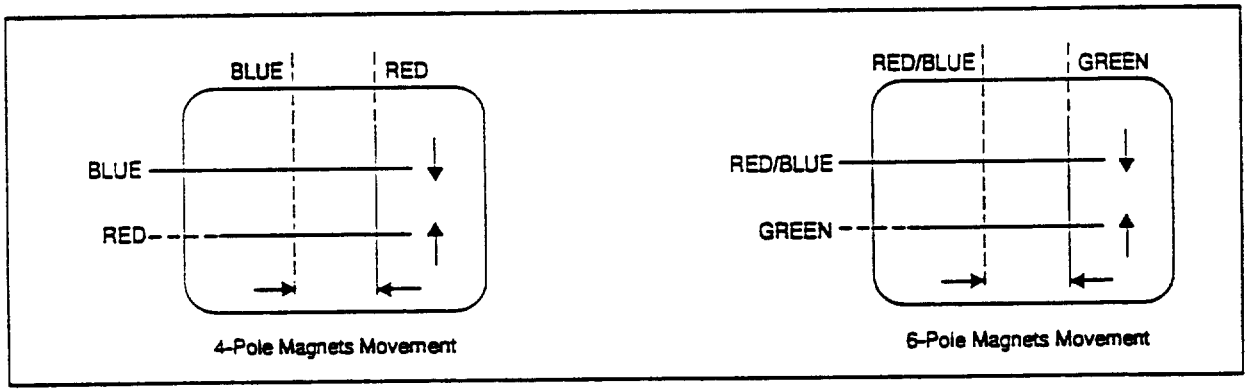


Figure 3.3 Center Covergence Adjustment

3-3-9 AGC Adjustment

1. Input a COLOR-BAR pattern. (CH2)
2. Set the RF input signal to 70DBuV.
3. Use Generator for PM5518 & PM5418.
4. Set AGC (in the Factory Mode) so that the DC level of IC TDA8377 Pin 33 is 3.2 (=0.05)V.

3-3-10 AFT (VCO Adjustment)

1. Input an AGC adjustment signal.
2. Select Factory Mode VCO and press the MUTE key one time.
3. GEOMATRIX adjustments

VS	EWA
VA	EWP
VSL	EWC
HS	EWT

3-3-11 White Balance Adjustment

3-3-11 (A) SCREEN ADJUSTMENTS

1. Input a TOSHIBA pattern.
2. Check R506 "G" pin on the CRT PCB with an oscillos-cope.
3. Enter the Horizontal Line Mode.
4. Adjust the screen on the FBT so that the waveform, of the 21st line and X 2.0 (=0.5)V.

3-3-11 (B) HIGH-LIGHT ADJUSTMENT

1. Input a TOSHIBA pattern.
2 Set high-light to 28F/L 275/295 (X,Y) with a color analyzer.
3. Set low-light to 1.0F/L and set GG to step 32.

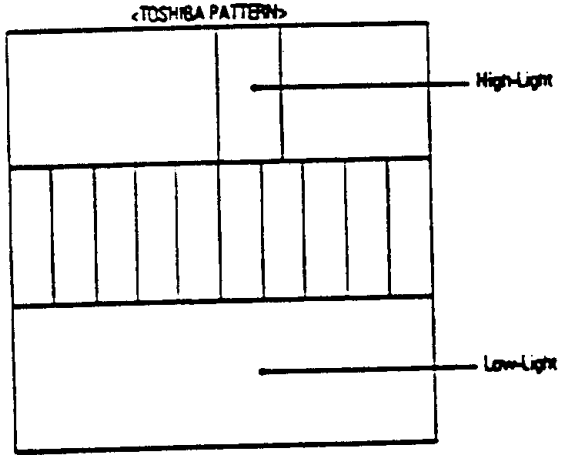
SIZE	20"	25"	27"
HIGH LIGHT	32F/L	30F/L	28F/L

3-3-11 (C) SUB-CONTRAST ADJUSTMENT

1. Set SCT so that the brightness level in highlight is 28 F/L: (In case of 27V.

3-3-11 (D) SUB-BRIGHTNESS ADJUSTMENT

1. Input a TOSHIBA pattern.
2. Set SBT so that the brightness level in low-light is 1.0F/L



3-3-11 (F) SUB-TINT ADJUSTMENT

1. Set "STT" in the Service Mode to step 2.

3-3-11 (G)VERTICAL SIZE ADJUSTMENT

1. Input a lion head Pattern.

2. Set "VS" to 32 in the Factory Mode.

3. Set, "VA" so that the top margin is 4.0. Adjust "VSL" so that the bottom mm-gin is 4.0. If the top and bottom margins are different, adjust "VA" so that their sum is 8.0.

3-3-11 (G) HORIZONTAL SHIFT ADJUSTMENT

1. Input a lion head pattern.

2. Adjust "HS" in the Service Mode so that the left and right margins of the lion head pattern are 5.0. (+/– 0.5)