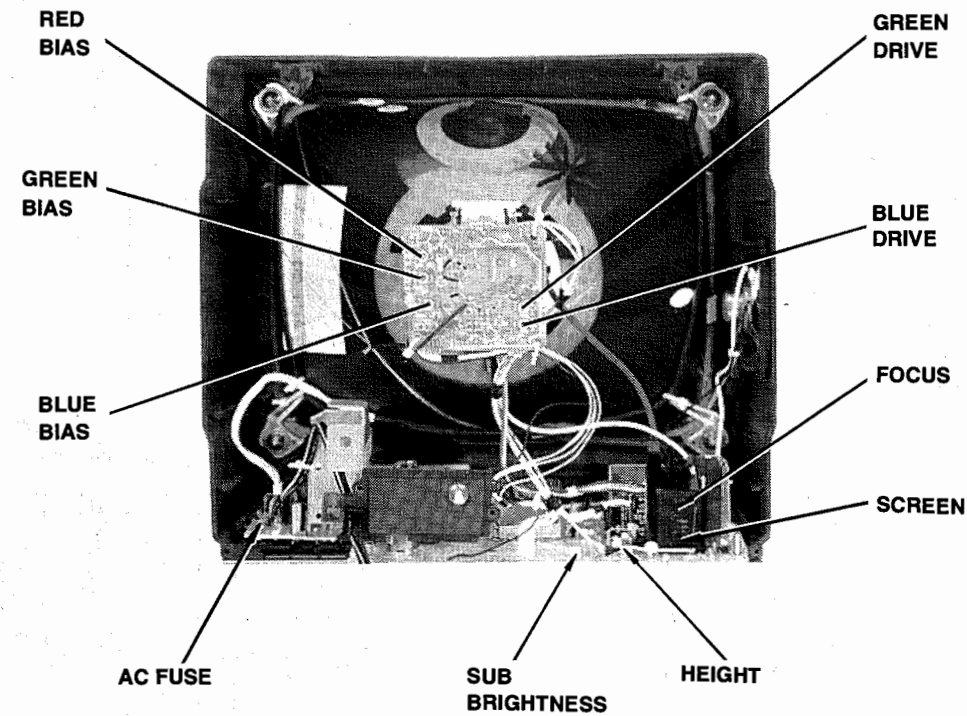


CABINET - REAR VIEW



PHOTOFACT® Technical Service Data

TOSHIBA  
Models CF1312A, CF1313A (Chassis TAC9121)



Model CF1313A

Essential coverage  
for servicing a television receiver...

- Schematics
- Component locations
- Parts lists



HOWARD W. SAMS & COMPANY

JUNE 1992 SET 3004

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

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SET 3004

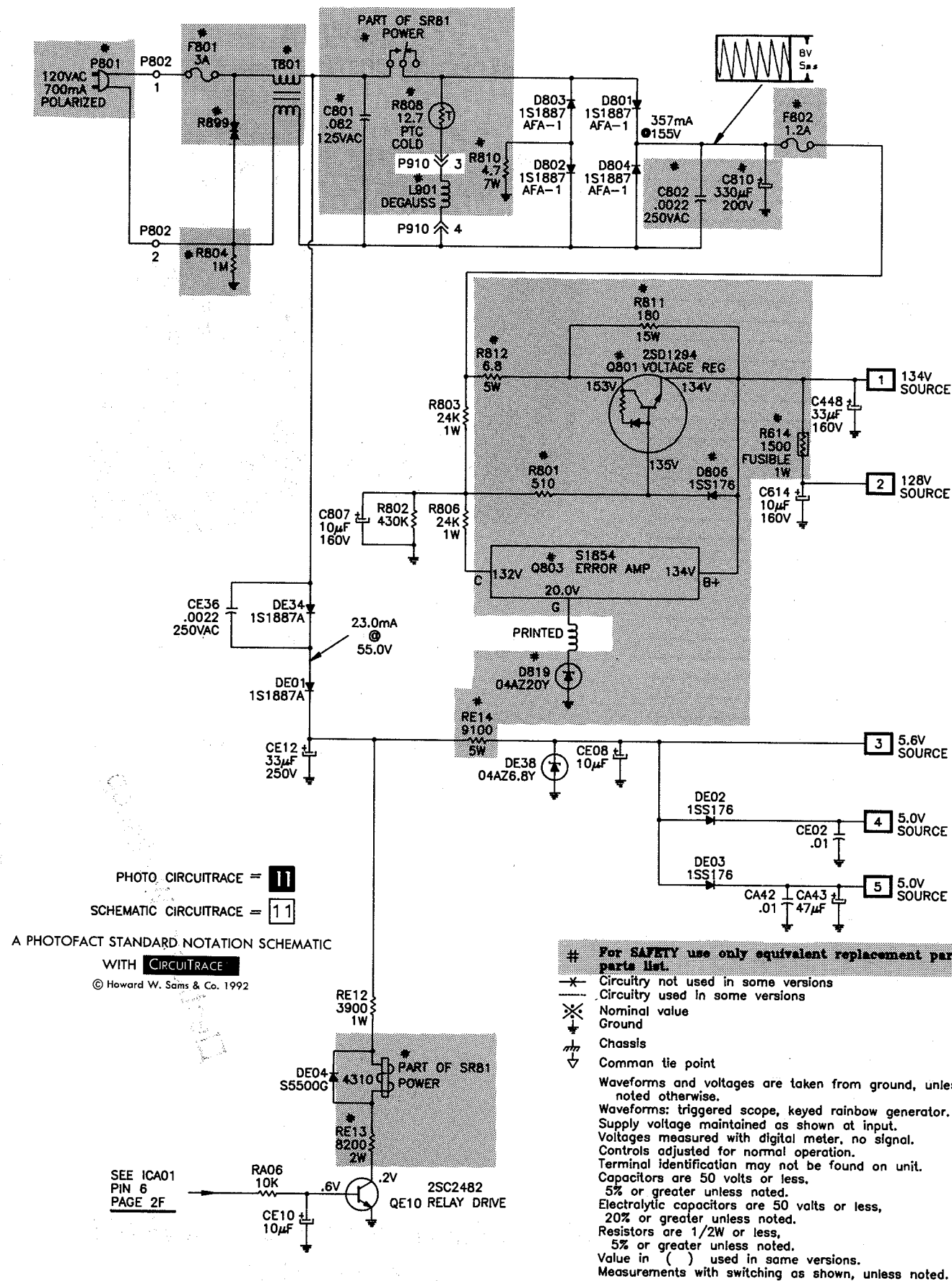
MODELS CF1312A, CF1313A (CHASSIS TAC9121)

TOSHIBA

For Supplier Address,  
See PHOTOFACT Annual Index



# POWER SUPPLY SCHEMATIC



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

— Circuitry not used in some versions

— Circuitry used in some versions

⊗ Nominal value

⊥ Ground

⊥ Chassis

⊥ Common tie point

Waveforms and voltages are taken from ground, unless noted otherwise.

Waveforms: triggered scope, keyed rainbow generator.

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Terminal identification may not be found on unit.

Capacitors are 50 volts or less, 5% or greater unless noted.

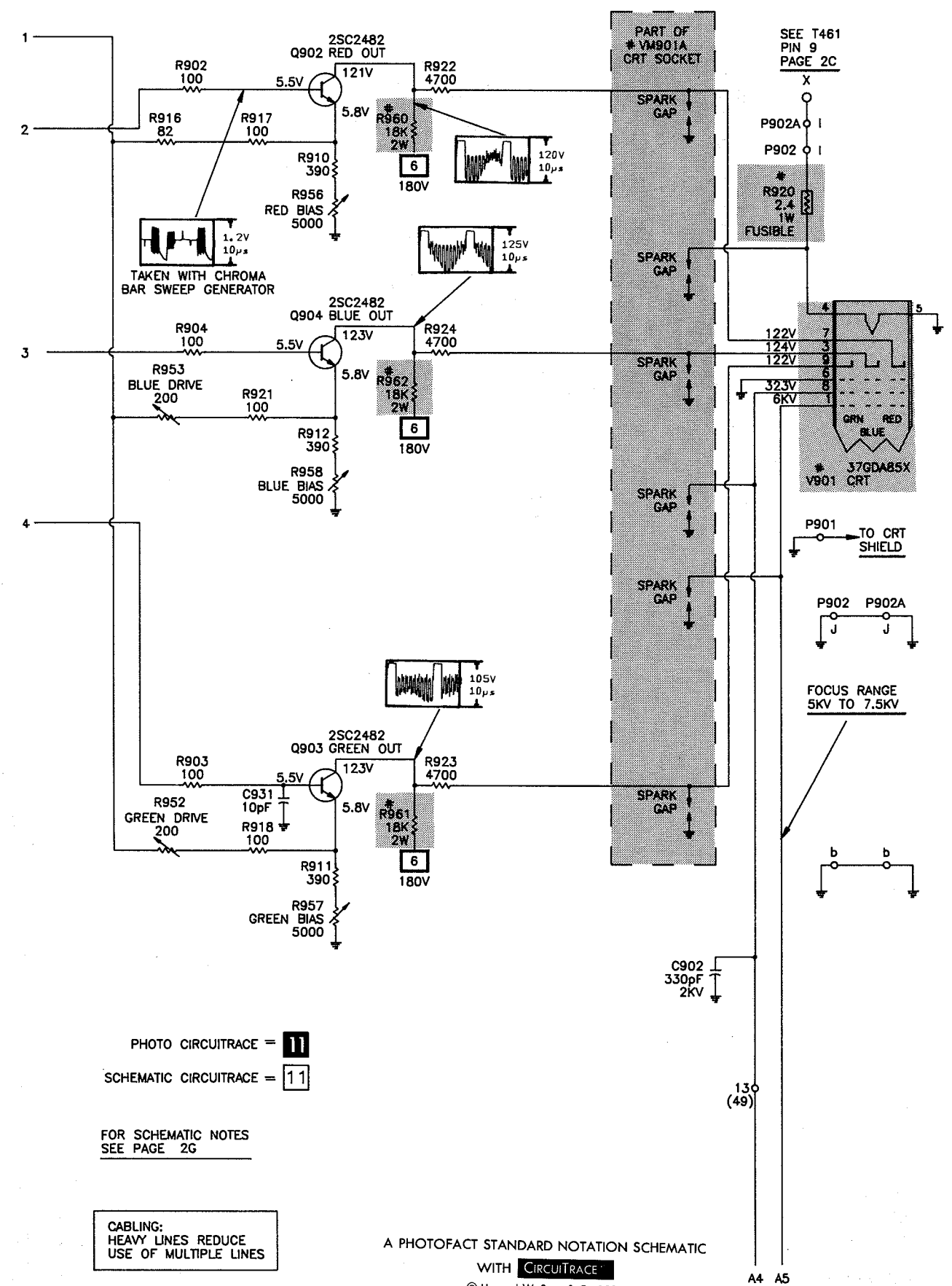
Electrolytic capacitors are 50 volts or less, 20% or greater unless noted.

Resistors are 1/2W or less, 5% or greater unless noted.

Value in ( ) used in same versions.

Measurements with switching as shown, unless noted.

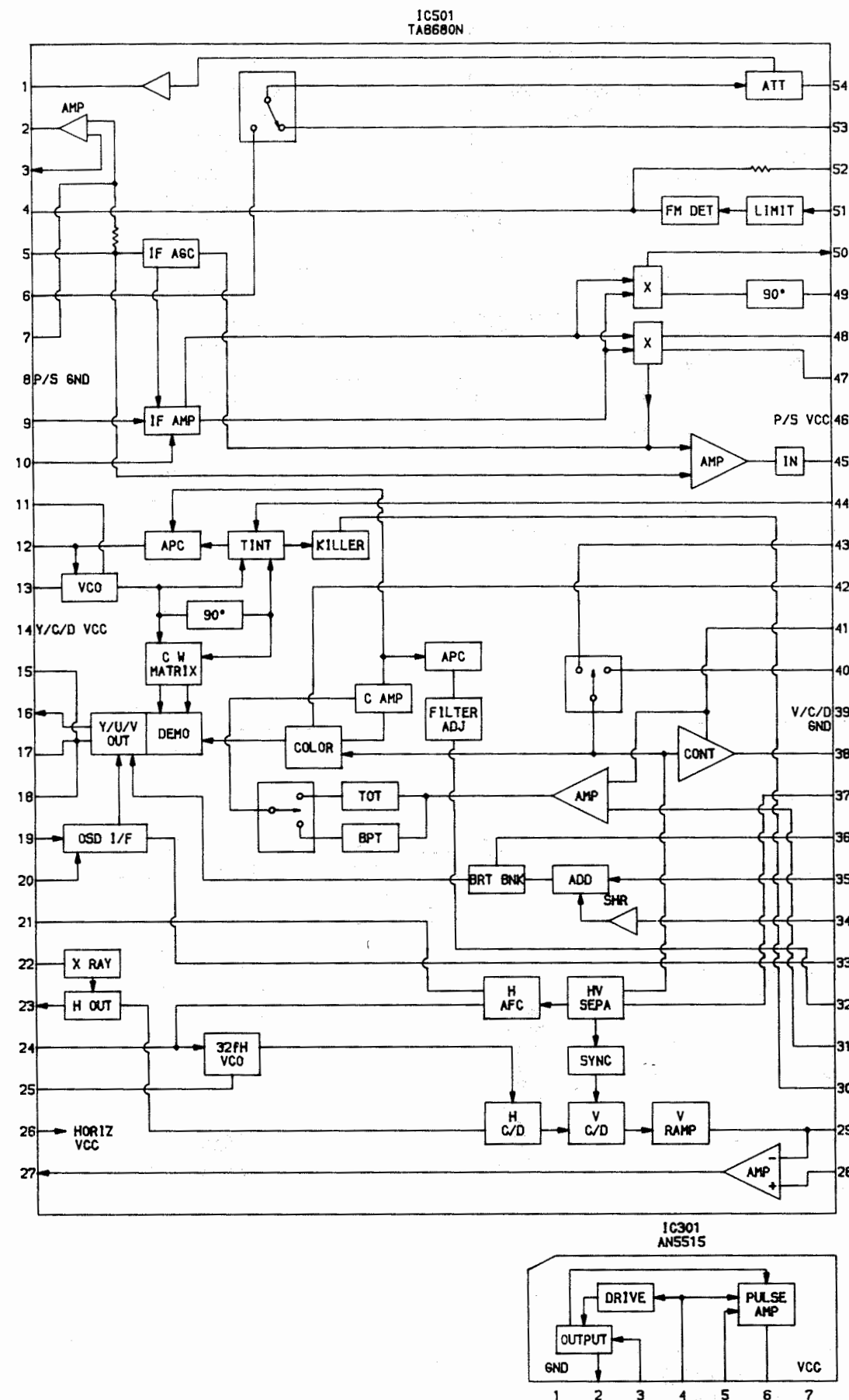
# CRT SCHEMATIC





# IC FUNCTIONS

# TUNER INFORMATION

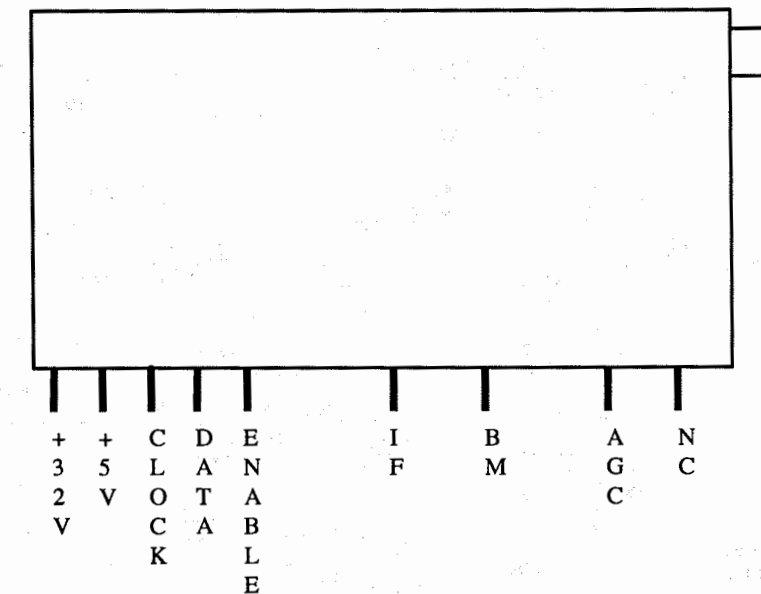


## TUNER VOLTAGE CHART

	VHF Low Band	VHF High Band	UHF Band
+32V	32V	32V	32V
+5V	5.0V	5.0V	5.0V
CLOCK	1.9V	1.8V	1.8V
DATA	2.4V	2.4V	2.3V
ENABLE	1.3V	1.3V	1.3V
IF	0V	0V	0V
BM	8.7V	8.7V	8.7V
AGC	6.7V	6.7V	6.7V
NC	1.0V	4.3V	5.9V

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

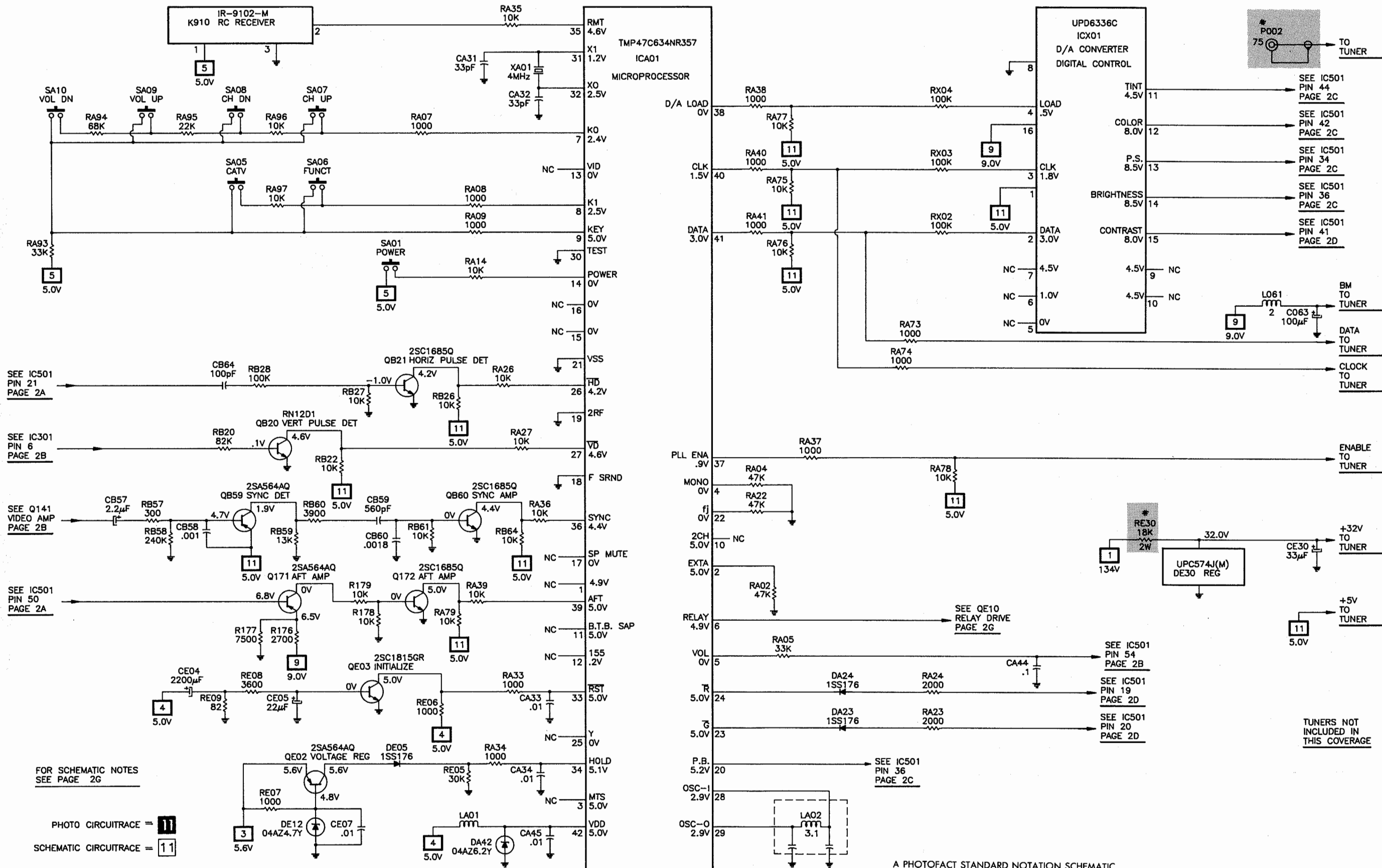


TOSHIBA

MODELS CF1312A, CF1313A (CHASSIS TAC9121)



## TUNER CONTROL SCHEMATIC



### A PHOTOFAC STANDARD NOTATION SCHEMATIC

WITH **CIRCUITRACE™**  
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SAFETY PRECAUTIONS

SERVICE WARNING

ONLY qualified service technicians who are familiar with safety checks and guidelines should perform service work. For continued SAFETY:

- 1. Before replacing parts, disconnect power source to protect electrostatically sensitive parts.
- 2. Do not attempt to modify any circuit unless so recommended by the manufacturer.
- 3. When servicing chassis, use an isolation transformer between the line cord and power receptacle.

SERVICING HIGH VOLTAGE AND PICTURE TUBE

Use EXTREME CAUTION when servicing the High Voltage circuits.

- 1. To discharge static High Voltage, connect a 10-kilohm resistor in series with a test lead between chassis and picture tube anode lead.
- 2. DO NOT lift picture tube by the neck.
- 3. ALWAYS wear shatterproof goggles when handling picture tube 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 picture tube is the only potential source of x-rays.

- 1. Keep an accurate High Voltage meter available at all times. Check meter calibration periodically.
- 2. Whenever servicing a chassis, check High Voltage at various brightness levels to be sure it is regulating properly.
- 3. 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.
- 4. When troubleshooting a set with excessive High Voltage, avoid close contact with picture tube. DO NOT operate set longer than necessary. To locate the cause of excessive High Voltage, use a variable AC transformer to regulate voltage.
- 5. In present chassis, 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.

SAFETY CHECKS – FIRE AND SHOCK HAZARD

Cold Leakage Checks for Sets with Isolated Ground

- 1. Unplug the AC cord, connect a jumper across the plug prongs, and turn the power switch ON.
- 2. Use an ohmmeter to measure the resistance between the jumpered 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 200 kilohms and 5 megohms. Parts without a return path must register infinity.

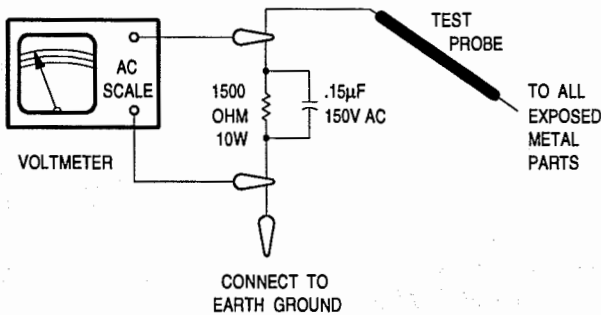
Hot Leakage Current Check

- 1. Plug the AC cord directly into AC outlet. DO NOT use an isolation transformer.
- 2. Use a 1500-ohm, 10-watt resistor in parallel with a .15-microfarad 150-volt AC capacitor to connect between any exposed metal parts on the set and a good earth ground. (See figure below.)
- 3. Use an AC voltmeter with at least 1000 ohms-per-volt sensitivity to measure the voltage across the resistor. Check all exposed metal parts and measure voltage at each point.
- 4. Voltage readings should not exceed .75 volts RMS (5 milliamps AC). Any value exceeding this limit constitutes a potential shock hazard and must be corrected.
- 5. If AC plug is not polarized, reverse the AC plug and repeat exposed metal part voltage measurement at each point.

GENERAL GUIDELINES

Perform a final SAFETY CHECK before returning set to customer.

- 1. Check repaired area for poorly soldered or de-soldered connections, and check entire circuit board for solder splashes.
- 2. Check inner board wiring for pinched wires or wires contacting any high-wattage resistors.
- 3. 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.

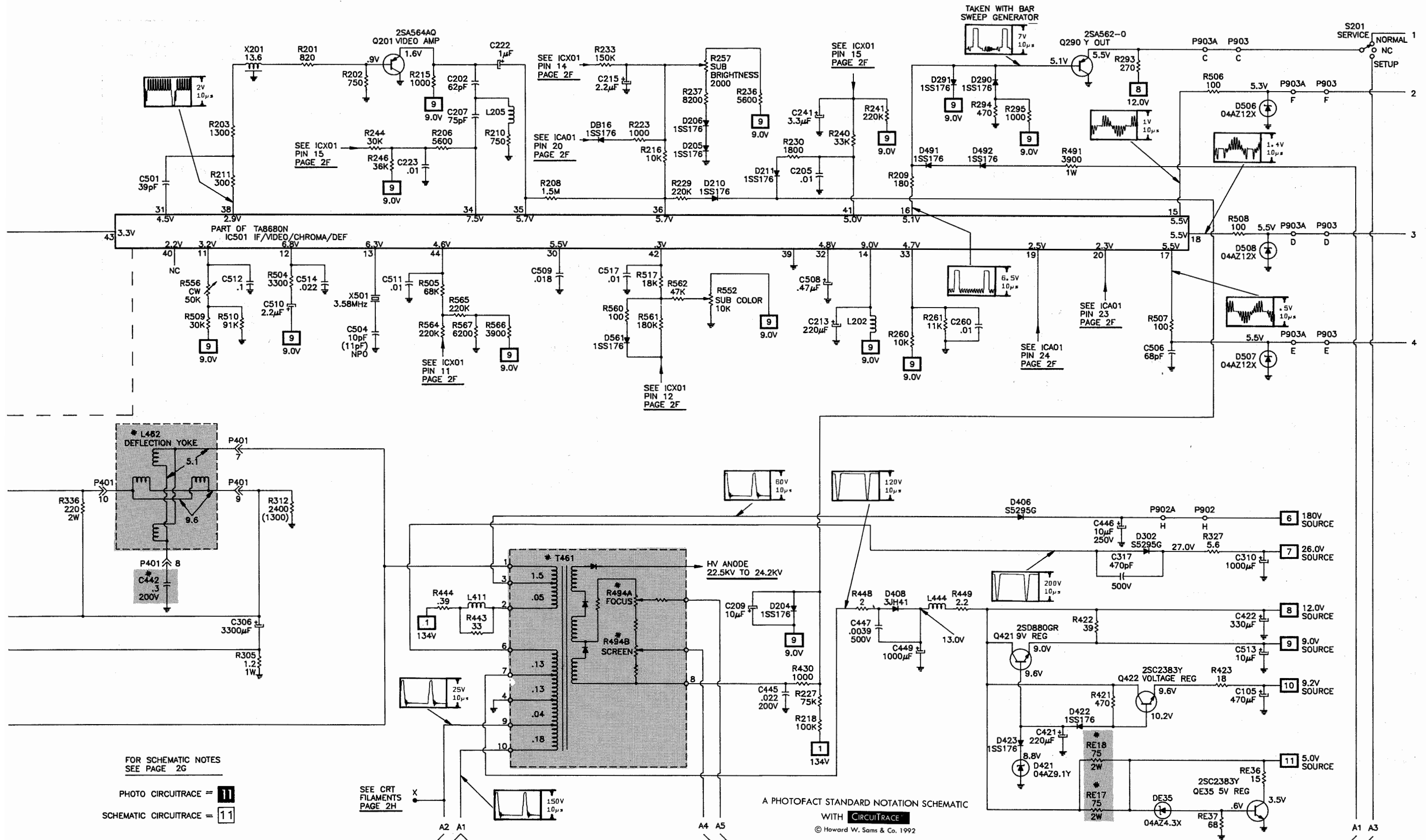


TEST EQUIPMENT

Test equipment listed by participating manufacturers illustrates typical or equivalent equipment used by Sams engineers to obtain measurements. This equipment is compatible with most types used by field service technicians.

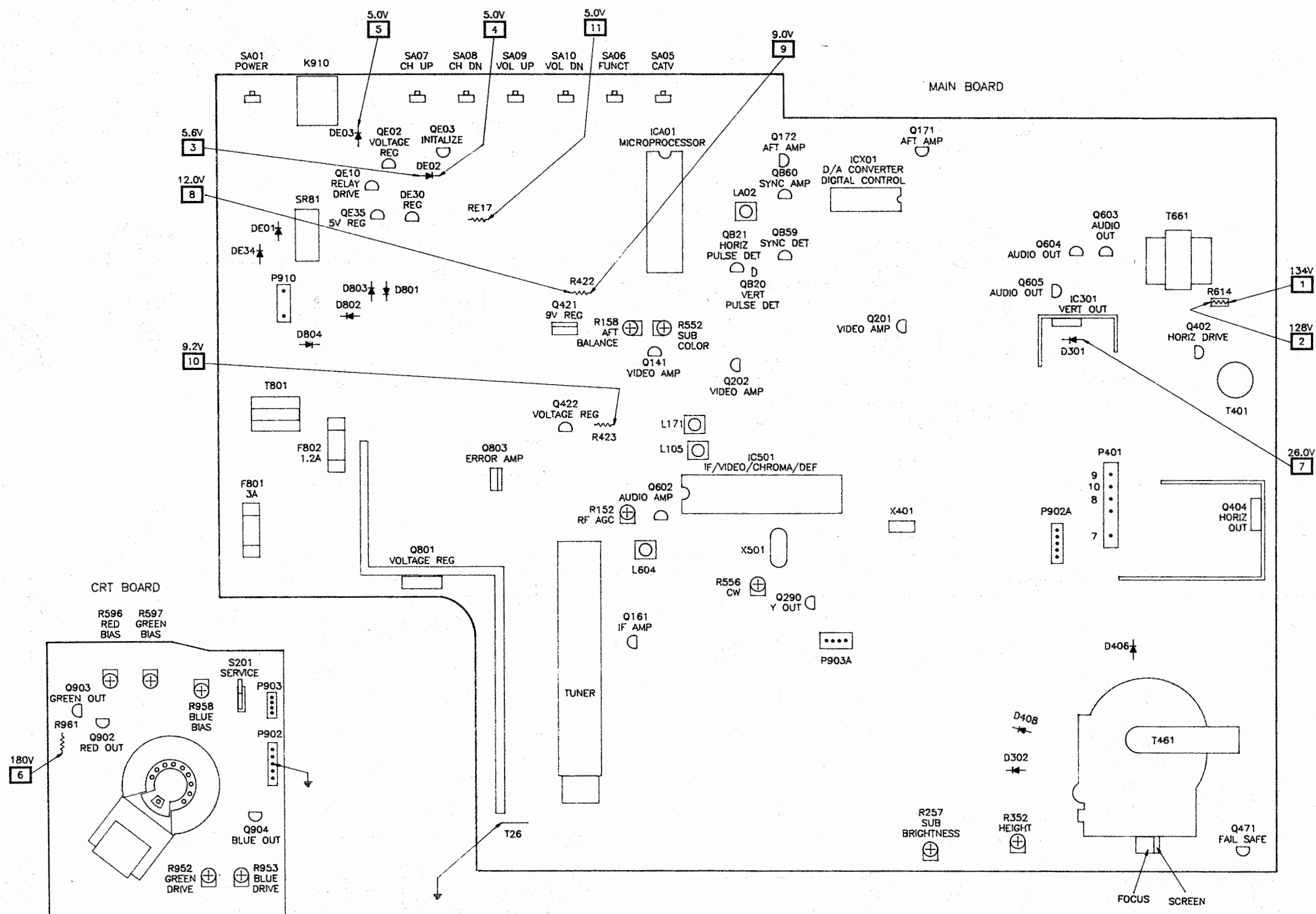
Equipment	B&K Precision No.	Sencore No.
Oscilloscope	1541A, 2120, 2125, 2160, 2190, 2522	SC61
Generators		
RGB	1249A, 1260	RG67
Multiburst Signal	1251, 1260	VA62A
Color Bar	1211A, 1249A, 1251, 1260	VA62A, CG25, NT64
TV Stereo	2009	ST65, ST66
Analog VOM	114, 117, 177, 214	-
Digital VOM	377, 388HD, 2700 Series, 2831A, 2860, 2900 Series	DVM37, DVM56A, SC61
Frequency Meter	1803A, 1804A, 1805, 1822, 1851, 1855	FC71, SC61
Hi-Voltage Probe	HV-44	HP200
VOM/DMM	-	TP212
Accessory Probes	PR-28(HV)	-
Isolation Transformer	TR110, 1604, 1653, 1655	PR57
Capacitance Analyzer	810A, 815, 820, 830	LC76, LC101, LC102
CRT Analyzer	480, 490	CR70
Temperature Probe	TP-28, TP-30	-
AC Leakage Tester	1655	PR57
Logic Probe	DP21, DP51	-
Logic Pulser	DP31, DP101	-
Inductance Analyzer	875A	LC76, LC101, LC102
Flyback Yoke Tester	875A	VA62A, LC76, LC101, LC102
TV Stereo Power Monitor	-	SR68
Field Strength Meter	-	FS73, FS74
Transistor Tester	510, 520B, 530	TF46
Video Analyzer	-	VA62A
Modulator/Converter	1201	-



**TELEVISION SCHEMATIC** continued



## PLACEMENT CHART

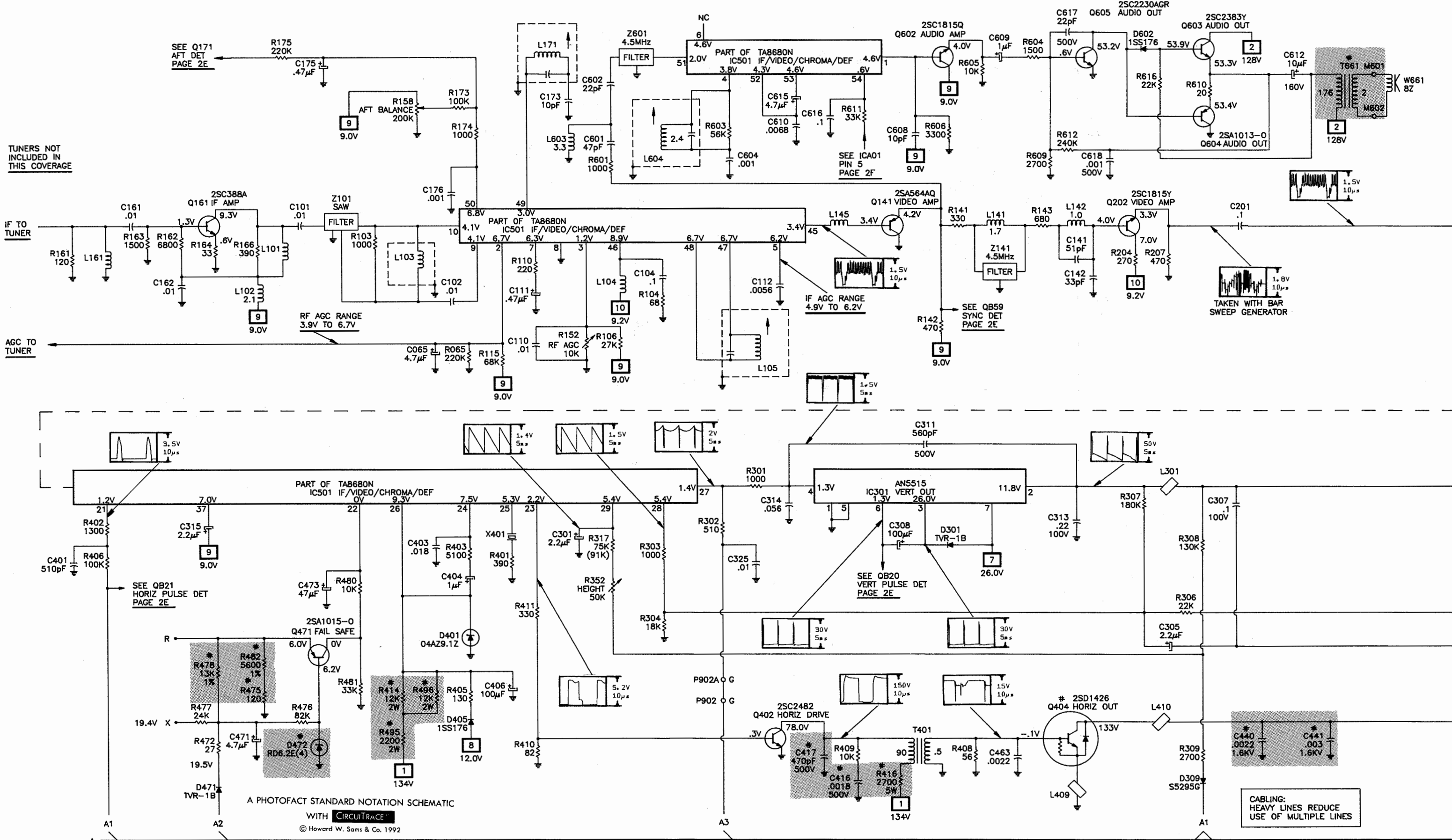




A

B

TELEVISION SCHEMATIC





PARTS LIST

SEMICONDUCTORS

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
D204, 5, 6	1SS176	A7150258	NTE177	ECG177	SK9091
D210, 11	1SS176	A7150258	NTE177	ECG177	SK9091
D290, 1	1SS176	A7150258	NTE177	ECG177	SK9091
D301	TVR-1B	A7568460	NTE552	ECG552	SK9000
D302, 9	S5295G	A7978850	NTE552	ECG552	SK9000
D401	04AZ9.1Z	A7116925	NTE5018A	ECG5018A	SK9A1
D405	1SS176	A7150258	NTE177	ECG177	SK9091
D406	S5295G	A7978850	NTE552	ECG552	SK9000
D408	3JH41	A7580658	-	-	-
D421	04AZ9.1Y	A7116915	NTE5018A	ECG5018A	SK9A1
D422, 3	1SS176	A7150258	NTE177	ECG177	SK9091
D471	TVR-1B	A7568460	NTE552	ECG552	SK9000
# D472	RD6.2E(4)	23115774	NTE5013A	ECG5013A	SK6A2
D491, 2	1SS176	A7150258	NTE177	ECG177	SK9091
D506, 7, 8	04AZ12X	A7117205	NTE5021T1	ECG5021T1	SK9971
D561	1SS176	A7150258	NTE177	ECG177	SK9091
D602	1SS176	A7150258	NTE177	ECG177	SK9091
D801 - D804	1S1887AFA-1	A7568754	NTE116	ECG116	SK3312
# D806	1SS176	A7150258	NTE177	ECG177	SK9091
# D819	04AZ20Y	A7117715	NTE5028A	ECG5028A	SK19A
DA23, 4	1SS176	A7150258	NTE177	ECG177	SK9091
DA42	04AZ6.2Y	A7116515	NTE5013A	ECG5013A	SK6A2
DB16	1SS176	A7150258	NTE177	ECG177	SK9091
DE01	1S1887A	A7568752	NTE552	ECG552	SK9000
DE02, 3	1SS176	A7150258	NTE177	ECG177	SK9091
DE04	S5500G	A7986480	NTE116	ECG116	SK3312
DE05	1SS176	A7150258	NTE177	ECG177	SK9091
DE12	04AZ4.7Y	A7116215	NTE5009A	ECG5009A	SK4A7
DE30	UPC574J(M)	23115922	NTE615P	ECG615A	SK9976
	UPC574J(L)	-	NTE615P	ECG615A	SK9976
DE34	1S1887A	A7568752	NTE552	ECG552	SK9000
DE35	04AZ4.3X	A7116105	NTE5008A	ECG5008A	SK4A3
DE38	04AZ6.8Y	A7116615	NTE5014A	ECG5014A	SK6A8
IC301	AN5515	23119548	NTE1684	ECG1684	SK9729
IC501	TA8680N	B0383100	NTE7010	ECG7010	SK10479
ICA01	TMP47C634NR357	-	-	-	-
	TMP47C634NR357(Z)	23319497	-	-	-
ICX01	UPD6336C	23318627	-	-	-
Q141	2SA564AQ	-	NTE290A	ECG290A	SK3932
	2SA564A-Q	23314055	NTE290A	ECG290A	SK3932
	2SA1015Y	-	NTE290A	ECG290A	SK9132
Q161	2SC388A	-	NTE85	ECG85	SK3132
	2SC388ATM	A6708871	NTE85	ECG85	SK3132
Q171	2SA564AQ	-	NTE290A	ECG290A	SK3932
	2SA564A-Q	23314055	NTE290A	ECG290A	SK3932
Q172	2SC1685Q	-	NTE85	ECG85	SK9229
	2SC1685-Q	23114552	NTE85	ECG85	SK9229
	2SC1815Y	-	NTE85	ECG85	SK3124A
Q201	2SA564AQ	-	NTE290A	ECG290A	SK3932
	2SA1015-Y	A6534040	NTE290A	ECG290A	SK9132
	2SA1015Y	-	NTE290A	ECG290A	SK9132

# For SAFETY use only equivalent replacement part.

SEMICONDUCTORS

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
Q202	2SC1685Q	-	NTE85	ECG85	SK9229
	2SC1685-Q	23114552	NTE85	ECG85	SK9229
	2SC1815Y	-	NTE85	ECG85	SK3124A
Q290	2SA562-O	-	NTE290A	ECG290A	SK3114A
	2SA562TM-O	A6509120	NTE290A	ECG290A	SK3114A
Q402	2SC2482	-	NTE399	ECG399	SK9352
	2SC2482FA-1	A6330069	NTE399	ECG399	SK9352
# Q404	2SD1426	A6868673	NTE2302	ECG2302	SK9422
	2SD1426FA	-	NTE2302	ECG2302	SK9422
Q421	2SD880GR	-	NTE152	ECG152	SK3440
	2SD880-Y	A6848520	NTE152	ECG152	SK3440
Q422	2SC2383Y	-	NTE31	ECG31	SK3866A
	2SC2655-Y(C)	A6333346	NTE293	ECG293	SK3849
	2SC2655Y	-	NTE293	ECG293	SK3849
	2SC2655-O	-	NTE293	ECG293	SK3849
Q471	2SA1015-O	A6534020	NTE290A	ECG290A	SK9132
Q602	2SC1685Q	-	NTE85	ECG85	SK9229
	2SC1685-Q	23114552	NTE85	ECG85	SK9229
	2SC1815Y	-	NTE85	ECG85	SK3124A
Q603	2SC2383Y	-	NTE31	ECG31	SK3866A
	2SC2383-Y(C)	A6328333	NTE31	ECG31	SK3866A
Q604	2SA1013-O	-	NTE32	ECG32	SK3867A
	2SA1013-O(C)	A6533760	NTE32	ECG32	SK3867A
Q605	2SC2230AGR	-	NTE399	ECG399	SK9352
	2SC2230A-GR	A6325077	NTE399	ECG399	SK9352
# Q801	2SD1294	A6867051	NTE2335	ECG2335	SK10305
	2SD1294FA	-	NTE2335	ECG2335	SK10305
# Q803	S1854	A6907751	-	-	-
Q902 - Q904	2SC2482	A6330059	NTE399	ECG399	SK9352
QB20	RN1201	A6002010	-	-	-
QB21	2SC1685Q	-	NTE85	ECG85	SK9229
	2SC1685-Q	23114552	NTE85	ECG85	SK9229
	2SC1815Y	-	NTE85	ECG85	SK3124A
QB59	2SA564AQ	-	NTE290A	ECG290A	SK3932
	2SA1015-Y	A6534040	NTE290A	ECG290A	SK9132
	2SA1015Y	-	NTE290A	ECG290A	SK9132
QB60	2SC1685Q	-	NTE85	ECG85	SK9229
	2SC1685-Q	23114552	NTE85	ECG85	SK9229
QE02	2SA564AQ	-	NTE290A	ECG290A	SK3932
	2SA1015-Y	A6534040	NTE290A	ECG290A	SK9132
	2SA1015Y	-	NTE290A	ECG290A	SK9132
QE03	2SC1815GR	-	NTE85	ECG85	SK3124A
	2SC1815-GR	A6317460	NTE85	ECG85	SK3124A
	2SC1815N(GR)	-	NTE85	ECG85	SK3124A
QE10	2SC2482	A6330059	NTE399	ECG399	SK9352
QE35	2SC2383Y	-	NTE31	ECG31	SK3866A
	2SC2655-Y(C)	A6333346	NTE293	ECG293	SK3849
	2SC2655Y	-	NTE293	ECG293	SK3849
	2SC2655-O	-	NTE293	ECG293	SK3849

# For SAFETY use only equivalent replacement part.



PARTS LIST continued

RESISTORS

Item No.	Rating	Mfr. Part No.	NTE Replacement
# R414	12K 2W 5% Metal Oxide Film	24383123	2W312
# R416	2700 5W Wire Wound	24007615	5W227
# R475	120 1/6W 5% Carbon Film	24366121	-
# R478	13K 1/4W 1% Metal Film	24327133	-
# R482	5600 1/4W 1% Metal Film	24327562	-
# R495	2200 2W 5% Metal Oxide Film	24383222	2W222
# R496	12K 2W 5% Metal Oxide Film	24383123	2W312
# R614	1500 1W 5% Fusible	24532152	-
# R801	510 1/2W 5% Metal Oxide Film	24552511	HW151
# R804	1M 1/2W 10% Carbon Composition	24946105	-
# R808	PTC 12.7 Cold	24000209	-
# R810	4.7 7W 5% Wire Wound	24007894	-
# R811	180 15W 5% Wire Wound	24007703	-
# R812	6.8 5W 5% Wire Wound	24007952	5W6D8
# R899	Varistor	24000205	-
# R920	2.4 1W 5% Fusible	24000886	F1W2D4
# R960	18K 2W 5% Metal Oxide Film	24554183	2W318
# R961	18K 2W 5% Metal Oxide Film	24554183	2W318
# R962	18K 2W 5% Metal Oxide Film	24554183	2W318
# RE13	8200 2W 5% Metal Oxide Film	24383822	2W282
# RE14	9100 5W 5% Wire Wound	24007551	-
# RE17	75 2W 5% Metal Oxide Film	24383750	-
# RE18	75 2W 5% Metal Oxide Film	24383750	-
# RE30	18K 2W 5% Metal Oxide Film	24383183	2W318

# For SAFETY use only equivalent replacement part.

COILS (RF-IF)

Item No.	Rating	Mfr. Part No.
L061		23284101
L101		23252923
L102		23237977
L103	Video IF	23262828
L104		23237999
L105	Video IF	23262827
L141		23238712
L142		23237984
L145		23238562
L161		23238560
L171	AFT	23262827
L202		23238562
L205		23238704
L411		23221739
L444		23221722
L603		23238709
L604	Sound IF	23252905
LA01		23238562
LA02	Oscillator	23262776
# T801	Line Filter	23211922

# For SAFETY use only equivalent replacement part.

COILS & TRANSFORMERS

Item No.	Function	Mfr. Part No.	On-Unit No.	Russell Part No.
# L462	Yoke 90° Horiz 3.97mH Vert 20.3mH	23227252	TDY-314GZ	-
T401	Horizontal Driver	23224983	TLN1039	-
# T461	Horizontal Output	23226412	TFB4030AD	FBT-299
T661	Speaker	23216941	TSP1063	-

# For SAFETY use only equivalent replacement part.

SPEAKER

Item No.	Description	Mfr. Part No.	Quam Part No.
W661	3" 8 Ohm 1W	23351029 SPK-1304 (1)	30A05Z8R

(1) Number on unit.



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.

- |  |  |
|--|--|
| ▪ B&K Precision                                | ▪ PTS Electronics Corporation (PTS)            |
| ▪ Custom Components Corporation (Chek-A-Color) | ▪ Quam-Nichols Co. (Quam)                      |
| ▪ EVG / Russell Industries, Inc.               | ▪ Sencore, Inc.                                |
| ▪ NTE Electronics, Inc. (NTE)                  | ▪ Thomson Consumer Electronics, Inc. (SK, TCE) |
| ▪ Philips ECG Company (ECG)                    |  |

ELECTROLYTIC CAPACITORS

Item	Rating	Mfr. Part No.
# C810	330 200V 20%	24086881

# For SAFETY use only equivalent replacement part.

CAPACITORS

Item	Rating	Mfr. Part No.
C173	10 50V $\pm$ .25pF	24436100
# C416	.0018 500V 10%	24214182
# C417	470 500V 10%	24214471
# C440	.002 1.6KV 5%	24095932
# C441	.003 1.6KV 5%	24095928
# C442	.3 200V 5%	24828304
C504	11 NPO 50V 5%	24353110
	10	-
C608	10 50V $\pm$ .25pF	24436100
# C801	.082 125VAC 20%	24095852
# C802	.0022 250VAC	24094909
C931	10 50V $\pm$ .25pF	24436100

# For SAFETY use only equivalent replacement part.

CONTROLS

(All wattages 1/2 watt or less, unless otherwise listed.)

Item No.	Function	Resistance	Mfr. Part No.
R152	RF AGC	10K	24066926
R158	AFT Balance	200K	24066922
R257	Sub Brightness	2000	24066928
R352	Height	50K	24066924
# R494A	Focus	-	(1)
# R494B	Screen	-	(1)
R552	Sub Color	10K	24066926
R556	CW	50K	24066924
R952	Green Drive	200	24061582
R953	Blue Drive	200	24061582
R956	Red Bias	5000	24061578
R957	Green Bias	5000	24061578
R958	Blue Bias	5000	24061578

# For SAFETY use only equivalent replacement part.

(1) Part of T461 Horizontal Output Transformer Part No. 23226412.



MISCELLANEOUS

Item No.	Description	Mfr. Part No.	Notes
# F801	Fuse	23144848	AC, 3A @ 250V
# F802	Fuse	23144847	DC, 1.2A @250V
# K910	Sensor	23120501	Remote, IR-9102-M
L301	Ferrite Bead	23103859	
L409	Ferrite Bead	23103859	
L410	Ferrite Bead	23103859	
# L901	Degaussing Coil	2300795	
# P002	Terminal	23142515	Antenna
# P801	Power Cord	23176583	AC, Polarized
S201	Switch	23145682	Service
SA01	Switch	23145227	Power
SA05	Switch	23145227	CATV
SA06	Switch	23145227	Function
SA07	Switch	23145227	Channel Up
SA08	Switch	23145227	Channel Down
SA09	Switch	23145227	Volume Up
SA10	Switch	23145227	Volume Down
# SR81	Relay	23146917	Power
# V901	CRT	37GDA85X	
	CRT	A34JFQ90X(W)	
# VM901A	Socket	23902022	CRT
X201	Delay Line	23250873	
X401	Resonator	23153721	Ceramic, 503kHz
X501	Crystal	23153961	3.58MHz
XA01	Resonator	23153845	4MHz
Z101	Filter	A5610690	SAW
Z141	Trap	23107976	Ceramic, 4.5MHz
Z601	Filter	23107932	Ceramic, 4.5MHz
	Adapter	23293966	Antenna Matching
	Antenna	23125866	VHF
	Board	23162703	Antenna
	Fuse Holder	23165081	For F801, F802
	Magnet	23102983	Purity/Convergence
	PC Board (1)	23337619	CRT
	PC Board (1)	23337618	Main Board
#	Tuner (1)	23121639	UHF/VHF, EL811LX1
REMOTE CONTROL TRANSMITTER			
	Resonator	23153736	Ceramic
	Transmitter	23120232	Remote Control, CT-9535
	PC Board (1)	23337588	Remote Control Transmitter

# For SAFETY use only equivalent replacement part.  
(1) Contact PTS Electronics Corporation for replacement; order by manufacturer's part number.

CABINET PARTS

MODEL CF1312A

Item	Part No.
Cabinet Front	23418993
Cabinet Rear	23424252
Knob-CATV, Function, Volume Up/Down, Channel Up/Down	23443446
Knob-Power	23443441

MODEL CF1313A

Item	Part No.
Cabinet Front	23418981
Cabinet Rear	23424252
Knob-CATV, Function, Volume Up/Down, Channel Up/Down	23443308
Knob-Power	23443307

REMOTE CONTROL TRANSMITTER

Item	Part No.
Battery Cover	23305360
Lower Case	23305359
Upper Case	23305352



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