SAFETY PRECAUTIONS

SERVICE WARNING

Only qualified service technicians who are familiar with safety checks and guidelines should perform service work. Before replacing parts, disconnect power source to protect electrostatically sensitive parts. Do not attempt to modify any circuit unless so recommended by the manufacturer. When servicing the receiver, use an isolation transformer between the line cord and power receptacle.

SERVICING THE HIGH VOLTAGE AND CRT

Use EXTREME CAUTION when servicing the high voltage circuits. To discharge static high voltage, connect a 10K ohms resistor in series with a test lead between the receiver ground and CRT anode lead. DO NOT lift the CRT by the neck. Always wear shatterproof goggles when handling the CRT to protect eyes in case of implosion.

X-RAY RADIATION AND HIGH VOLTAGE LIMITS

Be aware of the instructions and procedures covering X-ray radiation. In solid-state receivers and monitors, the CRT is the only potential source of X-rays. Keep an accurate high voltage meter available at all times. Check meter calibration periodically. Whenever servicing a receiver, check the high voltage at various brightness levels to be sure it is regulating properly. Keep high voltage at rated value, NO HIGHER. Excessive high voltage may cause X-ray radiation or failure of associated components. DO NOT depend on protection circuits to keep voltage at rated value. When troubleshooting a receiver with excessive high voltage, avoid close contact with the CRT. DO NOT operate the receiver longer than necessary. To locate the cause of excessive high voltage, use a variable AC transformer to regulate voltage. In present receivers, many electrical and mechanical components have safety related characteristics which are not detectable by visual inspection. Such components are identified by a # on both the schematic and the parts list. For SAFETY, use only equivalent replacement parts when replacing these components.

GENERAL GUIDELINES

Perform a final SAFETY CHECK before returning receiver to customer. Check repaired area for poorly soldered connections, and check entire circuit board for solder splashes. Check board wiring for pinched wires or wires contacting any high wattage resistors. Check that all control knobs, shields, covers, grounds, and mounting hardware have been replaced. Be sure to replace all insulators and restore proper lead dress.

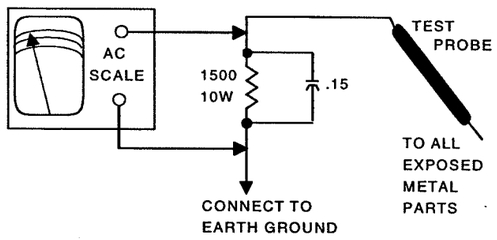
SAFETY CHECKS — FIRE AND SHOCK HAZARD

Cold Leakage Checks for Receivers with Isolated Ground

Unplug the AC cord, connect a jumper across the plug prongs, and turn the power switch on (if applicable). Use an ohmmeter to measure the resistance between the jumped AC plug and any exposed metal cabinet parts such as antenna screw heads, control shafts, or handle brackets. Exposed metal parts with a return path should measure between 1M ohms and 5.2M ohms. Parts without a return path must measure infinity.

Hot Leakage Current Check

Plug the AC cord directly into an AC outlet. DO NOT use an isolation transformer. Use a 1500 ohms, 10W resistor in parallel with a .15µF capacitor to connect between any exposed metal parts on the receiver and a good earth ground. (See figure below.) Use an AC voltmeter with at least 5000 ohms per volt sensitivity to measure the voltage across the resistor. Check all exposed metal parts and measure voltage at each point. Voltage measurements should not exceed .75VAC, 500µA. Any value exceeding this limit constitutes a potential shock hazard and must be corrected. If the AC plug is not polarized, reverse the AC plug and repeat exposed metal part voltage measurement at each point.



HIGH VOLTAGE SHUTDOWN TEST

Set all customer controls for normal picture. Use a digital meter to check for 21.3V ±1.5V at TP653. Using an external power supply, apply 27.2V to TP653. The receiver should shut down. If the receiver fails to shutdown, the high voltage circuit requires repair. To return to normal operation, remove AC power and momentarily place a short between TP651 and TP652. Restore AC power and check receiver for normal operation.

The listing of any available replacement part herein in no case constitutes a recommendation, warranty, or guarantee by SAMS Technical Publishing as to the quality and suitability of such replacement part. The numbers of the listed parts have been compiled from information furnished to SAMS Technical Publishing by the manufacturers of the specific type of replacement part listed.

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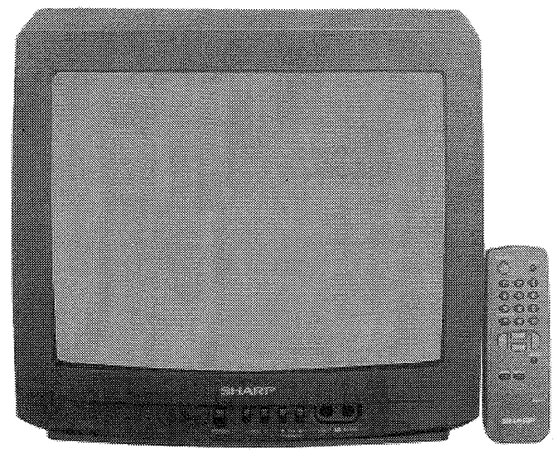
PHOTOFACT® *Technical Service Data*

INDEX

For Supplier Address,
See PHOTOFACT Annual Index

SHARP

Models CN19M10, 19N-M100, 19N-M100S



Representative Model

Essential coverage for servicing a television receiver...

- **Schematics**
- **Component locations**
- **Parts list**

SAMS™ Technical Publishing

SEPTEMBER 2001 SET 4483

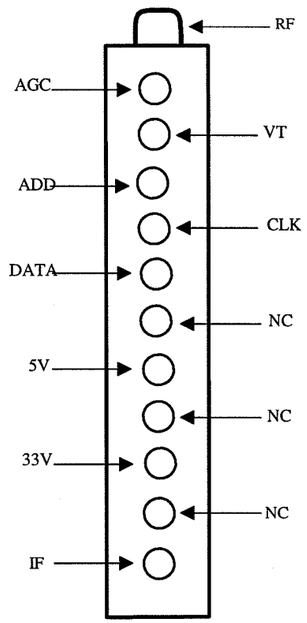
TUNER INFORMATION

TUNER VOLTAGE CHART

No.		HF Low Band	VHF High Band	UHF Band
1	AGC	2.3V	2.3V	1.9V
2	VT	1.0V	4.2V	4.9V
3	ADD	0V	0V	0V
4	CLK	4.6V	4.6V	4.6V
5	DATA	4.8V	4.8V	4.8V
6	NC	0V	0V	0V
7	5V	5.0V	5.0V	5.0V
8	NC	0V	0V	0V
9	+33V	33.6V	33.6V	33.6V
10	NC	0V	0V	0V
11	IF	0V	0V	0V

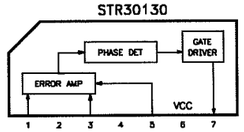
NOTE: VHF Low Band voltages taken on channel 2.
VHF High Band voltages taken on channel 7.
UHF Band voltages taken on channel 14.

TUNER TERMINAL GUIDE

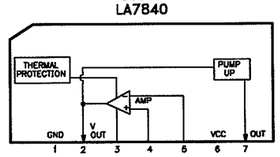


IC FUNCTIONS

IC701
STR30130



IC501
LA7840



MISCELLANEOUS ADJUSTMENTS

ENTERING SERVICE MODE

Service mode adjustments are required when IC201 and IC2101 are replaced. If the CRT is replaced, perform only adjustments relating to the picture tube.

To enter the service mode, remove the AC power, and press and hold the channel up and volume up buttons while restoring AC power. The receiver will come on with the service mode displayed.

When in the service mode a menu is displayed in blue. Pressing the channel up / down buttons on the receiver or remote transmitter will change the color of the item selected to yellow. Pressing the volume up / down buttons on the receiver or remote transmitter will enter the selected item submenu. Press the channel up / down buttons to select the adjustment item, and the data value of that service item can be changed by pressing the volume up / down buttons on the receiver or remote transmitter.

NOTE: EEPROM adjustment is Factory set DO NOT ADJUST.

EXIT SERVICE MODE

Turn off the power or unplug the receiver to exit service mode.

HIGH VOLTAGE CHECK

Tune in a picture. Set brightness, color, and picture to minimum. Connect a high voltage probe to the CRT anode. The high voltage should read between 24kV and 26kV.

B+ CHECK

Turn receiver on and tune in an active station. Set picture and brightness to normal. Check the voltage at pin 4 of IC701, it should be 129V ±1V*.

* Taken from a common tie point.

SERVICE MODE

DEF
SIGNAL
FIX VALUE

EEPROM

DISPLAY OF THE MAIN MENU
COLOR OF ITEM SELECTED CHANGES

D01 0C (012) **D02** 25 (037)
D03 20 (032) **D04** 18 (024)
D05 12 (018) **D06** 0F (015)

RETURN

DISPLAY IF THE DEF CATEGORY IS
SELECTED ON THE MAIN MENU

S01 1B (027) **S02** 02 (002)
S03 00 (000) **S04** 60 (096)
S05 6B (107) **S06** 17 (023)
S07 00 (000) **S08** 54 (084)
S09 62 (098) **S10** 5F (095)
S11 3A (058) **S12** 44 (068)
S13 3E (062)

RETURN

DISPLAY IF THE SIGNAL CATEGORY IS
SELECTED ON THE MAIN MENU

F01 B0 (176) **F02** 04 (004)
F03 2A (042) **F04** 00 (000)
F05 03 (003) **F06** 7C (124)
F07 00 (000) **F08** 04 (004)
F09 0C (012) **F10** 00 (000)
F11 0F (015) **F12** 01 (001)
F13 07 (007) **F14** 01 (001)

RETURN **NEXT**

DISPLAY IF THE FIX VALUE CATEGORY IS
SELECTED ON THE MAIN MENU

F15 19 (025) **F16** 00 (000)
F17 02 (002) **F18** 00 (000)
F19 04 (004) **F20** 02 (002)
F21 01 (001) **F22** 01 (001)
F23 00 (000) **F24** 08 (008)
F25 03 (003) **F26** 06 (006)

RETURN **PREVIOUS**

DISPLAY IF "NEXT" IS SELECTED
ON THE FIX VALUE FIRST MENU

NOTE: AT ANY TIME THE RETURN ITEM IS SELECTED, THE MAIN SERVICE MODE MENU WILL BE DISPLAYED.

MISCELLANEOUS ADJUSTMENTS continued

PURITY & CONVERGENCE

Convergence and purity are factory set. No convergence or purity required.

RF AGC DELAY

Tune in an active station. Activate the service adjustments display. Enter the Signal category of the menu, and select "S01". Press the volume up or down button to set data value to a point where snow just appears, then press the volume up or down button until snow disappears. Exit service mode and check other channels for a snow free picture.

VIDEO LEVEL

Tune in a picture. Set color and brightness to midrange. Set the contrast to maximum. Activate the service adjustments display. Enter the Signal category of the menu, and select "S02". Press the volume up or down button to set data value for 02 ±2 step to have a normal contrast level.

SCREEN ADJUST

Connect an oscilloscope to TP855 and ground on the CRT board. Tune in a crosshatch pattern. Set color, brightness, and picture to minimum. Enter the service mode and select service number S04 and adjust the data value to "60". Select service numbers S05, S06, S07, adjust data value for minimum. Select service number S03, adjust data value for "01" to turn off the luminance signal (Y-Mute). Select service number S13, adjust data value for 2.4V dc level on the scope. Adjust screen control, if necessary, to obtain a barely visible raster. Select service numbers S05, S06, S07, adjust data value for a good gray scale with normal white at high and low brightness. Select service number S03, adjust data value for "00". Set color to midrange. Adjust screen control for normal brightness.

WHITE BALANCE

Operate the receiver for 15 minutes. Activate the service adjustments display. Enter the Signal category of the menu, and select "S12". Press the volume up or down button to set data value for "00" then press channel up button on the remote to slect and select "S08" and "S09". Set the data values to obtain white screen. Set brightness for a visible raster. Alternately adjust data value of service numbers "S08" and "S09" , until a good gray scale with normal white is obtained. Set the data value of "S12" for normal color level.

SUB PICTURE

Tune in a picture. Set color and brightness to midrange. Set the contrast to maximum. Activate the service adjustments display. Enter the Signal category of the menu, and select "S10". Press the volume up or down button to set data value for normal contrast. Exit service mode and check other channels.

SUB TINT

Tune in a picture. Set color and brightness to midrange. Set the contrast to maximum. Activate the service adjustments display. Enter the Signal category of the menu, and select "S11". Press the volume up or down button to set data value for best flesh tone. Exit service mode and check other channels.

SUB COLOR

Tune in a color bar pattern. Set color and brightness to midrange. Set the contrast to maximum. Activate the service adjustments display. Enter the Signal category of the menu, and select "S12". Press the volume up or down button to set data value for best color level on screen. Exit service mode and check other channels for normal color picture.

SUB BRIGHTNESS

Tune in a picture. Set color, contrast, and brightness to minimum. Activate the service adjustments display. Enter the Signal category of the menu, and select "S13". Press the volume up or down button to set data value to a point where highlights are just visible.

HORIZONTAL POSITION

Tune in a crosshatch pattern. Set color and brightness to midrange. Set the contrast to maximum. Activate the service adjustments display. Enter the DEF category of the menu, and select "D01". Press the volume up or down button to set data value to adjust for best horizontal centering with slight overscan on both sides.

VERTICAL LINEARITY & V-S CORRECTION

Tune in a crosshatch pattern. Set color and brightness to midrange. Set the contrast to maximum. Activate the service adjustments display. Enter the DEF category of the menu, and select "D05". Press volume up or down button to adjust for the best vertical linearity. Select "D06", and repeat the process to adjust for the best vertical linearity.

VERTICAL SIZE

Tune in a crosshatch pattern. Set color and brightness to midrange. Set the contrast to maximum. Activate the service adjustments display. Enter the DEF category of the menu, and select "D02". Press volume up or down button to adjust for slight overscan on top and bottom.

VERTICAL PHASE

Tune in a crosshatch pattern. Set color and brightness to midrange. Set the contrast to maximum. Activate the service adjustments display. Enter the DEF category of the menu, and select "D03". Press volume up or down button to adjust for best vertical centering with slight overscan on top and bottom.

CAPTION POSITION CENTERING

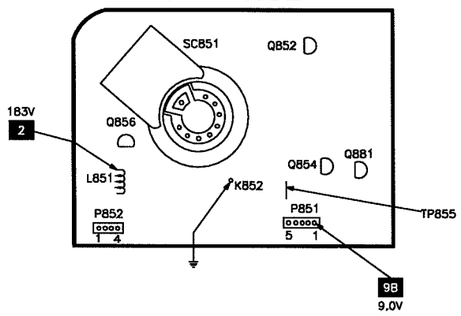
Activate the service adjustments display. Enter the DEF category of the menu, and select "D04". Press the volume up or down button to adjust for best horizontal centering of the on screen display of text box.

SERVICE MODE ADJUSTMENTS

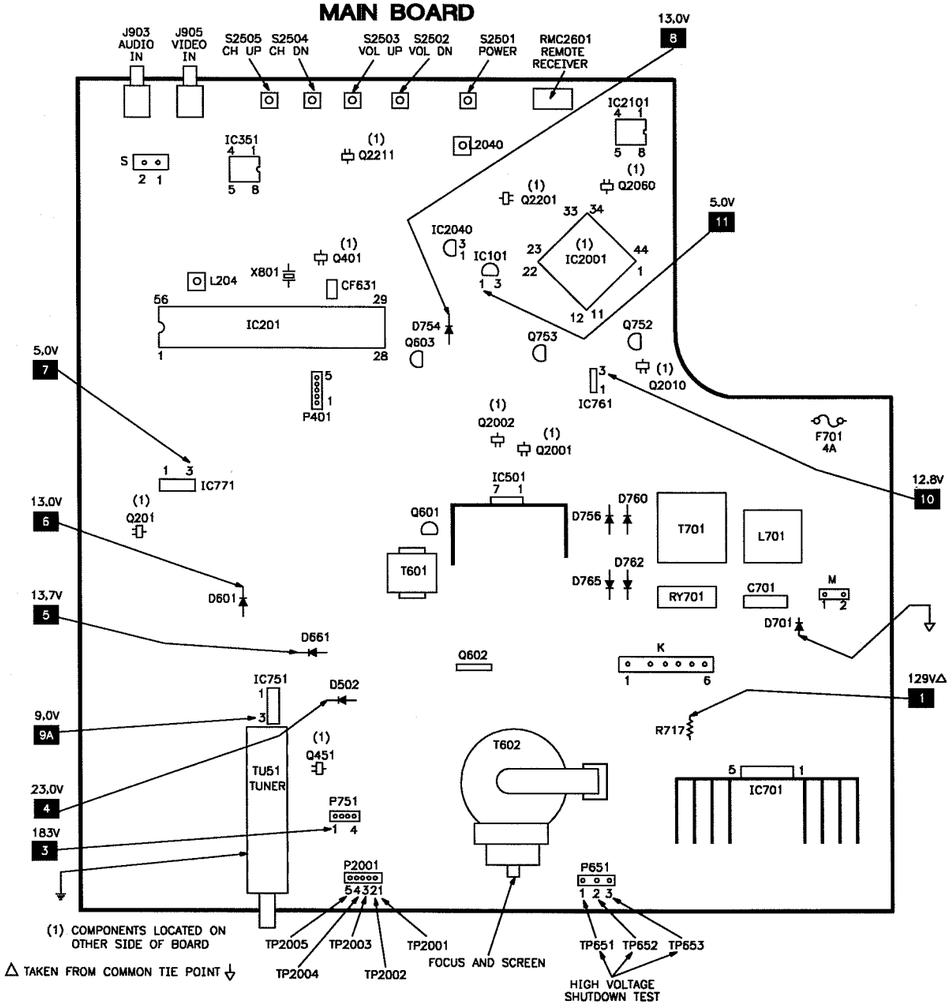
Item	Adjustment	Adjustment	Value Range	INIT Value (HEX)	On-set Value (HEX)	Notes
DEF						
D01	H PHASE	Horizontal Centering	00 - 1F	0C	0C	Adjust for proper horizontal centering.
D02	V SIZE	Vertical Size	00 - 7F	40	25	Adjust for proper vertical size.
D03	V POSI	Vertical Centering	00 - 3F	20	20	Must be set to 20.
D04	CC - POSI	Caption Centering	00 - FF	1A	18	Adjust for proper horizontal centering of text box.
D05	V LIN	Vertical Linearity	00 - 1F	10	12	Must be set to 12.
D06	V SC	Vertical Size Correction	00 - 1F	10	0F	Must be set to 0F.
SIGNAL						
S01	RF AGC	RF AGC	00 - 3F	14	1B	-
S02	VIDEO LEVEL	Video Level	00 - 07	03	02	-
S03	Y-MUTE	Y-Mute	00 - 03	00	00	"01" Y-Mute, "02" V-Stop&Y-Mute, "03" Activate color killer.
S04	SUB BIAS	-	00 - FF	40	60	Must be set to 60.
S05	RED BIAS	Red Cut Off	00 - FF	00	6B	-
S06	GREEN BIAS	Green Cut Off	00 - FF	00	17	-
S07	BLUE BIAS	Blue Cut Off	00 - FF	00	00	-
S08	RED DRIVE	Red Drive	00 - 7F	40	54	-
S09	BLUE DRIVE	Blue Drive	00 - 7F	40	62	-
S10	CONTRAST	Sub Contrast	00 - 7F	5A	5F	-
S11	TINT	Sub Tint	00 - 7F	40	3A	-
S12	COLOR	Sub Color	00 - 7F	40	44	-
S13	BRIGHTNESS	Sub Brightness	00 - 7F	40	3E	-
FIX VALUE						
F01	OPTION 1	OPTION 1	00 - FF	B0	B0	Must be set to B0 for 19N-M100 / M100S, and set to A0 for CN19M10.
F02	OPTION 2	OPTION 2	00 - FF	04	04	Must be set to 04.
F03	E-SAVE	-	00 - 3F	23	2A	-
F04	TUNER SETUP	-	00 , 01	00	00	-
F05	R-TONE RD	-	00 - 7F	19	03	-
F06	R-TONE BD	-	00 - 7F	00	7C	-
F07	B-TONE RD	-	00 - 7F	00	00	-
F08	B-TONE BD	-	00 - 7F	12	04	-
F09	FM LEVEL	FM Level	00 - 1F	0C	0C	-
F10	AFC GAIN	AFC Gain	00 , 01	00	00	-
F11	G DRIVE	Green Drive	00 , 0F	00	0F	-
F12	FBT BLK SW	-	00 , 01	01	01	-
F13	V COMP	Vertical Compression	00 - 07	07	07	-
F14	OSD CONT	OSD Contrast	00 - 03	02	01	-
F15	SHARPNESS	Sharpness	00 - 3F	19	19	-
F16	FLT SYS	-	00 - 07	00	00	-
F17	KILLER OP	-	00 - 07	04	02	-
F18	PRE SHOOT	-	00 - 03	03	00	-
F19	CORING	-	00 - 03	04	04	-
F20	DC REST	-	00 - 03	02	02	-
F21	BS START	-	00 - 03	01	01	-
F22	BS GAIN	-	00 - 03	01	01	-
F23	ABL START	-	00 - 07	00	00	-
F24	R/B ANGLE	-	00 - 0F	08	08	-
F25	H BLK R	-	00 - 0F	04	03	-
F26	H BLK L	-	00 - 0F	04	06	-

PLACEMENT CHART

CRT BOARD



MAIN BOARD



Important Parts Information

- The parts listed here are those not usually available from a well-stocked supply cabinet or bin.
- Where items may be replaced with equivalent parts, several alternates are shown from participating vendors.
- On the parts lists, safety items are marked with a # to remind you that only exact replacements are recommended for these items.
- When ordering parts, state the model number, part number, and description.

Obtaining Parts

Many of these parts are available from your local Sams authorized distributor or the manufacturer of the equipment. Call Sams for the name of your nearest distributor:

800-428-7267

Or consult the Sams *Annual Index* for the address of the original equipment manufacturer.

Participating Vendors

Information on test equipment and replacement parts is listed in these pages for the following participating vendors. Consult the Sams *Annual Index* for their current address.

- NTE Electronics, Inc. (NTE)
- Sencore, Inc.

TELEVISION SCHEMATIC

A

B

NC TO TUNER ← NC
VT TO TUNER ← NC
NC TO TUNER ← NC
NC TO TUNER ← NC
ADD TO TUNER

SEE IC2001 PIN 10 PAGE 2G
R2010 1000
R210 100K
R211 100K
C220 .1
7 5.0V

IF TO TUNER
C201 .01
Q201 2SC2735 IF AMP
1.0V 7.3V .3V
R201 220
R202 1200
R203 6800
R204 27
R205 68
L201
C203 .01
SF201 SAW FILTER
L202
R208 3300
C206 .001
R206 150
C202 .01
9A 9.0V
TUNER NOT INCLUDED IN THIS COVERAGE

AGC TO TUNER
R57 3900
RF AGC RANGE 3.8V TO 8.1V
C54 4.7µF
R56 82K
R207 12K
9A 9.0V
C205 .01
SEE IC2001 PIN 13 PAGE 2G

33V TO TUNER
C53 1µF
D52 32.0V
#R53 22K 5W
3 183V

5V TO TUNER
7 5.0V

J903 AUDIO IN
C905 10µF
R906 1000
R925 100K
L301
C304 47pF
C301 47pF
R301 1000
L204

51 2.2V EXT AUDIO IN
54 SIF IN 3.0V
PART OF IC201 TV SIGNAL PROCESSOR
AUDIO OUT 2.3V
SIF APC 2.3V
FM OUT 2.3V
FM FILTER 1.7V
53 2 9
C305 .01
C302 .001
R302 3300
C303 .01
R209 12K
C209 1µF

C354 2.2µF
R357 8200
C356 .0033
R354 10K
AN7511 IC351 AUDIO OUT
1 IN 0V
2 6.2V 6
S 2
S 1
SP1 32Z
4 MUTE 5.0V
1 POWER 3.9V
5 VCC 12.0V
3 GND
7 PWR GND
8 – 6.2V
C358 10µF
R355 22K
SEE IC2001 PIN 3 PAGE 2G
C357 10µF
R353 68K
SEE IC2001 PIN 1 PAGE 2G
#R736 33 5W
10 12.8V
C361 1000µF

TAKEN WITH BAR SWEEP GENERATOR
2.1V 10µs
R412 1000
Q401 2C3928 BUFFER
3.0V .7V
R413 1500
7 5.0V
R410 470
C416 1µF

10 2.5V AFT
48 4.2V VCO 2
49 4.2V VCO 1
52 1.5V SIF OUT
SAW IN 2.8V
PART OF IC201 TV SIGNAL PROCESSOR
VIDEO OUT 2.0V
PIF AGC 2.5V
46
SAW IN 2.8V
5
RF AGC 3.8V
4
APL FIL 2.6V
31
IF GND
7
VIDEO BUS GND
41
AGC FILT .8V
39
IF VCC 5.0V
8
3
C421 10µF
R421 22K
C802 10µF
L203
C207 47µF
C208 .01
7 5.0V
C204 .022
IF AGC RANGE 1.5V TO 2.5V

TV/VIDEO IN 2.6V
44
PART OF IC201 TV SIGNAL PROCESSOR
SCL 4.8V
12
SDA 4.8V
11
EXT VIDEO 2.5V
42
SEL V OUT 2.2V
40
VIDEO VCC
43
7 5.0V
SEE Q2060 BASE PAGE 2G
R961 100
SEE IC2001 PIN 33 PAGE 2G
R962 100
SEE IC2001 PIN 34 PAGE 2G
R901 100
J905 VIDEO IN
C901 1µF
R902 75

INTERNAL SYNC
5.0V 10µs
8.9V 10µs
2.1V 5ms
R623 5600
PART OF IC201 TV SIGNAL PROCESSOR
SYNC SEP OUT .34V 22
FBP IN 1.1V 28
AFC 2.6V 26
H/BUS VCC 5.1V 25
X-RAY 0V 34
H GND 33
24 2.4V
VCO REF 1.7V 29
H OUT 1.3V 27
V OUT 2.4V 23

R404 1000
SEE IC2001 PIN 36 PAGE 2G
R623 10K
R635 3300
C636 .015
C635 1µF
R634 150
C634 .01
C633 470µF
R636 120
8 13.0V
R622 2200
SEE Q2211 BASE PAGE 2G
L2201
#R641 6800 1W
D641 9.1V
A1
A
#R655 10K
C653 1µF
P651 TP653 2
P651 TP652 1
#D653 27.0V
#R662 1000 2%
P651 TP651 3
#R654 150K
#D651
#R651 1
C652 4.7µF
A2

3.8V 10µs
Q603 2SC945 BUFFER
R606 1000 1.3V
1.0V
6 13.0V
R608 100
R605 3300

31.7V 5ms
32.5V 5ms
53V 5ms
LA7840 IC501 VERT OUT
5 2.3V
2.5V
23.3V
1.9V
12.6V 2
4 6 3 7 1
C516 .0022
C517 .22µF
R522 1000
R525 2700
9A 9.0V
4 23.0V
C520 100µF
D511
SEE Q2201 BASE PAGE 2G
D510
R515 390 1W
C513 .047
R514
C512 .22
R518 33K
R516 15K
C515 4.7µF
R519 10K
R517 1000
C514 1000µF
R520 1.2
R513 1000 1W
R512 1000 1W
4 23.0V

DY601 YOKE
3.8
17
K 1
K 5
K 6
K 3
#R610 390 2W
1 129V△
C612 .47 250V (200V)

Q601 2SC2655 HORIZ DRIVER
.3V 9.6V
R609 330
34V 10µs
R602 82
C609 .022
#R603 22 3W
6 13.0V
#T601
28.3V△ 10µs
FB603
FB602
#Q602 2SD2586 HORIZ OUT
.05V△ 129V△ 0V△
#C608 .0077 (.0008) 1.6kV

ADDITIONAL SCHEMATIC NOTES, SEE PAGE 2E

△ TAKEN FROM COMMON TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE®
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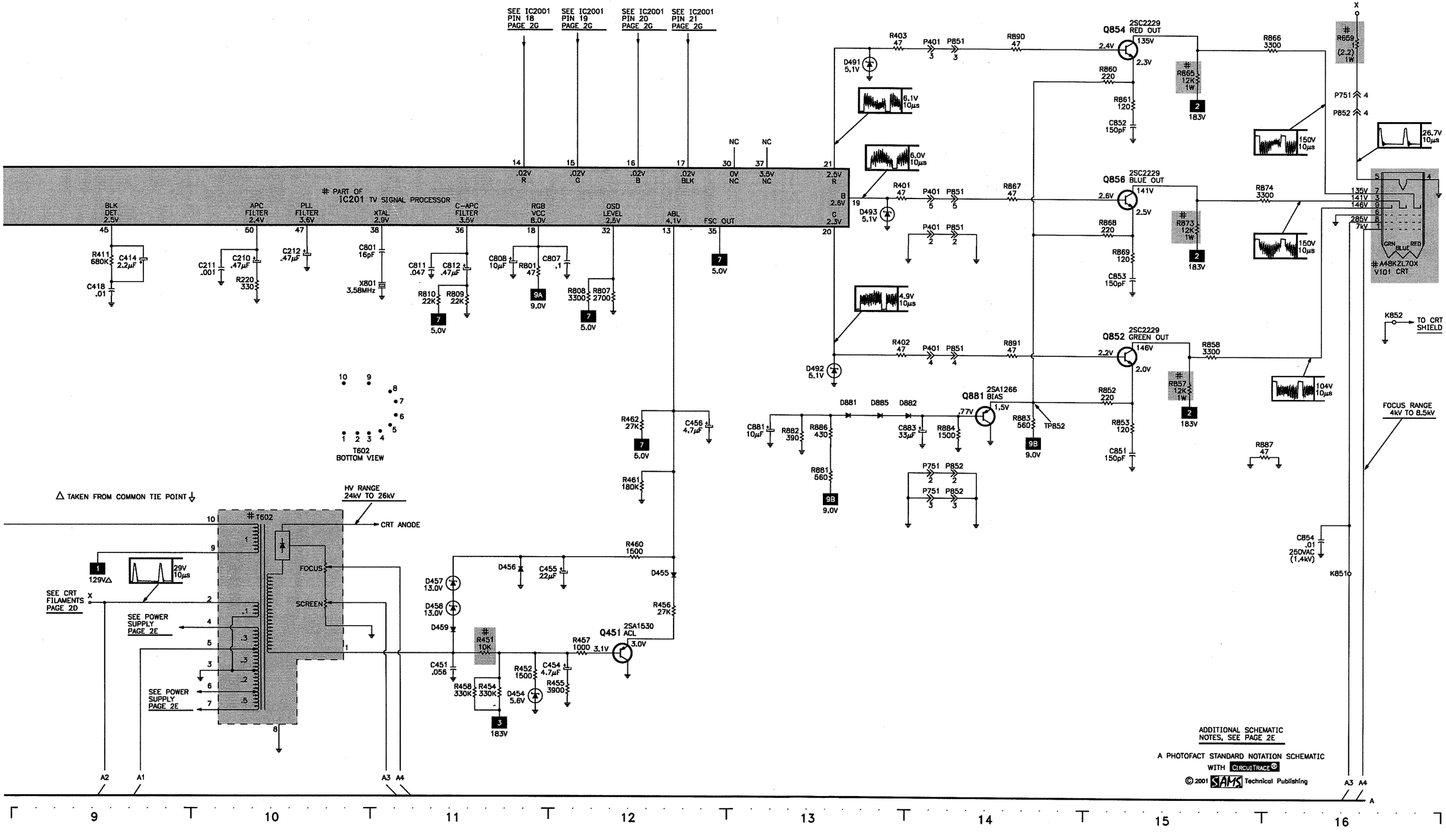
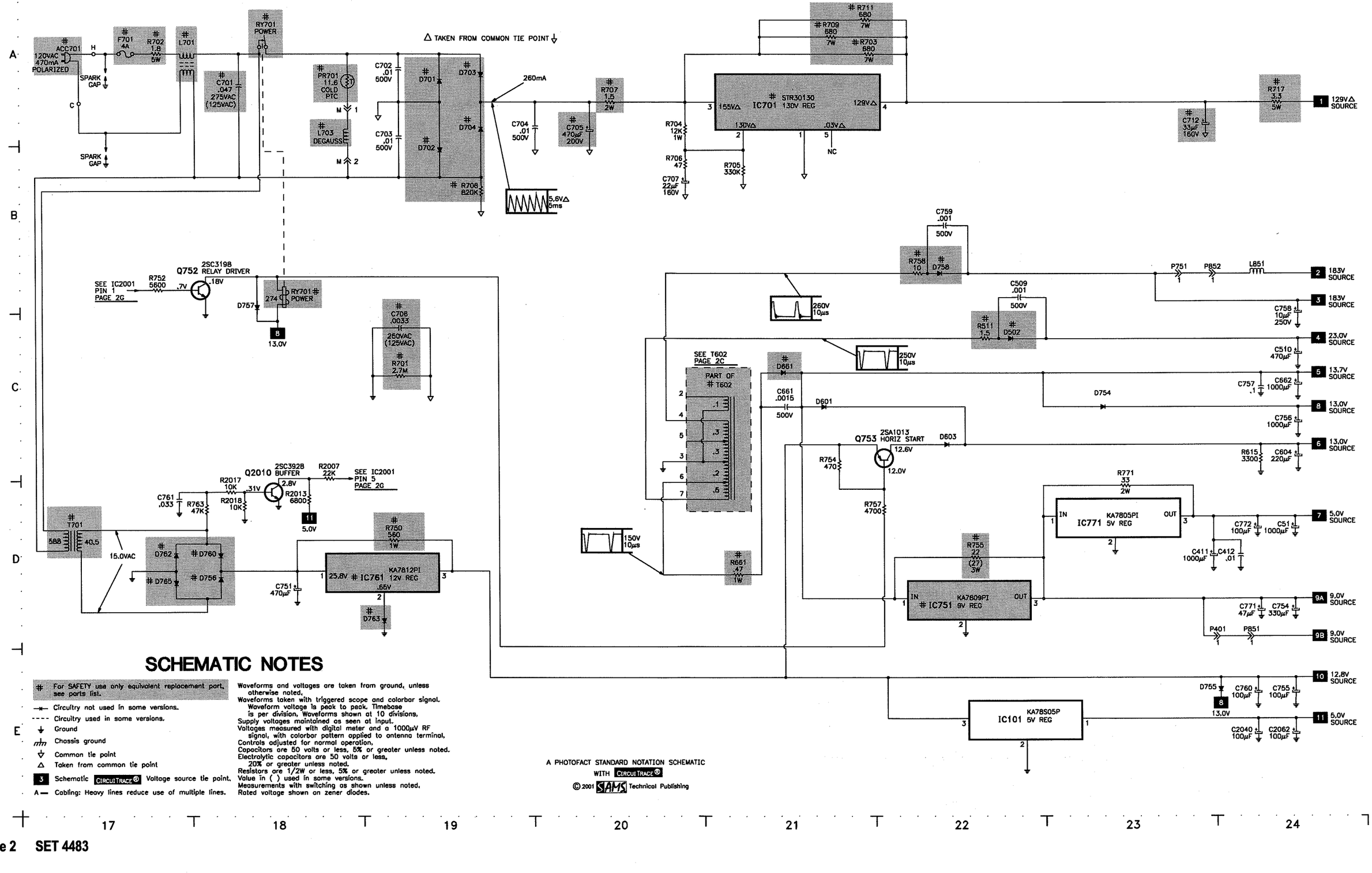
1 2 3 4 5 6 7 8

TELEVISION SCHEMATIC continued



POWER SUPPLY SCHEMATIC



SCHEMATIC NOTES

For SAFETY use only equivalent replacement part, see parts list.

—×— Circuitry not used in some versions.

- - - - Circuitry used in some versions.

Ground

Chassis ground

Common tie point

△ Taken from common tie point

3 Schematic CIRCUITRACE® Voltage source tie point.

A— Cabling: Heavy lines reduce use of multiple lines.

Waveforms and voltages are taken from ground, unless otherwise noted.
Waveforms taken with triggered scope and colorbar signal. Waveform voltage is peak to peak. Timebase is per division. Waveforms shown at 10 divisions.
Supply voltages maintained as seen at input.
Voltages measured with digital meter and a 1000µV RF signal, with colorbar pattern applied to antenna terminal.
Controls adjusted for normal operation.
Capacitors are 50 volts or less, 5% or greater unless noted.
Electrolytic capacitors are 50 volts or less, 20% or greater unless noted.
Resistors are 1/2W or less, 5% or greater unless noted.
Value in ( ) used in some versions.
Measurements with switching as shown unless noted.
Rated voltage shown on zener diodes.

A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE®

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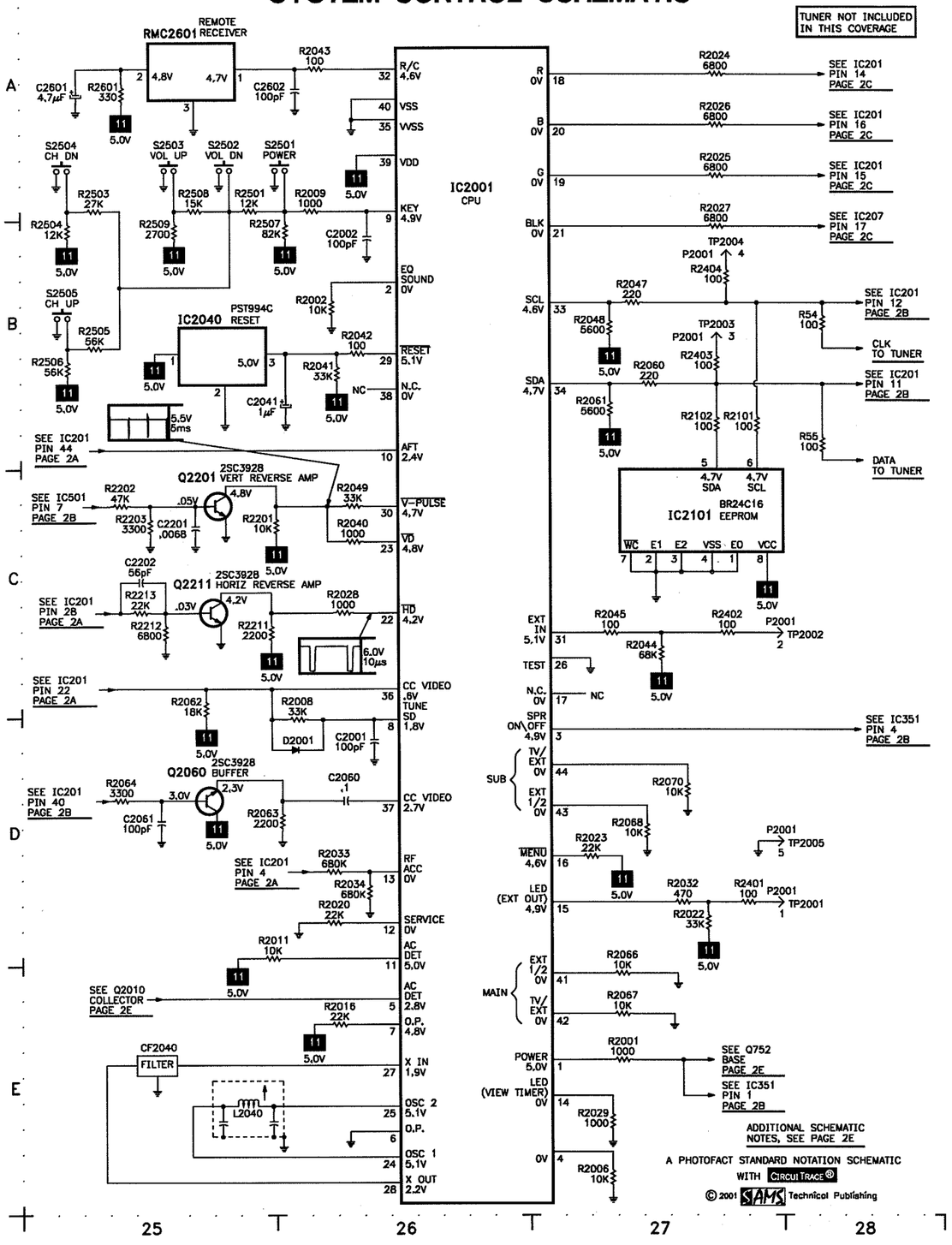
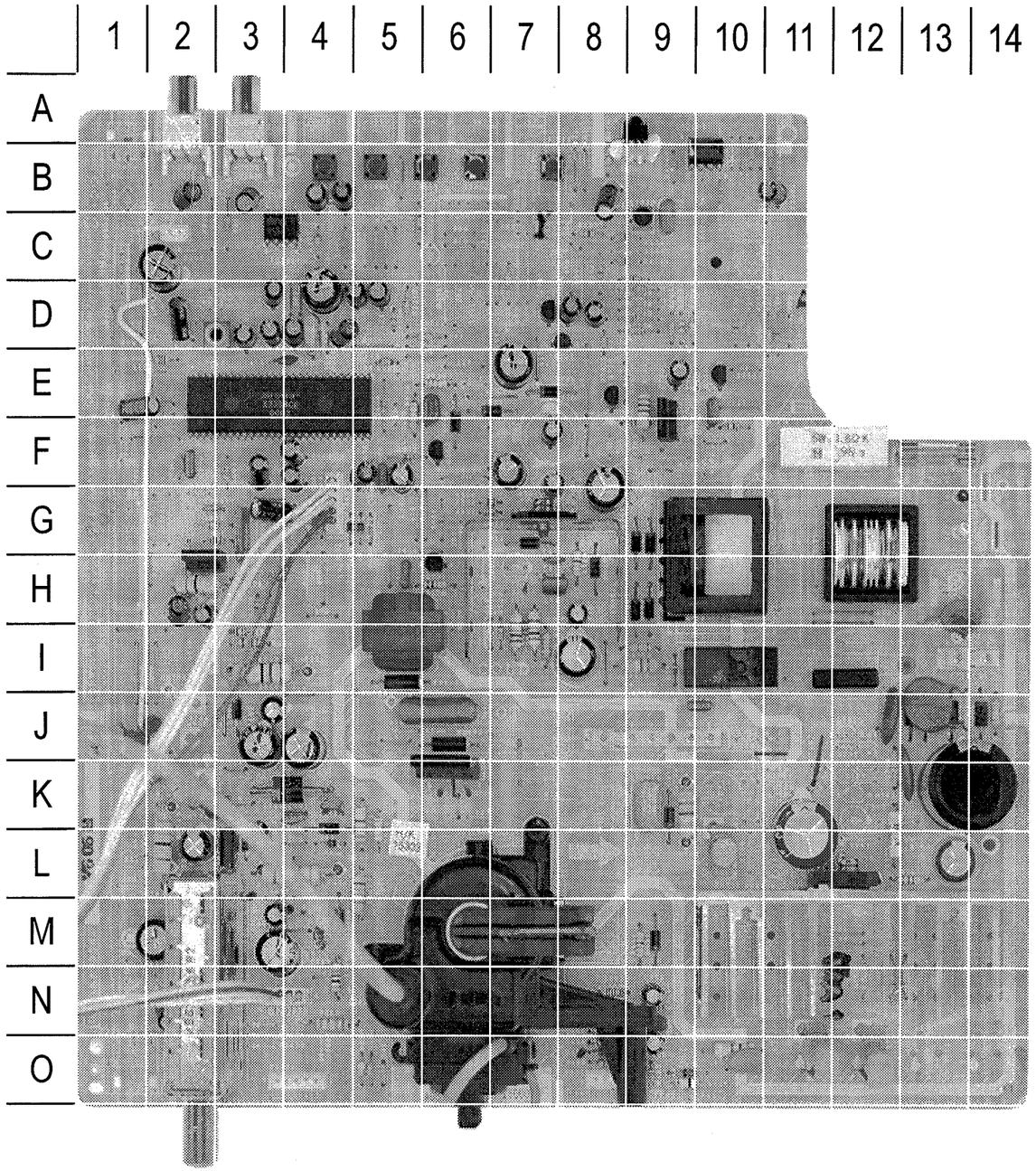
SYSTEM CONTROL SCHEMATIC



SCHEMATIC COMPONENT LOCATION GUIDE

ACC701	A17	C661	C21	D502	C22	PR701	A18	R461	D12	R807	C12	R2042	B26
C51	D24	C662	C24	D510	D6	Q201	B1	R462	C12	R808	C12	R2043	A26
C53	C1	C701	A18	D511	D5	Q401	B5	R511	C22	R809	C11	R2044	C27
C54	C1	C702	A19	D601	C21	Q451	E12	R512	D7	R810	C11	R2045	C27
C201	B1	C703	B19	D603	C22	Q601	E4	R513	D7	R852	C15	R2047	B27
C202	B2	C704	A19	D641	E1	Q602	E6	R514	D7	R853	C15	R2048	B27
C203	B2	C705	B20	D651	E2	Q603	E3	R515	D7	R857	C15	R2049	C26
C204	B4	C706	C19	D653	D2	Q752	B17	R516	D7	R858	C15	R2060	B27
C205	C3	C707	B20	D661	C21	Q753	C21	R517	D6	R860	A15	R2061	B27
C206	B2	C712	A23	D701	A19	Q852	C15	R518	D6	R861	B15	R2062	D25
C207	B4	C751	D18	D702	B19	Q854	A15	R519	D6	R865	A15	R2063	D26
C208	B4	C754	D24	D703	A19	Q856	B15	R520	D6	R866	A16	R2064	D25
C209	B5	C755	E24	D704	B19	Q881	C14	R522	D4	R867	B14	R2066	E27
C210	B10	C756	C24	D754	C23	Q2010	D18	R523	D4	R868	B15	R2067	E27
C211	B10	C757	C24	D755	E23	Q2060	D25	R525	D5	R869	B15	R2068	D27
C212	B10	C758	C24	D756	D18	Q2201	C25	R602	E5	R873	B15	R2070	D27
C220	B2	C759	B22	D757	C18	Q2211	C25	R603	E5	R874	B15	R2101	B27
C301	A3	C760	E24	D758	B22	R53	C2	R605	E3	R881	D13	R2102	B27
C302	A4	C761	D17	D760	D18	R54	B28	R606	E3	R882	C13	R2201	C25
C303	A4	C771	D24	D762	D17	R55	B28	R608	E4	R883	C14	R2202	C25
C304	A4	C772	D24	D763	D19	R56	C1	R609	E4	R884	C14	R2203	C25
C305	A4	C801	B11	D765	D17	R57	C1	R610	D8	R886	C13	R2211	C25
C354	A5	C802	B3	D881	C13	R201	B1	R615	C24	R887	D15	R2212	C25
C356	A5	C807	B12	D882	C13	R202	B1	R622	E1	R890	A14	R2213	C25
C357	A6	C808	B11	D885	C13	R203	B1	R623	D1	R891	C14	R2401	D27
C358	A6	C811	B11	D2001	D26	R204	B1	R624	D3	R901	B7	R2402	C27
C361	B6	C812	B11	DY601	D8	R205	B2	R634	D1	R902	C7	R2403	B27
C411	D23	C851	C15	F701	A17	R206	B2	R635	D1	R906	A3	R2404	B27
C412	D24	C852	B15	FB602	E6	R207	C2	R636	E1	R925	A3	R2501	B25
C414	B9	C853	C15	FB603	E5	R208	B2	R641	E1	R961	B6	R2503	B25
C416	B5	C854	D16	IC101	E22	R209	A5	R651	E2	R962	B6	R2504	B25
C418	C9	C881	C13	IC201	A4	R210	B2	R654	E2	R2001	E27	R2505	B25
C421	B3	C883	C14	IC201	B10	R211	B2	R655	D2	R2002	B26	R2506	B25
C451	E11	C901	C7	IC201	B3	R220	C10	R659	A16	R2006	E27	R2507	B26
C454	E12	C905	A3	IC201	B6	R301	B3	R661	D21	R2007	D18	R2508	B25
C455	D12	C2001	D26	IC201	D1	R302	B4	R662	E2	R2008	D26	R2509	B25
C456	C12	C2002	B26	IC351	A6	R353	A6	R701	C19	R2009	B26	R2601	A25
C509	C22	C2040	E24	IC501	D5	R354	A5	R702	A17	R2010	B2	RMC2601	A25
C510	C24	C2041	B26	IC701	A21	R355	A6	R703	A21	R2011	E25	RY701	A18
C512	D7	C2060	D26	IC751	D22	R357	A5	R704	B20	R2013	D18	RY701	B18
C513	D7	C2061	D25	IC761	D19	R401	B13	R705	B21	R2016	E26	S2501	A25
C514	D7	C2062	E24	IC771	D23	R402	C13	R706	B20	R2017	D18	S2502	A25
C515	D6	C2201	C25	IC2001	B26	R403	A13	R707	A20	R2018	D18	S2503	A25
C516	D4	C2202	C25	IC2040	B25	R404	D1	R708	B19	R2020	D26	S2504	A25
C517	D4	C2601	A25	IC2101	C27	R410	B5	R709	A21	R2022	D27	S2505	B25
C520	D5	C2602	A26	J903	A3	R411	B9	R711	A21	R2023	D27	SF201	B2
C531	D3	CF2040	E25	J905	C7	R412	B4	R717	A24	R2024	A27	SP1	A7
C604	C24	D52	C2	L201	B2	R413	B5	R736	B6	R2025	A27	T601	E5
C608	E6	D454	E11	L202	B2	R421	C3	R750	D19	R2026	A27	T602	C21
C609	E5	D455	D12	L203	B4	R451	E11	R752	B17	R2027	B27	T602	D10
C612	D8	D456	D11	L204	B3	R452	E11	R754	C21	R2028	C26	T701	D17
C633	D2	D457	D11	L301	A3	R454	E11	R755	D22	R2029	E27	V101	B16
C634	D2	D458	D11	L701	A17	R455	E12	R757	D21	R2032	D27	X801	C11
C635	D1	D459	E11	L703	B18	R456	D12	R758	B22	R2033	D26		
C636	D2	D491	A13	L851	B24	R457	E12	R763	D18	R2034	D26		
C652	E2	D492	C13	L2040	E25	R458	E11	R771	D23	R2040	C26		
C653	D2	D493	B13	L2201	E1	R460	D12	R801	C11	R2041	B26		

MAIN BOARD - TOP VIEW



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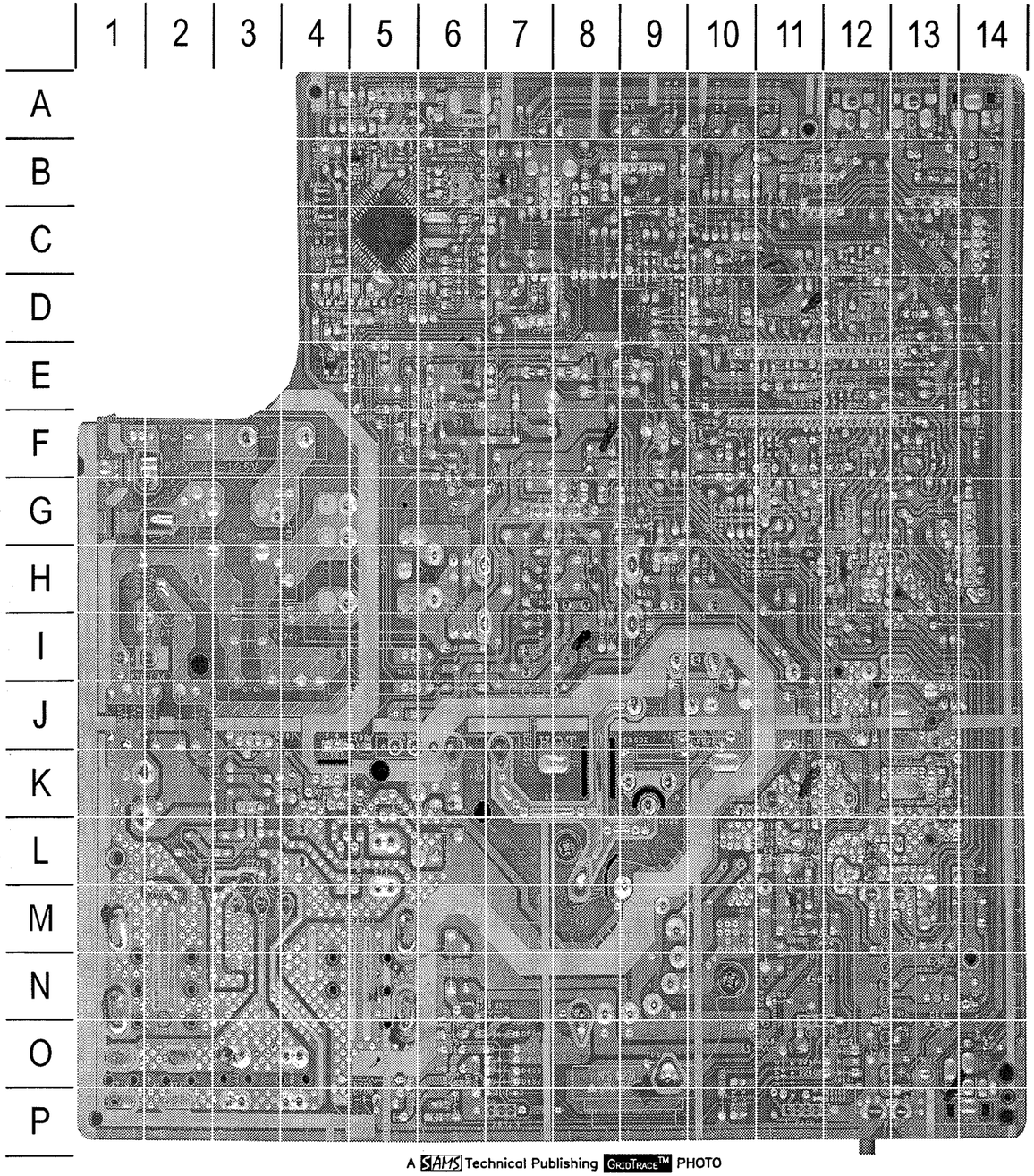
C51	M2	C636	F5	D455	L4	IC351	C4	R353	C4	R662	N8	R2032	D9
C53	L3	C652	N9	D456	O8	IC501	G8	R355	C2	R701	O10	R2033	D9
C54	N2	C653	D4	D457	O8	IC701	L12	R357	C3	R702	F12	R2040	C8
C204	F2	C661	K4	D458	O8	IC751	L3	R404	E5	R703	O12	R2042	C8
C205	G7	C662	J3	D459	N8	IC761	E9	R451	O9	R704	N12	R2043	B9
C207	F3	C701	I12	D491	G4	IC771	H2	R452	O9	R705	N13	R2048	B10
C209	F4	C702	J12	D492	G5	IC2040	D7	R454	O5	R706	L13	R2063	B11
C210	D2	C703	J13	D493	G4	IC2101	B10	R455	M4	R707	K12	R2064	B11
C212	D3	C704	K13	D502	K4	J903	A2	R457	L4	R708	J14	R2201	C8
C303	F2	C705	K14	D510	H8	J905	A3	R458	O5	R709	O11	R2202	C7
C354	E1	C706	O10	D511	G11	K	J8	R460	O8	R717	L10	R2211	C5
C357	B4	C707	L13	D601	J3	L201	H3	R511	L5	R736	K2	R2213	D5
C358	B3	C712	L11	D603	E7	L202	F3	R512	I7	R750	E9	R2601	B8
C361	C2	C751	F8	D641	L4	L203	G3	R513	I7	R752	E10	RMC2601	A9
C411	D4	C754	L2	D651	M9	L204	D3	R514	H8	R755	L2	RY701	I10
C414	D3	C755	E9	D653	N8	L301	E2	R515	I9	R757	E9	S	C2
C451	N9	C756	E7	D661	K4	L701	G12	R520	I7	R758	N4	S2501	B7
C454	M3	C757	K3	D701	J13	L2040	C9	R522	G7	R763	I9	S2502	B6
C455	O9	C758	M3	D702	J14	L2201	D6	R523	I7	R771	H2	S2503	B6
C456	F4	C759	M4	D703	J13	M	I13	R525	F6	R801	G4	S2504	B5
C509	K4	C760	F7	D704	J13	P401	G4	R602	H6	R901	C4	S2505	B4
C510	J4	C761	E10	D754	F6	P651	O8	R603	I3	R2001	D11	SF201	G3
C512	H7	C771	H2	D755	E7	P751	N3	R606	F5	R2007	D11	T601	H5
C513	J10	C772	H2	D756	G9	P2001	O4	R608	G6	R2008	B10	T602	M6
C514	I8	C802	D4	D757	I9	PR701	H13	R609	G6	R2010	C9	T701	G10
C515	H8	C808	G3	D758	M4	Q601	H6	R610	K9	R2011	D10	TP651	O8
C516	H7	C812	D5	D760	G9	Q602	K6	R615	I3	R2016	D10	TP652	O8
C517	F7	C901	B4	D762	H9	Q603	F6	R622	E5	R2017	F10	TP653	O8
C520	F7	C905	B2	D763	P9	Q752	E10	R624	D5	R2020	D9	TP2001	O4
C531	E6	C2040	D4	D765	H9	Q753	E8	R634	E5	R2022	D8	TP2002	O4
C604	J3	C2041	D8	D2001	B10	R53	L4	R636	E6	R2023	D9	TP2003	O4
C608	J6	C2062	B11	F701	F13	R57	G3	R641	L5	R2024	D9	TP2004	O4
C609	H5	C2601	B8	FB602	J6	R203	I3	R651	M9	R2025	D9	TP2005	O3
C612	K9	CF2040	C9	FB603	I6	R205	H3	R654	N9	R2026	D9	TU51	M2
C633	F5	D52	L3	IC101	D18	R206	I3	R659	N4	R2027	D9	X801	D4
C635	F5	D454	O9	IC201	F5	R207	G2	R661	K5	R2028	C8		

MAIN BOARD - BOTTOM VIEW



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MAIN BOARD - BOTTOM VIEW, GRIDTRACE LOCATION GUIDE

C201	I12	C801	D11	Q2211	C10	R403	F11	R754	E6	R2041	D7	R2402	P11
C202	H12	C807	F11	R54	O13	R410	D13	R807	E11	R2044	B6	R2403	P11
C203	H12	C811	C11	R55	O13	R411	E12	R808	D10	R2045	B6	R2404	O12
C206	F12	C2001	C5	R56	P13	R412	D12	R809	C11	R2047	B5	R2501	A8
C208	F12	C2002	C4	R201	M13	R413	D12	R810	D11	R2049	B6	R2503	A10
C211	E12	C2060	B5	R202	H12	R421	C10	R902	A12	R2060	B5	R2504	A10
C220	E12	C2061	B5	R204	H12	R456	M11	R906	B13	R2061	B5	R2505	A11
C301	D13	C2201	B7	R208	F12	R461	E11	R925	A13	R2062	B5	R2506	A11
C302	E13	C2202	D10	R209	F11	R462	H11	R961	E12	R2066	B4	R2507	A9
C304	E13	C2602	A6	R210	E12	R516	I7	R962	E12	R2067	B4	R2508	A9
C305	E13	IC2001	C5	R211	E12	R517	H7	R2002	C4	R2068	C4	R2509	A9
C356	B11	Q201	H12	R220	D13	R518	H7	R2006	C4	R2070	C4		
C412	E11	Q401	D12	R301	E12	R519	H8	R2009	C4	R2101	B5		
C416	D3	Q451	M11	R302	E13	R605	F10	R2013	D5	R2102	B5		
C418	E4	Q2010	E4	R354	B11	R623	E10	R2018	E4	R2203	B6		
C421	D5	Q2060	B5	R401	F11	R635	F10	R2029	C6	R2212	C10		
C634	F10	Q2201	B7	R402	F11	R655	E11	R2034	D5	R2401	P11		

SET 4483 Page 4

PARTS LIST

	Item No.	Type No.	Mfr. Part No.	NTE Part No.
	D52	-	RH-EX0676GEZZ	-
	D454	-	RH-EX0103CEZZ	NTE5011A
	D455, 56	-	RH-DX0475CEZZ	-
	D457, 58	-	RH-EX0644GEZZ	-
	D459	-	RH-DX0475CEZZ	-
	D491, 92, 93	-	RH-EX0630GEZZ	NTE139A
#	**D502**	-	RH-DX0131CEZZ	NTE552
	D510	-	RH-EX0654CEZZ	-
	D511	-	RH-DX0441CEZZ	NTE116
	D601, 03	-	RH-DX0441CEZZ	NTE116
		-	RH-DX0110CEZZ	NTE116
	D641	-	RH-EX0630GEZZ	NTE139A
#	**D651**	-	RH-DX0131CEZZ	NTE552
#	**D653**	-	RH-EX0667GEZZ	-
#	**D661**	-	RH-DX0229CEZZ	NTE580
#	**D701** Thru			
#	**D704**	-	RH-DX0490CEZZ	-
	D754, 55	-	RH-DX0441CEZZ	NTE116
		-	RH-DX0110CEZZ	NTE116
#	**D756**	-	RH-DX0441CEZZ	NTE116
		-	RH-DX0110CEZZ	NTE116
	D757	-	RH-DX0475CEZZ	-
#	**D758**	-	RH-DX0131CEZZ	NTE552
#	**D760, 62**	-	RH-DX0441CEZZ	NTE116
		-	RH-DX0110CEZZ	NTE116
#	**D763**	-	RH-DX0475CEZZ	-
#	**D765**	-	RH-DX0441CEZZ	NTE116
		-	RH-DX0110CEZZ	NTE116
	D881, 82, 85	-	RH-DX0475CEZZ	-
	D2001	-	RH-DX0475CEZZ	-
	IC101	KA78S05P	VHiKA78S05P-1	-
		TA7805S	VHiTA7805S/-1	NTE1960
#	**IC201**	-	RH-iX3354CEZZ	-
	IC351	AN7511	VHiAN7511//-1	-
#	**IC501**	LA7840	VHiLA7840//-1	-
#	**IC701**	STR30130	VHiSTR301301E	NTE1777
#	**IC751**	KA7809PI	VHiKA7809Pi-1	NTE1966
#	**IC761**	KA7812PI	VHiKA7812Pi-1	NTE1970
		TA7812SI	VHiTA7812S/-1	NTE1970
	IC771	KA7805PI	VHiKA7805Pi-1	NTE1960
		TA7805S	VHiTA7805S/-1	NTE1960
	IC2001	TMPA8700PF	RH-iX3355CEN2	-
	IC2040	PST994C	VHiPST994C/-1	-
	IC2101	BR24C16	VHiBR24C16/-1	-
		M24C16B	VHiM24C01B/-1	-
	Q201	2SC2735	VS2SC2735//1E	NTE2402
	Q401	2SC3928R	VS2SC3928R/-1	-
	Q451	2SA1530R	VS2SA1530R/-1	-
	Q601	2SC2655Y	VS2SC2655Y/-1	NTE2363
#	**Q602**	2SD2586	VS2SD2586//1E	-
	Q603	2SC945AQ	VS2SC945AQ/-1	NTE85
		2SC3198Y	VS2SC3198-Y-1	NTE85
	Q752	2SC945AQ	VS2SC945AQ/-1	NTE85
		2SC3198Y	VS2SC3198-Y-1	NTE85
	Q753	2SA1013	VS2SA1013//1E	NTE32
	Q852, 54, 56	2SC2229(O)	VS2SC2229O/1E	NTE399
	Q881	2SA1266(Y)	VS2SA1266-Y-1	NTE290A
	Q2010, 60	2SC3928R	VS2SC3928R/-1	-
	Q2201, 11	2SC3928R	VS2SC3928R/-1	-

	Item No.	Function/Rating	Mfr. Part No.	Notes
#	**ACC701**	Line Cord	QACCD3090CESA	AC, Polarized
		Line Cord	QACCD3060CESA	AC, Polarized
		Line Cord	QACCD3064CESA	AC, Polarized
#	**C608**	.0077 1.6kV	VCFPVC3CA772H	-
		.0008 1.6kV	VCFPVC3CA802H	-
#	**C701**	.047 10% 275VAC	-	-
		.047 10% 125VAC	RC-FZ027SCEZZ	-
		.047 10% 125VAC	RC-FZ015SCEZZ	-
		.047 10% 125VAC	RC-FZ004SGEZZ	-
		.047 10% 125VAC	RC-FZ035SCEZZ	-
		.047 10% 125VAC	RC-FZ027CUMZZ	-
#	**C705**	470µF 200V	RC-EZ1022CEZZ	-
		470µF 200V	RC-EZ0522CEZZ	-
#	**C706**	.0033 250VAC	-	-
		.0033 125VAC	RC-KZ0092GEZZ	-
		.0033 125VAC	RC-KZ0311CEZZ	-
#	**C712**	33µF 160V	RC-EZ0638CEZZ	-
	C854	.01 250VAC	-	-
		.01 1.4kV	RC-KZ0160GEZZ	-
		.01 1.4kV	RC-KZ0029CEZZ	-
	CF2040	Filter	RFiLC0121GEZZ	-
#	**DY601** (1)	Yoke	RCiLH0100MEZZ	Horiz 2.6mH, Vert 27mH
#	**DY601** (2)	Yoke	RCiLH0105GJZZ	Horiz 2.8mH, Vert 31mH
#	**F701**	Fuse	QFS-B4023CEZZ	4Amp, 125VAC, Slow Blow
		Fuse	QFS-B4021CEZZ	4Amp, 125VAC, Slow Blow
	FB602, 03	Ferrite Bead	RBLN-0037CEZZ	-
	FH701	Fuse Holder	QFSHD1013CEZZ	-
	FH702	Fuse Holder	QFSHD1014CEZZ	-
	J903	Jack	QJAKE0159CEZZ	Audio In
	J905	Jack	QJAKE0158CEZZ	Video In
	L201, 02	1.2µH	VP-XF1R2K0000	-
	L203	22µH	VP-XF220K0000	-
	L204	VCO	RCiLi0632CEZZ	-
	L301	15æH	VP-XF150K0000	-
#	**L701** (3)	Line Choke	RCiLF0069PEZZ	-
		Line Choke	RCiLF0037CEZZ	-
		Line Choke	RCiLF0078PEZZ	-
		Line Choke	RCiLF0029PEZZ	-
		Line Choke	RCiLF0090CEZZ	-
#	**L701** (4)	Line Choke	RCiLF0090CEZZ	-
#	**L703**	Degaussing	RCiLG0014MEZZ	-
		Degaussing	RCiLG0108GJZZ	-
	L851	82µH	VP-DF820K0000	-
	L2040	Oscillator	RCiLB0131CEZZ	-
	L2201	.82µH	VP-XFR82K0000	-
#	**PR701**	11.6 Cold PTC	RMPTP0026CEZZ	-
#	**R53**	22K 5% 3W	VRS-VV3LB223J	-
#	**R451**	10K 5% 1/2W	VRS-SV2HC103J	-
#	**R511**	1.5 5% 1/2W	VRN-SV2HC1R5J	-
#	**R603**	22 5% 3W	VRS-VV3LB220J	-
#	**R610**	390 5% 2W	VRS-VV3DB391J	-
	R624	4700 1% 1/8W	VRN-RA2BK472F	-
#	**R641**	6800 5% 1W	VRS-VV3AB682J	-
#	**R651**	1 5% 1/2W	VRD-RM2HD1R0J	-
#	**R654**	150K 5% 1/8W	VRD-RA2BE154J	-
#	**R655**	10K 5% 1/6W	VRS-CY1JF103J	-
#	**R659**	1 5% 1W	VRS-VV3AB1R0J	-
		2.2 5% 1W	VRn-VV3AB2r2J	-
#	**R661**	.47 5% 1W	VRN-VV3ABR47J	-
#	**R662**	1000 2% 1/8W	VRD-RA2BE102G	-
#	**R701**	2.7M 5% 1/2W	RR-DZ0047CEZZ	-
		2.7M 5% 1/2W	RR-HZ0046CEZZ	-
		2.7M 5% 1/2W	VRC-UB2HG275K	-
#	**R702**	1.8 10% 5W Wirewound	VRW-KP3HC1R8K	-
#	**R703**	680 5% 7W	VRS-KA3NG681J	-
#	**R707**	1.5 5% 2W	VRN-VV3DB1R5J	-
#	**R708**	820K 5% 1/2W	VRD-RM2HD824J	-
#	**R709, 11**	680 5% 7W	VRS-KA3NG681J	-
#	**R717**	3.3 10% 5W	VRS-KA3HG3R3K	-
#	**R736**	33 5% 3W	VRS-VV3LB330J	-
#	**R750**	560 5% 1W	VRS-VV3AB561J	-
#	**R755**	22 5% 3W	-	-
		27 5% 3W	VRS-VV3LB270J	-
#	**R758**	10 5% 1/2W	VRS-SV2HC100J	-
#	**R857, 65, 73**	12K 5% 1W	VRS-VV3AB123J	-
	RMC2601	Receiver	RRMCU0232CEZZ	Remote
#	**RY701**	Relay	RRLYU0041CEZZ	Power
		Relay	RRLYJ0077CEZZ	Power
		Relay	RRLYJ0090CEZZ	Power
	S2501	Switch	QSW-K0202PEZZ	Power
		Switch	QSW-K0079GEZZ	Power
	S2502	Switch	QSW-K0202PEZZ	Volume Down
		Switch	QSW-K0079GEZZ	Volume Down
	S2503	Switch	QSW-K0202PEZZ	Volume Up
		Switch	QSW-K0079GEZZ	Volume Up
	S2504	Switch	QSW-K0202PEZZ	Channel Down
		Switch	QSW-K0079GEZZ	Channel Down
	S2505	Switch	QSW-K0202PEZZ	Channel Up
		Switch	QSW-K0079GEZZ	Channel Up
	SC851 (1)	Socket	QS0CV0933CEZZ	CRT
	SC851 (2)	Socket	QSOCV0840CEZZ	CRT
		Socket	QSOCV0826CEZZ	CRT
	SF201	Filter	RfiLC0441CEZZ	SAW
	SP1	Speaker	VSP0080PBP7YA	3 Round, 32 Ohms, 2W
#	**T601**	Horizontal Driver	RTRNZ0168CEZZ	-
#	**T602** (6)	Horizontal Output	RTRNF0149PEZZ	-
		Horizontal Output	RTRNF0163PEZZ	-
		Horizontal Output	RTRNF0197PEZZ	-
#	**T701**	Power	RTRNP0527CEZZ	-
	TU51	Tuner	VTU115B8035AH	UHF/VHF
#	**V101** (1)	CRT	VB48KRD89X/3E	A48KRD89X
#	**V101** (2)	CRT	VB48AFS15X/*S	A48KZL70X
		CRT	VB48KZL70X/*S	-
		CRT	VB48JLL40X/*S	-
	X801	Crystal	RCRSB0001PEZZ	3.58MHz
		Crystal	RCRSB0205CEZZ	3.58MHz
		Buttons	JBT-0003GJSA	-
		Magnet (1)	PMAGF3046CEZZ	Purity/Convergence
		Magnet (2)	PMAGF3006CEZZ	Purity/Convergence
		PC Board (1)	DUNTKA056WEV0	CRT
		PC Board (2)	DUNTKA056WEW3	CRT
		PC Board (5)	DUNTKA055WEV0	Main
		PC Board (4)	DUNTKA056WEV1	Main
		PC Board (2)	DUNTKA056WEW3	Main
		Transmitter	RRMCG1324CESA	Remote

 # For SAFETY use only equivalent replacement part.

(1) Used in models CN19M10 and 19N-M100S.
(2) Used in model 19N-M100.
(3) Used in models 19N-M100 and 19N-M100S.
(4) Used in model CN19M10.
(5) Used in model 19N-M100S.
(6) Focus and screen controls are part of T602.

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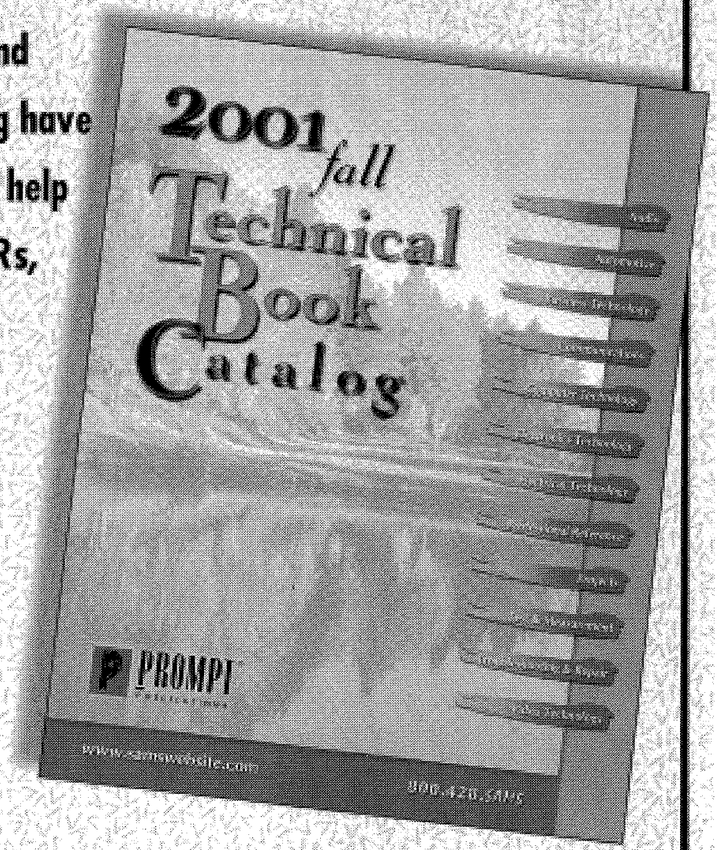

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TEST EQUIPMENT

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Oscilloscope	SC3100	Isolation Transformer	PR570
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RGB	CM2125	CRT Analyzer	CR7000
Multiburst Signal	VG91	AC Leakage Tester	PR570
Color Bar	VG91	Inductance Analyzer	LC102
TV Stereo	VG91	Flyback Yoke Tester	TVA92
Digital VOM	SC3100	Field Strength Meter	SL753
Frequency Meter	SC3100	Transistor Tester	TF46
Hi-Voltage Probe	HP200	Horizontal Analyzer	HA-2500
Accessory Probes	TP212	Video Analyzer	VG91, TVA92