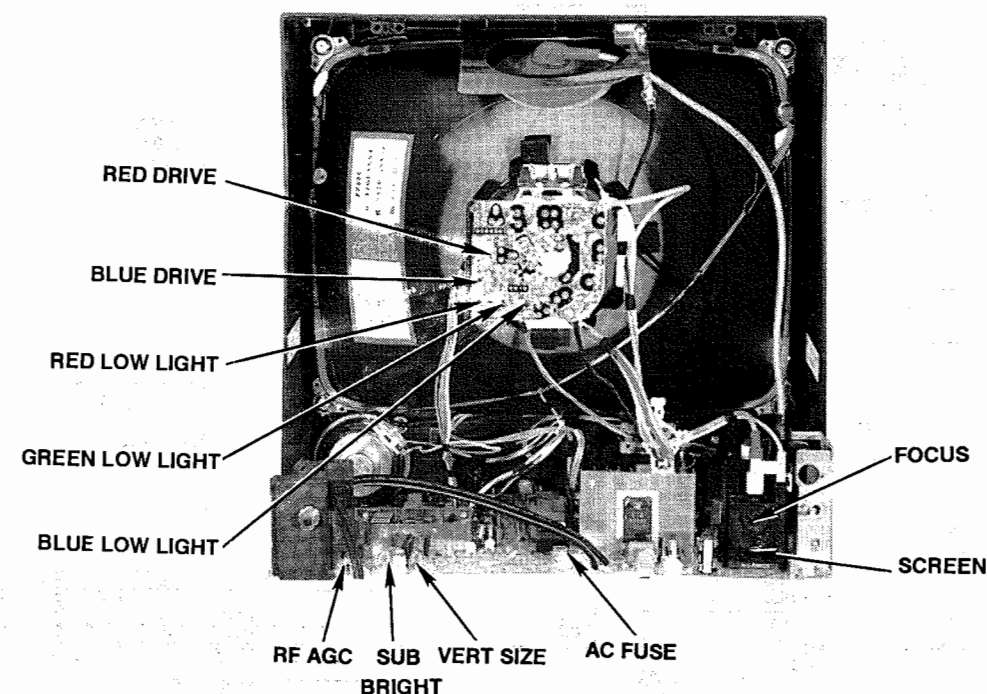


# CABINET - REAR VIEW



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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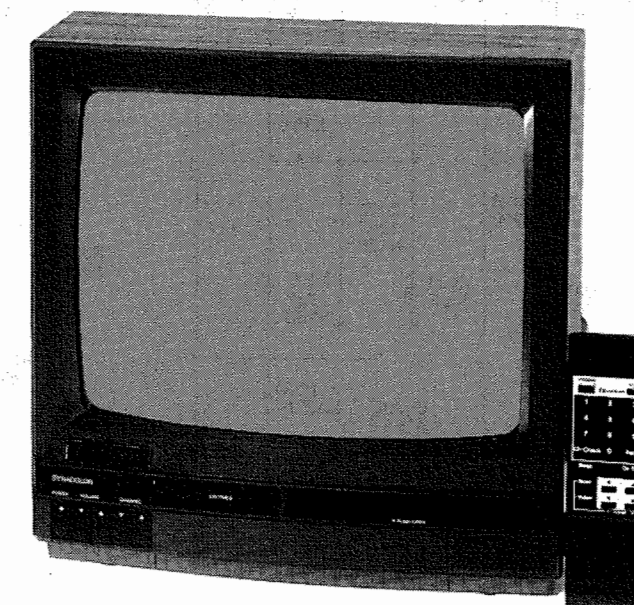
# PHOTOFACT® Technical Service Data

SET 2884

MODEL CTM-1340R

PANASONIC

**PANASONIC**  
Model CTM-1340R (Chassis AMDP197)



Essential coverage  
for servicing a television receiver...

- Schematics
- Component locations
- Parts lists

Coverage includes these additional models and chassis:

MODEL	CHASSIS
CTM1341R	ADP209
CTM1340R-1	ADP197
CTM1341R-1	ADP197
CTM1351R	APDP197
CTM1352R	APDP197
CTM1353R	APDP197



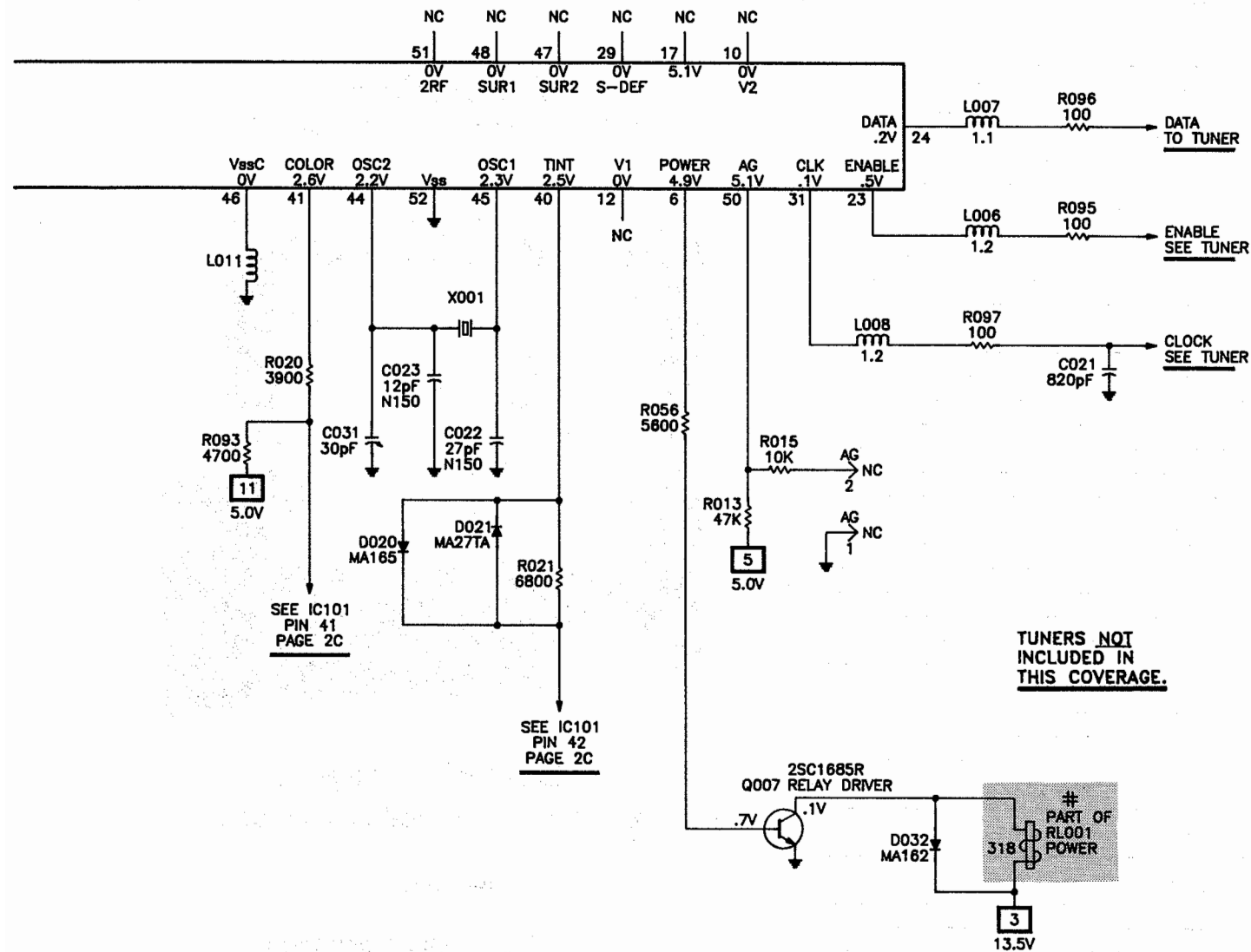
**HOWARD W. SAMS & COMPANY**

OCTOBER 1991 SET 2884

For Supplier Address,  
See PHOTOFACT Annual Index

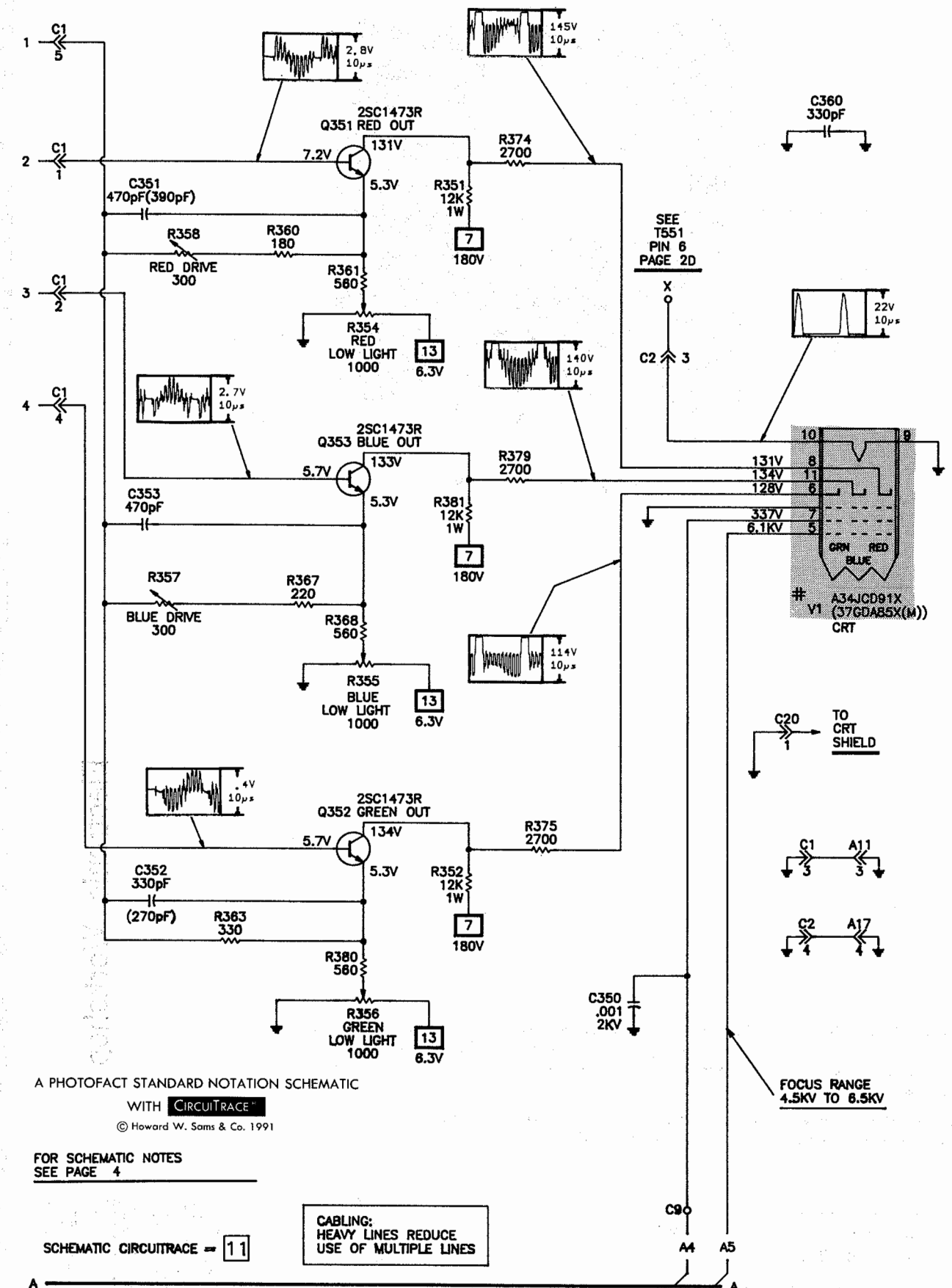
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# C P U SCHEMATIC continued



G

# CRT SCHEMATIC



H

PANASONIC

MODEL CTM-1340R

PARTS LIST continued

CAPACITORS

Item	Rating	Mfr. Part No.
C022	27 N220 50V 5%	ECCF1H270JP
C023	12 N220 50V 5%	ECCF1H120JP
C031	30pf Trimmer	ECRHA030E41
C103	2 NPO 50V .25pf	ECCF1H020CC
C104	2 NPO 50V .25pf	ECCF1H020CC
C112	18 NPO 50V 5%	ECCF1H180JC
C151	68 NPO 50V 5%	ECCF1H680JC
C152	15 NPO 50V 5%	ECCF1H150JC
C155	2 NPO 50V .25pf	ECCF1H020CC
C207	68 NPO 50V 10%	ECCF1H680KP
C314	33 NPO 50V 5%	ECCF1H330JC
C503	220 N750 50V 5%	ECCF1H221JU
# C533	.01 50V	ECKF1H103ZF
# C551	.3 200V 5%	ECQF2H304JS
	.27 200V 5%	ECQF2H274JS(1)
# C561	680 2KV 5%	ECKD3D681JB(2)
# C563	.0056 1.2KV 5%	ECWH12H562JS
	.0047 1.2KV 5%	ECWH12H472JS(1)
# C572	680 2KV 5%	ECKD3D681JB
	.001 2KV 5%	ECKD3D102JB(1)
C605	8 N750 50V .25pf	ECCF1H080DU
# C802	.0047 500V	ECKD2H472PU
# C803	.0047 500V	ECKD2H472PU
# C804	.0047 500V	ECKD2H472PU
# C817	.015 125V AC 10%	ECQU1A153KH
# C818	.015 125V AC 10%	ECQU1A153KH
# C819	.0022 125V AC	ECKCFL222ZE

# For SAFETY use only equivalent replacement parts.  
(1) Models CTM-1340R-1, CTM-1341-1 only.  
(2) All models except CTM-1340R-1, CTM-1341R-1.

COILS & TRANSFORMERS

Item No.	Function	Mfr. Part No.	Other Identification
# L570	YOKE 90° Horiz 1.02mH Vert 25.8mH	OLY15304FA TLY25363F1(2)	OLY15304FA(1) -
# L551	Linearity Coil	TLH6622P	6622P(1)
# T001	Power Supply Transformer	TLP16297	-
# T501	Horiz Driver Transformer	ETH19Y7OAY	H70(1)
# T502	Horiz Coupling Transformer	ETE19Z30AY	E1930(1)
# T551	Flyback Transformer	OLF04701F(3)(4)	-
T851	Converter, Drive	TLP15903	-
# T852	Power, DC	ETS39K70A	-

# For SAFETY use only equivalent replacement part.  
(1) Number on unit.  
(2) Models CTM-1340R-1, CTM-1341R-1 only.  
(3) EVG\Russell Recommended Replacement Part FBT-217.  
(4) Focus and Screen Controls are part of Horiz Output Transformer T551.

CONTROLS

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

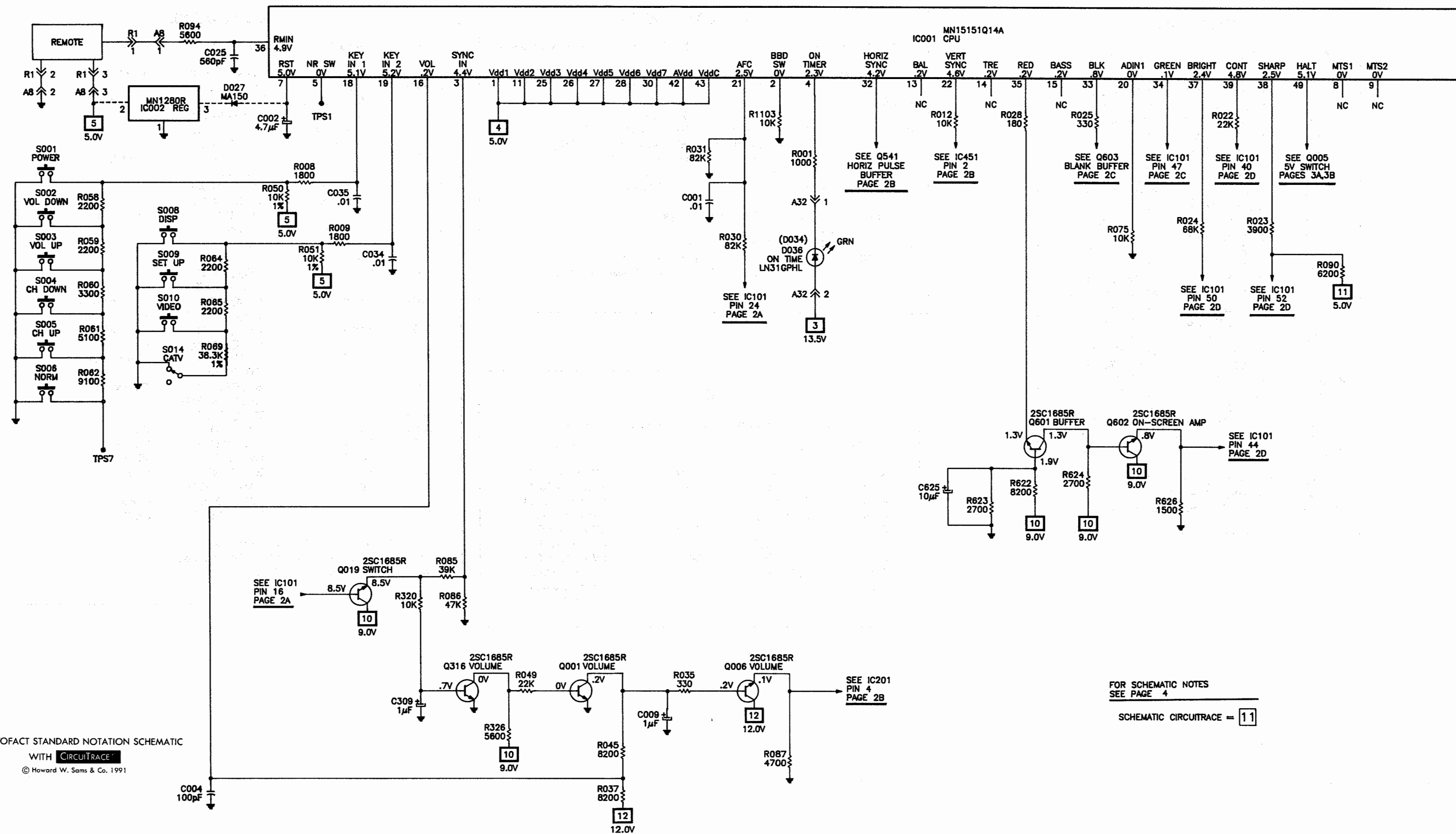
Item No.	Function	Resistance	Mfr. Part No.
R106	RF AGC	5000	EVN60AA00B23
R304	Sub Contrast	2000	EVND4AA00B23
R318	Sub Bright	10K	EVN60AA00B14
R354	R Low Light	1000	EVN49AA00B13
R355	B Low Light	1000	EVN49AA00B13
R356	G Low Light	1000	EVN49AA00B13
R357	Blue Drive	300	EVN49AA00B32
R358	Red Drive	300	EVN49AA00B32
R453	V-Size	50K	EVN60AA00B54
R619	Sub Tint	5000	EVND4AA00B53

MISCELLANEOUS

Item No.	Description	Mfr. Part No.	Notes
# CRA801	Capristor	EXNG131P155	130PF/1.5MEG
# F001	Fuse 4Amp 125V AC	XBA1F40NU100	-
L010	Ferrite Bead	EXCELSA24T	-
L109	Ferrite Bead	EXCELSA35B	-
L201	Quadrature	TLS63318-2	-
L301	Trap	ELB5A082	3.58MHz
# L555	Ferrite Bead	EXCELSA24B	-
# L556	Ferrite Bead	EXCELSA24B	-
L561	Ferrite Bead	EXCELSA24T	-
# L801	Choke	ELF18D217	AC, Line
# L804	Degaussing	OLK19019M	-
# P001	Cord, AC Line	TSX1174-1	-
# RL841	Relay	TSE1864	Power
S001	Switch	EVQQBH12T	Power
		EVQQBH06T(1)	-
S002	Switch	EVQQBH12T	Volume Down
		EVQQBH06T(1)	-
S003	Switch	EVQQBH12T	Volume Up
		EVQQBH06T(1)	-
S004	Switch	EVQQBH12T	Channel Down
		EVQQBH06T(1)	-
S005	Switch	EVQQBH12T	Channel Up
		EVQQBH06T(1)	-
S006	Switch	EVQQBH12T	Normal
S008	Switch	EVQQBH12T	Display
S009	Switch	EVQQBH12T	Set Up
S010	Switch	EVQQBH12T	Video
S014	Switch	ESB621283	CATV
# V1	CRT	A34JCD91X(2)	-
X001	Oscillator	TSS2077MX	Crystal
X101	Filter	EFCH45MVK12N	SAW

# For SAFETY use only equivalent replacement part.  
(1) Models CTM-1351R, CTM-1352R, CTM-1353R only.  
(2) Models CTM-1340R & CTM-1341R-1 ONLY

C P U SCHEMATIC



A PHOTOFACIT STANDARD NOTATION SCHEMATIC  
WITH **CIRCUITRACE**  
© Howard W. Sams & Co. 1991

FOR SCHEMATIC NOTES  
SEE PAGE 4  
SCHEMATIC CIRCUITRACE = 11

PARTS LIST

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
- Custom Components Corporation (Chek-A-Color)
- EVG / Russell Industries, Inc.
- GC-THORSEN
- NTE Electronics, Inc. (NTE)
- Philips ECG Company (ECG)
- PTS Electronics Corporation (PTS)
- Quam-Nichols Co. (Quam)
- Sencore, Inc.
- Thomson Consumer Electronics, Inc. (SK, TCE)

SEMICONDUCTORS

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
D004	MA165	-	NTE519	ECG519	SK3100
D005	QA205D	TVSQA205D	NTE5010A	ECG5010A	SK5A1
D020	MA165	-	NTE519	ECG519	SK3100
D021	MA27TA	-	NTE605A	ECG605A	SK7952
D022	MA161	-	NTE177	ECG177	SK9091
D027	MA150	-	NTE177	ECG177	SK9091
D031	AM01Z	-	NTE116	ECG116	SK3313
	ERA15-01	-	NTE552	ECG552	SK9000
D032	MA162	-	NTE519	ECG519	SK3100
D034 (1)	LN320GP	-	-	-	-
D036	LN31GPHL	-	NTE3024	ECG3024	SK2024
D302	MA150	-	NTE177	ECG177	SK9091
D451	ERA15-01	-	NTE552	ECG552	SK9000
D452,53	MA165	-	NTE519	ECG519	SK3100
D454	MA150	-	NTE177	ECG177	SK9091
D456	MA4120M	-	NTE5021A	ECG5021A	SK12A
D502	QA208C	TVSQA208C	NTE5016A	ECG5016A	SK8A2
D503,4,5	MA165	-	NTE519	ECG519	SK3100
D506	QA206B	TVSQA206B	NTE5012A	ECG5012A	SK6A0
# D531	AU01	-	NTE552	ECG552	SK9000
	AS01	-	NTE552	ECG552	SK9000
	ERA2204	-	NTE552	ECG552	SK9000
# D532	MA165	-	NTE519	ECG519	SK3100
# D533	QA208G	TVSQA208G	NTE5016A	ECG5016A	SK8A2
D541	MA4051M	-	NTE5010A	ECG5010A	SK5A1
# D551	RU2N	-	NTE552	ECG552	SK9000
# D552,53,54	AS01	-	NTE552	ECG552	SK9000
	AU01	-	NTE552	ECG552	SK9000
	ERA2204	-	NTE552	ECG552	SK9000
D555	MA165	-	NTE519	ECG519	SK3100
D556	MA1360H	-	-	-	-
D557	QB105N	TVSQB105N	NTE135A	ECG135A	SK5V1
D560	QB109SA	TVSQB109SA	-	-	-
D603	MA150	-	NTE177	ECG177	SK9091
# D801 - D804	RM11B	-	NTE125	ECG125	SK3081
	EM02BM	-	NTE125	ECG125	SK3081
	ERC13-08	-	NTE125	ECG125	SK3081
	ERC12-08	-	NTE125	ECG125	SK3081
# D806	-	ERPF5B0M050K	-	-	-
IC001	MN15151Q14A	-	-	-	-
	MN15151Q14	-	-	-	-
IC002	MN1280R	-	NTE15044	-	SK9854
	MN1280PQR	-	NTE15044	-	SK9854
# IC101	AN5160NK	-	-	-	-
	AN5160NK-N	-	-	-	-
IC201	AN5265	-	NTE1789	ECG1789	-

# For SAFETY use only equivalent replacement part.  
(1) Used in Models CTM-1351R, CTM-1352R, CTM-1

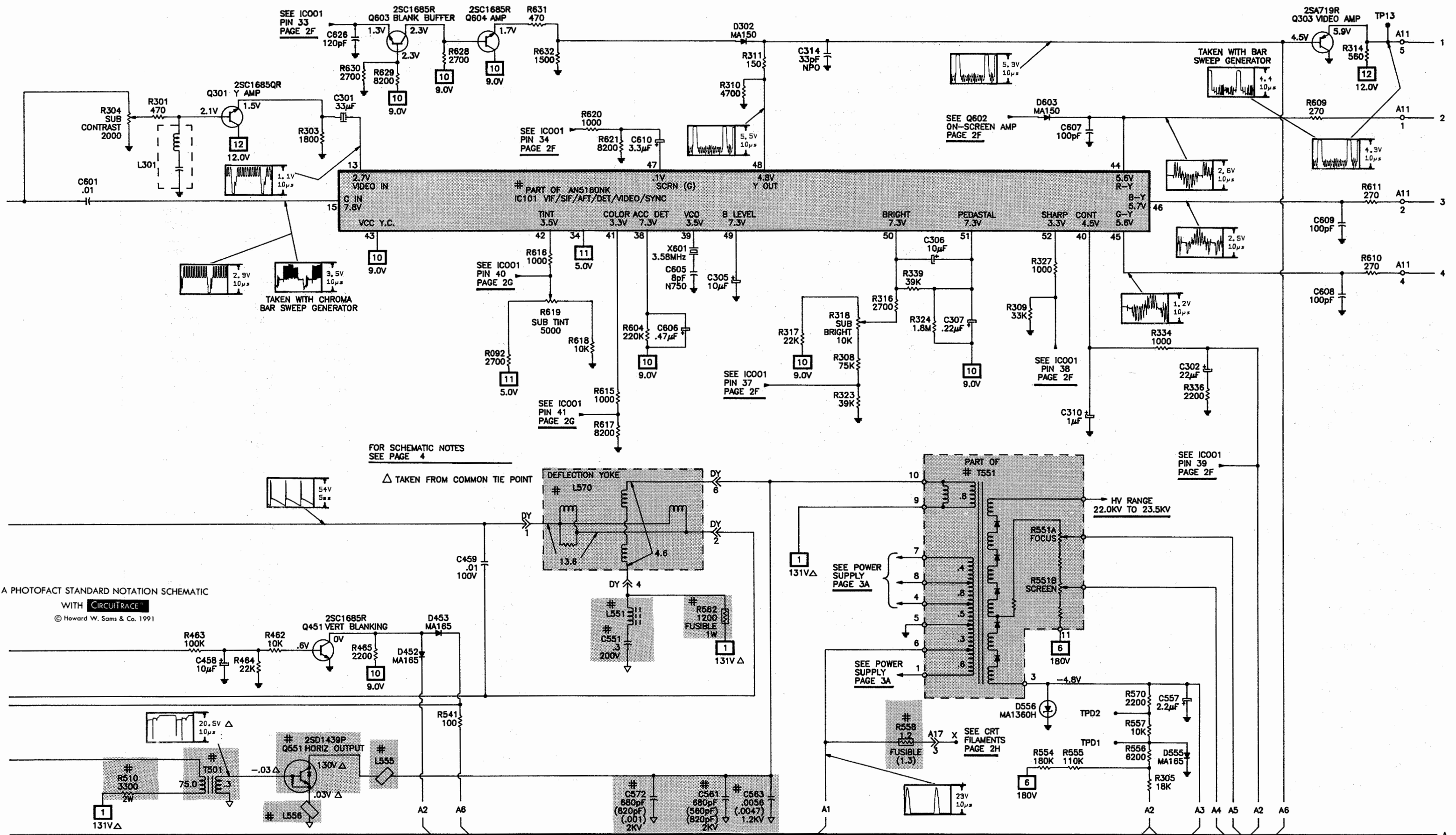
SEMICONDUCTORS continued

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
IC451	LA7835	-	NTE1855	ECG1855	SK10085
	LA7835-TV	-	NTE1855	ECG1855	SK10085
# IC551	AN78M12	-	NTE966	ECG966	SK3592
	AN78M12LB	-	NTE966	ECG966	SK3592
# IC801	STR30130	TVSSTR30130	NTE1777	ECG1777	SK9870
Q001	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
Q004	2SC1685	-	NTE85	ECG85	SK9229
	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
Q005	2SA564AQ	-	NTE290A	ECG290A	SK3932
	2SA564AQR	-	NTE290A	ECG290A	SK3932
	2SA564A	-	NTE290A	ECG290A	SK3932
Q006,7,	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
Q019	2SC1685	-	NTE85	ECG85	SK9229
	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
Q102	2SC1685	-	NTE85	ECG85	SK9229
	2SC1685Q	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
Q301	2SC1685	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
Q303	2SA719R	-	NTE290A	ECG290A	SK3114A
	2SA719QR	-	NTE290A	ECG290A	SK3114A
Q316	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
Q351,52,53	2SC1685	-	NTE85	ECG85	SK9229
	2SC1473R	-	NTE399	ECG399	SK9352
	2SC1473NC	-	NTE399	ECG399	SK9352
	2SC1473AQH	-	NTE399	ECG399	SK9352
Q451	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
	2SC1685	-	NTE85	ECG85	SK9229
Q454	2SA564AQ	-	NTE290A	ECG290A	SK3932
	2SA564AQR	-	NTE290A	ECG290A	SK3932
Q501	2SC1573A	-	NTE399	ECG399	SK9352
	2SC1573AH	-	NTE399	ECG399	SK9352
# Q531	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
	2SC1685	-	NTE85	ECG85	SK9229
# Q532	2SA564AQ	-	NTE290A	ECG290A	SK3932
	2SA564AQR	-	NTE290A	ECG290A	SK3932
	2SA564A	-	NTE290A	ECG290A	SK3932

# For SAFETY use only equivalent replacement part.





PARTS LIST continued

SEMICONDUCTORS continued

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
# Q533	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
	2SC1685	-	NTE85	ECG85	SK9229
Q541	2SC1685R	-	NTE85	ECG85	SK9229
	2SC1685QR	-	NTE85	ECG85	SK9229
	2SC1685	-	NTE85	ECG85	SK9229
# Q551	2SD1439P	-	NTE2302	ECG2302	SK9422
	2SD1439PLB	-	NTE2302	ECG2302	SK9422
	2SC1685R	-	NTE85	ECG85	SK9229
Q601,2,3,4	2SC1685QR	-	NTE85	ECG85	SK9229
	2SC1685	-	NTE85	ECG85	SK9229
	2SD637	-	NTE16	ECG16	SK9664
Q841 (2)	2SD637RS	-	NTE16	ECG16	SK9664

# For SAFETY use only equivalent replacement part.  
(2) Used in Model CTM-1353R.

RESISTORS

Item No.	Rating	Mfr. Part No.	NTE Replacement
# D806	Thermistor 7.2 Cold PTC	ERPF5B0M050K	-
R050	10K 1% 1/4W Mtl Flm	ER0S2CKF1002	-
R051	10K 1% 1/4W Mtl Flm	ER0S2CKF1002	-
R069	38.3K 1% 1/4 Mtl Flm	ER025CKF3832	-
R206	22 5% 1W Fusible	ERQ1CJP220	F1W022
# R509	5600 5% 2W Mtl Flm	ERG2ANJ562	2W256
# R510	3300 5% 2W Mtl Flm	ERG2ANJ332	2W233
	4700 5% 2W Mtl Flm	ERG2ANJ472(1)	2W247
# R531	47 5% 1/4W Cbn Flm	ERD25FJ470	QW0476
# R532	24.3K 1% 1/4W Mtl Flm	ER0S2CKF2432	-
# R533	16.5K 1% 1/4W Mtl Flm	ER0S2CKF1652	-
# R534	680K 5% 1/4W Mtl Flm	ERDS2TJ684	QW468
# R535	560 5% 1/4W Cbn Flm	ERDS2TJ561	QW156
# R536	820 5% 1/4W Cbn Flm	ERDS2TJ821	QW182
# R537	18K 5% 1/4W Cbn Flm	ERDS2TJ183	QW318
# R538	8200 5% 1/4W Cbn Flm	ERDS2TJ822	QW282
# R539	15K 5% 1/4W Cbn Flm	ERDS2T153	QW315
# R551	1 5% 1/2W Cbn Flm	ERDS1FJ1R0	HW1D0
# R552	1 5% 1/2W Cbn Flm	ERDS1FJ1R0	HW1D0
# R553	1 5% 1/2W Cbn Flm	ERDS1FJ1R0	HW1D0
# R558	1.2 5% 1W Fusible	ERQ1CJP1R2	1W1D2
	1.3 5% 1W Fusible	ERQ1CJP1R3(1)	1W1D3
R559	100 5% 3W Mtl Flm	ERG3ANJ101	3W110
# R562	1200 5% 1W Mtl Flm	ERG1ANJ122	1W212
# R569	100 5% 1W Mtl Flm	ERG1SJ101	1W110
# R801	.82 10% 5W WW	ERF5ZKR82	5WD82
# R802	220 5% 15W WW	ERF15ZJ221	-
# R804	220K 5% 1/4W Cbn Flm	ERDS2TJ224	QW422
# R805	10K 5% 1/2W Cbn Flm	ERDS1TJ103	HW310
# R807	47 5% 1/4W Cbn Flm	ERD25FJ470	QW047
# R808	33 5% 1/4W Cbn Flm	ERD25FJ330	QW033
# R810	5.6 5% 3W Fusible	ERQ3CJ5R6	-
# R815	2.7M 10% 1/2W Cbn Comp	ERC12ZGK275	HW527
# R816	1 10% 1/2W WW	ERW12PK1R0	-
# R854	107K 1% 1/4W Mtl Flm	ER0S2CKF1073	-
# R856	4870 1% 1/4W Mtl Flm	ER0S2CKF4871	-

# For SAFETY use only equivalent replacement part.  
(1) Models CTM-1340R-1, CTM-1341R-1 only.

COILS (RF-IF)

Item No.	Rating	Mfr. Part No.
L006	5.6uH	TLUABTA5R6K
L007	5.6uH	TLUABTA5R6K
L008	5.6uH	TLUABTA5R6K
L011	1.0uH	TLUABTA1ROK
L103	AFT	TLI67394-1
L104	1.2uH	TLQ012K205C
L105	VCO	TLI158755
L106	15uH	TLUABTA150K
L108	1.2uH	TLQ012K205C
L202	4.7uH	TLUABTA4R7K
L354	150uH	TLUABTA151K

ELECTROLYTIC CAPACITORS

Item	Rating	Mfr. Part No.
C301	33 16V NP	ECEA1CN330S
C452	1 25V	ECSZ25EF1V
# C531	33 25V	ECEA1EU330
# C552	220 25V	ECEA1EU221
# C553	220 25V	ECEA2EU220
# C559	220 25V	ECEA1EU221
# C566	220 35V	ECEA1VU221
# C805	220 200V	ECES2DU221
# C806	22 160V	ECEA2CU220
# C812	33 160V	ECEA160V33Z

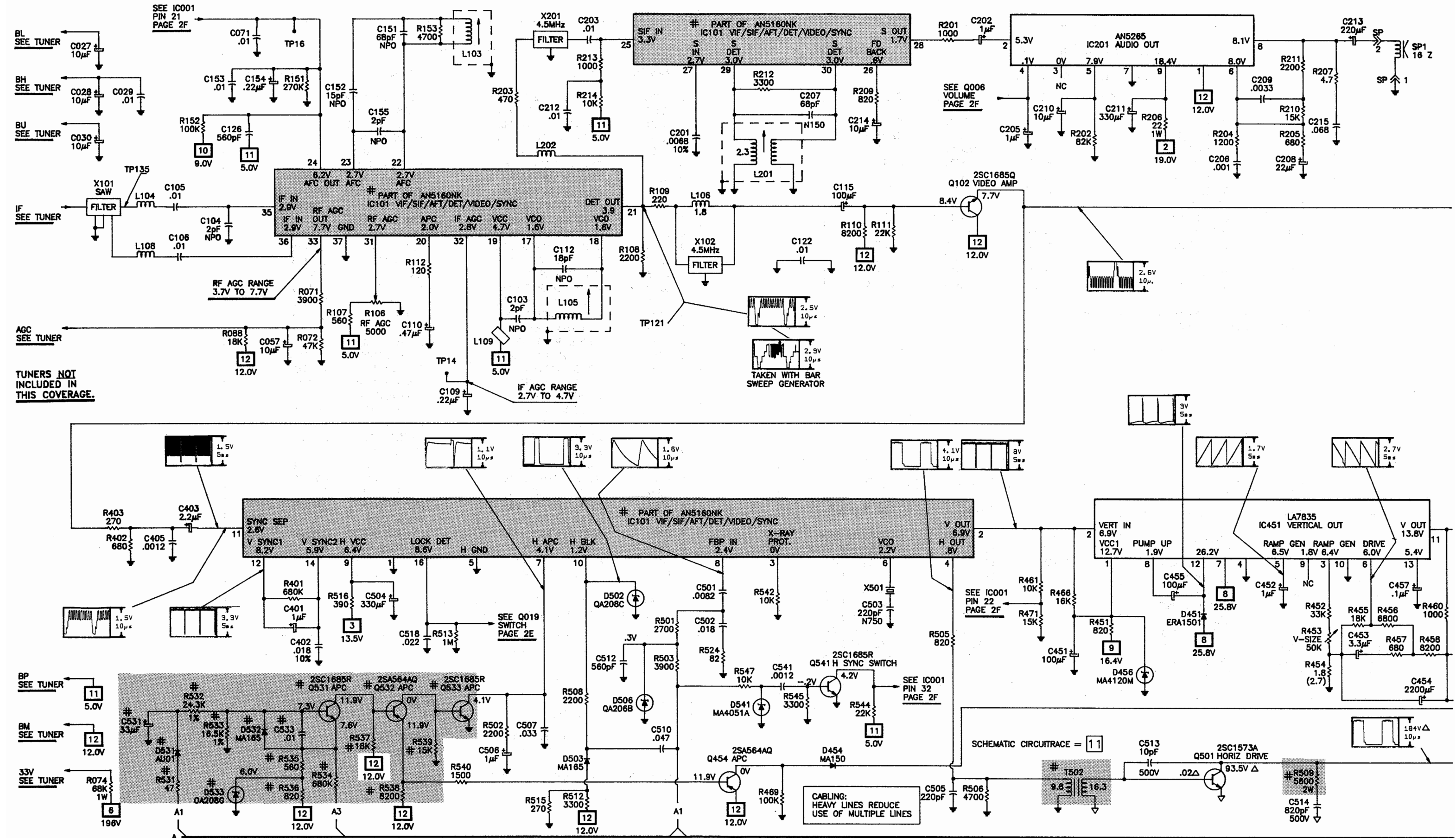
# For SAFETY use only equivalent replacement part.

SPEAKERS

Item No.	Description	Mfr. Part No.	QUAM Part No.
SP1	3" Rd. 16 Ohms 1.5W PM 2 1/2" Rd. 16 Ohms 1.5W PM	EAS8P133D6 EAS65P40AG(1)	25A05Z16R

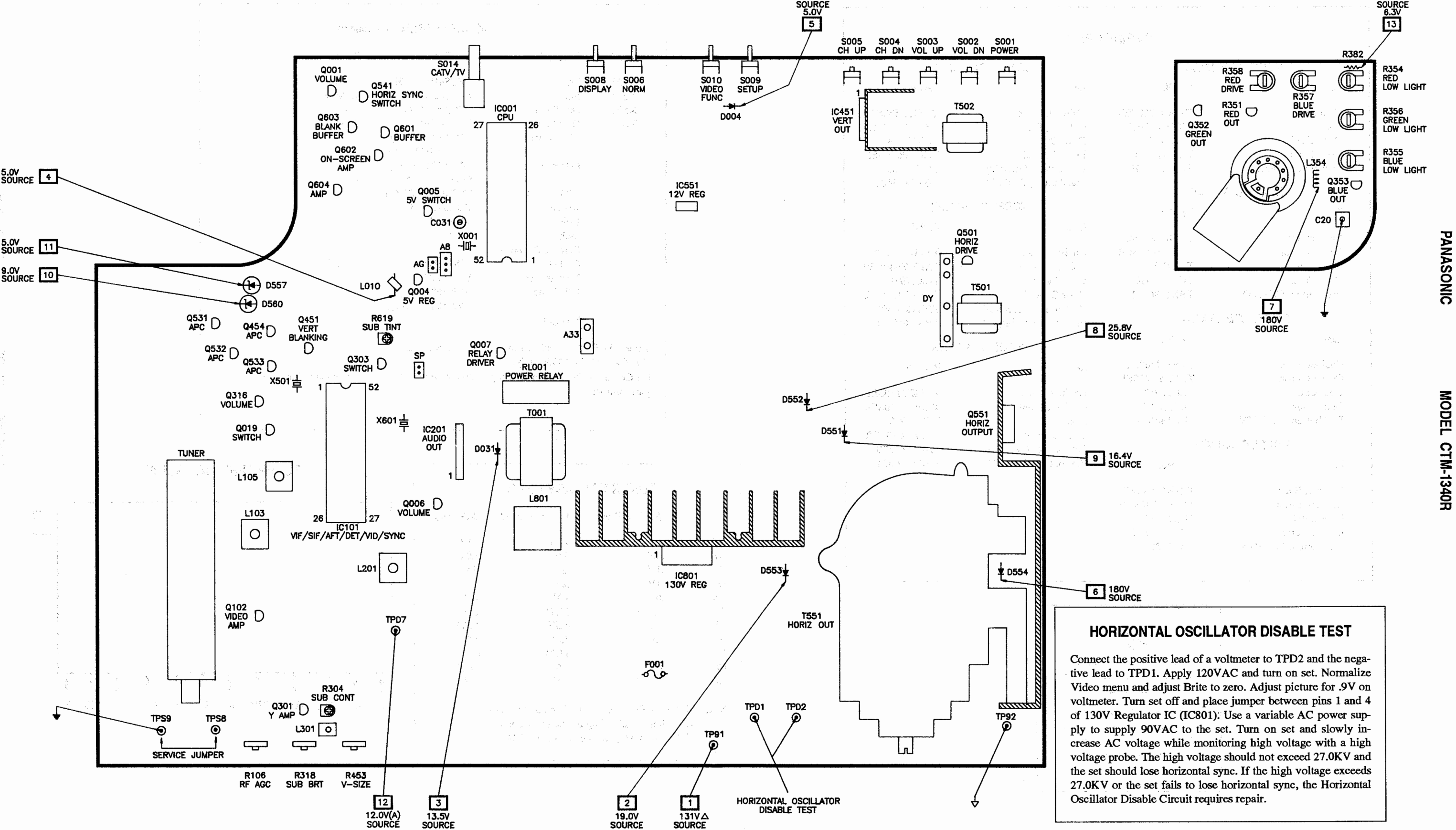
(1) Models CTM-1351R, CTM-1352R, CTM-1353R only.

**B**





PLACEMENT CHART



PANASONIC  
MODEL CTM-1340R

PARTS LIST continued

CABINET PARTS

MODEL CTM-1340R

Item	Part No.
Cabinet, Back	TXFKU260SER
Cabinet, Front	TXFKY050SER
Door Catch	TEK17918
Door Control	TKP2A10881
Pushbutton, Cable/TV	TBX1886601

MODEL CTM-1351R

Item	Part No.
Cabinet, Back	TXFKU538SER
Cabinet, Front	TXFKY340SER
Door Catch	TEK17918
Door Control	TXFKP080SER
Pushbutton Assembly	TBX1886500
Pushbutton, Cable/TV	TBX1886601

MODEL CTM-1341R

Item	Part No.
Cabinet, Back	TXFKU270SER
Cabinet, Front	TXFKY060SER
Door Catch	TEK17918
Door Control	TKP2A10882
Pushbutton, Cable/TV	TBX1886601

MODEL CTM-1352R

Item	Part No.
Cabinet, Back	TXFKU538SER
Cabinet, Front	TXFKY449SER
Door Catch	TEK17918
Door Control	TXFKP326SER
Pushbutton Assembly	TBX1886500
Pushbutton, Cable/TV	TBX1886601

MODEL CTM-1340R-1

Item	Part No.
Cabinet, Back	TXFKU260SER
Cabinet, Front	TXFKY320SER
Door Catch	TEK17918
Door Control	TKP2A10881
Pushbutton, Cable/TV	TBX1886601

MODEL CTM-1353R

Item	Part No.
Cabinet, Back	TXFKU230SER
Cabinet, Front	TXFKY340SER
Door Catch	TEK17918
Door Control	TXFKP080SER
Pushbutton Assembly	TBX1886500
Pushbutton, Cable/TV	TBX1886601

MODEL CTM-1341R-1

Item	Part No.
Cabinet, Back	TXFKU270SER
Cabinet, Front	TXFKY330SER
Door Catch	TEK17918
Door Control	TKP2A10882
Pushbutton, Cable/TV	TBX1886601

MISCELLANEOUS continued

Item No.	Description	Mfr. Part No.	Notes
X102	Trap	EFCS4R5MW3BA	4.5Mhz
X201	Filter	EFCS4R5MS4	4.5Mhz
X501	Oscillator	EFOA503KS41	Crystal
X601	Oscillator	TSS816MX	3.58Mhz
	Main Board	TNP190089WZ(4)	-
		TNP190089AD(3)	-
	L-Board	ONP14013AA(4)	-
		ONP14013ZA	-
	CRT Board	TNP101654DE(4)	-
	J-Board	EUR37234(4)	-
	Holder	TJC6319	-
	Jack	TJS1A7010	-
	Remote Receiver	-	-
	Socket	TJS1A5150	For CRT
	Transmitter	EUR64967	-
	U/V Tuner	EVN56898G3(4)	-
		EVN56898G3(3)(4)	-
	Wedges	-	-

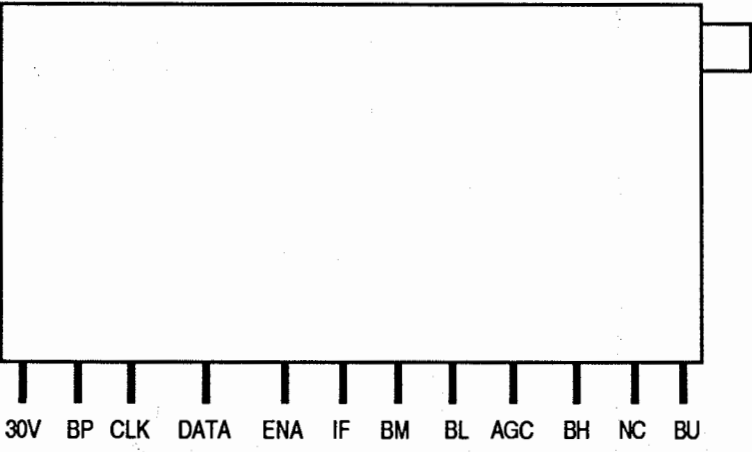
# For SAFETY use only equivalent replacement part.  
(3) Model CTM-1353R only.  
(4) Contact PTS Electronics Corporation for replacement; order by manufacturer's part number.

TUNER VOLTAGE CHART

	VHF Low Band	VHF High Band	UHF Band
30V	3.7V	7.0V	19.3V
BP	5.0V	5.0V	5.0V
CLK	.1V	.1V	.1V
DATA	.1V	.2V	.2V
ENA	.6V	.6V	.6V
BM	11.9V	11.9V	11.9V
BL	11.7V	4.5V	11.7V
AGC	7.8V	7.8V	7.8
BH	0V	11.7V	0V
NC	10.6V	4.5V	17.0V
BU	10.3V	.1V	.1V

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



Created with pride by the  
employees of Howard W. Sams  
& Company.

R. Bryant, B. Buchanan,  
D. Curran, G. Farrell, B. Fink,  
M. Herkless, M. McDonald,  
J. Watson, B. Smith

PANASONIC

MODEL CTM-1340R



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	-

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. Item numbers in rectangles appear in the alignment/adjustment instructions.
- 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 some versions.
- Measurements with switching as shown, unless noted.

ADJUSTMENT & ALIGNMENT TOOLS

Item No.	GC-THORSEN Tool No.
C031, R114, R304, R354, R355, R356, R357, R358, R619	9091
L105, L201, L202, L301	9440

SAFETY PRECAUTIONS

SERVICE WARNING

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

- 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 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.

- To discharge static High Voltage, connect a 10-kilohm resistor in series with a test lead between chassis and picture tube anode lead.
- DO NOT lift picture tube by the neck.
- 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.

- Keep an accurate High Voltage meter available at all times. Check meter calibration periodically.
- Whenever servicing a chassis, check 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 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.
- 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

- Unplug the AC cord, connect a jumper across the plug prongs, and turn the power switch ON.
- 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

- Plug the AC cord directly into AC outlet. DO NOT use an isolation transformer.
- 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.)
- 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.
- 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.
- 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.

- Check repaired area for poorly soldered or de-soldered connections, and check entire circuit board for solder splashes.
- Check inner 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.

