

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 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.

SAFETY CHECKS -- FIRE AND SHOCK HAZARD

Cold Leakage Checks for Receivers with Isolated Ground

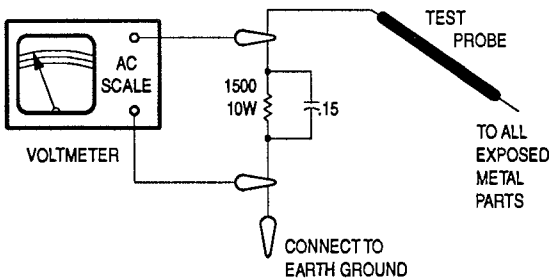
Unplug the AC cord, connect a jumper across the plug prongs, and turn the power switch on (if applicable). Use an ohmmeter to measure the resistance between the jumped AC plug and any exposed metal cabinet parts such as antenna screw heads, control shafts, or handle brackets. Exposed metal parts with 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 .15uF 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, 500uA. 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.

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 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.



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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Indianapolis, IN 46214-2012

Printed in the United States of America 5 4 3 2 1



95PF02757



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PHOTOFACT® Technical Service Data

SET 3435

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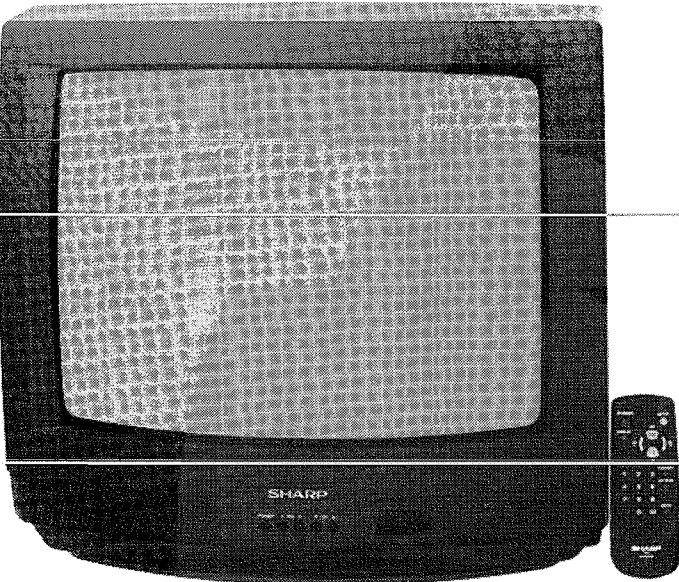
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MODELS 19F-M100M / M120 / M150

SHARP

For Supplier Address,
See PHOTOFACT Annual Index

SHARP Models 19F-M100M / M120 / M150



Model 19F-M100M

Complete coverage
for servicing a television receiver...

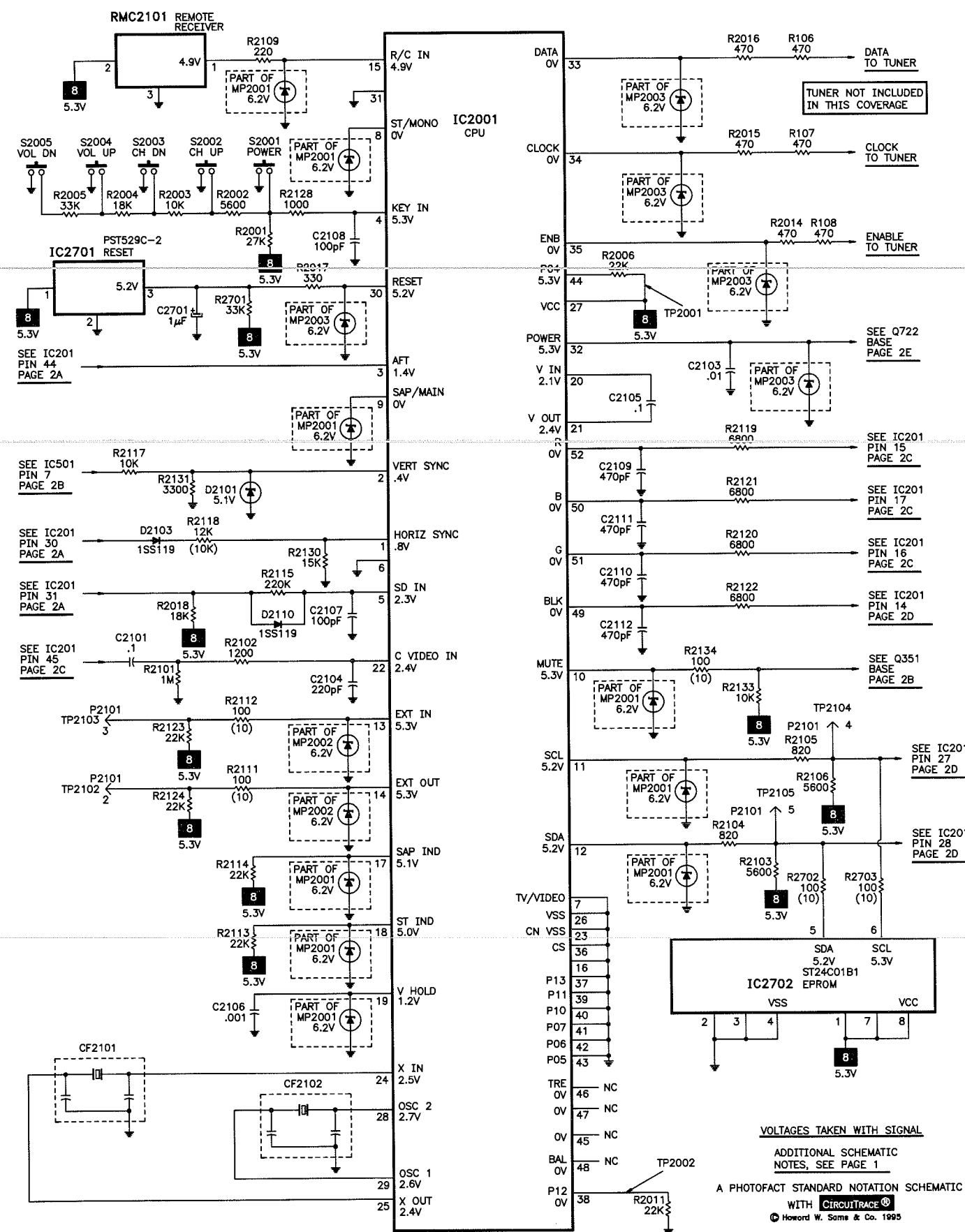
- Schematics
- Component locations
- Parts list
- Troubleshooting guide



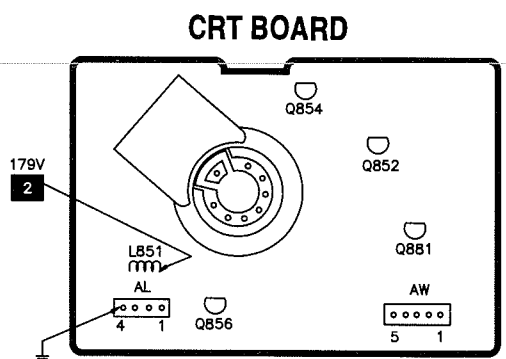
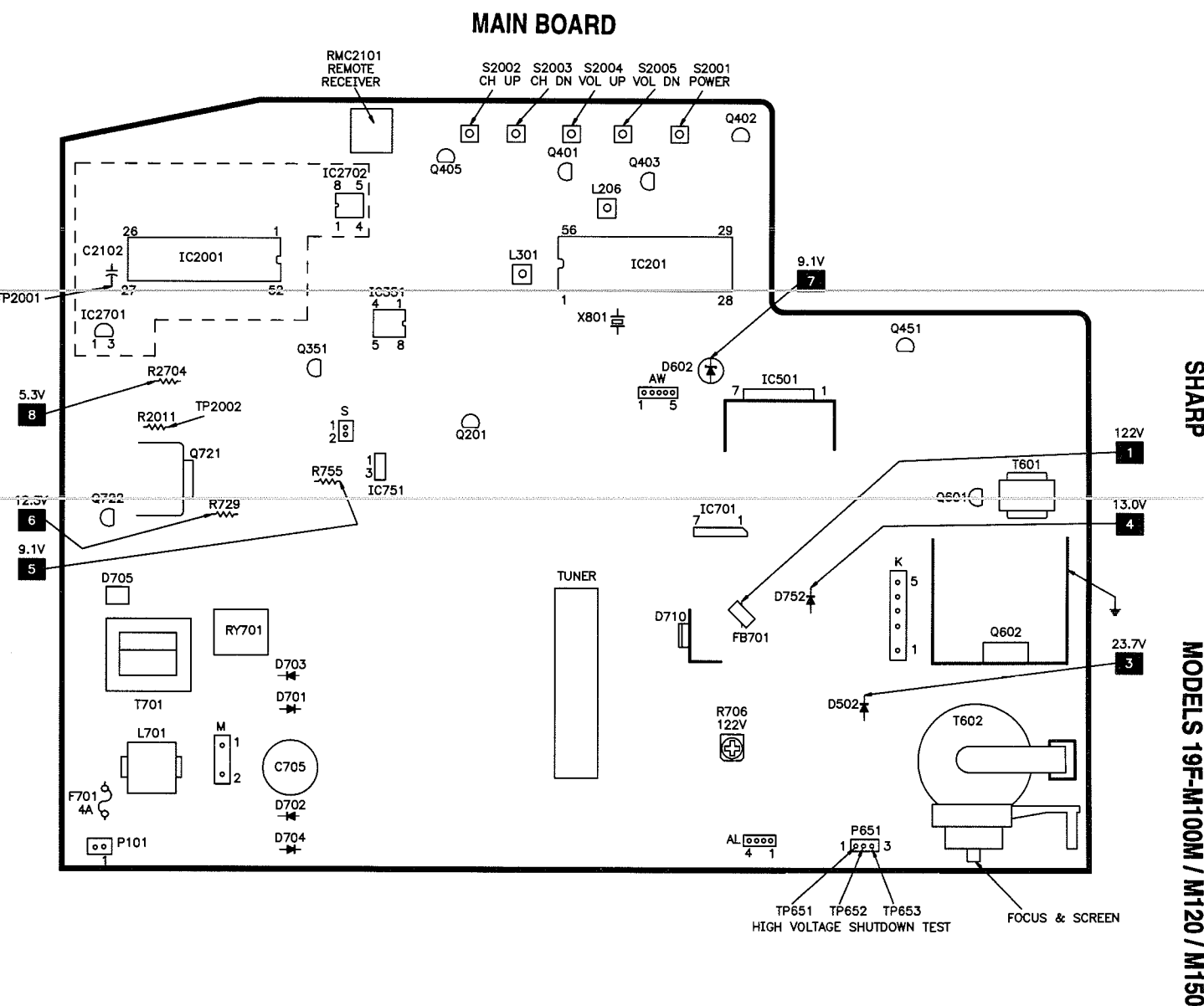
HOWARD W. SAMS & COMPANY

JANUARY 1995 SET 3435

SYSTEM CONTROL SCHEMATIC



PLACEMENT CHART

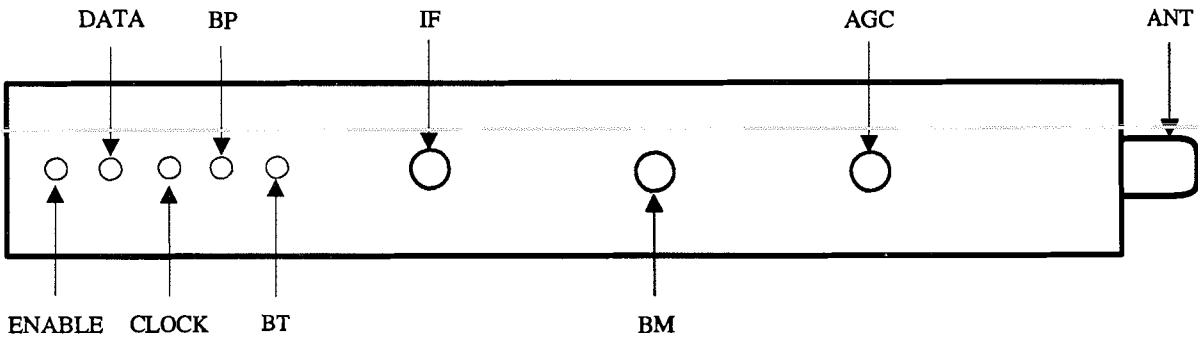


TUNER INFORMATION

TUNER VOLTAGE CHART

Pin	VHF Low Band	VHF High Band	UHF Band	Pin	VHF Low Band	VHF High Band	UHF Band
ENABLE	0V	0V	0V	BM	9.1V	9.1V	9.1V
DATA	0V	0V	0V	AGC	4.7V	4.8V	4.7V
CLOCK	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.			
BP	5.2V	5.2V	5.2V				
BT	32.9V	32.9V	32.9V				
IF	0V	0V	0V				

TUNER TERMINAL GUIDE



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 noted otherwise.

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.

TEST EQUIPMENT

Test equipment listed by participating manufacturer 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	Sencore No.	Equipment	Sencore No.
Oscilloscope	SC3100	Isolation Transformer	PR57
Generators		Capacitance Analyzer	LC101, LC102
RGB	CM2000	CRT Analyzer	CR70
Multiburst Signal	VG91	AC Leakage Tester	PR57
Color Bar	VG91	Inductance Analyzer	LC101, LC102
TV Stereo	VG91	Flyback Yoke Tester	TVA92
Digital VOM	SC3100	TV Stereo Power Monitor	SR68, PA81
Frequency Meter	SC3100	Field Strength Meter	SL750
Hi-Voltage Probe	HP200	Transistor Tester	TF46
Accessory Probes	TP212	Video Analyzer	VG91, TVA92

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

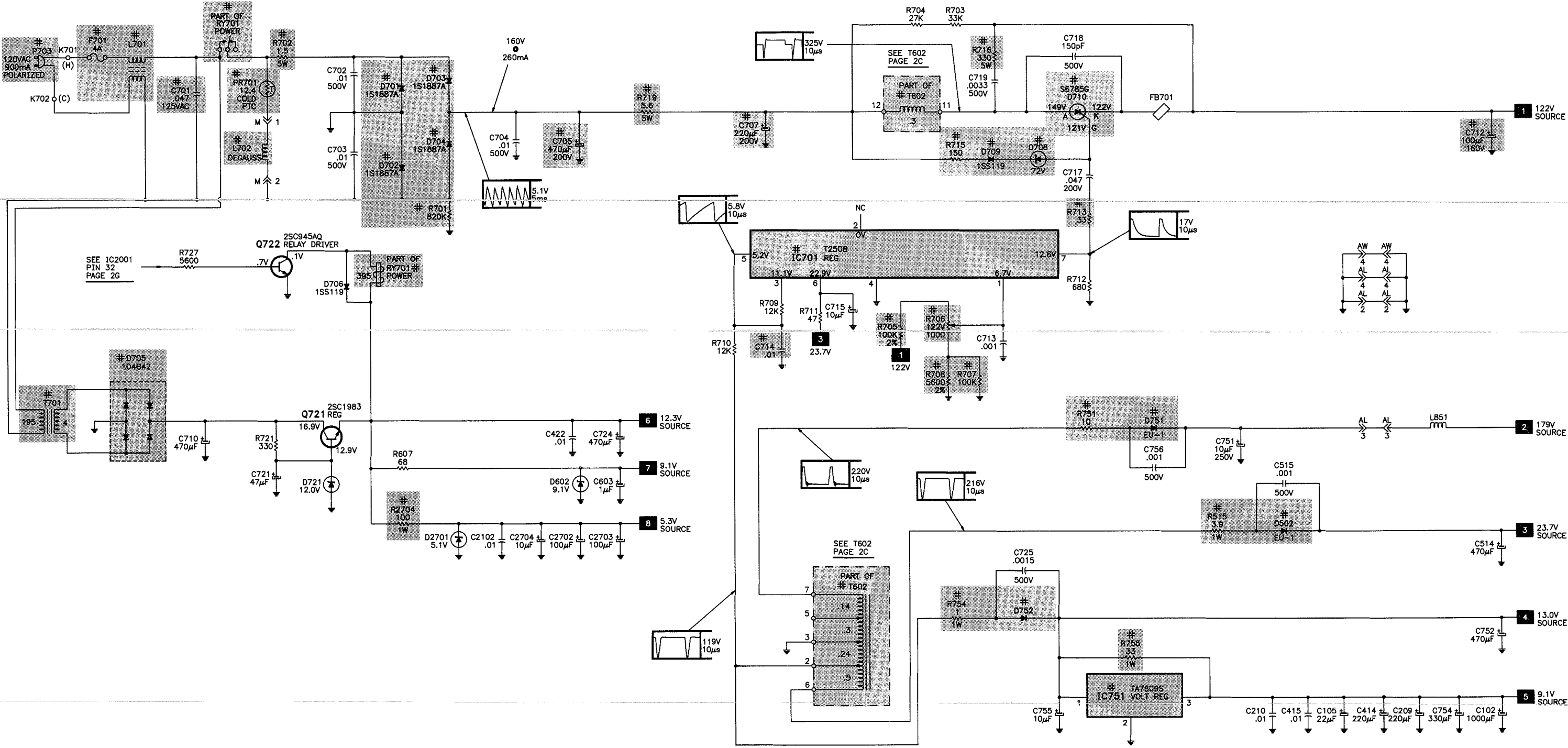
Information on test equipment and replacement parts is listed in these pages for the following participating vendors. Consult the Sams *Annual Index* for their current address.

- Custom Components Corporation (Chek-A-Color)
- NTE Electronics, Inc. (NTE)
- Philips ECG Company (ECG)
- PTS Electronics Corporation (PTS)
- Sencore, Inc.
- Thomson Consumer Electronics, Inc. (SK, TCE)

SHARP

MODELS 19F-M100M / M120 / M150

POWER SUPPLY SCHEMATIC



VOLTAGES TAKEN WITH SIGNAL
ADDITIONAL SCHEMATIC
NOTES, SEE PAGE 1
A PHOTOFACT STANDARD NOTATION SCHEMATIC
WITH CIRCUITTRACE
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TROUBLESHOOTING

POWER SUPPLY

Check F701, if the fuse is open, check C701 thru C705, D701 thru D704, D710, T701, and Q602. Apply 120VAC and check for 16.9V at the collector of Q721. If voltage is missing, check L701, T701, and D705. If 16.9V is present, check for 160V at the cathode of D704. If voltage is missing, check R702, R727, Q722, and RY701. If voltage is present, check for 122V at the cathode of D710. If voltage is missing, check D710, IC701, and C718. If voltage is present, refer to the "Horizontal" section of this Troubleshooting guide.

HIGH VOLTAGE SHUTDOWN TEST

Check for about 20.5V at TP651. Apply an external 26.5V to TP651, the receiver should shutdown. If the receiver fails to go into shutdown, the high voltage shutdown circuit requires repair. To return to normal operation, momentarily short TP652 to TP653.

HIGH VOLTAGE SHUTDOWN

CAUTION: When defeating the high voltage shutdown circuit, monitor the high voltage, and do not exceed the maximum high voltage specified on the schematic. The high voltage is monitored by D651 rectifying pulses from T602. Should the high voltage increase, the voltage at the cathode of D651 will also increase and trigger D652. To troubleshoot, remove R654 from the circuit. Use a variable AC power, start at 90VAC and increase as necessary to isolate and correct the defect. Return R654 to the circuit.

Voltages taken with receiver in shutdown		
IC201		
Pin 29	4.0V	

HORIZONTAL

Determine if the receiver is in shutdown, refer to the "High Voltage Shutdown" section of this Troubleshooting guide. If the receiver is not in shutdown, inject a horizontal signal at the base of Q602. If horizontal sweep returns, check Q601,T601, and pins 30 thru 33 of IC201. If horizontal sweep is still missing, check Q602, T602, D604, D751, D502, and D752 for defects. The high voltage rectifier is part of T602 and may be defective. Poor horizontal linearity or foldover problems may be caused by capacitors C605, C606, C608, and C610.

VERTICAL

Inject a vertical drive signal at pin 4 of IC501. If vertical deflection returns, check pins 22, 23, 24, and 31 of IC201. If vertical deflection does not return, check IC501 and the deflection yoke. Vertical linearity or foldover problems may be caused by C501, C508, C512, C513, and C516 being defective.

RASTER

Check the CRT and CRT voltages. If red is missing, check pin 19 of IC201 and Q852. If green is missing, check pin 20 of IC201 and Q854. If blue is missing, check pin 21 of IC201 and Q856. If the raster has a keystone shape, check DY601. If the raster has height or width problems, refer to the "Vertical," "Horizontal," or "Power Supply" sections of this Troubleshooting guide.

AUDIO

Select an active channel and check for an audio waveform at pin 8 of IC351. If the waveform is missing, check pins 2, 4, 47, 48, 51, and 52 of IC201 and Q405. If the waveform is present, check for audio waveforms at pin 5 of IC351. If the waveform is missing, check IC351 and Q351.

VIDEO

Inject a video signal at pin 47 of IC201 and check for video on the CRT. If video is present, refer to the "IF AGC" section of this Troubleshooting guide. If video is missing, check for a video waveform at pin 41 of IC201. If the waveform is missing, check Q401, Q402, Q405, and pin 37 of IC201. If the waveform is present at pin 41 of IC201, check Q403 and IC201.

CHROMA

Check for a chroma waveform at pin 45 of IC201. If the waveform is missing, check pin 45 of IC201, and refer to the "Video" section of this Troubleshooting guide. Check for the proper waveforms at pins 19, 20, and 21 of IC201. If these waveforms are missing, check IC201. Check the 3.58 MHz oscillator at pin 12 of IC201. If proper waveforms are present, refer to the "Raster" section of this Troubleshooting guide.

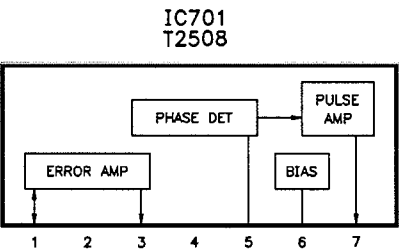
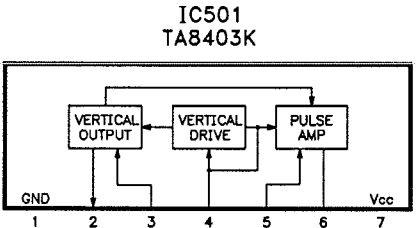
IF AGC

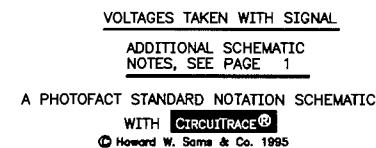
Inject an IF signal at the IF input and check for video on the CRT. If a picture is present, check the tuner, and AGC circuits. If the picture is missing, check for a video waveform at pin 47 of IC201. If the waveform is present at pin 47 of IC201, refer to the "Video" section of this Troubleshooting guide. If the waveform is missing, apply AGC bias to pin 5 of IC201. Check pins 5, 3, and 44 of IC201, if a video waveform is now present. If the waveform is still missing at pin 47 of IC201, check Q201 and IC201. A defective AGC circuit can cause an overloaded picture, excessive snow or loss of audio and video.

SERVICE MODE ADJUSTMENT CHART

Service No.	Adjustment	Value Range	Data Value	Notes
S1	Sub Picture	0 - 127	80	-
S2	Sub Tint	0 - 127	64	-
S3	Sub Color	0 - 127	45	-
S4	Sub Brightness	0 - 127	64	-
S5	Sharpness	0 - 63	32	-
S6	Vertical Phase	0 - 7	0	Must be set to 0
S7	Horizontal Position	0 - 31	20	-
S8	RF AGC	0 - 63	32	0 = Black raster
S9	Vertical Size	0 - 63	32	-
S10	VCO	0 - 127	45	-
S11	Red Cutoff	0 - 255	0	-
S12	Green Cutoff	0 - 255	0	-
S13	Blue Cutoff	0 - 255	0	-
S14	Green Gain	0 - 255	128	-
S15	Blue Gain	0 - 255	128	-
S16	3.58MHz Trap	0 - 1	0	0 = On, 1 = Off
S17 (1)	Bandpass Filter	0 - 1	1	0 = On, 1 = Off
S18 (1)	Blanking	0 - 1	0	0 = On, 1 = Off
S19	Y - Mute / Vertical, Collapse	0 - 3	0	0 = Normal raster, 1 = No Y, 2 = Test mode, 3 = No vertical
S20 (1)	Horizontal AFC	0 - 1	1	0 = X2 gain, 1 = Normal gain
S21	WPL	0 - 1	1	0 = Off, 1 = On
S22 (1)	60Hz	0 - 1	0	0 = Normal, 1 = Not available
S23	Volume	8 - 58	26	-
S24	Audio Balance	0 - 63	32	-
S25	Caption Position	0 - 15	7	-
(1) No adjustment is required, proper setting is automatic.				

IC FUNCTIONS





MISCELLANEOUS ADJUSTMENTS

B+

Adjust R706 for 122V ±1.0V at the positive end of C712.

HIGH VOLTAGE CHECK

Tune in a picture. Set brightness, color, picture, and screen control to minimum. Connect a high voltage probe to CRT anode. High voltage must never exceed 26.5kV.

HIGH VOLTAGE SHUTDOWN TEST

Check for about 20.5V at TP651. Apply an external 26.5V to TP651, the set should shut down. If the set fails to go into shutdown, the high voltage shutdown circuit requires repair. To return to normal operation, momentarily short TP652 to TP653.

ENTERING SERVICE MODE

Turn on receiver and use reset function in the video adjustment menu to ensure that customer controls are in their proper reset position. Momentarily short test point TP2001 to test point TP2002 to enter the service mode.

NOTE: Shorting test points TP2001 and TP2002 causes the receiver to toggle between service and normal modes.

When in the service mode a letter "S" with a number is displayed in the lower left part of the screen and a letter "D" with a number is displayed in the lower right part of the screen. The "S" is the service no. and it is changed by pressing the channel up / down buttons on the receiver or remote transmitter. The "D" is the data value of the service adjustment and it can be changed by pressing the volume up / down buttons on the receiver or remote transmitter. For a complete listing of the service adjustments, refer to the "Service Mode Adjustment Chart".

EXIT SERVICE MODE

To exit service mode when finished making adjustments, turn off the power or unplug the set.

RF AGC

Tune in a picture. Enter the service mode, select service no. S8. Set the data value to a point where no snow (noise) appears in picture. Exit the service mode to select another channel. Check all channels for proper operation.

VCO

Connect a digital voltmeter to pin 44 of IC201 and ground. Tune in a local channel. Enter the service mode, select service no. S10. Set the data value to 60. Adjust the L206 to obtain 4.0V on the digital voltmeter.

SUB PICTURE

Tune in a picture. Set brightness to minimum. Set picture to maximum. Enter the service mode, select service no. S1. Set the data value to achieve normal contrast range.

SUB TINT

Tune in a picture. Set tint at center of its range level. Enter the service mode, select service no. S2. Set the data value to achieve normal flesh tones.

SUB COLOR

Tune in a picture. Set color at center of its range level. Enter the service mode, select service no. S3. Set the data value to achieve normal color level.

SUB BRIGHTNESS

Tune in a picture. Set brightness at reset level. Enter the service mode, select service no. S4. Set the data value to achieve normal brightness level.

VERTICAL SIZE

Tune in a crosshatch pattern. Enter the service mode, select service no. S9. Set the data value to achieve proper vertical size and best vertical linearity.

VERTICAL PHASE

Tune in a crosshatch pattern. Enter the service mode, select service no. S6. Set the data value to 0.

HORIZONTAL POSITION

Tune in a crosshatch pattern. Enter the service mode, select service no. S7. Set the data value for the best centering on screen.

CAPTION POSITION

Tune in a local channel. Enter the service mode, select service no. S25. A black box will appear on the screen. Set the data value to center the black box on the screen.

WHITE BALANCE

Operate the receiver for 15 minutes. Enter the service mode, select service no. S3. Set the data value to 0. Set brightness for a visible raster. Alternately adjust data value of S14 and S15 until a good gray scale with normal white is obtained. Select service adjustment S3. Set the data value to achieve normal color level.

HORIZONTAL AFC

Tune in a local channel. Enter the service mode, select service no. S20. Set data value to 1, which is normal AFC gain. If increased horizontal gain is required, adjust data value to 0.

BLANKING

Tune in a local channel. Enter the service mode, select service no. S18. Set data value to 0, which is normal blanking. If data value is set to 1, blanking will be turned off.

WPL (WHITE PEAK LIMITER)

Tune in a local channel. Enter the service mode, select service no. S21. Set data value to 1 to turn on WPL or to 0 to turn it off.

3.58MHz TRAP

Tune in a local channel. Enter the service mode, select service no. S16. Set data value to 0 to turn on 3.58MHz trap or to 1 to turn it off.

BANDPASS FILTER

Tune in a local channel. Enter the service mode, select service no. S17. Set data value to 0 to turn on bandpass filter or to 1 to turn it off.

SHARPNESS

Tune in a local channel. Enter the service mode, select service no. S5. Set data value to 32 which is center of data range.

AUDIO BALANCE

Tune in a local channel. Enter the service mode, select service no. S24. Set data value to 32 which is center of data range.

VOLUME

Tune in a local channel. Enter the service mode, select service no. S23. Set data value to 26 or for normal listening volume.

60Hz

Tune in a local channel. Enter the service mode, select service no. S22. Set data value to 0 which is normal viewing.

GRAY SCALE

Connect a digital voltmeter to both ends of R852 on the CRT board. Tune in an active channel. Set color, brightness, and picture to minimum. Enter the service mode, select service no. S3. Set the data value to 0. Select service no. S19, adjust the data value to 1, this turns off the luminance signal (Y mute). Select service no. S4, adjust the data value to obtain .15V on the digital voltmeter. Adjust screen control, if necessary, to obtain a barely visible raster. Adjust service

numbers S11, S12, and S13 until a good gray scale with normal white at high and low brightness is obtained. Select service no. S19, adjust the data value to 0. Select service no. S3, adjust the data value to normal color level. Adjust screen control for normal brightness.

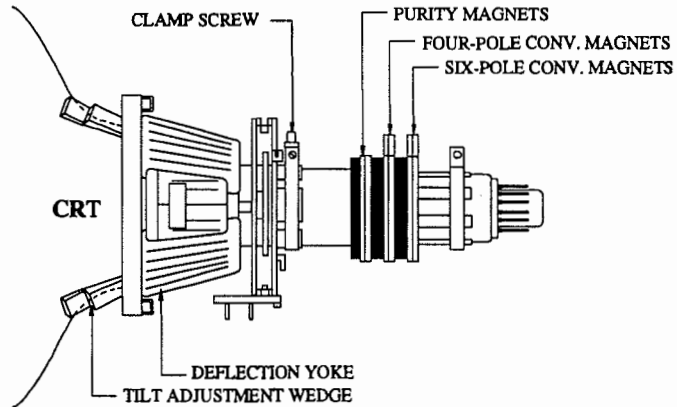
CONVERGENCE

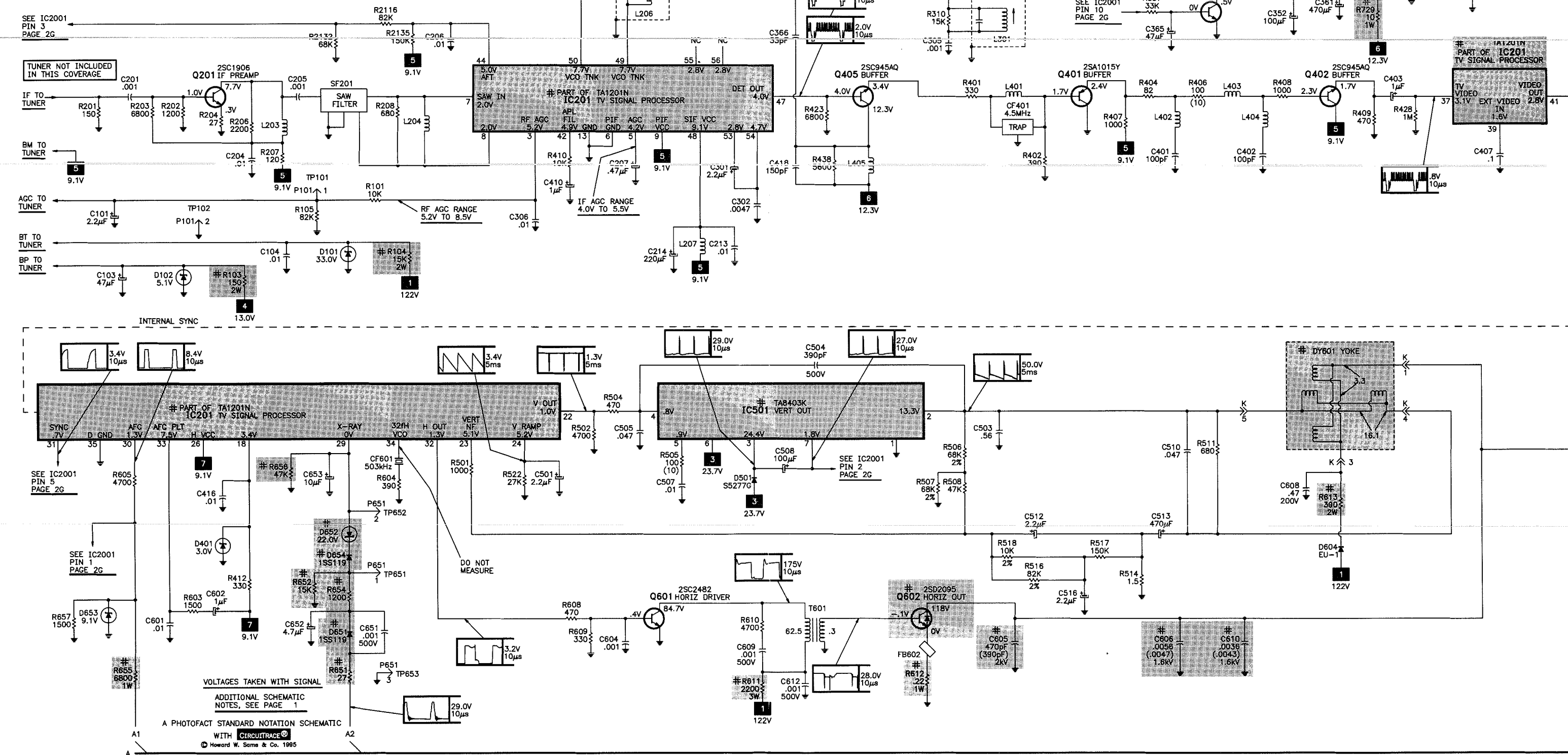
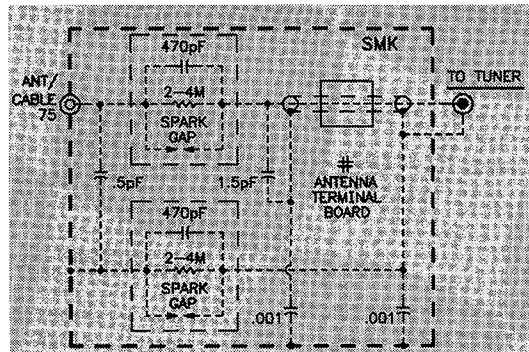
Operate the receiver for 15 minutes. Connect a color bar generator to the antenna terminals and tune in a dot pattern. Adjust the 4-pole magnet tabs to converge the red and blue dots at the center of the screen. Adjust the 6-pole magnet tabs to converge the red/blue dots over the green dots at the center of the screen.

NOTE: Rotate the two tabs of each set of magnets equally and opposite to converge vertically and rotate both tabs in the same direction to converge horizontally. The 4-pole and 6-pole magnets interact, repeat adjustment until center convergence is correct.

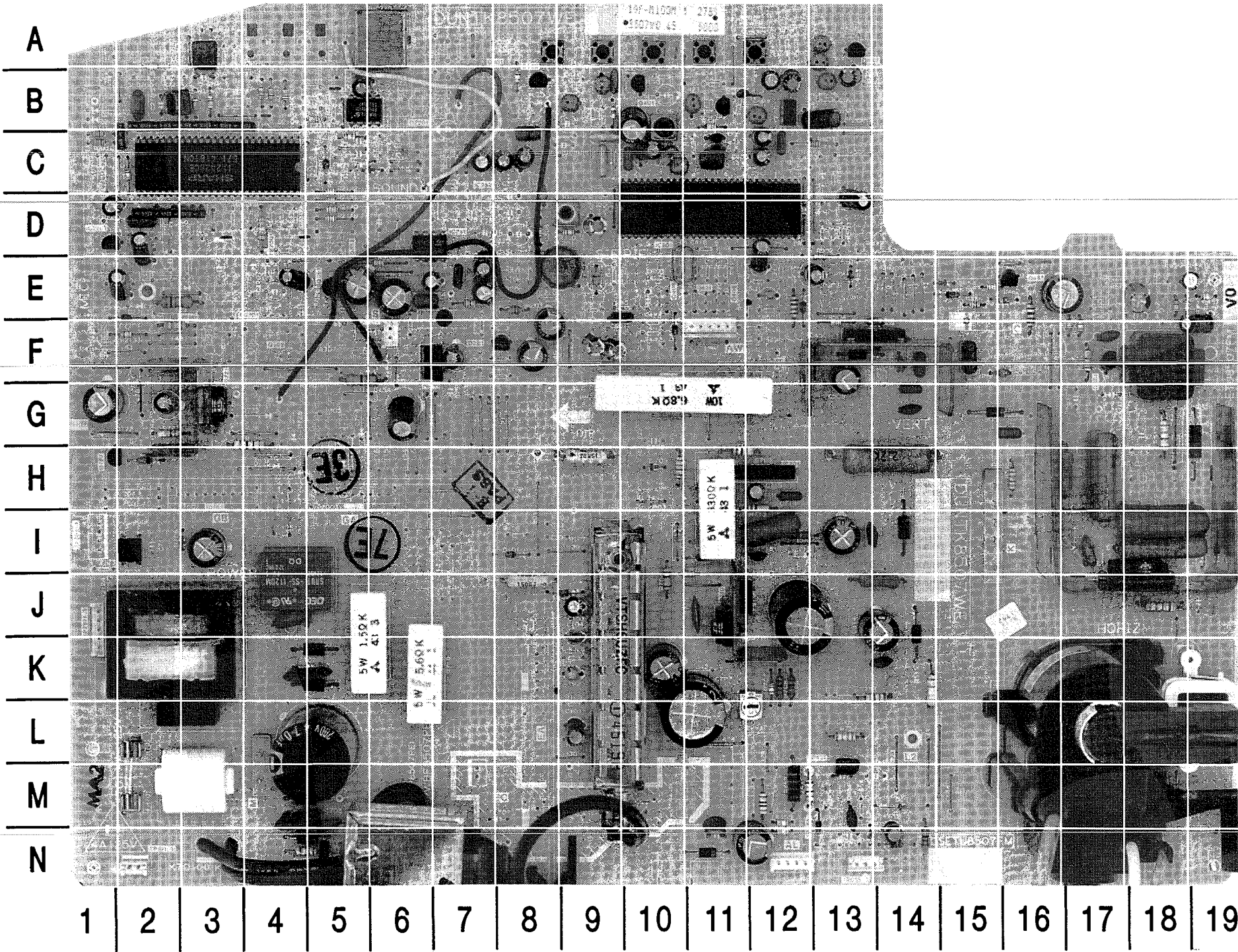
Tune in a crosshatch pattern and remove the rubber wedges between the deflection yoke and the CRT. Tilt the deflection yoke up or down to converge the vertical lines at top and bottom of screen and the horizontal lines at the right and left sides of the screen. Tilt the deflection yoke right or left to converge horizontal lines at top and bottom of screen and the vertical lines at the right and left sides of the screen. Repeat convergence procedure if necessary to obtain best overall convergence. Apply adhesive to wedges and carefully replace on the CRT.

CRT NECK ASSEMBLY





MAIN BOARD - TOP VIEW



A HOWARD W. SAMS GRIDTRACE™ PHOTO


MAIN BOARD - TOP VIEW, GRIDTRACE LOCATION GUIDE

AL	N-12	C605	I-17	D502	J-14	Q402	A-13	R721	G-2
AW	F-11	C606	I-18	D602	E-12	Q403	B-11	R729	G-4
C101	L-9	C608	H-17	D604	G-15	Q405	B-8	R751	M-12
C102	K-10	C609	F-17	D651	M-14	Q451	E-16	R752	L-13
C103	J-9	C610	I-18	D652	N-14	Q601	F-17	R753	K-14
C104	J-9	C612	G-14	D653	I-19	Q602	J-18	R754	J-14
C105	K-9	C651	M-13	D654	N-13	Q721	G-3	R755	F-5
C207	D-9	C652	N-14	D701	K-5	Q722	H-1	R805	C-7
C209	F-8	C653	B-13	D702	M-4	R103	J-8	R902	D-13
C211	F-9	C701	L-3	D703	K-5	R104	H-9	R2006	D-4
C213	C-10	C702	K-5	D704	N-5	R207	E-7	R2011	F-2
C214	B-10	C703	M-4	D705	I-2	R310	D-9	R2102	A-2
C301	C-10	C704	N-5	D706	I-3	R358	E-6	R2109	B-3
C302	C-10	C705	L-5	D708	I-11	R412	D-12	R2111	C-1
C305	D-8	C707	L-11	D709	H-10	R440	B-11	R2112	C-1
C306	D-8	C710	G-1	D710	J-11	R451	E-16	R2113	B-3
C351	E-7	C712	J-12	D721	H-2	R452	M-12	R2114	B-3
C352	E-7	C714	H-12	D751	N-11	R454	M-12	R2115	C-5
C353	E-6	C715	H-12	D752	I-14	R455	M-12	R2117	B-8
C354	E-6	C717	I-12	D2101	C-5	R456	N-12	R2118	C-5
C355	E-6	C718	I-12	D2103	C-6	R457	E-19	R2119	D-5
C361	E-5	C719	J-11	D2110	C-5	R459	E-15	R2120	D-5
C363	E-7	C721	G-2	D2701	E-2	R462	E-15	R2121	D-5
C365	E-4	C724	I-3	F701	M-2	R504	F-13	R2122	C-5
C366	B-9	C725	I-14	FB602	G-19	R506	F-17	R2128	B-4
C403	B-13	C751	N-12	FB701	J-12	R507	F-17	R2131	B-5
C404	C-12	C752	I-13	IC351	D-6	R511	H-16	R2133	F-2
C405	C-12	C754	G-6	IC501	F-13	R514	E-16	R2702	B-4
C407	C-8	C755	F-7	IC701	H-12	R515	K-14	R2703	B-4
C410	B-12	C756	M-11	IC751	F-7	R516	E-18	R2704	E-2
C412	C-11	C801	E-10	IC2001	C-3	R518	E-18	RMC2101	A-6
C413	B-11	C802	F-9	IC2701	D-1	R603	C-13	RY701	J-4
C414	F-8	C805	C-8	IC2702	B-5	R607	E-12	S	F-6
C415	D-10	C806	C-8	K	I-16	R610	F-17	S2001	A-12
C419	B-11	C807	C-7	L203	E-8	R611	H-13	S2002	A-8
C420	C-11	C2101	A-3	L204	E-9	R612	G-18	S2003	A-9
C421	C-11	C2102	C-2	L206	B-10	R613	H-17	S2004	A-10
C452	M-13	C2105	B-3	L207	C-10	R651	N-14	S2005	A-11
C453	F-19	C2701	D-2	L301	D-9	R655	J-18	SF201	E-9
C501	E-12	C2702	D-1	L401	B-9	R657	J-18	T601	F-18
C502	E-12	C2703	B-5	L402	A-13	R701	N-4	T602	L-17
C503	F-15	C2704	E-2	L403	B-13	R702	K-5	T701	K-2
C504	F-14	CF301	C-9	L404	A-13	R703	I-11	TP101	N-2
C505	F-14	CF302	C-9	L405	B-9	R704	J-10	TP102	N-2
C507	G-14	CF401	B-9	L406	B-12	R705	K-12	TP201	K-1
C508	G-13	CF601	B-12	L407	B-11	R706	L-12	TP202	K-1
C510	G-16	CF2101	B-2	L701	M-3	R707	K-12	TP203	J-1
C512	E-18	CF2102	D-2	M	M-4	R708	K-12	TP204	J-1
C513	E-17	D101	I-8	MP2001	B-3	R710	I-12	TP205	J-1
C514	J-14	D102	J-9	MP2002	C-2	R711	H-11	TP651	N-13
C515	K-14	D401	F-10	MP2003	D-2	R712	H-11	TP652	N-13
C516	E-19	D451	M-13	P703	N-3	R713	H-12	TP653	N-14
C601	C-12	D453	E-13	PR701	J-4	R715	H-10	TP2001	C-2
C602	D-13	D454	E-15	Q201	F-8	R716	H-11	TP2002	F-2
C603	E-13	D455	E-15	Q351	E-5	R717	G-10	X801	E-10
C604	F-16	D501	F-13	Q401	B-10	R719	K-6		

PARTS LIST

SEMICONDUCTORS					
(Select the replacement that gives the best results.)					
Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
D101	-	RH-EX0701GEZZ	-	-	-
D102	-	RH-EX0294CEZZ	-	-	-
D401	-	RH-EX0280CEZZ	-	-	-
D451	-	RH-EX0103CEZZ	NTE5011A	ECG5011A	SK5A6
D453, 54	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
	1N4148	RH-DX0045GEZZ	NTE519	ECG519	SK3100
D455	-	RH-EX0092CEZZ	NTE5006A	ECG5006A	SK3A6
D501	S5277G	RH-DX0110CEZZ	NTE116	ECG116	SK3312
# D502	EU-1	RH-DX0131CEZZ	NTE552	ECG552	SK9000
D602	-	RH-EX0312CEZZ	-	-	-
D604	EU-1	RH-DX0131CEZZ	NTE552	ECG552	SK9000
# D651	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
# D651	1N4148	RH-DX0045GEZZ	NTE519	ECG519	SK3100
	-	RH-EX0091CEZZ	NTE5030A	ECG5030A	SK22A
D653	-	RH-EX0313CEZZ	-	-	-
# D654	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
# D654	1N4148	RH-DX0045GEZZ	NTE519	ECG519	SK3100
	# D701 Thru				
# D704	1S1887A	RH-DX0154CEZZ	NTE552	ECG552	SK9000
# D705	1D4B42	RH-DX0200CEZZ	NTE5332	ECG5332	SK9232
D706	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
	1N4148	RH-DX0045GEZZ	NTE519	ECG519	SK3100
# D708	-	RH-EX0238CEZZ	-	-	-
# D709	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
# D709	1N4148	RH-DX0045GEZZ	NTE519	ECG519	SK3100
	S6785G	VHSS6785GLB2E	-	-	-
# D710	-	RH-EX0019TAZZ	NTE5022A	ECG5022A	SK13A
D721	-	RH-DX0131CEZZ	NTE552	ECG552	SK9000
# D751	EU-1	RH-DX0240CEZZ	-	-	-
# D752	-	RH-DX0240CEZZ	-	-	-
D881, 82	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
	1N4148	RH-DX0045GEZZ	NTE519	ECG519	SK3100
D885	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
D885	1N4148	RH-DX0045GEZZ	NTE519	ECG519	SK3100
	-	RH-EX0294CEZZ	-	-	-
D2101	-	RH-EX0294CEZZ	-	-	-
D2103, 10	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
	1N4148	RH-DX0045GEZZ	NTE519	ECG519	SK3100
D2701	-	RH-EX0294CEZZ	-	-	-
# IC201	TA1201N	RH-iX2429CEZZ	-	-	-
IC351	TDA7233	VHITDA7233/-1	-	-	-
# IC501	TA8403K	RH-iX1011CEZZ	-	-	-
# IC701	T2508	RH-iX0137CEZZ	NTE1751	ECG1751	-
# IC751	TA7809S	VHITTA7809S/-1	-	-	-
IC2001	-	RH-iX2428CEN1	-	-	-
IC2701	PST529C-2	VHIPPST529C2-1	-	-	-
IC2702	ST24C01B1	RH-iX2447CEZZ	-	-	-
MP2001	-	RMPTJ0154CEZZ	-	-	-
MP2002	-	RMPTJ0152CEZZ	-	-	-
MP2003	-	RMPTJ0153CEZZ	-	-	-
Q201	2SC1906	VS2SC1906//1E	NTE107	ECG107	SK3293
Q351	2SC945AQ	VS2SC945AQ/-1	NTE85	ECG85	SK3124A
	2SC1815Y	VS2SC1815YW-1	NTE85	ECG85	SK3124A
# For SAFETY use only equivalent replacement part.					

SEMICONDUCTORS continued					
(Select the replacement that gives the best results.)					
Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
Q401	2SA1015Y	VS2SA1015Y/1E	NTE290A	ECG290A	SK9132
Q402	2SC945AQ	VS2SC945AQ/-1	NTE85	ECG85	SK3124A
	2SC1815Y	VS2SC1815YW-1	NTE85	ECG85	SK3124A
Q403	2SA1015Y	VS2SA1015Y/1E	NTE290A	ECG290A	SK9132
Q405	2SC945AQ	VS2SC945AQ/-1	NTE85	ECG85	SK3124A
	2SC1815Y	VS2SC1815YW-1	NTE85	ECG85	SK3124A
Q451	2SC945AQ	VS2SC945AQ/-1	NTE85	ECG85	SK3124A
Q601	2SC1815Y	VS2SC1815YW-1	NTE85	ECG85	SK3124A
	2SC2482	VS2SC2482//1	NTE399	ECG399	SK9352
# Q602	2SC2610(BK)	VS2SC2610/1E	NTE399	ECG399	SK9352
	2SD2095	VS2SD2095//1E	NTE2331	ECG2331	SK10088
Q721	2SC1983	VS2SC1983//2	NTE56	ECG56	SK3929
Q722	2SC945AQ	VS2SC945AQ/-1	NTE85	ECG85	SK3124A
	2SC1815Y	VS2SC1815YW-1	NTE85	ECG85	SK3124A
Q852, 54, 56	2SC2229(O)	VS2SC2229O/1E	NTE399	ECG399	SK3244
Q881	2SA1015Y	VS2SA1015Y/1E	NTE290A	ECG290A	SK9132
# For SAFETY use only equivalent replacement part.					

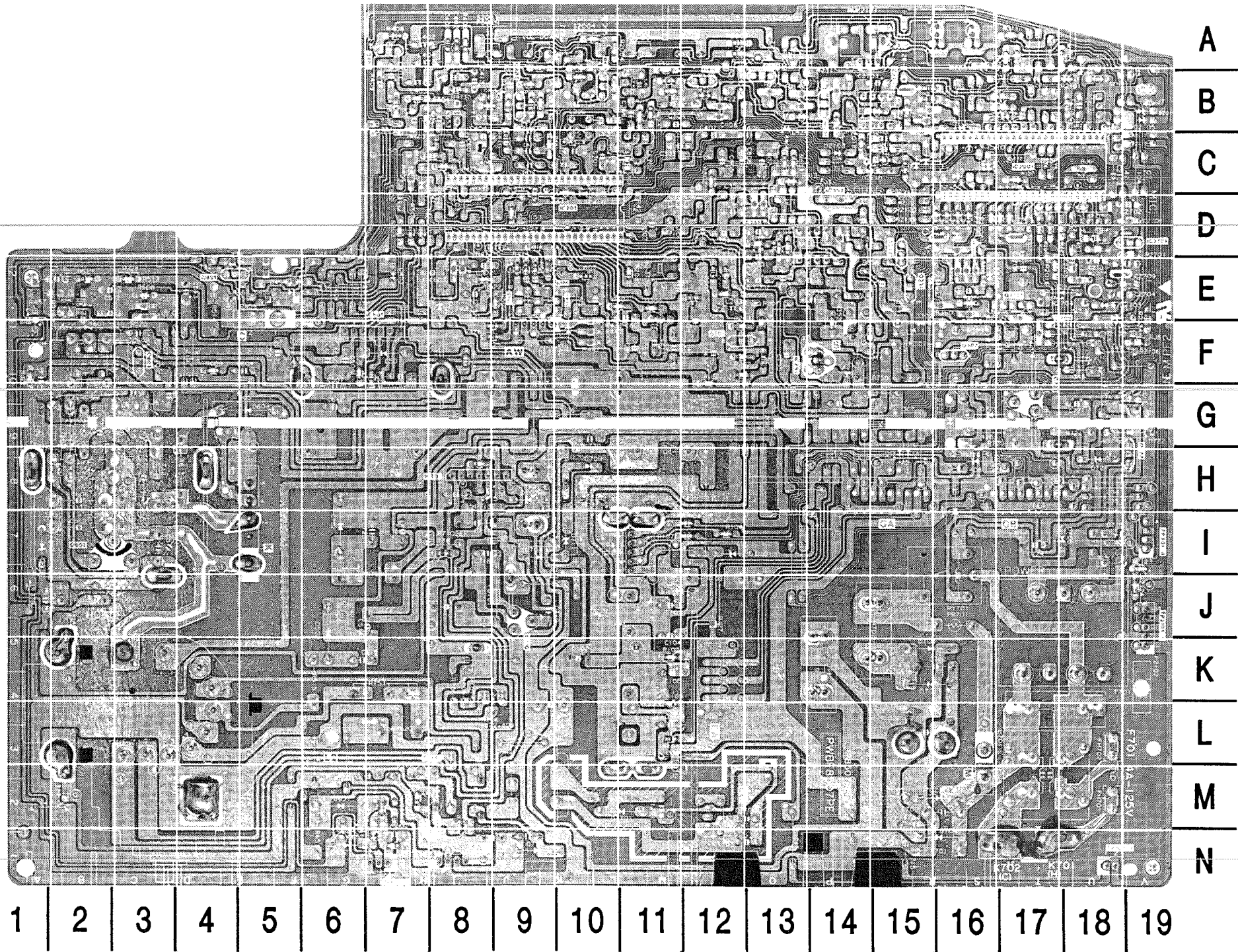


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COILS & TRANSFORMERS			
Item No.	Function/Rating	Mfr. Part No.	On-Unit No.
# DY601	Yoke 90° Horiz 2.4mH Vert 31.4mH	RCiLH0054MEZZ	H0053ME
FB602	Ferrite Bead	RBLN-0037CEZZ	-
FB701	Ferrite Bead	RBLN-0037CEZZ	-
L203	8.2µH	VP-XFR82K0000	-
L204	.68µH	VP-ZFR68K0000	-
L206	VCO	RCiLi0588CEZZ	-
L207	180MHz Filter	RCiLP0094CEZZ	-
L301	SIF	RCiLi0591CEZZ	-
L401	12µH	VP-MK120K0000	-
L402	10µH	VP-MK100K0000	-
L403	10µH	VP-MK100K0000	-
L404	6.8µH	VP-MK6R8K0000	-
L405	8.2µH	VP-0F8R2K0000	-
L406	68µH	VP-MK680K0000	-
L407	68µH	VP-MK680K0000	-
# L701	Line Filter	RCiLF0003PEZZ	F0003PE
# L702	Line Filter	RCiLF0254CEZZ	-
	Degaussing	RCiLG0014MEZZ	-
L851	220µH	VP-MK221K0000	-
T601	Horizontal Driver	RTRNZ0367CEZZ	Z0367CE
# T602 (1)	Horizontal Output	RTRNF0059PEZZ	F0058PE-M
# T701	Power	RTRNP0416CEZZ	P0416CE
# For SAFETY use only equivalent replacement part.			
(1) Focus and screen controls are part of T602.			

MAIN BOARD - BOTTOM VIEW



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MAIN BOARD - BOTTOM VIEW,
GRIDTRACE LOCATION GUIDE

C201	F-13	R423	B-11
C204	E-12	R424	E-9
C205	E-12	R425	F-9
C206	D-9	R426	E-9
C210	E-12	R428	B-7
C212	E-11	R438	B-11
C401	A-8	R439	D-10
C402	A-8	R441	C-9
C416	D-9	R453	M-7
C418	B-11	R501	D-7
C422	B-12	R502	E-9
C713	I-8	R505	F-7
C803	E-10	R508	E-3
C2103	D-18	R517	E-2
C2104	B-18	R522	E-8
C2106	B-18	R604	B-7
C2107	B-15	R605	C-8
C2108	B-15	R608	F-8
C2109	D-16	R609	F-4
C2110	D-16	R652	N-7
C2111	D-16	R654	M-7
C2112	D-16	R656	C-8
R101	L-11	R709	H-8
R105	L-11	R727	D-18
R106	I-12	R801	E-11
R107	I-12	R802	C-12
R108	I-12	R803	C-13
R201	F-12	R804	C-13
R202	F-12	R901	D-7
R203	F-12	R2001	A-16
R204	F-13	R2002	A-12
R206	E-12	R2003	A-12
R208	E-11	R2004	B-10
R209	E-11	R2005	A-10
R303	C-11	R2014	D-17
R351	D-13	R2015	D-17
R352	F-14	R2016	E-17
R355	D-13	R2017	D-18
R357	E-16	R2018	C-14
R401	B-11	R2101	B-18
R402	B-10	R2103	A-18
R404	B-9	R2104	B-17
R406	A-8	R2105	B-17
R407	B-10	R2106	A-17
R408	A-7	R2116	C-15
R409	B-7	R2123	I-19
R410	C-9	R2124	J-19
R411	B-8	R2130	B-15
R413	E-9	R2132	C-15
R414	E-9	R2134	E-19
R415	E-9	R2135	B-14
R416	B-9	R2701	D-19
R417	B-9		
R418	B-9		
R419	B-8		

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MODELS 19F-M100M / M120 / M150

PARTS LIST continued

CONTROLS & RESISTORS			
Item No.	Function/Rating	Mfr. Part No.	NTE Part No.
# PR701	12.4 Cold PTC	RMPTP0026CEZZ	-
# R103	150 5% 2W	VRS-VV3DB151J	2W115
# R104	15K 5% 2W	VRS-VV3DB153J	2W315
# R452	5600 10% 1/2W	VRC-MA2HG562K	HW256
# R454	10K 5% 1/2W	VRS-SV2HC103J	HW310
R506	68K 2% 1/8W	VRD-RA2BE683G	EW368
R507	68K 2% 1/8W	VRD-RA2BE683G	EW368
# R515	3.9 5% 1W	VRN-VV3AB3R9J	1W3D9
R516	82K 2% 1/8W	VRD-RA2BE823G	EW382
R518	10K 2% 1/8W	VRD-RA2BE103G	EW310
# R611	2200 5% 3W	VRS-SV3LB222J	3W222
# R612	.22 5% 1W	VRN-VV3ABR22J	1WD22
# R613	390 5% 2W	VRS-VV3DB391J	2W139
# R651	27 5% 1/4W	VRD-RA2EE270J	QW027
# R652	15K 5% 1/8W SMT	-	-
# R654	1200 5% 1/8W SMT	-	-
# R655	6800 5% 1W	VRS-VV3AB682J	1W268
# R656	47K 5% 1/8W SMT	-	-
# R701	820K 5% 1/2W	VRD-RM2HD824J	HW482
# R702	1.5 10% 5W Wirewound	VRW-KQ3HC1R5K	5W1D5
# R705	100K 2% 1/4W	VRD-RA2EE104G	QW410
# R706	1000 122V	RVR-M4328CEZZ	-
# R707	100K 5% 1/8W	VRD-RA2BE104J	EW410
# R708	5600 2% 1/4W	VRD-RA2EE562G	QW256
# R713	33 5% 1/2W	VRD-RM2HD330J	HW033
# R715	150 5% 1/2W	VRS-SV2HC151J	HW115
# R716	330 10% 5W Wirewound	VRW-KQ3HC331K	5W133
# R717	6.8 10% 10W Wirewound	VRW-KQ4AC6R8K	10W6D8
# R719	5.6 10% 5W Wirewound	VRW-KQ3HC5R6K	-
# R729	10 5% 1W	VRS-VV3AB100J	1W010
# R751	10 5% 1/2W	VRS-SV2HC100J	HW010
# R752	1.2 5% 2W	VRN-VV3DB1R2J	2W1D2
# R753	1 5% 2W	VRN-VV3DB1R0J	2W1D0
# R754	1 5% 1W	VRN-RV3AB1R0J	1W1D0
# R755	33 5% 1W	VRS-VV3AB330J	1W033
# R857	12K 5% 1W	VRS-VV3AB123J	1W312
# R865	12K 5% 1W	VRS-VV3AB123J	1W312
# R873	12K 5% 1W	VRS-VV3AB123J	1W312
# R2704	100 5% 1W	VRS-VV3AB101J	1W110
# For SAFETY use only equivalent replacement part.			

CAPACITORS & ELECTROLYTICS		
Item No.	Rating	Mfr. Part No.
C105	22µF 10% 16V Tantalum	VCSATA1CE226K
C351	2.2µF 20% 50V NP	VCE9GA1HW225M
C420	27pF 5% 50V NPO	VCCCPA1HH270J
C421	18pF 5% 50V NPO	VCCCPA1HH180J
C501	2.2µF 10% 16V Tantalum	VCSATA1CE225K
# C605	470pF 10% 2kV	-
	390pF 10% 2kV	RC-KZ0037CEZZ
# C606	.0056 5% 1.6kV	-
	.0047 5% 1.6kV	VCFFPD3CA472J
# C610	.0036 5% 1.6kV	-
	.0043 5% 1.6kV	VCFFPD3CA432J
# C701	.047 20% 125VAC	RC-QZ005SCEZZ
# C705	470µF 200V	RC-EZ0082CEZZ
# C707	220µF 200V	VCEAGH2DW227M
# C712	100µF 160V	RC-EZ0378CEZZ
# C714	.01 10% 50V	VCQYTA1HM103K
C854	.01 250V	-
	.01 1.4kV	RC-KZ0016CEZZ
# For SAFETY use only equivalent replacement part.		

CABINET PARTS	
Item	Part No.
MODEL 19F-M100M	
Button - Assembly	JBTN-1050MEKA
Cabinet Front	GCABA1188MEKA
Cabinet Front Complete	CCABA1188MESO
Cabinet Rear	GCABB1087MEKA
Window - Remote Receiver	GMADT0074MEKA
MODEL 19F-M120	
Button - Assembly	JBTN-1050MEKA
Cabinet Front	GCABA1189MEKA
Cabinet Front Complete	CCABA1189MESO
Cabinet Rear	GCABB1087MEKA
Speaker Grille	HDECA0093MESB
Window - Remote Receiver	GMADT0074MEKA
MODEL 19F-M150	
Button - Assembly	JBTN-1050MEKB
Cabinet Front	GCABA1189MEKB
Cabinet Front Complete	CCABA1189MES1
Cabinet Rear	GCABB1087MEKB
Speaker Grille	HDECA0093MESB
Window - Remote Receiver	GMADT0074MEKA

MISCELLANEOUS			
Item No.	Description	Mfr. Part No.	Notes
CF301	Filter	RFILC0001AJZZ	4.5MHz
CF302	Filter	RFILC0267CEZZ	4.5MHz
CF401	Trap	RFILC0002AJZZ	4.5MHz
CF601	Crystal	RFILA0034CEZZ	503kHz
CF2101	Crystal	RFILC0121GEZZ	-
CF2102	Crystal	RFILC0327GEZZ	-
# F701	Fuse	QFS-B4023CEZZ	4Amp, 125VAC, Slow Blow
	Fuse	QFS-B4021CEZZ	4Amp, 125VAC, Slow Blow
# P703 (1)	Line Cord	QACCD3030CESA	AC, Polarized
(2)	Line Cord	QACCD3030CESB	AC, Polarized
RMC2101	Receiver	RRMCU0215CEZZ	Remote
# RY701	Relay	RRLYU0022CEZZ	Power
S2001	Switch	QSW-K0079GEZZ	Power
S2002	Switch	QSW-K0079GEZZ	Channel Up
S2003	Switch	QSW-K0079GEZZ	Channel Down
S2004	Switch	QSW-K0079GEZZ	Volume Up
S2005	Switch	QSW-K0079GEZZ	Volume Down
SF201	Filter	RFILC0137CEZZ	SAW
SP1	Speaker	VSP0080P-E98S	3", 8 Ohms, 2W
# V101	CRT	VB48AAB36X/*S	A48KZL90X
X801	Crystal	RCRSB0001PEZZ	3.58MHz
	Fuse Holder	QFSHD1013CEZZ	-
	Fuse Holder	QFSHD1014CEZZ	-
	PC Board (3)	DUNTK8270WEV0	CRT
	PC Board (3)	DUNTK8269WEV0	Main
	Socket	QSOCV0913CEZZ	CRT
#	Terminal	QTANZ0131CEZZ	Antenna, KUNII or SMK
	Transmitter (1)	RRMCG1018CESA	Remote
	Transmitter (2)	RRMCG1018CESB	Remote
#	Tuner (3)	VTUVTSH6UZFC/	UHF/VHF
	Wedge	PSPAG0012MEZZ	Yoke Positioning (3 Used)
# For SAFETY use only equivalent replacement part.			
(1) Used in models 19F-M100M and 19F-M120.			
(2) Used in model 19F-M150 only.			
(3) Contact PTS Electronics Corporation for replacement; order by manufacturer's part number.			

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MODELS 19F-M100M / M120 / M150